

**ELECTRICAL SPECIFICATION**

Electrical installation shall be in accordance with the current edition of The Canadian Electrical Code, Provincial, Municipal and other codes, rules and regulations.

The Contractor shall include the furnishing of labor, new material, equipment and services necessary and reasonably implied and/or incidental to the complete installation of the electrical work as shown on the plans and as specified. Supply and install all devices required for the complete approved system, operating to the complete satisfaction of the Contract Administrator.

Prepare and submit to the proper authorities all necessary permits and pay all fees. Provide Contract Administrator a PDF copy of all electrical permits.

Upon completion and before final payment is made, present to Contract Administrator a Certificate of Approval for all electrical work from the inspection department having jurisdiction.

Electrical Work shall be completed in conformance with, and subject to, all cautionary notes available to the reader including those available on the websites of the manufacturers, consultants and Contract Administrator.

Electrical installation including electrical equipment supplied, installed or connected shall be tested in the presence of the City on completion of the Work.

The Electrical Subcontractor shall visit the site and ascertain that all work indicated can be performed without additional cost to the City.

The Electrical Subcontractor shall guarantee the satisfactory operation of all work and apparatus included and installed under this section of the specification for a period of twelve (12) calendar months after the final acceptance of the complete building.

The Electrical Subcontractor shall be responsible for any damage caused the Owners, the City or their Subcontractors by improperly carrying out the contract.

The Electrical Subcontractor shall carefully examine all drawings and specifications relating to the Work to be certain that the work under this Contract can be satisfactorily performed and prior to the submission of his tender, report at once to the Contract Administrator any defect, discrepancy, omission or interference affecting the Work of this section or the guarantee of same.

Submit one set of "as-built" prints or PDF documents to the Contract Administrator.

Grounding shall be in accordance with the latest edition of The Canadian Electrical Code.

Panels, motor starters, disconnect switches, etc., shall be properly identified by means of engraved laminated nameplates.

Supply and install all motor controls unless noted otherwise on the drawings. Refer to Mechanical drawings for exact location of motors and mechanical equipment. Unless otherwise specified and/or shown on the drawings, supply and install the following motor control equipment:

Manual motor starters.

Magnetic motor starters which are not part of package equipment. Refer to Mechanical drawings and specifications.

Pushbutton stations.

Hand-off-auto selector switches.

Motor disconnect switches.

Interlock contacts as required for starters.

Enclosures.

Starter heater elements as required for starters.

Conductors.

Time clocks, time switches and photoelectric relays.

Fluorescent ballasts for all starters, switches and pushbutton stations.

Mechanical and Electrical Subcontractors are responsible for the mutual coordination of all electrical requirements of mechanical equipment. Coordination is to include the communication of all final electrical complete information to the Mechanical Subcontractor to the Electrical Subcontractor, the communication of the detailed electrical information as well as any other information required for the final systems to be coordinated by the responsible Engineer. The coordination is to occur prior to the ordering of equipment by either trade. No extra compensation will be allowed for failure to carry out this coordination. Report at once to the Contract Administrator any defect, discrepancy, omission or interference affecting the satisfactory completion of Work.

Conduits shall be electric metallic tubing unless otherwise noted on drawings or unless prohibited by regulations. Conduits in direct contact with earth or in concrete shall be rigid PVC. Conduits shall be concealed unless otherwise noted on the drawings. Conduits shall not be exposed in any area where concealed installation, separation or work is required without prior written approval.

Outlet, junction and switch boxes shall be galvanized pressed steel of size and type to suit the requirements of each outlet. Outlet boxes shall be accessible.

All wiring shall be in conduit, except that armoured cable may be used in stud partitions and for drops to recessed luminaires (max. 4 luminaires per drop). Armoured cable drops (including any daisy chain) shall not exceed 9m in total length.

Wire and cable shall be copper of standard AWG sizes with 600V (90 degree C) insulation. Insulation shall be X-Line Polyethylene unless otherwise noted on drawings or prohibited by regulations. Aluminum conductors will not be accepted, unless otherwise indicated. Minimum wire size shall be #12 AWG.

