

**ELECTRICAL SPECIFICATIONS:**

**GENERAL**

1. INSTALLATION AND ALL RELATED WORK SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE, THE CURRENT EDITION OF THE CSA, ALL LOCAL CODES AND BYLAWS, AND THE MANUFACTURER'S RECOMMENDATIONS.
2. EXAMINE ALL PLANS AND SPECIFICATIONS PERTAINING TO THIS CONTRACT. NOTIFY CONTRACT ADMINISTRATOR OF ERRORS OR OMISSIONS BEFORE SUBMITTING THE PRICE. FAILING SUCH NOTIFICATION, THIS CONTRACTOR SHALL MEET ALL SUCH REQUIREMENTS WITHOUT EXTRA COST TO THE CITY.
3. PROVIDE ALL MATERIALS, LABOUR AND EQUIPMENT NECESSARY FOR INSTALLING, TESTING AND REPLACING IN INITIAL OPERATION THE COMPLETE ELECTRICAL SYSTEM.
4. ALL WORK PERFORMED SHALL MEET WORKPLACE SAFETY AND HEALTH ACT STANDARDS. CONTRACTOR SHALL ENSURE THAT ALL WORKERS FOLLOW SAFE WORKING PRACTICES.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED PERMITS AND INSPECTIONS, INCLUDING ALL ASSOCIATED FEES. ON COMPLETION OF WORK, SUBMIT CERTIFICATES OF ACCEPTANCE FROM THE ELECTRICAL AUTHORITY TO THE CONTRACT ADMINISTRATOR.
6. ALL NEW EQUIPMENT AND MATERIAL SHALL BE CSA AND/OR ULC CERTIFIED.
7. PROVIDE LAMACOID NAMEPLATES FOR ALL ELECTRICAL EQUIPMENT/DEVICES. MOUNT NAMEPLATES ON ALL EQUIPMENT TO INDICATE FUNCTION, DESIGNATION, VOLTAGE AND POWER OF DEVICES, WHITE/BLACK LETTERS. PROVIDE LISTING OF LAMACOIDS TO CONTRACT ADMINISTRATOR FOR APPROVAL PRIOR TO ORDERING.
8. THE CONTRACTOR IS TO EXAMINE THE CONDITIONS OF THE SITE AND BE RESPONSIBLE FOR RELOCATING OR REMOVING AND REPLACING ALL EQUIPMENT NECESSARY FOR THE WORK REQUIRED FOR THIS PROJECT.
9. ALL WORK COMPLETED SHALL BE ACCOMPLISHED IN A FIRST CLASS AND WORKMANLIKE STYLE.
10. SUBMIT 3 COPIES OF SHOP DRAWINGS TO CONTRACT ADMINISTRATOR, WITHIN 5 DAYS OF AWARD OF CONTRACT FOR APPROVAL AND INCLUSION IN O&M MANUALS.
11. THIS SPECIFICATION IS NOT INTENDED TO RESTATE THE APPLICABLE CODES. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING ALL GROUNDING, ACCESS PANELS, ETC. AND FOLLOWING ALL WIRING METHODS.
12. REMOVE ALL EXISTING ELECTRICAL EQUIPMENT, WIRING, FIXTURES AND NON ELECTRICAL SYSTEMS, IN THOSE PORTIONS OF THE EXISTING BUILDING WHICH ARE BEING MADE REDUNDANT BY THIS WORK BEING CARRIED OUT.
13. PRIOR TO SCHEDULING FINAL INSPECTION, CONTRACTOR IS TO ENSURE THAT ALL WORK IS COMPLETED AND IN PARTICULAR THAT O&MS ARE COMPLETED, ALL NAMEPLATES INSTALLED, VERIFICATION TESTS HAVE BEEN DONE AND CERTIFICATES HAVE BEEN RECEIVED THAT INDICATE WORK INSTALLED CONFORMS TO REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
14. CONTRACTOR SHALL LEAVE THE SITE IN A CLEAN AND SECURE CONDITION DAILY.

