

ELECTRICAL NOTES

- ALL WORK SHALL COMPLY WITH NFPA 820 REGARDING HAZARDOUS CLASSIFICATION, GROUP AND DIVISION.
- ALL ABOVE GRADE CONDUIT SHALL BE RIGID ALUMINUM OR PVC COATED ALUMINUM AS APPLICABLE.
- ALL INSULATED CONDUCTORS SHALL BE COPPER, XHHW, UNLESS APPROVED BY ENGINEER & OWNER
- ALL GROUNDING CONDUCTORS SHALL TINNED COPPER.
- ALL EXPOSED ENCLOSURES SHALL BE NEMA 4X 316 SS.
- THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE WITH ONCOR ELECTRIC COMPANY (972-552-9738).
- THE CONTRACTOR SHALL FURNISH AND PROVIDE EXPLOSION PROOF, 480/277 VOLT, 3 PHASE, 60 HZ. MOTORS.
- THE CONTRACTOR SHALL FURNISH AND PROVIDE 110 VOLT GFCI RECEPTACLE INSIDE CONTROL PANEL.
- THE CONTRACTOR SHALL PROVIDE COPPER WIRING WITH GROUND IN RIGID CONDUIT FROM METER TO SERVICE DISCONNECT TO CONTROL PANEL.
- THE CONTRACTOR SHALL COORDINATE ROUTING IN THE FIELD. ALL ELECTRICAL WORK SHALL CONFORM WITH NEC, NATIONAL, STATE, AND LOCAL CODES.
- THE CONTRACTOR SHALL PROVIDE 480 VOLT, 3-PHASE POWER TO SITE.
- THE CONTRACTOR SHALL FURNISH AND PROVIDE LIGHTNING ARRESTOR.
- THE CONTRACTOR SHALL FURNISH AND PROVIDE RUN TIME METER AND RUN LIGHT FOR EACH PUMP.
- THE CONTRACTOR SHALL FURNISH AND PROVIDE SEAL FAIL RELAYS WITH PILOT LIGHT, MAIN CIRCUIT BREAKER, AND EMERGENCY GFCI RECEPTACLE WITH PUSH BUTTON.
- THE CONTRACTOR SHALL FURNISH AND PROVIDE CONTROL PANEL AND MAIN DISCONNECT SHALL BE SIZED ACCORDING TO NEC.
- THE CONTRACTOR SHALL FURNISH AND PROVIDE TWO EXTRA FUSES OF EVERY SIZE AND TYPE USED, AND SHALL BE STORED AT THE LOCATION WHERE NEEDED.
- CONTRACTOR IS RESPONSIBLE FOR NEC REQUIREMENT CLEARANCE AROUND AND ABOVE OF ALL ELECTRICAL EQUIP. (NEC 110.26)
- ALL CIRCUIT HOME-RUNS SHALL BE MINIMUM 2-#12, #12G., 3/4" C. VOLTAGE DROP SHALL COMPLY WITH NEC.
- FLEXIBLE CONDUIT MAY BE USED ONLY FOR FINAL CONNECTION TO EQUIPMENT. (MAXIMUM LENGTH 6').
- ALL PANEL DIRECTORY SHOULD BE TYPED.
- CONTRACTOR SHALL PROVIDE LAMPS FOR ALL LUMINARIES.
- MINIMUM POWER CONDUCTORS, 2-#12, 1-#12 GROUND.
- MINIMUM CONDUIT ABOVE GRADE, 3/4" (RIGID ALUM) BELOW GRADE, 1" (SCH-40 PVC), TRANSITION FROM ABOVE TO BELOW GRADE SHALL BE PVC COATED ALUMINUM.
- CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO INSURE A COMPLETE WORKING SYSTEM.
- COORDINATE LOCATION OF ALL PANELS TO OWNER WITH SHOP DRAWING SUBMITTALS.
- THESE PLANS ARE SCHEMATIC, VERIFY EQUIPMENT LOCATION AND CONDUIT ROUTING, ETC. PRIOR TO BID.
- CONTRACTOR SHALL PROVIDE PROPER CONDUIT SEAL AS APPLICABLE FOR TERMINATION.
- INSTALLATION OF WORK SHALL COMPLY WITH ALL LOCAL AND STATE CODES AND AUTHORITIES HAVING JURISDICTION.
- ELECTRICAL SEAL FITTINGS SHALL BE FILLED BY CITY, NOT BY CONTRACTOR.
- CONTRACTOR SHALL PROVIDE AND INSTALL 'CORD CAPS' FOR ALL CONDUCTORS EXITING THE WET WELL AT THE FIRST JUNCTION BOX.

ABRIDGED T.C.E.Q. NOTES

§217.60. LIFT STATION, WET WELL, AND DRY WELL DESIGNS.
(A) PUMP CONTROLS.

- L13.5;(1) A LIFT STATION PUMP MUST OPERATE AUTOMATICALLY, BASED ON THE WATER LEVEL IN A WET WELL.
(2) THE LOCATION OF A WET WELL LEVEL MECHANISM MUST ENSURE THAT THE MECHANISM IS UNAFFECTED BY CURRENTS, RAGS, GREASE, OR OTHER FLOATING MATERIALS.
(3) A LEVEL MECHANISM MUST BE ACCESSIBLE WITHOUT ENTERING THE WET WELL.
(4) WET WELL CONTROLS WITH A BUBBLER SYSTEM REQUIRE DUAL AIR SUPPLY AND DUAL CONTROLS.
(5) 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.

(6) 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.

NOTE: REFER TO TECHNICAL PREVISIONS IN CONTRACTS DOCUMENTS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

**CITY OF ROCKWALL, TEXAS
SPECIFICATIONS FOR LIFT STATION CONTROL PANEL**

GENERAL:
THE CONTROL SYSTEM SHALL BE DESIGNED TO OPERATE THE REQUIRED NUMBER OF PUMPS SPECIFIED ON THE DRAWING AT THE POWER CHARACTERISTICS SHOWN ON THE PLANS.
THE CONTROL FUNCTION SHALL PROVIDE FOR THE OPERATION OF THE PUMPS IN HAND (MANUAL) AND AUTO (CONTROLLED BY PLC). SEE "24VAC REGULATOR SYSTEM" FOR FURTHER INFORMATION.
THE CONTROL SHALL FUNCTION AS DESCRIBED BELOW. THE EQUIPMENT LISTED BELOW IS A GUIDE AND DOES NOT RELIEVE THE SUPPLIER FROM PROVIDING A SYSTEM THAT WILL FUNCTION AS REQUIRED.

ENCLOSURE:
THE ENCLOSURE SHALL BE A NEMA 4X RATED STAINLESS STEEL. THE ENCLOSURE SHALL BE A WALL MOUNT TYPE WITH A MINIMUM DEPTH OF 8" SIZED TO ADEQUATELY HOUSE ALL THE COMPONENTS. THE DOOR GASKET SHALL BE RUBBER COMPOSITION WITH A RETAINER TO ASSURE A POSITIVE WEATHERPROOF SEAL. THE DOOR SHALL OPERATE WITH A SINGLE ACTION HANDLE THAT ACCEPTS A 3/8" SHAFT PADLOCK AND OPENS A MINIMUM OF 180 DEGREES.

INNER DEAD FRONT DOOR:
A POLISHED ALUMINUM DEAD FRONT SHALL BE MOUNTED ON A CONTINUOUS AIRCRAFT TYPE HINGE, CONTAIN CUTOUTS FOR MOUNTED EQUIPMENT AND PROVIDE PROTECTION OF PERSONNEL FROM LIVE INTERNAL WIRING. CUTOUTS FOR BREAKER HANDLES SHALL BE PROVIDED TO ALLOW OPERATION OF BREAKERS WITHOUT ENTERING THE COMPARTMENT. NO DOOR MOUNTED OPERATING MECHANISMS ALLOWED FOR BREAKER OPERATION. ALL CONTROL SWITCHES, INDICATOR PILOT LIGHTS, ONE GENERAL PURPOSE GFI DUPLEX RECEPTACLE AND OTHER OPERATIONAL DEVICES SHALL BE MOUNTED ON THE EXTERNAL SURFACE OF THE DEAD FRONT. THE DEAD FRONT SHALL OPEN A MINIMUM OF 180 DEGREES TO ALLOW ACCESS TO EQUIPMENT FOR MAINTENANCE. A 1/2" BREAK SHALL BE FORMED AROUND THE PERIMETER OF THE DEAD FRONT TO PROVIDE RIGIDITY.

BACK PLATE:
THE BACK PLATE SHALL BE MANUFACTURED OF 12-GAUGE SHEET STEEL AND BE FINISHED WITH A PRIMER COAT AND TWO (2) COATS OF BAKED ON WHITE ENAMEL. ALL DEVICES SHALL BE PERMANENTLY IDENTIFIED.

POWER DISTRIBUTION:
THE PANEL POWER DISTRIBUTION SHALL INCLUDE ALL NECESSARY COMPONENTS AND BE WIRED WITH STRANDED COPPER CONDUCTORS RATED AT A MINIMUM OF 90 DEGREES C.

SYSTEM SHALL BE EQUIPPED WITH AN EMERGENCY GENERATOR WITH AN AUTOMATIC TRANSFER SWITCH CAPABLE OF PROGRAMMABLE TEST DATES AND TIMES. INPUTS SHALL BE PROVIDED TO PLC TO INDICATE GENERATOR RUNNING, GENERATOR ALARM, AND GENERATOR LOW FUEL LEVEL OR IF NO GENERATOR IS AT THE LIFT STATION, A STAND ALONE MANUAL DOUBLE THROW SAFETY SWITCH TO ALLOW HARD WIRING TO A PORTABLE GENERATOR.

NO DOOR MOUNTED OPERATING MECHANISMS ALLOWED FOR BREAKER OPERATION IN CONTROL PANEL. ALL CONDUCTOR TERMINATIONS SHALL BE AS RECOMMENDED BY THE DEVICE MANUFACTURER.

CIRCUIT BREAKERS:
ALL CIRCUIT BREAKERS SHALL BE HEAVY-DUTY THERMAL MAGNETIC OR MOTOR CIRCUIT PROTECTORS SIMILAR AND EQUAL TO SQUARE D TYPE FAL. EACH MOTOR BREAKER SHALL BE ADEQUATELY SIZED TO MEET THE PUMP MOTOR OPERATING CHARACTERISTICS AND SHALL HAVE A MINIMUM OF 10,000 AMPS INTERRUPTING CAPACITY FOR 230 VAC AND 14,000 AMPS AT 480 VAC. THE CONTROL CIRCUIT AND THE DUPLEX RECEPTACLES SHALL BE INDIVIDUALLY CONTROLLED BY HEAVY-DUTY BREAKERS. CIRCUIT BREAKERS SHALL BE INDICATING TYPE, PROVIDING 'ON-OFF-TRIP' POSITIONS OF THE OPERATING HANDLE. WHEN THE BREAKER IS TRIPPED AUTOMATICALLY, THE HANDLE SHALL ASSUME A MIDDLE POSITION INDICATING 'TRIP'. THERMAL MAGNETIC BREAKERS SHALL BE QUICK-MADE AND QUICK-BREAK ON BOTH MANUAL AND AUTOMATIC OPERATION AND HAVE INVERSE TIME CHARACTERISTICS SECURED THROUGH THE USE OF BIMETALLIC TRIPPING ELEMENTS SUPPLEMENTED BY A MAGNETIC TRIP.

BREAKERS SHALL BE DESIGNED SO THAT AN OVERLOAD ON ONE POLE AUTOMATICALLY TRIPS AND OPENS ALL LEGS. FIELD INSTALLED HANDLED TIES SHALL NOT BE ACCEPTABLE.

MOTOR STARTERS:
MOTOR STARTERS SHALL BE OPEN FRAME, ACROSS THE LINE; NEMA RATED WITH INDIVIDUAL OVERLOAD PROTECTION IN EACH LEG. MOTOR STARTER CONTACT AND COIL SHALL BE REPLACEABLE FROM THE FRONT OF THE STARTER WITHOUT BEING REMOVED FROM ITS MOUNTED POSITION. OVERLOAD HEATERS SHALL BE SOLID STATE MOTOR LOGIC TYPE WITH THE FOLLOWING FEATURES: 3 TO 1 ADJUSTMENT FOR TRIP CURRENT, PHASE LOSS AND UNBALANCE PROTECTION, LED POWER INDICATION, AMBIENT INSENSITIVE AND SELF-POWERED, AND SHALL HAVE AVAILABILITY OF ELECTRICAL REMOTE RESET. OVERLOADS SHALL BE SIZED FOR THE FULL LOAD AMPERAGE DRAW OF THE PUMPS. DEFINITE PURPOSE CONTACTORS, FRACTIONAL SIZE STARTERS AND HORSEPOWER RATED CONTACTORS OR RELAYS SHALL NOT BE ACCEPTABLE.

TRANSFORMERS:
CONTROL TRANSFORMERS SHALL PROVIDE THE 120 VAC AND/OR 24 VAC FOR CONTROL CIRCUITS. TRANSFORMERS SHALL BE FUSED ON THE PRIMARY AND SECONDARY CIRCUITS. THE SECONDARY SHALL BE GROUNDED.

LIGHTNING-TRANSIENT PROTECTION:
A LIGHTNING-TRANSIENT PROTECTOR WITH TELL-TALE WARNING LIGHTS ON EACH PHASE TO INDICATE LOSS OF PROTECTION ON THE INDIVIDUAL PHASES SHALL BE PROVIDED. THE DEVICE SHALL BE SOLID STATE WITH A RESPONSE TIME OF LESS THAN 5 NANSECONDS WITHSTANDING SURGE CAPACITY OF 6500 AMPERES. UNIT SHALL BE INSTANT RECOVERY, LONG LIFE AND HAVE NO HOLDOVER CURRENTS.

PHASE MONITOR:
A LINE VOLTAGE RATED, ADJUSTABLE PHASE MONITOR SHALL BE INSTALLED TO SENSE LOW VOLTAGE, LOSS OF POWER, REVERSED PHASING AND LOSS OF A PHASE. CONTROL CIRCUIT SHALL DE-ENERGIZE UPON SENSING ANY OF THE FAULTS AND SHALL AUTOMATICALLY RESTORE SERVICE UPON RETURN TO NORMAL POWER.

ALARM SYSTEM:
THE ALARM LIGHT SHALL BE A WEATHERPROOF, SHATTERPROOF, RED LIGHT FIXTURE WITH 500 LUMENS MINIMUM TO INDICATE ALARM CONDITIONS. THE ALARM LIGHT SHALL BE TURNED ON BY THE ALARM LEVEL.

THE ALARM LIGHT SHALL BE MOUNTED ON THE EXTERIOR OF THE CABINET. THE ALARM HORN SHALL PROVIDE AN AUDIO SIGNAL OF NOT LESS THAN 90 DB AT 10 FEET. AN ALARM SILENCE SWITCH SHALL BE MOUNTED ON THE EXTERIOR OF THE CABINET AND DEACTIVATE THE ALARM HORN; HOWEVER, THE ALARM LIGHT SHALL FLASH UNTIL THE ALARM CONDITION CEASES TO EXIST AN INPUT SHALL BE PROVIDED TO PLC TO INDICATE HIGH WET WELL CONDITION.

24 VAC REGULATOR SYSTEM:
SCADA EQUIPMENT FOR SCADA SHALL BE KIMARK PART # TR-Y160-C50-P-IC CONSISTING OF A PLC, RADIO, ANTENNA, ECT. TOOPERATE THE SYSTEM.
CONTROL CABINET COMPONENTS SHALL BE INSTALLED WHEN THE PANEL IS BUILT.
CONTACT PHONE NUMBER FOR KIMARK IS 972-890-7910 SAUL SANCHEZ.
EMAIL:SAUL@KIMARK.COM
CONTACT THEM FOR PRICING AND EQUIPMENT SPECIFICATIONS FOR INSTALLATION IN THE CONTROL PANEL AND ON THE RACK.

PROGRAMMING SHALL BE INCLUDED IN PURCHASE PRICE OF THE ABOVE PART BY KIMARK, USING SCHNEIDER ELECTRIC PROWORX32 PLC PROGRAMMING SOFTWARE.CHECK WITH KIMARK TO VERIFY ALL NEEDED INPUTS AND OUTPUTS FOR PLC PROGRAMMING.
THE CONTROL SYSTEM SHALL PROVIDE FOR BOTH AUTOMATIC AND MANUAL CONTROL AND ALTERNATION OF THE PUMPS TO MAINTAIN A PUMPED DOWN CONDITION OF THE WET WELL.

