

**PART 1 SCOPE OF WORK**

- SCOPE**
- REMOVE EXISTING GENERATOR, PAD, AND ASSOCIATED EQUIPMENT AND REPLACE WITH NEW PAD, ASSOCIATED EQUIPMENT, CONNECTIONS AND CONTROLS FOR A COMPLETE INSTALLATION. THIS INSTALLATION INCLUDES GAS CONNECTIONS AS OUTLINED ON MECHANICAL DRAWINGS AND SHALL BE COMPLETED BY 10:00 AM ON STARTUP DATES. THE GENERATOR AND ITS ENCLOSURE SHALL BE TO CANULOC C282 COMPLIANT, THE GAS METER WILL NOT BE CANULOC C282 COMPLIANT. ENSURE LOAD BANK IS SETUP TO KEEP THE GENERATOR RUNNING AT A MINIMUM OF 45kVA BY ADDING SENSITIVE LOADS WHEN REQUIRED. GENERATOR SHOULD BE CAPABLE OF FULL LOAD TESTING UTILIZING THE LOAD BANK.
  - DISCONNECT AND RECONNECT SUMP PUMP AND CONTROL CIRCUITS FROM EXISTING PANEL 'X' (EXISTING PANEL, C/OCT 10 17) TO EXISTING PANEL 'C'. PROVIDE JUNCTION BOXES AND EXTEND CIRCUITS AS NECESSARY TO THE ENGINEER OF RECORD UPON REQUEST.
  - SUPPLY AND INSTALL NEW PANEL 'G' FOR GENERATOR AND ASSOCIATED EQUIPMENT.
  - RELABEL PANELS AND PANEL SCHEDULES AFFECTED BY THE PROJECT SCOPE. LOAD TEST PANELS AND REBALANCE PANELS TO THE ENGINEER OF RECORD UPON REQUEST.
  - SUPPLY AND INSTALL ALL NECESSARY CONDUIT, WIRING AND CONNECTIONS FOR GENERATOR AND LOAD BANK.
  - PROVIDE ITEMIZED PRICE CREDIT FOR EXISTING GENERATOR AND DISCONNECT SWITCH, ELSE TURN OVER GENERATOR AND DISCONNECT SWITCH TO OWNER.
  - SUPPLY AND INSTALL TEMPORARY GENERATOR EQUAL OR GREATER THAN 80kW. COORDINATE ALL SHUTDOWNS WITH OWNER. INCLUDE 1 FULL TANK OF FUEL. ALL OTHER FUEL TO BE PROVIDED BY OWNER.

- DELIVERABLES TO THE ENGINEER:**
- COPY OF ELECTRICAL SAFETY AUTHORITY NOTICE OF INSPECTION AND COMPLETION CERTIFICATE.
  - CONTRACTOR LETTER OF COMPLETION TO CERTIFY WORK IS COMPLETE IN ACCORDANCE WITH THE DRAWINGS.
  - EMERGENCY LIGHT LETTER TO IDENTIFY THE EMERGENCY LIGHTS HAVE BEEN TESTED TO THE MINIMUM REQUIREMENTS OF THE ONTARIO BUILDING CODE'S EMERGENCY POWER REQUIREMENTS.
  - PROVIDE SIGNED VERIFICATION REPORT THAT INCLUDES AUDIBLE VERIFICATION.

- GENERAL**
- CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, SERVICES, TOOLS, EQUIPMENT, AND FIXTURES NECESSARY TO PERFORM AND COMPLETE IN GOOD AND WORKMANLIKE MANNER TO THE WORK DESCRIBE. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL LAWS, ORDINANCES, BUILDING CODES, RULES AND REGULATIONS APPLYING TO THE WORK, INCLUDING, BUT NOT LIMITED TO, THE ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT, ENVIRONMENTAL REGULATIONS AND THE OCCUPATIONAL SAFETY AND HEALTH ACT. AS AMENDED, CONTRACTOR SHALL HAVE CONTROL OVER, AND BE SOLELY RESPONSIBLE FOR, ALL MEANS, METHODS AND SEQUENCES FOR PERFORMING THE WORK. ANY DISCREPANCIES BETWEEN SPECIFICATIONS OR DRAWING PACKAGES MUST BE IMMEDIATELY REPORTED TO THE ENGINEER OF RECORD. THE ENGINEER OF RECORD SHOULD BE NOTIFIED TO THE ENGINEER OF RECORD IN WRITING. ALL INFORMATION INCLUDED IN SUPPLEMENTARY DIVISION SECTIONS SHALL FORM PART OF THIS DIVISION SECTION AS APPLICABLE. ANY SMALL ITEMS REQUIRED TO FURNISH A COMPLETE INSTALLATION, BUT ARE NOT SPECIALLY CALLED OUT, ARE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE NOT CONSIDERED AS EXTRA.
  - VERIFY ALL COUNT QUANTITIES PRIOR TO TENDER CLOSE.

- REFERENCES**
- ONTARIO ELECTRICAL SAFETY CODE (LATEST EDITION)
  - ONTARIO BUILDING CODE
  - CSA C22.1, CANADIAN ELECTRICAL CODE, PART 1, SAFETY STANDARD FOR ELECTRICAL INSTALLATIONS.
  - CAN/CSA-22.3 NO. 1, OVERHEAD SYSTEMS.
  - CAN/CS-226, PREFERRED VOLTAGE LEVELS FOR AC SYSTEMS, 0 TO 35,000 V.
  - CANULOC-SS37 STANDARD FOR VERIFICATION OF FIRE ALARM SYSTEMS
  - CANULOC-SS24-14 STANDARD FOR THE INSTALLATION OF FIRE ALARM SYSTEMS

- CARE, OPERATION AND START-UP**
- INSTRUCT OWNER'S REPRESENTATIVE AND OPERATING PERSONNEL IN THE OPERATION, CARE AND MAINTENANCE OF SYSTEMS, SYSTEM EQUIPMENT AND COMPONENTS.
  - IS REQUIRED TO MAINTAIN MANUFACTURER'S WARRANTY, ARRANGE AND PAY FOR SERVICES OF MANUFACTURER'S FACTORY SERVICE ENGINEER TO SUPERVISE START-UP OF INSTALLATION, CHECK, ADJUST, BALANCE AND CALIBRATE COMPONENTS AND INSTRUCT OPERATING PERSONNEL.
  - PROVIDE THESE SERVICES FOR SUCH PERIOD, AND FOR AS MANY VISITS AS NECESSARY TO PUT EQUIPMENT IN OPERATION AND ENSURE THAT OPERATING PERSONNEL ARE CONVERSANT WITH ALL ASPECTS OF ITS CARE AND OPERATION.

- SUBMITTALS**
- ALL ALTERNATES OR SUBSTITUTIONS FOR PRODUCTS LISTED SHALL BE SUBMITTED TO THE PROJECT TEAM AT LEAST ONE (1) WEEK PRIOR TO TENDER CLOSE.
  - SUBMIT SHOP DRAWINGS, OR MANUFACTURER'S PRODUCT DATA, FOR TRANSFORMERS, PANELBOARDS, BREAKERS, DISCONNECTS, RECEPTACLES, COVERPLATES, HEATING EQUIPMENT, EXIT AND EMERGENCY LIGHTING, LUMINAIRE CUT SHEETS, FIRE ALARM, AND SPECIAL SYSTEMS, SUBMISSIONS SHALL BE IN THE SAME UNIT OF MEASURE AS USED ON THE DRAWINGS.
  - FOR LUMINAIRES, SUBMIT CUT SHEETS FROM THE MANUFACTURER WITH SPECIFIC CATALOGUE NUMBERS IN THE SAME ORDER AS THE LUMINAIRE SCHEDULE.
  - DETAILS OF CONSTRUCTION, DIMENSIONS, CAPACITIES, WEIGHTS, AND ELECTRICAL PERFORMANCE SHALL BE INDICATED ON THE SUBMITTALS.
  - WHERE APPLICABLE, WIRING OR SINGLE LINE DIAGRAMS SHALL BE PROVIDED.
  - EACH SHOP DRAWING SHALL BE STAMPED AS CORRECT BY THE CONTRACTOR TO INDICATE THEIR APPROVAL, AS THE TRADE PURCHASING THE ITEMS.
  - IF THE ABOVE HAS NOT BEEN MET, THE SHOP DRAWINGS WILL BE RETURNED AS 'REJECTED'.
  - THE REVIEW IS FOR THE SOLE PURPOSE OF IDENTIFYING DISCREPANCIES TO THE DESIGN CONCEPT. APPROVAL OF DESIGN DETAILS IS THE RESPONSIBILITY OF THE CONTRACTOR, ENGINEER'S REVIEWS DOES NOT RELIEVE THE CONTRACTOR OF THEIR REQUIREMENTS TO MEET THE INTENT OF THE DESIGN DOCUMENTS.

- QUALITY CONTROL**
- PROVIDE CSA CERTIFIED EQUIPMENT AND MATERIAL. WHERE CSA CERTIFIED EQUIPMENT AND MATERIAL IS NOT AVAILABLE, SUBMIT SUCH EQUIPMENT AND MATERIAL TO AUTHORITY HAVING JURISDICTION FOR APPROVAL BEFORE DELIVERY TO SITE.
  - SUBMIT CERTIFICATE OF ACCEPTANCE FROM AUTHORITY HAVING JURISDICTION UPON COMPLETION OF WORK TO OWNER'S REPRESENTATIVE.
  - MANUFACTURER'S FIELD REPORTS: SUBMIT TO OWNER'S REPRESENTATIVE WITHIN SEVEN (7) WORKING DAYS OF REVIEW, VERIFYING COMPLIANCE OF WORK AND ELECTRICAL SYSTEM AND INSTRUMENTATION TESTING, INSPECT AND TEST THE FOLLOWING SYSTEMS TO DEMONSTRATE OPERATION OF SYSTEMS, DEMONSTRATE TO THE SATISFACTION TO THE OWNER, THEIR REPRESENTATIVES, AND ENGINEERING TEAM AS REQUIRED:
    - POWER DISTRIBUTION INCLUDING PHASING AND LOAD BALANCING WITH ALL NORMAL OPERATING LOADS. ADJUST AS REQUIRED.
    - BRANCH CIRCUIT CONNECTIONS.
    - LIGHTING AND LIGHTING CONTROL SYSTEMS.
    - EMERGENCY LIGHT AND EXIT SIGNS.
    - MOTORS AND CONTROL EQUIPMENT.
    - FIRE ALARM SYSTEM.

- FIELD QUALITY CONTROL**
- SINGLE LINE ELECTRICAL DIAGRAMS
  - SUBMIT SINGLE LINE ELECTRICAL DIAGRAMS IN GLAZED FRAMES AS FOLLOWS:
    - ELECTRICAL DISTRIBUTION SYSTEM: LOCATE IN MAIN ELECTRICAL ROOM.
    - ELECTRICAL POWER GENERATION AND DISTRIBUTION SYSTEMS: LOCATE IN POWER PLANT ROOM.

- PERMITS, FEES AND INSPECTION**
- SUBMIT TO ELECTRICAL SAFETY AUTHORITY AND SUPPLY AUTHORITY NECESSARY NUMBER OF DRAWINGS AND SPECIFICATIONS FOR EXAMINATION AND APPROVAL PRIOR TO COMMENCEMENT OF WORK.
  - PAY ASSOCIATED FEES.
  - THE ELECTRICAL ENGINEER OF RECORD WILL PROVIDE DRAWINGS AND SPECIFICATIONS REQUIRED BY ELECTRICAL INSPECTION DIVISION AND SUPPLY AUTHORITY AT NO COST.
  - IF SPECIALIZED THIRD PARTY DESIGNERS ARE REQUIRED BY THE SUPPLY AUTHORITY, THE CONTRACTOR SHALL COORDINATE AND PAY FOR THIS SERVICE. THE ELECTRICAL ENGINEER OF RECORD SHALL SUPPLY INFORMATION REQUIRED FOR THE THIRD PARTY SERVICE TO COMPLETE THEIR WORK.
  - NOTIFY ELECTRICAL ENGINEER OF RECORD OF CHANGES REQUIRED BY ELECTRICAL SAFETY AUTHORITY PRIOR TO MAKING CHANGES.
  - FURNISH CERTIFICATES OF ACCEPTANCE FROM ELECTRICAL SAFETY AUTHORITY OR AUTHORITIES HAVING JURISDICTION ON COMPLETION OF WORK TO ENGINEER OF RECORD.

