SCOPE OF WORK:

.01 PROVIDE AN EMERGENCY GENERATOR TO PICK-UP THE ADMINISTRATION BUILDING LOADS AND REVISE THE ELECTRICAL DISTRIBUTION TO SUIT.

.02 SUB-FEED THE COMMERCIAL SCALE BUILDING FROM THE ADMINISTRATION BUILDING AND DISCONNECT THE EXISTING

.03 PROVIDE LOCATES, EXCAVATIONS AND DIRECTIONAL BORING AS REQUIRED. AFTER WORK IS COMPLETE THE CONTRACTOR SHALL PROVIDE DETAILED AS-BUILTS AND REPAIR ALL SURFACES TO MATCH EXISTING UNLESS OTHERWISE INDICATED.

.04 PROVIDE LIGHTS, PLUGS, AND HEATERS FOR THE NEW ADMINISTRATION BUILDING ELECTRICAL ROOM.

DIV.26 - ELECTRICAL SPECIFICATIONS

1.0 GENERAL PROVISIONS

.01 THE DRAWINGS, GENERAL CONDITIONS AND GENERAL PROVISIONS OF THE CONTRACT SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS. WHERE CONFLICTS ARISE BETWEEN THESE DOCUMENTS, THE MORE STRINGENT PROVISION WILL BE APPLICABLE, SUBJECT TO THE INTERPRETATION OF THE CONTRACT ADMINISTRATOR. THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE WHERE THE CONTRACT DOCUMENTS EXCEED CODE, UTILITY OR RECOGNIZED STANDARDS REQUIREMENTS.

.02 THE CONTRACT SHALL INCLUDE FURNISHING ALL LABOR, MATERIAL, SERVICES, AND SKILLED SUPERVISION NECESSARY FOR THE CONSTRUCTION, ERECTION, INSTALLATION, CONNECTIONS, TESTING, AND ADJUSTMENT OF ALL MATERIALS AND ELECTRICAL EQUIPMENT NECESSARY FOR A COMPLETE AND OPERATING SYSTEM AS INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN, AND ITS DELIVERY TO THE OWNER, COMPLETE IN ALL RESPECTS AND READY FOR USE.

.03 ALL ELECTRICAL WORK AND MATERIAL SHALL CONFORM WITH THE CURRENT RELEVANT NBC, CEC, LOCAL BY-LAWS AND TO THE SATISFACTION OF THE AHJ AND CONTRACT ADMINISTRATOR

.04 EXAMINE THE SITE, BUILDING AND LOCAL CONDITIONS AFFECTING WORK OF THIS CONTRACT. EXAMINE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL CONDITIONS TO ENSURE WORK CAN BE PERFORMED WITHOUT CHANGES, AS SHOWN ON CONTRACT DRAWINGS. NO ALLOWANCE WILL BE MADE LATER FOR NECESSARY CHANGES, UNLESS IT HAS BEEN BROUGHT TO CONTRACT ADMINISTRATOR'S ATTENTION IN WRITING, PRIOR TO CLOSING OF BIDS. BY SIGNING THE CONTRACT, THE EC ACKNOWLEDGES A SITE WALK-THROUGH HAS BEEN COMPLETED AND THE EXISTING CONDITIONS WERE ACCEPTED.

.05 APPLY FOR AND INCLUDE THE ASSOCIATED COSTS FOR ALL PERMITS, SERVICES, FEES AND INSPECTIONS IN THE BID QUOTE.

.06 INCLUDE ALL FEDERAL, PROVINCIAL AND MUNICIPAL TAXES FOR THE WORK IN THE BID PRICE.

.07 OBTAIN APPROVALS FROM THE AHJ AND NOTIFY THE CONTRACT ADMINISTRATOR OF ANY CHANGES REQUESTED BY THE AHJ PRIOR TO THE EXECUTION OF THE REQUEST.

.08 COMPLY WITH ALL DEPARTMENT OF LABOUR, WORKPLACE AND HEALTH REQUIREMENTS AT ALL TIMES.

.09 WHERE DOUBT EXISTS AS TO THE MEANING OF THE DRAWINGS OR SPECIFICATIONS, IT IS THE RESPONSIBILITY OF THE EC TO OBTAIN CLARIFICATION PRIOR TO BID

.10 PROVIDE TEMPORARY ELECTRICAL SERVICES AS REQUIRED BY ALL TRADES. COORDINATE POWER REQUIREMENTS FOR THE TEMPORARY SERVICE WITH THE GC.

.11 ALL MATERIALS USED SHALL BE NEW, OF THE TYPE SPECIFIED, AND APPROVED BY CERTIFICATION AGENCY RECOGNIZED BY THE AHJ, AND FREE FROM DEFECTS.

.12 EXECUTE WORK IN A FIRST-CLASS AND WORKMANLIKE MANNER, TO PRESENT A NEAT APPEARANCE.

.13 CLEAN ALL EQUIPMENT DURING CONSTRUCTION AND AGAIN ON COMPLETION OF THE CONTRACT. ALL SURPLUS MATERIALS, CUTTINGS, PACKAGING AND DEBRIS SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED.

.14 ALL ELECTRICAL EQUIPMENT (INCLUDING PANELBOARDS, DISCONNECT SWITCHES, MOTOR STARTERS, SERVICE ENTRANCE, AND MCC) SHALL HAVE A LIGHT GREY (ASA-61) FACTORY ENAMEL FINISH UNLESS SPECIFIED OTHERWISE IN THE OTHER SECTIONS.

.15 BUILDING ENVELOPE PENETRATIONS FOR ANY ELECTRICAL COMPONENTS (I.E. CONDUIT, BOXES, CABLES, ETC.) SHALL BE EXECUTED SO INTEGRITY OF ASSEMBLY IS NOT COMPROMISED. PROVIDE ADEQUATE SEALING, COVERS, GASKETS, CAPS, ETC. COORDINATE WORK AND REQUIREMENTS WITH ALL OTHER RELEVANT CONTRACTORS AND OTHER RELEVANT CONSULTANTS AND

.16 THE ELECTRICAL SERIES DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS PERTAIN TO THE ELECTRICAL SCOPE OF WORK ONLY. TASKS WHICH ARE NOT PART OF THE ELECTRICAL SCOPE OF WORK, EVEN IF MENTIONED IN THESE DOCUMENTS, ARE INDICATED PURELY FOR REFERENCE AND COORDINATION PURPOSES ONLY.

.17 THE DRAWINGS ARE DIAGRAMMATIC ONLY, AND DO NOT SHOW ALL DETAILS. INFORMATION INVOLVING ACCURATE MEASUREMENTS OF THE BUILDING. STRUCTURAL STEEL. EXISTING WALLS, ETC. IS TO BE TAKEN IN THE FIELD. THE EC SHALL MAKE WITHOUT ADDITIONAL EXPENSE TO OWNER NECESSARY CHANGES OR ADDITIONS TO RUNS TO ACCOMMODATE STRUCTURAL CONDITIONS

CHANGE IS MADE BEFORE FINAL INSTALLATION AND DOES NOT NECESSITATE ADDITIONAL MATERIALS. RECORD CHANGES ON RECORD CONTRACT: DRAWINGS.

.19 DRAWINGS SHOW GENERAL LOCATIONS FOR EQUIPMENT AND CIRCUITS; INSTALL THEM IN SUCH A WAY AS TO CONSERVE HEADROOM AND TO INTERFERE AS LITTLE AS POSSIBLE WITH THE SPACE THROUGH WHICH THEY PASS.

.20 ALL PAINTING AND PATCHING SHALL BE DONE BY QUALIFIED LABOURERS.

.21 MAINTAIN 1m CLEARANCE IN FRONT OF ALL SERVICEABLE ELECTRICAL EQUIPMENT (i.e. PANELBOARDS) AS PER CEC REQUIREMENTS

.22 INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE AHJ, CEC AND MANUFACTURER'S INSTRUCTIONS. EC SHALL COORDINATE WITH OTHER TRADES TO ENSURE PROPER INSTALLATION.