WET WELL LEVELS SHALL BE SENSED BY A PRESSURE TRANSDUCER. FLOAT REGULATORS SHALL BE INSTALLED AS BACK UP FOR HIGH AND LOW LEVELS ONLY. THE TRANSDUCER SHALL SENSE THE 'OFF', 'LEAD', 'LAG', AND 'HIGH' LEVELS AS GIVEN ON THE PLANS. AS THE LEVEL IN THE WET WELL RAISES THE LEAD PUMP, AS DETERMINED BY THE ALTERNATOR, SHALL START AND PUMP THE STATION TO THE 'OFF' POSITION. IN THE EVENT THE INCOMING FLOW EXCEEDS THE CAPACITY OF THE LEAD PUMP, THE LAG PUMP SHALL START AND BOTH PUMPS SHALL RUN TO THE OFF LEVEL. IF THE WET WELL LEVEL CONTINUES TO RISE, HIGH WELL ALARM FUNCTIONS SHALL BE ACTIVATED. THE ALTERNATOR SHALL SWITCH WHEN THE OFF LEVEL IS REACHED.

ALL INPUTS AND OUTPUTS SHALL BE WIRED TO A TERMINAL STRIP AT BOTTOM OF CABINET.

ANCLLARY EQUIPMENT:
HOA SWITCHES: A THREE POSITION HOA SWITCH SHALL BE PROVIDED ON THE INNER DEAD FRONT FOR EACH PUMP.INPUTS SHALL BE PROVIDED TO PLC TO INDICATE POSITION OF HOA.

RUN INDICATORS: A RUN PILOT INDICATOR SHALL BE PROVIDED ON THE INNER DEAD FRONT. ALL INDICATOR LIGHTS SHALL BE PUSH TO TEST.INPUTS SHALL BE PROVIDED TO PLC TO INDICATE PUMP RUNNING.

ELAPSED TIME: ELAPSE TIME METER SHALL BE MOUNTED ON THE DEAD FRONT DOOR.

CABINET TEMPERATURE CONTROL: THE CABINET SHALL BE EQUIPPED WITH A PANEL HEATER CONTROLLED BY A THERMOSTAT AND A VENT FAN CONTROLLED BY A THERMOSTAT.

RECEPTACLES: ONE DUPLEX RECEPTACLE LOCATED ON INNER DEAD FRONT DOOR FOR GENERAL PURPOSE USE. THIS RECEPTACLE SHALL BE OF THE GROUND FAULT TYPE, 120 VOLT, AND PROTECTED BY A 20 AMP BREAKER. A SECOND SINGLE RECEPTACLE SHALL BE LOCATED ON THE BACK PANEL TO PROVIDE POWER FOR UPS BACK UP SYSTEM. THIS RECEPTACLE SHALL BE 120 VOLT AND PROTECTED BY A SEPARATE 20 AMP BREAKER.

UPS BACK UP SYSTEM: WILL PROVIDED 120 VOLT POWER TO SCADA COMMUNICATION EQUIPMENT AND ALL LOW VOLTAGE POWER TRANSFORMERS. THIS MUST BE INSTALLED IN THE CONTROL PANEL. UPS SHALL BE APC 650VA 120 VOLTOR EQUIVALENT.

THE SYSTEM MUST BE ABLE TO TRANSMIT ALL ALARMS AND WET WELL LEVELS WHEN ON BACKUP POWER.

MOTOR PROTECTION: A CONTROL AND STATUS MODULE SHALL SENSE EITHER MOTOR OVER TEMPERATURE OR SEAL LEAKAGE, AND SHALL TURN OFF THE PUMP, LOCK OUT THE PUMP, AND SEND AN ALARM.INPUTS SHALL BE PROVIDED TO PLC TO INDICATE PUMP FAIL, SEAL FAIL AND TEMP FAIL INDIVIDUALLY FOR EACH PUMP.

MISCELLANEOUS:
PANEL RACKS:
POSTS SUPPORTING RACKS SHALL BE 3" MINIMUM RIGID CONDUIT CAPPED ANDBOLTED DIRECTLY TOCHANNEL FRAMEWORK SUPPORTING THE PANELS.
PANELS SHALL HAVE A RAIN SHIELD STRUCTURE USING 1/8" MINIMUM ALUMINUM PLATING PROVIDING A SOLID BACKPLATE BEHIND PANELS CONTINUOUS TO OVERHEAD PLATE TOPROTECT PANEL FROM RAIN. PROVIDE LIGHTING MOUNTED ON STRUCTURE WITH SWITCH MOUNTED ON EXTERIOR OF PANEL TO LIGHT UP PANEL AREA.
CONTACT CITY OF ROCKWALL AT 972-771-7730 FOR LOCATION OF EXISTING TYPE STRUCTURE.

EACH PUMP MUST HAVE ITS OWN CONDUIT FOR POWER CORD AND A SEPARATE CONDUIT FOR ALL FLOAT WIRES.

LEVEL CONTROL SYSTEM SHALL USE A PRESSURE TRANSDUCER WITH BUILT IN SURGE PROTECTION FOR PUMP OPERATION(WITH OFF AND HIGH LEVEL FLOATS AS BACK-UP IN CASE TRANSDUCER FAILS. SEPARATE CONDUITS SHALL BE USED FOR FLOATS, LEVEL TRANSMITTERS, AND PUMP POWER

DRAWINGS: CONTROL PANEL SCHEMATIC DRAWINGS SHALL BE SUBMITTED FOR APPROVALWITH THE SUBMITTAL PLANS. FINAL CONTROL PANEL WIRE SCHEMATIC DRAWINGSINCLUDING A LIST OF ALL LEGENDS (2 SETS TOTAL) SHALL BE PROVIDED. ONE SET SHALL BE ENCAPSULATED IN MYLAR AND ATTACHED TO THE INSIDE OF THE FRONT DOOR OF THE CONTROL CABINET. A SECOND SET SHALL BE DELIVERED TO THE CITY OF ROCKWALL WASTEWATER DEPARTMENT.

PANEL MARKINGS: ALL COMPONENT PARTS IN THE CONTROL PANEL SHALL BE PERMANENTLY MARKED AND IDENTIFIED AS THEY ARE INDICATED ON THE DRAWING. MARKING SHALL BE ON THE BACK PLATE ADJACENT TO THE COMPONENT. ALL CONTROL CONDUCTORS SHALL BE IDENTIFIED WITH WIRE MARKERS AS CLOSE AS PRACTICAL TO EACH END OF CONDUCTORS.

PANEL WIRING: ALL WIRING IN PANEL SHALL MAINTAIN A MINIMUM OF 1/2" SPACING BETWEEN COMPONENTS AND WIRE WAYS.

TESTING: ALL PANELS SHALL BE TESTED TO THE POWER REQUIREMENTS AS SHOWN ON THE PLANS TO ASSURE PROPER OPERATION OF ALL THE COMPONENTS. EACH CONTROL FUNCTION SHALL BE ACTIVATED TO CHECK FOR PROPER OPERATION AND INDICATION.

GUARANTEE: ALL EQUIPMENT SHALL BE GUARANTEED FOR A PERIOD OF THREE (3) YEARS FROM DATE OF ACCEPTANCE. THE GUARANTEE IS EFFECTIVE AGAINST ALL DEFECTS IN WORKMANSHIP AND/OR DEFECTIVE COMPONENTS. THE WARRANTY IS LIMITED TO REPLACEMENT OR REPAIR OF THE DEFECTIVE EQUIPMENT.

APPLICABLE CODES AND STANDARDS
NFPA 820
2008 NATIONAL ELECTRICAL CODE
TCEQ CHAPTER 217

CITY REQUIRE INSTRUCTIONS TO CONTRACTOR
SCADA CONNECTION TO OWNER'S SYSTEM. ALL PROGRAMMING SHALL COMPLY WITH OWNER'S REQUIREMENTS. SEE CITY SPECIFICATIONS FOR SCADA REQUIREMENTS. PLC & RADIO EQUIPMENT PURCHASED THROUGH KIMARK AND INSTALLED IN CONTROL CABINET.

CITY REQUIRED INSTRUCTIONS TO CONTRACTOR
SCADA CONNECTION TO OWNER'S SYSTEM. ALL PROGRAMMING SHALL COMPLY WITH OWNER'S REQUIREMENTS. SEE CITY SPECIFICATIONS FOR SCADA REQUIREMENTS.

RECORD DRAWINGS

Revisions Drawn By
T.TABOR CONSULTING, PLLC
Firm # 5279
Tommy D. Tabor P.E. # 57248
Date 2020-08-17

T. Tabor

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY THE CONTRACTOR. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

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Tommy D. Tabor
TOMMY D. TABOR
57248
2018/08/17

DOUPHATE & ASSOCIATES, INC.

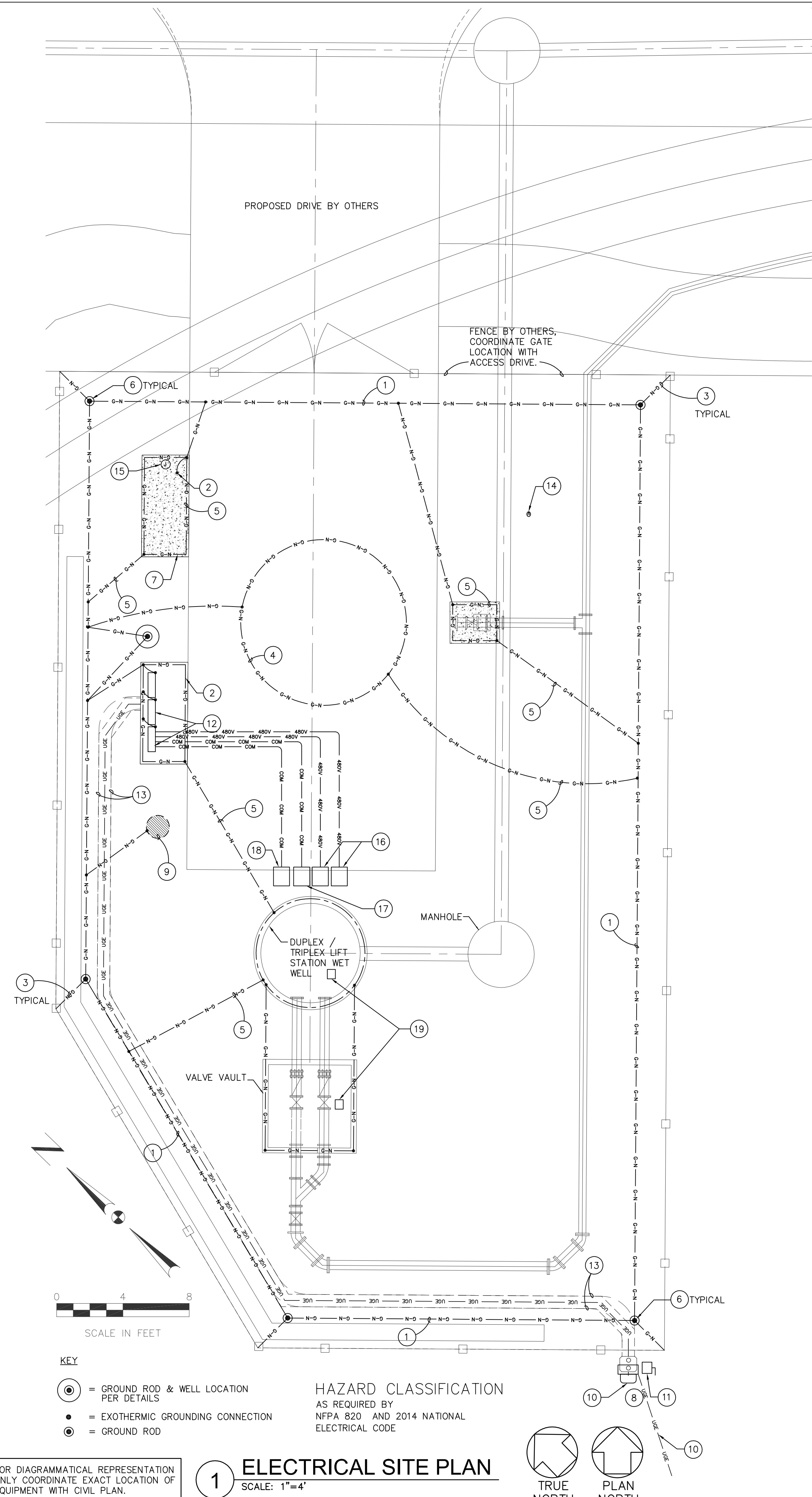
ENGINEERING - PROJECT MANAGEMENT - SURVEYING

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**LIFT STATION PLAN
THE STANDARD
ROCKWALL
CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS**

REVISION
T.D.T. CHECKED
CC/ED/PH DRAWN
08/06/2018 DATE
18-009-E PROJECT
ELECTRICAL GENERAL NOTES LSE - 1

FULL SIZE 24x36 1-INCH



GROUNDING NOTES BY SYMBOL "○"

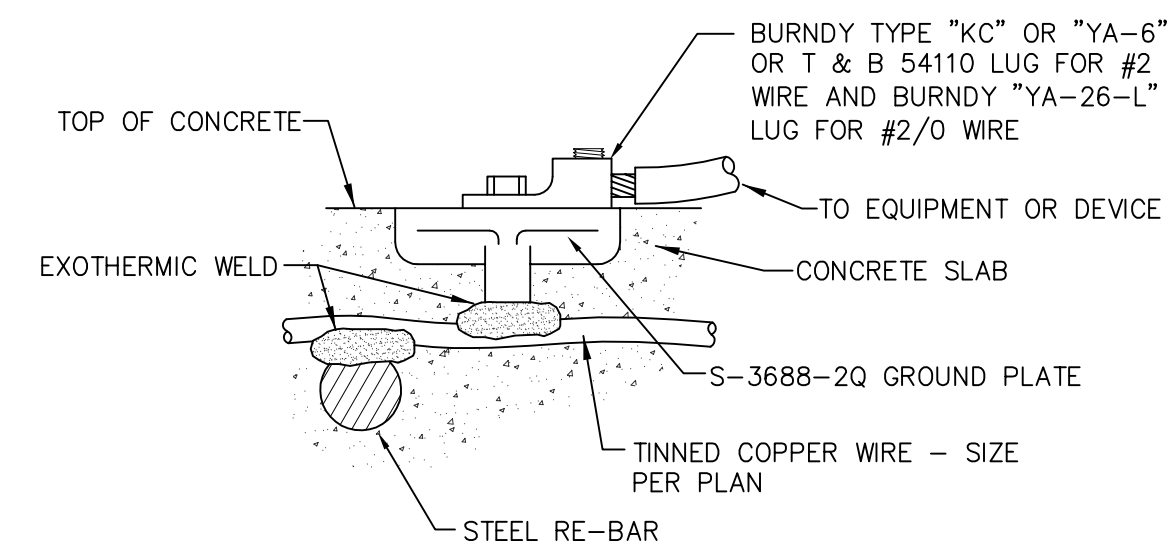
- 1/0 BARE TINNED COPPER, 36" DEEP LOOP, AT 36" FROM EDGE OF CONSTRUCTION OR FENCE.
- #4 BARE TINNED COPPER BONDING FOR ALL ELECTRICAL EQUIPMENT DEVICES AND GROUND SYSTEM.
- #4 BARE TINNED COPPER BONDING/GROUNDING SYSTEM TO FENCE.
- 10FT DIAMETER COIL OF 1/0 BARE TINNED COPPER. PROVIDE XYZ COORDINATES ON RECORD DRAWINGS. COORDINATE EXACT LOCATION WITH OWNER.
- 1/0 BARE TINNED COPPER FROM GROUND ROD TO GROUNDING CONDUCTOR AND REBAR IN CONCRETE STRUCTURES.
- 3/4" x 10'-0" COPPER CLAD GROUND ROD AND WELL.
- CONCRETE PAD FOR EMERGENCY GENERATOR, COORDINATE EXACT LOCATION WITH AND SIZE PER ACTUAL EQUIPMENT INSTALLED WITH ALL TRADES. MAINTAIN REQUIRED CLEARANCE PER CODE AND AHJ.
- ELECTRICAL SERVICE TO LIFT STATION. COORDINATE EXACT LOCATION WITH UTILITY PROVIDER, OWNER AND ALL TRADES.
- NEW POLE AND SCADA ANTENNA AS REQUIRED BY "KIMARK" 972-890-7910 SAUL SANCHEZ
- UTILITY METER, UNDERGROUND SERVICE FROM POLE MOUNTED TRANSFORMERS.
- SERVICE ENTRANCE RATED FUSED DISCONNECT.
- PUMP CONTROL PANEL, ATS, SCADA, MINI-POWER ZONE ON CONCRETE PAD. COORDINATE EXACT LOCATION AND SIZE WITH ACTUAL EQUIPMENT INSTALLED. ESTIMATED PAD SIZE (3' X 6').
- PROPOSED ROUTE FOR UNDERGROUND ELECTRICAL CONDUITS FROM SERVICE ENTRANCE TO CONTROL PANEL AS SHOWN ON PLANS.
- GFI WEATHERPROOF RECEPTACLE IN "HOT BOX". COORDINATE LOCATION WITH WATER SERVICE FOR LIFT STATION AND CIVIL DRAWINGS.
- J-BOX FOR GEN-SET CHARGER.
- PUMP CONTROL AND POWER J-BOX
- FLOAT CABLE J-BOX
- LIQUID LEVEL EQUIPMENT CABLE J-BOX (IF REQUIRED)
- INTRUSION SWITCH ON WET WELL AND VALVE VAULT HATCHES, SQUARE D, EMERSON "TOPWORX" OR APPROVED EQUAL. COORDINATE SWITCH TYPE WITH APPLICABLE, SUBMIT PRIOR TO MATERIAL ORDER.