Panels/boards shall be factory-assembled custom made of size, type and arrangement as shown on drawings. Circuit breakers shall be bottom-mounted, thermal and magnetic trip. Trip values as shown on drawings. Two or three pole breakers shall have common trip units. Mount on typewriter directory behind a plastic shield on the inside of panelboard doors. All distribution equipment to be sprinker-proof and c/w lockable door. Minimum fault rating of circuit breakers shall be 22KA S.C.C.C.

Wall-mounted flush switches shall be specification grade 15A, 125VAC, white handle, side or back wiring. Mount switches 1200mm above finished floor unless otherwise noted on the drawings.

Duplex receptacles shall be specification grade 15A, 125VAC, parallel slot, U-ground, white, side and back wiring. Mount receptacles 400mm above finished floor or 150mm above counter tops unless otherwise noted on the drawings.

Cover plates for flush-mounted receptacles and switches on concealed conduit system shall be stainless steel.

Telephone rotary system shall be in separate and independent conduit system. Empty conduits shall be completed with a #12 AWG pull wire as shown on drawings. Complete entire installation to local telephone utility requirements and satisfaction.

Mount surface mounted equipment such as panels, telephones and other electrical equipment on frequent mounting boards, c/w grey enamel finish.

Any cutting and patching in existing walls or floors required for the addition or relocation of electrical equipment shall be the responsibility of the Electrical Subcontractor.

Existing apparatus installations & work:

The Electrical Subcontractor shall take into account items which he is responsible for due to the changes and alterations to the existing building and allow for such items that may occur in his tender price.

The Electrical Subcontractor is to notify the supply utility of all load increases to existing service.

Existing conduits, wire and cables which are in good repair and used to meet all code requirements, may be reused. All equipment to be reused must be approved by the local inspection department and the Contract Administrator.

Modify existing Chubb Edwards fire alarm system as indicated. Provide a verification inspection report for all fire alarm system components added/modified.

The Electrical Subcontractor shall relocate outlets at no additional charge if requested prior to rough-in. The Electrical Subcontractor shall relocate outlets at no additional charge if requested by the local authority having jurisdiction.

Electrical installation shall be in conformance with the barrier free requirements applicable in the latest edition of the National Building Code of Canada.

Where luminaires are recessed into insulated ceilings, the Electrical Subcontractor is responsible for providing luminaires suitable for that use.

Supply and install all indicated electric heaters, standard watt density to be Chromalox or approved equal. Thermostats to be calibrated in degrees Celsius.

Equipment and material shall be installed as specified. Requests for equal status shall be submitted in accordance with B7.

Electrical Subcontractor shall submit shop drawings to Contract Administrator for review prior to ordering equipment. At the request of the Contract Administrator, the successful electrical Subcontractor shall submit a completed C-1 form (form available from Contract Administrator).

Supply and install, wire and connect all luminaires (to be complete with lamps) as indicated. All luminaires exceeding 150V shall be complete with an integral disconnecting means that will automatically open the circuit conductors and conductors supplying the luminaire(s). All luminaires exceeding 150V shall be marked in a conspicuous, legible, and permanent manner adjacent to the disconnecting means, identifying the specific purpose. Refer to Canadian Electrical Code rule 30-308(4).

Final connection to all mechanical equipment to be flexible. Obtain and refer to mechanical shop drawings of mechanical equipment for circuit breaker and wire size. Adjust circuit breaker and wire size without additional cost to the City.

All existing and new City equipment is to be wired and connected. Supply and install, wire and connect matching receptacle for portable equipment complete with cord and cap. Refer to equipment name plate rating for electrical characteristics prior to rough-in. All City equipment which is non-portable, shall be directly connected via cord type cord matching electrical characteristics as determined by nameplate ratings of equipment. Confirm nameplate characteristics prior to rough-in.

**FIRE ALARM SYSTEM SPECIFICATIONS - ADDRESSABLE SINGLE STAGE EXTENSION**

1.0 GENERAL

The Electrical Subcontractor shall supply and install a complete, fully operational supervised fire alarm system extension as shown on the plans and detailed herein.

All components of the fire alarm system shall match existing manufacturer and shall meet all ULC codes and regulations and local authorities having jurisdiction.

