# VERAMENDI LIFT STATION

# COMAL COUNTY, TEXAS CIVIL CONSTRUCTION PLANS

#### **NBU AS-BUILT REQUIREMENTS:**

NBU REQUIRES GPS POINTS FOR CERTAIN ELECTRIC, WATER AND WASTEWATER ATTRIBUTES, SOME OF WHICH MUST BE MEASURED PRIOR TO BACKFILL, DURING CONSTRUCTION.

GPS POINTS ARE REQUIRED FROM THE DEVELOPER'S CONTRACTOR OR ENGINEER. A MINIMUM OF THREE (3) COORDINATE POINTS FOR GEOREFERENCING ARE REQUIRED. THE WATER AND WASTEWATER GPS POINTS SHALL BE TO SURVEY GRADE AND ELECTRIC GPS POINTS SHALL BE MEASURED TO MAP GRADE. PLEASE REFERENCE NBU'S WATER CONNECTION POLICY FOR ADDITIONAL CAD DELIVERABLE REQUIREMENTS.

#### REQUIRED MEASUREMENTS FOR THE WATER SYSTEM INCLUDE

- VERTICAL BENDS AND EDGES OF STEEL CASINGS (IF APPLICABLE) PRIOR TO BACKFILL.
- HORIZONTAL BENDS PRIOR TO BACKFILL.
- TEES PRIOR TO BACKFILL.
- FITTINGS (REDUCERS AND COUPLINGS) PRIOR TO BACKFILL.
- FIRE HYDRANTS (TOP FLANGE).
- METERS (TOP CENTER OF BOX)
- BLOW OFF ASSEMBLIES.
- CORNER SLAB OF ALL WATER TANKS AND THE ISOLATION GATE VALVE ON THE WATER TANK.

### REQUIRED MEASUREMENTS FOR THE WASTEWATER SYSTEM INCLUDE:

- MANHOLES.
- CLEANOUTS. CORNER SLAB OF ALL LIFT STATIONS.

# REQUIRED MEASUREMENTS FOR THE ELECTRIC SYSTEM:

- POLES.
- TRANSFORMERS, BOTH ABOVE AND UNDERGROUND (FRONT LOCK).
- PULL BOXES.
- STREET LIGHTS.

### COORDINATE GPS REQUIREMENTS WITH NBU INSPECTOR

**REPORT** 

VERAMENDI LIFT STATION AND FORCE MAIN BASIS OF DESIGN REPORT FIRM: PAPE-DAWSON ENGINEERS

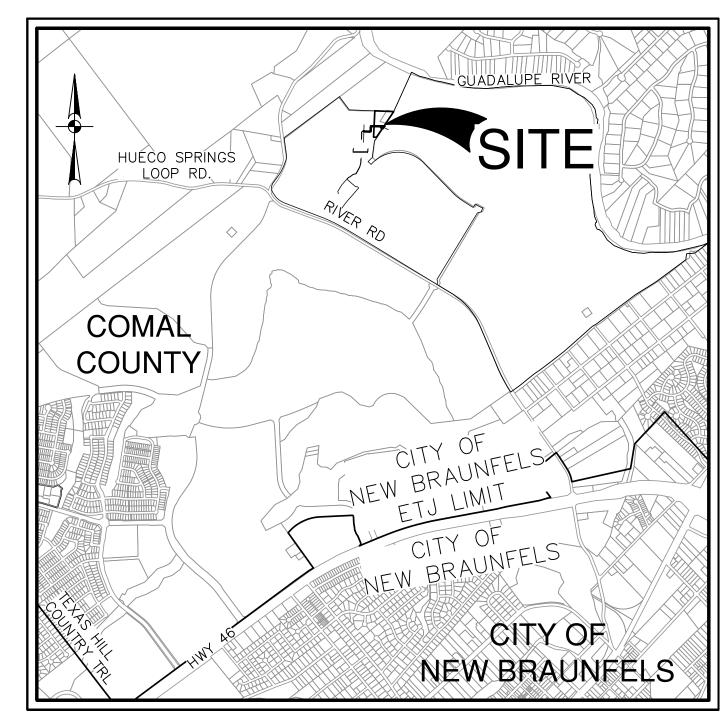
DATE: MAY 2024

GEOTECHNICAL ENGINEERING STUDY FOR LIFT STATION -PRECINCT 30, UNIT 3 VERAMENDI MASTER PLANNED DEVELOPMENT

FIRM: RABA KISTINER

LEGAL DESCRIPTION

DATE: MAY 2024



**LOCATION MAP** 

# PREPARED FOR:

VERAMENDI PE - FREMANTLE, LLC 2168 OAK RUN PKWY STE 101 NEW BRAUNFELS, TX 78132

JULY 2025

# PAPE-DAWSON BEING 0.413 ACRES OF LAND. OUT OF THE 193.732 ACRE TRACT DESCRIBED IN DOCUMENT NUMBER 202206035177 IN THE OFFICIAL PUBLIC RECORDS OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN

- 1. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, NEW BRAUNFELS UTILITIES MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD
- 2. THE ENGINEER OF RECORD ACKNOWLEDGES THAT ALL PROPOSED WATER OR WASTEWATER IMPROVEMENTS MUST COMPLY WITH CRITERIA FROM THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, THE CITY OF NEW BRAUNFELS, NBU W&WW DESIGN CRITERIA, ANY OTHER GOVERNING ENTITY ORDINANCES OR CODES, AND SOUND ENGINEERING
- 3. THE ENGINEER OF RECORD ACKNOWLEDGES THAT THE POINT OF DELIVERY FOR THE NBU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE/LATERAL/LEAD FROM THE CUSTOMER'S METER, BACKFLOW PREVENTER, OR EASEMENT EDGE. THE CUSTOMER IS RESPONSIBLE FOR THE DESIGN, PERMITTING, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER THE IT'S INSTALLATION
- THE ENGINEER OF RECORD ACKNOWLEDGES THAT THE POINT OF DELIVERY FOR A NBU WASTEWATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S THE DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER ITS INSTALLATION.
- 5. WATER IS A PRECIOUS COMMODITY IN THE STATE OF TEXAS AND NEW BRAUNFELS UTILITIES (NBU) IS PASSIONATE ABOUT PROTECTING THE LOCAL RESOURCE. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ACQUIRING A FIRE HYDRANT METER SO THAT ALL WATER USED FOR CONSTRUCTION OR TESTING PURPOSES IS PROPERLY ACCOUNTED FOR. NBU WILL NOT TOLERATE ANY WATER THEFT, REGARDLESS OF THE AMOUNT, IF WATER THEFT IS DISCOVERED THE CONTRACTOR SHALL BE SUBJECT TO MONETARY PENALTIES, CRIMINAL CHARGES, AND STOPPAGE OF ALL CONSTRUCTION ACTIVITIES RELATED TO THE PROJECT. COSTS ASSOCIATED WITH ANY WORK STOPPAGE RESULTING FROM WATER THEFT SHALL BE AT THE FULL EXPENSE OF THE CONTRACTOR.

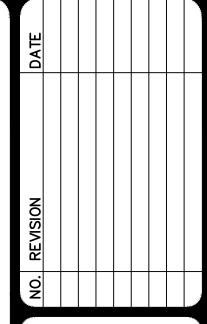
- TYPE 3 DEVELOPMENT.
- ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER RECORD.
- IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE YEAR OF CITY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.
- THIS PROJECT IS WITHIN THE EDWARDS AQUIFER RECHARGE ZONE.
- NO PORTION OF ANY LOT ON THIS PROJECT IS WITHIN AN INDICATED SPECIAL FLOOD HAZARD ZONE ACCORDING TO THE FEMA FIRM MAP NO. 48091C0435F EFFECTIVE DATE 9/2/2009.
- GAS UTILITIES ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN
- SHALL BE APPROVED BY THE CITY FOR ANY WORK WITHIN THE PUBLIC RIGHT-OF-WAY.
- FOLLOWING PERMITS ARE REQUIRED PRIOR TO START OF CONSTRUCTION: 1. CITY OF NEW BRAUNFELS PUBLIC INFRASTRUCTURE PERMIT
- 2. NEW BRAUNFELS UTILITY APPROVAL
- 3. TCEQ WATER POLLUTION ABATEMENT PLAN APPROVAL
- 4. TCEQ SEWAGE COLLECTION SYSTEM APPROVAL

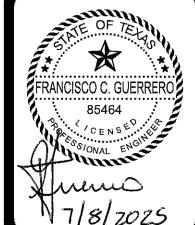


VERAMENDI SURVEY NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.

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VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS

#### Revised 03/2020

These notes must appear on the cover and/or "notes" sheet of all subdivision construction plans and on commercial plans where applicable:

If construction has not commenced within one-year of City approval for construction inspection, that approval is no longer valid.

The most current editions of the City of San Antonio Standard Specifications and the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges shall be followed for all construction except as amended by the City of New Braunfels Standard Details.

All responsibility for the adequacy of these plans remains with the engineer of record. In accepting these plans, the City of New Braunfels must rely upon the adequacy of the work of the engineer

Prior to the start of construction, the contractor shall contact the City of New Braunfels to schedule a preconstruction meeting.

For Public Infrastructure Permit or Grading Permit Projects:

- For inspections, you must call before 12:00 p.m., 48 hours prior to your inspection
- Each inspection will be allotted 1 hour unless you request for more time.
- Once your request has been accepted, you will receive a call from the City of New Braunfels Inspector.

#### For Commercial Permit (**CP**) Projects:

- All inspections are to be called in at 830-221-4068 or,
- Faxed in at 830-608-2117 or,
- E-mailed at inspections@nbtexas.org.

It is the Contractor's responsibility to see that all temporary and permanent traffic control devices are properly installed and maintained in accordance with the plans and latest edition of the Texas Manual on Uniform Traffic Control Devices. If, in the opinion of the engineering representative and the construction inspector, the barricades and signs do not conform to established standards or are incorrectly placed or are insufficient in quantity to protect the general public, the construction inspector shall have the option to stop operations until such time as the conditions are corrected. If the need arises, additional temporary traffic control devices may be ordered by the Engineering representative at the Contractor's expense.

A TxDOT Type II B-B blue reflective raised pavement marker shall be installed in the center of the roadway adjacent to all fire hydrants. In locations where hydrants are situated on corners, blue reflective raised pavement markers shall be installed on both approaches which front the hydrant. The raised pavement marker shall meet TxDOT material, epoxy and adhesive specifications.

It shall be the responsibility of the developer, contractor, subcontractors, builders, Geo-technical engineer, and project engineer to immediately notify the Office of the City Engineer and project engineer if the presence of groundwater within the site is evident. Upon notification the project engineer shall respond with plan revisions for the mitigation of the groundwater issue. The City Engineer shall respond within two (2) business days upon receipt of the mitigation plan. All construction activity, impacted by the discovery of groundwater, shall be suspended until the City Engineer grants a written approval of the groundwater mitigation plan.

As per Platting Ordinance Section 118-38m.: When all of the improvements are found to be constructed and completed in accordance with the approved plans and specifications and with the City's standards, and upon receipt of one set of "Record Drawing" plans, and a digital copy of all plans (PDF copy) the City Engineer shall accept such improvements for the City of New Braunfels, subject to the guaranty of material and workmanship provisions in this Section.

### **Construction Note**

Engineer of Record is responsible to ensure that erosion control measures and stormwater control sufficient to mitigate off site impacts are in place at all stages of construction.

### **Drainage Note**

Drainage improvements sufficient to mitigate the impact of construction shall be installed prior to adding impervious cover.

### **Finished Floor Elevations**

The elevation of the lowest floor shall be at least 10 inches above the finished grade of the surrounding ground, which shall be sloped in a fashion so as to direct stormwater away from the structure. Properties adjacent to stormwater conveyance structures must have floor slab elevation or bottom of floor joists a minimum of one foot above the 100-year water flow elevation in the structure. Driveways serving houses on the downhill side of the street shall have a properly sized cross swale preventing runoff from entering the garage.

### **Soils Testing**

Proctors shall be sampled from on-site material (on-site is defined as limits of construction for this -plan set) and a copy of the proctor results shall be delivered to the City of New Braunfels Street Inspector prior to any density tests.

All roadway compaction tests shall be the responsibility of the developer's Geotechnical Engineer. Flexible base or fill/embankment material shall be placed in uniform layers not to exceed eight inches (8") loose. The required density for the fill/embankment material shall meet the requirements of TxDOT's Specification Item 132. The required density for the flexible base material shall meet the requirements of TxDOT's Specification Item 247. Each layer of material, inclusive of subgrade, shall be compacted as specified and tested for density and moisture in accordance with Test Methods TEX-113-E, TEX-114-E, TEX-115-E. The number and location of required tests shall be determined by the Geotechnical Engineer and approved by the City of New Braunfels Street Inspector. At a minimum, tests shall be taken every 200 LF for each lift. Upon completion of testing, the Geotechnical Engineer will provide the City of New Braunfels Street Inspector with all testing documentation and a certification stating that the placement of flexible

base, and fill material, and subgrade, has been completed in accordance with the plans. Additional density tests may be requested by the City of New Braunfels Inspector.

Asphaltic concrete pavement shall be the type of hot mix asphalt as defined in TxDOT's standard specifications for current TxDOT Standard Specifications for Construction of Highways, Street and Bridges.

The City of New Braunfels will not accept the use of Recycled Asphalt Pavement (RAP) or Recycled Asphalt Shingles (RAS) in asphalt mixtures for new roadways. Any debris inclusions within new asphalt pavements will result in asphalt removal and replacement from curb to curb for limits to be determined by the City of New Braunfels.

The asphaltic concrete pavement surface course shall be plant mixed, hot laid type "D" meeting the specification requirements of TxDOT Item 340. The asphaltic concrete pavement sub-surface courses shall be plant mixed, hot laid type "B" meeting the specification requirements of TxDOT Item 340. The mixture shall be designed per the design requirements specified in TxDOT Item 340 and shall be compacted to between 91 and 95 percent of the maximum theoretical density as determined by TxDOT test method TEX-227-F. Place the mixture when the roadway surface temperature is at or above 60°F. Complete all compaction operations before the pavement temperature drops below 160°F. The asphalt cement content by percent of total mixture weight shall fall within a tolerance of  $\pm 0.5$  percent from a specific mix design.

### Utility Trench Compaction (added to the construction plans on All Utility Plan Sheets).

All utility trench compaction tests within the street pavement/sidewalk section shall be the responsibility of the developer's Geotechnical Engineer. Fill material shall be placed in uniform layers not to exceed twelve inches (12") loose. Determine the maximum lift thickness based on the ability of the compacting operation and equipment used to meet the required density. Each layer of material shall be compacted to a minimum 95% density and tested for density and moisture in accordance with Test Methods TEX-113-E, TEX-114-E, TEX-115-E. The number and location of required tests shall be determined by the Geotechnical Engineer and approved by the City of New Braunfels Street Inspector. At a minimum, tests shall be taken every 200 LF for each lift and every other service line. Upon completion of testing the Geotechnical Engineer shall provide the City of New Braunfels Street Inspector with all testing documentation and a certification stating that the placement of fill material has been completed in accordance with the plans. Additional density tests may be requested by the City of New Braunfels Inspector.

#### **Curb Cut Due to Construction of New Right-Of-Way Construction**

- (Indicate the 2 Options on the construction plans).
- 1. Sawcut existing street and match to new construction. 2. Sawcut existing curb to tie into existing construction.

#### **Construction Stabilized Entrance** Sawcut curb for construction entrance.

Stabilized construction area shall be constructed of 3"x5" rock to be placed a minimum length of 25-ft. and maintained so that construction debris does not fall within the city right-of-way. Rightof-way must be cleared from mud, rocks, etc. at all times.

#### (Notes to Be Placed on All WW Plan & Detail Sheets)

Ensure all driveway approaches are built in general accordance with A.D.A. specifications.

No valves, hydrants, etc. shall be constructed within curbs, sidewalks, or driveways.

### **Signing and Pavement Marking Plan Notes**

The Contractor shall furnish and install all regulatory and warning signs, streets name signs and sign mounts in accordance with approved engineering plans. The City will inspect all signs at final inspection.

The Contractor shall install all pavement markings in accordance with approved engineering plans. The Contractor shall notify the City at least twenty-four (24 hours prior to the installation of all sealer and final markings. The City will inspect all markings at final application.

# Seeding and Establishment of Vegetation within Earthen Channels, Stormwater Basins and

Seeding for the purpose of establishing vegetation within constructed earthen channels, basins and disturbed areas shall be conducted in accordance with Item 164 (Seeding for Erosion Control of TxDOT's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges manual. Only seed types and mixes specified for the San Antonio District (District 15 in Tables 1 and 2 under Item 164 shall be utilized. During the Cool Season (Sept 1-Nov 30, Cereal Rye and seed species specified for the San Antonio District in Table 3 may be used. For Cool Season seeding applications, cool season seed mixes shall be used in conjunction with seed mixes for the San Antonio District as specified in Table 1 and 2 under Item 164.

It may be deemed necessary to incorporate topsoil and soil amendments (i.e. compost/ fertilizer into existing soil in order to facilitate vegetation growth. Topsoil, compost and fertilizer additions shall be conducted according to Items 160, 161 and 166 of TxDOT's Standard Specifications manual, respectively.

Areas requiring permanent vegetation (earthen channels, ponds, etc.) are required to meet TxDOT Specifications for Item 160 Topsoil. Testing per Tex-128-E will be required at the

Watering may also be necessary to facilitate and expedite the sprouting and growth of vegetation. Item 168 of TxDOT's Standard Specifications manual shall be adhered to for vegetative watering.

If extended drought conditions exist that hinder or prohibit the growth and establishment of vegetation, the contractor/ developer shall provide a plan to the City of New Braunfels describing the measures that will be taken to stabilize earthen drainage infrastructure until a time when growing conditions become more favorable.

### SEQUENCE OF CONSTRUCTION

- Install erosion and sedimentation controls
- Clear site and begin earthworks
- Trench and install all underground utilities Install lift station and ancillary equipment
- Start-up and wet testing of lift station, training of operators
- Removal of erosion and sediment devices

#### **NBU General Notes**

#### All materials and construction procedures within the scope of the project shall be approved by New Braunfels Utilities and comply with the current "New

**General Notes** 

- Braunfels Utilities Water Systems Connection/Construction Policy". Contractor shall not proceed with any pipe installation work until they obtain a copy of the plans from the Consultant or Engineer and notify NBU Water Systems Engineering at 830-608-8971 with at least two (2) working days (48 hours) notice. WORK COMPLETED BY THE CONTRACTOR, WHICH HAS NOT RECEIVED A NOTICE TO PROCEED FROM NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.
- The Developer dedicates the water / wastewater mains upon completion by the Contractor and acceptance by the New Braunfels Utilities Water System. NBU will own and maintain said water / wastewater mains which are located within platted utility easements or public ROW of proposed developments. (As applicable).
- Contractor agrees to assume sole and complete responsibility for job site conditions during the construction of the project, including safety of all persons and property. This requirement shall apply continuously and not be limited to normal working hours. The contractor shall defend, indemnify and hold the owners and the engineer and his employees, partners officers, directors, or consultants harmless from any and all liability, real or alleged, in connection with the performance of the work on this project, excepting from liability arising from sole negligence of the owner or engineer, engineer's directors, officers, employees, or consultants.
- Contractor to contact the engineer-of-record (EOR) for any field changes. Any revisions or changes to the approved construction plans will require additional approval by NBU in writing.
- Contractor and / or contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.
- Contractor shall be responsible for restoring to its original or better condition, any damage to existing fences, curbs, streets, driveways, landscaping and structures, and existing utilities (not adjusted on plans). Cost of Restoration if any, shall be the Contractor's entire expense.
- The Contractor shall avoid cutting roots larger than one (1) inch in diameter when excavating near existing trees. Excavation in vicinity of trees shall proceed with caution.
- Contractor shall procure all permits and licenses, pay all charges, fees and taxes and give all notices necessary and incidental to the due and lawful prosecution of the work.
- No extra payment shall be allowed for work called for on the plans but not included on the bid schedule. This incidental work will be required and shall be included under the pay item to which it relates.
- Contractor is responsible for removal of all waste materials upon project completion. The contractor shall not permanently place any waste materials in the 100-year flood plain without first obtaining an approved flood plain development permit.

Approved 12/09/03: Rev 1/01/24

### **NBU General Notes**

Appendix/Appendix B

- 12. The contractor shall not place any materials on the recharge zone of the Edwards aquifer without an approved water pollution abatement plan from the TCEQ 31 TAC 313.4 and 31 TAC 313.9.
- Barricades and warning signs shall conform to the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and shall be located to provide maximum protection to the public as well as construction personnel and equipment while providing continuous traffic flow at all times during construction. The contractor is responsible for maintaining all devices during construction. Contractor is required to verify project elevations. The term "match existing"
- shall be understood to signify both horizontal and vertical alignment. The location of utilities, either underground or overhead, shown within the right of way are approximate and shall be verified by the contractor before beginning construction operations.
- OSHA regulations prohibit operations that will bring persons or equipment within 10 feet of an energized line. Where workmen and/or equipment must work close to an energized electrical line, the contractor shall notify the electrical power company involved and make whatever adjustments necessary to ensure the safety of those workmen.
- 17. It shall be the contractor's responsibility to locate utility service lines as required for construction. Contractors shall call the One Call System for water/wastewater location.
- Due to federal regulations Title 49, part 192 (8), Gas companies must maintain access to gas valves at all times. The contractor must protect and work around any gas valves that are in the project area.
- The contractor is fully responsible for the traffic control and will be responsible for furnishing all traffic control devices, and flaggers. The construction methods shall be conducted to provide the least possible interference to traffic. The continuous movement of the traffic in one direction, at minimum, shall be maintained at all times. The contractor shall clean up and remove from the work area any loose material resulting from contract operations at the end of each workday.
- Prior to ordering materials to be used in construction, contractor shall provide the engineer with four (4) copies of the source, type, gradation, material specification data and / or shop drawings, as applicable, to satisfy the requirements of the following items and all material items referred to in these listed items: a. Water mains and services
- b. Wastewater mains and services
- 21. Water jetting the backfill within a street will not be permitted. Wastewater
- trenches subject to traffic shall conform to NBU Connection and Construction Policy Manual.
- Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures. The Contractor's implementation of the systems, programs and/or procedures shall provide for adequate trench excavation safety protection that complies with as a minimum, OSHA Standards for trench excavations. Specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA

Appendix/Appendix B

**NBU General Notes** 

Approved 12/09/03; Rev 1/01/24

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Standards governing the presence and activities of individuals working in and around trench excavation. Utility Trench Compaction with street R.O.W.

be the responsibility of the developer's Geo-technical engineer. b. Fill material shall be placed in uniform layers not to exceed twelve inches

a. All utility trench compaction test within the street pavement section shall

- c. Each layer of material shall be compacted as specified and tested for density and moisture in accordance with Text Methods TEX-113-E, TEX-114-E. TEX-115-E.
- d. The number and location of required tests shall be determined by the Geo-technical Engineer and approved by the City of New Braunfels Street
- e. Upon completion of testing the Geo-technical Engineer shall provide the City of New Braunfels Street inspector with all testing documentation and a certification stating that the placement of fill material has been completed in accordance with the plans.



80 PAPE-DAWS ENGINEERS

STATION VERAMENDI LIFT NEW BRAUNFELS

LAT NO. JOB NO. 30001-71 ATE JULY 2025 DESIGNER HECKED FG DRAWN JL sнеет <u>G-3</u>

#### **NBU Wastewater Notes**

- 1. The point of delivery for an NBU owned and maintained wastewater line is typically the cleanout, property line, or edge of easement or as determined by
- 2. The contractor shall maintain service to the existing wastewater system at all times during construction.
- 3. All new wastewater mains and fittings shall be minimum 8-inch diameter (ASTM D-3034 SDR-26 PVC).
- 4. All residential wastewater service laterals shall be extended four (4) feet into the Public Utility Easement and a cleanout installed at the ROW line per NBU Standard Details. Services to lots will extend four (4) feet past the
- underground electric conduit if electric is installed in the front easement. 5. All sewer cleanouts that lead to NBU mains shall be installed with a protective
- utility shroud and pivoting marker pole during time of construction. 6. Pipe bedding of wastewater lines shall be compliant with NBU specification
- No. 120, "Utility Trenching and Backfill". 7. Wastewater mains shall have a minimum of 48 inches of cover to finished grade and wastewater laterals must have a minimum of 36 inches of cover to finished grade. Concrete encasement will be required if minimum cover cannot be met.
- 8. All gravity wastewater pipes shall have gasketed, compression or fused joints per 30 TAC §217.53 (c) (2).
- 9. For wastewater lines less than 24 inches in diameter, select initial backfill material shall be placed in two lifts.
  - a. The first lift shall be spread uniformly and simultaneously on each side and under the shoulders of the pipe to the mid-point or spring line of the pipe.
  - b. The second lift shall be placed to a depth as shown on the pipe backfill detail. For pipes larger than 24-inch, 12-inch maximum lifts shall be used.
- 10. All manholes shall be water-tight, either monolithic, cast-in-place concrete structures or prefabricated manholes specifically approved by NBU. Polymer concrete is required for manholes on mains 18-inch diameter and larger, at force main discharge points, or at drop manholes with high corrosion
- 11. Manholes shall have bolted water-tight rings and covers. In non-paved areas, a manhole marker assembly shall be installed on the manhole cover.
- 12. Manhole vents shall be installed at intervals no greater than 1500 feet. 13. All manholes shall be constructed so that the top of the ring is six inches (6") above surrounding ground in non-paved areas. In paved areas, the manhole ring shall be flush with pavement.
- 14. All new manholes, unless approved by NBU, shall have covers with 32-inch
- 15. Wastewater pipe connections to pre-cast manholes will be compression joints or mechanical "boot type" joint as approved by NBU.
- 16. Existing manholes shall be lined, coated, or replaced with a corrosion
- resistant material if a new connection is made by a main or lateral. 17. Wastewater mains shall be tested from manhole to manhole.
- 18. In areas where a new wastewater manhole is to be constructed over an existing wastewater system, it shall be the contactor's responsibility to test

Appendix/Appendix B Approved 12/09/03; Rev 1/01/24

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Approved 12/09/03; Rev 1/01/24

**NBU Wastewater Notes** 

- the existing manholes before construction. After the proposed manhole(s) has been built, the contractor shall re-test the existing system to the satisfaction of the construction inspector, no separate pay.
- 19. NBU Inspector to be present for all wastewater lines to be installed at depths of 15 feet or greater from final grade.
- 20. Where the minimum 9-foot separation distance between wastewater lines and water lines / mains cannot be maintained, the installation of wastewater lines shall be in strict accordance with TCEQ requirements. The wastewater line shall be constructed of ASTM D2241 PVC or AWWA C900 PVC with pressure rating of 150 psi and shall be in accordance with 30 TAC §217.53 (d) (3) (A) (i).
- 21. Contractor shall coordinate with the assigned water/wastewater inspector for completion of the Field Acceptance Checklist. No testing will be performed prior to 30 days from complete installation. All testing and acceptance shall conform to NBU Specifications be completed in the following order:
  - a. Pipe Deflection Test (Mandrel Test)
  - b. Pipe Low Pressure Air Test
  - c. Manhole Vacuum Test
  - d. Manhole Protective Coating Test
- e. CCTV Inspection (within 72 hours of cleaning and flushing) 22. TCEQ and EPA require erosion and sedimentation control for construction of wastewater collection systems. Developer or authorized representative shall provide erosion and sedimentation control as notes on the project's plan and profile sheets. All temporary erosion and sedimentation controls shall be removed by the Contractor at final acceptance of the project by NBU Water

- completion of the Field Acceptance Checklist. All testing and acceptance shall conform to NBU Specifications, including but not limited to: a. Bacteriological Testing
- b. Hydrostatic Testing (performed valve to valve)
- 18. The NBU water system shall be protected from hazards with appropriate backflow prevention assemblies installed on all irrigation systems, fire suppression systems and multi-unit complexes along with multi-level properties on the domestic meter containment. NBU can assist with the decision on appropriate backflow assemblies on a case-by-case basis. Contact NBU backflow prevention specialist for more details. Email questions to crossconnection@nbutexas.com
- 20. All residential and commercial properties shall have a Customer Service Inspection certificate (CSI Inspection) completed upon completion of the

**NBU Water Notes** 

- 1. The point of delivery for an owned and maintained water line is typically the domestic or irrigation water meter, fire line up to the containment backflow device, or hydrant meter or as determined by NBU.
- 2. Water infrastructure must be constructed in accordance with the NBU Water Connection Policy.
- 3. All water mains shall be constructed of AWWA C900 DR 14 PVC, AWWA C900 DR 18 PVC or minimum CL 250 Ductile Iron Pipe.
- 4. All residential water services shall be single services constructed of 1-inch ASTM B88 Type K Copper tubing. 1-inch AWWA C901 SDR9 CTS polyethylene tubing may be permitted with special approval from NBU only.
- 5. All 2-inch service lines shall be constructed of AWWA C901 SDR9 CTS polyethylene tubing. 6. Water mains shall have a minimum of 48 inches of cover to finished grade.
- Concrete encasement will be required if minimum cover cannot be met.
- 7. Pipe bedding of water lines shall be compliant with NBU specification No. 120, "Utility Trenching and Backfill".
- 8. Contractor shall install line stoppers at their cost for an outage during construction if system valves are not available or the existing valves do not
- function. Line stoppers will be required based on the following criteria: a. If the number of residential customers affected is greater than 20 and
- expected to last more than 4 hours. b. If any commercial customers are affected by the outage then the use
- of line stoppers will be determined on a case by case basis. c. If any critical care customers are affected by the outage then the use
- of line stoppers will be determined on a case by case basis. d. System conditions may require a line stopper and may not be known
- until construction commences.
- 9. Contractor will keep the area on top of, around, and within the water meter box free of all objects and debris.
- 10. Placement of meter boxes or vaults in sidewalks, driveways, drive aisles, parking areas, or other areas exposed to vehicular traffic is not permitted. Any meter boxes or vaults set in these areas will be relocated at the
- 11. Meter boxes or vaults must be set at proposed grade. Any meter boxes that are not set at the final grade will be adjusted at contractor's and/or

contractor's and/or developer's expense.

- developer's expense. 12. Meter boxes for 5/8-inch and 1-inch meters must be DFW Plastics DFW38C-14-AF1MP.
- 13. Meter boxes for 1.5" meters must be DFW Plastics DFW65C-14-AF1MP.
- 14. Meter boxes for 2" meters must be DFW Plastics DFW1730F-12-AF1MP.
- 15. Thrust blocks are not permitted without special approval. Joints must be restrained with restraining systems approved by NBU and restraint length shall be submitted to NBU at the time of plan submittal.
- 16. Contractor shall install tracer wire on top of non-ferrous water mains in accordance with NBU specifications. Tracer wire should run from valve to valve and exit at a tracer wire access point. The tracer wire should be attached to the top of the pipe using tape. Excess wire should be coiled within the tracer wire access point riser.

Appendix/Appendix B

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**NBU** Water Notes

17. Contractor shall coordinate with the assigned water/wastewater inspector for

- 19. All backflow prevention assemblies shall be tested upon installation and reports sent to NBU via the online tracking system. Contact an NBU backflow prevention specialist for more details. Email questions to crossconnection@nbutexas.com

building or home structure. Contact an NBU backflow prevention specialist for more details. Email questions to crossconnection@nbutexas.com



VERAMENDI LIF NEW BRAUNFEL

PLAT NO.		
JOB NO	30001-71	
DATE	JULY 2025	
DESIGNER	LL	
CHECKED_	FG DRAWN_	JL
SHEET	G-4	

Appendix/Appendix B

Approved 12/09/03; Rev 1/01/24

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Appendix/Appendix B

Approved 12/09/03; Rev 1/01/24

- 1. THIS LIFT STATION AND/OR FORCE MAIN MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S (TCEQ) EDWARDS AQUIFER RULES 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C), THE DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEMS 30 TAC CHAPTER 217, AND THE CITY OF HOUSTON STANDARD SPECIFICATIONS.
- 2. ANY MODIFICATION TO THE ACTIVITIES DESCRIBED IN THE REFERENCED LIFT STATION/FORCE MAIN SYSTEM APPLICATION FOLLOWING THE DATE OF APPROVAL MAY REQUIRE THE SUBMITTAL OF A LIFT STATION/FORCE MAIN SYSTEM APPLICATION TO MODIFY THIS APPROVAL, INCLUDING THE PAYMENT OF APPROPRIATE FEES AND ALL INFORMATION NECESSARY FOR ITS REVIEW AND APPROVAL.
- 3. PRIOR TO COMMENCING ANY REGULATED ACTIVITY, THE APPLICANT OR HIS AGENT MUST NOTIFY THE HOUSTON REGIONAL OFFICE, IN WRITING, OF THE DATE ON WHICH THE REGULATED ACTIVITY WILL BEGIN.
- 4. UPON COMPLETION OF THE WET WELL EXCAVATION, A GEOLOGIST MUST CERTIFY THAT THE EXCAVATION HAS BEEN INSPECTED FOR THE PRESENCE OF SENSITIVE FEATURES AND THE CERTIFICATION MUST BE SUBMITTED TO THE APPROPRIATE REGIONAL OFFICE. FURTHER ACTIVITIES MAY NOT PROCEED UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY FROM THE LIFT STATION. CONSTRUCTION MAY CONTINUE IF THE GEOLOGIST CERTIFIES THAT NO SENSITIVE FEATURE OR FEATURES ARE PRESENT.
- 5. IF ANY SENSITIVE FEATURES ARE DISCOVERED DURING THE WASTEWATER LINE TRENCHING ACTIVITIES, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPLICANT MUST IMMEDIATELY NOTIFY THE APPROPRIATE REGIONAL OFFICE OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY OF THE FEATURE DISCOVERY. A GEOLOGIST'S ASSESSMENT OF THE LOCATION AND EXTENT OF THE FEATURE DISCOVERED MUST BE REPORTED TO THAT REGIONAL OFFICE IN WRITING WITHIN TWO WORKING DAYS. THE APPLICANT MUST SUBMIT A PLAN FOR ENSURING THE STRUCTURAL INTEGRITY OF THE SEWER LINE OR FOR MODIFYING THE PROPOSED COLLECTION SYSTEM ALIGNMENT AROUND THE FEATURE. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY WHILE MAINTAINING THE STRUCTURAL INTEGRITY OF THE LINE.
- 6. LIFT STATIONS SHALL BE DESIGNED TO WITHSTAND AND OPERATE DURING A 100-YEAR FLOOD EVENT AND SHALL BE ACCESSIBLE DURING A 25-YEAR FLOOD. ALL LIFT STATIONS SHALL BE INTRUDER-RESISTANT WITH A CONTROLLED ACCESS.
- 7. DRY WELL SUMP PUMPS:
- (A) A DRY WELL MUST USE DUAL SUMP PUMPS, EACH WITH A MINIMUM CAPACITY OF 1,000 GALLONS PER HOUR AND CAPABLE OF HANDLING THE VOLUME OF LIQUID GENERATED DURING PEAK OPERATIONS. (B) A PUMP MUST HAVE A SUBMERSIBLE MOTOR AND WATERTIGHT WIRING.
- (C) A DRY WELL FLOOR MUST SLOPE TOWARD A SUMP SIZED FOR PROPER DRAINAGE.
- (D) THE MINIMUM SUMP DEPTH IS 6.0 INCHES AND MUST PREVENT STANDING WATER ON A DRY WELL
- FLOOR UNDER NORMAL OPERATION.
- (E) A SUMP PUMP MUST OPERATE AUTOMATICALLY BY USE OF A FLOAT SWITCH OR OTHER LEVEL-DETECTING DEVICE.
- (F) A SUMP PUMP MUST USE SEPARATE PIPES CAPABLE OF DISCHARGING MORE THAN THE MAXIMUM LIQUID LEVEL OF AN ASSOCIATED WET WELL.
- (G) A SUMP PUMP OUTLET PIPE MUST BE AT LEAST 1.5 INCHES IN DIAMETER AND HAVE AT LEAST TWO CHECK VALVES IN SERIES.
- 8. PUMP CONTROLS.
- (A) A LIFT STATION PUMP MUST OPERATE AUTOMATICALLY, BASED ON THE WATER LEVEL IN A WET WELL. (B) THE LOCATION OF A WET WELL LEVEL MECHANISM MUST ENSURE THAT THE MECHANISM IS UNAFFECTED BY CURRENTS, RAGS, GREASE, OR OTHER FLOATING MATERIALS.
- (C) A LEVEL MECHANISM MUST BE ACCESSIBLE WITHOUT ENTERING THE WET WELL.
- (D) WET WELL CONTROLS WITH A BUBBLER SYSTEM REQUIRE DUAL AIR SUPPLY AND DUAL CONTROLS. (E) MOTOR CONTROL CENTERS MUST BE MOUNTED AT LEAST 4.0 INCHES ABOVE GRADE TO PREVENT WATER INTRUSION AND CORROSION FROM STANDING WATER IN THE ENCLOSURE.
- (F) ELECTRICAL EQUIPMENT AND ELECTRICAL CONNECTIONS IN A WET WELL OR A DRY WELL MUST MEET NATIONAL FIRE PREVENTION ASSOCIATION 70 NATIONAL ELECTRIC CODE EXPLOSION PREVENTION REQUIREMENTS, UNLESS CONTINUOUS VENTILATION IS PROVIDED.
- 9. WET WELLS.
- (A) A WET WELL MUST BE ENCLOSED BY WATERTIGHT AND GAS TIGHT WALLS.
- (B) A PENETRATION THROUGH A WALL OF A WET WELL MUST BE GAS TIGHT.
- (C) A WET WELL MUST NOT CONTAIN EQUIPMENT REQUIRING REGULAR OR ROUTINE INSPECTION OR MAINTENANCE, UNLESS INSPECTION AND MAINTENANCE CAN BE DONE WITHOUT STAFF ENTERING THE
- (D) A GRAVITY PIPE DISCHARGING TO A WET WELL MUST BE LOCATED SO THAT THE INVERT ELEVATION IS ABOVE THE LIQUID LEVEL OF A PUMP'S "ON" SETTING.
- (E) GATE VALVES AND CHECK VALVES ARE PROHIBITED IN A WET WELL.
- (F) GATE VALVES AND CHECK VALVES MAY BE LOCATED IN A VALVE VAULT NEXT TO A WET WELL OR IN A DRY WELL.
- (G) PUMP CYCLE TIME, BASED ON PEAK FLOW, MUST EQUAL OR EXCEED THOSE IN THE FOLLOWING TABLE:

CYCLE TIMES		
PUMP HORSEPOWER	MINIMUM CYCLE TIME (MIN.)	
< 50	6	
50 - 100	10	
> 100	15	

(H) AN EVALUATION OF MINIMUM WET WELL VOLUME REQUIRES THE FOLLOWING FORMULA:

 $V = \frac{T \times Q}{4 \times 7.48}$ 

- V = ACTIVE VOLUME (CUBIC FEET)
- Q = PUMP CAPACITY (GALLONS PER MINUTE)
- T = CYCLE TIME (MINUTES)
- 7.48 = CONVERSION FACTOR (GALLONS/CUBIC FOOT)

### 10. WET WELL SLOPES.

(A) A WET WELL FLOOR MUST HAVE A SMOOTH FINISH AND MINIMUM SLOPE OF 10% TO A PUMP INTAKE. (B) A WET WELL DESIGN MUST PREVENT DEPOSITION OF SOLIDS UNDER NORMAL OPERATING CONDITIONS. (C) A LIFT STATION WITH GREATER THAN 5.0 MILLION GALLONS PER DAY FIRM PUMPING CAPACITY MUST HAVE ANTI-VORTEX BAFFLING.

- 11. DRY WELL ACCESS.
- (A) AN UNDERGROUND DRY WELL MUST BE ACCESSIBLE.
- (B) A STAIRWAY IN A DRY WELL MUST USE NON-SLIP STEPS AND CONFORM TO OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS WITH RESPECT TO RISE AND RUN.
- (C) A LADDER IN A DRY WELL MUST MADE OF NON-CONDUCTIVE MATERIAL AND RATED FOR THE LOAD NECESSARY FOR STAFF AND EQUIPMENT TO DESCEND AND ASCEND.
- 12. VENTILATION SHALL BE PROVIDED FOR LIFT STATIONS, INCLUDING BOTH WET AND DRY WELLS.
- 13. HOISTING EQUIPMENT. A LIFT STATION MUST HAVE PERMANENT HOISTING EQUIPMENT OR BE ACCESSIBLE TO PORTABLE HOISTING EQUIPMENT FOR REMOVAL OF PUMPS, MOTORS, VALVES, PIPES, AND OTHER SIMILAR EQUIPMENT.
- 14. A FLOOR DRAIN FROM A VALVE VAULT TO A WET WELL MUST PREVENT GAS FROM ENTERING A VALVE VAULT BY INCLUDING FLAP VALVES, "P" TRAPS, SUBMERGED OUTLETS, OR A COMBINATION OF THESE

#### 15. PUMPS.

- (A) GENERAL REQUIREMENTS. A RAW WASTEWATER PUMP, WITH THE EXCEPTION OF A GRINDER PUMP,
- (1) BE DESIGNED TO PREVENT CLOGGING
- (2) BE CAPABLE OF PASSING A SPHERE OF 2.5 INCHES IN DIAMETER OR GREATER; AND
- (3) HAVE GREATER THAN 3.0 INCH DIAMETER SUCTION AND DISCHARGE OPENINGS.
- (B) SUBMERSIBLE AND NON-SUBMERSIBLE PUMPS.
- (1) A NON-SUBMERSIBLE PUMP MUST HAVE INSPECTION AND CLEANOUT PLATES ON BOTH THE SUCTION AND DISCHARGE SIDES OF EACH PUMPING UNIT THAT FACILITATE LOCATING AND REMOVING BLOCKAGE-CAUSING MATERIALS, UNLESS THE PUMP DESIGN ACCOMMODATES EASY REMOVAL OF THE ROTATION ELEMENTS.
- (2) A PUMP SUPPORT MUST PREVENT MOVEMENT AND VIBRATION DURING OPERATION.
- (3) A SUBMERSIBLE PUMP MUST USE A RAIL-TYPE PUMP SUPPORT SYSTEM WITH MANUFACTURER-APPROVED MECHANISMS DESIGNED TO ALLOW PERSONNEL TO REMOVE AND REPLACE ANY SINGLE PUMP WITHOUT ENTERING OR DEWATERING THE WET WELL.
- (4) SUBMERSIBLE PUMP RAILS AND LIFTING CHAINS MUST BE CONSTRUCTED OF A MATERIAL THAT PERFORMS TO AT LEAST THE STANDARD OF SERIES 300 STAINLESS STEEL.
- (C) LIFT STATION PUMPING CAPACITY. THE FIRM PUMPING CAPACITY OF A LIFT STATION MUST HANDLE THE EXPECTED PEAK FLOW.
- (D) PUMP HEAD CALCULATIONS.
- (1) AN OWNER SHALL SELECT A PUMP BASED UPON ANALYSIS OF THE SYSTEM HEAD AND PUMP CAPACITY CURVES THAT DETERMINE THE PUMPING CAPACITIES ALONE AND WITH OTHER PUMPS AS THE TOTAL DYNAMIC-HEAD INCREASES DUE TO ADDITIONAL FLOWS PUMPED THROUGH A
- (2) THE PIPE HEAD LOSS CALCULATIONS, USING THE HYDRAULIC INSTITUTE STANDARDS, PERTAINING
- TO HEAD LOSSES THROUGH PIPES, VALVES, AND FITTINGS, MUST BE INCLUDED IN THE REPORT. (3) THE SELECTED FRICTION COEFFICIENT (HAZEN-WILLIAMS "C" VALUE) USED IN FRICTION HEAD
- LOSS CALCULATIONS MUST BE BASED ON THE PIPE MATERIAL SELECTED. (4) FOR A LIFT STATION WITH MORE THAN TWO PUMPS, A FORCE MAIN IN EXCESS OF ONE-HALF MILE, OR FIRM PUMPING CAPACITY OF 100 GALLONS PER MINUTE OR GREATER, SYSTEM CURVES MUST BE PROVIDED FOR BOTH THE NORMAL AND PEAK OPERATING CONDITIONS AT C VALUES

# FOR PROPOSED AND EXISTING PIPE.

- (1) A LIFT STATION OR A TRANSFER PUMPING STATION LOCATED AT OR DISCHARGING DIRECTLY TO A WASTEWATER TREATMENT SYSTEM MUST HAVE A PEAK PUMP CAPACITY EQUAL TO OR LESS THAN THE PEAK DESIGN FLOW, UNLESS EQUALIZATION IS PROVIDED.
- (2) A WASTEWATER TREATMENT SYSTEM WITH A PEAK FLOW THAT IS GREATER THAN 300,000 GALLON PER DAY MUST USE THREE OR MORE PUMPS, UNLESS DUPLEX, AUTOMATICALLY CONTROLLED, VARIABLE CAPACITY PUMPS ARE PROVIDED.
- (F) SELF-PRIMING PUMPS. (1) A SELF-PRIMING PUMP MUST BE CAPABLE OF PRIMING WITHOUT RELIANCE UPON A SEPARATE PRIMING SYSTEM, AN INTERNAL FLAP VALVE, OR ANY EXTERNAL MEANS FOR PRIMING.
- (2) A SELF-PRIMING PUMP MUST USE A SUCTION PIPE VELOCITY AT LEAST 3.0 FEET PER SECOND BUT NOT MORE THAN 7.0 FEET PER SECOND, AND MUST INCORPORATE ITS OWN SUCTION PIPE. (3) A SELF-PRIMING PUMP MUST VENT AIR BACK INTO THE WET WELL DURING PRIMING.
- (G) VACUUM-PRIMING PUMPS.
- (1) A VACUUM-PRIMED PUMP MUST BE CAPABLE OF PRIMING BY USING A SEPARATE POSITIVE PRIMING SYSTEM WITH A DEDICATED VACUUM PUMP FOR EACH MAIN WASTEWATER PUMP.
- (2) A VACUUM-PRIMING PUMP MUST USE A SUCTION PIPE VELOCITY AT LEAST 3.0 FEET PER SECOND BUT LESS THAN 7.0 FEET PER SECOND AND MUST HAVE ITS OWN SUCTION PIPE.
- (H) VERTICAL POSITIONING OF PUMPS. A RAW WASTEWATER PUMP MUST HAVE POSITIVE STATIC SUCTION HEAD DURING NORMAL ON-OFF CYCLING, EXCEPT A SUBMERSIBLE PUMP WITH "NO SUCTION" PIPES, A VACUUM-PRIMED PUMP, OR A SELF-PRIMING UNIT CAPABLE OF SATISFACTORY OPERATION UNDER ANY NEGATIVE SUCTION HEAD ANTICIPATED FOR THE LIFT STATION.
- (I) INDIVIDUAL GRINDER PUMPS. A GRINDER PUMP SERVING ONLY ONE RESIDENTIAL OR COMMERCIAL STRUCTURE THAT IS PRIVATELY OWNED, MAINTAINED, AND OPERATED IS NOT SUBJECT TO THE RULES OF THIS CHAPTER.
- (J) PUMP FOR LOW-FLOW LIFT STATION. A PUMP USED FOR A LIFT STATION WITH A PEAK FLOW OF LESS THAN 120 GALLONS PER MINUTE MUST BE SUBMERSIBLE AND INCLUDE A GRINDER.

### 16. PIPING.

### (A) HORIZONTAL PUMP SUCTIONS.

- (1) EACH PUMP MUST HAVE A SEPARATE SUCTION PIPE THAT USES AN ECCENTRIC REDUCER. (2) PIPES IN A WET WELL MUST HAVE A TURNDOWN TYPE FLARED INTAKE.
- (B) VALVES.
  - (1) THE DISCHARGE SIDE OF EACH PUMP FOLLOWED BY A FULL-CLOSING ISOLATION VALVE MUST
  - (a) A CHECK VALVE MUST BE A SWING TYPE VALVE WITH AN EXTERNAL LEVER.
  - (b) A VALVE MUST INCLUDE A POSITION INDICATOR TO SHOW ITS OPEN AND CLOSED POSITIONS, UNLESS A FULL-CLOSING VALVE IS A RISING-STEM GATE VALVE.
  - (2) A GRINDER PUMP INSTALLATION MAY USE A RUBBER-BALL CHECK VALVE OR A SWING-TYPE CHECK VALVE.
  - (3) A BUTTERFLY VALVE, TILTING-DISC CHECK VALVE, OR ANY OTHER VALVE USING A TILTING-DISC IN A FLOW PIPE IS PROHIBITED.

- (1) A LIFT STATION PIPE MUST HAVE FLANGED OR FLEXIBLE CONNECTIONS TO ALLOW FOR REMOVAL OF PUMPS AND VALVES WITHOUT INTERRUPTION OF THE LIFT STATION OPERATIONS.
- (2) WALL PENETRATIONS MUST ALLOW FOR PIPE FLEXURE WHILE EXCLUDING EXFILTRATION OR INFILTRATION.
- (3) PIPE SUCTION VELOCITIES MUST BE AT LEAST 3.0 FEET PER SECOND BUT NOT MORE THAN 7.0 FEET PER SECOND.

### 17. EMERGENCY PROVISIONS FOR LIFT STATIONS.

(A) A COLLECTION SYSTEM LIFT STATION MUST BE EQUIPPED WITH A TESTED QUICK-CONNECT MECHANISM OR A TRANSFER SWITCH PROPERLY SIZED TO CONNECT TO A PORTABLE GENERATOR, IF NOT EQUIPPED WITH AN ONSITE GENERATOR.

