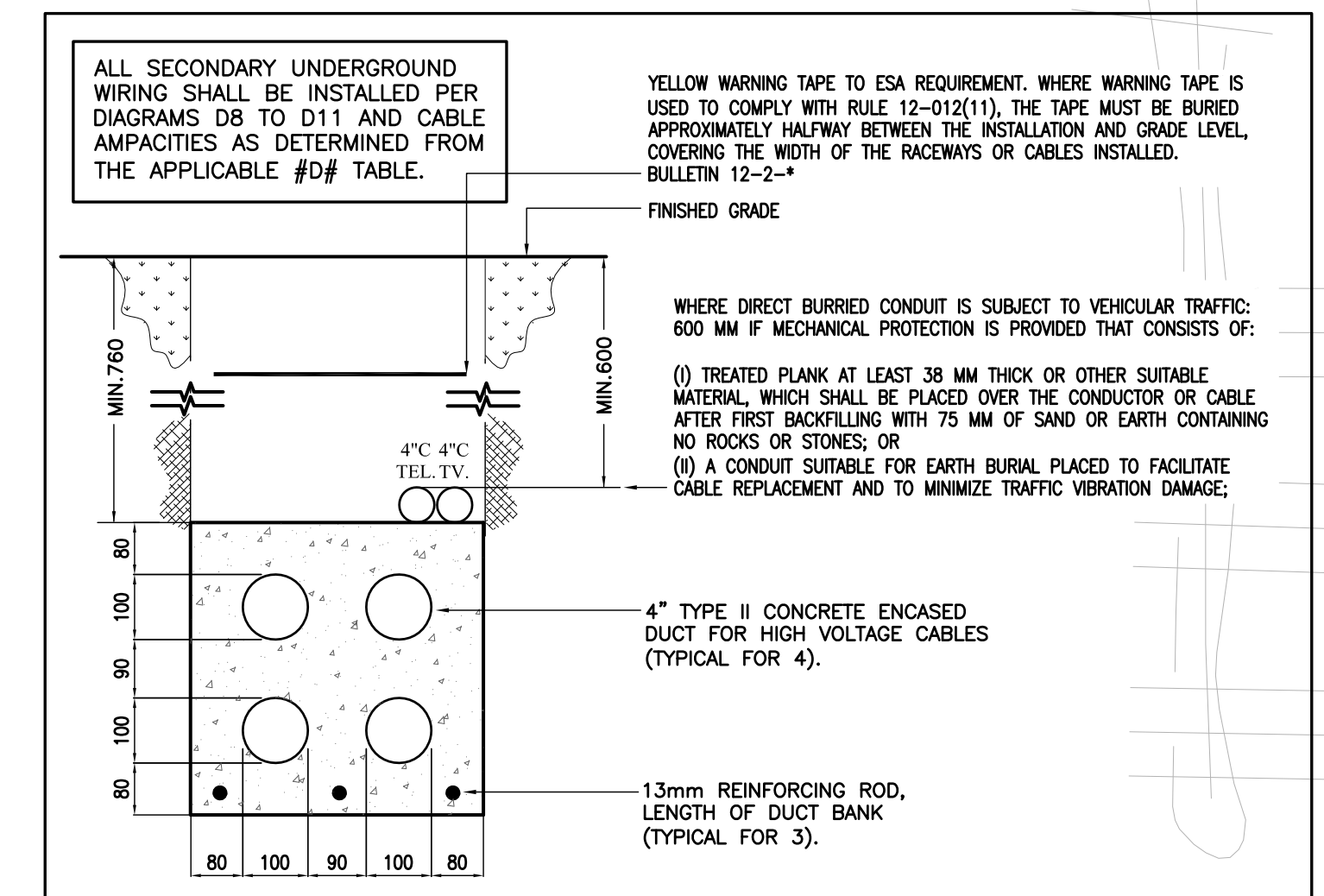
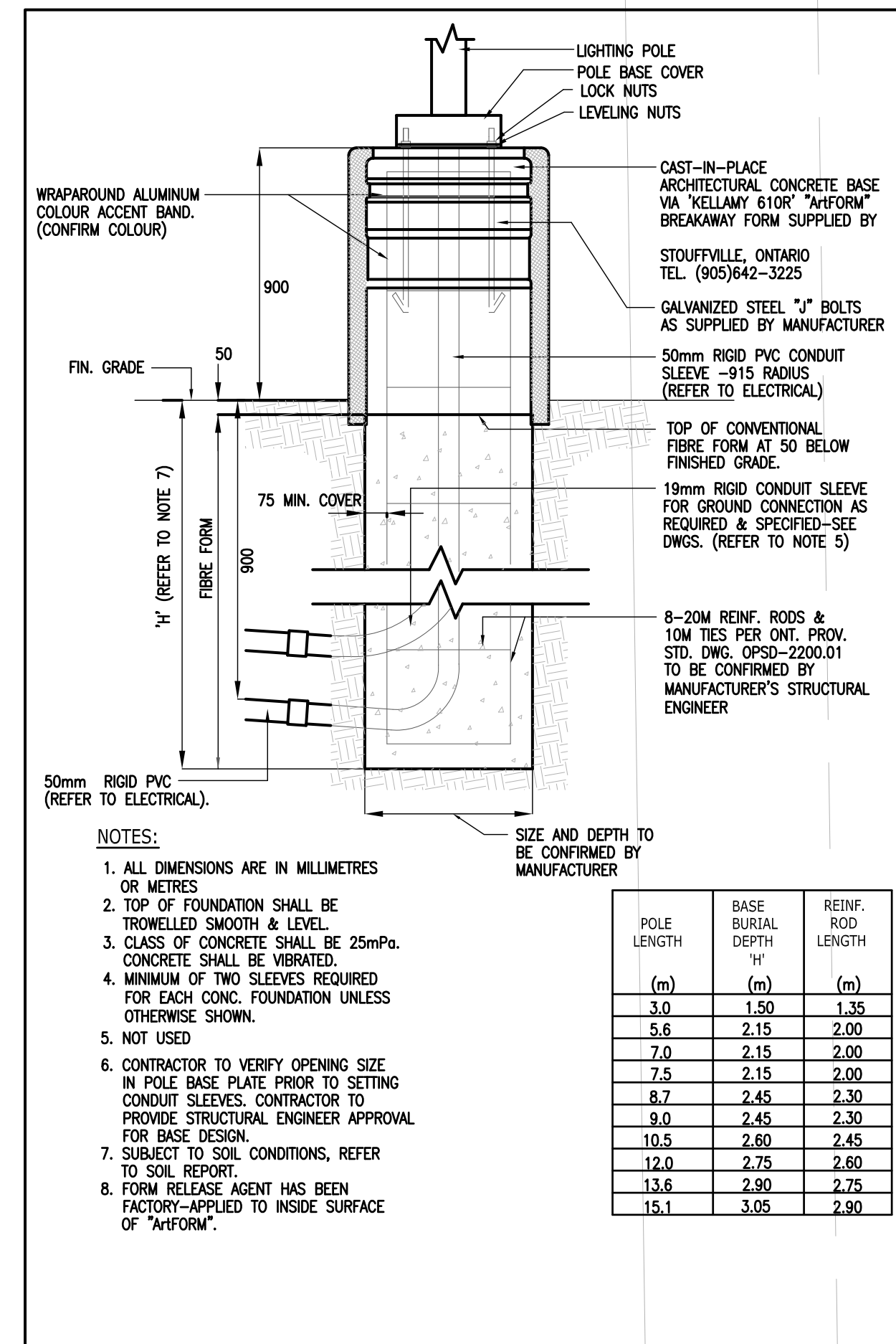


