

P:\SKE\Project\Share\Projects\2025\3740125 - KPA Levi WSC Falls County WTP\01 Design Phase\CAD - Current\WGL_3740125-E1.2A.dwg - E1.2A

PACKAGE DIESEL GENERATOR 450 KW

1 GENERAL

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
- ISO8528
- IEC61000
- UL508
- UL2200
- UL142
- DESIGNED TO ALLOW FOR INSTALLED COMPLIANCE TO NFPA 70, NFPA99 AND NFPA 110

1.2 RELATED SECTIONS

1.2.1 DIVISION 3 – STRUCTURAL CONCRETE

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.

1.3.2 FUEL SYSTEM

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

1.3.3 SYSTEM TEST

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®
- STEWART & STEVENSON®
- LOFTIN – KOHLER POWER SYSTEMS®
- TAYLOR POWER SYSTEMS

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.

1.4 SUBSTITUTION

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



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THE POWER SYSTEM HAS BEEN DESIGNED TO SOUTHERN PLAINS/CUMMINS ELECTRICAL AND PHYSICAL CHARACTERISTICS. THE EQUIPMENT SIZING, SPACING, AMOUNTS, ELECTRICAL WIRING, VENTILATION EQUIPMENT, FUEL AND EXHAUST COMPONENTS HAVE ALL BEEN SIZED AND DESIGNED AROUND SOUTHERN PLAINS/CUMMINS 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:

1. FACTORY PUBLISHED SPECIFICATION SHEET.
2. 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.

5. 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®
- STEWART & STEVENSON®
- LOFTIN – KOHLER POWER SYSTEMS®
- TAYLOR POWER SYSTEM

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 PRODUCT SPECIFICATIONS

2.1 GENERAL REQUIREMENTS

2.1.1 GENSET REQUIREMENTS

THE GENERATOR SET SHALL BE STANDBY DUTY RATED AT 450 KW, 563 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:
TYPICAL LOAD FACTOR = 70% OR LESS WITH VARIABLE LOAD
TYPICAL HOURS PER YEAR = 200 HOURS
MAXIMUM EXPECTED USAGE = 500 HOURS/YEAR
TYPICAL APPLICATION – STANDBY
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 1 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 +/- 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 1749 SKVA AT 20% 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) 600 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.

1. –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 DESCRIPTIONS.
2. AUDIBLE HORN FOR ALARM AND SHUTDOWN WITH HORN SILENCE SWITCH
3. STANDARD ISO LABELING
4. MULTIPLE LANGUAGE CAPABILITY
5. REMOTE START/STOP CONTROL
6. LOCAL RUN/OFF/AUTO CONTROL INTEGRAL TO SYSTEM MICROPROCESSOR
7. COOLDOWN TIMER
8. SPEED ADJUST
9. LAMP TEST
10. PUSH BUTTON EMERGENCY STOP BUTTON
11. PASSWORD PROTECTED SYSTEM PROGRAMMING

E1.2A

1		7/29/2026		HOT PRIMARY				PROJECT NO. 3740125				KASBERG, PATRICK & ASSOCIATES, LP CONSULTING ENGINEERS TEMPLE, TEXAS 76501		LEVI WATER SUPPLY CORP. FALLS COUNTY WATER PLANT SITE		SHEET NO. SE-03	
						DRAWN BY PD											
NO.		DATE		REVISION		BY		DESIGNED BY SO									
© 2026 Kasberg, Patrick & Associates, LP				Plot Date: Jul 31, 2026 - 1:59pm				APPROVED BY SK						ELECTRICAL GENERATOR SPECIFICATIONS		OF 12	
KPA Firm Registration Number F-510				Plotted By: SARAH.ORTIZ				DATE 06/23/25									

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PROJECT NO.	3740125
DRAWN BY	PD
DESIGNED BY	SO
APPROVED BY	SK
DATE	06/23/25



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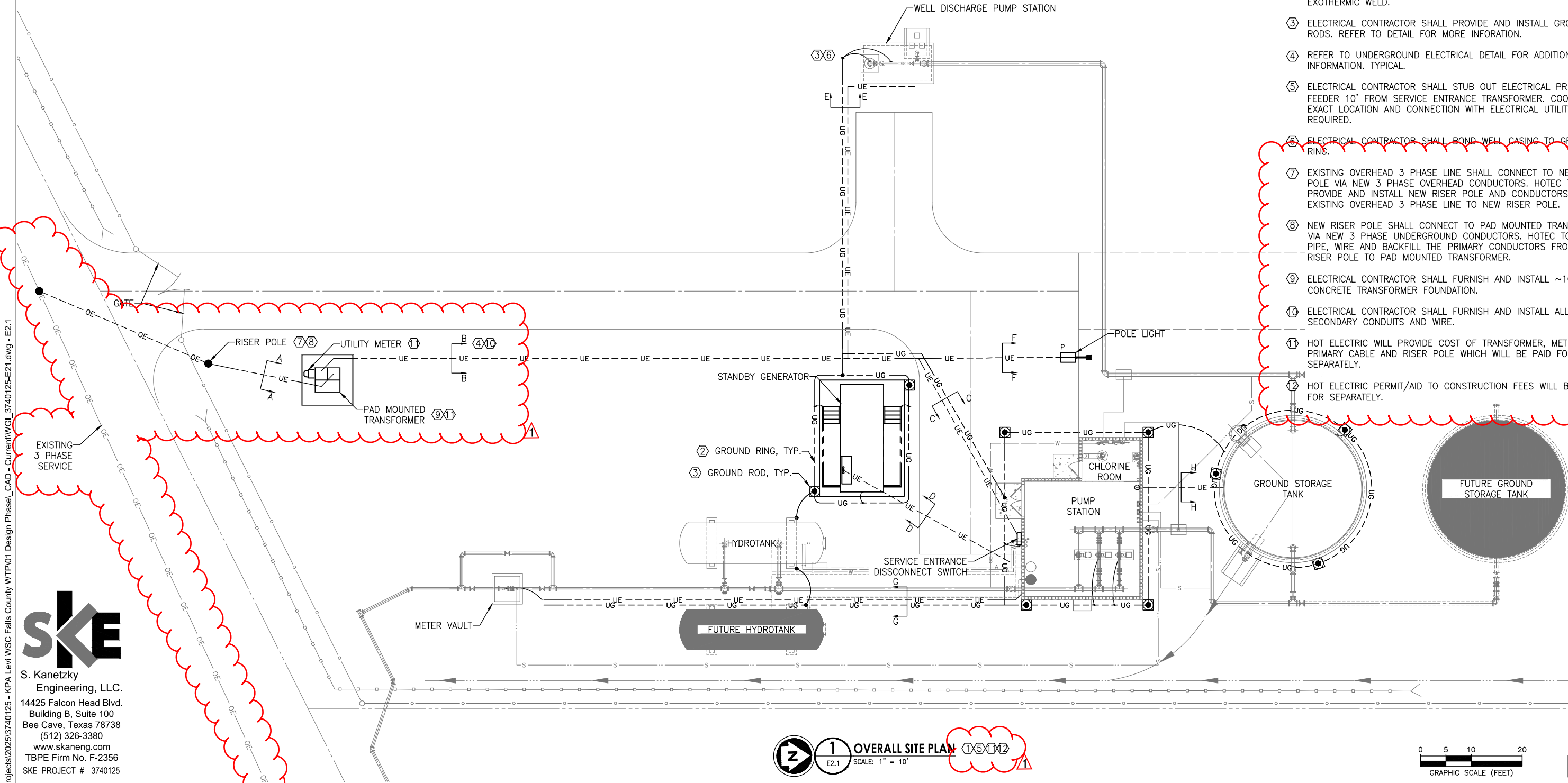
LEVI WATER SUPPLY CORP.
FALLS COUNTY WATER PLANT SITE