LINE TYPE LEGEND POWER

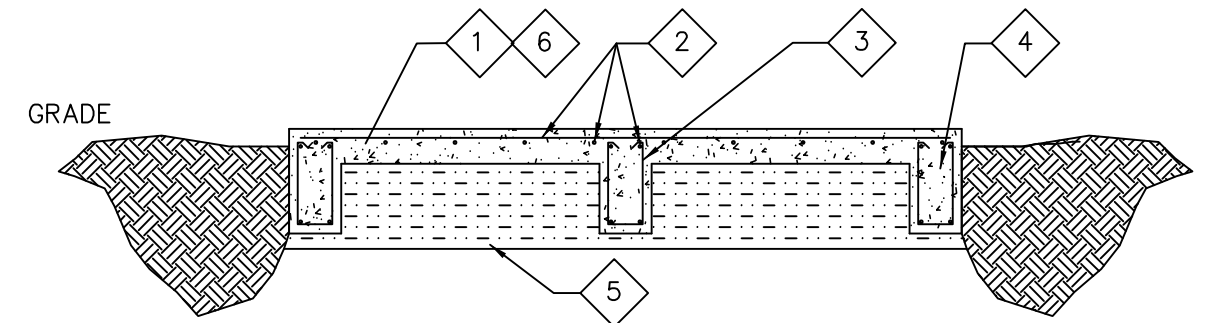
---	120V	120V	120V
---	208V	208V	208V
---	240V	240V	240V
---	277V	277V	277V
---	480V	480V	480V
---	LED	LED	LED
---	G-N	G-N	G-N
---	COM	COM	COM
---	CHE	CHE	CHE
---	USE	USE	USE

FOUNDATION NOTES BY SYMBOL "◇"

- 9" CONCRETE FOUNDATION, CONCRETE 4,000 PSI @ 28 DAYS MINIMUM 6.5 SACK MIX(10'-6" X 5'-6").
- #4 RE-BAR, FOR BEAMS AND GRID. GRID SPACING 12" C-C-E-W.
- #3 RE-BAR STURRUP.
- BEAM DIMENSION 9" WIDE, 18" DEEP.
- 18" SELECT FILL MECHANICALLY COMPACTED TO 95%.
- TOP OF CONCRETE TO BE 6" ABOVE ADJACENT GRADE.



2 BONDING AT SLAB DETAIL
NO SCALE



3 GENERATOR FOUNDATION
NO SCALE

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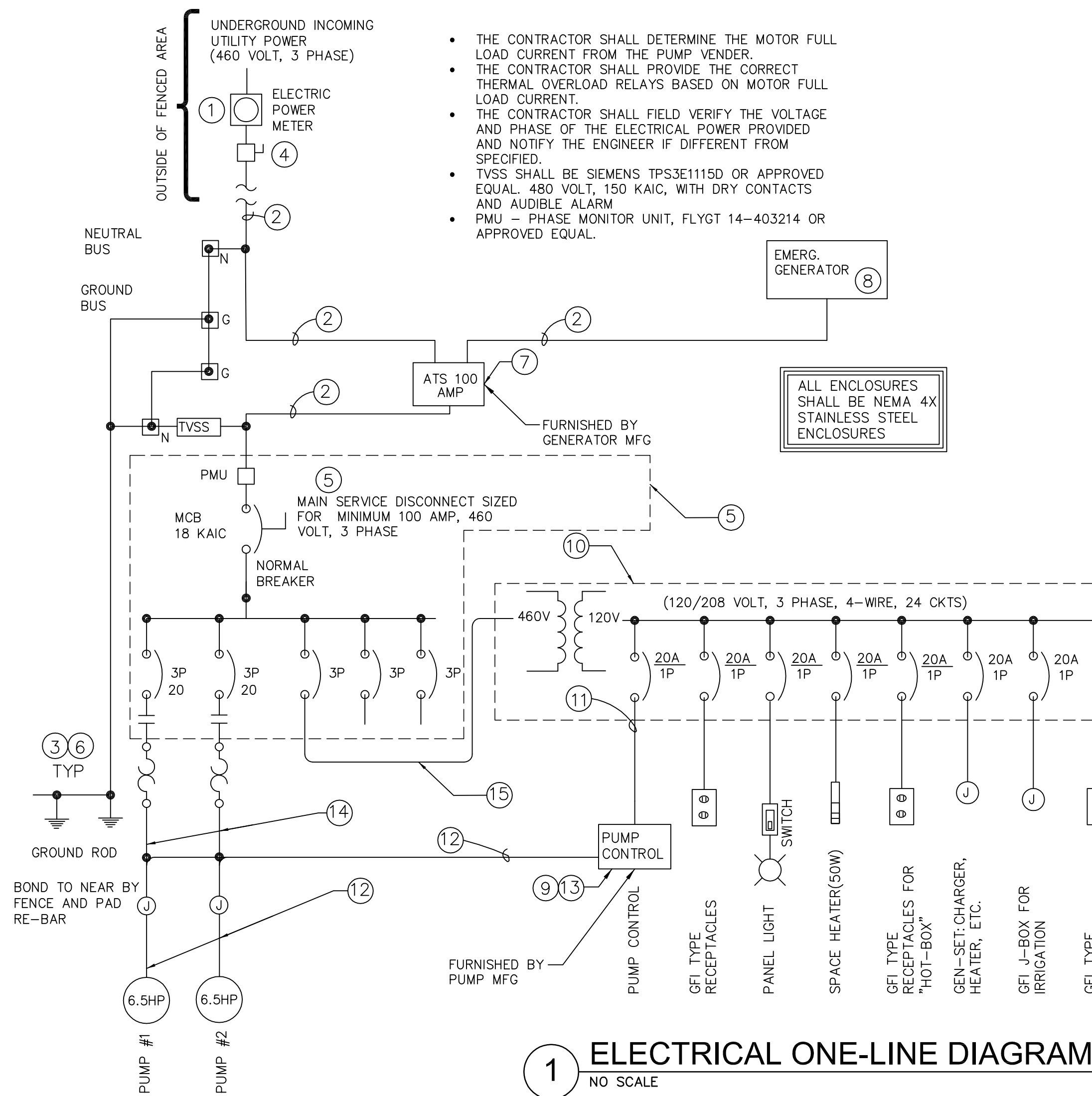
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LIFT STATION PLAN
THE STANDARD
ROCKWALL
CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS

REVISION	T.D.T.
CHECKED	CC/ED/PH
DRAWN	08/06/2018
DATE	18-009-E
PROJECT	ELECTRICAL SITE PLAN & DETAILS
	LSE - 2

FULL SIZE 24X36 1-INCH



1 ELECTRICAL ONE-LINE DIAGRAM
NO SCALE

- NOTES BY SYMBOL "O"
- 277/480 VOLT, 3-PHASE, "Y" NEW UTILITY METER (100 AMP).
 - #2 CONDUCTORS, NOT REDUCED GROUND. IN 1-1/2" CONDUIT.
 - PROVIDE 10 FT GROUND ROD AND GROUND WIRE.
 - SERVICE ENTRANCE RATED NEMA 4X-SS FUSED DISCONNECT (100 AMP MINIMUM 480 VOLT, 3-PHASE).
 - MAIN PANEL, MINIMUM 100 AMP MCB, COPPER BUSSING, 480 VOLT, 3-PHASE, WITH MINIMUM OF (2)3-POLE UNUSED SPACES IN PANEL AT COMPLETION OF CONSTRUCTION.
 - PROVIDE BONDING FROM METER TO MAIN PANEL.
 - AUTOMATIC TRANSFER SWITCH, 100 AMP, NEMA 4XSS, 480 VOLT OR APPROVED EQUAL.
 - EMERGENCY GENERATOR, 50 KW FOR FULL LOAD.
 - LIFT STATION PUMP CONTROL PANEL.
 - SQUARE D "MPZB09T2FSS" MINI POWER ZONE, (9KW), 480 TO 120/208, 316 SS.
 - #10 CONDUCTORS IN 3/4" CONDUIT.
 - PUMP SUPPLIER POWER / CONTROL CABLES.
 - PUMP CONTROLS AND SCADA AS REQUIRED BY CITY OF ROCKWALL LIFT STATION REQUIREMENTS.
 - 4-#8 CONDUCTORS, NOT REDUCED GROUND. IN 1" CONDUIT.
 - 4-#10 CONDUCTORS, NOT REDUCED GROUND. IN 3/4" CONDUIT.
 - SCADA TELEMETRY CONTROL PANEL AS APPROVED BY "OWNER"

Fault Current Calculations		The Standard, Rockwall, Texas	
Initial Fault Current		0	
First element	Transformer	50	
	Source Line-Line Voltage	25,000	0.0000
	Load Line-Line Voltage	480	0.0829
	Phase (1 or 3)	3	
	Impedance (2%)	1.80	3,341
			3,341
AT TRANSFORMER	AIC	3,341	
	Source	25,000	
	Load	480	
	Phase	3	
	Impedance	2	
	KVA	50	
	LINE		
	Conductor	#2	Largest anticipated service conductors
	Length	300	Ft
	Voltage	480	L-L
	Phase	3	Code
	Cond/Phase	1	Wire-Factor
	Conduit	NON-Magnetic conduit	4
	Cable	Triplex	0.7458
AT SERVICE ENTRANCE	AIC	1,914	
	Conductor	#2	
	Length	300	
	Voltage	480	
	Phase	3	
	Cond/Phase	1	
	Conduit	NON-Magnetic conduit	
	Cable	Triplex	

2 FAULT CURRENT
NO SCALE

STARTERS SHALL BE NEMA SIZE 1. PROVIDE SPACE IN CONTROL PANEL FOR FUTURE PUMP NEMA SIZE 2. FULL VOLTAGE, NON-REVERSING, AND 50 AMP BREAKERS

QuickSize Generator Load Profile

Project Customer: Rockwall THE STANDARD Station 2-15Hp

Generator Set: Model No. 50REOZJB, Engine 4045TF150 (Diesel), Alternator 4P8W, Gensets 1

Qty	Run kW	Run kVA	Run pF	Start kW	Start kVA	Volt Dip	Freq Dip	Volt (L-N) THD
Step #1 Load Step #1								
MISC (9.00 kW misc. load)								
1	9.00	9.00	1.00	9.00	9.00			
Step Totals	9.00	9.00	1.00	9.00	9.00	1.53	0.12	0.0%/0.0%/0.0%
Cum. Totals	9.00	9.00	1.00					
Step #2 Load Step #2								
Pump #1 (15.00 HP, 3 phase, code H, loaded motor, w/ A.T.L. starting)								
Rated motor torque from full voltage starting = 67.2%								
1	12.20	15.50	0.79	47.24	100.50			
Step Totals	12.20	15.50	0.79	47.24	100.50	18.03	3.23	0.0%/0.0%/0.0%
Cum. Totals	21.20	24.50	0.87					
Step #3 Load Step #3								
Pump #2 (15.00 HP, 3 phase, code H, loaded motor, w/ A.T.L. starting)								
Rated motor torque from full voltage starting = 66.8%								
1	12.20	15.50	0.79	47.24	100.50			
Step Totals	12.20	15.50	0.79	47.24	100.50	18.26	3.23	0.0%/0.0%/0.0%
Cum. Totals	33.40	40.00	0.84					
Grand Totals	33.40	40.00	0.84					0.0%/0.0%/0.0%

*Frequency dip calculation based on estimated data.

QuickSize Generator Set Sizing

Project Customer: Rockwall THE STANDARD Station 2-15Hp

Generator Set: Model No. 50REOZJB, Engine 4045TF150 (Diesel), Alternator 4P8W, Gensets 1

Performance Summary

LN / LL Voltage	277/480	volts	Altitude	500	feet
Frequency	60	hertz	Ambient Temp.	105	F
Phase(s)	3	phase			

Genset Rating @ 130C Rise: 55.00 kW
 Genset Derated Rating: 54.97 kW
 Total Running Power: 33.40 kW
 Percent of Available kW Used: 60.76 %

Alternator Starting kVA: 121.14 kVA @ 20% dip
 Peak Starting kVA: 119.75 kVA

Maximum Voltage Dip: 18.26 %
 Maximum Frequency Dip: 3.23 % (20% allowed)
 Voltage THD: 0.00 % (10% allowed)

3 ULTIMATE BUILD OUT ELECTRICAL
NO SCALE

Stationary Standby Industrial Generator Set Extended Five-Year or Three Thousand (3000)-Hour Comprehensive Limited Warranty

Your Kohler product has been manufactured and inspected with care by experienced craftsmen. If you are the original end user, Kohler Co. warrants, for the period indicated below, each product to be free from defects in materials and workmanship. In the event of a defect in materials or workmanship, Kohler Co. will repair, replace, or make appropriate adjustment at Kohler Co.'s option if the product, upon Kohler Co.'s inspection, is found to be properly installed, maintained, and operated in accordance with Kohler Co.'s instruction manuals. A Kohler distributor, dealer, or authorized service representative must perform startup.

Warranty Coverage
 Stationary Standby Generator Set & Accessories: Five (5) years from registered startup or three thousand (3000) hours (whichever occurs first).

This warranty is not effective unless a proper extended warranty registration form and warranty fee have been sent to Kohler Co. within one year of registered startup. The extended warranty start date is determined by the standard warranty requirements and runs concurrent with this standard warranty during the first year. To receive extended warranty coverage, the provisions of the standard warranty registration must be met.

- The following will not be covered by the warranty:
- Normal engine wear, routine tuneups, tuneup parts, adjustments, and periodic service.
 - Damage caused by accidents, improper installation or handling, faulty repairs not performed by an authorized Kohler service representative, or improper storage.
 - Damage caused by operation with improper fuel or at speeds, loads, conditions, modifications, or installation contrary to published specifications or recommendations.
 - Damage caused by negligent maintenance such as:
 - Failure to provide the specified type and sufficient quantity of lubricating oil.
 - Failure to keep the air intake and cooling fins areas clean.
 - Failure to service the air cleaner.
 - Failure to provide sufficient coolant and/or cooling air.
 - Failure to perform scheduled maintenance as prescribed in supplied manuals.
 - Failure to regularly exercise the generator set under load (stationary applications only).
 - Original installation charges and startup costs.
 - Starting batteries and the following related expenses:
 - Labor charges related to battery service.
 - Travel expense related to battery service.
 - Engine coolant heaters, heater controls, and circulating pumps after the first year.
 - Additional expenses for repair after normal business hours, i.e. overtime or holiday labor rates.
 - Rental of equipment during performance of warranty repairs.
 - Removal and replacement of non-Kohler-supplied options and equipment.
 - Replacement of a failed Kohler part with a non-Kohler part voids the warranty on that part.
 - Fuel injection pumps not repaired by an authorized Kohler service representative.
 - Non-Kohler-authorized repair shop labor without prior approval from Kohler Co. Warranty Department.
 - Engine fluids such as fuel, oil, or coolant/antifreeze.
 - Shop supplies such as adhesives, cleaning solvents, and rags.
 - Expenses incurred investigating performance complaints unless the problem is caused by defective Kohler materials or workmanship.
 - Maintenance items such as fuses, lamps, filters, spark plugs, loose or leaking clamps, and adjustments.
 - Travel time and mileage exceeding 300 miles round trip.

To obtain warranty service, call 1-800-544-2444 for your nearest authorized Kohler service representative or write Kohler Co., Kohler Power Systems Service Department, MS072, Kohler, WI 53044 USA.

KOHLER CO. SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, AND/OR CONSEQUENTIAL DAMAGES OF ANY KIND including, but not limited to, incidental and/or consequential labor costs, installation charges, telephone charges, or transportation charges in connection with the replacement or repair of defective parts.

This is our exclusive written warranty. We make no other express warranty nor is anyone authorized to make any on our behalf. ANY IMPLIED OR STATUTORY WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS EXPRESSLY LIMITED TO THE DURATION OF THIS WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental and/or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

KOHLER Power Systems

KOHLER CO., Kohler, Wisconsin 53044
 Phone 920-457-4441, Fax 920-459-1646
 For the nearest sales/service outlet in the US and Canada, phone 1-800-544-2444
 KOHLERPower.com
 TP-5581-01/16

- EMERGENCY GENERATOR SHALL BE KOHLER 50REOZJB OR "ROCKWALL" APPROVED EQUAL.
- ENGINE - 4045TF150 (DIESEL) OR EQUAL
 - ALTERNATOR - 4P8W OR EQUAL
 - VOLTAGE STARTERS WEATHER ENCLOSURE
 - QUIET-RUN EXHAUST SYSTEM TO COMPLY WITH CITY SUBDIVISION ORDINANCE.
 - ALTERNATOR PROTECTION
 - BATTERY RACK & CABLES
 - EMISSION COMPLIANT ENGINE INTEGRATED VIBRATION ISOLATION
 - OIL DRAIN EXTENSION-
 - BATTERY AND BATTERY CHARGER
 - AIR CLEANER, HEAVY DUTY
 - VOLTAGE REGULATION 1%
 - VOLTAGE REGULATOR SENSING, 3-PHASE
 - GENERAL MAINTENANCE KIT (FILTER SET)
 - COMMON FAILURE RELAY KIT
 - ALARM FAULT SYSTEM CONNECTED TO AUTO-DIALER
 - AUTOMATIC TRANSFER SWITCH (4-POLE) AND RELATED ITEMS FOR A COMPLETE OPERATING SYSTEM IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS AND CODES (KOHLER OR APPROVED EQUAL)
 - FURNISH AND INSTALL AUTOMATIC EXERCISE TIMER THAT WILL START THE GENERATOR AND PICK UP THE STATION LOAD DURING THE EXERCISE PERIOD.
 - PRIOR TO ACCEPTANCE OF THE THE GENERATOR, A LOAD BANK TEST SHALL BE PERFORMED ON THE GENERATOR SYSTEM. LOAD SHALL BE NOT LESS THAN PROJECTED PUMP MOTOR LOADINGS.
 - FIVE YEAR COMPREHENSIVE WARRANTY FOR LABOR AND PARTS.