.23 THE EC SHALL KEEP A SET OF FULL SIZED RECORD DRAWINGS ON WHICH THE EC SHALL RECORD ALL ADDITIONS OR DEVIATIONS FROM THE CONTRACT DOCUMENTS INCLUDING ALL CHANGES COVERED BY ADDENDA. CHANGE ORDERS. FIELD CHANGES. SITE CONDITIONS, ETC. A SET OF DRAWINGS SHALL BE UTILIZED FOR EACH SYSTEM AND THE EC SHALL OBTAIN PRINTS AS REQUIRED. DRAWINGS TO INCLUDE LOCATIONS OF ALL JUNCTION AND PULL BOXES, ROUTING OF FEEDERS AND CONDUITS, AND CHANGES TO CIRCUIT NUMBERS, ALL PRINCIPLE BELOW GRADE OR INACCESSIBLE CONDUITS, SYSTEMS, ETC, SHALL BE DIMENSIONED AT EACH CHANGE IN DIRECTION. ALL CONDUIT ROUTES NOT SHOWN BY THE ENGINEER ON ORIGINAL DRAWING SHALL BE SHOWN INCLUDING CIRCUIT WIRING, JUNCTION BOXES, ZONED CONDUIT RUNS, ETC.

.24 ALL EQUIPMENT HEIGHTS SHALL MEET THE BARRIER FREE REQUIREMENTS OF THE NBC. THE EC SHALL INSTALL ELECTRICAL COMPONENTS AT THE FOLLOWING HEIGHTS UNLESS INDICATED OR DIRECTED OTHERWISE.

- GENERAL PURPOSE OUTLETS: 18" (450mm) TO CENTER. VERTICAL ORIENTATION. OUTLETS ABOVE COUNTERS: 6" (150mm) TO BOTTOM, VERTICAL ORIENTATION.
- GENERAL PURPOSE OUTLETS IN MECHANICAL AREAS: 40" (1000mm) TO BOTTOM, VERTICAL ORIENTATION.
- CONTROL DEVICES (SWITCHES, THERMOSTATS, ETC.): 48" (1200mm) TO TOP, VERTICAL ORIENTATION. • FIRE ALARM DEVICES SHALL BE INSTALLED AS PER CAN /ULC-S524 IN CONJUNCTION WITH THE NBC.
- PANELBOARDS: 78" (2000mm) TO TOP.

25 PANELBOARDS AND OTHER EQUIPMENT WHICH ARE TO BE SURFACE MOUNTED SHALL BE INSTALLED ON MINIMUM 3/4" (19mm) .04 COORDINATE AS REQUIRED WITH THE OWNER DURING THE DEMOLITION AND CONSTRUCTION PHASES OF THE WORK. THIS FIRE RATED PLYWOOD MOUNTING BACKBOARDS. TREAT BACKBOARDS WITH WOOD PRESERVATIVE PRIOR TO INSTALLATION AND PAINT INCLUDES ANY TEMPORARY ELECTRICAL CONNECTIONS, REMOVAL OF EXISTING POWER SERVICES AND INSTALLATION OF NEW WITH PRIMER AND TWO (2) COATS OF GREY ENAMEL BEFORE ANY EQUIPMENT IS MOUNTED, PROVIDE PLYWOOD MOUNTED BOARDS UNLESS SPECIFIED OTHERWISE IN THE OTHER SECTIONS.

.26 TEST SYSTEM AND RECORD SAME FOR THE ENGINEER'S APPROVAL:

- PHASE BALANCE INSULATION RESISTANCE
- GROUND RESISTANCE
- VOLTAGE DROP
- SUBMIT VOLTAGE DROP RESULTS FOR ALL LARGE MECHANICAL EQUIPMENT AND PANEL BOARDS WHERE UPSTREAM AMPACITY EXCEEDS 100A

.27 ALL PCN COSTING SHALL BE REVIEWED BY THE CONTRACT ADMINISTRATOR USING PRICING STANDARDS BASED ON THE CURRENT EDITION OF RSMEANS "ELECTRICAL CHANGE ORDER COST DATA" PRICING GUIDE. THIS GUIDE SHALL BE THE MAXIMUM COST ALLOWED

.28 EXCAVATION AND FILI

- WHERE REQUIRED, THE EC SHALL PERFORM ALL EXCAVATION AND BACK-FILLING PERTAINING TO THIS PORTION OF THE CONTRACT. FILL MATERIAL SHALL BE EQUIVALENT TO THE SURROUNDING MATERIAL. THE EC SHALL COORDINATE ALL WORK REOURE UNDER NO CIRCUMSTANCES SHALL THE EC PROCEED WITH DIGGING WITHOUT CHECKING WITH PERTINENT PARTIES AND/OR
- AUTHORITIES REGARDING THE EXISTING UNDERGROUND SERVICES DUCTS, STRUCTURES, DOMESTIC WATER / SANITARY LINES, ETC. WHEN UNDERGROUND SERVICE/INSTALLATION HAS TO BE CONNECTED TO SERVICES SUPPLIED AND INSTALLED BY OTHER
- PARTIES, THE EC SHALL FULLY COORDINATE THE EXACT POINT OF CONNECTION WITH OTHER PARTIES. THIS COORDINATION HAS TO BE PERFORMED PRIOR TO EXCAVATION AND INSTALLATION. ALL CIVIL CONCRETE. EXCAVATION OR BACKFILL WORK INCLUDING SHORING AND BEDDING SHALL BE PERFORMED UNDER.
- THE DIRECTION OF THE RELEVANT PROFESSIONAL (CONTRACT ADMINISTRATOR OR STRUCTURAL ENGINEER) ON THE PROJECT. FOR DIRECTIONS, GUIDANCE, SPECIFICATION REGARDING THIS WORK, THE EC SHALL CONTACT THE RELEVANT PROFESSIONAL(S)

.29 FINAL ACCEPTANCE

- AS KGS GROUP IS REQUIRED TO GIVE PROFESSIONAL ASSURANCE THAT ALL ELECTRICAL SYSTEMS HAVE BEEN INSTALLED, TESTED AND VERIFIED IN ACCORDANCE WITH THE NBC AND THE CEC, KGS REQUIRES THE FOLLOWING ITEMS FROM THE EC PRIOR TO ISSUANCE OF "LETTER OF PROFESSIONAL ASSURANCE" FOR BUILDING OCCUPANCY:
- FINAL ELECTRICAL INSPECTION CERTIFICATE SIGNED BY THE ELECTRICAL INSPECTOR FOR THE PROJECT. A DECLARATION FORM SIGNED BY THE EC IS NOT ACCEPTABLE

