FIRE PUMP AND GEN-SET OPERATION SEQUENCE

1. THE STORE WILL UTILIZE A 350 KW/437 KVA AT 80% PF GEN-SET SERVING A 600 AMPERE, NEMA 3R, BREAKER "MGP" SERVING A 600 AMPERE OPTIONAL STAND-BY POWER PANEL "MDPB"; AND A 70 AMPERE, NEMA 3R, BREAKER "MGE" SERVING A 125 AMPERE EMERGENCY LIGHTING PANEL "ELS." PANEL "ELS" IS NORMALLY SERVED BY THE LOCAL POWER COMPANY SERVICE THROUGH PANEL "MDPA" AND A 70 AMPERE AUTOMATIC TRANSFER SWITCH. PANEL "MDPB" IS NORMALLY SERVED BY THE LOCAL POWER COMPANY THROUGH PANEL "MDPA" AND A 600 AMPERE AUTOMATIC TRANSFER SWITCH. BOTH "ELS" AND "MDPB" AUTOMATIC TRANSFER SWITCHES ARE LOCATED IN ELECTRICAL ROOM #1. PANEL "MDPA" IS LOCATED IN ELECTRIC ROOM #1. ALL "ELS" EQUIPMENT IS LOCATED IN A 2-HOUR FIRE RATED ENCLOSURE WHICH IS ALSO WITHIN ELECTRICAL ROOM #1.

2. IN THE EVENT OF POWER FAILURE THE GEN-SET STARTS AND IS CAPABLE OF CARRYING THE EMERGENCY LIFE SAFETY LOADS (PANEL "ELS") WITHIN 10 SECONDS. UPON LOSS OF UTILITY POWER THE PANEL "ELS" A.T.S. SWAPS OVER TO THE GEN-SET AND PICKS UP THE CONNECTED LOADS. PANEL "MDPB" A.T.S. SWAPS OVER TO THE GEN-SET WITHIN 60 SECONDS OF POWER FAILURE THEREBY PICKING UP THE OPTIONAL STAND-BY LOADS.

3. THE GEN-SET WILL NOT START THE FIRE PUMP WITH PANEL "MDPB" ESTIMATED LOADS CONNECTED. THEREFORE, THE GEN-SET IS RELIEVED OF PANEL "MDPB" LOADS PRIOR TO STARTING THE FIRE PUMP. PANEL "ELS" LOADS SHALL NOT BE INTERRUPTED. IN THE EVENT A POWER FAILURE HAS OCCURRED AND THE STORE IS OPERATING ON THE GEN-SET POWER SOURCE (SERVING PANELS "ELS" AND "MDPB" VIA THEIR RESPECTIVE A.T.S.'S) AND THE FIRE PUMP CONTROLLER RECEIVES A SIGNAL TO START THE FIRE PUMP, THE FOLLOWING SEQUENCE OCCURS:
   - 3.1. THE FIRE PUMP CONTROLLER SHUNT-TRIPS BREAKER "MGP" AND RELIEVES THE GEN-SET OF THE PANEL "MDPB" OPTIONAL STAND-BY LOADS. (SEE "FIRE PUMP CONTACTS" ON SHEET E7.01, "GEN-SET CONTROL WIRING SCHEMATIC")
   - 3.2. THE FIRE PUMP AUTOMATIC TRANSFER SWITCH WILL THEN SWAP FROM THE NORMAL UTILITY FEED TO THE GEN-SET FEED. THE FIRE PUMP CONTROLLER WILL THEN START THE FIRE PUMP AS REQUIRED.
   - 3.3. THE GEN-SET WILL SERVE EMERGENCY LIGHTING LOADS (PANEL "ELS") AND THE FIRE PUMP UNTIL DEVICES ARE MANUALLY RE-SET.