- CO-ORDINATION**
- CO-ORDINATE WORK WITH WORK OF OTHER DIVISIONS TO AVOID CONFLICT.
  - LOCATE DISTRIBUTION SYSTEMS, EQUIPMENT, AND MATERIAL TO PROVIDE MINIMUM INTERFERENCE AND MAXIMUM USABLE SPACE.
  - LOCATE ALL EXISTING UNDERGROUND SERVICES AND MAKE ALL PARTIES AWARE OF THEIR EXISTENCE AND LOCATION.
  - WHERE INTERFERENCE OCCURS, ELECTRICAL ENGINEER OF RECORD MUST APPROVE RELOCATION OF EQUIPMENT AND MATERIALS REGARDLESS OF INSTALLATION ORDER.
  - NOTWITHSTANDING THE REVIEW OF SHOP DRAWINGS, THE ELECTRICAL CONTRACTOR MAY BE REQUIRED TO RELOCATE ELECTRICAL EQUIPMENT WHICH INTERFERES WITH THE EQUIPMENT OF OTHER TRADES, DUE TO LACK OF CO-ORDINATION BY THE CONTRACTOR THE COST OF THIS RELOCATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER'S REPRESENTATIVE SHALL DECIDE THE EXTENT OF RELOCATION REQUIRED.

- CUTTING AND PATCHING**
- INFORM ALL OTHER DIVISIONS IN TIME, CONCERNING REQUIRED OPENINGS. WHERE THIS REQUIREMENT IS NOT MET, BEAR THE COST OF ALL CUTTING. OBTAIN WRITTEN APPROVAL OF STRUCTURAL ENGINEER BEFORE DRILLING ANY BEAMS OR FLOORS.
  - MAKE GOOD OF ALL TRADES AND FINISHES.
  - COORDINATE LOCATION AND SIZE OF ALL ACCESS HATCHES. SUBMIT SHOP DRAWINGS FOR REVIEW FROM OWNER'S ARCHITECTURAL REPRESENTATIVE PRIOR TO INSTALLATION. SPECIALIZED FINISHES MAY BE REQUIRED IN SPECIFIC AREAS.

- PROTECTION**
- PROTECT EXPOSED LIVE EQUIPMENT DURING CONSTRUCTION FOR PERSONAL SAFETY.
  - SHIELD AND MARK ALL LIVE PARTS (I.E. "LIVE 120 VOLTS"), OR WITH APPROPRIATE VOLTAGE IN ENGLISH.
  - ARRANGE FOR INSTALLATION OF TEMPORARY DOORS FOR ROOMS CONTAINING ELECTRICAL DISTRIBUTION EQUIPMENT. KEEP THESE DOORS LOCKED EXCEPT WHEN UNDER DIRECT SUPERVISION OF ELECTRICIAN.

- RECORD DRAWINGS**
- OBTAIN AND PAY FOR THREE SETS OF WHITE PRINTS. AS THE JOB PROGRESSES, MARK THESE PRINTS TO ACCURATELY INDICATE INSTALLED WORK. HAVE THE WHITE PRINTS AVAILABLE FOR INSPECTION AT THE SITE AT ALL TIMES AND PRESENT FOR SCRUTINY AT EACH JOB MEETING.
  - SHOW ON THE RECORD DRAWINGS THE INSTALLED REVISIONS OF ALL SERVICES ENTERING AND LEAVING THE BUILDING AND THE PROPERTY. DIMENSION UNDERGROUND SERVICES AT KEY POINTS OF EVERY RUN IN RELATION TO THE STRUCTURE AND BUILDINGS.
  - INDICATE EXACT LOCATION OF ALL SERVICES FOR FUTURE WORK. SHOW AND DIMENSION ALL WORK EMBEDDED IN THE STRUCTURE.
  - SUBMIT RECORD DRAWINGS WITHIN 30 DAYS PRIOR TO START OF COMMISSIONING.

**PART 1 SCOPE OF WORK (CONTINUED)**

- INSPECTION OF WORK**
- THE ENGINEER OF RECORD WILL MAKE PERIODIC VISITS TO THE SITE DURING CONSTRUCTION TO ENSURE CONFORMANCE CONFORMITY TO THE DRAWINGS PLANS AND SPECIFICATIONS BUT WILL NOT EXECUTE QUALITY CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXECUTION OF HIS WORK IN CONFORMITY WITH THE CONSTRUCTION DOCUMENTS AND WITH THE REQUIREMENTS OF THE DRAWINGS.
  - THE ENGINEER OF RECORD SHALL BE NOTIFIED THROUGHOUT CONSTRUCTION OF THE PROGRESS OF THE PROJECT AND INVITED FOR PERIODIC VISITS. AT A MINIMUM THE ENGINEER OF RECORD SHALL VISIT AT REGULAR INTERVALS TO MONITOR THE PROGRESS OF THE PROJECT AND TO VERIFY THAT THE WORK IS MADE. IF THE PROJECT REQUIRES STAGING OF ELECTRICAL WORK, THE ENGINEER OF RECORD SHALL BE NOTIFIED BEFORE ELECTRICAL WORK IS CLOSED IN BY OTHER CONTRACTORS WORK.
  - PHOTOGRAPHS OF INSTALLATION PROGRESS SHALL BE DOCUMENTED BY THE CONTRACTOR AND MADE AVAILABLE TO THE ENGINEER OF RECORD UPON REQUEST.

- SCHEDULING OF WORK**
- WORK SHALL BE SCHEDULED IN PHASES AS PER OTHER DIVISIONS OF THE ARCHITECTURAL SPECIFICATIONS.
  - BECOME FAMILIAR WITH THE PHASING REQUIREMENTS FOR THE WORK AND COMPLY WITH THESE REQUIREMENTS.
  - NO ADDITIONAL MONIES WILL BE PAID FOR CONTRACTOR'S REQUIREMENT TO COMPLY WITH WORK PHASING CONDITIONS.
  - THE CONTRACTOR IS RESPONSIBLE TO COORDINATE THE DELIVERY DATES OF ALL EQUIPMENT, MAJOR EQUIPMENT, INCLUDING LUMINAIRES, SHOULD BE INVESTIGATED AT THE START OF THE PROJECT AND LIST OF DELIVERY DATES SHALL BE PROVIDED WITHIN 7 DAYS OF THE START OF THE CONTRACT. THE OWNER SHALL RESERVE THE RIGHT TO RENEGOTIATE OR CANCEL THE CONTRACT AT NO COST, SHOULD THE DELIVERY DATES OF EQUIPMENT CARRIED NOT MEET THE PROJECT SCHEDULE.

- FIRE RATING OF PENETRATIONS**
- MAINTAIN FIRE RATINGS AROUND CONDUITS PASSING THROUGH FLOORS, CEILING AND FIRE RATED WALLS.
  - USE 3M BRAND OR EQUAL FIRE BARRIER PRODUCTS AT EACH PENETRATION.
  - ACCEPTABLE PRODUCTS FOR FIRE BARRIER PRODUCTS SHALL BE 3M #3CP25 FIRE BARRIER CAULK, #303 PUTTY, #FS 195 WRAP AND #CS195 SHEET.
  - ACCEPTABLE MANUFACTURERS: NELSON, FIRE STOP SYSTEMS, 3M OR APPROVED EQUAL. MATERIAL OF SAME MANUFACTURER TO BE USED THROUGHOUT PROJECT.

**PART 2 PRODUCTS**

- EXAMINATION OF SITE**
- THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE THEMSELVES WITH THE SITE CONDITION. DEVIATIONS FROM THE PLANS DUE TO CONFLICTS ON SITE SHALL BE NOTIFIED TO THE ENGINEER IN WRITING PRIOR TO THE VISIT.
  - DO NOT SCALE THE DRAWINGS.
  - PRIOR TO STARTING WORK, EXAMINE THE SITE VERIFY THE LAYOUT AND ARRANGEMENT OF ALL ELECTRICAL EQUIPMENT AND FEEDERS.
  - NOTIFY ENGINEER IN WRITING OF ANY CONFLICTS OR DISCREPANCIES TO THE DRAWINGS PRIOR TO THE TENDER CLOSE.
  - CLAIMS FOR EXTRA PAYMENT AS A RESULT OF NOT THOROUGHLY EXAMINING THE SITE WILL NOT BE GRANTED.

- WARRANTIES**
- INSTALLATION OF ALL EQUIPMENT SHALL BE IN A MANNER TO MAINTAIN ALL MANUFACTURERS WARRANTIES.
  - CONTRACTOR WILL WORKMANSHIP AND LABOUR FOR A MINIMUM OF ONE (1) YEAR OUTSIDE OF MANUFACTURER'S WARRANTIES.

- ELECTRIC MOTORS, EQUIPMENT AND CONTROLS**
- SUPPLY AND INSTALL AS INDICATED IN MOTOR, CONTROL AND EQUIPMENT SCHEDULES ON ELECTRICAL AND MECHANICAL DRAWINGS.
  - CONTROL DEVICES SHALL BE INSTALLED AS PART OF THE ELECTRICAL SCOPE OF WORK, EXCEPT FOR CONDUIT, WIRING AND CONNECTIONS BELOW 50V WHICH ARE RELATED TO CONTROL SYSTEMS SHOWN ON MECHANICAL DRAWINGS. MECHANICAL CONTROLS CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT, WIRING AND CONNECTIONS BELOW 50V WHICH ARE RELATED TO THE CONTROL SYSTEMS AND SHALL COMPLY WITH THE REQUIREMENTS OF ELECTRICAL FOR STANDARD OF QUALITY.

- FINISHES**
- SHOP FINISH METAL ENCLOSURE SURFACES BY APPLICATION OF RUST RESISTANT PRIMER INSIDE AND OUTSIDE, AND AT LEAST TWO COATS OF FINISH ENAMEL.
  - PAINT INDOOR SWITCHGEAR AND DISTRIBUTION ENCLOSURES LIGHT GREY TO EEMAC 2Y-1.

- WIRING IDENTIFICATION**
- LUGS, TERMINALS, SCREWS USED FOR TERMINATION OF WIRING TO BE SUITABLE FOR EITHER COPPER OR ALUMINUM CONDUCTORS.