2.0 DEFINITIONS

- .01 THE FOLLOWING ARE DEFINITIONS OF TERMS AND EXPRESSIONS USED IN THE ELECTRICAL SPECIFICATION AND DRAWINGS: AHJ - AUTHORITY HAVING JURISDICTION
- CA CONTRACT ADMINISTRATOR
- EC ELECTRICAL SUB-CONTRACTOR MC - MECHANICAL SUB-CONTRACTOR
- GC GENERAL CONTRACTOR
- INSPECTION AUTHORITY MEANS AGENT OF ANY AUTHORITY HAVING JURISDICTION OVER CONSTRUCTION STANDARDS ASSOCIATED WITH ANY PART OF ELECTRICAL WORK ON SITE.
- SUPPLY AUTHORITY MEANS ELECTRICAL POWER UTILITY COMPANY RESPONSIBLE FOR DELIVERY OF ELECTRICAL POWER TO PROJECT (MANITOBA HYDRO).
- CEC MEANS CANADIAN ELECTRICAL CODE OR LOCAL CODE IN FORCE AT PROJECT LOCATION.
- NBC MEANS NATIONAL BUILDING CODE OR LOCAL CODE IN FORCE AT PROJECT LOCATION.
- CODE MEANS ALL CODES, REGULATIONS AND REQUIREMENTS INCLUDING BUT NOT LIMITED TO THE CURRENT RELEVANT NBC, CEC AND LOCAL BY-LAWS. PROVIDE - MEANS TO SUPPLY, INSTALL AND LEAVE IN WORKING ORDER ALL MATERIALS AND NECESSARY WIRING, SUPPORTS,
- ACCESS PANELS, ETC., AS NECESSARY FOR EQUIPMENT INDICATED CONCEALED - MEANS HIDDEN FROM NORMAL SIGHT IN FURRED SPACES. SHAFTS, CEILING SPACES, WALLS AND PARTITIONS;
- EXPOSED MEANS WORK NORMALLY VISIBLE, INCLUDING WORK IN EQUIPMENT ROOMS, TUNNELS, AND SIMILAR SPACES;
- FINISHED MEANS WHEN IN DESCRIPTION OF ANY AREA OR PART OF AN AREA OR A PRODUCT WHICH RECEIVES A FINISH SUCH AS PAINT OR IN CASE OF A PRODUCT MAY BE FACTORY FINISHED;
- INSTALL (AND TENSES OF "INSTALL") MEANS SECURE IN POSITION, CONNECT COMPLETE, TEST, ADJUST AND VERIFY; CONNECT - TO BRING SERVICE TO THE EQUIPMENT AND MAKE FINAL ATTACHMENT INCLUDING NECESSARY SWITCHES,
- OUTLETS, BOXES, TERMINATIONS, ETC. SUPPLY - MEANS TO PROCURE, ARRANGE FOR DELIVERY TO SITE, DISTRIBUTE TO FLOORS, INSPECT, ACCEPT DELIVERY AND
- ADMINISTER SUPPLY OF MANUFACTURER'S PRODUCTS AND/OR SYSTEMS, AND INCLUDES MANUFACTURER'S SUPPLY OF ANY SPECIAL CABLES, STANDARD ON SITE TESTING, INITIAL START-UP, PROGRAMMING, BASIC COMMISSIONING, WARRANTIES AND ASSISTANCE TO CONTRACTOR: DELETE OR REMOVE (AND TENSES OF "DELETE" OR "REMOVE") - MEANS TO DISCONNECT, MAKE SAFE, REMOVE INCLUDING
- ANY BACK BOX AND EXPOSED CONDUITS. PATCH AND REPAIR/FINISH SURFACES TO MATCH ADJOINING SIMILAR CONSTRUCTION, INCLUDE FOR ASSOCIATED RE-PROGRAMMING OF SYSTEMS AND/OR CHANGE OF DOCUMENTATION IDENTIFICATIONS TO SUIT DELETIONS, AND LEGALLY DISPOSE OF DELETED PRODUCTS OFF-SITE UNLESS OTHERWISE
- INSTRUCTED BY THE CONTRACT ADMINISTRATOR OR OWNER, HOWEVER THE OWNER RESERVES FIRST RIGHTS TO SALVAGE; ELECTRICAL DIVISIONS - REFERS TO DIVISIONS 26, 27, 28 AND OTHER DIVISIONS AS SPECIFICALLY NOTED, AND WHICH WORK AS DEFINED IN SPECIFICATIONS AND /OR ON DRAWINGS IS RESPONSIBILITY OF EC, UNLESS OTHERWISE NOTED;
- MECHANICAL DIVISIONS REFERS TO DIVISIONS 20, 21, 22, 23, 25 AND OTHER DIVISIONS AS SPECIFICALLY NOTED, AND WHICH WORK AS DEFINED IN SPECIFICATIONS AND /OR ON DRAWINGS IS RESPONSIBILITY OF MC, UNLESS OTHERWISE NOTED; FACP - FIRE ALARM CONTROL PANEL;

3.0 SUBMITTALS

.01 SUBMIT PRODUCT DATA FOR ALL EQUIPMENT. ACCEPTABLE MATERIALS SHALL BE AS SPECIFIED, CODE APPROVED OR OWNER APPROVED. ALL MATERIAL SHALL BE NEW, UNLESS SPECIFIED OTHERWISE.

.02 MATERIALS AND EQUIPMENT LISTED ARE PREFERRED. THE EC MAY, HOWEVER, SUBMIT ALTERNATES TO THE CONTRACT ADMINISTRATOR TO BE APPROVED AS EQUALS AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO CLOSING OF BID.

.03 ALL REQUEST FOR LUMINAIRE EQUALS SHALL BE C/W CUTSHEETS AND PHOTOMETRICS. ONLY ONE REQUEST WILL BE CONSIDERED FROM EACH SUPPLIER. IF REJECTED, FOR ANY REASON, NO SUBSTITUTES FROM THE SAME SUPPLIER WILL BE REVIEWED.

.04 SHOP DRAWINGS SHALL BE SUBMITTED TO THE CONTRACT ADMINISTRATOR FOR REVIEW AND APPROVAL BEFORE MANUFACTURING AND INSTALLATION CAN PROCEED.

.05 LAMACOID LABEL WORDING SHALL BE SUBMITTED TO THE CONTRACT ADMINISTRATOR FOR REVIEW AND APPROVAL BEFORE MANUFACTURING AND INSTALLATION CAN PROCEED.

- A COPY OF THE CERTIFICATE CERTIFYING THAT EMERGENCY LIGHTING SYSTEM HAS BEEN TESTED UNDER FULL LOAD AS PER CODE REQUIREMENTS. AS-BUILTS.
- ONE (1) 0&M MANUAL HARDCOPY AND ONE (1) DIGITAL COPY IN DVD FORMAT. 0&M MANUALS SHALL CONTAIN COPIES OF ALL FINAL SHOP DRAWINGS, WARRANTY LETTER, AS-BUILTS, FIRE ALARM VI, TEST RESULTS AND THE CLOSED ELECTRICAL PERMIT THE HARDCOPY SHALL BE SUBMITTED IN A D-RING BINDER C/W COVERPAGE TABLE OF CONTENTS, DVD SLEEVE AND LABELED TABBED DIVIDERS FOR ALL SECTIONS INCLUDING POWER, LIGHTING, DATA, FIRE ALARM, ETC. THE DIGITAL COPY SHALL BE LABELED AND ORGANIZED TO MATCH THE HARDCOPY. THE FILES IN THE DIGITAL COPY SHALL BE ORGANIZED WITHIN SUBFOLDERS SIMILAR TO THE HARDCOPY A COPY OF THE 1 YEAR GUARANTEE LETTER
- ONCE COMMISSIONING IS COMPLETE THE CONTRACTOR SHALL SUBMIT THE RESULTS TO THE CONTRACT ADMINISTRATOR FOR REVIEW.
- THE CONTRACTOR SHALL SUBMIT A WRITTEN REPORT WITH TEST RESULTS INDICATED THAT THE TRANSFER SWITCH SYSTEM IS FULLY FUNCTIONAL

.07 AFTER WORK IS COMPLETED, FURNISH TO OWNER A WRITTEN GUARANTEE THAT FOR ONE YEAR FROM DATE OF ACCEPTANCE, ANY DEFECTS IN MATERIALS OR WORKMANSHIP WILL BE CORRECTED AT NO COST TO THE OWNER.

4.0 COORDINATION

.01 THE EC IS RESPONSIBLE TO DETERMINE THE SCOPE OF THE WORK REQUIRED FOR EACH TRADE. ALL TRADES MUST COORDINATE WORK TO ENSURE THAT THE ENTIRE SCOPE OF THE PROJECT IS COVERED. THERE SHALL BE NO ALLOWANCES GIVEN FOR ITEMS WHICH RESULT AS A FAILURE TO COORDINATE. THE EC WILL REVIEW THE DRAWINGS WITH ALL TRADES PRIOR TO BID TO RESOLVE ALL COORDINATION ISSUES

.02 COORDINATE WITH ALL TRADES AND ARRANGE EQUIPMENT IN PROPER RELATION WITH OTHER APPARATUS INCLUDING BUT NOT LIMITED TO ARCHITECTURAL FINISHES, DUCTS, PIPES, AND BUILDING CONSTRUCTION.