RECORD DRAWINGS

Revisions Drawn By
 T.TABOR CONSULTING, PLLC
 Firm # 5279
 Tommy D. Tabor P.E. # 57248
 Date 2020-08-17

T. Tabor

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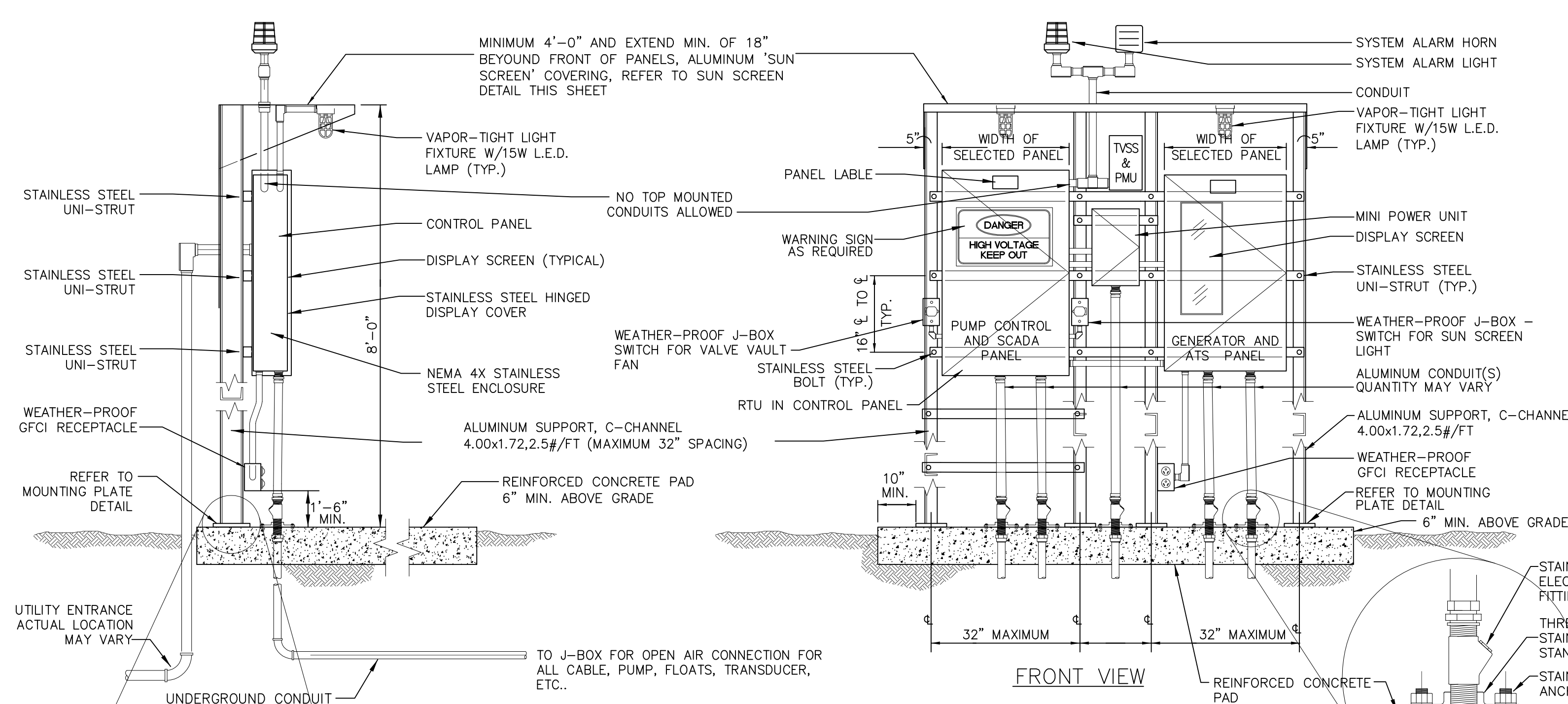
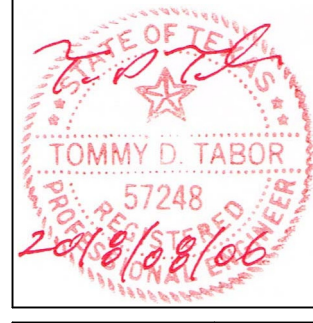
TTC
 T. TABOR CONSULTING, PLLC - FIRM ID # 5279
 1301 EAST DEBBIE LANE SUITE 102-152
 MANSFIELD, TEXAS 76063 OFFICE: 817-721-2113
 TTABOR@TTC-PLLC.COM 18-009-E

DOUPHRATE & ASSOCIATES, INC.
 ENGINEERING - PROJECT MANAGEMENT - SURVEYING
 2235 RIDGE RD., # 200 ROCKWALL, TEXAS 75087
 PHONE: (972)771-9004 FAX: (972)771-9005

LIFT STATION PLAN
 THE STANDARD
 ROCKWALL
 CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS

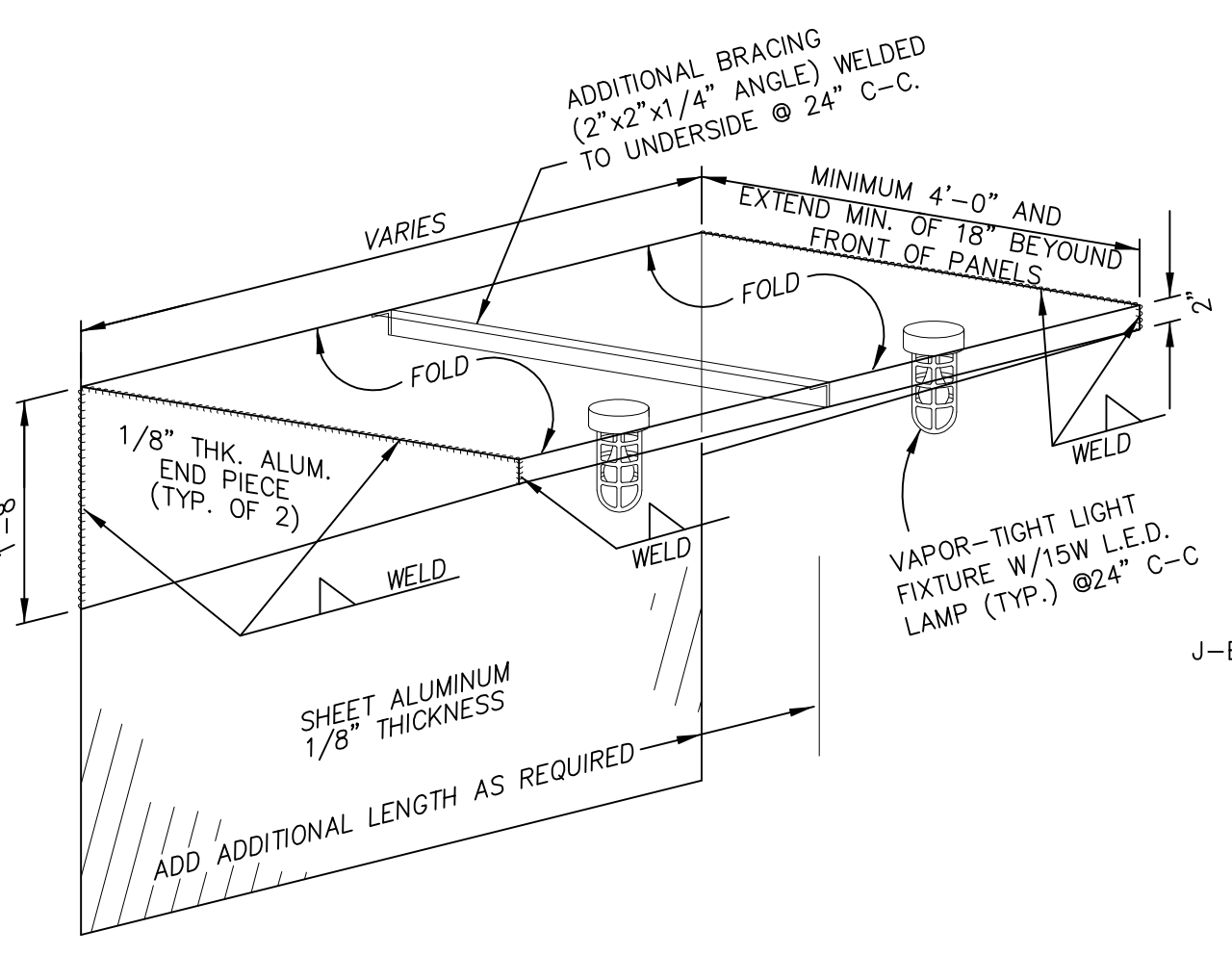
REVISION
T.D.T.
CHECKED
CC/ED/PH
DRAWN
08/06/2018
DATE
18-009-E
PROJECT
ELECTRICAL ONE-LINE & DETAILS
LSE - 3

FULL SIZE 24x36 1-INCH



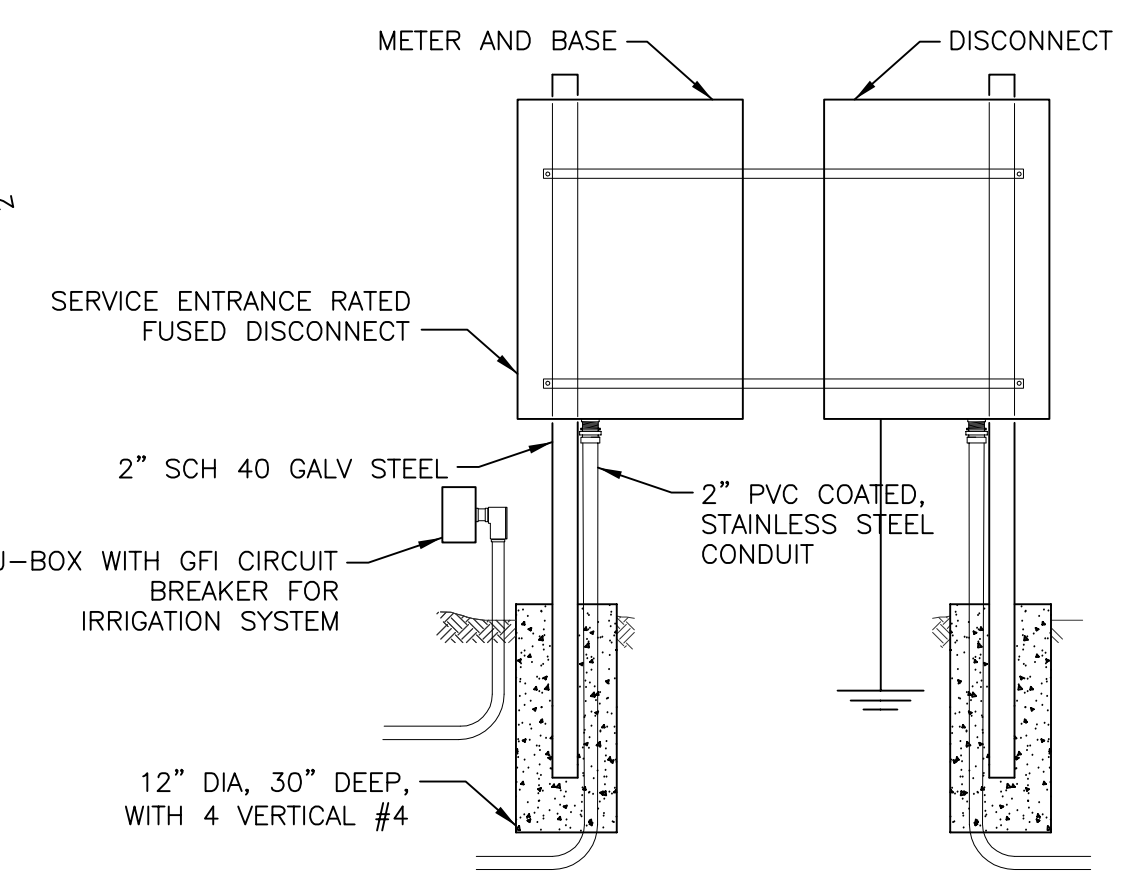
1 CONTROL PANEL MOUNTING WITH SUN SCREEN DETAIL
 NO SCALE
 DISPLAY SHALL FACE SOUTH

CONTRACTOR SHALL VERIFY PANEL DIMENSIONS AND REQUIRED CLEARANCES PRIOR TO SETTING OF SUPPORT COLUMNS OR CONSTRUCTION.