- EQUIPMENT IDENTIFICATION**
- IDENTIFY ELECTRICAL EQUIPMENT WITH NAMEPLATES AND LABELS AS FOLLOWS:
    - NAMEPLATES: LAMINATED 3 MM THICK PLASTIC ENGRAVING SHEET, BLACK FACE, WHITE CORE, MECHANICALLY ATTACHED WITH SELF TAPPING SCREWS. SIZES AS FOLLOWS:

SIZE 1	10 X 50MM	1 LINE	3MM HIGH LETTERS
SIZE 2	12 X 70MM	1 LINE	5MM HIGH LETTERS
SIZE 3	12 X 70MM	2 LINES	3MM HIGH LETTERS
SIZE 4	20 X 50MM	1 LINE	3MM HIGH LETTERS
SIZE 5	20 X 90MM	2 LINES	5MM HIGH LETTERS
SIZE 6	25 X 100MM	1 LINE	12MM HIGH LETTERS
SIZE 7	25 X 100MM	2 LINES	6MM HIGH LETTERS
    - LABELS:
      - EMBOSSED PLASTIC LABELS WITH 6MM HIGH LETTERS UNLESS SPECIFIED OTHERWISE.
      - WORDING ON NAMEPLATES AND LABELS TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO MANUFACTURE.
      - ALLOW FOR AVERAGE OF TWENTY-FIVE (25) LETTERS PER NAMEPLATE AND LABEL.
      - IDENTIFICATION TO BE ENGLISH (AND FRENCH WHERE APPLICABLE).
      - NAMEPLATES FOR TERMINAL CABINETS AND JUNCTION BOXES TO INDICATE SYSTEM NAME AND VOLTAGE.
      - NAMEPLATES FOR THE SIZES AND TYPES OF FUSES SPECIFIED.
      - DISCONNECTS, STARTERS AND CONTACTORS: INDICATE EQUIPMENT BEING CONTROLLED AND VOLTAGE.
      - TERMINAL CABINETS AND PULL BOXES: INDICATE SYSTEM NAME AND VOLTAGE.
      - ARMOUR: INTERLOCKING ALUMINUM, COMPLIANT TO APPLICABLE BUILDING CODE CLASSIFICATION FOR THIS PROJECT.
      - OVERALL COVERING: THERMOPLASTIC POLYVINYL CHLORIDE MATERIAL.
      - ONE HOLE STEEL STRAPS TO SECURE SURFACE CABLES 50 MM AND SMALLER, TWO HOLE STEEL STRAPS FOR CABLES LARGER THAN 50 MM.
      - CHANNEL TYPE SUPPORTS FOR TWO OR MORE CABLES AT 1500 MM CENTERS.
      - THREADED RODS: 6 MM DIA. TO SUPPORT SUSPENDED CABLES.

- CONDUIT AND CABLE IDENTIFICATION**
- COLOR CODE CONDUITS, BOXES AND METALLIC SHEATHED CABLES.
  - CODE WITH PLASTIC TAPE OR PAINT AT POINTS WHERE CONDUIT OR CABLE ENTERS WALL, CEILING, OR FLOOR, AND AT 15 M INTERVALS.
  - COLORS: 25 MM WIDE PRIME COLOUR AND 20 MM WIDE AUXILIARY COLOUR.
  - COLOR CODING TO MATCH EXISTING WHERE APPLICABLE.
- FUSED SWITCHES RATED 600 AMPERES AND LESS**
- SWITCHES SHALL BE IN ACCORDANCE WITH NEMA, NEC, UL, AS SPECIFIED, AND AS SHOWN ON THE DRAWINGS.
  - SHALL BE NEMA CLASSIFIED HEAVY DUTY.
  - SHALL BE HORSEPOWER (HP) RATED.
  - SHALL HAVE THE FOLLOWING FEATURES:
    - SWITCH MECHANISM SHALL BE THE QUICK-MAKE, QUICK-BREAK TYPE.
    - COPPER BLADES, VISIBLE IN THE OPEN POSITION.
    - AN ARC CHUTE FOR EACH POLE.
    - EXTERNAL OPERATING HANDLE SHALL INDICATE OPEN AND CLOSED POSITIONS, AND HAVE LOCK-OPEN AND LOCKING PROVISIONS.
    - MECHANICAL INTERLOCK SHALL PERMIT OPENING OF THE DOOR ONLY WHEN THE SWITCH IS IN THE OPEN POSITION, DEFEATABLE TO PERMIT INSPECTION.
    - FUSE HOLDERS FOR THE SIZES AND TYPES OF FUSES SPECIFIED.
    - SOLID NEUTRAL FOR EACH SWITCH BEING INSTALLED IN A CIRCUIT WHICH INCLUDES A NEUTRAL CONDUCTOR.
    - INTERNAL LUGS FOR EACH GROUND CONDUCTOR.
    - ELECTRICALLY OPERATED SWITCHES SHALL ONLY BE INSTALLED WHERE SHOWN ON THE DRAWINGS.

- ENCLOSURES**
- SHALL BE THE NEMA TYPES SHOWN ON THE DRAWINGS.
  - WHERE THE TYPES OF SWITCH ENCLOSURES ARE NOT SHOWN, THEY SHALL BE THE NEMA TYPES MOST SUITABLE FOR THE AMBIENT ENVIRONMENTAL CONDITIONS.
  - SHALL BE FINISHED WITH MANUFACTURER'S STANDARD GRAY BAKED ENAMEL PAINT OVER PRETREATED STEEL.
  - PROVIDE NEMA 2-5 FOR ALL SPRINKLERED BUILDINGS.

- UNFUSED SWITCHES RATED 600 AMPERES AND LESS**
- SHALL BE THE SAME AS FUSED SWITCHES, BUT WITHOUT PROVISIONS FOR FUSES.
- MOTOR RATED TOGGLE SWITCHES**
- TYPE 1, GENERAL PURPOSE FOR SINGLE-PHASE MOTORS RATED UP TO 1 HORSEPOWER.
  - QUICK-MAKE, QUICK-BREAK TOGGLE SWITCH WITH EXTERNAL RESET BUTTON AND THERMAL OVERLOAD PROTECTION MATCHED TO NAMEPLATE FULL-LOAD CURRENT OF ACTUAL PROTECTED MOTOR.

- CARTRIDGE FUSES**
- SHALL BE IN ACCORDANCE WITH NEMA FU 1. AND DESIGNED TO FIT THE ENCLOSURE THE FUSES ARE HOUSED IN, WITHOUT SPECIAL CLIPS. FUSE TYPES TO BE COORDINATED WITH THE SPECIFIC PIECE OF EQUIPMENT TO WHICH THEY ARE TO BE INSTALLED BELOW.
  - SERVICE ENTRANCE, CLASS 1, TIME DELAY OR CLASS J, TIME DELAY UNLESS OTHERWISE NOTED.
  - FEEDERS, CLASS 1, TIME DELAY OR CLASS J, TIME DELAY UNLESS OTHERWISE NOTE.
  - MOTOR BRANCH CIRCUITS, CLASS RK1 OR CLASS RK2, TIME DELAY UNLESS OTHERWISE NOTED.
  - OTHER BRANCH CIRCUITS, CLASS J, TIME DELAY UNLESS OTHERWISE NOTED.
  - CONTROL CIRCUITS, CLASS CC.
- SEPARATELY ENCLOSED CIRCUIT BREAKERS**
- PROVIDE CIRCUIT BREAKERS IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS IN SECTION PANELBOARDS.
  - ENCLOSURES SHALL BE THE NEMA TYPES SHOWN ON THE DRAWINGS, WHERE THE TYPES ARE NOT SHOWN, THE SHALL BE THE NEMA TYPE MOST SUITABLE FOR THE AMBIENT ENVIRONMENTAL CONDITIONS.

**PART 2 PRODUCTS (CONTINUED)**

- PANELBOARDS**
- PANELBOARDS: TO CSA C22.0 NO.28 AND PRODUCT OF ONE MANUFACTURER.
  - IN ADDITION TO CSA REQUIREMENTS, MANUFACTURER'S NAMEPLATE MUST SHOW FAULT CURRENT THAT PANEL, INCLUDING BREAKERS HAVE BEEN BUILT TO WITHSTAND.
  - 250 AMP 600 V PANELBOARDS, 81 AMP BREAKERS RATED FOR 10,000 AND 18,000 A (SYMMETRICAL) MINIMUM INTERRUPTING CAPACITY RESPECTIVELY OR AS INDICATED ON ELECTRICAL DRAWINGS.
  - SEQUENCE PHASE BUSSING WITH ODD NUMBERED BREAKERS ON LEFT AND EVEN ON RIGHT, WITH EACH BREAKER IDENTIFIED BY PERMANENT NUMBERING TO INDICATE CIRCUIT NUMBER AND PHASING INFORMATION MADE. IF PANELBOARDS: MAINS, NUMBER OF CIRCUITS, AND NUMBER AND SIZE OF BRANCH CIRCUIT BREAKERS AS INDICATED.
  - TWO KEYS FOR EACH PANELBOARD AND KEY PANELBOARDS ALIKE.
  - ALL VOICEDATA RECEPTACLE LOCATIONS TO BE FURNISHED WITH EMT CONDUIT (C/W NEOPRENE PULL STRING) TO ACCESSIBLE CEILING SPACE. PROVIDE SPARE NEOPRENE PULL STRING IN EACH RECEPTACLE FOR FUTURE INSTALLATIONS. INSTALL CONDUITS TO ENSURE NO MORE THAN TWO (2) LONG RADIUS EDGES BETWEEN PULL BOXES. PROVIDE CONDUIT BUSHING AT END OF EMT.
  - PROVIDE FIT RATED CATE CABLING FROM RECEPTACLE THROUGH CEILING SPACE TO NETWORK RACK. IN CEILING SPACE, HANG CABLES ON J-HOOKS OR IN PROVIDED CABLE TRAYS AS REQUIRED.
  - COLOR CODE CATE CABLING (BLUE FOR DATA AND WHITE FOR VOICE). TERMINATE AND TEST EACH RECEPTACLE AND PROVIDE LABEL IN CONFORMANCE WITH RECEPTACLE IDENTIFICATION.
  - TERMINATE ALL VOICE/DATA CABLES INTO PATCH PANEL LOCATED IN A LOCKABLE NETWORK RACK. PROVIDE PATCH CABLE FOR EACH COORDINATE SIZE OF NETWORK RACK AND NUMBER OF SPARE SPACES FOR NETWORK EQUIPMENT WITH OWNER'S IT REPRESENTATIVE.

- BREAKERS**
- BREAKERS: MOULDED CASE CIRCUIT BREAKERS.
  - BREAKERS WITH THERMAL AND MAGNETIC TRIPPING IN PANELBOARDS EXCEPT AS INDICATED OTHERWISE.
  - MAIN BREAKER, SEPARATELY MOUNTED ON TOP OR BOTTOM OF PANEL TO SUIT CABLE ENTRY. WHEN MOUNTED VERTICALLY, DOWN POSITION SHOULD OPEN BREAKER.
  - LOCK-ON DEVICES FOR 10% OF 15 TO 30 A BREAKERS INSTALLED AS INDICATED. TURN OVER UNUSED LOCK-ON DEVICES.
  - LOCK-ON DEVICES FOR RECEPTACLES, FIRE ALARM CLOCK OUTLET, EMERGENCY, DOOR SUPERVISORY, INTERCOM, STAIRWAY, EXIT AND NIGHT LIGHT CIRCUITS AS INDICATED.

- BREAKERS GENERAL**
- BOLT-ON MOULDED CASE CIRCUIT BREAKER; QUICK-MAKE, QUICK-BREAK TYPE, FOR MANUAL AND AUTOMATIC OPERATION WITH TEMPERATURE COMPENSATION FOR 40°C AMBIENT.
  - COMMON-TRIP BREAKERS, WITH SINGLE HANDLE FOR MULTI-POLE APPLICATIONS.
  - MAGNETIC INSTANTANEOUS TRIP ELEMENTS IN CIRCUIT BREAKERS TO OPERATE ONLY WHEN VALUE OF CURRENT REACHES SETTING. TRIP SETTINGS ON BREAKERS WITH ADJUSTABLE TRIPS TO RANGE FROM 3-8 TIMES CURRENT RATING.
  - CIRCUIT BREAKERS TO HAVE MINIMUM OF 10,000 A SYMMETRICAL RMS INTERRUPTING CAPACITY RATING.

- THERMAL MAGNETIC BREAKERS**
- MOULDED CASE CIRCUIT BREAKER TO OPERATE AUTOMATICALLY BY MEANS OF THERMAL AND MAGNETIC TRIPPING DEVICES TO PROVIDE INVERSE TIME CURRENT TRIPPING AND INSTANTANEOUS TRIPPING FOR SHORT CIRCUIT PROTECTION.