The system extension shall be installed and tested in accordance with the plans and specifications and the manufacturer's recommendations. Installation shall be in accordance with CAN/ULC-S524-05 STANDARD FOR THE INSTALLATION OF FIRE ALARMS. Final testing of the complete installation shall be carried out by the system manufacturer with assistance provided by the electrical contractor in accordance with the CAN/ULC-S537-04 "VERIFICATION FOR FIRE ALARM SYSTEM INSTALLATIONS".

The fire alarm system is a type 1, single stage, addressable fire alarm system.

All new fire alarm system components and wiring shall carry a full one-year warranty commencing on the date of the completed verification inspection or building occupancy, whichever ever occurs first.

2.0 OPERATION

Operation of any alarm initiating device shall cause all audible signals to sound continuously throughout the building. The signals may be silenced by operating the "signal silence" pushbutton on the control panel and/or by resetting the system after the initiating device has been returned to normal.

3.0 SYSTEM EQUIPMENT

1. Modify existing control panel as required to accommodate zones as shown on plans, complete with appropriate signal circuits, standby battery and alarm/trouble contacts, complete with monitoring feature. Standby batteries shall have minimum 1 hour alarm capacity after 24 hours of supervisory mode.

2. Manual pull stations shall match existing.

3. Automatic thermal heat detectors shall match existing. Fixed temperature heat detectors shall be 88°C or as required to suit environment. Heat detectors shall be red of fire unless indicated otherwise.

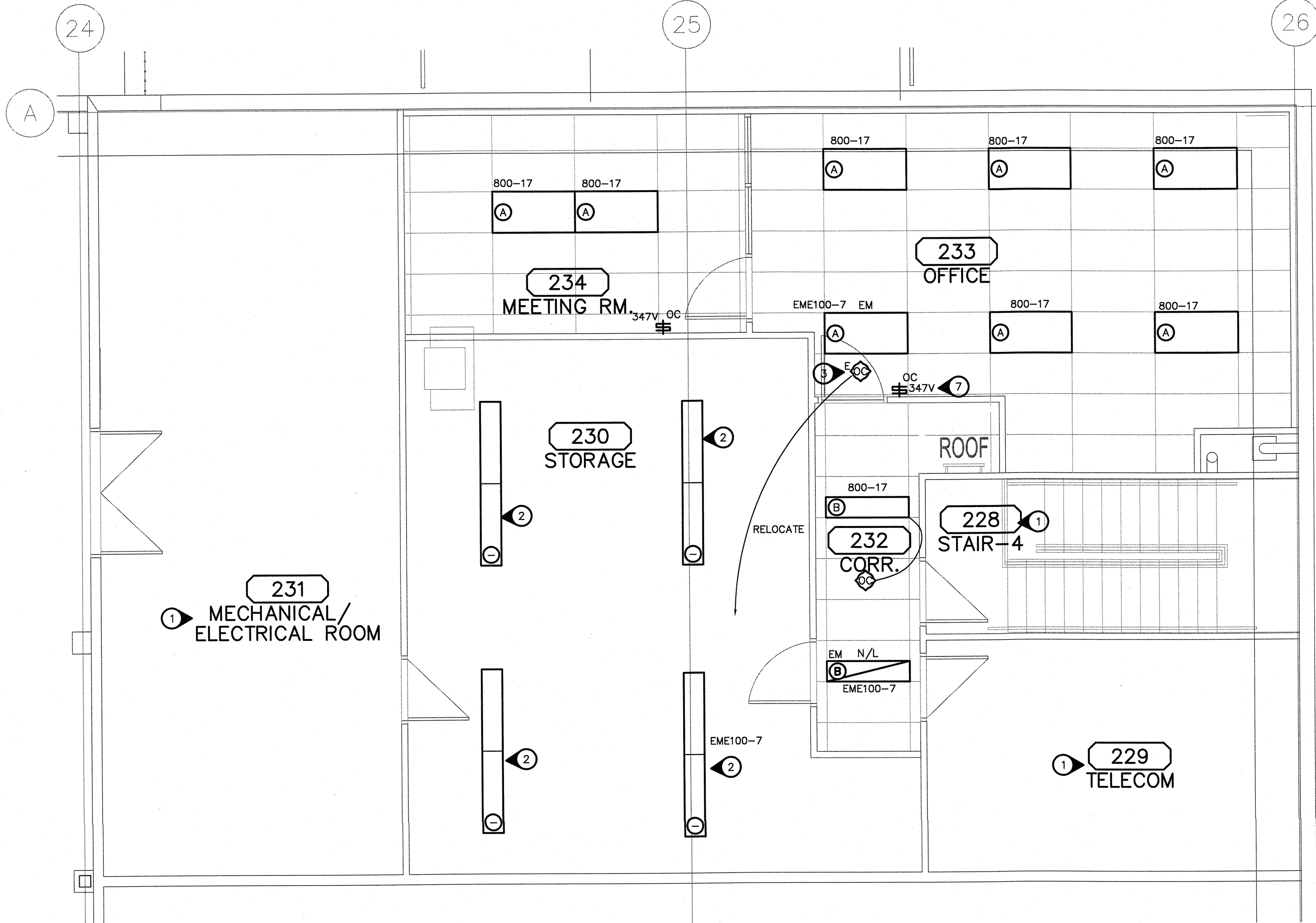
4. System smoke detectors shall be photoelectric type to match existing.

