

Project Name:	City of Mississauga Fire Station 123 3050 The Collegeway, Mississauga, ON	Date Issued:	June 6, 2024
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Addendum #: E01

Revision #: 0

This Addendum forms part of the Contract Specifications and Drawings, and modifies the Bidding Documents, with Amendments and Additions noted below. This Addendum shall be added to the front of the specifications as issued. Bidders shall acknowledge receipt of this Addendum in the space provided in the Bid Form and include in bid amount.

This addendum includes modifications to the drawings as summarized below. Unless otherwise noted, all drawings listed below are attached herewith.

1.0 Revisions to Specifications

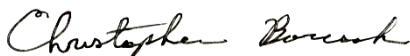
- .1 Section 25 56 50 – Integrated Automation Control of Electrical Lighting Systems**
 - i) Delete section in entirety.
- .2 Section 26 09 23 – Lighting Control Devices**
 - i) Add new section.
- .3 Section 26 09 43 – Network Lighting Controls**
 - i) Delete section in entirety.
- .4 Section 27 35 19.13 – Fire Station Call Status and Management Displays**
 - i) Add new section.
- .5 Section 28 46 21.22 – Fire-Alarm Remote Annunciators**
 - i) Delete section, and re-issue new section attached. Deletions noted by strikeout, insertions by underline.
- .6 Section 34 41 13.13 – Traffic System Pre-Emption Equipment**
 - i) Add new section.

2.0 Revisions to Drawings

- .1 Drawing E-001 – Electrical Legend and Drawing List**
 - i) General note 3: revise note to indicate correct designation of standard, CAN/ULC-S524-14.
 - ii) General note 4: revise note to indicate correct designation of standard CAN/ULC-S537-13.
 - iii) General note 6: revise noted specification section for seismic restraints to be Section 26 05 48.16.
- .2 Drawing E-002 – Electrical Site Plan**
 - i) Add new notes to plan related to PSN handwell and associated conduits.
- .3 Drawing E-101 – Power and Systems Plan**
 - i) Add general sheet note 1: "In apparatus bay, provide weatherproof while in use cover for all receptacles.
 - ii) Add provisions for Fire Station Alerting (Mach Alert) system:
 - (1) Add receptacle on north wall of apparatus bay at 10 feet AFF for Mach Alert Turn Out Timer.
 - (2) Add Mach Alert Timer and Mach Alert Acknowledge Push Buttons.

- iii) Add provision for Traffic Pre-Emption (Opticom Intelligreen) system:
 - (1) Add hard wired 120 circuit to Pre-emption base station unit.
- iv) Add convenience receptacle in Dormitory 113.
- v) Relocate kitchen island receptacle in Kitchen 126 to south side of island.
- .4 Drawing E-102 – Roof Power and Systems Plan**
 - i) Add 3 x 2 inch conduits for LMR400 cable or equivalent from IT room for Mach Alert System.
 - ii) Add location to roof plan for Traffic Pre-emption system antenna.
- .5 Drawing E-111 – Lighting Plan**
 - i) Add emergency battery units BU-3 to BU-6 inclusive.
 - ii) Update circuiting for emergency remote heads to suit new battery units.
 - iii) Update circuiting for exit signs to suit new battery units.
 - iv) Add emergency remote head type E1 in universal washroom 105.
- .6 Drawing E-503 – Electrical Details III**
 - i) Detail 1 – Emergency Power Control Wiring Interconnections: note ATS “non-life safety” but installed as a life safety generator in accordance with CSA C282.
- .7 Drawing E-504 – Fire Alarm Schedule and Details**
 - i) Add new detail 5 - Mach Alert System Riser.
 - ii) Add new detail 6 – Traffic Pre-emption system riser.
 - iii) Add new detail 7 for gooseneck for conduit roof penetration with gooseneck (for Mach Alert system and Traffic Pre-emption antenna).
 - iv) Add new detail 8 for typical standalone decentralized lighting controls.
 - v) Add new detail 9 for line voltage occupancy sensor switch wiring.
- .8 Drawing E-603 – Electrical Panelboard Schedule II**
 - i) Panel RP-RA:
 - (1) Add 15A/1P breaker to circuit 44 to feed Traffic Pre-Emption system.
 - (2) Add 15A/1P breaker to circuit 47 to feed Mach Alert Turn Out Timer.
- .9 Drawing E-605 – Schedules for Lighting**
 - i) Add emergency battery units BU-3 to BU-6 inclusive to Schedule 26 06 50.19 – Emergency Lighting and Exit Sign Schedule. Same specification as BU-1 and BU-2.

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1 GENERAL

1.1 SECTION INCLUDES

- 1.1.1 Standalone lighting controls that control the lighting in an individual space, and are not interconnected to other spaces, not connected to a centralized lighting control system, and not connected to the building automation system.
 - 1.1.1.1 Single wall or ceiling box mounted devices that integrate manual input, occupancy/vacancy, and dimming, etc., as applicable to the space, and usually intended for smaller spaces with area of 23.2 m² (250 sq ft) or smaller. This includes devices commonly referred to as “sensor switches”.
 - 1.1.1.2 Discrete sensors, 24 V power packs, and on/off manual control devices for on-off control of spaces larger than a single device can achieve.
 - 1.1.1.3 Digital Lighting Control systems, consisting of discrete sensors, dimming wall stations, load controllers, etc. that interconnect together via a digital bus, intended for larger spaces, or spaces requiring more complex controls than a single device can achieve.
- 1.1.2 Devices including the following:
 - 1.1.2.1 Occupancy and Vacancy sensors.
 - 1.1.2.2 Power packs, room controllers, and auxiliary relays.
 - 1.1.2.3 Manual control devices including momentary switches, dimmers, and scene controllers.
 - 1.1.2.4 Timers.
 - 1.1.2.5 Daylight harvesting photo sensors.
- 1.1.3 The lighting controls must meet the intent of ASHRAE 90.1-2013, as amended by Ontario Building Code supplementary standard SB-10, dated 01 January 2017.
 - 1.1.3.1 At least 50% of all 125 volt 15- and 20-Ampere receptacles (installed in conference rooms, rooms used primarily for printing and/or copying functions, breakrooms, classrooms, and individual workstations), and at least 25% of branch circuit feeders (installed for modular furniture not shown on the construction documents), are provided with automatic receptacle controls that function on a) time-of-day schedule or b) occupant sensor or c) occupancy signal from another control or alarm system, with exceptions as listed, as modified by SB-10.
 - 1.1.3.2 For each space in the building, all of the lighting control functions indicated in ASHRAE 90.1-2013 Table 9.6.1, for the appropriate space type in column A, have been implemented, as described by Section 9.4.1.1:
 - (1) Local Control.
 - (2) Restricted to manual ON.
 - (3) Restricted to partial automatic ON.
 - (4) Bilevel lighting control.
 - (5) Automatic daylight responsive controls for sidelighting.
 - (6) Automatic daylight responsive controls for toplighting.
 - (7) Automatic partial OFF (full OFF complies).
 - (8) Automatic full OFF.
 - (9) Scheduled shutoff.
 - 1.1.3.3 Third party functional testing of all lighting control devices and systems is specified in the construction documents.

1.2 PRODUCTS INSTALLED BUT NOT SUPPLIED UNDER THIS SECTION

- 1.2.1 Line voltage manual control devices, as described in Section 26 27 26 – Wiring Devices.

1.3 RELATED REQUIREMENTS

- 1.3.1 Section 26 08 50 – Commissioning of Lighting.
- 1.3.2 Section 26 27 26 – Wiring Devices.
- 1.3.3 Section 26 51 19 – LED Interior Lighting.
- 1.3.4 Section 26 56 19 – LED Exterior Lighting.
- 1.3.5 Lighting Controls Matrix: provides a space-by-space sequence of operation intent.

1.4 REFERENCES

- 1.4.1 ASHRAE 90.1-2013.
- 1.4.2 CSA Group:
 - 1.4.2.1 CSA C22.1:21, Canadian Electrical Code, Part 1 (25th Edition), Safety Standard for Electrical Installations.
 - 1.4.2.2 Ontario Electrical Safety Code (28th edition/2021).
 - 1.4.2.3 CSA C22.2 No. 42 – General Use Receptacles.
 - 1.4.2.4 CSA C22.2 No. 42.1 – Cover Plates for Flush Mounted Wiring Devices.
 - 1.4.2.5 CSA C22.2 No. 141 – Emergency lighting equipment.
 - 1.4.2.6 CSA C22.2 No. 184 – Solid-State Lighting Controls.
 - 1.4.2.7 CSA C22.2 No. 184.1 – Solid State Dimming Controls.
- 1.4.3 NEMA WD 7 – Occupancy motion sensors standard.
- 1.4.4 Ontario Building Code.
- 1.4.5 UL 924 - Standard for Safety of Emergency Lighting and Power Equipment.
- 1.4.6 UL 2043 – Standard for fire test for heat and visible smoke release for discrete products and their accessories installed in air-handling spaces.

1.5 ADMINISTRATIVE REQUIREMENTS

- 1.5.1 Coordination:
 - 1.5.1.1 Coordinate placement of sensors and wall controls with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 1.5.1.2 Coordinate placement of wall controls with actual installed door swings.
 - 1.5.1.3 Coordinate placement of daylight sensors with windows, skylights, and luminaires to achieve optimum operation. Coordinate placement with ductwork, piping, equipment, or other potential obstructions to light level measurement installed under other sections or by other trades.
 - 1.5.1.4 Coordinate work to provide luminaires and lamps compatible with lighting controls to be installed.
 - 1.5.1.5 Notify the Consultant of conflicts or deviations from contract documents to obtain direction prior to proceeding with work.
- 1.5.2 Preinstallation Meeting: Conduct on-site meetings with lighting control system manufacturer prior to commencing work as part of manufacturer's standard startup services. Manufacturer to review with installer:
 - 1.5.2.1 Low voltage wiring requirements.
 - 1.5.2.2 Separation of power and low voltage/data wiring.
 - 1.5.2.3 Wire labeling.
 - 1.5.2.4 Control locations.
 - 1.5.2.5 Load circuit wiring.
 - 1.5.2.6 Network wiring requirements.

- 1.5.2.7 Connections to other equipment.
 - 1.5.2.8 Installer responsibilities.
- 1.5.3 Sequencing:
 - 1.5.3.1 Do not install sensors and wall controls until final surface finishes and painting are complete.

1.6 SUBMITTALS

- 1.6.1 In accordance with Section 01 33 00.
- 1.6.2 Product Data:
 - 1.6.2.1 Submit manufacturer's descriptive literature and product specifications for each product.
 - 1.6.2.2 Manufacturer's product drawings.
 - 1.6.2.3 Manufacturer's installation instructions.
 - (1) Interconnection diagrams showing field-installed wiring.
 - (2) Include diagrams for power, signal, and control wiring.
- 1.6.3 Project specific data:
 - 1.6.3.1 Bill of Materials: Complete list of all parts needed to fully install selected system components.
 - 1.6.3.2 System One-Line Diagram.
 - 1.6.3.3 Device detail drawings providing wiring details and dimensional data.
- 1.6.4 Where the lighting controls include the option for custom engraving, or custom touchscreen interface on controls, switches, or scene controllers, the Contractor is to submit proposed engraving/labelling as part of the shop drawing submittal for review by the Owner. The Consultant will not review requests for any engraving.

1.7 CLOSEOUT SUBMITTALS

- 1.7.1 Documentation of all lighting control system setpoints, sensor sensitivities, occupancy sensor timeouts, and as-programmed sequences of operation to aid in future troubleshooting.
- 1.7.2 Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.
- 1.7.3 Lighting controls functional test report as required by ASHRAE 90.1.
- 1.7.4 Training attendance records.
- 1.7.5 Manufacturer's warranty letter.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- 1.8.1 Provide all tools required for maintenance of the lighting controls (i.e. Wattstopper LMCT-100-2 or similar if applicable to the installation).
- 1.8.2 Where lighting controls utilize computer software for programming, provide the computer interface (i.e. Wattstopper DLM LMCI-100 or similar if applicable to the installation). Provide a USB flash drive with the software, and ensure the O&M manual includes directions to download the latest edition of the software.
- 1.8.3 Where lighting controls utilize a phone based app for programming, ensure the O&M manual includes directions to download the latest version of the app.

1.9 QUALITY ASSURANCE

- 1.9.1 Manufacturer Qualifications:
 - 1.9.1.1 Products free of defects in material and workmanship.

- 1.9.1.2 Manufactured by an ISO 9002 certified manufacturing facility and shall have a defect rate of less than 1/3 of 1 per cent.
- 1.9.1.3 All devices specified shall have the ability to be connected on a digital loop and programmed separately.
- 1.9.1.4 All user input devices with two or more buttons have the ability to be programmed as multiple load switching or single load dimming.
- 1.9.1.5 The devices have the ability to be connected as a single room.
- 1.9.2 Products certified by a recognized testing agency accredited by the Standards Council of Canada, and bear a certification mark from that agency indicating acceptance to Canadian standards.

1.10 DELIVERY, STORAGE, AND HANDLING

- 1.10.1 Store products in clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.11 WARRANTY

- 1.11.1 Product is warranted free of defects in material and workmanship.
- 1.11.2 Product is warranted to perform the intended function within design limits.
- 1.11.3 Five year warranty.

2 PRODUCTS

2.1 OWNER'S REQUIREMENTS

- 2.1.1 General requirements:
 - 2.1.1.1 The City of Mississauga prohibits all wireless lighting control systems in City owned facilities.
 - 2.1.1.2 System must consist of hardwired components.
 - 2.1.1.3 The controls must function on standalone basis for each room controlled.
 - 2.1.1.4 The system must not use a server, or any cloud-based software.
 - 2.1.1.5 Any submittal that does not meet the requirements noted above will be immediately rejected.
- 2.1.2 Exterior Lighting Control by Building Automation System.

2.2 MANUFACTURERS

- 2.2.1 Manufacturer List:
 - 2.2.1.1 Acuity Brands Lighting (Sensorswitch).
 - 2.2.1.2 Cooper Lighting Solutions.
 - 2.2.1.3 Leviton.
 - 2.2.1.4 Current Lighting.
 - 2.2.1.5 Wattstopper.
- 2.2.2 Substitutions: Requests for substitution must be submitted to the Consultant for review during the bid period, prior to the deadline for questions. If accepted, additional manufacturers will be noted by form of an addendum.

2.3 LINE VOLTAGE AND 24 V ANALOGUE OCCUPANCY SENSORS, AND RELATED HARDWARE

- 2.3.1 All Occupancy Sensors:
 - 2.3.1.1 Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.

- 2.3.1.2 Sensor Technology:
 - (1) Passive Infrared/Ultrasonic Dual Technology Occupancy Sensors: Designed to detect occupancy using a combination of both passive infrared and ultrasonic technologies.
- 2.3.1.3 Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.
- 2.3.1.4 Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.
- 2.3.1.5 Dual Technology Occupancy Sensors: Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.
- 2.3.1.6 Turn-Off Delay: Field adjustable, with time delay settings up to 20 minutes.
- 2.3.1.7 Sensitivity: Field adjustable.
- 2.3.1.8 Compatibility (Non-Dimming Sensors): Suitable for controlling LED, incandescent lighting, low voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.
- 2.3.2 Wall Switch Occupancy Sensors:
 - 2.3.2.1 All Wall Switch Occupancy Sensors:
 - (1) Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.
 - (2) Where indicated, provide two-circuit units for control of two separate lighting loads, with separate manual controls and separately programmable operation for each load.
 - (3) Operation: Field selectable to operate either as occupancy sensor (automatic on/off) or as vacancy sensor (manual-on/automatic off).
 - (4) Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during the delayed-off time interval.
 - (5) Finish: Match finishes specified for wiring devices in Section 26 27 26, unless otherwise indicated.
 - 2.3.2.2 Passive Infrared/Ultrasonic Dual Technology Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 900 square feet.
 - 2.3.2.3 Example products:
 - (1) Lutron Maestro Series
 - (2) Greengate ONW Series.
 - (3) Wattstopper DW-100 Series.
- 2.3.3 Ceiling Mounted Occupancy Sensors:
 - 2.3.3.1 All Ceiling Mounted Occupancy Sensors:
 - 2.3.3.2 Description: Low profile occupancy sensors designed for ceiling installation.
 - 2.3.3.3 Unless otherwise indicated or required to control the load indicated on drawings, provide low voltage units, for use with separate compatible accessory power packs.
 - 2.3.3.4 Finish: White unless otherwise indicated.
- 2.3.4 Passive Infrared/Ultrasonic Dual Technology Ceiling Mounted Occupancy Sensors:

- 2.3.4.1 Standard Range Sensors: Capable of detecting motion within the area required at a mounting height of 9 feet, with a field of view of 360 degrees.
- 2.3.4.2 Example products:
- 2.3.4.3 Lutron LOS-CDT Series.
- 2.3.4.4 Cooper Greengate OAC-DT Series.
- 2.3.4.5 Wattstopper DT-300 Series.
- 2.3.5 Power Packs for Low Voltage Occupancy Sensors:
 - 2.3.5.1 Description: Plenum rated, self-contained low voltage class 2 transformer and relay compatible with specified low voltage occupancy sensors for switching of line voltage loads.
 - 2.3.5.2 Provide quantity and configuration of power and slave packs with all associated wiring and accessories as required to control the load indicated on drawings.
 - 2.3.5.3 Input Supply Voltage: 120 or 347 Vac, to suit circuit as noted on plans.
 - 2.3.5.4 Load Rating: As required to control the load indicated on drawings.

2.4 DIGITAL STANDALONE LIGHTING CONTROL SYSTEMS

- 2.4.1 Manufacturer List:
 - 2.4.1.1 Legrand/Wattstopper DLM (basis of design).
 - 2.4.1.2 Acuity Brands Lighting nLight.
 - 2.4.1.3 Cooper Lighting Solutions.
 - 2.4.1.4 Leviton.
 - 2.4.1.5 Current Lighting NX series.
- 2.4.2 Substitutions: Requests for substitution must be submitted to the Consultant for review during the bid period, prior to the deadline for questions. If accepted, additional manufacturers will be noted by form of an addendum.

2.5 OCCUPANCY AND VACANCY SENSORS FOR DIGITAL LIGHTING CONTROL SYSTEMS

- 2.5.1 General:
 - 2.5.1.1 Sensors using passive infrared, ultrasonic, microphonic, and multi-technology adaptive technology.
 - 2.5.1.2 Configurable sensor timeouts.
 - 2.5.1.3 Rating: 24 VDC input voltage.
 - 2.5.1.4 Environmental:
 - (1) Operating Temperature Range: 0 degrees C to 40 degrees C
 - (2) Relative Humidity: 5 per cent to 95 per cent non-condensing.
 - 2.5.1.5 Sensors shall connect with load controller via cat5e cabling with RJ45 terminations.
- 2.5.2 Dual Technology Wall Switch Sensor, 24V
 - 2.5.2.1 Available in one or two button configuration.
 - 2.5.2.2 Wattstopper LMDW-100 series (Basis of Design).
 - 2.5.2.3 Utilize a dual sensing verification principle for coordination between ultrasonic and Passive Infrared (PIR) Technologies to reduce likelihood of false triggering.
 - 2.5.2.4 Adjustable sensitivity, PIR 10-100%, Ultrasonic 10-100% in increments of 10%.
 - 2.5.2.5 Coverage up to 25 ft diameter for minor motion, and 35 ft diameter with a field view of 180 degrees.
 - 2.5.2.6 Adjustable automatic-ON or manual-ON operation.
 - 2.5.2.7 Adjustable detection and retrigger technology (PIR/Ultrasonic/both/either).
 - 2.5.2.8 Sensor shall have an adjustable time delay.
 - 2.5.2.9 Sensor shall fit in a single gang box with a typical decora faceplate.
- 2.5.3 Dual Technology Ceiling Mounted Sensor, 24V
 - 2.5.3.1 Wattstopper LMDC-100 series (Basis of Design).

- 2.5.3.2 Adjustable sensitivity, PIR 10-100%, Ultrasonic 10-100% in increments of 10%.
- 2.5.3.3 Coverage up to 20 ft diameter for minor motion, and 30 ft diameter with a field view of 360 degrees.
- 2.5.3.4 Adjustable detection and retrigger technology (PIR/Ultrasonic/both/either).
- 2.5.3.5 Sensor shall have an adjustable time delay.
- 2.5.3.6 Sensor shall fit in a 1.5 in deep octagon box.
- 2.5.4 Dual Technology Corner Mount Sensor, 24V
 - 2.5.4.1 Ceiling or wall mounted as directed.
 - 2.5.4.2 Wattstopper LMDX-100 series (Basis of Design).
 - 2.5.4.3 Adjustable sensitivity, PIR 10-100%, Ultrasonic 10-100% in increments of 10%.
 - 2.5.4.4 Coverage up to 25 ft diameter for minor motion, and 40 ft diameter with a field view of 90 degrees.
 - 2.5.4.5 Adjustable detection and retrigger technology (PIR/Ultrasonic/both/either).
 - 2.5.4.6 Sensor shall have an adjustable time delay.
 - 2.5.4.7 Sensor shall fit in a 4 in square box with mounting plate and base.

2.6 DAYLIGHT HARVESTING PHOTO SENSORS FOR DIGITAL LIGHTING CONTROL SYSTEMS

- 2.6.1 Closed loop photosensor
 - 2.6.1.1 Ceiling mounted, recessed or surface (with bracket).
 - 2.6.1.2 Wattstopper LMLS-400 series (Basis of Design).
 - 2.6.1.3 Spatial response: 100 degrees.
 - 2.6.1.4 Sensor suitable between 1-1,553 foot candles.
 - 2.6.1.5 Environmental:
 - (1) Operating Temperature Range: 0 degrees C to 55 degrees C
 - (2) Relative Humidity: 0 per cent to 95 per cent non-condensing.
- 2.6.2 Open loop photosensor
 - 2.6.2.1 Ceiling or wall mounted, recessed or surface (with bracket).
 - 2.6.2.2 Wattstopper LMLS-500 series (Basis of Design).
 - 2.6.2.3 Spatial response: 60 degrees.
 - 2.6.2.4 Sensor suitable between 1-1,500 footcandles.
 - 2.6.2.5 Environmental:
 - (1) Operating Temperature Range: 0 degrees C to 55 degrees C
 - (2) Relative Humidity: 0 per cent to 95 per cent non-condensing.