- (B) LIFT STATIONS MUST INCLUDE AN AUDIOVISUAL ALARM SYSTEM AND THE SYSTEM MUST TRANSMIT ALL ALARM CONDITIONS THROUGH USE OF AN AUTO-DIALER SYSTEM, SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEM, OR TELEMETERING SYSTEM CONNECTED TO A CONTINUOUSLY MONITORED
- (C) AN ALARM SYSTEM MUST SELF-ACTIVATE FOR A POWER OUTAGE, PUMP FAILURE, OR A HIGH WET
- (D) A LIFT STATION CONSTRUCTED TO PUMP RAW WASTEWATER MUST HAVE SERVICE RELIABILITY BASED

#### (1) RETENTION CAPACITY.

- (a) THE RETENTION CAPACITY IN A LIFT STATION'S WET WELL AND INCOMING GRAVITY PIPES MUST PREVENT DISCHARGES OF UNTREATED WASTEWATER AT THE LIFT STATION OR ANY POINT UPSTREAM FOR A PERIOD OF TIME EQUAL TO THE LONGEST ELECTRICAL OUTAGE RECORDED DURING THE PAST 24 MONTHS, BUT NOT LESS THAN 20 MINUTES.
- (b) FOR CALCULATION PURPOSES, THE OUTAGE PERIOD BEGINS WHEN A LIFT STATION PUMP FINISHED ITS LAST NORMAL CYCLE, EXCLUDING A STANDBY PUMP.
- (2) ON-SITE GENERATORS. A LIFT STATION MAY BE PROVIDED EMERGENCY POWER BY ON-SITE, AUTOMATIC ELECTRICAL GENERATORS SIZED TO OPERATE THE LIFT STATION AT ITS FIRM PUMPING CAPACITY OR AT THE AVERAGE DAILY FLOW, IF THE PEAK FLOW CAN BE STORED IN THE COLLECTION SYSTEM.
- (3) PORTABLE GENERATORS AND PUMPS.
- (a) A LIFT STATION MAY USE PORTABLE GENERATORS AND PUMPS TO GUARANTEE SERVICE IF THE REPORT INCLUDES:
  - THE STORAGE LOCATION OF EACH GENERATOR AND PUMP;
  - THE AMOUNT OF TIME THAT WILL BE NEEDED TO TRANSPORT EACH GENERATOR OR PUMP TO A LIFT STATION;
  - THE NUMBER OF LIFT STATIONS FOR WHICH EACH GENERATOR OR PUMP IS
  - THE TYPE OF ROUTINE MAINTENANCE AND UPKEEP PLANNED FOR EACH PORTABLE GENERATOR AND PUMP TO ENSURE THAT THEY WILL BE OPERATIONAL WHEN
- (a) AN OPERATOR THAT IS KNOWLEDGEABLE IN OPERATION OF THE PORTABLE GENERATORS AND PUMPS SHALL BE ON CALL 24 HOURS PER DAY EVERY DAY.
- (b) THE SIZE OF A PORTABLE GENERATOR MUST HANDLE THE FIRM PUMPING CAPACITY OF THE LIFT STATION.

#### (E) SPILL CONTAINMENT STRUCTURES.

- (1) THE USE OF A SPILL CONTAINMENT STRUCTURE AS A SOLE MEANS OF PROVIDING SERVICE
- (2) A LIFT STATION MAY USE A SPILL CONTAINMENT STRUCTURE IN ADDITION TO ONE OF THE
- SERVICE RELIABILITY OPTIONS DETAILED IN THIS IN SUBSECTION (A) OF THIS SECTION. (3) THE REPORT MUST INCLUDE A DETAILED MANAGEMENT PLAN FOR CLEANING AND MAINTAINING
- EACH SPILL CONTAINMENT STRUCTURE. (4) A SPILL CONTAINMENT STRUCTURE MUST HAVE A LOCKED GATE AND BE SURROUNDED AN INTRUDER RESISTANT FENCE THAT IS 6.0 FEET HIGH CHAIN LINK, MASONRY, OR BOARD FENCE

WITH AT LEAST THREE STRANDS OF BARBED WIRE OR 8.0 FEET HIGH CHAIN LINK, MASONRY, OR

- BOARD FENCE WITH AT LEAST ONE STRAND OF BARBED WIRE. (F) A LIFT STATION MUST BE FULLY ACCESSIBLE DURING A 25-YEAR 24-HOUR RAINFALL EVENT.
- (G) LIFT STATION SYSTEM CONTROLS MUST PREVENT OVER-PUMPING UPON RESUMPTION OF NORMAL POWER AFTER A POWER FAILURE. BACKUP OR STANDBY UNITS MUST BE ELECTRICALLY INTERLOCKED TO PREVENT OPERATION AT THE SAME TIME THAT OTHER LIFT STATIONS PUMPS ARE OPERATING ONLY ON THE RESUMPTION OF NORMAL POWER AFTER A POWER FAILURE.

# TEXAS COMMISSION OF ENVIRONMENTAL QUALITY CHAPTER 217 DESIGN

## CRITERIA FOR SEWERAGE SYSTEMS COMPLIANCE NOTES

- 1. FLOODPLAIN: THIS PROJECT IS NOT IN THE 100 YEAR FLOODPLAIN IN ACCORDANCE WITH FEMA MAP PANEL NO. 48091C0460F (DATED 09/02/2009), COMAL COUNTY, TEXAS.
- INCHES ABOVE THE INVERT. CHAPTER 217.55(I)(2)(H).

3. BEDDING: SHALL BE IN ACCORDANCE WITH CHAPTER 217.54(a)(2). CLASS IA, IB, II, OR III AS DESCRIBED

2. DROP MANHOLE: A DROP PIPE SHALL BE PROVIDED FOR A SEWER ENTERING A MANHOLE MORE THAN 24

- IN ASTM D-2321 (ANSI K65.171) SHALL BE USED FOR ALL FLEXIBLE AND SEMI-RIGID PIPES.
- 4. TESTS: AIR TEST AND DEFLECTION TEST SHALL BE IN ACCORDANCE WITH CHAPTER 217.57(a)(1) AND 217.57(b).

SEWER LINE / WATER LINE SEPARATION SHALL BE IN ACCORDANCE WITH TEXAS NATURAL RESOURCE

- CONSERVATION COMMISSION RULES, CHAPTER 217.53(d) THE FOLLOWING RULES APPLY TO SEPARATION DISTANCES BETWEEN POTABLE WATER AND SANITARY SEWER
- TREATMENT PLANTS. AND WATERLINES AND SANITARY SEWERS. (A) WATER LINE/NEW SEWER LINE SEPARATION. WHEN NEW SANITARY SEWERS ARE INSTALLED, THEY SHALL BE
- INSTALLED NO CLOSER TO WATERLINES THAN NINE FEET IN ALL DIRECTIONS. SEWERS THAT PARALLEL WATERLINES MUST BE INSTALLED IN SEPARATE TRENCHES. WHERE THE NINE FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE FOLLOWING GUIDELINES WILL APPLY: WHERE A SANITARY SEWER PARALLELS A WATERLINE, THE SEWER SHALL BE CONSTRUCTED OF CAST
- IRON, DUCTILE IRON OR PVC MEETING ASTM SPECIFICATIONS WITH A PRESSURE RATING FOR BOTH THE PIPE AND JOINTS OF 150 PSI. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF TWO FEET BETWEEN OUTSIDE DIAMETERS AND THE HORIZONTAL SEPARATION SHALL BE A MINIMUM OF FOUR FEET BETWEEN THE OUTSIDE DIAMETERS. THE SEWER SHALL BE LOCATED BELOW THE WATERLINE.
- WHERE A SANITARY SEWER CROSSES A WATERLINE AND THE SEWER IS CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC WITH A MINIMUM DISTANCE OF 6 INCHES BETWEEN OUTSIDE DIAMETERS SHALL BE MAINTAINED. IN ADDITION THE SEWER SHALL BE LOCATED BELOW THE WATERLINE WHERE POSSIBLE AND ONE LENGTH OF THE SEWER PIPE MUST BE CENTERED ON THE WATERLINE.
- WHERE A SEWER CROSSES UNDER A WATERLINE AND THE SEWER IS CONSTRUCTED OF ABS TRUSS PIPE, SIMILAR SEMI-RIGID PLASTIC COMPOSITE PIPE, CLAY PIPE OR CONCRETE PIPE WITH GASKET JOINTS, A MINIMUM TWO FOOT SEPARATION DISTANCE SHALL BE MAINTAINED. THE INITIAL BACKFILL SHALL BE CEMENT STABILIZED SAND (TWO OR MORE BAGS OF CEMENT PER CUBIC YARD OF SAND) FOR ALL SECTIONS OF SEWER WITHIN NINE FEET OF THE WATERLINE. THIS INITIAL BACKFILL SHALL BE FROM ONE QUARTER THE DIAMETER BELOW THE CENTER LINE OF THE PIPE TO ONE DIAMETER (BUT NOT LESS THAN 12 INCHES) ABOVE THE TOP OF THE PIPE.
- WHERE A SEWER CROSSES OVER A WATERLINE ALL PORTIONS OF THE SEWER WITHIN NINE FEET OF THE WATERLINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 PSI USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE THE NEW CONVEYANCE MAY BE ENCASED IN A JOINT OF 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT 5 FEET INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEAL.
- (B) WATER LINE/MANHOLE SEPARATION. UNLESS SANITARY SEWER MANHOLES AND THE CONNECTING SEWER CAN BE MADE WATERTIGHT AND TESTED FOR NO LEAKAGE, THEY MUST BE INSTALLED SO AS TO PROVIDE A MINIMUM OF NINE (9) FEET OF HORIZONTAL CLEARANCE FROM AN EXISTING OR PROPOSED WATERLINE. WHERE THE NINE (9) FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, A CARRIER PIPE AS DESCRIBED IN SUBSECTION (A) (4) OF THIS SECTION MAY BE USED WHERE APPROPRIATE.

#### **Texas Commission on Environmental Quality** Water Pollution Abatement Plan **General Construction Notes**

#### Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

The following/listed "construction notes" are intended to be advisory in nature only and do not constitute an approval or conditional approval by the Executive Director (ED), nor do they constitute a comprehensive listing of rules or conditions to be followed during construction. Further actions may be required to achieve compliance with TCEQ regulations found in Title 30, Texas Administrative Code (TAC), Chapters 213 and 217, as well as local ordinances and regulations providing for the protection of water quality. Additionally, nothing contained in the following/listed "construction notes" restricts the powers of the ED, the commission or any other governmental entity to prevent, correct, or curtail activities that result or may result in pollution of the Edwards Aquifer or hydrologically connected surface waters. The holder of any Edwards Aquifer Protection Plan containing "construction notes" is still responsible for compliance with Title 30, TAC, Chapters 213 or any other applicable TCEQ regulation, as well as all conditions of an Edwards Aquifer Protection Plan through all phases of plan implementation. Failure to comply with any condition of the ED's approval, whether or not in contradiction of any "construction notes," is a violation of TCEQ regulations and any violation is subject to administrative rules, orders, and penalties as provided under Title 30, TAC § 213.10 (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. The following/listed "construction notes" in no way represent an approved exception by the ED to any part of Title 30 TAC, Chapters 213 and 217, or any other TCEQ applicable regulation

- 1. A written notice of construction must be submitted to the TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
  - the name of the approved project;
  - the activity start date; and the contact information of the prime contractor.
- 2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan (WPAP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.
- If any sensitive feature(s) (caves, solution cavity, sink hole, etc.) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. Construction activities may not be resumed until the TCEQ has reviewed and approved the appropriate protective measures in order to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality.
- No temporary or permanent hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.
- Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the approved plans and manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.
- Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features,
- 7. Sediment must be removed from the sediment traps or sedimentation basins not later than

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when it occupies 50% of the basin's design capacity.

- Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.
- 9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.
- If portions of the site will have a temporary or permanent cease in construction activity lasting longer than 14 days, soil stabilization in those areas shall be initiated as soon as possible prior to the 14<sup>th</sup> day of inactivity. If activity will resume prior to the 21<sup>st</sup> day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.
- the dates when construction activities temporarily or permanently cease on a portion of the site; and - the dates when stabilization measures are initiated.

12. The holder of any approved Edward Aquifer protection plan must notify the appropriate

11. The following records shall be maintained and made available to the TCEQ upon request:

- the dates when major grading activities occur;

to prevent pollution of the Edwards Aquifer;

A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and

regional office in writing and obtain approval from the executive director prior to initiating any

- any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan
- any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office San Antonio Regional Office 12100 Park 35 Circle, Building A 14250 Judson Road San Antonio, Texas 78233-4480 Austin, Texas 78753-1808 Phone (512) 339-2929 Phone (210) 490-3096 Fax (512) 339-3795 Fax (210) 545-4329

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS

TCEQ-0592 (Rev. July 15, 2015) Page 2 of 2 \*

FRANCISCO C. GUERRERO 85464 CENSED memo 7/8/2025

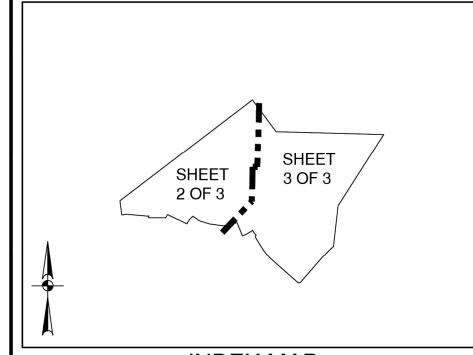
ATION RAMENDI LIF

VE

PLAT NO. JOB NO. 30001-71 ATE JULY 2025 DESIGNER LL HECKED FG DRAWN JI G-5

Page 1 of 2

#### **LOCATION MAP** NOT-TO-SCALE



**INDEX MAP** NOT TO SCALE

APPROVED THIS THE \_\_\_\_\_ DAY OF \_\_\_\_\_, 20 \_\_\_\_, BY THE PLANNING AND DEVELOPMENT SERVICES DEPARTMENT OF THE CITY OF NEW BRAUNFELS, TEXAS.

PLANNING DIRECTOR

### APPROVED FOR ACCEPTANCE



### SURVEYOR'S NOTES

- . MONUMENTS WERE FOUND OR SET AT EACH CORNER OF THE SURVEY BOUNDARY OF THE SUBDIVISION AS NOTED. MONUMENTS AND LOT MARKERS WILL BE SET WITH 1" IRON ROD WITH CAP MARKED "PAPE-DAWSON" OR MAG NAIL WITH DISK MARKED "PAPE-DAWSON" AFTER THE COMPLETION OF UTILITY INSTALLATION AND STREET CONSTRUCTION UNLESS NOTED OTHERWISE.
- 2. COORDINATES SHOWN ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 NAD83 (NA2011) EPOCH 2010.00 FROM THE TEXAS COORDINATE SYSTEM ESTABLISHED FOR THE SOUTH CENTRAL ZONE DISPLAYED IN GRID VALUES DERIVED FROM THE NGS COOPERATIVE CORS NETWORK.
- DIMENSIONS SHOWN ARE SURFACE (SCALE FACTOR = 0.00014) . BEARINGS ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 NAD83 (NA2011) EPOCH 2010.00, FROM THE TEXAS COORDINATE SYSTEM ESTABLISHED FOR THE SOUTH CENTRAL ZONE.

#### STATE OF TEXAS COUNTY OF COMAL

I, the undersigned <u>Keith</u> <u>W.</u> <u>Wooley</u>, a registered professional land surveyor in the state of texas, hereby certify that this plat is true and CORRECTLY MADE UNDER MY SUPERVISION AND IN COMPLIANCE WITH CITY AND STATE SURVEY REGULATIONS AND LAWS AND MADE ON THE GROUND AND THAT THE CORNER MONUMENTS WERE PROPERLY PLACED UNDER MY SUPERVISION.

PRELIMINARY, THIS DOCUMENT SHALL NOT BE RECORDED FOR ANY PURPOSE AND SHALL NOT BE USED OR VIEWED OR RELIED UPON AS A FINAL SURVEY DOCUMENT.

KEITH W. WOOLEY REGISTERED PROFESSIONAL LAND SURVEYOR #5463 PAPE-DAWSON ENGINEERS, INC.

1672 INDEPENDENCE DR., SUITE 102, NEW BRAUNFELS, TEXAS 78132

MAINTENANCE OF DEDICATED UTILITY EASEMENTS IS THE RESPONSIBILITY OF THE PROPERTY OWNER. ANY USE OF AN EASEMENT, OR ANY PORTION OF IT, INCLUDING LANDSCAPING OF DRAINAGE FEATURES, IS SUBJECT TO AND SHALL NOT CONFLICT WITH THE TERMS AND CONDITIONS IN THE EASEMENT, MUST NOT ENDANGER OR INTERFERE WITH THE RIGHTS GRANTED BY THE EASEMENT TO NEW BRAUNFELS UTILITIES, ITS SUCCESSORS AND ASSIGNS, AND SHALL BE SUBJECT TO APPLICABLE PERMIT REQUIREMENTS OF THE CITY OF NEW BRAUNFELS OR ANY OTHER GOVERNING BODY. THE PROPERTY OWNER MUST OBTAIN, IN ADVANCE, WRITTEN AGREEMENT WITH THE UTILITIES TO UTILIZE THE EASEMENT, OR ANY PART

2. UTILITIES WILL POSSESS A 5' WIDE SERVICE EASEMENT TO THE BUILDING STRUCTURE ALONG THE SERVICE LINE TO THE SERVICE ENTRANCE. THIS EASEMENT WILL VARY

DEPENDING UPON LOCATION OF DWELLING AND SERVICE. UTILITIES SHALL HAVE ACCESS TO THE METER LOCATIONS FROM THE FRONT YARD AND METER LOCATIONS SHALL NOT BE LOCATED WITHIN A FENCED AREA. 4. EACH LOT MUST HAVE ITS OWN WATER AND SEWER SERVICE AT THE

OWNER/DEVELOPERS EXPENSE. DO NOT COMBINE ANY NEW UTILITY EASEMENTS (UE) WITH DRAINAGE EASEMENTS

(DE) OR MAKE CHANGES IN GRADE WITHIN THE UTILITY EASEMENTS (UE) WITHOUT WRITTEN APPROVAL FROM NEW BRAUNFELS UTILITIES. NBU IS NOT RESPONSIBLE FOR LANDSCAPING OR IRRIGATION IN UE/LE.

A PRIVATE BOOSTER PUMP WILL BE REQUIRED WITH HOME CONSTRUCTION ON THE CUSTOMER SIDE OF THE METER FOR ANY LOT HAVING DOMESTIC WATER PRESSURE LESS THAN 50 PSI AND DESIGNATED WITH AN " \* " ON THIS SUBDIVISION

#### FLOOD ZONE NOTE

NO PORTION OF THE SUBDIVISION IS LOCATED WITHIN ANY SPECIAL FLOOD HAZARD AREA (100 YR. FLOOD), AS DEFINED BY THE COMAL COUNTY, TEXAS, FLOOD INSURANCE RATE MAP NO. 48091C0435F EFFECTIVE DATE 9/2/2009 AS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

#### UTILITY PROVIDER NOTE

THE PROPERTY WILL BE SERVED BY THE FOLLOWING: NEW BRAUNFELS UTILITIES (WATER, SEWER, ELECTRIC) AT&T (TELECOMMUNICATIONS)

#### DRAINAGE EASEMENT NOTES

SPECTRUM (TELECOMMUNICATIONS)

. DRAINAGE EASEMENTS SHALL "REMAIN FREE OF ALL OBSTRUCTIONS." 2. MAINTENANCE OF DRAINAGE EASEMENT SHOWN OUTSIDE OF LOT LINES SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNERS, OR THE PROPERTY OWNER'S ASSOCIATION, OR ITS SUCCESSORS OR ASSIGNS AND NOT THE RESPONSIBILITY OF THE CITY OF NEW BRAUNFELS OR COMAL COUNTY.

3. NO STRUCTURES, WALLS OR OTHER OBSTRUCTIONS OF ANY KIND SHALL BE PLACED WITHIN THE LIMITS OF DRAINAGE EASEMENTS SHOWN ON THIS PLAT. NO LANDSCAPING, FENCES, OR OTHER TYPE OF MODIFICATIONS WHICH ALTER THE CROSS SECTIONS OF THE DRAINAGE EASEMENTS OR DECREASES THE HYDRAULIC CAPACITY OF THE EASEMENT, AS APPROVED, SHALL BE ALLOWED WITHOUT THE APPROVAL OF THE CITY ENGINEER. THE CITY OF NEW BRAUNFELS AND COMAL COUNTY SHALL HAVE THE RIGHT OF INGRESS AND EGRESS OVER GRANTORS ADJACENT PROPERTY TO REMOVE ANY OBSTRUCTIONS PLACED WITHIN THE LIMITS OF SAID DRAINAGE EASEMENTS AND TO MAKE ANY MODIFICATIONS OR IMPROVEMENTS WITHIN SAID DRAINAGE EASEMENTS.

- FOUR (4) FOOT WIDE SIDEWALKS WILL BE CONSTRUCTED BY THE HOME BUILDER PER CITY STANDARDS AT THE TIME OF BUILDING CONSTRUCTION ALONG: a. APRENDER DR
- b. CALIZA LN c. GREY WOLF TRL
- d. LEADTREE DR
- f. SALT CEDAR VW
- FOUR (4) FOOT WIDE SIDEWALKS WILL BE CONSTRUCTED BY THE DEVELOPER PER CITY STANDARDS AT THE TIME OF SUBDIVISION STREET CONSTRUCTION ALONG: a. APRENDER DR - LOT 901, BLOCK 141; LOT 900, BLOCK 142; LOT 900, BLOCK
- 140; LOT 900, BLOCK 139 b. CALIZA LN - LOT 900, BLOCK 139; LOT 900, BLOCK 140; LOT 900, BLOCK 138 c. GREY WOLF TRL - LOT 900, BLOCK 142; LOT 900, BLOCK 140; LOT 900, BLOCK
- d. PLUMBAGO ST LOT 900, BLOCK 147; LOT 900, BLOCK 144; LOT 900, BLOCK
- 3. TEN (10) FOOT WIDE SIDEWALK WILL BE CONSTRUCTED BY THE DEVELOPER PER CITY STANDARDS AT THE TIME OF SUBDIVISION STREET CONSTRUCTION ALONG: a. LEADTREE DR - LOT 900, BLOCK 144 b. SALT CEDAR VW - LOT 900, BLOCK 138

### SUBDIVISION PLAT OF

# **VERAMENDI PRECINCT 30 - UNIT 3**

BEING 38.774 ACRES OF LAND, OUT OF THE 193.732 ACRE TRACT DRESCRIBED IN DOCUMENT NUMBER 202206035177 IN THE OFFICIAL PUBLIC RECORDS OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN VERAMENDI SURVEY NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.

- PLAT NOTES:

  1. THIS PLAT IS SUBJECT TO THE REQUIREMENTS AND REGULATIONS OF THE VERAMENDI DEVELOPMENT COMPANY DEVELOPMENT AGREEMENT, RECORDED AS DOCUMENT NO. 201506029547 AND AS AMENDED. THIS PLAT IS LOCATED WITHIN THE NEIGHBORHOOD (MIXED DENSITY) RESIDENTIAL
- PLANNING AREA. STANDARDS FOR PLANT MATERIALS SHALL CONFORM TO THE STANDARDS OF THE LATEST EDITION OF THE AMERICAN NATIONAL STANDARD A300 PLANTING AND TRANSPLANTING NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF
- NURSERYMEN. 4. TREE REPLACEMENT SHALL OCCUR WITHIN 12 MONTHS OF REMOVAL OF THE HIGH VALUE TREE UNLESS DEFERRED TO AN ADJACENT UNIT. WHERE A REPLACEMENT TREE DOES NOT SURVIVE FOR A PERIOD OF AT LEAST 24 MONTHS, THE ORIGINAL APPLICANT OR CURRENT LANDOWNER SHALL REPLACE THE TREE, PREFERABLY
- DURING OCTOBER FEBRUARY, UNTIL THE TREE SURVIVES A 12-MONTH PERIOD. 5. SHOULD ANY TREE DESIGNATED FOR RETENTION IN AN APPROVED TREE PROTECTION PLAN DIE PRIOR TO, OR WITHIN 12 MONTHS OF THE COMPLETION OF CONSTRUCTION WORKS, THE APPLICANT SHALL REPLACE THE DEAD TREE WITH A REPLACEMENT TREE/S EQUAL TO THE TOTAL CALIPER INCHES OF THE DEAD TREE. NO GRADING, TRENCHING OR EQUIPMENT SHALL BE CONDUCTED IN THE AREA IDENTIFIED IN THE ROOT PROTECTION ZONE. ALL WORK TO BE PERFORMED BY
- HAND OR UNDER THE SUPERVISION OF A CERTIFIED ARBORIST. 6. DURING CONSTRUCTION, THE CLEANING OF EQUIPMENT OR MATERIALS AND/OR THE DISPOSAL OF ANY WASTE MATERIAL, INCLUDING, BUT NOT LIMITED TO PAINT, OIL, SOLVENTS, ASPHALT, CONCRETE, MORTAR, ETC., UNDER THE CANOPY OR DRIP LINE OF ANY HIGH VALUE TREE SHALL BE PROHIBITED. NO GRADING, TRENCHING OR EQUIPMENT SHALL BE CONDUCTED OR USED IN THE AREA IDENTIFIED IN THE ROOT PROTECTION ZONE. ALL WORK SHALL BE PERFORMED BY HAND OR UNDER THE SUPERVISION OF A CERTIFIED ARBORIST, NO ATTACHMENTS OR WIRES OF ANY KIND, OTHER THAN THOSE OF A PROTECTIVE NATURE, SHALL BE ATTACHED TO ANY HIGH VALUE TREE.
- 7. LOTS TO BE HELD IN COMMON PROPERTY BY A HOMEOWNERS' OR PROPERTY OWNERS' ASSOCIATION SHALL BE SHOWN ON THE PLAT AS A SEPARATE LOT. 8. NO BUILDING SHALL BE SITED WITHIN THE EXTENT OF A SENSITIVE FEATURE AND ASSOCIATED BUFFER. FOR ANY LOT WHICH CONTAINS A HIGH VALUE TREE, AND A BUILDING ENVELOPE WAS NOT APPROVED AS PART OF A FINAL PLAT, THE LOCATION OF A BUILDING ENVELOPE SHALL BE APPROVED BY THE PLANNING DIRECTOR PRIOR TO A BUILDING PERMIT BEING ISSUED.
- 9. FUTURE DEVELOPMENT IS SUBJECT TO CHAPTER 114 (STREETS, SIDEWALKS AND OTHER PUBLIC SPACES) OF THE NEW BRAUNFELS CODE OF ORDINANCES. 10. <u>IMPERVIOUS</u> <u>COVER</u> THE MAXIMUM CUMULATIVE IMPERVIOUS COVER
- PERCENTAGE FOR THE PROPERTY AS A WHOLE AND FOR EACH SECTOR PLAN SHALL NOT EXCEED SIXTY-FIVE PERCENT (65%). 11. AMENDMENTS TO THE PARK PROGRAMMING SCHEDULE, INCLUDING BUT NOT LIMITED TO THE PROVISION OF ADDITIONAL IMPROVEMENTS OR SUBSTITUTING IMPROVEMENTS, SHALL BE ADMINISTRATIVELY APPROVED BY THE PARKS
- 12. THIS PLAT WILL COMPLY WITH LOCATION AND AMENITY STANDARDS FOR TRAILS AS SHOWN IN THE SECTOR PLAN. 13. 132 RESIDENTIAL LOTS, 8 COMMON SPACE LOTS.

#### **COMMON SPACE NOTE:**

OT 901, BLOCK 141, IS A LANDSCAPE, PEDESTRIAN, & ACCESS EASEMENT. LOT 900, BLOCK 142, IS A LANDSCAPE, PEDESTRIAN, & ACCESS EASEMENT. LOT 900, BLOCK 140, IS A LANDSCAPE, PEDESTRIAN, UTILITY, & ACCESS EASEMENT. LOT 900, BLOCK 139, IS A LANDSCAPE, PEDESTRIAN, UTILITY, & ACCESS EASEMENT. LOT 900, BLOCK 138, IS A LANDSCAPE, PEDESTRIAN, & ACCESS EASEMENT. LOT 900, BLOCK 144, IS A LANDSCAPE, PEDESTRIAN, UTILITY, & ACCESS EASEMENT. LOT 900, BLOCK 145, IS A LANDSCAPE, PEDESTRIAN, & ACCESS EASEMENT.

LOT 900, BLOCK 147, IS A LANDSCAPE, PEDESTRIAN, & ACCESS EASEMENT. LOT 901, BLOCK 149, IS A SANITARY SEWER EASEMENT.

OR PROPERTY OWNER AND NOT THE CITY OF NEW BRAUNFELS.

1672 INDEPENDENCE DR, STE 102 I NEW BRAUNFELS, TX 78132 I 830.632.5633 TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

DATE OF PREPARATION: June 25, 2025

#### STATE OF TEXAS COUNTY OF COMAL

(WE), THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN ON THIS PLAT, AND DESIGNATED HEREIN AS THE <u>VERAMENDI PRECINCT 30 - UNIT 3</u> SUBDIVISION TO THE CITY OF NEW BRAUNFELS, COUNTY OF COMAL, TEXAS, AND WHOSE NAME IS SUBSCRIBED HERETO, DO HEREBY SUBDIVIDE SUCH PROPERTY AND DEDICATE TO THE USE OF THE PUBLIC ALL STREETS, ALLEYS, PARKS, DRAINS, EASEMENTS, AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSES AND CONSIDERATION THEREIN EXPRESSED.

OWNER/DEVELOPER: PETER JAMES VERAMENDI PE - FREMANTLE, LLC

2168 OAK RUN PKWY NEW BRAUNFELS, TEXAS 78132

#### STATE OF TEXAS COUNTY OF COMAI

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME ON THIS \_\_\_\_\_

**NOTARY PUBLIC** STATE OF TEXAS

MY COMMISSION EXPIRES: \_

#### STATE OF TEXAS COUNTY OF COMAL

I (WE), THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN ON THIS PLAT, AND DESIGNATED HEREIN AS VERAMENDI PRECINCT 30 - UNIT 3 SUBDIVISION TO THE CITY OF NEW BRAUNFELS, COUNTY OF COMAL, TEXAS, AND WHOSE NAME IS SUBSCRIBED HERETO, DO HEREBY SUBDIVIDE SUCH PROPERTY AND DEDICATE TO THE USE OF THE PUBLIC ALL STREETS, ALLEYS, PARKS, DRAINS, EASEMENTS, AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSES AND CONSIDERATION THEREIN EXPRESSED.

ALL AFOREMENTIONED LOTS TO BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION OWNER/DEVELOPER: DATE COMAL COUNTY WCID 1F 14755 PRESTON ROAD, SUITE 600

> STATE OF TEXAS COUNTY OF COMAL THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME ON THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_\_, BY \_\_\_\_\_\_.

DALLAS, TEXAS 75254

NOTARY PUBLIC STATE OF TEXAS

MY COMMISSION EXPIRES: \_\_\_\_\_

I, \_\_\_\_\_, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT WAS FILED FOR RECORD IN THE MAP AND PLAT RECORDS, \_\_ OF COMAL COUNTY ON DOC # \_\_\_\_\_ WITNESS MY HAND OFFICIAL SEAL, THIS THE \_\_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_

COUNTY CLERK, COMAL COUNTY, TEXAS

SHEET 1 OF 3 DEPUTY

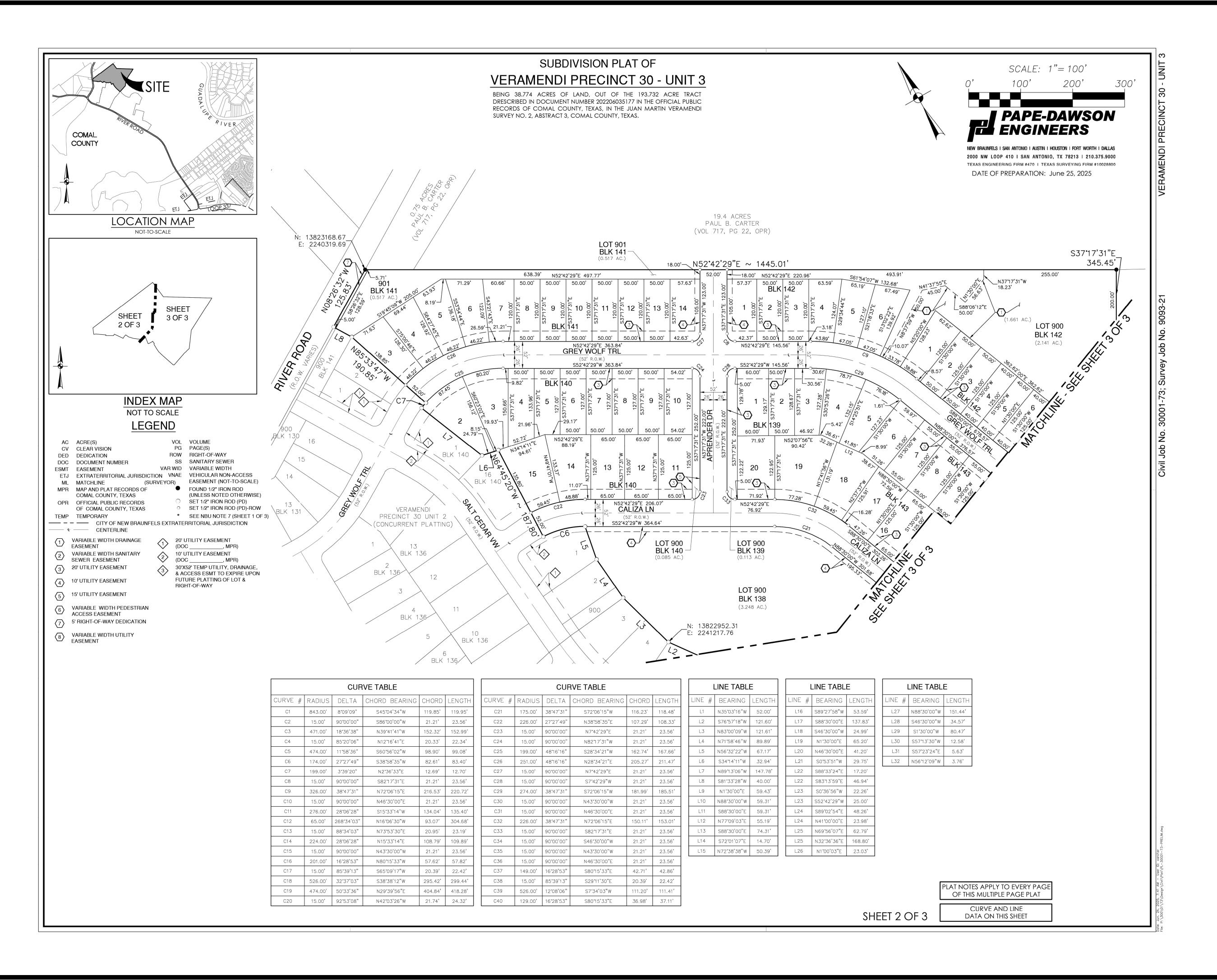
VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS

PLAT NO. JOB NO. 30001-71 ATE JULY 2025 DESIGNER LL CHECKED FG DRAWN JL

G-6

DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL. AERIAL IMAGERY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery © 2016,CAPCOG,Digital Globe,Texas Orthoimagery Program, USDA Farm Service Agency.

FOR CONSTRUCTION 30007-71



NO. REVISION DATE



PAPE-DAWSON ENGINEERS

VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS

PLAT NO.

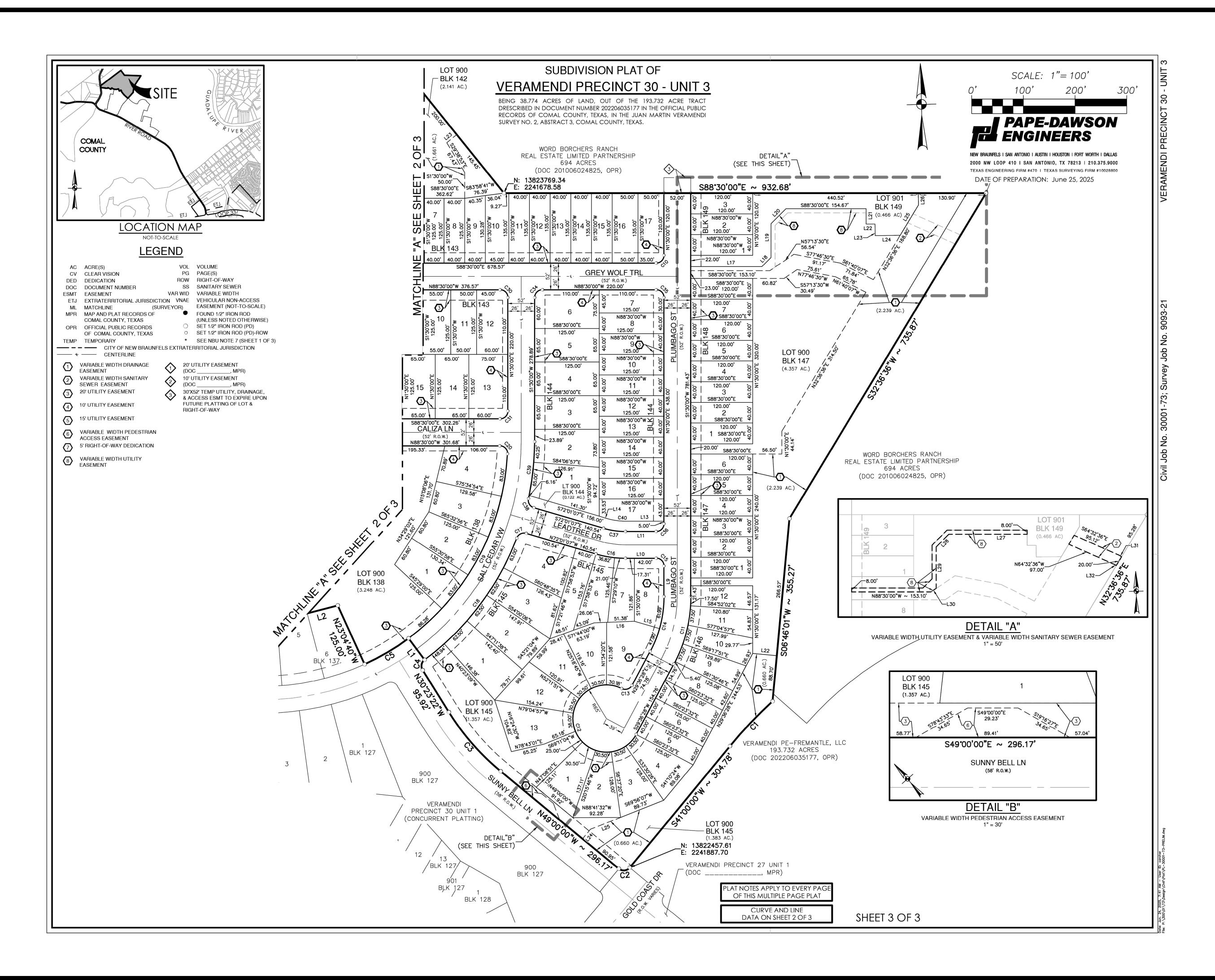
JOB NO. 30001-71

DATE JULY 2025

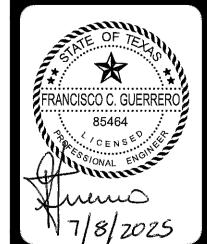
DESIGNER LL

CHECKED FG DRAWN JL

SHEET G-7

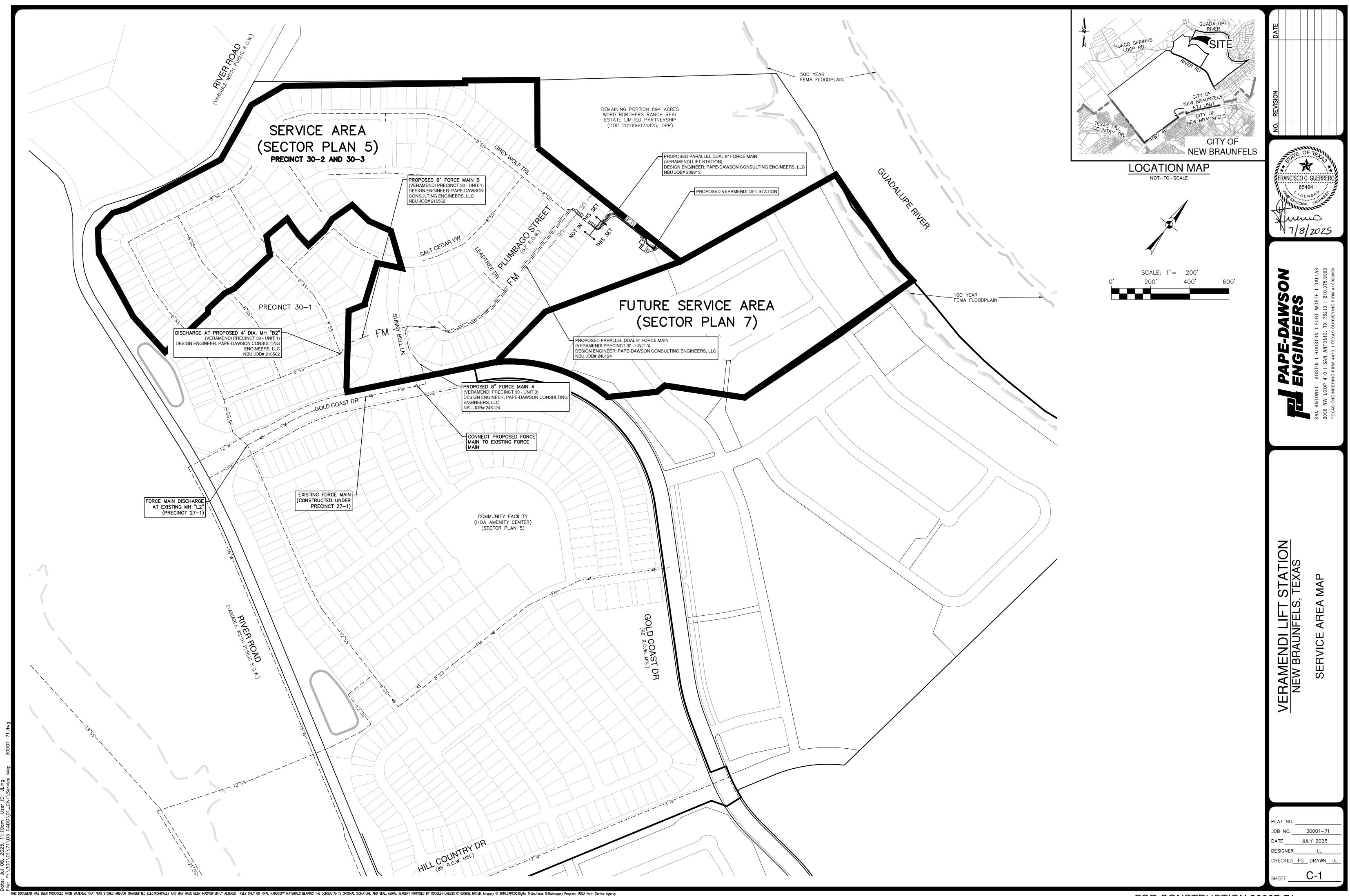


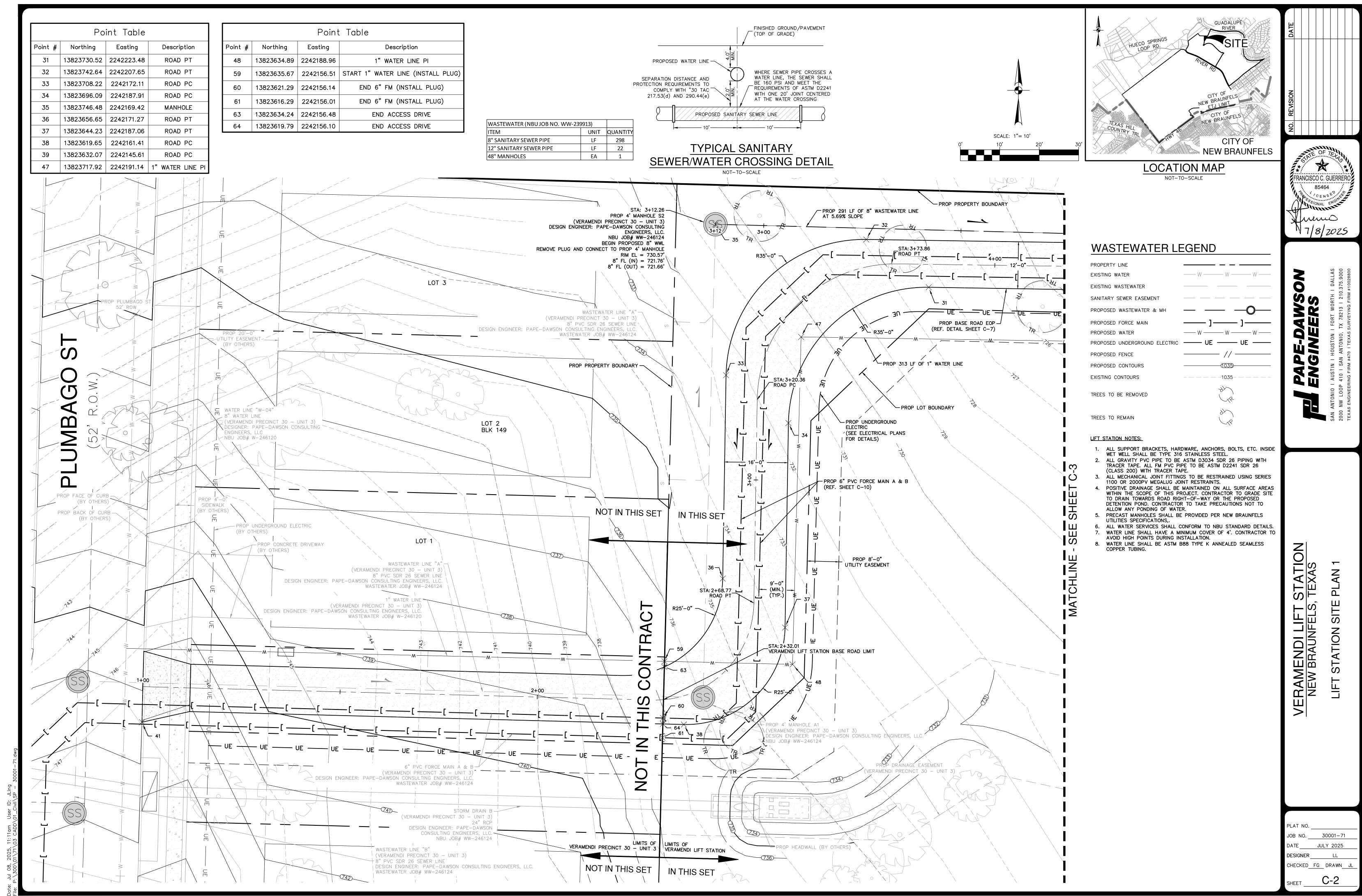
NO. REVISION DATE

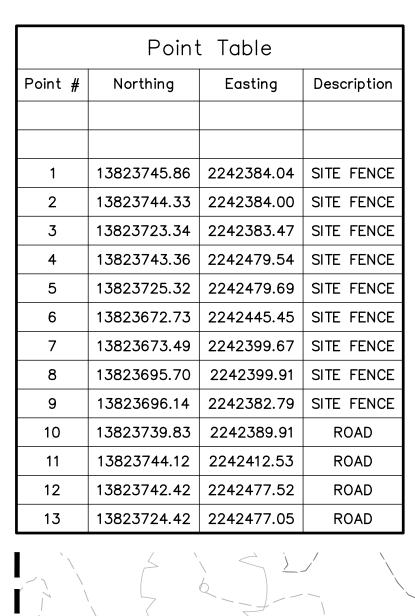


H PAPE-DAWSON ENGINEERS

VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS





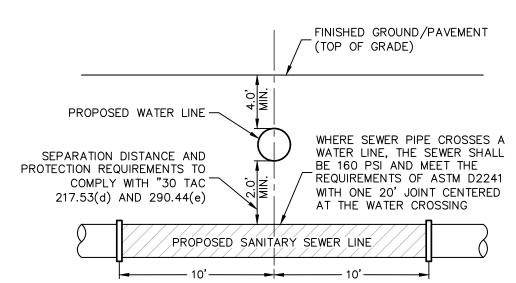


Point Table			
Point #	Northing	Easting	Description
14	13823725.11	2242450.93	ROAD
15	13823705.47	2242430.41	ROAD
16	13823673.97	2242429.85	ROAD
17	13823674.36	2242409.86	ROAD
18	13823692.45	2242410.15	ROAD
19	13823728.02	2242375.73	ROAD
20	13823716.39	2242446.53	WET WELL CORNER
21	13823711.06	2242446.53	WET WELL CORNER
22	13823713.73	2242460.03	WET WELL CENTER
23	13823714.68	2242392.35	HOSE BIB
24	13823703.08	2242457.27	MANHOLE
25	13823738.86	2242460.44	MANHOLE
26	13823721.56	2242374.95	TRANSFORMER
27	13823696.73	2242439.07	PAD CORNER
28	13823681.24	2242448.52	PAD CORNER