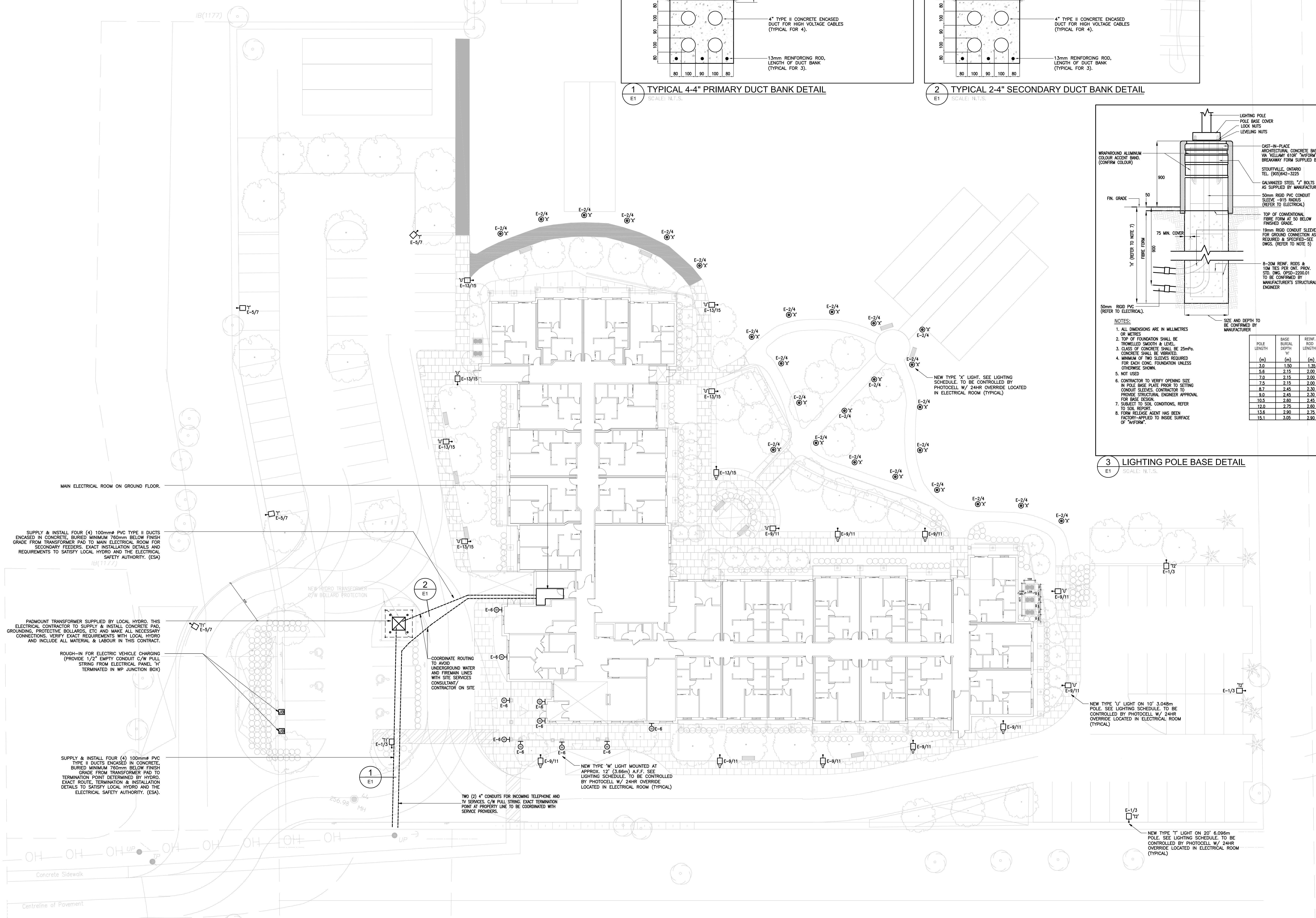
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SCALE: N.T.S.



2 TYPICAL 2-4" SECONDARY DUCT BANK DETAIL  
SCALE: N.T.S.

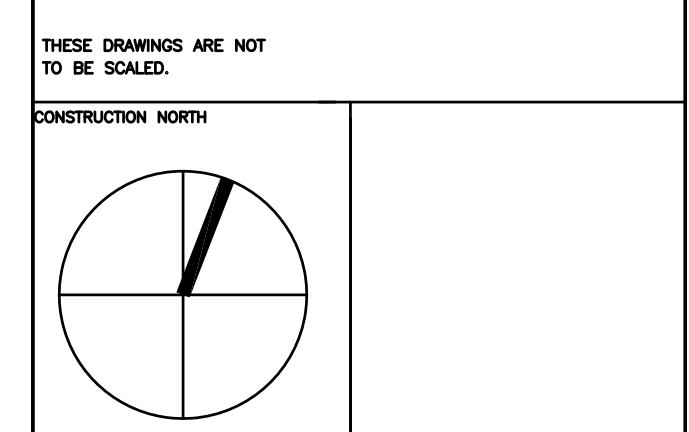


3 LIGHTING POLE BASE DETAIL  
SCALE: N.T.S.



NO.	DATE	DESCRIPTION
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**B K**

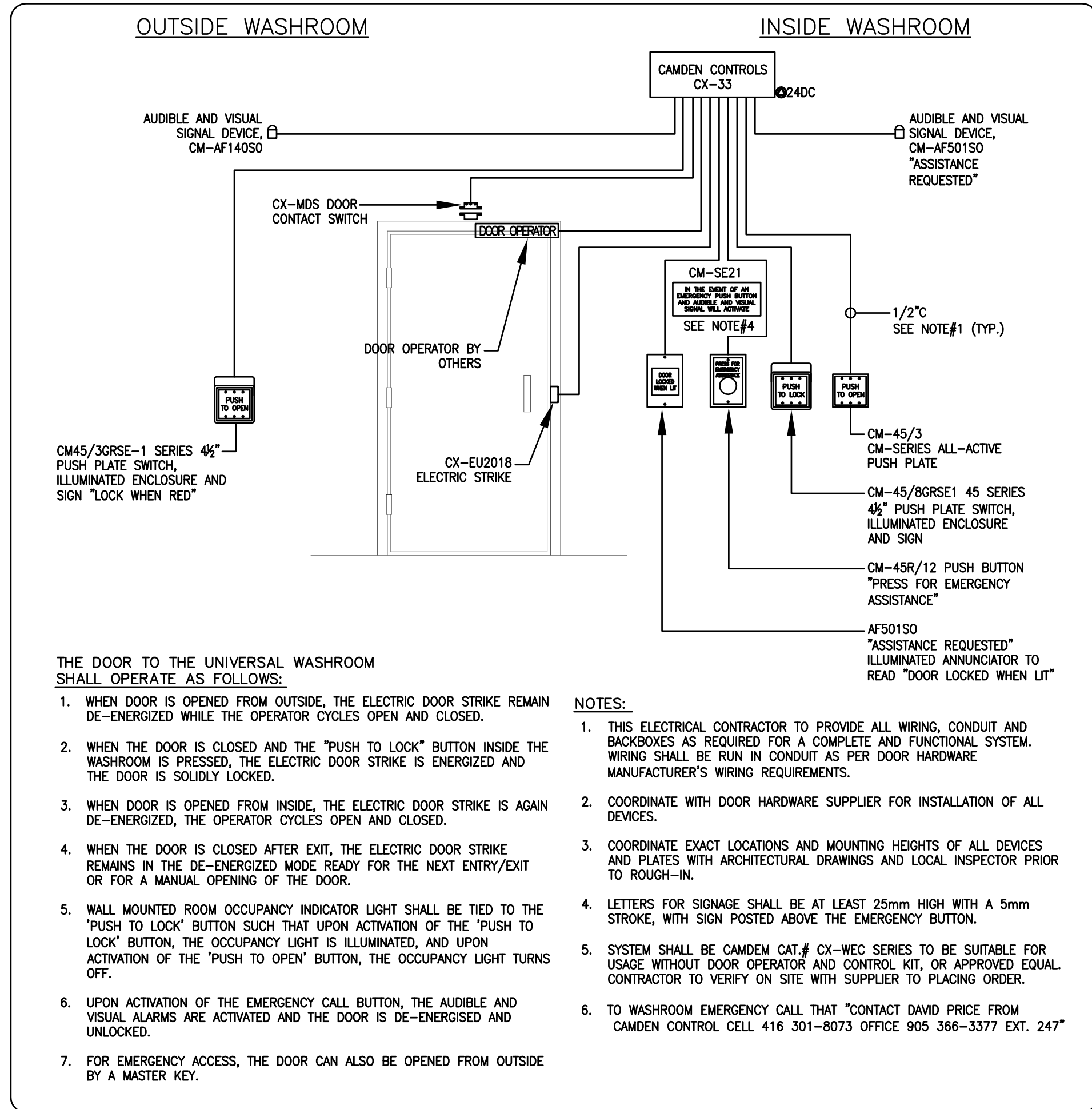
CONSULTING INC.