- OPTIONAL FEATURES**
- SHUNT TRIP.
  - AUXILIARY SWITCH.
  - MOTOR-OPERATED MECHANISM C/W TIME DELAY UNIT.
  - INTERLOCK RELEASE.
  - ON-OFF LOCKING DEVICE.
  - HANDLE MECHANISM.

- BUILDING WIRES**
- CONDUCTORS: STRANDED FOR 10 AWG AND LARGER. MINIMUM SIZE: 12 AWG. INCREASE WIRE SIZE WHERE NEEDED TO MEET VOLTAGE DROP REQUIREMENTS.
  - COPPER AND ACM ALLOY CONDUCTORS. SIZE AS INDICATED, WITH 600 V INSULATION OF CROSS-LINKED THERMOSETTING POLYETHYLENE MATERIAL RATED RW90 XLPE AND RW90 XLPE AS INDICATED.
  - PROVIDE RW90 XLPE RATED CABLE FOR UNDERGROUND WIRING, RELATED TO NEW SERVICE ENTRANCE FEEDERS AND SITE LIGHTING CIRCUITS.
  - COPPER CONDUCTORS: SIZE AS INDICATED, WITH THERMOPLASTIC INSULATION TYPE TWN RATED AT 600 V.
  - TYPE 1 USED FOR INSULATED GROUND WIRES.
  - WIRING FOR 120V BRANCH CIRCUITS SHALL BE #12AWG UP TO 22M AND #10AWG UP TO 35M. INCREASE WIRE SIZES FOR THE FULL RUN LENGTH STARTING AT THE OVERCURRENT DEVICE. INCREASE WIRE SIZE TO LIMIT VOLTAGE DROP TO 3% WHILE CARRYING 80% OF THE CIRCUIT LOAD.

- TECK CABLE**
- CABLE TO CAN/CSA-C22.2 NO. 131.
  - CONDUCTORS:
    - GROUNDING CONDUCTOR: COPPER.
    - CIRCUIT CONDUCTORS: COPPER AND ACM ALLOY. SIZE AS INDICATED.
  - INSULATION:
    - CROSS-LINKED POLYETHYLENE XLPE, RATINGS - 600 V.
    - INNER JACKET: POLYVINYL CHLORIDE MATERIAL.
    - ARMOUR: INTERLOCKING ALUMINUM, COMPLIANT TO APPLICABLE BUILDING CODE CLASSIFICATION FOR THIS PROJECT.
  - OVERALL COVERING: THERMOPLASTIC POLYVINYL CHLORIDE MATERIAL.
  - CONNECTORS:
    - ONE HOLE STEEL STRAPS TO SECURE SURFACE CABLES 50 MM AND SMALLER, TWO HOLE STEEL STRAPS FOR CABLES LARGER THAN 50 MM.
    - CHANNEL TYPE SUPPORTS FOR TWO OR MORE CABLES AT 1500 MM CENTERS.
    - THREADED RODS: 6 MM DIA. TO SUPPORT SUSPENDED CABLES.
  - CONNECTORS:
    - WATERTIGHT AND/OR TYPE APPROVED FOR TECK CABLE, AS INDICATED.

- ARMOURED CABLES**
- CONDUCTORS: INSULATED, COPPER, SIZE AS INDICATED.
  - TYPE: ACM.
  - ARMOUR: INTERLOCKING TYPE FABRICATED FROM ALUMINUM STRIP.
  - CONNECTORS: STANDARD AS REQUIRED, COMPLETE WITH ANTI-SHIRT RINGS.

- CONTROL CABLES**
- TYPE LVT: 2 SOFT ANNEALED COPPER CONDUCTORS, SIZED AS INDICATED, WITH THERMOPLASTIC INSULATION, OUTER COVERING OF THERMOPLASTIC JACKET.
  - LOW ENERGY 300 V CONTROL CABLE, WITH STRANDED ANNEALED COPPER CONDUCTORS SIZED AS INDICATED, WITH PVC INSULATION TYPE TW 40°C POLYETHYLENE INSULATION WITH SHIELDS OF TAPE COATED WITH FRAMAGNETIC MATERIAL WIRE BRAID OVER EACH CONDUCTOR AND OVERALL COVERING OF PVC JACKET.

- OUTLET AND CONDUIT BOXES GENERAL**
- SIZE BOXES IN ACCORDANCE WITH CSA C22.1.
  - 102 MM SQUARE OR LARGER OUTLET BOXES AS REQUIRED FOR SPECIAL DEVICES.
  - GANG BOXES WHERE WIRING DEVICES ARE GROUPED.
  - BLANK COVER PLATES FOR BOXES WITHOUT WIRING DEVICES.
  - 347 V OUTLET BOXES FOR 347 V SWITCHING DEVICES.
  - COMBINATION BOXES WITH BARRIERS WHERE OUTLETS FOR MORE THAN ONE SYSTEM ARE GROUPED.

- GALVANIZED STEEL OUTLET BOXES**
- ELECTRO-GALVANIZED STEEL SINGLE AND MULTI GANG FLUSH DEVICE BOXES FOR FLUSH INSTALLATION. MINIMUM SIZE: 76 X 50 X 38 MM OR AS INDICATED. 102 MM SQUARE OUTLET BOXES WHEN MORE THAN ONE CONDUIT ENTERS ONE SIDE WITH EXTENSION AND PLASTER RINGS AS REQUIRED.
  - ELECTRO-GALVANIZED STEEL UTILITY BOXES FOR OUTLETS CONNECTED TO SURFACE-MOUNTED EMT CONDUIT. MINIMUM SIZE: 102 X 54 X 48 MM.
  - 102 MM SQUARE OR OCTAGONAL OUTLET BOXES FOR LIGHTING FIXTURE OUTLETS.
  - 102 MM SQUARE OUTLET BOXES WITH EXTENSION AND PLASTER RINGS FOR FLUSH MOUNTING DEVICES IN FINISHED PLASTER WALLS.

- MASONRY BOXES**
- ELECTRO-GALVANIZED STEEL MASONRY SINGLE AND MULTI GANG BOXES FOR DEVICES FLUSH MOUNTED IN EXPOSED BLOCK WALLS.

- CONCRETE BOXES**
- ELECTRO-GALVANIZED SHEET STEEL CONCRETE TYPE BOXES FOR FLUSH MOUNT IN CONCRETE WITH MATCHING EXTENSION AND PLASTER RINGS AS REQUIRED.

- FLOOR BOXES**
- CONCRETE TIGHT ELECTRO-GALVANIZED SHEET STEEL FLOOR BOXES WITH ADJUSTABLE FINISHING RINGS TO SUIT FLOOR FINISH WITH BRASS FACEPLATE. DEVICE MOUNTING PLATE TO ACCOMMODATE SHORT OR LONG EAR DUPLEX RECEPTACLES. MINIMUM DEPTH: 28 MM FOR RECEPTACLES, 73 MM FOR COMMUNICATION EQUIPMENT.
  - ADJUSTABLE, WATERTIGHT, CONCRETE TIGHT, CAST-FLOOR BOXES WITH OPENINGS DRILLED AND TAPPED FOR 12 MM AND 19 MM CONDUIT. MINIMUM SIZE: 73 MM DEEP.

- FITTINGS - GENERAL**
- BUSHING AND CONNECTORS WITH NYLON INSULATED THROATS.
  - KNOCK-OUT FILLERS TO PREVENT ENTRY OF DEBRIS.
  - CONDUIT OUTLET BOXES FOR CONDUIT UP TO 32 MM AND PULL BOXES FOR LARGER CONDUITS.
  - DOUBLE LOCKNUTS AND INSULATED BUSHINGS ON SHEET METAL BOXES.
  - DOUBLE SPLIT RINGS FOR AC-90 TERMINATIONS.

- SURFACE MOUNT FITTINGS**
- EXPOSED CONDUITS AND FITTINGS TO BE LEGRAND WIREMOLD 500/700 SERIES STEEL RACEWAY OR EQUIVALENT LOW-PROFILE METALIC RACEWAY.

- HANGERS AND SUPPORTS**
- SECURE EQUIPMENT TO HOLLOW OR SOLID MASONRY, TILE AND PLASTER SURFACES WITH LEAD ANCHORS OR NYLON SHIELDS.
  - SECURE EQUIPMENT TO POURED CONCRETE WITH EXPANDABLE INSERTS.
  - SECURE EQUIPMENT TO HOLLOW MASONRY WALLS OR SUSPENDED CEILINGS WITH TOGGLE BOLTS.
  - SECURE SURFACE MOUNTED EQUIPMENT WITH TWIST CLIP FASTENERS TO INVERTED T BAR CEILING.
  - ENSURE THAT T BARS ARE ADEQUATELY SUPPORTED TO CARRY WEIGHT OF EQUIPMENT SPECIFIED.
  - SUPPORT EQUIPMENT, CONDUIT OR CABLES USING CLIPS, SPRING LOADED BOLTS, CABLE CLAMPS DESIGNED AS ACCESSORIES TO BASIC CHANGING MEMBERS.
  - FASTEN EXPOSED CONDUIT OR CABLES TO BUILDING CONSTRUCTION OR SUPPORT SYSTEM USING STRAPS:
    - ONE-HOLE STEEL STRAPS TO SECURE SURFACE CONDUITS AND CABLES 50 MM AND SMALLER.
    - TWO-HOLE STEEL STRAPS FOR CONDUITS AND CABLES LARGER THAN 50 MM.
    - BEAM CLAMPS TO SECURE CONDUIT TO EXPOSED STEEL WORK.
    - STRAP AC-90 CABLE AT BOLT LOCATION PLUS EVERY 900 MM.
  - SUPPORT INDIVIDUAL CABLE OR CONDUIT RUNS WITH 6 MM DIA THREADED RODS AND SPRING CLIPS.
  - SUPPORT 2 OR MORE CABLES OR CONDUITS ON CHANNELS SUPPORTED BY 6 MM DIA THREADED RODS.
  - MANAGE CABLES TO PREVENT DIRECT FASTENING TO BUILDING CONSTRUCTION AND EQUIPMENT.
  - FOR SURFACE MOUNTING OF TWO OR MORE CONDUITS USE CHANNELS AT 1.5 M ON CENTRE SPACING.
  - PROVIDE METAL BRACKETES, FRAMES, HANGERS, CLAMPS AND RELATED TYPES OF SUPPORT STRUCTURES WHERE INDICATED OR AS REQUIRED TO SUPPORT CONDUIT AND CABLES. SUPPORTS TO BE MAINTAINED IN AROUND ALL ELECTRICAL EQUIPMENT AND A MINIMUM HEADROOM OF 2.2M SHALL BE MAINTAINED.
  - ALL EQUIPMENT SHALL NOT BE LOCATED UNDERNEATH PIPES THAT MAY CONTAIN LIQUIDS (THIS INCLUDES CONDENSATE PIPES). CONSIDERATIONS REQUIRE ELECTRICAL EQUIPMENT TO BE LOCATED UNDER SUCH PIPING. THE ENGINEER OF RECORD SHALL BE NOTIFIED IN WRITING FOR EACH OCCURRENCE AND CONTAINMENT PANS WITH DRAIN PIPES TO FLOOR LEVEL SHALL BE PROVIDED BY THE CONTRACTOR.
  - DO NOT USE SUPPORTS OR EQUIPMENT INSTALLED FOR OTHER TRADES FOR CONDUIT OR CABLE SUPPORT EXCEPT WITH PERMISSION OF OTHER TRADE AND APPROVAL OF OWNER'S REPRESENTATIVE.
  - INSTALL FASTENINGS AND SUPPORTS AS REQUIRED FOR EACH TYPE OF EQUIPMENT, CABLES AND CONDUITS, AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION RECOMMENDATIONS.