2.7 DECORATOR LOW VOLTAGE MOMENTARY SWITCHES FOR DIGITAL LIGHTING CONTROL SYSTEMS

- 2.7.1 Switching and scene control: Wattstopper LMSW-100 series (basis of design).
- 2.7.2 Dimming: Wattstopper LMDM-101 series (basis of design).
- 2.7.3 Suitable for switching, dimming and scene selection.
- 2.7.4 Available in 1, 2, 3, 4, 5, and 8 button configurations.
- 2.7.5 Two RJ45 ports for daisy chaining multiple devices.
- 2.7.6 Switch shall fit in a single gang box with a typical decora faceplate.
- 2.7.7 Environmental:
 - 2.7.7.1 Operating Temperature Range: 0 degrees C to 55 degrees C.
 - 2.7.7.2 Relative Humidity: 5 per cent to 95 per cent non-condensing.

2.8 POWER PACKS

- 2.8.1 General:
 - 2.8.1.1 Power packs shall have the ability to be daisy chained on one digital loop.

- 2.8.1.2 Internal relay controlling up to 20A for 120/277VAC or 15A for 347VAC ballast loads total per power pack.
- 2.8.1.3 Power pack shall be available in 0-10V or forward phase dimming (120/277VAC only) technology.
- 2.8.1.4 Models of 0-10V dimming technology shall have the option for one, two or three control channels.
- 2.8.1.5 Power packs are digital and can be configured for pre-set scenes.
- 2.8.1.6 Wattstopper LMRC-210 series (0-10V or switched) (Basis of Design)
- 2.8.1.7 Wattstopper LMRC-220 series (forward phase) (Basis of Design)
- 2.8.1.8 Power pack shall utilize Zero Crossing Circuitry to protect from the effects of inrush current and increase product longevity.
- 2.8.1.9 Power pack shall be mounted on a 4 in square junction box and is plenum rated for ceiling installation.
- 2.8.1.10 Power packs shall at minimum meet the following environmental specifications:
 - (1) Operating Temperature Range: 0 degrees C to 55 degrees C
 - (2) Relative Humidity: 5 per cent to 95 per cent non-condensing

2.9 PLUG LOAD CONTROLLER

- 2.9.1 Plug load controllers shall have the ability to be daisy chained on one digital loop.
- 2.9.2 Internal relay controlling up to 20A for 120VAC per power pack.
- 2.9.3 Wattstopper LMPL-201 series (Basis of Design)
- 2.9.4 Power pack shall utilize Zero Crossing Circuitry to protect from the effects of inrush current and increase product longevity.
- 2.9.5 Power pack shall be mounted on a 4 in square junction box and is plenum rated for ceiling installation.
- 2.9.6 Power packs shall at minimum meet the following environmental specifications:
 - 2.9.6.1 Operating Temperature Range: 0 degrees C to 55 degrees C.
 - 2.9.6.2 Relative Humidity: 5 per cent to 95 per cent non-condensing.
- 2.9.7 Unless noted otherwise on plans, provide split receptacles for controlled plug load controls. Controlled portion of the receptacle shall have manufacturer's permanent marking in accordance with ASHRAE 90.1-2013.

2.10 SEQUENCES OF OPERATION

- 2.10.1 In accordance with ASHRAE 90.1-2013 and as noted on the lighting controls schedule.

3 EXECUTION

3.1 INSTALLATION

- 3.1.1 Perform installation in accordance with manufacturer's instructions.
- 3.1.2 Low voltage lighting control cabling shall be minimum Category 5e.
- 3.1.3 It shall be the Contractor's responsibility to locate and aim sensors in the correct location required for complete and proper volumetric coverage within the range of coverage(s) of controlled areas per the manufacturer's recommendations. Rooms shall have 90 per cent to 100 per cent coverage to completely cover the controlled area to accommodate all occupancy habits of single or multiple occupants at any location within the room(s). The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only the rooms which are to be provided with sensors. The contractor shall provide additional sensors if required to properly and completely cover the respective room.

- 3.1.4 It is the contractor's responsibility to arrange a pre-installation meeting with manufacturer's factory authorized representative, at Owner's facility, to verify placement of sensors and installation criteria.
- 3.1.5 Proper judgement must be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components.
- 3.1.6 Install manual control devices and sensors in accordance with manufacturer's instructions for Vacancy Operation.

3.2 SYSTEM STARTUP

- 3.2.1 The lighting controls manufacturer's representative shall conduct system startup and submit startup report.

3.3 SITE TESTS AND INSPECTIONS

- 3.3.1 The lighting controls manufacturer's representative and Contractor shall conduct functional testing and provide report as described in ASHRAE 90.1-2013:
 - 3.3.1.1 Lighting control devices and control systems shall be tested to ensure that control hardware and software are calibrated, adjusted, programmed, and in proper working condition in accordance with the construction documents and manufacturer's installation instructions.
 - 3.3.1.2 When occupant sensors, time switches, programmable schedule controls, or photosensors are installed, at a minimum, the following procedures shall be performed:
 - (1) Occupant Sensors
 - (A) Certify that the sensor has been located and aimed in accordance with manufacturer recommendations.
 - (B) For projects with up to seven (7) occupancy sensors, all occupancy sensors shall be tested.
 - (C) For projects with more than seven (7) occupancy sensors, testing shall be done for each unique combination of sensor type and space geometry.
 - (D) For each sensor to be tested, verify the following:
 - (a) Status indicator (as applicable) operates correctly.
 - (b) Controlled lights turn off or dim down to the specified level within the required time (20 minutes, or as noted), as applicable to the space type.
 - (c) For auto-on occupant sensors (occupancy mode), the lights turn on to the permitted level when someone enters the space.
 - (d) For manual-on sensors (vacancy mode), the lights turn on only when manually activated.
 - (e) The lights are not incorrectly turned on by movement in nearby areas or by HVAC operation.
 - (2) Automatic Time Switches
 - (A) Confirm that the automatic time switch control is programmed with appropriate weekday, weekend, and holiday (as applicable) schedules.

- (B) Document for the owner automatic time switch programming, including weekday, weekend, and holiday schedules, as well as all setup and preference program settings.
- (C) Verify that correct time and date are properly set in the time switch.
- (D) Simulate occupied condition. Verify and document the following:
 - (a) All lights can be turned on and off by their respective area control switch.
 - (b) The switch only operates lighting in the enclosed space in which the switch is located.
- (E) Simulate unoccupied condition. Verify and document the following:
 - (a) All non-exempt lighting turns off.
 - (b) Manual override switch allows only the lights in the enclosed space where the override switch is located to turn on or remain on until the next scheduled shut off occurs.

(3) Daylight Controls

- (A) All control devices (photocontrols) have been properly located, field-calibrated, and set for appropriate set points and threshold light levels.
- (B) Daylight controlled lighting loads adjust to appropriate light levels in response to available daylight.
- (C) The location where calibration adjustments are made is readily accessible only to authorized personnel.

3.3.1.3 The individual(s) responsible for the functional testing shall not be directly involved in either the design or construction of the project and shall provide documentation certifying that the installed lighting controls meet or exceed all documented performance criteria.

3.3.2 Commissioning:

- 3.3.2.1 Upon completion of the installation, the system shall be completely commissioned to verify all adjustments and sensor placement to ensure a trouble-free lighting control system.
- 3.3.2.2 Submit commissioning report to the Consultant and the Commissioning Authority for review.
- 3.3.2.3 Provide the Consultant and Commissioning Authority with ten working days written notice of the scheduled commissioning date.

3.4 TRAINING

- 3.4.1 Provide training session of minimum 4 hours duration in accordance with Section 01 79 00.
 - 3.4.1.1 Demonstrate system capabilities and functions to Owner's representative.
 - 3.4.1.2 Engage a factory-authorized service representative to train the Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- 1.1.1 Fire Station Alerting (FSA) system.

1.2 REFERENCES

- 1.2.1 Manufacturer's "statement of work" addressed to the Owner.

1.3 SUBMITTALS

- 1.3.1 In accordance with Section 01 33 00.

1.4 CLOSEOUT SUBMITTALS

- 1.4.1 In accordance with Section 01 77 00 and Section 01 78 23.
- 1.4.2 Functional test report including traffic signal work.
- 1.4.3 Demonstration and training literature.
- 1.4.4 Training attendance records.

1.5 DELIVERY, STORAGE, AND HANDLING

- 1.5.1 Receive, and store equipment on site in accordance with the manufacturer's instructions.

1.6 WARRANTY

- 1.6.1 In accordance with Section 01 78 39.

2 PRODUCTS

2.1 MANUFACTURERS

- 2.1.1 Motorola Mach Alert.
- 2.1.2 No substitutions.

2.2 BILL OF MATERIAL

- 2.2.1 One (1) Fire Station Controller (SC) cabinet including:
 - 2.2.1.1 One (1) ACE 3600 controller hardware and software
 - 2.2.1.2 One (1) Motorola alerting data radio (700/800 MHz)
 - 2.2.1.3 Integrated 6.5 Ah backup battery
 - 2.2.1.4 A balanced line-level audio output connection to interface with the station PA (Public Address) amplifier
 - 2.2.1.5 TTS / Tones module
 - 2.2.1.6 Audio mixer and audio relays to control the flow of audio to the station PA (Public Address) system
 - 2.2.1.7 One (1) 8-port Ethernet switch
 - 2.2.1.8 Eight (8) digital output relays
 - 2.2.1.9 Eight (8) digital input terminal blocks
- 2.2.2 Software Licenses:
 - 2.2.2.1 Station Controller software license
 - 2.2.2.2 TTS software license
- 2.2.3 One (1) turnout timer (TOT) display
- 2.2.4 Two (2) mushroom push button in NEMA 4 box
- 2.2.5 Standard spares for SC including:

- 2.2.5.1 TTS / Tones module
- 2.2.5.2 Standard mixer
- 2.2.5.3 12/24 V Converter
(1) 120 V Surge protector
- 2.2.5.4 8-port Ethernet switch
- 2.2.5.5 ACE 3600 RTU with 700/800 MHz mobile radio
- 2.2.6 All other required antennas and RF equipment

2.3 CONTRACTOR SUPPLIED EQUIPMENT

- 2.3.1 All conduit provisions for this system.
- 2.3.2 120 volt power.

3 EXECUTION

3.1 INSTALLERS LIST (EQUIPMENT INSTALLATION)

- 3.1.1 Kelcom.
- 3.1.2 No substitutions.

3.2 INSTALLATION

- 3.2.1 Provide all conduit pathways, backboxes, etc. to support the installation of this system.
- 3.2.2 Provide pull strings in all conduit pathways.
- 3.2.3 Coordinate installation of equipment with Kelcom.
- 3.2.4 Low-voltage interconnection wiring by Kelcom.

3.3 MANUFACTURER SERVICES

- 3.3.1 Coordinate with Kelcom to perform functional testing of the completely installed system.

3.4 CLOSEOUT ACTIVITIES

- 3.4.1 Provide demonstration and training of Owner's personnel in the operation and maintenance of the fire station alerting system.

END OF SECTION

1 GENERAL

1.1 SECTION INCLUDES

- 1.1.1 Fire alarm annunciator panels.
 - 1.1.1.1 Main ~~annunciator~~annunciator panel and remote LCD ~~annunciator~~annunciator panels.
- 1.1.2 Firefighter entrances.
- 1.1.3 Passive graphics.

1.2 RELATED REQUIREMENTS

- 1.2.1 Section 21 13 00 – Fire-Suppression Sprinkler Systems.
- 1.2.2 Section 26 05 00 – Common Work Results for Electrical.
- 1.2.3 Section 28 46 13 – Fire-Alarm Systems.

1.3 REFERENCE STANDARDS

- 1.3.1 The publications listed below form a part of this specification. The publications are referenced in text by the basic designation only. Comply with the latest edition/amendment referenced code, standard, or publication.
 - 1.3.1.1 Ontario Regulations
 - (1) Ontario Building Code.
 - (2) Ontario Fire Code.
 - 1.3.1.2 Underwriters Laboratories of Canada
 - (1) CAN/ULC-S524 – Installation of Fire Alarm Systems.
 - (2) CAN/ULC-S525 – Audible Signal Appliances for Fire Alarm Systems.
 - (3) CAN/ULC-S526 – Visual Signal Appliances for Fire Alarm Systems.
 - (4) CAN/ULC-S527 – Control Units for Fire Alarm Systems.
 - (5) CAN/ULC-S528 – Manual Pull Stations for Fire Alarm Systems.
 - (6) CAN/ULC-S529 – Smoke Detectors for Fire Alarm Systems.
 - (7) CAN/ULC-S530 – Heat Detectors for Fire Alarm Systems.
 - (8) CAN/ULC-S533 – Egress Door Securing and Releasing Devices.
 - (9) CAN/ULC-S536 – Inspection and Testing of Fire Alarm Systems.
 - (10) CAN/ULC-S537 – Verification of Fire Alarm Systems.
 - (11) CAN/ULC-S548 – Alarm Initiating and Supervisory Devices for Water Type Extinguishing Systems.
 - (12) ULC/ORD 693 – Central Station Fire Protective Signaling.
 - 1.3.1.3 All requirements of the Authority Having Jurisdiction (AHJ).
- 1.3.2 In the case of any discrepancy between these specifications, the project drawings, and any applicable local codes, comply with the most stringent requirement.

1.4 COORDINATION

- 1.4.1 Coordinate between all trades for inclusion of information to be included on passive graphic.

1.5 ACTION SUBMITTALS

- 1.5.1 In accordance with Section 01 33 00, and Section 28 46 13.
- 1.5.2 Shop Drawings:
 - 1.5.2.1 Annunciator:
 - (1) Provide annunciator layout and system wiring diagram showing each device and wiring connection required.
 - (2) Show annunciator layout and main control panel module layout, configurations, and terminations.
 - 1.5.2.2 Passive Graphic:
 - (1) Prepare a complete zoning schedule and artwork layout for each passive graphic to be included with submittal package.
 - (2) Submit colour PDF (electronic submittal) using the identical colours as will be used in a temporary graphic for use during occupancy review by municipal fire inspector.
 - (3) After occupancy review, incorporate comments from municipal fire inspector, and submit colour PDF (electronic submittal) using the identical colours as will be used in the final production graphic.

1.6 DELIVERY, STORAGE, AND HANDLING

- 1.6.1 In accordance with Section 01 60 00.

1.7 WARRANTY

- 1.7.1 All work performed and all material and equipment furnished to be warranted as free from defects and for a period of at least one year from the date of acceptance.

2 PRODUCTS

2.1 MANUFACTURERS

- 2.1.1 In accordance with Section 28 46 13.

2.2 FIRE ALARM ANNUNCIATOR PANEL (FAAP)

- 2.2.1 Annunciator panels will have an alphanumeric display for each detection device, and will identify the detection device initiating an alarm.
- 2.2.2 Annunciator panel located at the firefighter's entrance will have separate zone indication for each zone.
- 2.2.3 Install panel in a recessed enclosure with brushed aluminum finish. Coordinate exact location and dimensions with Architectural drawings.
- 2.2.4 Identify emergency exit door numbers/identifiers, and on the control panel/annunciator panel LED labels in order to identify the manual pull stations adjacent to said doors when being activated when cross referenced with the passive graphic.
 - 2.2.4.1 Coordinate with architectural plans indicating door IDs.

2.3 PASSIVE GRAPHIC DISPLAYS

- 2.3.1 Provide passive colour graphic display to be mounted adjacent to the fire alarm control panel, ~~at and~~ each annunciator panel at a minimum, and as indicated on the drawings.
 - 2.3.1.1 Provides building and zone layout while defining zone boundaries.
 - 2.3.1.2 Visual reference of user's location within the building.

- 2.3.2 Multicoloured Passive Graphics:
- 2.3.2.1 Plastic laminate type, on white background, framed and under ~~plexiglass~~clear protective lens, 600 mm by 600 mm (24 inch by 24 inch) minimum size. Confirm final size relative to site conditions.
- 2.3.2.2 Different brilliant colours used to distinguish ~~the~~ various fire alarm zones and building outline from one another, ~~silk-screened with durable acrylic-based inks on a white matte 3 mm (1/8 inch) thick acrylic sheet printed on 100% dimensionally stable archivable film.~~ Use UV protected inks to protect against fading or colour changes for life.
- 2.3.2.3 ~~Allow for Provide~~ a minimum of six different colours to distinguish zones.
- 2.3.2.4 Uppercase text, minimum height of 4 mm (0.15 in).
- 2.3.2.5 Graphical display will indicate the following at minimum to aid users in identifying the location of alarms and signals displays by the annunciator. Coordinate between all trades for inclusion of this information.
- (1) "YOU ARE HERE" indicated in red (unique to each passive graphic location), and properly oriented to the viewer when standing in front of the graphic.
 - (2) Zone colours to clearly indicate the extents of all fire alarm zones.
 - (A) Define all egress corridors in a distinctive (dot) black hatch pattern.
 - (B) All enclosed stairs and elevators to be coloured yellow.
 - (3) Indicate the extents of zones served by air handling units ~~with-that~~ shut ~~downs~~down during a fire alarm.
 - (4) Indicate the location of the fire alarm control panel, all annunciators, and network panels/nodes.
 - (5) Indicate the location of the ULC monitoring transmitter.
 - (6) Indicate the location and designation of sprinkler and standpipe monitoring devices.
 - (7) Indicate the location of Sprinkler Room(s), and all supervised fire protection devices. Coordinate with the fire protection trade(s) for exact locations of devices.
 - (8) Emergency exit doors with door numbers shown. These will be needed to cross reference with the annunciator panel labels for pull stations that are activated next to these doors.
 - (9) Label all Stair Letters. Designations to match Architectural drawings.
 - (10) Main gas shut off location.
- 2.3.3 Frame
- 2.3.3.1 Extruded aluminum frame with concealed mounting hardware and concealed screws.
- 2.3.3.2 Brushed silver finish.
- 2.3.3.3 Concealed security mounting hardware.
- 2.3.3.4 Frame to permit future replacement of graphic if the building or zone layouts change in future.
- 2.3.4 Allow for other requirements per the Authorities Having Jurisdiction, including the Municipal Building Inspector, and Municipal Fire Inspector.

3 EXECUTION

3.1 *INSTALLATION*

- 3.1.1 Installation in accordance with Section 28 46 13.
- 3.1.2 Install annunciators and passive graphics with the top no greater than 1800 mm (70 in) above finished floor.
- 3.1.3 Install main annunciators with temporary passive graphics in the following locations:
 - 3.1.3.1 Ground floor lobby (firefighter's entrance).
 - 3.1.3.2 Adjacent to fire alarm control panel.
- 3.1.4 Install temporary passive graphic at fire alarm control panel.

3.2 *SITE TESTS AND INSPECTIONS*

- 3.2.1 Review passive graphics and annunciators with municipal fire inspector on site during occupancy review. Incorporate any comments and resubmit to the Consultant for review.
- 3.2.2 Include reprogramming of zone nomenclature by system manufacturer to suit municipal review comments.
- 3.2.3 After review by the Consultant, fabricate final passive graphics, and replace temporary graphics on site.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- 1.1.1 Traffic pre-emption system designed to override operation of traffic signals at the intersection(s) near the fire station when trucks leave the station.

1.2 PRODUCTS SUPPLIED BY NOT INSTALLED UNDER THIS SECTION

- 1.2.1 All “intersection equipment” is to be purchased by the Contractor, received and stored on site, and turned over to the City’s traffic contractor for installation at the intersection(s).

1.3 ADMINISTRATIVE REQUIREMENTS

- 1.3.1 Coordinate turnover of “intersection equipment” to the City’s designated traffic contractor. The traffic contractor’s work is paid directly by the Owner.

1.4 SUBMITTALS

- 1.4.1 In accordance with Section 01 33 00.

1.5 CLOSEOUT SUBMITTALS

- 1.5.1 In accordance with Section 01 77 00 and Section 01 78 23.
- 1.5.2 Functional test report including traffic signal work.
- 1.5.3 Demonstration and training literature.
- 1.5.4 Training attendance records.

1.6 DELIVERY, STORAGE, AND HANDLING

- 1.6.1 Receive, and store equipment on site in accordance with the manufacturer’s instructions.

1.7 WARRANTY

- 1.7.1 In accordance with Section 01 78 39.

2 PRODUCTS

2.1 MANUFACTURERS

- 2.1.1 Miovision (formerly GTT-Global Traffic Technologies), Opticom series.
Manufacturer represented in Ontario by Innovative Traffic Solutions Inc. (ITS).
Contact: Brad Vandenberg, bvandenberg@its-traffic.com, 905-745-4867.
- 2.1.2 No substitutions (City of Mississauga standard).

2.2 FIRE STATION EQUIPMENT – BILL OF MATERIAL

- 2.2.1 Radio IntelliGreen kit, including the following components:
 - 2.2.1.1 Model 3100 radio intersection unit.
 - 2.2.1.2 Model 1060 radio IntelliGreen control unit.
- 2.2.2 Radio installation cable, Model 1070.
- 2.2.3 Bracket, vertical pole/wall Opticom Mounting Bracket.

2.3 INTERSECTION EQUIPMENT – BILL OF MATERIAL

- 2.3.1 Multimode phase selector, model 764.
 - 2.3.2 Card rack with P1 harness assembly, model 760.
-

- 2.3.3 Opticom radio intersection antenna unit, model 3100.
- 2.3.4 Radio installation cable, model 1070.
- 2.3.5 Bracket, vertical pole/wall Opticom mounting bracket.
- 2.3.6 ITS on-site commissioning services 1-day.

2.4 CONTRACTOR SUPPLIED EQUIPMENT

- 2.4.1 All conduit provisions for this system.
- 2.4.2 120 volt power for 1060 control unit.
- 2.4.3 Ballasted tripod stand.

3 EXECUTION

3.1 INSTALLATION

- 3.1.1 In accordance with manufacturer's instructions.

3.2 MANUFACTURER SERVICES

- 3.2.1 Coordinate with ITS to perform functional testing of the completely installed system.

3.3 CLOSEOUT ACTIVITIES

- 3.3.1 Provide demonstration and training of Owner's personnel in the operation and maintenance of the pre-emption system.