.03 THE EC IS RESPONSIBLE TO DETERMINE WHICH DIVISION OR SECTION PROVIDES VARIOUS PRODUCTS AND WORK. ADDITIONAL COMPENSATION WILL NOT BE CONSIDERED BECAUSE OF DIFFERENCES IN INTERPRETATION OF TECHNICAL PROVISIONS.

SERVICES. THE EC SHALL COMPLETE ALL PRELIMINARY WORK PRIOR TO ANY POWER OUTAGES IN ORDER TO MINIMIZE DOWNTIME.

.05 COORDINATE, NOTIFY AND ARRANGE WITH THE OWNER, GC AND ENGINEER ALL STAGING REQUIREMENTS TO MINIMIZE THE DURATION AND NUMBER OF POWER OUTAGES NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST.

.06 THE ELECTRICAL DRAWINGS AND SPECIFICATIONS SHALL BE READ IN CONJUNCTION WITH THE DRAWINGS AND SPECIFICATION OF ALL OTHER DISCIPLINES. THE EC SHALL BE RESPONSIBLE FOR THE INCLUSION OF ALL ELECTRICAL WORK ASSOCIATED WITH OTHER DISCIPLINES.

.07 OBTAIN AND REFER TO THE MECHANICAL EQUIPMENT SHOP DRAWINGS FOR THE REQUIRED CIRCUIT BREAKER (CB) AND WIRE SIZE PRIOR TO ORDERING. WHERE THE CB AND WIRE SIZE CHANGES THE EC SHALL ADJUST THE CB AND WIRE SIZE WITHOUT ADDITION COST TO OWNER.

ENGINEERS

- SERVICE ENTRANCE"
 - AND WIREWAY
 - 8.0 PANELBOARDS

- THE FOLLOWING:

5.0 IDENTIFICATION

.01 ALL ELECTRICAL EQUIPMENT INSTALLED OR CONNECTED SHALL BE IDENTIFIED BY MEANS OF ENGRAVED LAMACOID LABELS C/W MINIMUM 3/8" LETTERING. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING: SWITCHBOARDS, PANEL BOARDS, DISCONNECT SWITCHES, TRANSFORMERS, STARTERS/VFD'S, MECHANICAL EQUIPMENT (INDICATE EQUIPMENT TAG), ETC. WHERE THE OWNERS LABELING STANDARDS EXCEED THIS SPECIFICATION THE EC SHALL FOLLOW THE OWNERS STANDARDS. THE EC SHALL ALLOW FOR A MINIMUM OF 25-CHARACTERS PER LABEL AND SUBMIT THE PURPOSED LABELS TO THE CONTRACT ADMINISTRATOR FOR APPROVAL PRIOR TO ORDERING.

NORMAL POWER SYSTEMS: BLACK WITH WHITE LETTERING EMERGENCY POWER SYSTEMS: RED WITH WHITE LETTERING

ALL RECEPTACLE AND SWITCH FACE PLATES SHALL BE C/W CLEAR DYMOTAPE LABELS WITH BLACK LETTERING INDICATING THE SOURCE PANEL NAME AND CIRCUIT NUMBER. (PNL 'X' - CCT#)

.03 ALL CONDUITS SHALL BE COLOR CODED UTILIZING SELF ADHESIVE TAPE.

.04 ALL EXTERIOR IDENTIFICATION SHALL BE UV RESISTANT AND WEATHERPROOF

6.0 ELECTRICAL WORK IN EXISTING BUILDINGS

.01 COORDINATION ALLOW FOR AFTER HOURS WORK AS REQUIRED.

 WHERE EXISTING SERVICES OR SYSTEMS, SUCH AS ELECTRICAL POWER, TELEPHONE SYSTEM, DATA SYSTEMS, EQUIPMENT ALARM SYSTEM, FIRE ALARM SYSTEM, ETC. ARE REQUIRED TO BE DISRUPTED AND/OR SHUT-DOWN, COORDINATE THE SHUT-DOWNS WITH THE OWNER AND CARRY OUT THE WORK AT A TIME AND IN A MANNER ACCEPTABLE TO THEM. CAREFULLY SCHEDULE ALL DISRUPTIONS AND/OR SHUTDOWNS AND ENSURE THE DURATION OF SAME IS KEPT TO THE ABSOLUTE MINIMUM. SUBMIT FOR APPROVAL, A WRITTEN CONCISE SCHEDULE OF EACH DISRUPTION AT LEAST 120 HOURS IN ADVANCE OF PERFORMING WORK AND OBTAIN WRITTEN CONSENT PRIOR TO IMPLEMENTING.

 SHOULD ANY TEMPORARY CONNECTIONS BE REQUIRED TO MAINTAIN SERVICES OR SYSTEMS DURING WORK IN THE EXISTING BUILDING, SUPPLY AND INSTALL ALL NECESSARY MATERIAL AND EQUIPMENT AND PROVIDE ALL LABOUR AT NO EXTRA COST. SHOULD ANY EXISTING EQUIPMENT OR SYSTEM BE DAMAGED, MAKE FULL REPAIRS WITHOUT EXTRA COST, AND TO THE SATISFACTION OF THE OWNER AND CONTRACT ADMINISTRATOR.

 THE DRAWINGS INDICATE MAJOR ITEMS OF EQUIPMENT TO BE DELETED OR RELOCATED BUT MAY NOT INDICATE EVERY ITEM OF EQUIPMENT OR CONDUIT TO BE DELETED OR RELOCATED. THE EC SHALL BE RESPONSIBLE FOR DETERMINING WHICH EXISTING EQUIPMENT IS TO BE DELETED OR RELOCATED BY EXAMINING ALL SITE CONDITIONS AND ALL CONSTRUCTION DOCUMENTS

SCANNING

 NO CORING OR DRILLING IN CONCRETE FLOORS OR WALLS SHALL TAKE PLACE UNLESS THE CONCRETE HAS BEEN SCANNED (OR X-RAYED) FOR ELECTRICAL, MECHANICAL, AND STRUCTURAL ELEMENTS, THE EC SHALL NOTIFY THE OWNER BEFORE DRILLING. THE EC ASSUMES COMPLETE RESPONSIBILITY FOR ANY AND ALL DAMAGES OR WORK STOPPAGES OCCURRING FROM UNFORESEEN PROBLEMS

 CONDUIT, WIRING, AND EQUIPMENT SERVICING SPACES OUTSIDE OF THE DEMOLITION AREA SHALL BE MAINTAINED. THE EC SHALL RELOCATE AND EXTEND EXISTING CONDUIT AND WIRING AS REQUIRED TO MAINTAIN THE EXISTING SYSTEM AND SUIT THE NEW LAYOUT.

.03 EXISTING DEVICES IN NEW CONSTRUCTION

 DISCONNECT AND REMOVE EXISTING ELECTRICAL EQUIPMENT MADE OBSOLETE DUE TO RENOVATIONS C/W ASSOCIATED WIRING AND CONDUITS BACK TO SOURCE PANEL. WHERE EXISTING DEVICES (RECEPTACLES, SWITCHES, ETC.) ARE PRESENTLY MOUNTED ON A WALL WHICH WILL BE COVERED

WITH A NEW FINISH, PROVIDE AN EXTENSION RING, COVERPLATE, ETC., AS REQUIRED TO SUIT THE NEW WALL FINISH. ALL EXISTING JUNCTION BOXES IN WALLS AND CEILING SPACES REQUIRED TO MAINTAIN EXISTING CIRCUITS SHALL REMAIN ACCESSIBLE

 ANY DAMAGES CAUSED BY THE EC SHALL BE THE RESPONSIBILITY OF THE EC TO TAKE ALL ACTIONS REQUIRED AND AS MAY BE DEEMED NECESSARY BY THE OWNER TO CORRECT ANY DAMAGE. NO CORING SHALL BE UNDERTAKEN UNLESS PERMISSION IS GIVEN BY THE BUILDING OWNER.

 THE EC SHALL UPDATE ALL PANEL SCHEDULES AFFECTED BY DEMOLITION WORK. REMAINING UNUSED BREAKERS SHALL BE LEFT IN PANELBOARDS AND BE LABELED "SPARE".