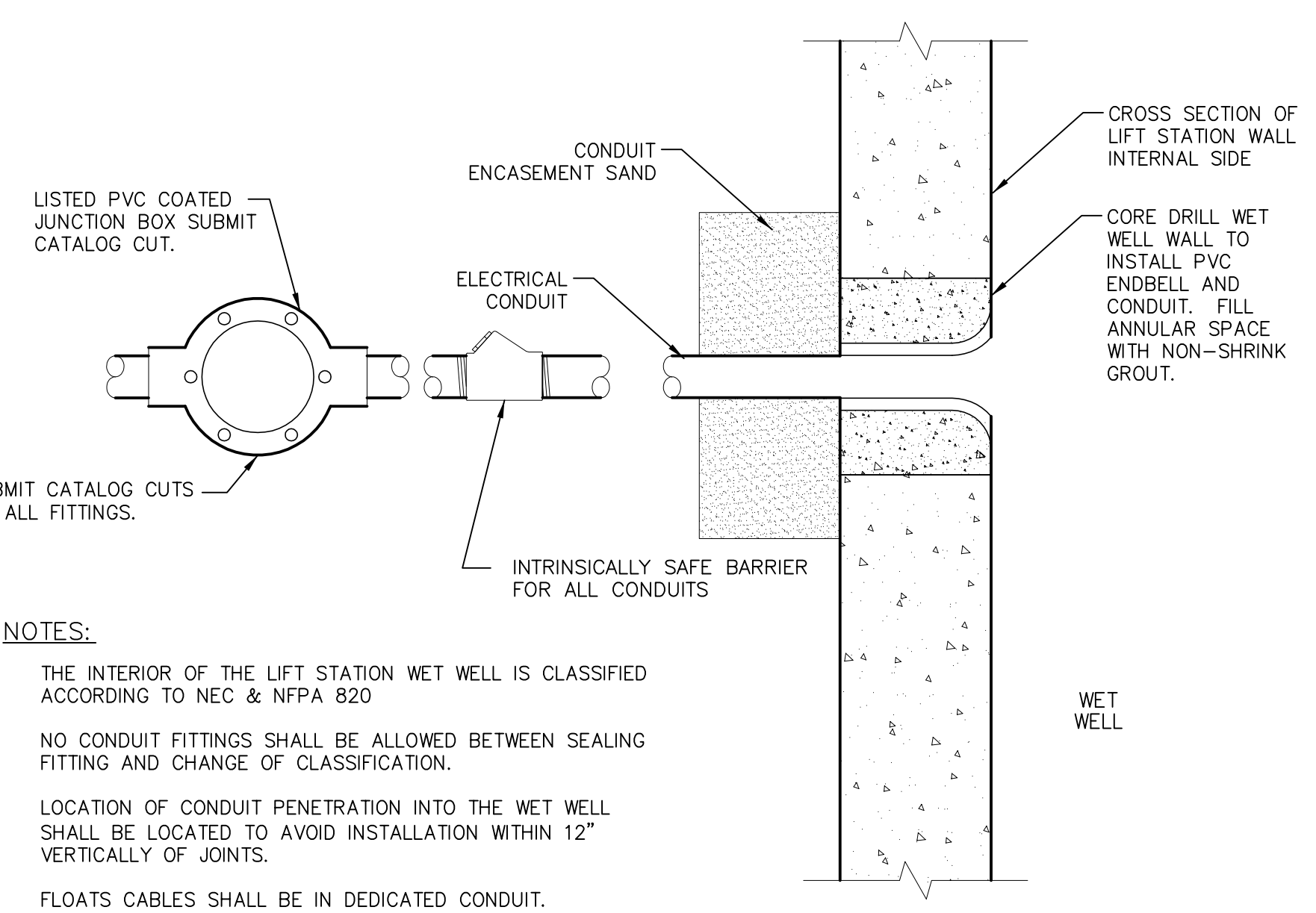
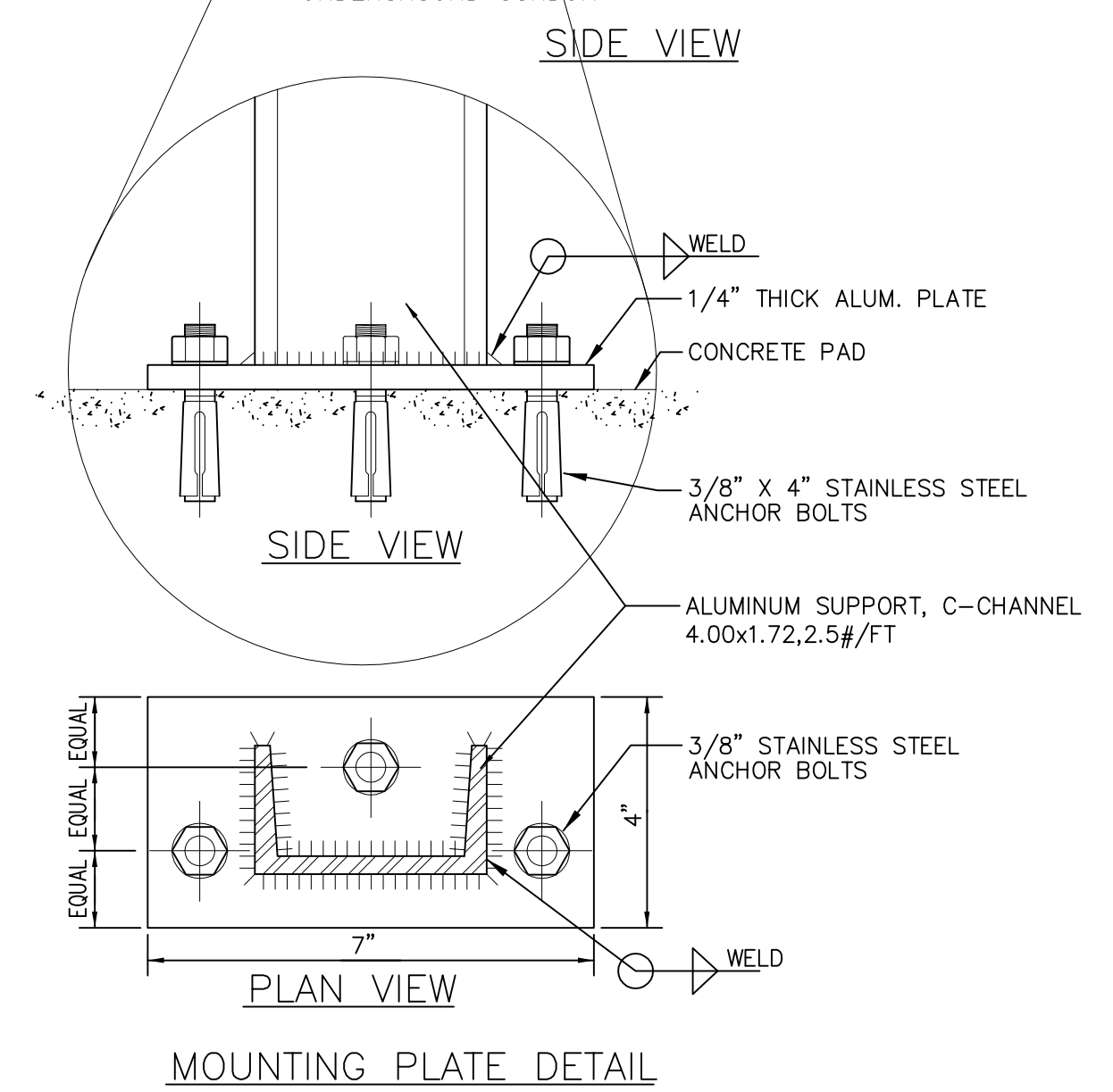


2 SUN SCREEN DETAIL
 NO SCALE

SUN SCREEN AND VERTICAL SUPPORTS IS DESIGNED TO WITHSTAND 90 MPH WIND (3-SECOND GUST) AND 75MPH SUSTAINED WIND SPEED



3 UNDERGROUND SERVICE METER PEDESTAL DETAIL
 NO SCALE



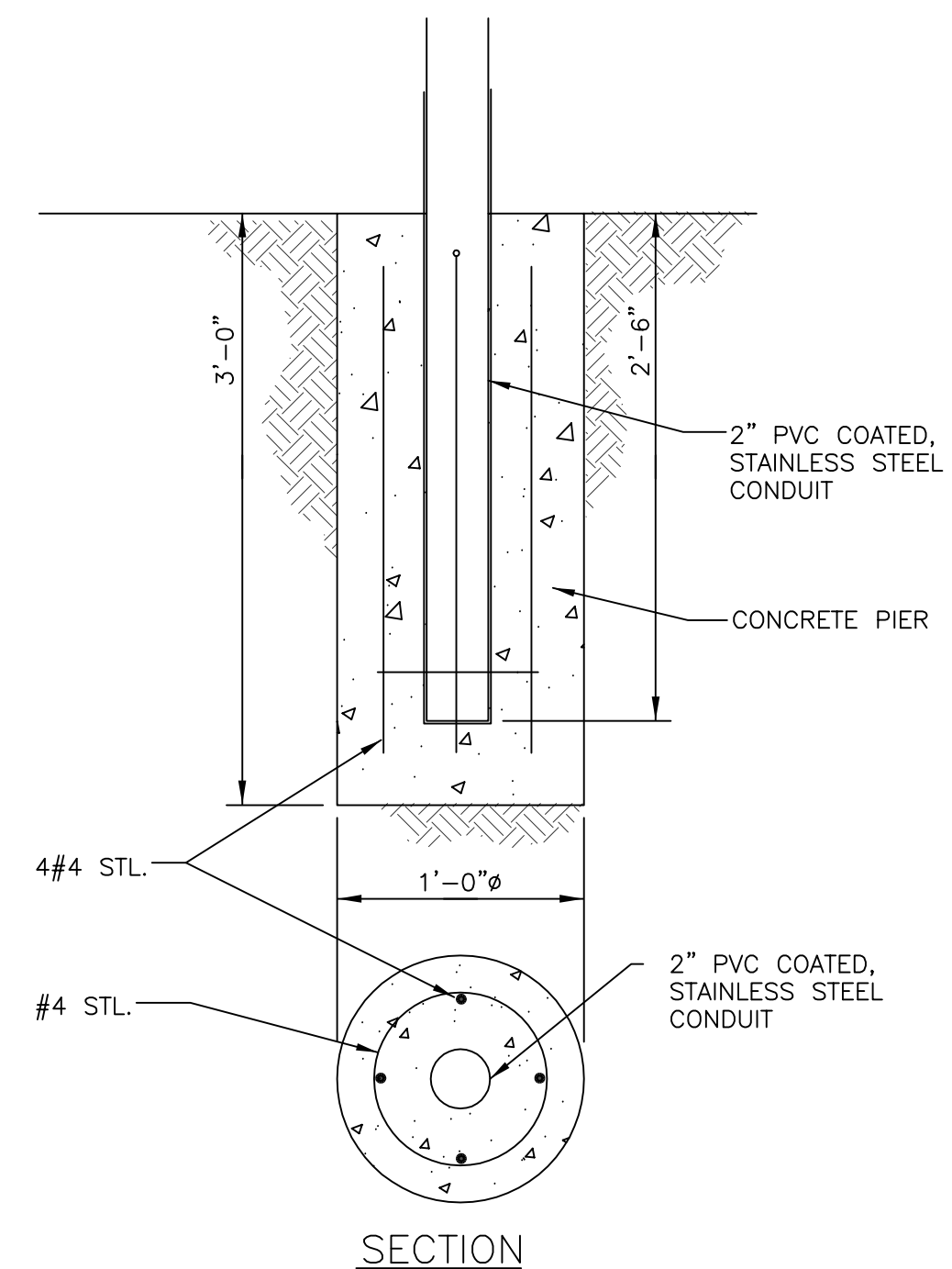
6 CONDUIT PENETRATION DETAIL
 NO SCALE

- NOTES:**
- 1 THE INTERIOR OF THE LIFT STATION WET WELL IS CLASSIFIED ACCORDING TO NEC & NFPA 820
 - 2 NO CONDUIT FITTINGS SHALL BE ALLOWED BETWEEN SEALING FITTING AND CHANGE OF CLASSIFICATION.
 - 3 LOCATION OF CONDUIT PENETRATION INTO THE WET WELL SHALL BE LOCATED TO AVOID INSTALLATION WITHIN 12" VERTICALLY OF JOINTS.
 - 4 FLOATS CABLES SHALL BE IN DEDICATED CONDUIT.
 - 5 POWER CABLES SHALL BE IN DEDICATED CONDUIT.
 - 6 LEVEL TRANSMITTER CABLES SHALL BE IN DEDICATED CONDUIT.

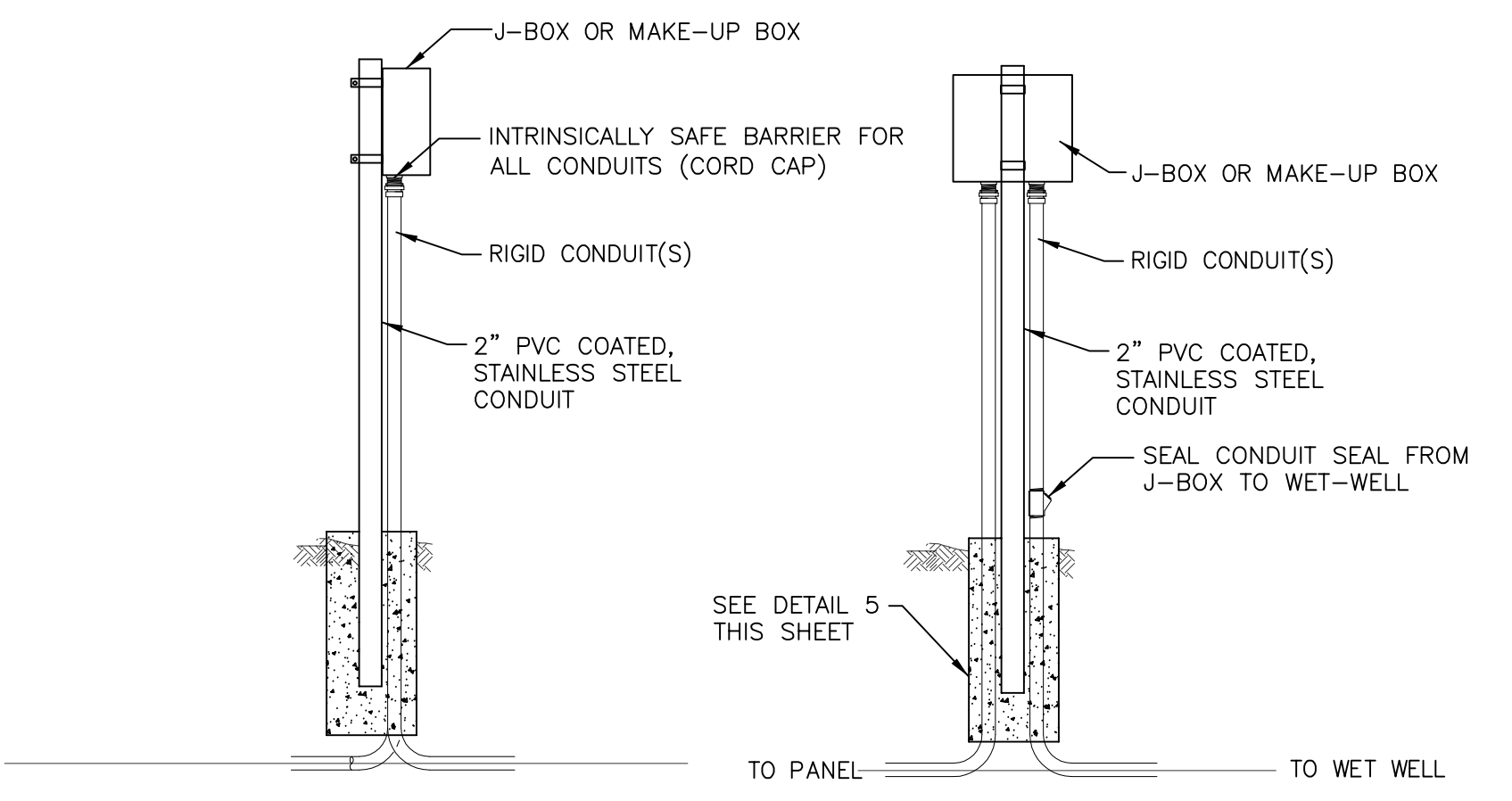


4 EQUIPMENT CONNECTION DETAIL
 NO SCALE

EITHER OF THE ABOVE MEANS OF PROVIDING SEPARATION IS ACCEPTABLE, OR AN ALTERNATE MEANS MAY BE USED.
 SEPARATION OF HAZAED ZONES SHALL COMPLY WITH NFPE 70 AND NFPA 820.



5 CONCRETE PIER DETAIL
 NO SCALE



7 EQUIPMENT CONNECTION DETAIL
 NO SCALE

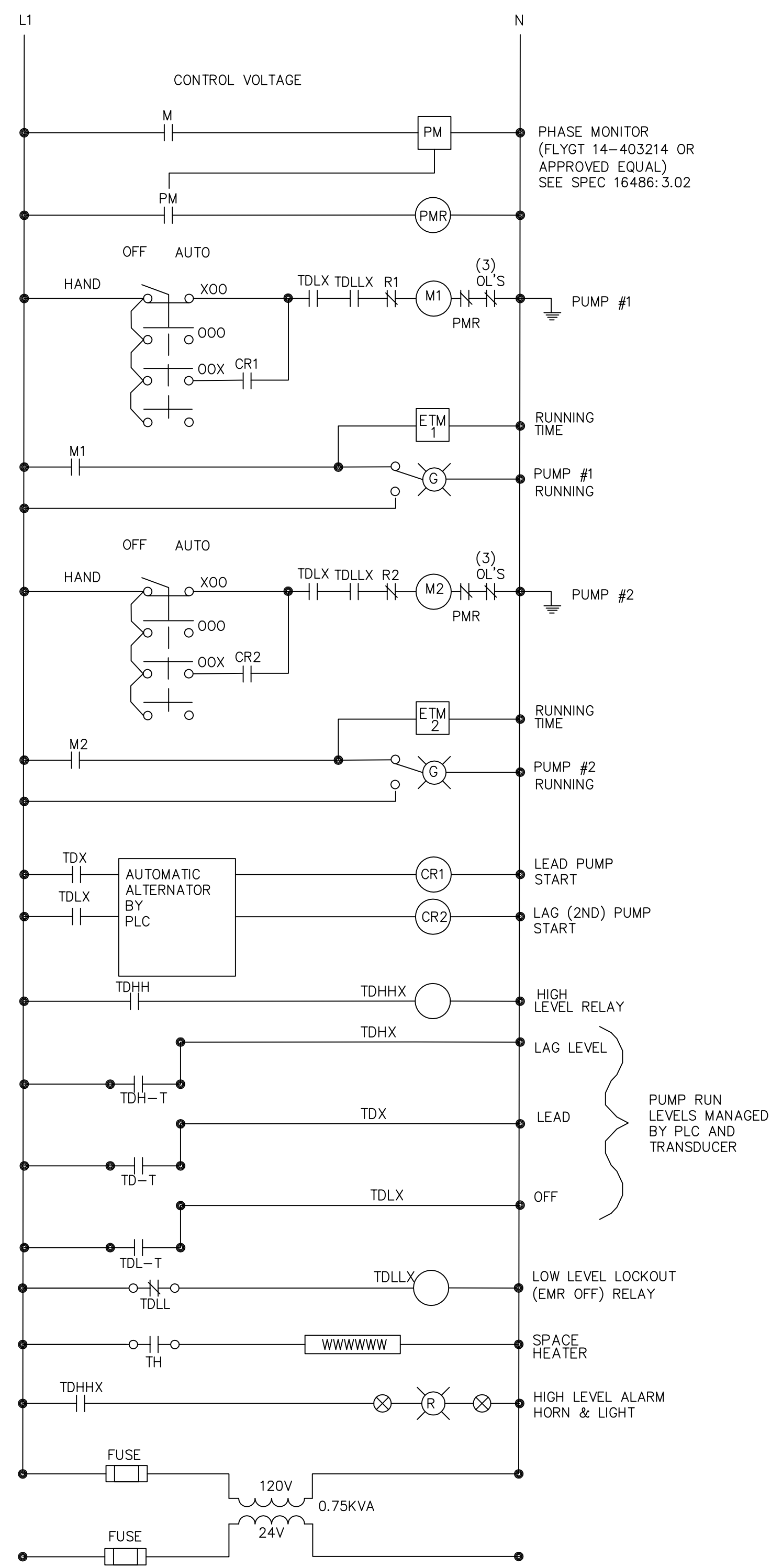
RECORD DRAWINGS

Revisions Drawn By
 T. TABOR CONSULTING, PLLC
 Firm # 5279
 Tommy D. Tabor P.E. # 57248
 Date 2020-08-17

