



DEVELOPMENT SERVICES
ENGINEERING DIVISION
156 S. BROADWAY, SUITE 150
TURLOCK, CA 95380

PHONE: (209) 668-5520
FAX: (209) 668-5563
TDD: (800) 735-2929
engineering@turlock.ca.us

Addendum No. 1

Date: November 26, 2018

City Project: 18-59, “Well 8 GAC System Rehabilitation and Site Work”

Plan holders:

This addendum includes changes to the project plans and specifications. Please make particular note of the change in the bid date.

Notice to Contractors:

1. The first paragraph is amended to read as follows:

Sealed proposals will be received by the City Engineer of the City of Turlock, Development Services/Engineering Division, 156 S. Broadway, Suite 150, Turlock, California 95380, until 2:00 PM on ~~December 6, 2018~~ December 12, 2018, for:

**City Project No. 18-
59
Well 8 GAC System Rehabilitation and Site
Work**

In accordance with and as described and provided in the plans, specifications and the proposed form of contract therefore, all of which are on file in the office of the City Engineer, and to which special reference is hereby made.

An **optional** pre-bid meeting will be held at the project site at 10:00 AM on Thursday, November 29, 2018. Representatives from the City and AECOM will be present to provide access to the site and allow bidders to familiarize themselves with existing conditions. Verbal responses to bidders' questions may not be relied upon in interpretation of the plans and specifications. Bidders questions may only be responded to upon receipt of a written Request for Information (RFI).

Project Drawings:

1. See technical addendum modifications made by AECOM (attached):

Technical Specifications:

1. See technical addendum modifications made by AECOM (attached):

This addendum must be acknowledged by signing the bidder's form in the space provided. If you have any questions, please call me at (209) 668-5417 or email at sfremming@turlock.ca.us.

Sincerely,

A handwritten signature in blue ink that reads "Stephen Fremming". The signature is written in a cursive, flowing style.

Stephen Fremming, P.E.
Senior Civil Engineer

Enclosures:

Addendum No. 1 modifications to Technical Specifications (25 pages)

Addendum No. 1 modifications to Project Drawings (16 pages)

ADDENDUM NO. 1

City of Turlock
Project No. 18-59
Well 8 GAC System Rehabilitation and Site Work

All bidders are hereby notified of the following modification to the contract documents, construction specifications and construction plans. This modification is to become a part of said contract documents, construction specifications and construction plans.

This Addendum shall supersede all previously issued specifications and drawings wherein it contradicts same. All other conditions remain unchanged. The following changes, modifications, corrections, clarifications, and/or additions as set forth herein shall apply to the above documents and shall be made a part thereof and shall be subject to all of the requirements thereof as though originally specified and/or shown.

Item No.	Reference	Description of Change
Contract Documents		
1.	Section 7 – Construction Details, page 55	<p>Bid Item 2. Change to read:</p> <p>“This is a lump-sum bid for furnishing and installing all aboveground water piping <u>and</u> appurtenances necessary to reconnect the GAC vessels to the City distribution system, complete in place, where shown on the plans and as specified herein. This lump sum price shall also include removal of short sections of existing welded steel pipe and then installation of new motor-actuated valves and pipe spools where shown on the plans and as specified herein. The bid price shall include, but is not limited to, all costs for pipe spools, fittings, <u>flow meters, expansion joints, burst discs, pressure-relief valves, air release</u> valves, supports, pressure testing, disinfection, and disinfection (water quality) testing per the plans and in accordance with the Project Specifications.”</p> <p>Bid Item 3. Delete last sentence.</p> <p>Bid Item 5. Change to read:</p> <p>“This is a lump-sum bid for furnishing and installing a new <u>prefabricated chemical building housing a new</u> chemical injection pump, injection and sample tubing and a sodium hypochlorite storage tank, where shown on the plans and as specified herein. The bid price shall include, but not be limited to, mounting a fiberglass shelf for the metering pump, installing a drain and sewer connection, <u>installing a building slab</u>, penetrating the building wall as necessary to make the plumbing connections, and other modifications per the plan and in accordance with the Project Specifications”</p> <p>Bid Item 8. Add to end of paragraph:</p> <p>“This bid price shall also include all costs for removing the existing eyewash station and installing a new eyewash station, including installation of a new buried water service, per the plans and in accordance with the Project Specifications.”</p>
2.	Section 133448 Precast Concrete Building	<p>Part 1.A. Change sentence to read:</p> <p>“This section includes materials and installation of a precast concrete building for <u>chlorine equipment</u>.”</p> <p>Part 2.E.1 and 3. Exhaust fan system and air conditioner shall be corrosion-proof.</p>
3.	Section 405000 PCIS General Requirements	Replace entire section with attached.
4.	Section 405010 PCIS Loop Descriptions	Replace entire section with attached.

Item No.	Reference	Description of Change
5.	Section 405020 Instrumentation Equipment	Add to end of Section: “C. Pipe Stand Two-inch pipe stand for transmitter mounting shall be 52 inches high, Schedule 40 pipe. The pipe stand shall be full-perimeter welded to baseplate and strengthened with two 1/4-inch gussets welded 90° apart. External surfaces shall be arc-spray metallized with pure zinc or hot dip galvanized. The unit shall be that manufactured by O'Brien, Anderson-Greenwood, Shirlee Industries, or equal.”
6.	Section 405030 Analytical Instruments	Part 2.A.6. Change paragraph to read: “The nitrate analyzer shall be a NITRATAX plus sc as manufactured by Hach, or approved equal.”
7.	Section 405040 Programmable Logic Controller and Operator Interface	Part 2.C.8. Change paragraph to read: “The PLC shall be AutomationDirect Productivity 2000 series PLC, no ‘or equal’ is acceptable.”
8.	Section 405080 Instrument Control Panel	Part 2.A.7.c. Change temperature to 110°F.
9.	Section 409210 Electric Motor Actuators for Valves	Part 2.E.3. Replace with: “Provide the following control features: a. Local-off-remote selector switch. b. Stop-open-close pushbuttons. c. Open and closed indicator lights. d. Internal relay to monitor actuator “health” status an indicating the actuator is “READY” for remote operation.” Part 2.E.14. Change first sentence to read: “Electric motor actuators shall be <u>Biffi F02 series, Rotork ROM series,</u> or equal.”
10.	Section 432154 Vertical Turbine Pumps—Water Wells	Part 2.O. Add to end of paragraph: “Strainer shall be fabricated from stainless steel.”
11.	Section 433277 Chlorine Residual Analyzer	Add attached section.
12.	Section 433282 GAC Vessels and Carbon Adsorption System	Add attached section.
Drawings		
13.	All drawings	Replace complete set of drawings with attached.

SECTION 405000 PROCESS CONTROL AND INSTRUMENTATION SYSTEM (PCIS) GENERAL REQUIREMENTS

PART 1 - GENERAL

A. Description

1. This section of the specifications includes materials, testing, and installation of process control and instrumentation system as specified herein and indicated on the drawings.
2. These specifications shall not be interpreted as permission or direction to violate any governing code or ordinance. Equipment, materials, and workmanship shall comply with the latest revisions of the following codes and standards:
 - a. Instrumentation: ISA - The International Society of Automation.
 - b. Wiring: National Electrical Code (NEC), ISA S5.3 and S5.4.
 - c. Control Panels: NEMA Standards Publication 250-2003.
 - d. Control Logic: NFPA 79.
 - e. Piping: ANSI B31.3 (instrumentation piping).

B. Related Work Specified Elsewhere

1. Process Control and Instrumentation System Loop Descriptions: Section 405010.
2. Instrumentation Equipment: Section 405020.
3. Programmable Logic Control System: Section 405040.
4. Instrument Control Panel (ICP): Section 405080.
5. Pressure Gauges and Pressure Switches: Section 409715.

C. Scope of Work

1. The work involves furnishing all hardware and software, PLC and Operator Interface programming, installation, labor, material, equipment, and engineering in strict compliance with the contract documents for the City of Turlock.
2. Existing SCADA System Modifications
 - a. Existing SCADA System will be modified by Owner.
 - b. Coordinate with Owner or Owner designated integrator communication and programming issues.

D. Submittals

1. PCIS Integrator Qualification Evidence
 - a. Submit PCIS Integrator Qualification Evidence per Section 405000 Part 1 Paragraph E.2 below.
 - b. Qualification Evidence shall be submitted prior to commencement of the work.
2. Detailed System Drawings and Data:
 - a. The submittal shall consist of six sets of detailed drawings and data prepared and organized by the Contractor. All drawings, schematics, layouts, and diagrams shall be done on 11" x 17" sheets utilizing AutoCAD.
 - b. Drawings shall contain only relevant simplified details using symbol approach. Photographic images of components depicting irrelevant details (screws, holes, logos, etc.) are not allowed.
 - c. Drawings prints shall not contain details and texts smaller than 3/64".
3. Two sets of submittals will be returned to the Contractor.
4. Submit these drawings and data as a complete package at the same time.
5. Submittals shall be in three-ring hardcover binders and arranged for convenient use including tab sheets, all indexed, and cross referenced with a separate index for each item.
6. Provide manufacturers cut sheets and manuals for all hardware to be provided.
7. Provide an Instrument Index.
8. Provide ISA type instrumentation data sheets for each component, together with a technical product brochure or bulletin. The data sheets, as a minimum, shall show:
 - a. Instrument tag designation.
 - b. Component name.
 - c. Manufacturer's model number.
 - d. Calibrated range.
 - e. Instrument location.
 - f. Input and output characteristics.
 - g. Scale range and units (if any) and multiplier (if any).
 - h. Requirements for electric supply.
9. Group the data sheets together in the submittal by type. Provide individual data sheets for each instrument with one brochure or bulletin to cover all identical uses of that component.

10. The detailed construction drawing submittal shall include, as a minimum, the following types of drawings and diagrams required for the construction of this project:
 - a. Legend, Symbols, and Index.
 - b. System Block Diagrams.
 - c. Power Distribution Diagrams.
 - d. Instrument Control Panel Layouts/Construction Drawings/Details. The drawings shall include the following:
 - (1) Dimensions
 - (2) Location of all components
 - (3) Identification of all components
 - (4) Bill of Materials
 - (5) Conduit entry area.
 - e. PLC/RTU Rack Elevation Drawing for each PLC/RTU.
 - f. Internal Panel Wiring Diagrams.
 - g. Digital I/O Module Wiring Diagrams.
 - h. Analog I/O Module Wiring Diagrams.
 - i. Detailed NFPA 79-style Ladder Diagrams (for discrete wiring) to meet the following minimum requirements:
 - (1) Each subassembly shall be shown as a rectangle in the diagram with all external terminals identified. Terminals unknown at the time of the submittal shall be left blank, to be filled later. Single contacts internal to the subassemblies shall be shown in the rectangle connected to their terminal points.
 - (2) Where the internal wiring diagrams of subassemblies are furnished on separate sheets, they shall be shown as a rectangle in the schematic diagram with all external points identified and cross-referenced to the separate sheets of the control circuit. Coils and contacts internal to the subassemblies shall be shown in the rectangle connected to their terminal points.
 - (3) Show unique rung numbers on left side of each rung. A cross-referencing system shall be used in conjunction with each relay coil so that associated contacts may be readily located on the diagram. The contacts shall be referenced to coils as well, so that associated coils may be readily located on the diagram. Where a relay contact appears on a sheet separate from the one on which the coil is shown, the purpose of the contact shall be described on the same sheet. Spare contacts shall be shown.

- (4) Limit, pressure, float, flow, temperature sensitive, and similar switch symbols shall be shown on the schematic (ladder) diagram with all utilities turned off (electric power, air, gas, oil, water, lubrication, etc.) and with the equipment at its normal starting position. If the equipment is shown in a specific position, the position shall be identified.
- (5) Contacts of multiple contact devices, e.g., selector switches, shall be shown on the line of the schematic diagram where they are connected in a circuit. A mechanical connection between the multiple contacts shall be indicated by a dotted line or arrow. This does not apply to control relays, starters, or contactors. Additional charts or diagrams may be used to indicate the position of multiple contact devices such as drum, cam, and selector switches.
- (6) The purpose or function of all switches shall be shown adjacent to the symbols. The purpose or function of controls such as relays, starters, contactors, solenoids, subassemblies, and timers on the diagram shall be shown adjacent to their respective symbols. The number of positions of the solenoid valve shall be shown adjacent to the valve solenoid symbol.
- j. Detailed Loop Interconnection Wiring Diagrams (per ISA S5.3 and S5.4) for the entire system showing all control equipment, instrumentation, electrical equipment, components, wiring, routing, boxes (pull, junction, and terminal junction), terminations, wire tags, and wire colors. The diagrams shall show the detailed interconnection of all electrical equipment, instrumentation, panels, enclosures, components and the like provided under this contract.
- k. Arrangement and construction drawings for consoles, control panels, and for other special panels for field installation. These drawings shall include dimensions, location of all components, identification of all components, bill of materials, detailed schematics of all internal wiring, preparation and finish data, nameplates, and the like. These drawings also shall include enough other details to define the style and overall appearance of the assembly; include a finish sample for all panel surfaces.
- l. Installation, mounting, and anchoring details for all field instruments and panel mounted components.
- m. An instrument list including all instruments provided under this project.
- n. An I/O List for each PLC/RTU in the project.
- 11. Detailed System Software Submittal: The submittal shall consist of six sets of the software system descriptions and diagrams. Two sets of submittals will be returned to the contractor. The software submittal can be made as a separate package to be inserted in the original submittal. The following items must be submitted at least eight weeks prior to the factory witness test orientation:
 - a. Detailed PLC/RTU software logic diagram printouts for each PLC/RTU. Logic diagrams shall be fully annotated such that an individual unfamiliar with the diagram format can fully understand the process control logic presented.
 - b. An updated I/O List for each PLC/RTU in the project.
 - c. Narrative control descriptions for each analog and discrete control loop. Loop descriptions shall describe how each control loop will operate, the PLC control logic,

SCS control and monitoring capabilities and in general a job specific description of each control loop in the system.

- d. Sample color printouts of each operator interface display.
- 12. Complete detailed bills of material: Detailed bill of material for all components shall be provided including complete manufacturers name and model number, quantity to be provided, and cross references to data sheet sections.
- 13. Operation, Maintenance, and Repair Manuals (OMM):
 - a. The organization of the initial submittal required above shall be compatible to eventual inclusion as one volume of the operation, maintenance, and repair manuals.
 - b. Operation manuals shall be prepared and submitted to the Owner's Representative for preliminary review in six copies. When the Owner's Representative is satisfied that these are complete and properly prepared, six final sets shall be delivered to the Owner's Representative.
 - c. The complete OMM shall contain the following:
 - (1) All the information included in the preliminary equipment submittal, the detailed installation submittal, and the additional information required herein, all bound in hard-cover binders and arranged for convenient use including tab sheets, all indexed and cross referenced with a separate index for each item.
 - (2) All final "as-built" drawings with the AutoCAD electronic files.
 - (3) Electronic files for all PLC and operator interface programming.
 - (4) Calibration and maintenance instructions.
 - (5) Trouble-shooting instructions.
 - (6) Instructions for ordering replacement parts.

E. Qualifications and Responsibility of Contractor

- 1. The Contractor shall furnish and install all proposed hardware as shown on the drawings and as specified herein. The PLC system installation and wiring connections to peripheral equipment and instruments shall be the responsibility of the system supplier using qualified personnel possessing the necessary equipment and having experience in making similar installations. Evidence of such qualification, as well as notification of the system supplier assuming unit responsibility, shall be furnished to the Owner in writing for approval prior to commencement of the work.
- 2. Qualification Evidence: The qualification evidence shall include the following:
 - a. Verification that the system supplier shall have had a minimum of five years' experience with the installation and programming of industrial control systems similar in type to those to be installed in this project.
 - b. Verification that the Contractor is Control Systems Integrators Association (CSIA) Certified.

- c. A list of completed similar installations including name, address, and telephone number of the owner, name of project, and date of completion.
 - d. The name and qualifications of supervisory personnel to be directly responsible for the programming and installation of the control system.
- 3. The PCIS Integrator shall be Control Systems Integrators Association (CSIA) certified member.
- 4. Under this section, the Contractor shall furnish the following:
 - a. Instrumentation equipment (Section 405020).
 - b. PLC, HMI, and UPS (Section 405040).
 - c. Control cabinets (Section 405080).
 - d. Spare parts per Sections 405020, 405040, 405050, and 405080.
 - e. Special tools and test equipment required by the supplier.
 - f. Installation, integration and testing.
 - g. Documentation.
 - h. Operator training.
 - i. Warranty (one year).
 - j. Shipping and receiving.
- 5. All calibration and final checkout of the process control and instrumentation system shall be witnessed by the Owner's Representative to determine if the system complies with the contract documents.
- 6. The Contractor shall be responsible for coordinating and interfacing with equipment supplied under these contract documents, which are an integral part of the system. Interfacing shall be incorporated in the detailed systems drawings and data section of the contract documents.
- 7. The system supplier shall be experienced in the design, programming, and service of this type of equipment. In the event of a dispute as to the acceptability of the system supplier, the Owner's Representative shall make the final determination.

F. Guarantee

- 1. The Contractor shall repair or replace defective components, rectify malfunctions, correct faulty workmanship, all at no additional cost to the Owner during the warranty period.
- 2. To fulfill this obligation, the Contractor shall utilize qualified technical service personnel designated by the Contractor who was originally assigned project responsibility. Services shall be performed within five calendar days after notification by the Owner's Representative.

G. Measurement and Payment

Payment for the work in this section shall be included as part of the lump-sum bid amount stated in the Proposal.

PART 2 - MATERIALS

A. Designations of Components

In these specifications and on the plans, all systems, and other elements are represented schematically and are designated by numbers, as derived from criteria in ISA standards. The nomenclature and numbers designated herein and on the plans shall be employed exclusively throughout shop drawings, data sheets, and the like. Any other symbols, designations, and nomenclature unique to a manufacturer's standard methods shall not replace those prescribed above, as used herein, and on the plans.

B. Instrument Tagging

Attach a stainless-steel tag to the instrument at the factory. Permanently mark the stainless-steel tag with the instrument tag number and the instrument calibration range. The manufacturer's standard metal nameplate as a minimum shall denote model number, serial number, operating electrical voltage and amperage (when applicable), and date of manufacture.

C. Instrument System Power

1. Power provided for the instrument system at the facility shall be 120-volt a-c, single phase, 60 Hz.
2. Where d-c power supplies are not furnished integral with any one instrument system loop, then provide separate solid-state power supplies.

D. Matching Style, Appearance, and Type

All display instruments of each type shall represent the same outward appearance, having the same physical size and shape and the same size and style of numbers and pointers.

PART 3 - EXECUTION

A. Uniformity of Components

Components, which perform the same or similar functions, shall, to the greatest degree possible, be of the same or similar type, the same manufacture, the same grade of construction, the same size, and the same appearance.

B. Mounting of Equipment and Accessories

Mount equipment in accordance with the installation detail drawings as prepared by the Contractor and reviewed by the Owner's Representative. Mount equipment so that they are rigidly supported, level and plumb, and in such a manner as to provide accessibility; protection from damage; isolation from heat, shock, and vibration; and freedom from interference with other equipment, piping, and electrical work. Do not install consoles, cabinets, and panels until heavy construction work adjacent to computer and telemetry equipment has been completed to the extent that there shall be no damage to the equipment.

1. Locate devices, including accessories, where they shall be accessible from grade, except as shown otherwise.
2. Mount local equipment in cabinets or existing panels as specified. Mount associated I/O terminals on a common panel or rack; mounting panels and rack shall be baked enamel.
3. Coordinate the installation of the electrical service to components related to the system to assure a compatible and functionally correct system. All accessories shall be coordinated and installation supervised by the Contractor.
4. Test the completed system after installation to assure that all components are operating with the specified range and all interlocks are functioning properly.
5. Tubing, Valves, and Fittings: All instrument tubing manifolds shall be Type 316 stainless steel, unless otherwise specified elsewhere in these specifications. Tubing runs to transmitters shall be installed with a positive slope in one direction. Fittings and valves shall be Type 316 stainless steel. Block/bleed valves shall be as manufactured by Hex Valve Series HB59, or equal.

C. Calibration

1. Each instrument requiring factory calibration shall be furnished with calibration data. The calibration data shall be factory certified.
2. Calibrate systems after installation in conformance with the component manufacturer's instructions. This shall provide that those components having adjustable features are set carefully for the specific conditions and applications of this installation and that the components and/or systems are within the specified limits of accuracy. Defective elements, which cannot achieve proper calibration or accuracy, either individually or within a system, shall be replaced. Accomplish this calibration work by a technical field representative of the single instrument supplier. He shall certify in writing to the Owner's Representative that all calibrations have been made and that all systems are ready to operate.

D. Factory Testing

1. The fully configured instrument control panel shall be successfully submitted to a witnessed factory acceptance test before shipment to the jobsite.
2. For testing purposes SCADA system shall reside on a laptop or desktop provided by the Owner. Interface with the PLC-8 shall be via a serial port.
3. Instrument Control Panel(s) shall be fully assembled and wired.
4. Factory testing shall take place at the PCIS Integrator's facility located in California.
5. The factory test will be for a minimum of one (1) day. Allow additional time for setup, breakdown and pre-testing.
6. Prior to factory system testing, submit a written detailed test procedure for review by the Owner. Notify the Owner in writing four weeks in advance of the scheduled testing.
7. Factory witness tests shall demonstrate that the system will perform each operation required for all specified conditions, including both normal and emergency operations and conditions. Provide a certification and log of all tests to the Owner for review and comment.

8. Check panel wiring against approved submittal drawings. Record any changes made during testing of the equipment on the record drawings.
9. The system shall be exercised through operational tests, under factory-simulated conditions to demonstrate that the system is fully configured to perform all control, logic, monitoring, reporting, logging, archiving and communications functions as specified and that the system is ready for field installation. All test equipment required to simulate actual field conditions shall be provided by the control system contractor.
10. The factory witness test shall take as long as necessary to demonstrate to the Owner and the Owner's Representative that the system performs each operation.
11. A return visit to the Contractor's facility for re-testing will be at the total expense of the Contractor.

E. Field Testing

1. Exercise systems through field tests in the presence of the Owner in order to demonstrate achievement of the specified performance.
2. Coordinate field tests dependent upon completion of work specified elsewhere. Schedule tests among all parties involved so that the tests may proceed without delays or disruption by uncompleted work.

F. 5-day Acceptance Test

1. When systems are assessed to have been successfully carried through a complete operational test and the Owner concurs in this assessment, a date to start the system acceptance test involving the Owner's operating personnel will be agreed upon.
2. Recheck the systems at this time to verify proper operation, and make final adjustments. The system testing shall consist of five (5) consecutive days (Monday – Friday) of continuous testing utilizing the Owner's day shift working hours. The Contractor shall be on call ready to respond to the site within two hours after day shift working hours and on weekends. The Owner's representative will determine the severity of the problem to the best of his ability and contact the Contractor for disposition. This arrangement will in no way relieve the system supplier of responding within 2 hours and resolving the problem in a mutually agreed upon time frame not greater than 48 hours.
3. The acceptance tests shall have a success factor of 95% system uptime. If the system should fail below the 95% factor, correct the system problems. System start-up shall start over again from day one. This will continue until the system functions for five consecutive days with a 95% uptime success factor.