490 Harry Walker Parkway South Unit #3  
Newmarket, Ontario L3Y 0B3  
Bus. (905) 773-0200 Fax 1-866-830-5484  
stmf@bkconsulting.ca

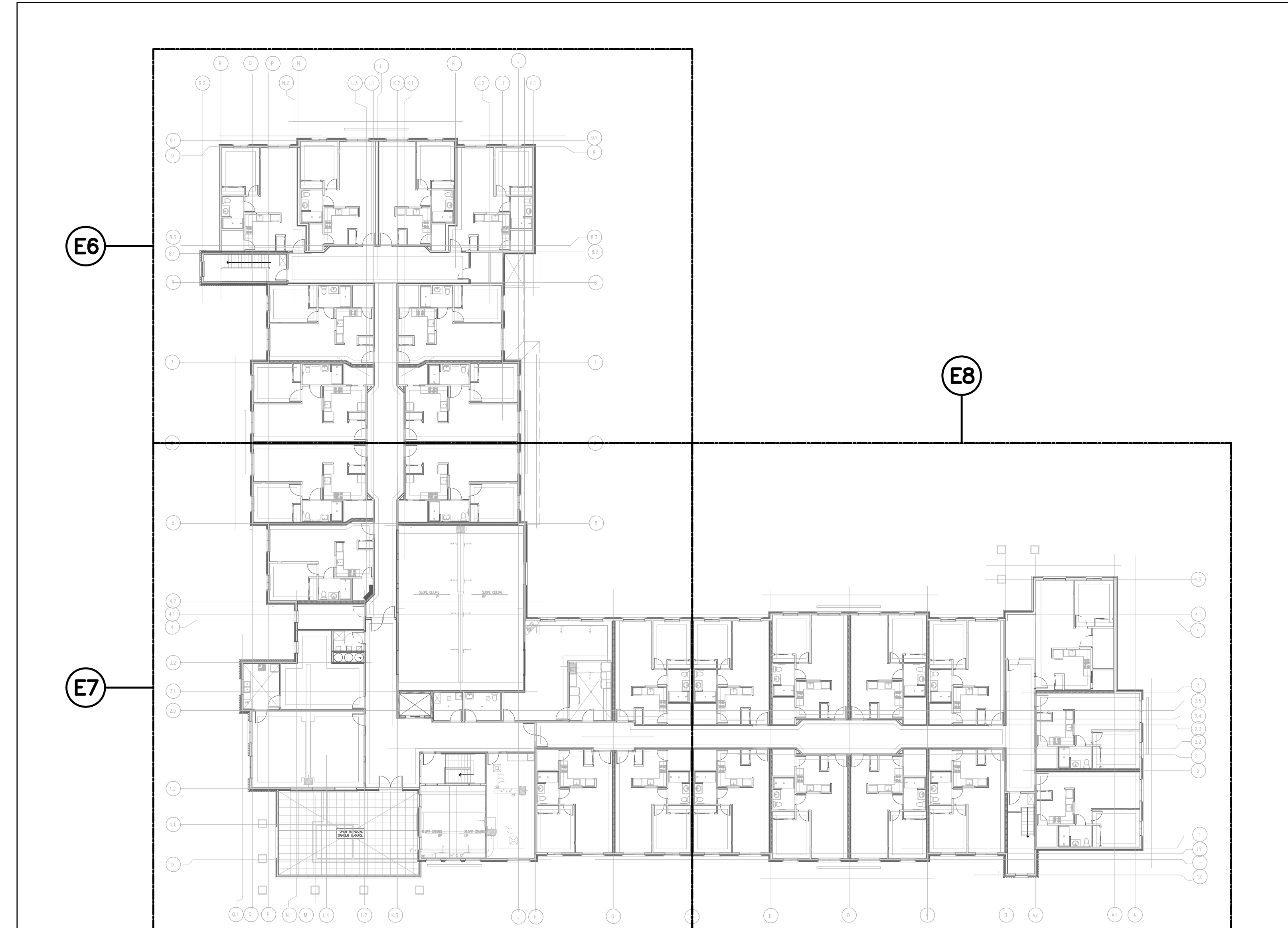
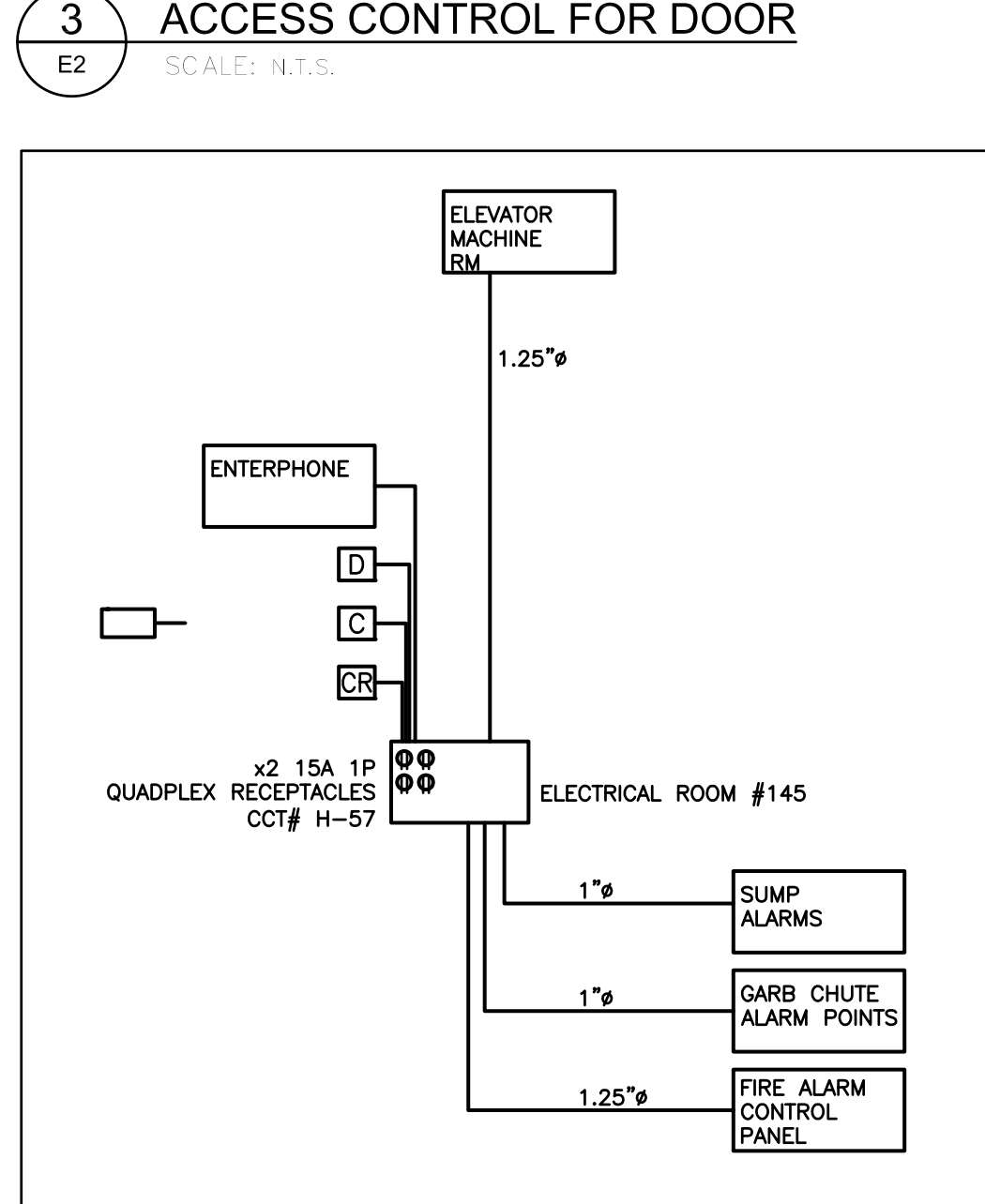
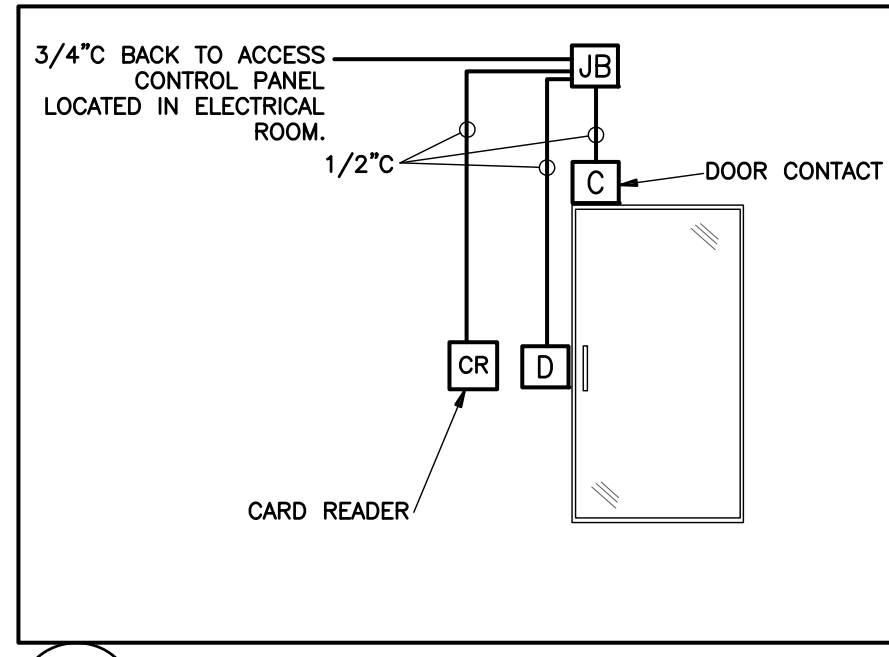
**SENIORS RESIDENCE**  
100 MCKAY STREET