END OF SECTION

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
LINETYPES	
	NEW WORK
	WORK TO BE DEMOLISHED, OR REMOVED
	EXISTING MATERIAL/EQUIPMENT/SERVICES TO REMAIN
	FUTURE WORK (NOT IN SCOPE)
	EXTENTS OF FIRE ALARM ZONE, WET LOCATION, OR OTHER AREA AS NOTED ON PLANS
	ABBREVIATIONS
E	EXISTING TO REMAIN
R	EXISTING TO BE DEMOLISHED/REMOVED
ER	EXISTING IN RELOCATED POSITION
RR	REMOVE AND RELOCATE
C	CEILING MOUNTED CONNECTION
W	WALL MOUNTED CONNECTION
F	FLOOR MOUNTED CONNECTION
A	CENTRE LINE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
O/C	OVER COUNTER
U/C	UNDER CABINET
U/F	UNDER BASED FLOOR
CCT	CIRCUIT
CTE	CONNECT TO EXISTING
AFCI	ARC FAULT CIRCUIT INTERRUPTER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
IG	ISOLATED GROUND
TL	TWIST LOCK
TR	TAMPER RESISTANT
WG	WIRE GUARD
WP	WEATHER PROOF
EX	EXPLOSION PROOF
HZ	HAZARDOUS LOCATION
R1	ROUGH-IN ONLY
N/C	NOT IN CONTRACT
SIM	SIMILAR TO
TYP.	TYPICAL
ABBREVIATIONS - CODES AND STANDARDS	
OBC	ONTARIO BUILDING CODE
OESC	ONTARIO ELECTRICAL SAFETY CODE
OFC	ONTARIO FIRE CODE
ABBREVIATIONS - CEILING TYPES	
ACT	ACOUSTIC CEILING TILE (T-BAR)
EXP	EXPOSED CEILING
OWSJ	OPEN WEB STEEL JOISTS
PCC	PAINTED OR POPCORN CEILING ON EXPOSED CONCRETE
WD	WOOD CEILING
ANNOTATIONS	
CL	CLOSET
WR	WASHROOM
PLUMBING	
PTP	ELECTRONIC TRAP PRIMER
PSC	PLUMBING SENSOR CONTROL (TOUCHLESS FAUCETS)
HVAC	
	THERMOSTAT OR TEMPERATURE SENSOR
	TIMER CONTROL
BBH	ELECTRIC BASEBOARD HEATER (BBH)
BFH	FORCED FLOW HEATER
ERV	ENERGY RECOVERY VENTILATOR
HRU	HEAT RECOVERY UNIT
MUA	MAKE-UP AIR UNIT
CONDUIT AND BOXES	
	CONDUIT WITH END BUSHING
	CONDUIT UP
	CONDUIT DOWN
	CONDUIT CONTINUES
	JUNCTION BOX
	PULL BOX
	HAND HOLE
CONNECTIONS TO EQUIPMENT	
DW	DISHWASHER
FR	FRIDGE
MW	MICROWAVE
HD	HAND DRYER, ALLOW UP TO 208V-1PH-20A
	1-PHASE DIRECT CONNECTION OUTLET AS NOTED.
	3-PHASE DIRECT CONNECTION OUTLET AS NOTED.
THIS LEGEND IS GENERIC. ALL SYMBOLS LISTED MAY NOT BE APPLICABLE FOR THIS PROJECT. REFER TO FLOOR PLANS TO DETERMINE USED DEVICES AND EQUIPMENT.	

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
	SYSTEM FURNITURE, WALL FEED FOR POWER AND TELECOMMUNICATIONS UNLESS NOTED OTHERWISE. 'C' ADJACENT TO SYMBOL DENOTES CEILING FEED, 'F' ADJACENT TO SYMBOL DENOTES FLOOR FEED.
W	ADJACENT TO 3-PHASE DIRECT CONNECTION, DENOTES WALL SYSTEM FURNITURE FEED FOR POWER AND COMMUNICATIONS.
	CONNECTION TO SINGLE PHASE MOTOR, HP (KW) AS NOTED. PROVIDE LOCAL DISCONNECT.
	THREE PHASE MOTOR, HP (KW) AS NOTED. PROVIDE LOCAL DISCONNECT.
LIGHTING CONTROLS	
REFER TO SPECIFICATIONS AND RESPECTIVE SCHEDULES FOR EXACT REQUIREMENTS	
	SWITCH OR OTHER USER INTERFACE DEVICE AS DESCRIBED ON LIGHTING CONTROLS SCHEDULE.
	3-WAY SWITCH
DM	ADJACENT TO SWITCH, DENOTES DIMMING SWITCH
K	ADJACENT TO SWITCH, DENOTES KEY SWITCH
T	ADJACENT TO SWITCH, DENOTES COUNTDOWN TIMER SWITCH
AS	ADJACENT TO SWITCH, DENOTES ASTRONOMICAL TIMER SWITCH
DS	ADJACENT TO SWITCH, DENOTES DOOR SWITCH
PIR	PASSIVE INFRARED SENSOR
DT	DUAL TECHNOLOGY SENSOR
UT	ULTRASONIC SENSOR
OS	SENSOR (TYPE UNKNOWN)
M	WALL MOUNTED SWITCH/OCCUPANCY SENSOR. PIR DENOTES 'PASSIVE INFRARED', DT DENOTES DUAL TECHNOLOGY, UT DENOTES ULTRASONIC, LINE VOLTAGE TO SUIT CONTROLLED CIRCUIT, OR AS NOTED.
RP	RELAY PANEL
PP	POWER PACK
SC	SCENE CONTROLLER
	PHOTOCELL SENSOR.
	PHOTOCELL SENSOR, 'PC' DENOTES CLOSED LOOP PHOTOCELL CONTROL, 'PO' DENOTES OPEN LOOP PHOTOCELL CONTROL.
	CEILING MOUNTED OCCUPANCY SENSOR. PIR DENOTES 'PASSIVE INFRARED', DT DENOTES DUAL TECHNOLOGY, (OR MICROPHONIC), DT DENOTES DUAL TECHNOLOGY, 'OS' DENOTES UNKNOWN TECHNOLOGY.
	WALL MOUNTED OCCUPANCY SENSOR.
DISTRIBUTION EQUIPMENT	
	TRANSFORMER, PLAN VIEW
	SURFACE MOUNTED LIGHTING AND RECEPTACLE PANELBOARD
	RECESSED RECEPTACLE AND LIGHTING PANELBOARD
	DISTRIBUTION PANELBOARD
	DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	CIRCUIT BREAKER
	LOOSE STARTER. COORDINATE STARTING CHARACTERISTIC WITH EQUIPMENT REQUIREMENTS.
	COMBINATION STARTER.
VFD	ADJACENT TO STARTER, DENOTES VARIABLE FREQUENCY DRIVE
POWER RECEPTACLES AND BOXES	
	120V U-GROUND DUPLEX RECEPTACLE.
	120V U-GROUND DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER TOP OR AS INSTRUCTED ON SITE.
	120V U-GROUND 20A DUPLEX RECEPTACLE.
	120V U-GROUND DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER TOP OR AS INSTRUCTED ON SITE.
	120V U-GROUND DUPLEX RECEPTACLE AUTOMATICALLY CONTROLLED (ASHRAE 90.1-2013, 8.4.2).
	120V U-GROUND 20A DUPLEX RECEPTACLE AUTOMATICALLY CONTROLLED (ASHRAE 90.1-2013, 8.4.2).
	120V U-GROUND DUPLEX RECEPTACLE - HALF OF RECEPTACLE AUTOMATICALLY CONTROLLED (ASHRAE 90.1-2013, 8.4.2).
	120V U-GROUND QUAD RECEPTACLE.
	INDICATES RECEPTACLE COMPLETE WITH ONE TYPE A AND ONE TYPE C USB CHARGING PORTS.
	14-30R RECEPTACLE FOR LAUNDRY DRYER, OR OTHER RECEPTACLE AS NOTED.
	14-50R RECEPTACLE FOR ELECTRONIC RANGE, OR OTHER RECEPTACLE AS NOTED. PROVIDE 40A/2P BREAKER TO SUIT, UNLESS NOTED OTHERWISE.
THIS LEGEND IS GENERIC. ALL SYMBOLS LISTED MAY NOT BE APPLICABLE FOR THIS PROJECT. REFER TO FLOOR PLANS TO DETERMINE USED DEVICES AND EQUIPMENT.	

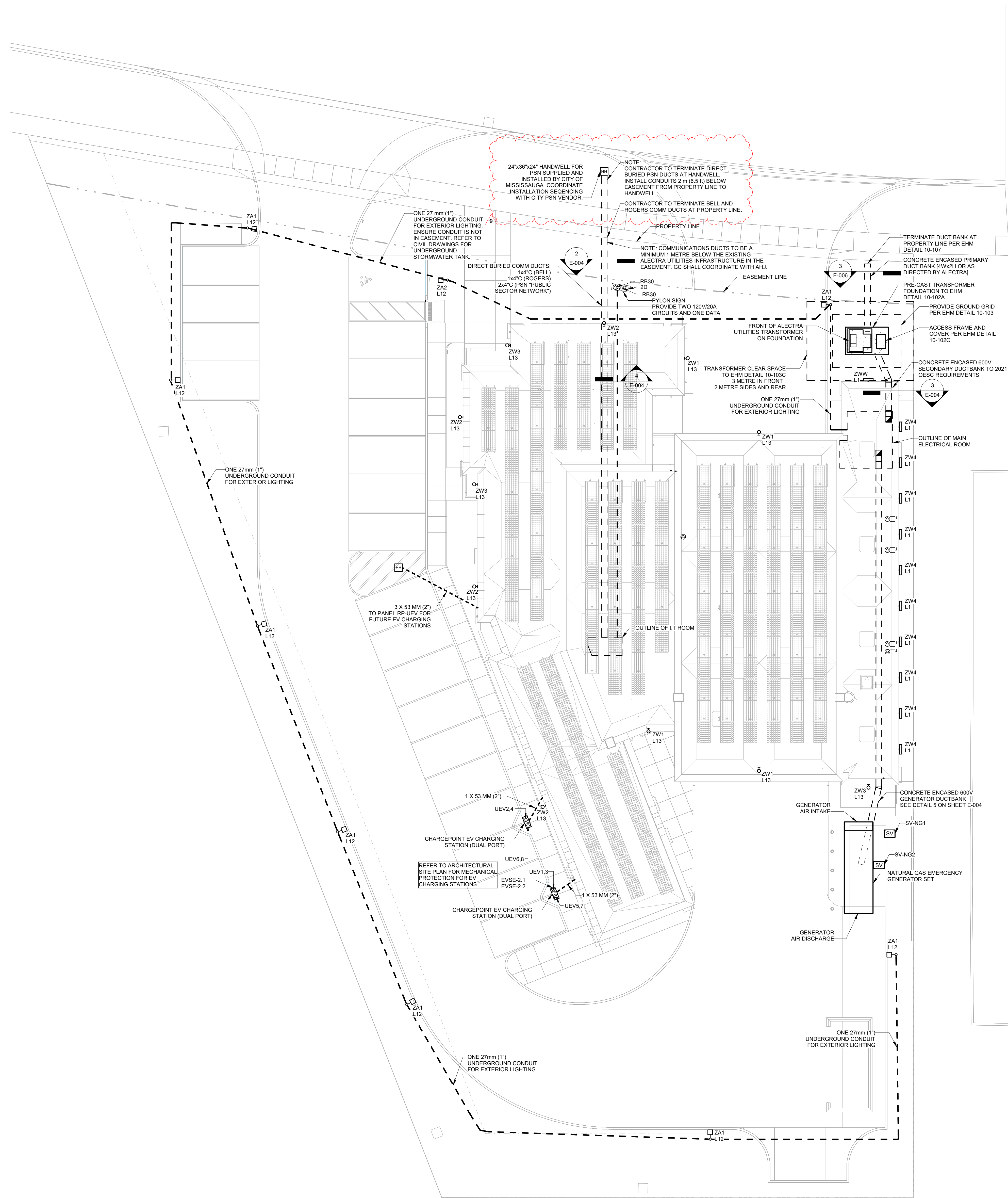
ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
	15-30R SPECIAL RECEPTACLE. VERIFY OUTLET REQUIREMENTS PRIOR TO ROUGH-IN.
	SPECIAL RECEPTACLE. VERIFY OUTLET REQUIREMENTS PRIOR TO ROUGH-IN.
	FLOOR RECEPTACLE OR RECEPTACLE IN FLOOR BOX (POWER ONLY).
FB1	SERVICE POLE, PROVIDE POWER TO JUNCTION BOX IN CEILING SPACE ABOVE. DEVICES ON POLE AS NOTED ON PLANS.
FB2	ADJACENT TO FLOOR RECEPTACLE, DENOTES FLOOR BOX TYPE.
*	ADJACENT TO DEVICE, DENOTES DEVICE CONNECTED TO EMERGENCY POWER
LIGHTING FIXTURES	
SYMBOLS IN ACCORDANCE WITH IES DC-3-00 AND IES HB-10-11 WHERE NOT DETAILED OTHERWISE HERE. REFER TO LIGHTING FIXTURE SCHEDULE FOR FURTHER DETAILS AND EXACT FIXTURE REQUIREMENTS.	
	LINEAR LUMINAIRE, SURFACE MOUNTED TO CEILING
	LINEAR LUMINAIRE, RECESSED IN CEILING
	LINEAR LUMINAIRE, SUSPENDED, PENDANT, CHAIN, STEM, OR AIRCRAFT CABLE HUNG TO SUIT APPLICATION, OR AS NOTED IN SCHEDULE. 'X', WHEN USED DENOTES POWER FEED LOCATION.
	LINEAR LUMINAIRE, WALL MOUNTED
	AS ABOVE, CONNECTED TO EMERGENCY OR NIGHT LIGHTING CIRCUIT AS NOTED.
	ROUND OR SQUARE DOWNLIGHT, RECESSED
	RECESSED DOWNLIGHTS, CONNECTED TO EMERGENCY OR NIGHT LIGHT CIRCUIT
	ROUND SUSPENDED LUMINAIRE
	WALL SCONCE OR OTHER WALL MOUNTED LUMINAIRE.
EM	CONNECTED TO EMERGENCY NIGHT LIGHT CIRCUIT
CE	CONNECTED TO EMERGENCY CIRCUIT, PROVIDE CUL 90A LISTED SHUNT TRIP RELAY OR EQUAL TO PERMIT CONTROL OF LUMINAIRE WITH ZONING BASED ON LOCAL LIGHTING CONTROLS.
NL	LUMINAIRE CONNECTED TO NON-EMERGENCY NIGHT LIGHT CIRCUIT (24 HOUR)
A, B, Z1, Z2, ETC.	DENOTES ZONING/CIRCUITING ASSIGNMENTS FOR LUMINAIRE AND CONTROLS IN THE SAME SPACE.
EMERGENCY LIGHTING	
REFER TO EMERGENCY LIGHTING FIXTURE SCHEDULE FOR EXACT FIXTURE REQUIREMENTS.	
	CEILING OR WALL MOUNTED ILLUMINATED EXIT SIGN. SHADED AREA INDICATES ILLUMINATED FACE. PROVIDE DIRECTIONAL ARROWS AS INDICATED ON PLANS.
	CEILING OR WALL MOUNTED ILLUMINATED EXIT SIGN. SHADED AREA INDICATES ILLUMINATED FACE. PROVIDE DIRECTIONAL ARROWS AS INDICATED ON PLANS.
SL	DENOTES 'SELF-LUMINOUS' EXIT SIGN
PL	PHOTOLUMINOUS EXIT SIGN.
	EMERGENCY LIGHTING BATTERY UNIT, WITH AND WITHOUT HEADS.
	ONE AND TWO HEAD WALL MOUNTED EMERGENCY LIGHTING REMOTE UNITS.
	ONE AND TWO HEAD CEILING MOUNTED EMERGENCY LIGHTING REMOTE UNITS.
	RECESSED EMERGENCY REMOTE HEAD.
EM	DENOTES 'EMERGENCY'
CCT	CORRELATED COLOUR TEMPERATURE
CRI	COLOUR RENDERING INDEX
EXTERIOR LIGHTING	
	ARM MOUNTED LUMINAIRE ON POLE. DIRECTIONAL ARROW, WHERE INDICATED DENOTES PRIMARY LUMEN ORIENTATION.
	POST TOP LUMINAIRE ON POLE. DIRECTIONAL ARROW, WHERE INDICATED DENOTES PRIMARY LUMEN ORIENTATION.
	LIGHTING BOLLARD. DIRECTIONAL ARROW, WHERE INDICATED DENOTES PRIMARY LUMEN ORIENTATION.
	GROUND MOUNTED FLOOD LIGHT
TELECOMMUNICATIONS	
	SYSTEM FURNITURE FEED.
W	ADJACENT TO SYSTEM FURNITURE FEED, DENOTES WALL SYSTEM FURNITURE FEED FOR POWER AND COMMUNICATIONS.
F	ADJACENT TO SYSTEM FURNITURE FEED, DENOTES FLOOR SYSTEM FURNITURE FEED FOR POWER AND COMMUNICATIONS.
C	ADJACENT TO SYSTEM FURNITURE FEED, DENOTES CEILING SYSTEM FURNITURE FEED FOR POWER AND COMMUNICATIONS (SERVICE POLE OR DROP CORD AS NOTED).
	CABLE TRAY (LADDER TYPE)
	CABLE TRAY (BASKET TYPE)
	WALL MOUNTED DATA (D) OR VOICE (V) OUTLET. PROVIDE 1V AND 1D UNLESS NOTED OTHERWISE.
	WALL MOUNTED VOICE (TELEPHONE) OUTLET. PROVIDE 1V UNLESS NOTED OTHERWISE.
THIS LEGEND IS GENERIC. ALL SYMBOLS LISTED MAY NOT BE APPLICABLE FOR THIS PROJECT. REFER TO FLOOR PLANS TO DETERMINE USED DEVICES AND EQUIPMENT.	

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
<1	WALL MOUNTED DATA OUTLET. PROVIDE 1D UNLESS NOTED OTHERWISE.
	WALL MOUNTED TELEVISION OUTLET.
	VOICE, DATA, OR TV OUTLET AS DESCRIBED ABOVE. MOUNTED ABOVE COUNTER TOP OR AS INSTRUCTED ON SITE.
B	ADJACENT TO COMMUNICATIONS OUTLET, INDICATES BLANK-OFF PLATE.
	HDMI OUTLET.
	AUDIO VIDEO GANG, AS NOTED.
	WIRELESS ACCESS POINT (WIFI)
	AUDIO VISUAL SYSTEM SPEAKER, CEILING MOUNTED.
	AUDIO VISUAL SYSTEM SPEAKER, WALL MOUNTED.
	PUBLIC ADDRESS SYSTEM SPEAKER, WALL MOUNTED.
	PUBLIC ADDRESS SYSTEM SPEAKER, WALL MOUNTED HORN SPEAKER.
	PUBLIC ADDRESS SYSTEM HANDSET
	PUBLIC ADDRESS SYSTEM ADMIN CONTROL CONSOLE (RECEIVER)
	PUBLIC ADDRESS SYSTEM VOLUME CONTROL SWITCH.
	INTERCOM
	IDC INSULATION DISPLACEMENT CONNECTION
	CLOCK
	GPS CLOCK SYSTEM MASTER TRANSMITTER
	GPS CLOCK SYSTEM GPS RECEIVER
	GPS CLOCK SYSTEM SETELITE TRANSMITTER (RECEIVER)
	GPS CLOCK SYSTEM RECEIVER SWITCH
ACCESS CONTROL AND DOOR HARDWARE	
	CARD READER
	DOOR ALARM SOUNDER
	DOOR CONTACT
	OVERHEAD DOOR CONTACT
	ELECTRIC STRIKE
	ELECTRIC POWER TRANSFER CABLE
	POWER TRANSFER HINGE
	KEY SWITCH
	ELECTROMAGNETIC LOCK
	MOTORIZED LATCH RETRACTION. PROVIDE 120 V.
	REQUEST TO EXIT SENSOR
	MUSHROOM HEAD PUSH BUTTON FOR REQUEST TO EXIT MAGLOCK RELEASE, OR OTHER PUSH BUTTON AS INDICATED.
	BARRIER FREE DOOR OPERATOR PUSH BUTTON
	TOUCHLESS 'WAVE SWITCH' FOR DOOR OPERATOR CONTROL
	DOOR BELL. C/W SOUNDER AND STROBE
	DOOR BELL (SOUNDER ONLY)
INTRUSION DETECTION	
	GLASS BREAK (GB)
	MOTION DETECTOR (MD)
	KEYPAD (KP)
	VIDEO SURVEILLANCE
	CCTV CAMERA
CP	CCTV CAMERA, CEILING OR POLE MOUNTED
	CCTV CAMERA, WALL MOUNTED
PTZ	PAN-TILT-ZOOM
DURESS SYSTEM	
	DURESS BUTTON (MOUNTED ON UNDERSIDE OF TABLETOP)
	WALL MOUNTED DURESS BUTTON WITH POLYCARBONATE ANTI-TAMPER COVER
	DURESS SYSTEM STROBE LIGHT
	FIRE DETECTION AND ALARM - GENERAL
CACF	CENTRAL ALARM AND CONTROL FACILITY
FACP	FIRE ALARM CONTROL PANEL
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FAAG	FIRE ALARM ACTIVE ANNUNCIATOR C/W GRAPHIC
FAPG	FIRE ALARM PASSIVE GRAPHIC
DGP	DATA GATHERING PANEL
FAZ	FIRE ALARM ZONE
FSZ	FIRE ALARM SUPERVISORY ZONE
FDSPCP	FIRE DETECTION, SUPPRESSION, AND PRE-ACTION CONTROL PANEL
FDSCP	FIRE DETECTION AND SUPPRESSION CONTROL PANEL
	FIRE ALARM PANEL (FACP, FAAP, FAMP) AS DENOTED ON PLANS
THIS LEGEND IS GENERIC. ALL SYMBOLS LISTED MAY NOT BE APPLICABLE FOR THIS PROJECT. REFER TO FLOOR PLANS TO DETERMINE USED DEVICES AND EQUIPMENT.	