**PART 2 PRODUCTS (CONTINUED)**

- LIGHT FIXTURES**
- REFER TO DRAWINGS FOR LUMINAIRE SCHEDULE. PROVIDE LIGHT FIXTURES AS OUTLINED WITH ALL ACCESSORIES INCLUDING HANGERS, LAMPS, AND SUPPORTS.
  - ALTERNATE FIXTURES MUST BE EQUIVALENT IN ALL RESPECTS (I.E. LENS, LUMEN PERFORMANCE, DISTRIBUTION, QANTITY, LOCATION, ETC). ALTERNATE FIXTURES MUST BE PROVIDED AT TIME OF TENDER CLOSE. ALL ALTERNATE FIXTURES TO BE BASE BID TO SUBSTITUTE THE FIXTURES. THE TENDER PRICE WILL BE EVALUATED ON THE SPECIFIED FIXTURES, NOT THE ALTERNATES SUBMITTED.
  - COORDINATE ALL LOCATIONS OF FIXTURES FOR INTERFERENCES WITH OTHER TRADES TO AVOID CONFLICTS WITH STRUCTURE, IN OPPOSITE CORNERS, WITH INDEPENDANT HANGERS.

- VOICE/DATA STRUCTURED CABLING**
- ALL VOICEDATA RECEPTACLE LOCATIONS TO BE FURNISHED WITH EMT CONDUIT (C/W NEOPRENE PULL STRING) TO ACCESSIBLE CEILING SPACE. PROVIDE SPARE NEOPRENE PULL STRING IN EACH RECEPTACLE FOR FUTURE INSTALLATIONS. INSTALL CONDUITS TO ENSURE NO MORE THAN TWO (2) LONG RADIUS EDGES BETWEEN PULL BOXES. PROVIDE CONDUIT BUSHING AT END OF EMT.
  - PROVIDE FIT RATED CATE CABLING FROM RECEPTACLE THROUGH CEILING SPACE TO NETWORK RACK. IN CEILING SPACE, HANG CABLES ON J-HOOKS OR IN PROVIDED CABLE TRAYS AS REQUIRED.
  - COLOR CODE CATE CABLING (BLUE FOR DATA AND WHITE FOR VOICE). TERMINATE AND TEST EACH RECEPTACLE AND PROVIDE LABEL IN CONFORMANCE WITH RECEPTACLE IDENTIFICATION.
  - TERMINATE ALL VOICE/DATA CABLES INTO PATCH PANEL LOCATED IN A LOCKABLE NETWORK RACK. PROVIDE PATCH CABLE FOR EACH COORDINATE SIZE OF NETWORK RACK AND NUMBER OF SPARE SPACES FOR NETWORK EQUIPMENT WITH OWNER'S IT REPRESENTATIVE.

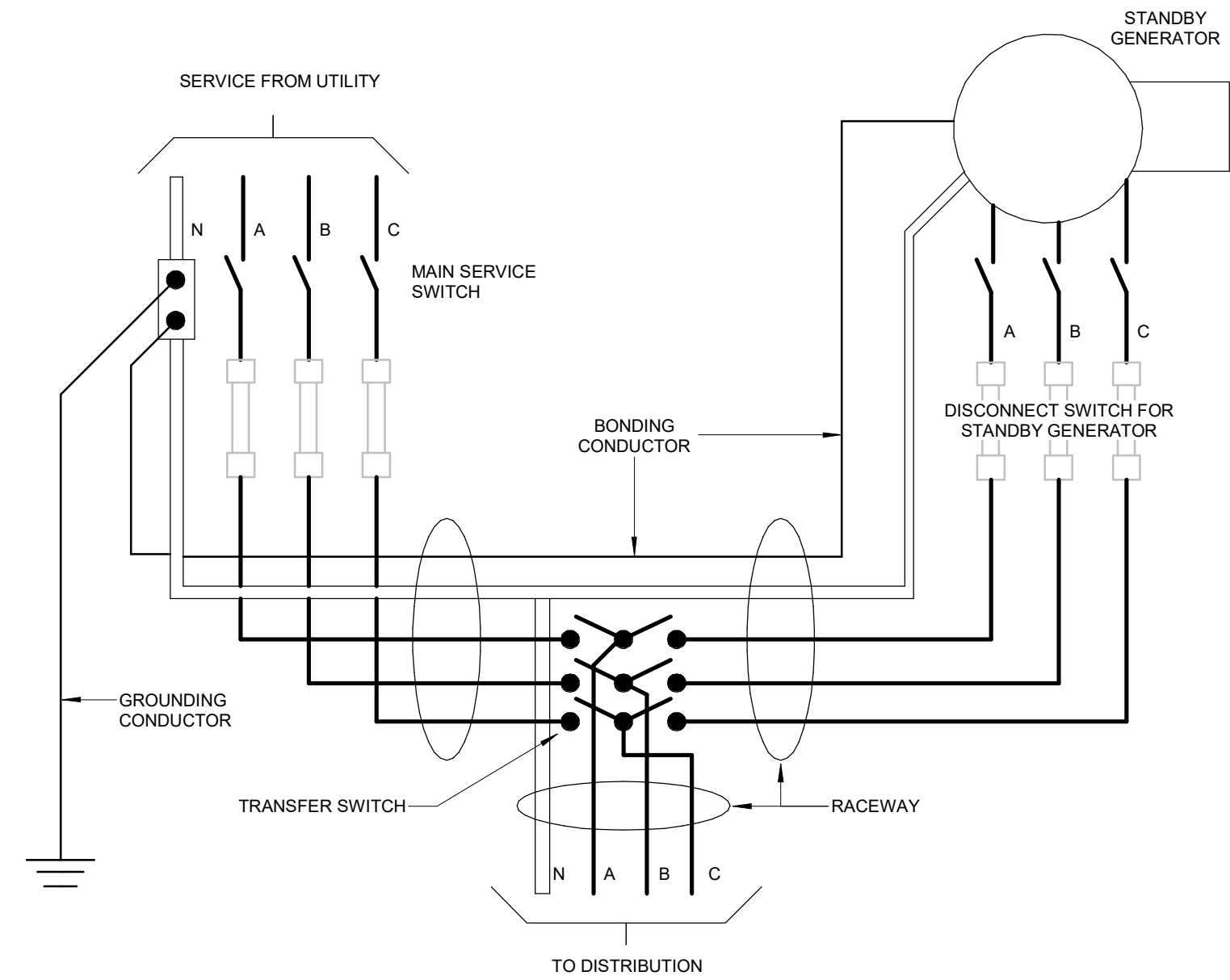
- WIRING DEVICES**
- THE OWNER RESERVES RIGHT TO RELOCATE RECEPTACLE SHOWN ON THE PLANS UP TO 3000MM IN ANY DIRECTION FREE OF CHARGE. COORDINATE ALL RECEPTACLES WITH OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
  - LOCATE LIGHT SWITCHES ON LATCH SIDE OF DOOR, AND IN SEQUENCE ORDER OF LIGHTING DRAWINGS

- RECEPTACLES**
- DUPLEX RECEPTACLES, CSA TYPE 5-15 R, 125 V, 15 A, U GROUND, TO: CSA-C22.2 NO 42 WITH FOLLOWING FEATURES:
    - IVORY THERMOPLASTIC MOULDED HOUSING, SUITABLE FOR NO. 10 AWG FOR BACK AND SIDE WIRING, BREAD CRUMB LUGS FOR USE AS SPLIT RECEPTACLES, FOUR (4) BARE WIRE CONTACTS AND RIVETTED GROUNDING CONTACTS. SPECIFICATION GRADE, HOSPITAL GRADE AS INDICATED.
    - SILVER CONTACTS AND RIVETS FOR DATA AND WHITE FOR VOICE). TERMINATE AND TEST EACH RECEPTACLE AND PROVIDE LABEL IN CONFORMANCE WITH RECEPTACLE IDENTIFICATION.
  - IVORY THERMOPLASTIC MOULDED HOUSING, SUITABLE FOR NO. 10 AWG FOR BACK AND SIDE WIRING, FOUR BARE WIRE ENTRANCES, 2 SIDE WIRING SCREWS.
  - TOGGLE OPERATED SWITCHES FOR TUNGSTEN FILAMENT AND FLUORESCENT LAMPS, AND UP TO 80% OF RATED CAPACITY OF MOTOR LOADS.
  - RECEPTACLES AND SWITCHES OF ONE MANUFACTURER THROUGHOUT THE PROJECT.

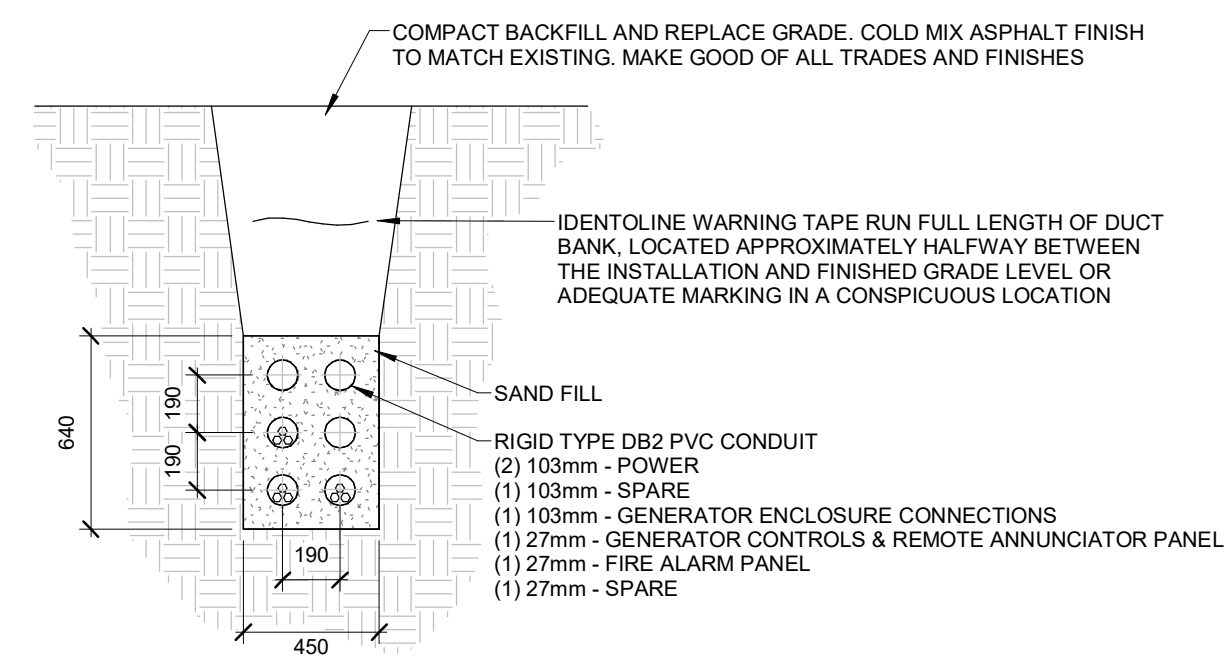
- SWITCHES**
- 20 A, 120 V, SINGLE POLE, DOUBLE POLE, THREE-WAY, FOUR-WAY SWITCHES AS INDICATED TO: CSA-C22.2 NO.55 AND CSA-C22.2 NO.111.
  - MANUALLY OPERATED GENERAL PURPOSE AC SWITCHES WITH FOLLOWING FEATURES:
    - TERMINAL HOLES APPROVED FOR NO. 10 AWG WIRE, SILVER ALLOY CONTACTS, UREA OR MELAMINE MOULDING FOR PARTS SUBJECT TO CARBON TRACKING, SUITABLE FOR BACK AND SIDE WIRING, WHITE TOGGLE. SPECIFICATION GRADE, HOSPITAL GRADE AS INDICATED.
    - TOGGLE OPERATED SWITCHES FOR TUNGSTEN FILAMENT AND FLUORESCENT LAMPS, AND UP TO 80% OF RATED CAPACITY OF MOTOR LOADS.