4. REFERENCES TO CONNECTING THE FIRE PUMP TO THE GEN-SET IS DIAGRAMMATIC ONLY. EXACT CONDUCTOR SIZE, CONDUIT SIZE, COMBINATION FIRE PUMP CONTROLLER/A.T.S. IS DEPENDENT ON THE FIRE PUMP SIZE. THE SPRINKLER SUBCONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING ALL EQUIPMENT ASSOCIATED WITH THE SPRINKLER SYSTEM. THE ELECTRICAL SUBCONTRACTOR SHALL FURNISH AND INSTALL SHUNT TRIP CONTROL WIRING BETWEEN BREAKER "MGP" AND FIRE PUMP CONTROLLER/A.T.S. ELECTRICAL SUBCONTRACTOR SHALL ALSO INSTALL CONDUITS BETWEEN SPRINKLER ROOM AND FIRE PUMP PULL SECTION IN ELECTRICAL ROOM 1 AND CONDUITS BETWEEN SPRINKLER ROOM, BREAKER "MGP" AND THE GEN-SET, SEE SHEETS E3.00, E3.02, E9.00 AND E9.01. THE FIRE PUMP HORSEPOWER AND FEEDER SIZE SHOULD BE SHOWN ON THE ELECTRICAL DRAWINGS. IF THE PUMP ELECTRICAL FEEDER SIZE IS NOT SHOWN ON SHEETS E9.00 AND E9.01 THEN THE ELECTRICAL SUBCONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL ENGINEER FOR THE SIZE OF THE FEEDER TO THE FIRE PUMP. THE ELECTRICAL SUBCONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL 480V WIRING ASSOCIATED WITH THE FIRE PUMP AND JOCKEY PUMP.

5. BREAKER "MGE", BREAKER "MGP" AND BREAKER "MG-FP" SHALL BE FURNISHED BY SQUARE-D AS PART OF THE SWITCHGEAR PACKAGE. THE ELECTRICAL SUBCONTRACTOR SHALL VERIFY THAT BREAKER "MGP" IS SUPPLIED AS A SHUNT-TRIP TYPE AND THAT IT HAS THE REQUIRED AUXILIARY CONTACTS FOR MONITORING BREAKER POSITION.

GEN-SET NOTES

1. ELECTRICAL SUBCONTRACTOR WILL BE REQUIRED TO DEMONSTRATE THAT ALL ALARMS AND CONTACT CLOSURES ARE FUNCTIONING PROPERLY AND ANNUNCIATING CORRECTLY.

2. ELECTRICAL SUBCONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT AND CONDUCTORS INDICATED ON DRAWINGS AND SHALL TERMINATE ALL CONDUCTORS AT MONITORING EQUIPMENT

3. TRANSFER SWITCHES ARE OWNER SUPPLIED AND SHIPPED WITH SWITCH GEAR. FOR ALL TRANSFER SWITCH TECHNICAL ISSUES AND SUBMITTAL INFORMATION PLEASE CONTACT MARK FREEMAN. 1-704-561-9650. ASCO POWER TECHNOLOGIES.

4. FOR LOWE'S ACCEPTED GENERATOR SUPPLIERS, SEE SPECIFICATION SECTION 16231.

TRANSFER SWITCH REQUIREMENTS

△2

THE 600-AMP AND 70-AMP AUTOMATIC AND MANUAL TRANSFER SWITCHES SHALL BE PROVIDED WITH THE SWITCHGEAR AND SHIPPED FROM SQUARE D. THE AUTOMATIC TRANSFER SWITCHES SHALL BE SUPPLIED WITH INTEGRAL MODBUS MODULE FOR COMMUNICATION WITH THE BMS THROUGH A CAT6 CABLE CONNECTION. THE TRANSFER SWITCHES WILL SHIP LOOSE AND THE ELECTRICAL SUBCONTRACTOR SHALL TAKE DELIVERY, UNLOAD, STORE AS REQUIRED AND INSTALL THESE COMPONENTS ACCORDING TO THE REQUIREMENTS IN THESE DRAWINGS. ALL POWER AND CONTROL WIRING FOR THE ATS AND MTS SHALL BE FURNISHED, INSTALLED, AND TERMINATED BY THE ELECTRICAL SUBCONTRACTOR ACCORDING TO THE INFORMATION PROVIDED IN THESE DRAWINGS.

