

THIS DRAWING IS 30" X 42" AT FULL SIZE. 15" X 21" AT HALF SIZE. © 2015 BY SALAS O'BRIEN ENGINEERS, INC.



SANDY ATC MICROWAVE SITE GENERATOR

County Project #10.10.0990



SALAS O'BRIEN
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VICINITY MAP



SITE MAP



GENERAL NOTES

1. ALL WORK, MATERIALS AND METHODS USED SHALL CONFORM TO MEP COMPONENT ANCHORAGE NOTE.
2. ALL WORK SHALL CONFORM WITH ALL APPLICABLE LOCAL, STATE, AND NATIONAL CODES.
3. PIPE HANGERS AND SUPPORTS SHALL BE SUPERSTRUT OR EQUAL INCLUDING CHANNEL, HANGERS, STRAPS, ISOLATORS, INSULATION, SHAW PIPE SHIELDS, INC., PORTABLE PIPE HANGERS, INC.
4. PATCH EXISTING AND NEW OPENINGS SO FINISH PROFILES, FIXTURES, ETC. MATCH ADJACENT UNDISTURBED WORK.
5. ALL DIMENSIONS ARE APPROXIMATE. THE DRAWINGS ARE DIAGRAMMATIC TO THE EXTENT THAT ALL FITTINGS, OFFSETS, ETC. ARE NOT SHOWN. THESE DRAWINGS ARE FOR THE GUIDANCE OF THE CONTRACTOR. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD FOR FABRICATION OF THE PIPING, PENETRATIONS, CONDUIT, WIRING, AND ALL COMPONENTS INTO A COMPLETE AND OPERABLE SYSTEM.
6. ALL WORK MUST BE SCHEDULED WITH THE PROJECT MANAGER TO MINIMIZE DISTURBANCE OF NORMAL ACTIVITIES. COORDINATE WORK WITH PROJECT MANAGER.
7. WHERE DISCREPANCIES OCCUR BETWEEN THE PLANS AND SPECIFICATIONS CONTRACTOR SHALL NOTIFY OWNER OF ANY DISCREPANCIES IN WRITING. ANY ADJUSTMENT OF THE CONTRACT DOCUMENTS WITHOUT A DETERMINATION BY THE OWNER SHALL BE AT THE CONTRACTOR'S OWN RISK AND EXPENSE. THE MOST STRINGENT REQUIREMENTS SHALL APPLY AS DETERMINED BY THE OWNER.
8. CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
9. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK OF THE ALTERATION, REHABILITATION OR RECONSTRUCTION IS TO BE IN ACCORDANCE WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS. SHOULD ANY EXISTING CONDITIONS SUCH AS DETERIORATION OR NONCOMPLYING CONSTRUCTION BE DISCOVERED WHICH IS NOT COVERED IN THE CONTRACT DOCUMENTS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS, A CONSTRUCTION CHANGE DOCUMENT, OR A SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER AND DSA BEFORE PROCEEDING WITH THE WORK.
10. PRIOR TO SUBMITTING PROPOSAL, BIDDER SHALL EXAMINE ALL GENERAL CONSTRUCTION DRAWINGS AND SHALL HAVE HAD VISITED THE CONSTRUCTION SITE. HE SHALL BE FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH HE WILL HAVE TO OPERATE AND WHICH WILL IN ANY WAY AFFECT THE WORK UNDER THIS CONTRACT. NO SUBSEQUENT ALLOWANCE WILL BE MADE IN THIS CONNECTION IN BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLIGENCE ON HIS PART.
11. THE CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE FOR THE PROPER RESTORATION OF ALL EXISTING SURFACES REQUIRING PATCHING, PLASTERING, PAINTING AND/OR OTHER REPAIR DUE TO THE INSTALLATION OF WORK UNDER THE TERMS OF THIS SPECIFICATION. CLOSE ALL OPENINGS, REPAIR ALL SURFACES, ETC., AS REQUIRED.
12. ALL TEMPORARY AND REMODELING WORK SHALL BE CONSIDERED A PART OF THIS CONTRACT AND NO EXTRA CHARGES WILL BE ALLOWED. THIS SHALL INCLUDE MINOR ITEMS OF MATERIAL OR EQUIPMENT NECESSARY TO MEET THE REQUIREMENTS AND INTENT OF THE PROJECT.
13. EXAMINE MECHANICAL & STRUCTURAL DRAWINGS AND SPECIFICATIONS TO DETERMINE THE SEQUENCE OF CONSTRUCTION THROUGHOUT THE PROJECT, INCLUDING EXISTING, TEMPORARY, REMODELED AND NEW AREAS.
14. ALL DEVICES & EQUIPMENT ARE NEW, UNLESS OTHERWISE NOTED.
15. CONTRACTOR SHALL PROPERLY DISPOSE OF OR RECYCLE DEMOLISHED MATERIALS.
16. MAINTAIN FIRE RATING OF ALL ASSEMBLIES PENETRATED.
17. SEAL ALL EXTERIOR PENETRATIONS WATER-TIGHT.
18. CONTRACTOR TO PROVIDE AN ASBESTOS REPORT PRIOR TO START OF CONSTRUCTION.

SUMMARY OF WORK

1. FURNISH AND INSTALL ELECTRICAL PANELS, MTS, ATS, GENERATOR, GENERATOR ANNUNCIATOR, CAM-LOCK, EMS CONNECTION FROM EQUIPMENT/DEVICES TO EMS PANEL (COORDINATE WITH COUNTY OF SAN BERNARDINO FOR LOCATION AND REQUIREMENT), NEW WORK PER FLOOR PLAN.
6. FURNISH AND INSTALL DIESEL GENERATOR WITH DUAL WALL BELLY TANK AND LEAK SENSOR, CONCRETE CONTAINMENT PAD WITH DRAIN VALVE AND FULL TANK OF FUEL SHALL BE PROVIDED.
7. CONTRACTOR SHALL BE RESPONSIBLE TO APPLY AND OBTAIN APPROVAL FROM AQMD FOR THE NEW GENERATOR.
8. FURNISH AND INSTALL ALL ELECTRICAL CONNECTION, COMPONENTS, DEVICES AND EQUIPMENT PER FLOOR PLAN.
9. FURNISH AND INSTALL POWER CONNECTION TO HVAC UNITS.
10. ALL PERMIT FEES SHALL BE CONTRACTOR'S RESPONSIBILITY.

PROJECT TEAM

ARCHITECTURAL/MECHANICAL ELECTRICAL/PLUMBING	STRUCTURAL ENGINEER
SALAS O'BRIEN 3700 S. SUSAN STREET, STE 150 SANTA ANA, CALIFORNIA 92704 TEL (949) 517-4900 FAX (408) 297-2995	BRANDOW & JOHNSTON 700 S. FLOWER ST #1800 LOS ANGELES, CALIFORNIA 90017 TEL (213) 596-4500 FAX (213) 596-4599

APPLICABLE CODES

- UNLESS OTHERWISE INDICATED OR SPECIFIED, PERFORM THE WORK IN CONFORMANCE WITH THE LATEST EDITIONS OF ALL APPLICABLE REGULATORY REQUIREMENTS, INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
1. CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE (PART 1, TITLE 24): 2019
 2. CALIFORNIA BUILDING CODE (PART 2, TITLE 24): 2018 IBC WITH 2019 CA AMENDMENTS
 3. CALIFORNIA ELECTRICAL CODE (PART 3, TITLE 24): 2017 NEC WITH 2019 CA AMENDMENTS
 4. CALIFORNIA MECHANICAL CODE (PART 4, TITLE 24): 2018 UMC WITH 2019 CA AMENDMENTS
 5. CALIFORNIA PLUMBING CODE (PART 5, TITLE 24) 2018 UPC WITH 2019 CA AMENDMENTS
 6. CALIFORNIA ENERGY CODE (PART 6, TITLE 24): 2019
 7. CALIFORNIA HISTORICAL BUILDING CODE, (PART 8, TITLE 24): 2019
 8. CALIFORNIA FIRE CODE (PART 9, TITLE 24): 2018 IFC WITH CA AMENDMENTS
 9. CALIFORNIA EXISTING BUILDING CODE (PART 10, TITLE 24): 2019 (2018 INTERNATIONAL EXISTING BUILDING CODE WITH CA AMENDMENTS)
 10. CALIFORNIA GREEN BUILDING STANDARDS CODE OR CAL GREEN (PART 11, TITLE 24): 2019
 11. CALIFORNIA REFERENCED STANDARDS CODE (PART 12, TITLE 24): 2019
 12. PUBLIC SAFETY (CCR TITLE 19), STATE FIRE MARSHAL: CURRENT REVISION
 13. NFPA 72, NATIONAL FIRE ALARM CODE, 2019 EDITION

DRAWING INDEX

SHEET NO.	DESCRIPTION
G-0.0	COVER SHEET
E-0.1	ELECTRICAL GENERAL NOTES, SYMBOLS & ABBREVIATIONS
E-0.2	ELECTRICAL SPECIFICATIONS
ED-1.1	ELECTRICAL SITE PLAN - DEMO
E-1.1	ELECTRICAL SITE PLAN - NEW
E-5.1	ELECTRICAL DETAILS
E-7.1	ELECTRICAL SINGLE LINE DIAGRAM