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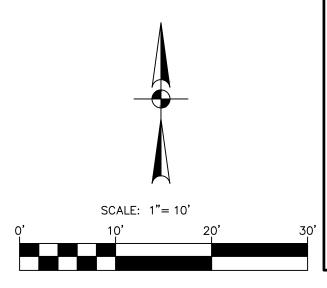
	Point Table			
Point #	Northing	Easting	Description	
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30	13823675.40	2242407.69	PAD CORNER	
31	13823730.52	2242223.48	ROAD PT	
32	13823742.64	2242207.65	ROAD PT	
33	13823708.22	2242172.11	ROAD PC	
34	13823696.09	2242187.91	ROAD PC	
45	13823714.73	2242389.03	BACKFLOW PREVENTE	
56	13823740.92	2242367.86	GATE CARD READER	
57	13823718.64	2242466.64	JIB CRANE AND HOIS	

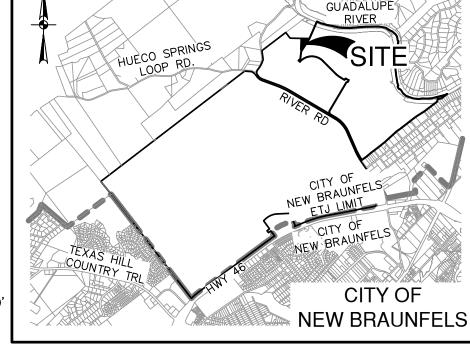
	WASTEWATER (NBU JOB NO. WW-239	913)	
1	ITEM	UNIT	QUANTITY
	8" SANITARY SEWER PIPE	LF	298
	12" SANITARY SEWER PIPE	LF	22
	48" MANHOLES	EA	1
	<del></del>		



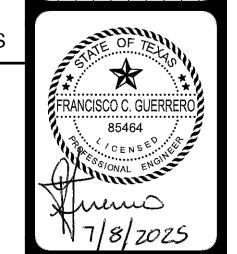
TYPICAL SANITARY

SEWER/WATER CROSSING DETAIL

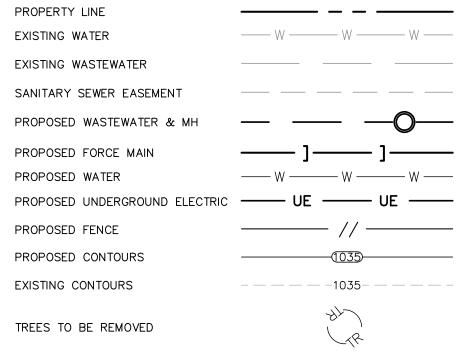








# WASTEWATER LEGEND



#### **LIFT STATION NOTES:**

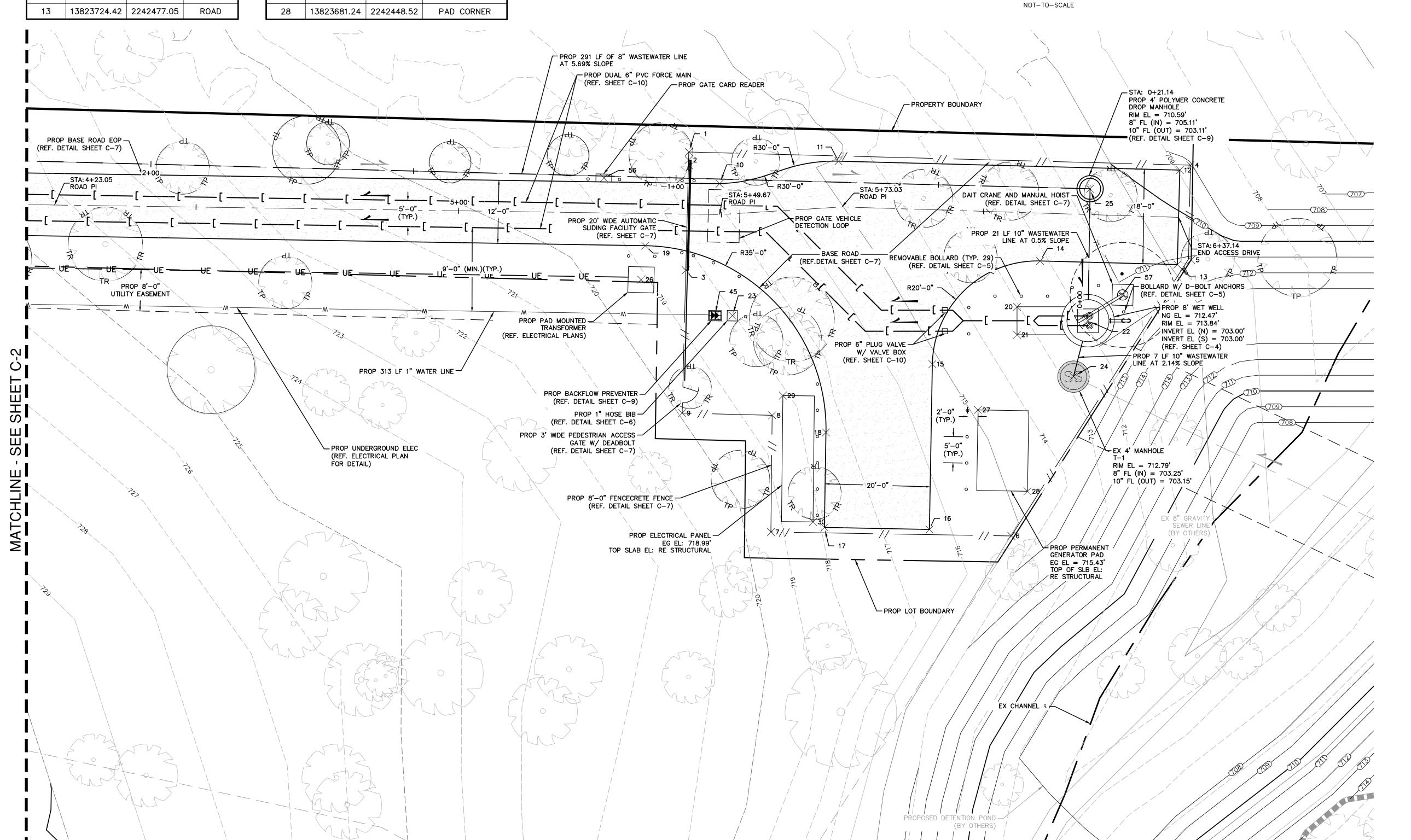
TREES TO REMAIN

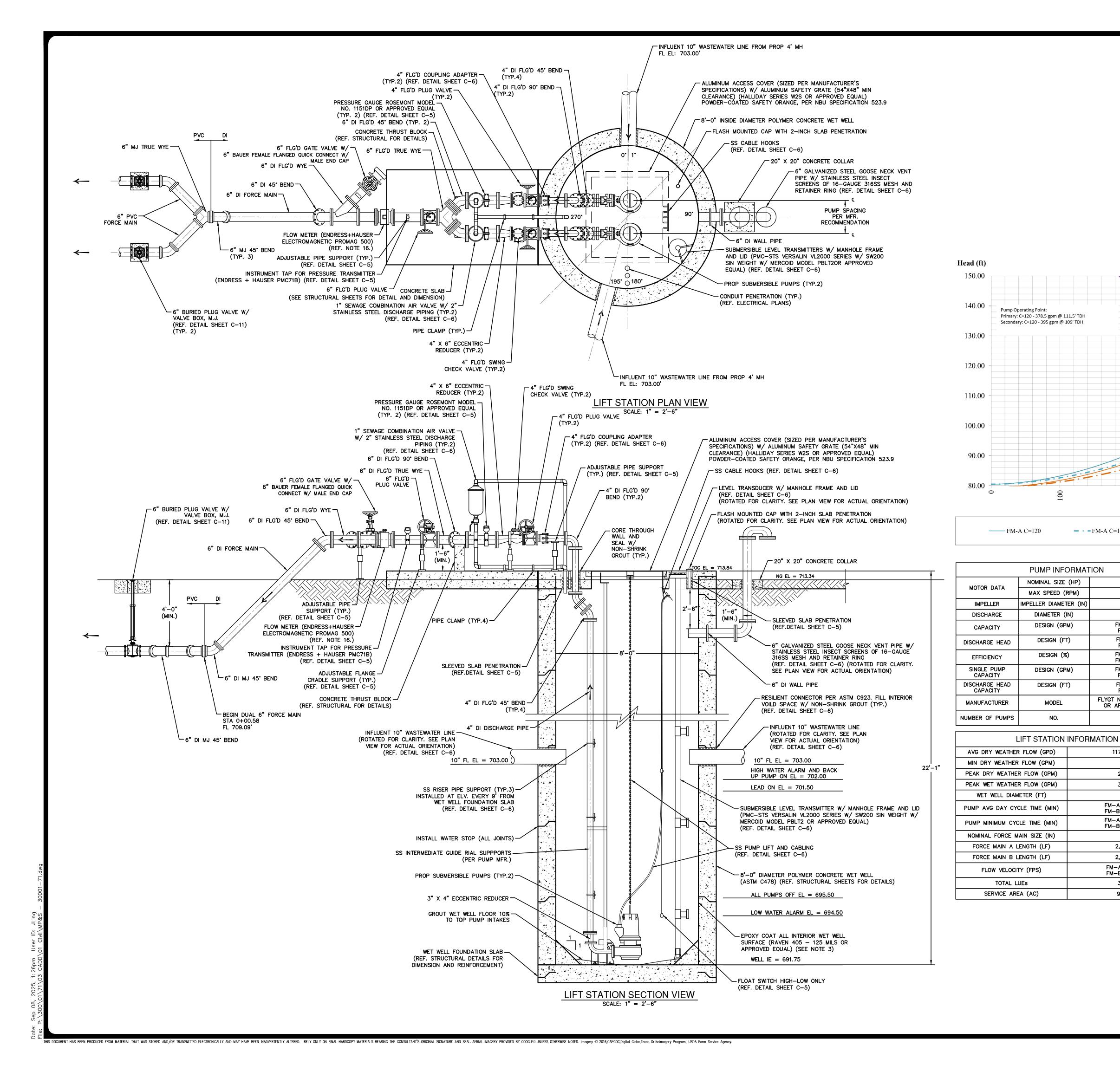
- 1. ALL SUPPORT BRACKETS, HARDWARE, ANCHORS, BOLTS, ETC. INSIDE WET WELL SHALL BE TYPE 316 STAINLESS STEEL. 2. ALL GRAVITY PVC PIPE TO BE ASTM D3034 SDR 26 PIPING WITH
- TRACER TAPE. ALL FM PVC PIPE TO BE ASTM D2241 SDR 26 (CLASS 200) WITH TRACER TAPE. 3. ALL PUMP DISCHARGE PIPING IN WET WELL, VALVE VAULT, AND UP TO ADAPTER TO BE FLANGED (INSIDE WET WELL/VAULT) OR TR FLEX RESTRAINED MECHANICAL JOINT (WHEN BURIED) DUCTILE IRON PIPING. ALL DUCTILE IRON PIPING SHALL BE EPOXY LINED WITH TNEMEC SERIES 431 PERMA-SHIELD PL CERAMIC EPOXY OR
- APPROVED EQUAL. ALL PIPING SHOULD BE RESTRAINED. 4. ALL EXPOSED DUCTILE IRON PIPING, FITTINGS, AND VALVES SHALL BE SANDBLASTED AND COATED WITH TWO (2) COATS OF TNEMEC SERIES 27WB EYPOXY APPLIED AT 6.0 TO 8.0 DRY MILS AND TOPCOATED WITH TNEMEC SERIES 740 UVX APPLIED AT 3.0 TO 5.0 DRY MILS. FINAL COLOR TO BE APPROVED BY OWNER. SHOP PRIMING
- SHALL NOT BE APPLIED TO EXPOSED DIP PIPING. 5. ALL BURIED DUCTILE IRON PIPING, FITTINGS, AND VALVES SHALL BE WRAPPED WITH A POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C105.

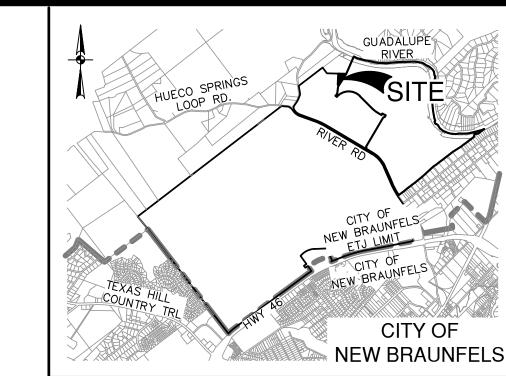
WITH TNEMEC SERIES N140 IS ACCEPTABLE. BITUMASTIC COATING

- 6. ALL MECHANICAL JOINT FITTINGS TO BE RESTRAINED USING SERIES 1100 OR 2000PV MEGALUG JOINT RESTRAINTS.
- 7. PUMP SPACING DIMENSIONS SHOWN ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE DETERMINED BY SPECIFIC PUMP MANUFACTURER.
- 8. ELECTRICAL CONTROLS CONCRETE PADS SHALL BE SIZED BASED ON THE SPECIFIC ELECTRICAL EQUIPMENT PROVIDED. CONCRETE PAD SHALL EXTEND A MINIMUM OF 12-INCHES BEYOND THE OUTSIDE EDGE OF EQUIPMENT ON ALL SIDES. 9. POSITIVE DRAINAGE SHALL BE MAINTAINED ON ALL SURFACE AREAS
- WITHIN THE SCOPE OF THIS PROJECT. CONTRACTOR TO GRADE SITE TO DRAIN TOWARDS ROAD RIGHT-OF-WAY OR THE PROPOSED DETENTION POND. CONTRACTOR TO TAKE PRECAUTIONS NOT TO ALLOW ANY PONDING OF WATER. 10. PRECAST MANHOLES SHALL BE PROVIDED PER NEW BRAUNFELS
- UTILITIES SPECIFICATIONS,.
- 11. ALL WATER SERVICES SHALL CONFORM TO NBU STANDARD DETAILS. 12. WATER LINE SHALL HAVE A MINIMUM COVER OF 4'. CONTRACTOR TO AVOID HIGH POINTS DURING INSTALLATION.
- 13. WATER LINE SHALL BE ASTM B88 TYPE K ANNEALED SEAMLESS COPPER TUBING.

HEET	C-3
HECKED_	FG DRAWN JL
ESIGNER_	LL
ATE	JULY 2025
OB NO	30001-71
LAT NO.	







**LOCATION MAP** NOT-TO-SCALE

\* FRANCISCO C. GUERRERO 85464 meno 7/8/2025

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### LIFT STATION NOTES:

—— FM-B C=120

Flow (gpm)

One Pump

**-** ⋅ **-** FM-A C=140

DIAMETER (IN)

DESIGN (GPM)

DESIGN (FT)

DESIGN (%)

DESIGN (GPM)

DESIGN (FT)

MODEL

NO.

23

3,510

6.57

3

FM-A: 378.5

FM-B: 395

FM-A: 111.5

FM-B: 109

FM-A: 60.37

FM-B: 60.00

FM-A: 378.5

FM-B: 395

FM-A: 111.5

FM-B: 109

FLYGT NP3153 SH 3~275

OR APPROVED EQUAL

117,600

17

299

349

8

FM-A: 70.27

FM-B: 69.47

FM-A: 47.70

FM-B: 45.70

6

2,482

2,985

FM-A: 3.88

FM-B: 4.05

392

95.5

**System and Pump Curves** 

1. ALL SUPPORT BRACKETS, HARDWARE, ANCHORS, BOLTS, ETC. INSIDE WET WELL SHALL BE TYPE 316 STAINLESS STEEL. 2. ALL GRAVITY PVC PIPE TO BE ASTM D3034 SDR 26 PIPING WITH TRACER TAPE. ALL FM

**─** • FM-B C=140

ALL INTERIOR SURFACES OF CONCRETE WET WELL SHALL BE COATED PER NBU SPECIFICATIONS 506.3.0. INTERIOR SURFACE COATINGS FOR WASTEWATER MANHOLES. ALL PUMP DISCHARGE PIPING IN WET WELL, VALVE VAULT, AND UP TO PVC TRANSITION TO BE FLANGED (INSIDE WET WELL/VAULT) OR TR FLEX RESTRAINED MECHANICAL JOINT

PVC PIPE TO BE ASTM D2241 SDR 26 (CLASS 200) WITH TRACER TAPE.

WITH TNEMEC SERIES 431 PERMA-SHIELD PL CERAMIC EPOXY OR APPROVED EQUAL. ALL EXPOSED DUCTILE IRON PIPING, FITTINGS, AND VALVES SHALL BE SANDBLASTED AND COATED WITH TWO (2) COATS OF TNEMEC SERIES 27WB TYPOXY APPLIED AT 6.0 TO 8.0 DRY MILS AND TOPCOATED WITH TNEMEC SERIES 740 UVX APPLIED AT 3.0 TO 5.0 DRY MILS. FINAL COLOR TO BE APPROVED BY THE OWNER. SHOP PRIMING WITH TNEMEC SERIES N140 IS ACCEPTABLE. BITUMASTIC COATING SHALL NOT BE APPLIED TO EXPOSED DI

(WHEN BURIED) DUCTILE IRON PIPING. ALL DUCTILE IRON PIPING SHALL BE EPOXY LINED

- ALL BURIED DUCTILE IRON PIPING, FITTINGS, AND VALVES SHALL BE WRAPPED WITH A POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C105. ALL MECHANICAL JOINT FITTINGS TO BE RESTRAINED USING SERIES 1100 OR 2000PV MEGALUG JOINT RESTRAINTS.
- 8. PUMP SPACING DIMENSIONS SHOWN ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE DETERMINED BY SPECIFIC PUMP MANUFACTURER. LEVEL CONTROL WILL BE PROVIDED BY SUBMERSIBLE LEVEL TRANSMITTERS WITH OPERATION POINTS AS SHOWN ON THE PLANS. HIGH WATER ALARM FLOAT SHALL BE USED FOR BACKUP ONLY. RADARS SHALL BE INSTALLED IN ACCORDANCE WITH
- MANUFACTURER RECOMMENDATIONS. 10. ELECTRICAL EQUIPMENT PAD LENGTH SHALL BE SET BASED ON THE SPECIFIC ELECTRICAL EQUIPMENT PROVIDED. CONCRETE PAD SHALL EXTEND A MINIMUM OF 12-INCHES BEYOND THE OUTSIDE EDGE OF EQUIPMENT ON ALL SIDES.
- 11. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF WET WELL HATCHES PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS. 12. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS NOT SHOWN.
- CONTRACTOR TO SUBMIT DESIGN OF PUMP ANCHOR BOLTS AND PATTERN, INCLUDING CALCULATIONS, DURING SHOP DRAWING SUBMISSION. 14. CONTRACTOR TO PROVIDE ADHESIVE ANCHORS IN LIEU OF WEDGE ANCHORS FOR ALL SUBMERGED CONDITIONS AND SUBMIT DESIGN OF ANCHOR BOLTS DURING SHOP DRAWING

17. CONTRACTOR SHALL COORDINATE ALL WET WELL WALL AND TOP SLAB PENETRATIONS WITH

13. PUMP ANCHOR BOLTS ARE TO BE ADHESIVE TYPE AND EMBEDDED IN CONCRETE SLAB.

- 15. ALL PIPING IN THE WET WELL SHALL BE FLANGED. NO FLANGED COUPLING ADAPTORS OR VICTAULIC STYLE COUPLINGS SHALL BE PERMITTED INSIDE THE WET WELL.
- 16. CONTRACTOR TO PROVIDE ENDRESS+HAUSER ELECTROMAGNETIC PROMAG 500 FLOW METER OR ENGINEER APPROVED EQUAL WITH NO REQUIRED MINIMUM PIPE STRAIGHT RUN BEFORE AND AFTER THE FLOW METER.
- 18. WET WELL TESTING. AN EXFILTRATION TEST MUST BE PERFORMED IMMEDIATELY AFTER THE WET WELL HAS BEEN BACKFILLED AND COMPACTED. EXFILTRATION MUST NOT EXCEED 0.142 GALLONS PER HOUR PER FOOT OF DIAMETER PER FOOT OF DEPTH. THE TEST MUST BE DONE BY PLUGGING THE GRAVITY INVERT AND FILLING UP THE WET WELL WITH WATER TO EITHER 1-FT BELOW THE WET WELL TOP SLAB, OR UP TO THE MANHOLE LID WITH THE LOWEST ELEVATION BELOW THE TOP SLAB. THIS LEVEL MUST BE CLEARLY MARKED ON THE
- WET WELL WALL. AFTER FILLING, THE WET WELL IS LEFT TO STABILIZE FOR 48 HOURS BEFORE CONDUCTING THE TEST. AFTER STABILIZATION, THE WET WELL IS REFILLED TO THE MARK LEFT ON THE WALL. THE TEST IS THEN RUN FOR TWO HOURS, MINIMUM, AND NO WATER IS ADDED. AFTER TWO HOURS, THE WET WELL IS REFILLED TO THE MARK. THE AMOUNT OF WATER NECESSARY TO REACH THE MARK IS CAREFULLY MEASURED. THE MAXIMUM ALLOWABLE WATER LOSS IS DETERMINED BY THE FOLLOWING EQUATION:

 $Water\ Loss\ (gallons) = 0.0142tDh$ 

t = test time (2 hours)

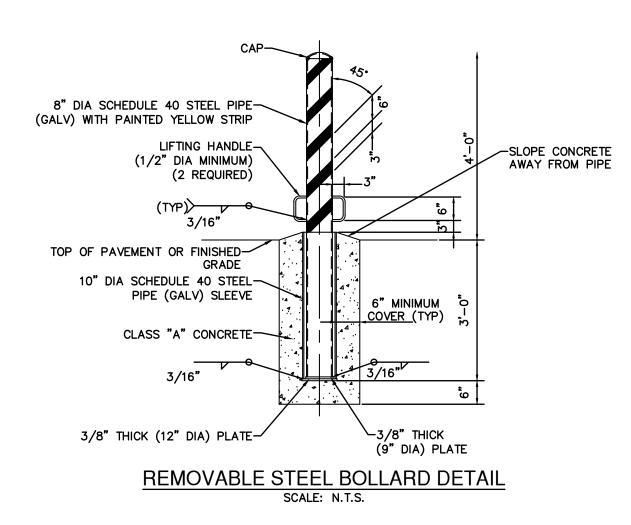
THE WET WELL MANUFACTURER.

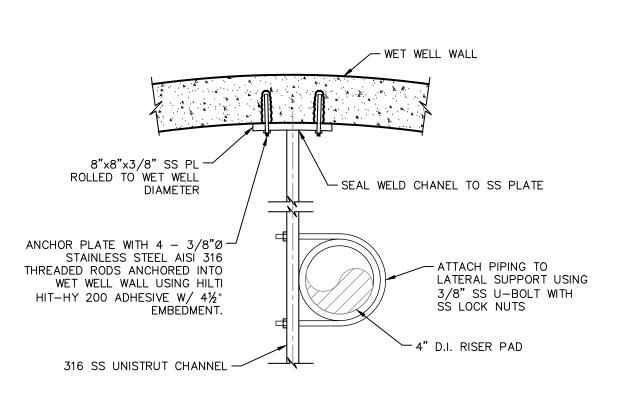
WATERTIGHT.

- D = wet well diameter (ft), and h = water level depth within the wet well after 2 hours (ft).
- IF THE TEST FAILS, THEE DESIGN ENGINEER MUST WORK WITH THE CONSTRUCTION CONTRACTOR TO DETERMINE WHAT CORRECTIVE ACTIONS MAY BE NECESSARY TO MAKE THE WET WELL

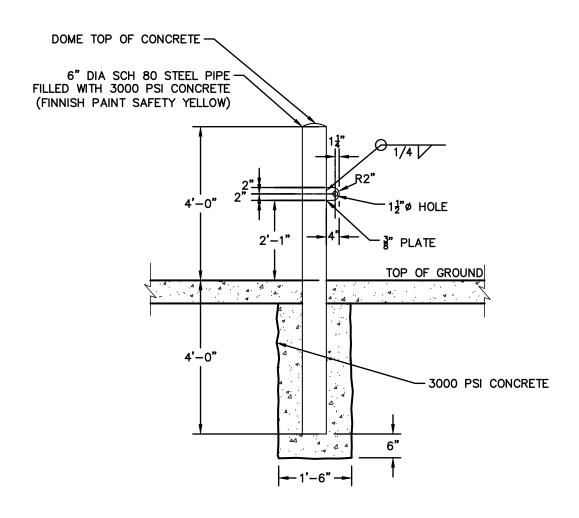
30001-71 JOB NO. JULY 2025 DESIGNER HECKED FG DRAWN J

# PRESSURE GAUGE INSTALLATION DETAIL SCALE: N.T.S.

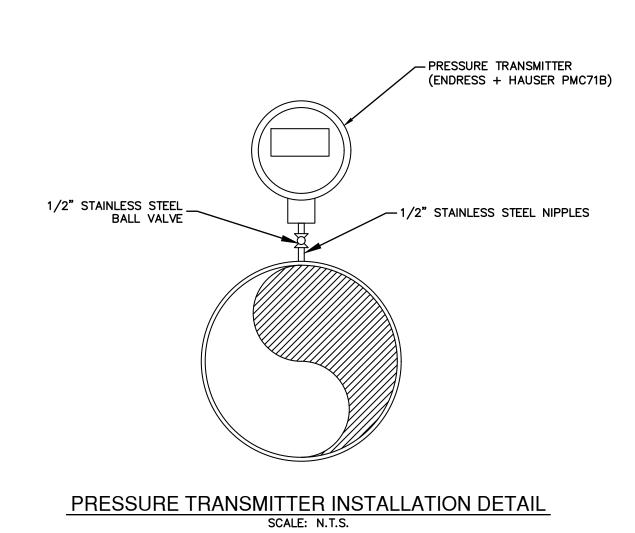


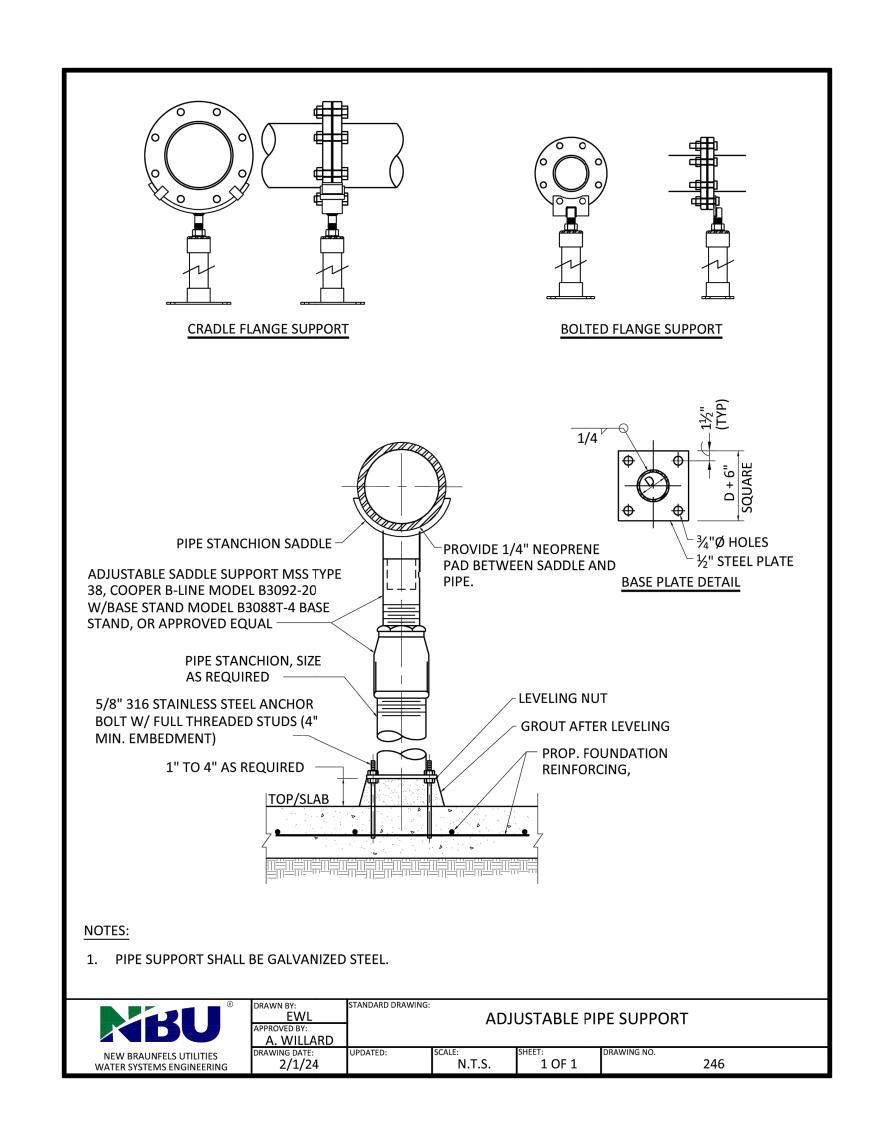


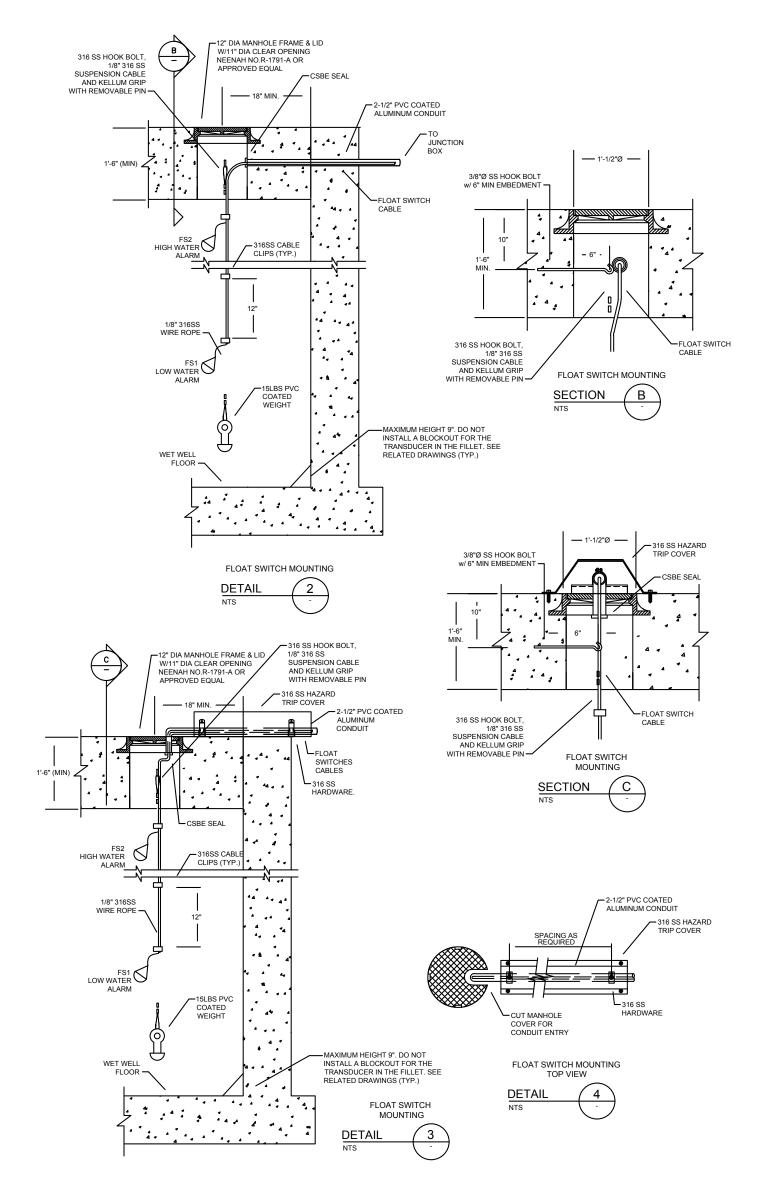
RISER PIPE SUPPPORT DETAIL SCALE: N.T.S.



BOLLARD W/ D-BOLT DETAIL SCALE: N.T.S.







FLOAT SWITCH MOUNTING DETAIL SCALE: N.T.S.

VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS

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FRANCISCO C. GUERRERO

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7/8/2025

PLAT NO.

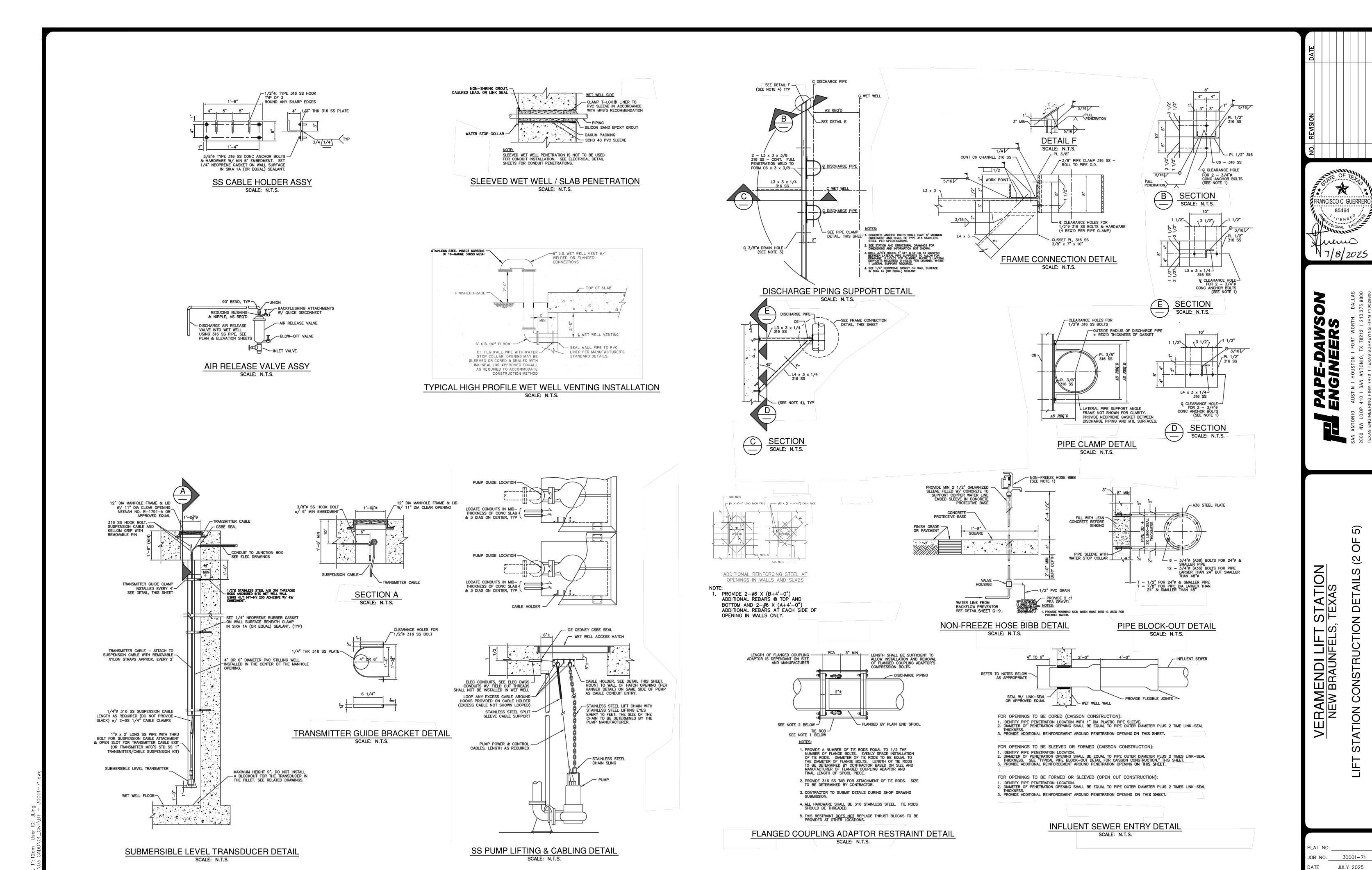
JOB NO. 30001-71

DATE JULY 2025

DESIGNER LL

CHECKED FG DRAWN JL

SHEET C-5

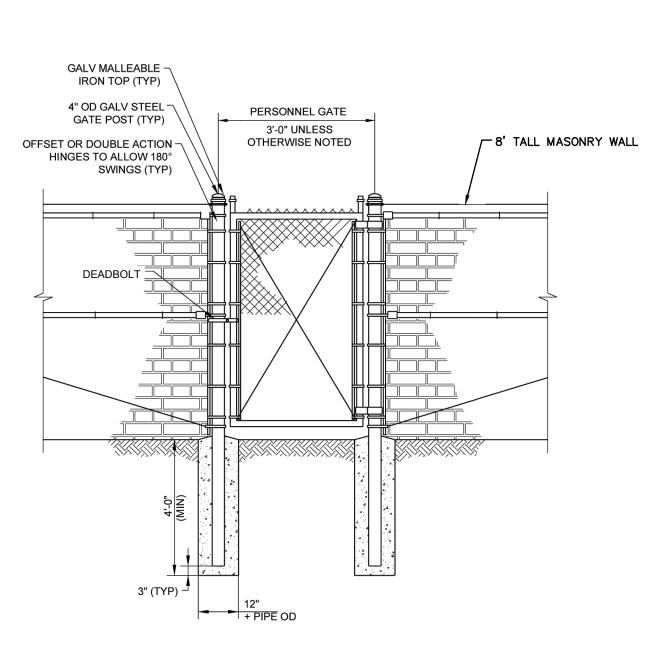


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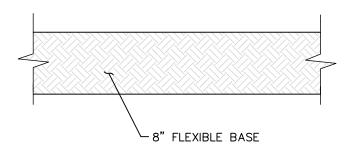
C-6

DESIGNER

CHECKED FG DRAWN



PEDESTRIAN ACCESS GATE SCALE: N.T.S.

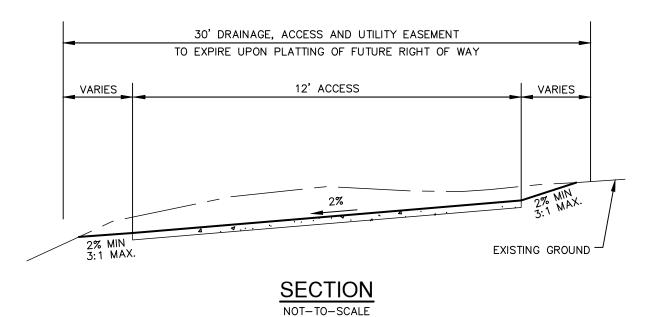


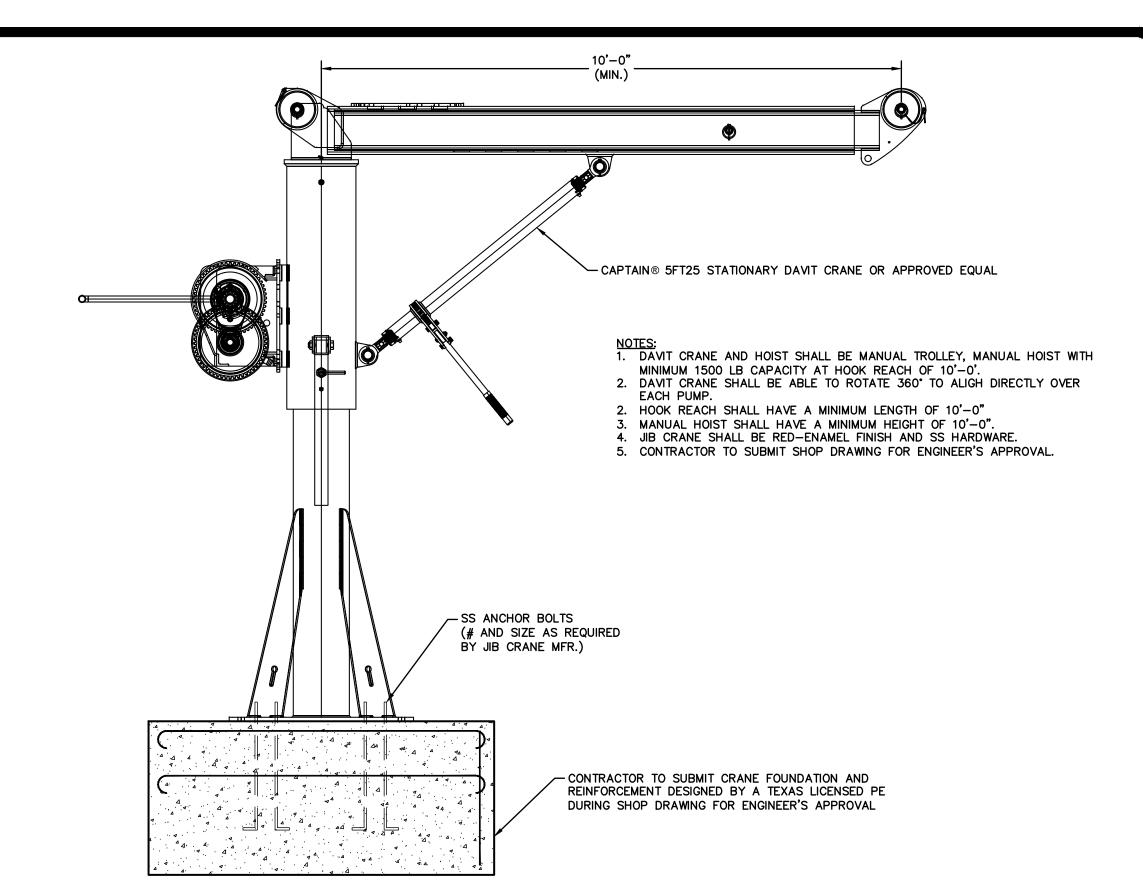
# ACCESS ROAD DETAIL NOT-TO-SCALE

### NOTES:

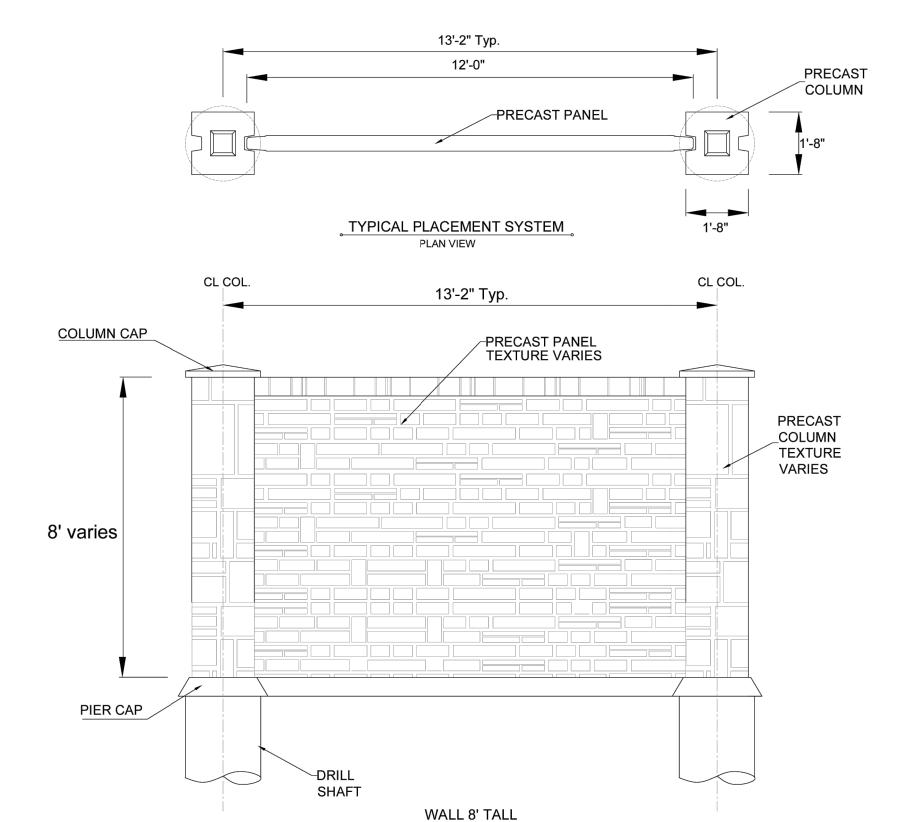
CONTRACTOR SHALL MATCH EXISTING PAVEMENT AT TIE—IN. IF EXISTING PAVEMENT ELEVATION DIFFERS SIGNIFICANTLY, CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO CONTINUING WORK.
 CONTRACTOR SHALL ENSURE NATURAL DRAINAGE PATTERNS AND

UNDISTURBED AFTER COMPLETION OF ACCESS ROAD.





DAVIT CRANE AND MANUAL HOIST DETAIL



NOTE:
1. DRILL SHAFT DIAMETER & DEPTH TO BE DESIGNED BY LICENSED PE BY APPROVED FENCE VENDOR BASED ON THE GEOTECHNICAL REPORT AS PROVIDED IN THE SPECIFICATION.

MASONRY WALL DETAIL SCALE: N.T.S.

**ELEVATION VIEW** 



JOB NO. 30001-71

DESIGNER

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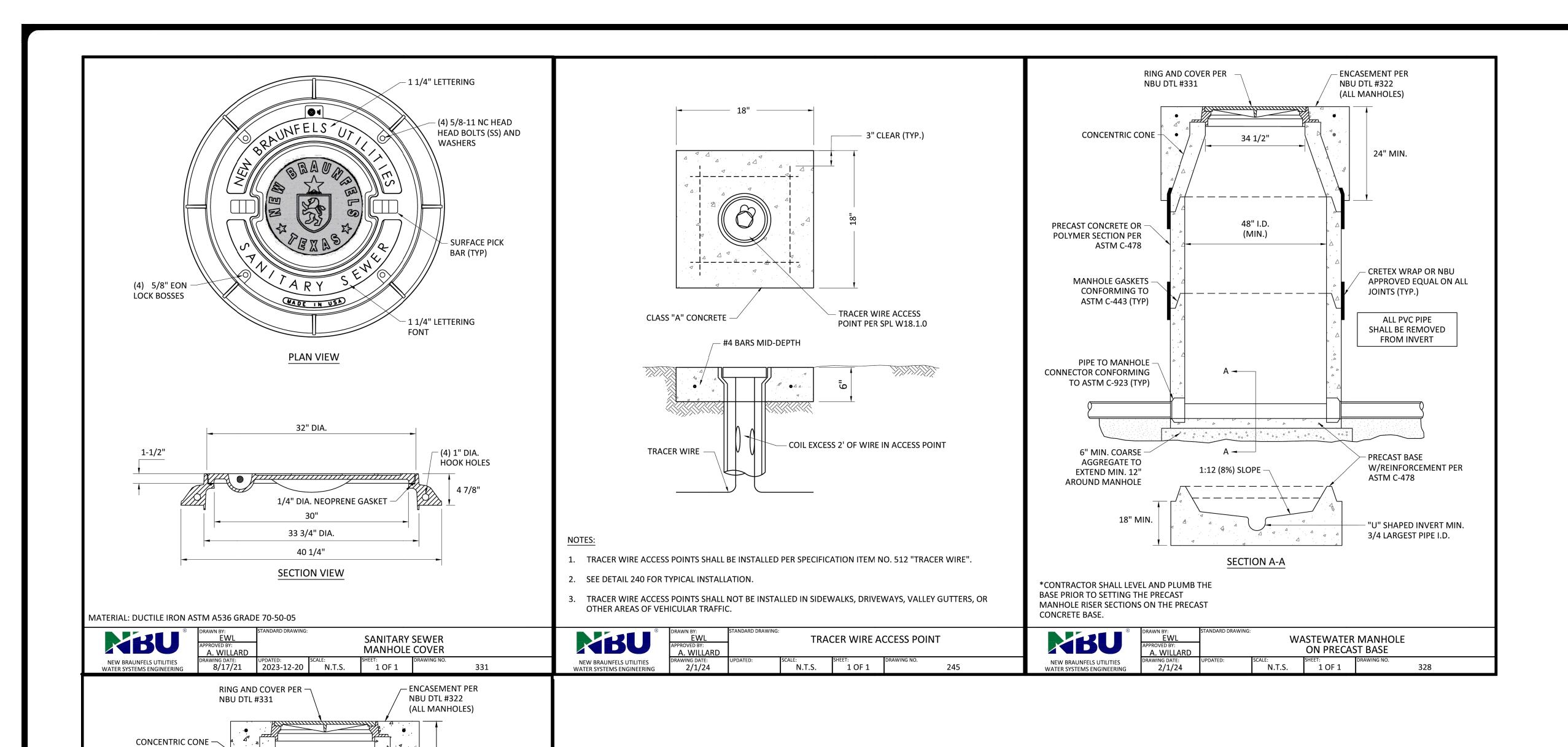
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FRANCISCO C. GUERRERO

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N7/8/2025



34 1/2"

48" I.D.

1:12 (8%) SLOPE -

— "U" SHAPED INVERT MIN.

PIPE TO MANHOLE

CONFORMING TO

ASTM C-923 (TYP)

CONNECTOR

3/4 LARGEST PIPE I.D.

MANHOLE GASKETS —

CONFORMING TO ASTM C-443 (TYP)

PRECAST CONCRETE OR — POLYMER SECTION PER

CRETEX WRAP OR NBU —— APPROVED EQUAL ON ALL

> PRECAST BASE ——— W/REINFORCEMENT

PER ASTM C-478

6" MIN. COARSE —

AGGREGATE TO EXTEND MIN. 12" AROUND MANHOLE

ASTM C-478

JOINTS (TYP.)

MBU

NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING

AWING DATE: 2/1/24

24" MIN.

☐ BRING CONCRETE 6"

– WYE MUST BE USED, TEE IS

NOT ACCEPTABLE

ABOVE PIPE

4" MIN. (TYP)

12" MIN.

