



**E-54 Regional Lift Station - RFCSP
Solicitation Number: CO-00537
Job No.: 22-2502**

**ADDENDUM 5
November 2, 2022**

To Respondent of Record:

This addendum, applicable to project referenced above, is an amendment to the proposal, plans and specifications and as such will be a part of and included in the Contract Documents. Acknowledge receipt of this addendum by entering the addendum number and issue date on the space provided in submitted copies of the Respondent Questionnaire.

RESPONSES TO QUESTIONS

QUESTION 1:

Can you please check with the Engineer on how we are to handle pricing for this training with no Rockwell part number.

RESPONSE: The Rockwell programmable hardware model and associated software are described in Specification Section 16921 – Supervisory Control and Data Acquisition (SCADA) System and Local Station Control and Monitoring, Section 2.02 – Programmable Logic Controller (PLC) System. See Changes to the Specifications #1.

QUESTION 2:

Reference Spec Section 16921-14.3.05 below: Is it possible to have this Rockwell training an allowance item on the bid form since a Rockwell course number will be given at a later date? Please advise on how this pricing needs to be handled.

3.05 TRAINING

A. Programmable Logic Controller (PLC) Hardware and Software and HMI System Software:

1. Provide 32-40 hours of manufacturer’s standard training course for five (5) of the Owner’s personnel in the operation, configuration, programming, installation, and maintenance of the HMI System software, SAWS Programmer staff will provide the Rockwell course number at a later date.

RESPONSE: Section 3.05 – Training of Specification Section 16921 - Supervisory Control and Data Acquisition (SCADA) System and Local Station Control and Monitoring has been deleted. See Changes to the Specifications #1.

QUESTION 3:

On Sheet S2.1, beams are called out as 24” x 24”, but reference detail shows 36” x 24”. I am planning to use 36” x 24”.

RESPONSE: The beam is intended to be 36”x24”. The text on Sheet 2.1 was a typo. Sheet S2.1 – Wetwell Grade Level Plan is revised and attached in this Addendum. Please see Changes to the Plans #3.

QUESTION 4:

Approximate 774 Sf of slab is called out as 8” thick, but no rebar details.

RESPONSE: Revised the detail to show the reinforcing on the slab and have clarified the slab reinforcing within the FN-Notes on S1.0 to reflect 8" slab. Sheet S1.0 – Notes, Sections, and Details revised and attached in this Addendum. Please see Changes to the Plans #2.

QUESTION 5:

Sheet S2.2 calls out Beams GB- is below 12" wall, but not shown on section details.

RESPONSE: Grade beam signifiers at bottom slab were remnant of previous iteration of design. There are no grade beams below anything at the bottom of the wetwell. Sheet S2.2 – Wetwell Slab Plan is revised and attached in this Addendum. Please see Changes to the Plans #4.

QUESTION 6:

12" Baffle wall has 2 sets of rebar information shown – 1 set w/ #8 vertical bars @ 10" OC & #6 horizontal @ 8" OC and the other set shows the vertical bars as #6 @ 8" OC with the horizontals as #5 @ 8" OC.

RESPONSE: Removal of incorrect wall reinforcing callout has been completed. Incorrect reinforcing was remnant of last iteration of design. Sheet S3.0 – Section is revised and attached in this Addendum. Please see Changes to the Plans #5.

QUESTION 7:

Slab is called as 12" thick without rebar details.

RESPONSE: 12" slabs were remnant of previous iteration of design and are no longer present in this project. Refer to FN-Notes on S1.0 for all applicable slab sizes. See response to Question 4 in this Addendum.

CHANGES TO THE SPECIFICATIONS

1. Remove Specification Section 16921 – Supervisory Control and Data Acquisition (SCADA) System and Local Station Control and Monitoring provided with Addendum 2 in its entirety and replace with the revised version attached to this addendum.

CHANGES TO THE PLANS

1. Remove Sheet E4.0: Electrical Site Layout & Grounding Plan in its entirety and replace with revised version attached to this Addendum. This sheet is in reference to Addendum #2 – Changes to Plans #9.
2. Remove Sheet S1.0: Notes, Sections, and Details in its entirety and replace with revised version attached to this Addendum.
3. Remove Sheet S2.1: Wetwell Grade Level Slab Plan in its entirety and replace with revised version attached to this Addendum.
4. Remove Sheet S2.2: Wetwell Slab Plan in its entirety and replace with revised version attached to this Addendum.
5. Remove Sheet S3.0: Section in its entirety and replace with revised version attached to this Addendum.
6. Remove Sheet S3.1: Section in its entirety and replace with revised version attached to this Addendum.

ADDENDUM

This Addendum, including these three (3) pages, is twenty-three (23) pages with attachments in its entirety.

Attachments:

Specification Section 16921 - *Supervisory Control and Data Acquisition (SCADA) System and Local Station Control and Monitoring (14 pages)*

Sheet E4.0: Electrical Site Layout & Grounding Plan (1 page)

Sheet S1.0: Notes, Sections, and Details (1 page)

Sheet S2.1: Wetwell Grade Level Slab Plan (1 page)

Sheet S2.2: Wetwell Slab Plan (1 page)

Sheet S3.0: Section (1 page)

Sheet S3.1: Section (1 page)



Kim S. Keefer
10/31/2022

Kim Keefer, P.E.
Pape-Dawson Engineers, Inc.

SECTION 16921**SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM
AND LOCAL STATION CONTROL AND MONITORING**

PART 1 GENERAL

1.01 SCOPE

- A. Contractor shall furnish all labor, materials, and components, and shall provide all design, assembly, licensing and start-up services, as specified herein and as shown on the Contract Drawings.
1. Contractor will be responsible for HMI SCADA System, programming, at the Owner's Production Control Center (PCC).
 2. Contractor will be responsible for programming the Local PLC System.
 3. Contractor to provide latest version of RS Studio 5000 Logix Designer, Standard Edition, Part number 9324-RLD300ENE.
 4. SCADA panel to be designed and certified to UL 508A standards.
- B. Contractor General Qualifications
1. Have a local office within one hundred (100) miles of the City of San Antonio.
 2. Be able to provide resumes, project experience history and references for all employees that will be qualified to work on the SCADA system.
 3. Have a local full time staff of employees that have developed and commissioned a minimum of three new Allen Bradley based systems within the past twelve months. Must have a minimum five years' experience designing, installing and commissioning SCADA systems.
 4. Have a minimum of three local full time employees qualified to perform the SCADA system configuration work.
 5. All proposals submitted to the San Antonio Water System must be accompanied by documentation supporting the qualifications of the Contractor as detailed above. The San Antonio Water System reserves the right to reject any proposal if the above qualifications are not met.
- C. The control, monitoring and SCADA system shall include, but is not limited to, the following component equipment:
1. SCADA PLC Panel to include:
 - a. PLC Processor.
 - b. PLC modules, chassis, and power supplies.

- c. 24Vdc power supply.
 - d. Surge protection.
 - e. UPS
 - f. Heater
 - g. All local indication and local control devices specified herein or indicated on the Contract Drawings.
 2. Raco Verbatim Autodialar
 - a. Autodialer
 - b. All local indication and local control devices specified herein or indicated on the Contract Drawings.
 3. Radio Transceiver and accessories
 4. Communication Panel to include
 - a. Industrial Grade Router
 - b. Radio Transceiver System.
 - c. Cambium POE Injector
 - d. SMA-JE to THCFE adaptor
 - e. All local indication and local control devices specified herein or indicated on the Contract Drawings.
 - D. The Application Service Provider (ASP) shall schedule and conduct separate workshops as further defined in this specification section.
 - E. The SCADA system shall be furnished in accordance with the requirements stated herein to assure compatibility with Owner's existing facilities and systems. No deviation from specified equipment will be allowed.
- 1.02 SUBMITTALS
- A. Pre-submittal Conference
 1. Prior to the Submittal Process, the Application Services Provider (ASP) shall hold a workshop, in which the Engineer and Owner may observe the displays and control strategies prior to submitting database, trends, graphics, reports, and control strategies. No display generation, programming, etc. shall begin until standards have been approved.
 2. Prior to commencement of any applications work, the ASP shall submit and receive approval from the Owner and Engineer for all required I/O Lists.
 - B. The manuals shall contain all illustrations, detailed drawings, wiring diagrams, and instructions necessary for installing, operating, and maintaining the equipment. The illustrated parts shall be numbered for identification. All information contained therein shall apply specifically to the equipment furnished and shall only include instructions that are applicable. All such illustrations shall be incorporated within the printing of the page to form a durable and permanent reference book.

- C. If the Process Control Systems Integrator (PCSI's) transmits any documentation or other technical information which he considers proprietary, such information shall be designated. Documentation or technical information which is designated as being proprietary will be used only for the design, construction, operation, or maintenance of the System and, to the extent permitted by law, will not be published or otherwise disclosed.
- D. CONTRACTOR shall submit the following in addition to the information in item A:
 - 1. Bill of Materials
 - 2. Catalog Cuts
 - 3. Component Data Sheets
 - 4. Panel Construction Drawings, including wiring and component layout
 - 5. List of Labels and Tags
 - 6. Include power supplies, network switches, signal isolators and other equipment as listed in this specification.
 - 7. CONTRACTOR shall submit control loop drawings complete with rack, card slot and point configuration.
 - 8. CONTRACTOR shall submit calculations as required.
 - 9. Proposed HMI SCADA System Screens.

1.03 OPERATION AND MAINTENANCE MANUAL

- A. CONTRACTOR shall provide the final O & M manual which shall contain a complete set of as-built control loop and wiring drawings in "11x17" format. Manual shall be submitted to OWNER electronically in PDF format on a CD.
- B. Complete and tested PLC Programs will be provided by CONTRACTOR to be inserted in the final O&M manual.

1.04 PLC INPUT/OUTPUT POINT LIST

- A. The Input/Output (I/O) Point List is attached to this specification as Appendix "A" and indicates nomenclature, and signal functions, and defines the scope of interface requirements for this project. All analog I/O shall be 4-20ma.
- B. The quantity of Input/Output modules furnished shall not be less than shown in the PLC I/O capacity summary in Appendix "A". Input/Output modules shall have the capacity to accommodate for an additional 25% spare I/O points. Otherwise an additional input/output module is required.
- C. Field wiring to complete all interconnections listed in the I/O are included in the Contractor's scope of work whether or not shown on the Contract Drawings.

- D. All spare points to be wired to terminal blocks.

1.05 PLC SYSTEM PROGRAMMING

- A. Programming of the PLC CPU will be provided by CONTRACTOR. CONTRACTOR shall coordinate with SAWS Inspector regarding witnessed SCADA testing.

1.06 HMI SYSTEM PROGRAMMING

- A. Programming of the HMI will be provided by CONTRACTOR. CONTRACTOR shall coordinate with SAWS Inspector regarding witnessed SCADA testing.

1.07 AUTO DIALER INPUT/OUTPUT POINTS

- A. The Input/Output (I/O) Points are shown on contract drawings
- B. Field wiring to complete all interconnections for the I/O shown on plans are included in the Contractor's scope of work whether or not shown on the Contract Drawings.

1.08 AUTO DIALER SYSTEM PROGRAMMING

- A. Programming of the Auto Dialer will be provided by contractor. CONTRACTOR shall provide coordinate with SAWS Inspector regarding witnessed SCADA testing.
- B. Contractor shall provide programmed auto dialer and shall document all I/O terminations. Contractor will provide field tracing for any programmed loop that does not function.

PART 2 PRODUCTS

2.01 SCADA PANEL

1. General:
2. Install PLC, 24Vdc power supply, interposing relays, power supplies and interface wiring terminals.
3. Provide mounting hardware, terminal blocks, circuit breakers, electrical wiring, communications wiring and all other items required for a complete operational system.
4. Panel layout and fabrication shall allow for convenient maintenance and removal of all equipment after installation.
5. Provide switched LED interior panel light and receptacle. Also provide one single non-GFCI receptacle dedicated to UPS.
6. Provide an enclosed thermostat controlled space heater with fan rated at 120Vac and sized to prevent condensation within the SCADA panel. Locate heater to avoid overheating electronic hardware or producing large temperature fluctuations on the hardware. The thermostat shall have an adjustment range of 40 degrees Fahrenheit

to 90 degrees Fahrenheit. Heater shall have circuit breaker as shown on the contract drawings shall be Hoffman type DAH or equal.

7. Provide an enclosed thermostat controlled filet fan rated at 120Vac. Filter fan to vent the heat out of the SCADA enclosure into the Electrical Building.
8. Provide UL508A certification label on panel.