SANDY ATC MICROWAVE SITE GENERATOR

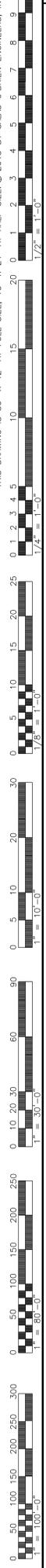
ISSUE	MARK	DATE	DESCRIPTION
		08/16/20	95% CD SUBMITTAL
		09/04/20	100% CD SUBMITTAL

SOBE PROJECT NO:	1901466
DATE:	04/15/20
DRAWN BY:	-
CHECKED BY:	-
APPROVED BY:	AC

SHEET TITLE	COVER SHEET
SCALE:	AS NOTED AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE	

G-0.0

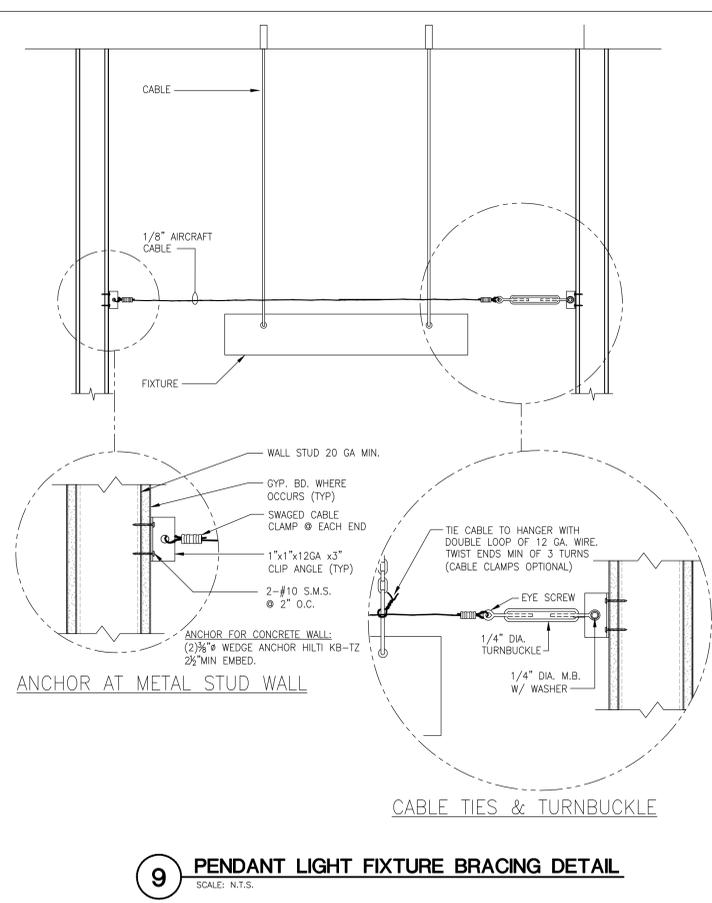
ELECTRICAL SPECIFICATIONS



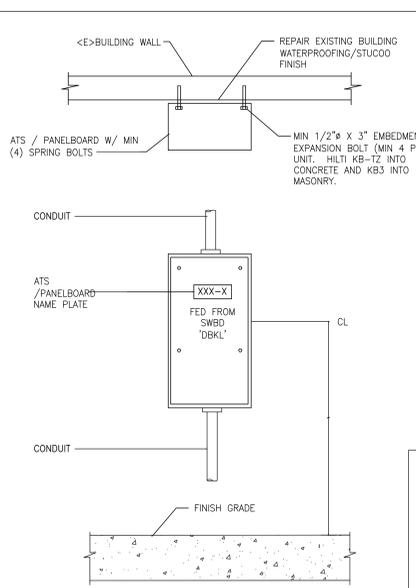
2.1. GENERAL
2.1.1. THE AUTOMATIC TRANSFER SWITCH SHALL BE FURNISHED BY THE MANUFACTURER OF THE ENGINE-GENERATOR SET SO AS TO MAINTAIN COMPATIBILITY AND LOCAL SERVICE RESPONSIBILITY FOR THE COMPLETE EMERGENCY POWER SYSTEM.
2.1.2. THE AUTOMATIC TRANSFER SWITCH SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
2.1.3. THE TRANSFER SWITCH SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
2.1.4. THE TRANSFER SWITCH SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
2.1.5. THE TRANSFER SWITCH SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
2.2. RATINGS & PERFORMANCE
2.2.1. THE AUTOMATIC TRANSFER SWITCH SHALL BE OF ZINZIN ZTS SERIES, 3 POLES, 120/208 VOLTS, 100 AMPS.
2.2.2. THE AUTOMATIC TRANSFER SWITCH SHALL BE OF ZINZIN ZTS SERIES, 3 POLES, 120/208 VOLTS, 100 AMPS.
2.3. CONSTRUCTION
2.3.1. THE TRANSFER SWITCH SHALL BE DOUBLE THROW CONSTRUCTION, POSITIVELY ELECTRICALLY AND MECHANICALLY LOCKED TO PREVENT SIMULTANEOUS CLOSING AND MECHANICALLY HELD IN BOTH NORMAL AND EMERGENCY POSITIONS.
2.3.2. THE TRANSFER SWITCH SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
2.3.3. THE TRANSFER SWITCH ELECTRICAL ACTUATOR SHALL HAVE AN INDEPENDENT DISCONNECT MEANS TO DISABLE THE ELECTRICAL OPERATION DURING MANUAL SWITCHING.
2.4. CONTROLS
2.4.1. ALL CONTROL EQUIPMENT SHALL BE MOUNTED ON THE INSIDE OF THE CABINET DOOR IN A METAL LOCKABLE ENCLOSURE WITH TRANSPARENT SAFETY SHIELD TO PROTECT ALL STATE CIRCUIT BOARDS.
2.4.2. A SOLID STATE UNDER VOLTAGE SENSOR SHALL MONITOR ALL PHASES OF THE NORMAL SOURCE AND PROVIDE ADJUSTABLE RANGES FOR FIELD ADJUSTMENTS FOR SPECIFIC APPLICATION NEEDS.
2.4.3. A SOLID STATE UNDER VOLTAGE SENSOR SHALL MONITOR ALL PHASES OF THE NORMAL SOURCE AND PROVIDE ADJUSTABLE RANGES FOR FIELD ADJUSTMENTS FOR SPECIFIC APPLICATION NEEDS.
2.4.4. SIGNAL THE ENGINE-GENERATOR SET TO START IN THE EVENT OF A POWER INTERRUPTION.
2.4.5. TRANSFER THE LOAD TO THE ENGINE-GENERATOR SET AFTER IT REACHED PROPER VOLTAGE, ADJUSTABLE FROM 70-90% OF SYSTEM VOLTAGE, AND FREQUENCY, ADJUSTABLE FROM 80-90% OF SYSTEM FREQUENCY.
2.4.6. RETRANSFER THE LOAD TO THE LINE AFTER NORMAL POWER RESTORATION.
2.4.7. THE OPERATING POWER FOR TRANSFER AND RETRANSFER SHALL BE OBTAINED FROM THE SOURCE TO WHICH THE LOAD IS BEING TRANSFERRED.
2.4.8. SIGNAL THE ENGINE-GENERATOR TO STOP AFTER THE LOAD RETRANSFERS TO NORMAL.
2.4.9. PROVIDE AN ENGINE MINIMUM RUN TIMER, ADJUSTABLE FROM 5-30 MINUTES, TO ENSURE AN ADEQUATE ENGINE RUN PERIOD.
2.4.10. THE TRANSFER SWITCH SHALL HAVE A TIME DELAY NEUTRAL FEATURE TO PROVIDE A TIME DELAY, ADJUSTABLE FROM 1-10 SECONDS, DURING THE TRANSFER IN EITHER DIRECTION, DURING WHICH TIME THE LOAD IS ISOLATED FROM BOTH POWER SOURCES.
2.4.11. THE TRANSFER SWITCH SHALL HAVE AN IN PHASE MONITOR WHICH ALLOWS THE SWITCH TO TRANSFER BETWEEN LINE SOURCES IF THEIR VOLTAGE WAVEFORMS BECOME SYNCHRONOUS WITHIN 20 ELECTRICAL DEGREES WITHIN 10 SECONDS OF TRANSFER INITIATION SIGNAL.
2.4.12. IF IN THE IN-PHASE MONITOR WILL NOT ALLOW SUCH A TRANSFER, THE CONTROL MUST DEFAULT TO TIME DELAY NEUTRAL OPERATION ARE NOT ACCEPTABLE.
2.4.13. FRONT MOUNTED CONTROLS SHALL INCLUDE A SELECTOR SWITCH TO PROVIDE FOR A NORMAL TEST MODE WITH FULL USE OF TIME DELAYS, FAST TEST MODE WHICH BYPASSES ALL TIME DELAYS TO ALLOW TESTING THE ENTIRE SYSTEM IN LESS THAN ONE MINUTE, OR AUTOMATIC MODE TO SET THE SYSTEM FOR NORMAL OPERATION.
2.4.14. PROVIDE BRIGHT LAMPS TO INDICATE THE TRANSFER SWITCH POSITION IN EITHER UTILITY (WHITE) OR EMERGENCY (RED).
2.4.15. PROVIDE MANUAL OPERATING HANDLE TO ALLOW FOR MANUAL TRANSFER.
2.4.16. PROVIDE A MAINTENANCE DISCONNECT SWITCH TO PREVENT LOAD TRANSFER AND AUTOMATIC ENGINE START WHILE PERFORMING MAINTENANCE.
2.4.17. PROVIDE LED STATUS LIGHTS TO GIVE A VISUAL READOUT OF THE OPERATING SEQUENCE.
2.5. MISCELLANEOUS TRANSFER SWITCH EQUIPMENT
2.5.1. THE TRANSFER SWITCH MECHANISM AND CONTROLS ARE TO BE MOUNTED IN A NEMA 1 ENCLOSURE.
7.3. SERVICE
7.3.1. SUPPLIER OF THE GENSET AND ASSOCIATED ITEMS SHALL HAVE PERMANENT SERVICE FACILITIES IN THIS TRADE AREA.
7.3.2. GENERATOR SUPPLIER'S SERVICE DEPARTMENT SHALL MAKE AVAILABLE TO THE OWNER ANY AND ALL SOFTWARE PROGRAMS AND PASSWORDS FOR ACCESSING THE GENERATOR'S WARRANTY DOCUMENTS MUST BE PROVIDED.
7.4. WARRANTY
7.4.1. THE STANDBY ELECTRICAL GENERATING SYSTEM COMPONENTS, COMPLETE GENSET AND INSTRUMENTATION PANEL SHALL BE WARRANTED BY THE MANUFACTURER AGAINST DEFECTIVE MATERIALS AND FACTORY WORKMANSHIP FOR A PERIOD OF TEN (10) YEARS.
7.4.2. THE WARRANTY PERIOD SHALL COMMENCE WHEN THE STANDBY POWER SYSTEM IS FIRST PLACED INTO SERVICE.
7.5. STARTUP AND CHECKOUT