G. Operator Training

1. Provide the Owner's operating personnel and/or the Owner's Representative with three (3) days of formal instruction in the functions and operations of each system provided under this contract. The training shall cover overall system theory, hardware architecture, the operating system, programming instruction in the applicable languages, utility, programs, system generation, and diagnostics. The programming instruction shall include program development, coding, sample programs, and debugging at every programming level. Actual programming exercises and hands-on experience shall be emphasized. Emphasis shall also be placed on safety features and features, which may require readjustment, resetting or checking, and recalibration by them from time to time.

2. Provide the training sessions at the Owner's facilities and on the equipment furnished under this contract. The education and instruction of operating personnel shall be by a qualified instructor familiar with the requirements for this project. Each training session shall be for eight hours of formal instruction. Session dates shall be directed by the Owner. There will be three (3) non-consecutive one-day training sessions, which shall not coincide with any system testing or start-up activities.

END OF SECTION

SECTION 405010 PROCESS CONTROL AND INSTRUMENTATION SYSTEM (PCIS) LOOP
DESCRIPTIONS

PART 1 - GENERAL

A. Description

1. The descriptions, together with the detail drawings, instrumentation diagrams, comprise the functional design criteria of the Process Instrumentation and Control System (PCIS). The process and instrumentation diagrams (P&IDs) represent the basic concept of the PCIS requirements, whereas the descriptions supplement the instrumentation diagrams.
2. The PCIS Supplier shall utilize the descriptions and P&IDs as the basic criteria for the design of the instrumentation schematics, control software, preparation of data sheets, wiring diagrams, piping layouts, assembly drawings, and other requirements set forth in these specifications.
3. The PCIS will provide an integrated control and reporting system. The function of this system is to monitor, control, report, and safeguard the system. The PCIS system will be based on remote terminal units, linked to a SCADA computer and peripherals, with selected monitoring and alarm functions displayed in the control room.
4. Status-to-Command Disagreement (STCD):
 - a. Provide a STCD alarm for all equipment controlled with the control system. The STCD alarm shall be initiated if a piece of equipment is commanded to start/stop or open/close by a PLC and the appropriate run or position status is not reported back within a time interval.
 - b. STCD alarm shall be latched, unless specified otherwise.
 - c. Typical STCD reset shall be accomplished by toggling AUTO (READY, REMOTE) signal back to AUTO (READY, REMOTE), unless specified otherwise.
5. Provide high-high, high, low, low-low, rate of change and instrument fail alarms for all analog points in the system. If a particular alarm is used by ladder logic, or requires to be displayed at local Operator Interface, that alarm shall be implemented at the PLC.
6. All software switches shall be implemented with associated time delays. Time delay value shall be pre-programmed initially to 10 seconds, unless specified otherwise.
7. All flow values and motors elapsed running time shall be totaled and stored at the PLC. Those totals shall be non-resettable.
8. All scaling of analog signals shall be implemented at the PLCs. Each PLC shall interface with an Operator Interface and with PLC network/SCADA System using data in engineering units.
9. At each PLC the processor shall monitor the internal operation of the PLC and communication system for failures. If a failure is detected, a dry contact closure shall close and illuminate the "PLC Fail Light" at an ICP.

10. SCADA System shall monitor communication with each PLC. If a communication failure with a PLC is detected, an alarm shall be generated and logged.

B. Related Work Specified Elsewhere

1. PCIS General Requirements: 405000.
2. Instrumentation Equipment: 405020.
3. Programmable Logic Controller and Operator Interface: 405040.
4. Instrument Control Panel: 405080.

PART 2 - LOOP DESCRIPTIONS

A. Loop 111, Well Control

1. Well Control Logic
 - a. Well is treated as not available when at least one of the following conditions is present:
 - (1) Well is not in AUTO at the SCS;
 - (2) Well READY signal from the VFD is not detected;
 - (3) Any fail alarm signal from VFD is detected;
 - (4) Well STCD is detected.
2. Operation Description
 - a. Idle Mode: Well pump is not running, Flush Valve BFV-01 is opened, Main Valve BFV-02 is closed.
 - b. Well Start
 - (1) Well pump starts and accelerates with a pre-set acceleration rate to until the well flow reaches an operator selected maximum desired set point (initially set at 800 gpm).
 - (2) After operator-selected flush time expires, BFV-02 is commanded by the PLC to open.
 - (3) When BFV-02 fully opened status is detected, PLC commands BFV-01 to close and activates "Pressure Control" mode for maintaining pump speed.
 - (4) An alarm shall be generated when either of the valves does not reach final position within preprogrammed time interval. Well pump shall stop.
 - c. Emergency Flushing:
 - (1) When water nitrate concentration measured by Nitrate Analyzer AE/AIT-115 remains above high-high setpoint for a preprogrammed time interval

(initially set for 90 seconds), PLC shall initiate transition to "Emergency Flush Mode". The following shall occur:

- (a) Flush Valve BFV-01 starts opening.
- (b) Main Valve BFV-02 starts closing when BFV-01 becomes fully opened and pump shall operate at desired maximum speed.
- (c) When water nitrate concentration remains below high setpoint for 2 minutes, transition to Normal Mode shall occur, as described in Steps 1.b and 1.c.

d. Well Stop:

- (1) When low flow (operator adjustable, initial set point = 300 GPM) demand is detected by the PLC, the stop mode shall be initiated and the following shall occur:
 - (a) Pump shall decelerate and Flush Valve BFV-01 shall open.
 - (b) When BFV-01 fully opens, Main Valve BFV-02 shall close.
 - (c) Well pump shall stop.

- 3. Operator shall be able to "Call" to operate the pump from SCS.
- 4. Operator shall be able to adjust the VFD speed from SCS.
- 5. PLC shall monitor the "Run" status of the pump motor and report it to SCS for indication and logging.
- 6. PLC shall report "Fail" status to SCS for alarming.

B. Loop 113, Flow Monitoring

- 1. Flow shall be monitored by PLC and values shall be reported to SCS for indication and recording.
- 2. When well pump is running, flow value shall be totalized.
- 3. When the well is running and the flow remains below or above the pre-programmed flow setpoints for a pre-programmed time interval, an alarm shall be generated.

C. Loop 115, Nitrate Analyzer Monitoring

- 1. Nitrate values shall be monitored by AIT-115 and shall interface to SCS for indication and recording.
- 2. PLC shall generate High Nitrate alarm for indication and recording.

D. Loop 117, Chlorine Analyzer Monitoring

- 1. Chlorine values shall be monitored by AIT-117 and shall interface to SCS for indication and recording.

2. PLC shall generate High and Low Chlorine alarm for indication and recording.
- E. Loop 119, Distribution Pressure Monitoring
- Distribution pressure shall be monitored by pressure transmitter PIT-119 and reported to SCS for indication and recording.
- F. Loop 121, Waste Valve
1. General Requirements (typ. for Main Valve)
 - a. ICP relay contact configuration to be coordinated with the actuator controls.
 - b. ICP relay contacts shall be configured such that PLC failure forces actuators to “Idle Mode” positions.
 2. The waste valve shall open and close per Operation Sequence in para A.2 above.
 3. Operator shall be able to open and close the valve from SCS.
 4. The waste valve Ready, Open, and Close position status shall be monitored by PLC for indication and recording.
- G. Loop 123, Distribution Valve
1. The distribution valve shall open and close per Operation Sequence in para A.2 above.
 2. Operator shall be able to open and close the valve from SCS.
 3. The distribution valve Ready, Open, and Close position status shall be monitored by PLC for indication and recording.
- H. Loop 201, NaOCL Tank Monitoring
1. Tank level shall be monitored by a level transmitter LT-201 and transmitted to the PLC.
 2. PLC shall generate High and Low tank level alarm for indication and recording.
 3. LS-203 shall detect and transmit an alarm for any leak in the tank wall.
- I. Loop 205, Metering Pump
1. Metering pump shall be called to operate when the well is running.
 2. Metering pump VFD shall be paced to maintain dosage (ppm)/flow (gpm) ratio. Operator shall be able to enter the desired ratio at the HMI.
 3. PLC shall monitor flow pulses generated by Flow Switch FS-207.
 4. When lack of flow pulses is detected, while there is a demand, a Low Sodium Hypochlorite Flow alarm shall be generated.
 5. The metering pump shall stop running when well is in “Flushing Mode”

J. Loop 211, Emergency Eyewash Flow Monitoring

Emergency eye wash flow detection and alarm shall be monitored and reported to SCS.

K. Loop 297, UPS Monitoring

Alarms shall be transmitted to the SCS when PLC detects "UPS Common Alarm" or "UPS on Battery" alarm.

L. Loop 299, Door Switch Intrusion Alarm

Alarms shall be transmitted to the SCS when PLC detects control panel door intrusion.

PART 3 – EXECUTION

See Section 405000.

END OF SECTION

SECTION 433277 CHLORINE RESIDUAL ANALYZERS

PART 1 - GENERAL

A. Description

This section describes residual analyzers for the measurement of free chlorine.

B. Related Work Specified Elsewhere

1. Manual, Check, and Process Valves: 400520.
2. Rubber and Plastic Hose and Tubing: 402035.
3. Chlorinating Equipment and Shelter: 433276.

C. Submittals

1. Submit shop drawings in accordance with the City of Modesto General Provisions.
2. Submit dimensional layouts showing piping connections, equipment dimensions, and installation details.
3. Submit manufacturer's catalog data and descriptive literature for equipment.
4. Submit electrical drawings showing wiring, controls, interlocks, terminals, and disconnects. Label each terminal, showing which control or electrical power wire connects to each terminal.

D. Manufacturer's Services

Provide equipment manufacturers services at the jobsite for the minimum labor days listed below, travel time excluded.

1. One labor days to check the installation and advise during start-up, testing, and adjustment of the equipment.

PART 2 - MATERIALS

A. Manufacturers

Residual analyzers shall be as manufactured by Siemens, or equal.

B. Free Chlorine Residual Analyzer

1. Provide amperometric-type chlorine residual analyzers for continuous measurement of free chlorine residual. The units shall receive a continuous sample of chlorinated water and produce a 4- to 20-mA d-c output signal proportional to the chlorine residual present. The unit shall be a sensitive microprocessor-based device with published accuracy of 0.01 mg/L. Provide the following features:

- a. A three-electrode amperometric cell for stable and sensitive analysis in the presence of varying background current.
 - b. Digital LED display of chlorine residual in one of eight field selectable ranges.
 - c. A scrollable, informative operator menu for display of operating parameters, alarm messages, and instructions for altering operating parameters.
 - d. A supervisor's setup menu for display of step-by-step instructions for proper setup and configuration changes.
 - e. An on-line self-diagnostic menu for calibration, servicing, and troubleshooting.
 - f. A four-digit, operator-defined access code to limit unauthorized changes.
 - g. Automatic backflushing of cell orifice and flow path up to 48 times daily as programmed by the operator.
 - h. NEMA 4X enclosure of electronics with plug-in connectors for all cell and pump devices.
 - i. Varistor-type surge protector for input power.
 - j. Analyzer shall turn off automatically when no sample flow is detected for five seconds to protect chlorine analyzer cell. Automatic shutdown time shall be adjustable.
 - k. The analyzer shall suffer no breakthrough from combined chlorine species present in the water including monochloramine.
2. The chlorine residual analyzers shall be Siemens Depolox 3 Plus with Bare Electrode Measuring Cell, or equal.

CHLORINE ANALYZER

GENERAL

- | | |
|-------------|-----------------------------|
| 1. Tag No. | AE/AIT-117 |
| 2. P&ID No. | N-601 |
| 3. Service | Potable Water Free Chlorine |

SENSOR ASSEMBLY

- | | |
|---------------------|-------------------|
| 4. Location | Well 8 Pump House |
| 5. Mounting | Analyzer Panel |
| 6. Housing Material | Mfr. Std. |

ANALYZER/TRANSMITTER

- | | |
|---|-------------------|
| 7. Location | Well 8 Pump House |
| 8. Mounting | Analyzer Panel |
| 9. Calibration ($\mu\text{g/L}$ as Cl_2) | 0-5 |
| 10. Output | 4-20 mA |
| 11. Enclosure | NEMA 4 |
| 12. Power | 120 VAC |

SERVICE CONDITIONS

13.	Process Media	Treated Water
14.	Temp. (deg. F) (min/max)	50/80
15.	Oper Pressure (psig) (min/max)	0/100
16.	Amb. Temp. (°F) (min/max)	50/110

C. Spare Parts

1. Provide the following spare parts:

Quantity	Description
1	Free Chlorine Electrode Measuring Cell

2. Pack spare parts in a wooden box and label with manufacturer's name; local representative's name, address, and telephone number; and list of materials contained within.

END OF SECTION

PART 1 - GENERAL

A. Description

This section describes rehabilitation of the existing preengineered Granular Activated Carbon Adsorption System (GACAS) described herein for the removal of dibromochloropropane (DBCP) from groundwater. The carbon has been removed from all of the existing vessels.

B. Work to be Included

1. The Contractor shall be responsible for reassembling the existing GACAS, cleaning and repainting the exterior, testing the interior coating for holidays, repairing the internal coating as needed, retesting, and complete installation.
2. The existing GACAS as specified herein is comprised of:
 - a. Skid-mounted, downflow adsorber vessels including interior lining and exterior priming.
 - b. Process and utility piping, valves, and accessories.
 - c. Influent and effluent pressure gauges.
 - d. Independent GAC fill and discharge piping.
 - e. Vent and pressure-relief piping and flush water connections.
 - f. Air connections for GAC transfers, pressure gauges, and sample ports.
 - g. Spray nozzles for GAC vessel washdown.
3. The following work is included and is to be the responsibility of the Contractor:
 - a. Disinfection per Specification 331300.
 - b. Finish painting.
 - c. Leak testing and disinfection of GACAS prior to GAC fill.
 - d. New and manual valves and vessel piping modifications.
 - e. Vessel hardware component loading, transportation and offloading with the vessels.
 - f. Training of site operators.

C. Submittals

Contractor's Field Reports - The following field reports shall be submitted:

1. Upon satisfactory completion of the installation of the system, the Contractor shall submit a written memorandum to the Owner notifying the Owner that installation is complete and

acceptable. The memorandum shall identify any conditions that must be corrected prior to carbon fill and system start-up by the Contractor. System conditions referred to above have been satisfactorily resolved.

2. Within 2 weeks following completion of system testing, the Contractor shall submit a report on field testing performed, including certification that the system has been installed and tested in accordance with these specifications and test system performance meets these specifications.

D. Storage and Protection

System components delivered to the site shall be stored in such a manner that they will not constitute an attractive nuisance or safety hazard.

E. Sequencing and Scheduling

Contractor's schedule for completing his work shall be submitted as required in the Submittals subsection. Contractor shall update his schedule and submit it to the Engineer if actual progress or conditions deviate from his previous schedule. Contractor shall make reasonable adjustments to his schedule, as needed, to accommodate the work of others.

PART 2 - MATERIALS

A. Lining

1. The GACAS interior lining void testing shall be certified by an Owner-approved Inspector.
2. Lining inspection shall include:
 - a. General Appearance: film shall be free of runs, sags, orange peel, pin-holing, fish-eyes, over-spray, trash in the film and voids.
 - b. Film thickness shall be determined using a Micro test thickness gauge as manufactured by KTA-Tater, Inc. or functionally equivalent non-destructive dry film thickness gauge for use on protective coatings with any accuracy of $\pm 5\%$, and which has been properly calibrated. The number of thickness measurements shall conform with WPCC requirements.
 - c. Voltage detector Midel AP-W as manufactured by Tinker and Rasor (San Gabriel, CA) or equal.
 - d. A water test, performed on the site, by filling the vessel with potable water, pressurizing the system for 48 hours, draining/evacuating venting the vessels and making a visual inspection after at least 48 hours of venting. Any traces of rust, deemed by the Owner to be deleterious to the integrity of the steel substrate shall be further inspected and if necessary, repaired. The detailed inspection and repair shall be at the Contractor's expense.
 - e. The Contractor shall pay for any re-testing of the lining.
3. The void testing shall be conducted at the lining application and curing site and the installation site after delivery. Any voids or cracks found will be repaired and retested by the Contractor, at his expense, within one week.

4. The interior lining of the vessel and all interior carbon steel internals (including process and utility piping described in Section D, below) will be repaired as necessary with: Plasite 4110 to a minimum/maximum dry film thickness of 35/45 mils respectively and per Plasite Bulletins PA-3 and PA-4,000 and instructions; or Enviroline 230 NSF to a minimum/maximum dry film thickness of 35/45 mils respectively and per Industrial Environmental Coatings Corporation guidelines and instructions; or an approved equal. Interior lining must be certified to NSF/ANSI Standard 61 for direct potable water contact. The Contractor shall contact the Owner at least 7 calendar days prior to vessel lining, and allow the Owner, and/or its authorized agent, access to inspect the vessel's interior lining application.

B. Process and Utility Piping

1. General

- a. All pipe which will operate under pressure shall be properly tied or blocked, restrained, and supported at all fittings where the pipe changes direction, changes size, or ends, using suitable anchors. Exposed pipe shall be installed in straight runs parallel to the axes of the structures or equipment. Pipe runs shall be horizontal and vertical except that gravity drain lines shall be pitched down in the direction of flow not less than 1/8 inch per foot.
- b. Pipe work shall be suspended and supported in such a manner as to prevent sagging or overstressing of pipe and connections and, furthermore, shall be supported so that no item of the piping system will transfer any load or stress to any equipment.
- c. Piping shall be made up with a sufficient number of unions, flanged joints, grooved end joints, or flexible couplings to permit ready breaking of lines as necessary for inspection and maintenance and to allow for expansions and contraction and general flexibility.
- d. Pipe and fittings shall be assembled so there will be no distortion or springing of the pipelines. Flanges, unions, flexible couplings, and other connections shall come together at the proper orientation. The fit shall not be made by springing any piping nor shall orientation alignment be corrected by taking up on any flange bolts. Flange bolts, union halves, flexible connectors, etc., shall slip freely into place. If the proper fit is not obtained, the piping shall be altered to fit.

C. Painting and Coating of Vessel Exterior

1. Exposed Metal Coating System: System No. 15--Exposed Metal, Atmospheric Weathering or Water Condensation Environment.
2. Finish Coat: Surfaces to be Coated: Exterior of GAC vessels, piping, valves, equipment support structure, and appurtenances. Color shall be approved by Owner.
3. Surfaces Not to be Coated: Aluminum, brass, bronze, copper, plastic, rubber, stainless steel, or lead. Grease fitting, nameplates, or serial numbers.

PART 3 - EXECUTION

A. Pressure Testing Preparation

1. Conduct pressure tests on exposed and aboveground piping after the piping has been installed and attached to the pipe supports, hangers, anchors, expansion joints, valves, and meters.
2. Provide any temporary piping needed to carry the test fluid to the piping that is to be tested. After the test has been completed and demonstrated to comply with the specifications, disconnect and remove temporary piping. Do not remove exposed vent and drain valves at the high and low points in the tested piping; remove any temporary buried valves and cap the associated outlets. Plug taps or connections to the existing piping from which the test fluid was obtained.
3. Provide temporary drain lines needed to carry testing fluid away from the pipe being tested. Remove such temporary drain lines after completing the pressure testing. Drain the pipes after they have been tested.
4. Prior to starting the test, the Contractor shall notify the Owner's Representative.

B. Testing and Disinfection Sequence for Potable Water Piping

Perform required disinfection after hydrostatic testing.