B. Wiring:

1. Internal wiring for control and low voltage power circuits shall be flame retardant NFPA 70, Type SIS, single conductor, Class B, stranded copper, rated 600 volts. Minimum wire size shall be #14 AWG.
2. Analog signal wiring shall be #16 AWG twisted shielded pairs with drain wire and outer jacket. Refer to section 16120.
3. Segregate signal wiring from control wiring, group functionally and arrange to facilitate tracing of circuits.
4. Arrange wiring on terminal blocks to segregate field incoming conductors on a common side separate from internal wiring.
5. Wire routing and bundling shall utilize wiring duct and plastic wire wrap, secured to the structure and with spare space.
6. Color code wiring as follows:
 - a. AC power at line voltageBlack
 - b. AC switched powerRed
 - c. Ground/earth ground..... Green or green w/ yellow tracer
 - d. Ungrounded DC power..... Blue
 - e. DC grounded commonBlue w/ white stripes or white w/ blue stripes
 - f. 4-20mA Twisted shielded pair Red+/Black-

C. Terminal Blocks:

1. Provide screw type 600 volt terminal blocks with pressure plate and marking strip. Do not use miniature terminal blocks.
2. Provide a minimum of 25 percent spare terminals.
3. Group interface terminals together.

D. Grounding:

1. Provide a ground bus connected to rack structure ground for grounding shields, cabinet, and components.
2. DC signal common shall be ungrounded.

E. Enclosure:

1. Enclosure shall be a NEMA 12 cabinet.
2. Doors shall have three-point latch with lockable hasp, and shall have full length hinges with stainless steel pins. Lock to be keyed for Owner's key.
3. Fabricate using mild steel. Grind and sand welds to a smooth finish. Surfaces shall be free of ridges, nuts, and boltheads.
4. Internal structural framing to provide enclosure bracing and equipment support.
5. Provide removable lifting lugs, with plugs for use after installation is complete.
6. Enclosure shall be complete with interior back panels, as required for component mounting. Interior shall be white.
7. Provide a print pocket on inside of each door.
8. Provide laminated wiring schematics of the entire panel.
9. Provide a foldable lap top table installed inside the SCADA panel door.

F. Devices:

1. Reference is made to Section 16050, BASIC ELECTRICAL MATERIALS AND METHODS, for devices not specified in this Section or on the Contract Drawings.
2. Interposing relays, auxiliary relays, and selector switches shall be as indicated on Contract Drawings. Interposing relays used for isolation purposes only shall be SPDT type.
3. Surge protective device for power main shall be Phoenix contact EMC filter surge protection device mounted using DIN-rail assembly in the SCP, P/N 2856702.
4. Temperature sensor shall be Ultra Electronics model # 753-PC-X4-(0°F to 150°F) transmitter with RTD.

G. Nameplates, Labels and Tags:

1. Furnish face-of-panel mounted nameplates to identify systems and equipment. Use plastic laminate nameplates having white letters on red background for 120V system equipment, and white letter on blue background for 24V system equipment. Center lettering on each line.
2. Use plastic tags with letters on a red (120V) and blue (24V) background in the panel interior to identify each device mounted on the panel exterior and interior. Place the tags adjacent to, but not on, the device. Do not obstruct visibility by wire bundles or other equipment.

2.02 PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEM

A. Subject to compliance with the Contract Documents, the following manufacturer is acceptable:

1. Rockwell Automation Allen Bradley CompactLogix 5370 Controller with Studio 5000 Logix software (or latest version currently in use by SAWS).
2. PLC processor
3. PLC modules, chassis, and power supply
4. Connection bases
5. All connection cables
6. 25% spare capacity on all I/O modules

B. Approved Products – NO SUBSTITUTIONS

DESCRIPTION	MANUFACTURER	PART NUMBER
Power Supply Module	Allen Bradley	1769-PA4
CPU	Allen Bradley	1769-L33
Analog Input Cable	Allen Bradley	1492-ACAB025EE69
Digital Input Cable	Allen Bradley	1492-CAB025RTN32I
32 Channel Digital Input Module	Allen Bradley	1769-IQ32
8 Channel Analog Input Module	Allen Bradley	1769-IF8
CPU Battery	Allen Bradley	1769-BA
Right End Cap/Terminator	Allen Bradley	1769-ECR
Left End Cap/Terminator	Allen Bradley	1769-ECL
Right to Right bank interconnection	Allen Bradley	1769-CRR3
Right to Left bank interconnection	Allen Bradley	1769-CRL3

The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions.

C. Programming – Local PLC:

1. The PLC shall use Studio 5000 Logix (or latest version) software for programming the CPU.
2. Software license shall be relinquished to SAWS.

3. PLC Programming shall be performed by Process Control Systems Integrator (PCSI).
 4. Recommended PCSIs:
 - a. Prime Controls
Office Park Circle
Lewisville, Texas 75057
Attn: Gary McNeil
Phone: 972.221.4849
 - b. Control Panels USA
16310 Bratton Lane, Suite 100
Austin, Texas 78728
Attn: Martin Salyer
Phone: 512.863.3224
 - c. Richardson Logic Control
8115 Hicks Hollow
McKinney, Texas 75071
Attn: Michael Cunningham
Phone: 972.542.7375
- D. Programming Languages
1. The PLC program shall utilize function blocks that are compatible with Rockwell PlantPAX system.
 2. Shall adhere to SAWS Standards for Tagging, etc.
- E. Programming – Owner’s Production Control Center:
1. Programming of the Rockwell Automation system at the Owner’s Production Control Center (PCC) shall be performed by the Applications Services Provider (ASP). Contractor shall coordinate with SAWS Inspector in order to notify SAWS Programming Manager about the programming of SCADA HMI graphics 15 calendar days prior to submitting the actual construction drawings of the SCADA Panel.
 2. The ASP shall perform all work necessary to configure, customize, debug, install, connect, and place into operation HMI and SCADA software specified within this Division and other related divisions. The PCSI shall coordinate with the ASP all scheduling, installation, and startup services. The PCSI shall be on site at all times when the ASP is working on site.
 3. The ASP shall be the following:
 - a. Recommended PCSI from above.
- F. Programming Languages
1. The PLC program shall be Function Block Diagram (FBD).

2. Refer to SAWS Standards for Tagging, etc.

G. Input / Output Capacity

1. Physical Input / Output capacity shall not be less than the following:
 - a. Analog – 256
 - b. Discrete – 1024

2.03 120 VAC UNINTERRUPTIBLE POWER SUPPLY (UPS)

A. Provide power conditioning during normal power operation.

1. Lightning and surge protection: Tested to ANSI/IEEE C62.41 Category A.
2. RF noise isolation: EMI/RFI suppression.
3. On-Line input range: 100-142 Vac, output 112-128 Vac.

B. Upon loss of feeder power to UPS, maintain power to the load for a minimum of 2 hours with 4 msec transfer time at 125% of constant load. Contractor to submit load calculation of proposed components and indicate the size of UPS needed for a 2 hour run time.

C. Ratings:

1. Volt – Ampere Capacity: UPS to be sized to run devices in SCADA panel including PLC, Radio, Auto Dialer and DC Power Supplies located in the SCADA panel for 2 hour run time.
2. Nominal Input Voltage: 120 Vac.
3. On-Battery Output Voltage: 120 Vac +/- 10%.
4. On-Battery Frequency: 60 Hz. Stepped sine wave.
5. Ambient Operating Temperature: 0-40 degrees C.

D. Battery shall be a sealed maintenance-free lead acid type with 3-year minimum life.

E. UL Compliance: UPS shall conform to UL Standards and have an applied UL listing.

F. UPS shall have Ethernet connectivity. Provide Network Card-MS for communications. UPS memory registers shall be configured by Contractor to work with SCADA system.

G. Manufacturer: Contractor to verify that the UPS will have a minimum runtime capacity of 2 hours at 125% of constant load in watts for the SCADA panel.

1. Powerware 5PX 1000 RT with extended battery module 5PXEBM48R or larger based on VA calculation as specified above. Contractor to verify that the UPS will have a minimum runtime capacity of 2 hours with SCADA panel fully loaded.

2. Tripp Lite SmartOnline SU/*750/1000/1500/2200/3000 XLCD
 - a. UPS shall be provided with an
 - (i) SNMPWEBCARD card
 - (ii) Model BPV2470. Extended Runtime Batteries for 2 hours runtime at 125% of constant load in watts.

*Size determined by contractor based on 2 hour runtime at 125% constant load.

2.04 DC POWER SUPPLY

- A. 24 Vdc Control Power shall be provided by a single-output DC Power Supply.
- B. Ratings:
 1. Input Voltage: 120 Vac, + 10% voltage adjustment
 2. Output Voltage: 24 Vdc single output.
 3. Current range ≥ 8 A, overload protected.
 4. Rated power ≥ 200 W
 5. Voltage adjust range: 22V-26.4V
 6. Frequency range: 47-63 hz
 7. Efficiency: 85%
 8. Ambient Operating Temperature: -10-60 degrees C.
- C. UL Compliance: Power Supply shall conform to UL Standards and have an applied UL listing.
- D. Manufacturer:
 1. IDEC, Model PS5R-SC24
 2. MEAN WELL, Model SP-200-24
 3. POWER-ONE, Model HN24-3.6-A.

2.05 COMMUNICATION PANEL

- A. Panel shall be American Products AM-202822-9RU beige color, NEMA 3R Enclosure. Must have UL 94 compliant bulb gasket. Panel to include the following.
 1. Wall mounting hardware shall be American Products AM-2418-WM.
 2. Backpanel shall be American Products AM-202822-WB.

3. Isolated Ground Bar shall be American Products AM-2X6-RB. Exhaust fan shall be American Products AM-2418-FP-115.
 4. Telecommunication 19" Rack Grounding bus bar shall be Harger TRGBHKIT14119.25 or American Product AM-2X6RB
- B. Provide mounting hardware, terminal blocks, circuit breakers, electrical wiring, communications wiring and all other items required for a complete operational system.
- C. Panel layout and fabrication shall allow for convenient maintenance and removal of all equipment after installation.
- D. Provide switched LED interior panel light. Also provide One duplex receptacle.
- E. Provide UL508A certification label on panel.
- F. Industrial Grade Router (Communications Cabinet)
1. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
 - a. Cisco model IR829GW-LTE-VZ-AK9
- G. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.
- H. Environmental:
1. Operating temperature in sealed NEMA Cabinet with no air flow: -40°F to 140°F
 2. Operating altitude: 13,800 ft.
 3. Mounting Options: Must be 19" self supporting.
- I. Physical:
1. Enclosure: Fully Modular construction to allow for field upgrades for existing and/or future technologies without requiring a platform replacement. Refer to section 2.1.D for additional requirements.
 2. Provide an enclosed thermostat controlled fan rated at 120Vac. Filter fan to vent the heat out of the enclosure into the Electrical Building.
 3. Power supply: 120VAC from UPS in SCADA Panel.
 4. Microprocessor based managed type.
 5. 19 inch rack mountable where shown in plans.
- J. Options and Accessories Required:

1. Provide twenty (20) percent spare port capacity for each port type.
2. Provide redundant power supply module Cisco PWR-125W-AC
3. WPA Antenna WMMG-7-27-5SP.
4. Female Adapter SMA-TNC.
5. Lighting Arrestor CGR-LA-NF-NF
6. Provide two (2) year extended maintenance: CON-SNT-IR82VZAK

2.06 RADIO TRANSCEIVER SYSTEM

- A. Contractor shall furnish and install the 5GHz broadband type radio system with the following features.
1. Integrated High Gain 5GHz PMP450i Subscriber:
 - a. Manufacturer: Cambium Networks
 - b. Part number: C050045C002C
 2. Tilt Bracket Assembly:
 - a. Manufacturer: Cambium Networks
 - b. Part number: N000045L002A.
 3. Power Injector:
 - a. Midspan DC power 60w
 - b. Manufacturer: Microsemi
 - c. Part number: PD-9501GI/DC
 4. Power cord:
 - a. Manufacturer: Cambium Networks
 - b. Part number: C0000065L007
 5. Lightning Protection:
 - a. Manufacturer: Cambium Networks
 - b. Part number: C000065L007
 6. Pole Mounting Kit:
 - a. Manufacturer: PolyPhaser
 - b. Part number: IX-POLE-KIT
 7. Surge Protection:
 - a. Manufacturer: Transector
 - b. Part number: ALPU-F140
 8. POE Injector:

- a. Manufacturer: Cambium Networks
 - b. Part number: N000065L001B
9. Grounding Kit:
- a. Manufacturer: Cambium Networks
 - b. Part number: C00006L007
- B. Feedline:
- 1. Broadband: TIA/EIA 568B OSP CAT 6, #23 AWG Ethernet Outdoor, UL Listed, 23 AWG with waterproof watertight rated IP67 rated RJ45 connectors at each ends. (Not to exceed 300 feet) cabling will be Superior ESSEX Type BBDGe cable, copper clad cabling, Part number Enduragain OSP Shielded Superior ESSEX 04-001-64, NO SUBSTITUTIONS.
- C. Waterproof- all connections must be waterproof as per IEC 60529 IP67 2.6 ANTENNA MAST
- D. Refer to specification 17600, ANTENNA TOWER for details
- E. Programming:
- 1. Radio programming shall be performed by contractor. SAWS Information Services will program-Security Risk.
- 2.07 AUTODIALER
- A. Contractor shall provide and install a new complete and operational new autodialer system. Autodialer System to be a Verbatim Gateway Series VPLC Autodialer with an expandable 32 digital input module. The autodialer is to use a standard rotary pulse or touch-tone "dial-up" phone line (installed by contractor) and is to be F.C.C. approved. Connection to the telephone is through 4-pin modular jack (RJ-11).
 - B. Contractor to coordinate with the phone company to get communication lines to the electrical building for the autodialer.
 - C. NEMA 12 Control panel for Autodialer to be mounted to the wall as shown on plans. Refer to section 2.1.D for additional requirements
 - D. Manufacturer:
 - 1. Raco Verbatim Gateway Series VPLC Autodialer with expandable 32 digital input monitoring module.
- PART 3 EXECUTION
- 3.01 COORDINATION MEETING
- A. The ASP shall be responsible to coordinate the work with the PCSI and/or the Contractor. The ASP shall schedule and administer a minimum of two mandatory control system

coordination meetings. The ASP shall make arrangements for meetings and prepare/distribute an agenda a minimum of one week before the scheduled meeting date.