5. Notification appliances shall match existing audibility type (bells, horns, speakers). Visual signals shall be combination type, or stand alone where indicated.

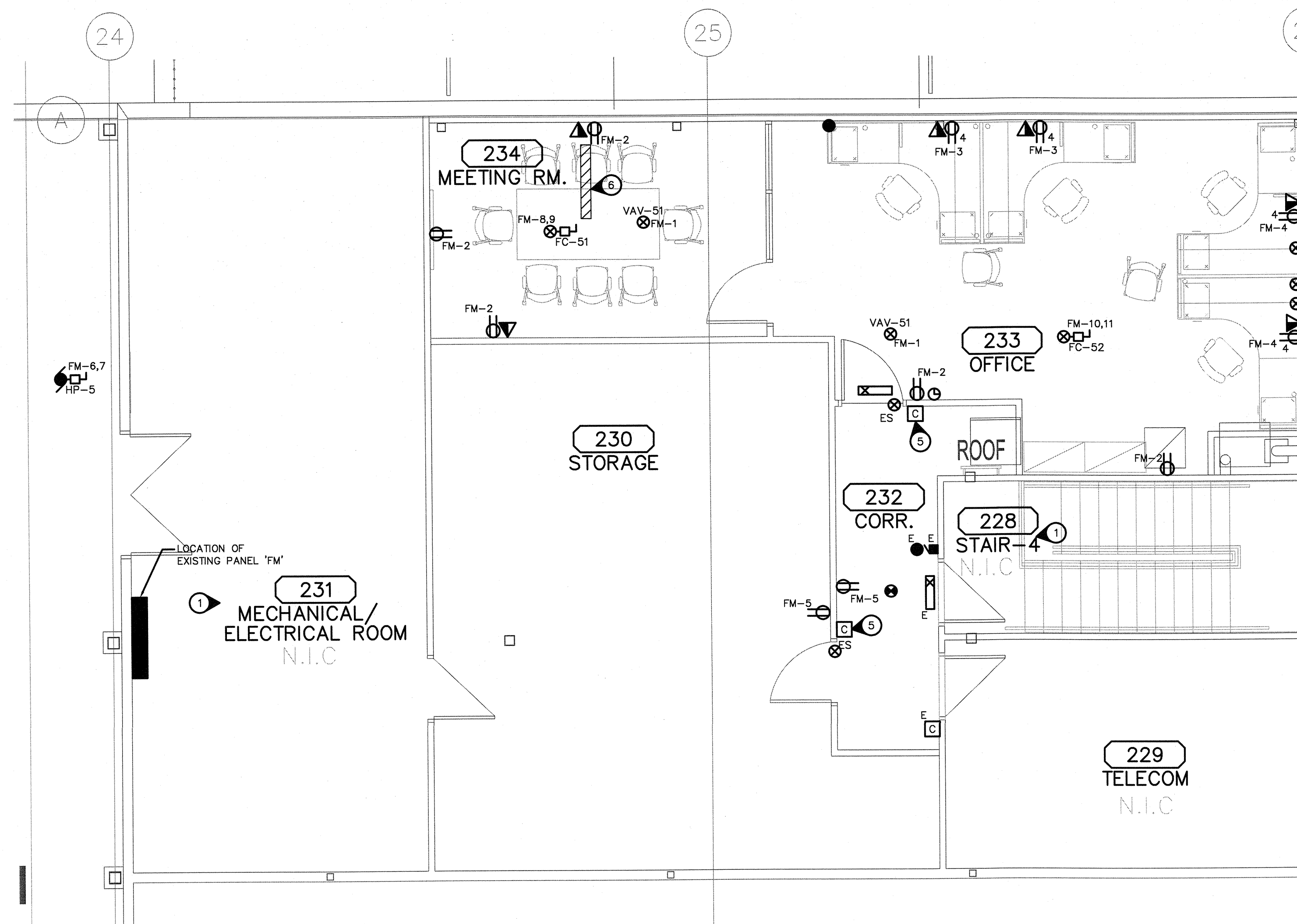
6. Duct mount smoke detectors shall match existing, with photoelectric detector and sampling tubes to suit duct width. Connect fan control to auxiliary contacts in control panel to shut down on an alarm condition.