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
FIRE DETECTION - INITIATION DEVICES	
	MANUAL PULL STATION (MPS)
LX	WHERE NOTED ADJACENT TO MANUAL PULL STATIONS, DENOTES PULL STATION C/W POLYCARBONATE (LEXAN) COVER.
WG	WHERE NOTED ADJACENT TO MANUAL PULL STATIONS, DENOTES PULL STATION C/W WIRE GUARD COVER.
A	WHERE NOTED ADJACENT TO MANUAL PULL STATIONS, DENOTES MANUAL PULL STATION C/W AUXILIARY CONTACT
	PHOTOELECTRIC SMOKE DETECTOR
	SAME AS ABOVE, WALL MOUNTED
SA	WHEN ADJACENT TO PHOTOELECTRIC SMOKE DETECTOR, INDICATES RESIDENTIAL SMOKE ALARM
	RESIDENTIAL SMOKE ALARM, 120 VOLT, COMPLETE WITH STROBE. FOR AREAS AS INDICATED ON PLANS BY '100'. PROVIDE INTEGRAL CARBON MONOXIDE DETECTION.
	SAME AS ABOVE, WALL MOUNTED
	DUCT MOUNTED SMOKE DETECTOR
CO	CARBON MONOXIDE DETECTOR
VEDSDA	VERY EARLY SMOKE DETECTING APPARATUS
BSOT	BEAM SMOKE DETECTOR TRANSMITTER
BSRD	BEAM SMOKE DETECTOR RECEIVER (OR REFLECTOR)
ASD	ASPIRATING SMOKE DETECTOR
	END OF LINE (EOI) DEVICE OR ZONE INITIATION OR SIGNAL CIRCUITS
	HEAT DETECTOR - FIXED TEMPERATURE
	ADJACENT TO HEAT DETECTOR, DENOTES 'HIGH TEMPERATURE'
	HEAT DETECTOR - 94 DEGREES C (200 DEGREES F) FIXED TEMPERATURE
	HEAT DETECTOR - 58 DEGREES C (135 DEGREES F) FIXED TEMPERATURE AND RATE OF RISE
	LINEAR HEAT DETECTION CABLE
	FLOW SWITCH
FIRE DETECTION AND ALARM - SUPERVISORY DEVICES	
	LOW TANK LEVEL
	LOSS OF POWER
	LOW TEMPERATURE
	PRESSURE SWITCH
	SUPERVISED VALVE
	SUPERVISED VALVE
FIRE DETECTION AND ALARM - SIGNALLING DEVICES	
	FIRE ALARM BELL, WALL MOUNTED.
C	ADJACENT TO BELL OR HORN, DENOTES CEILING MOUNTED.
	FIRE ALARM HORN
M	ADJACENT TO FIRE ALARM HORN, DENOTES 'MINI' HORN
	FIRE ALARM HORN/STROBE, WALL MOUNTED.
	FIRE ALARM EVACUATION SPEAKER, CEILING MOUNTED
	FIRE ALARM EVACUATION SPEAKER, COMPLETE WITH STROBE LIGHT, CEILING MOUNTED
	FIRE ALARM EVACUATION SPEAKER, WALL MOUNTED
	FIRE ALARM EVACUATION SPEAKER COMPLETE WITH STROBE LIGHT, WALL MOUNTED
	SILENCE SWITCH
	FIRE ALARM WALL MOUNTED STROBE LIGHT
FIRE DETECTION AND ALARM - VOICE COMMUNICATION DEVICES	
	EMERGENCY TELEPHONE FOR FIREFIGHTER'S USE
FIRE DETECTION AND ALARM - OTHER DEVICES	
	END OF LINE DEVICE
	WIRE GUARD
	'DO NOT ENTER' SIGN
	KEY SWITCH FOR FIREFIGHTER CONTROL OF ELEVATOR RECALL, OR AS NOTED
	ISOLATOR MODULE
	OUTPUT RELAY, FUNCTION AS INDICATED
	CONTROL MODULE
	MONITOR MODULE
	MAGNETIC DOOR HOLDER AND RELEASING DEVICE ('HOLD OPEN')
	FIRE SUPPRESSION RELEASING STATION
	FIRE SUPPRESSION ABORT STATION
	SINGLE LINE DIAGRAM
	AIR CIRCUIT BREAKER
	MOLDED CASE CIRCUIT BREAKER
	DISCONNECT (UNFUSED)
	FUSE
	METERING CABINET
	TRANSFORMER
	BUS DUCT
THIS LEGEND IS GENERIC. ALL SYMBOLS LISTED MAY NOT BE APPLICABLE FOR THIS PROJECT. REFER TO FLOOR PLANS TO DETERMINE USED DEVICES AND EQUIPMENT.	

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
	GENERATOR
	AUTOMATIC TRANSFER SWITCH
	AUTOMATIC TRANSFER SWITCH COMPLETE WITH SINGLE SIDED BYPASS ISOLATION
	AUTOMATIC TRANSFER SWITCH COMPLETE WITH SINGLE SIDED BYPASS ISOLATION
ATS	AUTOMATIC TRANSFER SWITCH
C	CONTACTOR
DP	DISTRIBUTION PANELBOARD
LP	LIGHTING PANELBOARD
MCB	MOBILE CONNECTION BOX
MCC	MOTOR CONTROL CENTRE
MPS	MANUAL TRANSFER SWITCH
RP	RECEPTACLE PANELBOARD
SPD	SURGE PROTECTIVE DEVICE
STS	STATIC TRANSFER SWITCH
SWBD	SWITCHBOARD
TX	TRANSFORMER
UPS	UNINTERRUPTIBLE POWER SUPPLY
DETAIL REFERENCES	
	SHEET KEYNOTE
	REVISION NUMBER
THIS LEGEND IS GENERIC. ALL SYMBOLS LISTED MAY NOT BE APPLICABLE FOR THIS PROJECT. REFER TO FLOOR PLANS TO DETERMINE USED DEVICES AND EQUIPMENT.	

ELECTRICAL ENERGY EFFICIENT NOTES FOR PERMIT (ONTARIO)				
ITEM	DESCRIPTION	CODE REFERENCE	SPECIFICATION REFERENCE	REMARKS
1A.	FEEDER CONDUCTORS TO BE SIZED FOR MAXIMUM VOLTAGE DROP OF 2% AT DESIGN LOAD.	OBC SB-10.2017, ASHRAE 90.1-2013, 8.4.1.	26 05 19	
1B.	BRANCH CIRCUIT CONDUCTORS TO BE SIZED FOR MAXIMUM VOLTAGE DROP OF 3% AT DESIGN LOAD.	OBC SB-10.2017, ASHRAE 90.1-2013, 8.4.1.	26 05 19	
2.	50% RECEPTACLE CONTROLS IN CONFERENCE ROOMS, COPY ROOMS, BREAK ROOMS, CLASSROOMS, AND INDIVIDUAL WORKSTATIONS.	OBC SB-10.2017, ASHRAE 90.1-2013, 8.4.2.	26 09 23	
3.	MEASUREMENT DEVICES ROUGHED IN TO MONITOR THE ELECTRICAL ENERGY USE FOR EACH OF THE FOLLOWING UNLESS EXEMPT: A. TOTAL ELECTRICAL ENERGY; B. HVAC; C. INTERIOR LIGHTING; D. EXTERIOR LIGHTING; E. RECEPTACLE CIRCUITS.	OBC SB-10.2017, ASHRAE 90.1-2013, 8.4.3.	26 27 13	
4.	NEW LOW-VOLTAGE TRANSFORMERS TO MEET THE NOMINAL EFFICIENCIES SHOWN IN ASHRAE 90.1-2013, TABLE 8.4.4, UNLESS EXEMPT	OBC SB-10.2017, ASHRAE 90.1-2013, 8.4.4.	26 22 13	
5.	PROVIDE LIGHTING CONTROL FUNCTIONS FOR EACH SPACE IN THE BUILDING PER ASHRAE 90.1-2013 TABLE 8.6.1.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1.1.	26 09 23	90.1 EXEMPTIONS: NORMALLY OFF EMERGENCY LIGHTING - LIFE SAFETY OR OTHER ORDINANCE
5.1.	SPACES PROVIDED WITH READILY ACCESSIBLE LOCAL CONTROLS.	OBC SB-10.2017, ASHRAE 90.1-2017, 9.4.1.1A.	26 09 23	
5.2.	MAXIMUM OCCUPANCY SENSOR TIMEOUT 20 MINUTES.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1.1G.	26 09 23	
6.1	PARKING GARAGE LIGHTING TO BE PROVIDED WITH AUTOMATIC CONTROLS PER ASHRAE 90.1-2017 SECTION 9.4.1.2.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1.2.		NOT APPLICABLE
6.2.	PARKING GARAGE LIGHTING TO AUTOMATICALLY REDUCE LIGHTING POWER BY AT LEAST 30% BASED ON OCCUPANCY	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1.2		NOT APPLICABLE
6.3.	PARKING GARAGE DAYLIGHT TRANSITION ZONE TO BE ON A SEPARATE SCHEDULE.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1.2		NOT APPLICABLE
6.4.	PARKING GARAGE LUMINAIRES TO BE PROVIDED WITH DAYLIGHT HARVESTING, IF NET OPENING-TO-WALL RATIO IS GREATER THAN 40% UNLESS EXEMPT	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1.2		NOT APPLICABLE
7.	PROVIDE ADDITIONAL CONTROLS FOR SPECIAL APPLICATIONS LISTED ASHRAE 90.1 SECTION 9.4.1.3.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1.3	26 09 23	
8.	INTERIOR LIGHTING POWER COMPLIES WITH ASHRAE 90.1-2013 9.2.2.3 AS MODIFIED BY SB-10.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.2.2.3	26 51 00	
9.1.	PROVIDE A PHOTOSENSOR FOR AUTOMATIC SHUTOFF OF EXTERIOR LIGHTS WHEN AVAILABLE DAYLIGHT IS SUFFICIENT.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1	26 09 23	
9.2.	PROVIDE A SHUTOFF FOR LANDSCAPE AND FACADE LIGHTING BETWEEN THE HOURS OF MIDNIGHT AND 5:00 A.M.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1	26 09 26	
9.3.	PROVIDE CONTROL TO REDUCE ILLUMINATED SIGNAGE POWER BY AT LEAST 30% BETWEEN MIDNIGHT AND 5:00 A.M.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.1	26 09 26	
10.	EXTERIOR LIGHTING POWER COMPLIES WITH ASHRAE 90.1-2013 9.4.2 AS MODIFIED BY SB-10.	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.2.	26 53 00	
11.	LIGHTING CONTROLS MANUFACTURERS REPRESENTATIVE TO PROVIDE FUNCTIONAL TESTING AND REPORT IN ACCORDANCE WITH ASHRAE 90.1-2013	OBC SB-10.2017, ASHRAE 90.1-2013, 9.4.3.	26 09 23	



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SEALS

9	ISSUED FOR ADDENDUM E-ADD-01	2024-06-06
8	ISSUED FOR TENDER	2024-05-01
7	ISSUED FOR TENDER	2024-05-01
6	ISSUED FOR TENDER REVIEW	2024-03-08
5	ISSUED FOR PERMIT	2024-01-24
4	ISSUED FOR 99% CD	2024-01-19
3	ELECTRA COORDINATION	2023-12-18
2	ISSUED FOR DESIGN DEVELOPMENT	2023-10-06
1	ELECTRA SERVICE REQUEST	2023-08-11

NO.	ISSUES/REVISIONS	DATE
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DRAWING TITLE:	
ELECTRICAL SITE PLAN	

ISSUE DATE:	2024-06-06
DRAWN BY: MS	CHECKED BY: CB
PROJECT NO.: CM-22-281	SCALE: 1 : 150
DRAWING NO.:	REVISION:

E-002 9



KEYNOTE LEGEND	
Key Value	Keynote Text
E1	PROVIDE ONE DATA DROP TO WIRELESS ACCESS POINT (WAP) MODEL C8130. MOUNT WAP DIRECTLY ON CEILING (DRYWALL OR DROP CEILING, AS NOTED ON RFP).
E2	PROVIDE ONE DATA DROP TO WAP MODEL C8120. MOUNT WAP ON WALL APPROXIMATELY 9'10" TO 11' AFF.
P2	TWO TRANSFORMERS STACKED ONE ON TOP OF THE OTHER, COMPLETE WITH ENGINEERED STRUCTURAL CHANNEL SUPPORT. CONTRACTOR TO HIRE STRUCTURAL ENGINEER TO PROVIDE SEALED DETAIL DURING SUBMITTAL REVIEW PHASE.
P3	CONFIRM EXACT LOCATION OF DEVICE WITH THE OWNER PRIOR TO ROUGH-IN. PROVIDE LAMACOID NAMEPLATE INDICATING FUNCTION OF THE BUTTON.
P4	PROVIDE AUDIBLE ALARM FOR NOTIFICATION VIA PA SYSTEM TO THE IN-STATION STAFF. SEQUENCE OF OPERATION INITIATE AUDIBLE ALARM WHEN ENTRY IS MADE INTO THE BUILDING. DO NOT INITIATE AUDIBLE ALARM WHEN AN EXIT IS MADE.
P6	CONTRACTOR TO REVIEW FOUR FOLD DOOR SHOP DRAWINGS AND CONFIRM CONDUIT REQUIREMENTS FOR DOOR STATUS. WHETHER PROVIDED BY DOOR CONTACTS SENSOR ON THE DOOR, OR BY STATUS CONTACT IN THE CONTROL PANEL FOR EACH RESPECTIVE DOOR. CONTRACTOR TO INCLUDE FOR CONDUIT ROUGH-IN BASED ON EITHER SCENARIO.
P7	FOR TV IN DAY ROOM, PROVIDE LEGRAND EFS84 4-GANG WALL BOX TO CONSOLIDATE POWER AND DATA BEHIND TV. PROVIDE DUPLEX RECEPTACLE AND AV PASS THRU BELOW TV SIMILAR TO DETAIL FOR TV AND DINING ROOM.
P8	ALTERNATIVE PRICE NO.1: CREDIT TO DELETE IN-FLLOOR RADIANT HEATING SYSTEM, DELETE BREAKERS, FEEDERS AND LOCAL DISCONNECTS FOR THE FOLLOWING EQUIPMENT: RFH-1, RFH-2, B-1, P-2 and P-3.
P9	ALTERNATIVE PRICE NO.2: DELETE 4-FOLD DOOR, AND IN LIEU, ADD OVERHEAD SECTIONAL DOOR. FOR POWER, DELETE 15A/3P CIRCUIT AND ADD 20A/2P CIRCUIT (BREAKER, FEEDER AND LOCAL DISCONNECT) TO SUIT 1HP, 208V/1PH OHLD.


GENERAL SHEET NOTES

1. IN APPARATUS BAY, PROVIDE WEATHERPROOF WHILE IN USE COVER FOR ALL RECEPTACLES.



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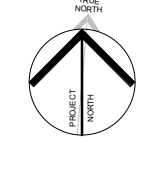
SEALS

9	ISSUED FOR ADDENDUM E-ADD-01	2024-06-06
8	ISSUED FOR TENDER	2024-05-01
7	ISSUED FOR TENDER	2024-05-01
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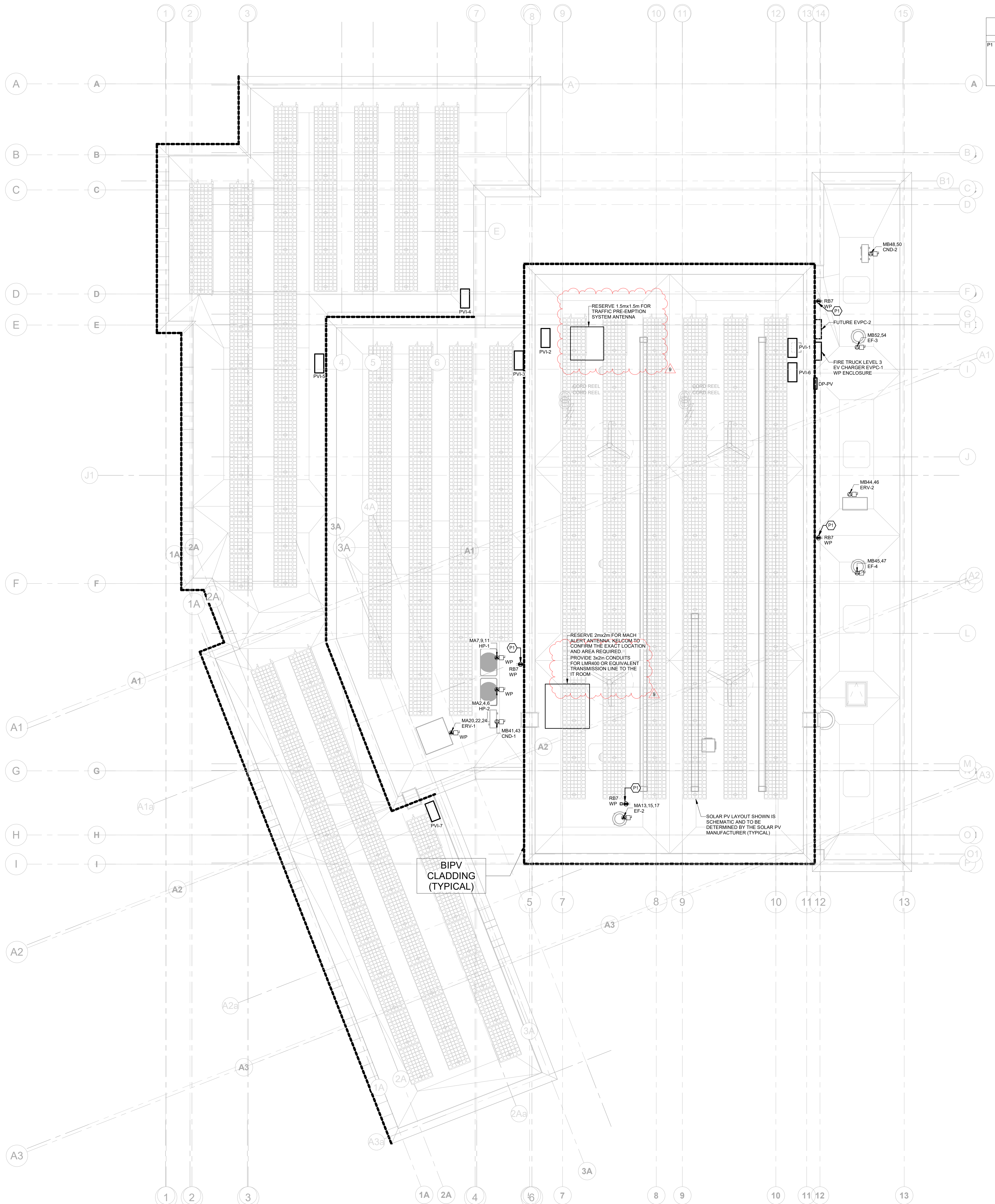
NO.	ISSUES/REVISIONS	DATE
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DRAWING TITLE:

**POWER AND SYSTEMS
PLAN**



ISSUE DATE:	2024-06-06
DRAWN BY: MS	CHECKED BY: CB
PROJECT NO.: CM-22-281	SCALE: As Indicated
DRAWING NO.:	REVISION:



KEYNOTE LEGEND		
Key Value	Keynote Text	
P1	PROVIDE WP GF1 5-20R @ 750mm (30") ABOVE FINISHED ROOF LEVEL ON WET LOCATION COVER PLATE FOR POWER TO ROOF MOUNTED HVAC EQUIPMENT. TYPICAL LOCATE WITHIN 750mm (25 FEET) OF NEW HVAC EQUIPMENT. AND AT LEAST 200mm (8 IN) AWAY FROM ROOF LINE. COVER PLATE TO BE MARKED 'EXTRA DUTY'. REFER TO 2021 OESC RULES 2-316, 2-708, AND 26-710, AND OESC BULLETIN 26-27-7, OR LATEST EDITION LABEL RECEPTACLE WITH PHENOLIC (LAMACOD) NAMEPLATE WITH PANELBOARD ID, CIRCUIT NUMBER, AND PANELBOARD LOCATION.	



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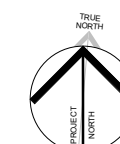
SEALS

9	ISSUED FOR ADDENDUM E-ADD-01	2024-06-06
8	ISSUED FOR TENDER	2024-05-01
7	ISSUED FOR TENDER	2024-05-01
6	ISSUED FOR TENDER REVIEW	2024-03-08
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4	ISSUED FOR 99% CD	2024-01-19
3	ELECTRA COORDINATION	2023-12-18
2	ISSUED FOR DESIGN DEVELOPMENT	2023-10-06
1	ELECTRA SERVICE REQUEST	2023-08-11

NO.	ISSUES/REVISIONS	DATE
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DRAWING TITLE:

ROOF POWER AND
SYSTEMS PLAN



ISSUE DATE: 2024-06-06

DRAWN BY: MS CHECKED BY: CB

PROJECT NO.: CM-22-281 SCALE: 1:75

DRAWING NO.: REVISION:

E-102 9



KEYNOTE LEGEND	
Key Value	Keynote Text
L1	CONTROLLED RECEPTACLES IN DAYROOM LOUNGE TO MEET D6C 58-10/ASHRAE 90-1-2013 REQUIREMENTS. TYPICAL RECEPTACLES ARE INTERLOCKED WITH LIGHTING OCCUPANCY SENSORS.
L4	LUMINAIRE TYPE S1A - OCCUPANCY MODE ON SENSOR, AND OFF WHEN TYPE D6D IS ON VIA MANUAL CONTROL. BOTH OFF AFTER 20 MINUTES OF NO OCCUPANCY DETECTED.
L5	PROVIDE TWO DAYLIGHT HARVESTING ZONES FOR APPARATUS BAY LUMINAIRES, NORTH AND SOUTH ROW OF LUMINAIRES RESPECTIVELY.
L6	LUMINAIRES MOUNTED ON NON-FULL HEIGHT PARTITIONS.

- GENERAL SHEET NOTES**
- ALL THE EMERGENCY SINGLE AND DOUBLE HEADS WILL BE FED FROM THE NEAREST BATTERY UNIT.
 - PROVIDE 120 VOLT CIRCUIT TO ALL EXIT SIGNS. FEED FROM SAME CIRCUIT AS THAT WHICH FEEDS THE NEAREST BATTERY UNIT.
 - IN APPARATUS BAY, PROVIDE WEATHERPROOF WHILE IN USE COVER FOR ALL LIGHTING CONTROL SWITCHES.