3.02 INSTALLATION

A. General

1. SCADA PLC Panel shall be a freestanding enclosure mounted to a wall with bolts of sufficient size and number for load conditions. Contractor shall install all interconnect wiring from the SCADA PLC Panel to field equipment and devices, except where the field device is future and has no provision for wiring termination.

B. Follow procedures, instructions, and check sheets provided by the manufacturers for proper installation of their equipment.

3.03 FIELD QUALITY CONTROL

A. In accordance with Section 16950 – ELECTRICAL TESTING.FUNCTIONAL TEST

B. PLC program shall be installed on the PLC by CONTRACTOR. Programmers shall provide assistance with testing the I/O from the field to the SAWS SCADA system once the field I/O and the communications systems have been fully checked out

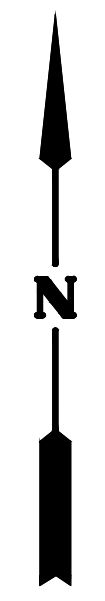
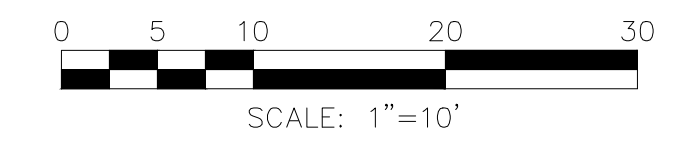
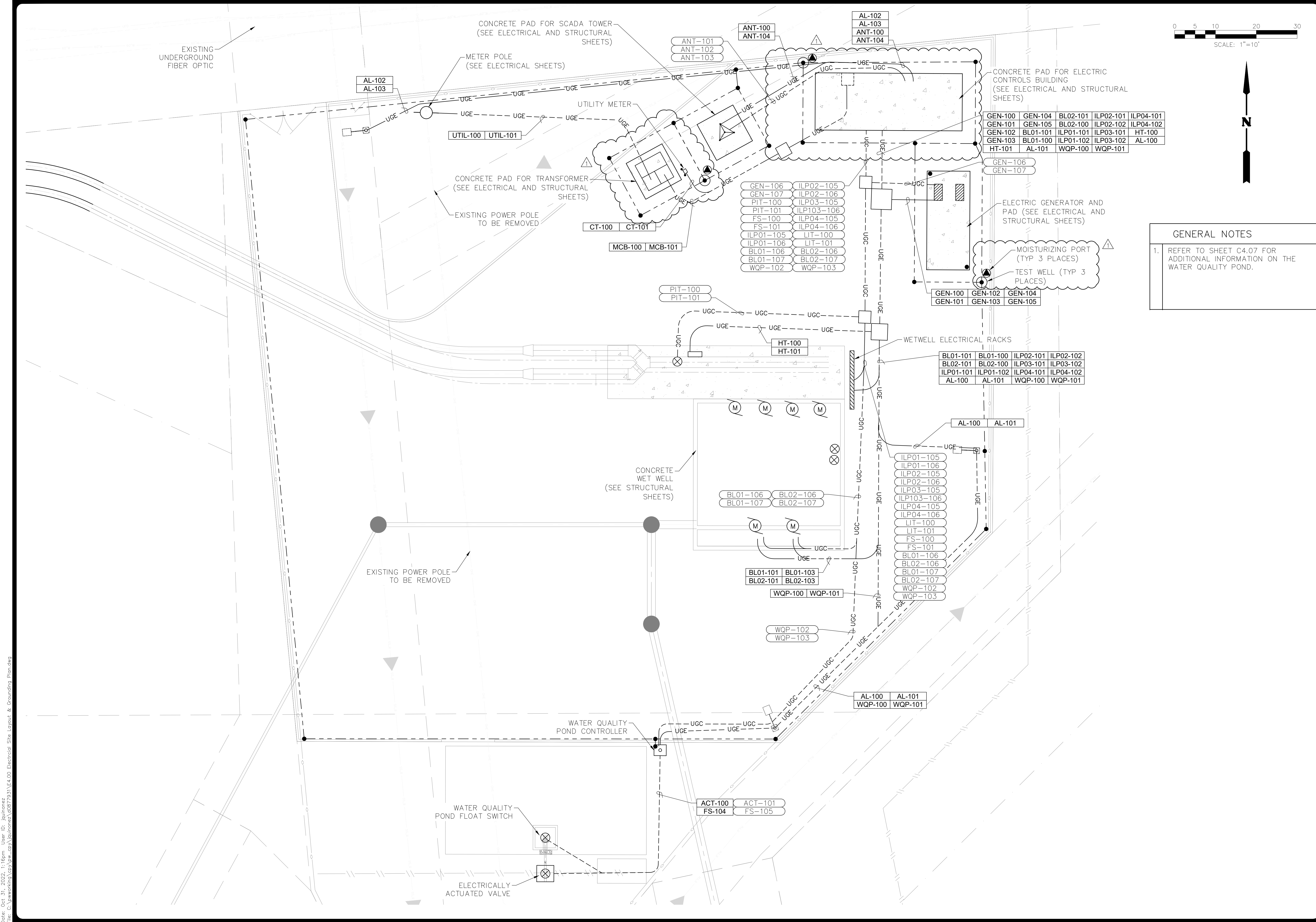
C. Contractor shall be responsible for testing the field I/O to the PLC panel.

3.04 STARTUP AND COMMISSIONING

A. Contractor shall coordinate the startup and commissioning efforts. Contractor shall develop the startup and commissioning plans and the check out forms.

B. Contractor shall coordinate with SAWS (startup and commissioning phases).

END OF SECTION



GENERAL NOTES

- REFER TO SHEET C4.07 FOR ADDITIONAL INFORMATION ON THE WATER QUALITY POND.

GEN-100	GEN-104	BL02-101	ILP02-101	ILP04-101
GEN-101	GEN-105	BL02-100	ILP02-102	ILP04-102
GEN-102	BL01-101	ILP01-101	ILP03-101	HT-100
GEN-103	AL-100	ILP01-102	ILP03-102	AL-100
HT-101	AL-101	WQP-100	WQP-101	

GEN-106	ILP02-105
GEN-107	ILP02-106
PIT-100	ILP03-105
PIT-101	ILP103-106
FS-100	ILP04-105
FS-101	ILP04-106
ILP01-105	LIT-100
ILP01-106	LIT-101
BL01-106	BL02-106
BL01-107	BL02-107
WQP-102	WQP-103

GEN-106	GEN-107
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AL-100	AL-101	WQP-100	WQP-101

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ILP02-105
ILP02-106
ILP03-105
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ILP04-105
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LIT-100
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FS-100
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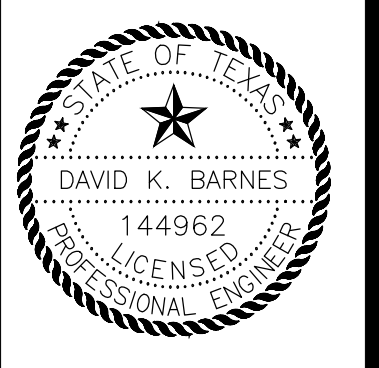
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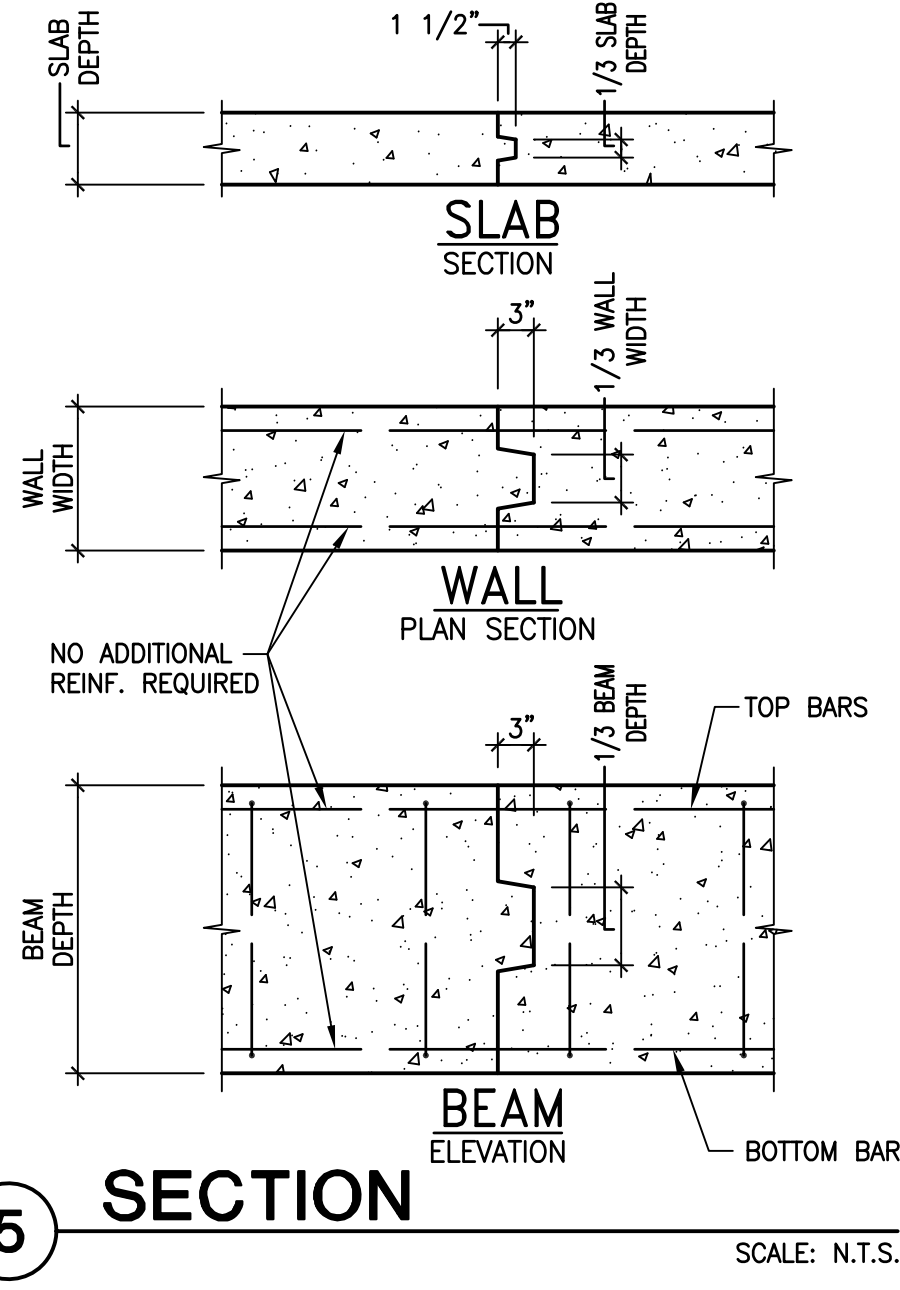
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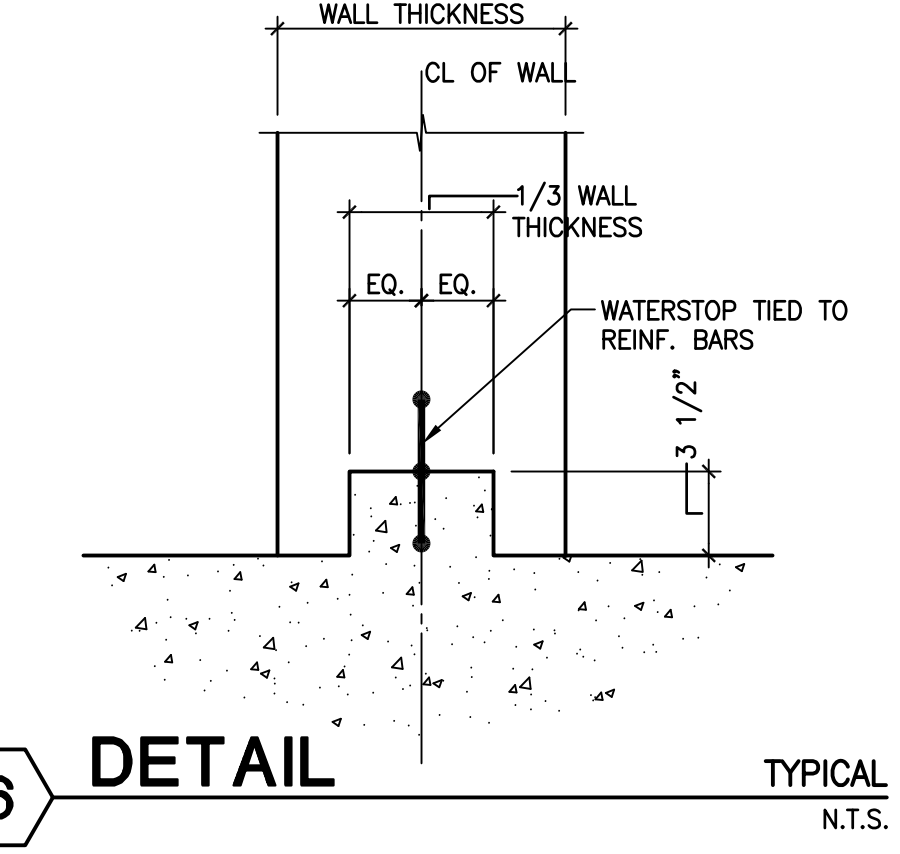
PAPE-DAWSON ENGINEERS
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 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 |
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E-54 REGIONAL LIFT STATION PLANS
 REGIONAL LIFT STATION
 ELECTRICAL SITE LAYOUT & GROUNDING PLAN