T. Tabor

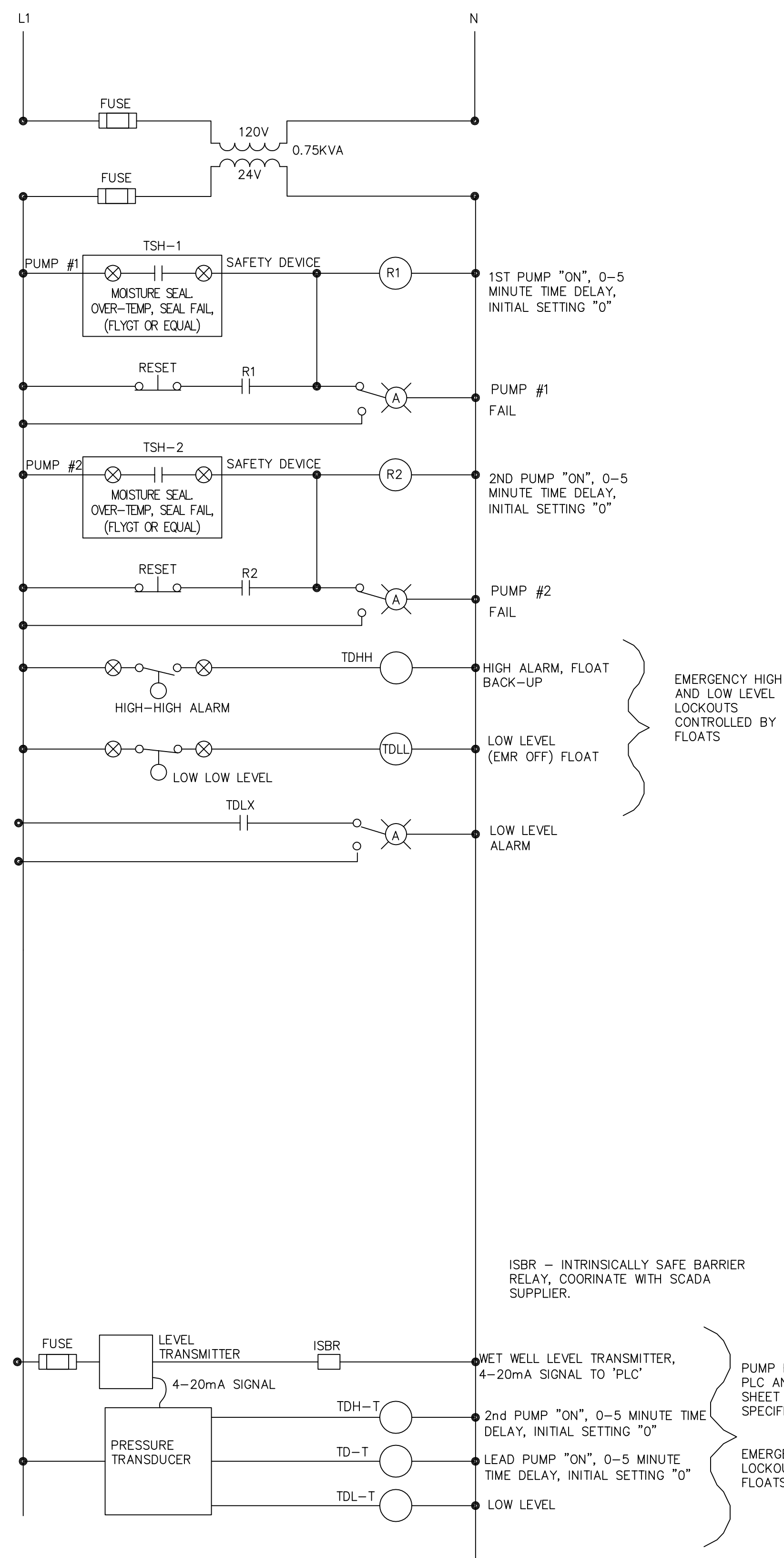
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FULL SIZE 24x36 1-INCH



1 PUMP CONTROL SCHEMATIC
NO SCALE

- LEVEL TRANSMITTER SHALL BE USED TO CONTROL ALL LIFT STATION PUMP FUNCTIONS. FLOAT SWITCHES SHALL BE USED AS BACK-UP CONTROLS FOR HIGH LEVEL AND LOW LEVEL LOCKOUT ALL PUMPS "OFF".
- THE 4-20 MA OUTPUT FROM LEVEL TRANSMITTER SHALL BE THE INPUT TO THE "PLC". THE "PLC" SHALL BE CONFIGURED WITH SETPOINTS AS DIRECTED BY CITY OF ROCKWALL FOR PUMPS OFF, PUMP 1 ON, PUMP 2 ON, HIGH ALARM LEVEL. POWER TO PLC AND LEVEL TRANSMITTER SHALL BE FROM CONTROL PANEL. THESE DEVICES SHALL BE INTEGRATED INTO THE PUMP CONTROL PANEL FOR POWER AND RESPONSE FUNCTION. PUMP ON/OFF SETTINGS SHALL BE CONTROLLED BY PLC EXCEPT FOR HIGH LEVEL AND LOW-LEVEL LOCK-OUT FLOATS. PUMPS MUST RUN IN 'HAND-ON' EVEN IF LOW-LEVEL LOCKOUT FLOAT IS OPEN.



2 ELECTRICAL SECTION - WET WELL
NO SCALE

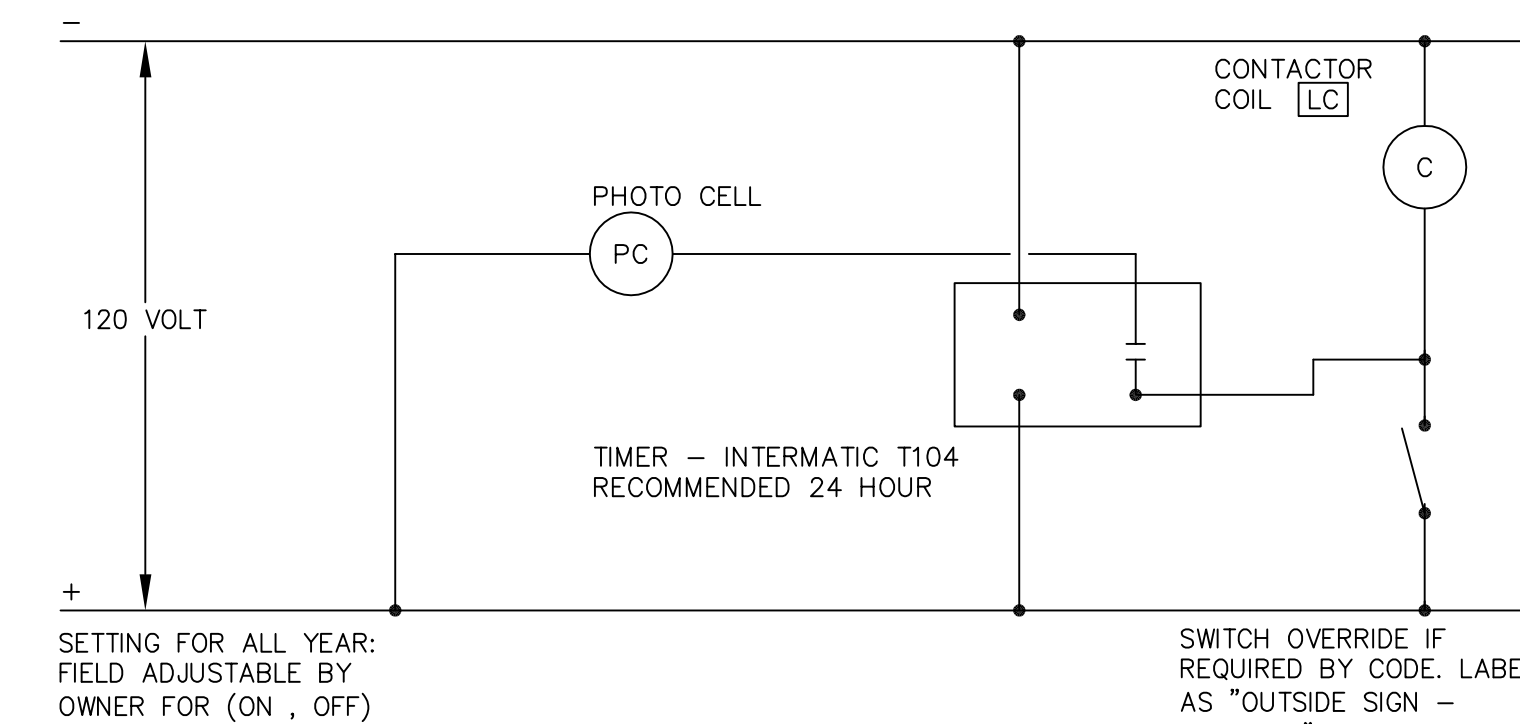
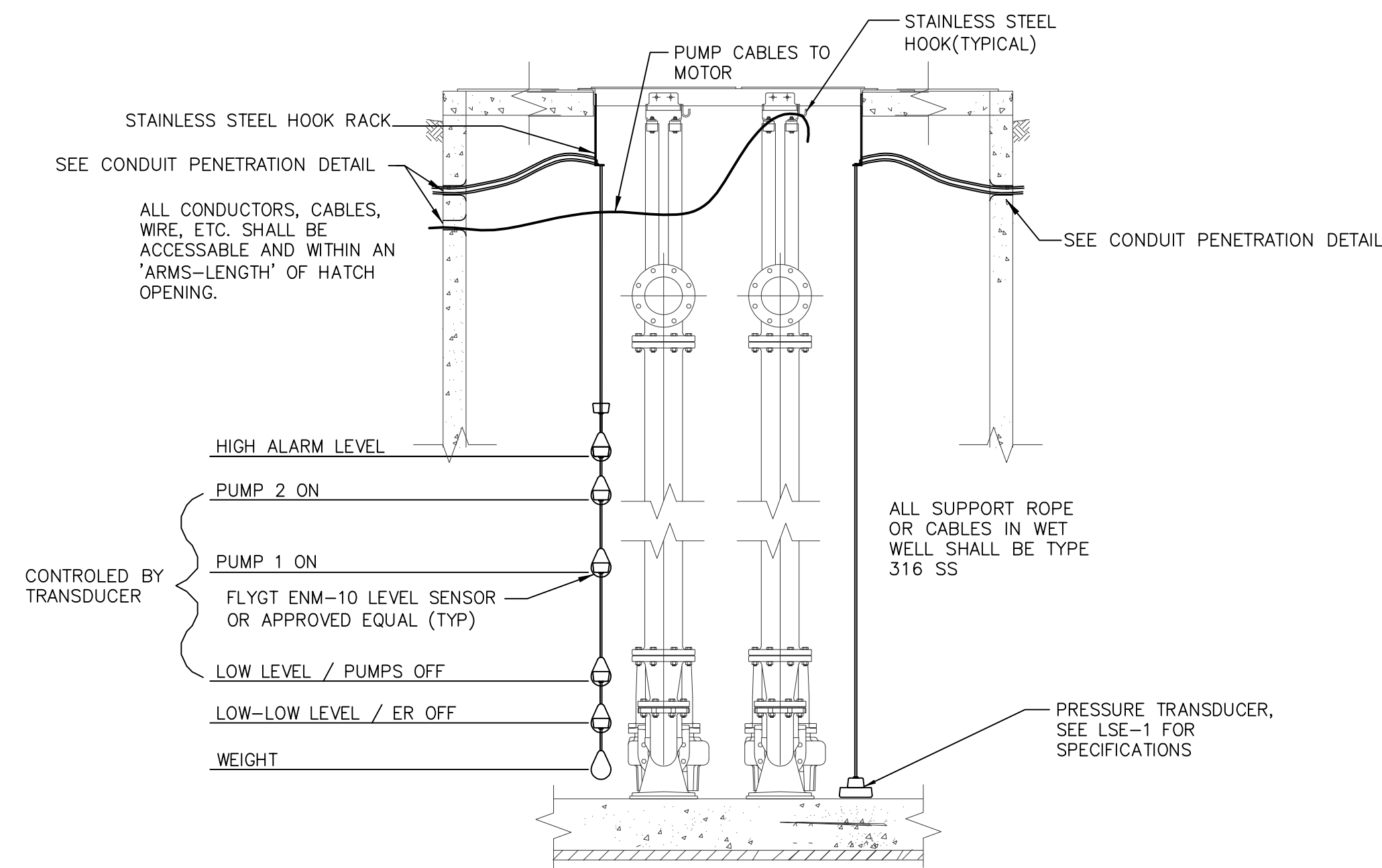
EMERGENCY HIGH AND LOW LEVEL LOCKOUTS CONTROLLED BY FLOATS

ISBR - INTRINSICALLY SAFE BARRIER RELAY, COORDINATE WITH SCADA SUPPLIER.

PUMP RUN LEVELS MANAGED BY PLC AND TRANSDUCER. SEE SHEET LSE-1 ROCKWALL SPECIFICATIONS.

EMERGENCY HIGH AND LOW LEVEL LOCKOUTS CONTROLLED BY FLOATS

- THESE DIAGRAMS ARE TO CONVEY THE GENERAL INTENT FOR THE CONTROL SEQUENCE OF OPERATION FOR A DUPLEX SEWER LIFT STATION WITH FLOAT SWITCHES AND LEVEL TRANSMITTER. CONTROL METROLOGY SHALL BE SELECTABLE FOR EITHER FLOATS OR LEVEL TRANSMITTER PROTOCOL. NOT ALL ELEMENTS ARE REPRESENTED IN THIS PUMP CONTROL SCHEMATIC.
- THE ELECTRICAL CONTROL PANEL SUPPLIER SHALL SUBMIT FOR APPROVAL A COMPLETE WIRING DIAGRAM INCLUDING, BUT NOT LIMITED TO, THE SPECIFIC MOTOR STARTERS, BREAKERS, LEVEL TRANSMITTER, FLOATS, SCADA, RELAYS, ALTERNATOR AND ALL ADDITIONAL INTEGRAL ELEMENTS FOR THE CONTROL PANEL.



