



ADDENDUM NO. 03

To: Prospective Bidders & Plan Holders

From: Craig A. Johnson, P.E.
Crist Engineers, Inc.

Date: July 12, 2023

Project: Gulpha Basin Pump Station Improvements
Hot Springs, Arkansas

Original Bid Date: June 26, 2023

Revised Bid Date: July 17, 2023

Bid Time: 2:00 PM

Location: Hot Springs Purchasing Office
324 Malvern Avenue
Hot Springs, Arkansas 71901

The BIDDER shall properly acknowledge Addendum No. 03 as required in Article 3 of Document 004100 on the Bid Form as confirmation that the BIDDER has examined the following Addenda and the related changes to the Contract Documents. Lack of proper acknowledgement on the Bid Form may deem a bid non-responsive.

The Contract Documents dated May 31, 2023, are hereby amended as follows:





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IMPORTANT REMINDERS:

The bid opening for this project has changed from the Bid Set documents.

The Bid Date per this Addendum (Addendum No. 02) is **July 17, 2023, at 2:00 PM**

Please reference Section 002113 - Instructions to Bidders, provided in the contract documents for information required for the bid submission.

Please reference Article 7 for attachment to the bid.

CLARIFICATIONS:

1. Contractor Questions

- A. A list of all contractor questions received to date is attached to this addendum as supplemental information for contractors use.

BID DOCUMENTS:

SPECIFICATIONS:

1. Section 279500 – Commissioning for Instrumentation and Controls

- A. Add Specification 279500 – Commissioning for Instrumentation and Controls

2. Section 331216 – Wastewater Valves (Addendum No. 2)

- A. Paragraph 2.2.: Modify as follows:

- i. ~~J. — Buried valves should have extended bonnets (ENK) to bring the Rotork electric motor operator above grade and eliminate the need for valve box. Length should be specified from centerline of valve to motor operator flange. Extension shall be provided by the valve manufacturer.~~

- B. Delete section 2.3 Electric Motor Operator

3. Section 444613 – Shaftless Spiral Conveyor (Addendum No. 2)

- A. Paragraph 2.2.B.: Add the following sentence:

- i. **B. THE SCHROUD ON THE EXISITNG SCREEN SHALL BE COMPLETELY REPLACED TO ACCOMODATE CONNNECTION TO THE TRANSPORTER.**

DRAWINGS:

1. Drawing G-2 – GENERAL CONSTRUCTION NOTES



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- A. Modify this drawing as shown on Addendum No. 03 – GENERAL CONSTRUCTION NOTES, attached hereto.
- 2. Drawing Q-1 – BYPASS CONSTRUCTION SEQUENCE 1 & 2 (Addendum No. 02)
 - A. Modify this drawing as shown on Addendum No. 03 – BYPASS CONSTRUCTION SEQUENCE 1 & 2, attached hereto.
- 3. Drawing CZ-5 – CIVIL STANDARD DETAILS V (Addendum No. 02)
 - A. Modify this drawing as shown on Addendum No. 03 – CIVIL STANDARD DETAILS V, attach hereto.
- 4. Drawing M-1 – HEADWORKS PLAN & SECTION (Addendum No. 02)
 - A. Modify this drawing as shown on Addendum No. 03 – HEADWORKS PLAN & SECTION, attached hereto.
- 5. Drawing M-7 – SURGE TANKS
 - A. Modify this drawing as shown on Addendum No. 03 – SURGE TANKS, attached hereto.

END ADDENDUM NO. 03

City of Hot Springs

Gulpha Basin Pump Station Improvements

CONTRACTOR QUESTIONS RECEIVED TO DATE:

40. "The drawings on page E11 indicate that the ducts are to be sand backfilled, but the specs #261300-10 indicate concrete encased. It also looks like Sched 40 PVC underground changing over to PCS when emerging, but I cannot find where it specifically says that and in one place in the specs it mentions PCS (pvc coated rigid) for the underground.

Regarding duct bank construction: 261300-10 refers to "as specified in Duct Bank Section [261330]". Section 261330 3.03(B)(1) requires concrete encasement "unless otherwise indicated on Drawings." Drawing detail 4/E11 requires sand backfill.

Regarding conduit material. 261300-12 states

2. Concrete-encased and embedded conduits:
 - a. Straight runs and bends less than 45 degrees:
 - 1) Type PVC Schedule 40.
 - b. Bends with total deflection greater than 45 degrees;
 - 1) PCS,
 - c. Entering and exiting duct bank, underground or embedded conduit runs a minimum 12 inches above and below grade, finished floor, or entering equipment:
 - 1) PCS."

41. And lastly, if it is to be Sch 40 underground, do we need to transition of PVC Coated Rigid when emerging enclosed in a cabinet?

Regarding emergence of conduit. Schedule 40 PVC conduit shall not be exposed.

SECTION 279500

COMMISSIONING FOR INSTRUMENTATION AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Testing requirements that apply to process control and instrumentation systems for the entire Project.
 - 2. Some SCADA/HMI software configuration will be provided by the Owner.
SPECIFICALLY, THE PLANT CONTROL PANEL PLC AND PLANT HMI CONFIGURATION WILL BE BY OWNER, ALL OTHER INSTALLATION, TESTING, CALIBRATION, PROGRAMMING, AND INTEGRATION SHALL BE BY CONTRACTOR.

1.2 REFERENCES

- A. As specified in the Common Work Results for Process Control and Instrumentation Systems Section.
- B. Electronics Industries Alliance (EIA).
- C. Telecommunications Industry Association (TIA).

1.3 DEFINITIONS

- A. As specified in the Commissioning Section and the Common Work Results for Process Control and Instrumentation Systems Section.
- B. Specific definitions:
 - 1. Complete End-to-End Testing (CEET) - Signals are tested from the field device through the PLC program, the network, and all the way to the operator's HMI graphic screens.
 - 2. Loop Validation Tests - Signals are tested from the field device to the PLC.
 - 3. Platform Testing: Testing of the PLC and SCADA/HMI at the manufacturer's shop to demonstrate the program's functionality based upon specified and designed control requirements.
 - 4. PTO: Profibus Trade Organization.

1.4 SYSTEM DESCRIPTION (NOT USED)

1.5 SUBMITTALS

- A. General:
 - 1. Reference additional detailed test submittal scheduling and prerequisite requirements as specified in the Sequencing article of the Common Work Results for Process Control and Instrumentation Systems Section.

- B. Overall test plan:
1. Develop the PCIS system test submittals in consultation and cooperation with all applicable subcontractors.
 2. Develop and submit an overall testing plan for the PCIS. The overall test plan to be reviewed and approved by the Engineer before detailed test plans, procedures, and forms will be reviewed.
 3. Describe the test phases as they apply specifically to this Project and each process system.
 4. Provide a preliminary testing schedule to show the sequence of tests and commissioning as they apply to each process system and each PLC.
 5. Provide a description of factory tests. Describe what equipment will be included, what testing equipment will be used, and the simulator that will be used.
 6. Provide examples of proposed forms and checklists.
- C. Test procedures:
1. Develop and submit detailed test procedures to show that the integrated SCADA system hardware and software is fully operational and in compliance with the requirements specified in the Contract Documents.
 2. Provide a statement of test objectives for each test.
 3. Prepare specific procedures for each process system.
 4. Describe sequentially the steps to be followed in verifying the correct operation of each process system, including all features described in the loop descriptions, control strategies, and shown in the P&IDs. Implied or generic test procedures are not acceptable.
 5. Specify who will perform the tests, specifically what testing equipment will be used (including serial numbers and NIST-traceable calibration), and how the testing equipment will be used.
 6. Describe the expected role of the Engineer, as well as any requirements for assistance from Owner's staff.
 7. Provide the forms and checklists to be used.
- D. Test forms:
1. Submit completed calibration forms, test forms, and checklists.
 - a. Test forms shall include the detailed test procedures or shall include clear references to separate pages containing the complete test procedure applicable to each form. If references to procedures are used, the complete procedure shall be included with each test binder.
 - b. Every page of each test form shall include project name, date, time, name of person conducting the test, signature of person conducting the test, and for witnessed tests, place for signature of person (Engineer and Owner) witnessing the test.
 - c. Sample test forms at the end of this Section show the minimum required content.
 - 1) The sample test forms have not been customized for this Project.
 - 2) Contractor shall develop and submit test forms customized for the Project and meeting the specified test and submittal requirements.
- E. Details on the simulator construction, components, and operation. Testing binders:
1. Sub-system to be tested, provide, and submit a test binder containing all test procedures and individual test forms for the test. References to other documents for test procedures and requirements are not acceptable.
 2. Fill out in advance headings and all other information known before the test.
 3. Include applicable test plan information, as well as a list of all test prerequisites, test personnel, and equipment.
 4. Include or list reference material and provide separately at the time of the test.
 5. Record test results and verify that all test requirements and conditions have been met.