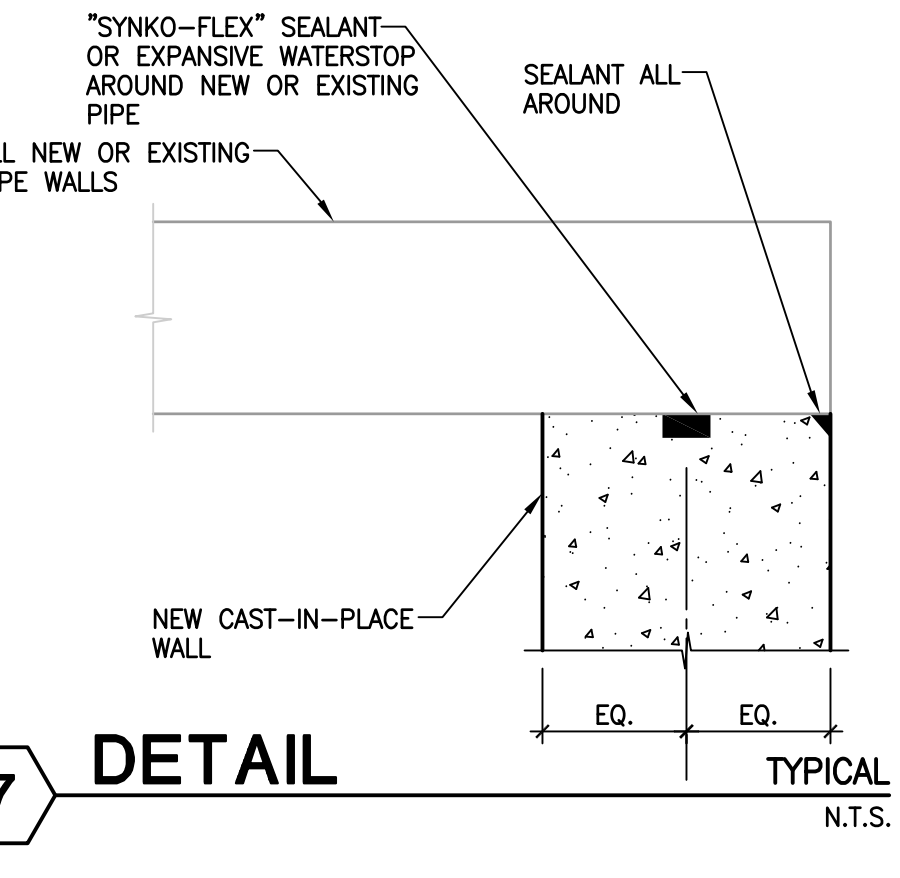
SAWS JOB NO.	22-2502
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CHECKED	KB
DRAWN	GL
SHEET	E4.00



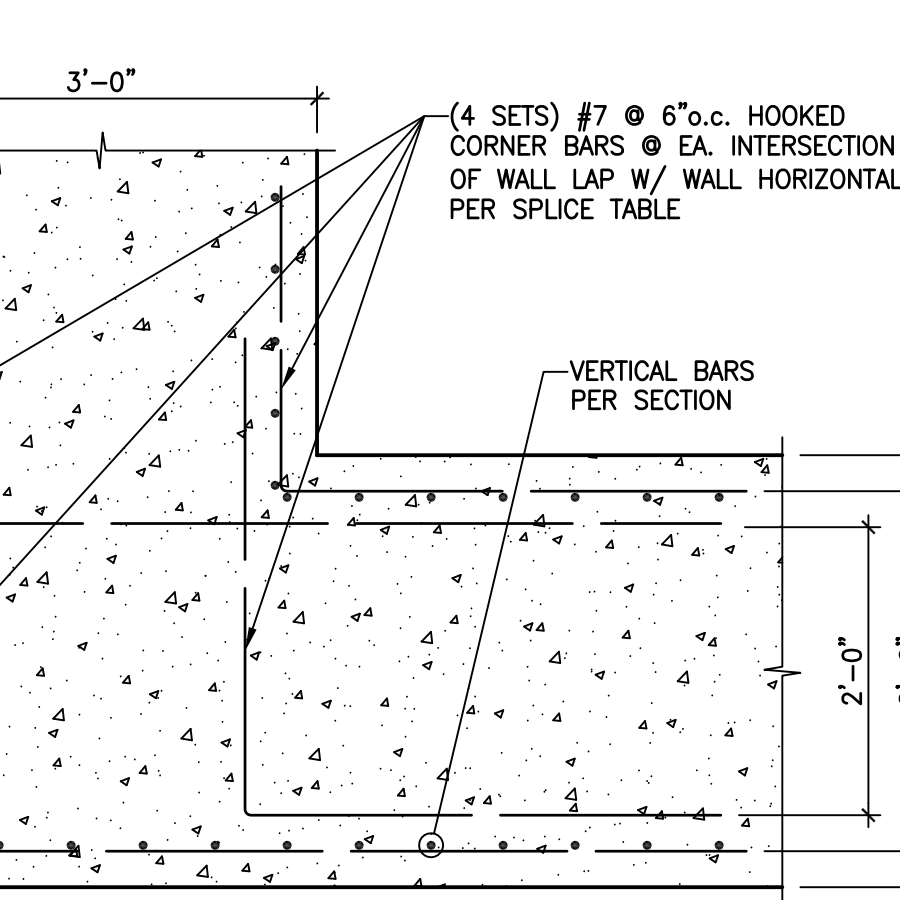
5 SECTION
SCALE: N.T.S.



6 DETAIL
TYPICAL
N.T.S.



7 DETAIL
TYPICAL
N.T.S.



8 DETAIL
TYPICAL
N.T.S.

CONCRETE NOTES:

CM-1 CONCRETE SHALL BE LABORATORY DESIGNED TO DEVELOP MINIMUM 28-DAY COMPRESSIVE STRENGTHS AS GIVEN BELOW. REFER TO SPECIFICATIONS FOR AGGREGATES, CEMENT, ADMIXTURES, ETC.

GRADE BEAMS, SLABS-ON-GRADE 4,000 PSI
BEAMS AND FLAT SLAB FLOOR SYSTEM 4,000 PSI
COLUMNS AND WALLS 4,000 PSI

NOTE: FLY ASH WILL BE PERMITTED UP TO 20% PORTLAND CEMENT REPLACEMENT, REFER TO SPECIFICATIONS.

CM-2 REINFORCING STEEL SHALL BE FROM NEW BILLET AND SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:

A615-GR 60 FOOTING SPIRALS
A185 WELDED WIRE FABRIC
A615-GR 60 BEAM STIRRUPS, COLUMN TIES
A615-GR 60 ALL OTHER REINFORCING
ASTM A108-60T HEADED CONCRETE ANCHORS
ASTM A496 DEFORMED BAR ANCHORS

CM-3 DETAILING OF CONCRETE REINFORCEMENT BARS AND ACCESSORIES SHALL BE IN ACCORDANCE WITH LATEST ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI 315). BAR SUPPORTS SHALL HAVE PLASTIC COATED LEGS OR BE HOT DIPPED GALVANIZED AFTER FABRICATION.

CM-4 PROVIDE BAR LAPS AND SPLICES PER REINFORCING BAR LAP SPLICE TABLE BELOW. SEE "CORNER DETAILS" FOR CONTINUOUS BARS AT CORNERS. SPLICES SHALL BE LAPPED 1-1/2 TURNS. WELDED WIRE MESH SHALL BE LAPPED 8" MINIMUM AT SPLICE POINTS, OR 1-1/2 MESHES, WHICHEVER IS GREATEST.

CM-5 CONTRACTOR SHALL PROVIDE NECESSARY CONSTRUCTION JOINTS IN MONOLITHIC CONCRETE FORMING SO THAT NOT MORE THAN 400 CUBIC YARDS IS POURED IN ONE DAY. LOCATION OF CONSTRUCTION JOINTS MUST HAVE PRIOR APPROVAL OF STRUCTURAL ENGINEER OF RECORD AND SHALL GENERALLY BE LOCATED AT OR NEAR MID-POINTS OF SPANS OF SLAB, BEAMS AND WALLS. ALL CONTINUOUS REINFORCING SHALL BE CARRIED THROUGH THE JOINT. SEE DETAILS FOR CONTINUOUS KEY BETWEEN ADJACENT POURS.

CM-6 SEE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS FOR LOCATION AND SIZES OF ALL SLAB OPENINGS AND SLEEVES, INSERTS, ANCHORS AND BOLTS REQUIRED BY ABOVE.

CM-7 REFER TO ARCHITECTURAL DRAWINGS FOR ALL FLOOR FINISHES, DIMENSIONS AND LOCATIONS OF SLAB DROPS AND DEPRESSIONS.

CM-8 MECHANICAL AND ELECTRICAL CONDUITS IN SLABS SHALL RUN UNDER THE TOP LAYER OF SLAB REINFORCING OR WELDED WIRE FABRIC. PROVIDE A MINIMUM OF 1-1/2" CLEAR BETWEEN INDIVIDUAL CONDUITS, AND BETWEEN CONDUIT AND PARALLEL REINFORCING. DO NOT "BUNDLE" CONDUITS.

CM-9 "HEADED CONCRETE ANCHORS" (HCA) SHALL BE OF 50,000 PSI STEEL ROD WITH UPSET ENDS, AUTOMATICALLY ARC WELDED THROUGH CERAMIC FERRULES, "NELSON CONCRETE ANCHORS" OR EQUAL.