— CLASS A CONCRETE

— PIPE TO MANHOLE CONNECTOR

CONFORMING TO

ASTM C-923 (TYP)

FILL ANNULAR SPACE W/
NON-SHRINK
GROUT
GROUTED
INVERT W/
OFFSET TO

OF PIPE

CONCRETE BASE.

WASTEWATER MANHOLE W/DROP INLET ON PRECAST BASE

1 OF 1

MATCH (%) (%) (%) (%) (%)

\*CONTRACTOR SHALL LEVEL AND

THE PRECAST MANHOLE RISER

SECTIONS ON THE PRECAST

PLUMB THE BASE PRIOR TO SETTING



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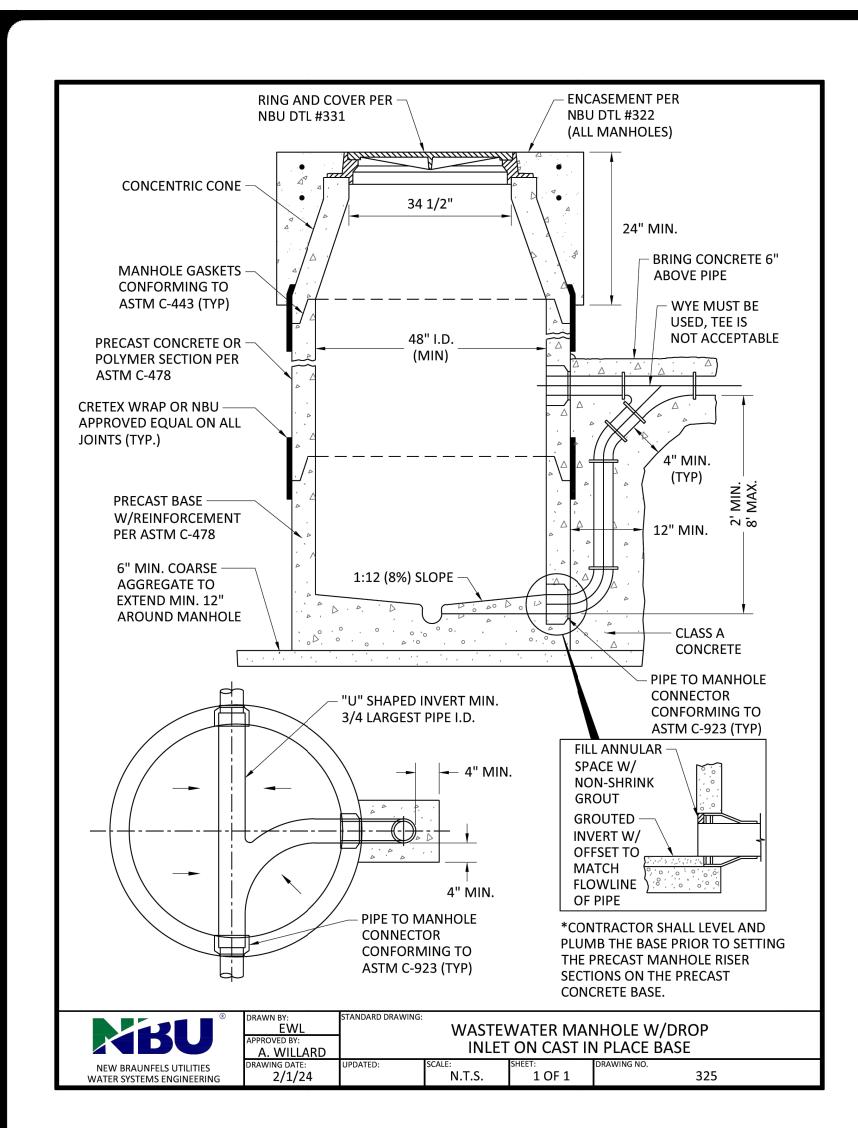
CHECKED<u>FG</u> DRAWN<u>J</u>

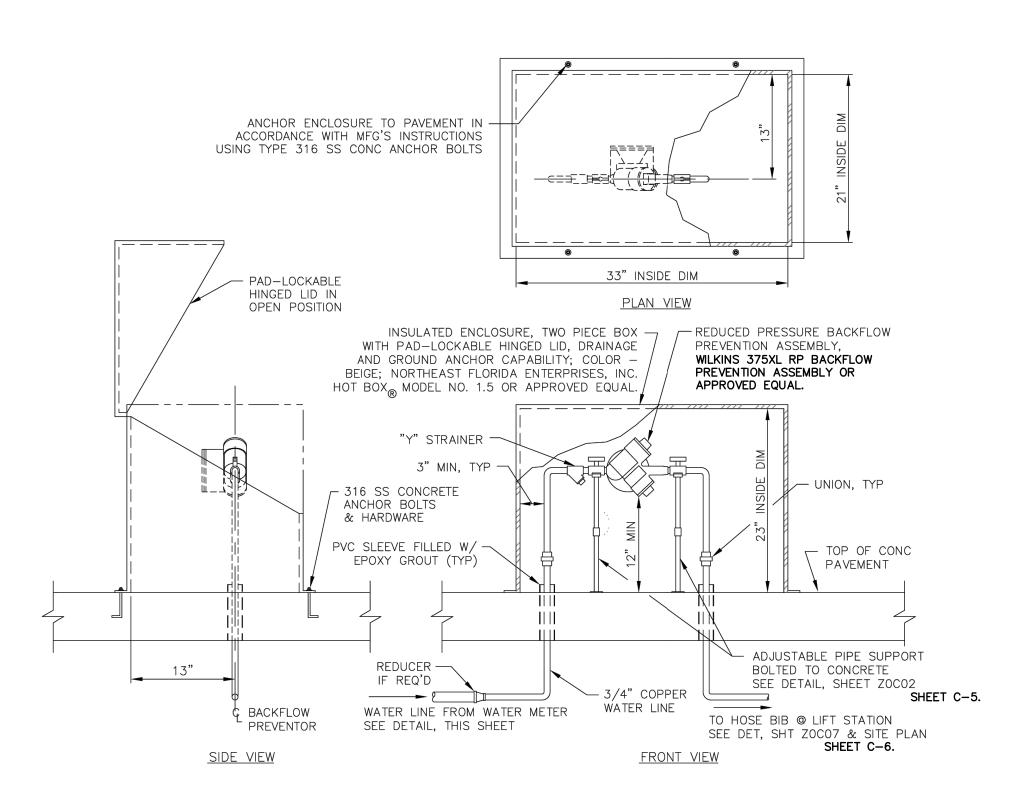
C-8

DESIGNER\_\_\_

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N7/8/2025





REDUCED PRESSURE BACKFLOW PREVENTOR DETAIL

SCALE: N.T.S.

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NO. REVISION

DATE

OF JETA

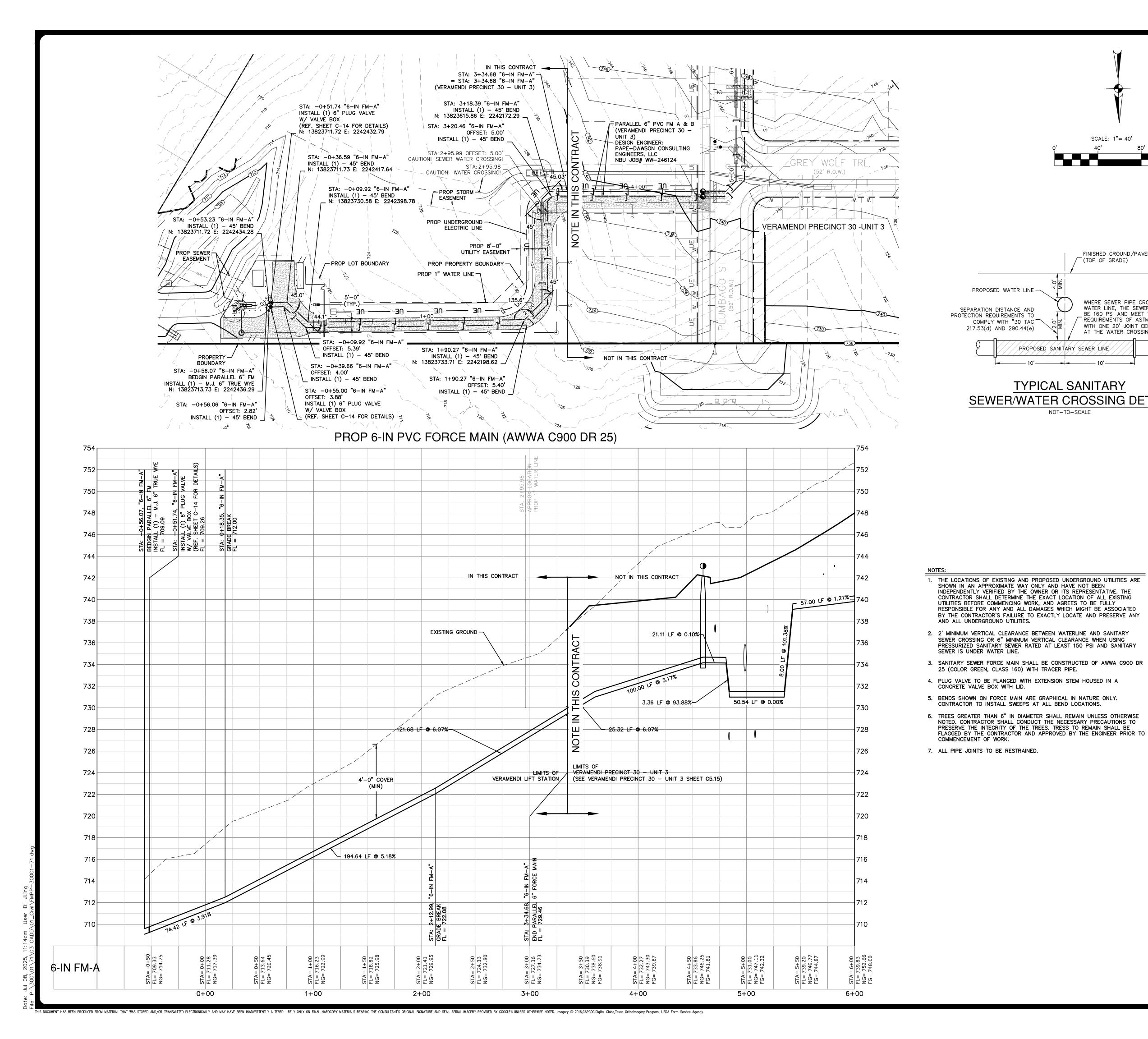


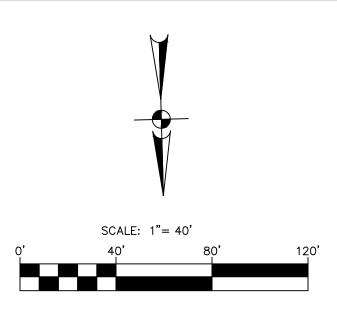
H PAPE-DAWSON ENGINEERS

VERAMENDI LIFT STATION

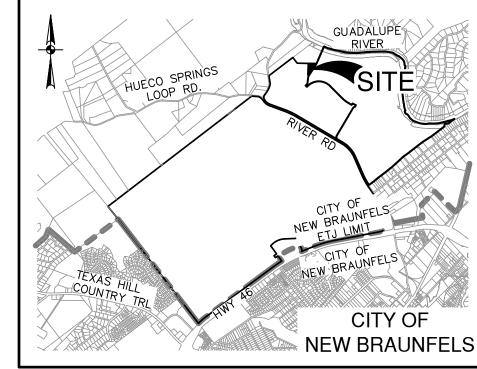
NEW BRAUNFELS, TEXAS

LIFT STATION CONSTRUCTION DETAILS (5 OF 5)





(TOP OF GRADE)



#### **LOCATION MAP** NOT-TO-SCALE

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

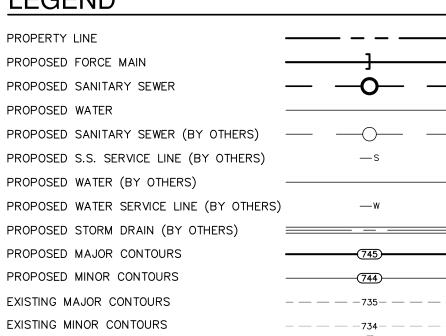
NOT-TO-SCALE

PROPOSED SANITARY SEWER LINE

### FINISHED GROUND/PAVEMENT **LEGEND** PROPERTY LINE WHERE SEWER PIPE CROSSES A WATER LINE, THE SEWER SHALL PROPOSED WATER BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT THE WATER CROSSING

PROPOSED STORM DRAIN (BY OTHERS) PROPOSED MAJOR CONTOURS PROPOSED MINOR CONTOURS EXISTING MAJOR CONTOURS EXISTING MINOR CONTOURS

WATER/SEWER CROSSING (REF. DETAIL)



# CAUTION OVERHEAD UTILITIES

CONTRACTOR TO EXERCISE EXTREME CAUTION WHEN WORKING UNDER "HIGH VOLTAGE TRANSMISSION LINES". A WORKING HEIGHT OF 30' FROM GROUND ELEVATION WILL BE OBSERVED WHEN WORKING UNDER THE HIGH VOLTAGE LINE. COORDINATE ALL WORK WITH THE LOCAL UTILITY PROVIDER.

### **CAUTION UNDERGROUND UTILITIES**

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION O EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE MEASUREMENTS TAKEN IN THE FIELD. INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE, AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCT BANKS, LANDSCAPE IRRIGATION FACILITIES AND GAS LINES. THE CONTRACTOR MUST CONTACT 1-800-DIG-TESS AND CALL APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION AND/OR START OF CONSTRUCTION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL B THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES (WHETHER SHOWN ON PLANS OR NOT) WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN OF THE PLANS. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE A CONTRACTORS SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

### CITY OF NEW BRAUNFELS NOTES:

- 1. NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
- ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS. THIS PROJECT INCLUDES UTILITY INSTALLATION GREATER THAN 5-FEET IN DEPTH. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO
- CITY PRIOR TO UTILITY INSTALLATION 4. UTILITY TRENCH COMPACTION -ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORMLY NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR. 5. PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAS

CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ÀCTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS

### TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/ EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

REFERENCE VERAMENDI PRECINCT 30 UNIT 3 (PI2024-0043) FOR LOCATION OF STAGE/STORAGE/SPOILS LOCATIONS.

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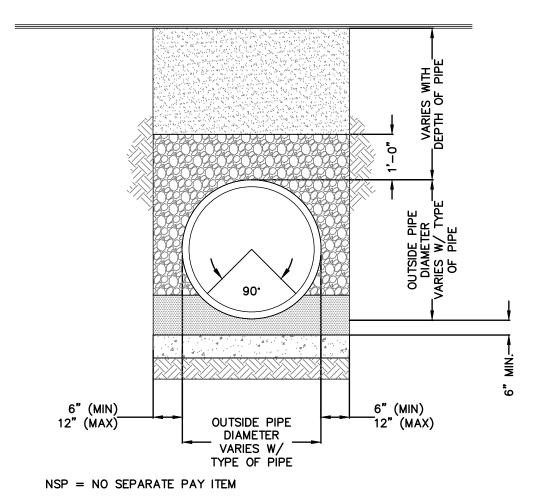
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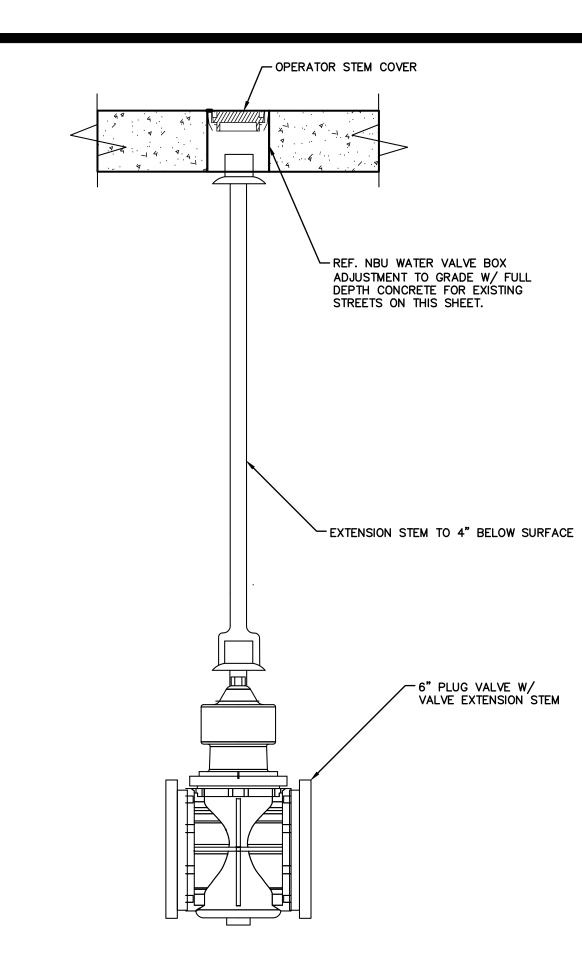
30001-71 JULY 2025 ESIGNER CHECKED FG DRAWN J C-10

FOR CONSTRUCTION 30007-71

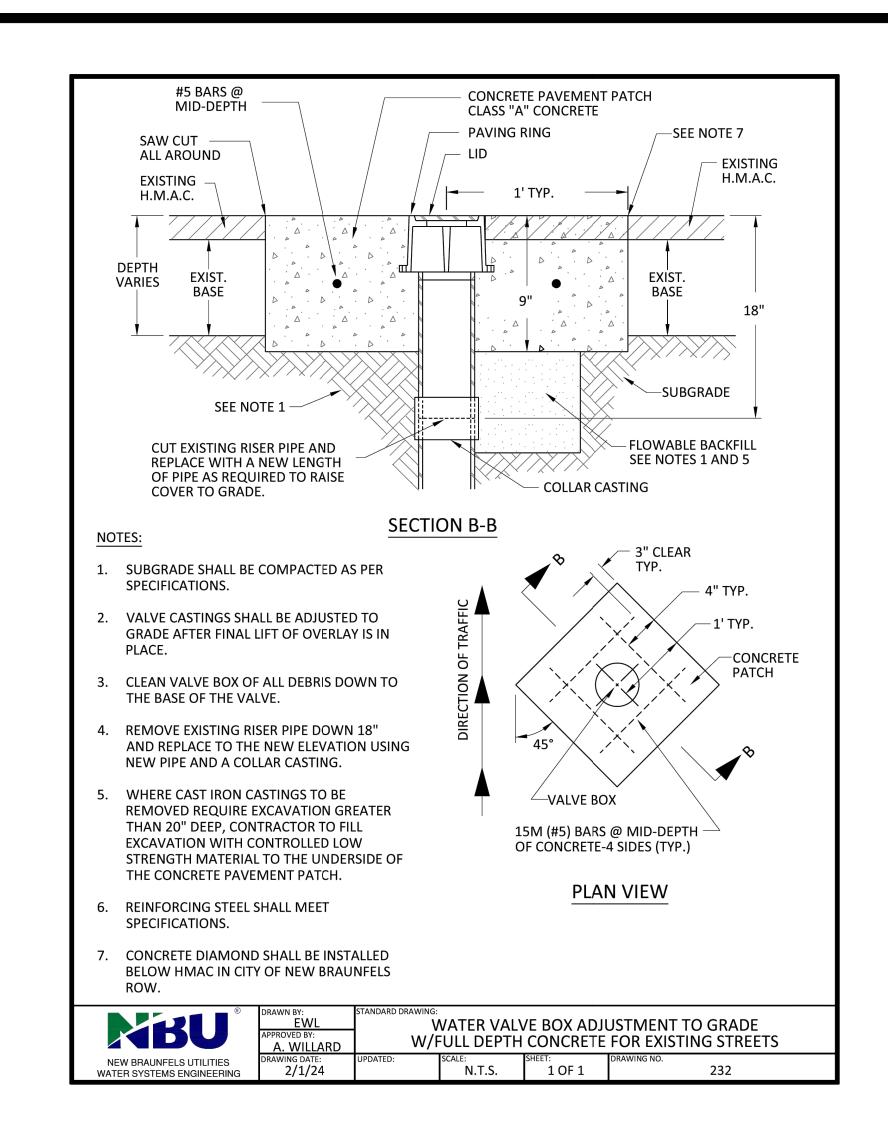
- 1. DEPTH OF GRAVEL SUBGRADE FILLER TO BE DETERMINED IN FIELD BY OWNER IN CONDITIONS WHERE TRENCH BOTTOM IS UNSTABLE
- 2. BEDDING SHALL HAVE A MINIMUM THICKNESS OF 6-INCHES BELOW OUTSIDE DIAMETER OF PIPE AND BE PLACED AND SHAPED TO CONFORM TO PIPE BARREL AND BELL OR FLANGES SUCH THAT THE ENTIRE LENGTH OF THE BARREL IS SUPPORTED BY THE BEDDING MATERIAL, NO SEPARATE PAY ITEM (NSPI).
- 3. INITIAL BACKFILL TO BE A MINIMUM OF 1—FOOT ABOVE OUTSIDE DIAMETER OF PIPE PLACED WITH A TEMPORARY SHIELD OVER THE PIPE TO PROTECT THE PIPE COATING AND/OR POLYWRAP, NO SEPARATE PAY ITEM (NSPI).
- 4. ALL BEDDING OR GRAVEL SUBGRADE FILLER IF USED TO BE PLACED ON UNDISTURBED
- 5. CONTRACTOR SHALL INCORPORATE THE USE OF A TRENCH BOX OR OTHER ACCEPTABLE SAFETY SYSTEM IN ANY TRENCH THAT EXCEEDS FIVE (5) FEET IN DEPTH.
- 6. ALL BACKFILL SHALL BE COMPACTED TO 98% OF THE MAXIMUM DRY DENSITY OR DETERMINED BY TXDOT TEST METHOD TEX-113E.

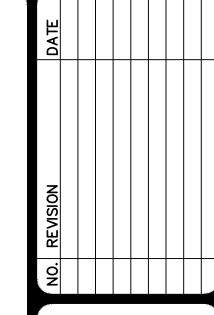


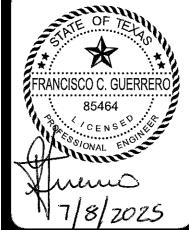
TYPICAL TRENCH INSTALLATION DETAIL
SCALE: N.T.S.



PLUG VALVE W/ VALVE EXTENSION STEM AND VALVE BOX







FAPE-DAWSON
ENGINEERS

LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000

VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS

PLAT NO.

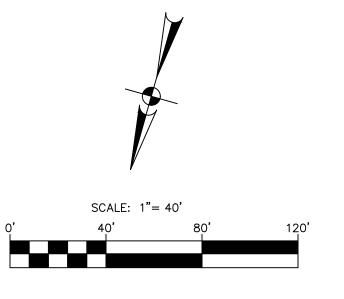
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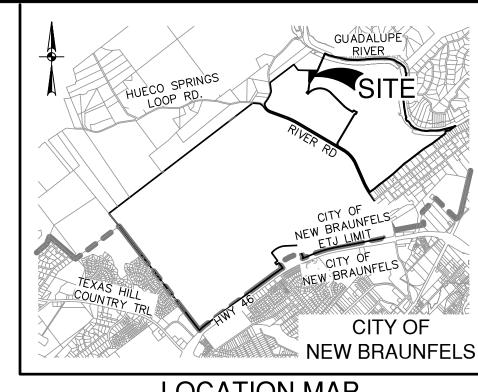
DATE JULY 2025

DESIGNER LL

CHECKED FG DRAWN

SHEET C-11





# **LOCATION MAP**

NOT-TO-SCALE

# LEGEND

PROPERTY LINE	
PROPOSED FORCE MAIN	<del></del>
PROPOSED SANITARY SEWER	_ <del>-</del>
PROPOSED WATER	
PROPOSED SANITARY SEWER (BY OTHERS)	
PROPOSED S.S. SERVICE LINE (BY OTHERS)	<b>—</b> s
PROPOSED WATER (BY OTHERS)	
PROPOSED WATER SERVICE LINE (BY OTHERS)	—w
PROPOSED STORM DRAIN (BY OTHERS)	
PROPOSED MAJOR CONTOURS	745
PROPOSED MINOR CONTOURS	<del></del>
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
PROPOSED SILT FENCE	SF
PROPOSED ROCK BERM	
PROPOSED STABILIZED CONSTRUCTION ENTRANCE	
PROPOSED LIMIT OF CONSTRUCTION	
FLOW ARROW	1

#### **CAUTION OVERHEAD UTILITIES**

CONTRACTOR TO EXERCISE EXTREME CAUTION WHEN WORKING UNDER "HIGH VOLTAGE TRANSMISSION LINES". A WORKING HEIGHT OF 30' FROM GROUND ELEVATION WILL BE OBSERVED WHEN WORKING UNDER THE HIGH VOLTAGE LINE. COORDINATE ALL WORK WITH THE LOCAL UTILITY PROVIDER.

### **CAUTION UNDERGROUND UTILITIES**

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION O EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE MEASUREMENTS TAKEN IN THE FIELD. TH INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE, AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCT BANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. THE CONTRACTOR MUST CONTACT 1-800-DIG-TESS AND CALL TI APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION AND/OR START OF CONSTRUCTION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BI THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES (WHETHER SHOWN ON PLANS OR NOT) WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTORS SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

### CITY OF NEW BRAUNFELS NOTES:

- 1. NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS. 2. ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.
- . THIS PROJECT INCLUDES UTILITY INSTALLATION GREATER THAN 5-FEET IN DEPTH. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION 4. UTILITY TRENCH COMPACTION -ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE
- STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORMLY NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR. 5. PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAS

CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ÀCTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS

## TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND / OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/ EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

STABILIZATION.

REFERENCE VERAMENDI PRECINCT 30 UNIT 3 (PI2024-0043) FOR LOCATION OF STAGE/STORAGE/SPOILS LOCATIONS.

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ART

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CONTROL

SEDIMENTATION

AND

OB NO. 30001-71 JULY 2025 DESIGNER CHECKED FG DRAWN LS

PROPOSED STORM EASEMENT (VERAMENDI PRECINCT 30 UNIT 3) PROP LOT BOUNDARY -- PROP VERAMENDI LIFT STATION PROP BOC (BY OTHERS) PROP 6" PVC FORCE MAIN A & B UTILITY EASEMENT  $\Delta$ prop gutter (by others)-PROP 8" PVC WASTEWATER LINE -PROP 4'-0" SIDEWALK -(BY OTHERS) PROP FOC (BY OTHERS) -PROP — LIMITS OF ROCK BERM PROPERTY BOUNDARY VERAMENDI LIFT STATION VERAMENDI PRECINCT 30 - UNIT 3 W/ J HOOK EVERY 100 FT

IS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL. AERIAL IMAGERY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery © 2016,CAPCOG,Digital Globe,Texas Orthoimagery Program, USDA Farm Service Agency.

SCHEMATIC OF TEMPORARY CONSTRUCTION ENTRANCE/EXIT

#### 1. THE AGGREGATE SHOULD CONSIST OF 4-INCH TO 8-INCH WASHED STONE OVER A STABLE FOUNDATION AS SPECIFIED IN THE PLAN. 2. THE AGGREGATE SHOULD BE PLACED WITH A MINIMUM THICKNESS OF

3. THE GEOTEXTILE FABRIC SHOULD BE DESIGNED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH AN APPROXIMATE WEIGHT OF 6 OZ/YD2, A MULLEN BURST RATING OF 140 LB/IN2, AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.

4. IF A WASHING FACILITY IS REQUIRED, A LEVEL AREA WITH A MINIMUM OF 4-INCH DIAMETER WASHED STONE OR COMMERCIAL ROCK SHOULD BE INCLUDED IN THE PLANS. DIVERT WASTEWATER TO A SEDIMENT TRAP OF

DRAINAGE

RUNOFF AWAY FROM THE PUBLIC ROAD.

SURFACE SMOOTH AND SLOPE FOR DRAINAGE.

LAY SOD IN A STAGGERED PATTERN. BUTT

THE STRIPS TIGHTLY AGAINST EACH OTHER.

DO NOT LEAVE SPACES AND DO NOT

OVERLAP. A SHARPENED MASON'S TROWEL

IS A HANDY TOOL FOR TUCKING DOWN THE

AUTOMATIC SOD CUTTER MUST BE MATCHED

ANGLED ENDS CAUSED BY TH

ENDS AND TRIMMING PIECES.

LAY SOD ACROSS THE DIRECTION OF FLOW

**MATERIALS** 

OF 36 HOURS.

SHOOT GROWTH AND THATCH.

SITE PREPARATION

CORRECTLY.

1. AVOID CURVES ON PUBLIC ROADS AND STEEP SLOPES. REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FOUNDATION FOR POSITIVE DRAINAGE.

2. THE MINIMUM WIDTH OF THE ENTRANCE/EXIT SHOULD BE 12 FEET OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.

3. THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG. 4. IF THE SLOPE TOWARD THE ROAD EXCEEDS 2%. CONSTRUCT A RIDGI 6-INCHES TO 8-INCHES HIGH WITH 3:1 (H: V) SIDE SLOPES, ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE ENTRANCE TO DIVERT

5. PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE STABILITY, ESPECIALLY WHERE WET CONDITIONS ARE ANTICIPATED. 6. PLACE STONE TO DIMENSIONS AND GRADE SHOWN ON PLANS. LEAVE

7. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN.

8. INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER PUBLIC ROAD

1. SOD SHOULD BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4" INCH

 $(\pm 1/4"$  INCH) AT THE TIME OF CUTTING. THIS THICKNESS SHOULD EXCLUDE

2. PIECES OF SOD SHOULD BE CUT TO THE SUPPLIER'S STANDARD WIDTH AND

LENGTH, WITH A MAXIMUM ALLOWABLE DEVIATION IN ANY DIMENSION OF 5%.

3. STANDARD SIZE SECTIONS OF SOD SHOULD BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN

4. SOD SHOULD BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD

. PRIOR TO SOIL PREPARATION, AREAS TO BE SODDED SHOULD BE BROUGHT

2. THE SURFACE SHOULD BE CLEARED OF ALL TRASH, DEBRIS AND OF ALL

3. FERTILIZE ACCORDING TO SOIL TESTS. FERTILIZER NEEDS CAN BE

DETERMINED BY A SOIL TESTING LABORATORY OR REGIONAL RECOMMENDATIONS CAN BE MADE BY COUNTY AGRICULTURAL EXTENSION AGENTS. FERTILIZE

SOIL.

# GEOTEXTILE FABRIC TO STABILIZE FOUNDATION

#### SECTION "A-A" OF A CONSTRUCTION ENTRANCE/EXIT

### COMMON TROUBLE POINTS

USED TO TRAP SEDIMENT.

SHOOTS OR GRASS BLADES.

GRASS SHOULD BE GREEN AND

HEALTHY: MOWED AT A 2"-3"

ROOT ZONE - SOIL AND ROOTS.

CUTTING HEIGHT.

SEDIMENT BASIN

STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL

NOT-TO-SCALE

APPEARANCE OF GOOD SOD

SOON AS THE SOD IS LAID.

THE MOWER HIGH (2"-3").

1. ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE

3. MOW WHEN THE SOD IS ESTABLISHED - IN 2-3 WEEKS. SET

2. WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS

1. INADEQUATE RUNOFF CONTROL-SEDIMENT WASHES ONTO PUBLIC ROAD. STONE TOO SMALL OR GEOTEXTILE FABRIC ABSENT, RESULTS IN MUDDY

CONDITION AS STONE IS PRESSED INTO SOIL. PAD TOO SHORT FOR HEAVY CONSTRUCTION TRAFFIC-EXTEND PAD BEYOND THE MINIMUM 50-FOOT LENGTH AS NECESSARY. . PAD NOT FLARED SUFFICIENTLY AT ROAD SURFACE, RESULTS IN MUD BEING TRACKED ON TO ROAD AND POSSIBLE DAMAGE TO ROAD.

5. UNSTABLE FOUNDATION - USE GEOTEXTILE FABRIC UNDER PAD AND/OR IMPROVE FOUNDATION DRAINAGE.

2. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC

3. WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT

. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED

WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR

5. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN,

RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.

PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

DITCH OR WATER COURSE BY USING APPROVED METHODS.

#### INSPECTION AND MAINTENANCE GUIDELINES . THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL INSPECTION AND MAINTENANCE GUIDELINES PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. . INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL BY THE THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES

RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE. . REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES

AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER THAT

ISOMETRIC PLAN VIEW

THE PURPOSE OF A ROCK BERM IS TO SERVE AS A CHECK DAM IN AREAS

OF CONCENTRATED FLOW, TO INTERCEPT SEDIMENT-LADEN RUNOFF, DETAIN

THE SEDIMENT AND RELEASE THE WATER IN SHEET FLOW. THE ROCK BERM

SHOULD BE USED WHEN THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 5

ACRES. ROCK BERMS ARE USED IN AREAS WHERE THE VOLUME OF RUNOFF

IS TOO GREAT FOR A SILT FENCE TO CONTAIN. THEY ARE LESS EFFECTIVE

FOR SEDIMENT REMOVAL THAN SILT FENCES, PARTICULARLY FOR FINE

PARTICLES, BUT ARE ABLE TO WITHSTAND HIGHER FLOWS THAN A SILT FENCE.

AS SUCH, ROCK BERMS ARE OFTEN USED IN AREAS OF CHANNEL FLOWS

(DITCHES, GULLIES, ETC.). ROCK BERMS ARE MOST EFFECTIVE AT REDUCING

BED LOAD IN CHANNELS AND SHOULD NOT BE SUBSTITUTED FOR OTHER

EROSION AND SEDIMENT CONTROL MEASURES FARTHER UP THE WATERSHED.

WOVEN WIF

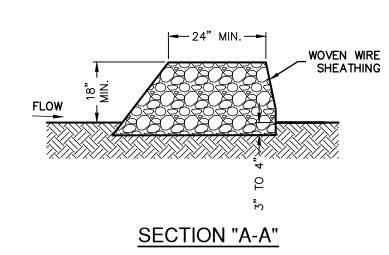
WILL NOT CAUSE ANY ADDITIONAL SILTATION. 3. REPAIR ANY LOOSE WIRE SHEATHING.

ROCK BERMS

I. THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION

. THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

6. THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.



### MATERIALS

1. THE BERM STRUCTURE SHOULD BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM OPENING OF 1 INCH AND A MINIMUM WIRE DIAMETER OF 20 GAUGE GALVANIZED AND SHOULD BE SECURED WITH SHOAT

2. CLEAN, OPEN GRADED 3-INCH TO 5-INCH DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5-INCH TO 8-INCH DIAMETER ROCKS MAY BE

#### INSTALLATION 1. LAY OUT THE WOVEN WIRE SHEATHING PERPENDICULAR TO THE FLOW LINE THE SHEATHING SHOULD BE 20 GAUGE WOVEN WIRE MESH WITH 1 INCH

2. BERM SHOULD HAVE A TOP WIDTH OF 2 FEET MINIMUM WITH SIDE SLOPES

BEING 2:1 (H: V) OR FLATTER. 3. PLACE THE ROCK ALONG THE SHEATHING AS SHOWN IN THE DIAGRAM TO A HEIGHT NOT LESS THAN 18"

4. WRAP THE WIRE SHEATHING AROUND THE ROCK AND SECURE WITH TIE WIRE SO THAT THE ENDS OF THE SHEATHING OVERLAP AT LEAST 2 INCHES, AND THE BERM RETAINS ITS SHAPE WHEN WALKED UPON.

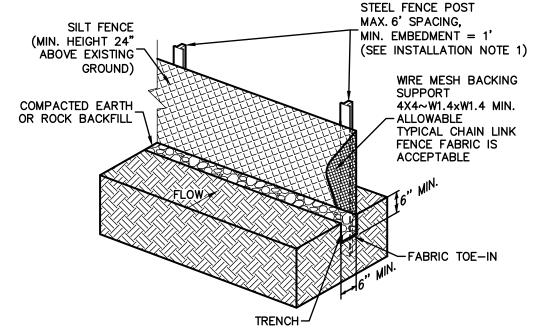
OR AS NEAR AS POSSIBLE. 6. THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.

5. BERM SHOULD BE BUILT ALONG THE CONTOUR AT ZERO PERCENT GRADE

COMMON TROUBLE POINTS . INSUFFICIENT BERM HEIGHT OR LENGTH (RUNOFF QUICKLY ESCAPES OVER THE TOP OR AROUND THE SIDES OF BERM).

2. BERM NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND ONE SIDE).

### **ROCK BERM DETAIL**



SILT FENCE DETAIL

NOT-TO-SCALE

### NOT-TO-SCALE

# -THATCH- GRASS CLIPPINGS AND DEAD LEAVES, UP TO 1/2" THICK. SHOULD BE 1/2"-3/4" THICK, WITH DENSE ROOT MAT FOR STRENGTH. INCORRECT SOD INSTALLATION

USE PEGS OR STAPLES TO FASTEN SOD

FIRMLY - AT THE ENDS OF STRIPS AND

THE STRIPS ARE LONG. WHEN READY TO

MOW, DRIVE PEGS OR STAPLES FLUSH

IN THE CENTER, OR EVERY 3-4 FEET IF

IN CRITICAL AREAS, SECURE SOD WITH NETTING. USE STAPLES.

#### GENERAL INSTALLATION (VA. DEPT. OF CONSERVATION. 1992)

. SOD SHOULD NOT BE CUT OR LAID IN EXCESSIVELY WET OR DRY WEATHER. SOD ALSO SHOULD NOT BE LAID ON SOIL SURFACES THAT ARE FROZEN. 2. DURING PERIODS OF HIGH TEMPERATURE, THE SOIL SHOULD BE LIGHTLY IRRIGATED IMMEDIATELY PRIOR TO LAYING THE SOD, TO COOL THE SOIL AND REDUCE ROOT BURNING AND DIEBACK.

THE FIRST ROW OF SOD SHOULD BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO AND BUTTING TIGHTLY AGAINST EACH OTHER. LATERAL JOINTS SHOULD BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. CARE SHOULD BE EXERCISED TO ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE DRYING OF THE ROOTS (SEE FIGURE ABOVE).

WITH THE GROUND.

4. ON SLOPES 3:1 OR GREATER, OR WHEREVER EROSION MAY BE A PROBLEM. SOD SHOULD BE LAID WITH STAGGERED JOINTS AND SECURED BY STAPLING OR OTHER APPROVED METHODS. SOD SHOULD BE INSTALLED WITH THE LENGTH PERPENDICULAR TO THE SLOPE (ON CONTOUR).

5. AS SODDING OF CLEARLY DEFINED AREAS IS COMPLETED, SOD SHOULD BE ROOTS, BRUSH, WIRE, GRADE STAKES AND OTHER OBJECTS THAT WOULD ROLLED OR TAMPED TO PROVIDE FIRM CONTACT BETWEEN ROOTS AND SOIL. AFTER ROLLING, SOD SHOULD BE IRRIGATED TO A DEPTH SUFFICIENT THAT THE UNDERSIDE OF THE SOD PAD AND THE SOIL 4 INCHES BELOW THE SOD IS

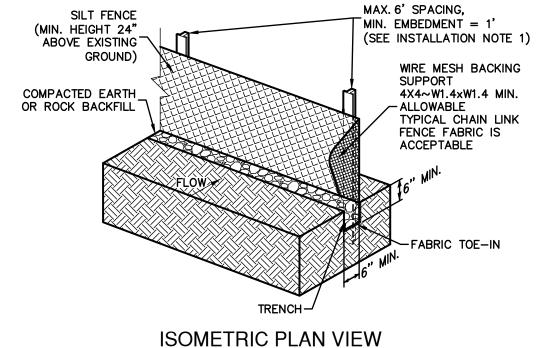
> UNTIL SUCH TIME A GOOD ROOT SYSTEM BECOMES DEVELOPED, IN THE ABSENCE OF ADEQUATE RAINFALL, WATERING SHOULD BE PERFORMED AS OFTEN AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF AT LEAST 8. THE FIRST MOWING SHOULD NOT BE ATTEMPTED UNTIL THE SOD IS FIRMLY ROOTED, USUALLY 2-3 WEEKS. NOT MORE THAN ONE THIRD OF THE GRASS

NSPECTION AND MAINTENANCE GUIDELINES 1. SOD SHOULD BE INSPECTED WEEKLY AND AFTER EACH RAIN EVENT TO LOCATE AND REPAIR ANY DAMAGE.

LEAF SHOULD BE REMOVED AT ANY ONE CUTTING.

DAMAGE FROM STORMS OR NORMAL CONSTRUCTION ACTIVITIES SUCH AS TIRE RUTS OR DISTURBANCE OF SWALE STABILIZATION SHOULD BE REPAIRED AS SOON AS PRACTICAL.

SOD INSTALLATION DETAIL



SILT FENCE

A SILT FENCE IS A BARRIER CONSISTING OF GEOTEXTILE FABRIC SUPPORTED BY METAL POSTS TO PREVENT SOIL AND SEDIMENT LOSS FROM A SITE. WHEN PROPERLY USED. SILT FENCES CAN BE HIGHLY EFFECTIVE AT CONTROLLING SEDIMENT FROM DISTURBED AREAS. THEY CAUSE RUNOFF TO POND, ALLOWING HEAVIER SOLIDS TO SETTLE OUT. IF NOT PROPERLY INSTALLED, SILT FENCES ARE NOT LIKELY TO BE EFFECTIVE.

THE PURPOSE OF A SILT FENCE IS TO INTERCEPT AND DETAIN WATER-BORN SEDIMENT FROM UNPROTECTED AREAS OF A LIMITED EXTENT. SILT FENCE IS USED DURING THE PERIOD OF CONSTRUCTION NEAR THE PERIMETER OF A DISTURBED AREA TO INTERCEPT SEDIMENT WHILE ALLOWING WATER TO PERCOLATE THROUGH. THIS FENCE SHOULD REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED. SILT FENCE SHOULD NOT BE USED WHERE THERE IS A CONCENTRATION OF WATER IN A CHANNEL OF DRAINAGE WAY. IF CONCENTRATED FLOW OCCURS AFTER INSTALLATION, CORRECTIVE ACTION MUST BE TAKEN SUCH AS PLACING A ROCK BERM IN THE AREAS OF CONCENTRATED FLOW.

SILT FENCING WITHIN THE SITE MAY BE TEMPORARILY MOVED DURING THE DAY TO ALLOW CONSTRUCTION ACTIVITY PROVIDED IT IS REPLACED AND PROPERLY ANCHORED TO THE GROUND AT THE END OF THE DAY. SILT FENCES ON THE PERIMETER OF THE SITE OR AROUND DRAINAGE WAYS SHOULD NOT BE MOVED AT ANY TIME.

1. SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE, OR POLYAMIDE WOVEN OR NONWOVEN FABRIC. THE FABRIC SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD, MULLEN BURST STRENGTH EXCEEDING 190 LB/IN2, ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NUMBER 30.

. FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y-BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM WEIGHT 1.25 LB/FT, AND BRINDELL HARDNESS

3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.

1. STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 1-FOOT DEEP AND SPACED NOT MORE THAN 8 FEET ON CENTER. WHERE WATER CONCENTRATES, THE MAXIMUM SPACING SHOULD BE 6 FEET.

. LAY OUT FENCING DOWN-SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS 1/4 ACRE/100 FEET OF FENCE.

3. THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN-SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP). WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.

TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL. 5. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE

4. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE

POST. THERE SHOULD BE A 3-FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET. 6. SILT FENCE SHOULD BE REMOVED WHEN THE SITE IS COMPLETELY

COMMON TROUBLE POINTS 1. FENCE NOT INSTALLED ALONG THE CONTOUR CAUSING WATER TO CONCENTRATE AND FLOW OVER THE FENCE.

STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

2. FABRIC NOT SEATED SECURELY TO GROUND (RUNOFF PASSING UNDER FENCE).

3. FENCE NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING

4. FENCE TREATING TOO LARGE AN AREA, OR EXCESSIVE CHANNEL FLOW (RUNOFF OVERTOPS OR COLLAPSES FENCE).

#### INSPECTION AND MAINTENANCE GUIDELINES 1. INSPECT ALL FENCING WEEKLY, AND AFTER RAINFALL

### 2. REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.

3. REPLACE TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.

4. REPLACE OR REPAIR SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DIKE MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.

WHEN CONSTRUCTION IS COMPLETE, THE SEDIMENT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTATION AND THE PRIOR LOCATION OF THE SILT FENCE SHOULD BE REVEGETATED. THE FENCE ITSELF SHOULD BE DISPOSED OF IN AN APPROVED LANDFILL.

> PIT DETAIL NOT-TO-SCALE

FILTER FABRIC PLAN VIEW SAND BAGS WITH -WASHED PEA 2"x 4"-W1.4x W1.4 GRAVEL FILLER SUPPORTING FABRIC E GRAVEL FILTER\_ AG DETAIL FILTER FABRIC-

**SECTION "A-A"** 

GENERAL NOTES . THE SANDBAGS SHOULD BE FILLED WITH WASHED PEA GRAVEL AND STACKED TO FORM A CONTINUOUS BARRIER ABOUT 1 FOOT HIGH AROUND

2. THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT RUNOFF FROM FLOWING BETWEEN THE BAGS.

INSPECTION AND MAINTENANCE GUIDELINES . INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR . INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY

AND CURB.

2. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. 2. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN A MANNER THAT IT WILL NOT ERODE. SUCH A MATTER THAT IT WILL NOT ERODE. 3. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE AND 3. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE

FILTER FABRIC-

-CURB INLET

WIRE MESH

4. INSPECT FILTER FABRIC AND PATCH OR REPLACE IF TORN OR MISSING. 5. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

**PLAN VIEW** 

**SECTION "A-A** 

CONTRACTOR TO INSTALL 2"x4"-W1.4xW1.4 WIRE MESH SUPPORTING FILTER

FABRIC OVER THE INLET OPENING. FABRIC MUST BE SECURED TO WIRE BACKING

WITH CLIPS OR WIRE TIES AT THIS LOCATION. SAND BAGS FILLED WITH WASHED

PEA GRAVEL SHOULD BE PLACED ON TOP OF WIRE MESH ON TOP OF THE INLET

AS SHOWN ON THIS DETAIL TO HOLD WIRE MESH IN PLACE. SANDBAGS FILLED

WITH WASHED PEA GRAVEL SHOULD ALSO BE PLACED ALONG THE GUTTER AS

SHOWN ON THIS DETAIL TO HOLD WIRE MESH IN PLACE. SAND BAGS TO BE

INSPECTION AND MAINTENANCE GUIDELINES

STACKED TO FORM A CONTINUOUS BARRIER AROUND INLETS.

RUNOFF FROM FLOWING BETWEEN THE BAGS.

SAND BAGS WITH WASHED PEA-GRAVEL FILLER

SEE GRAVEL FILTER\_

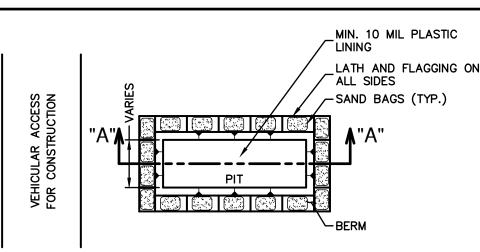
**GENERAL NOTES** 

FILTER FABRIC-

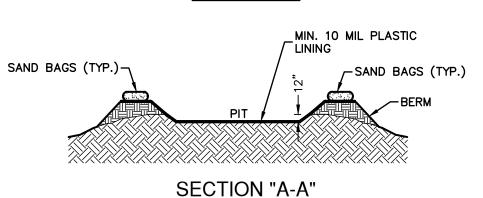
**BAG DETAIL** 

# BAGGED GRAVEL CURB INLET PROTECTION DETAIL

NOT-TO-SCALE



**PLAN VIEW** 



WASTE GENERATED BY WASHOUT OPERATIONS.

GENERAL NOTES . DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.

2. WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC. WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORM WATER RUNOFF.

4. LOCATE WASHOUT AREA AT LEAST 50 FEET FROM SENSITIVE FEATURES, STORM DRAINS, OPEN DITCHES OR WATER BODIES. TEMPORARY CONCRETE WASHOUT FACILITY SHOULD BE CONSTRUCTED WITH SUFFICIENT QUANTITY AND VOLUME TO CONTAIN ALL LIQUID AND CONCRETE

MATERIALS

PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MIL IN POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL

MAINTENANCE WHEN TEMPORARY CONCRETE WASHOUT FACILITIES ARE NO LONGER

REQUIRED FOR THE WORK, THE HARDENED CONCRETE SHOULD BE REMOVED AND DISPOSED OF. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED

HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCES CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE BACKFILLED AND REPAIRED.

CONCRETE TRUCK WASHOUT

INSPECT FILTER FABRIC AND PATCH OR REPLACE IF TORN OR 5. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED. BAGGED GRAVEL GRATE INLET PROTECTION DETAIL

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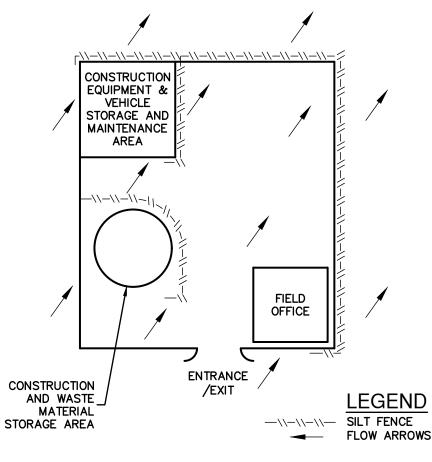
NOT-TO-SCALE **PLAN VIEW SECTION "A-A"** 

. THE FILTER BAG MATERIAL SHALL BE MADE OF POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN FABRIC, MIN. UNIT WEIGHT OF 4 OUNCES/SY, HAVE A MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRAVIOLET STABILITY EXCEEDING 70%.