7.5.1. THE SUPPLIER OF THE ELECTRICAL GENERATING PLANT AND ASSOCIATED ITEMS COVERED HEREIN SHALL PROVIDE FACTORY TRAINED TECHNICIANS TO CHECKOUT THE COMPLETED INSTALLATION AND TO PERFORM AN INITIAL STARTUP INSPECTION TO INCLUDE:
7.5.1.1. ENSURING THE ENGINE STARTS (BOTH HOT AND COLD) WITHIN THE SPECIFIED TIME.
7.5.1.2. VERIFICATION OF ENGINE PARAMETERS WITHIN SPECIFICATION.
7.5.1.3. VERIFY NO LOAD FREQUENCY AND VOLTAGE, ADJUSTING IF REQUIRED.
7.5.1.4. TEST ALL AUTOMATIC SHUTDOWNS OF THE ENGINE-GENERATOR.
7.5.1.5. PERFORM A LOAD TEST OF THE ELECTRICAL PLANT, ENSURING FULL LOAD FREQUENCY AND VOLTAGE ARE WITHIN SPECIFICATION BY USING BUILDING LOAD.
7.6. TRAINING
7.6.1. TRAINING IS TO BE SUPPLIED BY THE START-UP TECHNICIAN DURING COMMISSIONING.
3. ALTERNATOR
3.1. THE ALTERNATOR SHALL BE THE VOLTAGE AND PHASE CONFIGURATION AS SPECIFIED IN SECTION 1.1.1.1.
3.2. THE ALTERNATOR SHALL BE A 12 POLE, REVOLVING FIELD, STATIONARY ARMATURE, SYNCHRONOUS MACHINE.
3.3. THE ALTERNATOR SHALL INCLUDE A PERMANENT MAGNET GENERATOR (PMG) FOR EXCITATION SUPPORT.
3.4. THE ALTERNATOR SHALL SUPPORT 37 SKVA WITH A MAXIMUM VOLTAGE DIP OF 30 %.
3.5. SINGLE PHASE ALTERNATORS SHALL BE FOUR LEAD AND DEDICATED VOLTAGE DESIGNS.
3.6. THE ALTERNATOR SHALL BE CONNECTED TO THE ENGINE FLYWHEEL USING FLEXIBLE DRIVE DISKS.
3.7. THE ALTERNATOR SHALL MEET TEMPERATURE RISE STANDARDS OF UL2200 (120 DEGREES C).
3.8. THE ALTERNATOR SHALL BE PROTECTED AGAINST OVERLOADS AND SHORT CIRCUIT CONDITIONS BY ADVANCED CONTROL PANEL PROTECTIVE FUNCTIONS.
4. CONTROLS
4.1. THE GENERATOR CONTROL SYSTEM SHALL BE A FULLY INTEGRATED MICROPROCESSOR BASED CONTROL SYSTEM FOR STANDBY EMERGENCY ENGINE GENERATORS MEETING ALL REQUIREMENTS OF NFPA 110 LEVEL 1.
4.2. THE GENERATOR CONTROL SYSTEM SHALL BE A FULLY INTEGRATED CONTROL SYSTEM INCLUDING REMOTE DIAGNOSTICS AND EASY BUILDING MANAGEMENT INTEGRATION OF ALL GENERATOR FUNCTIONS.
4.3. MANUFACTURER SHALL BE SUPPORTED WITH BUILDING AUTOMATION VIA THE MOBUS PROTOCOL WITHOUT NETWORK CARDS.
4.4. THE CONTROL SYSTEM SHALL PROVIDE AN ENVIRONMENTALLY SEALED DESIGN INCLUDING ENCAPSULATED CIRCUIT BOARDS AND SEALED AUTOMATIC STYLE PLUGS FOR ALL SENSORS AND CIRCUIT BOARD CONNECTIONS.
4.5. CIRCUIT BOARDS SHALL UTILIZE SURFACE MOUNT TECHNOLOGY TO PROVIDE VIBRATION DURABLE CIRCUIT BOARDS THAT UTILIZE LARGE CAPACITORS OR HEAT SINKS MUST UTILIZE ENCLOSURE METHODS TO SECURELY SUPPORT THESE COMPONENTS.
4.6. A PREDICTIVE MAINTENANCE ALGORITHM THAT ALARMS WHEN MAINTENANCE IS REQUIRED.
4.7. DIAGNOSTIC CAPABILITIES SHOULD INCLUDE TIME-STAMPED EVENT AND ALARM LOGS, ABILITY TO VIEW OPERATIONAL PARAMETERS DURING EVENTS, SIMULTANEOUS MONITORING OF ALL INPUT OR OUTPUT PARAMETERS, CALLED CAPABILITIES, SUPPORT FOR MULTI-CHANNEL DIGITAL STRIP CHART FUNCTIONALITY AND 2 MSEC DATA LOGGING CAPABILITIES.
4.8. AN ADDITION TO STANDARD NFPA 110 ALARMS, THE APPLICATION LOADS SHOULD ALSO BE PROTECTED THROUGH INSTANTANEOUS AND STEADY STATE PROTECTIVE SETTINGS ON SYSTEM VOLTAGE, FREQUENCY, AND POWER.
4.9. THE CONTROL SYSTEM SHALL PROVIDE PRE-WIRED CUSTOMER USE I/O, 4 RELAY OUTPUTS (USER DEFINABLE FUNCTIONS), 4 CONTACT INPUTS, 2 ANALOG INPUTS, COMMUNICATIONS SUPPORT VIA RS232, RS485, OR AN OPTIONAL MODEM.
4.10. CUSTOMER I/O SHALL BE SOFTWARE CONFIGURABLE PROVIDING FULL ACCESS TO ALL ALARM, EVENT, DATA LOGGING, AND SHUTDOWN FUNCTIONALITY.
4.11. THE CONTROL PANEL SHALL INCLUDE A DIGITAL DISPLAY FOR ALL USER PERTINENT UNIT PARAMETERS INCLUDING: ENGINE AND ALTERNATOR OPERATING CONDITIONS, OIL PRESSURE AND OPTIONAL OIL TEMPERATURE; COOLANT TEMPERATURE AND LEVEL ALARM; FUEL LEVEL (WHERE APPLICABLE); ENGINE SPEED; DC BATTERY VOLTAGE; RUN TIME HOURS; GENERATOR VOLTAGE, AMPS, FREQUENCY, KILOVOLTS, AND POWER FACTOR; ALARM STATUS AND CURRENT ALARM(S) CONDITION PER NFPA 110 LEVEL 1.
4.12. GENERATOR PACKAGE SHALL INCLUDE AN ELECTRICAL LOAD CENTER RATED FOR 125 AMPS WITH THE CIRCUITS FOR THE BATTERY, CHARGER, JACKET WATER HEATER, AND STRIP HEATER PRE-WIRED.
5. ENGINE / ALTERNATOR PACKAGING
5.1. THE ENGINE/ALTERNATOR SHALL BE BOLTED DIRECTLY TO THE GENSET FRAME AND THE ENTIRE FRAME SHALL BE MOUNTED ON SPRING ISOLATORS.
5.2. A MANUAL, THERMAL, MAGNETIC CIRCUIT BREAKER CARRYING THE UL MARK SHALL BE FACTORY INSTALLED THE BREAKER SHALL BE RATED 100 AMPS, THE LINE SIDE CONNECTIONS ARE TO BE MADE AT THE FACTORY.
5.3. ENCLOSURE
5.3.1. THE GENSET SHALL BE PACKAGED WITH A LEVEL 2 SOUND ATTENUATING ENCLOSURE TO MEET THE 70.5 DBA SOUND LEVEL REQUIREMENT.
5.3.2. THE ENCLOSURE SHALL BE MADE OF STEEL WITH A MINIMUM THICKNESS OF 14 GAUGE.
5.3.3. THE ENCLOSURE SHALL BE COATED WITH ELECTROSTATIC APPLIED POWDER PAINT, SHARED AND FINISHED TO MANUFACTURER'S SPECIFICATIONS.
5.3.4. THE SOUND ATTENUATED ENCLOSURE SHALL UTILIZE AN UPWARD DISCHARGING RADIANT HEAT EXCHANGE SYSTEM.
5.4. SUB-BASE FUEL TANK
5.4.1. THE PACKAGING SHALL INCLUDE A DOUBLE WALL, SUB-BASE MOUNTED, UL142 LISTED FUEL TANK.
5.4.2. THE TANK SHALL INCLUDE FUEL SUCTIION AND RETURN CONNECTIONS, NORMAL AND EMERGENCY VENTS, SECONDARY CONTAMINATION EMERGENCY VENT AND RUPTURE BASIN SENSOR, MECHANICAL FUEL LEVEL INDICATOR AND A SUB-UP AREA CONVENIENT FOR ELECTRICAL CONDUIT ENTRY.