3 TIME CLOCK-PHOTOCELL AND MANUAL CONTROL SWITCH FOR POLE MOUNTED LIGHT
NO SCALE

SETTING FOR ALL YEAR: FIELD ADJUSTABLE BY OWNER FOR (ON, OFF)

SWITCH OVERRIDE IF REQUIRED BY CODE. LABEL AS "OUTSIDE SIGN - OVERRIDE"

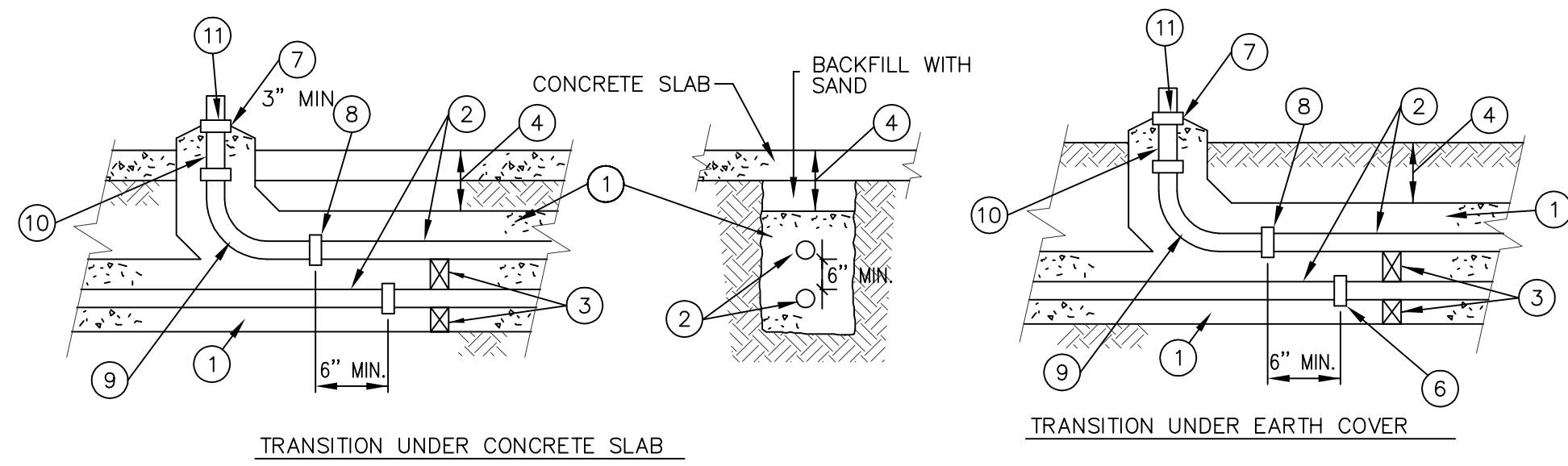
REVISION	
CHECKED	T.D.T.
DRAWN	CC/ED/PH
DATE	08/06/2018
PROJECT	18-009-E
	PUMP CONTROL SCHEMATIC
	LSE - 5

RECORD DRAWINGS

Revisions Drawn By
T. TABOR CONSULTING, PLLC
Firm # 5279
Tommy D. Tabor P.E. # 57248
Date 2020-08-17

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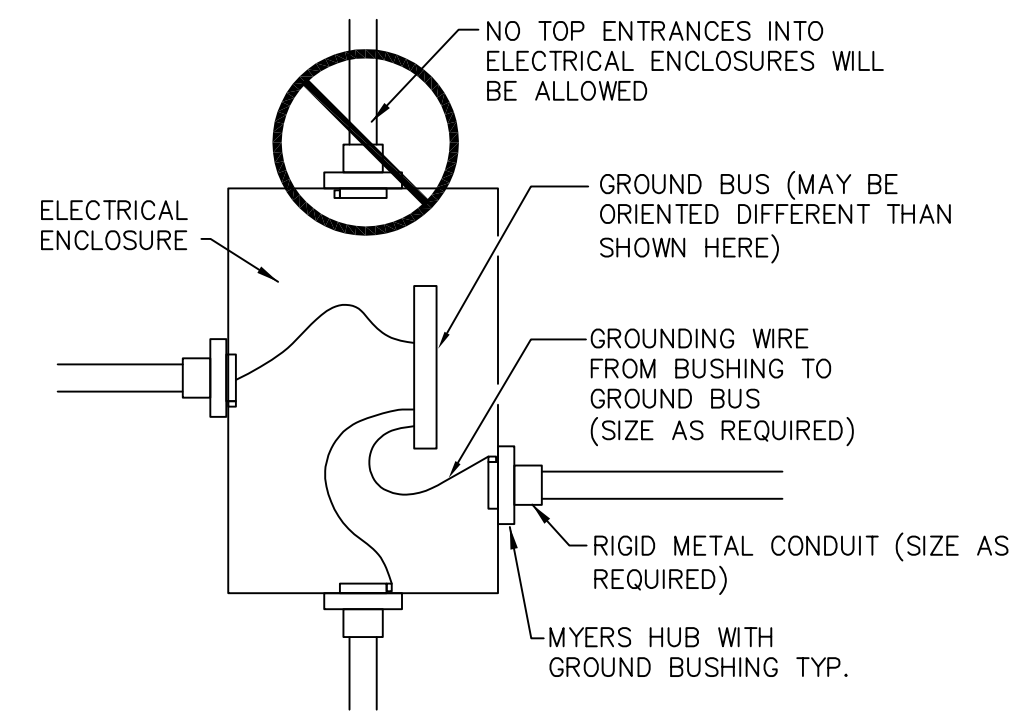
FULL SIZE 24x36 1"=1" INCH



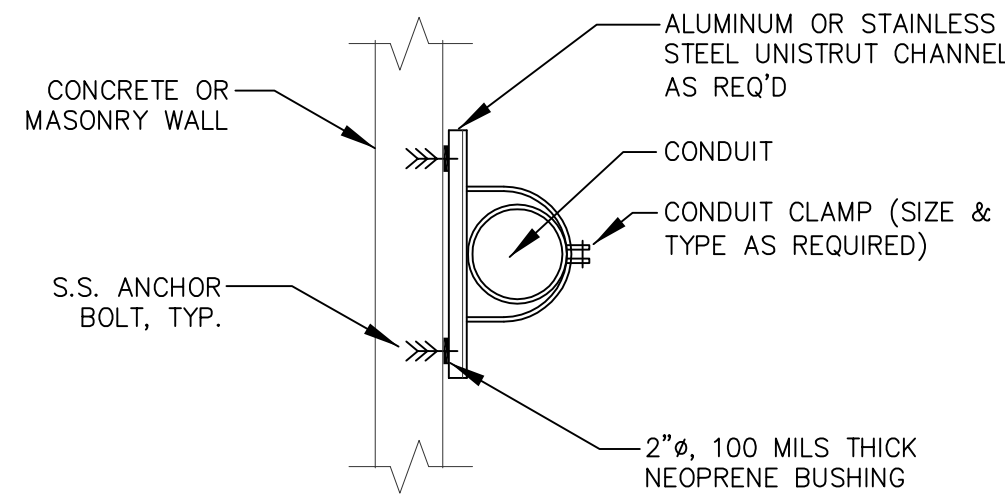
NOTES BY SYMBOL "○"

- ① CLASS 'C' CONCRETE.
- ② CONDUIT SIZE AS REQUIRED BY NEC UNLESS OTHERWISE DIRECTED. ALL UNDERGROUND CONDUITS SHALL BE PVC SCHEDULE 40 UNLESS OTHERWISE INDICATED ON THE PLANS.
- ③ SPACERS SHALL BE JOHNS MANVILLE PLASTIC SPACERS OR EQUIVALENT. SPACED 5"-0" O.C.
- ④ COVER SHALL BE 2'-0" MINIMUM BELOW SOIL SURFACE AND 1'-0" MINIMUM BELOW CONCRETE SLABS, OR AS SHOWN ON PLANS.
- ⑤ UNDERGROUND CONDUIT WITHIN PLANT FENCED AREA SHALL BE ENCASED IN AN ENVELOPE OF CONCRETE.
- ⑥ COUPLING.
- ⑦ PROTECT EXPOSED CONDUIT ENDS DURING CONSTRUCTION WITH PIPE PLUG OR CAPS. FUTURE AND SPARE CONDUIT ENDS SHALL HAVE PIPE PLUGS OR CAPS.
- ⑧ ADAPTOR FROM NON-METALLIC CONDUIT AS REQUIRED.
- ⑨ PVC COATED RIGID ALUMINUM CONDUIT BENDS FOR LESS THAN 2". PVC SCH 80 CONDUIT FOR 2 INCH AND LARGER.
- ⑩ RIGID ALUMINUM CONDUIT SIZE AND TYPE AS REQUIRED EXTEND THIS CONDUIT A MINIMUM OF 6" INTO CONCRETE.
- ⑪ CONDUIT TERMINATING IN AN ENCLOSURE CONTAINING A GROUND BUS SHALL HAVE A GROUNDING BUSHING WITH A GROUND WIRE TO THE GROUND BUS.

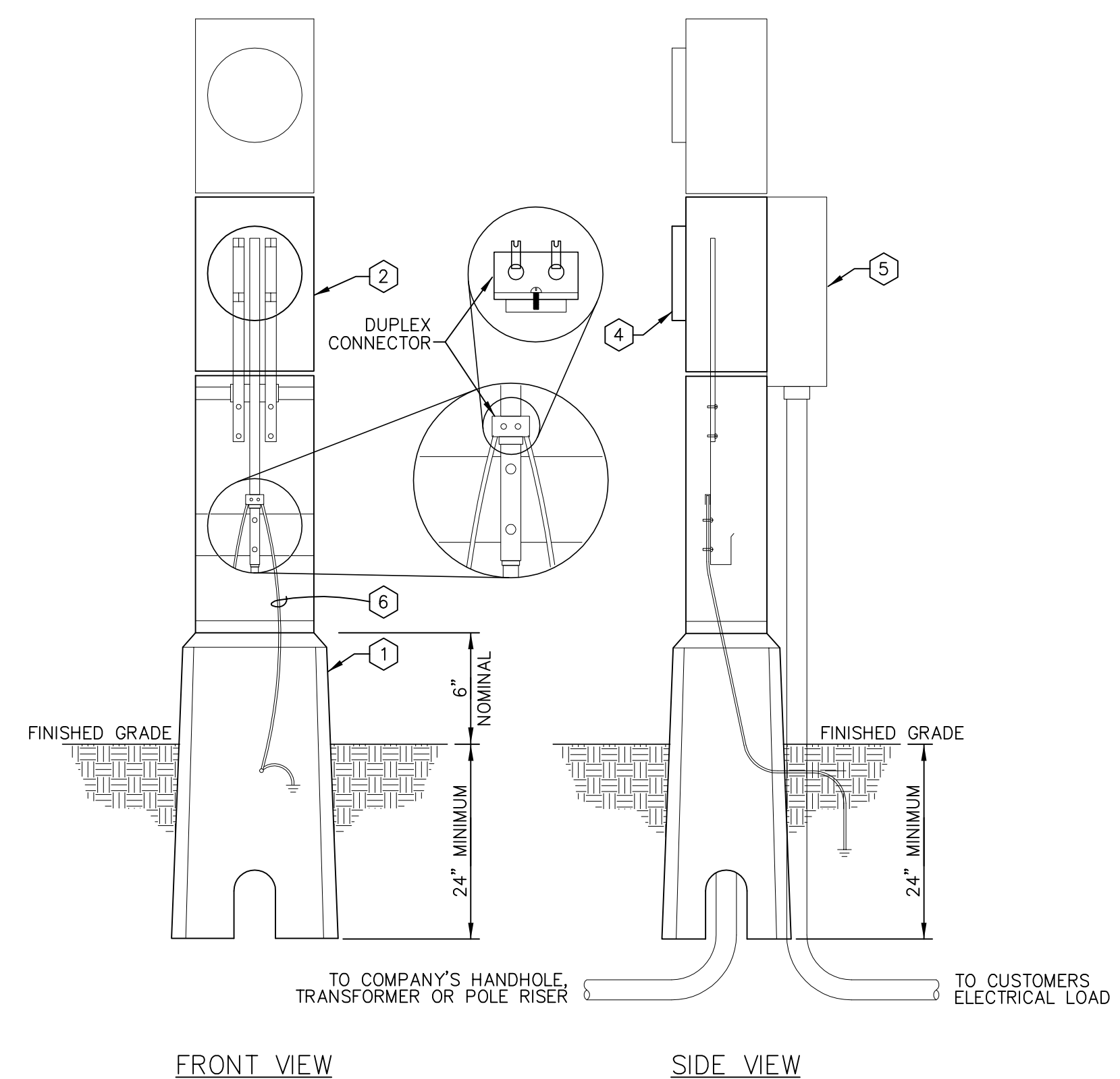
1 UNDERGROUND CONDUIT INSTALLATION DETAIL
NO SCALE



2 ENCLOSURE / CONDUIT DETAIL
NO SCALE



3 CONDUIT SUPPORT AT WALL DETAIL
NO SCALE



NOTES BY SYMBOL "◇"

- ① PRECAST FOUNDATION PROVIDED BY ELECTRIC COMPANY.
- ② ABOVE GROUND METER PEDESTAL PROVIDED, INSTALLED AND MAINTAINED BY CUSTOMER.
- ③ CUSTOMER PROVIDES ANCHOR CLIPS AND BOLTS WITH METER PEDESTAL. SERVICE LATERAL OF SOURCE CONDUCTORS PROVIDED AND INSTALLED AS PER 400.02, PAGE 28.
- ④ FOUR FEET CLEARANCE IS REQUIRED FROM METER SIDE OF PEDESTAL TO ANY OBSTRUCTION OR STRUCTURE.
- ⑤ CUSTOMER SERVICE EQUIPMENT MAY BE INSTALLED ON METER PEDESTAL IN ACCORDANCE WITH ALL APPLICABLE CODES.
- ⑥ CUSTOMER MAY CONNECT GROUNDING ELECTRODE CONDUCTOR TO DUPLEX CONNECTOR ON NEUTRAL BUS. THE GROUNDING ELECTRODE CONDUCTOR (#8 CU MIN.) SHALL CONNECT TO AN APPROVED GROUND ELECTRODE. COMPANY RESERVES THE RIGHT TO REFUSE INSTALLATION OF SERVICE CONTINGENT UPON OBSERVING AN UNSAFE CUSTOMER CONNECTION.
- ⑦ ALTERNATE DESIGN - CUSTOMER SHALL OBTAIN COMPANY APPROVAL OF ANY ALTERNATE DESIGN PRIOR TO INSTALLATION.

4 UNDERGROUND SERVICE METER PEDESTAL DETAIL
NO SCALE

DETAIL PROVIDED PER ONCOR ELECTRICAL SERVICE COMPANY STANDARDS 2012 (FIG. 4-F)

RECORD DRAWINGS

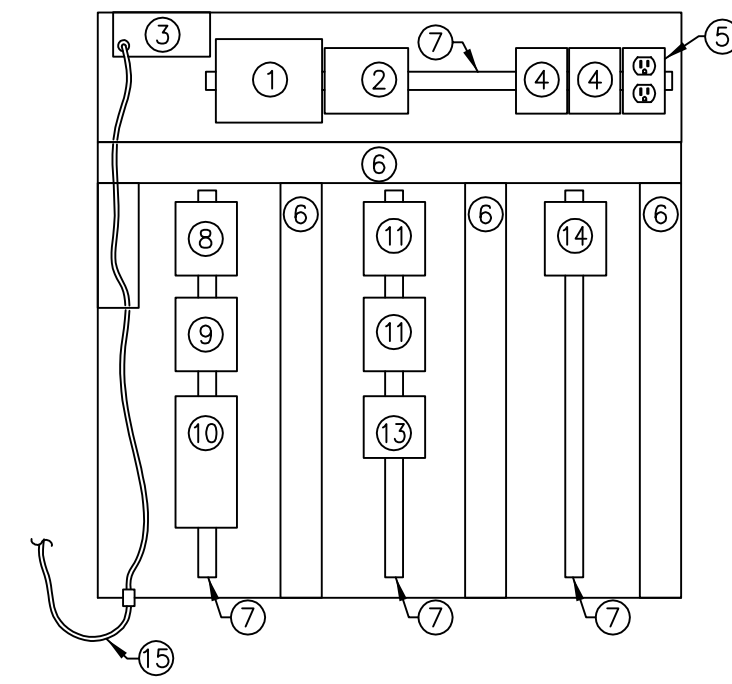
Revisions Drawn By
T.TABOR CONSULTING, PLLC
Firm # 5279
Tommy D. Tabor P.E. # 57248
Date 2020-08-17

Tabor

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REVISION	
CHECKED	T.D.T.
DRAWN	CC/ED/PH
DATE	08/06/2018
PROJECT	18-009-E
	ELECTRICAL DETAILS
	LSE - 6

FULL SIZE 24x36 1-INCH



RTU I/O SCHEDULE				
DESCRIPTION	I/O TYPE	FUNCTION	FIELD DEVICE	COMMENTS
WET WELL LEVEL	A/I	MONITOR	HYDRORANGER	FLOW RATE
FLOW TRANSMITTER	D/I	ALARM	HYDRORANGER	ALARM
INTRUSION ALARM INSTRUMENT ENCLOSURE	D/I	ALARM	SENSOR SWITCH	OPEN DOOR
INTRUSION ALARM INSTRUMENT ENCLOSURE	D/I	ALARM	SENSOR SWITCH	HATCH OPEN
INTRUSION ALARM INSTRUMENT ENCLOSURE	D/I	ALARM	SENSOR SWITCH	HATCH OPEN
MANUAL TRANSFER SWITCH	D/I	ALARM	TRANSFER SWITCH	ONE PER ALARM
PUMP CONTROL PANEL	D/I	ALARM & MONITOR	PUMP CONTROL PANEL	ONE PER ALARM
POWER MONITOR	A/I & D/I	ALARM & MONITOR	POWER MONITOR	ONE PER ALARM

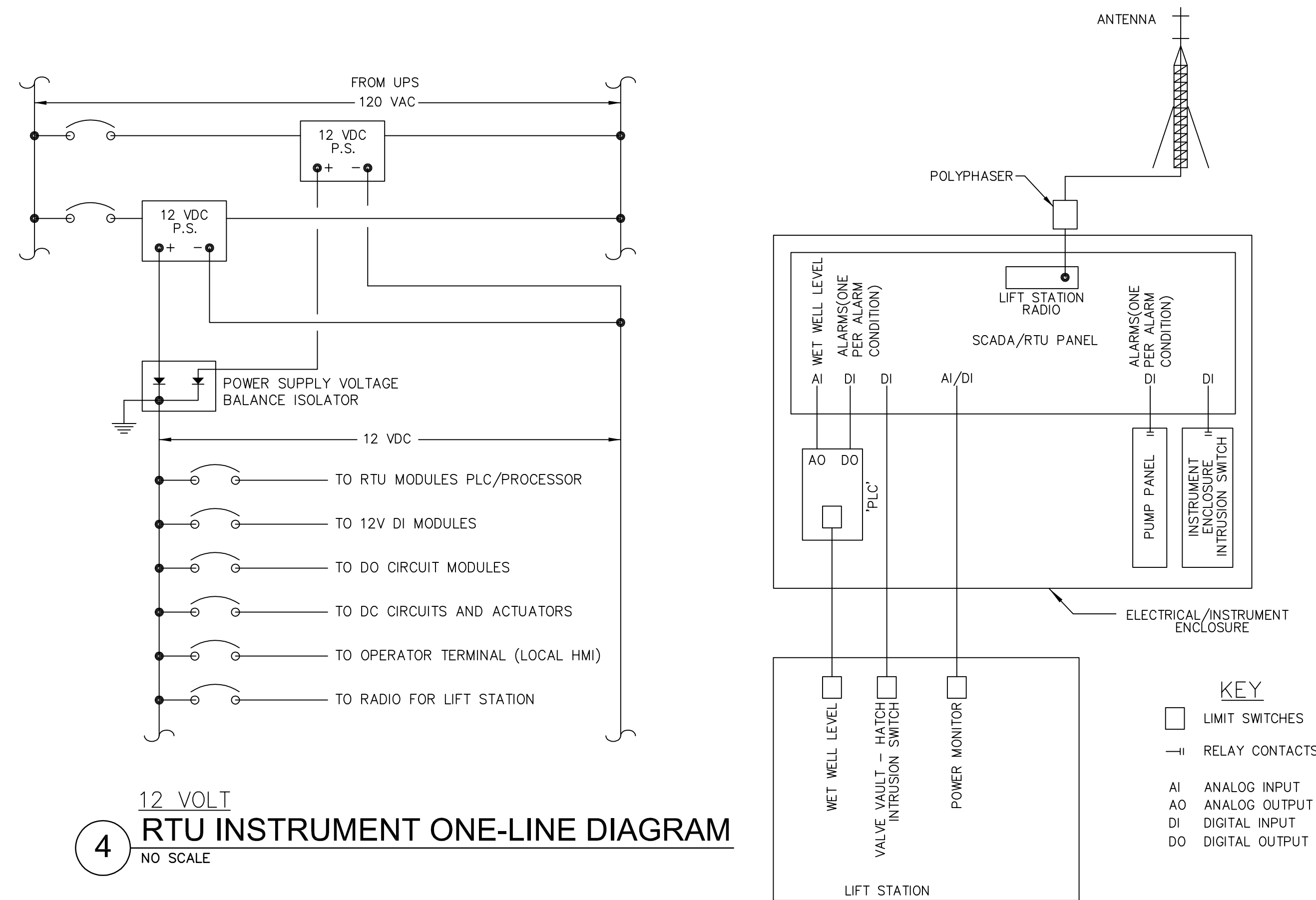
NOTES:
1. PROVIDE NECESSARY ANALOG TRANSDUCERS FOR POWER QUALITY METER (PQM) FOR MONITORING SIGNALS TO THE RTU.

