

1 GENERAL  
1.1 GENERAL REQUIREMENTS

- 1.1.1 PERFORM THE WORK IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL BUILDING CODE OF CANADA AND THE CANADIAN ELECTRICAL CODE ADOPTED BY LOCAL AUTHORITIES HAVING JURISDICTION AND OTHER CODES OF PROVINCIAL OR LOCAL APPLICATION INCLUDING AMENDMENTS UP TO PROJECT TENDER CLOSING.
- 1.1.2 THE ELECTRICAL CONTRACTOR SHALL MAKE A THOROUGH EXAMINATION OF THE SITE AND REVIEW OTHER TRADES DRAWINGS, SPECIFICATIONS, AND ADDENDUMS TO COORDINATE ASSOCIATED ELECTRICAL WORK PRIOR TO SUBMITTING TENDER PRICE. ADDITIONAL COSTS WILL NOT BE CONSIDERED DUE TO A FAILURE TO ADHERE TO THIS REQUIREMENT.
- 1.1.3 DRAWINGS FOR THE ELECTRICAL WORK ARE SHOWN DIAGRAMMATICALLY. THEY ARE INTENDED TO CONVEY THE SCOPE OF WORK AND TO INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT.
- 1.1.4 SUBMIT TO INSPECTION DEPARTMENTS NECESSARY NUMBER OF DRAWINGS AND SPECIFICATIONS FOR EXAMINATION AND APPROVAL PRIOR TO COMMENCEMENT OF WORK.
- 1.1.5 WORK SHALL BE WARRANTED FOR ONE (1) YEAR AFTER THE DATE OF SUBSTANTIAL COMPLETION.
- 1.1.6 COMPLY WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT FOR THE PROVINCE OF NEW BRUNSWICK, AND THE GENERAL REGULATIONS MADE PURSUANT TO THE ACT.
- 1.1.7 PLAN AND SCHEDULE SHUTDOWNS OF EXISTING SERVICES IN CONSULTATION WITH OWNER. MINIMIZE IMPACT AND DOWNTIME OF FACILITY OPERATIONS. OWNER'S DIRECTIVES TO BE STRICTLY FOLLOWED IN THIS REGARD.
- 1.1.8 ALTERED, CUT, PATCH AND MAKE GOOD TO MATCH EXISTING WORK. THIS INCLUDES SECTIONS OF EXISTING WORK AFFECTED BY THE REMOVAL OF EXISTING SERVICES. FIRE STOP PENETRATIONS AS REQUIRED.
- 1.1.9 WHERE UNKNOWN SERVICES ARE ENCOUNTERED, IMMEDIATELY ADVISE OWNER'S REPRESENTATIVE. CONFIRM FINDINGS IN WRITING.
- 1.1.10 THE CONTRACTOR SHALL BE RESPONSIBLE FOR REINSTATEMENT OF DISTURBED LANDSCAPING AND SITE CONDITIONS TO MATCH EXISTING CONDITIONS OR BETTER. THIS MAY INCLUDE, BUT IS NOT LIMITED TO, REINSTATEMENT OF GRASS AND TOPSOIL, CONCRETE CURBS AND SIDEWALKS, ASPHALT.
- 1.1.11 EXISTING DAMAGE IS TO BE IDENTIFIED AND REPORTED PRIOR TO COMMENCEMENT OF WORK
- 1.1.12 COORDINATE POWER SHUTDOWNS WITH NB POWER AND DEPARTMENTAL REPRESENTATIVE.

1.2 DESCRIPTION OF WORK

- 1.2.1 INSTALLATION OF NEW DIESEL GENERATOR, SUB-BASE FUEL TANKS, SOUND ATTENUATED ENCLOSURE, AUTOMATIC TRANSFER SWITCH AND ANY ASSOCIATED ELECTRICAL WORK TO MAKE SYSTEM OPERATIONAL.
- 1.2.2 ALTERATION TO BUILDING ELECTRICAL DISTRIBUTION SYSTEM TO ACCOMMODATE NEW GENERATOR.
- 1.2.3 INSTALLATION OF CONCRETE PAD AND SECURITY FENCE FOR NEW GENERATOR.
- 1.2.4 TRENCHING AND INSTALLATION OF NEW UNDERGROUND CONDUIT AND WIRE.