600 AMPERE - AUTOMATIC TRANSFER SWITCH - "MDPB" ATS - **IP ADDRESS 10.21.9.198**
ASCO - J03ATSB30600NGXC, 7ES, 11BE, 18RX, 72EE - SERIES 300
NOTE: ASCO IS THE BASIS OF DESIGN. ALTERNATE MANUFACTURERS
WITH EQUIVALENT OPTIONS/CAPABILITY ARE ACCEPTABLE.

70 AMPERE - AUTOMATIC TRANSFER SWITCH - "ELS" ATS - **IP ADDRESS 10.21.9.197**
ASCO - D03ATSB30070NGXC, 7ES, 11BE, 18RX, 72EE - SERIES 300
NOTE: ASCO IS THE BASIS OF DESIGN. ALTERNATE MANUFACTURERS
WITH EQUIVALENT OPTIONS/CAPABILITY ARE ACCEPTABLE.

600 AMPERE - MANUAL TRANSFER SWITCH WITH CAM-LOCKS - MTS
ASCO - J03MTQA30600N0XM, 44A
NOTE: ASCO IS THE BASIS OF DESIGN. ALTERNATE MANUFACTURERS
WITH EQUIVALENT OPTIONS/CAPABILITY ARE ACCEPTABLE.

ENGINE START MONITORING MODULE
ASCO - 5101-GEN - TO BE FIELD INSTALLED AT GEN-SET

FIRE PUMP ATS MONITORING MODULE
ASCO - 5101-ATS - TO BE FIELD INSTALLED AT FIRE PUMP CONTROLLER ATS

FIRE PUMP ATS MONITORING MODULE
ASCO - 5101-ATS - TO BE FIELD INSTALLED AT FIRE PUMP CONTROLLER ATS

NOTE:
ASCO OR ALTERNATE TRANSFER SWITCH PROVIDER SHALL PROVIDE IN THEIR "OWNER FURNISHED" PRICING TO LOWE'S, A PER PROJECT SYSTEM START UP PROCESS FOR EACH NEW ATS ORDER. A FACTORY AUTHORIZED SERVICE REPRESENTATIVE SHALL VERIFY AND/OR PERFORM THIS ON-SITE EQUIPMENT START UP PROCEDURE PRIOR TO THE COMMENCEMENT OF THE BUILDING COMMISSIONING. EQUIPMENT SHALL BE SET UP TO PROPERLY COMMUNICATE WITH LOWE'S BMS SYSTEM. DURING BUILDING COMMISSIONING, ANY DEFICIENCIES OR CONNECTION ISSUES FOUND DUE TO THE EQUIPMENT NOT PROGRAMMED OR INCORRECTLY PROGRAMMED, SHALL BE THE RESPONSIBILITY OF THE PROVIDER TO CORRECT AT NO ADDITIONAL EXPENSE TO LOWE'S.

- START UP/INITIAL TESTING, IP ADDRESS PROGRAMMING (**SEE ABOVE FOR IP ADDRESSES**), AND COMMUNICATION MODE PROGRAMMING

EMERGENCY STAND-BY GENERATOR (TIER III)