5.4.3. THE FUEL TANK SHALL USE AN ELECTRIC FUEL SENSOR TO PROVIDE AN ANALOG INDICATION OF FUEL LEVEL.
5.4.4. THE FUEL TANK MUST BE SUPPLIED BY THE ENGINE-GENERATOR SET MANUFACTURER AND BE INSTALLED BEFORE SHIPMENT.
6. LOOSE ITEMS
6.1. SUPPLIES TO ITEMIZE LOOSE PARTS THAT REQUIRE SITE MOUNTING AND INSTALLATION.
6.2. PAD TYPE VIBRATION ISOLATORS
7. ADDITIONAL PROJECT REQUIREMENTS
7.1. FACTORY TESTING
7.1.1. BEFORE SHIPMENT OF THE EQUIPMENT, THE ENGINE-GENERATOR SET SHALL BE TESTED UNDER RATED LOAD FOR PERFORMANCE AND PROPER FUNCTIONING OF CONTROL AND INTERFACING CIRCUITS.
7.1.2. THE MANUFACTURER SHALL SUPPLY ITS RECOMMENDED STAINLESS STEEL, FLEXIBLE CONNECTOR TO COUPLE THE ENGINE EXHAUST MANIFOLD TO THE EXHAUST SYSTEM.
7.2. OWNER'S MANUALS
7.2.1. THREE (3) SETS OF OWNER'S MANUALS SPECIFIC TO THE PRODUCT SUPPLIED MUST ACCORDANT DELIVERED TO THE OWNER.
7.2.2. THE MANUFACTURER SHALL SUPPLY A CRITICAL GRADE EXHAUST SILENCER AS STANDARD.
7.2.3. FOR GENSETS IN A WEATHER OR SOUND ATTENUATED ENCLOSURE, ALL EXHAUST PIPING FROM THE TURBO-CHARGER DISCHARGE TO THE SILENCER SHALL BE THERMALLY WRAPPED TO MINIMIZE HEAT DISSIPATION INSIDE THE ENCLOSURE.
7.2.4. THE ENGINE INTAKE AIR IS TO BE FILTERED WITH ENGINE MOUNTED, REPLACEABLE, DRY ELEMENT FILTERS.
ENGINE GENERATOR SPECIFICATION (SANDY)
1. GENERAL
1.1. DESCRIPTION OF SYSTEM & SITE
1.1.1. PROVIDE A 30 KW STANDBY POWER SYSTEM TO SUPPLY ELECTRICAL POWER AT 120/208 VOLTS, 60 HERTZ, THREE PHASE.
1.1.2. THE SITE IS AN NEC ORDINARY LOCATION WITH NO SPECIFIC HARSH ENVIRONMENT REQUIREMENT.
1.1.3. THE GENSET SHALL BE APPLIED AT THE LISTED AMBIENT AND ELEVATION.
1.1.4. BIDDERS ARE TO SUBMIT THE GENSET'S SOUND LEVEL VERIFYING 70 DBA AT 23 FT BASED ON THE CONFIGURATION SPECIFIED.
1.2. REQUIREMENTS OF REGULATORY AGENCIES
1.2.1. AN ELECTRICAL GENERATING SYSTEM, CONSISTING OF A PRIME MOVER, GENERATOR, GENERATOR COUPLING AND ALL CONTROLS, MUST HAVE BEEN TESTED, AS A COMPLETE UNIT, ON A REPRESENTATIVE ENGINEERING PROTOTYPE MODEL OF THE EQUIPMENT TO BE SOLD.
1.2.2. THE GENERATOR SET MUST CONFORM TO APPLICABLE NFPA REQUIREMENTS.
1.2.3. THE GENERATOR SET MUST BE AVAILABLE WITH THE UNDERWRITERS LABORATORIES LISTING (UL2200) FOR A STATIONARY ENGINE GENERATOR ASSEMBLY.
1.2.4. THE GENERATOR SET MUST MEET EPA FEDERAL EMISSION GUIDELINES FOR STATIONARY STANDBY POWER GENERATION.
1.2.5. THE GENERATOR SET MUST MEET ADO 400 REQUIREMENT.
1.3. MANUFACTURER QUALIFICATIONS
1.3.1. THIS SYSTEM SHALL BE SUPPLIED BY AN ORIGINAL EQUIPMENT MANUFACTURER (OEM) WHO HAS BEEN REGULARLY ENGAGED IN THE PRODUCTION OF ENGINE-ALTERNATOR SETS, AUTOMATIC TRANSFER SWITCHES, AND ASSOCIATED CONTROLS FOR A MINIMUM OF 25 YEARS.
1.3.2. THE MANUFACTURER SHALL HAVE PRINTED LITERATURE AND BROCHURES DESCRIBING THE STANDARD SERIES SPECIFIED, NOT A ONE OF A KIND FABRICATION.
1.3.3. MANUFACTURER'S AUTHORIZED SERVICE REPRESENTATIVE SHALL MEET THE FOLLOWING CRITERIA:
1.3.3.1. CERTIFIED, FACTORY TRAINED, INDUSTRIAL GENERATOR TECHNICIANS
1.3.3.2. SERVICE SUPPORT 24/7
1.3.3.3. SERVICE LOCATION WITHIN 200 MILES
1.3.3.4. RESPONSE TIME OF 4 HOURS
1.3.3.5. SERVICE & REPAIR PARTS IN-STOCK AT PERFORMANCE LEVEL OF 95%
1.3.3.6. OFFER OPTIONAL REMOTE MONITORING AND DIAGNOSTIC CAPABILITIES
1.4. SUBMITTALS
1.4.1. ENGINE GENERATOR SPECIFICATION SHEET
1.4.2. CONTROLS SPECIFICATION SHEET(S)
1.4.3. INSTALLATION / LAYOUT DIMENSIONAL DRAWING
1.4.4. WIRING SCHEMATIC
1.4.5. SOUND DATA
1.4.6. EMISSION CERTIFICATION
1.4.7. WARRANTY STATEMENT
2. ENGINE
2.1. ENGINE RATING AND PERFORMANCE
2.1.1. THE PRIME MOVER SHALL BE A LIQUID COOLED, DIESEL FUEL, TURBOCHARGED AFTER-COOLING ENGINE OF 4-CYCLE DESIGN, IT WILL HAVE ADEQUATE HORSEPOWER TO ACHIEVE RATED KW OUTPUT WITH A 4% OPERATING SLIP OF 1800 RPM.
2.1.2. THE ENGINE SHALL SUPPORT A 100% LOAD STEP.
2.1.3. THE ENGINE SYSTEM SHALL SUPPORT GENERATOR START-UP AND LOAD TRANSFER WITHIN 10 SECONDS.
2.2. ENGINE OIL SYSTEM
2.2.1. FULL PRESSURE LUBRICATION SHALL BE SUPPLIED BY A POSITIVE DISPLACEMENT LUBE OIL PUMP.
2.2.2. THE ENGINE SHALL OPERATE ON MINERAL BASED OIL, SYNTHETIC OILS SHALL NOT BE REQUIRED.
2.2.3. THE OIL SHALL BE COOLED BY A COIL COOLER WHICH IS INTEGRATED INTO THE ENGINE'S WATER SYSTEM.
2.3. ENGINE COOLING SYSTEM
2.3.1. THE ENGINE IS TO BE COOLED WITH A UNIT MOUNTED RADIATOR, FAN, WATER PUMP, AND CLOSED COOLANT RECOVERY SYSTEM.
2.3.2. THE ENGINE SHALL HAVE (A) UNIT MOUNTED, THERMOSTATICALLY CONTROLLED WATER JACKET HEATERS) TO AID IN QUICK STARTING.
2.3.3. ENGINE COOLANT AND OIL DRAIN EXTENSIONS, EQUIPPED WITH PIPE PLUGS AND SHUT-OFF VALVES, MUST BE PROVIDED TO THE OUTSIDE OF THE MOUNTING BASE FOR CLEANER AND MORE CONVENIENT ENGINE SERVICING.
2.3.4. A RADIATOR FAN GUARD MUST BE INSTALLED FOR PERSONNEL SAFETY THAT MEETS UL AND OSHA SAFETY REQUIREMENTS.
2.4. ENGINE STARTING SYSTEM
2.4.1. STARTING SHALL BE BY A SOLENOID SHIF, DC STARTING SYSTEM.
2.4.2. THE ENGINE'S CRANKING BATTERIES SHALL BE LEAD ACID.
2.4.3. THE GENSET SHALL HAVE AN ENGINE DRIVEN, BATTERY CHARGING ALTERNATOR WITH INTEGRATED VOLTAGE REGULATION.