OVERALL SITE PLAN

SHEET NO **BE-02**
OF **2**

REFERENCE NOTES

- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL NEW 600A, 277/480V, 3 PHASE 4 WIRE ELECTRIC SERVICE. ELECTRICAL CONTRACTOR IS TO COORDINATE WITH HEART OF TEXAS ELECTRIC COOPERATIVE, WWW.HOTEC.COOP (1-800-840-2957). PROVIDE PULL STRING IN EACH CONDUIT. VERIFY EXACT LOCATION OF TRANSFORMER PRIOR TO INSTALLATION. SEE DETAILS FOR UTILITY REQUIREMENTS.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL #3/0 BARE COPPER GROUNDING RING. BOND MAIN CIRCUIT BREAKER, ELECTRICAL BUILDING, GROUND STORAGE TANK, FLOW METER, MOTOR CASINGS AND GENERATOR SKID TO GROUNDING ELECTRODE SYSTEM VIA EXOTHERMIC WELD.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL GROUND RODS. REFER TO DETAIL FOR MORE INFORMATION.
- REFER TO UNDERGROUND ELECTRICAL DETAIL FOR ADDITIONAL INFORMATION. TYPICAL.
- ELECTRICAL CONTRACTOR SHALL STUB OUT ELECTRICAL PRIMARY FEEDER 10' FROM SERVICE ENTRANCE TRANSFORMER. COORDINATE EXACT LOCATION AND CONNECTION WITH ELECTRICAL UTILITY AS REQUIRED.
- ELECTRICAL CONTRACTOR SHALL BOND WELL CASING TO GROUNDING RING.
- EXISTING OVERHEAD 3 PHASE LINE SHALL CONNECT TO NEW RISER POLE VIA NEW 3 PHASE OVERHEAD CONDUCTORS. HOTEC TO PROVIDE AND INSTALL NEW RISER POLE AND CONDUCTORS FROM EXISTING OVERHEAD 3 PHASE LINE TO NEW RISER POLE.
- NEW RISER POLE SHALL CONNECT TO PAD MOUNTED TRANSFORMER VIA NEW 3 PHASE UNDERGROUND CONDUCTORS. HOTEC TO TRENCH, PIPE, WIRE AND BACKFILL THE PRIMARY CONDUCTORS FROM THE RISER POLE TO PAD MOUNTED TRANSFORMER.
- ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ~10' X 10' CONCRETE TRANSFORMER FOUNDATION.
- ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SECONDARY CONDUITS AND WIRE.
- HOT ELECTRIC WILL PROVIDE COST OF TRANSFORMER, METER, PRIMARY CABLE AND RISER POLE WHICH WILL BE PAID FOR SEPARATELY.
- HOT ELECTRIC PERMIT/AID TO CONSTRUCTION FEES WILL BE PAID FOR SEPARATELY.



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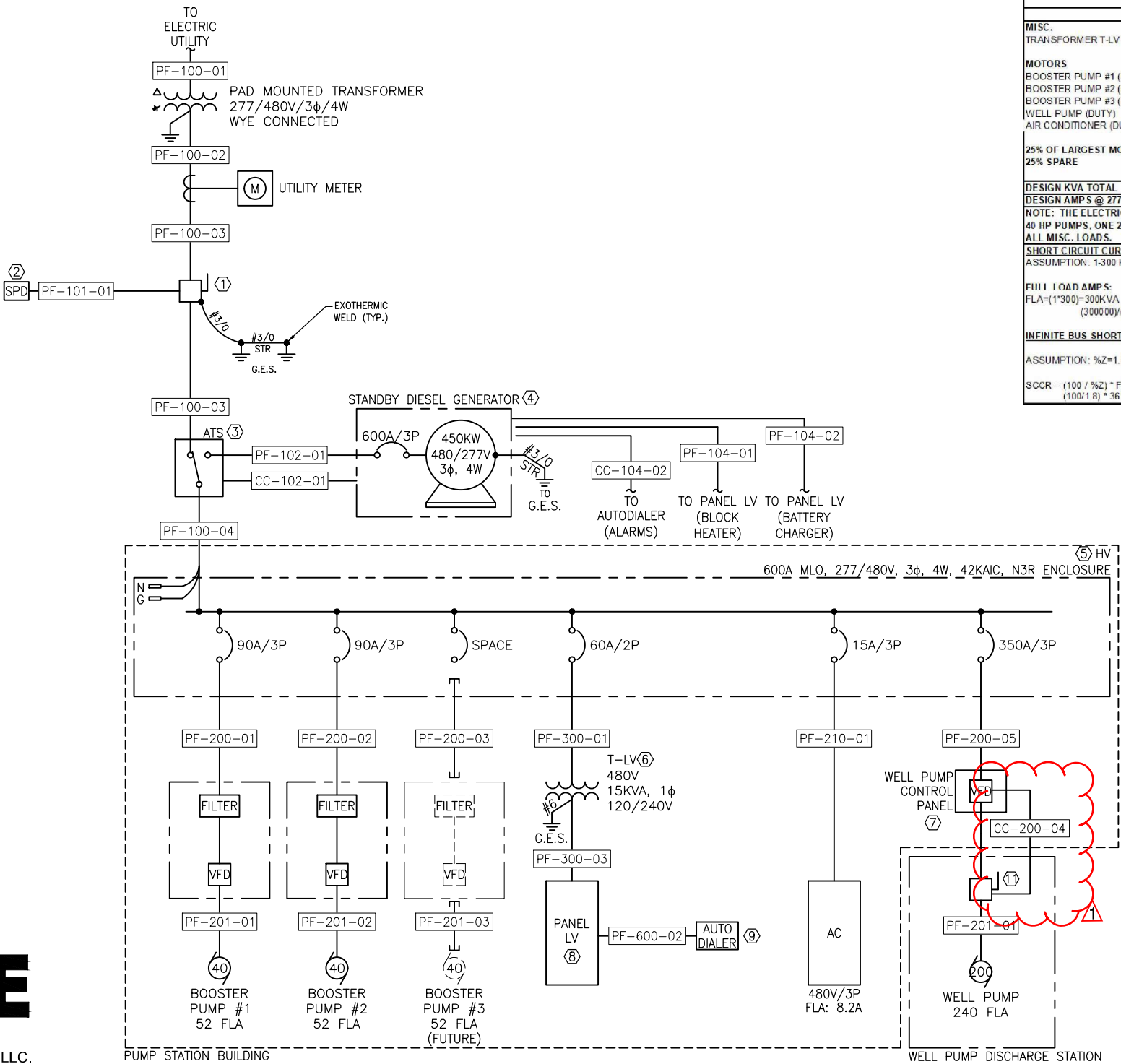
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LEVI WATER SUPPLY CORP.
FALLS COUNTY WATER PLANT SITE