SPECIFICATIONS AND INSTALLATION GUIDELINES

1. THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE AND INSTALL A COMPLETE AND WORKING DIESEL POWERED GENERATOR SET (GEN-SET), PURCHASED FROM THE NATIONAL ACCOUNT SUPPLIER AND SHALL TAKE DELIVERY, UNLOAD, STORE AS REQUIRED, AND SET INTO PLACE ALL GENERATOR COMPONENTS, AS REQUIRED IN THE SPECIFICATIONS SECTION 16231. THE GENERATOR SHALL BE RATED 350-KW STANDBY (437-KVA AT 80% PF), 277Y/480-VOLTS, 60-HZ. THE FUEL TANK SHALL BE SET ON THE CONCRETE BASE AND THE GEN-SET SHALL BE SECURELY FASTENED TO THE ABOVE GROUND BASE MOUNTED TANK AS SHOWN IN DETAIL 5-E3.02. THE ELECTRICAL SUBCONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT, WIRE, AND ACCESSORIES TO COMPLETELY WIRE THE GEN-SET TO THE TRANSFER SWITCHES ACCORDING TO ALL WIRING DIAGRAMS OF THE MANUFACTURER AND THE REQUIREMENTS IN THESE DRAWINGS. ALL GROUNDING SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS IN THESE DRAWINGS AND AS REQUIRED FOR THE TRANSFER SWITCHES.

2. THE GENERATOR SHALL COME ON-LINE AND SUPPLY THE REQUIRED EMERGENCY POWER THROUGH PANEL "ELS" WITHIN 10 SECONDS ACCORDING TO THE REQUIREMENTS OF NEC ARTICLE 700 AND THE LIFE SAFETY CODE NFPA 101. PANEL "ELS" IS FED FROM THE 70-AMP TRANSFER SWITCH. ADDITIONALLY, THE GEN-SET SHALL DELIVER POWER TO THE "OPTIONAL" STAND-BY LOADS WITHIN 60 SECONDS. STAND-BY LOADS ARE FED FROM THE 600-AMP TRANSFER SWITCH.

3. THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE AND INSTALL A SIGN, SUITABLE FOR OUTDOOR USE, AT THE SERVICE ENTRANCE LOCATION INDICATING THE TYPE AND LOCATION OF THE ON-SITE EMERGENCY POWER SOURCES (REFERENCE NEC ARTICLE 700.8). INSTALL ALL OTHER SIGNS REGARDING MULTIPLE POWER SOURCES AS REQUIRED FOR CODE COMPLIANCE.

4. THE GEN-SET SHALL BE SUPPLIED WITH THE 600-AMP MAIN LUGS.

5. THE GEN-SET SHALL INCLUDE THE FOLLOWING ITEMS AND OPTIONS:
   - 5.1. WEATHERPROOF ENCLOSURE WITH FACTORY-INSTALLED, HINGED, LOCKABLE DOORS.
   - 5.2. MANUFACTURER SHALL PROVIDE A 72 HOUR, 100% FULL LOAD RUN TIME DOUBLE-WALLED DIESEL STATE-COMPLIANT FUEL TANK, UL 142 LABELED. TANK SHALL BE STANDARD SIZE OFFERING BY GEN-SET MANUFACTURER AND NO CUSTOM TANK SIZE ALLOWED UNLESS PRE-APPROVED BY LOWE'S PROJECT MANAGER. INCLUDE SENSORS FOR INTERSTITIAL LEAK DETECTION, 90% FULL AUDIBLE ALARM WITH RESET, OVER-FILL ALARM, AND LOW FUEL LEVEL ALARM. MAXIMUM TANK DIMENSIONS SHALL BE 70-INCHES WIDE AND 260-INCHES LONG. THE TANK SHALL BE FILLED INITIALLY, AND REFILLED AS REQUIRED, BY AND AT THE EXPENSE OF THE ELECTRICAL SUBCONTRACTOR AND SHALL BE FULL WHEN PROVIDED TO THE OWNER AT KEY TURNOVER.
   - 5.3. FUEL/WATER SEPARATOR.
   - 5.4. 8-INCH CRITICAL GRADE EXHAUST SILENCER WITH FLEXIBLE CONNECTION (FIELD-INSTALLED BY ELECTRICAL SUBCONTRACTOR).
   - 5.5. 24-VOLT DC, 10-AMP BATTERY CHARGER.
   - 5.6. 7-DAY, ELECTRONIC PROGRAMMABLE EXERCISER CLOCK WITH DIGITAL READOUT AND OPTIONS FOR LOAD TRANSFER DURING TEST CYCLE
   - 5.7. ELECTRIC CANISTER TYPE JACKET WATER HEATER WITH ISOLATION VALVES SIZED BY THE SUPPLIER FOR LOCAL AMBIENT CONDITIONS.
   - 5.8. 24-VOLT BATTERY SYSTEM SIZED FOR AMBIENT CONDITIONS IN WHICH GENERATOR MUST BE STARTED.
   - 5.9. ALL FLUIDS REQUIRED TO OPERATE THE GENERATOR.