1.3 SUBMITTALS

- 1.3.1 SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH THE GENERAL REQUIREMENTS OF THE CONTRACT FOR THE FOLLOWING:
  - 1.3.1.1 GENERATOR C/W ENCLOSURE AND FUEL TANKS
  - 1.3.1.2 AUTOMATIC TRANSFER SWITCH C/W BYPASS SWITCH.
  - 1.3.1.3 ASSOCIATED ELECTRICAL DISTRIBUTION EQUIPMENT.
  - 1.3.1.4 ASSOCIATED HARDWARE AND ACCESSORIES.
  - 1.3.1.5 FENCE DATA SHEETS.
- 1.3.2 SUBMIT AS-BUILT DRAWINGS IN ACCORDANCE WITH THE GENERAL REQUIREMENTS OF THE CONTRACT.
- 1.3.3 SUBMIT REVIEWED SHOP DRAWINGS, MAINTENANCE INSTRUCTIONS, PERMITS, AND TEST RESULTS FOR INSERTION INTO O&M MANUAL IN ACCORDANCE WITH THE GENERAL REQUIREMENTS OF THE CONTRACT.

2 PRODUCTS

2.1 BURIED CABLE AND DUCT

2.1.1 WIRE:

- 2.1.1.1 STRANDED CONDUCTORS FOR 10 AWG AND LARGER. MINIMUM SIZE 12 AWG. COPPER CONDUCTORS SIZE AS INDICATED, WITH 600 V INSULATION OF CHEMICALLY CROSS LINKED THERMOSETTING POLYETHYLENE MATERIAL RATED RW90. COLOURED GREEN FOR BOND WIRE.
- 2.1.1.2

2.1.2 CONDUIT AND FITTINGS:

- 2.1.2.1 RIGID PVC CONDUIT TYPE DB2 FOR DIRECT BURIAL TO CSA C22.2 NO. 211.
- 2.1.2.2 RIGID PVC FITTINGS TO CAN/CSA C22.2 NO. 18, MANUFACTURED FOR USE WITH CONDUIT SPECIFIED.
- 2.1.2.3 RIGID PVC 90° AND 45° BENDS AS REQUIRED.
- 2.1.2.4 RIGID 5" ANGLE COUPLINGS AS REQUIRED.
- 2.1.2.5 EXPANSION JOINTS AS RECOMMENDED BY MANUFACTURER.

2.1.3 MARKER TAPE: RED POLYETHYLENE MARKER TAPE, 75MM WIDE MARKED "WARNING - ELECTRICAL POWER CABLE BELOW".

2.1.4 INSTALLATION:

- 2.1.4.1 INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 2.1.4.2 INSTALL BURIED PVC CONDUIT COMPLETE WITH FITTINGS, CAPS, COUPLINGS, BENDS, EXPANSION JOINTS, SOLVENT WELD, ETC. TO MAKE THE COMPLETE INSTALLATION.
- 2.1.4.3 SLOPE WITH 1 TO 400 MINIMUM SLOPE.
- 2.1.4.4 DURING CONSTRUCTION, CAP ENDS OF DUCTS TO PREVENT ENTRANCE OF FOREIGN MATERIALS.
- 2.1.4.5 INSTALL MARKERS AS REQUIRED.
- 2.1.4.6 INSTALL POLYPROPYLENE FISH CORD IN ALL DUCTS.
- 2.1.4.7 DO NOT PULL SPLICED CABLES INSIDE DUCTS.
- 2.1.4.8 INSTALL EXPANSION JOINTS IN CONDUIT SYSTEMS IN ALL RISES ABOVE GRADE AND IN ALL CONNECTIONS TO FIXED EQUIPMENT.
- 2.1.4.9 AFTER INSTALLATION OF CABLES, SEAL DUCT ENDS WITH DUCT SEALING COMPOUND.

2.1.5 FIELD QUALITY CONTROL:

- 2.1.5.1 PERFORM TESTS USING QUALIFIED PERSONNEL. PROVIDE NECESSARY INSTRUMENTS AND EQUIPMENT.
- 2.1.5.2 CHECK EACH FEEDER FOR CONTINUITY, SHORT CIRCUITS, AND GROUNDS. ENSURE RESISTANCE TO GROUND OF CIRCUITS IS NOT LESS THAN 50 MEGAOHMS.
- 2.1.5.3 PERFORM INSULATION RESISTANCE TEST WITH 1000 V MEGGER ON EACH PHASE CONDUCTOR.
- 2.1.5.4 CONDUCT HIPOT TESTING TO IEEE 400 AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- 2.1.5.5 REMOVE AND REPLACE ENTIRE LENGTH OF CABLE IF CABLE FAILS TO MEET ANY OF TEST CRITERIA.