ONE-LINE DIAGRAM

SHEET NO. **IE-01**

OF **3**



LOAD CALCULATION					
	UTILITY			GENERATOR	
	HP	AMPS	KVA	STARTING	STEP
MISC.					
TRANSFORMER T-LV (1-PHASE)		63	30	N/A	1
MOTORS					
BOOSTER PUMP #1 (DUTY)	40	52	43	VFD	2
BOOSTER PUMP #2 (DUTY)	40	52	43	VFD	3
BOOSTER PUMP #3 (FUTURE/STANDBY)	40				
WELL PUMP (DUTY)	200	240	199	VFD	4
AIR CONDITIONER (DUTY)		8.2	7	FVNR	5
25% OF LARGEST MOTOR		60	50		
25% SPARE		119	93		
DESIGN KVA TOTAL			466		
DESIGN AMPS @ 277/480 VOLTS, 3 PHASE		593			
NOTE: THE ELECTRICAL SERVICE IS DESIGNED TO RUN TWO 40 HP PUMPS, ONE 200HP PUMP, ONE AIR CONDITIONER AND ALL MISC. LOADS.					
SHORT CIRCUIT CURRENT CALCULATION: ASSUMPTION: 1-300 KVA PAD MOUNTED TRANSFORMER					
FULL LOAD AMPS: FLA=(1*300)/300KVA (300000)/(480*1.73) = 361.27 A					
INFINITE BUS SHORT CIRCUIT CURRENT CALCULATION: ASSUMPTION: %Z=1.8					
SCCR = (100 / %Z) * FLA (100/1.8) * 361.27 = 20,070.5 A					

REFERENCE NOTES

- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL SERVICE ENTRANCE DISCONNECT SWITCH 600A/3P/600AF/NEMA 3R/SN/SE SQUARE D OR APPROVED EQUAL. USE BUSSMANN #FERS-R-600 OR EQUAL WITH FACTORY NEUTRAL KIT OR GROUND BAR..
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL SPD, EATON SPD-200-480Y-3-P OR EQUAL IN A NEMA 3R ENCLOSURE. CONNECTED TO LOAD SIDE.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL AUTOMATIC TRANSFER SWITCH, 600 AMP, 4 POLE, 600V, NEMA 3R ASCO OR EQUAL.
- ALTERNATE BID: ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL STANDBY GENERATOR 450 KW, 277/480V, 3 PHASE, 4-WIRE.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL PANEL HV, SQUARE D OR EQUAL.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL 15KVA TRANSFORMER T-LV, 480V PRIMARY, 120/240V SECONDARY, N1 ENCLOSURE TYPE SQUARE D OR EQUAL.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL WELL PUMP CONTROL PANEL, 3 PHASE, 4-WIRE IN A NEMA 1 ENCLOSURE.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL PANEL LV, SQUARE D OR EQUAL. REFER TO PANEL LV SCHEDULE FOR MORE INFORMATION.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL AUTODIALER, OMNISITE CRYSTAL BALL OR EQUAL IN A NEMA 1 ENCLOSURE. CONNECTED TO LOAD SIDE.
- ELECTRICAL CONTRACTOR SHALL PROCURE THE SERVICES OF A QUALIFIED ENGINEERING FIRM TO PERFORM A COMPREHENSIVE POWER SYSTEMS STUDY. THE STUDY SHALL INCLUDE A SHORT CIRCUIT ANALYSIS, PROTECTIVE DEVICE COORDINATION, AND AN ARC FLASH HAZARD EVALUATION IN ACCORDANCE WITH THE LATEST EDITION OF NFPA 70E AND IEEE 1584. ALL FINDING AND RECOMMENDATIONS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO SYSTEM ENERGIZATION. ARC FLASH WARNING LABELS SHALL BE PROVIDED AND INSTALLED ON ALL APPLICABLE ELECTRICAL EQUIPMENT BASED ON THE RESULTS OF THE STUDY.
- ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL A 400A/3P/NF/N3R/600V DISCONNECT SWITCH FOR THE WELL. PROVIDE AND INSTALL DISCONNECT VFD INTERLOCK KIT FOR THE DISCONNECT SWITCH.