CANNINGTON ONTARIO	
ELECTRICAL	
PROJECT NO.	18-660
SITE PLAN	
DATE	2018
DRAWN BY	TH
SCALE	1:200

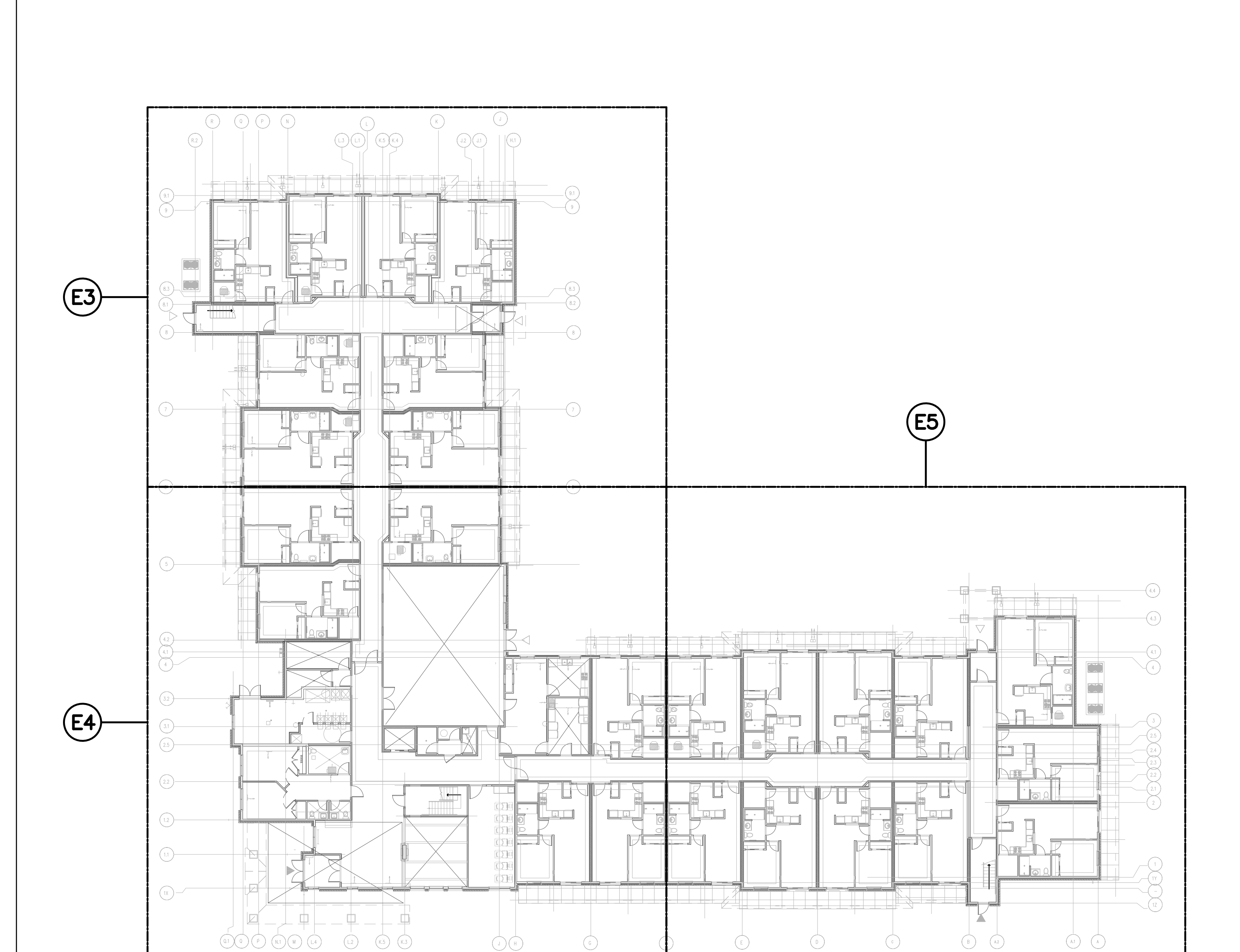
**E-1**  
OF 11



**2 UNIVERSAL WASHROOM DOOR AND CALL FOR ASSISTANCE SYSTEM**  
SCALE: N.T.S.



**SECOND FLOOR**



**GROUND FLOOR**

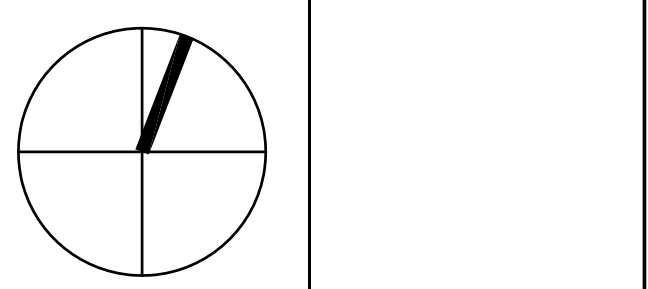
NO.	DATE	DESCRIPTION
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THESE DRAWINGS ARE NOT TO BE SCALED.

CONSTRUCTION NORTH



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**SENIORS RESIDENCE**  