MATERIALS

 PROVIDE NEW WIRING AS REQUIRED TO INTERCONNECT NEW DEVICES TO EXISTING SYSTEMS TO SUIT THE MANUFACTURER REQUIREMENTS AND INSTRUCTIONS • PROVIDE NEW GROUNDING MATERIALS AS REQUIRED TO MAKE EXISTING GROUNDING SYSTEMS GOOD IN RENOVATED AREAS .16 EMT COUPLINGS AND CONNECTORS TO BE T&B STEEL.

ONLY. CONFIRM EXISTING ON SIT WHERE AN EXISTING PANELBOARD REQUIRES TO BE RELOCATED, PROVIDE JUNCTION AND/OR PULL BOXES IN ACCESSIBLE CEILING SPACE AS REQUIRED TO PROPERLY EXTEND ALL CONDUCTORS. PROVIDE PERMANENT COMPRESSION CONNECTIONS OR, APPROPRIATE TERMINAL BLOCKS TO TERMINATE ALL CONDUCTORS C/W TAGGING. PROVIDE PERMANENT

IDENTIFICATION ON ALL RELATED JUNCTION AND PULL BOXES. MATERIAL QUALITY FOR NEW SYSTEM DEVICES (SPEAKERS, STARTERS, PANELBOARDS, BREAKERS, ETC.) THAT ARE REQUIRED TO BE TIED INTO EXISTING SYSTEMS SHALL MATCH OR EXCEED EXISTING.

IT IS THE INTENT OF THESE SPECIFICATIONS TO NOT RE-USE ANY EXISTING WIRING.

INSTALLATION PATCH AND REPAIR WALLS AND CEILINGS IN EXISTING BUILDING AREAS THAT HAVE BEEN DAMAGED OR CUT OPEN DUE TO

THE INSTALLATION OF NEW ELECTRICAL EQUIPMENT. PATCH AND MAKE GOOD EXISTING WALLS WHICH ARE TO REMAIN WHERE EXISTING ELECTRICAL DEVICES HAVE BEEN

TEST AND CONFIRM ALL EXISTING GROUNDING SYSTEMS ARE EFFECTIVE AND IN GOOD CONDITION. INCLUDE WORK AND

MATERIALS REQUIRED TO CHANGE WIRING AND MAKE GOOD.

7.0 SERVICE ENTRANCE EQUIPMENT

.01 PROVIDE SERVICE ENTRANCE RATED BREAKER AND EQUIPMENT AS DETAILED ON THE DRAWINGS AND SPECIFIED HEREIN.

.02 ALL ELEMENTS OF ELECTRIC POWER DISTRIBUTION SYSTEM SHALL BE RATED FOR PROPER VOLTAGE AND AVAILABLE FAULT LEVELS. OVER CURRENT PROTECTION DEVICES SHALL BE APPROVED AND MARKED AS BREAKERS OR BREAKER/FUSES COMBINATION IN SERIES. SHOP DRAWINGS SHALL CLEARLY IDENTIFY THE COMPLIANCE WITH THIS REQUIREMENT.

.03 ENSURE THAT THE SERVICE EQUIPMENT BEARS EVIDENCE OF "SUITABLE FOR

.04 SERVICE ENTRANCE BOARDS TO BE AS FOLLOWS:

RATINGS AS INDICATED ON DRAWINGS

FLOOR MOUNTED, LEVELED, WALL SUPPORTED, STEEL ENCLOSURE, DEAD FRONT C/W MAIN BREAKER, DISTRIBUTION SECTION

 BREAKERS SHALL BE BOLT-ON MOLDED CASE BREAKERS. BUS BAR, GROUND BAR AND MAIN CONNECTIONS SHALL BE SILVER PLATED ALUMINUM.

.01 PROVIDE PANELBOARDS AND BREAKERS AS DETAILED ON THE DRAWINGS AND SPECIFIED HEREIN.

.02 LIGHTING AND POWER PANELBOARDS TO BE CIRCUIT BREAKER TYPE AND AS SHOWN ON DRAWINGS. PANELS SHALL CONTAIN

BOLT-ON MOLDED CASE CIRCUIT BREAKERS: QUICK-MAKE, QUICK-BREAK TYPE, FOR MANUAL AND AUTOMATIC OPERATION

WITH TEMPERATURE COMPENSATION FOR 40C AMBIENT PANEL AND BREAKERS TO BE OF ONE MANUFACTURER. CIRCUIT BREAKERS SHALL BE LISTED FOR USE IN THE ASSOCIATED

PANELBOARDS AND BE INSTALLED IN PANELBOARDS BEFORE SHIPMENT,

 ALUMINUM BUSSING WITH NEUTRAL OF SAME AMPERE RATING AS MAINS, TRIM WITH CONCEALED FRONT BOLTS AND HINGES AND DOOR.

METAL DOOR COVER C/W PLASTIC COVERED TYPED PANEL SCHEDULE,

• THE PANEL SCHEDULE SHALL BE TYPED IN UPPERCASE AND MATCH THE NAMING CONVENTION ON THE DRAWINGS. DIRECTORY TO INDICATE CIRCUITS SERVED AS PER FINAL WIRING CONNECTIONS,

IN ADDITION TO CSA REQUIREMENTS MANUFACTURER'S NAMEPLATE SHALL INDICATE THE PANELBOARDS FAULT CURRENT

• TWO KEYS SHALL BE PROVIDED FOR EACH PANELBOARD AND ALL PANELBOARDS SHALL BE KEYED ALIKE FOR THE ENTIRE

• THE EC SHALL CONFIRM CABLE ENTRY AND THAT PANEL LUGS SUIT FEEDER SIZE AND TYPE DURING THE SHOP DRAWING REVIEW

LAMACOID LABEL TO INDICATE PANEL NAME, VOLTAGE AND SOURCE.

.03 GENERAL BREAKER REQUIREMENTS:

MULTI-POLE BREAKERS TO HAVE COMMON TRIP (NO TIE HANDLE WILL BE ACCEPTED),

 BREAKERS USED FOR LIGHTS SHALL BE RATED FOR SWITCHING THAT DUTY, SERIES RATED BREAKERS ARE ACCEPTABLE HOWEVER ARE REQUIRED TO BE FACTORY TESTED COMBINATIONS AND BE CLEARLY IDENTIFIED ON THE PANELBOARD (i.e. "XX, 000A SERIES RATED") C/W SEPARATE COMPATIBILITY CHART.

OCATION APPROVED

JNDERGROUND STRUCTURES

LOCATION OF UNDERGROUND STRUCTURES AS

AVAILABLE BUT NO GUARANTEE IS GIVEN

CONFIRMATION OF EXISTENCE AND EXACT

LOCATION OF ALL SERVICES MUST BE

OBTAINED FROM THE INDIVIDUAL UTILITIES

BEFORE PROCEEDING WITH CONSTRUCTION.

SHOWN ARE BASED ON THE BEST INFORMATION

THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT.

SUPV. U/G STRUCTURES

COMMITTEE

B.M

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ISSUED FOR CONSTRUCTION

REVISIONS

.04 BREAKERS FOR USE IN EXISTING PANELBOARDS SHAL

- BE LISTED FOR USE WITH THE EXISTING PANELBOARDS BE SUPPLIED WITH A BUS KIT TO SUIT THE INSTALLATION WHERE THE ORIGINAL BREAKERS ARE NO LONGER BEING
- MANUFACTURED MATCH THE EXISTING PANELBOARDS KA RATING UNLESS SPECIFICATIONS REQUIRE TO EXCEED EXISTING RATINGS

.05 ACCEPTABLE MANUFACTURERS: SQUARE 'D' AND EATON 9.0 CONDUIT, WIRE, AND CONNECTIONS

.01 PROVIDE ALL CONDUIT, WIRING AND CONNECTIONS FOR A CODE COMPLIANT, COMPLETE AND OPERATIONAL SYSTEM.