2.2 DISCONNECT SWITCH:

2.2.1 DESCRIPTION:

- 2.2.1.1 SERVICE ENTRANCE RATED, HEAVY DUTY, FUSIBLE, QUICK-MAKE, QUICK-BREAK, VOIDABLE COVER, ON-OFF POSITION INDICATOR AND PROVISIONS FOR PADLOCKING IN ON OR OFF POSITION WITH NEUTRAL BAR, CSA 1 ENCLOSURE.
- 2.2.1.2 FUSED HOLDERS ARE TO SUIT RATING AND TYPES OF FUSES.
- 2.2.1.3 WITHSTAND RATING 6 TIMES CONTINUOUS CURRENT RATING AT RATED VOLTAGE.
- 2.2.1.4 FUSES SHALL BE HRC TYPE, VOLTAGE AS REQUIRED, FORM I, CLASS "J" NON-RENEWABLE, DUAL ELEMENT, TIME DELAY, 200 KAIC. PROVIDE 2 SPARE FUSES. ACCEPTABLE MANUFACTURERS: FERRAZ-SHAWMUT, LITTLEFUSE, BUSSMAN.
- 2.2.1.5 PROVIDE LAMACOID LABEL MARKED "MAIN DISCONNECT".

2.2.2 ACCEPTABLE MANUFACTURER: SIEMENS, SQUARE D, CUTLER-HAMMER.

2.3 AUTOMATIC TRANSFER SWITCH:

2.3.1 DESCRIPTION:

- 2.3.1.1 MONITOR VOLTAGE ON PHASES OF NORMAL POWER SUPPLY.
- 2.3.1.2 INITIATE CRANKING OF STANDBY GENERATOR UNIT ON NORMAL POWER FAILURE OR ABNORMAL VOLTAGE ON ANY ONE PHASE BELOW PRESET ADJUSTABLE LIMITS FOR ADJUSTABLE PERIOD OF TIME.
- 2.3.1.3 TRANSFER LOAD FROM NORMAL SUPPLY TO STANDBY UNIT WHEN STANDBY UNIT REACHES RATED FREQUENCY AND VOLTAGE PRESET ADJUSTABLE LIMITS.
- 2.3.1.4 TRANSFER LOAD FROM STANDBY UNIT TO NORMAL POWER SUPPLY WHEN NORMAL POWER IS RESTORED, CONFIRMED BY SENSING OF VOLTAGE ON PHASES ABOVE ADJUSTABLE PRESET LIMIT FOR ADJUSTABLE TIME PERIOD.
- 2.3.1.5 SHUT DOWN STANDBY UNIT AFTER RUNNING UNLOADED TO COOL DOWN USING ADJUSTABLE TIME DELAY RELAY.
- 2.3.1.6 TRANSFER SWITCH TO BE 200A, 240V, 1 PHASE, CSA 1 ENCLOSURE C/W SPRINKLER SHIELD AS REQUIRED.
- 2.3.1.7 TRANSFER SWITCH TO HAVE SOLID NEUTRAL.
- 2.3.1.8 TRANSFER SWITCH TO HAVE MAINTENANCE BYPASS SWITCH.