2. THE FILTER BAG SHALL BE FILLED WITH CLEAN, MEDIUM WASHED PEA GRAVEL TO COARSE GRAVEL (0.31 TO 0.75 INCH DIAMETER). 3. SAND SHALL <u>NOT</u> BE USED TO FILL THE FILTER BAGS.

# GRAVEL FILTER BAG DETAIL

NOT-TO-SCALE



CONSTRUCTION STAGING AREA NOT-TO-SCALE

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE TPDES-STORM WATER POLLUTION PREVENTION PLAN (SWP3) REGULATIONS.

THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF THE SWP3 ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.

**EXHIBIT** 

30001-71 OB NO. JULY 2025 ESIGNER HECKED FG DRAWN C-13

FOR CONSTRUCTION 30007-71

SHOULD BE WORKED INTO THE SOIL TO A DEPTH OF 3 INCHES WITH A DISC, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT. ON SLOPING LAND, THE FINAL HARROWING OR DISCING OPERATION SHOULD BE ON THE CONTOUR.

TORN OR UNEVEN PADS SHOULD NOT BE ACCEPTABLE.

SUSPENDED FROM A FIRM GRASP ON ONE END OF THE SECTION.

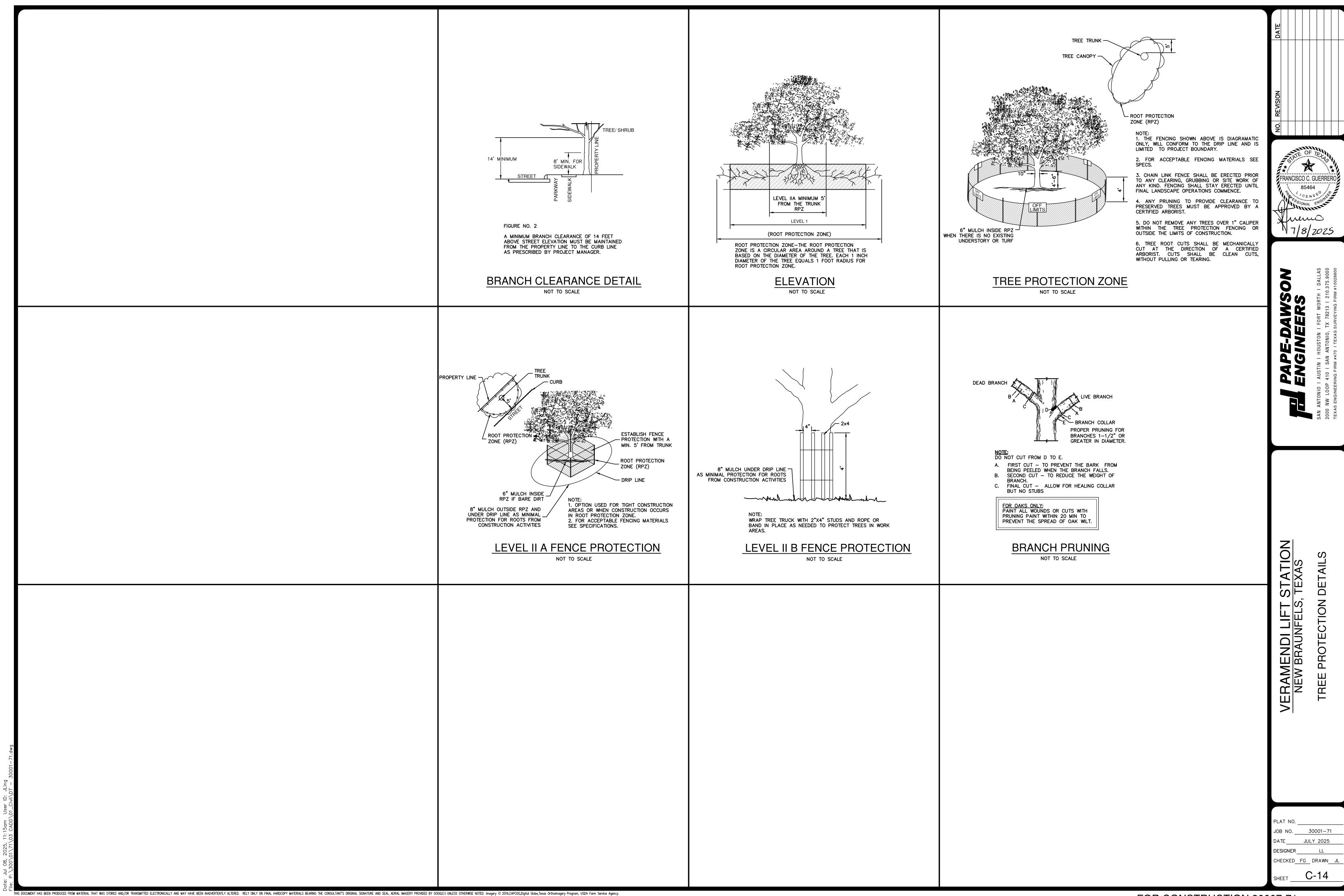
TO FINAL GRADE IN ACCORDANCE WITH THE APPROVED PLAN.

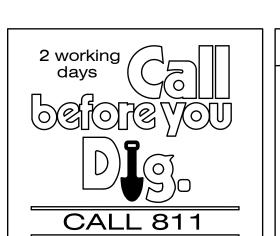
INTERFERE WITH PLANTING, FERTILIZING OR MAINTENANCE OPERATIONS.

INSTALLATION IN CHANNELS . SOD STRIPS IN WATERWAYS SHOULD BE LAID PERPENDICULAR TO THE DIRECTION OF FLOW. CARE SHOULD BE TAKEN TO BUTT ENDS OF STRIPS

TIGHTLY (SEE FIGURE ABOVE).

2. AFTER ROLLING OR TAMPING, SOD SHOULD BE PEGGED OR STAPLED TO RESIST WASHOUT DURING THE ESTABLISHMENT PERIOD. MESH OR OTHER NETTING MAY BE PEGGED OVER THE SOD FOR EXTRA PROTECTION IN CRITICAL





FIXED TEMPERATURE

RECESSED

GROUNDED

UNG

UNGROUNDED

CONDUIT AND WIRING LEGEND \_\_\_\_ \_\_ \_\_ \_\_ \_\_ EXISTING TO BE REMOVED - EXISTING TO REMAIN ——————— UE ————— UE ——— UNDERGROUND ELECTRICAL —————— UF ———— UF ——— UNDERGROUND FIBER OPTIC —— OE —— OE —— OE —— OVERHEAD ELECTRICAL

ONE LINE AND CONTROL SCHEMATIC LEGEND (CONT'D) <u>SYMBOL</u> **DESCRIPTION** ──□┤├─□─ INSTRUMENT TRANSFORMER PT-POTENTIAL TRANSFORMER CONTROL POWER TRANSFORMER. VOLTAGE AS SHOWN LIGHTNING ARRESTOR ---- NORMALLY OPEN CONTACT NORMALLY CLOSED CONTACT —<u>o</u> <u>o</u> momentary pushbutton THREE POSITION MAINTAINED CONTACT SWITCH (MOV)MOTOR OPERATED VALVE SOLENOID VALVE ELAPSED TIME METER TIME DELAY RELAY. TIMES OUT AFTER ENERGIZATION TIME DELAY RELAY. TIMES OUT AFTER DENERGIZATION PILOT LIGHT R=RED B=BLUE G=GREEN A=AMBER Y=YELLOW HIGH LEVEL FLOAT SWITCH LOW LEVEL CUTOFF FLOAT SWITCH MOTOR STARTER FVNR=FULL VOLTAGE NON-REVERSING VFD=VARIABLE FREQUENCY DRIVE WITH BYPASS SIZE SOFT START=ELECTRONIC SOFT START RVNR=REDUCED VOLTAGE NON-REVERSING FVR=FULL VOLTAGE REVERSING MCP=MOTOR CIRCUIT PROTECTOR SIZE=NEMA STARTER SIZE LEVEL SENSOR TERMINATION ENCLOSURE TEMPERATURE SWITCH MOISTURE PROBE SOLENOID VALVE LIMIT SWITCH AMMETER SWITCH VOLTMETER SWITCH PRESSURE SWITCH

# ELECTRICAL DRAWING INDEX

ELECTRICAL NOTES, SYMBOLS AND ABBREVIATIONS

LIGHTING CONTACTOR

**ELECTRICAL SPECIFICATIONS** 

GENERATOR SPECIFICATIONS

GENERATOR / ATS SPECIFICATIONS

SCADA SPECIFICATIONS

ELECTRICAL SITE PLAN

ELECTRICAL ONE-LINE DIAGRAM AND SCHEDULES

ELECTRICAL DETAILS

ELECTRICAL DETAILS

E4.2 ELECTRICAL DETAILS

PUMP CONTROL PANEL DETAILS

PUMP CONTROL DETAILS

SCADA DETAILS

#### ABBREVIATIONS (CONT'D) **ABBREVIATIONS**

AMPERES OR TRIP AMPERES MOTOR CIRCUIT PROTECTOR ALTERNATING CURRENT MINIMUM ABOVE COUNTER TOP MAIN LUGS ONLY MSB MAIN SWITCH BOARD AIR CONDITIONING MTD MOUNTED ABOVE FINISHED FLOOR MTG MOUNTING ABOVE FINISHED GRADE SYMMETRICAL AMPS INTERRUPTING CAPACITY N.C. NORMALLY CLOSED NEC NATIONAL ELECTRICAL CODE AMERICAN WIRE GAGE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION BUILDING **NEUTRAL** CONDUIT NIC NOT IN THIS CONTRACT CABINET N.O. NORMALLY OPEN CAPACITOR NTS NOT TO SCALE CIRCUIT BREAKER ON CENTER CKT CIRCUIT CURRENT LIMITING OVERHEAD OVERLOAD CONNECT OR CONNECTION CONN PHASE CONT'D CONTINUED **CONTR** CONTRACTOR **PHOTOELECTRIC** CONTROL POWER TRANSFORMER CPT PEN PENDANT CURRENT TRANSFORMER **PANELBOARD** COPPER PRESSURE REDUCING VALVE DOUBLE POLYVINYL CHLORIDE DIMENSION RELOCATED DISCONNECT SWITCH RECP RECEPTACLE DIRECT CURRENT REQ'D REQUIRED REQ'MTS REQUIREMENTS ELECTRICAL CONTRACTOR EXHAUST FAN ROOM RM ELECTRICAL SCHEDULE **EMERGENCY** SERVICE ENTRANCE ELECTRICAL METALLIC TUBING SURFACE MOUNT **ENCLOSURE ENCL** SOLID NEUTRAL SN **EQUIP EQUIPMENT** SOV SOLENOID OPERATED VALVE FULL LOAD AMPS SPACES(S) ONLY (NO BREAKER OR DEVICE) FLEX FLEXIBLE CONDUIT SPARE BREAKER OR DEVICE FIXTURE FIX SURGE PROTECTIVE DEVICE GENERAL CONTRACTOR CONTRACT SPECIFICATIONS GALVANIZED STAINLESS STEEL HARDWARE SS GENERATOR SWITCHBOARD GROUND FAULT CIRCUIT INTERRUPTER GROUND FAULT INTERRUPTER SWITCH GEAR TELEPHONE BACKBOARD HAND-OFF-AUTO TTB TELEPHONE TERMINAL BOARD HORSEPOWER HEIGHT UNDERGROUND ELECTRIC HEATER UNDERWRITERS LABORATORIES HERTZ UNLESS OTHERWISE NOTED JUNCTION BOX UNDERGROUND TELEPHONE **KCMIL** THOUSAND CIRCULAR MILLS **VOLT AMPERES** KILOVOLT AMPERES KILOWATT KILOWATT HOURS WATER HEATER LIGHTNING ARRESTOR WEATHER PROOF LINE TO LINE TRANSFORMER LINE TO NEUTRAI XMTR TRANSMITTER LIGHT OR LIGHTING SINGLE CONDUCTOR CABLE MECHANICAL CONTRACTOR THREE CONDUCTOR CABLE MAIN CIRCUIT BREAKER MOTOR CONTROL CENTER

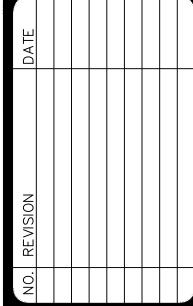
### GENERAL NOTES: (APPLICABLE TO ALL ELECTRICAL SHEETS)

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, ALL CITY, COUNTY, AND STATE REGULATIONS, NFPA, ANSI, UL, IEEE, AND THE LOCAL CODE AUTHORITY HAVING JURISDICTION. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS AND INSPECTIONS.
- ALL ELECTRICIANS SHALL BE LICENSED BY THE APPROPRIATE CITY, STATE, OR LOCAL CODE AUTHORITY HAVING JURISDICTION.
- 3. THE ELECTRICAL CONTRACTOR SHALL FOLLOW ALL OSHA AND OWNER SAFETY RULES AS REQUIRED TO WORK ON THIS SITE.
- ALL INSTALLATIONS SHALL BE DONE IN A NEAT AND WORKMAN LIKE MANNER.
- ALL POWER OUTAGES SHALL BE PERFORMED DURING NON-BUSINESS HOURS. COORDINATE ALL POWER OUTAGES WITH THE OWNER. NOTIFY THE OWNER IN WRITING 10 DAYS PRIOR TO SCHEDULING ANY POWER OUTAGES.
- 6. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL TEMPORARY ELECTRICAL POWER AND LIGHTING REQUIRED FOR THIS PROJECT.
- THE DEMOLITION DRAWINGS (IF APPLICABLE) ARE DIAGRAMMATIC IN NATURE. THE ELECTRICAL CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH THE PROJECT SCOPE OF WORK PRIOR TO SUBMITTING THEIR BID.
- THE ELECTRICAL CONTRACTOR SHALL VERIFY THE ELECTRICAL REQUIREMENTS OF ALL OWNER PROVIDED EQUIPMENT AND SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
- 9. ALL WORK SHOWN ON DRAWINGS IS NEW UNLESS OTHERWISE NOTED.
- 10. ALL GROUNDING SHALL BE PER NEC AND LOCAL CODES.
- 11. ALL ELECTRICAL CONSTRUCTION ON THE PROJECT SHALL CONFORM TO THE NEC AND ALL OTHER AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED AND PAY ALL FEES.
- 12. ALL WIRING SHALL BE FREE OF SHORTS AND GROUNDS. NO CIRCUIT WIRING SHALL BE LOADED BEYOND THE PERMITTED AMPACITIES ALLOWED BY THE NEC. ALL WIRE SIZES ARE FOR COPPER.
- 13. CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO SUBMITTING BID.
- ELECTRICAL CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND MATERIALS NECESSARY TO MAKE A COMPLETE AND WORKABLE JOB INCLUDING FINAL HOOK-UP OF ALL EQUIPMENT.
- 15. FIRE STOP SHALL BE PROVIDED AT ALL LOCATIONS WHERE ELECTRICAL EQUIPMENT OR SYSTEMS PENETRATE FIRE RATED WALLS. SEE ARCHITECTURAL PLANS FOR RATED WALL LOCATIONS. CONTROL WIRING TO MECHANICAL EQUIPMENT IS NOT SHOWN ON THESE SHEETS.
- RISER AND ONE-LINE DIAGRAMS ARE MEANT TO SHOW ONLY VERTICAL AND ELECTRICAL RELATIONSHIPS AND THEREFORE MAY NOT INCLUDE ALL REQUIRED EQUIPMENT, DEVICES AND ACCESSORIES.
- EQUIPMENT INTERRUPTING CAPACITIES SPECIFIED IN THE CONTRACT DOCUMENTS ARE BASED UPON EQUIPMENT CHARACTERISTICS AND IMPEDANCES SHOWN ON THE DRAWINGS. IF ACTUAL INSTALLED EQUIPMENT DEVIATES FROM THESE CHARACTERISTICS OR HAS LOWER IMPEDANCES THE CONTRACTOR SHALL INCREASE THE INTERRUPTING CAPACITIES OF ALL ITEMS ON THE LOAD SIDE OF THE DEVIANT EQUIPMENT IN DIRECT PROPORTION TO THE CHANGED CHARACTERISTICS. INTERRUPTING CAPACITIES SHALL NOT BE REDUCED TO VALUES LESS THAN THOSE REQUIRED BY THE CONTRACT DOCUMENTS.
- 18. EQUIPMENT SIZES ARE AS DESIGNED. CIRCUIT BREAKERS, CONDUIT, MOTOR STARTERS, DISCONNECT SWITCHES, PLUG-IN'S, ETC., SHALL BE ADJUSTED TO THE EQUIPMENT SUBMITTED AND APPROVED FOR INSTALLATION ON THIS PROJECT.
- 19. LIGHT FIXTURE MOUNTING HEIGHTS ARE MEASURED BETWEEN THE FLOOR AND THE BOTTOM OF THE FIXTURE.



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THE LIFT STATION SHALL OPERATE PER THE SEQUENCE OF OPERATIONS AS NOTED ON THE CIVIL DRAWINGS AND SPECIFICATIONS. PLEASE NOTIFY THE ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES.





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OB NO. 30001-71 APRIL 2024 ESIGNER DRAWN GB HECKED

#### 1.01 WORK INCLUDED

#### A. ELECTRICAL SYSTEMS

#### 1.02 RELATED WORK

- A. THE WORK COVERED BY THIS SPECIFICATION CONSISTS OF FURNISHING ALL LABOR, SUPPLIES AND MATERIALS, SHOP DRAWINGS AND A LIST OF MAKE AND CATALOG NUMBERS OF ALL EQUIPMENT AND MATERIALS TO BE INSTALLED AND PERFORMING ALL OPERATIONS, INCLUDING INSTALLATION OF LIGHTING FIXTURES, ELECTRICAL EQUIPMENT, CUTTING AND PATCHING, COORDINATION WITH OTHER TRADES ON THE JOB, ETC., NECESSARY FOR THE INSTALLATION OF COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS AND HEREINAFTER SPECIFIED. THESE SPECIFICATIONS SUPPLEMENT THE GENERAL CONDITIONS AND SPECIFICATIONS.
- B. EXAMINATION OF SITE: THE CONTRACTOR SHALL THOROUGHLY EXAMINE SITE AND SATISFY HIMSELF AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. THE CONTRACTOR SHALL VERIFY AT THE SITE ALL MEASUREMENTS AFFECTING HIS WORK AND SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF THE SAME. NO EXTRA COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR EXPENSES DUE TO HIS NEGLECT TO EXAMINE OR FAILURE TO DISCOVER CONDITIONS WHICH AFFECT HIS WORK. NO EXTRA COMPENSATION WILL BE ALLOWED ON ACCOUNT OF DIFFERENCES BETWEEN ACTUAL DIMENSIONS AND THOSE INDICATED ON THE DRAWINGS.
- C. THE AGREEMENT FORMS, GENERAL CONDITIONS AND SUPPLEMENTARY CONDITIONS OF THE SPECIFICATIONS SHALL APPLY TO THE WORK SPECIFIED IN DIVISION 26.

#### 1.03 DEFINITION

- A. "WIRING": WIRE OR CABLE, INSTALLED IN RACEWAY WITH ALL REQUIRED BOXES, FITTINGS, CONNECTORS AND ACCESSORIES, COMPLETELY INSTALLED.
- B. "FEEDER": WIRING TO ANY DEVICE OR EQUIPMENT IN WHICH NUMBER SIX AWG COPPER (#6 CU) OR LARGER CONDUCTORS ARE USED.
- C. "POWER WIRING": WIRING TO ANY DEVICE OR EQUIPMENT SERVED BY A MULTI-POLE BREAKER.

#### 1.04 QUALITY ASSURANCE

- A. CODES: COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) AND ANY OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK
- B. PERMITS AND INSPECTIONS: PROVIDE ALL PERMITS REQUIRED AND OBTAIN FINAL INSPECTION AND APPROVAL FROM THE INSPECTION DEPARTMENT HAVING JURISDICTION.
- C. WHERE DIFFERENT SECTIONS OF ANY APPLICABLE CODES SPECIFY DIFFERENT MATERIALS, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE SHALL GOVERN.
- D. STANDARDS FOR MATERIAL AND WORKMANSHIP: USE MATERIALS THAT ARE NEW AND LISTED AND LABELED BY UNDERWRITERS LABORATORIES (UL)
  AS CONFORMING TO ITS STANDARDS, WHERE SUCH A STANDARD HAS BEEN ESTABLISHED FOR THE PARTICULAR TYPE OF MATERIAL IN QUESTION.
  EXECUTE WORK IN A WORKMAN LIKE MANNER, TO PRESENT A NEAT AND MECHANICAL APPEARANCE WHEN COMPLETED.

#### 1.05 SUBSTITUTION OF MATERIALS

- A. NO SUBSTITUTION OF MATERIAL IS ALLOWED WITHOUT WRITTEN PRIOR AUTHORIZATION FROM THE ENGINEER AND OWNER. DETERMINATION OF WHAT IS CONSIDERED EQUAL IS AT THE SOLE DISCRETION OF THE ENGINEER AND OWNER.
- B. INCLUDE SUFFICIENT DESCRIPTIVE INFORMATION, INCLUDING MANUFACTURER'S PUBLISHED DATA TO ESTABLISH CONTRACT COMPLIANCE. SUBMIT SAMPLES IF REQUESTED BY ARCHITECT/ENGINEER.

#### 1.06 DRAWINGS AND SPECIFICATIONS

A. THE WIRING LAYOUTS ARE SCHEMATIC AND DO NOT NECESSARILY SHOW THE EXACT LOCATION OF RACEWAYS, OUTLETS, ETC. REFER TO THE ARCHITECTURAL DRAWINGS FOR ACTUAL DIMENSIONS. FIT WORK TO CONFORM TO THE DETAILS OF BUILDING CONSTRUCTION. COORDINATE ALL WORK TO ASSURE PROPER CLEARANCE.

#### 1.07 AS-BUILT DRAWINGS

- A. AS WORK PROGRESSES, RECORD ON ONE (1) SET OF ELECTRICAL PRINTS ALL CHANGES AND DEVIATIONS FROM THE CONTRACT DOCUMENTS IN SIZE, LOCATIONS AND TYPES OF ALL MATERIALS AND EQUIPMENT. RECORD FINAL LOCATION OF OUTLETS, SWITCHES, STARTERS, UNDERGROUND AND EXPOSED CONDUITS, ETC. TO INDICATE THE FINAL INSTALLATION. MAKE SUFFICIENT MEASUREMENTS TO LOCATE ALL EQUIPMENT AND CONDUITS. PROVIDE AS—BUILT DRAWINGS.
- B. THE CONTRACTOR SHALL PREPARE A TYPED PANEL DIRECTORY FOR EACH PANEL UTILIZED FOR THIS PROJECT. THIS DIRECTORY SHALL IDENTIFY THE CIRCUIT NUMBER, DEVICES SERVED, AND LOCATION OF DEVICES BY ROOM NUMBER. HE SHALL FILE THEM WITH THE BUILDING MANAGER WHEN THE WORK IS COMPLETE.

### 1.08 MAINTENANCE DATA

A. FURNISH AND DELIVER TO THE ARCHITECT/ENGINEER TWO (2) COMPLETE COPIES OF ALL DATA PREPARED BY MANUFACTURERS, DETAILING OPERATION AND MAINTENANCE INSTRUCTION FOR ALL EQUIPMENT.

### 1.09 PENETRATIONS, CUTTING, AND PATCHING

- A. PERFORM CUTTING AND PATCHING IN ACCORDANCE WITH THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THE CONTRACT.
- B. PROVIDE ALL SLEEVES REQUIRED FOR PROPER INSTALLATION OF WORK INCLUDED IN THIS SECTION.
- C. MAKE ALL PENETRATIONS THROUGH WALLS AT 90 DEGREE ANGLES. SEAL ALL PENETRATIONS AT FIRE AND SMOKE PARTITIONS WITH FIRE SAFING MATERIAL. SEAL ALL PENETRATIONS AT SOUND WALLS WITH SOUNDPROOFING MATERIAL.

### 1.10 SUBMITTALS

- A. SHOP DRAWINGS AND MATERIAL BROCHURES: FURNISH AN ELECTRONIC SET OF SHOP DRAWINGS AND PRODUCT DATA IN PDF FORMAT TO THE ARCHITECT/ENGINEER ON THE FOLLOWING MATERIALS:
- 1. LIGHTING FIXTURES
- 2. DISCONNECT SWITCHES
- 3. TRANSFORMERS
- 4. RACEWAYS5. CONDUCTORS
- 6. MOTOR CONTROLLERS
- 7. SWITCHGEAR, PANELBOARDS
- 8. CONTROL PANELS
- 9. INSTRUMENTATION
- 10. GENERATOR & ATS
- 11. SCADA

# 1.11 COOPERATION

A. THE CONTRACTOR SHALL SCHEDULE HIS WORK, AND IN EVERY WAY POSSIBLE, COOPERATE WITH ALL OTHER TRADES IN THE JOB TO AVOID DELAYS, INTERFERENCES AND UNNECESSARY WORK. HE SHALL COOPERATE WITH THEM IN PROVIDING FOR THE INSTALLATION OF THIS WORK AND COORDINATE WITH WORK OF OTHER TRADES TO ASSURE PROPER CLEARANCE OF PIPING, DUCTWORK, CONDUIT, ETC. WHEN SUCH IS REQUIRED.

### 1.12 WIRING WORKMANSHIP

- A. RUN WIRING IN ALL BRANCH CIRCUIT PANELBOARDS AND TERMINAL CABINETS PARALLEL OR AT RIGHT ANGLES TO THE SIDES OR TOP OF THE EQUIPMENT HOUSING.
- B. GROUP AND HARNESS CONDUCTORS TOGETHER USING LOCKING TYPE CABLE TIES. CABLE TIES: AS MANUFACTURED BY THE PANDUIT CORPORATION OR THOMAS AND BETTS.

#### 1.13 STORAGE MATERIALS

A. KEEP THE BUILDING AND PREMISES CLEAN AND CLEAR OF SCRAP MATERIALS AT ALL TIMES. STORE MATERIALS AND EQUIPMENT IN DESIGNATED

#### 1.14 ORDERING OF MATERIALS

A. ORDER MATERIALS AND EQUIPMENT SO AS NOT TO JEOPARDIZE PROGRESS OF CONSTRUCTION OR COMPLETION DATE.

#### 1.15 SAFETY PRECAUTIONS AND PROGRAMS

A. IT SHALL BE THE DUTY AND RESPONSIBILITY OF THE CONTRACTOR AND ALL OF ITS SUBCONTRACTORS TO BE FAMILIAR AND COMPLY WITH ALL REQUIREMENTS OF PUBLIC LAW 91-96, 29 U.S.C. SECS. 651 ET. SEQ., THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (OSHA), AND ALL AMENDMENTS THERETO AND TO ENFORCE AND COMPLY WITH ALL OF THE PROVISIONS OF THIS ACT. IN ADDITION, ON PROJECTS IN WHICH TRENCH EXCAVATION WILL EXCEED A DEPTH OF FIVE FEET (5'), THE CONTRACTOR AND ALL OF ITS SUBCONTRACTORS SHALL COMPLY WITH ALL REQUIREMENTS OF 29 C.F.R., SECS. 1926.652 AND 1926.653, OSHA SAFETY AND HEALTH STANDARDS.

#### 1.16 WARRANTY

A. GUARANTEE ALL WORK UNDER THIS SECTION FOR WORKMANSHIP, LABOR AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER OR HIS AUTHORIZED REPRESENTATIVE.

#### PART 2 - PRODUCTS AND EXECUTION

#### 2.01 CONDUIT

A. EXCEPT AS OTHERWISE NOTED, SPECIFIED OR REQUIRED, INSTALL ALL WIRES USED IN THIS PROJECT IN CONDUIT AS HEREINAFTER SPECIFIED:

BELOW GRADE: SCHEDULE 40 PVC
ABOVE GRADE (OUTSIDE): ALUMINUM RIGID
ABOVE GRADE (INSIDE): ALUMINUM RIGID
ELBOWS: PVC COATED RIGID STEEL

- B. INSTALL CONDUITS CONTINUOUS FROM OUTLET TO OUTLET, FROM OUTLET TO CABINET, JUNCTION BOX AND PULL BOX. SECURE CONDUITS TO ALL BOXES, ETC., IN SUCH A MANNER THAT EACH SYSTEM WILL BE ELECTRICALLY CONTINUOUS FROM SERVICE TO ALL OUTLETS. TERMINATE ALL CONDUIT RUNS FROM CABINETS AND JUNCTION BOXES IN APPROVED OUTLET BOXES. INSTALL CONDUITS AS HIGH AS POSSIBLE UP AGAINST STRUCTURE ABOVE. AVOID ROUTING CONFLICTS WITH HVAC EQUIPMENT/DUCTWORK, SANITARY WASTE, VENT PIPING, AND DOMESTIC WATER PIPING.
- C. INSTALL A NYLON PULL WIRE (200 LB. TEST) AND TIE ENDS IN ALL CONDUIT LINES LEFT EMPTY FOR FUTURE USE.
- D. TRAPPED OR INACCESSIBLE JUNCTION BOXES, OUTLETS, ETC. ARE NOT ALLOWED.
- E. GENERALLY, CONCEAL ALL CONDUITS UNLESS OTHERWISE DIRECTED OR INDICATED ON THE DRAWINGS.

H. INCREASE CONDUIT SIZES SHOWN ON THE PLANS AS REQUIRED FACILITATING PULLING OF CONDUCTORS.

- F. NO BENDS PERMITTED WITH A RADIUS LESS THAN SIX (6) TIMES THE DIAMETER OF THE CONDUIT OR MORE THAN 900.
- O DECLINE HINESTERN DOVES OF THE POVES TO AVOID EVERSOINE DUNS OF TOO MANY DENIES DETWEEN CHITETE
- G. PROVIDE JUNCTION BOXES OR PULL BOXES TO AVOID EXCESSIVE RUNS OR TOO MANY BENDS BETWEEN OUTLETS.
- I. RUN ALL CONDUITS PARALLEL TO OR AT RIGHT ANGLES TO THE BUILDING WALLS AND SUPPORT FROM WALLS OR CEILINGS AT INTERVALS REQUIRED BY CODE WITH APPROVED CLAMPS OR HANGERS.
- J. INSTALL APPROVED APPLETON, CROUSE HINDS, OR O.Z. MANUFACTURING CO. EXPANSION FITTINGS IN ALL EMT RUNS WHICH PASS THROUGH EXPANSION JOINTS IN THE BUILDING. OTHER METHODS TO PROVIDE FOR THIS EXPANSION MUST BE APPROVED BY THE ARCHITECT/ENGINEER.

#### 2.02 WIRING

- A. INSTALL WIRING AS FOLLOWS:
  - 1. FEEDERS AND POWER WIRING: CONDUCTORS IN RIGID ALUMINUM RIGID CONDUIT WHEN INSTALLED IN DRY LOCATION ABOVE GRADE. SCHEDULE 40 PVC WHEN INSTALLED BELOW GRADE. USE PVC COATED RIGID ELBOWS.
  - 2. BRANCH CIRCUITS: INSTALL CONDUCTORS IN ALUMINUM RIGID CONDUIT.

GREEN

- 3. INSTALL ALL WIRING IN CONDUIT. USE ONLY UL LISTED LUBRICANTS IN PULLING THE CONDUCTORS.
- 4. INSTALL CONDUCTORS CONTINUOUS FROM OUTLET TO OUTLET AND FROM OUTLET TO JUNCTION BOX OR PULL BOX. INSTALL SPLICES AND JOINTS CAREFULLY AND SECURELY TO BE MECHANICALLY AND ELECTRICALLY SOLID WITH PRESSURE TYPE CONNECTORS. USE 3M "SCOTCHLOCK" OR IDEAL "WING NUT" OR EQUAL TWIST—ON CONNECTORS FOR #10 AND SMALLER CONDUCTORS.

**GREEN** 

5. CONNECT CONDUCTORS FOR LIGHTING AND RECEPTACLE CIRCUITS TO THE PANEL AS DETAILED WITH COLOR CODED JACKET. COLOR CODE ALL WIRES WITH THE TYPE, SIZE, MAKE AND VOLTAGE MARKED ON IT. COLOR CODE WIRING WITH THE SAME COLOR BEING USED WITH ITS RESPECTIVE PHASE AS FOLLOWS, UNLESS OTHERWISE REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

	120/240 VOLT DELTA	120/208 VOLT WYE	480/277 VOLT WYE
PHASE A	RED	RED	BROWN
PHASE B	ORANGE	BLACK	YELLOW
PHASE C	BLACK	BLUE	PURPLE
NEUTRAL	WHITE	WHITE	GRAY

- 6. BRANCH CIRCUIT CONDUCTORS SHALL NOT BE SMALLER THAN NO. 12 AWG. INCREASE THE WIRE SIZES UP ONE (1) SIZE WHEREVER THE RUN DISTANCE EXCEEDS 200 FEET.
- 7. ALL WIRING AND CABLE INCLUDING FIBER OPTIC, ELECTRICAL, DATA, TELECOMMUNICATIONS, TEMPERATURE CONTROLS, SECURITY, FIRE PROTECTION, ETC. SHALL BE RUN IN CONDUIT.

GREEN

- 8. ELECTRICAL CONTRACTOR MAY GROUP WIRES WITH SAME VOLTAGE FOR FIELD DEVICES IN CONDUIT AS HE DEEMS BEST APPROPRIATE.
- 9. ANALOG AND LOW VOLTAGE SIGNALS SHALL NOT RUN IN SAME CONDUIT AS 120VAC AND 480VAC CIRCUITS.

### 2.03 CONDUCTORS

GROUND

- A. COPPER OF 98% CONDUCTIVITY.
- B. NO. 10 AND SMALLER: SOLID TYPE SIMPULL XHHW-2, EXCEPT AS OTHERWISE NOTED.
- C. NO. 8 AND LARGER: STRANDED, TYPE SIMPULL XHHW-2, EXCEPT AS OTHERWISE NOTED.
- D. MINIMUM SIZE CONDUCTORS USED SHALL BE NO. 12 AWG FOR ALL APPLICATIONS EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE (A.C. CONTROLS, ETC.).
- E. USE WIRE AND CABLE FROM ONE (1) MANUFACTURER. DELIVER IN THE ORIGINAL WRAPPING BEARING THE UNDERWRITERS LABORATORIES (UL)

### 2.04 OUTLETS

- A. USE GALVANIZED STEEL OR CAST TYPE BOXES AT ALL OUTLETS FOR LIGHTING FIXTURES, WALL SWITCHES, WALL RECEPTACLES, ETC.
- B. SECURELY ATTACH OUTLET BOXES FOR FIXTURES AND DEVICES TO THE BUILDING CONSTRUCTION WITH EXPANSION BOLTS.
- C. FLUSH MOUNT ALL OUTLET BOXES, REGARDLESS OF WALL OR CEILING CONSTRUCTION, UNLESS THEY ARE SPECIFICALLY SHOWN AS BEING USED WITH EXPOSED CONDUIT. IF SURFACE MOUNTED, USE CAST TYPE AS SPECIFIED ABOVE. UTILITY BOXES ARE NOT ALLOWED.

### 2.05 INSTALLATION

- A. INSTALL RACEWAYS EXPOSED. SUPPORT EXPOSED RACEWAYS AT INTERVALS NOT EXCEEDING TEN FEET (10') WITH MACHINE SCREWS FOR METAL CONSTRUCTION AND EXPANSION BOLTS FOR CONCRETE CONSTRUCTION.
- B. INSTALL THE EDGES OF ALL OUTLET BOXES FLUSH WITH THE SURFACE IN WHICH THEY ARE RECESSED. SCREW ATTACH INTERNAL DEVICES BEFORE ATTACHING COVERPLATE. DO NOT USE COVERPLATES AS A MEANS OF TIGHTENING THE DEVICES IN PLACE.

#### 2.06 DISCONNECT AND FEEDER SWITCHES

- A. FEEDER SWITCHES AND DISCONNECT SWITCHES: HEAVY DUTY, EXCEPT AS OTHERWISE NOTED. IN DAMP LOCATIONS OR EXPOSED TO THE WEATHER, USE NEMA 3R, RAINTIGHT.
- B. DISCONNECT SWITCHES: FACTORY INSTALLED PROVISION FOR PADLOCKING IN EITHER THE "ON" OR "OFF" POSITION.

#### 2.07 FUSES

A. FUSES: BUSSMANN OR APPROVED EQUAL.

#### 2.08 LABFLING

- A. LABEL ALL PANELS, CONTROL POINTS, SWITCHES, AND MOTORS, AS DIRECTED. IDENTIFY PANELS BY PANEL NUMBER. LABEL SWITCHES, INDICATING THE EQUIPMENT WHICH THEY CONTROL. ALL LABELS SHALL BE ENGRAVED. PANEL DIRECTORIES TO BE TYPED. COORDINATE ALL EQUIPMENT NUMBERING WITH MECHANICAL CONTRACTOR.
- B. INSTALL ARC FLASH HAZARD LABELS ON ALL NEW SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS, METER SOCKET ENCLOSURES AND MOTOR CONTROL CENTERS PER NEC 110.16. PANDUIT #PPS0305W2100 OR EQUAL.

#### 2.09 GROUNDING

A. PROVIDE GROUNDING FOR ELECTRICAL SYSTEM IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC)

### 2.10 COVERPLATES

- A. WHERE WIRING DEVICES ARE FLUSH MOUNTED, INSTALL STAINLESS STEEL COVERPLATES.
- B. WHERE WIRING DEVICES ARE SURFACE MOUNTED, INSTALL FORMED STEEL COVERPLATES WITH CADMIUM PLATING.
- C. WHERE WEATHERPROOF COVERPLATES ARE REQUIRED, MEET UL "WET LOCATION COVER CLOSED" REQUIREMENTS. USE COVERPLATES THAT ARE HINGED AND GASKETED WITH SPRING LOADED CLOSER.
- D. INSTALL FINISHED COVERPLATES ON ALL JUNCTION BOXES, OUTLET BOXES, SECTIONAL SWITCH BOXES, UTILITY BOXES, ETC.
- E. WHERE MORE THAN ONE (1) DEVICE IS INDICATED AT A LOCATION, MOUNT DEVICES IN COMBINED SECTION GANG BOXES, COVERED BY A COMMON PLATE.

#### 2.11 RECEPTACLES

- A. DUPLEX RECEPTACLES: 20 AMPERE, 125 VOLT, SELF OR AUTOMATIC GROUNDING, GFCI.
- B. SPECIAL MOUNTING HEIGHTS ARE NOTED ON THE ARCHITECTURAL DRAWINGS. UNLESS OTHERWISE INDICATED ON THE ELECTRICAL DRAWINGS, MOUNT DEVICES AT THE FOLLOWING HEIGHTS ABOVE FINISHED FLOOR:

MODITI DEVICES AT THE POLEOWING HEIGHTS	/IDOVI
1. DUPLEX RECEPTACLE	18"
2. WALL SWITCHES	48"
3. VOICE & VOICE/DATA OUTLETS	18"
4. WALL TELEPHONE OUTLETS	48"

#### 2.12 SWITCHES

A. PROVIDE HEAVY-DUTY, AC, QUIET SWITCHES. THE SWITCHES SHALL BE HUBBELL 1221 OR EQUAL, 120-277 VOLT, 20 AMPERES, SPECIFICATION GRADE. SWITCHES SHALL BE SINGLE POLE, DOUBLE POLE, THREE WAY, FOUR WAY, OR KEY OPERATED AS SCHEDULED ON THE DRAWINGS AND SHALL BE THE SELF GROUNDING TYPE. COLOR SHALL BE IVORY.

#### 2.13 LIGHTING FIXTURES

- A. PROVIDE ALL LIGHTING FIXTURES, AS SCHEDULED ON DRAWINGS, COMPLETE WITH LAMPS AND HARDWARE. INSTALL COMPLETELY WIRED, CONNECTED AND IN OPERATING ORDER.
- B. CONFIRM ALL CEILING CONDITIONS, CLEARANCES AND OPERATING VOLTAGES BEFORE ORDERING LIGHTING FIXTURES.
- C. SUBMIT SHOP DRAWINGS.

#### 13.1 LAMPS

A. INSTALL SCHEDULED LAMPS MANUFACTURED BY GENERAL ELECTRIC, PHILLIPS, OR APPROVED EQUAL.

### 2.13.2 FIXTURES

- A. PROVIDE LIGHTING FIXTURES WHICH HAVE BEEN TESTED AND CERTIFIED FOR PROPER OPERATION BY THE FIXTURE'S MANUFACTURER.
- B. PROVIDE LIGHTING FIXTURES WITH TRIM COMPATIBLE WITH CEILING OR SURFACE ON OR IN WHICH INSTALLED.
- C. EACH LUMINAIRE SHALL HAVE TWO SUPPORT WIRES INSTALLED, ONE ON EACH END, AT DIAGONAL CORNERS. LUMINAIRES IN FIRE RATED CEILINGS SHALL BE SUPPORTED ON ALL FOUR CORNERS.
- D. SUPPORT AND SECURELY ATTACH WITH GALVANIZED FASTENERS IN A LEVEL POSITION.
- E. INSTALL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

F. FIRE RATED ASSEMBLIES, COMPLY WITH DETAILS OF LISTED ASSEMBLY.

### 2.14 TEMPORARY POWER

A. PROVIDE TEMPORARY POWER (SMALL TOOL) AND LIGHTING PER OSHA REQUIREMENTS.

S. Kanetzky

14425 Falcon Head Blvd.
Building B, Suite 100
Bee Cave, Texas 78738
(512) 326-3380
www.skaneng.com
TBPE Firm No. F-2356
SKE PROJECT # 2390424

Engineering, LLC.

THE LIFT STATION SHALL OPERATE PER THE SEQUENCE OF OPERATIONS AS NOTED ON THE CIVIL DRAWINGS AND SPECIFICATIONS. PLEASE NOTIFY THE ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES.

NO. REVISION DATE

STEVE L. KANETZKY

8 4696

10/25/24

PAPE-DAWSO

FILE ENGINEERS

SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DA

2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375

VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS

CITY NO.

JOB NO. 30001-71

DATE APRIL 2024

DESIGNER RM

CHECKED DRAWN GB

#### <u>GENERAL</u>

#### 1.1 REFERENCES AND STANDARDS

THE GENERATOR SET COVERED BY THESE SPECIFICATIONS SHALL BE DESIGNED, TESTED, RATED, ASSEMBLED AND INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE STANDARDS BELOW:

- CSA C22.2 NO14
- CSA 282 CSA 100
- EN61000-6
- EN55011 FCC PART 15 SUBPART B
- IS08528 IEC61000
- UL508
- UL2200 • UL142 DESIGNED TO ALLOW FOR INSTALLED COMPLIANCE TO NFPA 70, NFPA99 AND NFPA 110

#### 1.2 RELATED SECTIONS

#### <u>1.2.1 DIVISION 3 — STRUCTURAL CONCRETE</u>

#### 1.2.2 DIVISION 15 - MECHANICAL

#### 1.3 WORK INCLUDED

#### 1.3.1 INSTALLATION

THE WORK INCLUDES SUPPLYING AND INSTALLING A COMPLETE INTEGRATED GENERATOR SYSTEM. THE SYSTEM CONSISTS OF A DIESEL GENERATOR SET WITH RELATED COMPONENT ACCESSORIES AND AUTOMATIC TRANSFER SWITCH(ES) SPECIFIED UNDER A SEPARATE SECTION.

THE CONTRACTOR SHALL PROVIDE A FULL TANK OF DIESEL FUEL AFTER THE COMPLETION OF ALL TESTING.

A COMPLETE SYSTEM LOAD TEST SHALL BE PERFORMED AFTER ALL EQUIPMENT IS INSTALLED. GUIDELINES IN THE START-UP SECTION.

#### 1.3.4 REQUIREMENTS, CODES AND REGULATIONS

THE EQUIPMENT SUPPLIED AND INSTALLED SHALL MEET THE REQUIREMENTS OF THE NEC AND ALL APPLICABLE LOCAL CODES AND REGULATIONS. ALL EQUIPMENT SHALL BE OF NEW AND CURRENT PRODUCTION BY A MANUFACTURER WHO HAS 25 YEARS OF EXPERIENCE BUILDING THIS TYPE OF EQUIPMENT. MANUFACTURER SHALL BE ISO9001 CERTIFIED.

#### 1.3.5 APPROVED MANUFACTURES

THE STANDBY DIESEL GENERATOR SHALL BE SUPPLIED BY

- SOUTHERN PLAINS CUMMINS®
- HOLT CAT® LOFTIN – KOHLER POWER SYSTEMS®
- KIRBY STEWART & STEVENSON®

OR BY ALTERNATE MANUFACTURES WHO SHALL SUBMIT A REQUEST TWO WEEKS PRIOR TO BID AND INCLUDE A WRITTEN LIST OF DEVIATIONS FROM THIS SPECIFICATION TO BE CONSIDERED FOR APPROVAL.

PROPOSED DEVIATIONS FROM THE SPECIFICATIONS SHALL BE TREATED AS FOLLOWS:

#### 1.4.1 SUBSTITUTION TIME REQUIREMENT

REQUESTS FOR SUBSTITUTIONS SHALL BE MADE A MINIMUM OF TWO WEEKS PRIOR TO BID DATE. MANUFACTURERS CATALOG DATA SHALL ACCOMPANY EACH REQUEST AND AUTHORIZED ACCEPTANCE SHALL BE ADDENDA ONLY.

#### 1.4.2 SUBSTITUTION RESPONSIBILITY

THE POWER SYSTEM HAS BEEN DESIGNED TO LOFTIN/KOHLER POWER SYSTEMS ELECTRICAL AND PHYSICAL CHARACTERISTICS. THE EQUIPMENT SIZING, SPACING, AMOUNTS, ELECTRICAL WIRING, VENTILATION EQUIPMENT, FUEL AND EXHAUST COMPONENTS HAVE ALL BEEN SIZED AND DESIGNED AROUND LOFTIN/KOHLER POWER SYSTEMS SUPPLIED EQUIPMENT. SHOULD ANY OF THE OTHER APPROVED MANUFACTURER SUBSTITUTIONS BE MADE, THE CONTRACTOR SHALL BEAR RESPONSIBILITY FOR THE INSTALLATION. COORDINATION AND OPERATION OF THE SYSTEM AS WELL AS ANY ENGINEERING AND REDESIGN COSTS. WHICH MAY RESULT FROM SUCH SUBSTITUTIONS.

### 1.5 SUBMITTALS

ENGINE-GENERATOR SUBMITTALS SHALL INCLUDE THE FOLLOWING INFORMATION: FACTORY PUBLISHED SPECIFICATION SHEET.

- MANUFACTURER'S CATALOG CUT SHEETS OF ALL AUXILIARY COMPONENTS SUCH AS BATTERY CHARGER, CONTROL PANEL, ENCLOSURE, ETC.
- 3. DIMENSIONAL ELEVATION AND LAYOUT DRAWINGS OF THE GENERATOR SET, ENCLOSURE AND TRANSFER SWITCHGEAR AND RELATED ACCESSORIES.
- 4. WEIGHTS OF ALL EQUIPMENT. CONCRETE PAD RECOMMENDATION. LAYOUT AND STUB-UP LOCATIONS OF ELECTRICAL AND FUEL SYSTEMS.
- 6. INTERCONNECT WIRING DIAGRAM OF COMPLETE EMERGENCY SYSTEM, INCLUDING GENERATOR, SWITCHGEAR, DAY TANK, REMOTE PUMPS, BATTERY CHARGER, CONTROL PANEL, AND REMOTE ALARM INDICATIONS.
- 7. ENGINE MECHANICAL DATA, INCLUDING HEAT REJECTION, EXHAUST GAS FLOWS, COMBUSTION AIR AND VENTILATION AIR FLOWS, FUEL CONSUMPTION. ETC.
- 8. GENERATOR ELECTRICAL DATA INCLUDING TEMPERATURE AND INSULATION DATA, COOLING REQUIREMENTS, EXCITATION RATINGS, VOLTAGE REGULATION, VOLTAGE REGULATOR, EFFICIENCIES, WAVEFORM DISTORTION AND TELEPHONE INFLUENCE FACTOR.
- 9. GENERATOR RESISTANCES, REACTANCES AND TIME CONSTANTS.
- 10. GENERATOR LOCKED ROTOR MOTOR STARTING CURVES.
- 11. MANUFACTURER'S DOCUMENTATION SHOWING MAXIMUM EXPECTED TRANSIENT VOLTAGE AND FREQUENCY DIPS. AND RECOVERY TIME DURING OPERATION OF THE GENERATOR SET AT THE SPECIFIED SITE CONDITIONS WITH THE SPECIFIED LOADS.
- 12. MANUFACTURER'S AND DEALER'S WRITTEN WARRANTY.

### 1.7 SYSTEM RESPONSIBILITY

### 1.7.1 GENERATOR SET DISTRIBUTOR

THE COMPLETED ENGINE GENERATOR SET SHALL BE SUPPLIED BY THE MANUFACTURER'S AUTHORIZED DISTRIBUTOR ONLY.

- SOUTHERN PLAINS CUMMINS®
- HOLT CAT® LOFTIN – KOHLER POWER SYSTEMS®
- KIRBY STEWART & STEVENSON®

### 1.7.2 REQUIREMENTS, CODES AND REGULATIONS

THE EQUIPMENT SUPPLIED AND INSTALLED SHALL MEET THE REQUIREMENTS OF NEC AND ALL-APPLICABLE LOCAL CODES AND REGULATIONS. ALL EQUIPMENT SHALL BE NEW, OF CURRENT PRODUCTION. THERE SHALL BE ONE SOURCE RESPONSIBILITY FOR WARRANTY; PARTS AND SERVICE THROUGH A LOCAL REPRESENTATIVE WITH FACTORY TRAINED SERVICE PERSONNEL.