100 MCKAY STREET

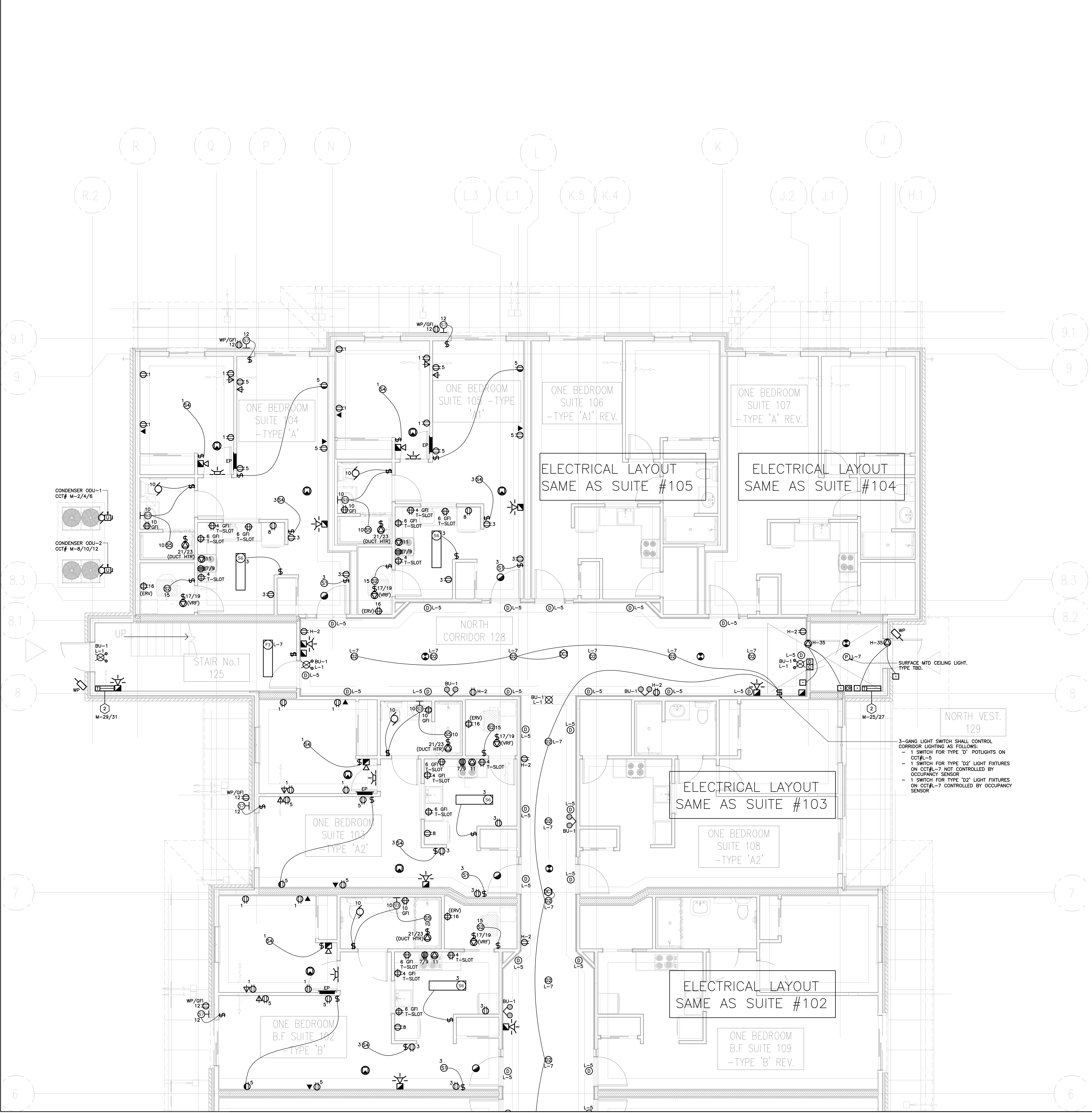
CANNINGTON ONTARIO

**ELECTRICAL**

PROJECT No. 18-660

KEY PLAN & DETAILS

DATE	2018	<b>E-2</b>
DRAWN BY	TH	
SCALE	N.T.S.	



PANEL SCHEDULE																																																																																																																																											
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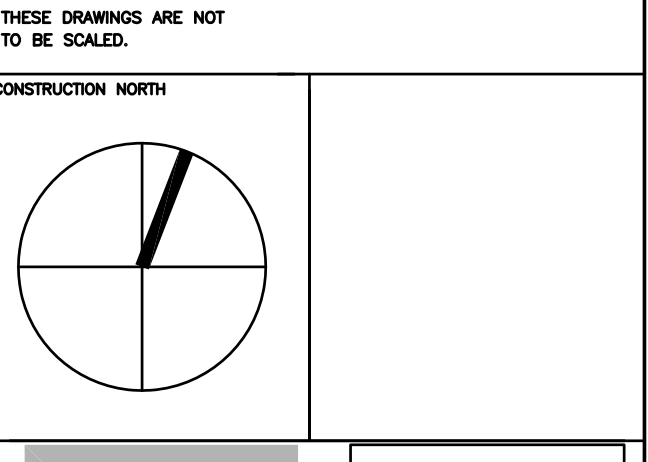
1 TYPICAL SUITE PANEL SCHEDULE  
E3 SCALE: N.T.S.