2.4.4. THE GENSET SHALL HAVE AN AUTOMATIC DUAL RATE, FLOAT EQUALIZE, 10 AMP BATTERY CHARGER.
2.4.5. THE ENGINE FUEL SYSTEM SHALL BE DESIGNED FOR OPERATION ON #2 DIESEL FUEL AND COLD WEATHER DIESEL BLENDS.
2.4.6. THE WEATHER SEALING INCLUDE A PRIMARY FUEL FILTER, WATER SEPARATOR, MANUAL FUEL PRIMING PUMP, AND ENGINE FLEXIBLE FUEL LINES MUST BE INSTALLED AT THE POINT OF MANUFACTURE.
2.4.7. THE ENGINE'S SUCTION LINE SHALL BE FITTED WITH A CHECK VALVE TO SECURE PRIME FOR THE ENGINE'S INJECTION PUMP.
2.5. ENGINE CONTROLS
2.5.1. ENGINES THAT ARE EQUIPPED WITH AN ELECTRONIC ENGINE CONTROL MODULE (ECM), SHALL MONITOR AND CONTROL ENGINE FUNCTIONALITY AND SEAMLESSLY INTEGRATE WITH THE GENSET CONTROLLER.
2.5.2. THE GENSET CONTROLLER SHALL MONITOR THE ENGINE'S OPERATIONAL PARAMETERS SHALL BE INTEGRATED INTO THE GENSET CONTROLS NFPA 110 ALARM AND WARNING REQUIREMENTS.
2.5.3. FOR ENGINES WITHOUT ECM FUNCTIONALITY OR FOR ANY ADDITIONAL GENSET CONTROLLER MONITORING, SENSORS ARE TO BE CONDITIONED TO A 4-20mA SIGNAL LEVEL TO ENHANCE NOISE IMMUNITY AND ALL SENSOR CONNECTIONS SHALL BE SEALED TO PREVENT CORROSION.
2.5.4. ENGINE SPEED SHALL BE CONTROLLED WITH AN INTEGRATED ISOCRONOUS GOVERNOR FUNCTION WITH NO CHANGE IN ALTERNATOR FREQUENCY FROM NO LOAD TO FULL LOAD. STEADY STATE REGULATION IS TO BE 0.25%.
2.6. ENGINE EXHAUST & INTAKE
2.6.1. THE ENGINE EXHAUST EMISSIONS SHALL MEET THE EPA EMISSION REQUIREMENTS FOR STANDBY POWER GENERATION.
2.6.2. THE MANUFACTURER SHALL SUPPLY ITS RECOMMENDED STAINLESS STEEL, FLEXIBLE CONNECTOR TO COUPLE THE ENGINE EXHAUST MANIFOLD TO THE EXHAUST SYSTEM.
2.6.3. THE EXHAUST PIPE TERMINATE THE EXHAUST PIPE COMPONENTS MUST BE PROPERLY SIZED TO ASSURE OPERATION WITHOUT EXCESSIVE BACK PRESSURE WHEN INSTALLED.
2.6.4. THE MANUFACTURER SHALL SUPPLY A CRITICAL GRADE EXHAUST SILENCER AS STANDARD.
2.6.5. FOR APPLICATIONS WITH SITE SPECIFIC SOUND REQUIREMENTS (REFERENCE SECTION 1.1), THE SILENCER SHALL BE SELECTED TO ACHIEVE THE REQUIRED SOUND LEVELS.
2.6.6. FOR GENSETS IN A WEATHER OR SOUND ATTENUATED ENCLOSURE, ALL EXHAUST PIPING FROM THE TURBO-CHARGER DISCHARGE TO THE SILENCER SHALL BE THERMALLY WRAPPED TO MINIMIZE HEAT DISSIPATION INSIDE THE ENCLOSURE.
2.6.7. THE ENGINE INTAKE AIR IS TO BE FILTERED WITH ENGINE MOUNTED, REPLACEABLE, DRY ELEMENT FILTERS.
19. SPLICING AND TERMINATING SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURER'S PUBLISHED PROCEDURES.
20. ROUTE WIRE AND CABLE AS REQUIRED TO MEET PROJECT CONDITIONS.
21. PROTECT EXPOSED CABLE FROM DAMAGE.
22. MAKE ELECTRICAL CONNECTIONS IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S INSTRUCTIONS.
23. INSTALL SUITABLE STRAIN-RELIEF CLAMPS AND FITTINGS FOR CORD CONNECTIONS AT OUTLET BOXES AND EQUIPMENT CONNECTION BOXES.
24. INSTALL JUNCTION OR PULLBOXES WHERE REQUIRED TO LIMIT BENDS IN CONDUIT RUNS TO NOT MORE THAN 360 DEGREES OR WHERE PULLING TENSION ACHIEVED WOULD EXCEED THE MAXIMUM ALLOWABLE FOR THE CABLE TO BE INSTALLED.
25. SECURELY FASTEN DEVICES INTO BOXES AND ATTACH APPROPRIATE COVER PLATES.
26. FURNISH AND INSTALL ENGRAVED LEGEND OF EACH SWITCH THAT CONTROLS EXHAUST FANS, MOTORS, EQUIPMENT SYSTEMS, ETC.
27. MOUNT RECEPTACLES VERTICALLY WITH U-SHAPED GROUND POSITION.
28. FUSES SHALL BE INSTALLED AND SIZED AS NOTED ON PLANS AND AS REQUIRED PER MANUFACTURER.
29. GROUND NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT ENCLOSURES, FRAMES, CONDUCTOR RACEWAYS OR CABLE TRAYS TO PROVIDE A LOW IMPEDANCE PATH FOR LINE-TO-GROUND FAULT CURRENT AND TO BOND ALL NON-CURRENT CARRYING METAL PARTS TOGETHER.
30. GROUNDING CONDUCTORS SHALL BE IDENTIFIED WITH GREEN INSULATION.
31. INSTALL RACEWAY COUPLINGS, FITTINGS AND TERMINATIONS SECURE AND TIGHT TO INSURE GOOD GROUND CONTINUITY.
32. CONDUIT TERMINATING IN CONCENTRIC KNOCKOUTS AT PANELBOARDS, CABINETS AND GUTTERS SHALL HAVE INSULATED GROUNDING BUSHINGS AND BONDING JUNCTIONS INSTALLED INTERCONNECTING ALL SUCH CONDUITS AND THE PANELBOARD CABINET, GUTTER, ETC.
33. PANELBOARDS SHALL HAVE COPPER BUSSING, COPPER GROUND BAR AND LABEL IN-DOOR TRIM.
PERFORM TESTING AS DESCRIBED IN NETA ATS, INCLUDE TESTING OF MOTORS FOR CORRECT OPERATION AND ROTATION, ANY PRODUCTS WHICH FAIL DURING THE TESTS OR ARE RULED UNSATISFACTORY BY THE ENGINEER SHALL BE REPLACED, REPAIRED, OR CORRECTED AS PRESCRIBED BY THE CONTRACTOR AT THE EXPENSE OF THE CONTRACTOR.
TESTING AS DESCRIBED IN NETA ATS, INCLUDE TESTING OF MOTORS FOR CORRECT OPERATION AND ROTATION, ANY PRODUCTS WHICH FAIL DURING THE TESTS OR ARE RULED UNSATISFACTORY BY THE ENGINEER SHALL BE REPLACED, REPAIRED, OR CORRECTED AS PRESCRIBED BY THE CONTRACTOR AT THE EXPENSE OF THE CONTRACTOR.
TESTS SHALL BE CONDUCTED DURING THE CONSTRUCTION PERIOD AND AT COMPLETION TO DETERMINE CONFORMITY WITH APPLICABLE CODES AND WITH THESE SPECIFICATIONS.
TESTS, IN ADDITION TO SPECIFIC SYSTEM TEST DESCRIBED ELSEWHERE, SHALL INCLUDE:
TESTING:
1. AT COMPLETION OF JOB, CHECK VOLTAGE AT SEVERAL POINTS OF UTILIZATION ON THE SYSTEM WHICH HAS BEEN INSTALLED UNDER THIS CONTRACT.
2. CONTRACTOR SHALL PERFORM TESTS AS SPECIFIED TO PROVE INSTALLATION IS IN ACCORDANCE WITH CONTRACT REQUIREMENTS.