1 LIGHTING PLAN
SCALE: 1 : 75

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10	ISSUED FOR ADDENDUM E-ADD-01	2024-06-06
9	ISSUED FOR TENDER	2024-05-01
8	ISSUED FOR TENDER	2024-05-01
7	RESPONSE TO PERMIT COMMENTS	2024-03-26
6	ISSUED FOR TENDER REVIEW	2024-03-08
5	ISSUED FOR PERMIT	2024-01-24
4	ISSUED FOR 99% CD	2024-01-19
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2	ISSUED FOR DESIGN DEVELOPMENT	2023-10-06
1	ELECTRA SERVICE REQUEST	2023-08-11

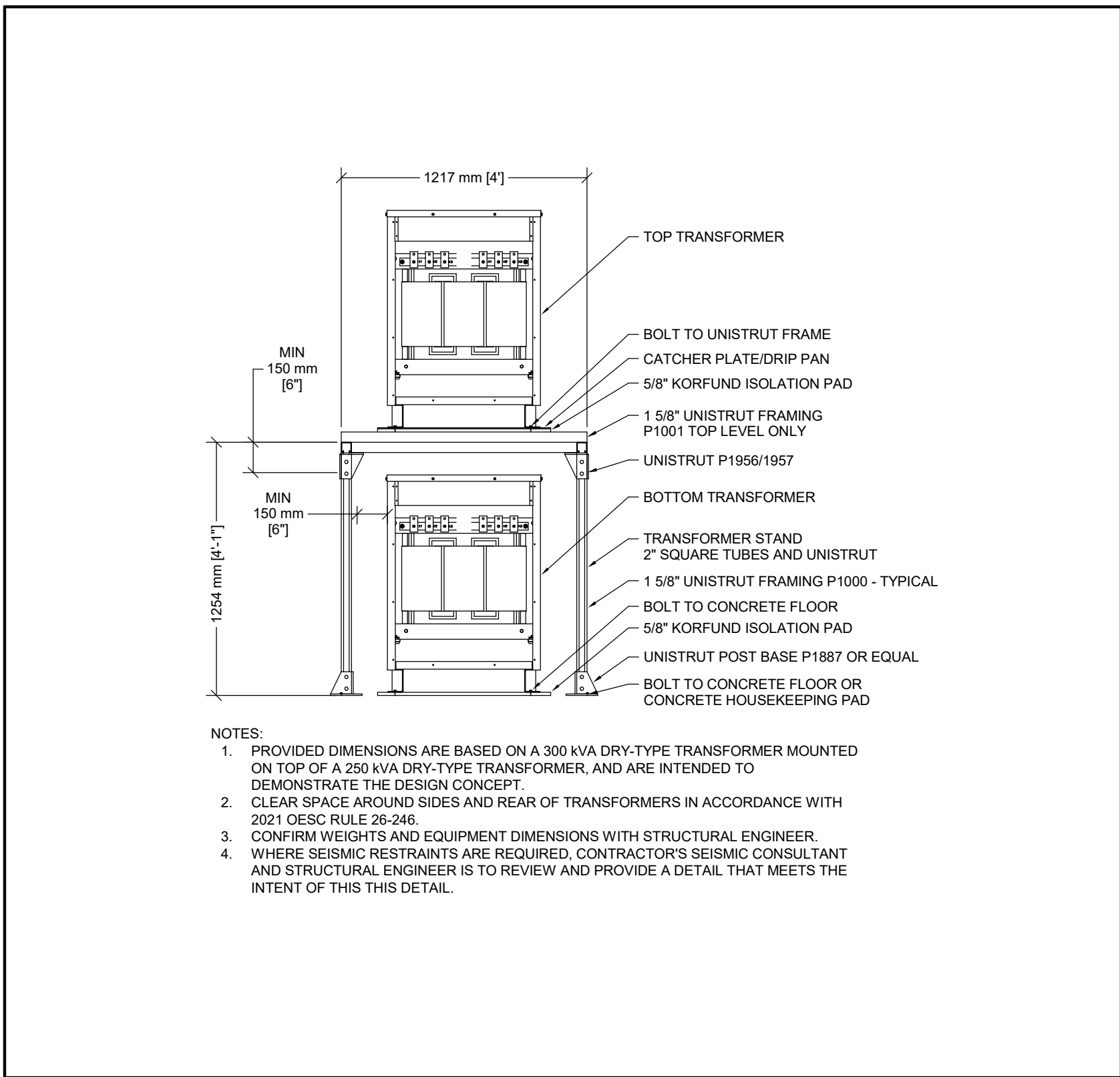
DRAWING TITLE: LIGHTING PLAN

ISSUE DATE: 2024-06-06

DRAWN BY: MS CHECKED BY: CB

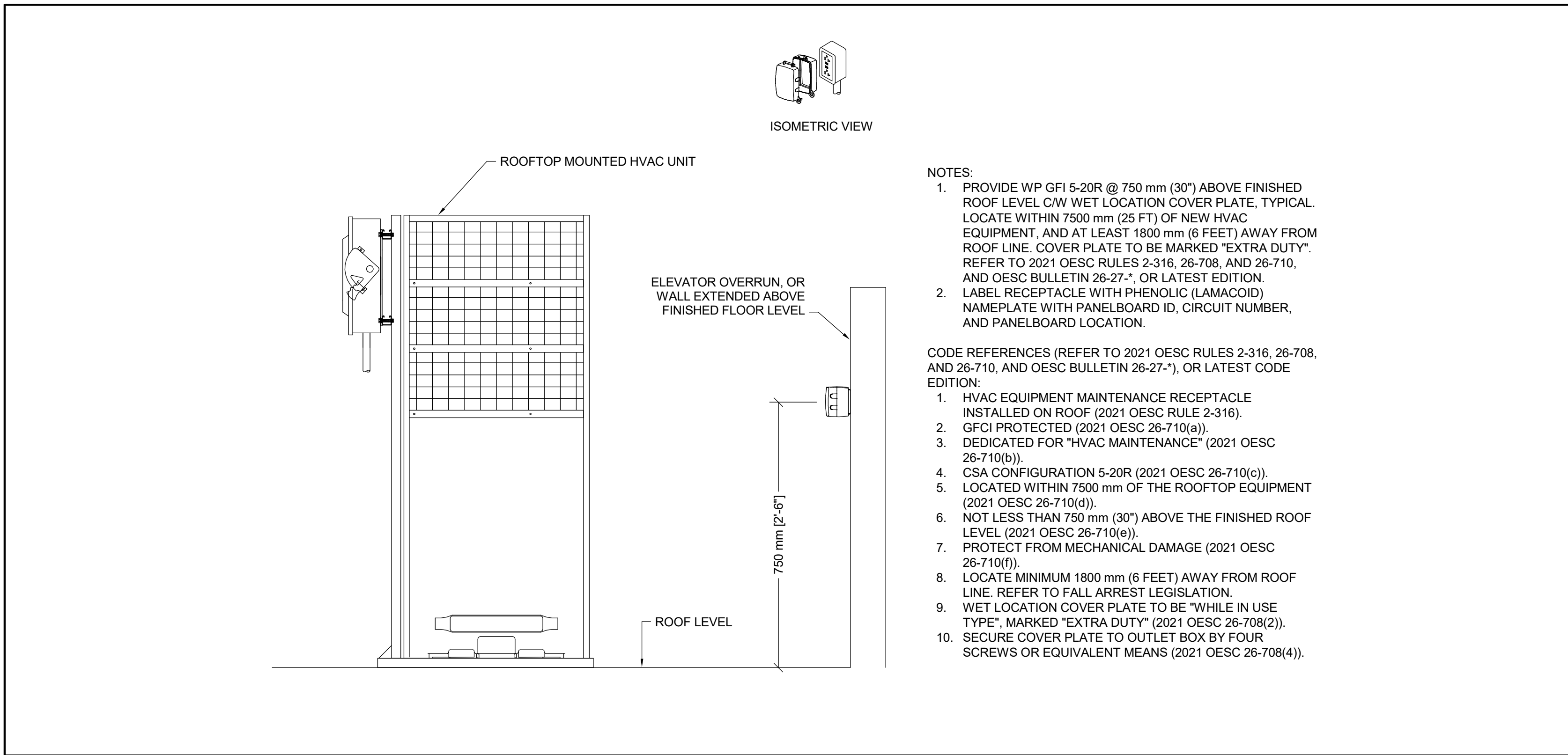
PROJECT NO.: CM-22-281 SCALE: As Indicated

DRAWING NO.: E-111 REVISION: 10



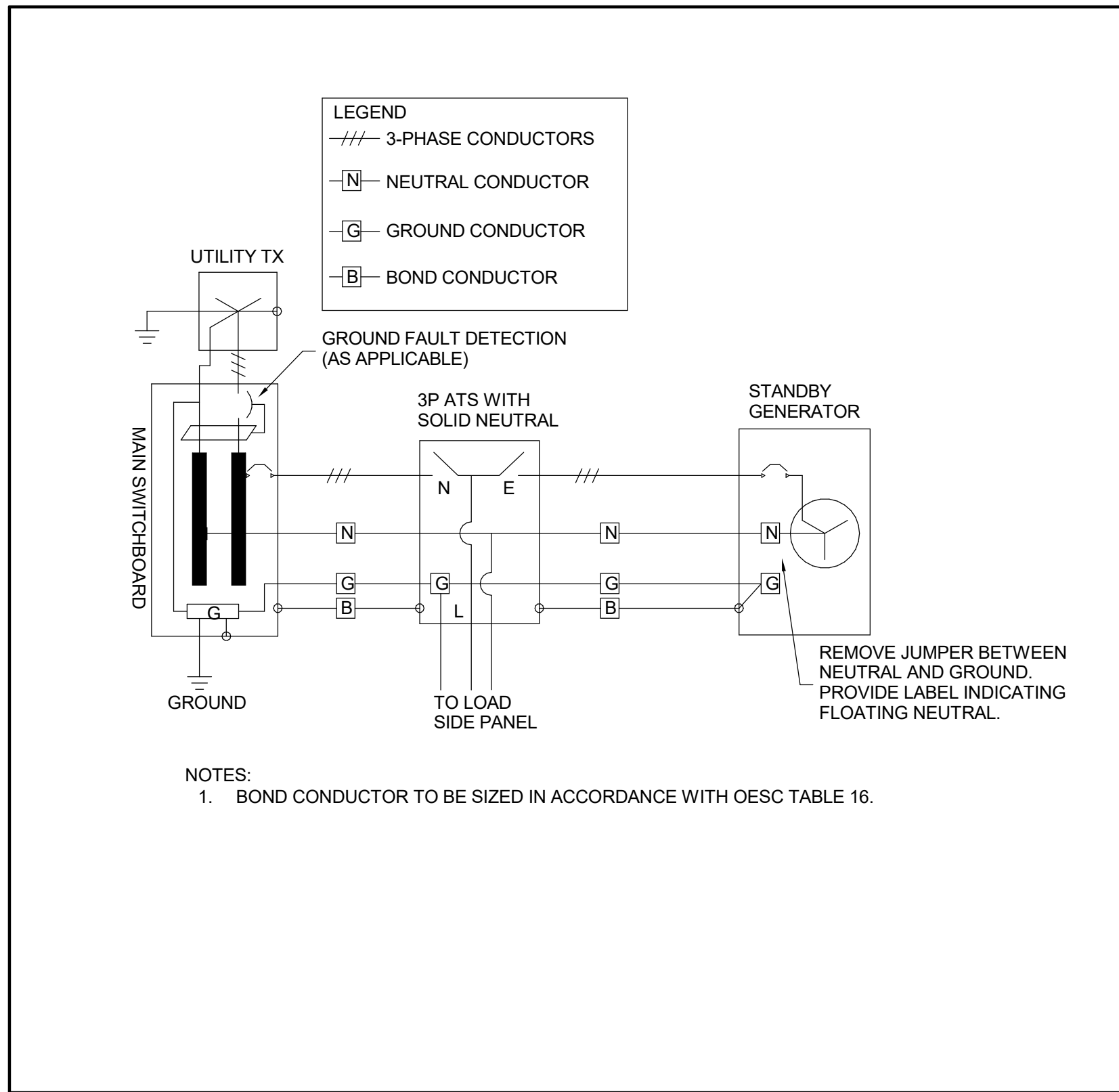
TRANSFORMER STAND

SCALE: N.T.S



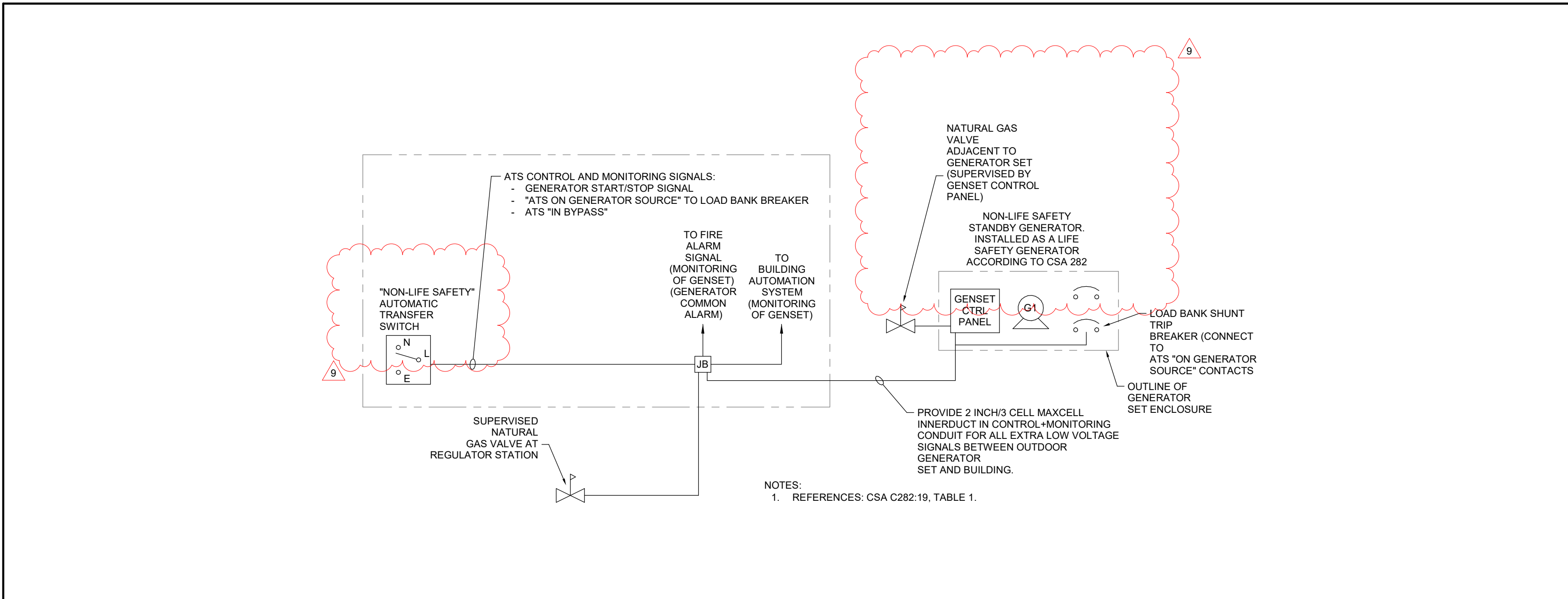
MAINTENANCE RECEPTACLE FOR ROOF MOUNTED HVAC EQUIPMENT

SCALE: N.T.S



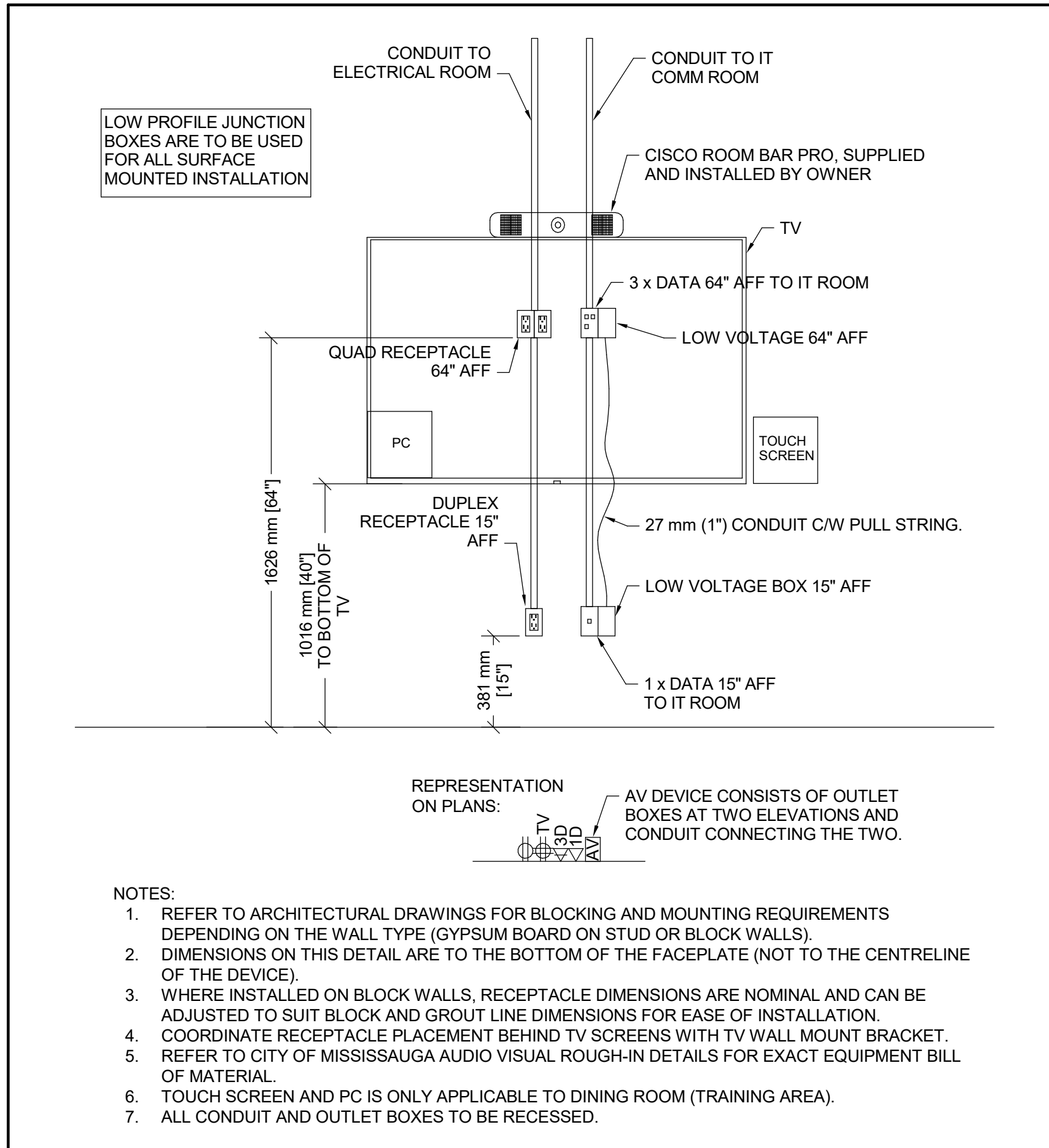
3-POLE TRANSFER SWITCH GENERATOR SCHEMATIC