2.3.2 BYPASS ISOLATION SWITCH:

- 2.3.2.1 TWO-WAY BYPASS ISOLATION SWITCH FOR MANUAL BYPASS OF THE LOAD TO EITHER SOURCE AND PERMIT ISOLATION OF THE ATS.
- 2.3.2.2 SEPARATE BYPASS AND ISOLATION HANDLES PERMANENTLY AFFIXED AND OPERABLE WITHOUT OPENING THE ENCLOSURE DOOR.
- 2.3.2.3 BYPASS TO THE LOAD-CARRYING SOURCE SHALL BE ACCOMPLISHED WITHOUT INTERRUPTION OF POWER TO THE LOAD.
- 2.3.2.4 BYPASS OPERATING MODES: BYPASS TO NORMAL, AUTOMATIC, AND BYPASS TO EMERGENCY.
- 2.3.2.5 ISOLATION HANDLE OPERATING MODES: CLOSED, TEST, AND OPEN.
- 2.3.2.5.1 TEST MODE SHALL PERMIT TESTING OF THE ENTIRE EMERGENCY POWER SYSTEM, WITH NO INTERRUPTION OF POWER TO THE LOAD.
- 2.3.2.5.2 OPEN MODE SHALL COMPLETELY ISOLATE THE AUTOMATIC TRANSFER SWITCH FROM SOURCE AND LOAD POWER CONDUCTORS.
- 2.3.2.6 BYPASS SWITCH SHALL FUNCTION AS A MANUAL TRANSFER SWITCH IN OPEN OR TEST MODES.

2.3.3 INSTALLATION

- 2.3.3.1 INSTALL EQUIPMENT AS INDICATED, MAINTAIN MINIMUM 1M CLEARANCE PER CEC REQUIREMENTS.
- 2.3.3.2 CHECK FACTORY CONNECTIONS FOR MECHANICAL SECURITY AND ELECTRICAL CONTINUITY.
- 2.3.3.3 CHECK RELAYS, SOLID STATE MONITORS, AND ADJUST TO ENSURE PROPER WORKING CONDITIONS.
- 2.3.3.4 PROVIDE FACTORY TRAINED FIELD SERVICE TECHNICIAN TO VERIFY INSTALLATION AND WITNESS START-UP AND COMMISSIONING OF EMERGENCY POWER SYSTEM.
- 2.3.3.5 ENERGIZE TRANSFER EQUIPMENT FROM NORMAL POWER SUPPLY.
- 2.3.3.6 SET GENERATOR CONTROL PANEL SELECTOR SWITCH IN TEST POSITION TO ENSURE PROPER STANDBY START, RUNNING, TRANSFER AND RE-TRANSFER. RETURN SELECTOR SWITCH TO AUTO POSITION TO ENSURE STANDBY SHUTS DOWN.
- 2.3.3.7 SET GENERATOR CONTROL PANEL SELECTOR SWITCH MANUAL POSITION AND CHECK TO ENSURE PROPER PERFORMANCE.
- 2.3.3.8 SET GENERATOR CONTROL PANEL SELECTOR SWITCH IN ENGINE START POSITION AND CHECK TO ENSURE PROPER PERFORMANCE. RETURN SWITCH TO AUTO TO STOP ENGINE.
- 2.3.3.9 SET GENERATOR CONTROL PANEL SELECTOR SWITCH IN "AUTO" POSITION AND OPEN NORMAL POWER SUPPLY DISCONNECT. STANDBY SHOULD START, COME UP TO RATED VOLTAGE AND FREQUENCY, AND THEN LOAD SHOULD TRANSFER TO STANDBY. ALLOW TO OPERATE FOR TEN (10) MINUTES, THEN CLOSE MAIN POWER SUPPLY DISCONNECT. LOAD SHOULD TRANSFER BACK TO NORMAL POWER SUPPLY AND STANDBY SHOULD SHUTDOWN.
- 2.3.3.10 REPEAT, AT ONE (1) HOUR INTERVALS, SIX (6) TIMES, COMPLETE TEST WITH SELECTOR SWITCH IN EACH POSITION, FOR EACH TEST.
- 2.3.3.11 PROVIDE OPERATION AND MAINTENANCE DATA, TECHNICAL DATA, AND COPIES OF FIELD TEST RESULTS FOR AUTOMATIC LOAD TRANSFER EQUIPMENT FOR INCORPORATION INTO MANUAL SPECIFIED IN SECTION 01 78 00 - CLOSEOUT SUBMITTALS.