GENERAL NOTES

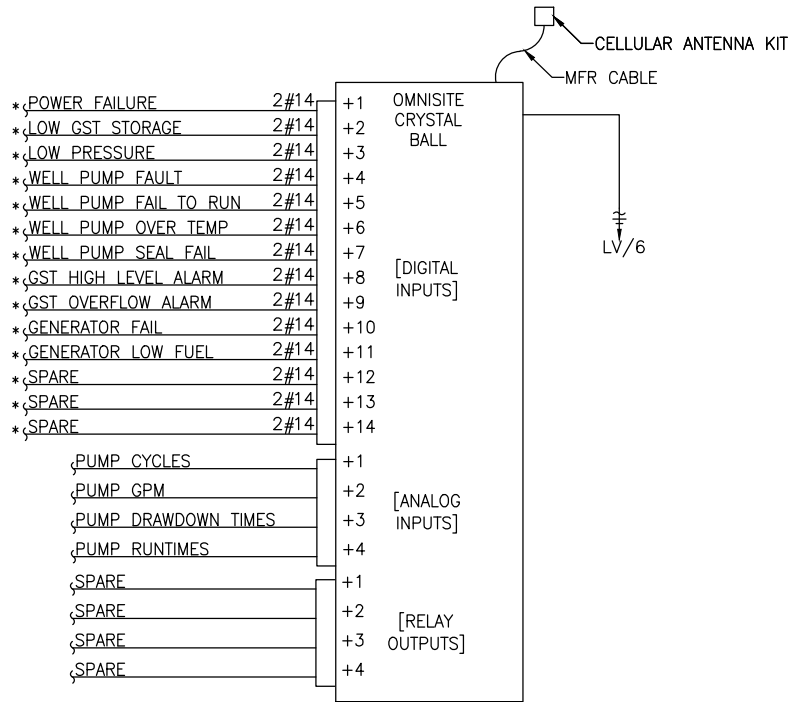
- IT IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO PROVIDE AND INSTALL ALL RACEWAYS AND CONDUCTORS CUMULATIVELY BETWEEN THE UNDERGROUND ELECTRICAL DETAILS, PANEL SCHEDULES, I/O SCHEDULES, AND CIRCUIT SCHEDULES. THE CIRCUIT SCHEDULES, I/O SCHEDULES AND PANEL SCHEDULES TAKE PRECEDENCE OVER THE UNDERGROUND ELECTRICAL DETAILS.
- THE AVAILABLE FAULT CURRENT FROM THE UTILITY PROVIDER IS AN ESTIMATE BASED ON THE BEST INFORMATION DURING THE DESIGN PHASE. THE UTILITY TRANSFORMER IMPEDANCE IS AN ESTIMATE BASED ON THE BEST INFORMATION DURING THE DESIGN PHASE. BASED ON FINAL INFORMATION FROM THE UTILITY COMPANY, IT MAY RESULT IN EQUIPMENT SPECIFICATION CHANGES WHICH MAY RESULT INTO A CHANGE TO THE ORIGINAL DESIGN.

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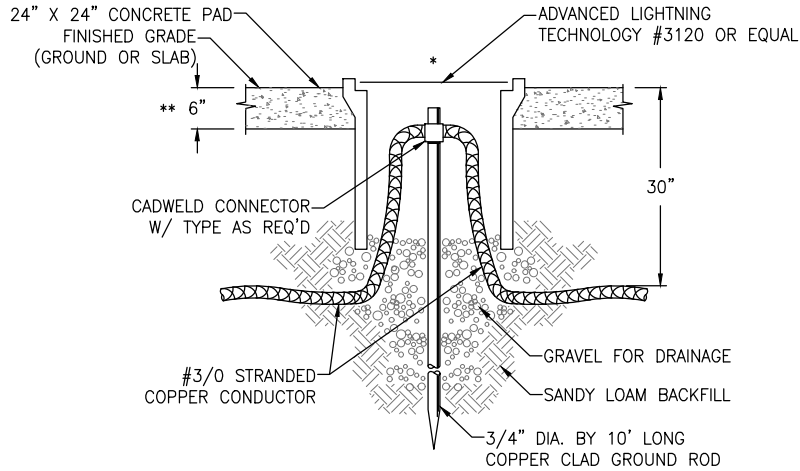
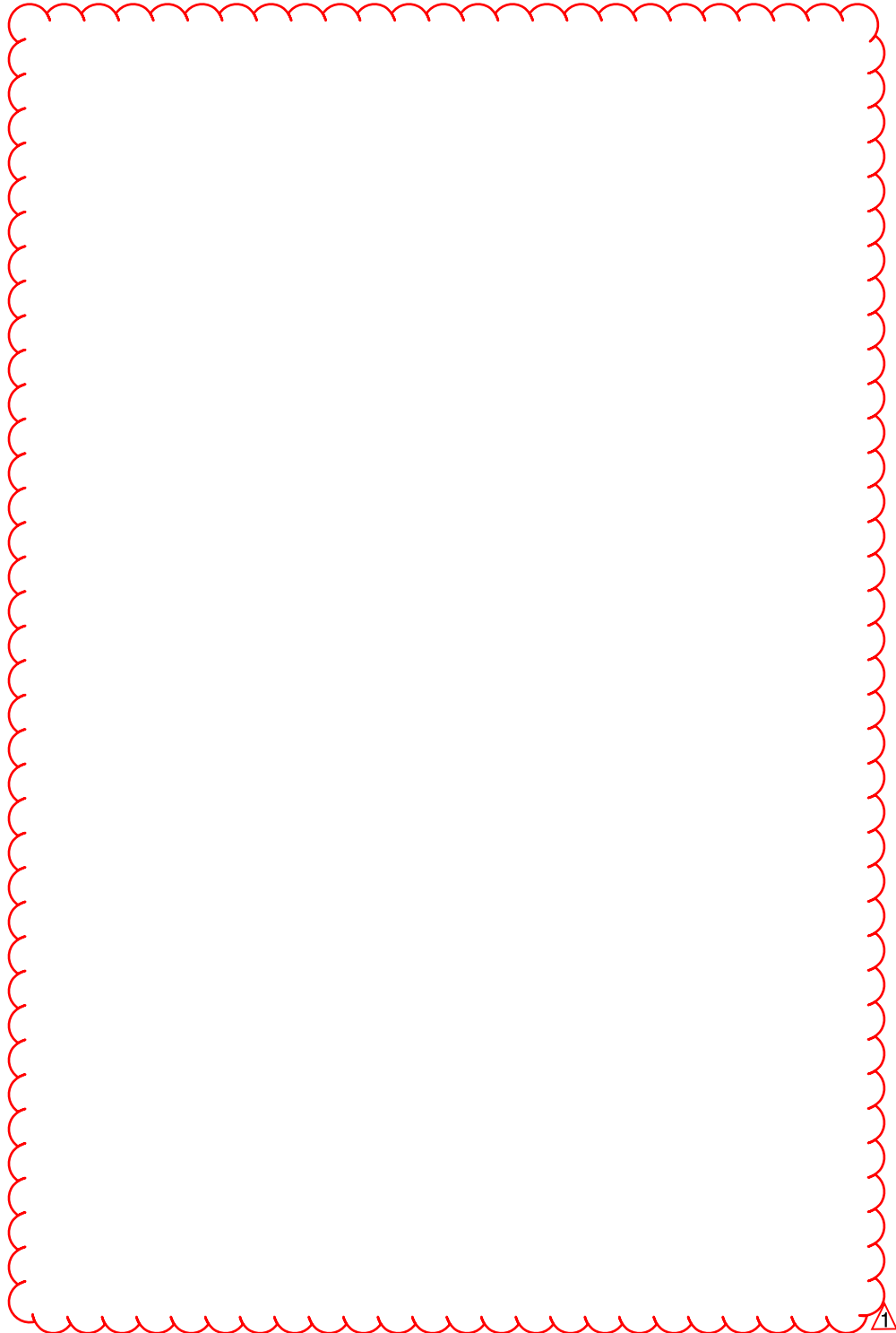
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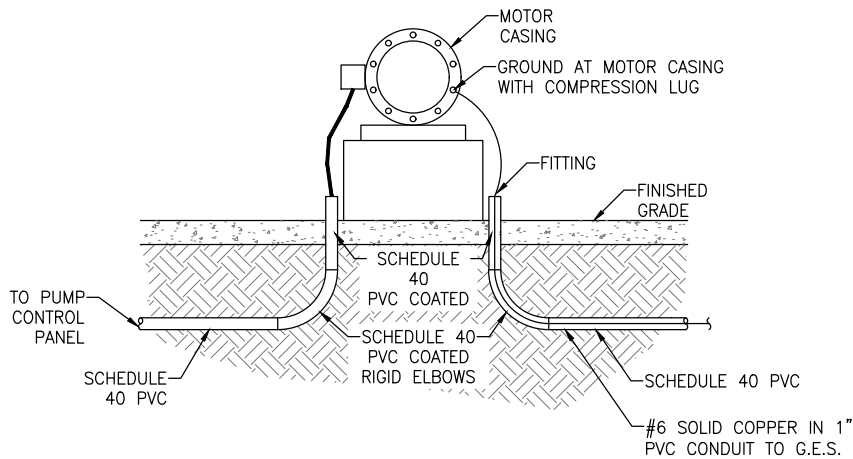
* INDICATES FIELD WIRING REQUIRED BY CONTRACTOR
5 OMNISITE - CRYSTAL BALL AUTO DIALER
E4.3 SCALE: NTS