- F. Test reports:
 - 1. At the conclusion of each test, submit a complete test report, including all test results and certifications.
 - 2. Include all completed test binders, forms, and checklists.
 - 3. Submission, review, and acceptance of each test report is required before the start of the sub-system.

1.6 QUALITY ASSURANCE

- A. Test personnel:
 - 1. Furnish qualified technical personnel to perform all calibration, testing, and verification. The test personnel are required to be familiar with this Project and the equipment, software, and systems before being assigned to the test program.

1.7 DELIVERY, STORAGE, AND HANDLING (NOT USED)

1.8 PROJECT OR SITE CONDITIONS (NOT USED)

1.9 SEQUENCING (NOT USED)

1.10 SCHEDULING

- A. As specified in the Common Work Results for Process Control and Instrumentation Systems Section.

1.11 WARRANTY (NOT USED)

1.12 SYSTEM START-UP (NOT USED)

1.13 OWNER'S INSTRUCTIONS (NOT USED)

1.14 MAINTENANCE (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION (NOT USED)

3.2 PREPARATION (NOT USED)

3.3 INSTALLATION

- A. As specified in the Common Work Results for Process Control and Instrumentation Systems Section.

- B. Installation supervision:
 - 1. Provide as specified in the Common Work Results for Process Control and Instrumentation Systems Section.

3.4 ERECTION, INSTALLATION, APPLICATION, CONSTRUCTION (NOT USED)

3.5 REPAIR/RESTORATION (NOT USED)

3.6 COMMISSIONING

A. Testing and training phase:

1. Source testing:
2. Owner training:
3. Installation testing:
 - a. Calibration:
 - 1) Performed by Contractor and ICSC.
 - 2) Calibrate and adjust all instruments, devices, valves, and systems, in conformance with the component manufacturer's instructions and as specified in these Contract Documents.
 - 3) Replace either individually or within a system, defective elements that cannot achieve proper calibration or accuracy.
 - a) Calibration for discrete devices:
 - (1) Calibrate and adjust devices for reliable operation and to avoid nuisance tripping.
 - b) Calibration for ultrasonic and radar level devices:
 - (1) Provide Echo Transmission and signal quality on level transmitters including guided and unguided units.
 - (a) Submit printout of the actual transmission and parameters.
 - (2) Adjust mounting, as required, to obtain accurate readings.
 - (3) Post mounting: Provide any additional calibration required by manufacturer.
 - c) Calibrating analog transmitters:
 - (1) Components having adjustable features are to be set accurately for the specific conditions and applications of this installation.
 - (2) Test and verify that components and/or systems are within the specified limits of accuracy.
 - (3) Calibration points:
 - (a) Calibrate each analog instrument at 0 percent, 25 percent, 50 percent, 75 percent, and 100 percent of span, using test instruments with accuracies traceable to NIST.
 - (4) Field verify calibration of instruments including units that have been factory-calibrated to determine whether any of the calibrations are in need of adjustment.
 - d) Analyzer calibration:
 - (1) Calibrate and test each analyzer system as a workable system after installation. Follow the testing procedures directed by the manufacturers' technical representatives.
 - (2) Submit completed instrument calibration sheets for every field instrument and analyzer.
 - (3) Calibration tags:
 - (a) Attach a calibration and testing tag to each instrument, piece of equipment, or system.
 - (b) Sign the tag when calibration is complete.
 - e) Calibration for industrial networking test equipment:
 - f) Submit calibration documentation.
 - b. Loop check:
 - 1) Performed by the Contractor.
 - 2) Cabling installed, terminated, and labeled.
 - 3) Perform continuity check of wiring to each field device through intermediate devices to field terminals in the cabinet.
 - 4) Complete loop check form for each device.
 - 5) Submit loop check test results before proceeding to the next step.
 - c. Loop validation tests:

- 1) Performed by the Contractor, ICSC, and manufacturer's representative, working together, and witnessed by the Owner or Owner's representative.
- 2) Perform tests on the signal from each field device through intermediate devices to the I/O module on the PLC.
 - a) The PLC may or may not be connected to the network.
- d. Complete End-to-End Testing (CEET):
 - 1) Performed by Contractor, ICSC, manufacturer's representative working together, with assistance from the OWNER or the inspection staff, as needed.
 - a) The participants need to be dedicated full-time to CEET.
 - b) ICSC will provide staff to verify input signals at, and create output signals from, an HMI or Engineering Workstation.
 - c) Contractor and ICSC will be responsible for creating field signals and verifying proper operation of final control elements.
 - 2) Prerequisites:
 - a) CEET cannot begin until the successful completion of the preceding tests:
 - (1) Calibration.
 - (2) Loop check.
 - (3) Loop validation tests.
 - (4) LAN cable post-testing.
 - (5) Industrial network testing.
 - 3) Testing description:
 - a) This testing is to ensure all I/O signals operate to the intent of the design from the field device to the HMI and all other auxiliary controls and indicators in the PCS.
 - b) Connect PLC to the network to test signals from the field device through the PLC program, the network, and to the operator's HMI graphic screens. The outputs will be energized for a duration long enough to verify proper operation of the final control element.
 - c) SCADA screens:
 - (1) Test and record operator commands and signal readouts to each operator device where there is more than one operator interface point.
 - (2) For each signal, perform separate tests for SCADA computer screens, local operator interface (LOI) screens, and local control panels.
 - (3) Retest any loop following any necessary corrections.
 - 4) Check control loops under simulated operating conditions by causing a range of input signals at the primary control elements and observing appropriate responses of the respective control and monitoring elements, final control elements, and the graphic displays associated with the HMI/SCADA system.
 - a) Use actual process inputs wherever available.
 - b) Issue commands from the HMI/SCADA system and verify proper responses of field devices.
 - (1) Test SCADA system inputs from field device to SCADA system operator workstations.
 - (a) Track responses through trend charts in the HMI/SCADA system.
 - (2) Test SCADA system outputs from SCADA operator workstations to field devices and equipment.

- 5) Discrete device testing:
 - a) Exercise each field device providing a discrete input to the HMI/SCADA system in the field and observe the proper operation shall be observed at the operator workstation:
 - (1) Test limit switches, set limits mechanically, and observe proper operation at the operator workstation.
 - (2) Exercise starters, relay contacts, switch contacts, and observe proper operation.
 - (3) Calibrate and test instruments supplying discrete inputs and observe proper operation.
 - b) Test each device accepting a discrete output signal from the HMI/SCADA. Perform the appropriate operator action at the SCADA operator stations (including LOIs, if present) and confirm the proper operation of the field device:
 - (1) Stroke valves through outputs from the HMI/SCADA system and confirm proper directional operation. Confirm travel limits and any feedback signals to the HMI/SCADA system.
 - (2) Exercise motors starters from the HMI/SCADA system and verify proper operation through direct field observation.
 - (3) Exercise solenoids and other field devices from the HMI/SCADA system and verify proper operation through direct field observation.
- 6) Analog device testing:
 - a) Apply continuously variable up and down analog inputs to verify the proper operation and setting of discrete devices (signal trips, etc.).
 - b) Apply provisional settings on controllers and alarm setpoints.
- 7) Analog input:
 - a) Exercise each field device monitoring the analog signal, through the HMI/SCADA system.
 - (1) Apply simulated sensor inputs corresponding to 0 percent, 25 percent, 50 percent, 75 percent, and 100 percent of span for networks that incorporate analog elements and monitor the resulting outputs to verify compliance to accuracy tolerance requirements.
- 8) Analog output:
 - a) Exercise each field device requiring an analog command signal, through the HMI/SCADA system.
 - (1) Vary the output from the PLC HMI/SCADA system and measure the end device position, speed, etc. to confirm the proper operation of the device for the supplied analog signal.
 - (2) Manually set the output from the HMI/SCADA screen at 0 percent, 25 percent, 50 percent, 75 percent, and 100 percent and measure the response at the final device and at any intermediate devices.
- 9) Submit completed test forms.
 - a) Discrete instrument input devices:
 - (1) Switch setting, contact action, and dead band.
 - (2) Valve position switches:
 - (a) Response in the PLC as the valve is stroked from the PLC.
 - (b) Field observed actual valve position, and valve indicator position as the valve is stroked from the PLC.
 - (3) Operator interface switches (control stations and other pilot devices) and associated response.
 - (4) Starter and drive auxiliary device contact response.
 - (5) Response of all other discrete inputs to the PLC.
 - (6) Test equipment used and associated serial numbers.