C. Hydrostatic Testing of GAC Vessels

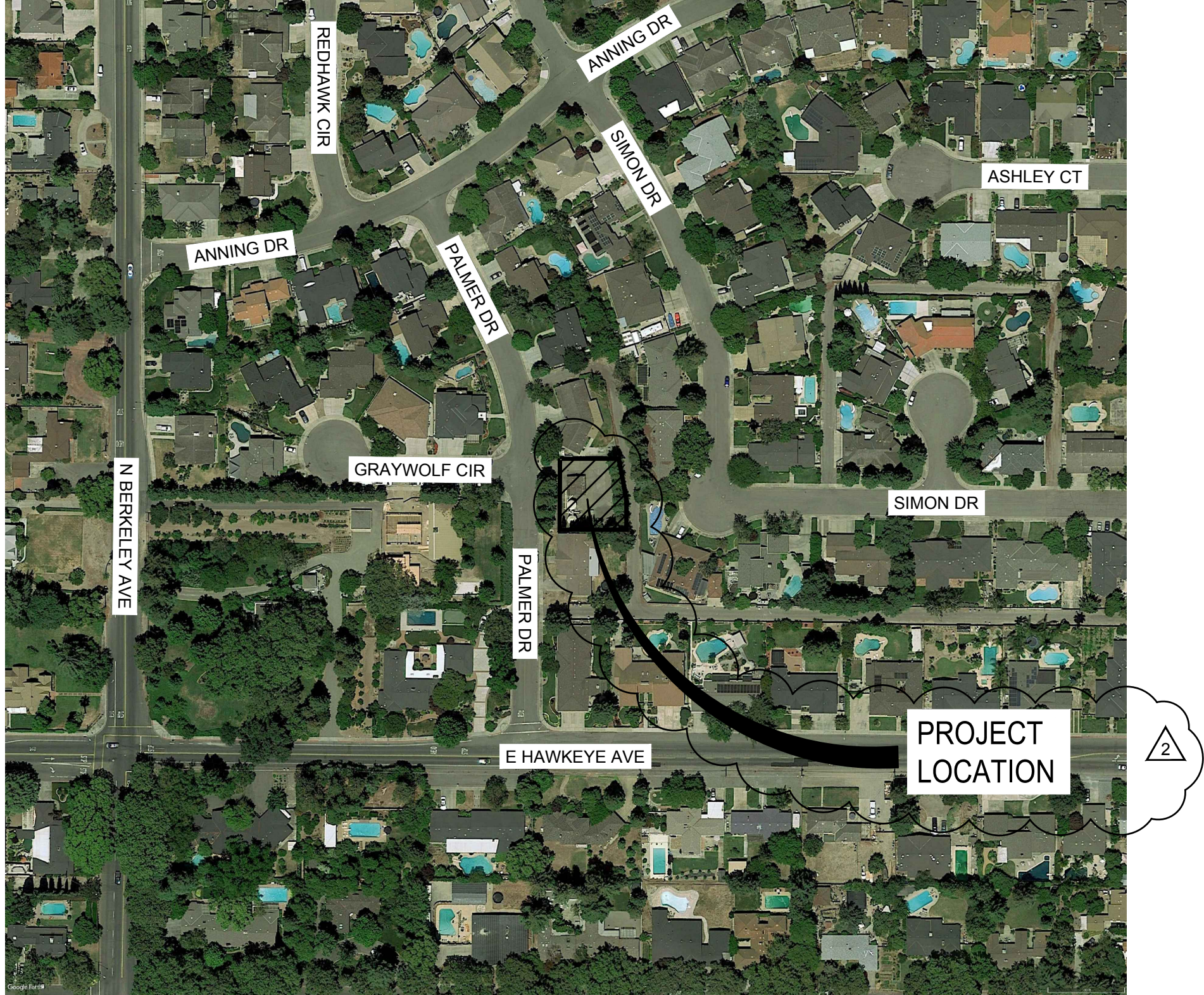
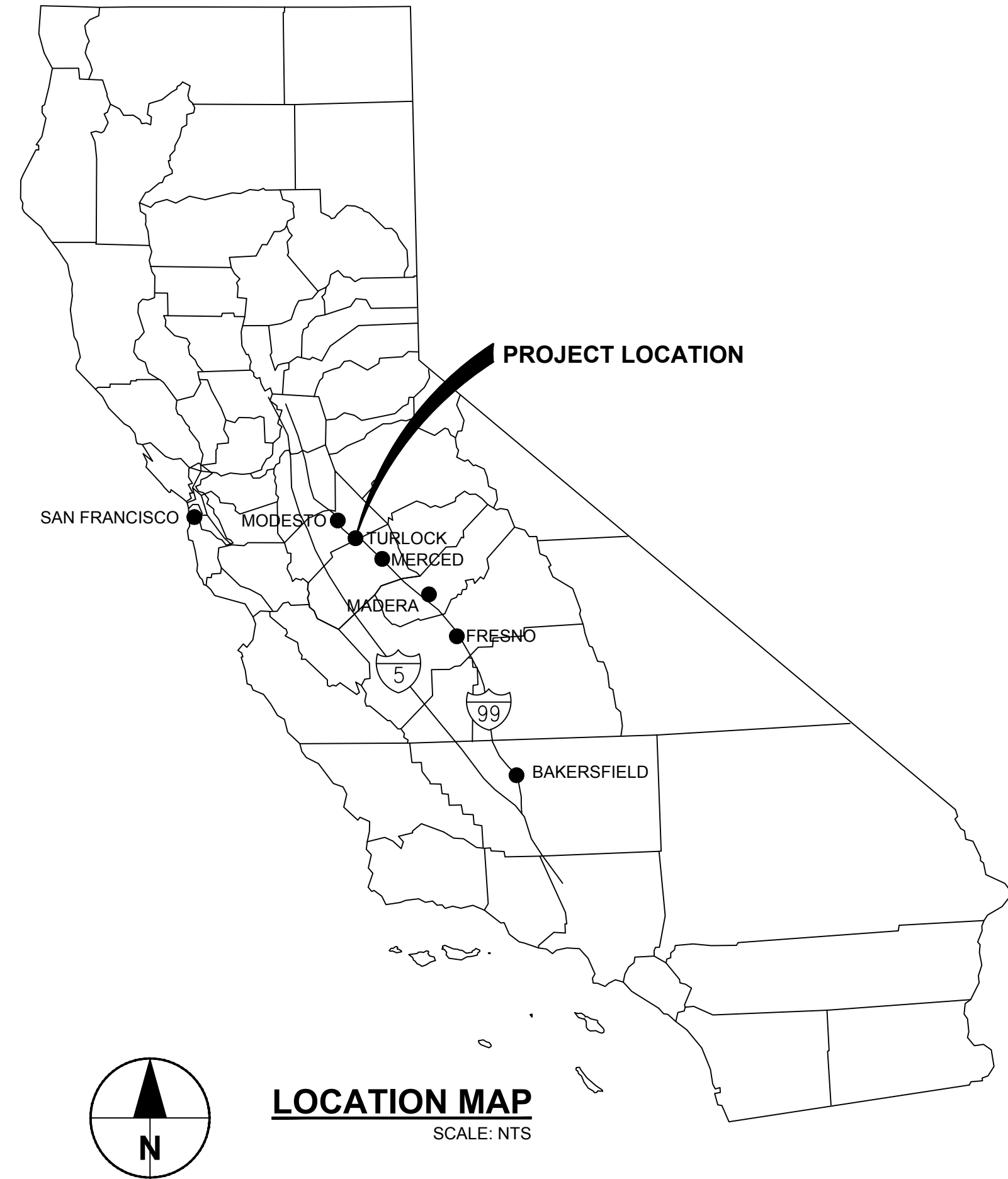
Isolate GAC vessels from connecting pipelines and test to 100 psi for a minimum of 4 hours. Following testing, dewater GAC vessels, open manways, and allow vessels to air dry for 48 hours, after which time the interior coatings will be inspected by the manufacturer. Repairs, if necessary, will be conducted by the manufacturer. Following the repairs, secure the manways and conduct the disinfection procedures prior to loading the carbon.

END OF SECTION

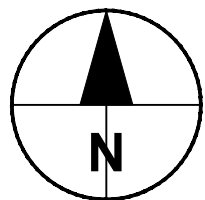
CITY OF TURLOCK

CONSTRUCTION PLANS FOR WELL 8 GAC SYSTEM REHABILITATION/RESTART CITY OF TURLOCK PROJECT NO. 18-59

SHEET LIST	
GENERAL	
SHEET NUMBER	SHEET DESCRIPTION
G-001	COVER SHEET AND SHEET INDEX
G-002	ABBREVIATIONS AND LEGEND
CIVIL	
C-100	EXISTING TREATMENT SITE LAYOUT
C-101	EXISTING TREATMENT SITE LAYOUT & DEMO PLAN
C-102	UPGRADES TO EXISTING WELL #8 BUILDING
C-201	GAC - PLAN & SECTIONS
C-202	MISCELLANEOUS DETAILS 1
C-203	MISCELLANEOUS DETAILS 2
C-204	CHEMICAL BUILDING PLAN & ELEVATIONS
ELECTRICAL	
E-100	ELECTRICAL LEGEND AND ABBREVIATIONS
E-101	ELECTRICAL SITE PLAN
E-102	SINGLE LINE DIAGRAM
E-103	CONDUIT SCHEDULE
E-104	ELECTRICAL DETAILS
E-105	SCHEMATIC DIAGRAMS
INSTRUMENTATION	
N-001	INSTRUMENTATION LEGEND & SYMBOLS
N-002	COMMUNICATION BLOCK DIAGRAM
N-501	INSTRUMENTATION DETAILS
N-601	GAC TREATMENT P&ID
N-602	CHEMICAL FEED SYSTEM P&ID



VICINITY MAP
SCALE: NTS



GENERAL NOTES

- ALL WORK ON THIS PROJECT SHALL COMPLY WITH THE CITY OF TURLOCK CONSTRUCTION STANDARDS AND DRAWINGS AND ANY MODIFICATIONS THERETO BY THESE CONTRACT DOCUMENTS. ALL CONSTRUCTION DETAILS NOT SHOWN HEREON SHALL CONFORM TO THE CITY STANDARDS SET FORTH IN THE CURRENT CITY OF TURLOCK STANDARD SPECIFICATIONS AND DRAWINGS.
- THE LOCATIONS OF THE EXISTING UNDERGROUND STRUCTURES AND UTILITIES HAVE BEEN LOCATED IN THE FIELD OR OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR SHALL ASSUME THE SOLE RESPONSIBILITY FOR DETERMINING OR CONFIRMING THE EXACT LOCATIONS OF THESE FACILITIES AND PROTECTING SAME FROM DAMAGE.
- AT LEAST TWO (2) WORKING DAYS BEFORE BEGINNING WORK, THE CONTRACTOR SHALL REQUEST UTILITY OWNERS TO MARK OR OTHERWISE INDICATE THE LOCATION OF SUBSURFACE FACILITIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION AND DEPTH OF ALL SUBSURFACE FACILITIES WHICH HAVE BEEN MARKED BY THE RESPECTIVE OWNERS AND WHICH MAY AFFECT OR BE AFFECTED BY THEIR CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL TAKE DUE PRECAUTIONARY MEASURES TO PROTECT UTILITIES OR STRUCTURES FOUND AT THE SITE.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND HAVING ON-SITE THE LATEST UPDATED AND SIGNED IMPROVEMENT DRAWINGS PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL NOTIFY AND COORDINATE ALL RELATED WORK WITH THE FOLLOWING AGENCIES IN ACCORDANCE WITH THE SPECIFICATIONS AND THESE DRAWINGS. NOTE THAT THIS PROJECT REQUIRES THE CONTACTOR TO OBTAIN AND PAY FOR A CITY OF TURLOCK BUILDING PERMIT.

CITY OF TURLOCK
DEVELOPMENT SERVICES
DEPARTMENT
NATHAN BRAY, P.E.
156 S. BROADWAY, STE 258
TURLOCK, CA 95380
(209) 668-5520

APPROVALS:

NATHAN BRAY P.E.
INTERIM DEVELOPMENT SERVICES
DIRECTOR/CITY ENGINEER

AECOM

PROJECT

CITY OF TURLOCK
WELL 8 GAC SYSTEM
REHABILITATION
/RESTART
1690 PALMER DRIVE,
TURLOCK, CA 95382

CLIENT

CITY OF TURLOCK
156 S. BROADWAY AVE. SUITE 270,
TURLOCK, CA 95380



CONSULTANT

AECOM
1360 E. SPRUCE AVENUE #101
FRESNO, CA 93720
559.448.8222 tel 559.448.8233 fax
www.aecom.com

REGISTRATION



ISSUE/REVISION

NO.	DATE	DESCRIPTION
2	2018-11-21	ADDENDUM NO. 1
1	2018-11-02	BID SET
I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

6056689

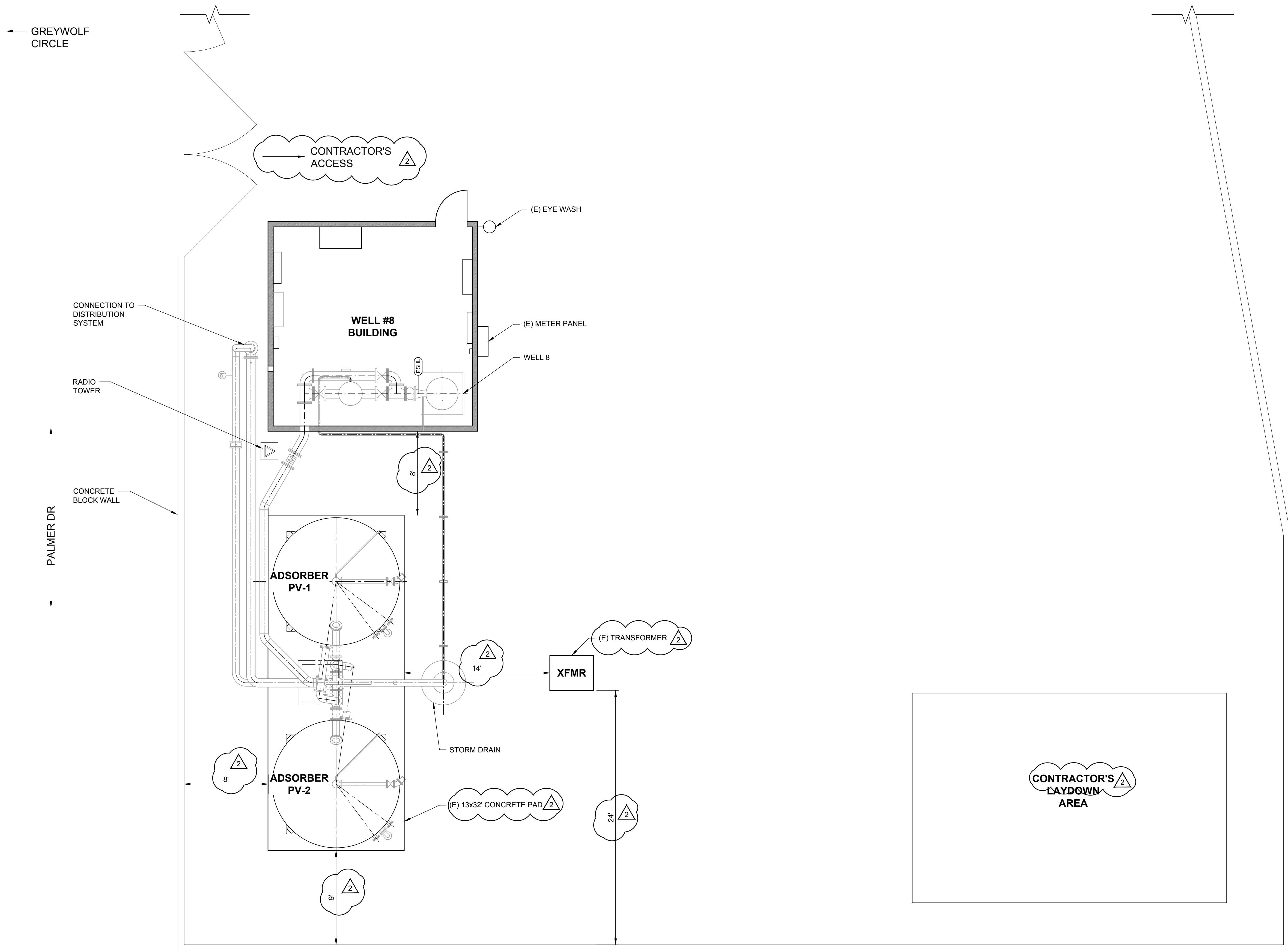
SHEET TITLE

COVER SHEET & SHEET INDEX

ADDENDUM NO. 1

SHEET NUMBER

G-001



NOTE:

DIMENSIONS SHOWN
FOR REFERENCE ONLY



PROJECT

CITY OF TURLOCK WELL 8 GAC SYSTEM REHABILITATION /RESTART

1690 PALMER DRIVE,
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CLIENT

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FRESNO, CA 93720
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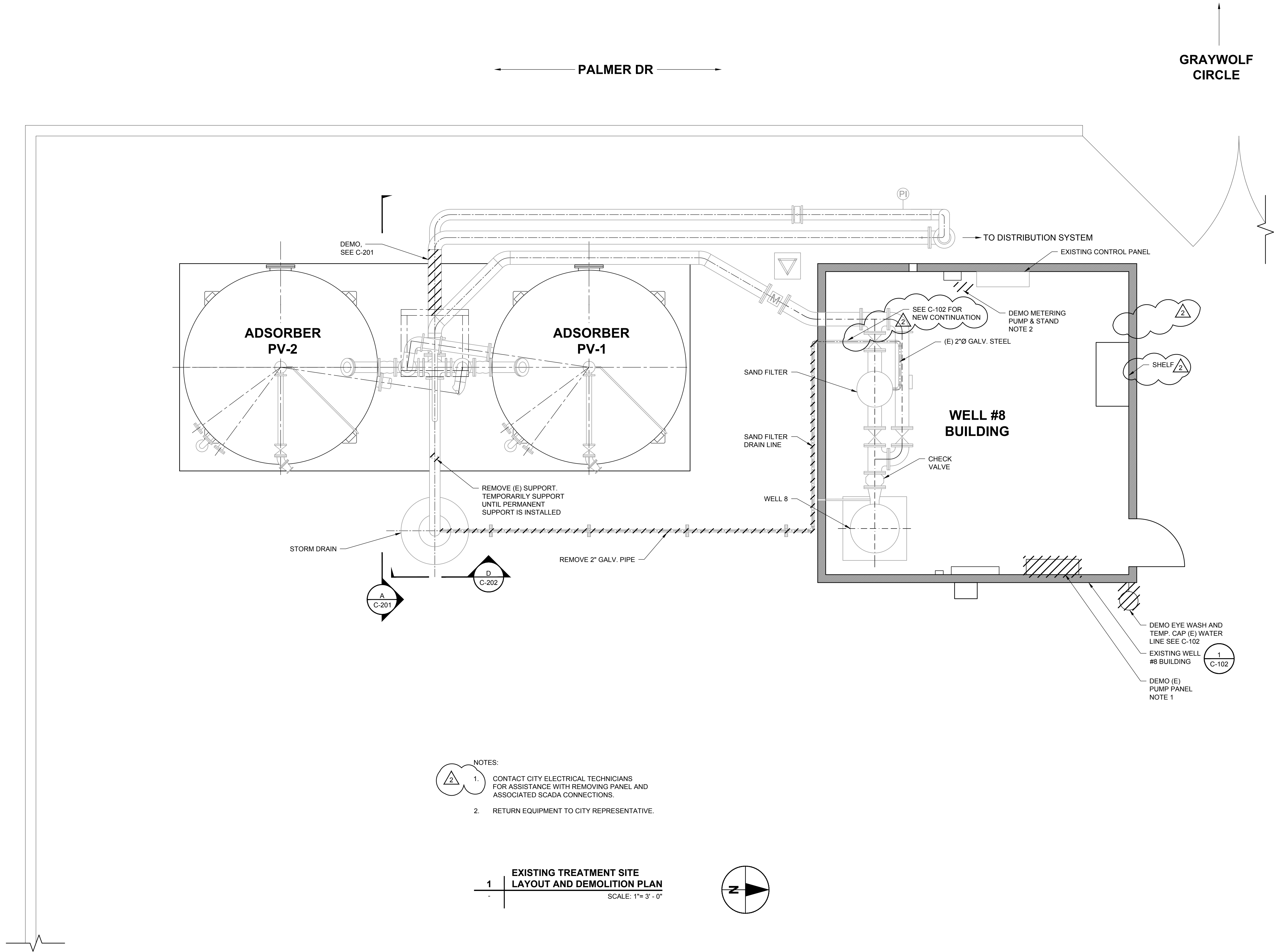
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EXISTING TREATMENT SITE LAYOUT

ADDENDUM NO. 1
SHEET NUMBER

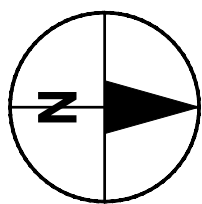
C-100

C-100



- NOTES:
1. CONTACT CITY ELECTRICAL TECHNICIANS FOR ASSISTANCE WITH REMOVING PANEL AND ASSOCIATED SCADA CONNECTIONS.
 2. RETURN EQUIPMENT TO CITY REPRESENTATIVE.

1 | EXISTING TREATMENT SITE LAYOUT AND DEMOLITION PLAN
- | SCALE: 1"= 3' - 0"



PROJECT

CITY OF TURLOCK
WELL 8 GAC SYSTEM
REHABILITATION
/RESTART

1690 PALMER DRIVE,
TURLOCK, CA 95382

CLIENT

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AECOM
1360 E. SPRUCE AVENUE #101
FRESNO, CA 93720
559.448.8222 tel 559.448.8233 fax
www.aecom.com

