# **DIV.26 - 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 ENGINEER. THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE WHERE THE CONTRACT DOCUMENTS EXCEED CODE, UTILITY OR RECOGNIZED STANDARDS REQUIREMENTS.

.02 THE CONTRACT SHALL INCLUDE FURNISHING ALL LABOUR, 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 ENGINEER.

.04 EXAMINE THE SITE, AND LOCAL CONDITIONS AFFECTING WORK OF THIS CONTRACT. EXAMINE LANSCAPE, 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 ENGINEER'S ATTENTION IN WRITING. PRIOR TO CLOSING OF TENDERS BY SIGNING THE CONTRACT. THE EC ACKNOWLEDGES A SITE WALK-THROUGH HAS BEEN COMPLETED AND THE EXISTING

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

06 OBTAIN APPROVALS FROM THE AHJ AND NOTIFY THE ENGINEER OF ANY CHANGES REQUESTED BY THE AHJ PRIOR TO THE EXECUTION OF THE REQUEST.

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

08 WHERE DOUBT EXISTS AS TO THE MEANING OF THE DRAWINGS OR SPECIFICATIONS, IT IS THE RESPONSIBILITY OF THE EC TO OBTAIN CLARIFICATION

BY CERTIFICATION AGENCY RECOGNIZED BY THE AHJ. AND FREE FROM DEFECTS.

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

.11 ALL PACKAGING BARCODE LABELS SHALL BE REMOVED PRIOR TO

.12 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.

.13 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.

.14 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.

.15 LOCATION OF DEVICES MAY BE ALTERED BY THE ENGINEER WITHOUT CHARGE TO OWNER, PROVIDED THE CHANGE IS MADE BEFORE FINAL INSTALLATION AND DOES NOT NECESSITATE ADDITIONAL MATERIALS. RECORD CHANGES ON RECORD

.16 MAINTAIN 40" (1m) CLEARANCE IN FRONT OF ALL SERVICEABLE ELECTRICAL EQUIPMENT (i.e. PANELBOARDS) AS PER CEC REQUIREMENTS.

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

.18 THE EC SHALL KEEP A SET OF FULL SIZED RECORD DRAWINGS ON WHICH THE 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 COORDINATION ISSUES. INCLUDE LOCATIONS OF ALL JUNCTION AND PULL BOXES, ROUTING OF FEEDERS ANI CONDUITS, AND CHANGES TO CIRCUIT NUMBERS. ALL PRINCIPLE BELOW GRADE OR .02 COORDINATE WITH ALL TRADES AND ARRANGE EQUIPMENT IN PROPER 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.

# .19 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.

.20 ALL PCN COSTING SHALL BE REVIEWED BY THE ENGINEER 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.

.21 EXCAVATION AND FILL

 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 REQUIRED. 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 5.0 IDENTIFICATION 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 (CIVIL OR STRUCTURAL ENGINEER) ON THE PROJECT. FOR DIRECTIONS, GUIDANCE, SPECIFICATION REGARDING THIS WORK, THE EC SHALL CONTACT THE RELEVANT PROFESSIONAL(S).

.22 FINAL ACCEPTANCE

NOT ACCEPTABLE.

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": FINAL ELECTRICAL INSPECTION CERTIFICATE SIGNED BY THE ELECTRICAL

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

INSPECTOR FOR THE PROJECT. A DECLARATION FORM SIGNED BY THE EC IS

# 2.0 DEFINITIONS

.01 THE FOLLOWING ARE DEFINITIONS OF TERMS AND EXPRESSIONS USED IN THE **ELECTRICAL SPECIFICATION AND DRAWINGS:** 

- AHJ AUTHORITY HAVING JURISDICTION 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
- 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.

• 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 ENGINEER OR OWNER. HOWEVER THE OWNER RESERVES FIRST RIGHTS TO SALVAGE;

WARRANTIES AND ASSISTANCE TO CONTRACTOR

 ELECTRICAL DIVISIONS - REFERS TO DIVISIONS 26, 27, 28 AND OTHER DIVISIONS
 EXCAVATIONS. 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:

#### 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.

.09 ALL MATERIALS USED SHALL BE NEW, OF THE TYPE SPECIFIED, AND APPROVED .02 MATERIALS AND EQUIPMENT LISTED ARE PREFERRED. THE EC MAY, HOWEVER, SUBMIT ALTERNATES TO THE ENGINEER TO BE APPROVED AS EQUALS AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO CLOSING OF TENDER.