- b) Discrete output devices:
 - (1) Observed response of field device to the discrete output from the PLC.
 - (2) Observe the proper operation of Open, Close, Start, Stop, On, Off, etc.
 - (3) Test equipment used and associated serial numbers.
 - c) Analog input devices:
 - (1) Calibration range.
 - (2) Calibration data: Input, output, and error at each test value.
 - (3) Analog input associated PLC register address.
 - (4) Value in PLC register at each test point.
 - (5) Value displayed at each operator interface station (local operator interface displays and SCADA workstations).
 - (6) Test equipment used and associated serial numbers.
 - d) Analog output devices:
 - (1) Calibration range.
 - (2) Test value at each test point.
 - (3) Analog output associated PLC register address.
 - (4) Control variable value at field device at each test point.
 - (5) Physical device response at each test point:
 - (a) Response to be actual valve position, or motor speed, etc.
 - (6) Test equipment used and associated serial numbers.
 - 10) Failure testing:
 - a) Demonstrate how the system reacts and recovers from abnormal conditions including, but not limited to:
 - (1) Equipment failure.
 - (2) Communications sub-system error.
 - (3) Power failure.
 - (4) Process equipment failure.
 - (5) High system loading conditions.
- 4. Functional testing:
 - a. General:
 - 1) Testing to demonstrate proper operation of systems with process equipment operating over full operating ranges under conditions as closely resembling actual operating conditions as possible.
 - 2) Performed by Contractor, ICSC, manufacturer's representative together, with assistance from the OWNER or the inspection staff, as needed.
 - 3) Additional tests are specified in other Instrumentation and Control Sections.
 - 4) Follow approved detailed test procedures and check lists for Functional Test activities.

B. Process Start-up Phase:

- 1. Process Start-up:
 - a. ICSC shall be onsite to support Process Start-up activities and provide functional changes as required.
- 2. Process Operation Period:
 - a. ICSC shall be available to support Process Operational Period and provide functional changes as required.

3.7 FIELD QUALITY CONTROL (NOT USED)

3.8 RE-INSTALLATION (NOT USED)

3.9 ADJUSTING (NOT USED)

3.10 CLEANING (NOT USED)

3.11 PROTECTION (NOT USED)

3.12 SCHEDULES

A. Example test forms:

1. Example test forms are attached at the end of this Section. They may be used as a starting point for the development of Project-specific test forms for this Project.
2. The example test forms are not intended to be complete or comprehensive. Edit and supplement the forms to meet the requirements for testing and test forms specified in this Section and other Contract Documents.

END OF SECTION

	INSTALLATION AND CERTIFICATION CHECKLIST DOCUMENTATION	
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INSTRUMENT LOOP NO. _____

SERVICE DESCRIPTION _____

A COPY OF LATEST ISSUE OF THE FOLLOWING DOCUMENTS ARE INCLUDED IN THIS INSTRUMENT INSTALLATION
CERTIFICATION FILE:

- ☐ INSTRUMENT SPECIFICATION SHEETS (FOR ALL INSTRUMENTS IN THE LOOP)
- ☐ INSTRUMENT INSTALLATION DETAILS (FOR ALL INSTRUMENTS IN THE LOOP)
- ☐ INSTRUMENT LOOP WIRING DIAGRAMS
- ☐ INSTRUMENT INSTALLATION CERTIFICATION CHECKLIST
- ☐ SIZING CALCULATIONS
- ☐ INSTRUMENT INSTALLATION SCHEDULE (APPLICABLE PART)
- ☐ NAMEPLATE SCHEDULE (APPLICABLE PART)
- ☐ VENDOR LITERATURE CALIBRATION INFORMATION

	☐	☐
INSTRUMENT LOOP IS PART OF EQUIPMENT START-UP/SHUTDOWN INTERLOCKS?	No	Yes

REMARKS: _____

CHECKED BY (COMPANY) _____	ACCEPTED BY (COMPANY) _____
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SIGNATURE _____	SIGNATURE _____
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DATE _____	DATE _____
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	SWITCHES INSTALLATION AND CALIBRATION CHECKLIST	
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INSTRUMENT LOOP NO. _____

SERVICE DESCRIPTION _____

CHECK BELOW, WHEN COMPLETED:

- ☐ BENCH CALIBRATED PER SPECIFICATION SHEET NO. _____
- ☐ VERIFIED PER P&ID NO. _____
- ☐ CORRESPONDS TO SPECIFICATION SHEET NO. _____
- ☐ WIRING CORRECT PER INSTRUMENT LOOP DRAWING NO. _____
- ☐ INSTALLATION CORRECT PER DETAIL NO. _____
- ☐ ACCESSORIES ARE PRESENT AND PROPERLY INSTALLED
- ☐ INSTRUMENT IS ACCESSIBLE FOR MAINTENANCE OR REMOVAL
- ☐ ENGRAVED LAMINATED NAMEPLATE (NO SPELLING ERRORS) PERMANENTLY INSTALLED

☐ ☐

INSTRUMENT LOOP IS PART OF EQUIPMENT START-UP/SHUTDOWN INTERLOCKS? No Yes

<u>FIELD CALIBRATION CHECK</u>						
CONTACT NO.	FUNCTION	FOR SIGNAL	CONTACT IS TO	AT SPECIFIED VALUE FOR	ACTUAL TRIP POINT WAS	
1	☐ ALARM	☐ INCR	☐ OPEN	SET PT = _____	SET PT = _____	_____
	☐ S/D PERM	☐ DECR	☐ CLOSE	RESET = _____	RESET = _____	_____
2	☐ ALARM	☐ INCR	☐ OPEN	SET PT = _____	SET PT = _____	_____
	☐ S/D PERM	☐ DECR	☐ CLOSE	RESET = _____	RESET = _____	_____
3	☐ ALARM	☐ INCR	☐ OPEN	SET PT = _____	SET PT = _____	_____
	☐ S/D PERM	☐ DECR	☐ CLOSE	RESET = _____	RESET = _____	_____
4	☐ ALARM	☐ INCR	☐ OPEN	SET PT = _____	SET PT = _____	_____
	☐ S/D PERM	☐ DECR	☐ CLOSE	RESET = _____	RESET = _____	_____

NOTE: PERM IS ABBREVIATION FOR PERMISSIVE

	TRANSMITTER/CONTROLLER/INDICATOR INSTALLATION AND CALIBRATION CHECKLIST	
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☐ ☐

INSTRUMENT LOOP IS PART OF EQUIPMENT START-UP/SHUTDOWN INTERLOCKS?