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KEY PLAN

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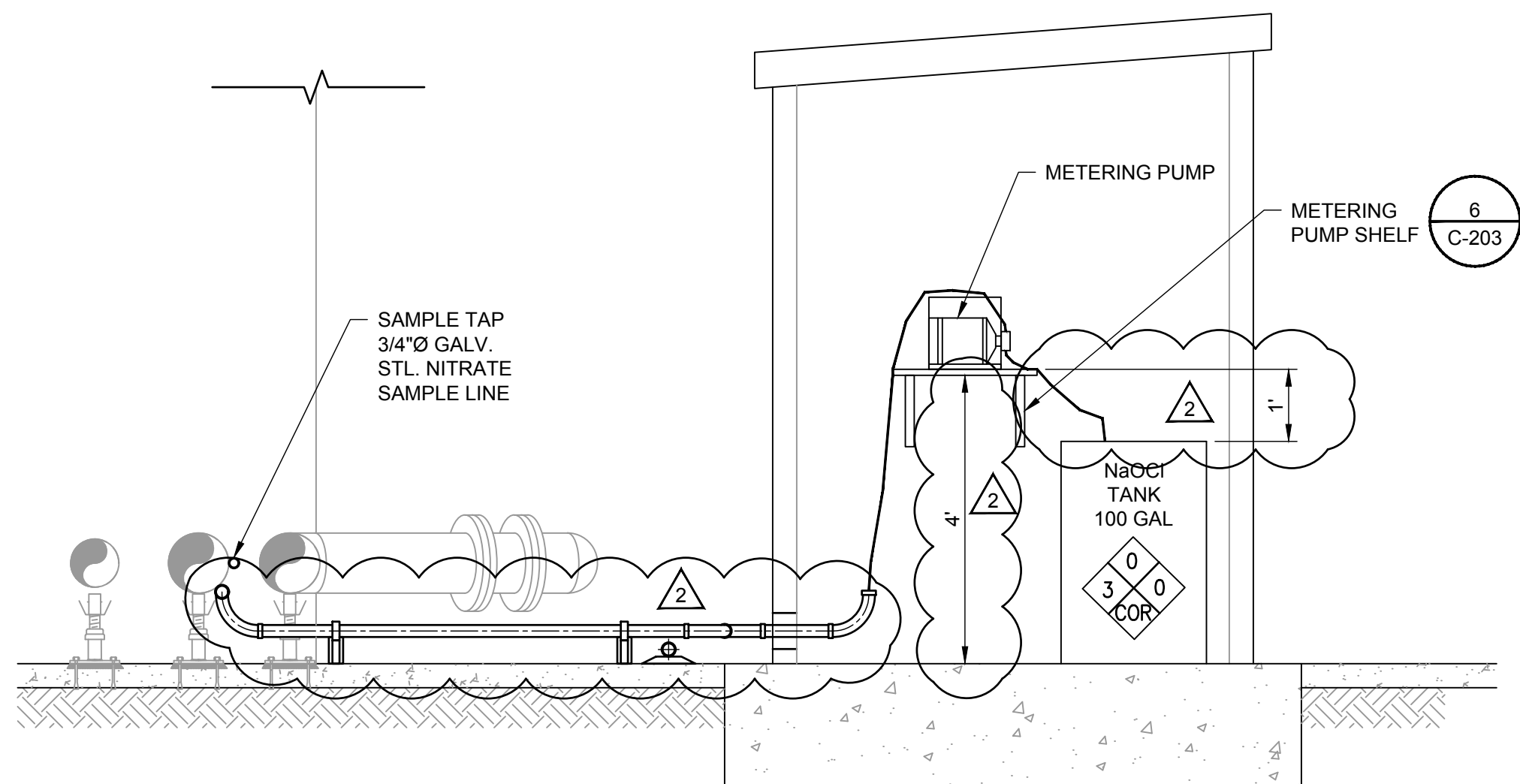
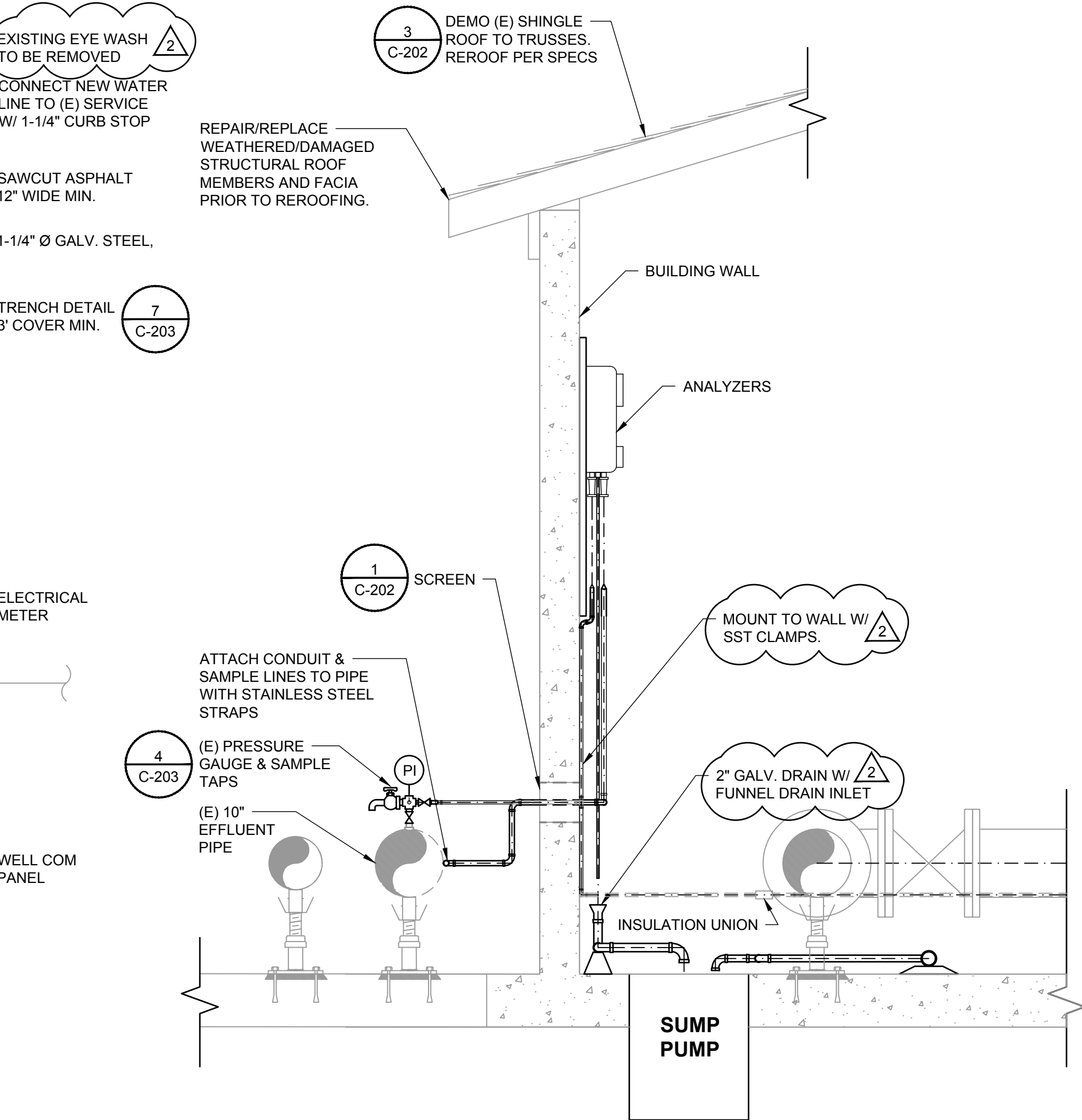
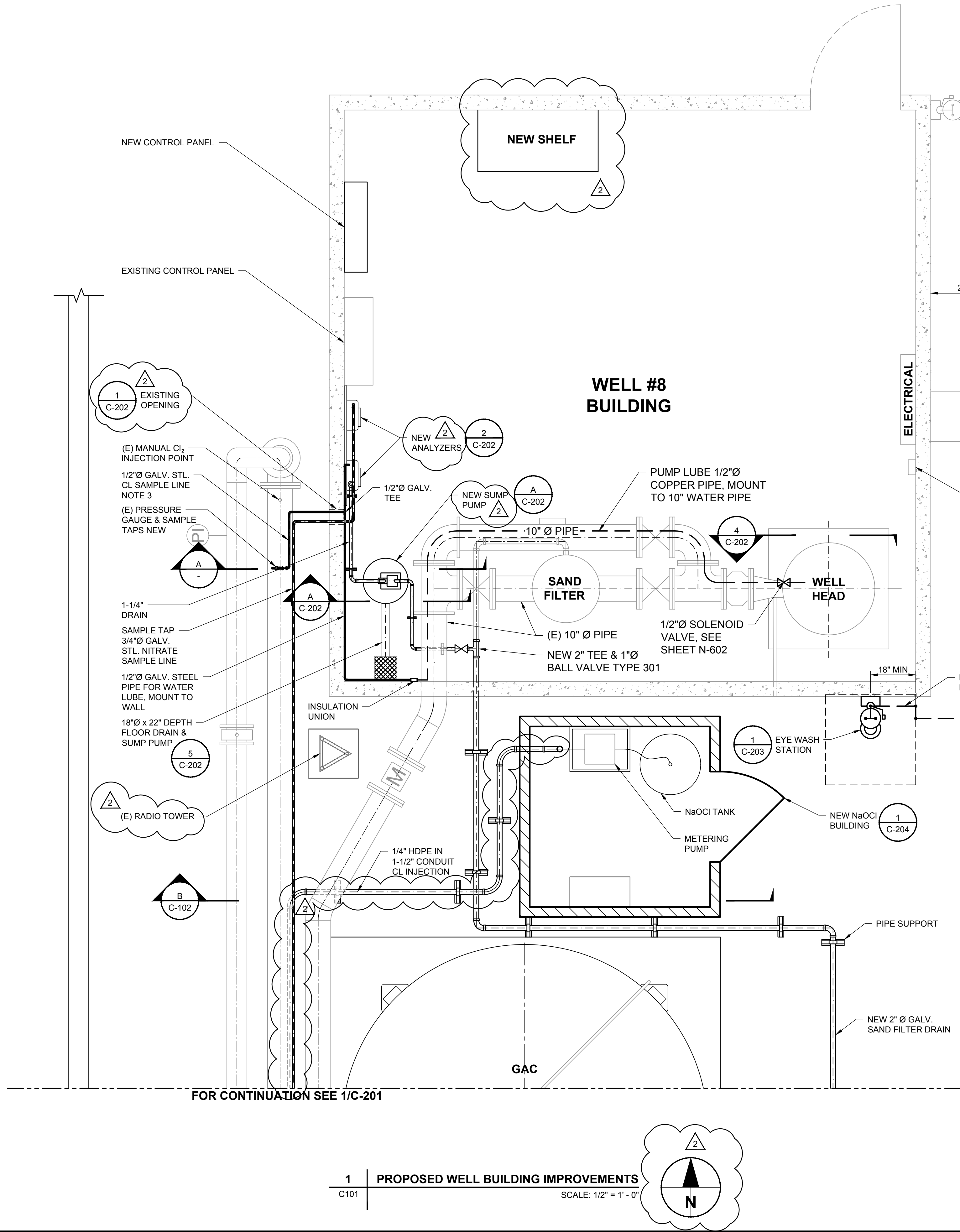
SHEET TITLE

EXISTING TREATMENT SITE
LAYOUT & DEMO PLAN

ADDENDUM NO. 1

SHEET NUMBER

C-101



1 | PROPOSED WELL BUILDING IMPROVEMENTS
C101 | SCALE: 1/2" = 1' - 0"

B | SODIUM HYPOCHLORITE BUILDING SECTION
SCALE: 3/4" = 1' - 0"

AECOM

PROJECT

**CITY OF TURLOCK
WELL 8 GAC SYSTEM
REHABILITATION
/RESTART**

1690 PALMER DRIVE,
TURLOCK, CA 95382

CLIENT

CITY OF TURLOCK

156 S. BROADWAY AVE. SUITE 270,
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CONSULTANT

AECOM
1360 E. SPRUCE AVENUE #101
FRESNO, CA 93720
559.448.8222 tel 559.448.8233 fax
www.aecom.com

REGISTRATION



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I/R	DATE	DESCRIPTION
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1	2018-11-02	BID SET

KEY PLAN

PROJECT NUMBER

60566889

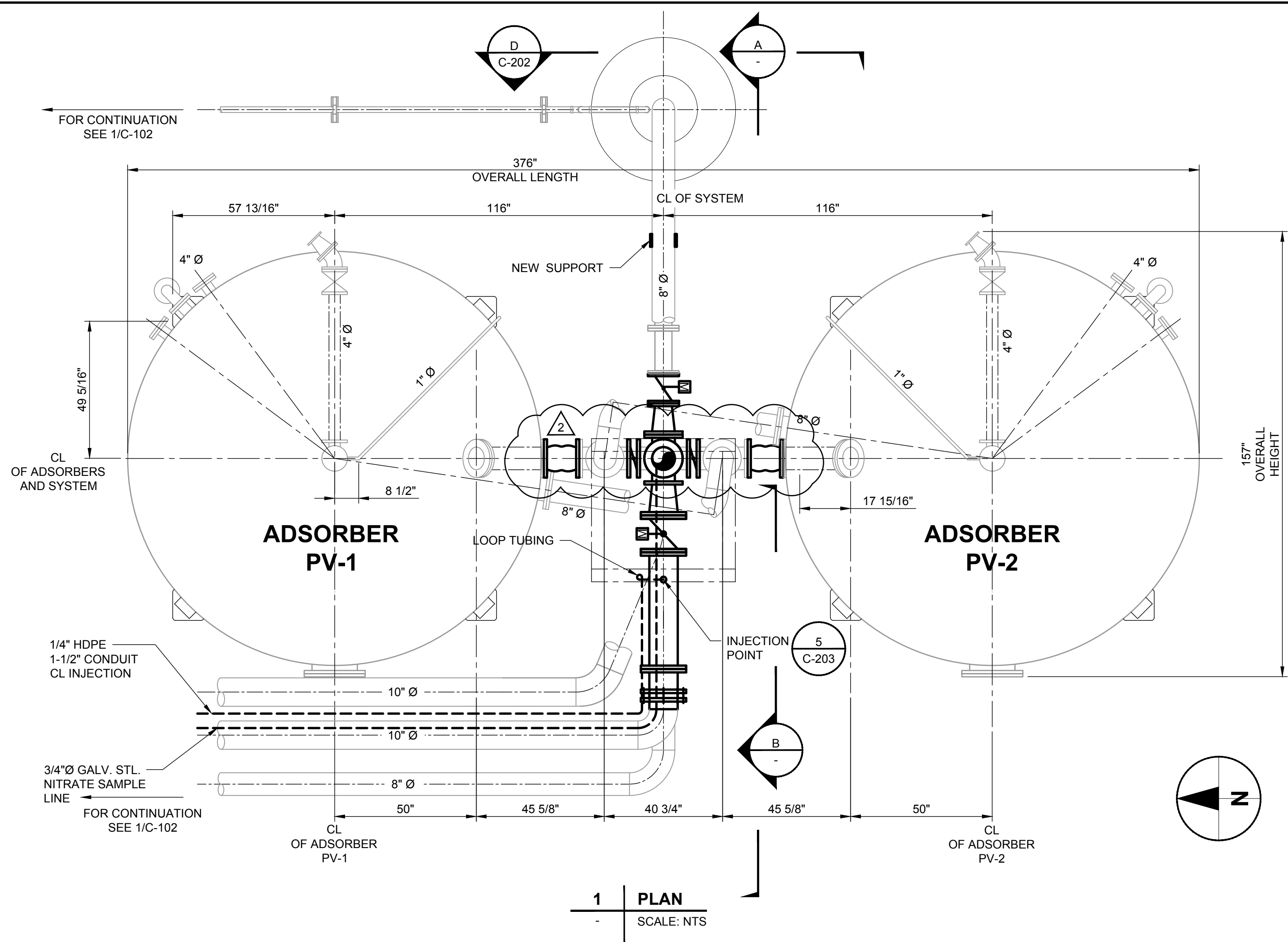
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UPGRADES TO EXISTING
WELL #8 BUILDING

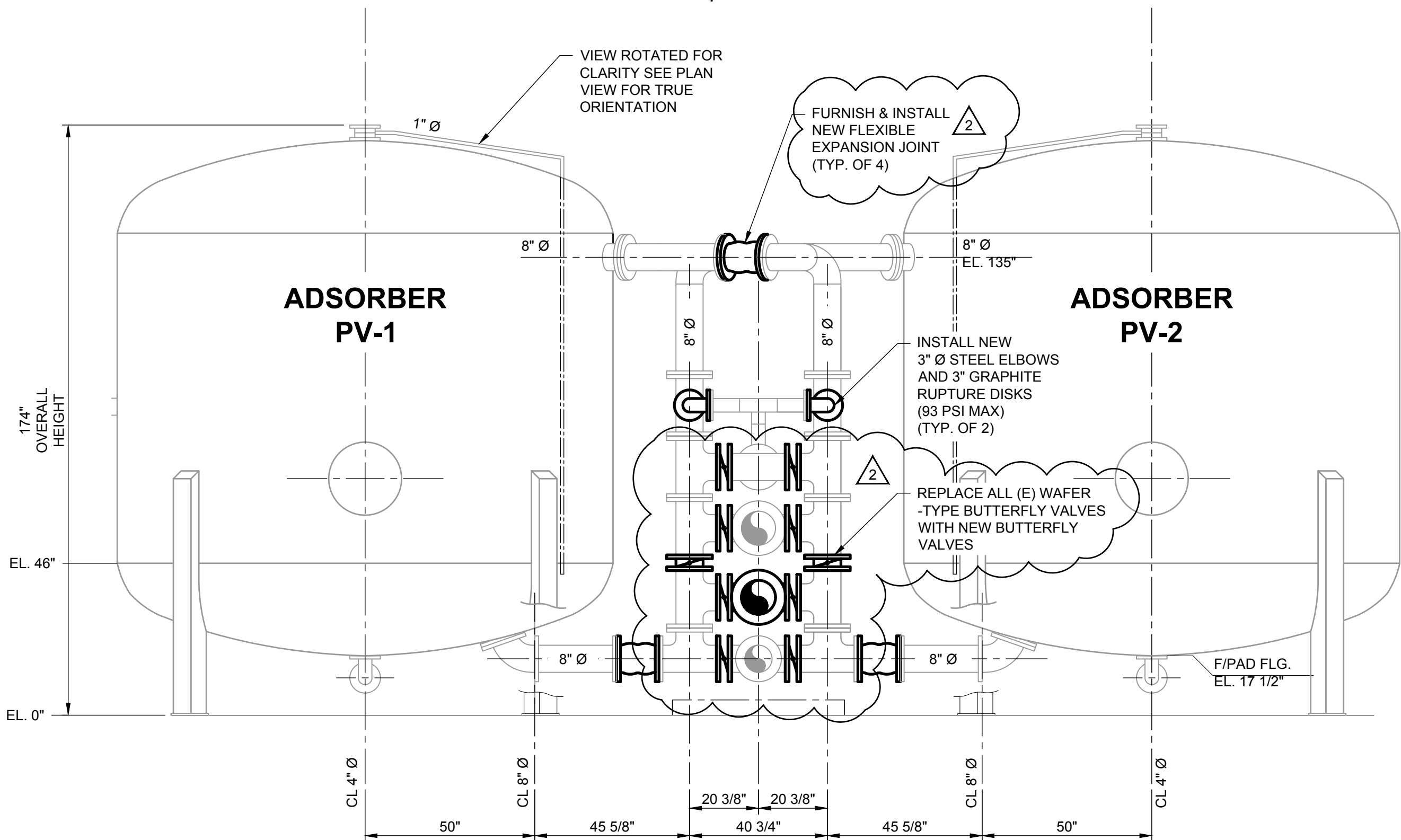
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SHEET NUMBER

C-102



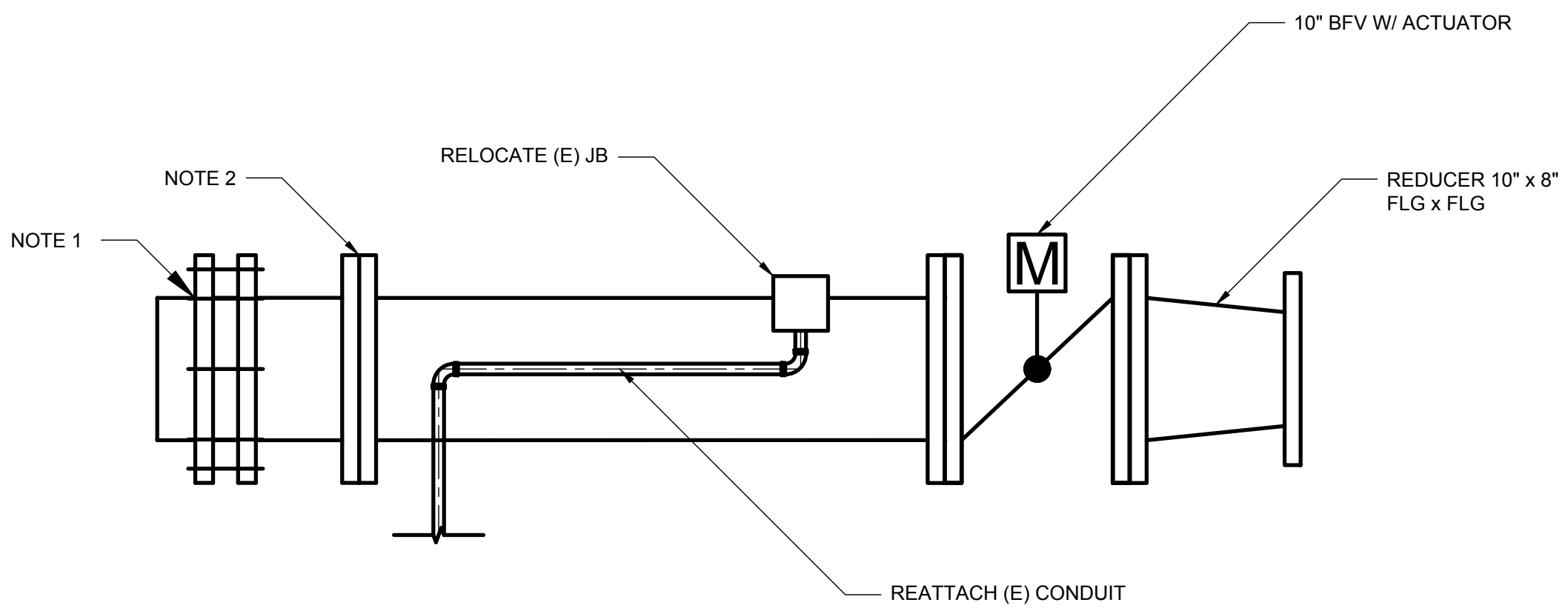
1 PLAN
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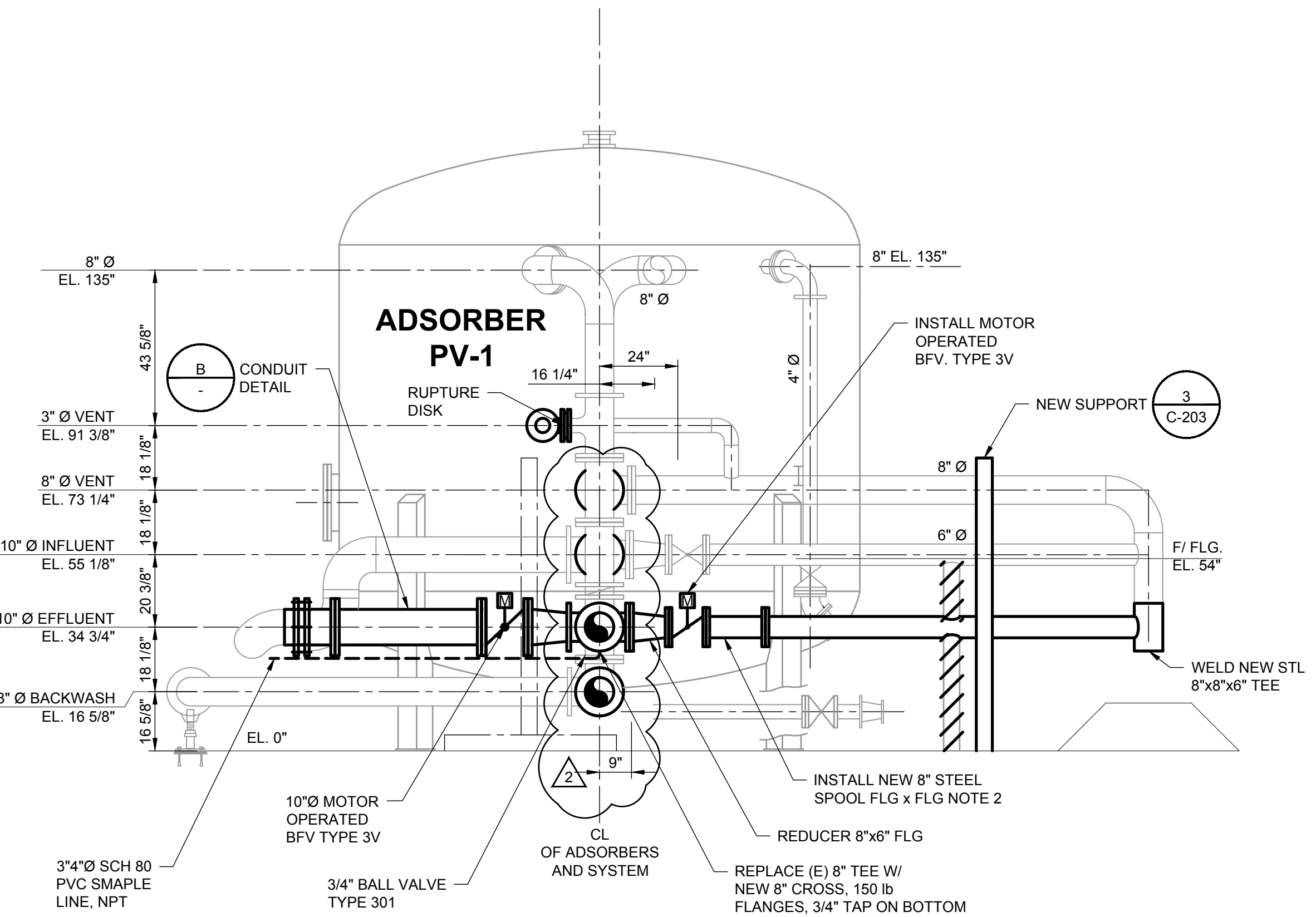
2 ELEVATION
SCALE: NTS

NOTE:

- CUT EXISTING PIPE TO ADD VALVE AND SPOOL.
- TRIM PLAIN END SQUARE AND INSTALL FLANGE ADAPTER.
- DIMENSIONS FOR REFERENCE ONLY



B CONDUIT DETAIL
SCALE: NTS



A SECTION
SCALE: NTS

AECOM

PROJECT

CITY OF TURLOCK
WELL 8 GAC SYSTEM
REHABILITATION
/RESTART

1690 PALMER DRIVE,
TURLOCK, CA 95382

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CITY OF TURLOCK

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CONSULTANT

AECOM
1360 E. SPRUCE AVENUE #101
FRESNO, CA 93720
559.448.8222 tel 559.448.8233 fax
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KEY PLAN