- COVER PLATES**
- COVER PLATES FOR WIRING DEVICES TO: CSA-C22.2 NO 42.1.
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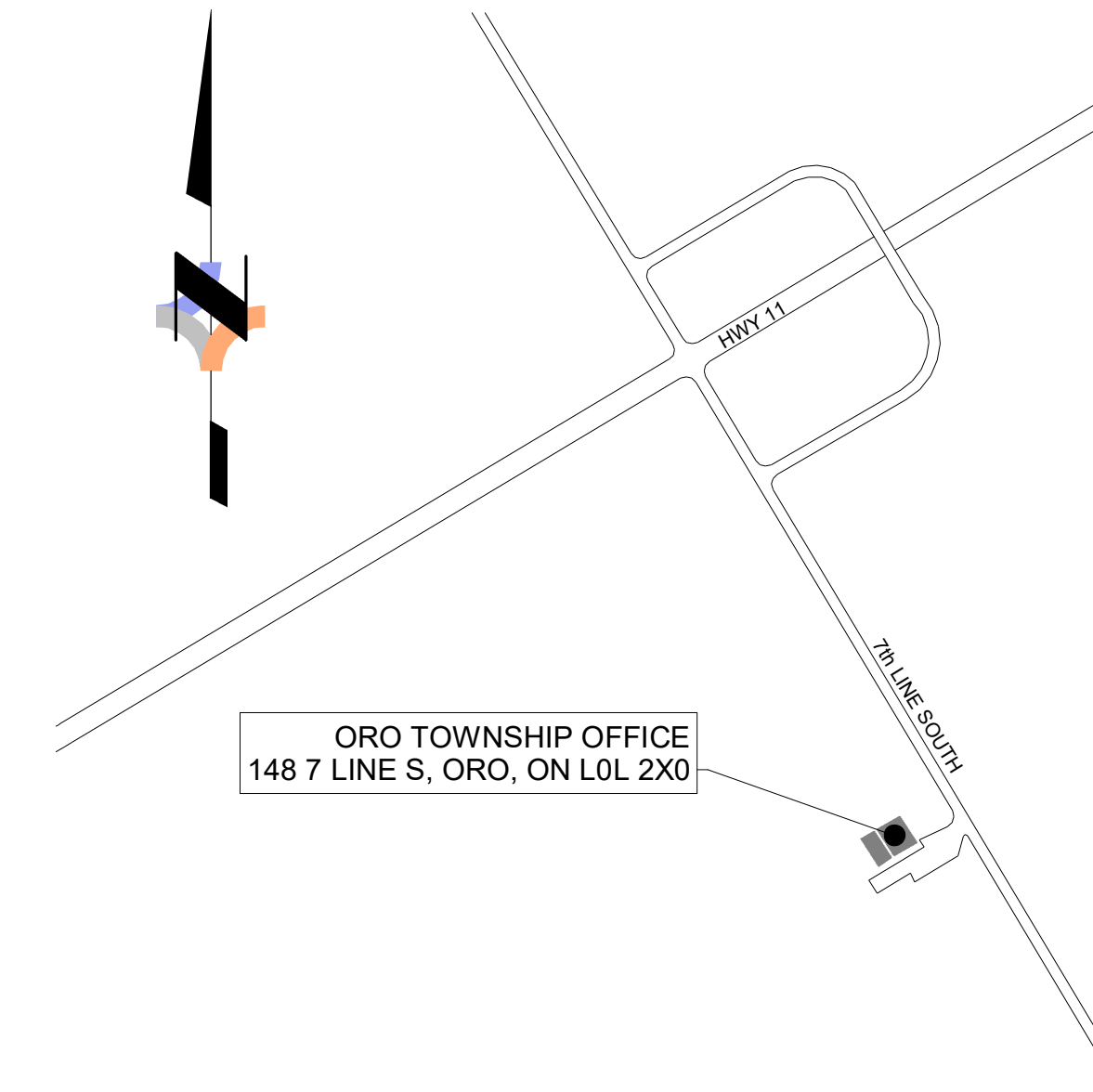




4 Generator Bonding Detail  
N.T.S.



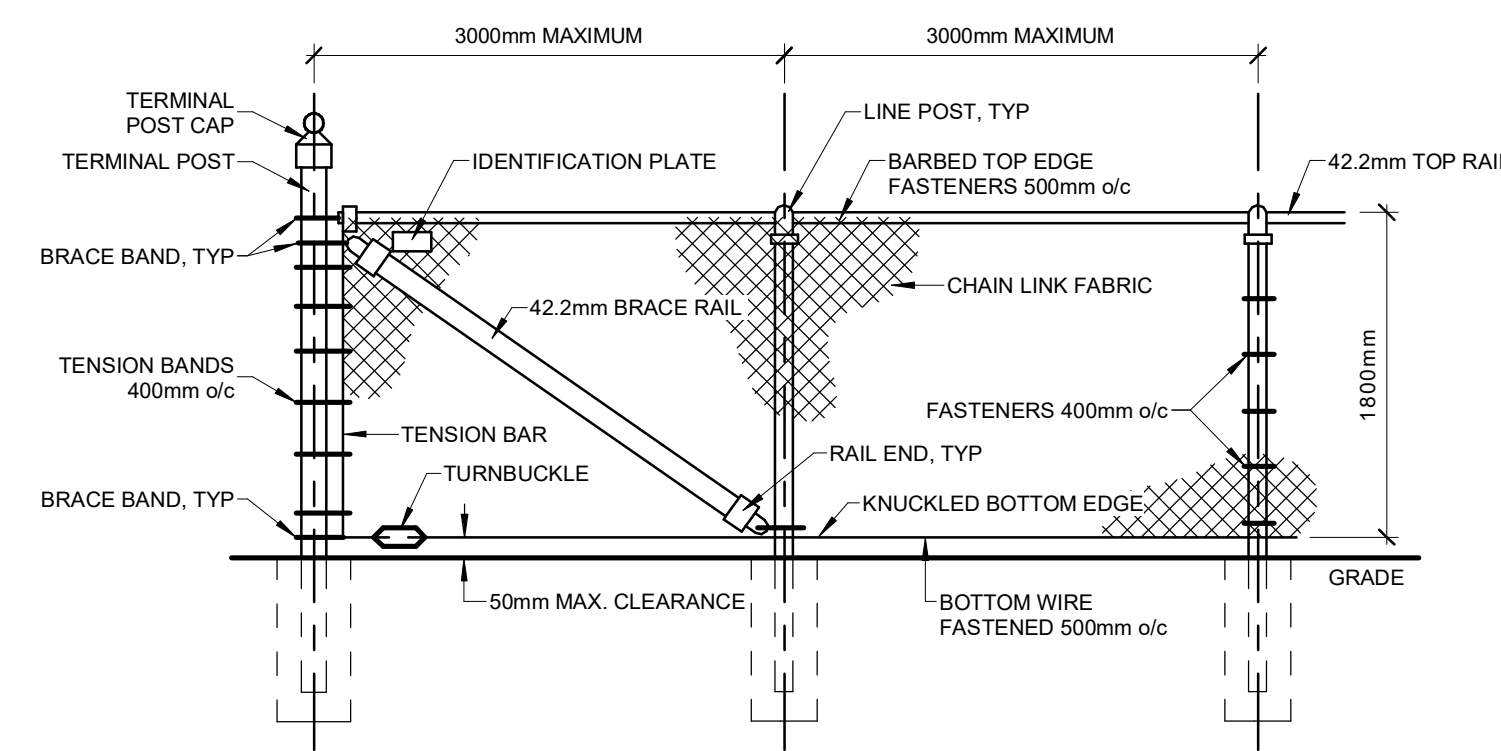
5 Underground Conductor - Table D11--Detail 6  
N.T.S.



2 Site Location Plan  
N.T.S.

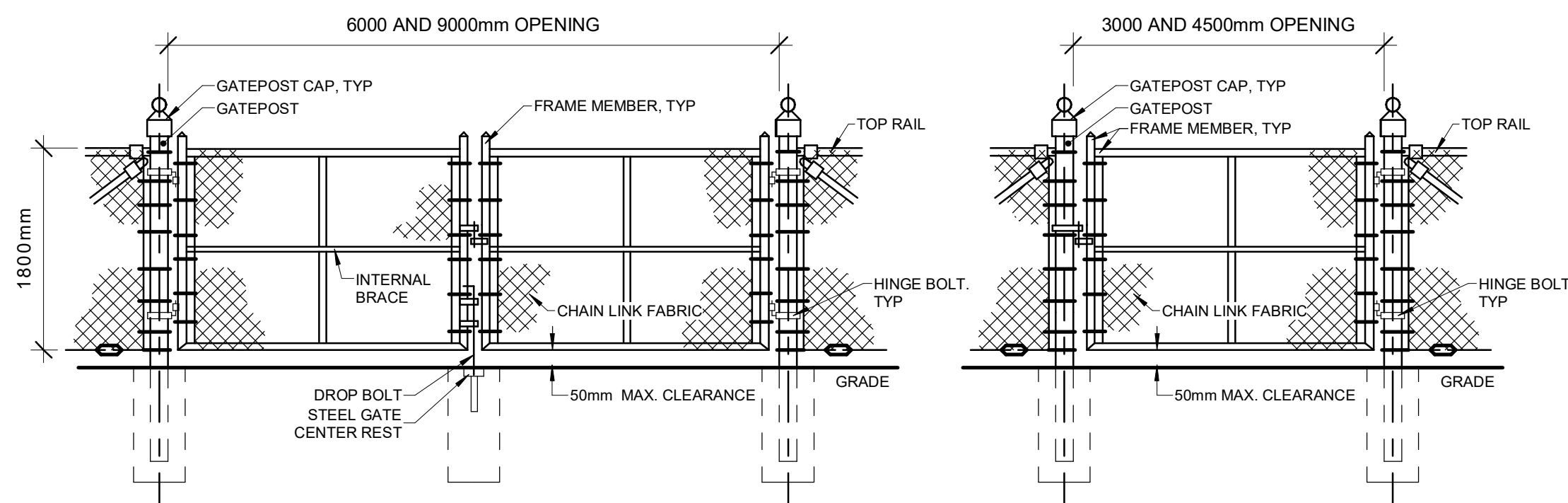
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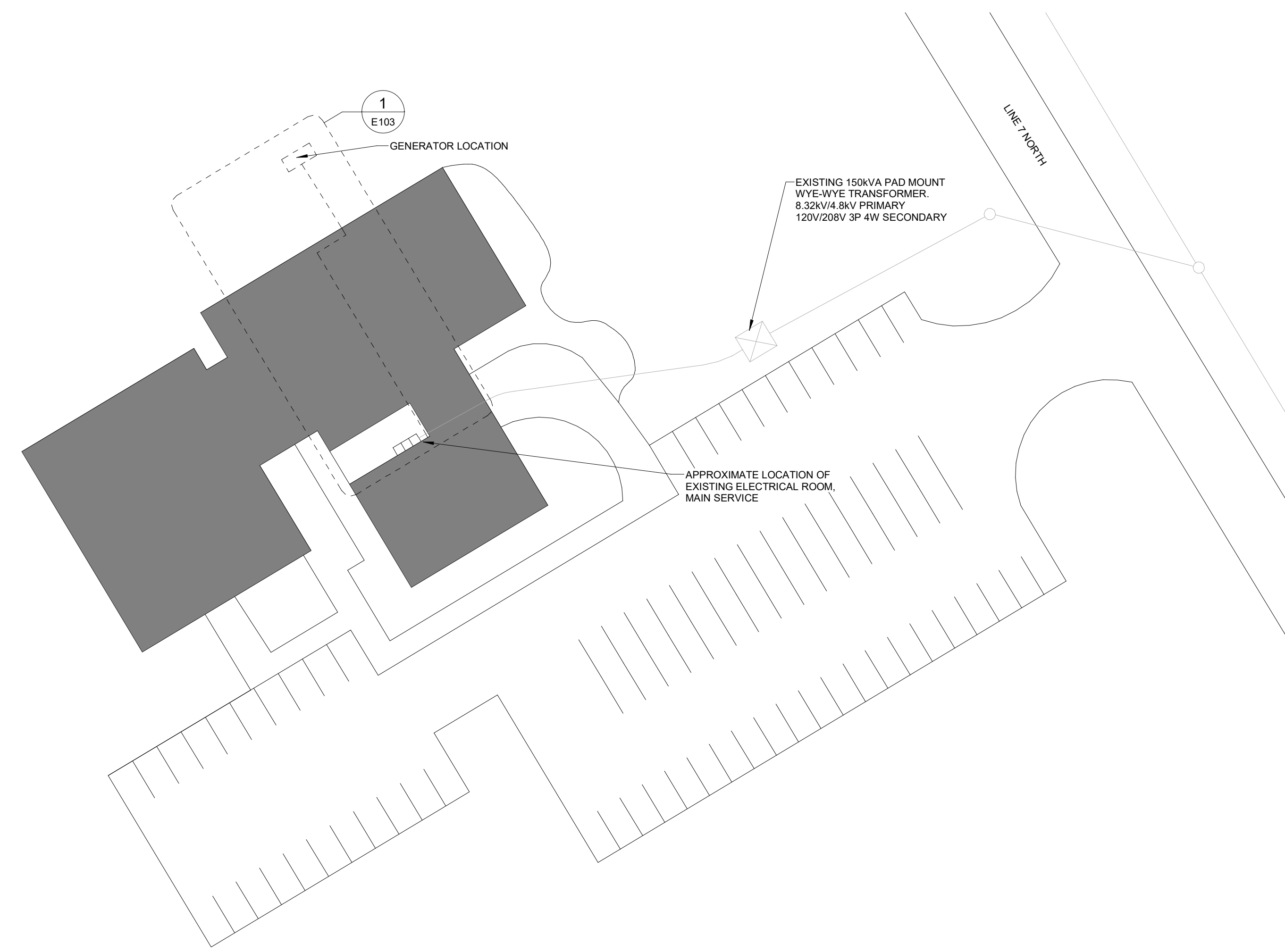