No Yes

INSTRUMENT TYPE
INDICATOR

☐ TRANSMITTER

☐ CONTROLLER ☐

☐ OTHER

DESCRIPTION _____

INSTRUMENT TAG NO. _____ SERIAL NO. _____

SERVICE
DESCRIPTION _____

<u>BENCH CALIBRATION CHECK</u>				
INPUT RANGE = _____			OUTPUT RANGE = _____	
HEAD CORRECTION = _____			☐ LINEAR	
CALIBRATED SPAN = _____			☐ SQUARE ROOT	
% CALIB SPAN	DESIRED VALUE	ACTUAL VALUE	EXPECTED VALUE	ACTUAL VALUE
0				
50				
100				

CHECK BELOW, WHEN COMPLETED:

- ☐ BENCH CALIBRATED PER SPECIFICATION SHEET NO. _____
- ☐ VERIFIED PER P&ID NO. _____
- ☐ CORRESPONDS TO SPECIFICATION SHEET NO. _____
- ☐ WIRING CORRECT PER INSTRUMENT LOOP DRAWING NO. _____
- ☐ INSTALLATION CORRECT PER DETAIL NO. _____
- ☐ ACCESSORIES ARE PRESENT AND PROPERLY INSTALLED
- ☐ INSTRUMENT IS ACCESSIBLE FOR MAINTENANCE OR REMOVAL
- ☐ ENGRAVED LAMINATED NAMEPLATE (NO SPELLING ERRORS) PERMANENTLY INSTALLED

<u>FIELD CALIBRATION CHECK</u>				
INPUT RANGE = _____			OUTPUT RANGE = _____	
% CALIB SPAN	DESIRED VALUE	ACTUAL VALUE	EXPECTED VALUE	ACTUAL VALUE
0				
50				
100				

	TRANSMITTER/CONTROLLER/INDICATOR INSTALLATION AND CALIBRATION CHECKLIST	
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- ☐ DIRECT ☐ REVERSE
☐ ACTION VERIFIED AT 50% SPAN
☐ ACTION VERIFIED AT _____ SPAN

CONTROLLER SETTINGS								
SETTING	GAIN	PB	RESET (INTEGRAL)	DERIV. (RATE)	HIGH LIMIT	LOW LIMIT	ELEV. ZERO	ZERO SUPP
PRE-TUNE								
POST-TUNE								

PRE-TUNE SETTINGS					
	GAIN	PB	RESET (REPEAT/MIN)	RESET (MIN/REPEAT)	DERIVATION (MINUTES)
FLOW	1.0	100	10	0.1	N/A
LEVEL	1.0	100	MIN.	MAX.	N/A
PRESSURE	2.0	50	2.0	0.5	N/A
TEMP.	4.0	25	0.1	10	OFF

REMARKS _____

CHECKED BY (COMPANY) _____ ACCEPTED BY (COMPANY) _____

SIGNATURE _____ SIGNATURE _____

DATE _____ DATE _____

	ANALYZERS INSTALLATION AND CALIBRATION CHECKLIST	
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☐ ☐

INSTRUMENT LOOP IS PART OF EQUIPMENT START-UP/SHUTDOWN INTERLOCKS?

No Yes

TYPE OF INSTRUMENT _____

INSTRUMENT TAG NO. _____ SERIAL NO. _____

SERVICE DESCRIPTION _____

CHECK BELOW, IF TRUE

☐ BENCH CALIBRATED PER SPECIFICATION SHEET NO. _____

☐ VERIFIED PER P&ID NO. _____

☐ CORRESPONDS TO SPECIFICATION SHEET NO. _____

☐ WIRING CORRECT PER INSTRUMENT LOOP DRAWING NO. _____

☐ INSTALLATION CORRECT PER DETAIL NO. _____

☐ ACCESSORIES ARE PRESENT AND PROPERLY INSTALLED

☐ INSTRUMENT IS ACCESSIBLE FOR MAINTENANCE OR REMOVAL

☐ ENGRAVED LAMINATED NAMEPLATE (NO SPELLING ERRORS) PERMANENTLY INSTALLED

REMARKS _____

CHECKED BY (COMPANY) _____ ACCEPTED BY (COMPANY) _____

SIGNATURE _____ SIGNATURE _____

DATE _____ DATE _____

	CONTROL VALVES INSTALLATION AND CALIBRATION CHECKLIST	
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☐ ☐

INSTRUMENT LOOP IS PART OF EQUIPMENT START-UP/SHUTDOWN INTERLOCKS?

No Yes

- ☐ VALVE TAG NO. _____ SERIAL NO. _____
- ☐ TRANSDUCER TAG NO. _____ SERIAL NO. _____
- ☐ SOLENOID TAG NO. _____ SERIAL NO. _____
- ☐ VOLUME BOOSTER TAG NO. _____ SERIAL NO. _____
- ☐ POSITIONER _____ SERIAL NO. _____

SERVICE DESCRIPTION _____

TRANSDUCER CHECK					
INPUT RANGE =			OUTPUT RANGE =		
CALIBRATED SPAN =			CALIBRATED SPAN =		
BENCH					
SPAN	DESIRED	ACTUAL	SPAN	EXPECTED	ACTUAL
0%			0%		
50%			50%		
100%			100%		
FIELD					
SPAN	DESIRED	ACTUAL	SPAN	EXPECTED	ACTUAL
0%			0%		
50%			50%		
100%			100%		

CHECK BELOW, IF TRUE:

- ☐ BENCH CALIBRATED PER ABOVE _____
- ☐ VERIFIED PER P&ID NO. _____
- ☐ CORRESPONDS TO SPECIFICATION SHEET NO. _____
- ☐ VALVE SPECIFICATION NO. _____
- ☐ TRANSDUCER SPECIFICATION NO. _____
- ☐ SOLENOID SPECIFICATION NO. _____
- ☐ WIRING CORRECT PER INSTRUMENT LOOP DRAWING NO. _____
- ☐ INSTALLATION CORRECT PER INSTRUMENT INSTALLATION DETAILS _____
- ☐ VALVE DETAIL NO. _____
- ☐ TRANSDUCER DETAIL NO. _____
- ☐ SOLENOID DETAIL NO. _____

	CONTROL VALVES INSTALLATION AND CALIBRATION CHECKLIST	
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- ☐ ACCESSORIES ARE PRESENT AND PROPERLY INSTALLED
- ☐ INSTRUMENT IS ACCESSIBLE FOR MAINTENANCE OR REMOVAL
- ☐ ENGRAVED LAMINATED NAMEPLATE (NO SPELLING ERRORS) PERMANENTLY INSTALLED