7. Booster power supplies shall be supplied and installed where required, complete with sync module(s) to suit application.

8. Install appropriate devices to suit application.



**ELECTRICAL LIGHTING LAYOUT**  
 SCALE: 1:50



**ELECTRICAL RENOVATION LAYOUT**  
 SCALE: 1:50

**SYMBOL SCHEDULE**

- ⊙ Fluorescent luminaire, '31'-d' denotes panel circuit No. and switch.
- ⊙ Night light luminaire.
- ⊙ Single pole switch, '347V' indicates voltage.
- ⊙ Ceiling mounted occupancy sensor - 347V rated - to match existing.
- ⊙ Duplex receptacle.
- ⊙ Conduit/riser/data outlet c/w cover plate. Run one(1) 1/4" conduit to accessible ceiling space below (hooks in mth floor ceiling space) c/w two (2) CAT6 communication cables back to Room 229. Provide jacking, terminate and test. Utilize existing City provided patch panels.
- ⊙ Meter. Refer to mechanical for exact location. For roof mounted equipment, supply and install wire and connect a separate circuit. Cf. notebook in accordance with C.E.C. rule 26-704.
- ⊙ Disconnect switch to suit application. By electrical Subcontractor.
- ⊙ Junction box.
- ⊙ Fire alarm audible device, c/w strobe light - to match existing Chubb Edwards.
- ⊙ New wall clock - to match existing.
- ⊙ Card access system reader - to match existing.
- ⊙ Electric strike (if any). Tie to card access system.
- ⊙ Fire alarm pull station.
- ⊙ Fire alarm smoke detector. To match existing Chubb Edwards.

**NOTES:**

1. 'X' DENOTES EXISTING ELECTRICAL TO REMAIN UNLESS OTHERWISE INDICATED.
2. 'M' DENOTES WIRING TO EMERGENCY POWER PANEL.
3. 'OC' DENOTES C/W OCCUPANCY SENSOR.

THESE DRAWINGS SHALL NOT BE SCALED.

THE CONTRACTOR SHALL VISIT THE SITE AND ASCERTAIN ALL DIMENSIONS, DATA, AND CONTACT INFORMATION SHOWN ARE CORRECT.

THE CONTRACTOR IS TO REVIEW AND COORDINATE ALL ARCHITECTURAL, MECHANICAL, ELECTRICAL DRAWINGS FOR ADDITIONAL OPENINGS THROUGH FLOORS, WALLS AND CEILINGS FOR DUCT, PIPES, ELECTRICAL RISERS AND ALL OPENINGS NOT SHOWN ON DRAWINGS.

ALL OPENINGS THROUGH FIRE ASSEMBLIES ARE TO BE STOPPED AND SEALED WITH ULC APPROVED FIRE STOPPING TO MAINTAIN THE INTEGRITY OF THE FIRE SEPARATION AND PROVIDE A SOUND BARRIER.