### 1.7.3 AUTOMATIC TRANSFER SWITCH(ES)

THE AUTOMATIC TRANSFER SWITCH(ES) SPECIFIED IN ANOTHER SECTION SHALL BE SUPPLIED BY THE GENERATOR SET MANUFACTURER IN ORDER TO ESTABLISH AND MAINTAIN A SINGLE SOURCE OF SYSTEM RESPONSIBILITY AND COORDINATION.

### 1.8 WARRANTY

### 1.8.1 TWO YEAR STANDBY (ISO 8528-1: ESP) GENERATOR SET WARRANTY

THE MANUFACTURER'S STANDARD WARRANTY SHALL IN NO EVENT BE FOR A PERIOD OF LESS THAN TWO (2) YEARS FROM DATE OF INITIAL START-UP OF THE SYSTEM AND SHALL INCLUDE REPAIR PARTS, LABOR, REASONABLE TRAVEL EXPENSE NECESSARY FOR REPAIRS AT THE JOB SITE, AND EXPENDABLES (LUBRICATING OIL, FILTERS, ANTIFREEZE, AND OTHER SERVICE ITEMS MADE UNUSABLE BY THE DEFECT) USED DURING THE COURSE OF REPAIR. RUNNING HOURS SHALL BE LIMITED TO 500 HOURS ANNUALLY FOR THE SYSTEM WARRANTY BY BOTH THE MANUFACTURER AND SERVICING DISTRIBUTOR. SUBMITTALS RECEIVED WITHOUT WRITTEN WARRANTIES AS SPECIFIED WILL BE REJECTED IN THEIR ENTIRETY.

### 1.9 PARTS AND SERVICE QUALIFICATIONS

### 1.9.1 SERVICE FACILITY

THE ENGINE-GENERATOR SUPPLIER SHALL MAINTAIN 24 HOUR PARTS AND SERVICE CAPABILITY WITHIN 100 MILES OF THE PROJECT SITE. THE DISTRIBUTOR SHALL STOCK PARTS AS NEEDED TO SUPPORT THE GENERATOR SET PACKAGE FOR THIS SPECIFIC PROJECT. THE SUPPLIER MUST CARRY SUFFICIENT INVENTORY TO COVER NO LESS THAN 80% PARTS SERVICE WITHIN 24 HOURS AND 95% WITHIN 48 HOURS.

1.9.2 SERVICE PERSONNEL

THE DEALER SHALL MAINTAIN QUALIFIED FACTORY TRAINED SERVICE PERSONNEL

### 2.1 GENERAL REQUIREMENTS

### 2.1.1 GENSET REQUIREMENTS

THE GENERATOR SET SHALL BE STANDBY DUTY RATED AT 80 KW, 100 KVA, 1800 RPM, 0.8 POWER FACTOR, 480/277 V, 3-PHASE, 60 HERTZ INCLUDING RADIATOR FAN AND ALL PARASITIC LOADS. GENERATOR SET SHALL BE SIZED TO OPERATE AT THE SPECIFIED LOAD AT A MAXIMUM AMBIENT OF 115F (46.1C) AND ALTITUDE OF 1,000.0 FEET (304.8 M).

#### STANDBY RATING AS DEFINED BY THE FOLLOWING: <u> TYPICAL LOAD FACTOR = 70% OR LESS WITH VARIABLE LOAD</u>

- <u>TYPICAL HOURS PER YEAR = 200 HOURS</u>
- MAXIMUM EXPECTED USAGE = 500 HOURS/YEAR
- <u> TYPICAL APPLICATION STANDBY</u> TYPICAL PEAK DEMAND = 80% OF ESP RATED KW WITH 100% OF RATING AVAILABLE FOR THE DURATION OF AN EMERGENCY OUTAGE

#### 2.1.2 MATERIAL AND PARTS

ALL MATERIALS AND PARTS COMPRISING THE UNIT SHALL BE NEW AND UNUSED.

#### 2.1.3 ENGINE

THE ENGINE SHALL BE DIESEL FUELED, FOUR (4) CYCLE, WATER-COOLED, WHILE OPERATING WITH NOMINAL SPEED NOT EXCEEDING 1800 RPM. THE ENGINE WILL UTILIZE IN-CYLINDER COMBUSTION TECHNOLOGY, AS REQUIRED, TO MEET APPLICABLE EPA NON-ROAD MOBILE REGULATIONS AND/OR THE EPA NSPS RULE FOR STATIONARY RECIPROCATING COMPRESSION IGNITION ENGINES. ADDITIONALLY, THE ENGINE SHALL COMPLY WITH THE STATE EMISSION REGULATIONS AT THE TIME OF INSTALLATION/COMMISSIONING. ACTUAL ENGINE EMISSIONS VALUES MUST BE IN COMPLIANCE WITH APPLICABLE EPA EMISSIONS STANDARDS PER ISO 8178 - D2 EMISSIONS CYCLE AT SPECIFIED EKW / BHP RATING. UTILIZATION OF THE "TRANSITION PROGRAM FOR EQUIPMENT MANUFACTURERS" (ALSO KNOWN AS "FLEX CREDITS") TO ACHIEVE EPA CERTIFICATION IS NOT ACCEPTABLE. THE IN-CYLINDER ENGINE TECHNOLOGY MUST NOT PERMIT UNFILTERED EXHAUST GAS TO BE INTRODUCED INTO THE COMBUSTION CYLINDER. EMISSIONS REQUIREMENTS / CERTIFICATIONS OF THIS PACKAGE: EPA TIER 3

#### 2.1.3.1 ENGINE GOVERNING

THE ENGINE WILL BE EQUIPPED WITH AN ISOCHRONOUS ELECTRONIC GOVERNOR TO MAINTAIN +/- 0.25% STEADY STATE FREQUENCY VARIATION FROM STEADY STATE NO LOAD TO STEADY STATE FULL LOAD.

#### 2.2 GENERATOR

### 2.2.1 GENERATOR SPECIFICATIONS

THE SYNCHRONOUS THREE PHASE GENERATOR SHALL BE A SINGLE BEARING, SELF-VENTILATED, DRIP-PROOF DESIGN IN ACCORDANCE WITH NEMA MG AND DIRECTLY CONNECTED TO THE ENGINE FLYWHEEL HOUSING WITH A FLEX COUPLING. THE GENERATOR SHALL MEET PERFORMANCE CLASS G2 OF ISO 8528. THE EXCITATION SYSTEM SHALL ENABLE THE ALTERNATOR TO SUSTAIN 300% (250% FOR 50HZ) OF RATED CURRENT BASED ON THE 125C (CLASS H) OR 105C (CLASS F) RISE RATING FOR TEN SECONDS DURING A FAULT CONDITION AND SHALL IMPROVE THE IMMUNITY OF THE VOLTAGE REGULATOR TO NON-LINEAR DISTORTING LOADS. THE EXCITATION SYSTEM SHALL BE OF BRUSHLESS CONSTRUCTION AND BE INDEPENDENT OF MAIN STATOR WINDINGS, PERMANENT MAGNET.

#### 2.2.2 VOLTAGE REGULATOR

#### 2.2.2.1 AUTOMATIC VOLTAGE REGULATOR

THE AUTOMATIC VOLTAGE REGULATOR (AVR) SHALL MAINTAIN GENERATOR OUTPUT VOLTAGE WITHIN  $\pm 1/2$  0.5% FOR ANY CONSTANT LOAD BETWEEN NO LOAD AND FULL LOAD. THE REGULATOR SHALL BE A TOTALLY SOLID STATE DESIGN, WHICH INCLUDES ELECTRONIC VOLTAGE BUILDUP, VOLTS PER HERTZ REGULATION, OVER-EXCITATION PROTECTION, SHALL LIMIT VOLTAGE OVERSHOOT ON STARTUP, AND SHALL BE ENVIRONMENTALLY SEALED.

#### 2.2.3 MOTOR STARTING

PROVIDE LOCKED ROTOR MOTOR STARTING CAPABILITY OF 385 SKVA AT 35% INSTANTANEOUS VOLTAGE DIP AS DEFINED PER NEMA MG 1. SUSTAINED VOLTAGE DIP DATA IS NOT ACCEPTABLE.

#### 2.3 CIRCUIT BREAKER

#### 2.3.1 CIRCUIT BREAKER SPECIFICATIONS

PROVIDE A GENERATOR MOUNTED 100% CIRCUIT BREAKER, MOLDED CASE, QTY. (1) 150 AMP TRIP, 3 POLE, NEMA 1/IP22. BREAKER SHALL UTILIZE A SOLID STATE TRIP UNIT. THE BREAKER SHALL BE UL/CSA LISTED OF IEC CONSTRUCTION AND CONNECTED TO ENGINE/GENERATOR SAFETY SHUTDOWNS. BREAKER SHALL BE HOUSED IN AN EXTENSION TERMINAL BOX WHICH IS ISOLATED FROM VIBRATIONS INDUCED BY THE GENERATOR SET. MECHANICAL TYPE LUGS, SIZED FOR THE CIRCUIT BREAKER FEEDERS SHOWN ON DRAWING, SHALL BE SUPPLIED ON THE LOAD SIDE OF BREAKER.

### 2.4 CONTROLS — GENERATOR SET MOUNTED

PROVIDE A FULLY SOLID-STATE, MICROPROCESSOR BASED, GENERATOR SET CONTROL. THE CONTROL PANEL SHALL BE DESIGNED AND BUILT BY THE ENGINE MANUFACTURER. THE CONTROL SHALL PROVIDE ALL OPERATING, MONITORING, AND CONTROL FUNCTIONS FOR THE GENERATOR SET. THE CONTROL PANEL SHALL PROVIDE REAL TIME DIGITAL COMMUNICATIONS TO ALL ENGINE AND REGULATOR CONTROLS.

### 2.4.1 ENVIRONMENTAL

THE GENERATOR SET CONTROL SHALL BE TESTED AND CERTIFIED TO THE FOLLOWING ENVIRONMENTAL CONDITIONS.

- I. -40°C TO +70C OPERATING RANGE
- 2. 95% HUMIDITY NON-CONDENSING, 30C TO 60C 3. IP22 PROTECTION FOR REAR OF CONTROLLER: IP55 WHEN INSTALLED IN CONTROL PANEL
- 4. 5% SALT SPRAY, 48 HOURS, +38C, 36.8V SYSTEM VOLTAGE
- 5. SINUSOIDAL VIBRATION 4.3G'S RMS, 24-1000HZ
- 6. ELECTROMAGNETIC CAPABILITY (89/336/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC, BS EN 50081-2, 50082-2)
- 7. SHOCK: WITHSTAND 15G

### 2.4.2 FUNCTIONAL REQUIREMENTS

THE FOLLOWING FUNCTIONALITY SHALL BE INTEGRAL TO THE CONTROL PANEL. 1. THE CONTROL SHALL INCLUDE A 33 X 132 PIXEL, 24MM X 95MM, POSITIVE IMAGE, TRANSFLECTIVE LCD DISPLAY WITH TEXT BASED ALARM/EVENT

- 2. AUDIBLE HORN FOR ALARM AND SHUTDOWN WITH HORN SILENCE SWITCH
- 4. MULTIPLE LANGUAGE CAPABILITY
- 5. REMOTE START/STOP CONTROL 6. LOCAL RUN/OFF/AUTO CONTROL INTEGRAL TO SYSTEM MICROPROCESSOR

5. STANDARD ISO LABELING

- 7. COOLDOWN TIMER
- 8. SPEED ADJUST
- 9. LAMP TEST 10. PUSH BUTTON EMERGENCY STOP BUTTON
- 11. PASSWORD PROTECTED SYSTEM PROGRAMMING

### 2.4.3 DIGITAL MONITORING CAPABILITY

THE CONTROLS SHALL PROVIDE THE FOLLOWING DIGITAL READOUTS FOR THE ENGINE AND GENERATOR. ALL READINGS SHALL BE INDICATED IN EITHER METRIC OR ENGLISH UNITS

1. ENGINE OIL PRESSURE 2. ENGINE OIL TEMPERATURE 3. ENGINE COOLANT TEMPERATURE

4. ENGINE RPM 5. BATTERY VOLTS

- 1. GENERATOR AC VOLTS (LINE TO LINE, LINE TO NEUTRAL AND AVERAGE) 2. GENERATOR AC CURRENT (AVG AND PER PHASE)
- 3. GENERATOR AC FREQUENCY 4. GENERATOR KW (TOTAL AND PER PHASE)
- 5. GENERATOR KVA (TOTAL AND PER PHASE) 6. GENERATOR KVAR (TOTAL AND PER PHASE)
- 7. POWER FACTOR (AVG AND PER PHASE) 8. TOTAL KW-HR
- 9. TOTAL KVAR-HR
- 10. % KW 11. % KVA

# 12. % KVAR

#### 2.4.4 ALARMS AND SHUTDOWNS

THE CONTROL SHALL MONITOR AND PROVIDE ALARM INDICATION AND SUBSEQUENT SHUTDOWN FOR THE FOLLOWING CONDITIONS. ALL ALARMS AND SHUTDOWNS ARE ACCOMPANIED BY A TIME, DATE, AND ENGINE HOUR STAMP THAT ARE STORED BY THE CONTROL PANEL FOR FIRST AND LAST OCCURRENCE:

ENGINE ALARM/SHUTDOWN LOW OIL PRESSURE ALARM/SHUTDOWN

- 2. HIGH COOLANT TEMPERATURE ALARM/SHUTDOWN
- 3. LOSS OF COOLANT SHUTDOWN 4. OVERSPEED SHUTDOWN
- 5. OVERCRANK SHUTDOWN
- LOW COOLANT LEVEL ALARM 7. LOW FUEL LEVEL ALARM
- 8. EMERGENCY STOP DEPRESSED SHUTDOWN 9. LOW COOLANT TEMPERATURE ALARM
- 10. LOW BATTERY VOLTAGE ALARM

13. BATTERY CHARGER FAILURE ALARM

11. HIGH BATTERY VOLTAGE ALARM 12. CONTROL SWITCH NOT IN AUTO POSITION ALARM

### GENERATOR ALARM/SHUTDOWN

- 1. GENERATOR OVER VOLTAGE
- 2. GENERATOR UNDER VOLTAGE 3. GENERATOR OVER FREQUENCY
- 4. GENERATOR UNDER FREQUENCY
- 5. GENERATOR REVERSE POWER 6. GENERATOR OVERCURRENT

#### 2.4.5 INPUTS AND OUTPUTS

THE CONTROLLER SHALL INCLUDE THE ABILITY TO ACCEPT SIX (6) DIGITAL INPUT SIGNALS. THE SIGNALS MAY BE PROGRAMMED FOR EITHER HIGH OR LOW ACTIVATION USING PROGRAMMABLE NORMALLY OPEN OR NORMALLY CLOSED CONTACTS.

UP TO 300MA.

THE CONTROL SHALL INCLUDE THE ABILITY TO OPERATE SIX (6) PROGRAMMABLE RELAY OUTPUT SIGNALS, INTEGRAL TO THE CONTROLLER. THE OUTPUT RELAYS SHALL BE RATED FOR 2A @ 30VDC.

# THE CONTROL SHALL INCLUDE THE ABILITY TO OPERATE ONE (1) DISCRETE OUTPUTS, INTEGRAL TO THE CONTROLLER, WHICH ARE CAPABLE OF SINKING

### 2.4.6 MAINTENANCE

ALL ENGINE, VOLTAGE REGULATOR, CONTROL PANEL AND ACCESSORY UNITS SHALL BE ACCESSIBLE THROUGH A SINGLE ELECTRONIC SERVICE TOOL. THE

- FOLLOWING MAINTENANCE FUNCTIONALITY SHALL BE INTEGRAL TO THE GENERATOR SET CONTROL: 1. ENGINE RUNNING HOURS DISPLAY
- 2. SERVICE MAINTENANCE INTERVAL (RUNNING HOURS OR CALENDAR DAYS)
- 3. ENGINE CRANK ATTEMPT COUNTER
- 4. ENGINE SUCCESSFUL STARTS COUNTER 5. 20 EVENTS ARE STORED IN CONTROL PANEL MEMORY 6. PROGRAMMABLE CYCLE TIMER THAT STARTS AND RUNS THE GENERATOR FOR A PREDETERMINED TIME. THE TIMER SHALL USE 14
- USER-PROGRAMMABLE SEQUENCES THAT ARE REPEATED IN A 7-DAY CYCLE. EACH SEQUENCE SHALL HAVE THE FOLLOWING PROGRAMMABLE SET A. DAY OF WEEK
- B. TIME OF DAY TO START C. DURATION OF CYCLE

## 2.4.7 REMOTE COMMUNICATIONS

REMOTE COMMUNICATIONS THE CONTROL SHALL INCLUDE ETHERNET/IP COMMUNICATIONS AS STANDARD

# REMOTE ANNUNCIATOR (NFPA 99/110, CSA 282)

PROVIDE A REMOTE ANNUNCIATOR TO MEET THE REQUIREMENTS OF NFPA 110, LEVEL 1 THE ANNUNCIATOR SHALL PROVIDE REMOTE ANNUNCIATION OF ALL POINTS STATED ABOVE AND SHALL INCORPORATE RING-BACK CAPABILITY SO THAT AFTER SILENCING THE INITIAL ALARM, ANY SUBSEQUENT ALARMS WILL SOUND THE HORN.

REMOTE MONITORING SOFTWARE THE CONTROL SHALL PROVIDE MONITORING SOFTWARE WITH THE FOLLOWING FUNCTIONALITY:

ABILITY TO BE LOCATED UP TO 800 FT FROM THE GENERATOR SET

1. PROVIDE ACCESS TO ALL DATE AND EVENTS ON GENERATOR SET COMMUNICATIONS NETWORK PROVIDE REMOTE CONTROL CAPABILITY FOR THE GENERATOR SET

ABILITY TO MONITOR UP TO 12 GENERATOR SETS

#### 4. ABILITY TO COMMUNICATE VIA MODBUS RTU OR REMOTE MODEM 2.5 COOLING SYSTEM

THE GENERATOR SET SHALL BE EQUIPPED WITH A RAIL-MOUNTED, ENGINE-DRIVEN RADIATOR WITH BLOWER FAN AND ALL ACCESSORIES. THE COOLING SYSTEM SHALL BE SIZED TO OPERATE AT FULL LOAD CONDITIONS AND 110 F\* AMBIENT AIR ENTERING THE ROOM OR ENCLOSURE (IF AN ENCLOSURE IS SPECIFIED). THE GENERATOR SET SUPPLIER IS RESPONSIBLE FOR PROVIDING A PROPERLY SIZED COOLING SYSTEM BASED ON THE ENCLOSURE STATIC PRESSURE RESTRICTION.

# 2.6 FUEL SYSTEM

### 2.6.1 FUEL SYSTEM

THE FUEL SYSTEM SHALL BE INTEGRAL WITH THE ENGINE. IN ADDITION TO THE STANDARD FUEL FILTERS PROVIDED BY THE ENGINE MANUFACTURER. THERE SHALL ALSO BE INSTALLED A PRIMARY FUEL FILTER/WATER SEPARATOR IN THE FUEL INLET LINE TO THE ENGINE. ALL FUEL PIPING SHALL BE BLACK IRON OR FLEXIBLE FUEL HOSE RATED FOR THIS SERVICE. NO GALVANIZED PIPING WILL BE PERMITTED. FLEXIBLE FUEL LINES SHALL BE MINIMALLY RATED FOR 300 DEGREES F AND 100 PSI.

# 2.6.2 FUEL SUB BASE TANK

2.7 EXHAUST SYSTEM

2.7.1 SILENCER

PROVIDE A DOUBLE WALL SUB-BASE TANK CONSTRUCTED TO MEET ALL LOCAL CODES AND REQUIREMENTS. A FUEL TANK BASE OF 48 HOUR CAPACITY SHALL BE PROVIDED AS AN INTEGRAL PART OF THE ENCLOSURE. IT SHALL BE CONTAINED IN A RUPTURE BASIN WITH 110% CAPACITY. THE TANK SHALL MEET UL142 STANDARDS. A LOCKING FILL CAP, A MECHANICAL READING FUEL LEVEL GAUGE, LOW FUEL LEVEL ALARM CONTACT, AND FUEL TANK RUPTURE ALARM CONTACT SHALL BE PROVIDED.

A CRITICAL GRADE SILENCER, COMPANION FLANGES, AND FLEXIBLE EXHAUST FITTING PROPERLY SIZED SHALL BE FURNISHED AND INSTALLED ACCORDING

INSTALLATIONS ONLY). THE SILENCER SHALL BE MOUNTED SO THAT ITS WEIGHT IS NOT SUPPORTED BY THE ENGINE NOR WILL EXHAUST SYSTEM GROWTH

TO THE MANUFACTURER'S RECOMMENDATION. MOUNTING SHALL BE PROVIDED BY THE CONTRACTOR AS SHOWN ON THE DRAWINGS (INDOOR

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Bee Cave. Texas 78738

THE LIFT STATION SHALL OPERATE PER THE SEQUENCE O OPERATIONS AS NOTED ON THE CIVIL DRAWINGS AND SPECIFICATIONS. PLEASE NOTIFY THE ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES.



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#### 2.8.1 STARTING MOTOR

A DC ELECTRIC STARTING SYSTEM WITH POSITIVE ENGAGEMENT SHALL BE FURNISHED. THE MOTOR VOLTAGE SHALL BE AS RECOMMENDED BY THE ENGINE

#### 2.8.2 JACKET WATER HEATER

JACKET WATER HEATER SHALL BE PROVIDED AND SHALL BE SIZED TO INSURE THAT GENSET WILL START WITHIN THE SPECIFIED TIME PERIOD AND AMBIENT CONDITIONS.

#### 2.8.3 BATTERIES

BATTERIES - A LEAD-ACID STORAGE BATTERY SET OF THE HEAVY-DUTY STARTING TYPE SHALL BE PROVIDED. BATTERY VOLTAGE SHALL BE COMPATIBLE WITH THE STARTING SYSTEM. THE BATTERIES SUPPLIED SHALL MEET NFPA 110 CRANKING REQUIREMENTS OF 90 SECONDS MINIMUM OF TOTAL CRANKING TIME. BATTERY SPECIFICATIONS (TYPE, AMP-HOUR RATING, COLD CRANKING AMPS) TO BE PROVIDED IN THE SUBMITTAL

BATTERY CHARGER - A CURRENT LIMITING BATTERY CHARGER SHALL BE FURNISHED TO AUTOMATICALLY RECHARGE BATTERIES. THE CHARGER SHALL BE DUAL CHARGE RATE WITH AUTOMATIC SWITCHING TO THE BOOST RATE WHEN REQUIRED. THE BATTERY CHARGER SHALL BE MOUNTED ON THE GENSET PACKAGE OR INSIDE THE GENSET ENCLOSURE/ROOM.

#### 2.9 ENCLOSURE

#### 2.9.1 SOUND ATTENUATED ENCLOSURE

THE COMPLETE DIESEL ENGINE GENERATOR SET, INCLUDING GENERATOR CONTROL PANEL, ENGINE STARTING BATTERIES AND FUEL OIL TANK, SHALL BE ENCLOSED IN A FACTORY ASSEMBLED, SOUND ATTENUATED ENCLOSURE MOUNTED ON THE FUEL TANK BASE.

- 1. A WEATHER RESISTANT, SOUND ATTENUATED ENCLOSURE OF STEEL WITH ELECTROSTATICALLY APPLIED POWDER COATED BAKED POLYESTER PAINT THE ENCLOSURE SHALL HAVE A RESULTING SOUND LEVEL OF 75 DBA @ 23 FT WITH THE GENSET RUNNING UNDER FULL LOAD. IT SHALL CONSIST
- OF A ROOF, SIDE WALLS, AND END WALLS. FASTENERS SHALL BE EITHER ZINC PLATED OR STAINLESS STEEL. 2. ENCLOSURE SOUND ATTENUATION: ACOUSTICAL FOAM SHALL BE PROVIDED BETWEEN ALL SUPPORTS AND INSIDE DOORS AND SOUND BAFFLES ON AIR INTAKE AND AIR DISCHARGE.

#### 3 EXECUTION

#### 3.1 INSTALLATION

INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, THE PROJECT DRAWINGS AND SPECIFICATIONS, AND ALL APPLICABLE

COORDINATE ALL START-UP AND TESTING ACTIVITIES WITH THE ENGINEER AND OWNER. AFTER INSTALLATION IS COMPLETE AND NORMAL POWER IS AVAILABLE, THE MANUFACTURER'S LOCAL DEALER SHALL PERFORM THE FOLLOWING:

#### NFPA 110 LOAD TEST REQS

- VERIFY THAT THE EQUIPMENT IS INSTALLED PROPERLY.
- 2. CHECK ALL AUXILIARY DEVICES FOR PROPER OPERATION, INCLUDING BATTERY CHARGER, JACKET WATER HEATER(S), GENERATOR SPACE HEATER,
- REMOTE ANNUNCIATOR, ETC. TEST ALL ALARMS AND SAFETY SHUTDOWN DEVICES FOR PROPER OPERATION AND ANNUNCIATION.
- CHECK ALL FLUID LEVELS.
- START ENGINE AND CHECK FOR EXHAUST, OIL, FUEL LEAKS, VIBRATIONS, ETC.
- VERIFY PROPER VOLTAGE AND PHASE ROTATION AT THE TRANSFER SWITCH BEFORE CONNECTING TO THE LOAD.
- CONNECT THE GENERATOR TO BUILDING LOAD AND VERIFY THAT THE GENERATOR WILL START AND RUN ALL DESIGNATED LOADS. 8. THE SYSTEM SHALL BE TESTED UNDER FULL LOAD AND MONITOR THE FOLLOWING READINGS:

#### OIL PRESSURE COOLANT TEMPERATURE

BATTERY CHARGE RATE

AC VOLTS

AC AMPERES - ALL PHASES FREQUENCY

KILOWATTS AMBIENT TEMPERATURE

#### 3.3 OPERATION AND MAINTENANCE MANUALS

PROVIDE TWO (2) SETS OF OPERATION AND MAINTENANCE MANUALS COVERING THE GENERATOR, SWITCHGEAR, AND AUXILIARY COMPONENTS. INCLUDE FINAL AS-BUILT WIRING INTERCONNECT DIAGRAMS AND RECOMMENDED PREVENTATIVE MAINTENANCE SCHEDULES.

### 3.4 TRAINING

### 3.4.1 ON-SITE TRAINING

PROVIDE ON-SITE TRAINING TO INSTRUCT THE OWNER'S PERSONNEL IN THE PROPER OPERATION AND MAINTENANCE OF THE EQUIPMENT. REVIEW OPERATION AND MAINTENANCE MANUALS, PARTS MANUALS, AND EMERGENCY SERVICE PROCEDURES.

AUTOMATIC TRANSFER SWITCH 150 AMP, 4 POLE, NEMA 4XSS

#### 1 GENERAL

A. IT IS THE INTENT OF THIS SPECIFICATION TO SECURE A TRANSFER SWITCH THAT HAS BEEN PROTOTYPE TESTED, FACTORY BUILT, PRODUCTION TESTED AND SITE TESTED. A TRANSFER SWITCH WITH THE NUMBER OF POLES, VOLTAGE AND CURRENT RATINGS SHOWN ON THE PLANS AND SPECIFIED HEREIN SHALL BE PROVIDED.

#### 1.2 CODES AND STANDARDS

- A. THE AUTOMATIC TRANSFER SWITCH SHALL CONFORM TO THE REQUIREMENTS OF:
- 1. UL 1008: UNDERWRITERS LABORATORIES STANDARD FOR AUTOMATIC TRANSFER SWITCHES
- 2. CSA: C22.2 NO. 178 CERTIFIED 3. IEC: 947-6-1 CERTIFIED AT 480 VAC
- 4. NFPA 70: NATIONAL ELECTRICAL CODE INCLUDING USE IN EMERGENCY AND STANDBY SYSTEMS IN ACCORDANCE WITH ARTICLES
- 517, 700, 701, 702 5. NFPA 99: ESSENTIAL ELECTRICAL SYSTEMS FOR HEALTH CARE FACILITIES
- NFPA 101: LIFE SAFETY CODE NFPA 110: STANDARD FOR EMERGENCY AND STANDBY POWER SYSTEMS
- IEEE 241: I.E.E.E. RECOMMENDED PRACTICE FOR ELECTRICAL POWER SYSTEMS IN COMMERCIAL BUILDINGS
- 9. IEEE 446: I.E.E.E. RECOMMENDED PRACTICE FOR EMERGENCY AND STANDBY POWER SYSTEMS 10. NEMA ICS10: AC AUTOMATIC TRANSFER SWITCH EQUIPMENT
- 11. UL 50/508: ENCLOSURES 12. ICS 6: ENCLOSURES
- 13. ANSI C33.76: ENCLOSURES
- 14. NEMA 250: ENCLOSURES 15. IEEE 472: (ANSI C37.90A): RINGING WAVE IMMUNITY
- 16. EN55022 (CISPR11): CONDUCTED AND RADIATED EMISSIONS (EXCEEDS EN55011 & MILSTD 461 CLASS 3)
- 17. EN61000-4-2: (LEVEL 4): ESD IMMUNITY TEST CLASS B:
- 18. EN61000-4-3: (ENV50140): RADIATED RF, ELECTROMAGNETIC FIELD IMMUNITY
- 19. EN61000-4-4: ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST
- 20. EN61000-4-5: IEEE C62.41: SURGE IMMUNITY TEST (1.2 X 50\_\_\_S, 5 & 8 KV)
- 21. EN61000-4-6: (ENV50141): CONDUCTED IMMUNITY TEST 22. EN61000-4-11: VOLTAGE DIPS AND INTERRUPTION IMMUNITY
- 23. IEE-693-2005: SEISMIC CERTIFIED AT HIGH LEVEL WITH 2.5 AMPLIFICATION FACTOR

### 24. IBC-2003: AT IP=1.5 FOR Z/H LESS THAN OR EQUAL TO (IN ACCORDANCE WITH ICC-ES-AC156)

- A. THE AUTOMATIC TRANSFER SWITCH SHALL BE SUPPLIED BY:

1.3 APPROVED MANUFACTURES

- RUSSELECTRIC®
- OR BY ALTERNATE MANUFACTURES WHO SHALL SUBMIT A REQUEST ONE WEEK PRIOR TO BID AND INCLUDE A WRITTEN LIST OF DEVIATIONS FROM THIS SPECIFICATION TO BE CONSIDERED FOR APPROVAL.

#### 2 PRODUCTS

#### 2.1 PERFORMANCE AND CONSTRUCTION

- A. THE AUTOMATIC TRANSFER SWITCH SHALL BE OF DOUBLE THROW CONSTRUCTION OPERATED BY A RELIABLE SOLENOID DRIVEN MECHANISM. THERE SHALL BE A DIRECT MECHANICAL COUPLING TO FACILITATE TRANSFER IN 6 CYCLES OR LESS.
- B. THE TRANSFER SWITCH SHALL INCORPORATE A TIMED, CENTER-OFF OR NEUTRAL POSITION FOR MOTOR AND INDUCTIVE LOAD DECAY. TRANSFER TIME SHALL BE ADJUSTABLE FROM 0-10 MINUTES TO EITHER SOURCE. A MECHANICAL INTERLOCK SHALL BE PROVIDED TO ENSURE THAT BOTH SETS OF CONTACTS CANNOT BE CLOSED AT THE SAME TIME.
- C. FOR SWITCHES INSTALLED IN SYSTEMS HAVING GROUND FAULT PROTECTIVE DEVICES, AND/OR WIRED SO AS TO BE DESIGNATED A SEPARATELY DERIVED SYSTEM BY THE NEC, A 4TH POLE SHALL BE PROVIDED. THIS ADDITIONAL POLE SHALL ISOLATE THE NORMAL AND EMERGENCY NEUTRALS. THE NEUTRAL POLE SHALL HAVE THE SAME WITHSTAND AND OPERATIONAL RATINGS AS THE OTHER POLES AND SHALL BE ARRANGED TO BREAK LAST AND MAKE FIRST TO MINIMIZE NEUTRAL SWITCHING TRANSIENTS. ADD-ON OR ACCESSORY POLES THAT ARE NOT OF IDENTICAL CONSTRUCTION AND WITHSTAND CAPABILITY WILL NOT BE CONSIDERED.
- D. THE CONTACT STRUCTURE SHALL CONSIST OF A MAIN CURRENT CARRYING CONTACT, WHICH IS A SILVER ALLOY WITH A MINIMUM OF 50% SILVER CONTENT. THE CURRENT CARRYING CONTACTS SHALL BE PROTECTED BY SILVER TUNGSTEN ARCING CONTACTS ON ALL SIZES ABOVE 400 AMPS.
- E. THE TRANSFER SWITCH MANUFACTURER SHALL SUBMIT TEST DATA FOR EACH SIZE SWITCH, SHOWING IT CAN WITHSTAND FAULT CURRENTS OF THE MAGNITUDE AND THE DURATION NECESSARY TO MAINTAIN THE SYSTEM INTEGRITY. MINIMUM UL LISTED WITHSTAND AND CLOSE INTO FAULT RATINGS SHALL BE AS FOLLOWS:

SIZE (AMPS)	COORDINATED BREAKER	CURRENT LIMITING F
40 - 600	50,000	200,000
800	65,000	200,000
1000 - 1200	85,000	200,000
1600 - 3000	100,000	200,000

- F. A DIELECTRIC TEST AT THE CONCLUSION OF THE WITHSTAND AND CLOSING TESTS SHALL BE PERFORMED.
- G. THE AUTOMATIC TRANSFER SWITCH MANUFACTURER SHALL CERTIFY SUFFICIENT ARC INTERRUPTING CAPABILITIES FOR 50 CYCLES OF OPERATION BETWEEN A NORMAL AND EMERGENCY SOURCE THAT ARE 120 DEGREES OUT OF PHASE AT 480 VOLTS, 600% OF RATED CURRENT AT .50 POWER FACTOR. THIS CERTIFICATION IS TO ENSURE THAT THERE WILL BE NO CURRENT FLOW BETWEEN THE TWO ISOLATED SOURCES DURING SWITCHING.
- H. ALL RELAYS SHALL BE CONTINUOUS DUTY INDUSTRIAL TYPE WITH WIPING CONTACTS. COILS, RELAYS, TIMERS AND ACCESSORIES SHALL BE READILY FRONT ACCESSIBLE. THE CONTROL PANEL AND POWER SECTION SHALL BE INTERCONNECTED WITH A HARNESS AND KEYED DISCONNECT PLUGS FOR
- I. MAIN AND ARCING CONTACTS SHALL BE VISIBLE WITHOUT MAJOR DISASSEMBLY TO FACILITATE INSPECTION AND MAINTENANCE.
- J. A MANUAL HANDLE SHALL BE PROVIDED FOR MAINTENANCE PURPOSES WITH THE SWITCH DE-ENERGIZED. AN OPERATOR DISCONNECT SWITCH SHALL BE PROVIDED TO DEFEAT AUTOMATIC OPERATION DURING MAINTENANCE, INSPECTION OR MANUAL OPERATION.
- K. SWITCHES COMPOSED OF MOLDED CASE BREAKERS, LIGHTING CONTACTORS OR COMPONENTS THEREOF WILL NOT BE ACCEPTABLE.
- L. THE CURRENT RATING SHALL BE A CONTINUOUS RATING WHEN THE SWITCH IS INSTALLED IN AN ENCLOSURE, AND SHALL CONFORM TO NEMA TEMPERATURE RISE STANDARDS.
- M. THE UNIT SHALL BE RATED BASED ON ALL CLASSES OF LOADS, I.E., RESISTIVE, TUNGSTEN, BALLAST AND INDUCTIVE LOADS. SWITCHES RATED 400 AMPERES OR LESS SHALL BE UL LISTED FOR 100% TUNGSTEN LAMP LOAD.
- N. TEMPERATURE RISE TESTS IN ACCORDANCE WITH UL 1008 SHALL HAVE BEEN CONDUCTED AFTER THE OVERLOAD AND ENDURANCE TESTS TO CONFIRM THE ABILITY OF THE UNITS TO CARRY THEIR RATED CURRENTS WITHIN THE ALLOWABLE TEMPERATURE LIMITS.
- O. UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS, THE SWITCH SHALL BE MOUNTED IN A NEMA 1 ENCLOSURE.

### 2.2 CONTROL

- A. THE CONTROL PANEL SHALL BE OPTO—ISOLATED FROM ELECTRICAL NOISE AND PROVIDED WITH THE FOLLOWING INHERENT CONTROL FUNCTIONS AND CAPABILITIES:
- EASY-TO-VIEW 4X20 LCD DISPLAY WITH LONG LASTING LED INDICATORS.
- CONTROL PANEL SHALL DISPLAY VOLTAGE AND FREQUENCY OF BOTH SOURCES.
- THE USER SHALL BE ABLE TO VIEW THE LAST 16 RECORDED EVENTS. CAPABILITY FOR EXTERNAL COMMUNICATION AND NETWORK INTERFACE.
- 5. ADJUSTMENTS TO ALL SETTINGS SHALL BE MADE FROM THE FRONT OF THE PANEL WITHOUT OPENING THE DOOR.
- B. THE TRANSFER SWITCH SHALL BE EQUIPPED WITH A MICROPROCESSOR BASED CONTROL PANEL. THE CONTROL PANEL SHALL PERFORM THE OPERATIONAL AND DISPLAY FUNCTIONS OF THE TRANSFER SWITCH. THE DISPLAY FUNCTIONS OF THE CONTROL PANEL SHALL INCLUDE ATS POSITION, SOURCE AVAILABILITY, SEQUENCE INDICATION AND DIAGNOSTICS.
- C. ALL PROGRAMMABLE AND CONTROL FUNCTIONS SHALL BE PASS CODE PROTECTED AND ACCESSIBLE THROUGH THE KEYPAD.
- D. THE CONTROL PANEL SHALL BE PROVIDED WITH A SIMPLE USER INTERFACE FOR TRANSFER SWITCH MONITORING, CONTROL AND FIELD CHANGEABLE FUNCTIONS AND SETTINGS.
- E. TOUCH PAD TEST SWITCH WITH FAST TEST/LOAD/NO LOAD SELECTION CAPABILITY TO SIMULATE A NORMAL SOURCE FAILURE.
- F. THE CONTROLLER SHALL PROVIDE DIGITAL TIMER ADJUSTMENTS WITH 1—SECOND RESOLUTION. VOLTAGE AND FREQUENCY SHALL BE ADJUSTABLE TO 1% RESOLUTION TO FACILITATE ACCURATE TRANSFER.
- G. TO ENSURE RELIABLE AND CONSISTENT USER OPERATION THE CONTROLS MUST BE EQUIPPED WITH NONVOLATILE MEMORY AND ALLOW AUTOMATIC DAYLIGHT SAVINGS TIME ADJUSTMENT.

#### <u>3 OPERATION</u>

#### 3.1 SEQUENCE OF OPERATION

- A. THE ATS SHALL INCORPORATE ADJUSTABLE THREE PHASE UNDER VOLTAGE SENSING ON THE NORMAL SOURCE.
- B. WHEN THE VOLTAGE OF ANY PHASE OF THE NORMAL SOURCE IS REDUCED TO 80% OF NOMINAL VOLTAGE, FOR A PERIOD OF 0-10 SECONDS (PROGRAMMABLE) A PILOT CONTACT SHALL CLOSE TO INITIATE STARTING OF THE ENGINE GENERATOR.
- C. THE ATS SHALL INCORPORATE ADJUSTABLE UNDER VOLTAGE AND UNDER FREQUENCY SENSING ON THE EMERGENCY SOURCE. IN ADDITION, THE SWITCH WILL BE PROVIDED WITH A CENTER-OFF OR NEUTRAL POSITION
- D. WHEN THE EMERGENCY SOURCE HAS REACHED A VOLTAGE VALUE OF 90% NOMINAL, ACHIEVED FREQUENCY WITHIN 95% OF THE RATED VALUE AND HAS REACHED THE END OF THE ADJUSTABLE DELAY, THE LOAD SHALL BE TRANSFERRED TO THE NEUTRAL POSITION FOR AN ADJUSTABLE TIME PERIOD OF 0-10 MINUTES. UPON COMPLETION OF THIS NEUTRAL TIME DELAY THE SWITCH SHALL BE TRANSFERRED TO THE EMERGENCY
- E. WHEN THE NORMAL SOURCE HAS BEEN RESTORED TO NOT LESS THAN 90% OF RATED VOLTAGE ON ALL PHASES AND THE TIME DELAY TRANSFER TO NORMAL HAS EXPIRED. THE LOAD SHALL BE RETRANSFERRED TO THE NEUTRAL POSITION FOR AN ADJUSTABLE TIME PERIOD OF 0-10 MINUTES. AFTER WHICH THE SWITCH SHALL BE CONNECTED TO THE NORMAL SOURCE. THE GENERATOR SHALL RUN UNLOADED FOR 5 MINUTES (PROGRAMMABLE) AND THEN AUTOMATICALLY SHUT DOWN. THE GENERATOR SHALL BE READY FOR AUTOMATIC OPERATION UPON THE NEXT FAILURE OF THE NORMAL SOURCE.
- F. IF THE ENGINE GENERATOR SHOULD FAIL WHILE CARRYING THE LOAD, RETRANSFER TO THE NORMAL SOURCE SHALL BE MADE INSTANTANEOUSLY UPON RESTORATION OF PROPER VOLTAGE (90%) ON THE NORMAL SOURCE.
- G. INSPECTION AND OPERATIONAL TESTING/DEMONSTATION OF THE ATS SHALL BE CONDUCTED IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE TO INDICATE THE ATS SATISFIES THESE SPECIFICATIONS.

#### 3.2 STANDARD ACCESSORIES

- A. ADJUSTABLE TIME DELAY TO OVERRIDE MOMENTARY NORMAL SOURCE FAILURE PRIOR TO ENGINE START. FIELD PROGRAMMABLE 0-10 SECONDS FACTORY SET AT 3 SECONDS.
- B. ADJUSTABLE TIME DELAY ON RETRANSFER TO NORMAL SOURCE, PROGRAMMABLE 0-60 MINUTES FACTORY SET AT 30 MINUTES. IF THE EMERGENCY SOURCE FAILS DURING THE RETRANSFER TIME DELAY, THE TRANSFER SWITCH CONTROLS SHALL AUTOMATICALLY BYPASS THE TIME DELAY AND IMMEDIATELY RETRANSFER TO THE NORMAL POSITION.
- C. A TIME DELAY ON TRANSFER TO EMERGENCY, PROGRAMMABLE 0-5 MINUTES, FACTORY SET AT 1 SECOND.
- D. A TIME DELAY AND CONTROL PANEL DISPLAY ON TRANSFER TO EITHER SOURCE WITH A CENTER-OFF POSITION, PROGRAMMABLE 0-10 MINUTES, AND FACTORY SET AT 5 SECONDS.
- E. AN IN-PHASE MONITOR SHALL BE PROVIDED. THE MONITOR SHALL COMPARE THE PHASE ANGLE DIFFERENCE BETWEEN THE NORMAL AND EMERGENCY SOURCES AND BE PROGRAMMED TO ANTICIPATE THE ZERO CROSSING POINT TO MINIMIZE SWITCHING TRANSIENTS.
- F. AN EXERCISER TIMER WITH MOMENTARY TEST PUSHBUTTON SHALL BE INCORPORATED WITHIN THE MICROPROCESSOR AND SHALL BE CAPABLE OF STARTING THE ENGINE GENERATOR SET AND TRANSFERRING THE LOAD (WHEN SELECTED) FOR EXERCISE PURPOSES ON A DAILY, WEEKLY OR MONTHLY BASIS. THE EXERCISER SHALL CONTAIN A BATTERY FOR MEMORY RETENTION DURING AN OUTAGE.
- G. PROVIDE A MOMENTARY PUSHBUTTON TO BYPASS THE TIME DELAYS ON TRANSFER AND RETRANSFER AND PROGRAMMABLE COMMIT/NO COMMIT
- H. THE CONTROLLER SHALL ACCEPT A REMOTE PEAK SHAVE OR TEST INPUT TO SIGNAL THE TRANSFER SWITCH TO THE EMERGENCY POSITION.
- I. A SET OF CUSTOMER CONTACTS SHALL BE PROVIDED TO INDICATE BOTH EMERGENCY AND NORMAL SOURCE POSITION.
- J. ADDITIONAL AUXILIARY CONTACTS (A3) CLOSED WHEN THE TRANSFER SWITCH IS IN SOURCE 2 POSITION.
- K. ADDITIONAL AUXILIARY CONTACTS (A4) CLOSED WHEN THE TRANSFER SWITCH IS IN SOURCE 1 POSITION.

A. THE TRANSFER SWITCH SHALL BE INSTALLED AS SHOWN ON THE PLANS, IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS AND ALL APPLICABLE CODES.

#### 4.2 FACTORY TESTS

A. THE TRANSFER SWITCH MANUFACTURER SHALL PERFORM A COMPLETE FUNCTIONAL TEST ON THE SWITCH, CONTROLLER AND ACCESSORIES PRIOR TO SHIPPING FROM THE FACTORY. A CERTIFIED TEST REPORT SHALL BE AVAILABLE UPON REQUEST.

## 4.3 SERVICE

A. THE MANUFACTURER SHALL MAINTAIN A NATIONAL SERVICE ORGANIZATION THAT IS FACTORY TRAINED AND CERTIFIED FOR TRANSFER SWITCH EQUIPMENT. IN ADDITION, THE SERVICE ORGANIZATION SHALL BE AVAILABLE 24 HOURS PER DAY, 365 DAYS PER YEAR.

### **4.4 WARRANTY**

A. THE AUTOMATIC TRANSFER SWITCH SHALL BE WARRANTED AGAINST DEFECTIVE WORKMANSHIP FOR A PERIOD OF TWO YEARS.



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#### 1.01 SCOPE OF WORK:

A. THE PROJECT SHALL CONSIST OF A COMPLETE AND OPERATING SCADA SYSTEM FOR THE FOLLOWING SITES:

THE COMPLETE SYSTEM SHALL INCLUDED BUT NOT LIMITED TO ALL HARDWARE, SOFTWARE, LABOR, AND COAX CABLE AS LISTED IN THIS PERFORMANCE SPECIFICATION. THE CONTRACTOR SHALL VISIT EACH SITE PRIOR TO SUBMITTING THEIR BID.

B. A SINGLE PRE-APPROVED SCADA SYSTEM INTEGRATOR (SSI) SHALL FURNISH ALL SERVICES AND EQUIPMENT DEFINED HEREIN AND IN OTHER SPECIFICATION SECTIONS AS REQUIRED TO PROVIDE A FULLY-FUNCTIONAL SCADA SYSTEM.

PRE-APPROVED SSI'S

- 1. TRAC-N-TROL (512-930-5721) 2. PRIME CONTROLS (830-358-3008) 3. MW CONTROLS (737-600-7411)
- C. THE SSI SHALL PROVIDE ALL MATERIALS, EQUIPMENT, LABOR, AND SERVICES REQUIRED TO ACHIEVE A FULLY INTEGRATED AND OPERATIONAL SCADA SYSTEM. THE SSI SHALL DESIGN AND COORDINATE THE CONTROL SYSTEM FOR PROPER OPERATION WITH RELATED EQUIPMENT AND MATERIALS FURNISHED BY OTHER SUPPLIERS UNDER OTHER SECTIONS OF THESE SPECIFICATIONS AND WITH RELATED EXISTING EQUIPMENT. THE SSI SHALL
- PROVIDE A TURNKEY SCADA SYSTEM INCLUDING ALL REQUIRED ELECTRICAL CONDUIT AND WIRE UNLESS OTHERWISE SPECIFIED. D. TO FACILITATE THE OWNER'S FUTURE CONSTRUCTION, OPERATION, AND MAINTENANCE, PRODUCTS SHALL BE BY A MAJOR INSTRUMENTATION AND

SCADA EQUIPMENT MANUFACTURERS, WITH PANEL MOUNTED DEVICES OF THE SAME TYPE AND MODEL AS FAR AS POSSIBLE.

- E. ALL MATERIALS, EQUIPMENT, LABOR, AND SERVICES NECESSARY TO ACHIEVE THE MONITORING AND CONTROL FUNCTIONS DESCRIBED HEREIN SHALL BE PROVIDED IN A TIMELY MANNER SUCH THAT THE MONITORING AND CONTROL FUNCTIONS ARE AVAILABLE WHEN THE EQUIPMENT IS READY TO BE PLACED INTO SERVICE.
- F. A MANDATORY PRE-BID WALK-THROUGH SHALL BE SCHEDULED FOR ALL PLAN HOLDERS BIDDING ON THE SCADA PORTION OF THIS PROJECT.