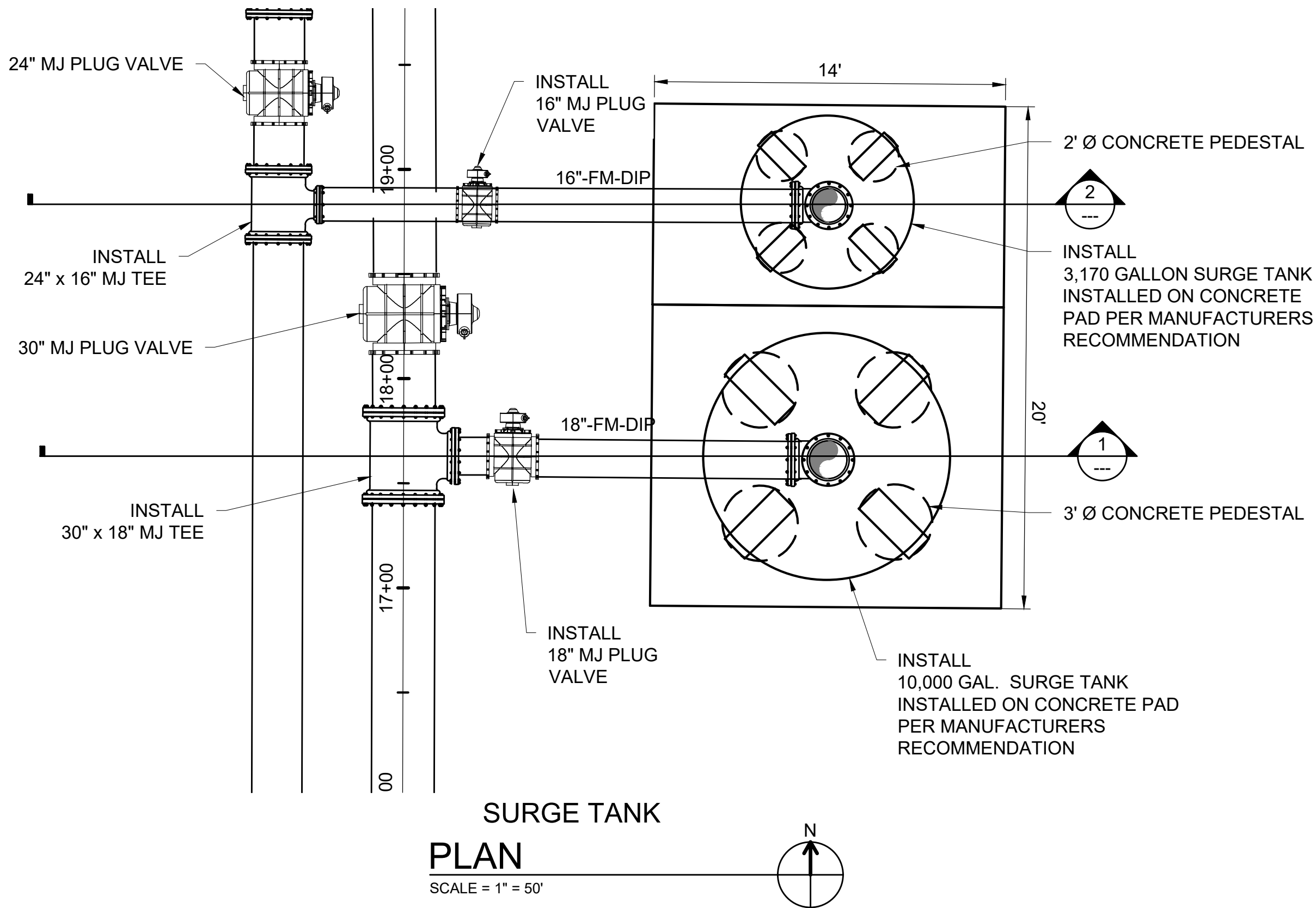
VALVE CHECK			
FLOW CHECK	☐ PROCESS FLOW DIRECTION THROUGH THE VALVE IS CORRECT		
SAFETY CHECK	ON LOSS OF AIR VALVE FAILS ☐ OPEN ☐ CLOSE		ON LOSS OF POWER SOLENOID FAILS ☐ TO VENT ☐ TO VALVE
TRAVEL CHECK	FULL OPEN AT _____ PSI	FULL CLOSED AT _____ PSI	MEASURED TRAVEL _____ INCHES
SEATING CHECK	☐ ON BENCH ☐ IN-LINE	RESULTS	ACTUATOR BENCH SET
POSITIONER CHECK			
VALVE FULL OPEN AT _____ PSI TO POSITIONER			
VALVE FULL CLOSED AT _____ PSI TO POSITIONER			
VOLUME BOOSTER CHECK			
BYPASS VALVE (GAIN) ADJUSTING SCREW BACKED OUT _____ TURNS FROM CLOSED TO ENSURE QUICK BUT STABLE OPERATION (TYPICALLY 1-1/2 TO 2 TURNS)			