> .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 ENGINEER FOR REVIEW AND APPROVAL BEFORE MANUFACTURING AND INSTALLATION CAN PROCEED.

05 LAMACOID LABEL WORDING SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL BEFORE MANUFACTURING AND INSTALLATION CAN

06 SUBMIT THE FOLLOWING CLOSE-OUT SUBMITTALS TO THE ENGINEER UPON COMPLETION OF THE CONTRACT:

 ONE (1) O&M MANUAL HARDCOPY AND ONE (1) DIGITAL COPY IN DVD FORMAT. O&M MANUALS SHALL CONTAIN COPIES OF ALL FINAL SHOP DRAWINGS, WARRANTY LETTER, AS-BUILTS, 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, 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.

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

.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 TENDER TO RESOLVE ALL

INACCESSIBLE CONDUITS, SYSTEMS, ETC. SHALL BE DIMENSIONED AT EACH CHANGE RELATION WITH OTHER APPARATUS INCLUDING BUT NOT LIMITED TO LANDSCAPE

.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

.04 COORDINATE AS REQUIRED WITH THE OWNER DURING THE DEMOLITION AND CONSTRUCTION PHASES OF THE WORK. THIS INCLUDES ANY TEMPORARY ELECTRICAL CONNECTIONS, REMOVAL OF EXISTING POWER SERVICES AND INSTALLATION OF NEW 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.

.01 UNLESS OTHERWISE NOTED ALL ELECTRICAL EQUIPMENT INSTALLED OR CONNECTED SHALL BE IDENTIFIED BY MEANS OF ENGRAVED LAMACOID LABELS C/W COMPLETE AND OPERATIONAL SYSTEM. MINIMUM 3/8" LETTERING. AS A MINIMUM THE LABEL SHALL INDICATE THE EQUIPMENT TAG AND SOURCE. 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 PROPOSED LABELS TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING.

 NORMAL POWER SYSTEMS: WHITE WITH BLACK LETTERING ALL EXTERIOR IDENTIFICATION SHALL BE UV RESISTANT AND WEATHERPROOF

.02 ELECTRICAL EQUIPMENT

RECEPTACLES (PNL 'X' - CCT#) :

•• FLUSH MOUNTED: CLEAR DYMOTAPE LABELS WITH BLACK LETTERING •• SURFACE MOUNTED IN UTILITY ROOMS: LAMACOID LABELS DISTRIBUTION EQUIPMENT - LAMACOID LABELS INDICATING THE EQUIPMENT TAG, VOLTAGE, AND SOURCE. (PNL 'X' / xxxV / FED FROM PNL 'X')

• TRANSFORMERS - I AMACOID LABELS INDICATING THE EQUIPMENT TAG. KVA. PRIMARY / SECONDARY VOLTAGE, SOURCE AND DESTINATION. ('TR-X' / xxxKVA / xxxV-xxxV / FED FROM PNL 'X', FEEDS PANEL 'Y') DISCONNECT SWITCHES - LAMACOID LABELS INDICATING THE EQUIPMENT TAG,

VOLTAGE, AND SOURCE. ('TAG' / xxxV / FED FROM PNL 'X') FUSED DISCONNECT SWITCHES - LAMACOID LABELS INDICATING THE EQUIPMENT TAG, VOLTAGE, SOURCE, AND FUSE SIZE. ('TAG' / xxxV / FED FROM

• MECHANICAL EQUIPMENT / MOTORS - LAMACOID LABELS INDICATING THE EQUIPMENT TAG, HP, VOLTAGE, AND SOURCE. ('TAG' / xxHP / xxxV / PNL 'X' -

.03 SWITCHBOARD AND PANELS:

 MOLDED CASE CIRCUIT BREAKERS - LAMACOID LABELS INDICATING THE FULL EQUIPMENT NAME AND TAG ('EQUIPMENT NAME' / 'TAG') PROVIDE PANEL SCHEDULES FOR ALL DISTRIBUTION PANELS. 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. .04 ALL CONDUITS SHALL BE COLOUR CODED UTILIZING SELF ADHESIVE TAPE

.05 THE EC SHALL UPDATE ALL ELECTRICAL LABELING AFFECTED BY THE SCOPE OF WORK AND THE REVISED LABELING SHALL MEET THE REQUIREMENTS OF THIS SPECIFICATION.