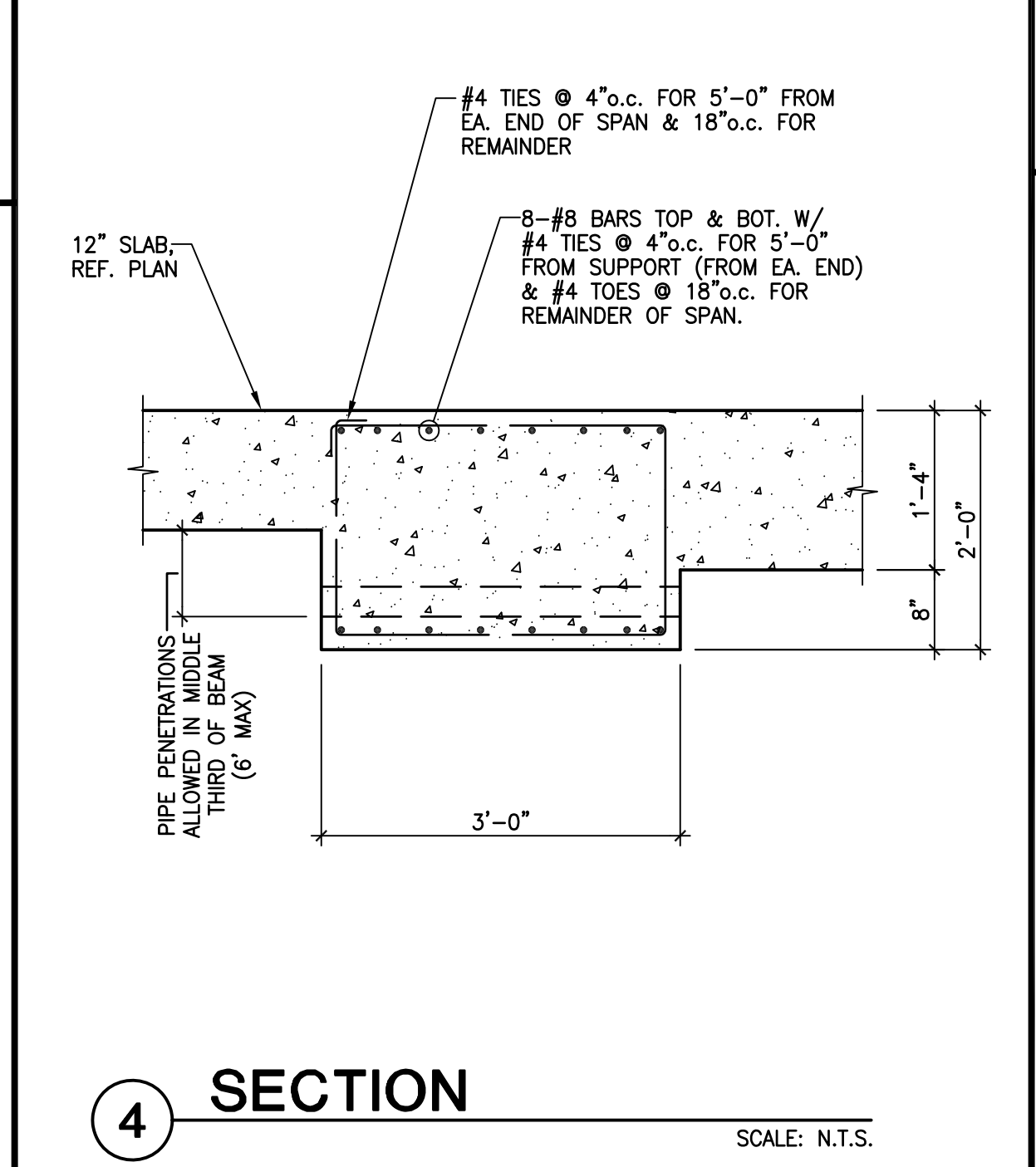
MECHANICAL TESTING OF HCA IN SHOP

MECHANICAL TESTS SHALL BE MADE BEFORE INITIATION OF PRODUCTION WELDING AND AFTER ANY EQUIPMENT MAINTENANCE TO ENSURE THAT THE WELDING SCHEDULE IS SATISFACTORY. THEY MAY ALSO BE MADE DURING THE PRODUCTION RUN OR AT THE BEGINNING OF A SHIFT TO ENSURE THAT WELDING CONDITIONS HAVE NOT CHANGED. ARC WELDED STUDS ARE TESTED BY BENDING THE STUD. BENDING MAY BE DONE BY STRIKING THE STUD WITH A HAMMER OR BY BENDING IT USING A TUBE OR PIPE. THE ANGLE THROUGH WHICH THE STUD WILL BEND WITHOUT WELD FAILURE WILL DEPEND ON THE STUD AND BASE METAL COMPOSITIONS, CONDITIONS (COLD WORKED, HEAT TREATED), AND STUD DESIGN. ACCEPTABLE BENDING SHOULD BE DETERMINED WHEN THE WELDING PROCEDURE SPECIFICATION IS ESTABLISHED OR FROM THE APPLICABLE WELDING CODE. BEND TESTING MAY DAMAGE THE STUD; THEREFORE, IT SHOULD BE DONE ON QUALIFICATION SAMPLES ONLY. THE METHOD USED TO APPLY TENSILE LOAD ON AN ARC WELDED STUD WILL DEPEND ON THE STUD DESIGN. SPECIAL TOOLING MAY BE REQUIRED TO GRIP THE STUD PROPERLY WITHOUT DAMAGE, AND A SPECIAL LOADING DEVICE MAY BE NEEDED.

MECHANICAL TESTING OF HCA IN FIELD

MECHANICAL TESTS SHALL BE MADE IN THE FIELD BEFORE PLATES ARE INSTALLED IN CONCRETE. THE CONTRACTOR SHALL SUPPLY AT A MINIMUM ONE ADDITIONAL PER 50 PLATES OF EACH TYPE OR ADDITIONAL STUDS SHALL BE PLACED ON SPECIAL CONFIGURATION PLATES AND MEMBERS. THESE STUDS SHALL BE TESTED IN THE FIELD. ARC WELDED STUDS ARE TESTED BY BENDING THE STUD. BENDING MAY BE DONE BY STRIKING THE STUD WITH A HAMMER OR BY BENDING IT USING A TUBE OR PIPE. THE ANGLE THROUGH WHICH THE STUD WILL BEND WITHOUT WELD FAILURE WILL DEPEND ON THE STUD AND BASE METAL COMPOSITIONS, CONDITIONS (COLD WORKED, HEAT TREATED), AND STUD DESIGN. BEND TESTING MAY DAMAGE, THUS THEY MAY NOT BE USED. THE STUD; THEREFORE, IT SHOULD BE DONE ON QUALIFICATION SAMPLES ONLY. THE METHOD USED TO APPLY TENSILE LOAD ON AN ARC WELDED STUD WILL DEPEND ON THE STUD DESIGN. PROPERLY WITHOUT DAMAGE, AND A SPECIAL LOADING DEVICE MAY BE NEEDED.

CM-10 REFER TO SPECIFICATIONS FOR TESTING REQUIREMENTS. ALL TESTING SHALL BE AT POINT OF DISCHARGE. IF PUMP IS USED, TESTING SHALL BE AT THE END OF THE HOSE.



4 SECTION
SCALE: N.T.S.

REINFORCING BAR LAP SPLICE TABLE (MASONRY)

BAR SIZE	POSITION	CONCRETE f'c (PSI) AND LAP CLASS	
		2500 B	3000 B
#3 thru #6	ALL	40db	40db
#7 thru #11	ALL	72db	72db

REINFORCING BAR LAP SPLICE TABLE (BEAMS AND COLUMNS)

BAR SIZE	POSITION	CONCRETE f'c (PSI) AND LAP CLASS			
		3000 B	4000 B	5000 B	6000 B
#3 thru #6	ALL	74db	64db	58db	50db
#7 thru #11	ALL	93db	80db	72db	60db

REINFORCING BAR LAP SPLICE TABLE (SLABS AND WALLS)

BAR SIZE	POSITION	CONCRETE f'c (PSI) AND LAP CLASS			
		3000 B	4000 B	5000 B	6000 B
#3 thru #6	0.75" COVER 2.0" COVER	75db 46db	64db 40db	58db 40db	
#7 thru #11	0.75" COVER 2.0" COVER	138db 74db	120db 65db	106db 56db	

REBAR LAP SPLICE TABLE NOTES:

RL-1 "db" DENOTES BAR DIAMETER.

RL-2 ALL SPLICES SHALL BE CLASS B UNLESS OTHERWISE NOTED.

RL-3 VALUES APPLY TO ALL BARS WITH MINIMUM CONCRETE COVER 1.0db AND MINIMUM CENTER TO CENTER SPACING OF 2.0db.

RL-4 FOR LIGHTWEIGHT CONCRETE, MULTIPLY BY 1.3.

RL-5 THE CHART ABOVE IS A SIMPLIFIED AND CONSERVATIVE METHOD FOR MEETING THE REQUIREMENTS OF ACI 12.2.2. THE CONTRACTOR MAY SUBMIT A DETAILED REBAR SPLICING PLAN IN ACCORDANCE WITH ACI 12.2.2 FOR APPROVAL.

UNDERFLOOR FILL NOTES:

UF-1 BEFORE ANY CONSTRUCTION IS BEGUN, PERFORM ROUGH GRADING AND CUT SWALES SO THAT GROUNDS WILL DRAIN AWAY FROM THE BUILDING. MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION SO THAT STORM WATER WILL BE CONDUCTED AWAY FROM THE BUILDING. KEEP EXCAVATIONS PUMPED FREE OF STORM WATER AT ALL TIMES.

UF-2 PRECAUTIONS SHALL BE TAKEN TO PROTECT OPEN EXCAVATIONS FROM EXCESSIVE LOSS OR GAIN IN NATURAL MOISTURE LEVEL PRIOR TO PLACEMENT OF BASE MATERIAL. KEEP MOIST DURING DRY WEATHER AND KEEP STORM WATER PUMPED OUT, INCLUDING NIGHTS AND WEEKENDS, DURING RAINS.

UF-3 IN THE AREA OCCUPIED BY THE FOUNDATION AND ALL ADJACENT SIDEWALKS, PLUS 3'-0", REMOVE A MINIMUM OF 2'-0" OF TOPSOIL INCLUDING ALL ORGANIC MATERIALS, ROOTS, ETC. FROM THE SITE. DO NOT USE FOR UNDERFLOOR FILL. REMOVE ADDITIONAL MATERIAL AS NECESSARY TO PROVIDE A MINIMUM OF 2'-0" OF SELECT FILL AS PER UF-6.

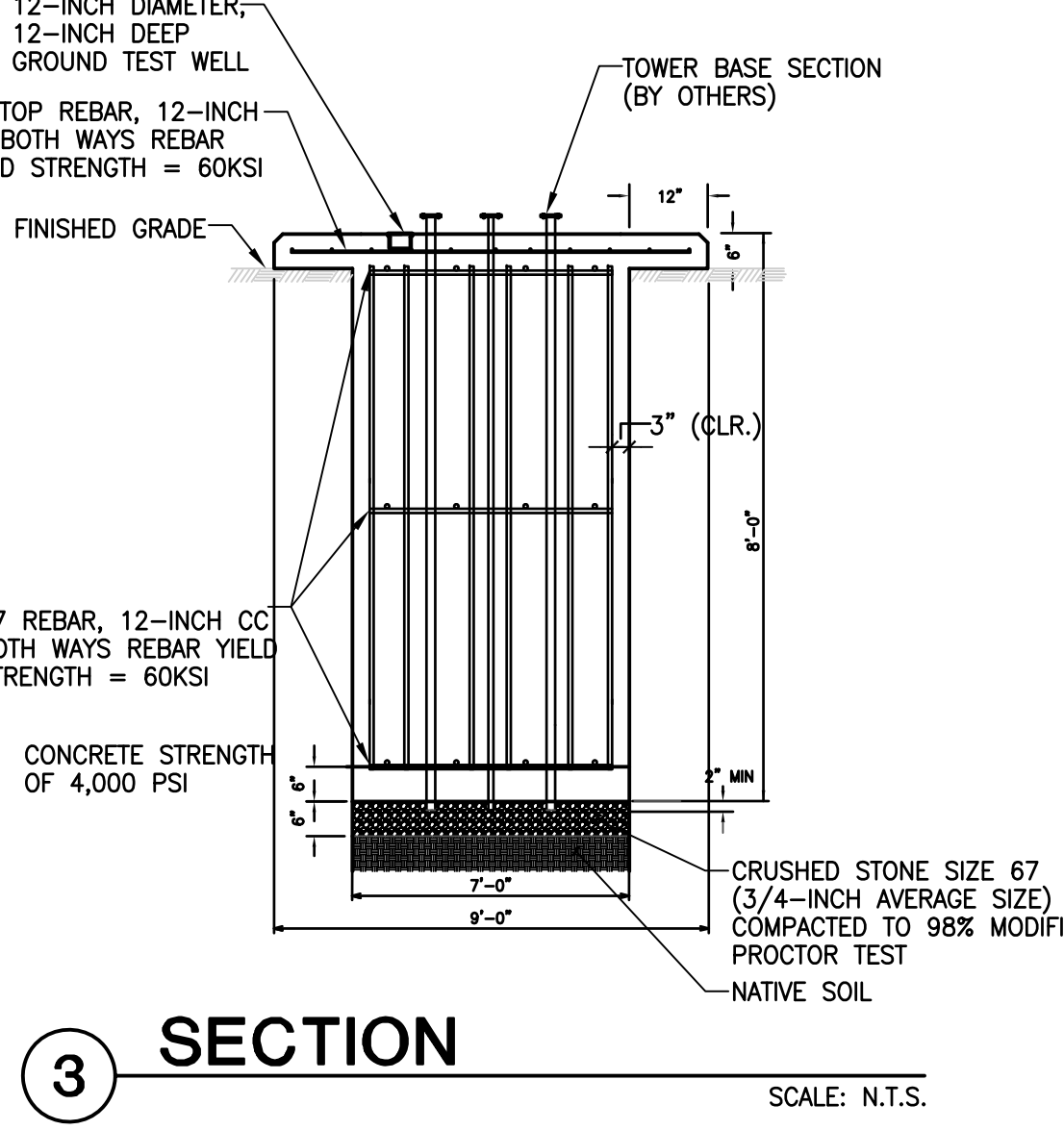
UF-4 THE RESULTING SURFACE SHALL BE PROOF ROLLED WITH A SUFFICIENTLY HEAVY ROLLER (15 TONS) TO LOCATE AND DENSITY WEAK AND COMPRESSIBLE ZONES. A MINIMUM OF 6 PASSES OF THE ROLLER IS REQUIRED. ANY SOFT SPOTS SHALL BE REMOVED AND REPLACED WITH COMPACTED SELECT FILL.