ALL PRODUCTS AND MATERIALS TO BE USED AND INSTALLED SHALL CONFORM WITH MANUFACTURER'S SPECIFICATIONS & APPLICABLE CODES.

THE CONTRACTOR SHALL BE RESPONSIBLE TO PATCH AND MAKE GOOD ALL EXISTING CONSTRUCTION AFFECTED BY THE REMOVAL OF ALL ITEMS FORMING THE PART OF THE RENOVATION WORK.

WHERE NEW FLOORING AND BASE IS TO BE INSTALLED IN EXISTING AREAS REFER TO FLOOR PLAN AND ROOM SCHEDULES. THE EXISTING FLOORING SURFACE AND BASE MUST BE REMOVED UNLESS OTHERWISE NOTED. ALL FLOOR SURFACES SHALL BE PREPARED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION OF NEW FLOOR.

WHERE FINISHING OF EXISTING WALLS IS INDICATED ON THE ROOM SCHEDULE, THESE WALLS MUST BE CLEANED OF ANY EXISTING WALL COVERING, PATCHED & PREPARED TO ACCEPT NEW MATERIAL, UNLESS OTHERWISE NOTED.

**LUMINAIRE SCHEDULE**

TYPE	DESCRIPTION	CATALOG NUMBER	LAMPS
A	2'x4' FLUORESCENT LUMINAIRE RECESSED IN T-BAR CEILING	LITHONIA 2R15-54TSHD-347-CSA	2-54W TSHD
B	1'x4' FLUORESCENT LUMINAIRE RECESSED IN T-BAR CEILING	LITHONIA 3R5-2-54TSHD-A12-347-CSA	2-54W TSHD

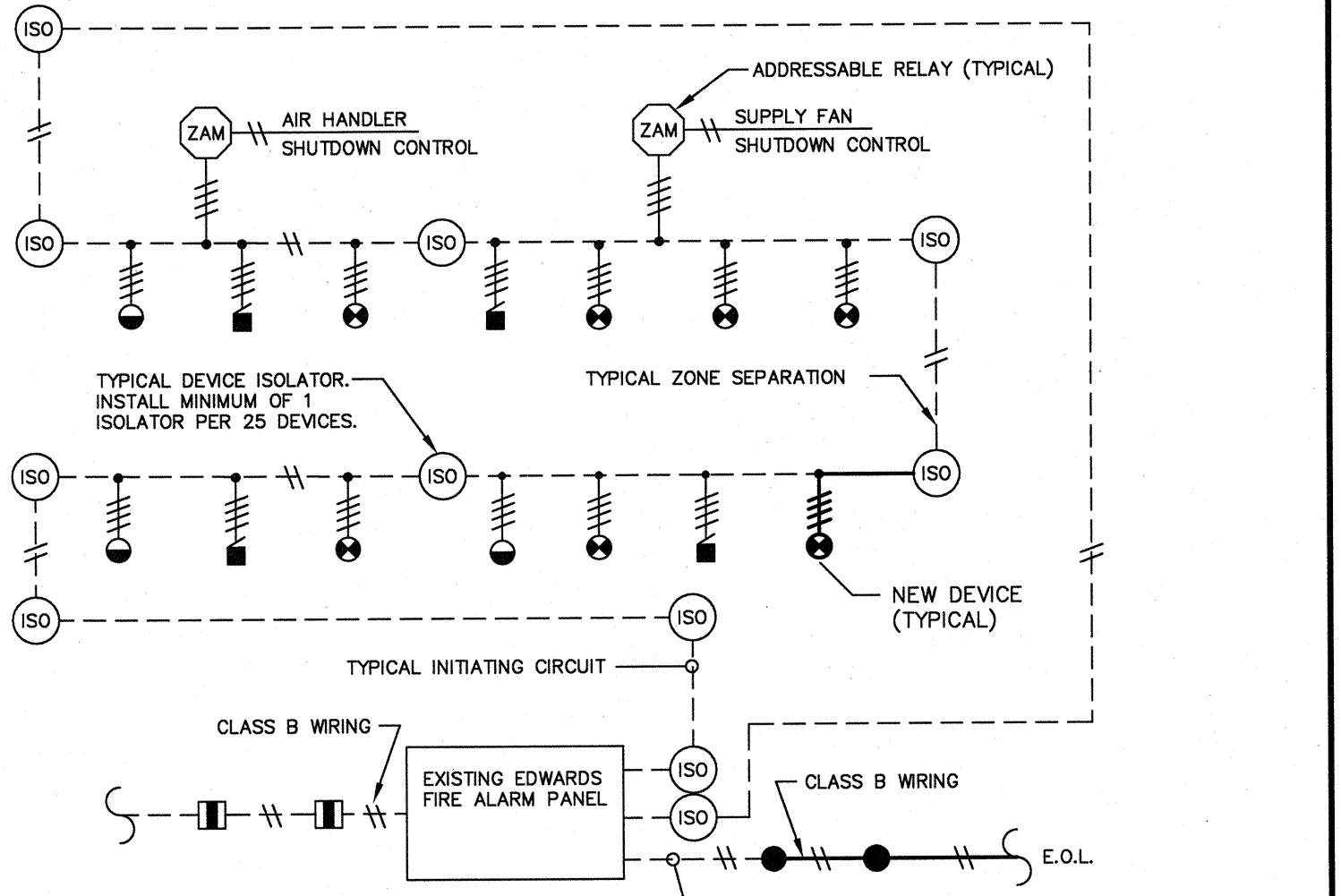
LUMINAIRE SCHEDULE NOTES:  
 1. ALL FLUORESCENT BALLASTS TO BE ELECTRONIC, MB HYDRO "POWER SMART" APPROVED.  
 2. ALL FLUORESCENT LAMPS TO BE 3500K & 85 CR, UNLESS OTHERWISE NOTED.