SCALE: N.T.S



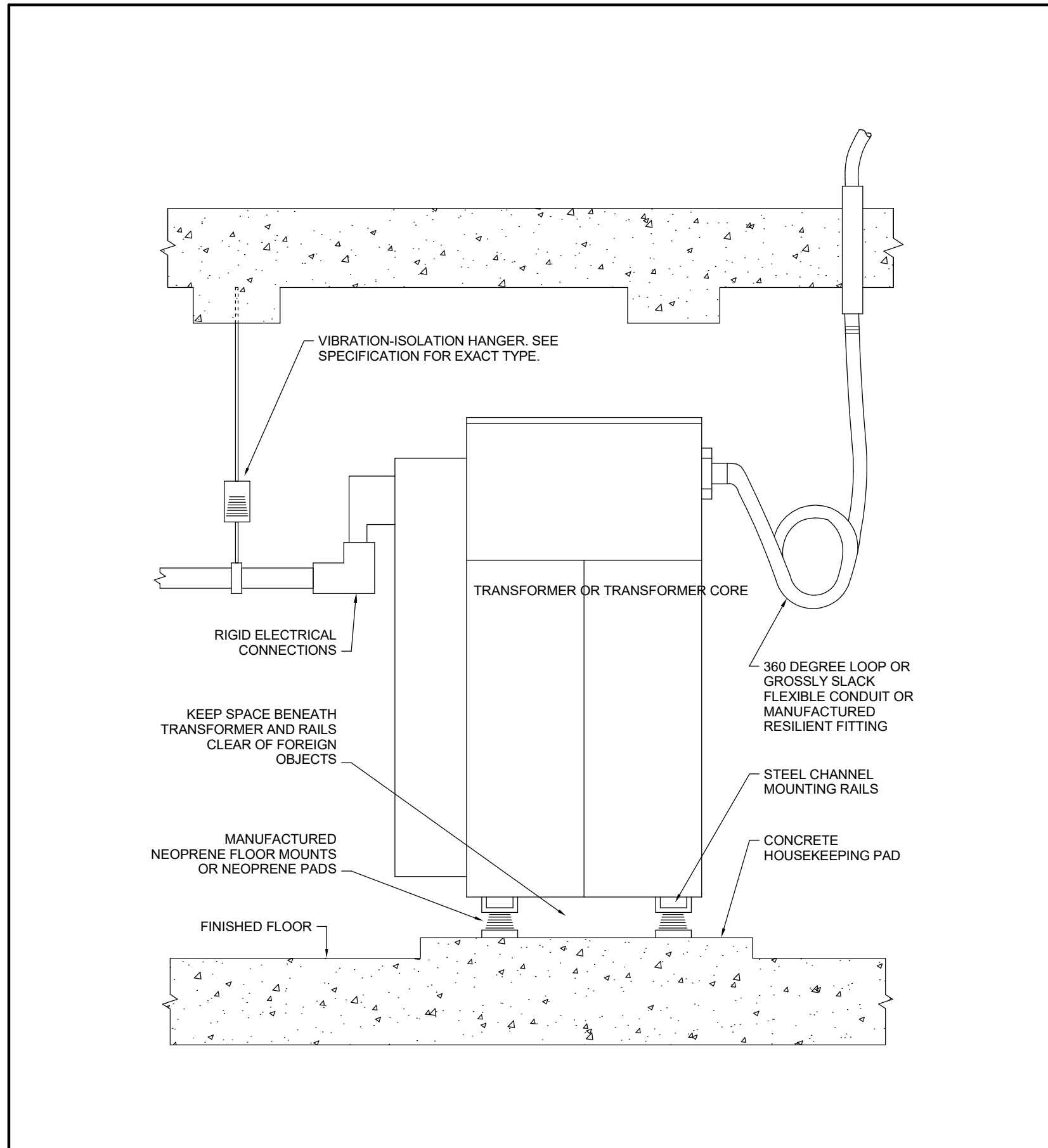
EMERGENCY POWER CONTROL WIRING INTERCONNECTIONS

SCALE: N.T.S



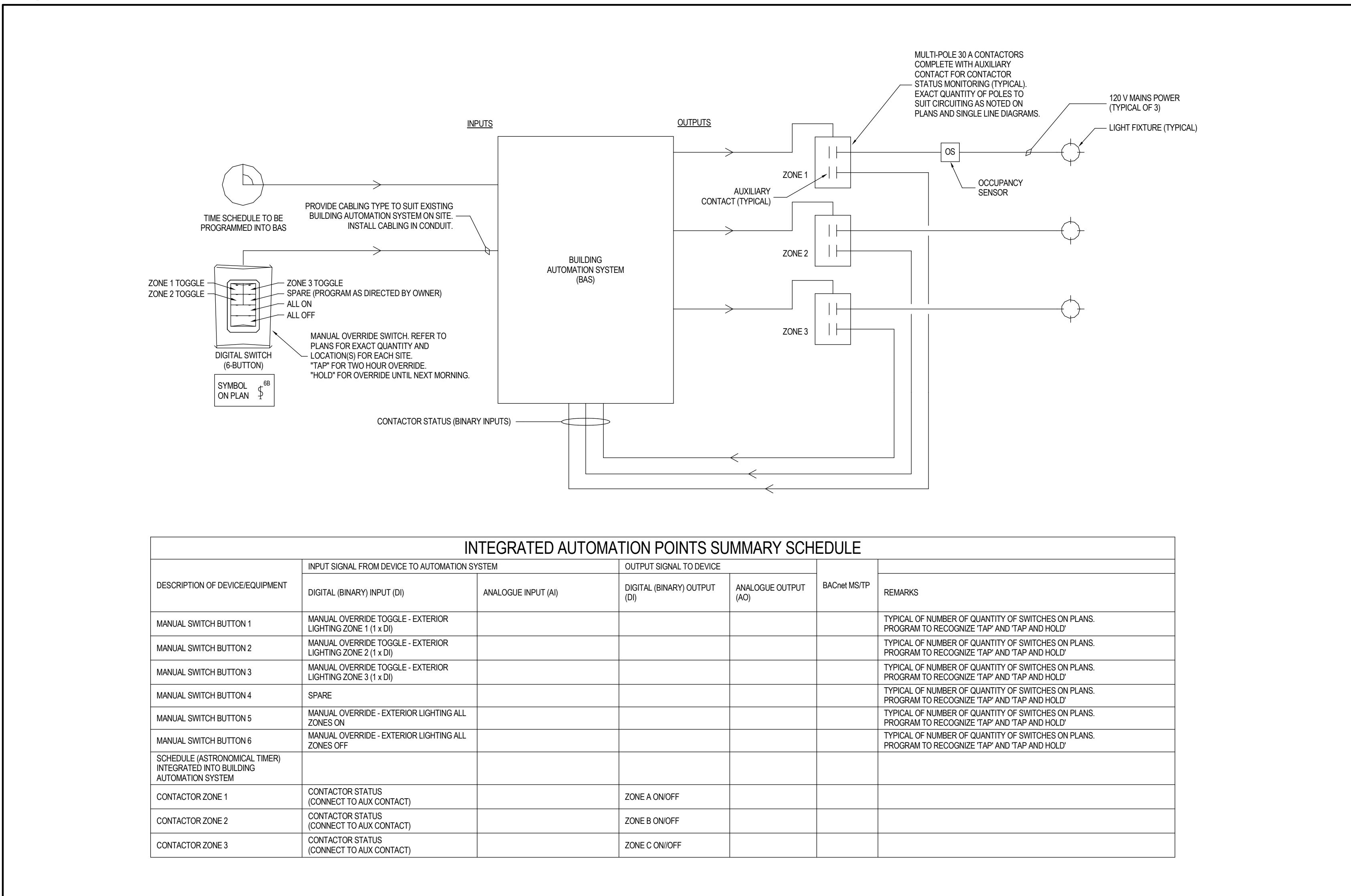
AV ELEVATION AT TV'S

SCALE: N.T.S



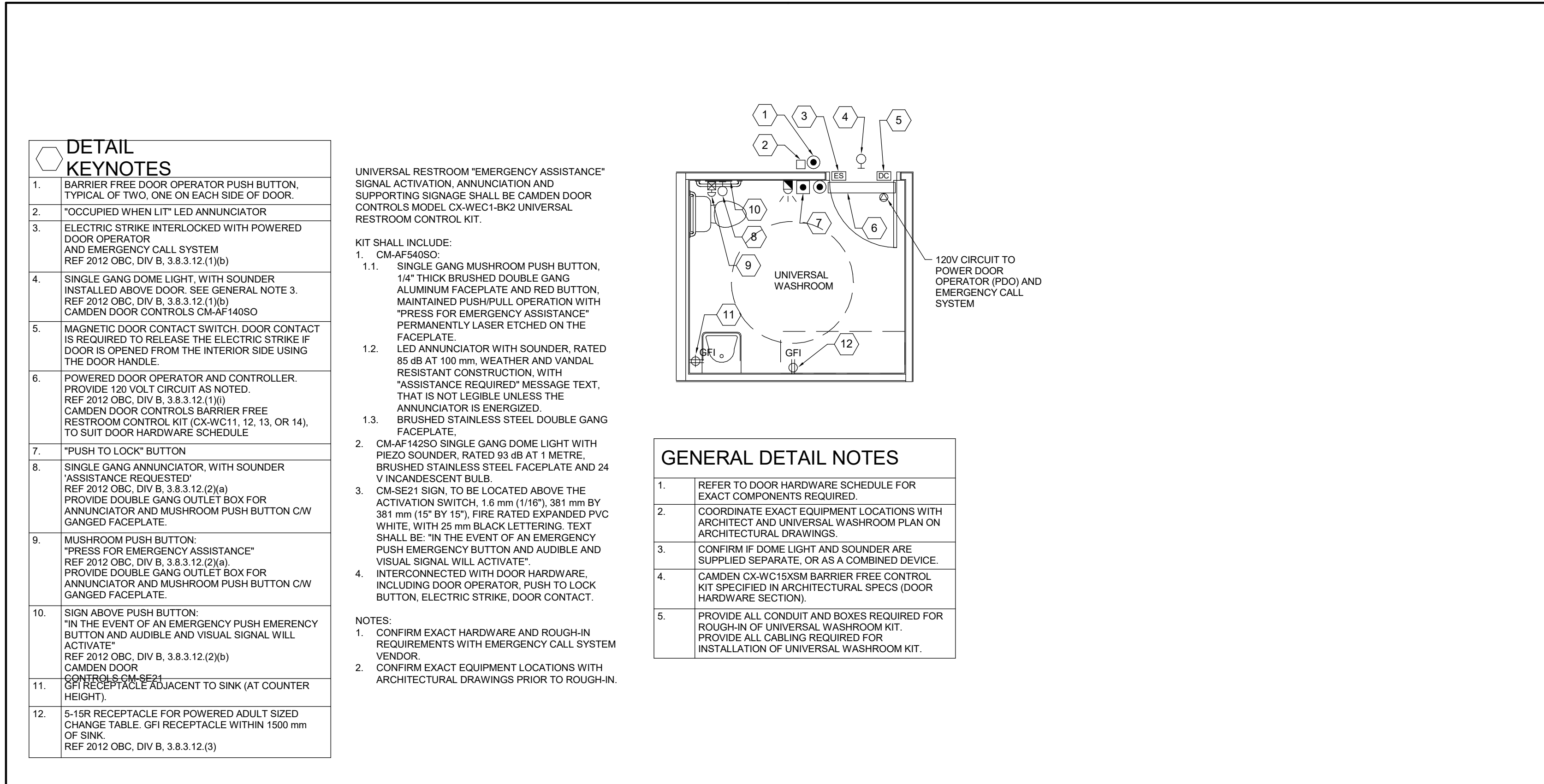
VIBRATION ISOLATION OF TRANSFORMERS

SCALE: N.T.S



INTEGRATED AUTOMATION CONTROL OF EXTERIOR LIGHTING

SCALE: N.T.S



UNIVERSAL WASHROOM EMERGENCY CALL SYSTEM

SCALE: N.T.S



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SEALS

9	ISSUED FOR ADDENDUM E-ADD-01	2024-06-06
8	ISSUED FOR TENDER	2024-05-01
7	ISSUED FOR TENDER	2024-05-01
6	ISSUED FOR TENDER REVIEW	2024-03-08
5	ISSUED FOR PERMIT	2024-01-24
4	ISSUED FOR 99% CD	2024-01-19
3	ELECTRA COORDINATION	2023-12-18
2	ISSUED FOR DESIGN DEVELOPMENT	2023-10-06
1	ELECTRA SERVICE REQUEST	2023-08-11

NO. ISSUES/REVISIONS DATE

DRAWING TITLE

ELECTRICAL DETAILS III

ISSUE DATE: 2024-06-06

DRAWN BY: Author CHECKED BY: checker

PROJECT NO.: CM-22-281 SCALE: As Indicated

DRAWING NO.: REVISION:

E-503

9

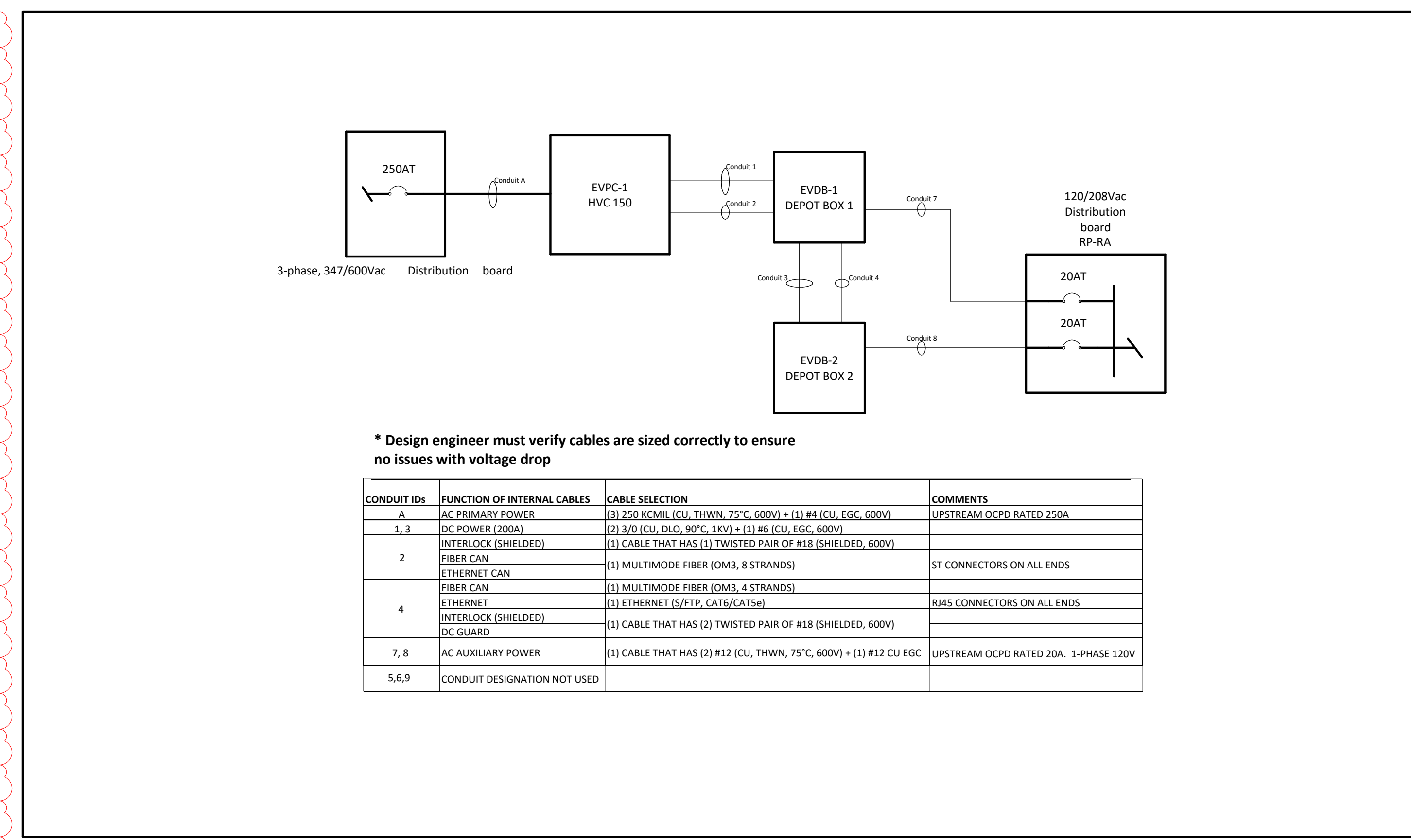
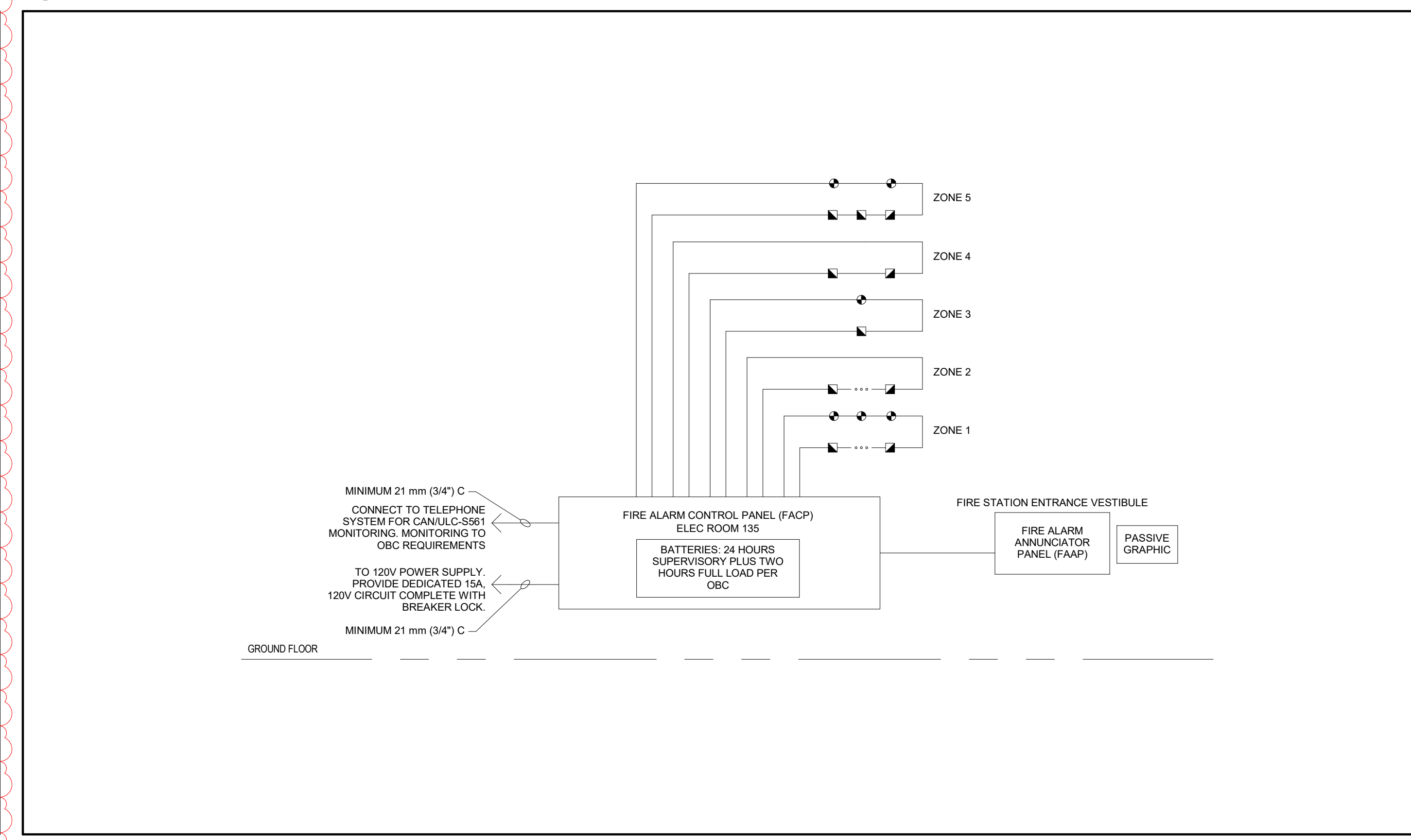
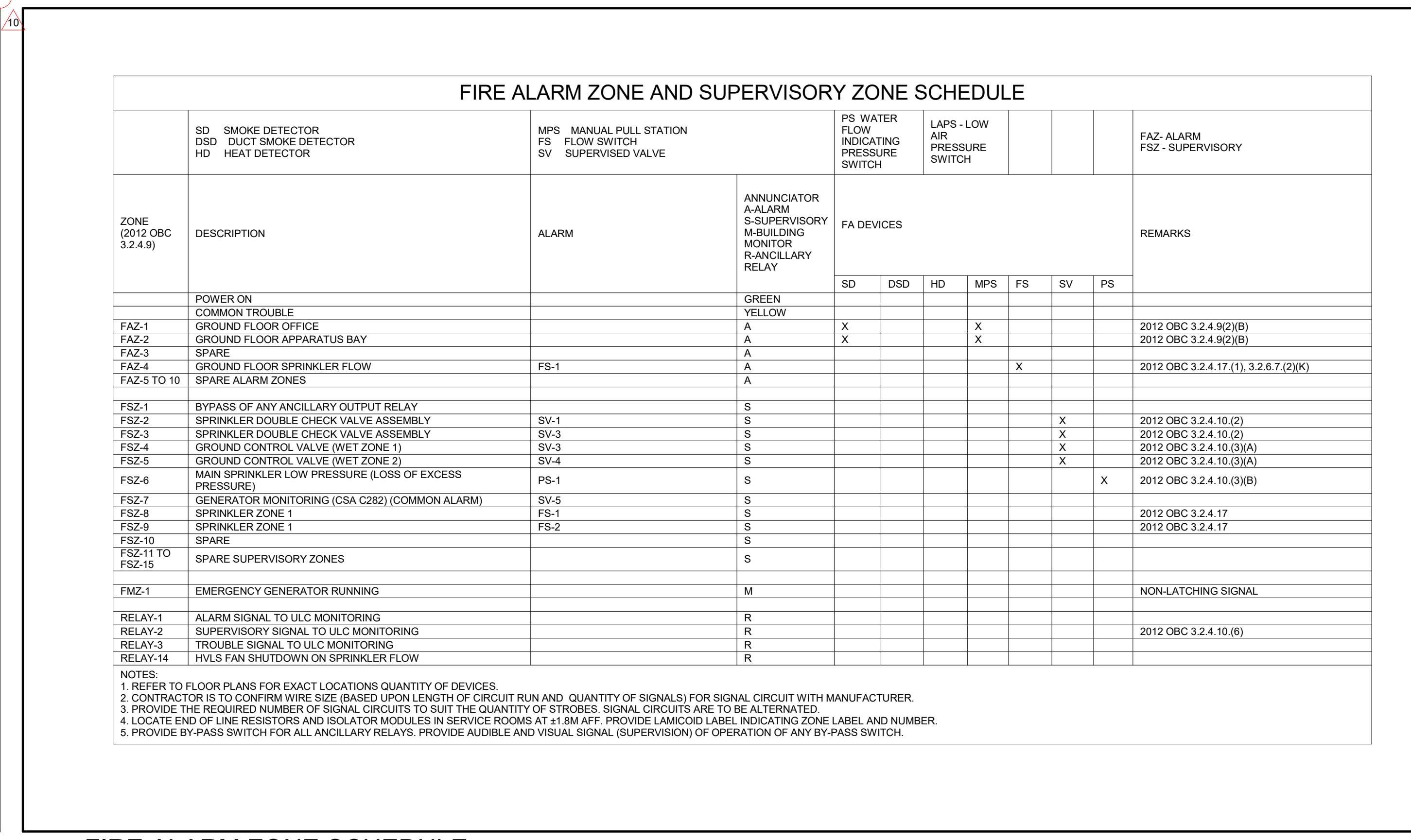


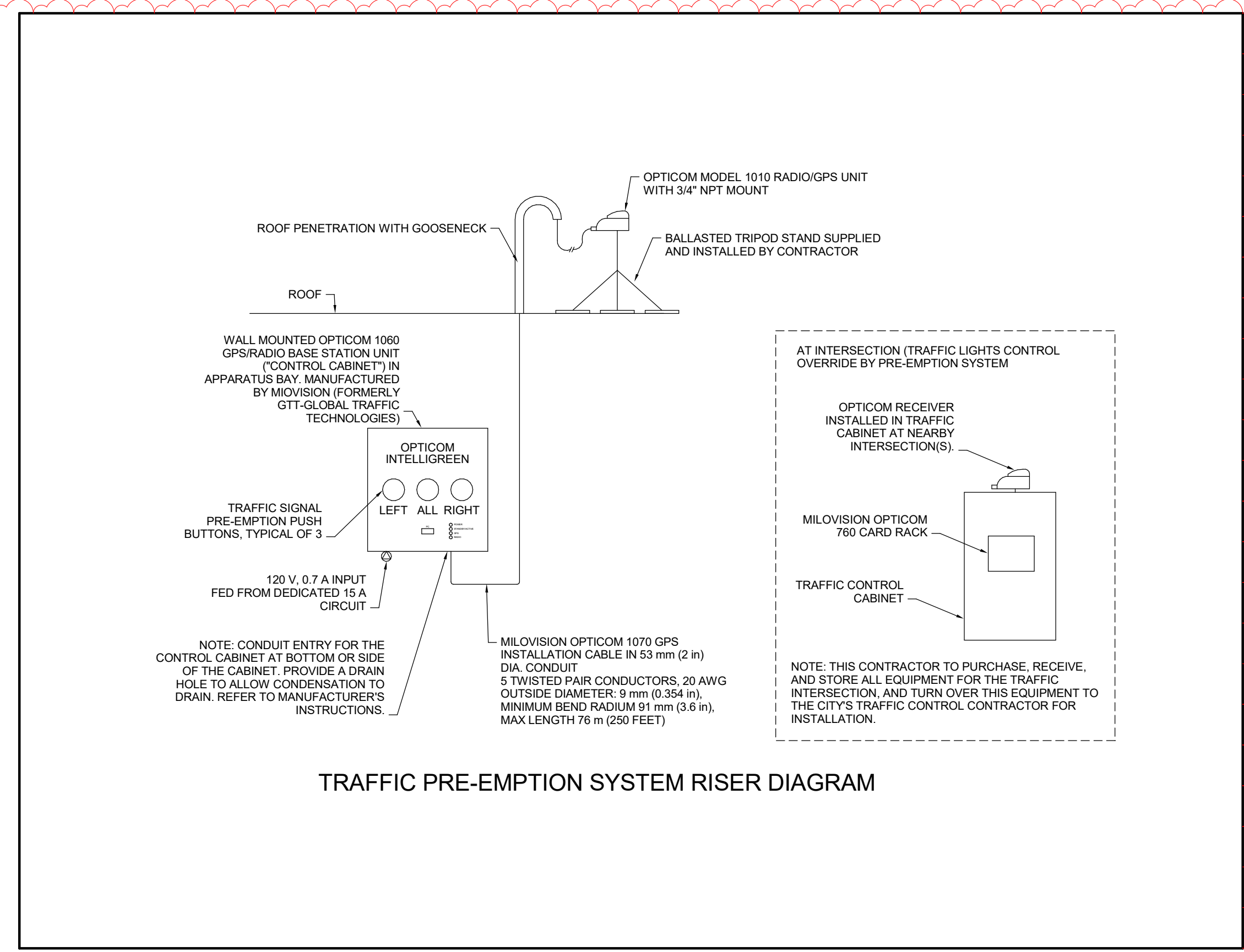
ABB HVC DEPOT BOX
SCALE: N.T.S.