POST/ FRAME MEMBER TYPE	OUTSIDE Ø	LENGTH	WALL THICKNESS	WALL WEIGHT kg/m (NOTE 2)	
LINE POST	60.3mm	2.6m	3.91mm	5.4	
TERMINAL POST	88.9mm	2.9m	5.49mm	11.3	
GATE (SINGLE 3.0m, DOUBLE 6.0m)	GATE POST	88.9mm	2.6m	5.49mm	11.3
	FRAME MEMBER	42.2mm	N/A	3.56mm	3.4
GATE (SINGLE 4.5m, DOUBLE 9.0m)	GATE POST	114.3mm	2.9m	6.02mm	16.1
	FRAME MEMBER	48.3mm	N/A	3.68mm	4.0
POST SLEEVES	LINE POST	88.9mm	N/A	5.49mm	11.3
	TERMINAL POST	114.3mm	N/A	6.02mm	16.1

NOTES:  
1. ALL POST AND FRAME MEMBERS ARE SCHEDULE 40, REGULAR GRADE, GALVANIZED STEEL PIPE  
2. THE ACTUAL WEIGHT SHALL NOT VARY BY MORE THAN 10% OF THE NOMINAL WEIGHT



3 Chain-Link Fence Detail  
N.T.S.



1 Key Plan  
N.T.S.

STAMP:



**C.D. Martyn**  
ENGINEERING LTD

623 Fortune Crescent #100  
Kingston, Ontario K7P 0L5  
O: 613 539-4199  
F: 613 653-9424

CDMartyn.com

CLIENT:

Township of Oro-Medonte

148 7 Line S, Oro, ON L0L 2X0

PROJECT:

Oro Town Office Generator

148 Line 7 South, Oro Medonte, ON, L0L 2X0

PROJECT NO.

21-030

SHEET NAME:

Key Plan, Details and Legends

DRAWN BY: MS

CHECKED BY: C.D.M.

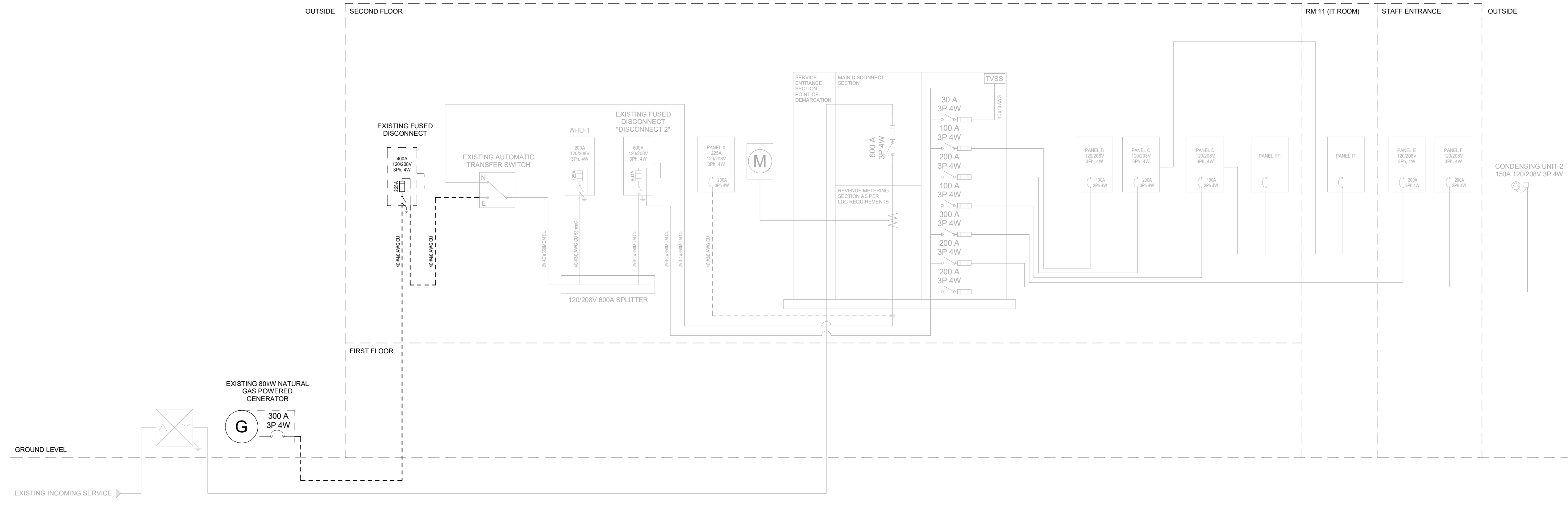
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E001

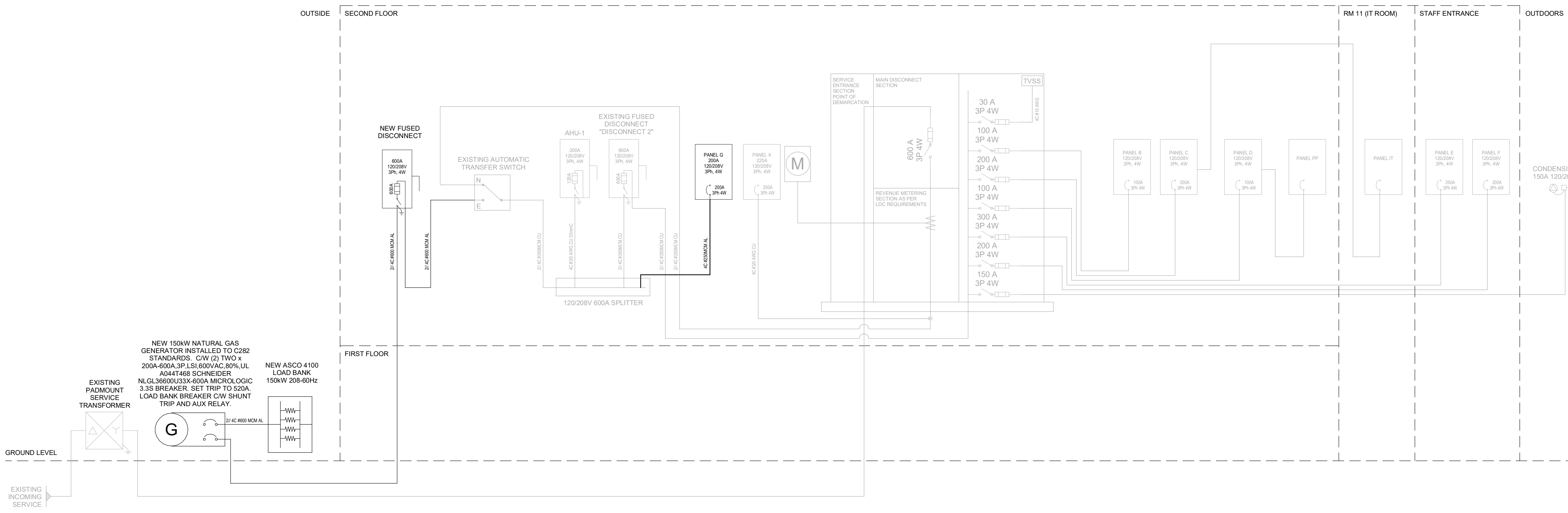
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1 Single Line Diagram - Existing  
 N.T.S.



2 Single Line Diagram - New Work  
 N.T.S.

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 Kingston, Ontario K7P 0L5  
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SHEET NAME:  
 Electrical Single Line Diagram