- SUITE LAYOUT NOTES:**
- SUITES ARE FULLY SPRINKLERED.
  - COORDINATE SUITE PANEL LOCATIONS WITH LATEST ARCHITECTURAL DRAWINGS AND PLUG/SWITCH LAYOUT WITH LATEST INTERIOR DESIGN/MARKETING PLANS.
  - OUTLETS/DEVICES MAY BE MOVED WITHIN A 3.0m RADIUS OF LOCATION SHOWN, AT NO EXTRA COST TO THE CONTRACTOR IF RELOCATED PRIOR TO FINAL INSTALLATION.
  - CONFIRM ALL LUMINAIRE TYPES & LOCATIONS WITH CLIENT PRIOR TO ROUGH IN. DO NOT INSTALL LIGHTS IN CEILING AREAS WHERE THE CEILING FINISH CHANGES.
  - INSTALL A RECESSED MOUNTED COMMUNICATIONS JUNCTION BOX IN EACH SUITE, SHARED FOR TELEPHONE AND TV. EXACT LOCATION OF JB TO BE DETERMINED ON SITE AND COORDINATED WITH ARCHITECT & CLIENT. RUN TWO 3/4" CONDUITS WITH FULL STRING, FROM JB BACK TO ELECTRICAL CLOSET IN CORRIDOR. MARK SUITE NUMBER ON EACH CONDUIT.
  - CONFIRM KITCHEN MILLWORK LAYOUT PRIOR TO PLUG LAYOUT & REVISE ROUGH IN TO SUIT. INSTALL PLUG IN KITCHEN ISLAND ONLY IF ISLAND IS PERMANENTLY FIXED.
  - PROVIDE ADDITIONAL OUTLETS AS MAY BE REQUIRED TO MEET ELECTRICAL CODES, WHETHER SPECIFICALLY SHOWN ON DRAWINGS OR NOT. ELECTRICAL CONTRACTOR TO CONFIRM FINAL SUITE LAYOUTS & PROVIDE ADDITIONAL RECEPTACLES AS PER CODE AS REQUIRED. ALL EXTRA RECEPTACLES REQUIRED BY CODE SHALL BE INCLUDED IN TENDER PRICE.
  - KITCHEN COUNTER RECEPTACLES TO BE 20A T-SLOT. GFI WHERE REQUIRED.
  - ALL DWELLING UNITS TO HAVE TAMPER PROOF RECEPTACLES.
  - ALL BRANCH CIRCUITS SHALL BE ARC FAULT CIRCUIT INTERRUPTER "AFI" TYPE
  - COMBINATION SMOKE/CO ALARMS SHALL BE INSTALLED WITH PERMANENT CONNECTION TO PANEL WITH NO DISCONNECT SWITCH BETWEEN THE OVER CURRENT DEVICE AND THE SMOKE/CO ALARM. THE ALARMS SHALL BE WIRED SO THAT IF ONE ALARM IN A SUITE SOUNDS, ALL ALARMS IN THE SAME SUITE WILL SOUND, AS PER CODE, ONE SMOKE IN EACH BEDROOM AND ONE OUTSIDE IN THE DWELLING UNIT. CO/SMOKE IS TO BE L/W STROBE LIGHT.
  - ELECTRICAL CONTRACTOR SHALL SUPPLY DRIVERS CURRENT SENSE RELAY. CONFIRM LOCATION OF DRYER BOOSTER FAN PRIOR TO ROUGH IN.
  - ONLY GROUND FLOOR BALCONIES AND TERRACES TO RECEIVE LIGHT FIXTURE.
  - IN KITCHENS WITH SEPARATE COOKTOP & OVEN, A TAP CONNECTION MAY BE USED.
  - PER CODE, LIVING ROOM TO RECEIVE A FIRE ALARM HORN/STROBE.

NO.	DATE	DESCRIPTION
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**B K**

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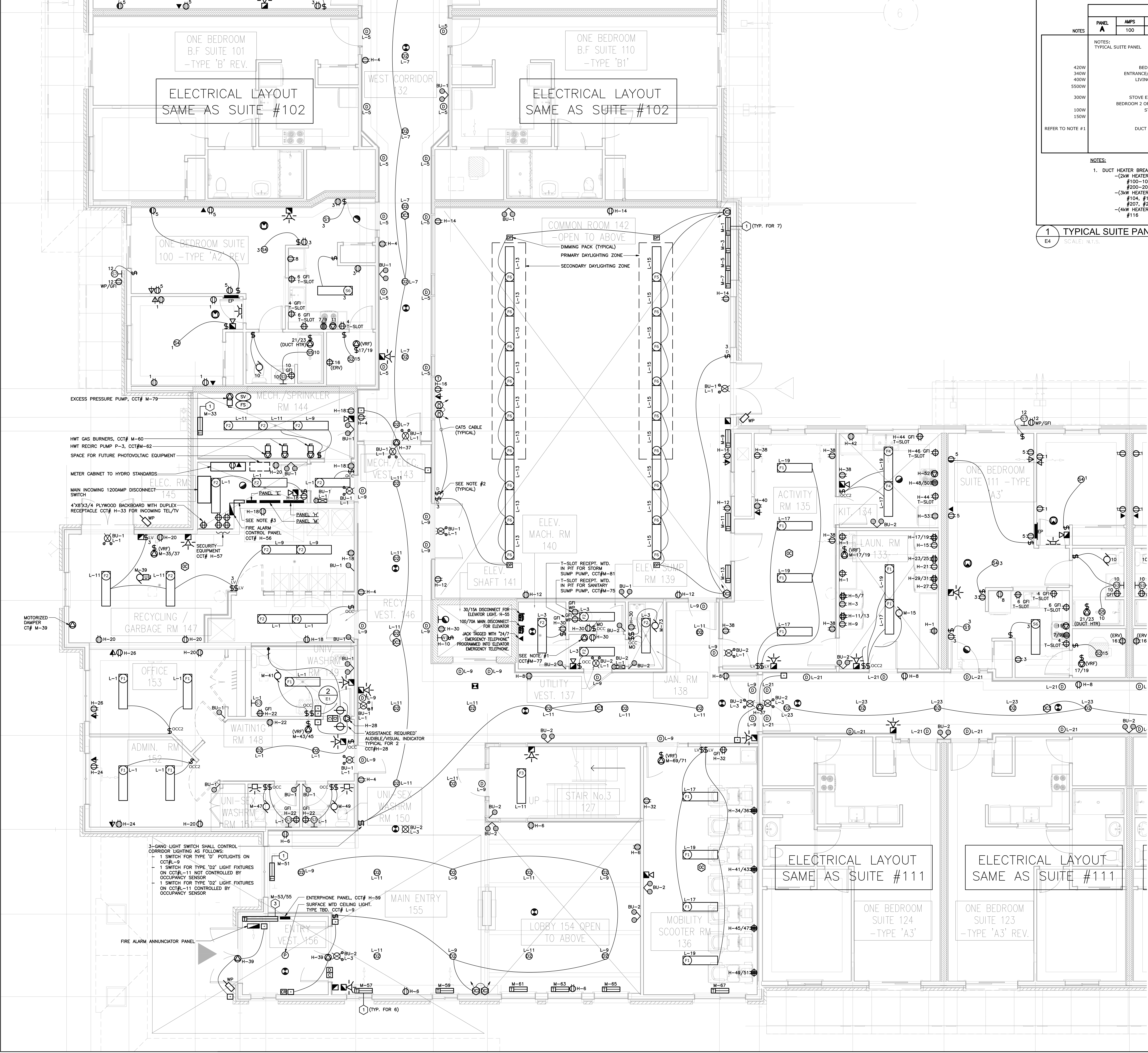
**SENIORS RESIDENCE**  
100 MCKAY STREET