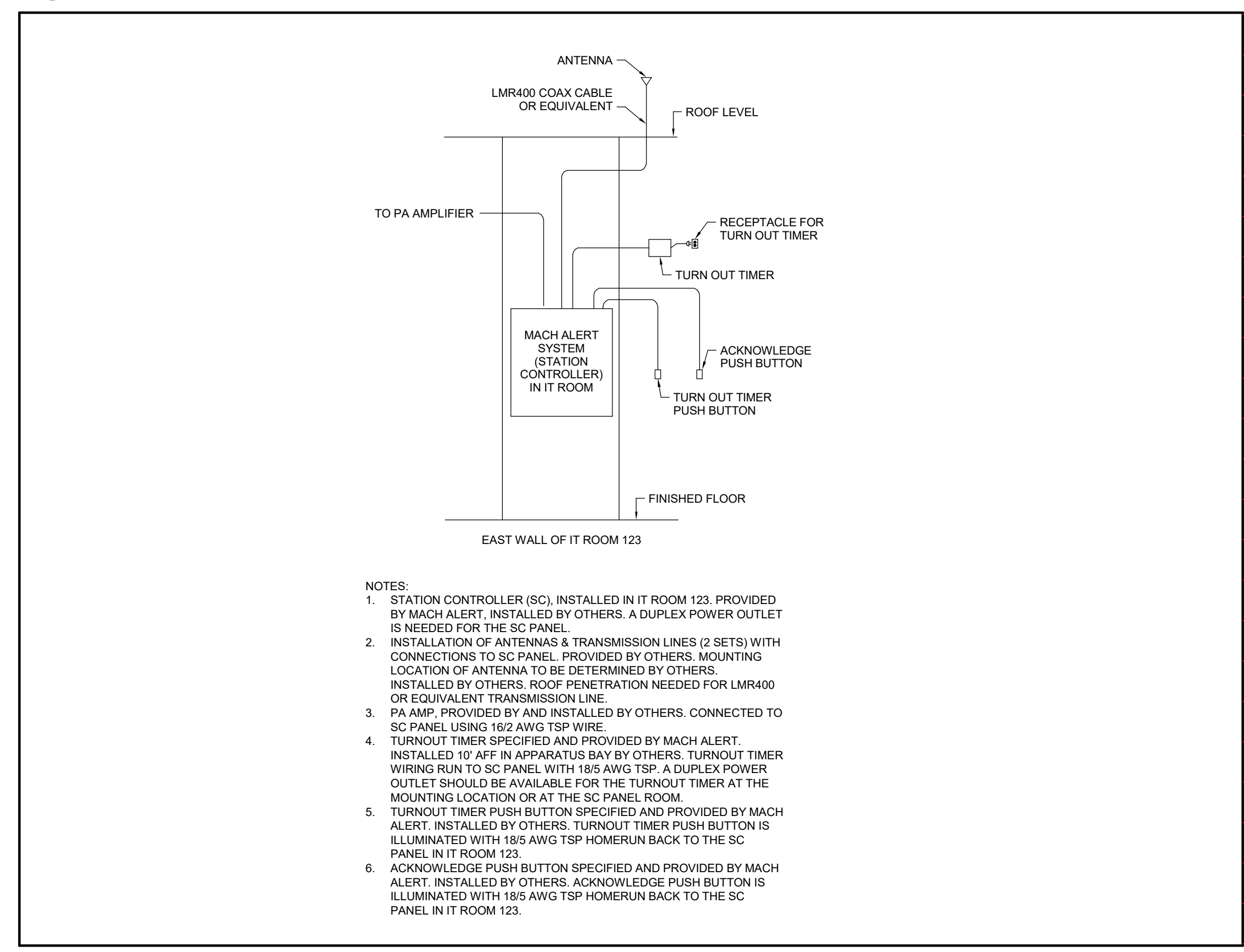
FIRE ALARM RISER
SCALE: N.T.S.



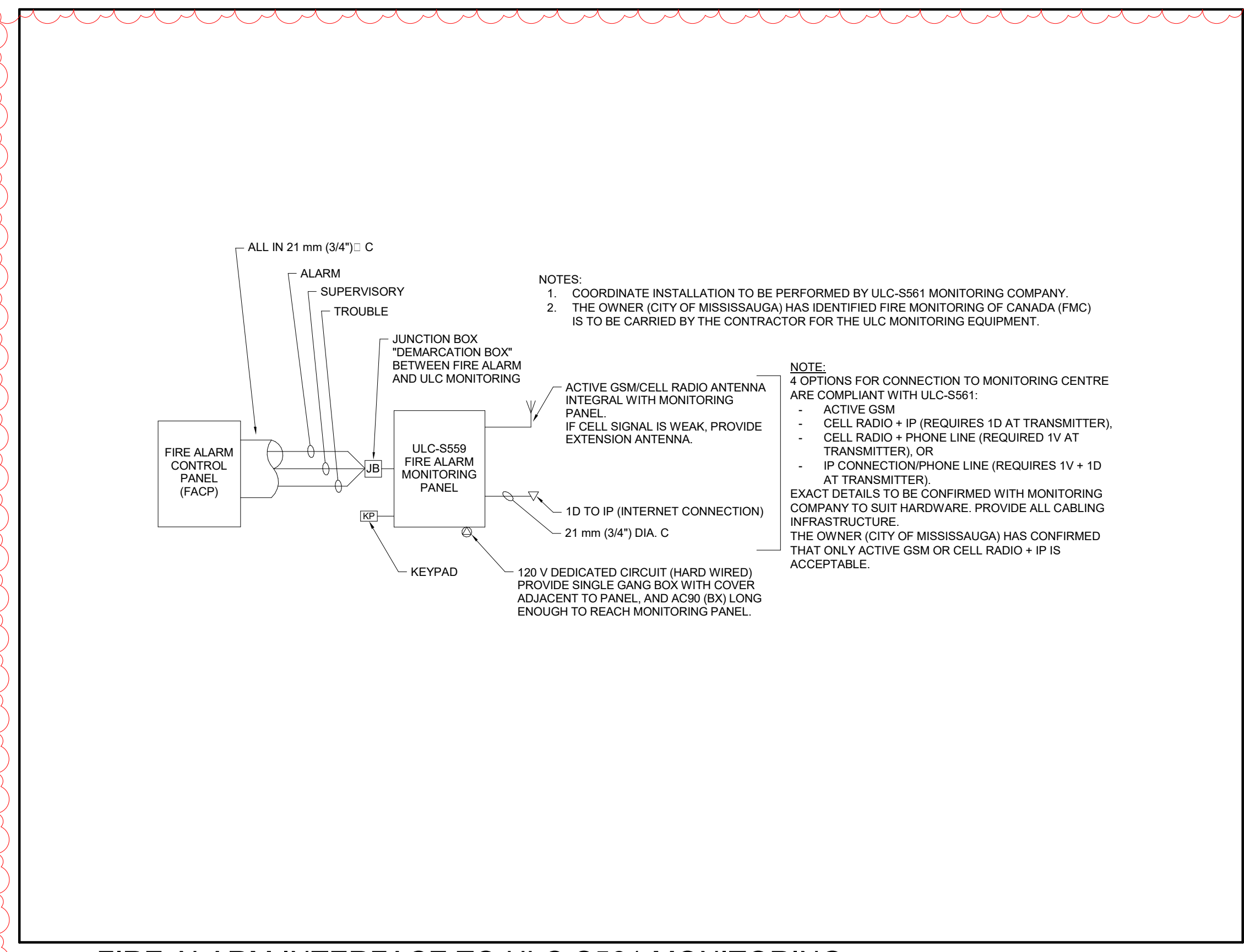
FIRE ALARM ZONE SCHEDULE
SCALE: N.T.S.



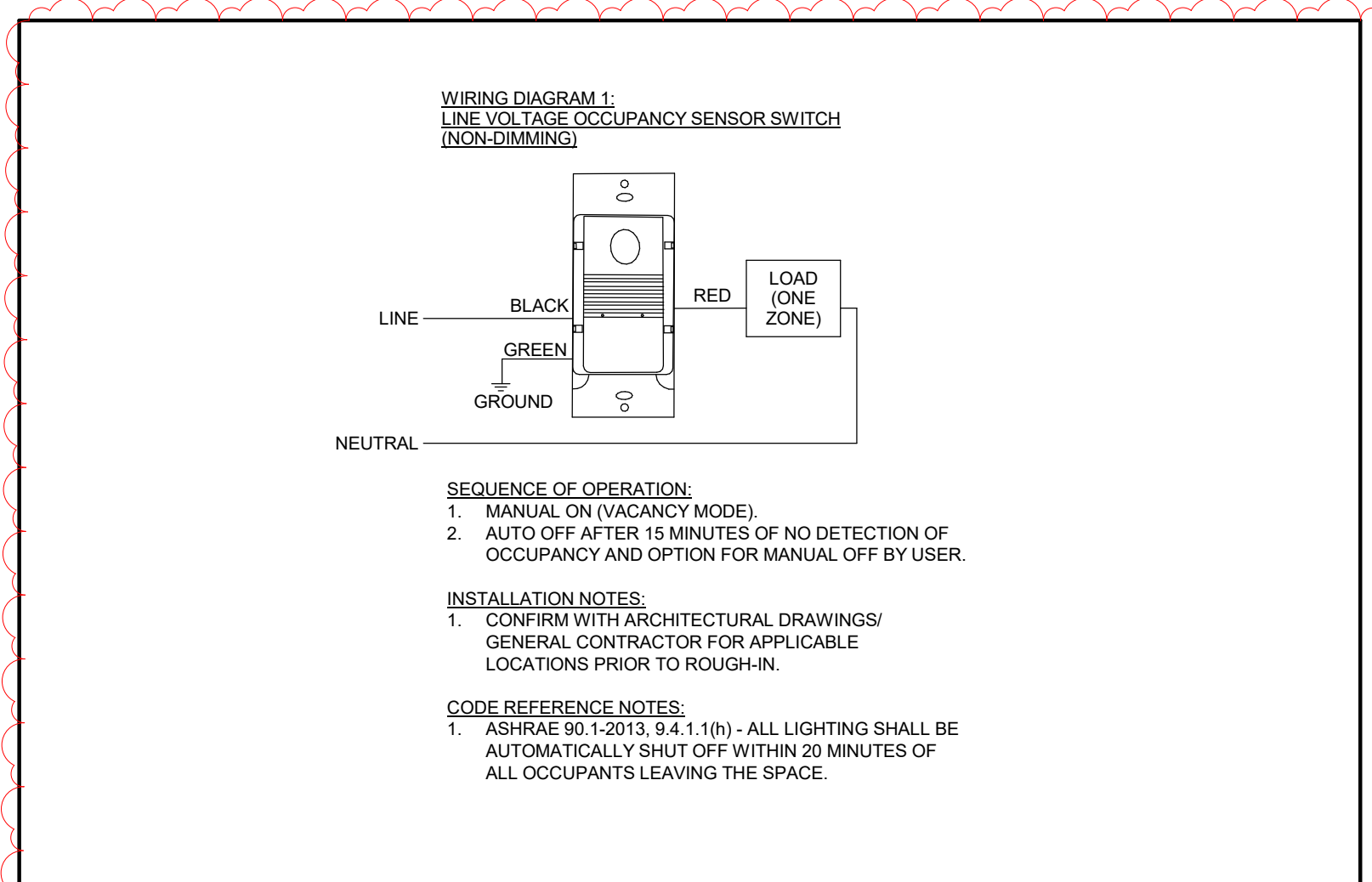
TRAFFIC PRE-EMPTION SYSTEM
SCALE: N.T.S.



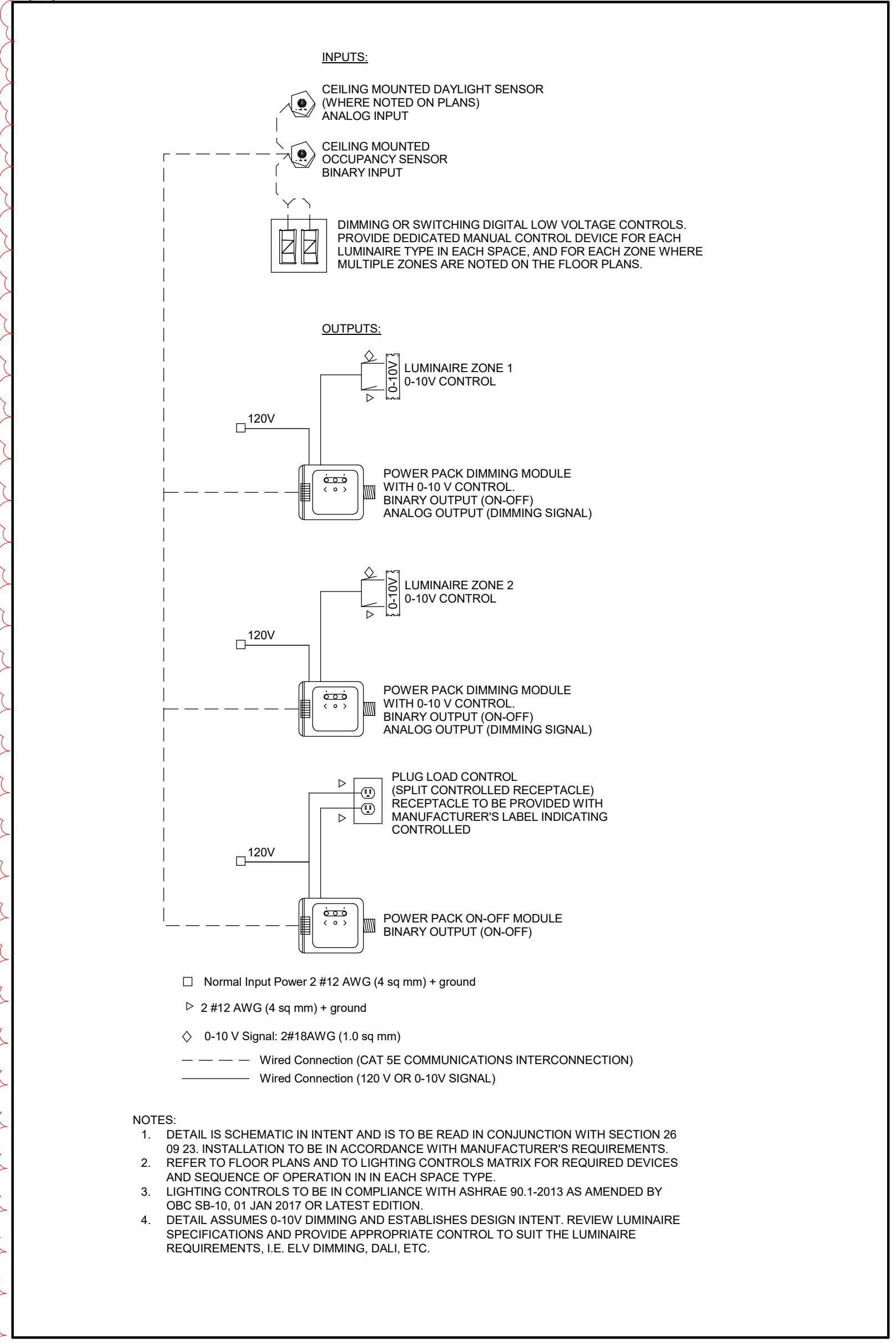
MACH ALERT SYSTEM RISER
SCALE: N.T.S.



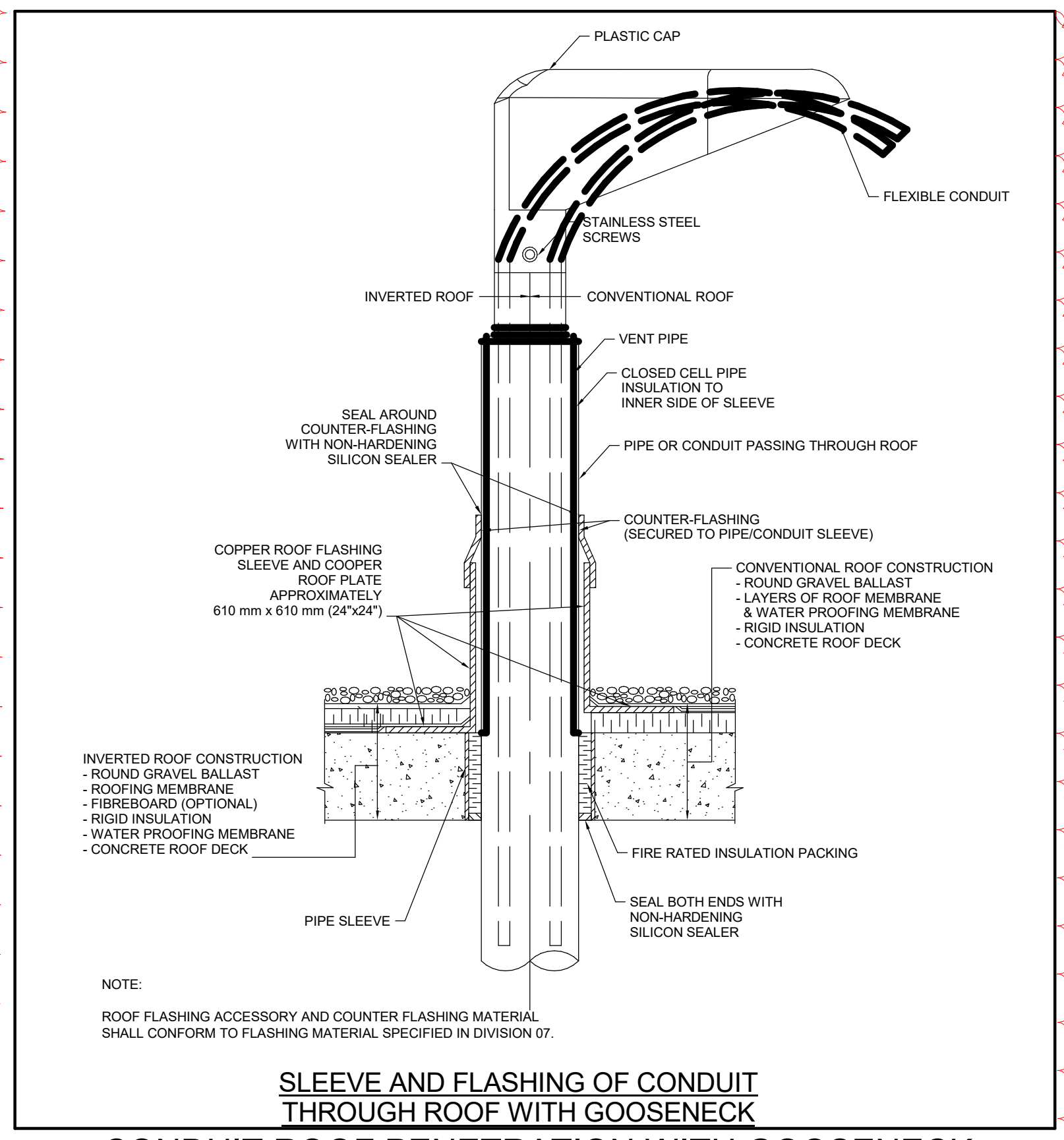
FIRE ALARM INTERFACE TO ULC-S561 MONITORING
SCALE: N.T.S.



LINE VOLTAGE OCC SENSOR SWITCH
SCALE: N.T.S.



STANDALONE DECENTRALIZED LIGHTING CONTROLS
SCALE: N.T.S.



CONDUIT ROOF PENETRATION WITH GOOSENECK
SCALE: N.T.S.