3. CONTRACTOR SHALL PERFORM TESTS AS SPECIFIED TO PROVE INSTALLATION IS IN ACCORDANCE WITH CONTRACT REQUIREMENTS.
4. CONTRACTOR SHALL PERFORM TESTS AS SPECIFIED TO PROVE INSTALLATION IS IN ACCORDANCE WITH CONTRACT REQUIREMENTS.
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16. CONTRACTOR SHALL PERFORM TESTS AS SPECIFIED TO PROVE INSTALLATION IS IN ACCORDANCE WITH CONTRACT REQUIREMENTS.
17. CONTRACTOR SHALL PERFORM TESTS AS SPECIFIED TO PROVE INSTALLATION IS IN ACCORDANCE WITH CONTRACT REQUIREMENTS.
18. CONTRACTOR SHALL PERFORM TESTS AS SPECIFIED TO PROVE INSTALLATION IS IN ACCORDANCE WITH CONTRACT REQUIREMENTS.
GENERAL PROVISIONS:
1. FURNISH ALL LABOR, MATERIALS, APPARATUS, TOOLS, EQUIPMENT, TRANSPORTATION, TEMPORARY CONSTRUCTION AND SPECIAL OR OCCASIONAL SERVICES AS REQUIRED TO MAKE A COMPLETE WORKING ELECTRICAL INSTALLATION, AS SHOWN ON THE DRAWINGS AND DESCRIBED IN THESE SPECIFICATIONS.
2. STRUCTURAL MEMBERS SHALL IN NO CASE BE DRILLED, BORED OR NOTCHED IN SUCH A MANNER THAT WILL IMPAIR THEIR STRUCTURAL VALUE.
3. KEEP CONDUITS, JUNCTION BOXES, AND OUTLET BOXES, AND OTHER OPENINGS CLOSED TO PREVENT ENTRY OF FOREIGN MATTER.
4. DRAWINGS FOR THE WORK UNDER THIS SECTION ARE DIAGRAMMATIC, THE CONTRACTOR SHALL VISIT THE SITE AND DETERMINE THE LOCAL, WORKING CONDITIONS, CONFLICTING UTILITIES, AND THE CONDITIONS IN WHICH THE ELECTRICAL WORK WILL TAKE PLACE.
5. CONTRACTOR SHALL INSURE RECONNECTION OF EXISTING EQUIPMENT AND CIRCUITS AFFECTED BY CONTRACT DEMOLITION WHETHER OR NOT RECONNECTION IS SPECIFICALLY SHOWN ON THE CONTRACT DOCUMENTS.
6. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND TECHNICAL DATA PARTICULAR TO THE PRODUCT SPECIFIED AND/OR SHALL BE EQUAL OR BETTER.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL AGENCIES AND WITH THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION "STANDARD OF INSTALLATION" FOR GENERAL INSTALLATION PRACTICE.
BASIC MATERIALS AND METHODS:
1. RIGID STEEL CONDUIT SHALL BE FULL WEIGHT, PIPE SIZE, FINISHED INSIDE AND OUT BY HOT-DIP GALVANIZING AFTER FABRICATION, AND SHALL CONFORM WITH ANSI C80.1 AND UL REQUIREMENTS.
2. ELECTRICAL METALLIC TUBING (EMT) SHALL BE FORMED OF COLD ROLLED STRIP STEEL, AND SHALL COMPLY WITH ANSI C80.3, J AND UL REQUIREMENTS.
3. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL BE FABRICATED IN CONTINUOUS LENGTHS FROM GALVANIZED STEEL SPIRALLY WOUND FLEXIBLE CONDUIT.
4. LOW VOLTAGE WIRING SHALL BE INSTALLED IN CONDUIT, MINIMUM 3/4" TRADE DIAMETER.
5. CONDUITS SHALL BE TIGHTLY COVERED AND WELL PROTECTED DURING CONSTRUCTION USING BUSHINGS AND TO SEAL OPEN ENDS.
6. CONDUIT SYSTEMS SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT.
7. LOW VOLTAGE CONDUIT SHALL BE GROUPED SEPARATELY AND LABELED EVERY 10 FT INTERVAL AS TO SYSTEM (I.E. FIRE, CONTROL, ETC)
8. EXPOSED CONDUIT SHALL BE RUN PARALLEL OR AT RIGHT ANGLES TO THE CENTERLINES OF THE COLUMNS AND BEAMS.
9. CONDUITS SHALL NOT BE PLACED CLOSER THAN 12 INCHES FROM A PARALLEL HOT WATER OR STEAM LINE OR THREE INCHES FROM SUCH LINES CROSSING PERPENDICULAR TO THE RUNS.
10. CONDUIT SYSTEMS SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT.
11. RACEWAYS SHALL BE JOINED USING SPECIFIED COUPLINGS OR TRANSITION COUPLINGS WHERE DISSIMILAR RACEWAYS ARE JOINED.
12. FURNISH AND INSTALL METAL SLEEVES FOR ALL EXPOSED INTERIOR CONDUIT RUNS PASSING THROUGH FLOORS OR WALLS.
13. CONDUITS PENETRATING RATED WALLS, FLOORS, ETC. SHALL BE FIREPROOFED.
14. FOR EXISTING CONDUITS THAT WILL BE REUSED, PULL OUT EXISTING CONDUITS AND COMPLETELY AND THOROUGHLY SWAB RACEWAY BEFORE INSTALLING WIRE.
15. WIRE AND CABLE, 0 TO 600 VOLT SHALL BE NEC TYPE THWN, OR TYPE XHHW FOR FEEDERS AND BRANCH CIRCUITS IN WET OR DRY LOCATIONS.
16. WIRE AND CABLE, 0 TO 600 VOLT SHALL BE NEC TYPE THWN, OR TYPE XHHW FOR FEEDERS AND BRANCH CIRCUITS IN WET OR DRY LOCATIONS.
17. COLOR CODING: SYSTEM CONDUCTORS SHALL BE IDENTIFIED AS TO VOLTAGE AND PHASE CONNECTIONS BY MEANS OF COLOR IMPREGNATED INSULATION OR APPROVED COLORED MARKING TAPE AS FOLLOWS:
a. 120/240 VOLT, SINGLE PHASE, 3 WIRE SYSTEM, PHASE A - BLACK, PHASE B - RED, PHASE C - GREEN FOR HIGH LEG (208V TO NEUTRAL), NEUTRAL - WHITE, GROUND - ORANGE.
b. 120/208 VOLT, 3 PHASE, 4 WIRE SYSTEMS, PHASE A - BLACK, PHASE B - RED, PHASE C - BLUE, NEUTRAL - WHITE, GROUND - GREEN.
c. 277/480 VOLT, 3 PHASE, 4 WIRE SYSTEM, PHASE A - BROWN, PHASE B - ORANGE, PHASE C - YELLOW, NEUTRAL - GREY, GROUND - GREEN.
18. UL LISTED APPROVED NON-PETROLEUM BASE AND INSULATING TYPE PULLING COMPOUND SHALL BE USED FOR BRANCH CIRCUITS.
19. ALL CABLES SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND WARRANTY.
20. TACKLE, POWER DRIVEN WINCH OR OTHER MECHANICAL MEANS SHALL NOT BE USED IN PULLING CONDUCTORS OF SIZE SMALLER THAN AWG # 1.
ISSUE
MARK DATE DESCRIPTION
08/16/20 95% CD SUBMITTAL
09/04/20 100% CD SUBMITTAL
SOBE PROJECT NO: 1901466
DATE: 04/15/20
DRAWN BY:
CHECKED BY:
APPROVED BY:
SHEET TITLE
ELECTRICAL SPECIFICATIONS
SCALE: AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE
E-02