* INSTALL GROUND RODS AWAY FROM HEAVY TRAFFIC AREAS AND SIDEWALKS. COORDINATE EXACT LOCATION WITH CIVIL DRAWINGS

** INSTALL 2'X2'X6" CONCRETE PAD

2 DETAIL - 3/4" X 10' GROUND ROD
E4.3 SCALE: NTS

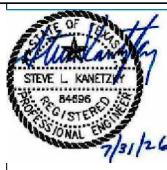


1 DETAIL - MOTOR POWER & GROUNDING
E4.3 SCALE: NTS

E4.3

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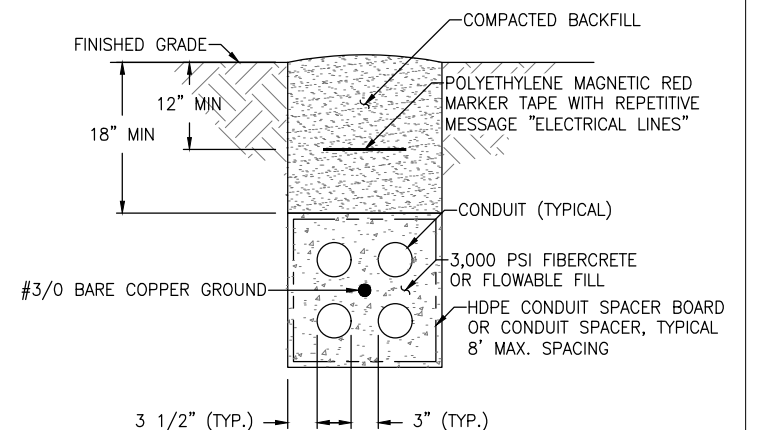
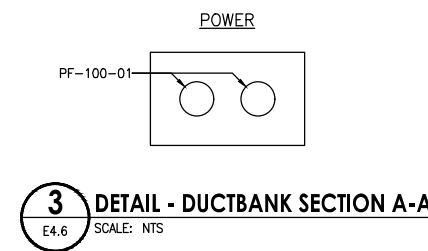
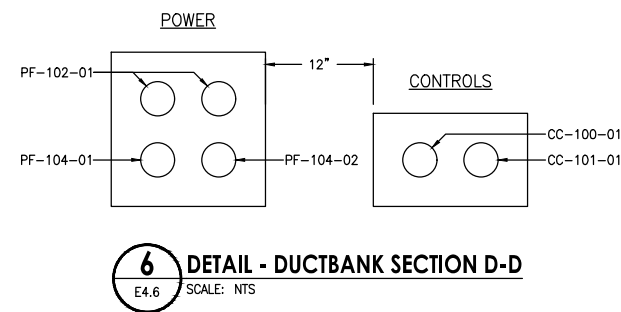
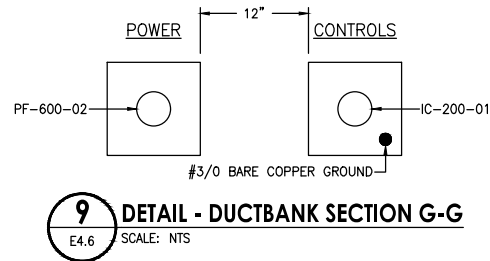
PROJECT NO.	3740125
DRAWN BY	PD
DESIGNED BY	SO
APPROVED BY	SK
DATE	06/23/25



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LEVI WATER SUPPLY CORP. FALLS COUNTY WATER PLANT SITE
ELECTRICAL DETAILS

SHEET NO. **SE-07**
OF **12**



1
E.4.6

**DETAIL - TYP. DUCTBANK
SECTION CONSTRUCTION**

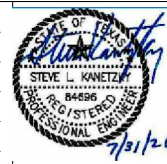
SCALE: NTS

E4.5

SHEET NO. **SE-09**

OF **12**

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LEVI WATER SUPPLY CORP.
FALLS COUNTY WATER PLANT SITE

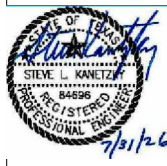
ELECTRICAL DETAILS

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SKE PROJECT # 3740125

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LEVI WATER SUPPLY CORP. FALLS COUNTY WATER PLANT SITE	SHEET NO. SE-10 OF 12
ELECTRICAL DETAILS	