UF-5 THE ROLLED SUBGRADE SHALL BE SCARIFIED JUST PRIOR TO FILL PLACEMENT TO A MINIMUM DEPTH OF 6" AND RECOMPACTED TO MINIMUM OF 95% OF THE MAXIMUM DENSITY DETERMINED BY ASTM D698 COMPACTION TEST, MAINTAINING MOISTURE CONTENT BETWEEN -1 AND +3 PERCENTAGE POINTS UNTIL COVERED.

UF-6 FOR A DISTANCE OF 3'-0" OUTSIDE OF THE BUILDING LINE AND ALL ADJACENT SIDEWALKS, AND BEGINNING AT THE LOW END, BUILD UP TO THE ELEVATION OF THE BOTTOM OF THE SLAB WITH SELECT CRUSHED STONE FILL CONFORMING TO TxDOT SPECIFICATIONS, ITEM 247, TYPE "A" GRADE 2. A MINIMUM THICKNESS OF 2'-0" IS REQUIRED. NO DIRT FILL SHALL BE USED UNDER THE BUILDING FOUNDATION. SUBMIT WRITTEN CERTIFICATION OF COMPLIANCE WITH TxDOT, ITEM 247 SPECIFICATIONS BY TEST PERFORMED ON FIELD EXAMPLES.

UF-7 ALL FILL SHALL BE PLACED IN 8" LOOSE HORIZONTAL LIFTS AND COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM D698 COMPACTION TEST, MAINTAINING MOISTURE CONTENT BETWEEN -1 AND +3 PERCENTAGE POINTS UNTIL COVERED. EXCESS FILL AT BUILDING PERIMETER SHALL BE CUT AND GRADED TO COMPLY WITH FINISHED GRADE REQUIREMENTS.

UF-8 PERFORM ALL EARTH WORK DESCRIBED ABOVE BEFORE TRENCHING FOR GRADE BEAMS OR MECHANICAL LINES.



3 SECTION
SCALE: N.T.S.

GENERAL NOTES:

GM-1 THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (2018) AS AMENDED AND ADOPTED BY THE GOVERNING AUTHORITY, AND APPLICABLE INDUSTRY STANDARDS (AISC, ACI, ETC.).

GM-2 THE DESIGN LOADS ARE:

SUPERIMPOSED DEAD LOADS
MECHANICAL DUCTS/CONDUITS, CEILING, ETC. 5 PSF
MECHANICAL EQUIPMENT AS INDICATED ON PLANS

FLOOR LIVE LOAD
CORRIDOR 100 PSF
OFFICES 50 PSF
MOVEABLE PARTITIONS 20 PSF
MECHANICAL PUMPS 150 PSF
(NON REDUCIBLE)

ASSEMBLY AREAS:
FIXED SEATS 60 PSF
LOBBIES 100 PSF
MOVEABLE SEATS 100 PSF
STAGES & PLATFORMS 125 PSF
CATWALKS 40 PSF

ROOF LIVE LOAD
FLAT ROOF 20 PSF
PITCHED ROOF 20 PSF

ROOF SNOW LOAD
GROUND SNOW Pg 5 PSF
SNOW EXPOSURE FACTOR Ce 1.0
SNOW LOAD IMPORTANCE FACTOR Is 1.1
THERMAL FACTOR Ct 1.0

WIND LOAD
BASIC WIND SPEED (ULTIMATE DESIGN) 115MPH
BUILDING CATEGORY II
WIND EXPOSURE C
INTERNAL PRESSURE COEF. ±0.18
COMPONENTS AND CLADDING WIND PRESSURE 25 PSF

EARTHQUAKE LOADS
SEISMIC IMPORTANCE FACTOR Ie 1.00
SPECTRAL RESPONSE ACCELERATION Ss 14%
SPECTRAL RESPONSE ACCELERATION S 3%
SPECTRAL RESPONSE COEF. SDS 14%
SPECTRAL RESPONSE COEF. SD 5%
SEISMIC DESIGN CATEGORY AND WIND PRESSURE A
SEISMIC RESPONSE COEF Cs 01

RETAINING WALLS
GLOBAL STABILITY ANALYSIS FACTOR OF SAFETY 6.0
TYPE CANTILEVER
EQUIVALENT FLUID PRESSURE 65 PSF
BACKFILL DRAINED/ONSITE
FOOTING BEARING 1500 PSF
SURCHARGE 200 PSF

FLOOR LOAD
ELEVATION OF LOWEST FLOOR REF. ARCH. DWGS.

GM-3 ALLOWABLE STRESS DESIGN LOAD COMBINATIONS (FOR ALL DESIGNS EXCEPT CONCRETE)

D
D+L
D+(Lr, or S or R)
D+0.75L+0.75(Lr, or S or R)
D+(0.6W)
D+0.75L+0.75(0.6W)+0.75(Lr or S or R)
0.6D+0.6W
D+0.7E

STRENGTH DESIGN LOAD COMBINATIONS (FOR CONCRETE DESIGN)

1.4D
1.2D+1.6L+0.5(Lr, or S or R)
1.2D+1.6(Lr, or S or R)+(L or 0.5W)
1.2D+1.0W+L+0.5(Lr, or S or R)
0.9+1.0W
1.2D+E+L+0.2S

GM-4 PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR AND FABRICATOR SHALL VERIFY ALL QUANTITIES, DIMENSIONS AND CONDITIONS AND NOTIFY ARCHITECT/STRUCTURAL ENGINEER OF RECORD OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

GM-5 UTILITIES PENETRATING BUILDING SHALL BE FLEXIBLE, USING SLEEVE JOINTS, BENDS, LOOPS, ETC. TO PERMIT MOVEMENTS DUE TO EXPANSIVE UNDERLYING SOILS.

GM-6 PROVIDE ADEQUATE AND APPROPRIATE STRUCTURAL STEEL FRAMING FOR THE SUPPORT AND MOUNTING OF MECHANICAL EQUIPMENT RESTING ON, OR SUSPENDED FROM, STEEL SUPERSTRUCTURE.

GM-7 THE STRUCTURAL DRAWINGS FOR THIS PROJECT ARE COPYRIGHTED AND SHALL NOT BE REPRODUCED FOR USE AS FABRICATOR'S ERECTION DRAWINGS. THE CONTRACTOR SHALL ALLOW ADEQUATE TIME AND EXPENSE FOR SUBCONTRACTORS TO PRODUCE THEIR OWN ORIGINAL ERECTION AND PLACEMENT DRAWINGS.

GM-8 THE STRUCTURE HAS BEEN DESIGNED TO RESIST DESIGN LOADS ONLY AS A COMPLETED STRUCTURE. ANY PROPOSED APPLICATION OF CONSTRUCTION LOADS OR OF ANY LOADS TO THE PARTIALLY COMPLETED STRUCTURE WHICH EXCEED THE DESIGN LOADS WILL REQUIRE REANALYSIS AND PROBABLE REDESIGN.

GM-9 PROVIDE 5.0 TONS OF EXTRA REINFORCING STEEL, DETAILING, LABOR FOR PLACING AND FABRICATION AS DIRECTED IN THE FIELD AND SHOP.

BACKFILL NOTES:

BN-1 GROUND WATER LEVELS SHOULD BE VERIFIED IMMEDIATELY PRIOR TO CONSTRUCTION. GROUND WATER WAS ENCOUNTERED AND THE CONTRACTOR SHOULD ANTICIPATE THE NEED FOR DEWATERING MEASURES AS OUTLINED BY THE GEOTECHNICAL REPORT. CONTRACTOR IS RESPONSIBLE FOR ALL DEWATERING DESIGN AND MEASURES.

BN-2 POSITIVE DRAINAGE AND WATER PUMPING SHALL BE MAINTAINED AT ALL TIMES SUCH THAT STORM WATER OR EXCESS MOISTURE IS KEPT FROM ACCUMULATING AT THE BOTTOM OF THE EXCAVATION

BN-3 THE BACKFILL MATERIAL PLACED BETWEEN THE CUT SLOPES OF THE EXCAVATION AND THE SELECT FILL FILL PLACED ADJACENT TO THE BELOW GRADE STRUCTURES MAY CONSIST OF THE MATERIALS LISTED IN THE GEOTECHNICAL REPORT, AS SPECIFICALLY OUTLINED BY THE GEOTECHNICAL ENGINEER, MEETING ALL COMPACTION AND DENSITY REQUIREMENTS OUTLINED IN THE REPORT. CARE SHOULD BE TAKEN TO NOT OVER COMPACT THE BACKFILL PLACED BEHIND THE FIXED WALLS.

BN-4 DO NOT USE FLOWABLE FILL TO BACKFILL AROUND THE WET WELL.

BN-5 UTILITY BEDDING SHOULD NOT INCLUDE GRAVEL AT THE PERIMETER OF THE FOUNDATION. COMPACTED CLAY OR FLOWABLE FILL TRENCH BACKFILL SHOULD BE USED IN LIEU OF PERMEABLE BEDDING MATERIALS BETWEEN 2 FEET INSIDE THE SLAB EDGES TO THE OVERBUILD EDGES. A CLAY CAP CAN BE USED AROUND THE PERIMETER OF THE PLANNED FOUNDATION OVER THE SELECT FILL OVERBUILD AREAS.

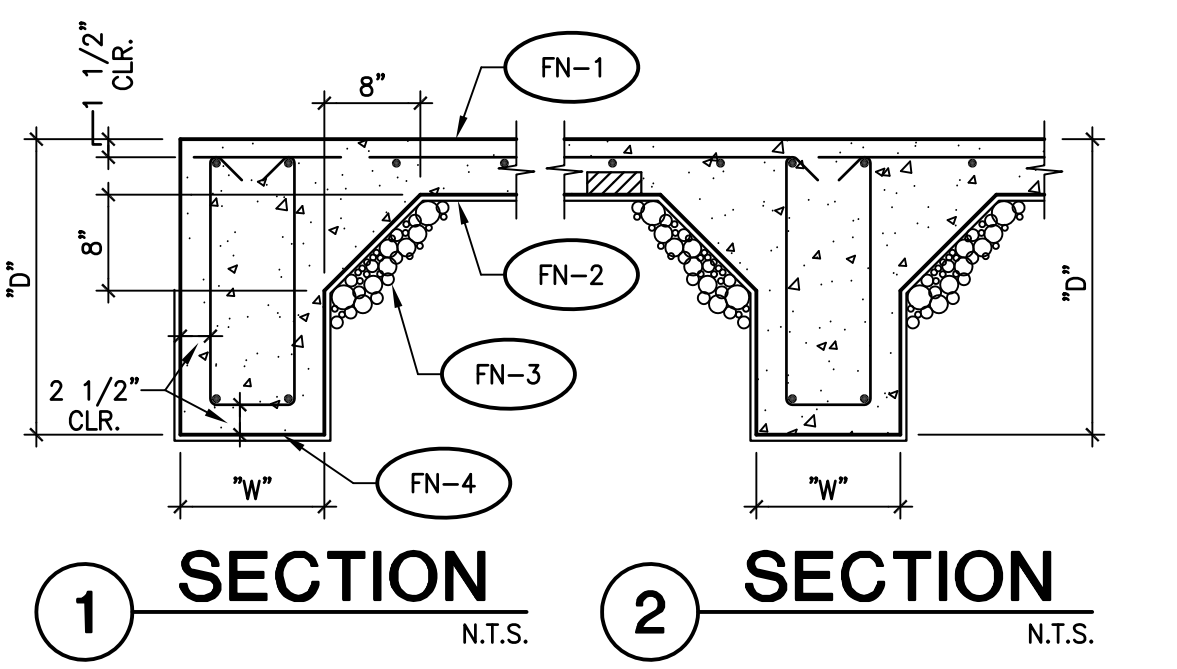
BN-6 EXCAVATIONS OVER 20' (20 FEET) DEEP REQUIRES THE SIDE SLOPS BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS WITH RELEVANT DESIGN EXPERIENCE.