Salasobrien logo and contact information: 305 South 11th Street, San Jose, California 95121-2218, 877.725.2755 | 877.925.1477 (F). National Strength. Local Action. Includes a table with issue tracking and project details.

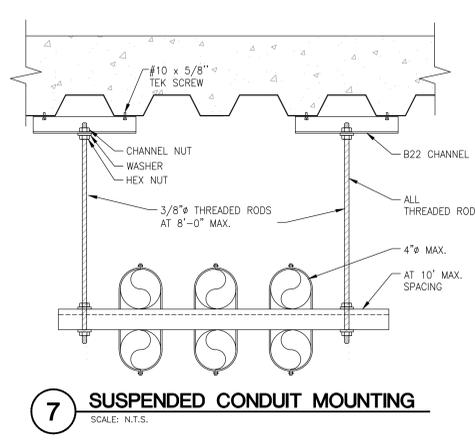
THIS DRAWING IS 30" X 42" AT FULL SIZE. 15" X 21" AT HALF SIZE. © 2015 BY SALAS O'BRIEN ENGINEERS, INC.



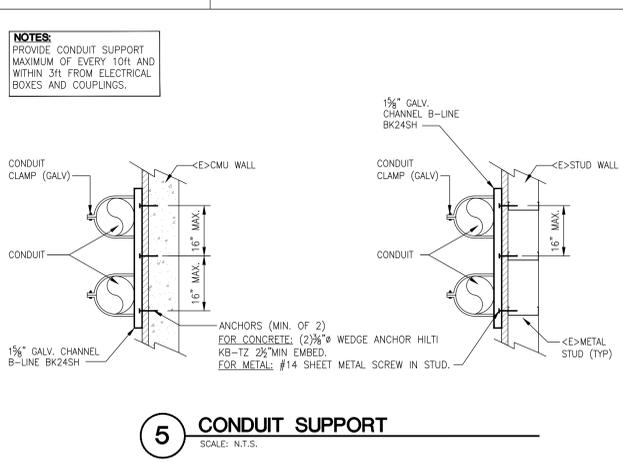
9 PENDANT LIGHT FIXTURE BRACING DETAIL
SCALE: N.T.S.



8 ATS/PANEL MOUNTING DETAIL
SCALE: N.T.S.



7 SUSPENDED CONDUIT MOUNTING
SCALE: N.T.S.

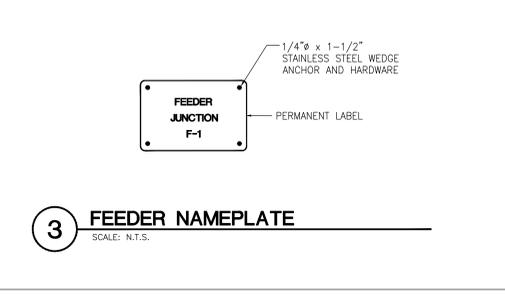


5 CONDUIT SUPPORT
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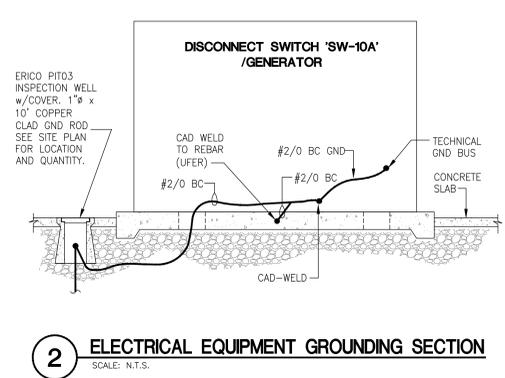
4 NOT USED.
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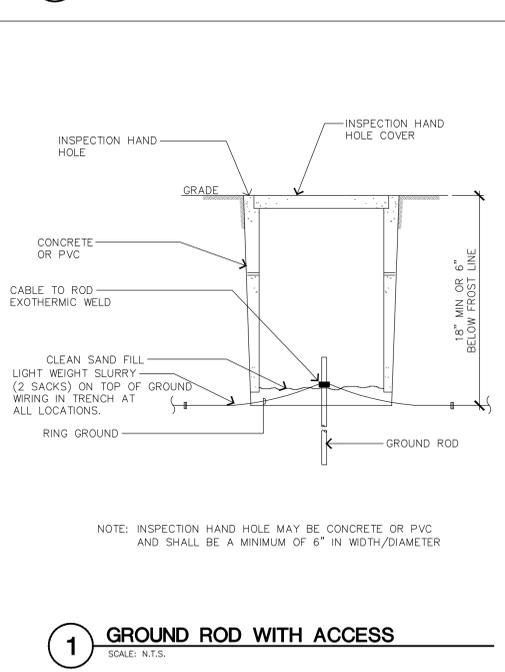
6 SIGNAGE
SCALE: N.T.S.



3 FEEDER NAMEPLATE
SCALE: N.T.S.

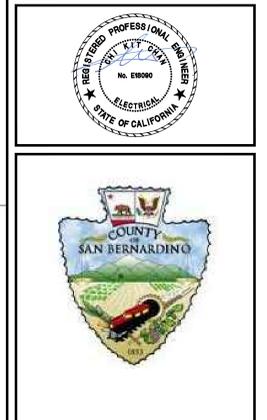
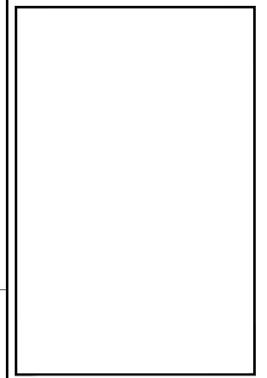


2 ELECTRICAL EQUIPMENT GROUNDING SECTION
SCALE: N.T.S.



1 GROUND ROD WITH ACCESS
SCALE: N.T.S.

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National Strength.
Local Action.



**SANDY ATC
MICROWAVE SITE
GENERATOR**

MARK	DATE	DESCRIPTION
	08/16/20	95% CD SUBMITTAL
	09/04/20	100% CD SUBMITTAL

SOBE PROJECT NO: 1901466
DATE: 04/15/20
DRAWN BY: --
CHECKED BY: --
APPROVED BY: --

SHEET TITLE
**ELECTRICAL
DETAILS**
SCALE: AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE

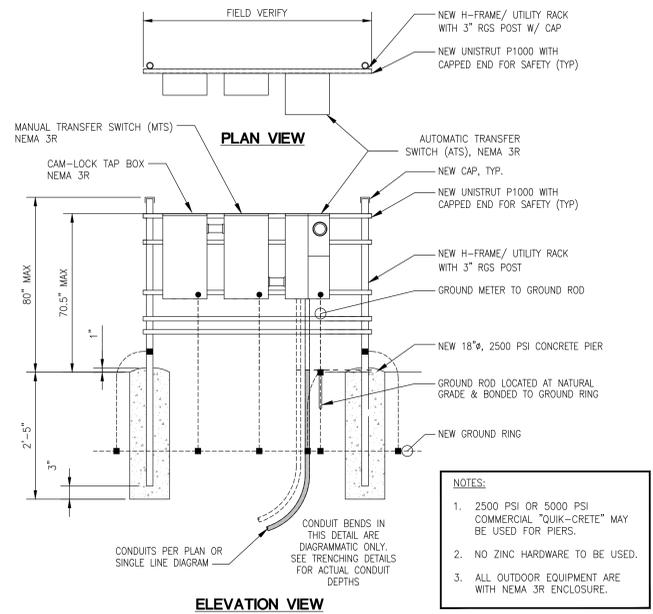
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<E> PANEL 'L1A'		VOLTAGE		120/ 208 V								
LOCATION	EQUIPMENT RM.	TYPE	NOOD	FED FROM	MSB							
AIC RATING	XX KAIC	PHASE	3	WIRE	4							
DESCRIPTION	BRKR	P	T	LCL	KVA LOAD	A	B	C	LCL	P	T	DESCRIPTION
1 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	2
3 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	4
5 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	6
7 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	8
9 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	10
11 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EQUIP	12
13 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	14
15 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.1	X	1	20	LIGHTS	16
17 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	COUNTY SB EQUIP BREAKER	18
19 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	20
21 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	22
23 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	WGLY	24
25 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	26
27 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	EXISTING LOAD	28
29 EXISTING LOAD	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	SPACE	30
31 OUTDOOR GFCI RECEPTACLES	1	20	0.0	0.2	0.2	0.0	0.0	0.0	1	20	SPACE	32
33 GENERATOR BATTERY CHARGER	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	SPACE	34
35 GENERATOR BLOCK HEATER	1	20	0.0	0.5	0.5	0.0	0.0	0.0	1	20	SPACE	36
37 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	38
39 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	40
41 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	42
SUBTOTAL		0.0	3	3	3	3	2	0.1	SUBTOTAL			
LIGHTING & HVAC LOADS		0	0	0	0	1	0					
MCB OR MLO		MLO		TOTAL LOAD PHASE A		5 KVA						
MAIN CIRCUIT BREAKER RATING		100 AMPS		TOTAL LOAD PHASE B		5 KVA						
BUS RATING		SURFACE		TOTAL LOAD PHASE C		5 KVA						
MOUNTING		NEMA 1		TOTAL LCL (NECEC 215.2 A.1)		0 KVA						
ENCLOSURE				TOTAL PANEL LOAD (KVA)		18 KVA						
				TOTAL PANEL LOAD (AMPS)		44 AMPS						
OPTIONS		1 PROVIDE NEW PANEL DIRECTORY		LIGHTING AND HVAC LOADS @ 100%		1 KVA						
		2 ALL BOLD CIRCUIT BREAKER SHALL BE NEW AND SHALL MATCH EXISTING CIRCUIT BREAKER, KAC RATING AND MODEL.		PLUG LOADS CONNECTED LOAD		15 KVA						
		3 CONTRACTOR IS RESPONSIBLE TO TRACE ALL CIRCUITS. TAG ALL UNUSED CIRCUIT WITH "SPARE", IF ANY.		10 KVA @ 100%		10 KVA						
				REMAINING @ 50%		3 KVA						
				PLUG LOAD DEMAND LOAD		13 KVA						
				TOTAL DEMAND LOAD		13 KVA						
				TOTAL DEMAND LOAD		37 AMPS				V.19		