2.3.4 ACCEPTABLE MANUFACTURER: KOHLER, CATERPILLAR, CUMMINS, ASCO, GENERAC.

2.4 DIESEL GENERATOR:

2.4.1 SYSTEM DESCRIPTION:

- 2.4.1.1 AUTOMATIC STARTING ON ABNORMAL OR LOSS OF NORMAL VOLTAGE: VOLTAGE SENSING RELAYS TO SENSE THREE PHASES OF UTILITY POWER SUPPLY. IF VOLTAGE ON ANY ONE PHASE SHOULD DROP BELOW PRESET LIMITS (ADJUSTABLE) FOR ADJUSTABLE PERIOD OF TIME, CLOSE ENGINE START CONTACT AND START ENGINE.
- 2.4.1.2 WHEN EMERGENCY SUPPLY HAS REACHED SETTLED VOLTAGE AND FREQUENCY PRESET LIMITS (ADJUSTABLE) TRANSFER SWITCH WILL TRANSFER LOAD TO EMERGENCY SUPPLY.
- 2.4.1.3 CONTINUE TO SUPPLY LOAD UNTIL UTILITY POWER SUPPLY RETURNS OR SET IS SHUT DOWN MANUALLY OR UNDER FAILURE CONDITIONS.
- 2.4.1.4 ON UTILITY POWER RESTORATION, CONFIRMED BY THREE PHASE SENSING OF VOLTAGE ABOVE ADJUSTABLE PRESET, FOR TIME PERIOD IN EXCESS OF THREE MINUTES (ADJUSTABLE), TRANSFER SWITCH WILL TRANSFER LOAD TO UTILITY POWER SUPPLY.
- 2.4.1.5 PROVIDE ADJUSTABLE TIME DELAY RELAY TO ALLOW ENGINE TO RUN UNLOADED TO COOL DOWN AND SUBSEQUENTLY TO SHUT DOWN, READY FOR NEXT CYCLE.
- 2.4.1.6 EQUIP ENGINE WITH KEY SWITCH WITH FOLLOWING POSITIONS: AUTO-OFF-CRANK-START, KEY REMOVABLE IN AUTO POSITION ONLY.
- 2.4.1.7 AUTOMATIC SHUTDOWN ON:
  - 2.4.1.7.1 OVERCRANKING.
  - 2.4.1.7.2 OVERSPEED.
  - 2.4.1.7.3 HIGH ENGINE TEMP.
  - 2.4.1.7.4 LOW LUBRICATING OIL PRESSURE.
  - 2.4.1.7.5 OVER AND UNDER FREQUENCY.
  - 2.4.1.7.6 EMERGENCY BREAKER FAILURE.
  - 2.4.1.7.7 ELECTRICAL BREAKER FAILURE.
  - 2.4.1.7.8 ELECTRICAL FAULT LOCK-OUT ON SHORT CIRCUIT AND GENERATOR OVER AND UNDER VOLTAGE.

2.4.2 REQUIREMENTS:

- 2.4.2.1 TOTAL OUTPUT: 40KW.
- 2.4.2.2 VOLTAGE: 240V.
- 2.4.2.3 FREQUENCY: 60HZ.
- 2.4.2.4 PHASEWIRE: 1 PHASE, 3 WIRE.
- 2.4.2.5 POWER FACTOR: 0.8 LAG.
- 2.4.2.6 LOAD HARMONIC CONTENT: 20% THD.
- 2.4.2.7 MAXIMUM ROTATIONAL SPEED: 1800RPM.
- 2.4.2.8 DAILY FULL LOAD CONTINUOUS PLUS 10% OVERLOAD FOR 1 HOUR IN EVERY 12 HOUR PERIOD.
- 2.4.2.9 PERFORMANCE: AUTOMATIC.
- 2.4.2.10 SOLID NEUTRAL.

2.4.3 SYSTEM COMPONENTS:

- 2.4.3.1 DIESEL ENGINE.
- 2.4.3.2 LUBRICATION SYSTEM.
- 2.4.3.3 VIBRATION ISOLATORS.
- 2.4.3.4 DOUBLE WALL CONTAINMENT SUB-BASE FUEL TANK.
- 2.4.3.5 ULTRASONIC FUEL LEVEL TRANSMITTER (4-20MA)
- 2.4.3.6 HIGH FUEL LEVEL FLOAT SWITCH.
- 2.4.3.7 GOVERNOR.
- 2.4.3.8 ENGINE EXHAUST SYSTEM.
- 2.4.3.9 ENGINE COOLING SYSTEM.
- 2.4.3.10 ENGINE VENTILATING SYSTEM.
- 2.4.3.11 STARTING MOTOR(S).
- 2.4.3.12 BATTERIES AND RACK.
- 2.4.3.13 BATTERY CHARGER.
- 2.4.3.14 GENERATOR AND EXCITER.
- 2.4.3.15 VOLTAGE REGULATOR AND ACCESSORIES.
- 2.4.3.16 COMBINED CONTROL, TRANSFER BYPASS PANEL.
- 2.4.3.17 SOUND ATTENUATED WEATHERPROOF ALUMINUM ENCLOSURE.
- 2.4.3.18 SPARES AND ACCESSORIES.