CANNINGTON ONTARIO

ELECTRICAL  
PROJECT No. 18-860  
DRAWING TITLE

PART GROUND FLOOR  
POWER, LIGHTING AND LIFE  
SAFETY PLAN

DATE: 2018  
DRAWN BY: TH  
SCALE: 1:50  
E-3  
OF 11



PANEL SCHEDULE																																																																																																																																											
PANEL	AMPS	VOLTAGE	PHASE	WIRE	CIRCUIT	TYPE	MOUNTING	NOTES																																																																																																																																			
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    - (4kW HEATER) 25A/2P FOR THE FOLLOWING SUITES: #207, #216, #116

1 TYPICAL SUITE PANEL SCHEDULE  
E4 SCALE: N.T.S.

- SUITE LAYOUT NOTES:
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  - IN KITCHENS WITH SEPARATE COOKTOP & OVEN, A TAP CONNECTION MAY BE USED.
  - PER CODE, LIVING ROOM TO RECEIVE A FIRE ALARM HORN/STROBE.

- DRAWING NOTES:
- SANITARY SUMP PUMP CONTROL PANEL/HIGH WATER ALARM. PROVIDE 21mm C/C FROM PIT TO HIGH WATER ALARM BUZZER LOCATION.
  - ACTIVITY BRAND #PDM-2P-DX DIMMER:
    - 1 POLE FOR CONTROL OF DAYLIGHT CONTROLLED LIGHTS IN ROW
    - 1 POLE FOR CONTROL OF NON-DAYLIGHT CONTROLLED LIGHTS IN ROW
  - EXTERIOR LIGHTING CONTROL RELAY PANEL SIZED TO SUIT LOAD C/W PHOTOCELL KIT FOR ON/OFF SWITCHING AND ASTRONOMICAL TIME CLOCK. PANEL INPUT POWER CCT# E-17.

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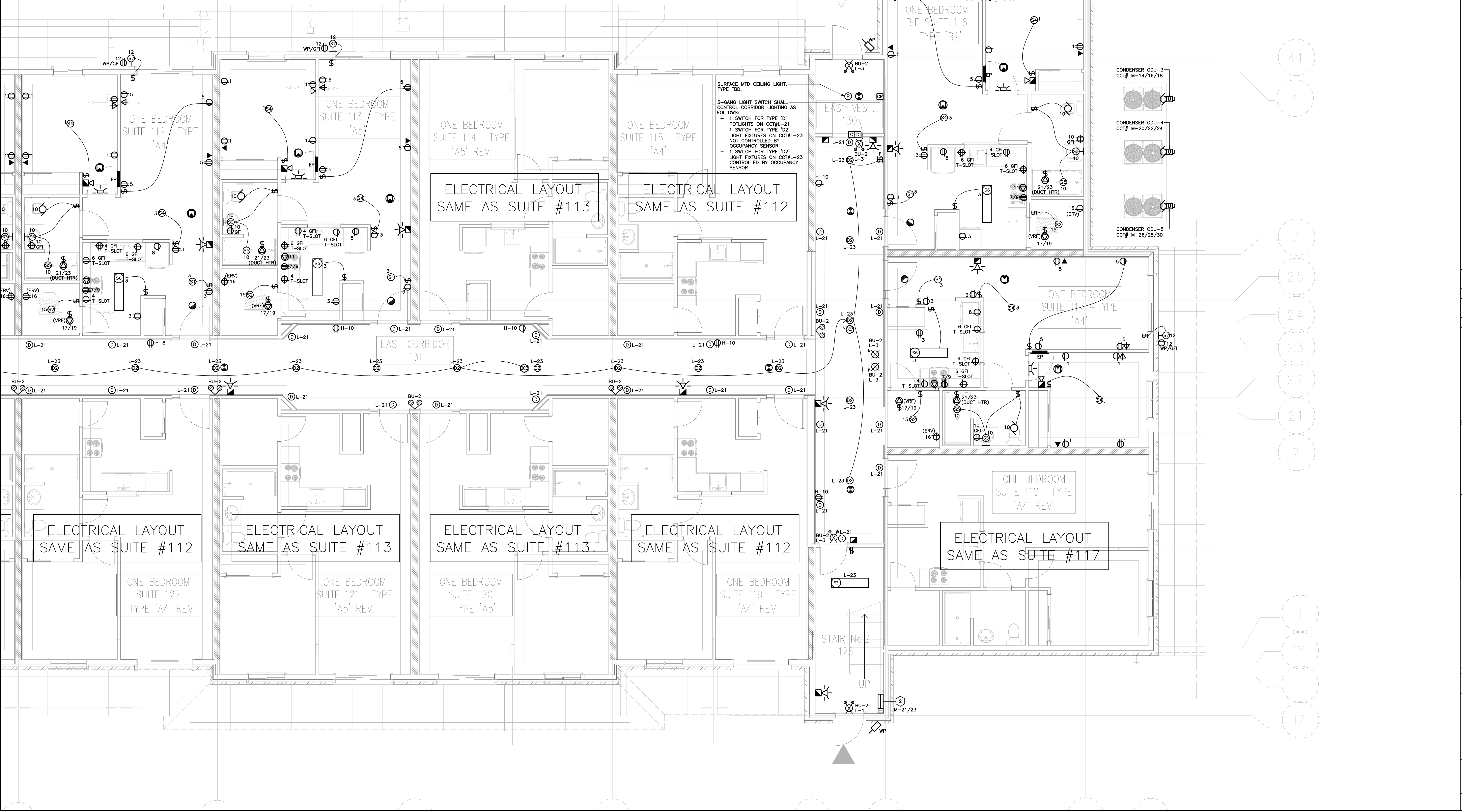
**SENIORS RESIDENCE**  
100 MCKAY STREET

CANNINGTON ONTARIO	
ELECTRICAL	
PLG DATE	PROJECT No. 18-660
PART GROUND FLOOR POWER, LIGHTING AND LIFE SAFETY PLAN	
DATE	2018
DRAWN BY	TH E-4
SCALE	1:50 OF 11

PANEL SCHEDULE									
PANEL	AMPS	VOLTAGE	PHASE	WIRE	CIRCUIT	TYPE	MOUNTING	NOTES	
A	100	120/240	1	3	24	NEW	RECESSED		
NOTES:									
TYPICAL SUITE PANEL									
420W	BEDROOM 1	15A	1	2	15A	SPARE			
340W	ENTRANCE/DINING	15A	3	4	20A	KITCHEN T-SLOTS			400W
400W	LIVING ROOM	15A	5	6	20A	KITCHEN T-SLOTS			400W
5500W	STOVE	40A	7	8	15A	FRIDGE			500W
300W	STOVE EXHAUST	15A	9	10	15A	BATHROOM			340W
100W	BEDROOM 2 OR SPARE	15A	11	12	15A	OUTDOOR			100W
150W	STORAGE	15A	13	14	15A	SPARE			
	STORAGE	15A	15	16	15A	ERV UNIT			160W
	VRF	15A	17	18		SPACE			
	DUCT HEATER	2P	19	20					
		2P	21	22					
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1 TYPICAL SUITE PANEL SCHEDULE  
E5 SCALE: N.T.S.