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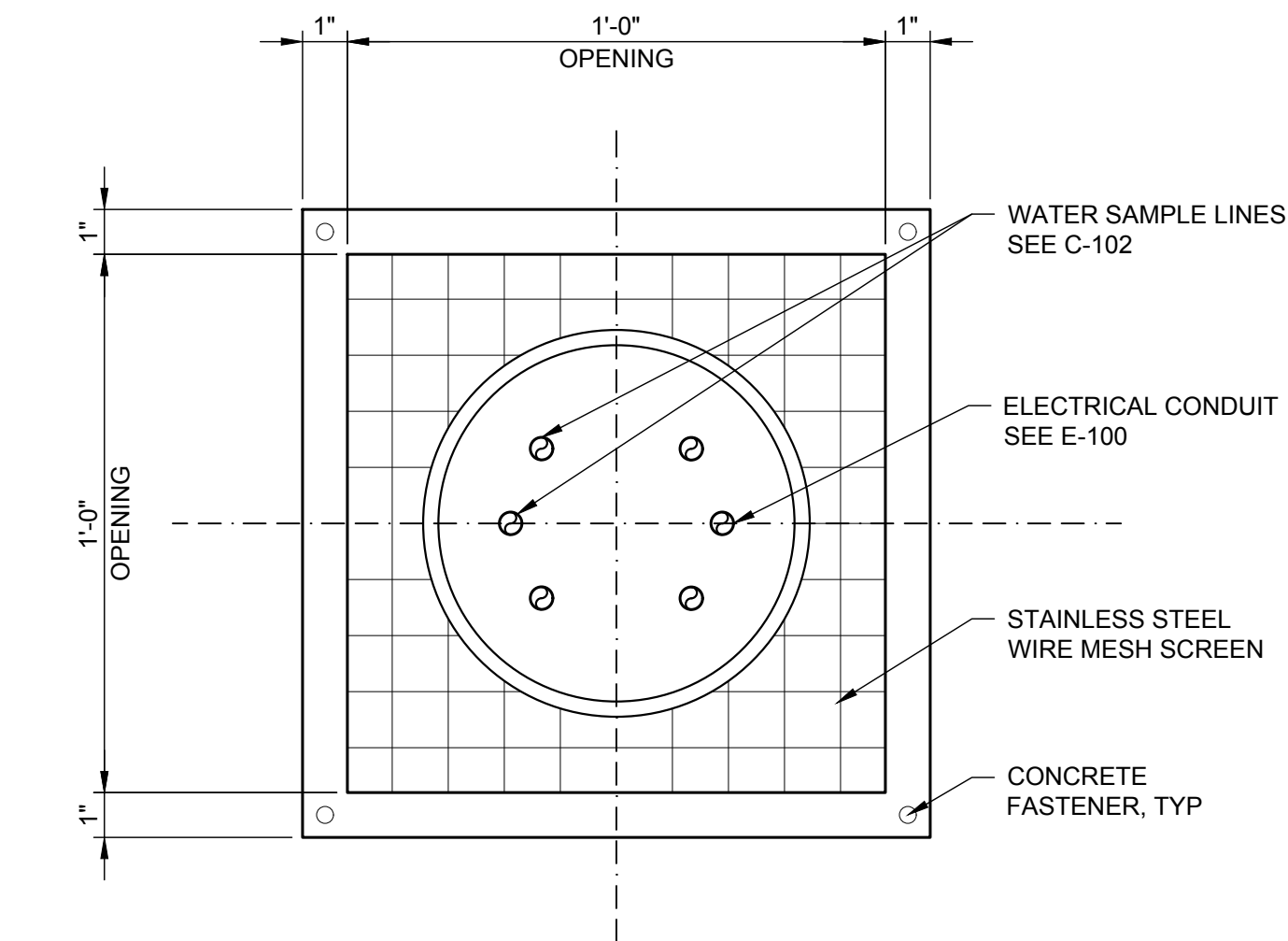
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GAC - PLAN & SECTIONS

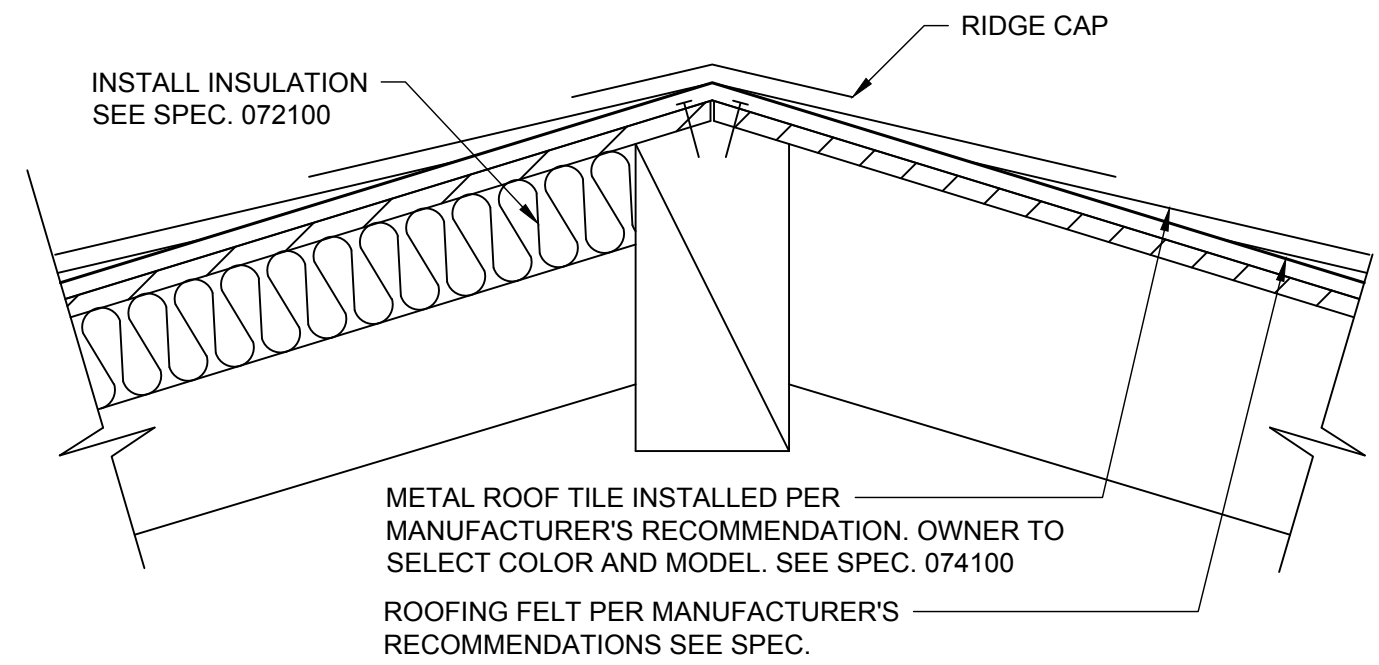
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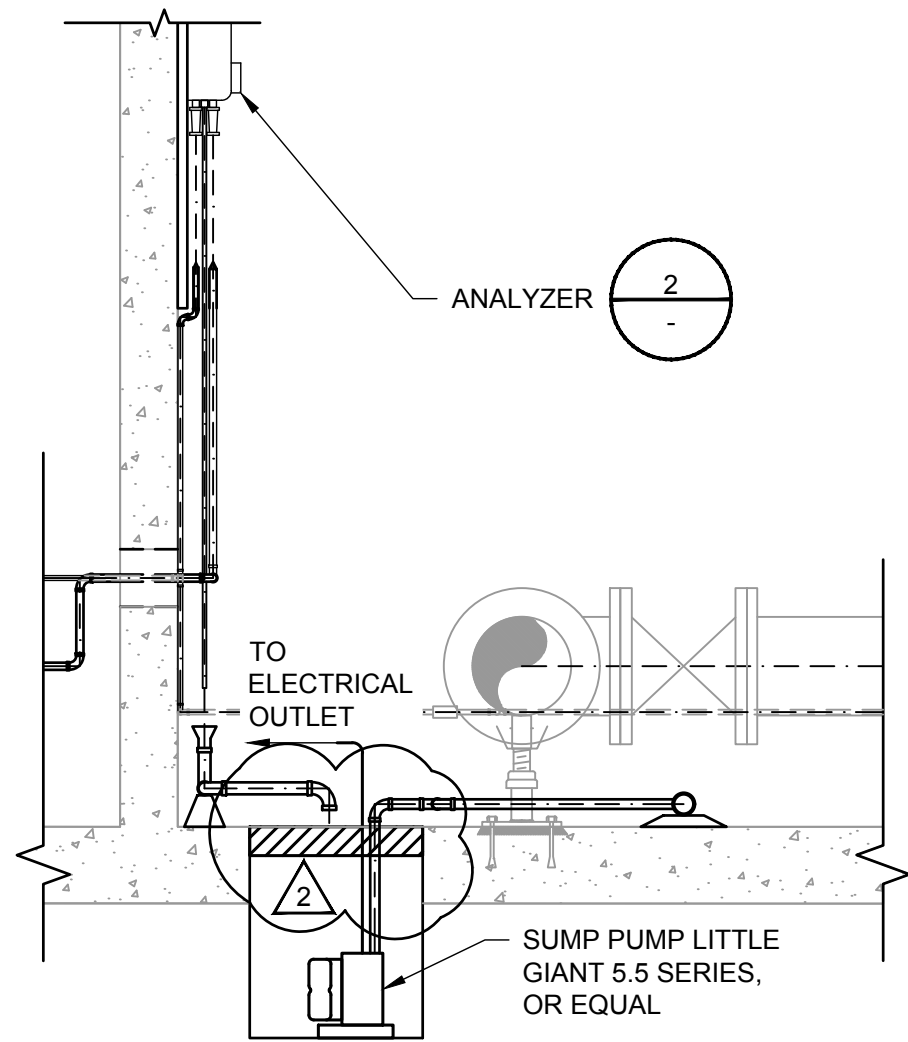
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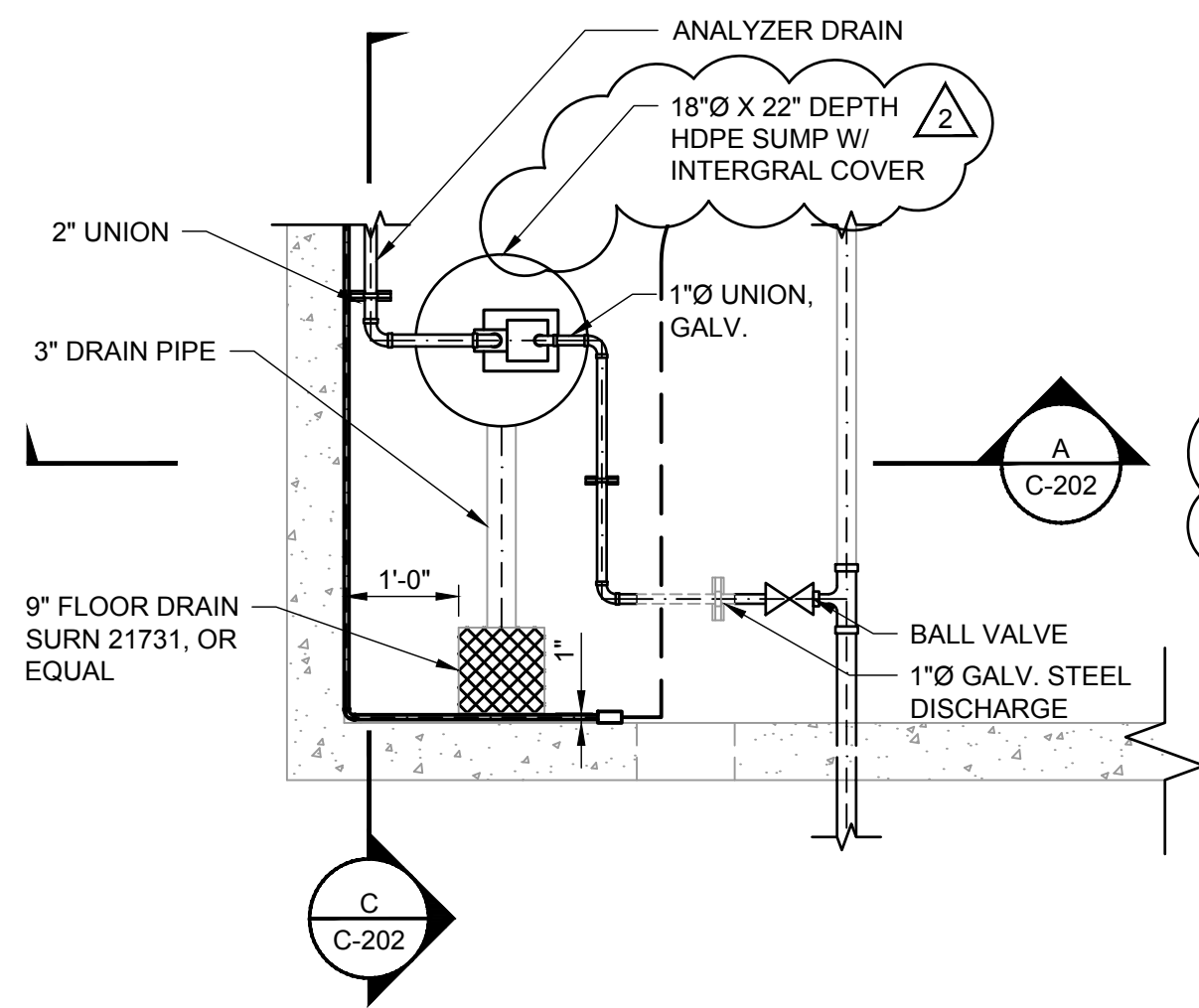
1 PIPE SCREEN DETAIL
SCALE: NTS