11/27/2024 14:00:00 11/27/2024 14:00:00

Branch Panel: DP-MA															
Location: ELECTRICAL ROOM 135					Volts: 347/600V					A.I.C. Rating:					
Supply From:					Phases: 3					Mains Type:					
Mounting:					Wires: 4					Mains Rating:					
Enclosure:										MCB Rating:					
Notes:															
CKT	Circuit Description	QTY	Trip	Poles	A	B	C	A	B	C	Poles	Trip	QTY	Circuit Description	CKT
MA1	B-1	1	20 A	3	167 VA	167 VA		5000 VA	5000 VA		3	20 A	1	HP-2	MA2
MA3															MA4
MA5							167 VA			5000 VA					
MA7	HP-1	1	20 A	3	5000 VA			1667 VA	1667 VA		3	20 A	1	EF-1	MA8
MA9						5000 VA									MA10
MA11							5000 VA		1667 VA	1667 VA					MA12
MA13	EF-2	1	20 A	3	500 VA			167 VA	167 VA		3	20 A	1	ENGINE EXHAUST CONTROL PANEL (PCI)	MA14
MA15						500 VA									MA16
MA17							500 VA			167 VA					167 VA
MA19	AIR COMPRESSOR	1	20 A	3	6667 VA			6167 VA	6167 VA		3	20 A	1	ERV-1	MA20
MA21						6667 VA			6167 VA	6167 VA					MA22
MA23							6667 VA								MA24
MA25	SPARE	--	15 A	1	0 VA			--	--		1	--	--	SPACE	MA26
MA27	SPARE	--	15 A	1		0 VA			--	--	1	--	--	SPACE	MA28
MA29	SPARE	--	15 A	1			0 VA		--	--	1	--	--	SPACE	MA30
MA31	SPARE	--	20 A	1	0 VA			--	--		1	--	--	SPACE	MA32
MA33	SPARE	--	20 A	1		0 VA			--	--	1	--	--	SPACE	MA34
MA35															MA36
MA37															MA38
MA39															MA40
MA41															MA42
Total Load:					25333 VA		25333 VA		25333 VA						
Total Amps:					73 A		73 A		73 A						
Legend:															
Load Classification					Connected Load		Demand Factor		Estimated Demand		Panel Totals				
POWER					76000 VA		100.00%		76000 VA						
											Total Conn. Load: 76000 VA				
											Total Est. Demand: 76000 VA				
											Total Conn.: 73 A				
											Total Est. Demand: 73 A				
Notes:															

Branch Panel: RP-RA																
Location: ELECTRICAL ROOM 135					Volts: 120/208 Wye					A.I.C. Rating:						
Supply From:					Phases: 3					Mains Type:						
Mounting:					Wires: 4					Mains Rating:						
Enclosure:										MCB Rating: 1 A						
Notes:																
CKT	Circuit Description	QTY	Trip	Poles	A		B		C		Poles	Trip	QTY	Circuit Description	CKT	
RA1	CORD REEL (GFCI BREAKER)	1	20 A	1	500 VA	167 VA								RP-RB	RA2	
RA3	CORD REEL (GFCI BREAKER)	1	20 A	1			500 VA	167 VA				3	200 A	1		RA4
RA5	BAS PANEL - 2	1	20 A	1					500 VA	167 VA						RA6
RA7	CORD REEL (GFCI BREAKER)	1	20 A	1	500 VA	500 VA						1	20 A	1	CORD REEL (GFCI BREAKER)	RA8
RA9	RECEPTACLE	12	15 A	1			2160 VA	540 VA				1	20 A	3	POWER	RA10
RA11	LAUNDRY DRYER	1	20 A	2	2496 VA	180 VA			2496 VA	720 VA		1	15 A	4	RECEPTACLE	RA12
RA13							167 VA	180 VA				1	20 A	1	GEAR DRYER 1	RA14
RA15												1	20 A	1	GEAR DRYER 2	RA16
RA17	FFD 130B POWER	1	15 A	3					167 VA	180 VA		1	20 A	1	LAUNDRY WASHER	RA18
RA19					167 VA	167 VA										RA20
RA21							167 VA	167 VA				3	15 A	1	FFD 130A POWER	RA22
RA23	FFD 130D POWER	1	15 A	3					167 VA	167 VA						RA24
RA25					167 VA	167 VA										RA26
RA27							833 VA	167 VA				3	15 A	1	FFD 130C POWER	RA28
RA29	WASHER/EXTRACTOR	1	20 A	3					833 VA	167 VA						RA30
RA31					833 VA	--						1	--	--	SPACE	RA32
RA33	RECEPTACLE	6	15 A	1			1080 VA	--				1	--	--	SPACE	RA34
RA35	SPARE	--	15 A	1					0 VA	--		1	--	--	SPACE	RA36
RA37	SPARE	--	15 A	1	0 VA	--						1	--	--	SPACE	RA38
RA39	SPARE	--	15 A	1			0 VA	--				1	--	--	SPACE	RA40
RA41	SPARE	--	20 A	1					0 VA	--		1	--	--	SPACE	RA42
RA43	SPARE	--	20 A	1	0 VA	500 VA						1	15 A	1	TRAFFIC PRE-EMPTION SYSTEM	RA44
RA45	SPARE	--	20 A	1			0 VA									RA46
RA47	RECEPTACLE FOR TURNOUT TIMER	1	15 A	1					180 VA							RA48
RA49																RA50
RA51																RA52
RA53																RA54
RA55																RA56
RA57																RA58
RA59																RA60
Total Load:					6343 VA		6127 VA		5743 VA							
Total Amps:					53 A		52 A		48 A							
Legend:																
Load Classification		Connected Load		Demand Factor		Estimated Demand		Panel Totals								
POWER		18212 VA		100.00%		18212 VA										
								Total Conn. Load: 18212 VA								
								Total Est. Demand: 18212 VA								
								Total Conn.: 51 A								
								Total Est. Demand: 51 A								
Notes:																



MISSISSAUGA

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SEALS

9

ISSUED FOR ADDENDUM E-ADD-01

2024-06-06

8

ISSUED FOR TENDER

2024-05-01

7

ISSUED FOR TENDER

2024-05-01

6

ISSUED FOR TENDER REVIEW

2024-03-08

5

ISSUED FOR PERMIT

2024-01-24

4

ISSUED FOR 99% CD

2024-01-19

3

ELECTRA COORDINATION

2023-12-18

2

ISSUED FOR DESIGN DEVELOPMENT

2023-10-06

1

ELECTRA SERVICE REQUEST

2023-08-11

NO.

ISSUES/REVISIONS

DATE

DRAWING TITLE:

ELECTRICAL PANELBOARD
SCHEDULES II



ISSUE DATE:

2024-06-06

DRAWN BY: Author

CHECKED BY: Checker

PROJECT NO.: CM-22-281




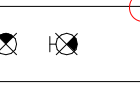

SCALE:

DRAWING NO.: E-603

REVISION: 9

Lighting Controls Matrix																																
Room #	Room Name or Type	ASHRAE 90.1-2013 Space Type	Same as	Controls Philosophy				Local Control...				Occupancy Sensor		Time Schedule		Daylight...		Other		Remarks												
				Controls Integrated into Luminaires	Line Voltage Controls	Standalone Control Devices	Network Lighting Controls	Building Automation System Lighting Controls	Manual (On/Off)	One zone only for space	Manual (On/Off) a, b Zoned switching	Manual Dimming Control	Key Switch (KS)	Scene Control (SC) or Graphic Touchscreen	Vacancy Mode (Manual On) (ASHRAE 90.1-2013 9.4.1.1b)	Occupancy Mode (Auto On) (Full On)	Occupancy Mode (Auto On) (Partial on to Max 50%)	Automatic Partial Off Sensor Time Out (Minutes) (ASHRAE 90.1-2013 9.4.1.1g)	Automatic Partial Off Luminaire Dimming Level		Full Off Sensor Time Out (Minutes) (ASHRAE 90.1-2013 9.4.1.1h)	Scheduled On Time	Scheduled Off Time	Schedule Override Switch	Open Loop (Switching On/Off)	Closed Loop (Dimming)	Target Lighting Levels (lux or fc)	Reduce light levels by 50% between midnight at 6am	Exterior Location	Plug Load Control	Controlled Emergency	
100	Vestibule	Corridor, all other corridors		X																												
101	Access Corridor	Corridor, all other corridors	100																													
102	District Chief	Office and Dorm					X		X			X																				Disable Sensor.
103	Captain's Office 103	Office and Dorm	102																													
104	Captain's Office 104	Office and Dorm	102																													
105	Universal Washroom 105	Restroom, all other restrooms		X				X					X						20 mins													
106	Access Corridor 106	Corridor, all other corridors	100																													
107	Gym 107	Gymnasium/Fitness Centre, exercise area		X			X	X				X							20 mins								X					
108	Access Corridor 108	Corridor, all other corridors	100																													
109	Clean Laundry 109	Laundry/Washing Area						X																								
110	Janitor's Closet 110	Storage		X					X										20 mins													
111	Access Corridor 111	Corridor, all other corridors	100																													
112	Staff Vestibule 112	Corridor, all other corridors	100																													
113	Dormitory 113	Fire Station - Sleeping Quarters		X					X																							
114	Access Corridor 114	Corridor, all other corridors	100																													
115	Washroom/Shower 115	Restroom, all other restrooms	105																													
116	Washroom/Shower 116	Restroom, all other restrooms	105																													
117	Washroom/Shower 117	Restroom, all other restrooms	105																													
118	Washroom/Shower 118	Restroom, all other restrooms	105																													
119	Locker Room 119	Locker Room						X	X				X						20 mins													
120	Change Room 120	Locker Room	119																													
121	Change Room 121	Locker Room	119																													
122	Access Corridor 122	Corridor, all other corridors	100																													
123	I.T. Room 123	Computer Room						X	X				X						20 mins													
124	Access Corridor 124	Corridor, all other corridors	100																													
125	Access Corridor 125	Corridor, all other corridors	100																													
126	Kitchen 126	Food Preparation Area						X	X				X						20 mins													
127	Dining Area 127	Dining area, all other dining areas						X	X				X						20 mins													
128	Dayroom Lounge 128	Lounge/Breakroom, all other						X	X				X						20 mins									X				
129	Computer Workstation 129							X																								Part of adjacent space. Use sensor in Dining Room.
130	Apparatus Bay 130	Emergency Vehicle Garage						X		X			X						20 mins						X	800 lux						
131	Janitors 131	Storage	110																													
132	Mechanical Room 132	Electrical/Mechanical Room		X						X																						
133	Bay Vestibule 133	Corridor, all other corridors	100																													
134	Water Meter/Sprinkler Room 134	Electrical/Mechanical Room		X					X																							
135	Electrical Room 135	Electrical/Mechanical Room		X																												
136	Workshop 136	Workshop						X	X				X						20 mins													
137	Laundry 137	Laundry/Washing Area						X	X				X						20 mins													
138	Bunker Gear Room 138	Storage Room		X					X										20 mins													
139	Hose Room 139	Storage Room	138																													
140	Compressor Room 140	Storage Room	138																													
141	Material Storage 141	Storage Room	138																													
142	Outdoor Storage 142	Storage Room	138																													
E1	Exterior Parking Areas and Drives	Exterior			X														Sunset	Sunrise												Provide photocell with contactor
E2	Exterior Illuminated Signage	Exterior			X														Sunset	Sunrise												Provide photocell with contactor
E3	Exterior Wall Packs East Wall	Exterior			X														Sunset	Sunrise												Provide photocell with contactor...

Lighting Fixture Schedule														
LIGHTING FIXTURE SCHEDULE NOTES: 1. UNLESS NOTED OTHERWISE, ACCEPTABLE SUBSTITUTE MANUFACTURES AND SUPPLIERS: - COOPER LIGHTING SOLUTIONS - CREE (T5 LIGHTING) - CURRENT LIGHTING (FORMERLY HUBBELL) (OMNILUMEN) - SIGMA (FORMERLY PHILIPS) (SALIX) - LUMENPULSE (TORONTO LIGHTWORKS) 2. WHERE AN INCOMPLETE MODEL/CAT NO. IS LISTED, MANUFACTURERS/SUPPLIERS MUST CONFIRM THE PROPOSED FIXTURE WITH THE CONSULTANT A MINIMUM OF ONE WEEK PRIOR TO TENDER CLOSE. 3. SUBMIT SHOP DRAWINGS FOR CONSULTANT'S REVIEW PRIOR TO PLACING ANY ORDER. 4. ALL LIGHT FIXTURES MUST BEAR A CERTIFICATION OR LISTING MARK FROM A CERTIFICATION BODY ACCREDITED BY THE STANDARDS COUNCIL OF CANADA, I.E., CSA, cUL, cETL, ETC.														
Type	DESCRIPTION	MANUFACTURER	CATALOG NO.	VOLTAGE	WATTS	LUMEN PACKAGE	CONTROLS	CRI	CCT	MOUNTING	MOUNTING HEIGHT	SUBSTITUTIONS		REMARKS
D6B	4.5" Recessed Downlight (Suitable for Wet Locations)	3G LIGHTING	3G-DL45RF-22-H90-35K-60D (Wet Location Rated)	120 V	22 W	1827	0-10V	90	3500 K	RECESSED	<varies>	Alphabet NU4-20LM, COOPER HALO HC6		
D6C	4.5" Recessed Downlight	3G LIGHTING	3G-DL45RF-10-H90-35K-60D	120 V	10 W	1031	0-10V	90	3500 K	RECESSED	<varies>	Alphabet NU4-10LM, COOPER HALO HC6		
D6D	3.3" Recessed Downlight	3G LIGHTING	3G-DL33RF70-15-H90-35K-60D	120 V	14 W	1212	0-10V	90	3500 K	RECESSED	2750 mm	Alphabet NU3-15LM, COOPER HALO HC4		
HBA	Round Highbay Fixtures	CREE LIGHTING	VUE-A-UV-24L-35K9-M-UL-10V	120 V	151 W	23500	0-10V	90	3500 K	SUSPENDE	5450 mm	CURRENT LIGHTING/Albeo ABN1 Series, COOPER METALUX UHBS Series		
SP4A	4ft Pendant Linear LED	CREE LIGHTING	LS4-40L-35K	120 V	31 W	4000	0-10V	90	3500 K	SUSPENDE	<varies>	CURRENT LIGHTING/COLUMBIA MPS, COOPER METALUX SNX Lensed		
SP4B	4ft Pendant Linear LED	CREE LIGHTING	LS4-60L-35K	120 V	45 W	6000	0-10V	90	3500 K	SUSPENDE	<varies>	CURRENT LIGHTING/COLUMBIA MOD 3L-P-D, COOPER METALUX SNX Lensed		
SP8A	8ft Pendant Linear LED	3G LIGHTING	3G-4PLI-D-L1000-H90-35K-FL-8FT	120 V	65 W	7990	0-10V	90	3500 K	SUSPENDE	3900 mm	CURRENT LIGHTING/COLUMBIA MOD 3L-P-D, COOPER Neo-Ray Define 4		
SP8B	8ft Pendant Linear LED	3G LIGHTING	3G-4PLI-D-L750-H90-35K-FL-8FT	120 V	48 W	6000	0-10V	90	3500 K	SUSPENDE	2340 mm	CURRENT LIGHTING/COLUMBIA MOD 3L-P-D, COOPER Neo-Ray Define 4		
SR4A	4ft Recessed Linear LED	3G LIGHTING	3G-4RL-L750-H90-35K-FL-4FT	120 V	24 W	3004	0-10V	90	3500 K	RECESSED	2750 mm	CURRENT LIGHTING/COLUMBIA MOD 3L-R-D, COOPER Neo-Ray Define 4		
SR4B	4ft Recessed Linear LED	3G LIGHTING	3G-4RL-L1000-H90-35K-FL-4FT	120 V	32 W	4005	0-10V	90	3500 K	RECESSED	2750 mm	CURRENT LIGHTING/COLUMBIA MOD 3L-R-D, COOPER Neo-Ray Define 4		
SR8	8ft Recessed Linear LED	3G LIGHTING	3G-4PLI-D-L1000-H90-35K-FL-8FT	120 V	65 W	7990	0-10V	90	3500 K	RECESSED	3900 mm	CURRENT LIGHTING/COLUMBIA MOD 3L-R-D, COOPER Neo-Ray Define 4		
STA	LED Step Light	MP LIGHTING	L36-3-W30S	120 V	3 W	200	0-10V	90	3500 K	SURFACE	300 mm	AMICO LUNAR SERIES		
UCL1	Under Cabinet LED fixture	SOLID STATE LUMINAIRES	UNLE-2-35K-WH	120 V	12 W	300lm/ft	0-10V	80	3500 K	SURFACE	<varies>	CURRENT LIGHTING/COLUMBIA CUC, COOPER HALO HU30M		
WSA	3ft Wall Sconce	3G LIGHTING	3G-4WL-D-L500-H90-35K-DASY-3FT	120 V	12 W	1500	0-10V	90	3500 K	WALL	2136 mm	CURRENT LIGHTING/COLUMBIA MOD 3L-W-D, COOPER Neo-Ray Define 4		
ZA1	Pole Mounted LED Fixture	CREE LIGHTING	ARE-EDR-4MB-04-E-350-30K	120 V	46 W	5003	0-10V	80	3000 K	POLE-MOUNTED	REFER TO PLAN	CURRENT LIGHTING/BEACON VIPER, COOPER Invue MSA MESA		
ZA2	Pole Mounted LED Fixture	CREE LIGHTING	ARE-EDR-4M-04-E-350-30K	120 V	46 W	5003	0-10V	80	3000 K	POLE-MOUNTED	REFER TO PLAN	CURRENT LIGHTING/BEACON VIPER, COOPER Invue MSA MESA		
ZDA	6" Recessed Downlight	3G LIGHTING	3G-DL45RF-22-H90-35K-60D	120 V	22 W	1827	0-10V	90	3500 K	RECESSED	REFER TO PLAN	Alphabet NU4-20LM, COOPER HALO HC6		
ZW1	Wall Mounted LED Fixture	CREE LIGHTING	SEC-EDG-4M-02-E-525-30K	120 V	37 W	3550	0-10V	80	3000 K	WALL	REFER TO PLAN	CURRENT LIGHTING/BEACON QSP2, COOPER McGraw-Edison		
ZW2	Wall Mounted LED Fixture	CREE LIGHTING	SEC-EDG-3M-02-E-525-30K	120 V	37 W	3365	0-10V	80	3000 K	WALL	REFER TO PLAN	CURRENT LIGHTING/BEACON QSP2, COOPER McGraw-Edison		
ZW3	Wall Mounted LED Fixture	CREE LIGHTING	SEC-EDG-3M-02-E-525-30K	120 V	25 W	2501	0-10V	80	3000 K	WALL	REFER TO PLAN	CURRENT LIGHTING/BEACON QSP2, COOPER McGraw-Edison		
ZW4	Wall Washer	ECOSENSE LIGHTING	L50-I-12-06-30-80-MULT-9x59	120 V	2 W	139	0-10V	80	3000 K	WALL	REFER TO PLAN	ACCLAIM XTR SERIES, COOPER IO LED CoviO Graze		
ZWW	Wall Washer	ECOSENSE LIGHTING	L50-I-12-06-30-80-MULT-70x70	120 V	6 W	614	0-10V	80	3000 K	WALL	REFER TO PLAN	ACCLAIM XTR SERIES, COOPER IO LED CoviO Graze		

SCHEDULE 26 06 50.19 - EMERGENCY LIGHTING AND EXIT SIGN SCHEDULE							
SYMBOL	TYPE	DESCRIPTION	MANUFACTURER AND PRODUCT SERIES	VOLTAGE	LAMPS	MOUNTING	SPEC SECTION/REMARKS
	E1	SINGLE REMOTE HEAD.	-LUMACELL MQM-1-24V20W-CSA SERIES -EMERILITE EPM SERIES	24V	1x8W MR16	WALL SURFACE	26 52 13.13
	E2	DOUBLE REMOTE HEAD.	-LUMACELL MQM-2-24V20W-CSA SERIES -EMERILITE EPM SERIES	24V	2x8W MR16	WALL SURFACE	26 52 13.13
	BU-1 BU-2 BU-3 BU-4 BU-5 BU-6	EMERGENCY LIGHTING BATTERY UNIT C/W AUTO TEST, TWO REMOTE HEADS, AND SIX ZONE VOLTAGE SENSING RELAY.	-LUMACELL RG24S-360-AT-VSR SERIES -EMERILITE E3L SERIES	120V-347V IN 24V OUT	2x8W MR16	WALL SURFACE	26 52 13.13
	X1	PLASTIC PICTOGRAM EXIT SIGN, UNIVERSAL MOUNTING, FACTORY WHITE FINISH.	-LUMACELL LP SERIES -STAMPING RUPM SERIES	SEE NOTE 2	3W LED	CEILING OR WALL SURFACE	26 52 13.16
	X2	SAME AS X1, DOUBLE FACE		SEE NOTE 2	3W LED	CEILING OR WALL SURFACE	26 52 13.16
EMERGENCY LIGHTING FIXTURE AND EXIT SIGN SCHEDULE NOTES: 1. WHERE AN INCOMPLETE MODEL/CAT NO. IS LISTED, MANUFACTURERS/SUPPLIES MUST CONFIRM THE PROPOSED FIXTURE WITH THE CONSULTANT A MINIMUM OF ONE WEEK PRIOR TO TENDER CLOSE. 2. EXIT SIGNS SHALL BE CAPABLE OF UNIVERSAL 120/247V AC AND 6 TO 48V DC INPUT. BATTERY UNITS SHALL BE CAPABLE OF UNIVERSAL 120/247V AC INPUT. 3. FOR EXIT SIGNS, REFER TO ARROWS, AND NUMBER OF SHADED FACES AS DIRECTED ON LIGHTING LAYOUT. WHERE ARROWS INDICATE TWO DIRECTIONS, PROVIDE TWO PICTOGRAM STYLE EXIT SIGNS. 4. SUBMIT SHOP DRAWINGS FOR CONSULTANT'S REVIEW PRIOR TO PLACING ANY ORDER. 5. ACCEPTABLE MANUFACTURERS AS NOTED IN SECTION 26 52 13.13 AND SECTION 26 52 13.16. 6. REMOTE HEADS CERTIFIED TO CSA C22.2 No. 141. 7. COCB - CENTRE BEAM CANDLE POWER. 8. CONFIRM RECOMMENDED SPACING WITH EMERGENCY LIGHTING MANUFACTURER PRIOR TO START OF ROUGH-IN. 9. WHERE AN EXIT SIGN IS TO BE INSTALLED IN AN AREA WITH NO CEILING, PROVIDE SUITABLE PENDANT MOUNT SUCH THAT THE SIGN IS VISIBLE AND NOT OBSCURED.							



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DRAWINGS ARE NOT TO BE SCALED.
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON THE JOB AND REPORT ANY DISCREPANCY TO ARCHITECTS BEFORE PROCEEDING WITH WORK.
ALL DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECT AND MUST BE RETURNED AT THE COMPLETION OF THE WORK.

SEALS

10 ISSUED FOR ADDENDUM E-ADD-01 2024-06-06
9 ISSUED FOR TENDER 2024-05-01
8 ISSUED FOR TENDER 2024-05-01
7 RESPONSE TO PERMIT COMMENTS 2024-03-26
6 ISSUED FOR TENDER REVIEW 2024-03-08
5 ISSUED FOR PERMIT 2024-01-24
4 ISSUED FOR 99% CD 2024-01-19
3 ALECTRA COORDINATION 2023-12-18
2 ISSUED FOR DESIGN DEVELOPMENT 2023-10-06
1 ALECTRA SERVICE REQUEST 2023-08-11

NO. ISSUES/REVISIONS DATE
DRAWING TITLE:

SCHEDULES FOR LIGHTING

ISSUE DATE: 2024-06-06

DRAWN BY: MS CHECKED BY: CB

PROJECT NO.: CM-22-281 SCALE: 1 : 100

DRAWING NO.: REVISION:

E-605 10