**WIRING METHODS**

15. CONDUCTORS SHALL BE COPPER. MINIMUM WIRE SIZE SHALL BE #12 AWG RW90 UNLESS AS NOTED.
16. INSTALL A SEPARATE CONDUIT FOR EACH ELECTRICAL SYSTEM RUN. IN THE POOL AREA INSTALL A RIGID PVC CONDUIT AND MAINTAIN IP65 PROTECTION.
17. WHERE NEW CONDUITS OR CABLES HAVE BEEN INSTALLED, SEAL OPENING AROUND EQUIPMENT TO MAINTAIN FIRE RATING OF THE STRUCTURE.
18. MARK ALL WIRES TO INDICATE DESIGNATION AND/OR FUNCTION WITH SELF ADHESIVE NUMBERS AT EACH TERMINATION AND JUNCTION.
19. ALL CONDUITS TO HAVE SEPARATE INSULATED GROUND CONDUCTOR.
20. THE ENTIRE INSTALLATION SHALL BE GROUNDED IN CONFORMANCE WITH LATEST EDITION OF THE CEC.
21. ALL DEVICES, WIRING AND ELECTRICAL EQUIPMENT SHALL BE SECURELY ATTACHED TO THE BUILDING STRUCTURE TO ACCEPTABLE INDUSTRY STANDARDS.

**PANELBOARDS**

22. TYPED PANEL SCHEDULES MUST BE COMPLETED FOR ALL PANELS. PANEL SCHEDULES SHALL BE PROTECTED FROM DIRT BY A PLASTIC SLEEVE ON THE INSIDE COVER OF THE PANEL.
23. PROVIDE LAMACOID NAMEPLATE FOR EACH PANELBOARD TO INDICATE PANEL DESIGNATION, FEEDING FROM AND VOLTAGE.
24. ELECTRICAL EQUIPMENT SHALL BE FIELD MARKED TO WARN OF POTENTIAL ELECTRIC SHOCK AND ARC FLASH HAZARDS AS PER CEC SECTION 2-306

**DELIVERABLES**

25. CONTRACTOR SHALL MAINTAIN AT THE JOB SITE ONE SET OF PLANS, WHICH HE SHALL CLEARLY NOTE ALL CHANGES OR DEVIATIONS FROM THE CONTRACT DOCUMENT AS THE JOB PROGRESS. SUBMIT TO THE CONTRACT ADMINISTRATOR AT THE COMPETITION OF THE WORK.
26. PROVIDE 3 (THREE) COPIES OF O&M MANUALS. O&M MANUALS TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF TECHNICAL BULLETIN #15 ISSUED BY THE JOINT MAA/WCA COMMITTEE AND THE CONTRACT GENERAL CONDITIONS. SUBMIT ONE PRELIMINARY COPY TO THE CONTRACT ADMINISTRATOR PRIOR TO COMPETITION OF WORK. REVISE AS DIRECTED AND SUBMIT FINAL COPIES, ALSO INCLUDE A COPY OF THE PANEL DIRECTORIES AND ALL INSPECTIONS AND TESTING CERTIFICATES.