.02 ALL WIRING SHALL BE INSTALLED IN EMT CONDUIT (MIN. 21mmØ) UNLESS OTHERWISE NOTED ON THE DRAWINGS OR SPECIFICATION.

.03 ALL WIRE AND CABLE SHALL BE COPPER, 98% CONDUCTIVITY, COLOUR CODED, NEW AND MARKED AS PER CEC REQUIREMENTS. WIRES SHALL BE RW90 TYPE RATED MINIMUM 600V. RWU90 SHALL BE USED FOR UNDERGROUND RACEWAY INSTALLATIONS.

.04 ALL WIRING SHALL BE SIZED AS PER CODE. MINIMUM ALLOWABLE WIRE SIZE IS #12 AWG. CONDUCTORS #8 AND LARGER SHALL BE STRANDED. ALL WIRING INSTALLED IN CONDUIT SHALL BE PULLED IN AT THE SAME TIME WITH APPROVED PULLING I UBRICANT

05 AC90 TYPE ARMORED CABLE WITH SCREW TYPE CONNECTORS SHALL BE USED FOR CONNECTIONS FROM CONDUIT SYSTEMS TO LUMINAIRES IN ACCESSIBLE CEILINGS AND STUD PARTITIONS ONLY. AC90 TYPE CABLE SHALL NOT BE USED FOR ANY OTHER APPLICATION

.06 MAXIMUM LENGTH OF AC90 CABLE FOR CONNECTIONS TO LUMINAIRES MOUNTED IN STUD PARTITIONS TO BE 1.5m. CABLE DROPS FOR LUMINAIRES IN ACCESSIBLE CEILINGS TO BE OF SUFFICIENT LENGTH TO ALLOW LUMINAIRE TO BE RELOCATED TO ANY LOCATION WITH A 3m RADIUS.

07 UNLESS OTHERWISE NOTED, FOR ALL OUTSIDE LIGHTING, USE MINIMUM #10 IN MINIMUM 1" CONDUIT C/W BOND WIRE. INCREASE WIRE GAUGE ACCORDING TO LOAD AND DISTANCE.

.08 MAXIMUM VOLTAGE DROP SHALL BE AS PER CODE REQUIREMENTS. WHERE REQUIRED THE EC SHALL UPSIZE THE FEEDER WIRING FOR EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER IN ORDER TO MEET MINIMUM VOLTAGE DROP REQUIREMENTS: AS THE FINAL FEEDER ROUTING IS DETERMINED BY THE EC. NO ALLOWANCE WILL BE GIVEN FOR A FAILURE TO ACCOUNT FOR VOLTAGE DROP PRIOR TO BID.

CONDUITS SHALL NOT HAVE MORE THAN ONE VOLTAGE LEVEL OF WIRING RUNNING WITHIN THEM.

10 ALL CABLES AND WIRES, ETC., TO BE RATED FT1 FOR COMBUSTIBLE BUILDINGS, FT4 FOR NON-COMBUSTIBLE BUILDINGS AND FT6 FOR PLENUM AND AS REQUIRED BY THE CODE.

PROVIDE A SEPARATE RACEWAY FOR EACH ELECTRICAL SYSTEM.

.12 CONDUIT RUNS IN WALLS TO BE VERTICAL; HORIZONTAL RUNS IN WALLS ARE NOT ACCEPTABLE.

SOLID (WIREHOLD TYPE) RACEWAY, TRANSFORMERS AND EQUIPMENT SUBJECT TO MOVEMENT OR VIBRATION. FINAL MOTOR AND TRANSFORMER CONNECTIONS SHALL BE MADE WITH 12-18" LIQUID-TIGHT FLEX.

.14 DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHOWN INDICATE POINTS TO BE JOINED. RUNS MAY BE ALTERED BY THE EC TO SUIT FIELD CONDITIONS. ELECTRICAL DRAWINGS ONLY GIVE INDICATION OF OTHER TRADES EQUIPMENT.

.15 WIRING DEVICES IN FINISHED AREAS SHALL BE RECESSED MOUNTED AND FOR ALL UNFINISHED AREAS MAY BE SURFACE MOUNTED. EXPOSED CONDUITS SHALL NOT BE ACCEPTED UNLESS OTHERWISE NOTED ON THE DRAWINGS. WHERE CONDUITS RUN EXPOSED ON EXISTING SURFACES PAINT TO MATCH WALL FINISH.

.17 ALL CONDUITS AND ARMORED CABLES SHALL BE SECURELY FASTENED WITH APPROVED CLIPS. SCREWS IN PARTITIONS AND CADDY CLIPS IN CEILING. NAILS ARE NOT ACCEPTED.

.18 PROVIDE OUTLET BOXES FOR CONNECTING TO DEVICES AND EQUIPMENT AS REQUIRED OR AS INDICATED ON DRAWINGS. LOCATIONS OF OUTLETS MAY BE CHANGED UP TO 15'-0" WITHOUT EXTRA CHARGE PROVIDED THAT INSTRUCTIONS FOR CHANGE ARE ISSUED PRIOR TO INSTALLATION OF OUTLET.

.19 ALL CONDUIT, CONDUCTORS, WIRES, ETC. TO BE LABELED IN INDELIBLE INK AT PANEL AND JUNCTION BOXES INDICATING DEVICE FED, PANEL NAME AND CIRCUIT NUMBER.

- .20 SURFACE MOUNTED CONDUITS IN FINISHED AREAS SHALL BE PAINTED OUT TO MATCH THE EXISTING SURFACE.
- RACEWAYS SHALL BE RGS, EMT OR FLEXIBLE CONDUIT AS SHOWN ON THE DRAWINGS. ALL CONDUIT INSTALLED IN CONCRETE

10.0 BONDING AND GROUNDING

- PROVIDE A COMPLETE BONDING AND GROUNDING SYSTEM AS REQUIRED BY CODE AND SPECIFIED HEREIN.
- .02 PROVIDE A COMPLETE PERMANENT, CONTINUOUS GROUNDING SYSTEM INCLUDING ELECTRODES, CONDUCTORS AND
- CONNECTORS.
- .03 PROVIDE UL LISTED BONDING CLAMPS AND TERMINATIONS.

FLOOR SHALL BE RIGID PVC OR RGS CONDUIT C/W BOND CONDUCTOR.

.04 ALL NON-CURRENT CARRYING METAL PARTS SHALL BE GROUNDED AND/OR BONDED IN ACCORDANCE WITH THE CODE.

11.0 WIRING DEVICES

PROVIDE RECEPTACLES AND LINE VOLTAGE CONTROLS C/W SUITABLE DEVICE BOXES AND COVER PLATES WHERE INDICATED ON THE PLANS.

- .02 RECEPTACLES SHALL MEET THE FOLLOWING REQUIREMENTS UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- SINGLE / DUPLEX RECEPTACLES
- CSA TYPE 5-15 R, 125V, 15A SUITABLE FOR NO. 10 AWG FOR BACK AND SIDE WIRING
- BREAK-OFF LINKS FOR USE AS SPLIT RECEPTACLES
- SPECIFICATION GRADE
- DECORA FORM FACTOR WHITE FINISH DUAL PORT 3A USB CHARGER WHERE INDICATED
- TAMPER RESISTANT
- ACCEPTABLE MANUFACTURERS: HUBBELL, LEVITON, LEGRAND

.03 LINE VOLTAGE LIGHTING CONTROLS SHALL MEET THE FOLLOWING REQUIREMENTS.

- GENERAL REQUIREMENTS SUITABLE FOR NO. 10 AWG WIRE
- WHITE FINISH
- DECORA FORM FACTOR UNLESS SPECIFIED OTHERWISE
- SPECIFICATION GRADE

VANDAL RESISTANT PIR LENS

MINIMUM 5 YEAR WARRANTY

DUAL TECHNOLOGY (PIR AND ULTRASONIC).

DURING COMMISSIONING SET TO 30MIN DELAY

ADJUSTABLE TIME DELAY: 30S, 5MIN, 10MIN, 20MIN, 30MIN

.04 COVER PLATES SHALL MEET THE FOLLOWING REQUIREMENTS:

RECEPTACLES, EXCEPT FOR PARKING LOT BLOCK HEATER RECEPTACLES.