TYPICAL SPECIFICATIONS FOR ALL PADS

1. REQUIRE 3" OR 4" CONDUIT (UNLESS OTHERWISE SPECIFIED BY PEC) WITH BELL-END FITTINGS TO EXTEND 1 1/2" TO 2" ABOVE PAD. TYPICAL CONDUIT SPECIFICATIONS ARE ON THE NEXT PAGE.
2. PADS MUST EXTEND A MINIMUM OF 4" ABOVE FINAL GRADE AND 1 1/2" BELOW FINAL GRADE. ALL PADS MUST B PLACED ON A SLOPE LESS THAN OR EQUAL TO 3:1. IF GREATER THAN 3:1, CONTRACTOR MUST BRING SLOPE TO REQUIRED GRADE.
3. ALL DISTURBED SOIL UNDERNEATH PAD MUST BE REPLACED BY CONCRETE.
4. ALL GROUND RODS SHALL BE 3/4" X 10' COPPER-CLAD WITH CLAMP AND MUST EXTEND 3" ABOVE TOP OF PAD.
5. WOOD FLOAT FINISH LEAVING PAD SQUARE AND LEVEL WITH NO DIPS OR CROWN.
6. CONTACT PEC BEFORE POURING CONCRETE AND COMPLY WITH THE FOLLOWING INSTRUCTIONS:
 - 6.1. PRE-POUR INSPECTION: CHECK FRAMING AND LAYOUT OF PAD AND CONDUIT COMPONENTS.
 - 6.2. FINAL INSPECTION: OVERALL REVIEW OF PAD AND CONDUITS. ENSURE BELL ENDS ARE ON CONDUIT.

TYPICAL FOR THREE-PHASE TRANSFORMER PADS

7. CONCRETE TESTING, 4,000 PSI; 4%-6% ENTRAINED AIR, 3/4" MAXIMUM-SIZE AGGREGATE.
8. STEEL REINFORCEMENT SHALL BE 3/8" RE-BAR ON 12" CENTER, STOPPING 1" FROM SIDES.
9. MINIMUM CONCRETE COVER OVER REINFORCING STEEL 2" UNLESS NOTED.

TYPICAL TRENCH SPECIFICATIONS

10. TRENCHES MUST BE KEPT FREE OF BUILDING MATERIALS AND OTHER DEBRIS IN ACTIVE BUILDING SITES.
11. BOTTOM OF TRENCH SHALL BE SANDED TO PROVIDE SMOOTH, EVEN SUPPORT OF CONDUITS.
12. INITIAL BACKFILL SHALL BE MANUFACTURED OR COMMERCIAL SAND PLACED DIRECTLY AROUND CONDUITS MINIMUM 3/8" PEA GRAVEL MAY BE USED FOR INITIAL BACKFILL IN FLOOD-PRONE AREAS.
13. SCHEDULE 40 ELECTRICAL-GRADE PVC CONDUIT. SCHEDULE 80 ELECTRICAL-GRADE CONDUIT MAY BE USED WITH ROCK-FREE BACKFILL IN PLACE OF SAND IN SECONDARY-ONLY TRENCHES.
14. FAILURE TO RECEIVE INSPECTION WILL REQUIRE REMOVAL OF THE BACKFILL TO ALLOW INSPECTION. CONTACT PEC TO RECEIVE ALL APPLICABLE INSPECTION
15. MINIMUM COVER SHALL BE 30" FROM THE TOP OF PRIMARY CONDUIT TO SUB-GRADE. WITH PEC APPROVAL, MINIMUM COVER REQUIREMENTS MAY BE REDUCED BY 6" WITH EVERY 2" OF 3,000 PSI CONCRETE POURED DIRECTLY ONTO CONDUIT.*CONTACT PEC BEFORE POURING CONCRETE.*
16. CONCRETE OR FLOWABLE FILL SHALL BE POURED AROUND ALL CONDUIT CROSSINGS AND 90-DEGREE BENDS. ON CONDUIT BENDS OF OTHER ANGLES, CONCRETE OR FLOWABLE FILL MAY BE REQUIRED UPON INSPECTION. *CONTACT PEC BEFORE POURING CONCRETE.*
17. TRENCH MAY BE USED JOINTLY WITH GAS AND OTHER UTILITIES IF ADEQUATE SEPARATION IS PROVIDED. THERE SHALL BE A MINIMUM OF 12" SEPARATION BETWEEN ELECTRICAL CONDUITS AND ALL OTHER UTILITIES' CONDUITS. SEE DRAWINGS 510-014, 510-022, 510-023, 510-024, AND 510-025.
18. WARNING TAPE SHALL BE A MINIMUM OF 12" ABOVE ELECTRICAL CONDUITS.
19. ALL OTHER UTILITIES MUST BE ROUTED AROUND PEC EQUIPMENT VAULTS, PEDESTALS, TRANSFORMERS, PRIMARY ENCLOSURES, AND/OR SIMILAR UNDERGROUND ELECTRIC FACILITIES.
20. FOR 2" AND SMALLER WATERLINES, SPECIAL PERMISSION MUST BE GRANTED BY PEC. WATER LINES LARGER THAN 2" ARE NOT ALLOWED IN PEC TRENCHES.
21. CONDUIT MAY BE UNDER PAVEMENT IF A DEPTH OF 30" COVER TO SUB-GRADE IS MAINTAINED.
22. UNDERGROUND CONDUCTOR FROM SECONDARY ENCLOSURE/TRANSFORMER TO METER SHALL HAVE 24" OF COVER. THIS DEPTH MAY BE REDUCED TO 18" WHEN A 2" SUPPLEMENTAL PROTECTIVE COVERING OF CONCRETE IS PROVIDED. IF RIGID GALVANIZED STEEL CONDUIT IS USED, THE DEPTH CAN BE REDUCED BY 6". RED ELECTRIC WARNING TAPE IS REQUIRED IN THE DITCH.