6. A REMOTE EMERGENCY STOP SWITCH SHALL BE MOUNTED ON THE OUTSIDE OF THE GEN-SET WEATHER ENCLOSURE. THE SWITCH SHALL HAVE A WEATHERPROOF BOX WITH BREAK-GLASS TYPE COVER.

MONITORING EQUIPMENT REQUIREMENTS

1. THE GENERATOR SHALL BE PROVIDED WITH A FACTORY-INSTALLED MODBUS/OPEN PROTOCOL CONTROL PANEL FOR THE GENERATOR. THE GENERATOR MANUFACTURER SHALL COORDINATE MODBUS PROGRAMMING POINTS WITH LOWE'S AND HONEYWELL. THE CONTROL PANEL SHALL MONITOR/CONTROL THE FOLLOWING POINTS:

2. MODBUS SIGNALS REQUIRED BY OWNER'S MONITORING OF THE GENERATOR:
   - 2.1. LOW FUEL IN TANK FUEL
   - 2.2. TANK RUPTURED
   - 2.3. SWITCH NOT IN "AUTO"
   - 2.4. HIGH ENGINE TEMPERATURE
   - 2.5. LOW OIL PRESSURE
   - 2.6. LOW ENGINE TEMPERATURE
   - 2.7. LOW COOLANT LEVEL
   - 2.8. OVERSPEED
   - 2.9. OVERCRANK
   - 2.10. EMERGENCY STOP
   - 2.11. LOW BATTERY VOLTAGE
   - 2.12. GENERATOR RUNNING
   - 2.13. PERCENTAGE OF REMAINING FUEL IN TANK
   - 2.14. REMOTE START THROUGH HONEYWELL BMS / MODBUS / TO GENSET CONTROLLER

3. MODBUS SIGNALS REQUIRED BY OWNER'S MONITORING AND CONTROL OF THE TRANSFER SWITCHES:
   - 3.1. ELS ATS IN NORMAL POSITION
   - 3.2. MDPB ATS IN NORMAL POSITION
   - 3.3. ELS ATS IN EMERGENCY POSITION
   - 3.4. MDPB ATS IN EMERGENCY POSITION
   - 3.5. ELS ATS NORMAL POWER AVAILABLE
   - 3.6. MDPB ATS NORMAL POWER AVAILABLE
   - 3.7. ELS ATS EMERGENCY POWER AVAILABLE
   - 3.8. MDPB ATS EMERGENCY POWER AVAILABLE
   - 3.9. MTS IN SOURCE 1 POSITION (PERMANENT GENERATOR)
   - 3.10. MTS IN SOURCE 2 POSITION (TEMPORARY GENERATOR)
   - 3.11. MTS IN CENTER OFF POSITION (NO GENERATOR BACKUP)
   - 3.12. REMOTE SCHEDULING AND PROGRAMMING OF GENERATOR BI-WEEKLY TESTS

4. CONTROL TERMINALS REQUIRED:
   - 4.1. REMOTE START-STOP
   - 4.2. REMOTE RESET FOR STARTING
   - 4.3. REMOTE TRANSFER/RETRANSFER
   - 4.4. CRANKING BATTERY POSITIVE
   - 4.5. CRANKING BATTERY NEGATIVE