REMARKS _____

CHECKED BY (COMPANY) _____ ACCEPTED BY (COMPANY) _____

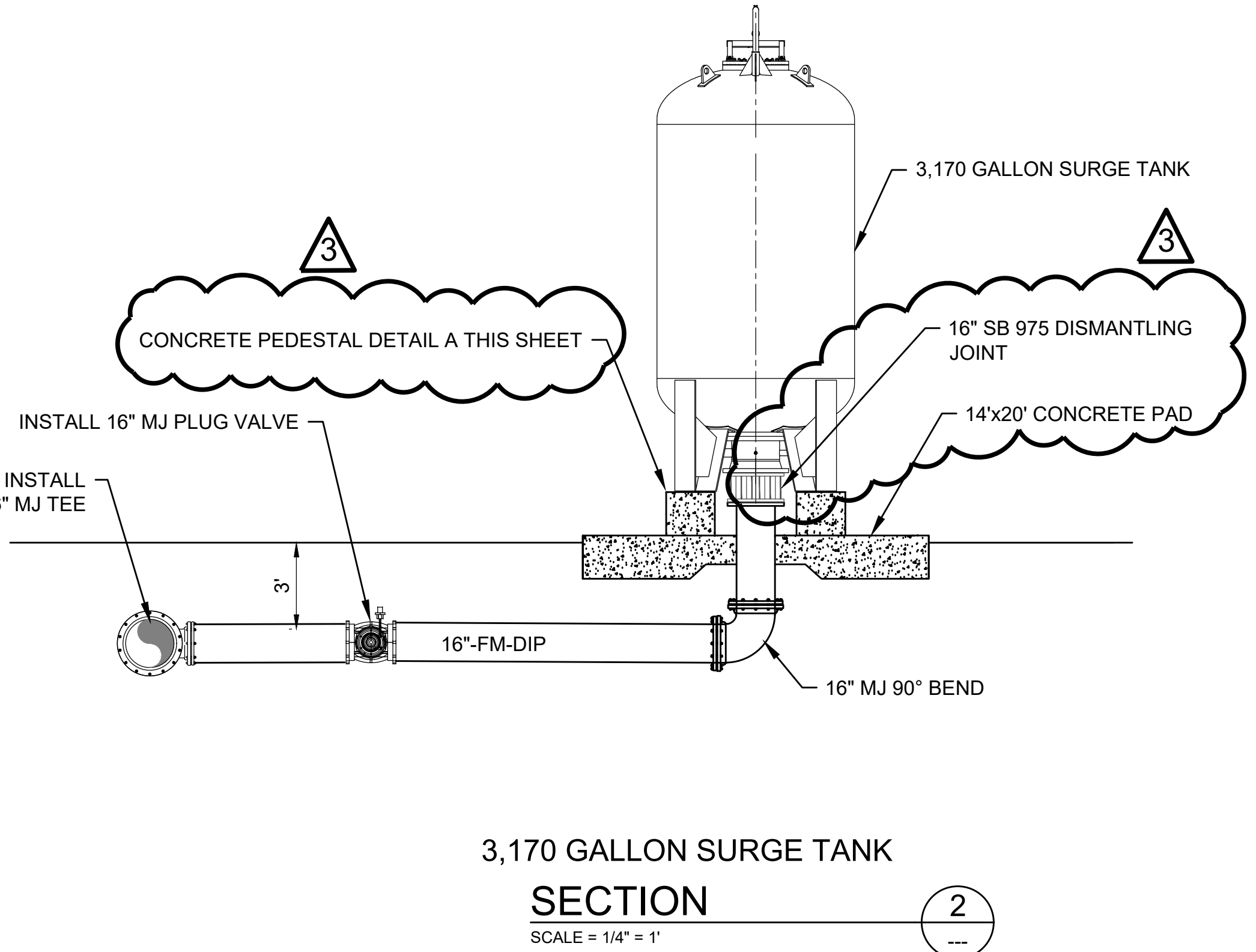
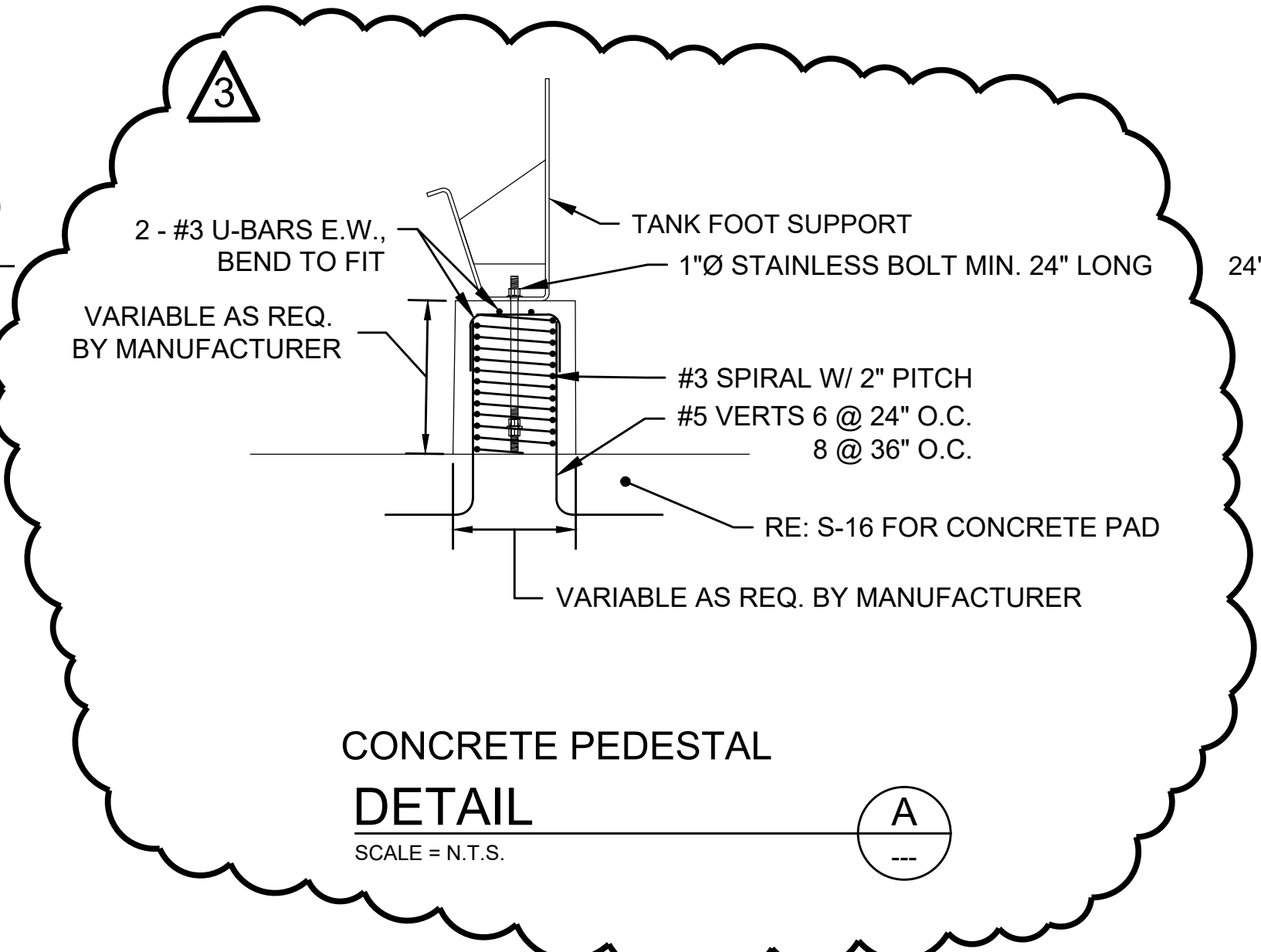
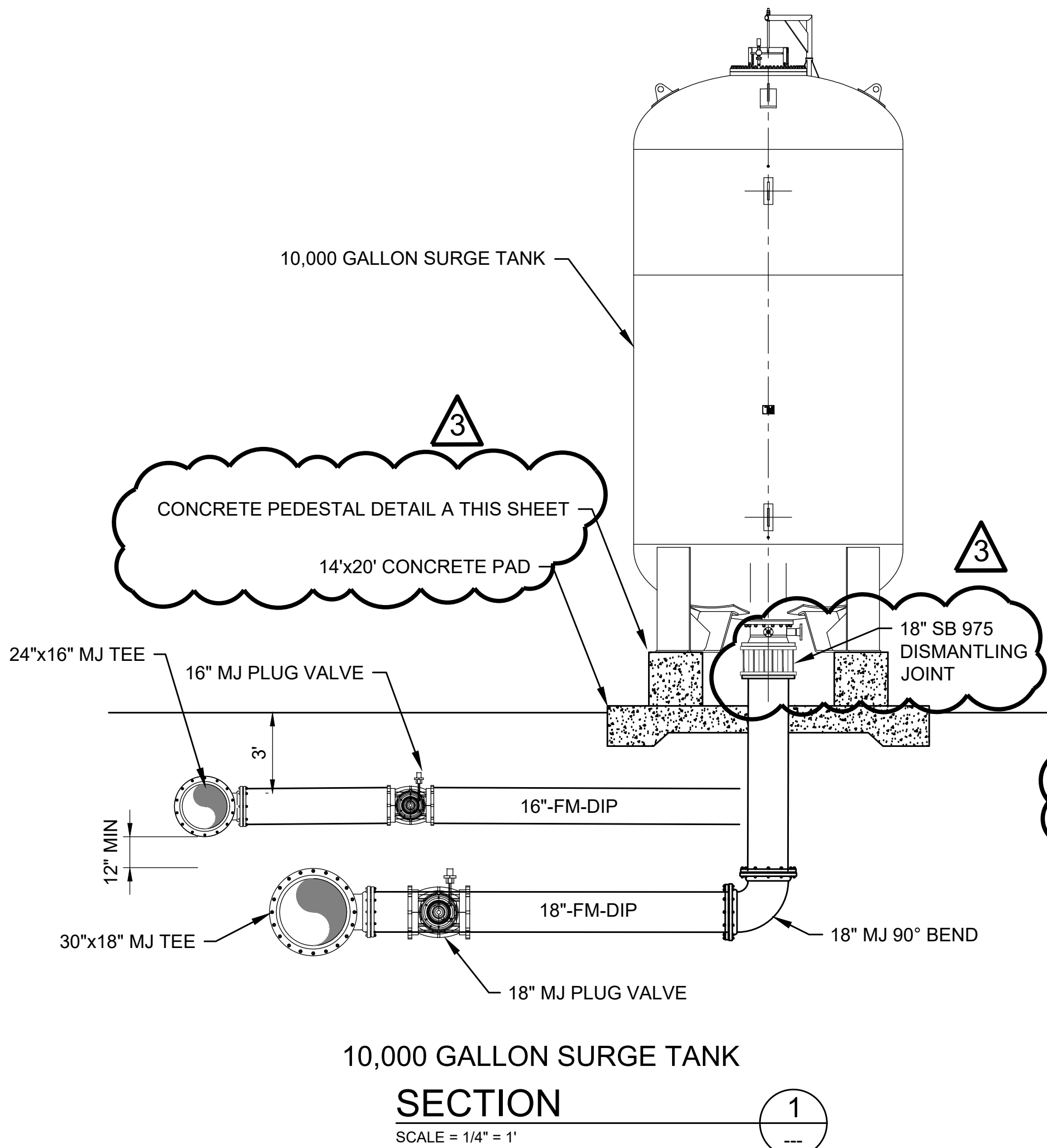
SIGNATURE _____ SIGNATURE _____

DATE _____ DATE _____



SURGE TANK DRAIN NOTES:

PROVIDE A 2-IN. WELDED ON BOSS FLANGE OUTLET DRAIN
FLANGE TO ACCEPT A 1.5-IN. FNPT THREADED OUTLET.
PROVIDE 316 STAINLESS STEEL BALL VALVE MNT X MNT
THAT IS LOCKABLE. OUTLET SIDE OF THE DRAIN VALVE
SHALL HAVE A FNT SS 316 CAP.



1	7/11/2023	MAB	CAJ	REVISED PER ADDENDUM NO. 3	
REV. NO.	DATE	DRWN	CHKD	REMARKS	

0 1" 1" 1"

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

DESIGNED:	CAJ
DRAFTED:	MAB
CHECKED:	CAJ
DATE:	AB



CRIST ENGINEERS, INC.
CONSULTING ENGINEERS

205 EXECUTIVE COURT
LITTLE ROCK, ARKANSAS 72205
TELEPHONE: (501) 664-1552
FAX: (501) 664-8579
WWW.CRISTENGINEERS.COM

HOT SPRINGS, ARKANSAS

GULPHA BASIN PUMP STATION IMPROVEMENTS
CITY OF HOT SPRINGS

ADDENDUM 2

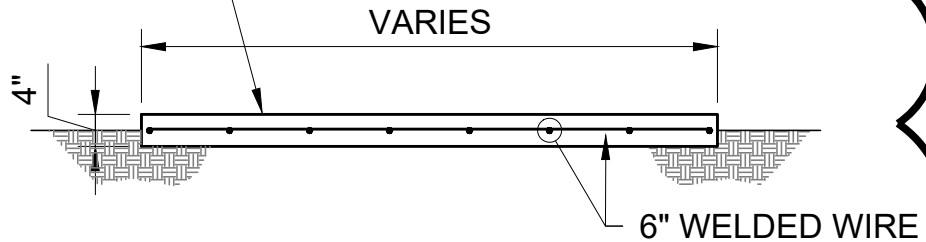
SURGE TANKS

JOB NO.
22009

SHEET NO.
M-7

3

3,000 PSI CONCRETE



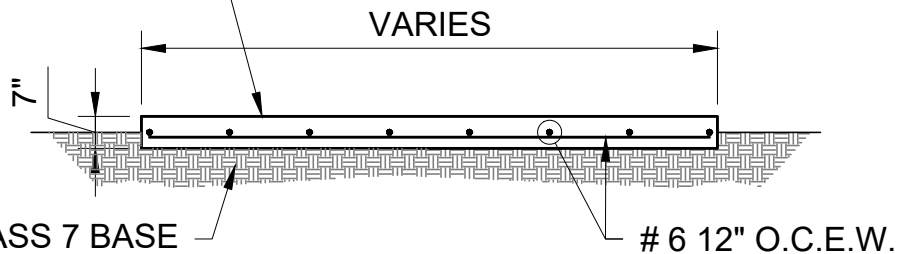
CONCRETE SIDEWALK DETAIL

N.T.S.