2.4.4 INSTALLATION:

- 2.4.4.1 SECURE GENERATOR TO SUB-BASE FUEL TANK AND SECURE FUEL TANK TO CONCRETE SLAB AS PER MANUFACTURER'S RECOMMENDATIONS.
- 2.4.4.2 TERMINATE ALL POWER AND CONTROL WIRING TO GENERATOR CONTROL PANEL AND POWER PANEL.
- 2.4.4.3 PERFORM THE FOLLOWING NON-OPERATIONAL TEST AND CHECKS BEFORE STARTING THE UNIT:
  - 2.4.4.3.1 SHAFT ALIGNMENT, END FLOAT, ANGULAR AND PARALLEL.
  - 2.4.4.3.2 OIL RESISTANCE OF GENERATOR WINDINGS.
  - 2.4.4.3.3 BELT TENSIONING.
  - 2.4.4.3.4 EQUIPMENT GROUNDS.
  - 2.4.4.3.5 ELECTRICAL WIRING.
  - 2.4.4.3.6 ALL GREASE LUBRICATING POINTS.
  - 2.4.4.3.7 PERSONNEL SAFETY GUARDS.
  - 2.4.4.3.8 AIR CLEANER.
  - 2.4.4.3.9 COOLANT.
  - 2.4.4.3.10 LUBRICATING OIL TYPE AND LEVEL.
  - 2.4.4.3.11 TYPE OF FUEL.
  - 2.4.4.3.12 VIBRATION ISOLATOR ADJUSTMENT.
  - 2.4.4.3.13 TEMPERATURE AND PRESSURE SENSORS.
  - 2.4.4.3.14 ENGINE EXHAUST SYSTEM.
  - 2.4.4.3.15 TOOLS.
- 2.4.4.4 PERFORM THE FOLLOWING PROTECTION AND CONTROL DEMONSTRATION TEST AND CHECKS:
  - 2.4.4.4.1 OVERHEAT PROTECTION.
  - 2.4.4.4.2 LOW OIL PRESSURE PROTECTION.
  - 2.4.4.4.3 CRANKING CUT OUT.
  - 2.4.4.4.4 OVER CRANK PROTECTION (3 TRIES).
  - 2.4.4.4.5 OVER SPEED PROTECTION.
  - 2.4.4.4.6 UNDER AND OVER FREQUENCY.
  - 2.4.4.4.7 UNDER AND OVER VOLTAGE.
  - 2.4.4.4.8 ELECTRICAL FAULT PROTECTION:
    - 2.4.4.4.8.1 FAILURE TO CLOSE BREAKER.
    - 2.4.4.4.8.2 FAILURE TO BUILD UP VOLTAGE.
  - 2.4.4.4.9 GENERATOR SHORT CIRCUIT AND OVERCURRENT.
  - 2.4.4.4.9 ALL CONTROL FUNCTIONS.
- 2.4.4.5 LOAD TESTS: LOAD TEST UNIT FOR 4 HOURS AT FULL RATED LOAD. RECORD THE FOLLOWING DATA AT START OF LOAD TEST AND EVERY 30 MINUTE INTERVALS THEREAFTER: SUBMIT THE DATA TO THE DEPARTMENTAL REPRESENTATIVE UPON COMPLETION OF TESTING
  - 2.4.4.5.1 TIME OF READING.
  - 2.4.4.5.2 FREQUENCY.
  - 2.4.4.5.3 VOLTAGE.
  - 2.4.4.5.4 CURRENT.
  - 2.4.4.5.5 KILOWATTS.
  - 2.4.4.5.6 GENERATOR WINDING TEMPERATURE.
  - 2.4.4.5.7 GENERATOR FRAME TEMPERATURE.
  - 2.4.4.5.8 ENGINE COOLANT TEMPERATURE.
  - 2.4.4.5.9 OIL TEMPERATURE AND PRESSURE.
  - 2.4.4.5.10 MANIFOLD PRESSURE.
  - 2.4.4.5.11 AMBIENT TEMPERATURE.
  - 2.4.4.5.12 GENERATOR COOLING AIR OUTLET TEMPERATURE.
  - 2.4.4.5.13 EXCITER FIELD CURRENT AND VOLTAGE.
- 2.4.4.6 RECORD TEST DATA AND MANUFACTURER'S TEST FORMS C/W DIAGRAMS, DESCRIPTION OF TEST RESULTS, DEFICIENCIES AND CORRECTIVE ACTION.
- 2.4.4.7 ONCE TESTS ARE COMPLETE, FILL FUEL TANKS TO MAX CAPACITY. PROVIDE OPERATION AND MAINTENANCE DATA, TECHNICAL DATA, AND COPIES OF FIELD TEST RESULTS FOR AUTOMATIC LOAD TRANSFER EQUIPMENT FOR INCORPORATION INTO MANUAL SPECIFIED IN SECTION 01 78 00 - CLOSEOUT SUBMITTALS.
- 2.4.4.8