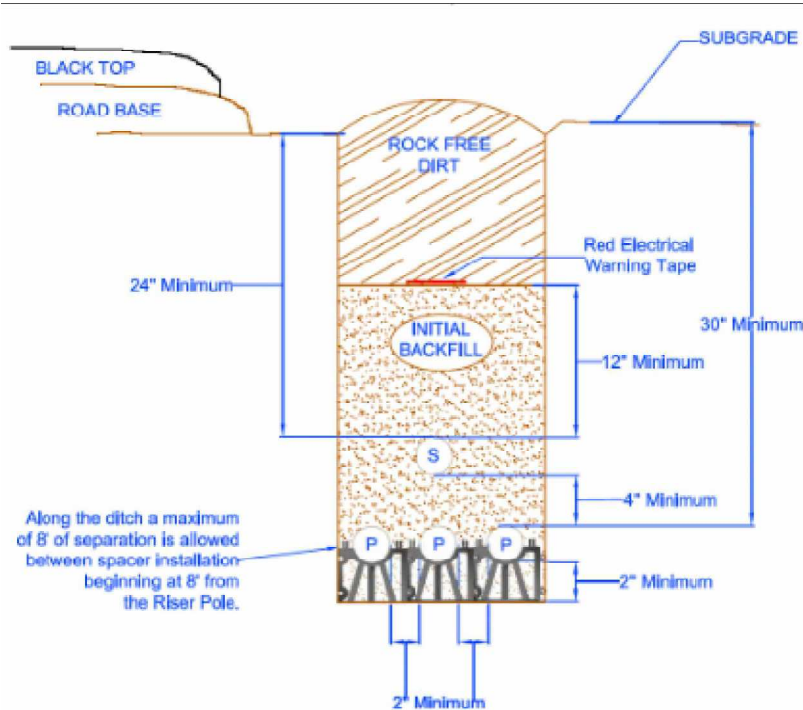
TYPICAL CONDUIT SPECIFICATIONS

1. PRIMARY CONDUIT:
 - 1.1. 3" SCHEDULE 40 ELECTRICAL-GRADE PVC WITH 36" MINIMUM SCHEDULE 80 RADIUS BENDS.
2. SECONDARY/SERVICE CONDUIT:
 - 2.1. 3" SCHEDULE 80 ELECTRICAL-GRADE PVC WITH 24" MINIMUM SCHEDULE 80 RADIUS BENDS. SCHEDULE 40 WITH 24" MINIMUM SCHEDULE 80 RADIUS BENDS CAN BE USED IF EMBEDDED IN SAND. SIZE SERVICE CONDUIT AS NEEDED.
3. RISER CONDUIT OR OTHER ABOVE-GROUND CONDUIT:
 - 3.1. 3" OR 4" SCHEDULE 80 ELECTRICAL-GRADE PVC.

CONDUIT LEGEND

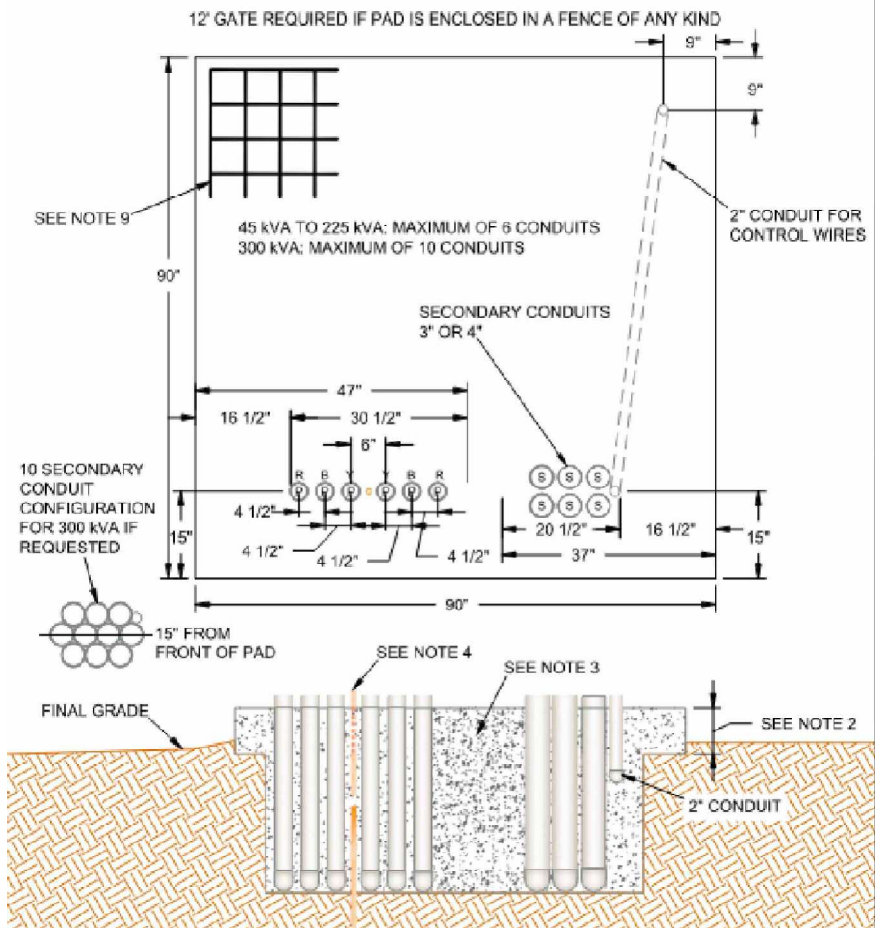
TYPICAL IN ALL DRAWINGS

(P) PRIMARY CONDUIT (S) SECONDARY CONDUIT



GENERAL NOTES

1. IT IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO PROVIDE AND INSTALL ALL RACEWAYS AND CONDUCTORS CUMULATIVELY BETWEEN THE UNDERGROUND ELECTRICAL DETAILS, PANEL SCHEDULES, AND CIRCUIT SCHEDULES. THE CIRCUIT SCHEDULES, AND PANEL SCHEDULES TAKE PRECEDENCE OVER THE UNDERGROUND ELECTRICAL DETAILS.
2. THIS IS FOR BIDDING PURPOSES ONLY. FINAL SPECIFICATIONS TO BE CONFIRMED BY HEART OF TEXAS ELECTRIC PRIOR TO CONSTRUCTION.