 ACCEPTABLE MANUFACTURERS: LUTRON, LEGRAND, LEVITON, nLIGHT, HUBBELL 15A 120V SINGLE POLE WALL SWITCH OCCUPANCY SENSORS:

20/05/26

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COVER PLATES FOR SURFACE MOUNTED DEVICES IN UTILITY ROOMS SHALL BE SHEET METAL WITH LAMACOID CIRCUITING LABEL.

PROVIDE WEATHERPROOF "WHILE-IN-USE" WET LOCATION LISTED METAL DIECAST COVER PLATES FOR ALL EXTERIOR WEATHERPROOF

KGS

GROUP

CLS

SDC

AS NOTED

AS NOTED

20/03/26

DESIGNED

HOR. SCALE:

VERTICAL:

DATE

DRAWN

.01 SUPPLY AND INSTALL LUMINAIRES AS INDICATED ON THE PLANS AND SPECIFICATIONS. LUMINAIRES SHALL BE C/W LAMPS, DRIVERS, DIFFUSERS, HANGERS, GASKETS, END CAPS CONNECTORS, CANOPIES AND SUPPORTS FOR A COMPLETE AND OPERATIONAL SYSTEM. FINAL LAYOUT OF LUMINAIRES SHALL BE MADE AFTER DUCTING AND PIPING LAYOUTS ARE COMPLETE. ALL LUMINAIRES TO

.02 ALL FIRE RESISTANCE RATED ASSEMBLIES (I.E. WALLS, CEILINGS, ETC.) WHICH CONTAIN RECESSED LIGHTING FIXTURES SHALL BE C/W FIRE RATED BACKING TO MAINTAIN THE INTEGRITY OF THE FIRE RESISTANCE.

.01 SUPPLY, INSTALL, WIRE, CONNECT AND COMMISSION A COMPLETE LIGHTING CONTROL SYSTEM.

12.0 LUMINAIRES, LAMPS AND DRIVERS

13.0 LIGHTING CONTROLS

14.0 ELECTRIC HEATERS

15.0 EMERGENCY LIGHTING

INTEGRAL TAMPER PROOF THERMOSTAT

DYMO TAPE LABEL TO INDICATE EQUIPMENT TAG AND SOURCE.

.03 ONLY LISTED MATERIALS AND METHODS SHALL BE UTILIZED.

.02 PROVIDE NEW DRY TYPE TRANSFORMER TO MEET THE FOLLOWING:

NEMA 3R ENCLOSURE OUTDOORS, NEMA 1 ENCLOSURE INDOORS

INSULATION TEMPERATURE CLASS 220°C AND 150°C RISE RATING.

18.0 EMERGENCY STANDBY DIESEL GENERATOR

THE REQUIREMENTS OF THE CEC, NBC AND CSA-C282.

CONTROLS AND/OR EQUIPMEN

AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM

SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

COOLING. LOAD BANK REQUIRED

UNIT START AND SHUT DOWN ON "MANUAL" CONTROL

UNIT START ON "ENGINE START" CONTROL.

OPERATION OF MANUAL BYPASS SWITCH.

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UNIT START AND TRANSFER ON "TEST" CONTROL.

.04 THE CONTRACTOR SHALL DEMONSTRATE THE FOLLOWING:

OPERATION OF AUTOMATIC ALARMS AND SHUT DOWN DEVICES.

ANNUNCIATOR PANEL SHALL ENABLE REMOTE VIEWING OF THE GENERATOR STATUS, ALARMS AND FUEL LEVEL.

ENGINEER'S SEAL

FOR REVIEW.

TANK OF DIESEL FUEL.

RECOMMENDATIONS

CHECKED

APPROVED

RELEASED FOR

CONSTRUCTION:

BY

DATE

PARALLELING PROVISIONS

THREE CORES FOR THREE PHASE, SINGLE CORE FOR SINGLE PHASE.

WHERE APPLICABLE.

WHITE FINISH

SPECIFIED HEREIN.

16.0 FIRE STOPPING

SHALL COMPLY WITH CODE

17.0 DRY-TYPE TRANSFORMER

ALUMINUM WINDINGS

SIZE AS INDICATED

ENERGY EFFICIENT MEETING CSA C802.2-18

BE ADEQUATELY ATTACHED DIRECTLY TO THE BUILDING STRUCTURE.

.02 PROVIDE STAND ALONE LINE VOLTAGE LIGHTING CONTROLS WHERE SHOWN ON THE DRAWINGS C/W CONTROL WIRING

.01 PROVIDE NEW ELECTRIC HEATERS AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

.02 ELECTRIC BASEBOARD HEATERS SHALL BE SIZED AS SHOWN ON THE DRAWINGS AND MEET THE FOLLOWING REQUIREMENTS:

.03 ACCEPTABLE MANUFACTURERS: STELPRO - BRAVA, OUELLET - OFM, CHROMALOX.

.01 PROVIDE EMERGENCY BATTERY UNITS, EMERGENCY HEADS AND EXIT LIGHTS AS INDICATED ON THE DRAWINGS AND/OR AS

.02 ALL EMERGENCY LIGHTING SHALL BE CSA CERTIFIED TO C22.2#141 AND SHALL OPERATE FOR 2 HR MINIMUM.

.03 UNLESS OTHERWISE NOTED, ALL EMERGENCY LIGHTING HEADS ARE TO BE LOCATED ON CEILING AT WALL AND BE COORDINATED WITH WALL AND CEILING DETAILS AND FINISHES. EC TO SUPPLY AND INSTALL ALL WIRING FROM BATTERY PACK TO REMOTE HEADS AS REQUIRED. ENSURE WIRE SIZE IS ADEQUATE FOR VOLTAGE DROP (MAXIMUM 3%).

.01 ALL ELECTRICAL WIRES, CABLES, RACEWAYS, OUTLET BOXES AND OTHER SIMILAR SERVICES THAT PENETRATE FIRE WALL, FIRE SEPARATION OR ASSEMBLY REQUIRED TO HAVE A FIRE RESISTANCE RATING OR FIRE SEPARATION, SHALL BE SEALED BY FIRE STOP SYSTEM WHICH HAS AN "F" AND/OR "FT" RATING NOT LESS THAN REQUIRED FIRE PROTECTION RATING OF FIRE SEPARATION.

.02 ALL FIRE STOPPING REQUIRING RATINGS OF 2HRS OR MORE IN UNOCCUPIED SPACES (I.E. CEILING SPACES, STORAGE ROOMS, ELECTRICAL ROOMS, ETC.) SHALL BE LABELED AND INSTALLED BY A CERTIFIED INSTALLER.

.05 ALL FIRE RESISTANCE RATED ASSEMBLIES (I.E. WALLS CEILINGS, ETC.) WHICH CONTAIN PANELBOARDS, BACK BOXES RECESSED LIGHTING FIXTURES, ETC. SHALL BE C/W FIRE RATED BACKING TO MAINTAIN THE INTEGRITY OF THE FIRE RESISTANCE ELECTRICAL EQUIPMENT BACK BOARDS SHALL BE 3/4" THICK PLYWOOD PAINTED WITH FIRE RETARDANT PAINT (GREY) ON ALL SIX

OPENINGS FOR STEEL ELECTRICAL BOXES NOT EXCEEDING 16 SQUARE INCHES ARE PERMITTED PROVIDED OPENINGS DO NOT AGGREGATE MORE THAN 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL OR PARTITION OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITIONS MUST BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES.

.01 PROVIDE NEW DRY-TYPE TRANSFORMERS AS DETAILED ON THE DRAWINGS AND SPECIFIED HEREIN.

 MOUNTED FIBERGLASS BASE OUTDOORS AND ON LEGS WITH VIBRATION ISOLATORS. STANDARD OF ACCEPTANCE: "KORFUND DYNAMICS" R-SERIES. NEOPRENE OR RUBBER PADS ARE NOT ACCEPTANCE

ACCEPTABLE MANUFACTURERS: SQUARE 'D', DELTA, HAMMOND POWER SOLUTIONS AND REX.