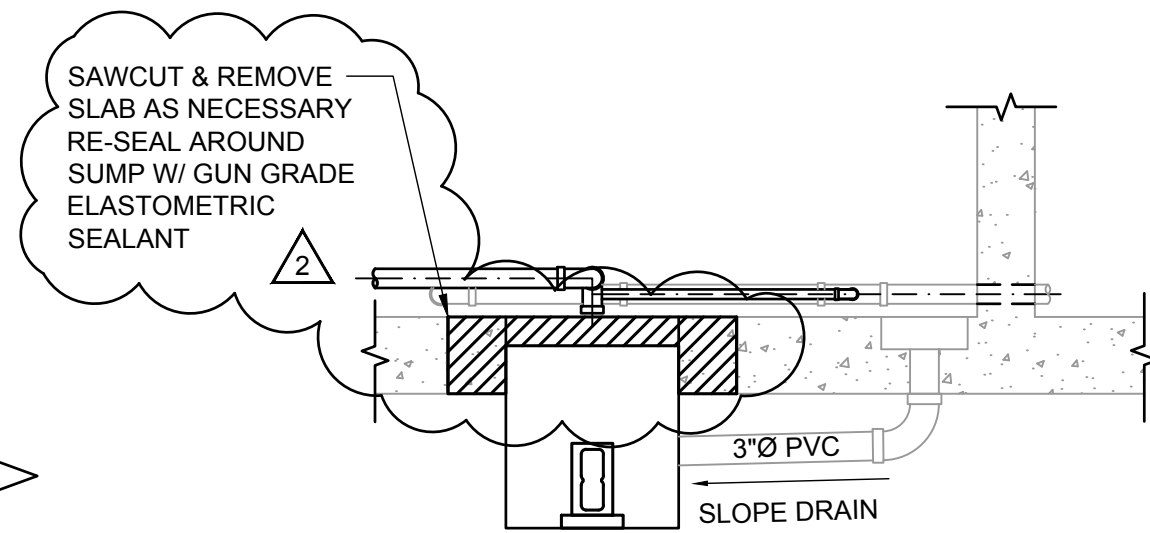
3 REROOFING DETAIL
SCALE: NTS



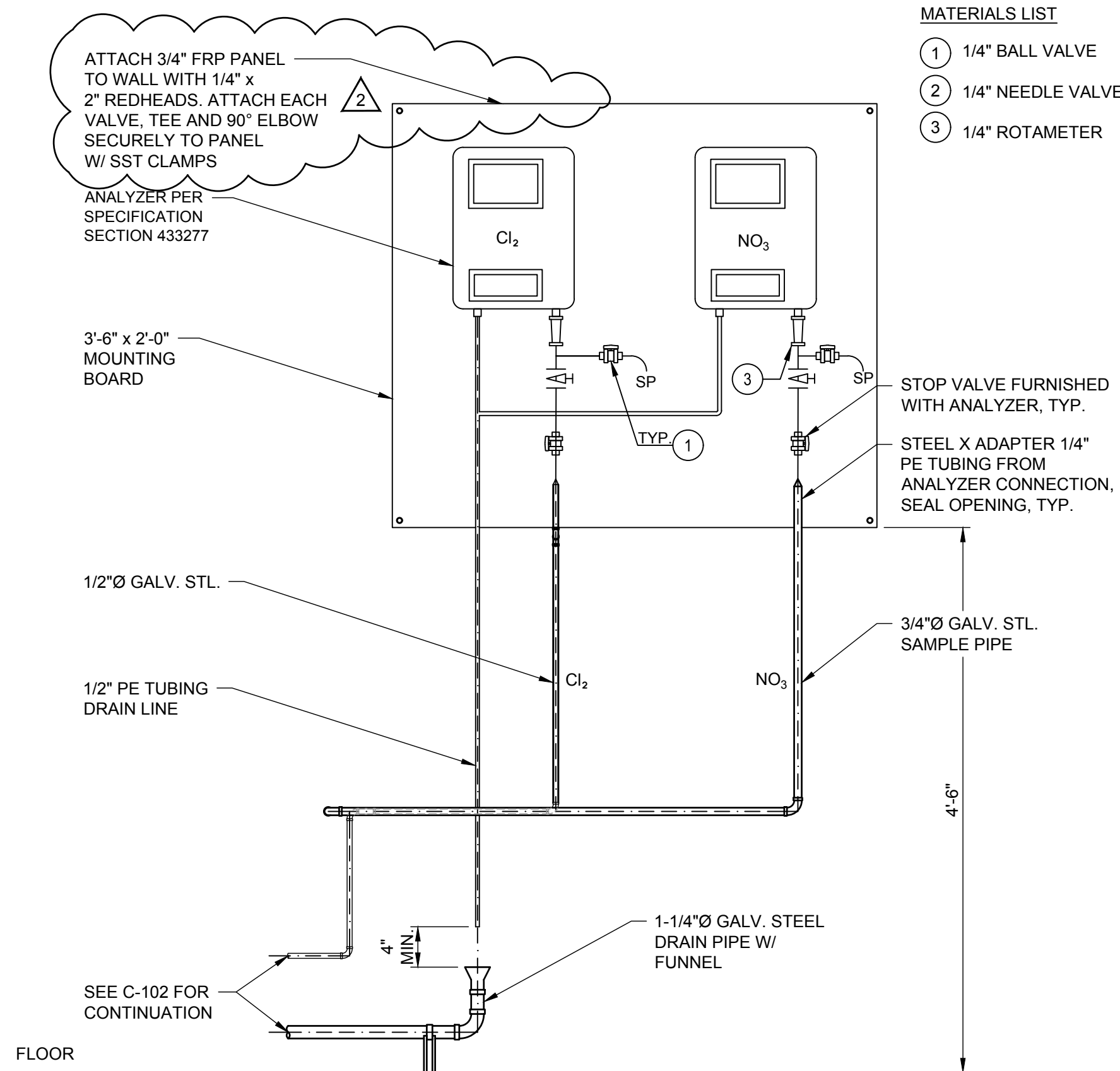
A SUMP PUMP SECTION
SCALE: NTS



B SUMP PUMP
SCALE: NTS

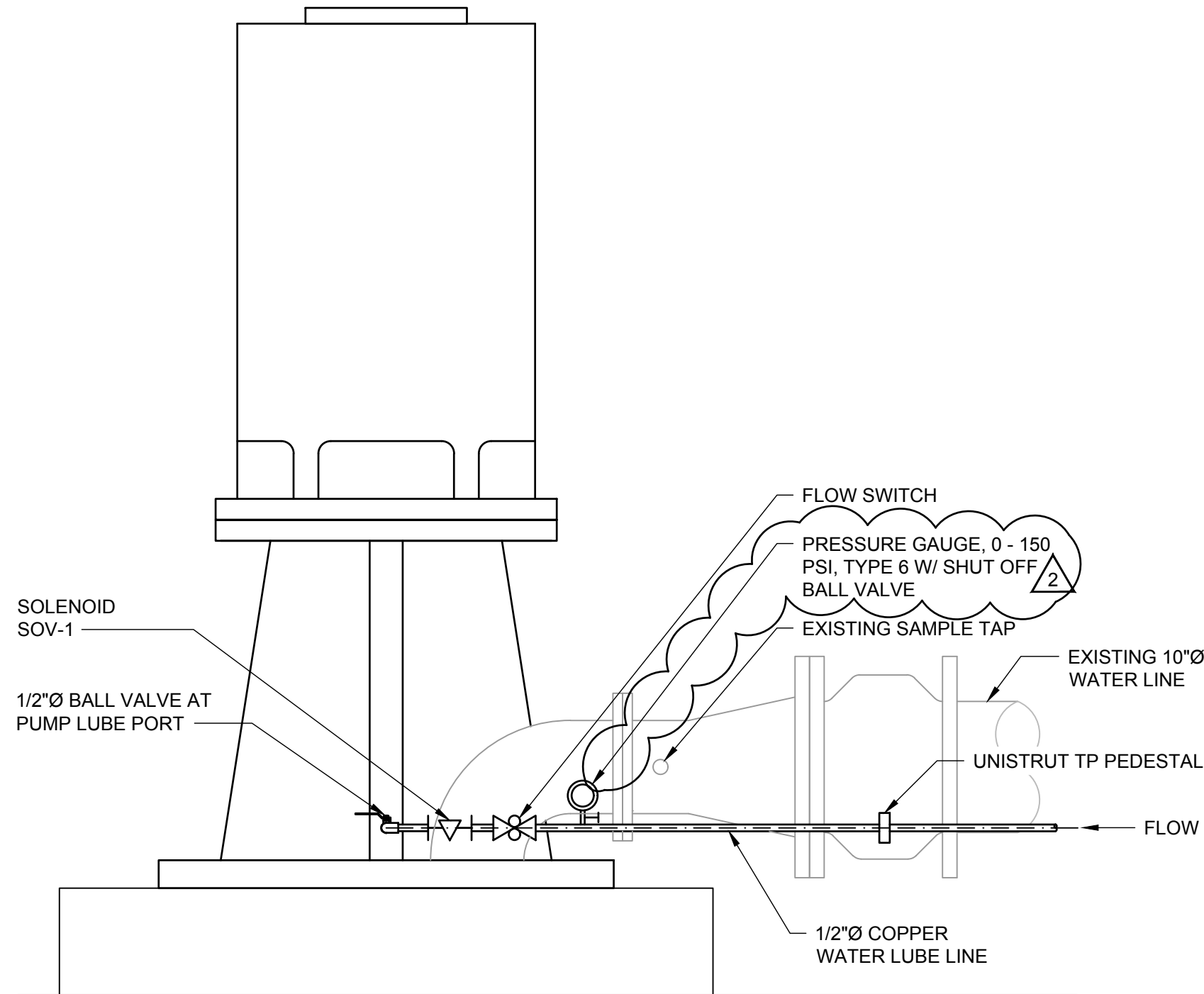


C SUMP PUMP SECTION
SCALE: NTS

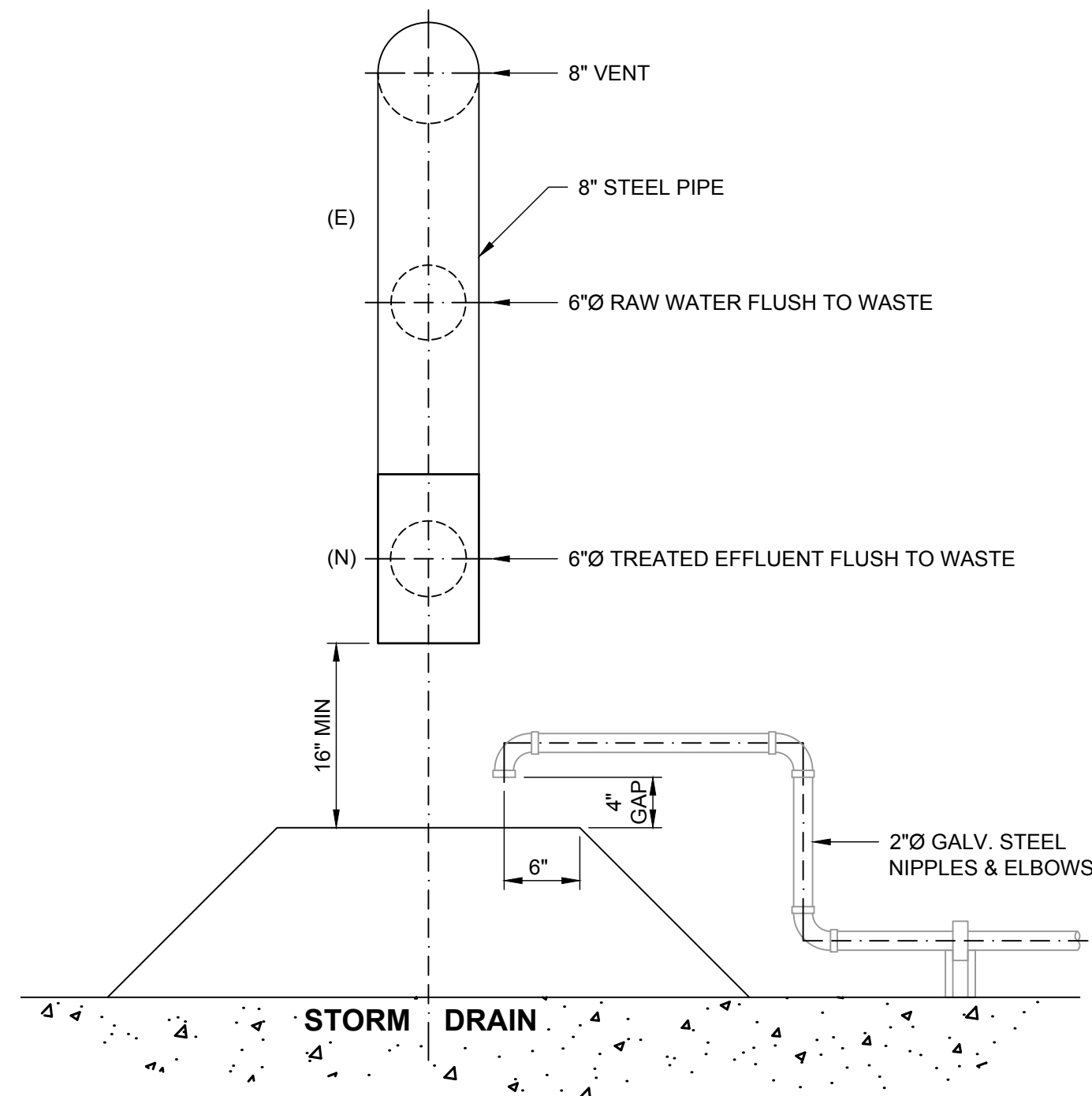


2 TYPICAL ANALYZER DETAIL
SCALE: NTS

- MATERIALS LIST
- 1 1/4" BALL VALVE
 - 2 1/4" NEEDLE VALVE
 - 3 1/4" ROTAMETER



4 PRELUBE CONNECTION AT WELL
SCALE: NTS



D STORM DRAIN SECTION
SCALE: NTS

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PROJECT

CITY OF TURLOCK
WELL 8 GAC SYSTEM
REHABILITATION
/RESTART

1690 PALMER DRIVE,
TURLOCK, CA 95382

CLIENT

CITY OF TURLOCK
156 S. BROADWAY AVE. SUITE 270,
TURLOCK, CA 95380



CONSULTANT

AECOM
1360 E. SPRUCE AVENUE #101
FRESNO, CA 93720
559.448.8222 tel 559.448.8233 fax
www.aecom.com

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2	2018-11-21	ADDENDUM NO. 1
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KEY PLAN

PROJECT NUMBER

60566889

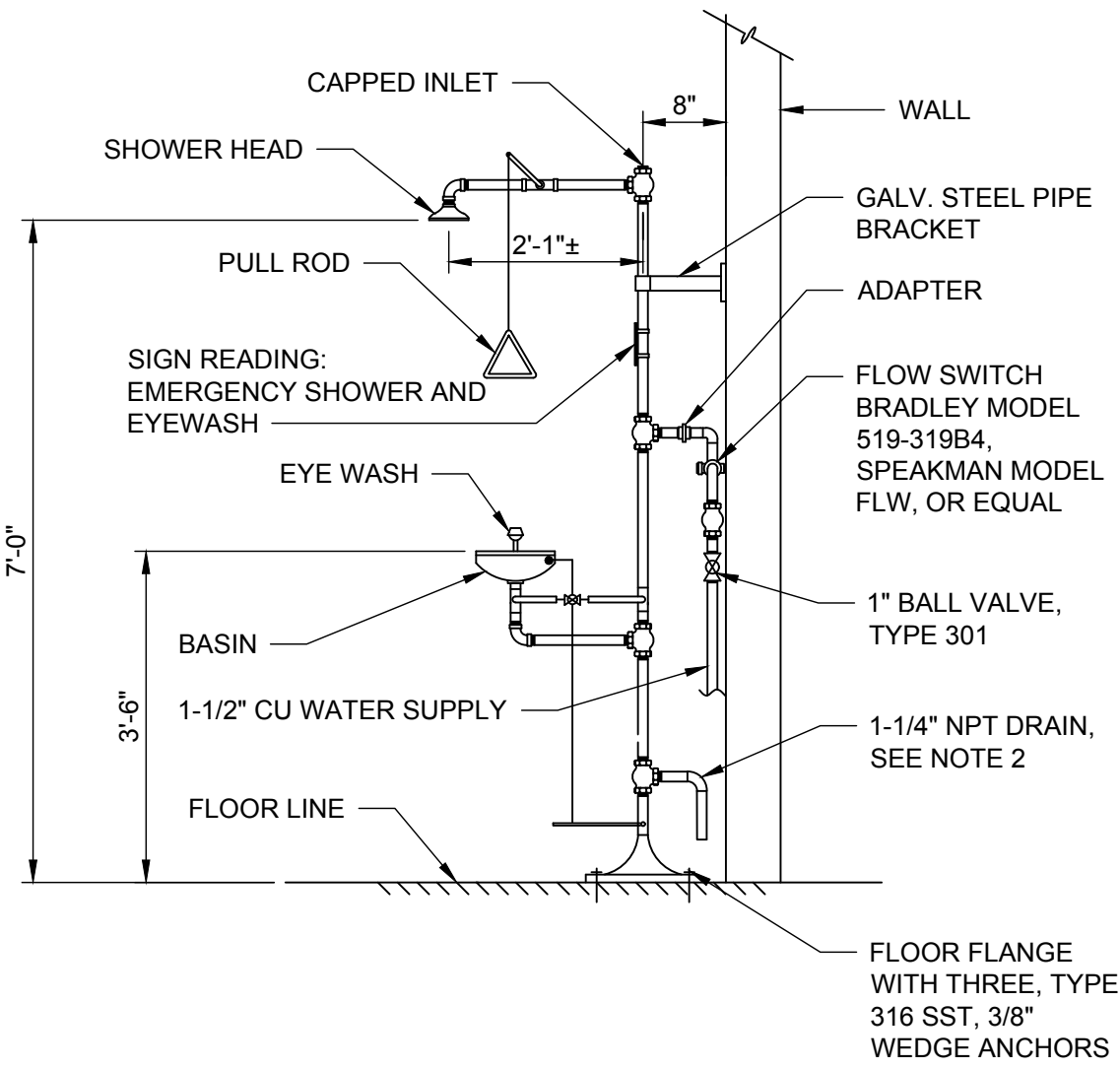
SHEET TITLE

MISCELLANEOUS DETAILS 1

ADDENDUM NO. 1

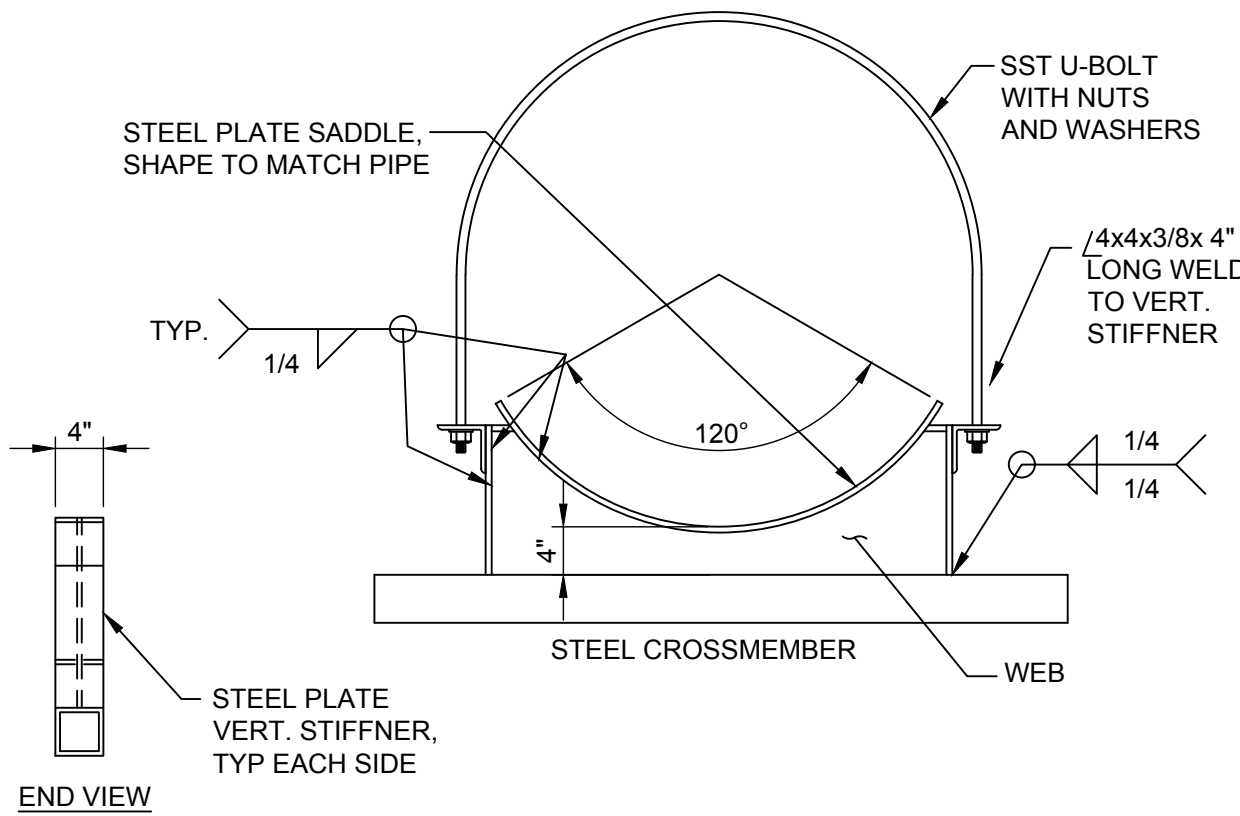
SHEET NUMBER

C-202



- NOTES:
- SHOWER SHALL BE A FREE-STANDING FREEZE PROOF EMERGENCY SHOWER/EYEWASH COMBINATION. SHOWER SHALL BE ACTIVATED BY STAINLESS-STEEL PULL ROD THAT OPERATES A 1-INCH STAY-OPEN BALL VALVE. A PUSH FLAG THAT OPERATES A 1/2-INCH STAY-OPEN BALL VALVE SHALL ACTIVATE EYEWASH. SHOWER SHALL BE BRADLEY S19-310AC, SPEAKMAN SE-612, OR EQUAL.
 - TERMINATE THE EYEWASH DRAIN 4-INCHES ABOVE FINISHED FLOOR.
 - SUBMIT ENTIRE UNIT IN ACCORDANCE WITH SECTION 013300.

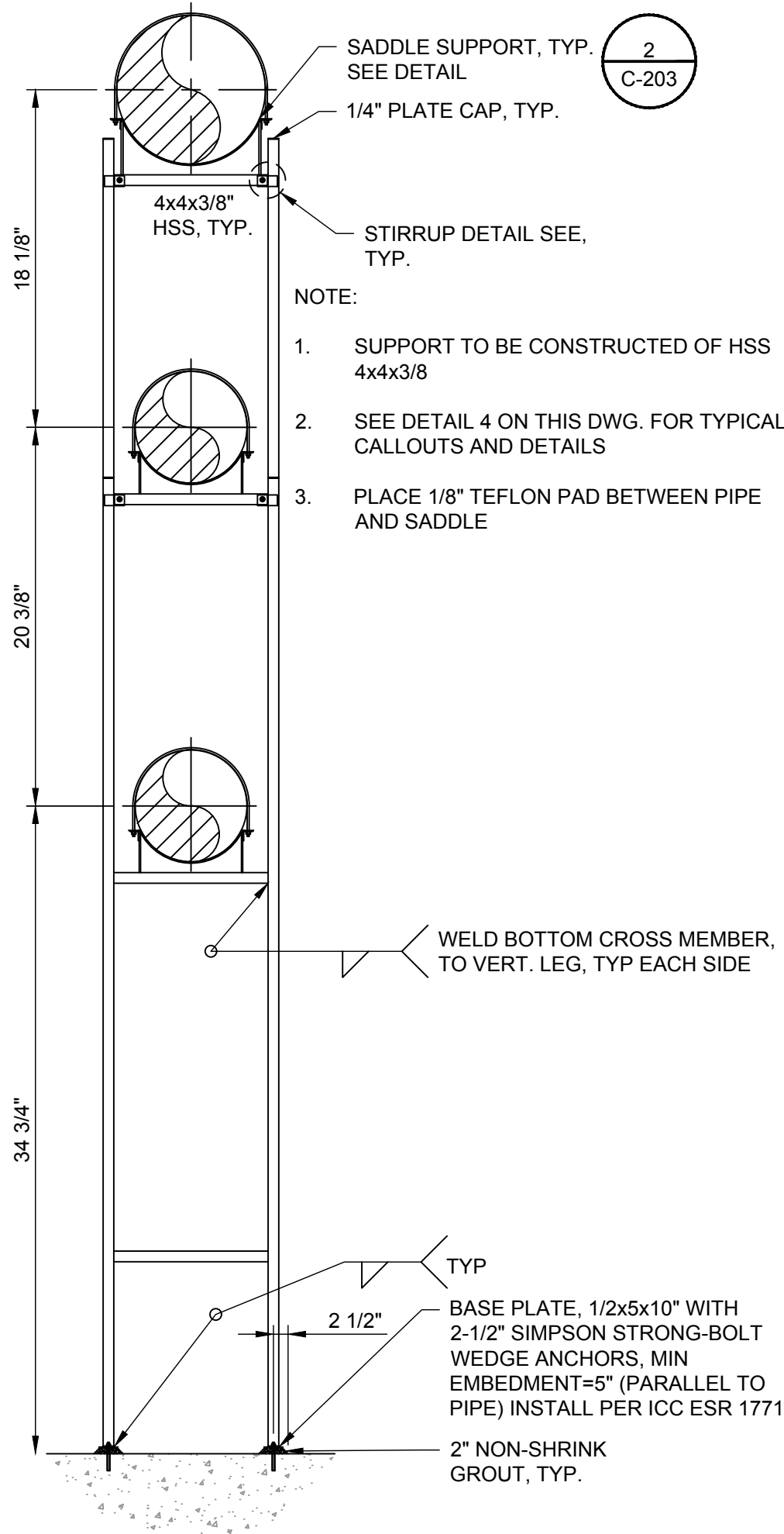
1 | EMERGENCY SHOWER & EYEWASH
SCALE: NTS



- PIPE SUPPORT NOTES:
- PLACE 1/8" THICK TEFLON PAD BETWEEN PIPE AND PIPE SADDLE (TYP)
 - SEE PLANS FOR PIPE SIZE, TYPE, AND ELEVATION
 - ALL PIPES 4" AND LARGER SHALL BE SUPPORTED ON A PIPE SADDLE
 - SEE PLAN FOR PIPE SUPPORT SPACING
 - ALL PIPE SUPPORTS SHALL BE WELDED UNLESS SHOWN OTHERWISE. ALL WELDS SHALL BE GROUND SMOOTH.
 - ALL U-BOLTS, BOLTS, NUTS AND WASHERS SHALL BE STAINLESS STEEL.
 - ALL STEEL SUPPORTS SHALL BE FUSION BONDED EPOXY COATED.

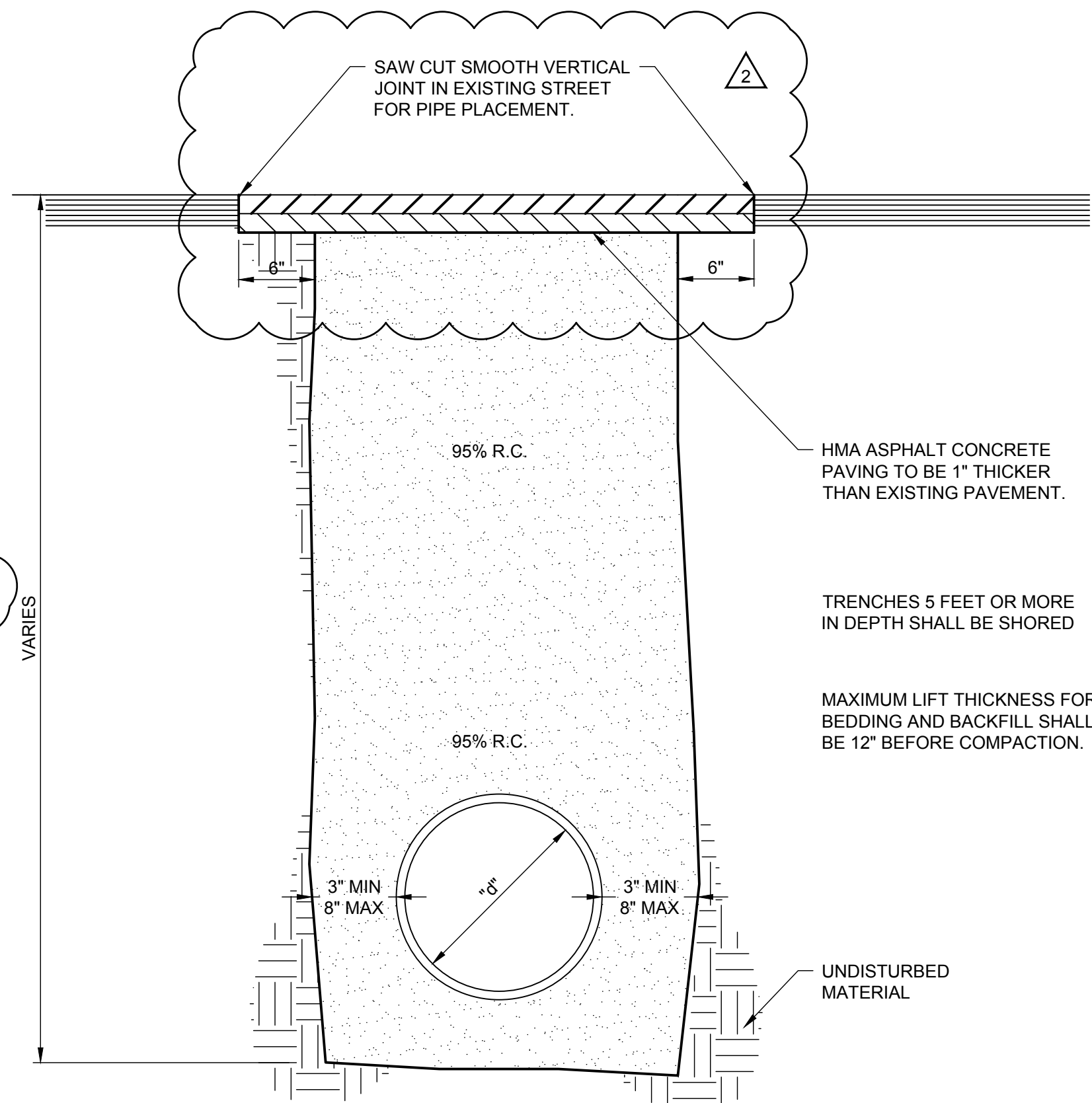
U-BOLT TABLE:		SUPPORT MATERIAL
PIPE SIZE	U-BOLT	
4" - 10"	3/8" DIA	4" - 12", 1/4" STEEL PLATE
12" - 16"	1/2" DIA	16" - 42", 3/8" STEEL PLATE
18" - 30"	5/8" DIA	
42"	3/4" DIA	

2 | PIPE SADDLE
SCALE: 3/4" = 1' - 0"

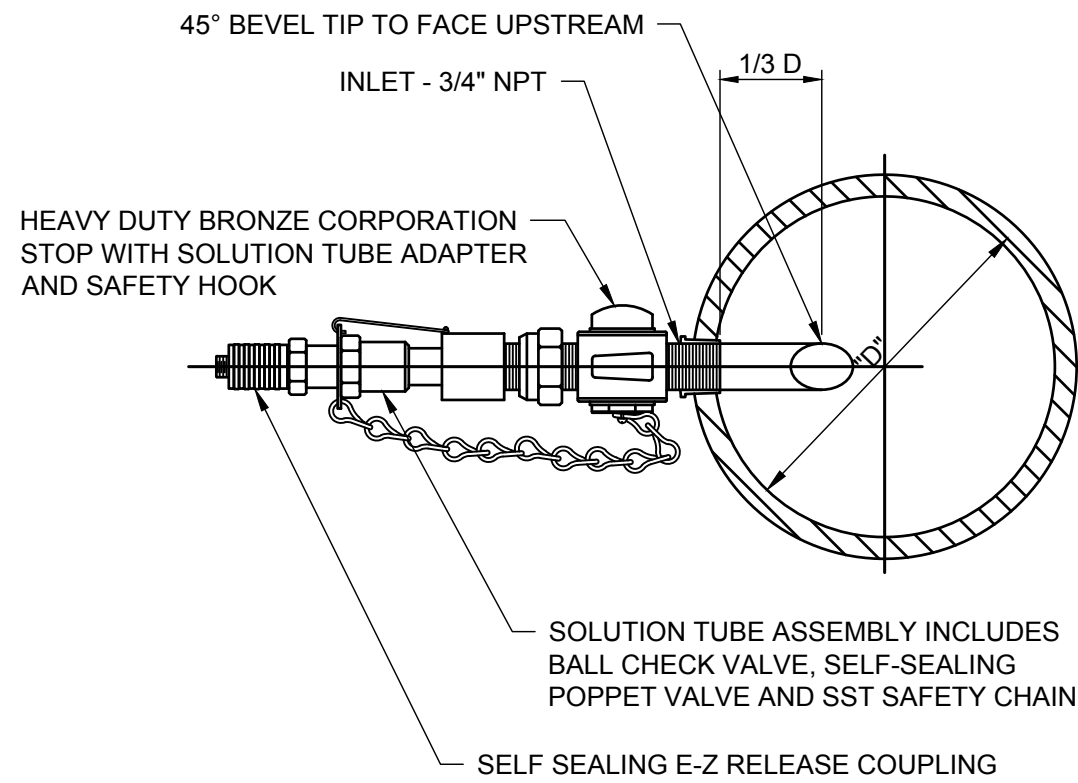


3 | NEW PIPE SUPPORT
SCALE: 1/2" = 1' - 0"