DATE: 05/04/2022

STATE OF TEXAS
SHAWN J. FRANKE
82639
LICENSED PROFESSIONAL ENGINEER

LUNDY & FRANKE ENGINEERING
540 HEIMER ROAD SUITE 360 PH: (210) 979-7500
SAN ANTONIO, TEXAS 78222 FX: (210) 979-7800
TX FIRM REG. #3388

Shawn Franke



GRADE BEAM SCHEDULE

MARK	W x D*	MAIN REINFORCING	TIES
GB1	12 x 36	2-#7 x CONT. TOP & BOTTOM	#3 @ 18" o.c.
GB2	18 x 36	2-#7 x CONT. TOP & BOTTOM	#3 @ 18" o.c.

* REF. NOTE FN-4

FOUNDATION NOTES: (SLAB ON GRADE)

FN-1 5" CONCRETE SLAB REINFORCED W/ #4 @ 12" o.c. EACH WAY IN TOP. SUPPORT AT 4'-0" o.c. EACH WAY WITH CONCRETE BLOCKS OR BRICKS. SUPPORT BOTTOM BEAM REINFORCEMENT AT 4'-0" INTERVALS.

FN-1A 8" CONCRETE SLAB REINFORCED W/ #4 @ 12" o.c. EACH WAY TOP & BOTTOM. SUPPORT AT 4'-0" o.c. EACH WAY WITH CONCRETE BLOCKS OR BRICKS. SUPPORT BOTTOM BEAM REINFORCEMENT AT 4'-0" INTERVALS.

FN-1B 16" CONCRETE SLAB REINFORCED W/ #8 @ 10" o.c. EACH WAY TOP AND BOTTOM. SUPPORT AT 4'-0" o.c. EACH WAY WITH CONCRETE BLOCKS OR BRICKS.

FN-2 15 MIL POLYOLEFIN VAPOR BARRIER UNLESS NOTES OTHERWISE IN SPECIFICATIONS. AT ALL JOINTS PROVIDE 6" LAPS W/ #1 TAPE.

FN-3 COMPACTED SELECT FILL (SEE UF-6 "UNDERFLOOR FILL NOTES").

FN-4 ALL BEAM SOFFITS SHALL BEAR 30" MINIMUM INTO NATURAL GRADE OR COMPACTED FILL. ON PERIMETER, INCREASE SCHEDULED BEAM DEPTH AS REQUIRED FOR SOFFIT TO BEAR 30" MINIMUM BELOW FINISH GRADE.

FN-5 GRADE BEAMS AND SHAP TURN-DOWNS SHALL BE FORMED BY WALLS AND SOFFIT OF CAREFULLY SLOPED TRENCH. USE A SMOOTH-MOUTHED BUCKET. IF A TOOTHED BUCKET IS USED, EXCAVATION SHALL BE STOPPED 6" ABOVE FINAL GRADE AND THE REMAINING EXCAVATION ACCOMPLISHED WITH A SMOOTH MOUTHED BUCKET OR BY HAND LABOR TO REMOVE ALL LOOSE SOILS DISTURBED BY THE BUCKET TEETH. WOODFORM EXPOSED FACES TO A DEPTH OF 8" BELOW FINISHED GRADE.

FN-6 AT ALL BEAM CORNERS & T-INTERSECTIONS, PROVIDE 4-#7 x 6'-0" CORNER BARS (2-TOP AND 2-BOTTOM).

FN-7 TRENCHES SHALL BE VERIFIED FOR SIZE TO MAINTAIN CLEARANCES AROUND REINFORCEMENT PRIOR TO PLACING REINFORCEMENT.

FN-8 WHERE BEAM DEPTH EXCEEDS 36", ADD #4 @ 12" o.c. IN EACH FACE OF BEAM.

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CONTRACTOR NOTE

THE STRUCTURAL SYSTEM FOR THIS PROJECT SHALL NOT BE CONSTRUCTED BY USING THE STRUCTURAL DRAWINGS ALONE. THESE DRAWINGS WERE DEVELOPED FROM DATA DERIVED PRIMARILY FROM THE ARCHITECTURAL DRAWINGS AND SECONDARILY FROM MEP, CIVIL AND OTHER DISCIPLINES' DOCUMENTS. IT IS INTENDED THAT CONSTRUCTION PROCEED BY UTILIZING ALL OF THE INFORMATION CONTAINED IN THE ENTIRE SET OF CONSTRUCTION DOCUMENTS TAKEN AS A WHOLE. FAILURE TO DO SO WILL RESULT IN ERRORS WHICH SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.

DATE: 11/07/2022

NO. REVISION: 1A

ADDENDUM #5

PAPE-DAWSON ENGINEERS

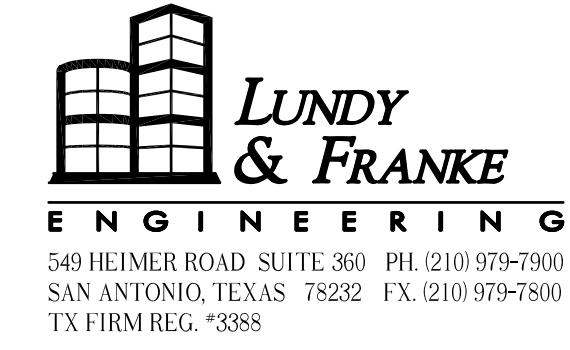
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TXBE FIRM REGISTRATION #170 | TBPAS FIRM REGISTRATION #10028800

E-54 REGIONAL LIFT STATION PLANS
REGIONAL LIFT STATION

NOTES, SECTIONS AND DETAILS

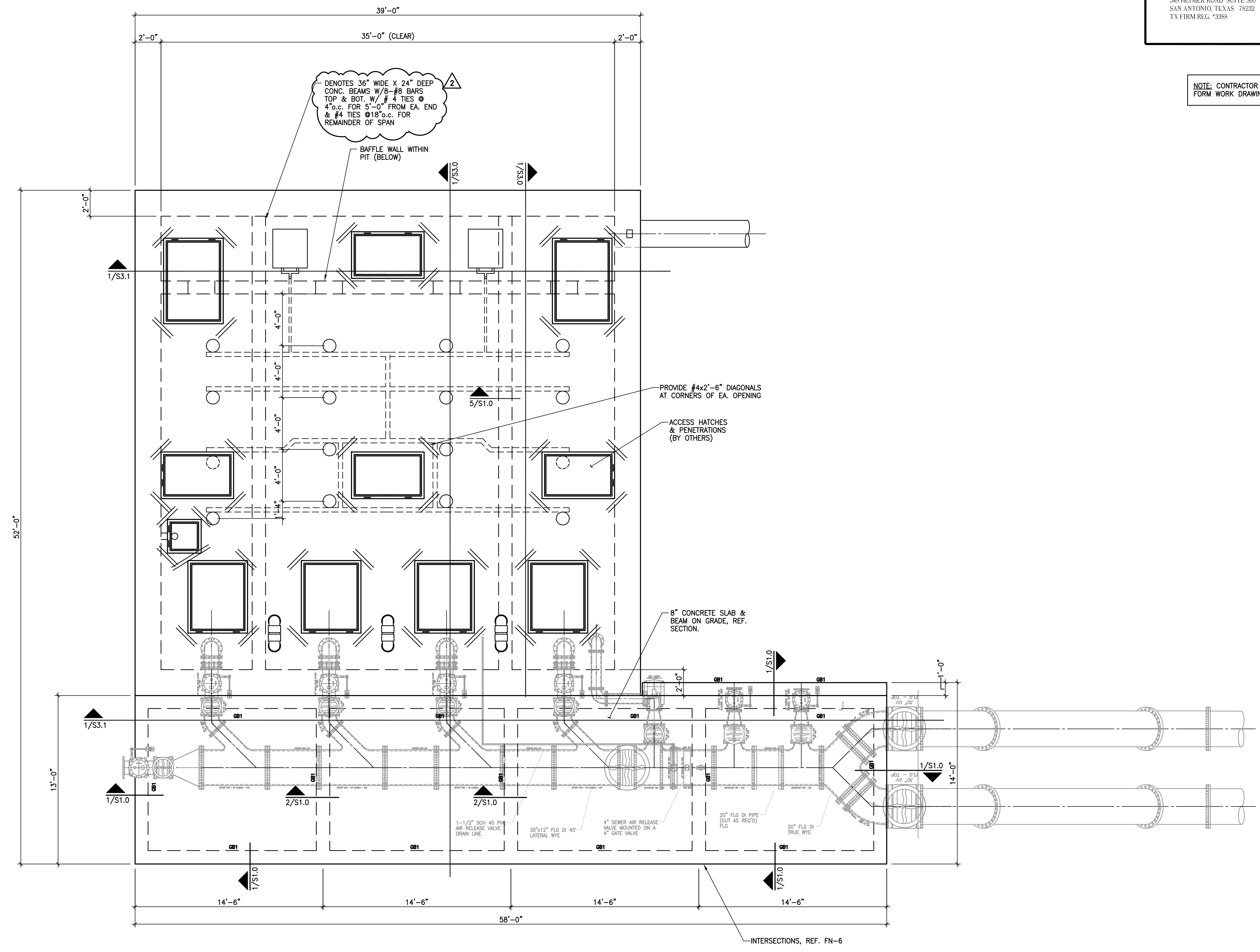
SAWS JOB NO. 22-2502
JOB NO. 11500-51
DATE MAY 2022
DESIGNER J.H.
CHECKED S.J.F., DRAWN S.J.F.
SHEET **S1.0**

LA PROJECT NO.: 13-171-00
 LA FILE NO.: E54LST2-1



NO.	REVISION	DATE
1	SAWS COMMENTS	08/12/2022
2	ADDENDUM #5	11/07/2022

NOTE: CONTRACTOR RESPONSIBLE FOR ENGINEERED FORM WORK DRAWINGS.



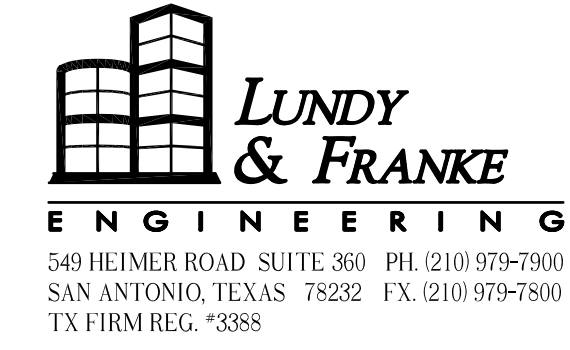
WET WELL GRADE LEVEL SLAB PLAN
 SCALE: N.T.S.