CONTROLLER MINIMUM REQUIREMENTS

1. THE CONTROLLER IS SPECIFIED IN DIVISION 16231 AND IS PART OF THE NATIONAL ACCOUNT AGREEMENT WITH THE GENERATOR SUPPLIER. THE CONTROLLER SHALL INCLUDE AN ELECTRONIC ISOCHRONOUS GOVERNOR. MONITORING POINTS ARE INDICATED IN THE SPECS AND ARE SHOWN ABOVE IN THE CONTROL WIRING SCHEMATIC AND WILL UTILIZE A MODBUS CONNECTION FOR COMMUNICATION.
2. SUPERVISORY SIGNALS SHALL INCLUDE, BUT ARE NOT LIMITED TO: PRE-LOW OIL PRESSURE, PRE-HIGH COOLANT TEMPERATURE, LOW COOLANT LEVEL, LOW FUEL LEVEL, WEAK BATTERY, BATTERY MALFUNCTION.
3. ALARM SIGNALS SHALL INCLUDE, BUT ARE NOT LIMITED TO: LOW OIL PRESSURE, HIGH COOLANT TEMPERATURE, OVER-SPEED, OVER-CRANK, HIGH AC VOLTAGE, LOW AC VOLTAGE, UNDER/OVER FREQUENCY.
4. A FACTORY PROVIDED, FIELD INSTALLED REMOTE ANNUNCIATOR SHALL BE INCLUDED WITH THE GENERATOR PACKAGE.
5. THE INTEGRITY OF THE START SIGNALS BETWEEN ALL TRANSFER SWITCHES AND THE GEN-SET SHALL BE MONITORED FOR BROKEN, DISCONNECTED, OR SHORTED WIRES UTILIZING ASCO START SIGNAL INTEGRITY MONITORING SYSTEM. LOSS OF INTEGRITY SHALL ALSO START THE GEN-SET.
6. THE MODBUS CONNECTION SHALL PROVIDE A PERCENTAGE OF FUEL REMAINING IN THE FUEL TANK AND PROVIDE THE ABILITY TO REMOTE START THROUGH THE BMS.

NOTE:
GENERATOR PROVIDER SHALL PROVIDE IN THEIR "CONTRACTOR FURNISHED" PRICING TO LOWE'S, A PER PROJECT SYSTEM START UP PROCESS FOR EACH NEW GENERATOR ORDER. A FACTORY AUTHORIZED SERVICE REPRESENTATIVE SHALL VERIFY AND/OR PERFORM THIS ON-SITE EQUIPMENT START UP PROCEDURE PRIOR TO THE COMMENCEMENT OF THE BUILDING COMMISSIONING. GENERATOR CONTROLLER SHALL BE SET UP TO PROPERLY COMMUNICATE WITH LOWE'S BMS SYSTEM. DURING BUILDING COMMISSIONING, ANY DEFICIENCIES OR CONNECTION ISSUES FOUND DUE TO THE CONTROLLER NOT PROGRAMMED OR INCORRECTLY PROGRAMMED, SHALL BE THE RESPONSIBILITY OF THE PROVIDER TO CORRECT AT NO ADDITIONAL EXPENSE TO LOWE'S.

- START UP/INITIAL TESTING, IP ADDRESS PROGRAMMING (**IP ADDRESS 10.21.9.199**), AND COMMUNICATION MODE PROGRAMMING

FINAL	SECOND	ORIGINAL

REVISIONS
◇ PRE-BID SET ISSUE DATE △ POST BID SET ISSUE DATE

DATE		DESCRIPTION
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10.05.2025

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LOWE'S

GEN-SET CONTROL WIRING NOTES

LOWE'S OF WESTLAKE
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Westlake, Florida, 33470

PCN: 77-24-13-41-29-000-0010
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