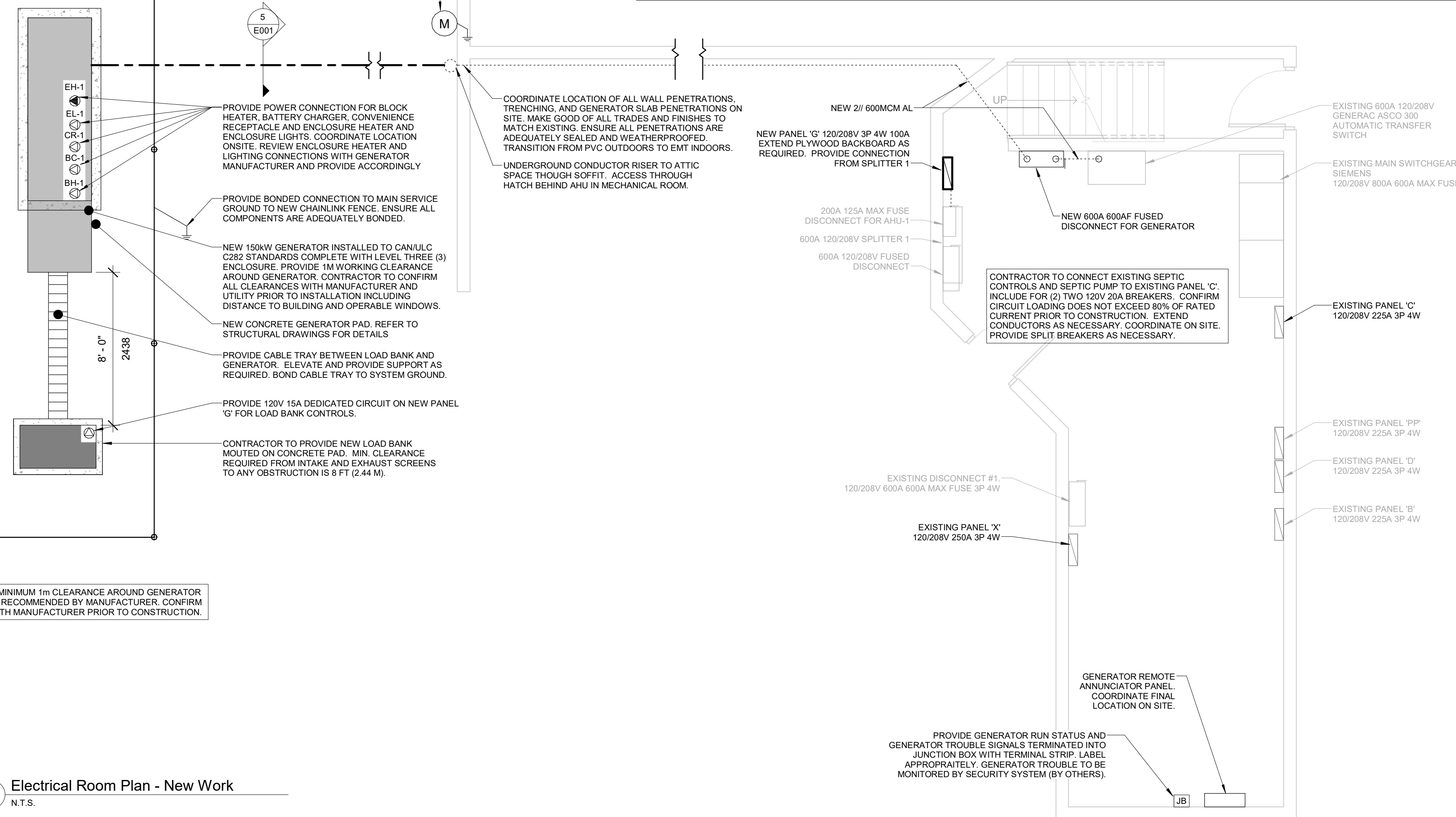
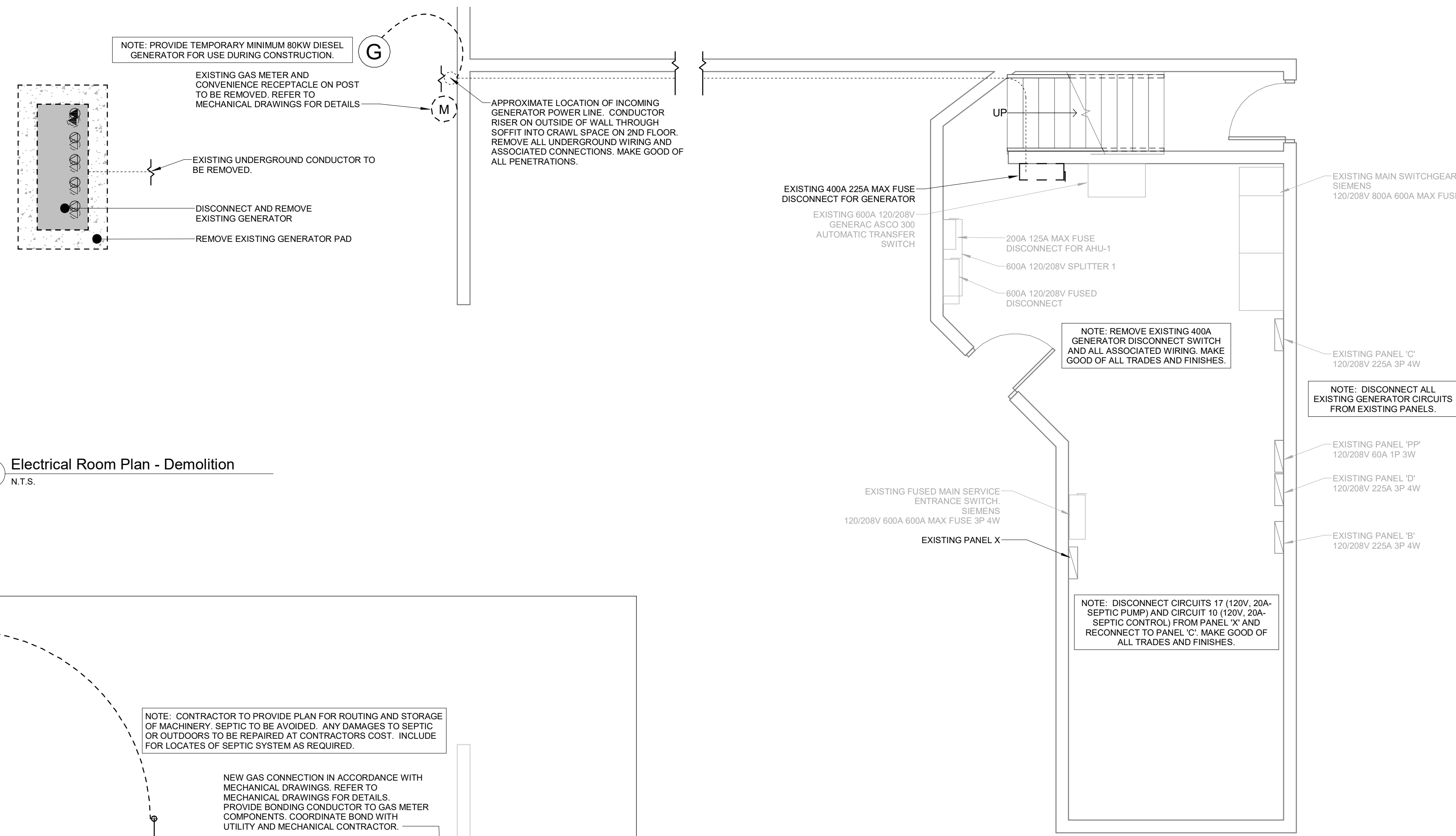
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REVISION: 0 2021-06-21

SCALE: N.T.S.

E102





ELECTRICAL SYMBOLS LEGEND

- ELECTRICAL PANEL**
- ⊕ xx 120 VAC, 15A, 1Φ, 2W + GROUND, DUPLEX RECEPTACLE, MOUNTED 450MM AFF TO CENTERLINE. LETTER DENOTES TYPE IF APPLICABLE. GFI = GROUND FAULT INTERRUPTING, H = HOSPITAL GRADE, AFI = ARC FAULT INTERRUPTING, USB = COMES WITH USB CHARGING PORTS x2, F = DEDICATED FOR REFRIGERATOR, MW = DEDICATED FOR MICROWAVE, WP = GROUND FAULT INTERRUPTING IN WEATHERPROOF ENCLOSURE, TR = TAMPER RESISTANT
  - ⊕ xx 120 VAC, 15A, 1Φ, 2W + GROUND, SINGLE RECEPTACLE, MOUNTED 450MM AFF TO CENTERLINE
  - ⊕ xx 120 VAC, 1Φ EQUIPMENT CONNECTION
  - ⊕ xx 208/240 VAC, 1Φ EQUIPMENT CONNECTION
  - ⊕ xx 208/240 VAC, 3Φ EQUIPMENT CONNECTION
  - ⊕ xx 347 VAC, 1Φ EQUIPMENT CONNECTION
  - ⊕ xx 600 VAC, 1Φ EQUIPMENT CONNECTION
  - ⊕ xx 600 VAC, 3Φ EQUIPMENT CONNECTION
  - ⊕ xx 120 VAC, 1Φ EQUIPMENT CONNECTION c/w DISCONNECTION SWITCH
  - ⊕ xx 208/240 VAC, 1Φ EQUIPMENT CONNECTION c/w DISCONNECTION SWITCH
  - ⊕ xx 208/240 VAC, 3Φ EQUIPMENT CONNECTION c/w DISCONNECTION SWITCH
  - ⊕ #D, #V VOICE/DATA OUTLET, 1 RJ-45 VOICE AND 1 RJ-45 DATA UNLESS OTHERWISE NOTED. MOUNTED 450MM AFF TO CENTERLINE. LETTER DENOTES NUMBER AND TYPE.
  - ⊕ #D DATA OUTLET, 1 RJ-45 DATA UNLESS OTHERWISE NOTED. MOUNTED 450MM AFF TO CENTERLINE. LETTER DENOTES NUMBER AND TYPE.
  - ⊕ #V VOICE OUTLET, 1 RJ-45 VOICE UNLESS OTHERWISE NOTED. MOUNTED 450MM AFF TO CENTERLINE. LETTER DENOTES NUMBER AND TYPE.
  - ⊕ JB JUNCTION BOX

- DEMOLITION LEGEND**
- ⊕ [Symbol] EXISTING FIXTURE TO REMAIN
  - ⊕ [Symbol] EXISTING FIXTURE TO BE REMOVED
- NEW WORK LEGEND**
- ⊕ [Symbol] EXISTING FIXTURE TO REMAIN
  - ⊕ [Symbol] NEW FIXTURE TO BE INSTALLED
- \*ER -- EXISTING TO BE RELOCATED

**Panel: Panel G**

Location: Phases: 3  
Mounting: Wires: 4  
Voltage: 120/208 Wye K.A.I.C. Rating: Mains Type: Breaker  
Minimum Mains Rating: 200 A  
MCB Rating: 200 A

Wire Size	Circuit Description	Type	Trip	Pole	CCT #	A	B	C	CCT #	Pole	Trip	Type	Circuit Description	Wire Size
	Gen - Enclosure Heater (EH-1)		30 A	2	1	2500 VA	100 VA		2	1	15 A		Gen - Enclosure Heater (EH-1)	
	Gen - Block Heater (BH-1)		15 A	1	5		2500 VA	200 VA	4	1	15 A		Gen - Receptacle (CR-1)	
	Spare		20 A	1	7	0 VA	200 VA		6	1	15 A		Gen - Battery Charger (BC-1)	
	Spare		20 A	1	9		0 VA	--	8	1	15 A		LB - Controls	
	Spare		20 A	1	11			0 VA	10	1	--		Space	
	Spare		20 A	1	13	0 VA	--		12	1	--		Space	
	Spare		20 A	1	15		0 VA	--	14	1	--		Space	
	Space		--	1	17			--	16	1	--		Space	
	Space		--	1	19	--	--		18	1	--		Space	
	Space		--	1	21	--	--		20	1	--		Space	
	Space		--	1	23	--	--		22	1	--		Space	
	Space		--	1	25	--	--		24	1	--		Space	
	Space		--	1	27	--	--		26	1	--		Space	
	Space		--	1	29	--	--		28	1	--		Space	
	Space		--	1	31	--	--		30	1	--		Space	
	Space		--	1	33	--	--		32	1	--		Space	
	Space		--	1	35	--	--		34	1	--		Space	
	Space		--	1	37	--	--		36	1	--		Space	
	Space		--	1	39	--	--		38	1	--		Space	
	Space		--	1	41	--	--		40	1	--		Space	
	<b>Total Amps:</b>					25 A	25 A	9 A	42	1	--		Space	

Note: Minimum #12 Copper Wire U.N.O. GFI = Ground Fault Protection  
AFI = Arc Fault Protection

NOTE: FINAL BREAKER SELECTION TO BE COORDINATED WITH ACTUAL EQUIPMENT SUPPLIED WITH GENERATOR

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Kingston, Ontario K7P 0L5  
O: 613 539-4199  
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148 Line 7 South, Oro Medonte, ON, L0L 2X0

PROJECT:  
Oro Town Office Generator

148 Line 7 South, Oro Medonte, ON, L0L 2X0

PROJECT NO. 21-030

SHEET NAME:  
Electrical Plans

DRAWN BY: MS CHECKED BY: C.D.M.

REVISION: 0 2021-06-21

SCALE: N.T.S. **E103**