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 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TBPES FIRM REGISTRATION #170 | TBPES FIRM REGISTRATION #10028800

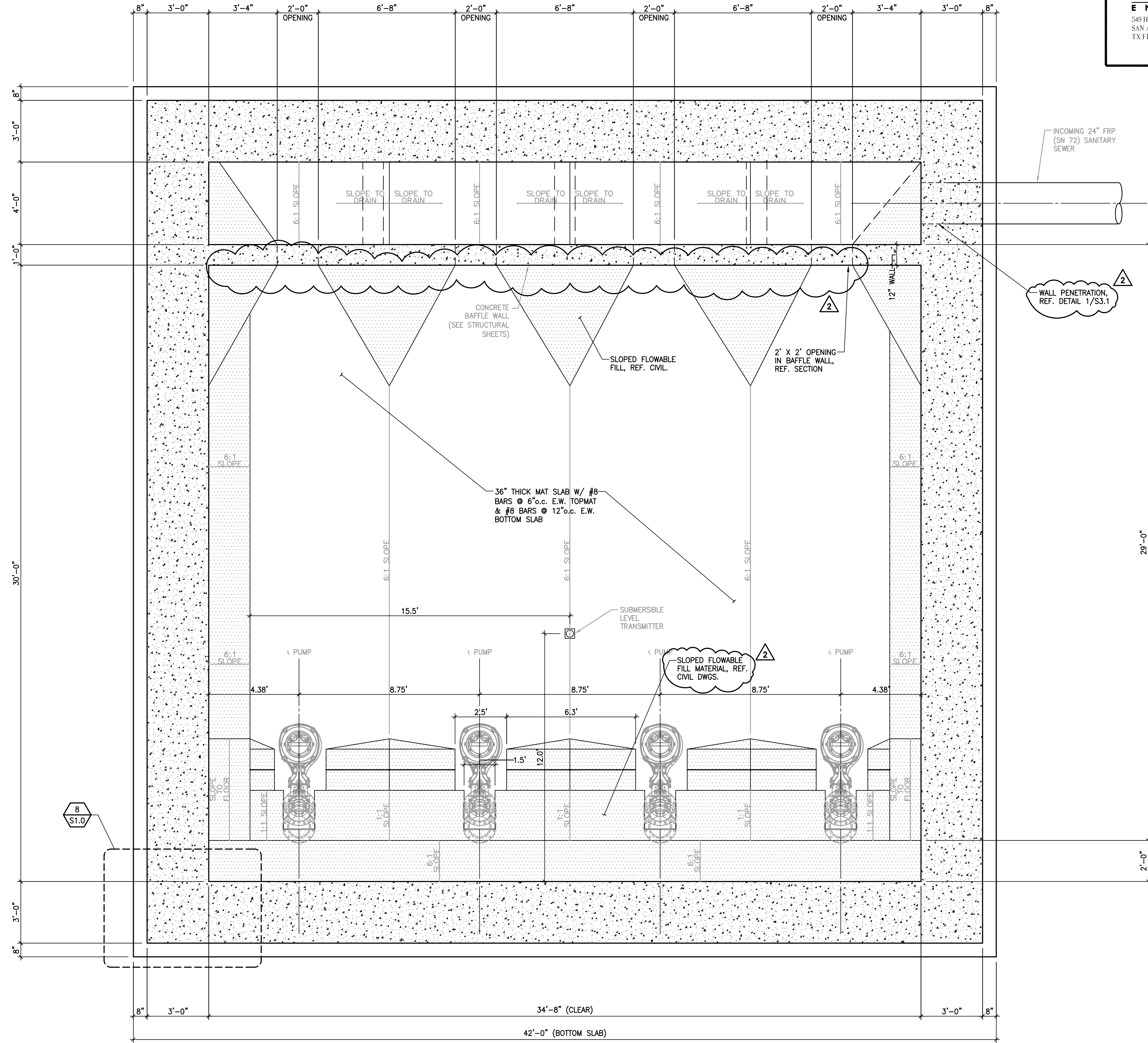
E-54 REGIONAL LIFT STATION PLANS
 REGIONAL LIFT STATION
 WET WELL GRADE LEVEL SLAB PLAN

SAWS JOB NO.	22-2502
JOB NO.	11500-51
DATE	MAY 2022
DESIGNER	J.H.
CHECKED S.J.F.	DRAWN S.J.F.
SHEET	S2.1

LA PROJECT NO.: 13-171-00
 LA FILE NO.: E54LST2-2



DATE	10/27/2022
REVISION	
ADDENDUM #4	
ADDENDUM #5	



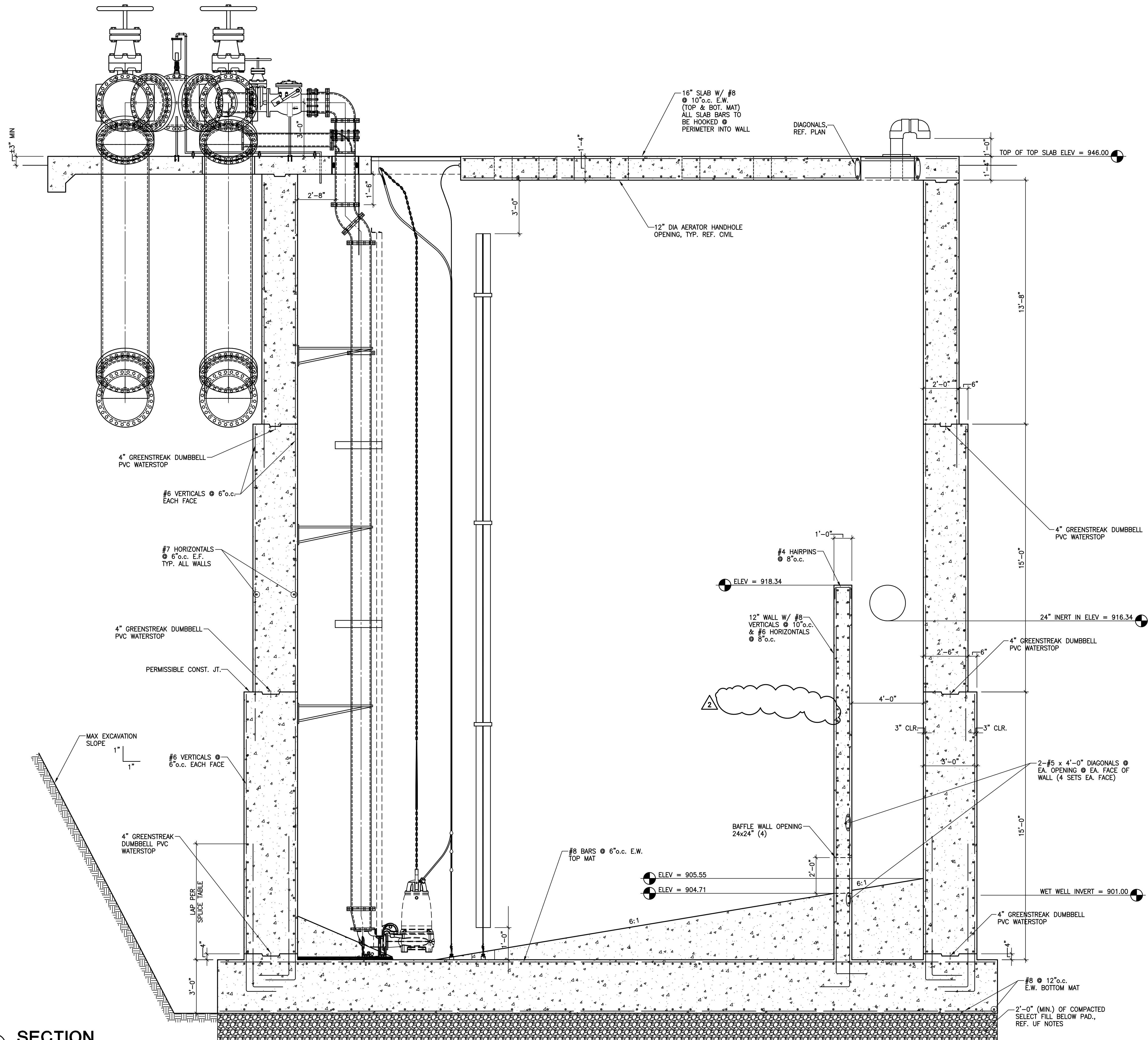
WET WELL SLAB PLAN
 SCALE: 3/8" = 1'-0" (N.T.S.)

PAPE-DAWSON ENGINEERS
 SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
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 TBPB FIRM REGISTRATION #170 | TBPB FIRM REGISTRATION #10028800

E-54 REGIONAL LIFT STATION PLANS
 REGIONAL LIFT STATION
 WET WELL SLAB PLAN

SAWS JOB NO.	22-2502
JOB NO.	11500-51
DATE	MAY 2022
DESIGNER	J.H.
CHECKED S.J.F.	DRAWN S.J.F.
SHEET	S2.2

NO.	REVISION	DATE
1	ADDENDUM #4	10/27/2022
2	ADDENDUM #5	11/07/2022



1 SECTION

PAPE-DAWSON
ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
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TX FIRM REGISTRATION #170 | TPLS FIRM REGISTRATION #10028800

E-54 REGIONAL LIFT STATION PLANS
REGIONAL LIFT STATION
SECTION

SAWS JOB NO. 22-2502
JOB NO. 11500-51
DATE MAY 2022
DESIGNER J.H.
CHECKED S.J.F., DRAWN S.J.F.
SHEET **S3.0**

LA PROJECT NO.: 13-171-00
LA FILE NO.: E54LST3-0

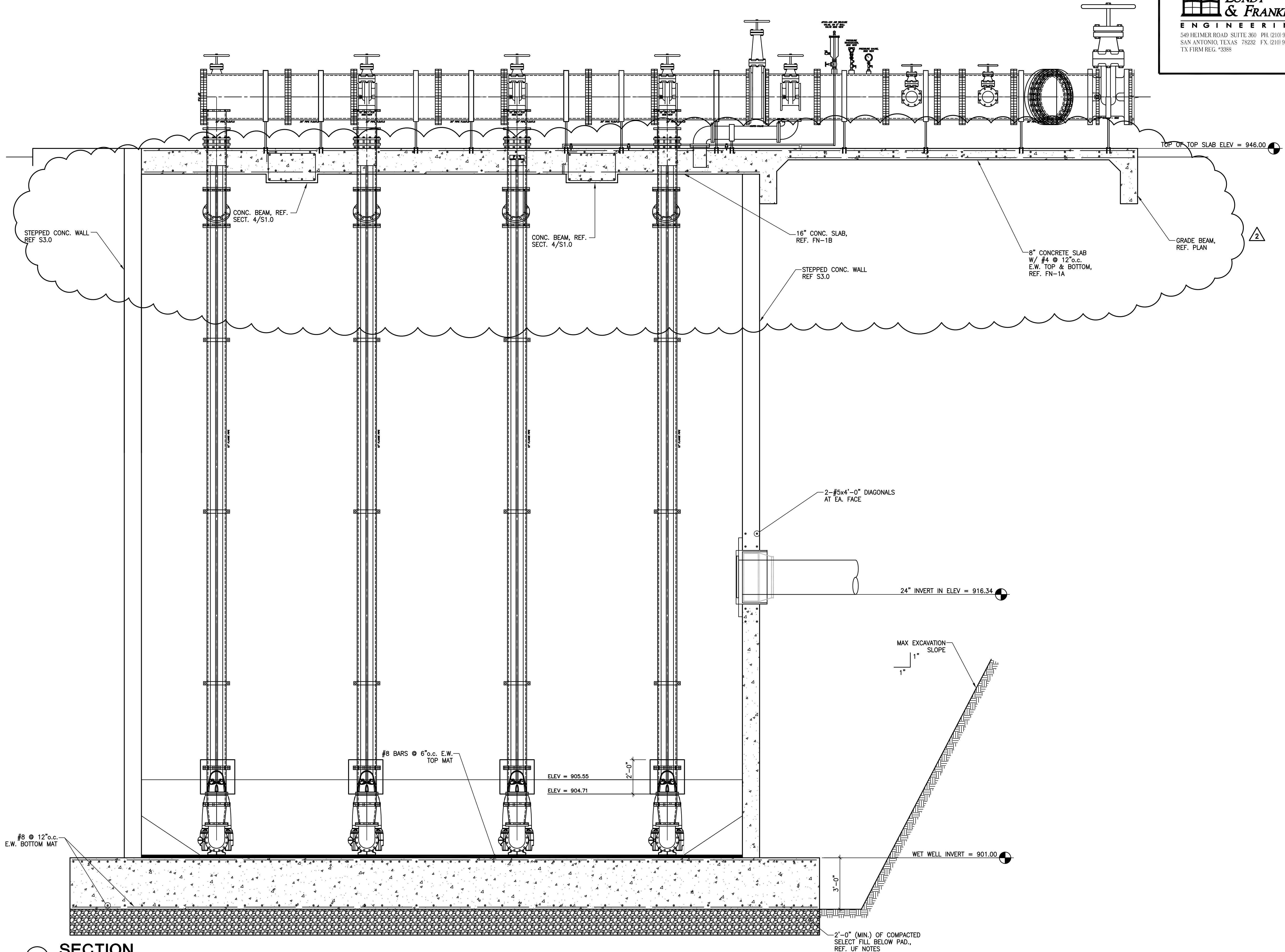
SCALE: 3/8" = 1'-0"

LA PROJECT NO.: 13-171-00
 LA FILE NO.: E54LST3-1

LUNDY & FRANKE
 ENGINEERING
 549 HEIMER ROAD SUITE 360 PH. (210) 979-7900
 SAN ANTONIO, TEXAS 78222 FX. (210) 979-7800
 TX FIRM REG. *3388

DATE: 05/04/2022
 STATE OF TEXAS
 SHAWN J. FRANKE
 82639
 LICENSED PROFESSIONAL ENGINEER
Shawn Franke

NO.	REVISION	DATE
1	ADDENDUM #4	10/27/2022
2	ADDENDUM #5	11/01/2022



1 SECTION

PAPE-DAWSON
 ENGINEERS
 SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TUBE FIRM REGISTRATION #170 | TBPES FIRM REGISTRATION #10028800

E-54 REGIONAL LIFT STATION PLANS
 REGIONAL LIFT STATION
 SECTION

SAWS JOB NO. 22-2502
 JOB NO. 11500-51
 DATE MAY 2022
 DESIGNER J.H.
 CHECKED S.J.F., DRAWN S.J.F.

SHEET **S3.1**

SCALE: 3/8" = 1'-0"