#### 1.02 QUALIFICATIONS AND REQUIREMENTS:

- A. IN ORDER TO ENSURE A COMPLETE AND SUCCESSFUL PROJECT, THE SSI'S MUST DEMONSTRATE A HISTORY OF SUCCESSFUL REFERENCES AND FINANCIAL STABILITY, AND FIVE YEARS OF SUSTAINED BUSINESS ACTIVITY IN THE SCADA INDUSTRY SERVING WATER AND WASTEWATER UTILITIES IN
- B. IN ORDER TO ENSURE QUALITY CONTROL AND COMPATIBILITY WITH EXISTING OPERATIONS, THE INDIVIDUAL INTEGRATOR(S) TO COMPLETE THE WORK MUST BE SPECIFIED IN THE PROPOSAL AND THEIR EXPERIENCE MUST BE ACCEPTABLE, WITHOUT LIMITATION, IN THE FOLLOWING AREAS: LIST SPECIFIC QUALIFICATIONS INCLUDING:
- 1. INTEGRATION EXPERIENCE OF WATER UTILITIES SERVING SIMILAR GEOGRAPHICAL OR COUNTY-WIDE AREAS OF AT LEAST TEN PROJECTS OF SUCCESSFUL REFERENCE FOR RADIO TELEMETRY SCADA WITHIN THE STATE OF TEXAS.
- C. IN ORDER TO ENSURE ADEQUATE RESPONSE TO EMERGENCIES AND SERVICE NEEDS, THE SSI MUST HAVE A SERVICE FACILITY WITHIN A 150 MILE RADIUS OF THE WATER TREATMENT PLANT.
- D. THE ATTACHED "SCOPE OF PROJECT AND EQUIPMENT SPECIFICATIONS" WILL BE REQUIRED AS PRESENTED. SEE SECTION ON "SUBSTITUTE EQUIPMENT".
- E. THE SSI WILL SPECIFY EQUIPMENT, SIZES AND QUANTITIES WHICH ARE PROPOSED TO BE USED FOR THE PROJECT. ALL EQUIPMENT SPECIFIED SHALL BE NON-PROPRIETARY AND UNIVERSALLY AVAILABLE TO ALL SSI'S. ALL COMPUTER AND COMPUTER RELATED EQUIPMENT SHALL BE COMPLIANT FOR DATE-BASED FUNCTIONALITY. A COMPLIANCE CERTIFICATE SHALL BE REQUIRED FROM THE SSI STATING COMPLIANCE WITH THESE REQUIREMENTS.
- F. THE SSI SHALL PROVIDE A SCHEDULE OF THE WARRANTY PROVIDED FOR WORK COMPLETED UNDER THIS PROPOSAL AND NON-WARRANTY SERVICE SCHEDULE WITH PRICING AND TERMS BEYOND THE WARRANTY PERIOD AS A PART OF ITS PROPOSAL.
- G. THE SSI SHALL BE A "SYSTEMS HOUSE" REGULARLY ENGAGED IN THE DESIGN AND THE INSTALLATION OF COMPUTER SYSTEMS AND THEIR ASSOCIATED SUBSYSTEM AS THEY ARE APPLIED TO THE RETAIL PUBLIC WATER UTILITY INDUSTRY. FOR THE PURPOSES OF THIS SPECIFICATIONS SECTION, A "SYSTEMS HOUSE" SHALL BE INTERPRETED TO MEAN AN ORGANIZATION THAT COMPLIES WITH ALL OF THE FOLLOWING CRITERIA:
- 1. EMPLOYS DESIGN AND TECHNICAL PERSONNEL ON THIS PROJECT WHO HAVE SUCCESSFULLY COMPLETED A MANUFACTURER'S TRAINING COURSE ON THE CONFIGURATION AND IMPLEMENTATION OF THE SPECIFIC HARDWARE AND SOFTWARE FOR THIS PROJECT.
- H. THE SSI SHALL MAINTAIN A FULLY EQUIPPED OFFICE/PRODUCTION FACILITY WITH FULL TIME EMPLOYEES CAPABLE OF, CONFIGURING, INSTALLING, CALIBRATING, TROUBLESHOOTING, AND TESTING THE SYSTEM SPECIFIED HEREIN.
- LISTED SSI'S SHALL NOT BE REQUIRED TO SUBMIT A QUALIFICATION PROPOSAL. SSI'S INTERESTED IN BEING LISTED AS AN EQUAL SHALL SUBMIT THREE (3) COPIES OF A QUALIFICATIONS PROPOSAL, AS REQUIRED HEREIN, TO THE ENGINEER NO LATER THAN TEN (10) DAYS BEFORE THE BID OPENING DATE. A LIST OF APPROVED EQUALS WILL BE ISSUED NO LATER FIVE (5) DAYS BEFORE THE BID OPENING DATE BY ADDENDUM.
- 1. THE QUALIFICATIONS PROPOSAL SHALL PROVIDE DETAILS AND A DESCRIPTION OF HOW THE SSI PROPOSES TO FULFILL THE REQUIREMENTS SET FORTH IN THIS SPECIFICATION. THE SSI SHALL ALSO BE CAPABLE OF SATISFYING THE OWNER'S FUTURE NEEDS WITH REGARD TO A FULLY FUNCTIONAL SCADA SYSTEM. THE SSI SHALL PRESENT THE PROPOSAL IN SUFFICIENT DETAIL SO THAT PROPER EVALUATION REGARDING THE EXPERIENCE AND CAPABILITIES OF THE SSI CAN BE PERFORMED. ALL ITEMS LISTED AS QUALIFICATION REQUIREMENTS SET FORTH IN THIS SECTION MUST BE PROVIDED FOR PROPER EVALUATION. FAILURE TO PROVIDE SUCH DOCUMENTATION WILL DISQUALIFY THE APPLICANT.
- 2. THE PROPOSAL SHALL CONTAIN EVIDENCE THAT THE SSI HAS SUFFICIENT FINANCIAL RESOURCES TO MEET THE OBLIGATIONS INCIDENTAL TO THE PERFORMANCE OF THE WORK INCLUDING BONDING. (THIS REQUIREMENT MAY BE PROVIDED IN THE FORM OF A VERIFIABLE OR CERTIFIED FINANCIAL REPORT FOR THE COMPANY'S LATEST FISCAL YEAR).
- 3. THE PROPOSAL SHALL CONTAIN A LIST OF PERSONNEL AVAILABLE FOR ASSIGNMENT TO THE RESPONSIBLE POSITIONS OF PROJECT MANAGER, PROJECT ENGINEER, LEAD PROGRAMMER, INSTALLATION SUPERVISOR, AND AREA SERVICE REPRESENTATIVE. ALSO, INCLUDE A CONCISE RESUME OF EACH INDIVIDUAL'S EDUCATION, TRAINING, WORK EXPERIENCE, AND ACCOMPLISHMENTS.
- 4. THE PROPOSAL SHALL CONTAIN THE FOLLOWING SPECIFIC INFORMATION:

FABRICATION, AND TESTING.

- A. LOCATION OF SERVICE CENTER IN RELATION TO THE OWNER'S OFFICE.
- B. TECHNICAL VALIDATION SAMPLES OF RECENTLY COMPLETED AND SIMILAR SCOPE PROJECTS. C. A DESCRIPTION OF HOW THE SUPPLIER PLANS TO EXECUTE THE VARIOUS FUNCTIONS AND LOCATIONS WHERE THE VARIOUS WORK CAN BE
- PERFORMED, INCLUDING EXISTING LOCATIONS TO INTEGRATE INTO THE FUTURE PROJECTS AS DESIGNATED BY THE OWNER. 5. THE SSI SHALL BE REQUIRED TO PROVIDE A REFERENCE LIST OF A MINIMUM OF FIVE (5) YEARS RECENT PAST EXPERIENCE IN THE DESIGN, ASSEMBLY, AND COMMISSIONING OF INSTRUMENTATION AND CONTROL SYSTEMS OF COMPARABLE SIZE, TYPE, AND COMPLEXITY TO THE

PROPOSED PROJECT. THE SSI SHALL BE REQUIRED TO HAVE HIS/HER OWN IN-HOUSE CAPABILITY TO HANDLE COMPLETE SYSTEM ENGINEERING.

6. THE SSI SHALL INDICATE THAT HE/SHE HAS IN HIS/HER EMPLOY CAPABLE PERSONNEL FOR DETAILED ENGINEERING, COORDINATION, DRAFTING, PROCUREMENT AND EXPEDITING, SCHEDULING, CONSTRUCTING, TESTING, INSPECTION, INSTALLATION, TRAINING, AND START-UP SERVICE FOR CALIBRATION AND COMMISSIONING AND WARRANTY COMPLIANCE FOR THE PERIOD SPECIFIED.

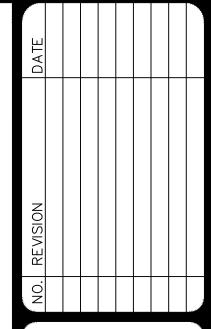
#### PART 2: SCADA SYSTEM

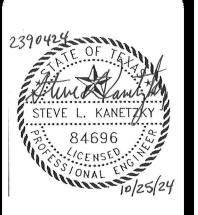
#### 2.01 SCOPE OF PROJECT AND EQUIPMENT SPECIFICATIONS

- A. THE SCADA SYSTEM SHALL BE A MICRO-PROCESSOR BASED MONITORING AND CONTROL-SYSTEM READY FOR COMMUNICATION WITH A MASTER TERMINAL UNIT (MTU) COMMUNICATING WITH OTHER REMOTE TERMINAL UNITS (RTU'S) VIA COMMUNICATION TECHNOLOGIES. RTU'S HEREIN SPECIFIED SHALL ALSO BE REQUIRED TO COMMUNICATE WITH OTHER RTU'S IN A PEER-TO-PEER MANNER FOR THE PURPOSE OF MEETING REGIONAL OR PRESSURE-PLANE-SPECIFIC REQUIREMENTS. PEER-TO-PEER COMMUNICATIONS BETWEEN RTU'S SHALL NOT REQUIRE PROGRAMMING AT EACH LOCATION. EACH MONITORING AND CONTROL SITE AT WHICH COMMANDS WILL BE EXECUTED SHALL BE LOCALLY CONTROLLED UTILIZING A LOGIC CONTROLLER WHICH SHALL BE PROGRAMMED ACCORDING TO IEC 61131 STANDARDS.
- B. SYSTEM EQUIPMENT SPECIFICATIONS:
- 1. EXISTING MASTER TERMINAL UNIT (MTU): THE MTU IS A CONTROLLER/INTERPRETER WHICH IS INSTALLED AT THE EQUIPMENT RACK AND SHALL BE MODIFIED/EXPANDED AS NECESSARY TO ACHIEVE THE MONITORING AND CONTROL FUNCTIONS DESCRIBED HEREINAFTER. THE MTU SHALL COMMUNICATE WITH AN OPERATOR INTERFACE TERMINAL (OIT) CONTAINING THE HUMAN MACHINE INTERFACE (HMI) SOFTWARE (VTS SCADA). THE MTU SHALL INCLUDE THE REQUIRED NUMBER OF OPERATOR INTERFACE TERMINALS ALONG WITH WHATEVER IS NECESSARY IN ORDER TO EFFECT GOOD COMMUNICATIONS, DATA ACQUISITION AND SUPERVISORY CONTROL TO AND WITH THE RTU'S. THE MTU SHALL INCLUDE SCADA ALARM SOFTWARE THAT WILL PROVIDE ALARM DIALING CAPABILITY AND AN INSQL HISTORIAN WITH REPORTING CAPABILITY. THE MTU SHALL BE CAPABLE OF RECEIVING THE FOLLOWING SITES:
- VERAMENDI LIFT STATION
- 2. REMOTE TERMINAL UNIT (RTU): THE RTU IS A LOGIC CONTROLLER INSTALLED AT EACH REMOTE WELL SITE FOR THE CONTROL OF THE LOCAL EQUIPMENT AND THE MONITORING OF OPERATING PARAMETERS OF EACH SITE. EACH RTU SHALL CONTAIN A LOGIC CONTROLLER, MODEM, POWER SUPPLIES, RELAYS, WIRING, CONDUIT, CABLING, POWER/SURGE SUPPRESSION PROTECTION, UPS AND NEMA 4XSS RATED ENCLOSURES.
- 3. ENCLOSURES W/BACK PANELS: NEMA 4XSS RATED ELECTRICAL AND INSTRUMENTATION ENCLOSURES TO HOUSE ELECTRONIC SCADA EQUIPMENT, CONTROL AND INSTRUMENTATION DEVICES PER THE CONSULTING ENGINEERS REQUIREMENTS SHALL BE PROVIDED. THE SSI SHALL INSTALL THE SCADA RTU EQUIPMENT PER THE PLANS. THE RTU SHALL BE SUFFICIENTLY SIZED TO INCORPORATE THE SCADA HARDWARE HARDWARE. THE RTU ENCLOSURE SHALL HAVE 25% SPARE CAPACITY.
- 4. LOGIC CONTROLLER (LC): AN LC IS A MICRO-PROCESSOR INSTALLED AT THE MTU AND/OR EACH RTU SCADA SITE TO INTERPRET INFORMATION REGARDING THE OPERATION AT THE SITE AND TO EXECUTE LOCAL COMMANDS OR COMMANDS SENT FROM OTHER SCADA SITES.

#### ALLEN-BRADLEY COMPACT LOGIX 5069 OR APPROVED EQUAL

- NOTE: WHEREVER POSSIBLE, ALL LOGIC CONTROLLERS SHALL BE OF THE SAME MODEL AND CONFIGURATION FOR ALL SITES IN ORDER TO PROVIDE THE OWNER WITH STANDARD PARTS FOR SERVICE CONTINUITY.
- 5. POWER SUPPLY: EACH RTU/MTU REQUIRES ALTERNATING CURRENT CONVERSION TO DIRECT CURRENT FOR OPERATIONS OF ITS COMPONENTS. A BATTERY PACK ALLOWS FOR DIRECT CURRENT FEED IN THE EVENT OF A POWER FAILURE. THIS BATTERY PACK WILL ENSURE CONTINUED OPERATION AND FLOW OF INFORMATION FROM LOGIC CONTROLLERS AT SCADA SITES DURING SHORT TERM POWER OUTAGES AND ENSURE MTU COMPUTER POWER SUPPLY BACKUP DURING SHORT- TERM POWER OUTAGES. TYPE QUINT4-PS/1AC/24DC BY PHOENIX CONTACT.





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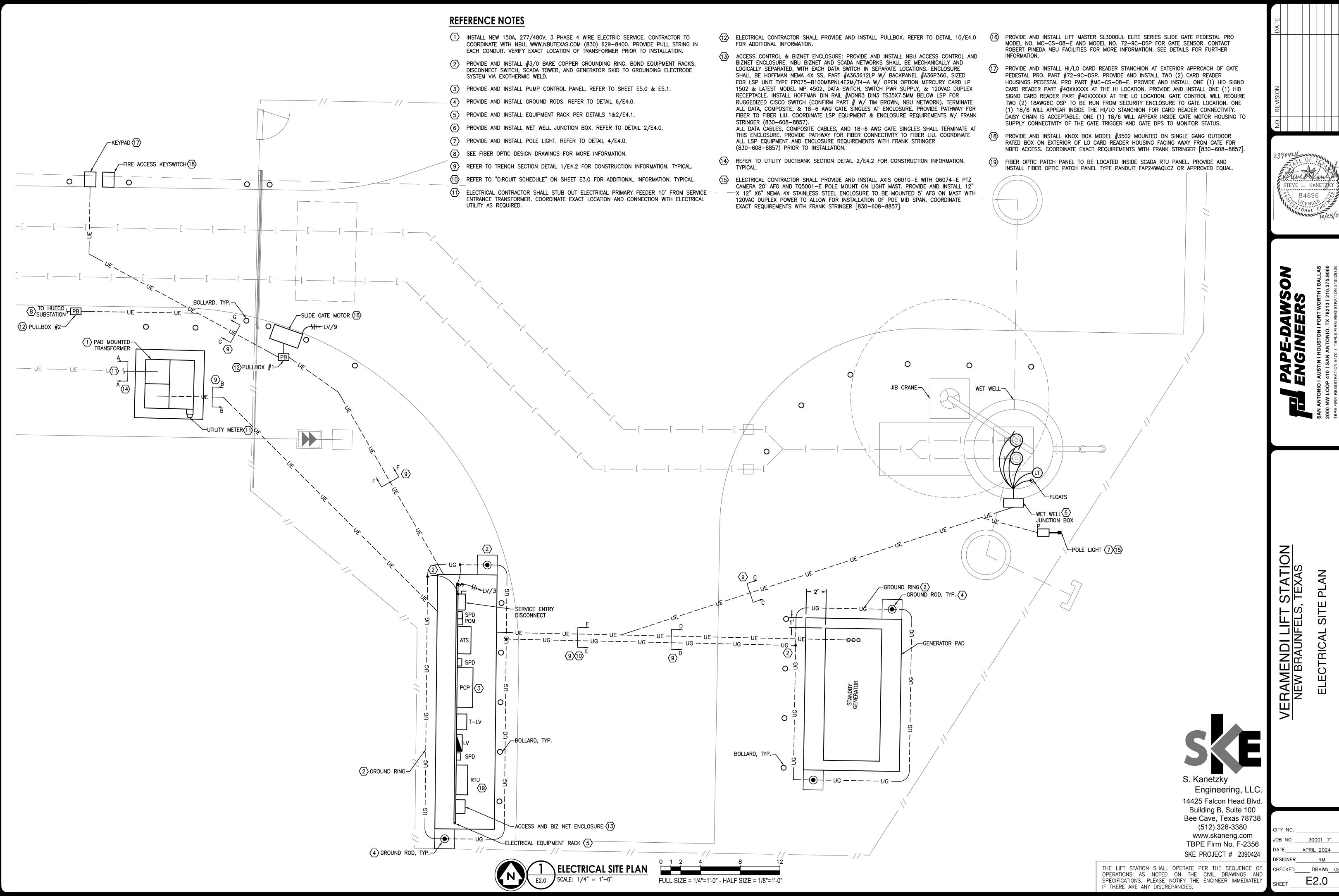
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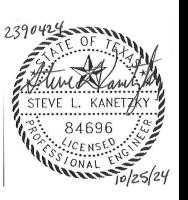
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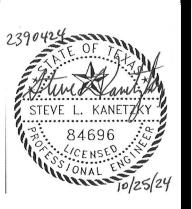
THE LIFT STATION SHALL OPERATE PER THE SEQUENCE OF OPERATIONS AS NOTED ON THE CIVIL DRAWINGS AND SPECIFICATIONS. PLEASE NOTIFY THE ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES.

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VERAMENDI LIFT STATION
NEW BRAUNFELS, TEXAS
ELECTRICAL ONE-LINE DIAGRAM
AND SCHEDULES

Bee Cave, Texas 78738
(512) 326-3380
www.skaneng.com
TBPE Firm No. F-2356
SKE PROJECT # 2390424

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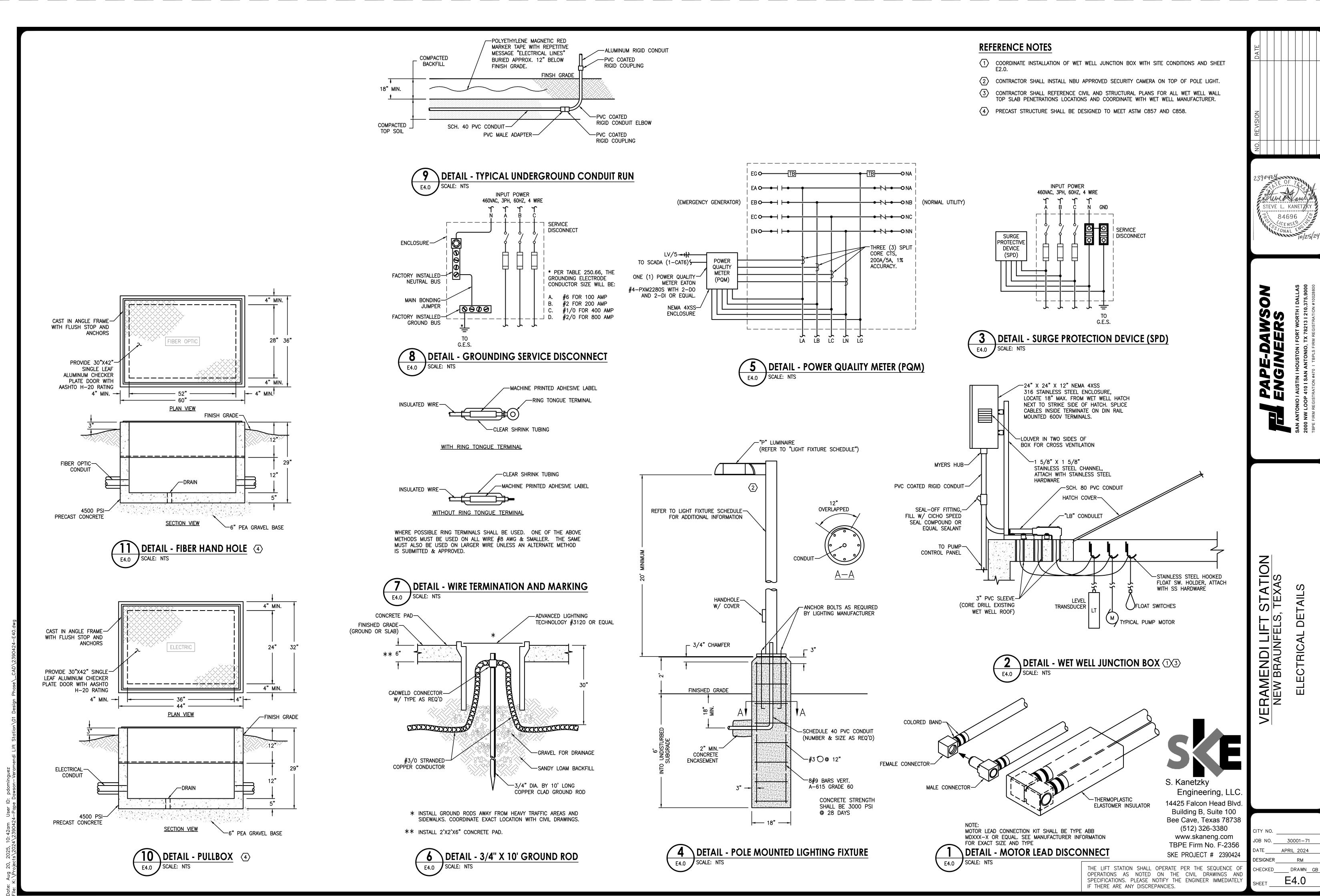
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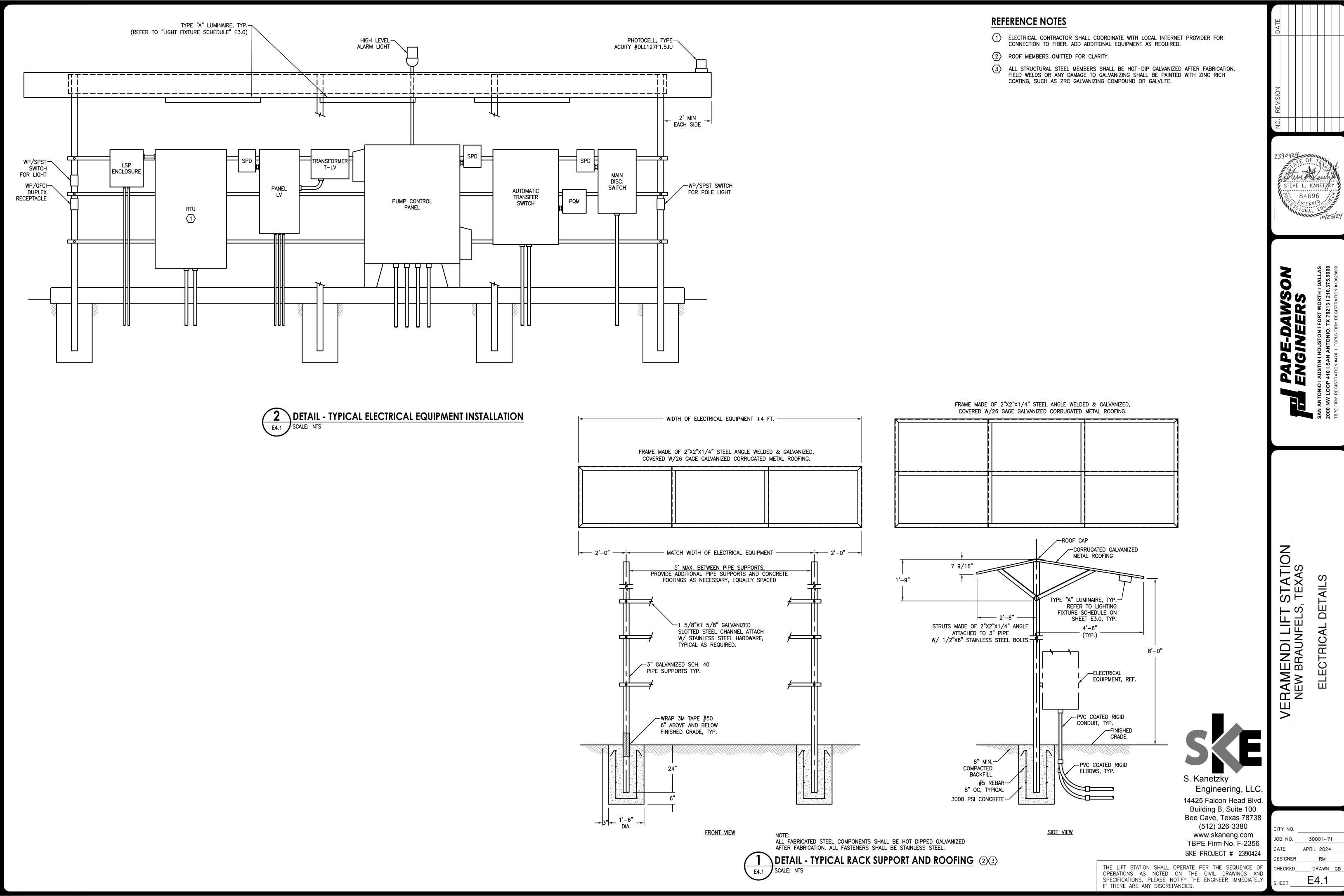
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LIFT STATION ONE-LINE DIAGRAM (5)



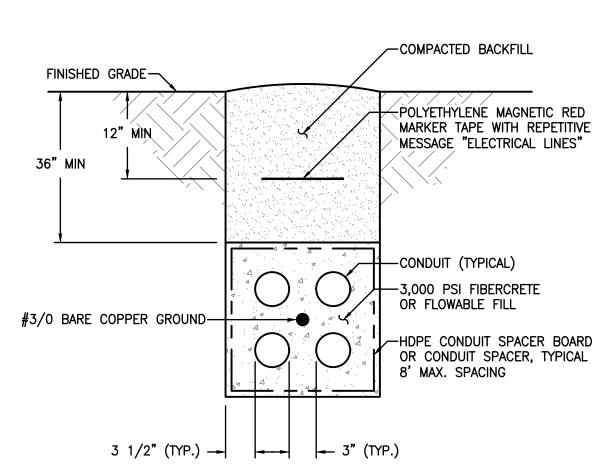


### **GENERAL NOTE**

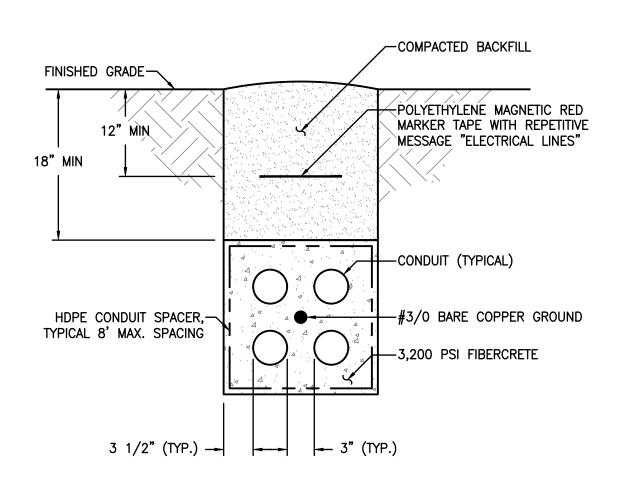
1. IT IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO PROVIDE AND INSTALL ALL RACEWAYS AND CONDUCTORS CUMULATIVELY BETWEEN THE DUCT BANK DETAILS, PANEL SCHEDULE, I/O SCHEDULE, AND CIRCUIT SCHEDULE. THE CIRCUIT SCHEDULE, I/O SCHEDULE AND PANEL SCHEDULES TAKE PRECEDENCE OVER THE DUCT BANK DETAILS.







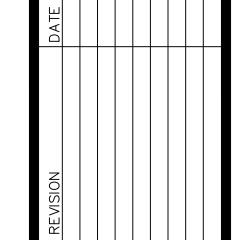


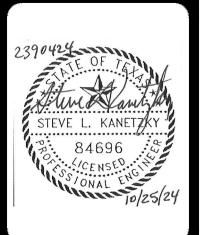






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E4.2

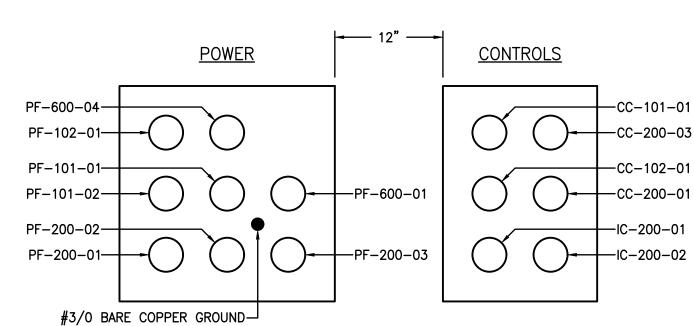
FOR PERMITTING 30001-71

CC-200-04-10 DETAIL - DUCTBANK SECTION G-G (1/3) E4.2 SCALE: NTS

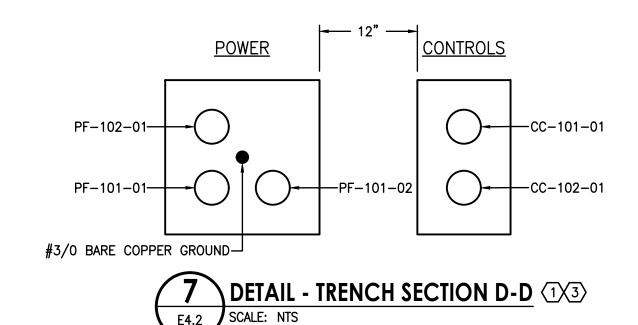
<u>CONTROLS</u>

**CONTROLS** 

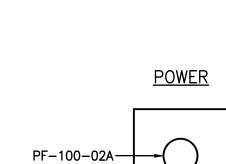
**\ DETAIL - DUCTBANK SECTION F-F** \(\frac{1}{\chi\_3}\) E4.2 SCALE: NTS



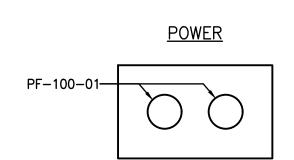
8 DETAIL - TRENCH SECTION E-E 1\3 SCALE: NTS



<u>CONTROLS</u> <u>POWER</u> PF-200-02 -IC-200-01 -CC-200-03 PF-600-01 **DETAIL - TRENCH SECTION C-C** ①3 **6** E4.2



5 DETAIL -SCALE: NTS DETAIL - TRENCH SECTION B-B 1\3



4 DETAIL - DUCTBANK SECTION A-A (1\sqrt{3}) E4.2 SCALE: NTS

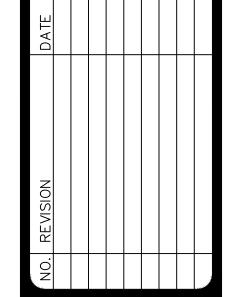
\* = FIELD WIRED BY CONTRACTOR.

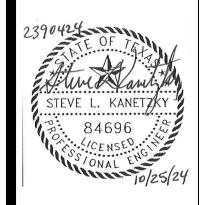
E5.0 SCALE: NTS

CONTROL PANEL WIRING DIAGRAM

### REFERENCE NOTES

- PUMP CONTROL PANEL WIRING IS TYPICAL. FINAL HARDWARE CONFIGURATION WILL VARY ACCORDING TO PUMP CONTROL PANEL SPECIFICATIONS.
- DUPLEX PUMP CONTROL PANEL, 480V, 3 PHASE, UL805A LABELED. VERIFY EXACT PUMP SIZES AND SIZE CIRCUIT BREAKERS AND OVERLOADS ACCORDINGLY. THE PUMP CONTROL PANEL SHALL BE MANUFACTURED BY 5 STAR ELECTRIC, SAN ANTONIO, TEXAS 210-492-4200 OR APPROVED EQUAL.
- 3 PROVIDE AND INSTALL NEMA RATED CLASS 2 STARTERS.
- (4) CONTRACTOR SHALL PROVIDE AND INSTALL VFD'S TYPE ABB MODEL ACQ580 SIZED FOR 23HP MOTORS SERIES W/ ETHERNET UP. TYPICAL.





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S. Kanetzky

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TBPE Firm No. F-2356 SKE PROJECT # 2390424

\* = FIELD WIRED BY CONTRACTOR.

**CONTROLS SCHEMATIC** 

E5.1 SCALE: NTS

### **REFERENCE NOTES**

- 1 PUMP CONTROL PANEL WIRING DIAGRAM IS TYPICAL. FINAL HARDWARE CONFIGURATION WILL VARY ACCORDING TO PUMP CONTROL PANEL SPECIFICATIONS FOR THE SUBMERSIBLE PUMPS.
- 2 PROVIDE STARTUP AND MINIMUM 4 HOURS TRAINING FOR OPERATOR PERSONNEL. SUBMIT STARTUP REPORT TO ENGINEER.
- (3) MOISTURE/OVER TEMPERATURE MONITOR RELAY SHALL BE INTEGRATED TO THE CONTROL LOGIC TO PROVIDE FAIL SAFE OPERATION. THUS, WHEN THE MOISTURE/OVER TEMPERATURE MONITOR RELAY IS REMOVED FROM THE CONTROL CIRCUIT OR FAILS, THE CORRESPONDING PUMP WILL BE LOCKED OUT.
- 4 ALL SEALED FLOAT SWITCHES SHALL BE CONNECTED TO THE CONTROL LOGIC VIA INTRINSICALLY SAFE RELAYS.

### **SEQUENCE OF OPERATION:**

#### LEVEL CONTROL OPERATION:

THE PUMP CONTROL PANEL SHALL UTILIZE ONE (1) LEVEL SENSOR TO CONTROL THE LEVEL IN THE WET WELL. ON SUMP LEVEL RISE TO 1ST PUMP TURN-ON LEVEL SETTING, THE CONTROLLER SHALL START THE 1ST PUMP. IF THE LEVEL CONTINUES TO RISE TO THE 2ND PUMP TURN-ON LEVEL SETTING, THE CONTROLLER SHALL START THE 2ND PUMP. SUMP LEVEL SHALL LOWER TO LOW LEVEL TURN-OFF SETTING AND ALL PUMPS SHALL STOP. ALTERNATING RELAY SHALL INDEX ON STOPPING OF PUMP SO THAT 2ND PUMP WILL START ON NEXT OPERATION AND SO FORWARD. IF LEVEL CONTINUES TO RISE AND HIGH LEVEL SETTING IS REACHED, THE CONTROLLER SHALL TRIGGER THE HIGH LEVEL ALARM. ALARM SHALL BE MANUAL RESET. LEVELS SHALL BE SET AS INDICATED IN THE SPECIFICATIONS AND SHOWN ON THE CIVIL PLANS. AN AUTOMATIC BACKUP LEVEL FLOATS SYSTEM SHALL BE PROVIDED. IF ONE PUMP SHOULD FAIL FOR ANY REASON, THE SECOND PUMP SHALL OPERATE ON THE CONTROLLER OVERRIDE SIGNAL. ALL LEVEL SETTINGS SHALL BE ADJUSTABLE FROM THE CONTROLLER SELECTABLE MENU/SCREEN. WITH THE PUMP OPERATING, THE SUMP FLUID LEVEL SHALL LOWER. WHEN THE LÓW LEVEL TURN-OFF SETTING IS REACHED THE PUMP RUNNING WILL THEN CEASE TO OPERATE.

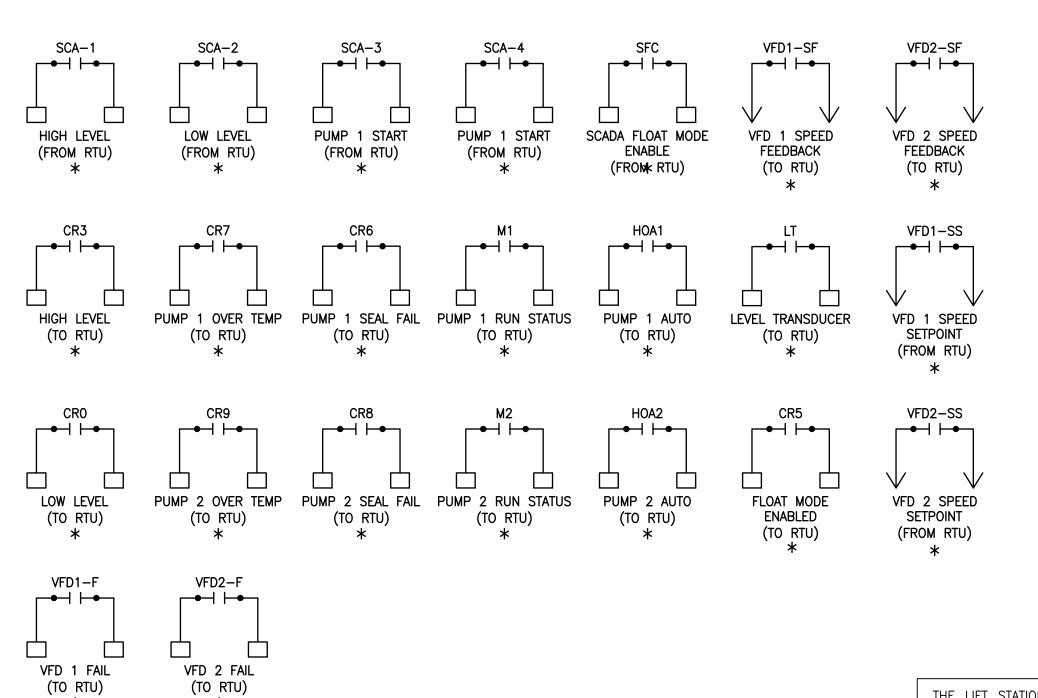
#### **AUTOMATIC BACKUP LEVEL FLOATS OPERATION:**

WHEN THE LEVEL TRANSMITTER FAILS THE PUMP CONTROL PANEL SHALL AUTOMATICALLY OPERATE BY THE LEVEL FLOATS ACCORDING TO THE FOLLOWING ORDER.

ON SUMP LEVEL RISE, LOWER (OFF) FLOAT SWITCH SHALL FIRST BE ENERGIZED. WITH THE PUMP OPERATING, THE SUMP FLUID LEVEL SHALL LOWER. WHEN THE LEVEL CAUSES THE LOWER (OFF) MERCURY FLOAT SWITCH TO TILT BACK TOWARD HANGING VERTICAL, ITS CONTACT SHALL OPEN CAUSING THE MOTOR CONTRACTOR TO LOSE POWER TO THE COIL AND THUS OPEN THE CIRCUIT TO THE PUMP MOTOR. THE PUMP OR PUMPS RUNNING WILL THEN CEASE TO OPERATE.

IF THE HIGH LEVEL FLOAT IS ACTIVATED ALL PUMPS SHALL BE CALLED TO RUN AT 100% FLOW CAPACITY.

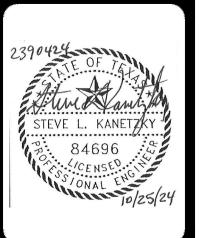
SCADA SHALL HAVE THE ABILITY TO TURN THE BACKUP FLOAT MODE ON AND OFF REMOTELY.





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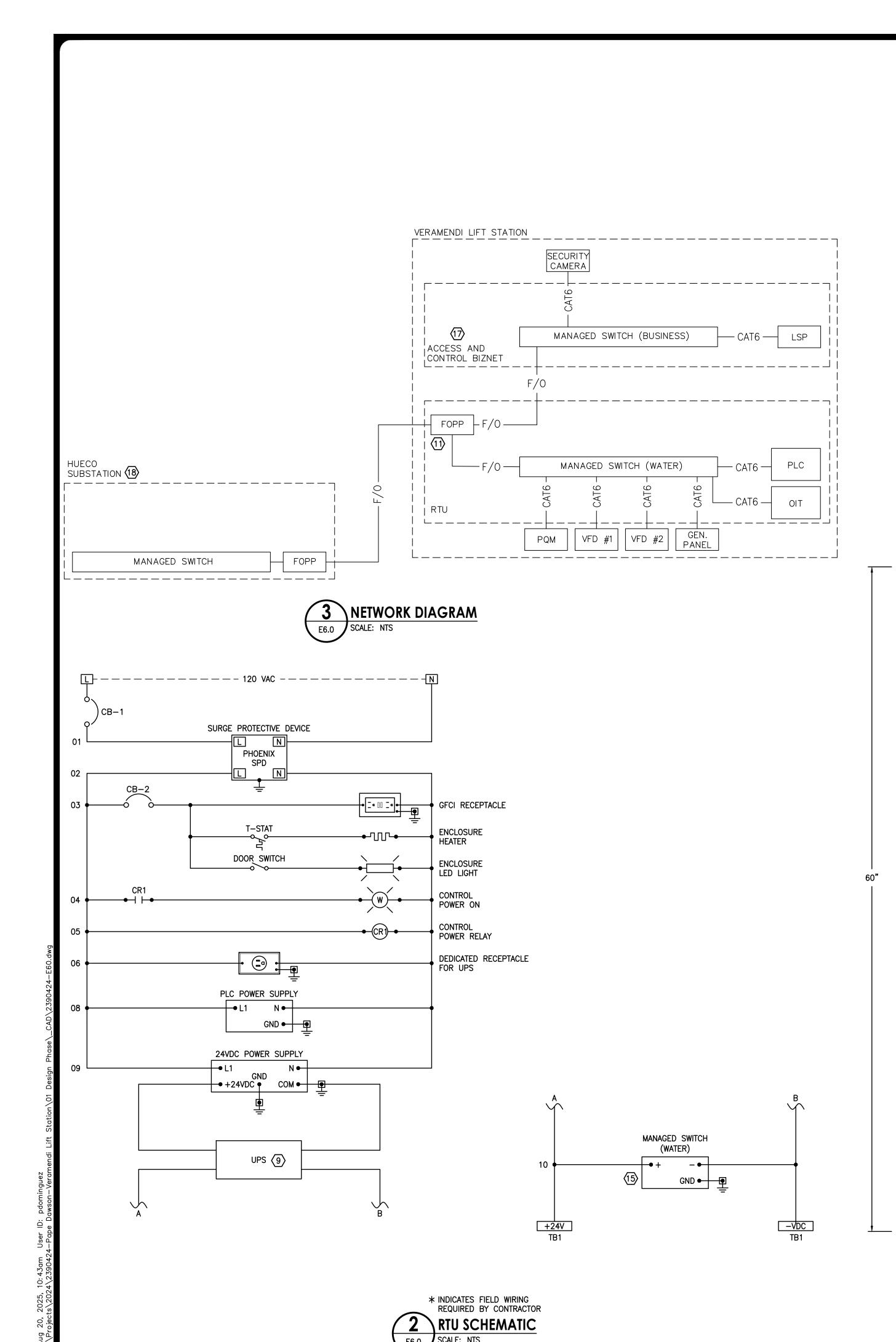


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# REFERENCE NOTES

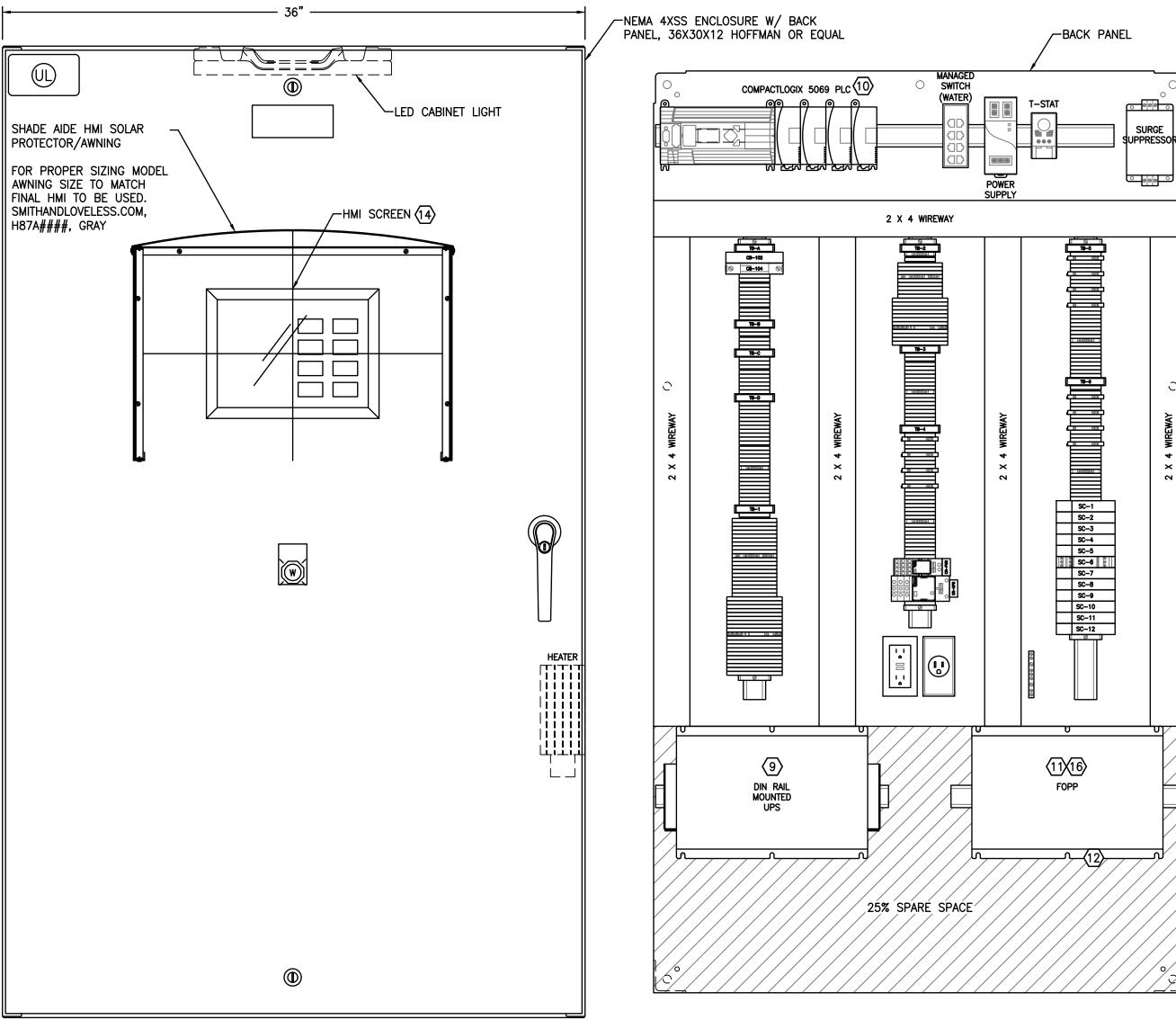
PRIOR TO INSTALLATION.

- 1 RTU PANEL SCHEMATIC AND WIRING DIAGRAM IS TYPICAL IN NATURE. FINAL HARDWARE CONFIGURATION MAY VARY.
- PROVIDE FACTORY AUTHORIZED STARTUP AND MINIMUM 4 HOURS TRAINING FOR OPERATOR PERSONNEL.
- THE LIFT STATION SCADA SYSTEM SHALL OPERATE PER THE SEQUENCE OF OPERATIONS PROVIDED BY THE CIVIL ENGINEER.
- 4 ALL CONDUITS AND WIRING PROVIDED, INSTALLED BY THE ELECTRICAL CONTRACTOR AND TERMINATED BY THE SCADA CONTRACTOR.
- 5 ELECTRICAL CONTRACTOR MAY GROUP WIRES WITH SAME VOLTAGE FOR FIELD DEVICES IN
- CONDUIT AS HE DEEMS BEST APPROPRIATE. 6 ANALOG AND LOW VOLTAGE SIGNALS SHALL NOT BE RUN IN SAME CONDUIT AS 120VAC AND
- 480VAC CIRCUITS. QUANTITY OF CONDUCTORS SHOWN ARE FOR REFERENCE ONLY. VERIFY EXACT WIRING REQUIREMENTS TO FIELD DEVICES PER INFORMATION PROVIDED BY THE EQUIPMENT VENDOR
- 8 USE SHIELDED TWISTED PAIR (STP) CABLE BELDEN #5341FE OR EQUAL.
- PROVIDE AND INSTALL PHOENIX QUINT DC-UPS WITH DIN RAIL PANEL MOUNTED UPS WITH PHOENIX QUINT SERIES BATTERY PACK. MODEL SHALL BE QUINT4-UPS/24DC/24DC/XX/EIP AND UPS-BAT/PB/24VDC BY PHOENIX CONTACT.
- PROVIDE AND INSTALL ALLEN BRADLEY COMPACTLOGIX 5069 PLC WITH I/O AS SHOWN ON SCHEDULE THIS SHEET.
- (11) ELECTRICAL CONTRACTOR SHALL COORDINATE FIBER CONNECTION TO HUECO SUBSTATION WITH NBU NETWORK SYSTEMS SUPERVISOR JASON STARNES (JSTARNES@NBUTEXAS.COM). FIBER DESIGN TO BE PROVIDED AS A SEPARATE DESIGN PACKAGE.