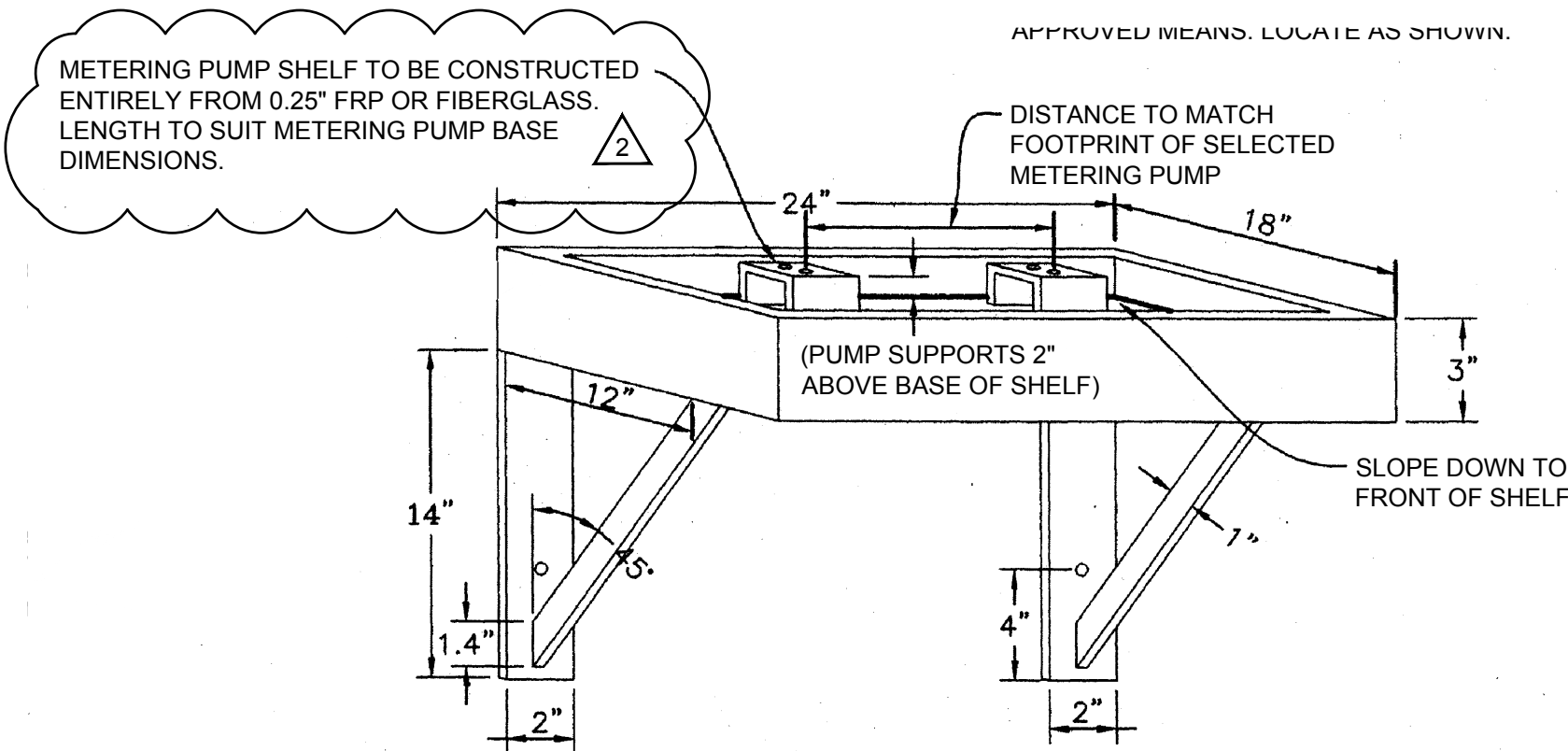
- NOTES:
- ALL BACKFILLED TRENCHES SHALL BE PAVED WITH TEMPORARY A.C. PAVEMENT AS DIRECTED IN THE FIELD BY THE CITY ENGINEER, UNTIL PERMANENT PAVEMENT IS PLACED
 - BACKFILL SHALL BE NATIVE WITH COMPACTION TESTS, EXCEPT AS PROVIDED IN NOTE NO. 4
 - COMPACTION TESTS SHALL BE APPROVED BY THE CITY BEFORE PAVING.
 - TRENCHES WHICH ARE 30" IN DEPTH OR LESS THAN 18" IN WIDTH OR LESS, SHALL BE BACKFILLED WITH TWO SACK CEMENT SLURRY.
 - IN LIEU OF COMPACTION TESTS, BACKFILL MAY BE TWO SACK SAND CEMENT SLURRY.



7 | TYPICAL TRENCH EXCAVATION AND BACKFILL
SCALE: NTS

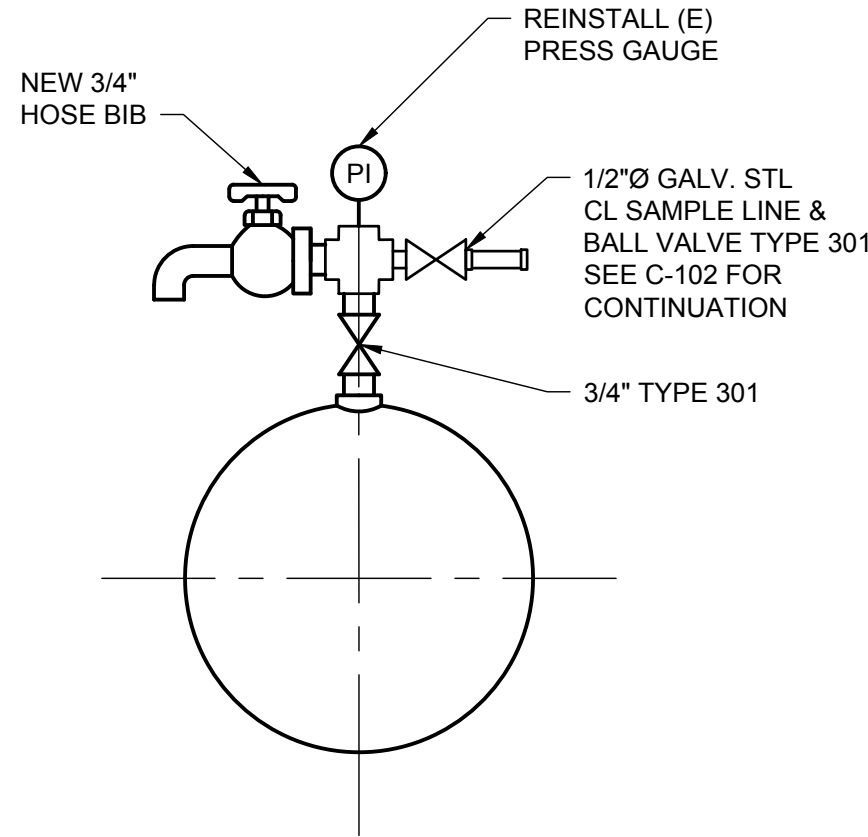


5 | INJECTION TAP
SCALE: NTS



6 | CHEMICAL PUMP CONTAINMENT SHELF
SCALE: NTS

- NOTES:
- REFER TO SITE PIPING DWGS FOR "D"
 - CHEMICAL INJECTION ASSEMBLIES WILL BE SAF-T-FLO MODEL EB-191, OR EQUAL.



4 | PRESSURE GAUGE & HOSE BIB
SCALE: NTS

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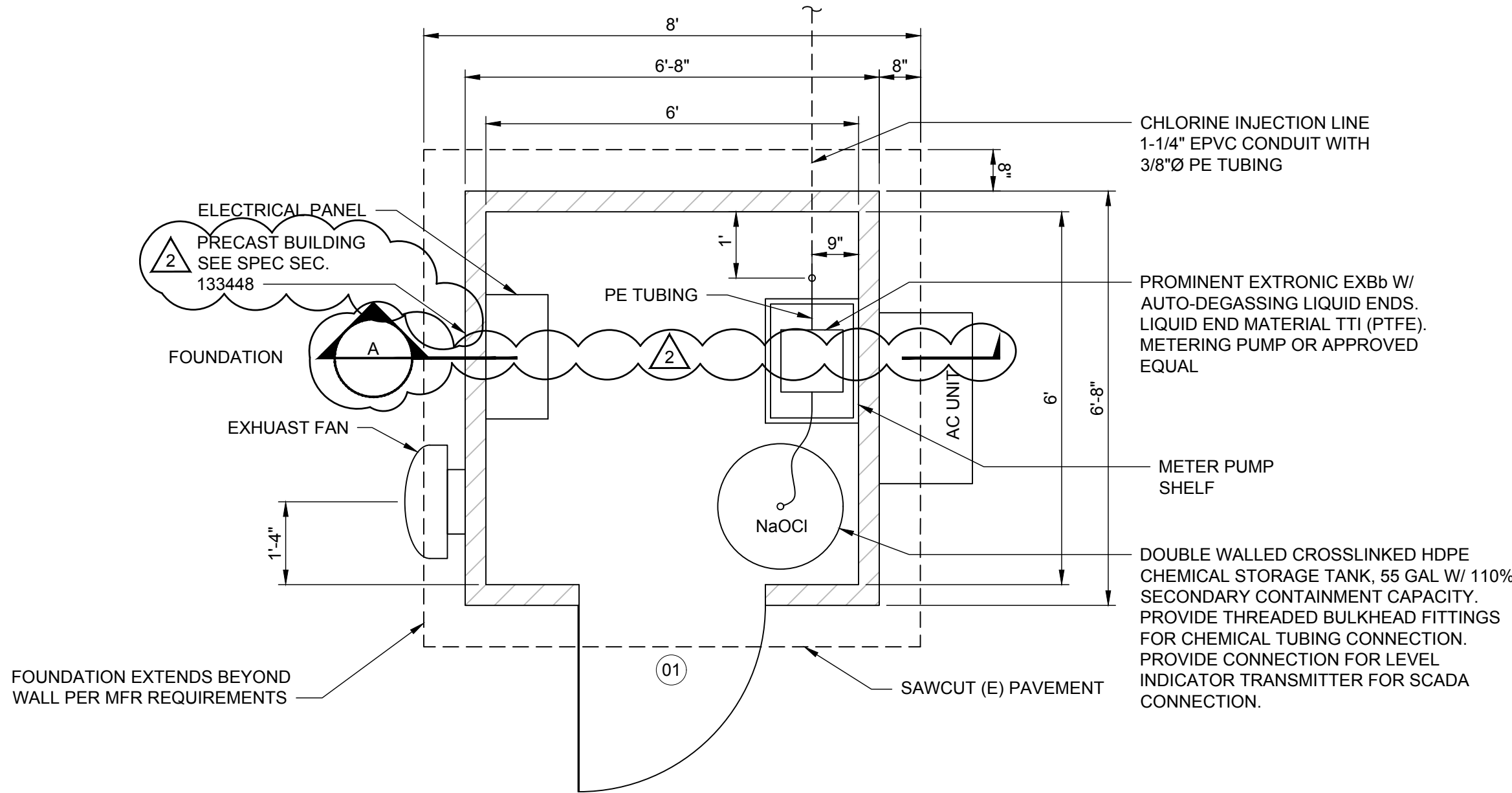
SHEET TITLE

MISCELLANEOUS DETAILS 2

ADDENDUM NO. 1

SHEET NUMBER

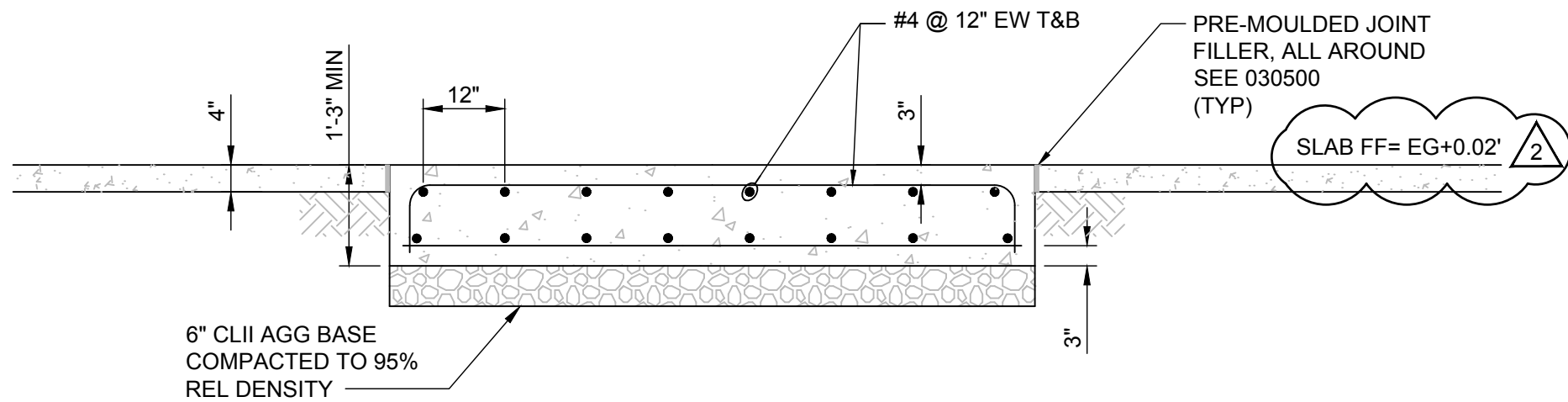
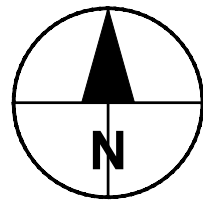
C-203



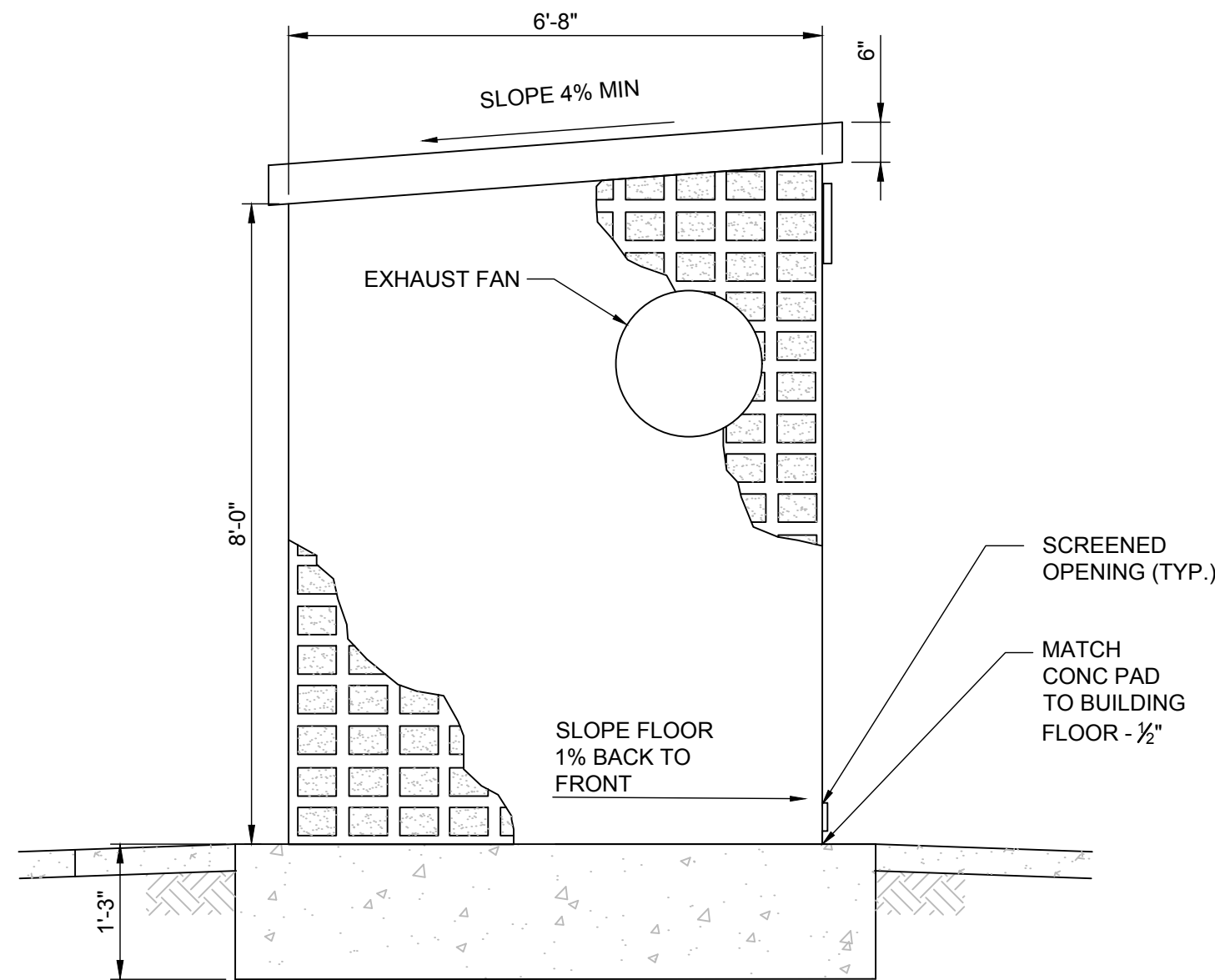
NOTES:

- SEE SPEC 133448 FOR PRECAST BUILDING REQUIREMENTS.
- ANCHOR BUILDING TO CAST-IN-PLACE FOUNDATION PER PRECAST BUILDING MANUFACTURERS RECOMMENDATION.
- PRECAST BUILDING MFR TO PROVIDE WALL CUT-OUTS FOR PIPE PENETRATIONS AS NECESSARY.
- ALL FASTENERS SHALL BE TITANIUM PER 434127 PART 2.F

1 | FLOOR PLAN
SCALE: 1/2" = 1' - 0"



A | FOUNDATION DETAIL
SCALE: 1/2" = 1' - 0"

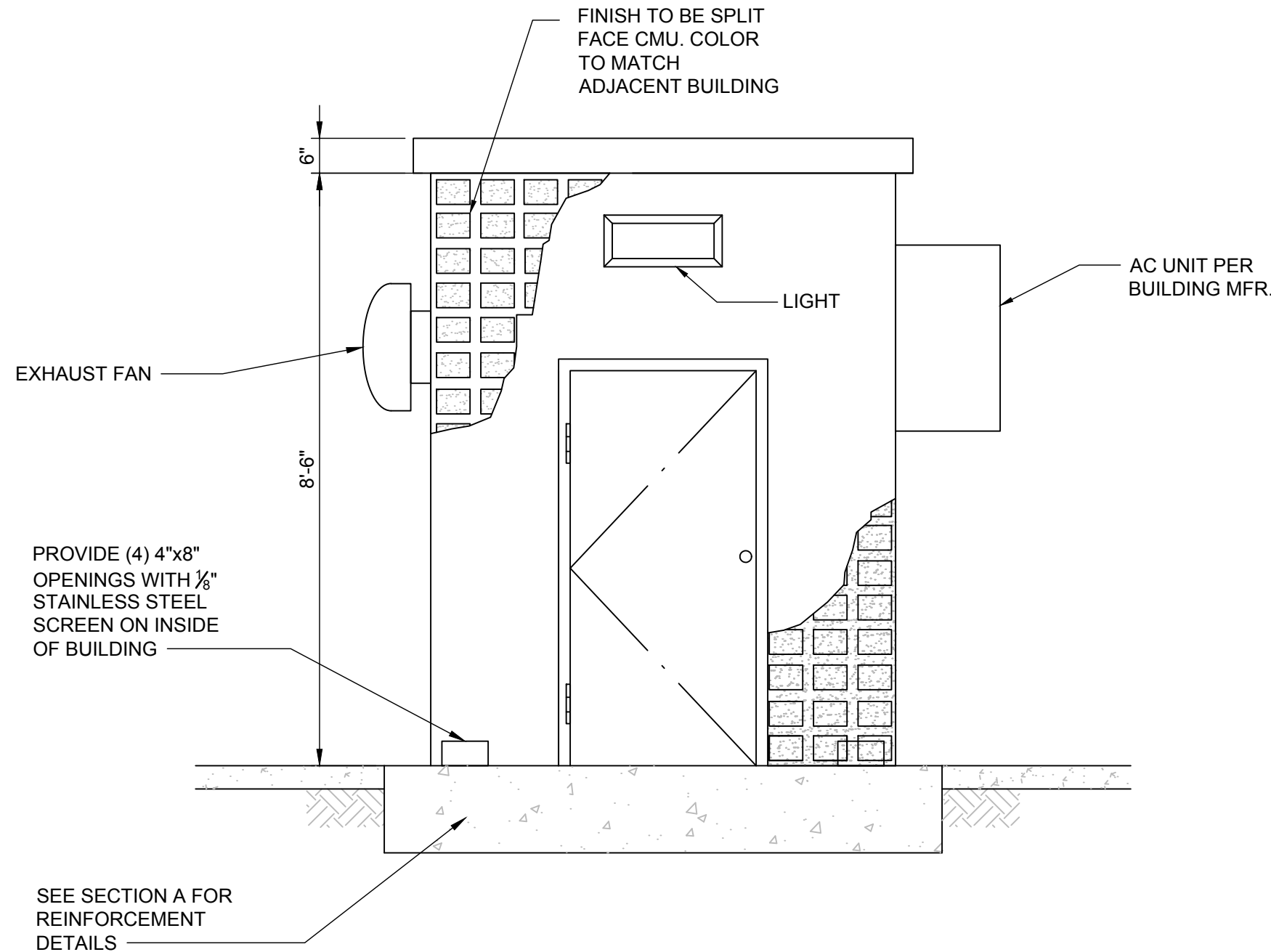


2 | WEST ELEVATION
SCALE: 1/2" = 1' - 0"

DOOR AND FRAME SCHEDULE

NUMBER	SIZE	THK.	TYPE	FACE	CORE	CLOSER	THRSH	HDWR	FRAME MAT'L	REMARKS
01	3'x7'	1 3/4"	B	METAL	MINERAL	*		1	HM	SINGLE DOOR