**MOTOR SCHEDULE**

NO.	DESCRIPTION	LOCATION	VOLTAGE	HP/W/MCA	C.B.	COND.	STARTER	NOTES
FC-51	FAN COIL	SEE DRAWING	208V-1PH	2.64KW	20A-2P	#12	-	1
FC-52	FAN COIL	SEE DRAWING	208V-1PH	3.52KW	30A-2P	#10	-	1
HP-5	HEAT PUMP	SEE DRAWING	208V-1PH	17.8MCA	20A-2P	#12	-	1
VAV-51	VARIABLE AIR VOLUME	SEE DRAWING	120V-1PH	FRAC.	15A-1P	#12	-	1
VAV-52	VARIABLE AIR VOLUME	SEE DRAWING	120V-1PH	FRAC.	15A-1P	#12	-	1

**SPECIFIC NOTES:**

1. WIRE AND CONNECT AS REQUIRED. REFER TO MECHANICAL.
- GENERAL NOTES:  
 A. MANUAL STARTERS TO BE C/W OVERCURRENT PROTECTION.  
 B. ALL DISCONNECT SWITCHES TO BE SUPPLIED BY ELECTRICAL SUBCONTRACTOR.  
 C. ELECTRICAL SUBCONTRACTOR TO PROVIDE CIRCUIT BREAKERS AND WIRING ACCORDING TO THE FINAL NAMEPLATES OF ALL THE MECHANICAL EQUIPMENT.  
 D. ALL LOW VOLTAGE CONTROL WIRING BY MECHANICAL SUBCONTRACTOR.  
 E. ALL LINE VOLTAGE CONTROL WIRING BY ELECTRICAL SUBCONTRACTOR - REFER TO MECHANICAL SECTION. CO-ORDINATE EXACT REQUIREMENTS WITH MECHANICAL SUBCONTRACTOR.



**FIRE ALARM SYSTEM NOTES:**

1. BUILDING PRINTS WITH DEVICE ADDRESSING/LOOP LAYOUT & ISOLATOR LAYOUTS TO FOLLOW BY MANUFACTURER.
2. SHIELD (ANY RUN) TO BE CONTINUOUS, ISOLATED FROM GROUND AND TERMINATED AT FIRE ALARM PANEL GROUND ONLY.
3. DASHED LINES INDICATE EXISTING.
4. PROVIDE DEVICE ISOLATION AND SEPARATE AUDIBLE CIRCUITS IN ACCORDANCE WITH MBC 3.2.4.18. 5. COMPLETE FIRE ALARM INSTALLATION TO CAN/ULC-S524-08.