2 RTU INSTRUMENT BLOCK DIAGRAM
NO SCALE

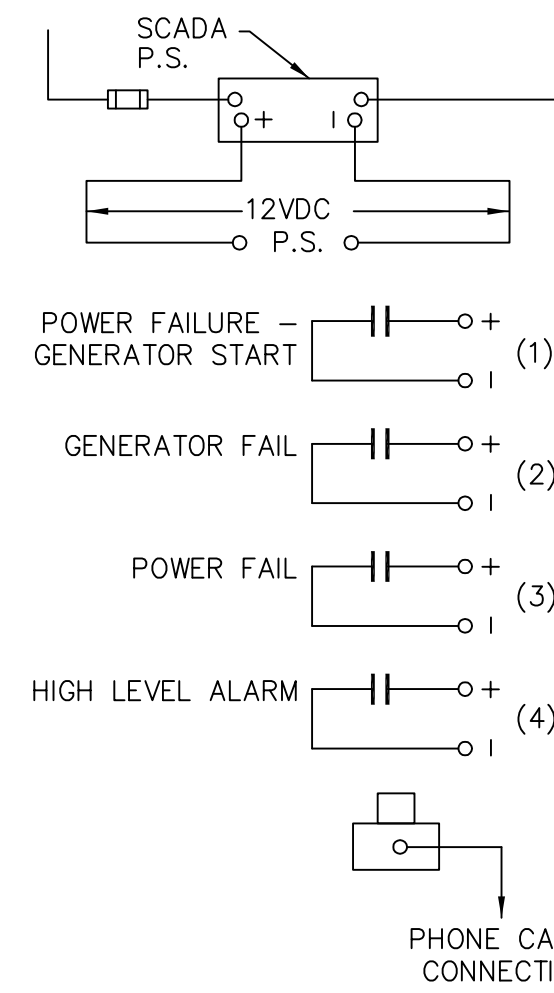
TAG	DESCRIPTION	MANUFACTURER	MODULE / TYPE	COMMENTS
1	HSQ PROCESSOR		PROCESSOR	WITH ETHERNET PORT
2	HSQ PROCESSOR MODULE		AS REQUIRED	
3	RADIOS FOR METERING STATION		AS REQUIRED PER SCADA SYSTEM	
4	POWER SUPPLY	PHOENIX CONTACT	DIN RAIL MOUNTED	AS REQUIRED
5	120 VAC RECEPTACLE	PHOENIX CONTACT	DIN RAIL MOUNTED	AS REQUIRED
6	WIRE DUCT WITH COVER	PANDUIT	2" X 3" (WHITE)	AS REQUIRED
7	DIN RAILS	PHOENIX CONTACT	AS REQUIRED	
8	CIRCUIT BREAKER	PHOENIX CONTACT	SIZE AS REQUIRED	
9	SURGE PROTECTION DEVICE	PHOENIX CONTACT	TRAB TECH	AS REQUIRED
10	FUSE & TERMINAL BLOCKS	PHOENIX CONTACT	AS REQUIRED	
11	D/I RELAY MODULE	PHOENIX CONTACT	DIN RAIL MOUNTED	16 POINT D/I
12	ANALOG SURGE PROTECTORS	PHOENIX CONTACT	TRAB TECH	AS REQUIRED
13	D/O RELAYS	PHOENIX CONTACT	DIN RAIL MOUNTED	AS REQUIRED
14	POWER SUPPLY DIODES ISOLATOR	PHOENIX CONTACT	DIN RAIL MOUNTED	REDUNDANT PS DIODES
15	ANTENNA COAX SURGE ARRESTOR	POLYPHASER	AS REQUIRED	NOT SHOWN

NOTES:
1. OPERATOR INTERFACE PANEL (OIP) TO BE MOUNTED IN FRONT DOOR OF PANEL. SEE SPECIFICATION.
2. UPS TO MOUNT IN FRONT OF PANEL.
3. CAUTION PLATE TO BE MOUNTED ON EXTERIOR OF FRONT DOOR.

1 RTU / SCADA POWER SIMPLIFIED SCHEMATIC
NO SCALE



4 RTU INSTRUMENT ONE-LINE DIAGRAM
NO SCALE



3 SCADA RADIO ONE-LINE DIAGRAM
NO SCALE

CITY REQUIRED INSTRUCTIONS TO CONTRACTOR
SCADA CONNECTION TO OWNER'S SYSTEM. ALL PROGRAMMING SHALL COMPLY WITH OWNER'S REQUIREMENTS. SEE CITY SPECIFICATIONS FOR SCADA REQUIREMENTS.

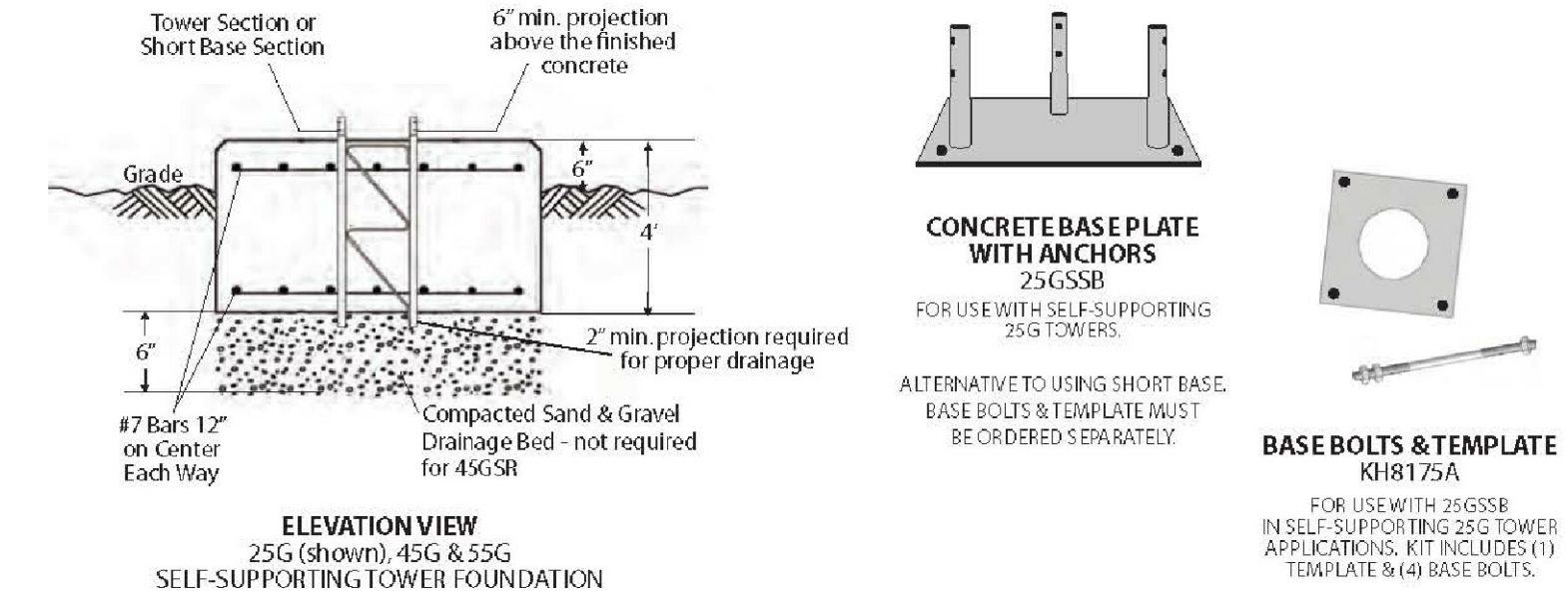
UPS SHALL BE APC-BR700G OR APPROVED EQUAL.
TVSS SHALL BE SIEMENS TPS3F1115D OR APPROVED EQUAL.
DC POWER SUPPLIES SHALL PHOENIX, MINIMUM 2.4AMP, 12 VOLT OR APPROVED EQUAL.
INTRUSION DETECTION SHALL BE SQUARE D, STAINLESS STEEL LIMIT SWITCHED OR APPROVED EQUAL.
RADIO SHALL MATCH THE EXISTING SYSTEMS RADIOS OR APPROVED EQUAL.
ANTENNA SHALL MATCH THE EXISTING SYSTEMS ANTENNAS, OR APPROVED EQUAL.
ANTENNA CABLE SHALL BE 1/2" DIAMETER IF LESS THAN 50 FT, OR 7/8" FOR GREATER THAN 50 FT.
SCADA SHALL MONITOR THE OPERATION OF THE LIFT STATION ONLY.
THE LIFT STATION SHALL BE CONTROLLED FROM THE LOCAL LEVELS.
AUTOMATIC PUMP ALTERNATOR SHALL NOT BE CONTROLLED BY THE 'PLC'.
INTRINSICALLY SAFE BARRIER ON ALL CABLES, OR CONDUCTORS TO WET WELL.

100 MPH
3-Second Gust

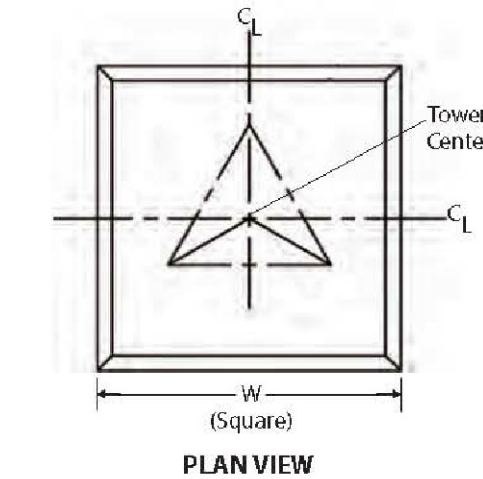
Height	100 MPH 3-Second Gust Wind Speed														
	25G		45G		45GSR		55G		65G						
	EPA	Part No.	EPA	Part No.	EPA	Part No.	EPA	Part No.	EPA	Part No.					
10'	20.7	16.4	25SS010	42.4	39.5	45SS010	82	66	45SR010	78	63	55SS010	95	95	65SS010
20'	14.0	9.9	25SS020	23.2	16.9	45SS020	74	55	45SR020	43	32	55SS020	95	95	65SS020
30'	5.3	2.2	25SS030	9.7	4.8	45SS030	66	43	45SR030	24	14	55SS030	81	55	65SS030
35'	2.1	-	25SS035	5.1	0.7	45SS035	59	38	45SR035	17	8	55SS035	61	40	65SS035
40'	-	-	-	-	-	45SS040	46	30	45SR040	10	3	55SS040	47	29	65SS040
45'	-	-	-	-	-	-	35	22	45SR045	5	-	55SS045	35	20	65SS045
50'	-	-	-	-	-	-	27	15	45SR050	-	-	-	26	13	65SS050
55'	-	-	-	-	-	-	20	9	45SR055	-	-	-	17	6	65SS055
60'	-	-	-	-	-	-	13	4	45SR060	-	-	-	11	1	65SS060

NOICE

SELF-SUPPORTING G-SERIES FOUNDATIONS

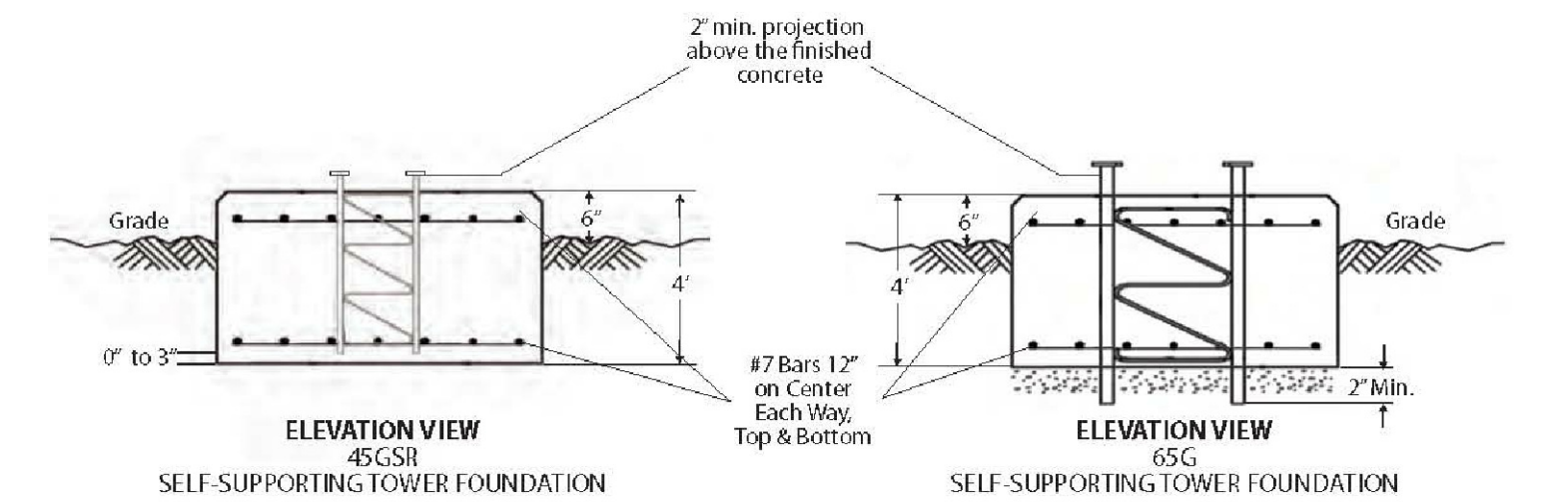


ELEVATION VIEW
25G (shown), 45G & 55G
SELF-SUPPORTING TOWER FOUNDATION



PLAN VIEW

Tower	Mat Width (W)	Concrete Volume (Cu. Yds.)
25G	4'-0"	2.4
45G	5'-3"	4.1
55G	6'-0"	5.3
45GSR 65G	7'-9"	8.9



ELEVATION VIEW
45GSR
SELF-SUPPORTING TOWER FOUNDATION

ELEVATION VIEW
65G
SELF-SUPPORTING TOWER FOUNDATION

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Tommy D. Tabor
Professional Engineer
57248
2018/08/06

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2235 RIDGE RD., # 200 ROCKWALL, TEXAS 75087
PHONE: (972)771-9004 FAX: (972)771-9005

LIFT STATION PLAN
THE STANDARD
ROCKWALL
CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS

REVISION	T.D.T. CHECKED	CC/ED/PH DRAWN	08/06/2018 DATE	18-009-E PROJECT	SCADA DETAILS	LSE - 7
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RECORD DRAWINGS
Revisions Drawn By
T. TABOR CONSULTING, PLLC
Firm # 5279
Tommy D. Tabor P.E. # 57248
Date 2020-08-17
Tabor

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY THE CONTRACTOR. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

FULL SIZE 24X36 1-INCH