NOTE: SCHEDULE DOOR SIZE DOES NOT INCLUDE FRAME



3 | SOUTH ELEVATION
SCALE: 1/2" = 1' - 0"

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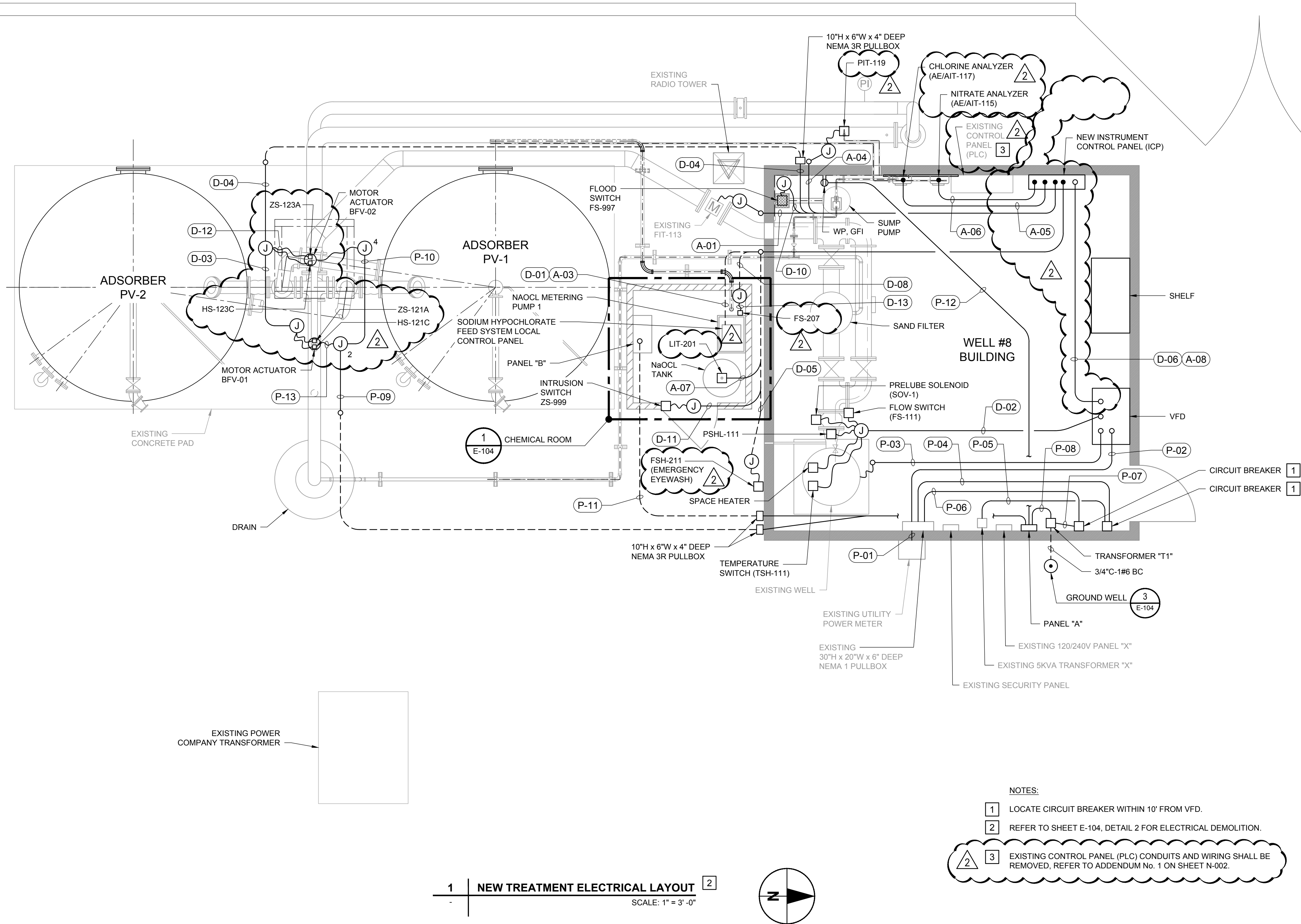
SHEET TITLE

NEW CHEMICAL BUILDING
PLAN & ELEVATIONS

ADDENDUM NO. 1

SHEET NUMBER

C-204



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/RESTART**

1690 PALMER DRIVE,
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CITY OF TURLOCK

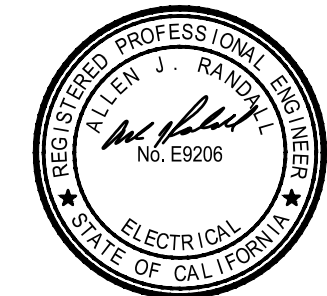
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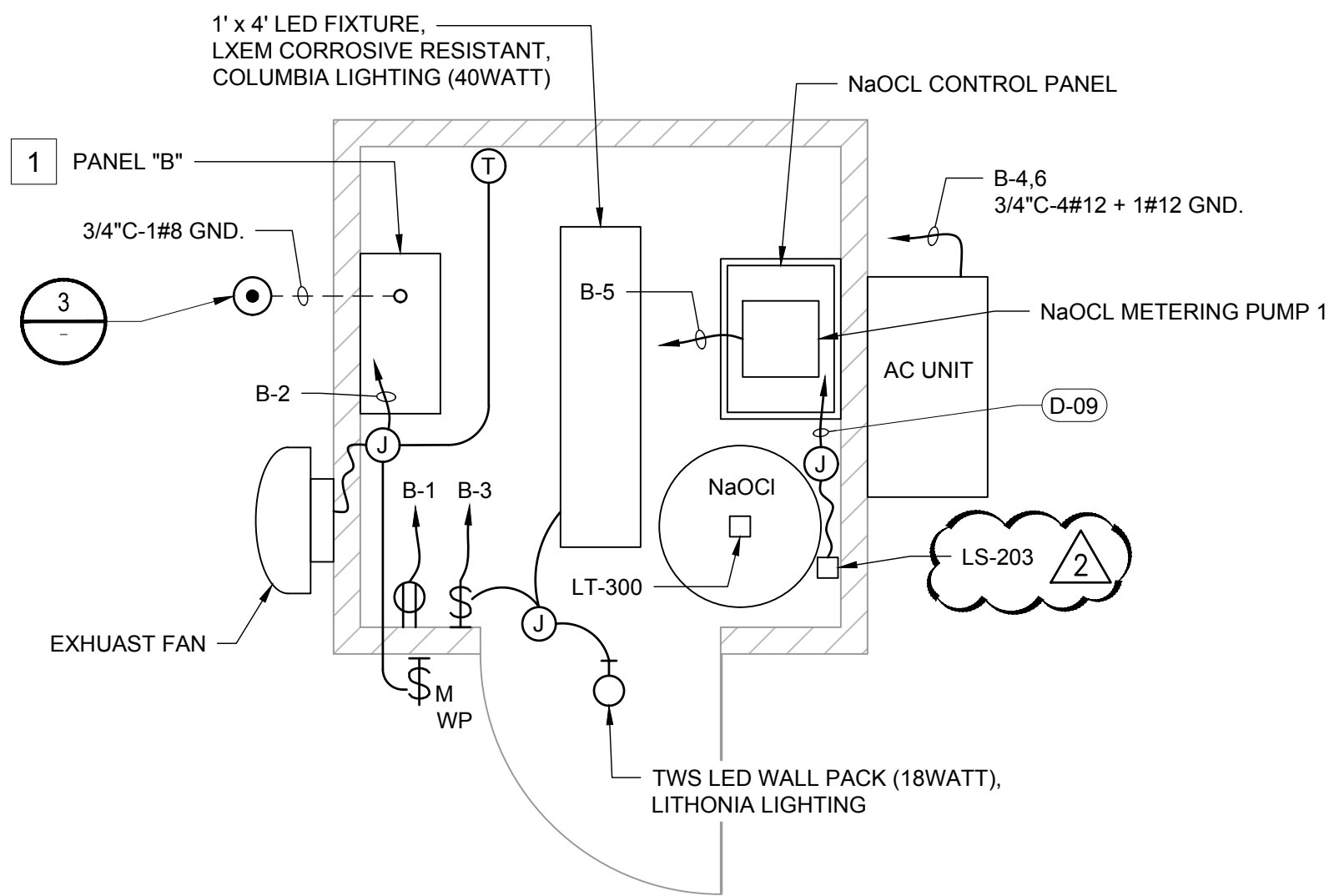
SHEET TITLE

ELECTRICAL SITE PLAN

ADDENDUM NO. 1

SHEET NUMBER

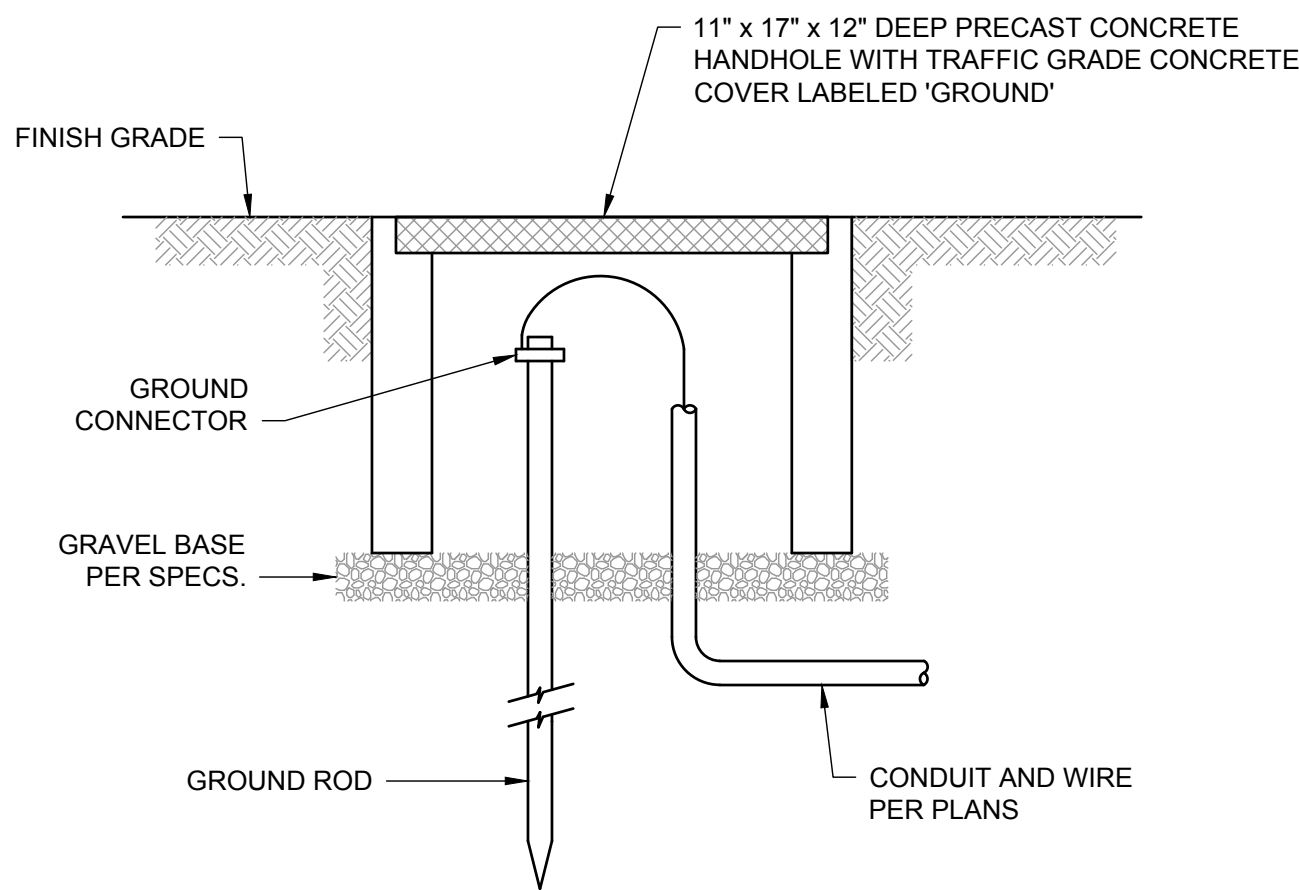
E-101



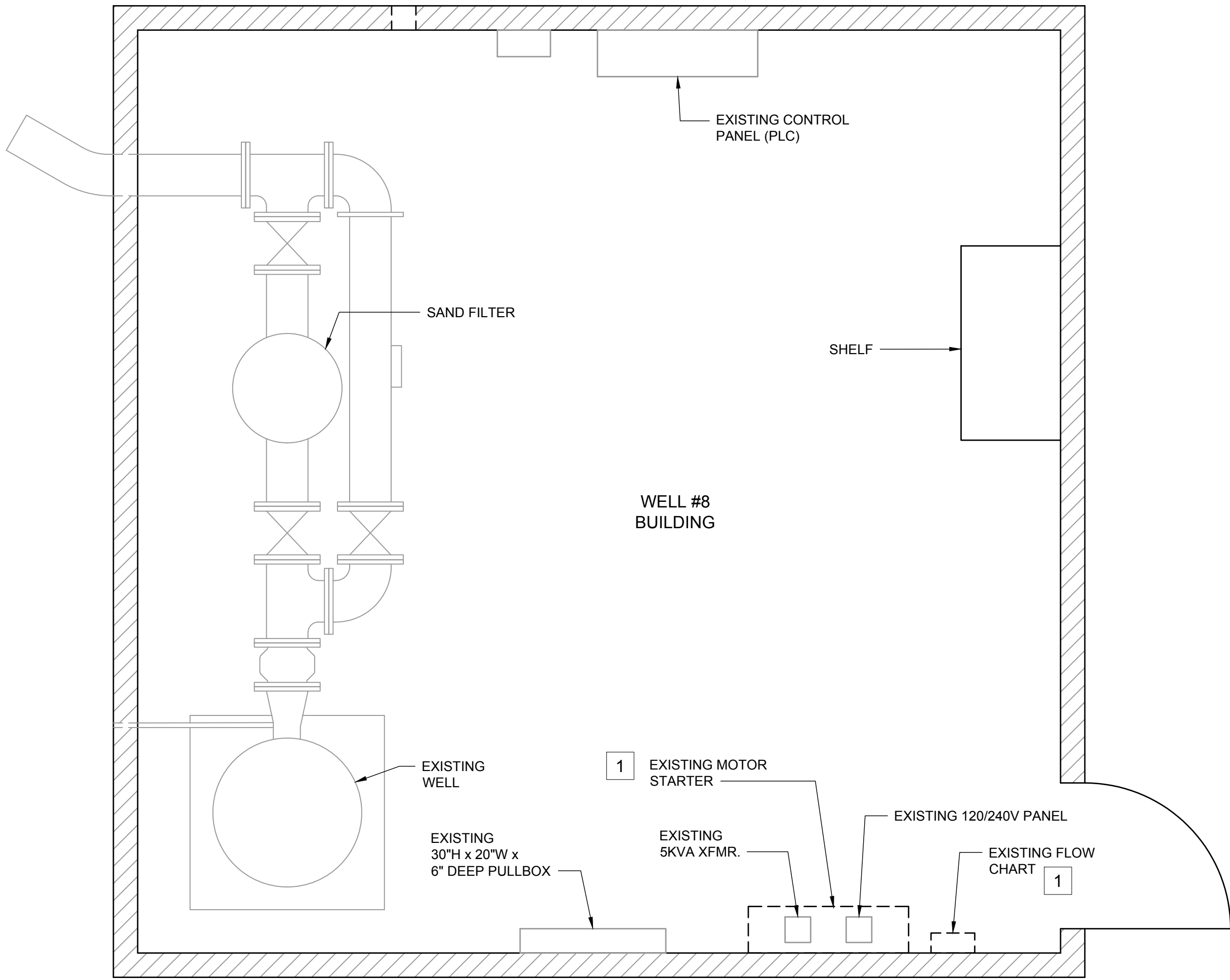
1 CHEMICAL ROOM ELECTRICAL PLAN
SCALE: 1/2" = 1' - 0"

NOTES:

- 1 PROVIDE POWER CONNECTIONS TO BUILDING RECEPTACLES, LIGHTS, AC UNIT, EXHAUST FAN, AND NaOCl CONTROL PANEL.



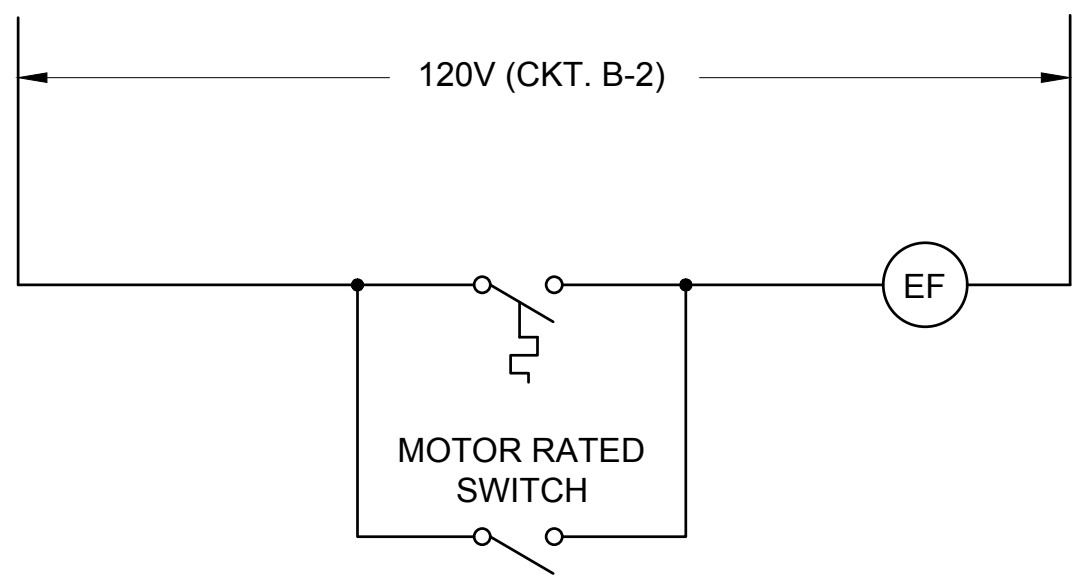
3 GROUND WELL DETAIL
SCALE: NTS



2 ELECTRICAL DEMOLITION PLAN
SCALE: 1/2" = 1' - 0"

NOTES:

- 1 REMOVE ELECTRICAL EQUIPMENT INCLUDING CONDUIT AND WIRE. SEE NOTE 1 ON SHEET C-101.



4 CHEMICAL ROOM EXHAUST FAN CONTROL SCHEMATIC

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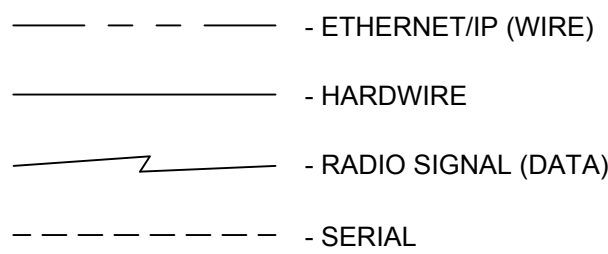
SHEET TITLE

ELECTRICAL DETAILS

ADDENDUM NO. 1

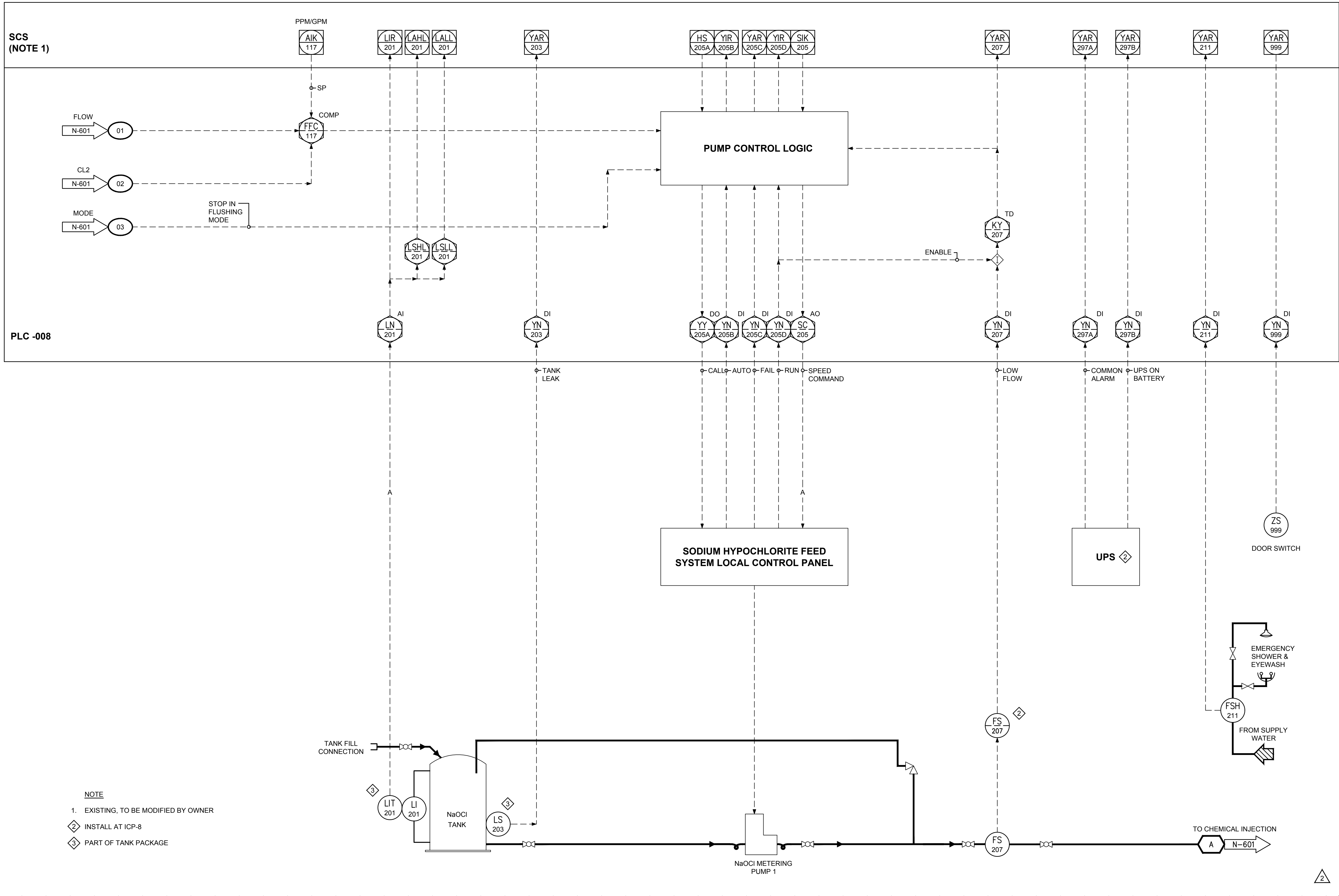
SHEET NUMBER

E-104





N-601



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CITY OF TURLOCK

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TURLOCK, CA 95380



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SHEET TITLE

CHEMICAL FEED SYSTEM P&ID

SHEET NUMBER

SHEET NUMBER

N-602