 ELECTRICAL SUB-CONTRACTOR TO CONFIRM LUGS SUIT FEEDER SIZE AND TYPE AT SHOP DRAWING STAG LAMACOID LABEL TO INDICATE TRANSFORMER TAG, KVA, PRIMARY / SECONDARY VOLTAGE AND SOURCE.

.01 SUPPLY AND INSTALL A NEW GENERAC (SD-175) 175KW 347/600V EMERGENCY STANDBY RATED DIESEL GENERATOR TO PROVIDE EMERGENCY POWER. THE GENSET SHALL INCLUDE SEPARATE LOAD BANK BREAKER, DOUBLE WALL UNDERMOUNT DIESEL FUEL TANK, WEATHER PROOF SKIN TIGHT STEEL ENCLOSURE, PROVISIONS FOR FUTURE PARALLELING SET-UP, AND ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM OR APPROVED EQUAL. ACCESSORIES SHALL INCLUDE BUT NOT BE LIMITED TO THE ENGINE. ALTERNATOR, MUFFLER, BLOCK HEATER, ENCLOSURE HEATER TO MAINTAIN ENVIROMENT ABOVE 5°C, BATTERY / BATTERY CHARGER, CONTROLLER, RADIATOR, SUPERVISORY DRY CONTACT, REMOTE ANNUNICATOR, AND 240V LOAD CENTER. THE GENSET SHALL MEET

THE GENERATOR SHALL COME COMPLETE WITH ALL SYNCHRONIZING AND PARALLELING CONTROLS. ADDITIONAL GENERATOR(S) SHALL BE ABLE TO BE CONNECTED TO "NEW SPLITTER" WITHOUT ANY RE-WORK OR ADDITION OF ANY

SEPARATE LOAD BANK BREAKER TO INCLUDE A SHUNT TRIP TO RESTORE BUILDING POWER WHEN CALLED BY THE ATS.

.02 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS OF INSTALLATION AND INCLUDE ALL COMPONENTS AND WIRING

.03 THE CONTRACTOR SHALL PERFORM ALL COMMISSIONING FOR THE GENSET AS REQUIRED BY CSA-C282. THE COMMISSIONING PHASE ROTATION CHECK. THE CONTRACTOR SHALL ELECTRICALLY CHECK THE PHASE ROTATION PRIOR TO CONNECTING THE GENERATOR TO THE LOAD. ONCE CONNECTED THE CONTRACTOR SHALL PHYSICALLY VERIFY PHASE ROTATION.

 LOAD TEST THE UNIT AT 100% LOAD FOR MINIMUM PERIOD OF 4HR TO SHOW LOAD CARRYING ABILITY, STABILITY OF VOLTAGE AND FREQUENCY, AND SATISFACTORY PERFORMANCE OF DAMPERS IN VENTILATING SYSTEM TO PROVIDE ADEQUATE ENGINE

ONCE COMMISSIONING IS COMPLETE THE CONTRACTOR SHALL SUBMIT THE RESULTS TO THE CONTRACT ADMINISTRATOR

UNIT START, TRANSFER TO LOAD, RETRANSFER TO NORMAL POWER, UNIT SHUT DOWN, ON "AUTOMATIC" CONTROL.

.05 THE CONTRACTOR SHALL PROVIDE ALL FUEL REQUIRED FOR COMMISSIONING AND HAND OVER THE GENERATOR WITH A FULL

.06 THE CONTRACTOR SHALL PROVIDE A REMOTE ANNUNCIATOR PANEL IN THE BASEMENT MECHANICAL ROOM. THE REMOTE

.07 THE CONTRACTOR SHALL PROVIDE TRAINING FOR THE BUILDING MAINTENANCE PERSONNEL.

.08 THE CONTRACTOR SHALL INSTALL ALL COMPONENTS OF THE SYSTEM ACCORDING TO MANUFACTURER'S

- .08 THE CONTRACTOR SHALL PROVIDE A 10HR UNDERMOUNT DOUBLE WALL DIESEL FUEL TANK COMPLETE WITH THE FOLLOWING: ONBOARD FUEL ALARM PANEL WITH THE FOLLOWING ALARMS:
- LOCAL AND REMOTE LOW LEVEL ALARM CRITICAL LOW LEVEL ALARM AND INTERLOCK WITH GENERATOR
- LOCAL HIGH LEVEL ALARM - I FAK AI ARM
- SECURITY ALARM SYSTEM DRY CONTACTS (CRITICAL / LOW LEVEL
- AND LEAK ALARMS) LOCAL FILL WARNING LIGHT / ALARM
- FACTORY MOUNTED DROP TUBES AND FILL LIMITER VALVE (90%)
- THE FUEL TANK SHALL STORE 10HRS OF USABLE FUEL AT THE 80% TANK LEVEL MECHANICAL FUEL GAUGE
- ELECTRONIC LEVEL TRANSMITTER
- .09 ACCEPTABLE MANUFACTURES: GENERAC, KOHLER, CATERPILLAR, CUMMINS. ALL GENERATOR MANUFACTURERS SHALL HAVE LOCAL SUPPORT.

.10 WARRANTY: 10-YEAR

19.0 AUTOMATIC TRANSFER SWITCH (ATS)

SUPPLY AND INSTALL THE NEW 400A-3P 600V NON-ESSENTIAL OPEN TRANSITION MECHANICALLY HELD TRANSFER SWITCH AS INDICATED ON THE DRAWINGS (GENERAC PSTS SERIES OR APPROVED EQUIVALENT). THE TRANSFER SWITCH SHALL MEET CEC, NBC, CSA-C282 AND CSA-Z32 REQUIREMENTS.

.02 THE TRANSFER SWITCH SYSTEM SHALL INCLUDE BUT NOT BE LIMITED TO THE CONTROLLERS (COMPLETE WITH KEYPADS), VOLTAGE/FREQUENCY/PHASE SENSING, TIME DELAYS, TEST SWITCH, PHASE ROTATION SENSING, DATA LOGGING, COMMUNICATIONS INTERFACE, SELF DIAGNOSTICS, NEMA 1 ENCLOSURE, AND LOAD SHEDDING.

.03 THE CONTRACTOR SHALL INSTALL ALL COMPONENTS OF THE SYSTEM ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND INCLUDE ALL COMPONENTS AND WIRING AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.

.04 THE CONTRACTOR SHALL PROVIDE TRAINING FOR THE BUILDING MAINTENANCE PERSONNEL.

.05 THE CONTRACTOR SHALL ARRANGE AND PAY FOR FINAL COMMISSIONING AND TESTING. THE CONTRACTOR SHALL SUBMIT A WRITTEN REPORT WITH TEST RESULTS INDICATED THAT THE TRANSFER SWITCH SYSTEM IS FULLY FUNCTIONAL. THE FINAL TESTING SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING FUNCTIONAL TEST:

- SET SELECTOR SWITCH IN "TEST" POSITION TO ENSURE PROPER STANDB' START, RUNNING, TRANSFER, RETRANSFER. RETURN SELECTOR SWITCH TO "AUTO" POSITION TO ENSURE STANDBY SHUTS
- SET 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 10 MIN, THEN CLOSE MAIN POWER SUPPLY DISCONNECT. LOAD SHOULD TRANSFER BACK TO NORMAL POWER SUPPLY AND STANDBY SHOULD SHUTDOWN.
- REPEAT, AT 1 H INTERVALS, 4 TIMES, COMPLETE TEST WITH SELECTOR SWITCH IN EACH POSITION, FOR EACH TEST. .06 ACCEPTABLE MANUFACTURERS: EATON, SQUARE-D, GENERAC, KOHLER, CATERPILLAR, CUMMINS

THE CITY OF WINNIPEG WATER AND WASTE DEPARTMEN Winnipec

PROJECT TITLE BRADY ROAD LANDFILL STANDBY GENERATOR

SPECIFICATIONS

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