**GENERAL ELECTRICAL NOTES**

1. 'X' DENOTES EXISTING ELECTRICAL TO REMAIN UNLESS OTHERWISE INDICATED.

**ELECTRICAL DEMOLITION NOTE**

1. ALL ITEMS REQUIRED TO BE DEMOLISHED ARE NOT NECESSARILY SHOWN. THOSE INDICATED ARE FOR REFERENCE ONLY. ALL ITEMS INTERFERING WITH NEW CONSTRUCTION SHALL BE REMOVED AT NO ADDITIONAL COST.
2. CIRCUITS 'FM-1' TO 'FM-5' INDICATE TO PROVIDE MATCHING 15A-1P CIRCUIT BREAKERS IN EXISTING PANEL 'FM' LOCATED IN ROOM 231. UTILIZE #12 WIRE.
3. CIRCUITS 'FM-6,7' AND 'FM-8,9' INDICATE TO PROVIDE MATCHING 20A-2P CIRCUIT BREAKERS IN EXISTING PANEL 'FM' LOCATED IN ROOM 231. UTILIZE #12 WIRE.
4. CIRCUITS 'FM-10,11' INDICATE TO PROVIDE A MATCHING 30A-2P CIRCUIT BREAKERS IN EXISTING PANEL 'FM' LOCATED IN ROOM 231. UTILIZE #10 WIRE.

**SPECIFIC ELECTRICAL NOTES**

1. EXISTING ELECTRICAL TO REMAIN IN THIS AREA.
2. REUSE EXISTING 8' FLUORESCENT CHAIN SUSPENDED LUMINAIRES IN EXISTING SPACES FOR NEW STORAGE ROOM. EXTEND/REROUTE EXISTING WIRING TO ACCOMMODATE RELOCATION.
3. RELOCATE EXISTING ELECTRICAL AS INDICATED. EXTEND/REROUTE WIRING AS REQUIRED.
4. EXISTING JUNCTION BOXES AND CONDUIT TO BE CONCEALED WITHIN NEW WALL OR RELOCATED. JUNCTION BOXES TO BE ACCESSIBLE AS REQUIRED BY C.E.C.
5. PROVIDE DOOR CONTACT, REQUEST TO EXIT DEVICE AND ALL ASSOCIATED WIRING FOR CARD ACCESS SYSTEM CONTROL OF THIS DOOR. REFER TO CITY OF WINNIPEG CARD ACCESS REQUIREMENTS.
6. PROVIDE OVERFLOOR RACEWAY FROM 120V RECEPTACLE AND DATA PORT ON WALL TO CENTER OF TABLE FOR EXTENSION OF CABLES TO TABLE. LEGRAND WIREMOLD OPR SERIES.
7. PROVIDE TWO-POLE OCCUPANCY SENSOR.

**APGEM**  
 Certificate of Authorization  
 Nova 3 Engineering Ltd.  
 No. 962 Date: 2015-06-10

**NOVA 3 ENGINEERING LTD.**  
 CONSULTING ENGINEERS  
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NO.	ISSUED FOR CONSTRUCTION	CHECKED	DATE	REVISION/DESCRIPTION	DATE	BY	DATE
1							

**THE CITY OF WINNIPEG**  
 PLANNING, PROPERTY AND DEVELOPMENT DEPARTMENT  
 MUNICIPAL ACCOMMODATIONS DIVISION  
 3-65 GARRY STREET, R3C 4K4

**PROJECT:**  
 PUBLIC WORKS DEPARTMENT  
 EAST YARDS COMPLEX  
 FLEET MANAGEMENT  
 980 THOMAS AVENUE

**SHEET TITLE:**  
 SECOND FLOOR ELECTRICAL LAYOUTS

**SCALE:**  
 AS SHOWN PROJECT NO: 2015-106 SHEET NO: E1  
 DRAWING SHEET SIZE: A0 (1189mm x 841mm) PLOT 1:1