### 6.0 UTILITY SERVICES

.01 PROVIDE TERMINATION AND CONDUITS FOR INCOMING POWER UNDERGROUND SERVICES. OBTAIN EXACT LOCATION OF ALL DUCTS FROM UTILITY PROVIDERS BEFORE INSTALLATION. PROVIDE NYLON PULL CORD FOR EMPTY CONDUITS. INCLUDE ALL POWER UTILITY CHARGES IN THE TENDER PRICE. ALL THE ABOVE

.02 COORDINATE THE FOLLOWING WITH THE LOCAL POWER UTILITIES: APPROVAL OF ANY CHANGES TO THE UNDERGROUND CONDUIT ROUTE PRIOR

SHALL MEET THE REQUIREMENTS OF THE RESPECTIVE UTILITIES.

TO INSTALLATION. POWER SUPPLY AUTHORITY INSPECTION AND APPROVAL OF ALL

UNDERGROUND CONDUIT AND TRANSFORMER PAD INSTALLATION PRIOR TO POURING OF CONCRETE AND BACKFILL. SUBMISSION OF THREE (3) COPIES OF THE ARRANGEMENT OF ALL SERVICE

ENTRANCE EQUIPMENT PRIOR TO PURCHASE AND INSTALLATION. .03 CONFIRM EXACT LOCATION OF ALL POWER SERVICE ENTRANCES DIRECTLY

.04 DB2 OR ES2 DUCT SHALL BE USED FOR UNDERGROUND ON-SITE UTILITY SERVICES FOR POWER SERVICES.

.05 OBTAIN PERMITS FROM LOCAL UTILITY INSPECTION DEPARTMENTS FOR GAS AND ELECTRIC UNDERGROUND SERVICES PRIOR TO UNDERTAKING ANY

.06 ALL UNDERGROUND SERVICES SHALL BE LABELED PER CODE.

#### 7.0 SERVICE ENTRANCE EQUIPMENT

WITH THE UTILITY PRIOR TO INSTALLATION.

.01 PROVIDE SERVICE EQUIPMENT AS DETAILED ON THE DRAWINGS AND SPECIFIED HEREIN. ENSURE THAT THE SERVICE EQUIPMENT BEARS EVIDENCE OF "SUITABLE FOR SERVICE ENTRANCE"

#### 8.0 MECHANICAL EQUIPMENT CONNECTIONS

.01 PROVIDE ALL POWER AND LINE VOLTAGE CONTROL CONNECTIONS AND CONTROL POWER FOR MECHANICAL EQUIPMENT AND CONTROL PANELS. THE ELECTRICAL CONNECTIONS SHALL INCLUDE BUT NOT BE LIMITED TO MOTOR STARTERS, LOCKABLE DISCONNECTS, CONDUIT, WIRING, FITTINGS, INTERLOCKS, OUTLETS / JUNCTION BOXES, AND ALL ASSOCIATED EQUIPMENT REQUIRED TO PROVIDE POWER WIRING FOR MECHANICAL EQUIPMENT. UNLESS OTHERWISE

.02 UNLESS OTHERWISE NOTED, MOTORS AND CONTROLS SHALL BE SUPPLIED BY DIVISION 21, 22 AND 23. MOTOR HORSEPOWER RATINGS SHALL BE AS SHOWN IN THE DIVISION 21. 22 AND 23 SPECIFICATIONS. MOTOR VOLTAGE AND PHASE RATINGS SHALL BE AS SHOWN ON THE DIVISION 26, 27 AND 28 DRAWINGS.

.03 CONDUIT, WIRE, DEVICES AND FITTINGS REQUIRED TO WIRE AND CONNECT LOW VOLTAGE MECHANICAL CONTROL SYSTEMS, SHALL BE SUPPLIED AND INSTALLED BY THE TRADE SUPPLYING THE CONTROL SYSTEM. ALL CONTROL WIRING SHALL BE INSTALLED IN CONDUIT MEETING THE MINIMUM REQUIREMENTS OF THIS

### 9.0 DISCONNECT SWITCHES

.01 PROVIDE FUSIBILE / NON-FUSIBLE, HORSEPOWER RATED DISCONNECT SWITCHES IN CSA (WEATHERPROOF WHERE INSTALLED OUTSIDE) ENCLOSURES AS 14.0 LUMINAIRES, LAMPS AND DRIVERS DETAILED ON THE DRAWINGS. SPECIFIED HEREIN AND AS REQUIRED BY CODE.