- (12) CONTRACTOR TO INSTALL DIN RAIL MOUNTED LIU TO CONNECT TO SCADA NETWORK WITH LC
- ALL CONDUCTORS IN PLC CABINET SHALL REQUIRE CRIMPED FERRULES. TYPICAL. PLC WIRE COLOR SHALL BE
- 24VDC POSITIVE ORANGE 24VDC NEGATIVE — WHITE W/ORANGE

LABELING SHALL FOLLOW THE FOLLOWING NOMENCLATURE:

- +24VDC WIRE NUMBERS 2000-2499
- -24VDC WIRE NUMBERS 2500-2999 - 120VAC WIRE NUMBERS - 3000-2499
- NEUTRAL WIRE NUMBERS 3500-3999 - DIGITAL IN WIRE NUMBERS - 5000-5999 - DIGITAL OUT WIRE NUMBERS - 6000-6999
- ANALOG IN WIRE NUMBERS 7000—7999 - ANALOG OUT WIRE NUMBERS - 8000-8999
- (14) CONTRACTOR SHALL PROVIDE HMI SCREEN TYPE 15" MAPLE SYSTEMS MODEL CMT3162X4.
- (15) CONTRACTOR SHALL PROVIDE AND INSTALL CISCO IE 3400-8P2S W/ FOUR (4) SFP MODULES MODEL GLC-EX-SM-RGD-AO OR EQUAL. SEPERATE SWITCHES SHALL BE USED FOR DIFFERENT NBU NETWORKS (BUSINESS, ELECTRIC AND WATER) AS REQUIRED. COORDINATE EXACT REQUIREMENTS WITH NBU NETWORK SYSTEMS SUPERVISOR TIM BROWN (TBROWN@NBUTEXAS.COM).
- 16 PROVIDE AND INSTALL FIBER OPTIC PATCH PANEL TYPE PANDUIT FAPZEWAQLCZ OR APPROVED EQUAL.
- (17) SEE SHEET E2.0 FOR ACCESS AND CONTROL BIZNET DETAILS.
- (18) WATER SCADA FIBER TO BE JUMPERED AT HUECO SUBSTATION BY OTHERS.



FRONT VIEW (EXTERIOR)

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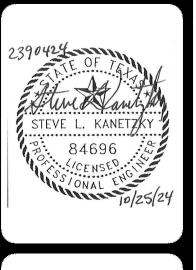
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FRONT VIEW (INTERIOR)

SCADA RTU ENCLOSURE (1) (2) (3) (4) (5) (6) (7) (8) (1) (1) (2) (3)

SKE PROJECT # 2390424 DRAWN<u>GB</u>

FOR PERMITTING 30001-71



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VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS

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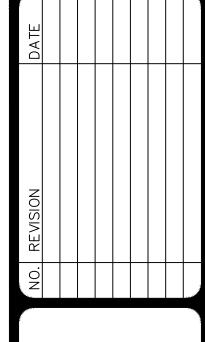
**GENERATOR** 

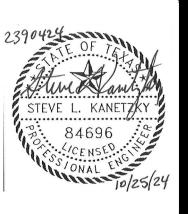
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46 GENERATOR CONTROL PANEL

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PAPE-DAWSON
ENGINEERS

N ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DALLAS

VERAMENDI LIFT STATION NEW BRAUNFELS, TEXAS

S. Kanetzky
Engineering, LLC.

14425 Falcon Head Blvd.
Building B, Suite 100

Building B, Suite 100
Bee Cave, Texas 78738
(512) 326-3380
www.skaneng.com
TBPE Firm No. F-2356
SKE PROJECT # 2390424

THE LIFT STATION SHALL OPERATE PER THE SEQUENCE OF OPERATIONS AS NOTED ON THE CIVIL DRAWINGS AND SPECIFICATIONS. PLEASE NOTIFY THE ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES.

#### STRUCTURAL GENERAL NOTES AND SPECIFICATIONS

#### GENERAL REQUIREMENTS

- 1 APPLICABLE CODES AND STANDARDS ALL CODES AND STANDARDS REFERENCED SHALL BE THE LATEST EDITION.
- 2 ANY REQUIRED CHANGES TO THE STRUCTURAL DRAWINGS DUE TO THE ACCEPTANCE OR INCLUSION OF ALTERNATES OR SUBSTITUTIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
- 3 THE CONTRACTOR SHALL COMPARE THE STRUCTURAL DRAWINGS WITH THE CIVIL DRAWINGS AND REPORT ANY DISCREPANCY TO THE ENGINEER PRIOR TO FABRICATION OR INSTALLATION OF STRUCTURAL MEMBERS.
- 4 JOB SITE SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL, AS A MINIMUM, ADHERE TO OCCUPATIONAL SAFETY AND HEALTH (OSHA) REGULATIONS TO PROTECT PERSONNEL.

#### FOUNDATION NOTES

#### 1 DESIGN LOADS

AT REST LATERAL EARTH PRESSURE - EQUIVALENT FLUID PRESSURE OF 120

- LIVE LOAD ON WET WELL TOP SLAB 200 PSF UNIFORM LOAD OR 2,000 LBS CONCENTRATED LOAD
- 2 DESIGN ALLOWABLE SOIL BEARING PRESSURE IS 4,000 PSF AT THE BOTTOM OF THE WET WELL AND 2,000 PSF FOR ALL OTHER FOUNDATION PADS.
- 3 THE GEOTECHNICAL INVESTIGATIONS FOR THIS PROJECT WAS PREPARED BY RABA KISTNER, INC., 211 TRADE CENTER, SUITE 300 NEW BRAUNFELS, TX, 78130. TEL. (830) 214-0544. RABA KISTNER PROJECT NUMBER ANA24-015-00, DATED MAY 24, 2024. THE CONTRACTOR SHALL OBTAIN A COPY OF THIS REPORT AND REVIEW ITS CONTENTS TO BECOME FAMILIAR WITH THE GEOTECHNICAL CONDITIONS THAT EXIST AT THIS SITE AND THE RECOMMENDATIONS PRESENTED IN THE GEOTECHNICAL INVESTIGATION.
- 4 PRIOR TO COMMENCEMENT OF EXCAVATION OPERATIONS, FIELD LOCATE AND ADEQUATELY PROTECT ANY EXISTING STRUCTURES, TREES, UTILITIES AND/OR OTHER PERMANENT ELEMENTS TO REMAIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY DAMAGE RESULTING FROM CONSTRUCTION OPERATIONS.
- 5 THE CONTRACTOR SHALL PROVIDE AND ENSURE PROPER DRAINAGE OF THE SITE PRIOR TO BEGINNING CONSTRUCTION OF THE LIFT STATION. DRAINAGE SHALL BE SUCH THAT SURFACE RUNOFF IS ROUTED AROUND OR AWAY FROM THE CONSTRUCTION AREA. MEASURES SHALL BE TAKEN TO PREVENT THE PONDING OF WATER WITHIN THE FOUNDATION AREA.
- 6 THE CONSTRUCTION AREA SHALL BE STRIPPED OF ALL VEGETATION, LOOSE TOP SOIL, DEBRIS, ORGANICS AND OTHER DELETERIOUS MATERIAL. ROOTS AND STUMPS OF TREES WITHIN THE CONSTRUCTION AREA SHALL BE REMOVED FOR THEIR FULL DEPTH. INCLUDING THE DRY SOILS AROUND THE ROOT BULB. EXCAVATIONS IN CUT AREAS SHALL BE BENCHED.
- 7 EXCAVATE EXISTING SUBGRADE TO DOWN TO COMPETENT NATURAL LIMESTONE EXISTING GRADE SHALL BE EXCAVATED TO THE DEPTH NECESSARY TO REMOVE ALL VEGETATION AND ORGANICS. THE EXCAVATION OF SURFICIAL SOILS AND SHALL EXTEND A MINIMUM DISTANCE OF 3 FEET BEYOND THE FOOTPRINT OF THE FOUNDATION PADS ON ALL SIDES. ONCE FINAL SUBGRADE ELEVATIONS HAVE BEEN ACHIEVED. THE EXPOSED SUBGRADE SHALL BE CAREFULLY PROOFROLLED WITH A 15-TON PNEUMATIC ROLLER OR EQUIVALENT EQUIPMENT TO DETECT WEAK ZONES IN THE SUBGRADE. WEAK AREAS DETECTED DURING PROOFROLLING SHALL BE REMOVED AND REPLACED WITH SOILS EXHIBITING SIMILAR CLASSIFICATION, MOISTURE CONTENT AND DENSITY AS THE ADJACENT IN-SITU SOILS.
- ALL FOUNDATION SLABS OTHER THAN THE WET WELL BOTTOM SLAB SHALL BE FOUNDED ON TOP OF COMPACTED & DENSITY TESTED SELECT FILL MATERIAL. AS SPECIFIED IN NOTE 12, ABOVE NATURAL LIMESTONE SUBGRADE.
- THE WET WELL BOTTOM SLAB SHALL BE FOUNDED ON NATURAL LIMESTONE
- TOP SOIL SHALL BE STOCKPILED ON-SITE FOR LATER GRADING AROUND THE PROJECT. EXCESS MATERIAL NOT USED FOR FINAL GRADING SHALL BE HAULED OFF AND DISPOSED OF OFF-SITE.
- 8 TEMPORARY EXCAVATION SUPPORT SYSTEM
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DESIGNING AND CONSTRUCTING STABLE. TEMPORARY EXCAVATIONS AND SHOULD SHORE. SLOPE. OR BENCH THE SIDES OF THE EXCAVATIONS AS REQUIRED TO MAINTAIN STABILITY OF BOTH THE EXCAVATION SIDES AND BOTTOM. ALL EXCAVATION SHOULD COMPLY WITH APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS INCLUDING CURRENT OSHA EXCAVATION AND TRENCH SAFETY STANDARDS. REFERENCE GEOTECHNICAL ENGINEER FOR TEMPORARY EXCAVATION RECOMMENDATIONS.
- 9 IN THE EVENT THAT SELECT FILL IS COMPACTED TO A DEPTH LESS THAN THAT REQUIRED BY THE DRAWINGS, THE CONTRACTOR SHALL, FILL THE UNDERCOMPACTION WITH CONCRETE. CONCRETE REQUIRED TO COMPENSATE THE UNDERCOMPACTION SHALL BE AT THE CONTRACTOR'S EXPENSE.
- 10 ANY WATER ACCUMULATIONS IN EXCESS OF 1 INCH SHALL BE PUMPED OUT PRIOR TO PLACEMENT OF CONCRETE. REBAR AND CONCRETE FOR FOOTINGS SHALL BE PLACED AS SOON AS PRACTICAL FOLLOWING COMPLETION OF EXCAVATIONS TO PREVENT EXCESSIVE DRYING OR WETTING OF THE
- 11 THE BACKFILL FOR THE LOWER PORTION OF THE LIFT STATION WET WELL SHALL CONSIST OF CLEAN CRUSHED STONE MATERIAL COVERED BY FILTER FABRIC. THE CLEAN CRUSHED STONE BACKFILL SHALL BE FREE OF ORGANIC AND OTHER DELETERIOUS MATERIALS. ALL ROCK PARTICLES SHALL BE LESS THAN TWO INCHES IN THE LONGEST DIMENSION. THE CLEAN CRUSHED STONE SHALL MEET THE FOLLOWING GRADATION:

SIEVE SIZE PERCENT PASSING 100% 3/4" 75-100% NO. 4 0-20% NO. 50 0-5%

### AN ACCEPTABLE PRODUCT IS TEXAS CRUSHED STONE 066.

THE CLEAN CRUSHED STONE BACKFILL SHOULD BE PLACED IN LIFTS OF 12 INCHES MAXIMUM THICKNESS WITH A MINIMUM OF 4 COMPLETE OVERLAPPING PASSES OVER THE ENTIRE SURFACE WITH A VIBRATORY PLATE COMPACTOR UNTIL FURTHER PASSES WILL NOT RESULT IN GREATER DENSIFICATION.

12 ALL SELECT FILL MATERIAL AT THE LIFT STATION SHALL CONSIST OF IMPORTED SELECT FILL OR ON-SITE PROCESSED LIMESTONE MATERIAL APPROVED BY THE GEOTECHNICAL ENGINEER.

IMPORTED SELECT FILL - IMPORTED SELECT FILL SHALL CONSIST OF LIMESTONE BASE MATERIAL MEETING THE REQUIREMENTS OF TXDOT ITEM 247. TYPE A. GRADE 4 OR A LOW PLASTICITY CLAYEY SOIL WITH A PLASTICITY INDEX BETWEEN 7 AND 20 PERCENT, A MAXIMUM GRAVEL CONTENT (PERCENT RETAINED ON THE NO. 4 SIEVE) OF 40 PERCENT, AND ROCKS NO LARGER THAN FOUR INCHES IN THEIR LARGEST DIMENSION.

ON-SITE PROCESSED LIMESTONE MATERIAL - IT IS ANTICIPATED THAT EXISTING ON-SITE WEATHERED LIMESTONE MAY BE ACCEPTABLE AS SELECT FILL. THE ON-SITE MATERIAL SHALL BE PROCESSED SUCH THAT A RELATIVELY WELL GRADED GRAIN SIZE DISTRIBUTION WITH A MAXIMUM PARTICLE SIZE OF 4 INCHES IS ACHIEVED. IN ADDITION, THE

- PLASTICITY INDEX OF THE MATERIAL PASSING THE NO. 40 SEIVE SHALL NOT EXCEED 20. THE USE OF ON-SITE MATERIAL SHALL BE APPROVED AND MONITORED BY THE TESTING LABORATORY OR GEOTECHNICAL ENGINEER.
- ALL SELECT FILL MATERIAL SHALL BE PLACED IN UNIFORM LOOSE LIFT THICKNESS OF 8 INCHES MAXIMUM AND COMPACTED TO UNIFORM LIFTS NOT EXCEEDING 6 INCHES IN THICKNESS. SELECT FILL SHALL BE COMPACTED TO A MINIMUM OF 95 PERCENT OF THE STANDARD PROCTOR (ASTM D 698) MAXIMUM DRY DENSITY AT +/- 3% OF OPTIMUM MOISTURE CONTENT.
- THE TOP 12 INCHES OF BACKFILL SHALL CONSIST OF A CLAY MATERIAL WITH A MINIMUM PI OF 32. THE CLAY MATERIAL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE STANDARD SPECIFICATION.

#### REINFORCED CONCRETE NOTES

- 1 ALL CONCRETE SHALL BE CLASS C (3600 PSI) NORMAL WEIGHT CONCRETE WITH A WATER/CEMENT RATIO OF NOT MORE THAN 0.45 AND A SLUMP IN THE RANGE OF 5 TO 8 INCHES. WATER CONTENT SHALL BE CLOSELY MONITORED DURING BATCHING. UNDER NO CIRCUMSTANCES SHALL THE WATER/CEMENT RATIO BE PERMITTED TO EXCEED THE SPECIFIED MAXIMUM. THE USE OF A MID RANGE WATER REDUCING ADMIXTURE IS RECOMMENDED TO IMPROVE WORKABILITY DURING PLACING OPERATIONS.
- 2 THE USE OF FLY ASH IS REQUIRED. CONCRETE SHALL BE PROPORTIONED WITH A MINIMUM FLY ASH CONTENT EQUAL TO 25 PERCENT OF THE TOTAL WEIGHT OF THE CEMENT PLUS FLY ASH BY WEIGHT. FLY ASH SHALL BE CLASS F OR C, BUT CONCRETE MIXED WITH CLASS C FLY ASH SHALL BE SUBJECT TO THE FOLLOWING RESTRICTIONS:
- A COARSE AGGREGATE SHALL CONSIST OF CRUSHED LIMESTONE. THE USE OF ROCK GRAVEL AGGREGATE WILL NOT BE PERMITTED.
- B CEMENT SHALL BE TYPE II LA (LOW ALKALI) OR TYPE I/II LA. ALKALI CONTENT OF THE CEMENT SHALL BE LESS THAN 0.6%.
- 3 REINFORCING STEEL SHALL BE ASTM/ANSI A615, GRADE 60. DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, ACI 315.
- 4 CONCRETE CONSTRUCTION, INCLUDING MINIMUM REINFORCING STEEL COVERAGE BY CONCRETE, SHALL BE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, " ACI 318, UNLESS OTHERWISE NOTED.
- 5 PROVIDE SUPPORTS OR CHAIRS TO SUPPORT REBAR AT THE POSITIONS REQUIRED BY THE DRAWINGS. REINFORCEMENT FOR FOOTINGS SHALL BE SUPPORTED ON PRECAST CONCRETE BLOCKS OF A THICKNESS TO PROPERLY POSITION THE REBAR. BLOCKS SHALL BE PROVIDED AT 3'-0" MAXIMUM ON CENTERS.
- 6 LAP CONTINUOUS UNSCHEDULED REINFORCING BARS 40 BAR DIAMETERS UNLESS OTHERWISE NOTED.
- 7 THERE SHALL BE NO HORIZONTAL CONSTRUCTION JOINTS EXCEPT WHERE SPECIFICALLY NOTED ON THESE DRAWINGS.
- 8 THE CONTRACTOR SHALL ENSURE THAT ALL EMBEDDED ITEMS ARE DELIVERED TO THE SITE IN A TIMELY FASHION AND INSTALLED IN THE FORMWORK PRIOR TO PLACEMENT OF CONCRETE.
- 9 FIELD CUTTING OF REINFORCEMENT SHALL BE BY SHEARING OR SAWING. FIELD CUTTING OF REINFORCEMENT BY TORCH WILL BE PERMITTED ONLY WITH THE APPROVAL OF THE ENGINEER.
- 10 UNLESS OTHERWISE NOTED, ALL 90, 135 AND 180 DEGREE REINFORCING STEEL HOOKS SHALL BE STANDARD ACI HOOKS.
- 11 THE CONTRACTOR SHALL USE A TREMIE TO PLACE CONCRETE IN ALL AREAS WHERE THE FALL OF THE CONCRETE WILL EXCEED 5 FEET.
- 12 THE CONTRACTOR SHALL USE CARE TO PROPERLY VIBRATE CONCRETE DURING PLACING OPERATIONS TO ENSURE GOOD DENSITY OF CONCRETE AND TO MINIMIZE SURFACE DEFECTS.

### 13 CHAMFER ALL EXPOSED EDGES 3/4 INCH.

14 FORMWORK FOR SURFACES TO BE EXPOSED TO VIEW IN THE FINISHED CONSTRUCTION SHALL BE SMOOTH, EITHER WOOD OR METAL. SMOOTH FORMS SHALL BE FREE OF RAISED GRAIN. TORN SURFACES. WORN EDGES. PATCHES. DENTS OR OTHER DEFECTS. STRENGTH OF FORMS SHALL BE SUCH THAT NO WARPING. BULGING OR BOWING OCCUR UNDER THE WEIGHT OF THE WET CONCRETE. JOINTS SHALL BE SMOOTH AND MORTAR TIGHT. FORMS WHICH DO NOT PRESENT A SMOOTH SURFACE OR LINE UP PROPERLY SHALL NOT BE USED. FORMS SHALL BE FREE OF RUST, GREASE OR OTHER FOREIGN SURFACES THAT MAY DISCOLOR THE FINISHED CONCRETE.

### CONCRETE FINISHING

1 REPAIR OF SURFACE DEFECTS - DEFECTIVE AREAS SHALL BE REPAIRED IMMEDIATELY AFTER REMOVAL OF FORMS. HONEYCOMBED AND OTHER DEFECTIVE AREAS SHALL BE REMOVED DOWN TO SOUND CONCRETE. THE DEFECTIVE AND SURROUNDING AREA SHALL BE DAMPENED AND A BONDING GROUT APPLIED TO THE AREA. BONDING GROUT SHALL CONSIST OF APPROXIMATELY ONE PART CEMENT TO ONE PART FINE SAND PASSING A NO. 30 SIEVE. MIX GROUT TO THE CONSISTENCY OF A THICK CREAM AND BRUSH THOROUGHLY INTO THE SURFACE.

PATCHING MORTAR SHALL BE OF THE SAME MATERIALS AND APPROXIMATELY THE SAME PROPORTIONS AS CONCRETE EXCEPT THAT COARSE AGGREGATE SHALL BE OMITTED. PREPARE MORTAR WITH NO MORE THAN ONE PART CEMENT TO 2 1/2 PARTS SAND. USE WHITE PORTLAND CEMENT FOR PART OF THE GRAY CEMENT TO MIX A MORTAR OF A COLOR TO MATCH THE SURROUNDING CONCRETE. USE NO MORE WATER THAN NECESSARY AND MIX MORTAR TO THE STIFFEST CONSISTENCY THAT WILL PERMIT PLACING.

THOROUGHLY BRUSH PATCHING MORTAR INTO THE BONDING GROUT.

AFTER SURFACE WATER FROM THE BONDING GROUT HAS DISSAPATED.

IN LIEU OF USE OF BONDING GROUT, A LATEX BONDING AGENT MAY BE

2 ALL VERTICAL CONCRETE SURFACES EXPOSED TO VIEW SHALL RECEIVE A RUBBED FINISH. ALL HORIZONTAL CONCRETE SURFACES EXPOSED TO VIEW SHALL RECEIVE A SMOOTH TROWEL FINISH.

### WATERSTOPS

1 ALL WATERSTOPS SHALL BE PREFORMED PLASTIC SEALING TYPE WATERSTOP SUCH AS SYNKO-FLEX. PLASTIC SEALING TYPE WATERSTOP SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

### INSTALLATION OF BOLTS INTO EXISTING CONCRETE

1 BOLTS INSTALLED INTO EXISTING CONCRETE SHALL BE DRILLED AND ANCHORED USING HILTI HIT-HY 200 ADHESIVE, USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. EXTRA CARE SHALL BE USED TO PROPERLY CLEAN HOLES PRIOR TO INSTALLATION OF ADHESIVE AND RODS. HOLE CLEANING SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS, BUT SHALL INCLUDE BLOWING THE DRILLED HOLE OUT WITH COMPRESSED AIR FOLLOWED BY CLEANING WITH A BRUSH AND FINAL CLEANING WITH COMPRESSED AIR. COMPRESSED AIR SHALL BE APPLIED TO THE BOTTOM OF THE HOLE USING A NOZZLE EXTENSION FOR HOLE CLEANING. ADHESIVE SHALL COMPLETELY FILL THE HOLE AFTER INSTALLATION OF THE BOLTS.

#### NON-SHRINK GROUT

- 1 NON-SHRINK GROUT SHALL CONSIST OF A HIGH STRENGTH GROUT CAPABLE OF PROVIDING A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI GROUT SHALL BE A NON-FERROUS MATERIAL BLENDED OF CAREFULLY GRADED SILICA AGGREGATE, SELECT PORTLAND CEMENT AND EXPANSIVE AGENTS OR ADMIXTURES.
- 2 PRODUCT SHALL BE SUITABLE FOR USE AT CONSISTENCIES RANGING FROM FLUID TO PLASTIC WITHOUT SEGREGATION.
- 3 GROUT SHALL BE MIXED, PLACED AND CURED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. PLACEMENT SHALL BE IN SUCH A MANNER AS TO PREVENT OR AVOID AIR POCKETS OR VOIDS.

#### FILTER FABRIC

- 1 FILTER FABRIC SHALL CONSIST OF NON-WOVEN POLYPROPYLENE FIBERS WITH THE FOLLOWING PROPERTIES.
- A GRAB TENSILE STRENGTH OF 120 POUNDS AND ELONGATION AT ULTIMATE
- STRENGTH OF 50% IN ACCORDANCE WITH ASTM D 4632. B MULLEN BURST STRENGTH OF 225 PSI IN ACCORDANCE WITH ASTM D
- C TRAPEZOIDAL TEAR STRENGTH OF 50 POUNDS IN ACCORDANCE WITH ASTM
- D 4355. D PUNCTURE STRENGTH OF 65 POUNDS IN ACCORDANCE WITH ASTM D 4833.
- RETAINAGE OF 70% OF STRENGTH AFTER 500 HOURS OF EXPOSURE TO ULTRAVIOLET LIGHT IN ACCORDANCE WITH ASTM D 4355.
- APPARENT OPENING SIZE OF 0.212 MILLIMETER, OR US SIEVE 70, PER ASTM D 4751. G FLOW RATE OF 135 GALLONS PER MINUTE PER SQUARE FOOT IN
- ACCORDANCE WITH ASTM D 4491. 2 ACCEPTABLE PRODUCT IS MIRAFI 140N NON-WOVEN POLYPROPYLENE GEOTEXTILE FABRIC AS MANUFACTURED BY TC MIRAFI, INC., PENDERGRASS,

#### SUBMITTALS

GEORGIA, OR APPROVED EQUAL.

THE FOLLOWING ITEMS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. WORK ASSOCIATED WITH THESE ITEMS SHALL NOT COMMENCE UNTIL THE SUBMITTALS HAVE BEEN REVIEWED AND RETURNED BY THE ENGINEER. THE CONTRACTOR SHALL SUBMIT THE FOLLOWING:

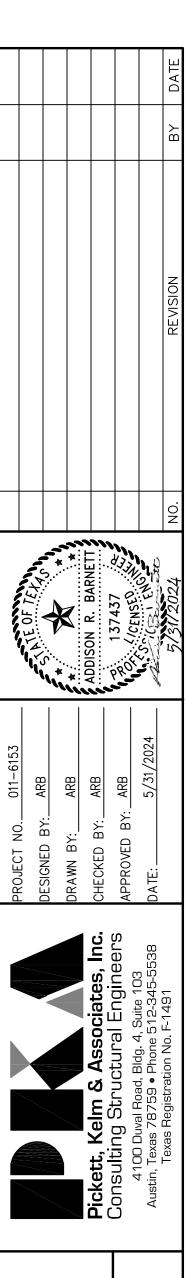
- 1 TEST DATA AND MIX DESIGNS FOR EACH TYPE AND STRENGTH OF CONCRETE SPECIFIED.
- 2 REINFORCING STEEL SHOP DRAWINGS DETAILING REINFORCEMENT FABRICATION AND BAR PLACEMENT. SHOP DRAWINGS SHALL CLEARLY INDICATE THE LOCATION, SIZE, SPACING, SPLICES AND PIECEMARK FOR ALL REINFORCING STEEL. THE SHOP DRAWINGS SHALL PROVIDE SUFFICIENT DETAIL TO PERMIT PLACEMENT OF REINFORCEMENT WITHOUT THE USE OF THE DESIGN DRAWINGS. THE SHOP DRAWINGS SHALL INCLUDE A COMPLETE BILL OF MATERIALS FOR ALL REINFORCING STEEL. FABRICATION OF REINFORCING STEEL SHALL NOT COMMENCE UNTIL THE ENGINEER HAS COMPLETED THE REVIEW OF THE SHOP DRAWINGS.
- 3 PROPOSED METHOD OF CONCRETE CURING AND PRODUCT DATA FOR ANY CURING COMPOUNDS PROPOSED FOR USE ON THE PROJECT.
- 4 LABORATORY TEST REPORT CERTIFYING THAT THE SELECT FILL MATERIAL AND CLEAN CRUSHED STONE BACKFILL PROPOSED FOR THE PROJECT MEETS THE REQUIREMENTS SPECIFIED IN THESE CONSTRUCTION DOCUMENTS.
- 5 LABORATORY TEST RESULTS FOR CONCRETE CYLINDER COMPRESSION TESTS AND SUBGRADE AND FILL COMPACTION TESTS.
- 6 PRODUCT DATA FOR FILTER FABRIC AND WATERSTOPS.

### TESTING LABORATORY REQUIREMENTS

THE CONTRACTOR SHALL SECURE THE SERVICES OF A COMMERCIAL TESTING LABORATORY TO PERFORM ALL REQUIRED MATERIALS TESTS AND INSPECTIONS.

1 ONE SET OF CONCRETE TEST CYLINDERS SHALL BE OBTAINED FOR EVERY 50

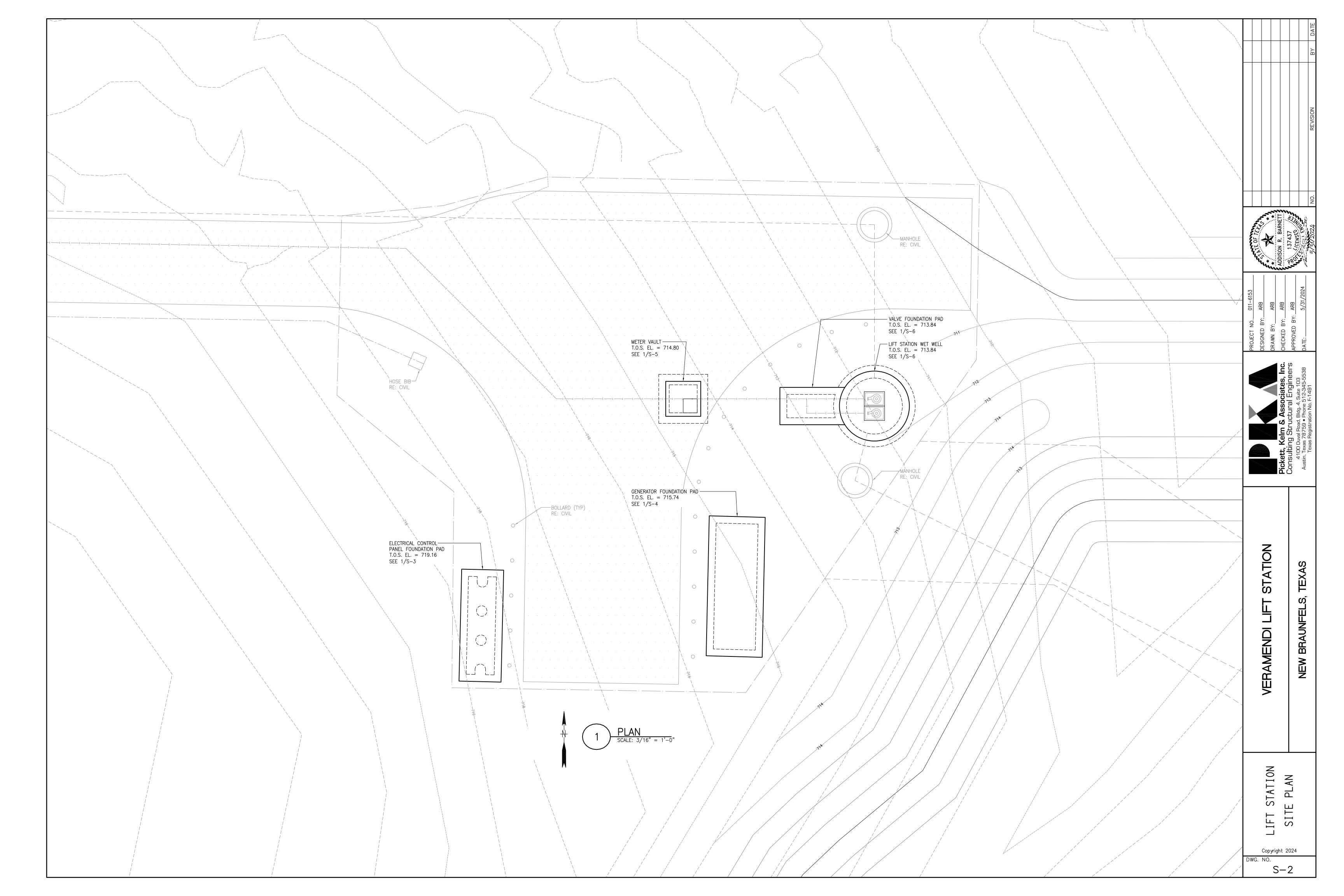
- CUBIC YARDS OF CONCRETE PLACED, OR ANY PORTION THEREOF PLACED IN A SINGLE DAY, AS FOLLOWS:
- A FIVE (5) CONCRETE TEST CYLINDERS SHALL BE MOLDED FROM EACH SAMPLE AND CURED ACCORDING TO ASTM C 31. COMPRESSIVE TESTS SHALL BE PERFORMED ON ONE CYLINDER AT 7 DAYS AND THREE CYLINDERS AT 28 DAYS. THE FIFTH CYLINDER SHALL BE RETAINED FOR 56 DAYS AND TESTED ONLY IF THE AVERAGE STRENGTH OF THE 28 DAYS TESTS DO NOT MEET THE MINIMUM REQUIRED COMPRESSIVE STRENGTH.
- B A SLUMP TEST AND TEMPERATURE MEASUREMENT SHALL BE PERFORMED FOR EACH SAMPLE.
- C COMPUTATION OF WATER/CEMENT RATIO, AS REQUIRED OR DIRECTED BY THE ENGINEER.
- 2 ADDITIONAL CYLINDERS MAY BE MADE AND TESTED, AS NECESSARY, FOR ACCELERATED REMOVAL OF FORMS OR ERECTION OF MEMBERS TO VERIFY THAT NECESSARY STRENGTHS HAVE BEEN OBTAINED. SUCH CYLINDERS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.
- 3 APPROPRIATE TESTS SHALL BE PERFORMED TO CERTIFY THAT SELECT FILL AND CLEAN CRUSHED STONE PROPOSED FOR USE IN THE CONSTRUCTION IS
- 4 FIELD DENSITY TESTS SHALL BE PERFORMED ON THE SUBGRADE AND EACH LIFT OF FILL MATERIAL. ONE DENSITY TEST WILL BE REQUIRED FOR EACH 5,000 SQUARE FEET, BUT NOT LESS THAN THREE (3) TESTS PER
- 5 REINFORCED CONCRETE CONSTRUCTION SERVICES ARE TO BE PROVIDED AS FOLLOWS:
- A INSPECT EXCAVATIONS, SUBGRADE MODIFICATION PREPARATION, AND REINFORCING STEEL PLACEMENT PRIOR TO CONCRETE POURS.
- 6 THE CONTRACTOR SHALL COOPERATE AND COORDINATE FULLY WITH THE TESTING LABORATORY.
- 7 IN THE EVENT THAT CONCRETE ELEMENTS OR MEMBERS DO NOT ACHIEVE THE SPECIFIED MINIMUM COMPRESSIVE STRENGTHS, THE ENGINEER MAY REQUIRE ADDITIONAL ANALYSIS, TESTING OR REMOVAL AND REPLACEMENT OF MEMBERS. ANY AND ALL SUCH ADDITIONAL ANALYSIS OR TESTING SHALL BE AT THE CONTRACTOR'S EXPENSE, WHETHER SUCH ANALYSIS OR TESTING DEMONSTRATES ADEQUATE STRENGTH OR NOT. REPLACEMENT OF ANY MEMBERS DEEMED QUESTIONABLE OR INADEQUATE BY THE ENGINEER SHALL BE AT THE CONTRACTOR'S EXPENSE.
- 8 THE CONTRACTOR SHALL ARRANGE FOR COPIES OF THE INSPECTION AND TESTING REPORTS TO BE SENT TO THE ENGINEER. COPIES OF TEST AND INSPECTION REPORTS SHALL BE FORWARDED TO THE ENGINEER AS QUICKLY AS POSSIBLE FOLLOWING COMPLETION OF THE TESTS AND INSPECTIONS.

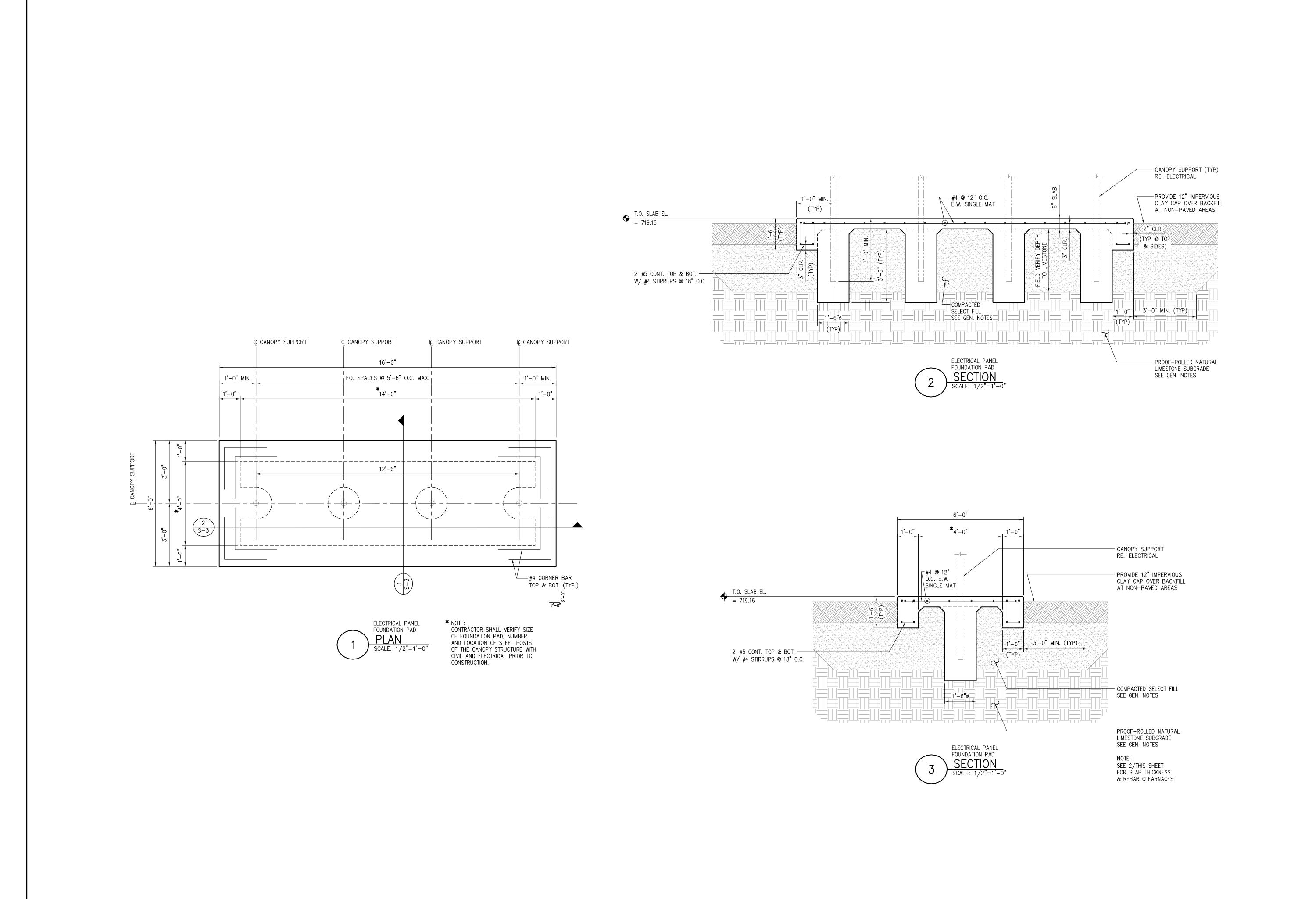


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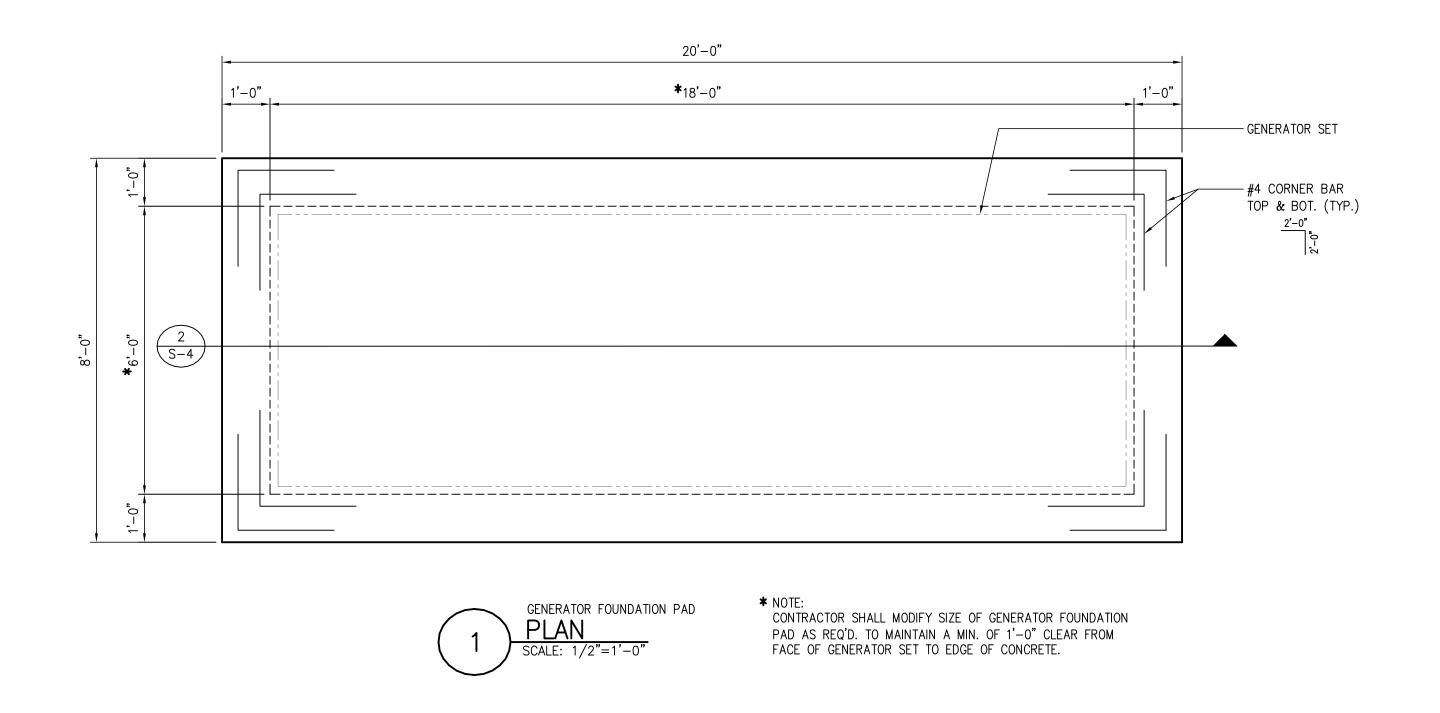
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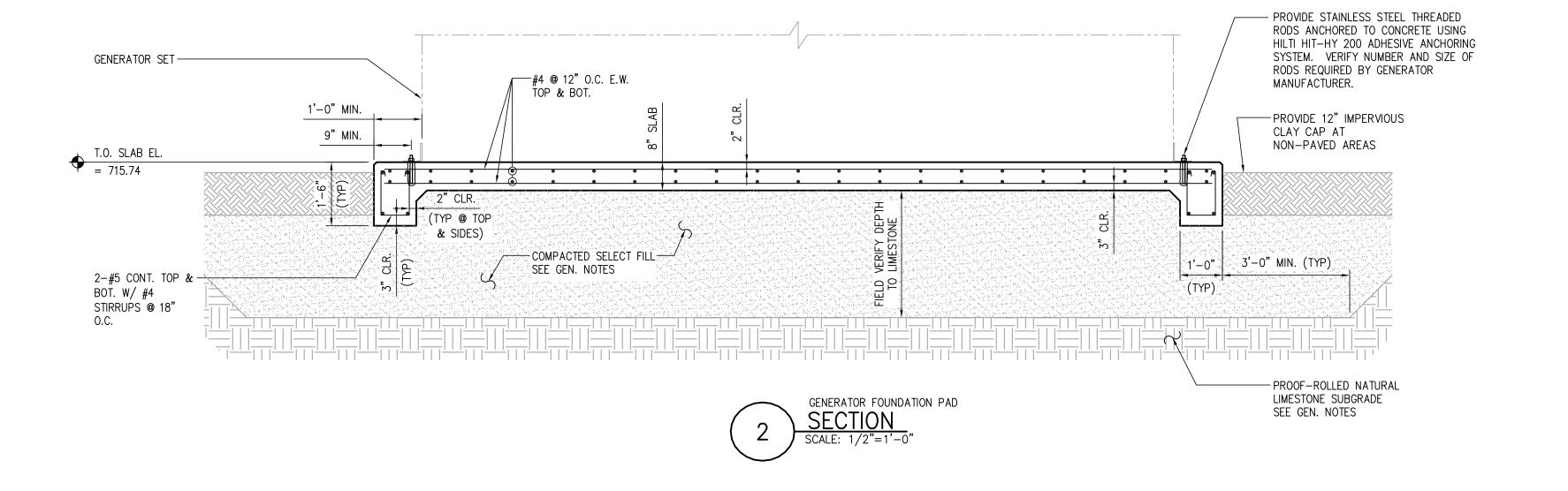
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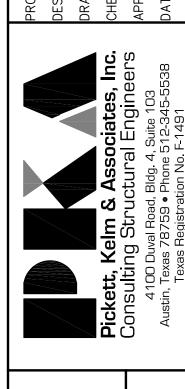
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ELECTRICAL PANEL FOUNDATION PAD PLAN & SECTIONS Copyright 2024

DWG. NO. S-3





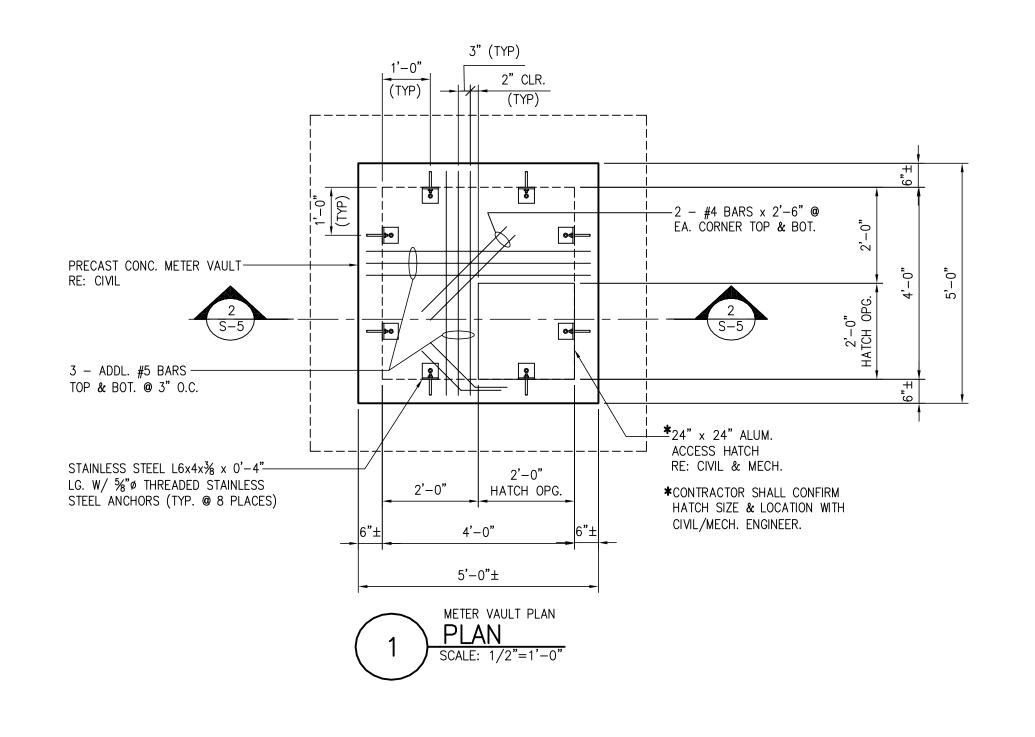


STATION

VERAMENDI

SECTION FOUNDATION PAD GENERATOR ≪ PLAN Copyright 2024

DWG. NO. S-4



5'-0"± 4'-0" \*CONTRACTOR SHALL CONFIRM HATCH SIZE & LOCATION WITH 2'-0" HATCH OPG. CIVIL/MECH. ENGINEER. 3 - ADDL. #5 BARS— TOP AND BOT. (TYP) - PROVIDE 12" IMPERVIOUS CLAY CAP AT NON-PAVED AREAS #5 BARS @ 12" O.C.— Ë.W. TOP AND BOT. T.O. SLAB EL. = 714.80 \*24" x 24" ACCESS HATCH SYNKO-FLEX WATERSTOP-RE: CIVIL & MECH. ALL AROUND (TYP. WHERE SHOWN) -PRECAST CONC. VALVE VAULT RE: CIVIL 6"ø PVD PIPE — — COMPACTED SELECT FILL SEE GEN. NOTES RE: CIVIL T.O. FTG. EL.  $= 707.63 \pm$ VERIFY W/ CIVIL — 3"ø PVC DRAIN RE: CIVIL #5 BARS @ 12" O.C.-E.W. TOP AND BOT. %"Ø THREADED STAINLESS STEEL RODS ANCHORED INTO WALL PROOF-ROLLED-NATURAL LIMESTONE SUBGRADE USING HILTI HIT HY-200 ADHESIVE W/ 3" MIN. EMBED. SEE GEN. NOTES 4'-0" 1'-6" STAINLESS STEEL L6x4x¾ x 0'-4" LG.——SEE PLAN FOR LOCATIONS 7'-0" METER VAULT
SECTION
SCALE: 1/2"=1'-0'

NOTE:
REFER TO GEOTECHNICAL INVESTIGATION
REPORT FOR REQUIREMENTS FOR
TEMPORARY CONSTRUCTION SLOPES.

#### NOTES 1 R

- REFER TO CIVIL FOR COATING SYSTEM TO BE APPLIED TO INTERIOR AND EXTERIOR SURFACES OF WET WELL.
   REFER TO CIVIL FOR ALL METER VAULT WALL PIPE
- PENETRATION REQUIREMENTS.
- 3. AT THE CONTRACTOR'S OPTION, METER VAULT BOTTOM SLAB MAY BE PRECAST. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER APPROVAL FOR METER VAULT BOTTOM SLAB. PRECAST METER VAULT BOTTOM SLAB SHALL BE MIN. 12" THICK AND A MIN. 7'-0" DIAMETER OR 7'-0" SQUARE. BOTTOM SLAB REINF. SHALL BE AS SHOWN.

VERAMENDI LIFT STATION

Pickett, Kelm & A

Consulting Structu

VAULT SECTI

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METER

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