<N> PANEL 'A'		VOLTAGE		120/ 208 V								
LOCATION	ISD EQUIPMENT RM.	TYPE	NOOD	FED FROM	SWB 'MSB' VIA ATS							
AIC RATING	22KAIC	PHASE	3	WIRE	4							
DESCRIPTION	BRKR	P	T	LCL	KVA LOAD	A	B	C	LCL	P	T	DESCRIPTION
1 RECEPT - DATA RACK	1	20	0.0	1.0	1.0	0.0	0.0	0.0	1	20	LTG - ISD EQUIP RM	2
3 SPARE	1	20	0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPARE	4
5 SPARE	1	20	0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPARE	6
7 SPARE	1	20	0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPARE	8
9 SPARE	1	20	0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPARE	10
11 SPARE	1	20	0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPARE	12
13 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	14
15 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	16
17 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	18
19 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	20
21 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	22
23 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	24
25 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	26
27 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	28
29 SPACE			0.0	0.0	0.0	0.0	0.0	0.0	1	20	SPACE	30
SUBTOTAL		0.0	1	0	0	1	0	0	0.1	SUBTOTAL		
LIGHTING & HVAC LOADS		0	0	0	1	0						
MCB OR MLO		MCB		TOTAL LOAD PHASE A		2 KVA						
MAIN CIRCUIT BREAKER RATING		100 AMPS		TOTAL LOAD PHASE B		0 KVA						
BUS RATING		100 AMPS		TOTAL LOAD PHASE C		0 KVA						
MOUNTING		SURFACE		TOTAL LCL (NECEC 215.2 A.1)		0 KVA						
ENCLOSURE		NEMA 1		TOTAL PANEL LOAD (KVA)		2 KVA						
				TOTAL PANEL LOAD (AMPS)		5 AMPS						
OPTIONS		1 COPPER BUSSING		LIGHTING AND HVAC LOADS @ 100%		1 KVA						
		2 100% NEUTRAL		PLUG LOADS CONNECTED LOAD		1 KVA						
		3 DOOR-IN-DOOR ENCLOSURE		10 KVA @ 100%		1 KVA						
		4 TVSS PER SINGLE LINE DIAGRAM		REMAINING @ 50%		0 KVA						
				PLUG LOAD DEMAND LOAD		1 KVA						
				TOTAL DEMAND LOAD		2 KVA						
				TOTAL DEMAND LOAD		5 AMPS				V.19		

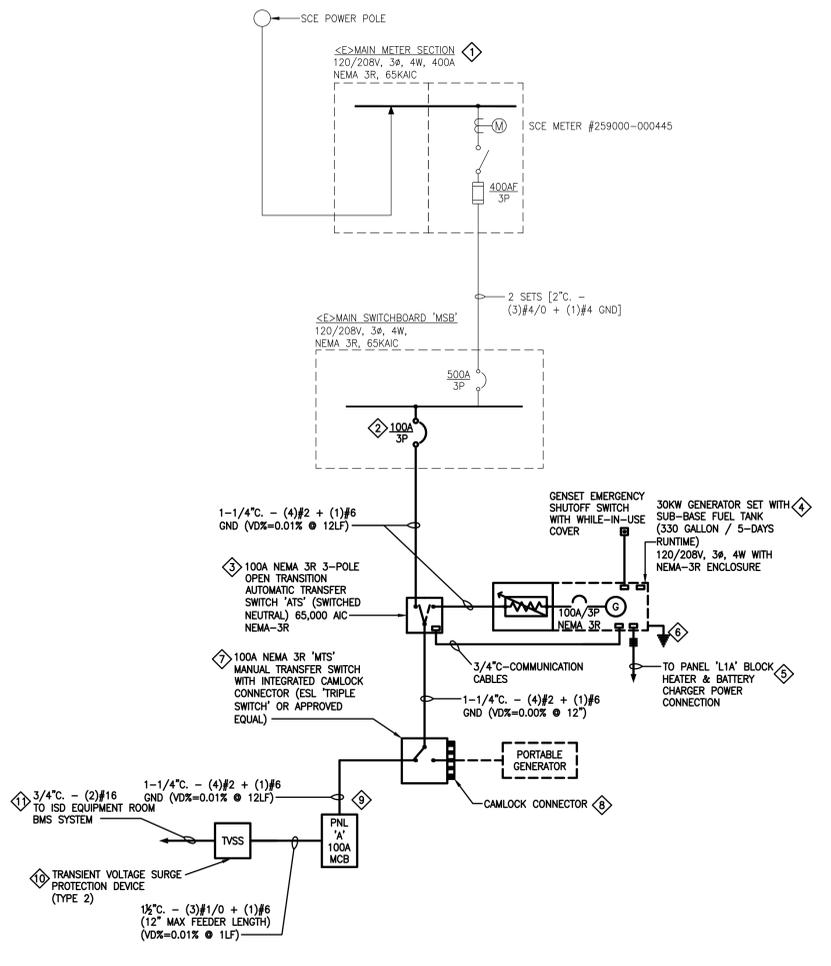
3 PANEL SCHEDULES

SCHEMATIC



2 H-FRAME DETAIL

SCALE: N.T.S.



1 ELECTRICAL SINGLE LINE DIAGRAM

SCHEMATIC

GENERAL SHEET NOTES

- A. ALL EQUIPMENT SHALL HAVE COPPER BUSSING AND WIRING. ALL TRANSFORMERS SHALL HAVE COPPER WINDING.
- B. PROVIDE NEW PRINTED PANEL SCHEDULE AT PANEL DOOR FOR ALL AFFECTED PANEL OR SWITCHBOARD.
- C. POWER SHUTDOWN OR CUTOVER SHALL BE APPROVED BY COUNTY OF SAN BERNARDINO PRIOR TO ANY WORK. COORDINATE WITH COUNTY OF SAN BERNARDINO FOR SEQUENCE OF REMOVAL OF EXISTING GENERATOR/ATS. MOP SHALL BE SUBMITTED AND APPROVED BY COUNTY OF SAN BERNARDINO PRIOR TO ANY DISCONNECTION/DEMOLITION. PROVIDE TEMPORARY GENERATOR, LIGHTING AND HVAC TO DATA ROOM AS REQUIRED BY COUNTY OF SAN BERNARDINO.
- D. CONTRACTOR IS RESPONSIBLE TO MATCH NEW EQUIPMENT WITH EXISTING EQUIPMENT RATING.
- E. CONTRACTOR IS RESPONSIBLE TO SCAN UNDERGROUND UTILITIES, MARK THE GROUND AND PROVIDE SHOP DRAWINGS PRIOR TO ANY GROUND WORK.
- F. CONTRACTOR SHALL PROVIDE ARC FLASH STUDY AND ARC FLASH LABEL TO ALL EXISTING AND NEW ELECTRICAL EQUIPMENT.

REFERENCE SHEET NOTES

1. CONTRACTOR SHALL FIELD VERIFY THE EXACT SCE INCOMING UTILITY SERVICE.
2. FURNISH AND INSTALL CIRCUIT BREAKER AT SPACE. MATCH EXISTING FOR RATING.
3. FURNISH AND INSTALL ATS PER SPECIFICATION AND FLOOR PLAN. COORDINATE WITH MANUFACTURER FOR EXACT REQUIREMENT.
4. FURNISH AND INSTALL GENERATOR PER SPECIFICATION AND FLOOR PLAN. COORDINATE WITH MANUFACTURER FOR EXACT REQUIREMENT.
5. CONTRACTOR SHALL FIELD VERIFY AVAILABLE SPARE/UNUSED CIRCUIT BREAKERS AT PANEL 'L1A'. CONTRACTOR SHALL TAG ALL UNUSED CIRCUIT BREAKERS AS 'SPARE' WITH PERMANENT NAMEPLATE. PROVIDE (2)120V CIRCUITS TO GENERATOR FOR BLOCK HEATER AND BATTERY CHARGER. VERIFY WITH GENERATOR MANUFACTURER FOR EXACT REQUIREMENT.
6. GROUNDING WITHIN GROUND WELL PER FLOOR PLAN AND DETAIL.
7. FURNISH AND INSTALL MANUAL TRANSFER SWITCH. VERIFY WITH COUNTY OF SAN BERNARDINO FLEET MANAGEMENT FOR EXACT REQUIREMENT.
8. FURNISH AND INSTALL CAMLOCK CONNECTOR FOR FUTURE PORTABLE GENERATOR. VERIFY WITH COUNTY OF SAN BERNARDINO FLEET MANAGEMENT FOR EXACT REQUIREMENT.
9. FURNISH AND INSTALL POWER CONNECTION TO ISD PANEL 'A'.
10. FURNISH AND INSTALL AC TRANSIENT VOLTAGE SURGE SUPPRESSOR (ACDATA SOLUTION #B2XR). INSTALL SUPPRESSOR BELOW EXISTING PANEL. VERIFY WITH MANUFACTURER FOR EXACT REQUIREMENT.
11. FURNISH AND INSTALL ALARM CONNECTION TO <E>BMS. COORDINATE WITH BSC ISD FOR <E>BMS TERMINATION. VERIFY WITH MANUFACTURER FOR EXACT REQUIREMENT.

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Local Action.



SANDY ATC MICROWAVE SITE GENERATOR

ISSUE	MARK	DATE	DESCRIPTION
		08/16/20	95% CD SUBMITTAL
		09/04/20	100% CD SUBMITTAL

SOBE PROJECT NO:	1901466
DATE:	04/15/20
DRAWN BY:	-
CHECKED BY:	-
APPROVED BY:	-

SHEET TITLE

ELECTRICAL SINGLE LINE DIAGRAM

SCALE: AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE