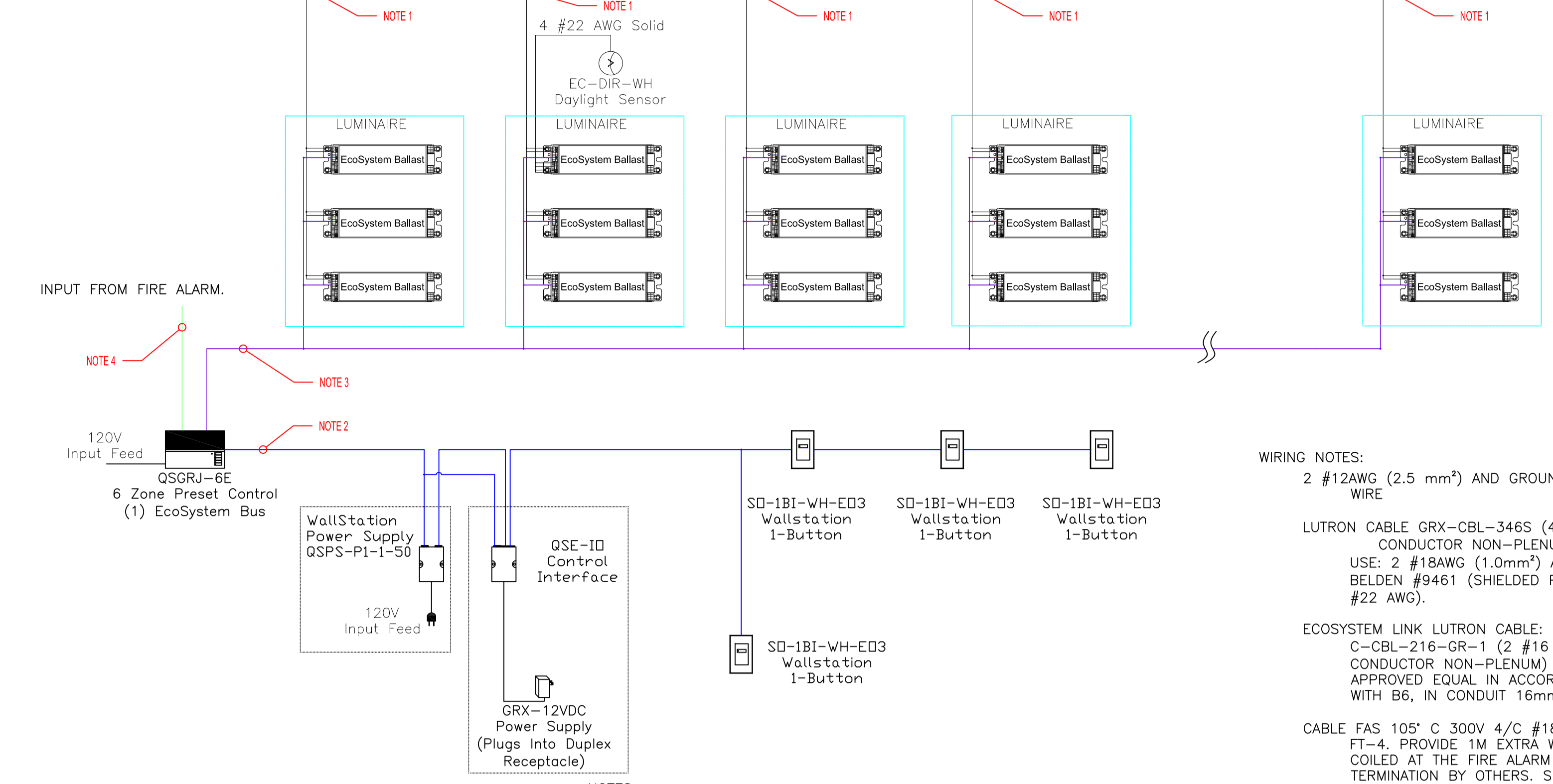
**HAZARDOUS MATERIALS**

27. THE SITE CONDITIONS IDENTIFY THE LOCATION AND CONDITION OF ALL KNOWN ASBESTOS-CONTAINING MATERIAL (ACM) IN THE WORKING AREA. THIS INFORMATION IS PROVIDED FOR REFERENCE PURPOSES ONLY. REMOVAL OF HAZARDOUS MATERIALS SHALL BE DEALT WITH BY THE CITY.
28. EVERY EFFORT HAS BEEN MADE BY THE CITY TO IDENTIFY KNOWN ACM WITHIN THE WORK AREA. WHERE MATERIAL IS ENCOUNTERED BY THE CONTRACTOR THAT IS SUSPECTED OF CONTAINING ASBESTOS FIBRES, THE CONTRACTOR IS TO IMMEDIATELY STOP WORK IN THE AREA AND NOTIFY THE CONTRACT ADMINISTRATOR. DO NOT RESUME WORK IN THE AREA UNTIL THE ASBESTOS CONTENT OF THE MATERIAL HAS BEEN DETERMINED AND THE CONTRACT ADMINISTRATOR HAS GRANTED AUTHORIZATION.
29. REFER TO ASBESTOS INVENTORY CONTROL SHEET FOR FURTHER INFORMATION.

**PRODUCTS**

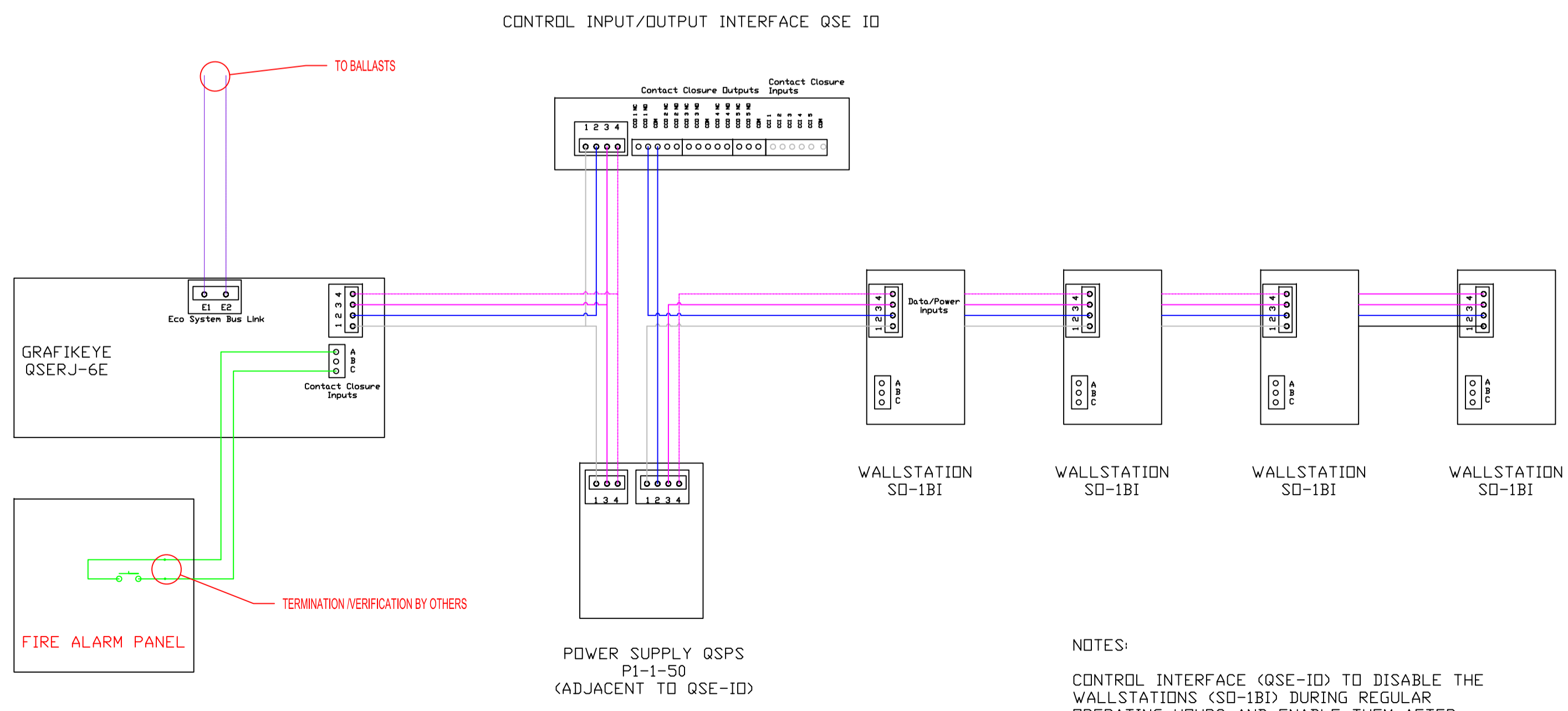
30. BREAKERS
  - 30.1. SHALL MATCH THE EXISTING
  - 30.2. MULTI-POLE BREAKERS SHALL BE OF ONE PIECE CONSTRUCTION WITH COMMON TRIP.
31. LUMINAIRES
  - 31.1. BALLAST MODULE SHALL NOT INTERFERE, AT ANY LIGHT OUTPUT LEVEL, WITH INFRARED DEVICES OPERATING AT FREQUENCIES BETWEEN 38KHZ AND 42KHZ.
  - 31.1.2. BALLAST MODULE SHALL HAVE A CONTINUOUS FLICKER-FREE DIMMING RANGE OF 100% DOWN TO MINIMUM BALLAST LEVEL OF 10% AND SHALL MAINTAIN CONSTANT LIGHT OUTPUT ±2% FOR A LINE VOLTAGE VARIATION OF ±10%.
  - 31.1.3. BALLAST MODULE SHALL UTILIZE A COMBINATION OF DIGITAL INPUT AND SENSOR INPUT.
  - 31.1.4. BALLAST TO OPERATE AT 120V, AND TO HAVE THD ≤20%, INPUT POWER ≤120VA, POWER FACTOR ≥0.95.
  - 31.1.5. BALLAST TO BE COMPATIBLE WITH THE CONTROL SYSTEM.
  - 31.1.6. BALLAST TO BE LUTRON EC5T554 J UNV2 OR APPROVED EQUAL IN ACCORDANCE WITH B6.
  - 31.2. LAMPS LAMPS TO BE PHILIPS F54T5/841/HO/ALTO OR APPROVED EQUAL IN ACCORDANCE WITH B6.
  - 31.3. TYPE A LUMINAIRES SHALL:
    - 31.3.1. BE RATED NOT LESS THAN IP65,
    - 31.3.2. HAVE LENS TETHER,
    - 31.3.3. BE HUNG WITH AVIATION CABLE CAPABLE OF SAFELY SUPPORTING THE LUMINAIRE. SAFETY CHAIN SHALL BE USED TO APPEND THE LUMINAIRE TO THE STRUCTURE.
    - 31.3.4. BE ATTACHED IN A MANNER WITHOUT ENDANGERING STRUCTURAL INTEGRITY OF THE STRUCTURE.
    - 31.3.5. BE PEERLESS AP4-HB-4-654-AC-LSS-HT-VH-LT OR APPROVED EQUAL IN ACCORDANCE WITH B6.
  - 31.4. TYPE E LUMINAIRES SHALL:
    - 31.4.1. BE RATED NOT LESS THAN IP65,
    - 31.4.2. BE PEERLESS AP2W-4-254-ACLR-LSS-HT OR APPROVED EQUAL IN ACCORDANCE WITH B6.
32. CONTROL SYSTEM
  - 32.1. WALL STATION SWITCH SHALL:
    - 32.1.1. BE PROGRAMMABLE TO OPERATE ONLY AFTER HOURS,
    - 32.1.2. HAVE ON BUTTON,
    - 32.1.3. BE IN WATERTIGHT ENCLOSURE COMPLETE WITH FLEXIBLE SILICONE COVER-PASS&SEYMOUR PRODUCT No. 4517 OR APPROVED EQUAL IN ACCORDANCE WITH B6,
    - 32.1.4. BE LUTRON PRODUCT No. SO-1BI-WH-E03 OR APPROVED EQUAL IN ACCORDANCE WITH B6.
  - 32.2. PHOTOCELL SHALL:
    - 32.2.1. BE CONSTRUCTED OF FLAME RETARDANT MATERIAL,
    - 32.2.2. BE REPLACED WITHOUT RE-PROGRAMING,
    - 32.2.3. BE IN ACRYLIC TRANSPARENT WATERTIGHT ENCLOSURE,
    - 32.2.4. BE LUTRON EC-DIR-WH OR APPROVED EQUAL IN ACCORDANCE WITH B6.
  - 32.3. CONTACT CLOSURE INTERFACE:
    - 32.3.1. SHALL PROVIDE FIVE INPUTS AND FIVE DRY CLOSURE OUTPUTS MAY BE PROGRAMMED TO CONTROL OR BE CONTROLLED BY ANY OTHER SYSTEM CONTROL UNITS.
    - 32.3.2. BE LUTRON QSPS-P1-1-50 OR APPROVED EQUAL IN ACCORDANCE WITH B6.
    - 32.3.3. BE LUTRON QSE-IO OR APPROVED EQUAL IN ACCORDANCE WITH B6.
  - 32.4. POWER MODULE:
    - 32.4.1. SHALL PROVIDE POWER FOR UP TO 8 (EIGHT) WALLSTATIONS BE LUTRON QSPS-P1-1-50 OR APPROVED EQUAL IN ACCORDANCE WITH B6.
  - 32.5. MAIN CONTROL UNIT:
    - 32.5.1. BE ABLE TO RETURN TO THE PREVIOUS STATE PRIOR TO POWER LOSS.
    - 32.5.2. HAVE ASTRONOMICAL TIME CLOCK.
    - 32.5.3. HAVE CONTROL INPUTS TO CONNECT WITH OTHER SYSTEMS (e.g. FIRE ALARM SYSTEM)
    - 32.5.4. HAVE PROGRAMMER INTERFACE
    - 32.5.5. BE ABLE TO ENABLE/DISABLE