 PROVISION FOR PADLOCKING SWITCH IN ON/OFF POSITIONS MECHANICALLY INTERLOCKED DOOR TO PREVENT OPENING WHEN HANDLE IN

 QUICK-MAKE, QUICK-BREAK ACTION. ON-OFF SWITCH POSITION INDICATION ON SWITCH ENCLOSURE COVER.

.02 ACCEPTABLE MANUFACTURERS: SCHNEIDER, EATON, AND SIEMENS.

10.0 PANELBOARDS

.01 PROVIDE PANELBOARDS AND BREAKERS AS DETAILED ON THE DRAWINGS AND SYSTEM TO CONSIST OF TIME BASED AND MANUAL LIGHTING CONTROL

.02 LIGHTING AND POWER PANELBOARDS TO BE CIRCUIT BREAKER TYPE AND AS SHOWN ON DRAWINGS. PANELS SHALL CONTAIN THE FOLLOWING: 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 COPPER GROUND BAR 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, • IN ADDITION TO CSA REQUIREMENTS MANUFACTURER'S NAMEPLATE SHALL INDICATE THE PANELBOARDS FAULT CURRENT RATING,

 TWO KEYS SHALL BE PROVIDED FOR EACH PANELBOARD AND ALL PANELBOARDS SHALL BE KEYED ALIKE FOR THE ENTIRE SITE. THE EC SHALL CONFIRM CABLE ENTRY AND THAT PANEL LUGS SUIT FEEDER

.03 GENERAL BREAKER REQUIREMENTS: MULTI-POLE BREAKERS TO HAVE COMMON TRIP (NO TIE HANDLE WILL BE

 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

.04 BREAKERS FOR USE IN EXISTING PANELBOARDS SHALL:

SIZE AND TYPE DURING THE SHOP DRAWING REVIEW.

 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', EATON, AND SIEMENS.

# 11.0 CONDUIT, WIRE, AND CONNECTIONS

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

.02 GENERAL CONDUIT REQUIREMENTS:

 ALL WIRING SHALL BE INSTALLED IN CONDUIT UNLESS OTHERWISE NOTED. ALL CONDUIT SHALL BE MIN. 3/4" (21mm)Ø. CONDUIT TYPES:

•• EXTERIOR ABOVE GRADE: GALVANIZED EMT C/W WATER TIGHT FITTINGS •• BELOW GRADE OR WITHIN CONCRETE: RIGID PVC CONDUITS SHALL NOT HAVE MORE THAN ONE VOLTAGE LEVEL OF WIRING RUNNING WITHIN THEM.

 PROVIDE A SEPARATE RACEWAY FOR EACH ELECTRICAL SYSTEM. OVERSIZE PULL BOXES FOR EXTERIOR LIGHTING TO ALLOW FOR FUTURE POWER MONITORING TO BE INSTALLED.

.02 GENERAL DEVICE BOX REQUIREMENTS: 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" (4572mm) WITHOUT EXTRA CHARGE PROVIDED THAT INSTRUCTIONS FOR CHANGE ARE ISSUED PRIOR TO INSTALLATION OF OUTLET. 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

.03 GENERAL WIRING REQUIREMENTS:

WALL FINISH.

EXTERIOR: PVC

• UNLESS OTHERWISE NOTED ALL WIRING SHALL BE COPPER, 98% CONDUCTIVITY, COLOUR CODED, NEW AND MARKED AS PER CEC

MINIMUM 600V. RWU90 SHALL BE USED FOR UNDERGROUND RACEWAY • 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

UNLESS OTHERWISE NOTED ALL WIRING SHALL BE RWU90 TYPE RATED

WHERE ACUW90/TECK90 CABLE IS PERMITTED ALL FITTINGS SHALL BE WATER

.04 GENERAL INSTALLATION NOTES DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHOWN INDICATE POINTS TO BE JOINED. RUNS MAY BE ALTERED BY THE EC TO SUIT FIELD CONDITIONS.

FLECTRICAL DRAWINGS ONLY GIVE INDICATION OF OTHER TRADES EQUIPMENT. ALL CONDUIT, CONDUCTORS, WIRES, ETC. TO BE LABELED IN INDELIBLE INK AT PANEL AND JUNCTION BOXES INDICATING DEVICE FED, PANEL NAME AND

#### 12.0 BONDING AND GROUNDING .01 PROVIDE A COMPLETE BONDING AND GROUNDING SYSTEM AS REQUIRED BY

INCLUDING ELECTRODES, CONDUCTORS AND CONNECTORS.