2.4.5 ACCEPTABLE MANUFACTURER: KOHLER, CATERPILLAR, CUMMINS, GENERAC.

2.5 CONCRETE SLAB:

2.5.1 SYSTEM DESCRIPTION:

- 2.5.1.1 CONCRETE: CLASS C-2, 32MPa MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS.
- 2.5.1.2 CONCRETE WORKMANSHIP AND MATERIALS TO CSA A23.1-14 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION.
- 2.5.1.3 REINFORCING: TO CSA G30.18, GRADE 400 DEFORMED BARS.
- 2.5.1.4 INSULATION: STYROFOAM SM TYPE 4 BY DOW OR APPROVED EQUAL.
- 2.5.1.5 STRUCTURAL FILL: CRUSHED STONE, FREE OF DELETERIOUS MATERIALS SUCH AS WEAK ROCK, ORGANICS, MUD, FROZEN GROUND, ICE, SNOW, AND FOREIGN MATTER (SUCH AS ASPHALT OR CONCRETE, ETC.). SIZE: 30mm MINUS.

2.6 FENCE:

2.6.1 SYSTEM DESCRIPTION:

- 2.6.1.1 FENCE WIRE TO BE 9 GAUGE STEEL, HOT DIPPED GALVANIZED AFTER WEAVING IN A 50mm DIAMOND PATTERN. TOP EDGE TWISTED EDGE.
- 2.6.1.2 PROVIDE GATE THAT SWINGS OUT, IN FRONT PORTION OF FENCE C/W LATCH FOR PADLOCKING.
- 2.6.1.3 PROVIDE ALL CORNER, GATE, AND LINE POSTS AS REQUIRED.
- 2.6.1.4 EXCAVATE POST HOLES TO DIMENSIONS AS REQUIRED BY MANUFACTURER/INSTALLER. PLACE CONCRETE IN POST HOLES THEN EMBED POSTS INTO CONCRETE. BRACE TO HOLD POSTS PLUMB UNTIL CONCRETE SETS. DO NOT INSTALL FENCE UNTIL POSTS HAVE SET AND CONCRETE HAS CURED (5 DAYS).
- 2.6.1.5 PROVIDE ALL BRACES, TOPS, CAPS, TOP RAILS, AND BOTTOM TENSION WIRES AS REQUIRED TO COMPLETE INSTALLATION.
- 2.6.1.6 FENCE TO BE INSTALLED BY A CERTIFIED FENCE INSTALLER.

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BUILDINGS - EARTH & ENVIRONMENT  
 ENERGY - INDUSTRIAL  
 INFRASTRUCTURE - SUSTAINABILITY



0	RELEASED FOR TENDER	APR.30 2015
revisions		date
project		project

GRAND MANAN,  
INSTALL NEW  
GENERATOR

drawing dessin

ELECTRICAL  
SPECIFICATION

designed	M. GALLANT	conçu
date	APRIL 2015	
drawn	M. GALLANT	dessiné
date	APRIL 2015	
approved		approuvé
date		
Tender		Soumission
PWGC Project Manager	2015/05/19	Administrateur de projets TPSCC
project number		no. du projet
	R.061867.002	
drawing no.		no. du dessin
	E-2	