1
-

NOTE:
INSTALL CONSTRUCTION JOINTS
TOOLED @ 4'-0" ON CENTER.

4,000 PSI CONCRETE



4" COMPACTED CLASS 7 BASE
COURSE (95% MODIFIED)

CONCRETE PAVING DETAIL

N.T.S.

F
-

NOTE:
INSTALL CONSTRUCTION JOINTS
@ DISTANCE EQUAL TO PAVING
WIDTH

P:\2022 projects\22009 - city of hot springs - gulpha basin pump station improvements\06 - cadd\02 - Civil\22009 - CIVIL DETAILS.dwg

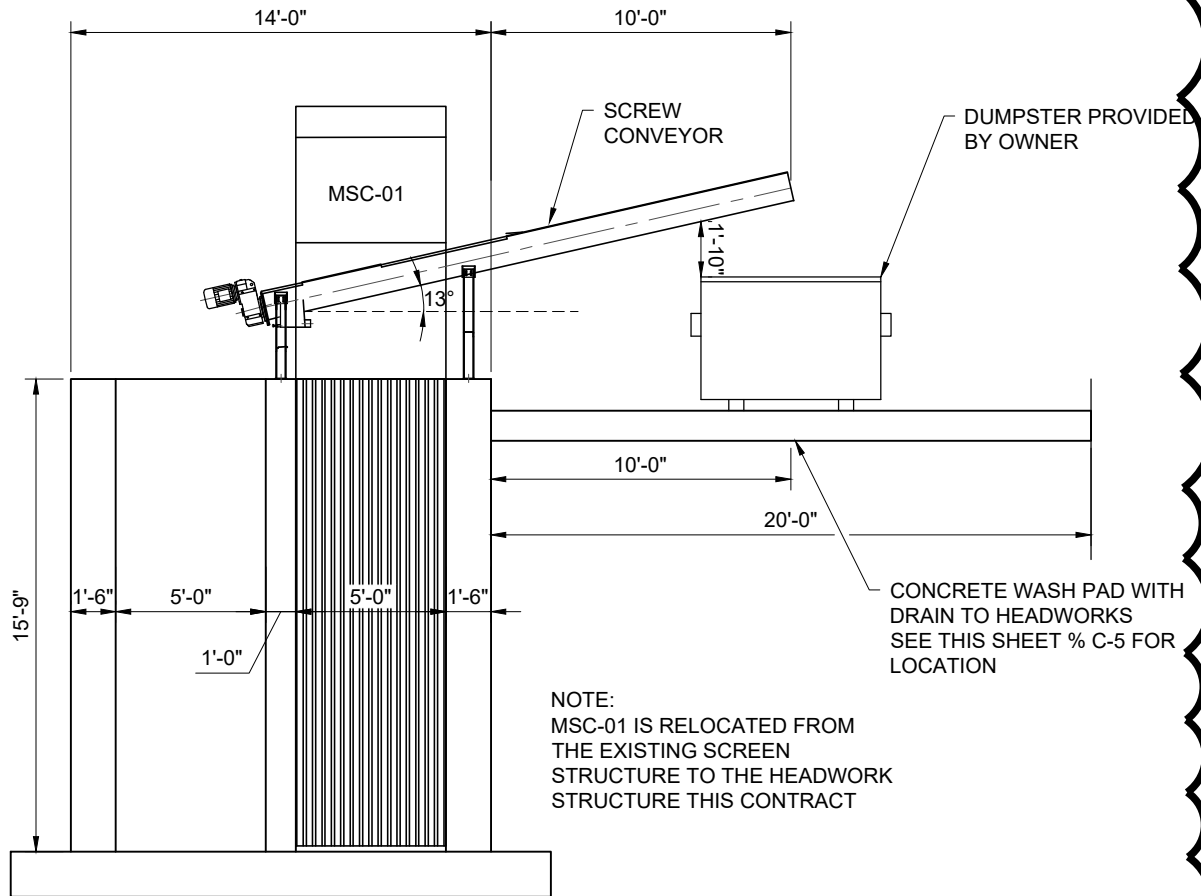


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HOT SPRINGS, ARKANSAS
GULPHA P. S. IMPROVEMENTS
CITY OF HOT SPRINGS
CIVIL STANDARD DETAILS V

DESIGNED: CAJ	JOB NO. 22009	DATE JULY 11, 2023	ADD. NO. 3
DRAFTED: MAB	SCALE: NOT TO SCALE	REF SHEET CZ-5	
CHECKED: CAJ			

P:\2022 projects\22009 - city of hot springs - gulpha basin pump station improvements\06 - cadd\05 - Mechanical\22009 - SCREEN & DIVERTER PLAN.dwg



		CRIST ENGINEERS, INC.	
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HOT SPRINGS, ARKANSAS			
GULPHA P. S. IMPROVEMENTS			
CITY OF HOT SPRINGS			
HEADWORKS PLAN & SECTION			
DESIGNED: CAJ	JOB NO. 22009	DATE JULY 11, 2023	ADD. NO. 3
DRAFTED: MAB	SCALE:	NOT TO SCALE	REF SHEET M-1
CHECKED: CAJ			

P:\2022 projects\22009 - city of hot springs - gulpha basin pump station improvements\06 - cadd\02 - Civil\22009 - GENERAL NOTES.dwg

3

GENERAL PUMP DELIVERY NOTE

1. IT IS THE MANUFACTURERS RESPONSIBILITY TO DELIVER PUMPS TO 741 ADAMS STREET, HOT SPRINGS, ARKANSAS FOR STORAGE AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PICK UP AND DELIVER THE PUMPS FROM 741 ADAMS STREET TO THE JOB SITE FOR INSTALLATION.

		CRIST ENGINEERS, INC.	
CONSULTING ENGINEERS		LITTLE ROCK, ARKANSAS	
HOT SPRINGS, ARKANSAS			
GULPHA P. S. IMPROVEMENTS			
CITY OF HOT SPRINGS			
GENERAL NOTES & CONTACTS			
DESIGNED: CAJ	JOB NO. 22009	DATE JUNE 11, 2023	ADD. NO. 3
DRAFTED: MAB	SCALE: NOT TO SCALE	REF SHEET G-2	
CHECKED: CAJ			