CODE AND SPECIFIED HEREIN. .02 PROVIDE A COMPLETE PERMANENT, CONTINUOUS GROUNDING SYSTEM

.03 PROVIDE A MINIMUM OF THREE GROUNDING RODS 3/4" (19mm) DIAMETER X 120" (3048mm) COPPER CLAD STEEL GROUND RODS WITH A #4/0 AWG BARE CU INTERCONNECTING CABLE.

.04 ALL GROUND CONNECTIONS BELOW GRADE SHALL BE CADWELD AND ALL GROUND CONNECTIONS ABOVE GRADE SHALL BE COMPRESSION TYPE

.05 INSTALL RIGID PVC CONDUIT SLEEVES WHERE GROUND WIRES PASS THROUGH CONCRETE SLABS.

.06 PROVIDE UL LISTED BONDING CLAMPS AND TERMINATIONS.

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

.08 ALL CONDUIT INSTALLED IN CONCRETE OR DIRECT BURIED SHALL BE C/W BOND

TAMPER RESISTANT

13.0 WIRING DEVICES .01 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. **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

ACCEPTABLE MANUFACTURERS: HUBBELL, LEVITON, LEGRAND

.03 COVER PLATES SHALL MEET THE FOLLOWING REQUIREMENTS: PROVIDE WEATHERPROOF "WHILE-IN-USE" WET LOCATION LISTED METAL DIECAST COVER PLATES FOR ALL EXTERIOR WEATHERPROOF RECEPTACLES.

01 SUPPLY LUMINAIRES AS DETAILED IN LUMINAIRE SCHEDULE 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 COORDINATED WITH THE LANDSCAPE DRAWINGS

AND BE MADE AFTER DUCTING, PIPING, AND MILLWORK LAYOUTS ARE COMPLETE.

### 15.0 LIGHTING CONTROLS

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

.02 THE LIGHTING CONTROL SYSTEM SHALL BE A COMPLETE "DISTRIBUTED INTELLIGENCE" AND DIGITALLY ADDRESSABLE SYSTEM

CABLING W/ RJ45 CONNECTORS ON ALL DEVICES.

SYSTEM CONTROL TO BE EXECUTED BY LOCAL CONTROLS, TOUCH SCREEN INTERFACE. OR VIA SOFTWARE INSTALLED ON A SINGLE HOST COMPUTER WITH THE ABILITY TO REMOTELY CONFIGURE AND MONITOR EVERY SYSTEM DEVICE. SYSTEM TO FORM A NETWORK UTILIZING CAT5E LOW VOLTAGE

• INSTALL ENTIRE SYSTEM AS PER MANUFACTURER'S RECOMMENDATIONS AND COORDINATE ALL WORK WITH THE GC.

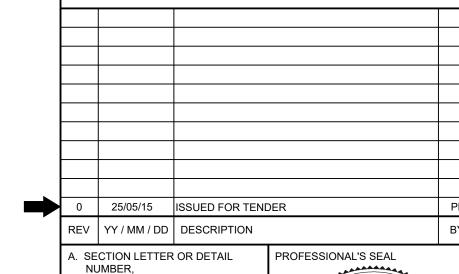
5 YFAR WARRANTY

 ACCEPTABLE BRANDS: WAVELINX PROVIDE DIGITAL ADDRESS LABELS ON ALL ADDRESSABLE EQUIPMENT AND

ALL TOUCH SCREENS SHALL BE COMMISSIONED TO DISPLAY THE CLIENTS

INDICATE DIGITAL ADDRESSES ON AS-BUILTS

----- END OF SPECIFICATION -----



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DRAWING WHERE SECTION OR DETAIL IS DRAWN,

DRAWING WHERE SECTION OR DETAIL IS INDICATED. SECTION OR DETAIL SHOWN ON SAME DRAWING.

NOTES:

Licence No. 41812 2025-05-16

APOINTE

ODEON PARK UDAC



AIR CANADA WINDOW PARK REDEVELOPMENT

**ELECTRICAL SPECIFICATIONS** 

DATE - Y / M / D DESIGN DRAWN JDP/RD | 25/05/15 AS SHOWN CHECKED APPROVED | PROJECT No. DRAWING No 24-0107-012