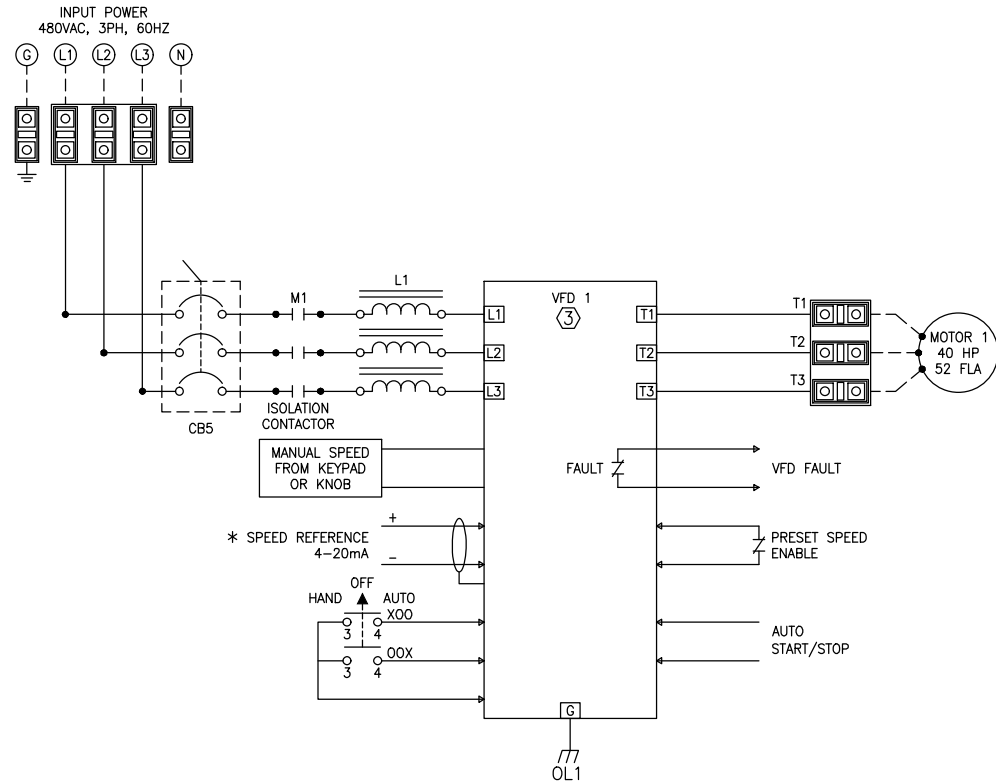


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E4.6

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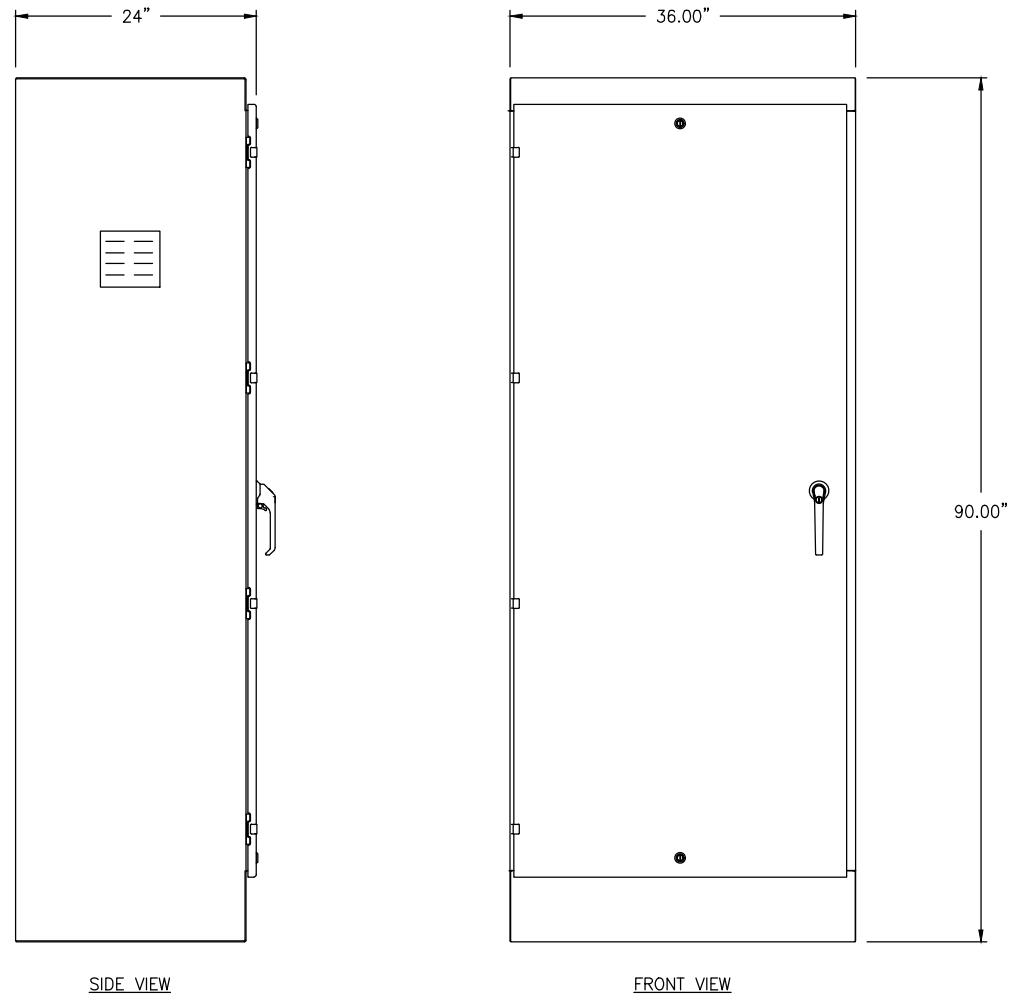
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TBPE Firm No. F-2356
SKE PROJECT # 3740125



OPERATION MODE:
HAND MODE - VFD IS CONTROLLED VIA KEYPAD / KNOB
AUTO MODE - VFD IS CONTROLLED REMOTELY

* = FIELD WIRED BY CONTRACTOR.

2 VFD ENCLOSURE WIRING DIAGRAM TYPICAL (1/2)
E5.0 SCALE: NTS



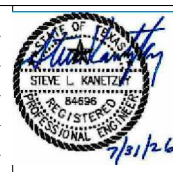
2 VFD ENCLOSURE PANEL TYPICAL (1)
E5.0 SCALE: NTS
ENCLOSURE: NEMA 1
W/ INNER DOOR, 36.00" X 90.00" X 24.00"

REFERENCE NOTES

- ① VFD ENCLOSURE WIRING IS TYPICAL. FINAL HARDWARE CONFIGURATION WILL VARY ACCORDING TO SPECIFICATIONS. VFD/HARMONIC FILTER ENCLOSURE SHALL BE MANUFACTURED BY 5 STAR ELECTRIC, SAN ANTONIO, TX. 1(800) 229-8965 OR APPROVED EQUAL.
- ② VFD ENCLOSURES, 480V, 3 PHASE. VERIFY EXACT PUMP SIZES, SIZE CIRCUIT BREAKERS AND OVERLOADS ACCORDINGLY. PANEL SHALL BE MANUFACTURED BY 5 STAR ELECTRIC OR EQUAL.
- ③ PROVIDE AND INSTALL VFD TYPE YASWAKA FP605 #FP65-U-4-052-A-F-A OR EQUAL FOR EACH PUMP.

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LEVI WATER SUPPLY CORP.
FALLS COUNTY WATER PLANT SITE
VFD ENCLOSURE DETAILS

SHEET NO. **SE-11**
OF **12**