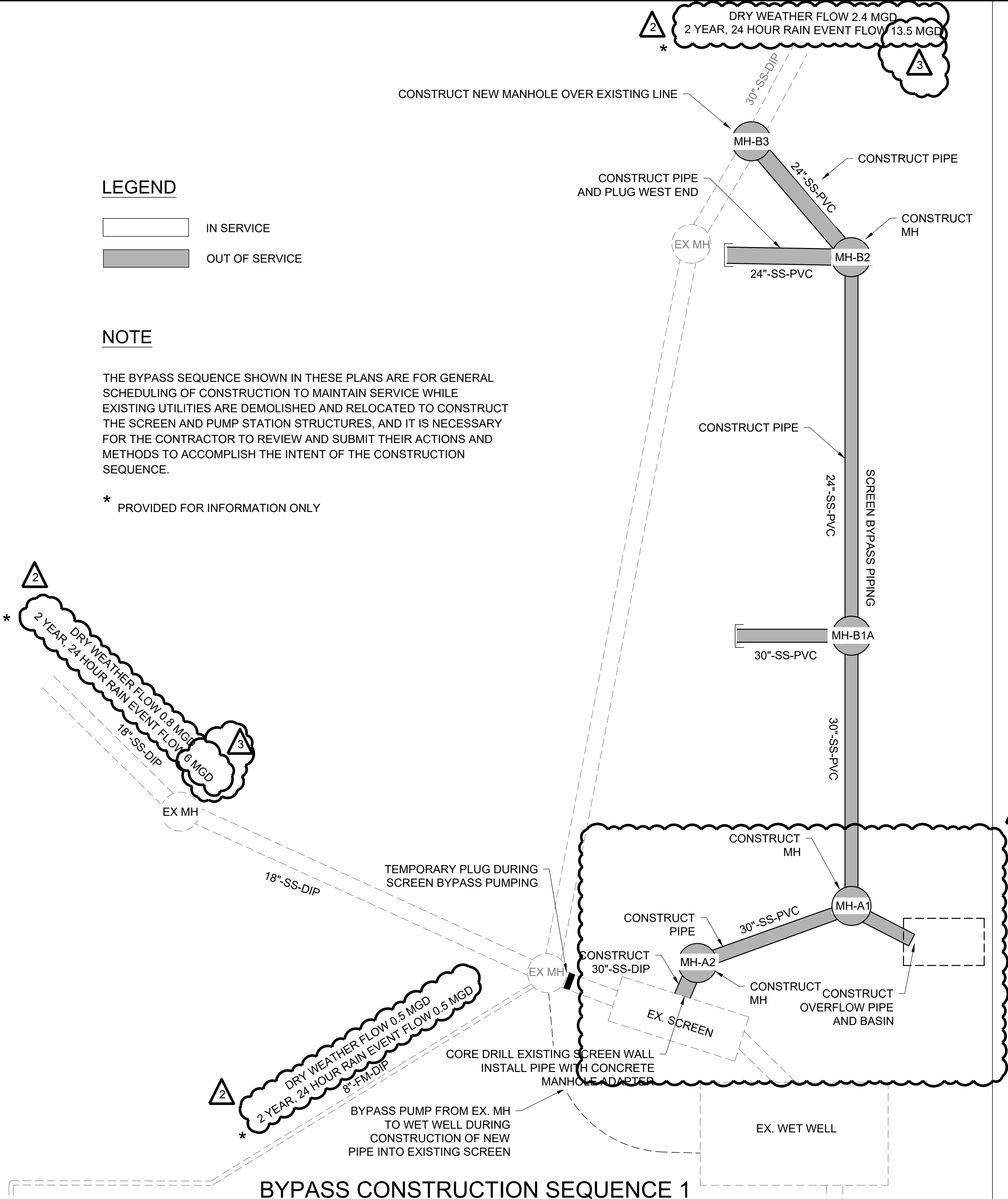
LEGEND

- IN SERVICE
- OUT OF SERVICE

NOTE

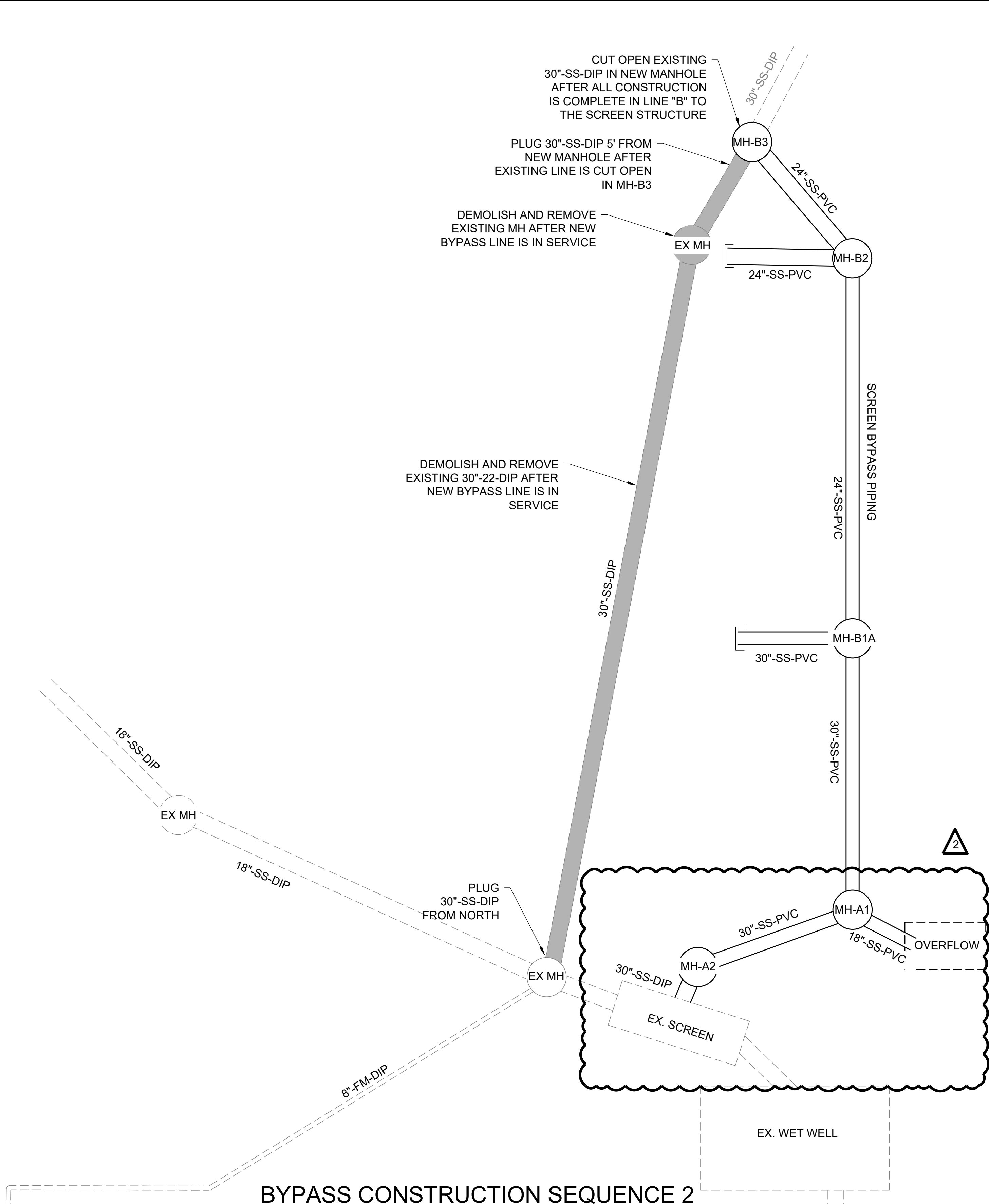
THE BYPASS SEQUENCE SHOWN IN THESE PLANS ARE FOR GENERAL SCHEDULING OF CONSTRUCTION TO MAINTAIN SERVICE WHILE EXISTING UTILITIES ARE DEMOLISHED AND RELOCATED TO CONSTRUCT THE SCREEN AND PUMP STATION STRUCTURES, AND IT IS NECESSARY FOR THE CONTRACTOR TO REVIEW AND SUBMIT THEIR ACTIONS AND METHODS TO ACCOMPLISH THE INTENT OF THE CONSTRUCTION SEQUENCE.

* PROVIDED FOR INFORMATION ONLY



BYPASS CONSTRUCTION SEQUENCE 1

SCALE: N.T.S.



BYPASS CONSTRUCTION SEQUENCE 2

SCALE: N.T.S.

2	7/11/2023	MAB	CAJ	REVISED PER ADDENDUM NO.3	
1	6/6/23	SBM	OA	REVISED PER ADDENDUM NO. 2	
REV. NO.	DATE	DRWN	CHKD	REMARKS	

0 1"
1" = 1"
THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

DESIGNED:	CAJ
DRAFTED:	MAB
CHECKED:	CAJ
DATE:	MAY 2023



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HOT SPRINGS, ARKANSAS
GULPHA BASIN PUMP STATION IMPROVEMENTS
CITY OF HOT SPRINGS
ADDENDUM 2

BYPASS CONSTRUCTION SEQUENCE 1 & 2

JOB NO.	22009
SHEET NO.	Q-1