**1 LIGHTING CONTROL SINGLE LINE DIAGRAM**  
E-4 SCALE: N.T.S.



**WIRING NOTES:**  
 2 #12AWG (2.5 mm<sup>2</sup>) AND GROUND WIRE  
 LUTRON CABLE GRX-CBL-346S (4 CONDUCTOR NON-PLENUM) OR USE: 2 #18AWG (1.0mm<sup>2</sup>) AND 1 BELDEN #9461 (SHIELDED PAIR #22 AWG).  
 ECOSYSTEM LINK LUTRON CABLE: C-CBL-216-GR-1 (2 #16 CONDUCTOR NON-PLENUM) OR APPROVED EQUAL IN ACCORDANCE WITH B6, IN CONDUIT 16mm.  
 CABLE FAS 105° C 300V 4/C #18 AWG FT-4. PROVIDE 1M EXTRA WIRE COILED AT THE FIRE ALARM PANEL. TERMINATION BY OTHERS. SEE DWG.E-3.

**NOTES:**  
 FOR DETAILED WIRING DIAGRAM SEE DETAIL E-4/2. THE FIRE ALARM SIGNAL INVOKES 200lx ON THE POOL DECK.  
**OPERATION SCHEDULE:**  
 1. OPERATING HOURS:  
 1.1. CONTROLS (WALLSTATIONS) TO BE DISABLED.  
 1.2. LUMINAIRES TO BE PROGRAMMED TO MAINTAIN ILLUMINANCE OF 200lx ON THE POOL DECK, BASED ON THE PHOTOCELL INPUT.  
 2. AFTER HOURS:  
 2.1. CONTROLS (WALLSTATIONS) TO BE ENABLED.  
 2.2. ILLUMINANCE OF 10lx SHALL BE MAINTAINED ON THE POOL DECK DURING NON-OCCUPIED PERIODS.  
 2.3. ACTIVATION OF WALLSTATION SWITCH RAISES AND MAINTAINS ILLUMINANCE TO 200lx ON THE POOL DECK FOR 30min, FOLLOWED BY FLASHES TO WARN THAT THE LIGHT LEVELS ARE RETURNING TO 10lx.



**2 LIGHTING CONTROL WIRING DIAGRAM**  
E-4 SCALE: N.T.S.

NO.	REVISION/DESCRIPTION	BY	DATE
SEALS			

DRAWN BY	VC	CHECKED BY	VC	APPROVED	SPR BY
DATE	July 2010	USER APPROVAL			

**CITY OF WINNIPEG**  
 PLANNING, PROPERTY AND DEVELOPMENT DEPARTMENT  
 Municipal Accommodations Division  
 185 King St Winnipeg, MB R3B 1J1

**PROJECT**  
 CINDY KLASSEN POOL  
 REPLACE LIGHTING ON POOL DECK

989 SARGENT AV.  
**SHEET TITLE**  
 SPECIFICATIONS AND DETAILS

SCALE	PROJECT NO.	SHEET NO.
N.T.S.	557-2010	E-4