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  - CONFIRM ALL LUMINAIRE TYPES & LOCATIONS WITH CLIENT PRIOR TO ROUGH IN, DO NOT INSTALL LIGHTS IN CEILING AREAS WHERE THE CEILING FINISH CHANGES.
  - INSTALL A RECESSED MOUNTED COMMUNICATIONS JUNCTION BOX IN EACH SUITE, SHARED FOR TELEPHONE AND TV. EXACT LOCATION OF JB TO BE DETERMINED ON SITE AND COORDINATED WITH ARCHITECT & CLIENT. RUN TWO 3/4" CONDUITS WITH PULL STRING, FROM JB BACK TO ELECTRICAL CLOSET IN CORRIDOR. MARK SUITE NUMBER ON EACH CONDUIT.
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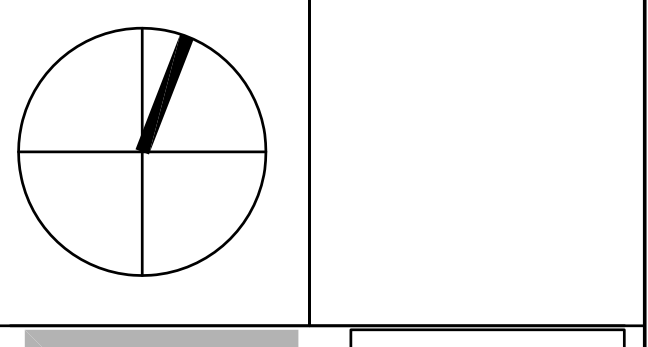


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**SENIORS RESIDENCE**  
100 MCKAY STREET

CANNINGTON ONTARIO

ELECTRICAL

PROJECT No. 18-860

PART GROUND FLOOR  
POWER, LIGHTING AND LIFE  
SAFETY PLAN

DATE: 2018  
DRAWN BY: TH  
SCALE: 1:50

E-5  
OF 11

PANEL SCHEDULE																																																																																																																																											
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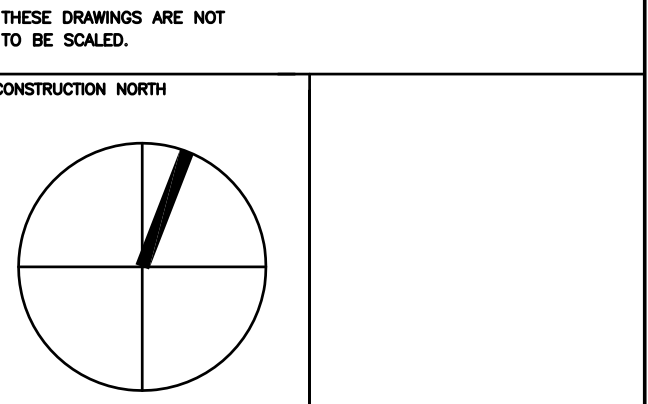
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E4 SCALE: N.T.S.

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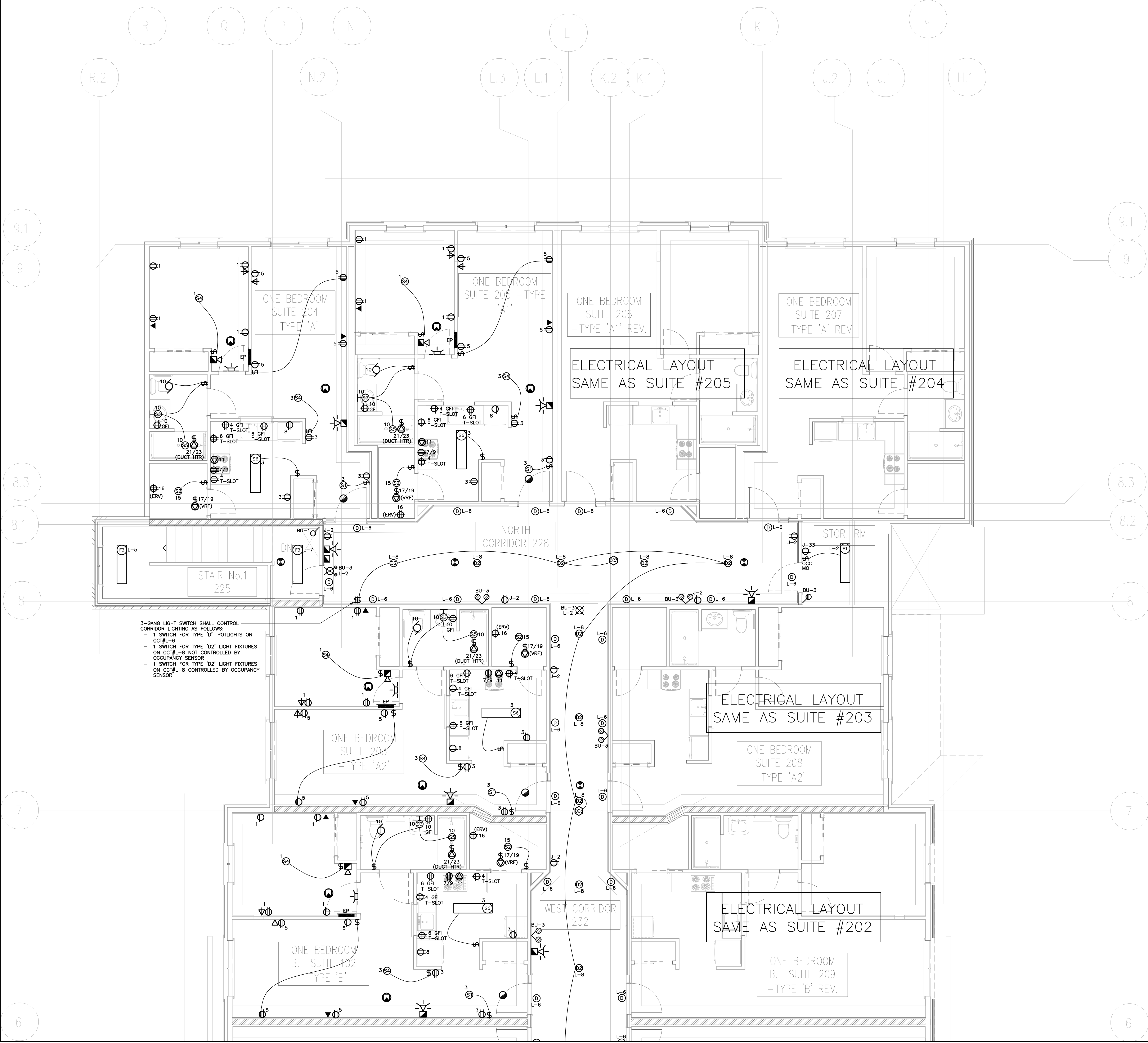
CANNINGTON ONTARIO

ELECTRICAL

PART SECOND FLOOR  
POWER, LIGHTING AND LIFE  
SAFETY PLAN

DATE: 2018  
DRAWN BY: TH  
SCALE: 1:50

PROJECT No: 18-660  
E-6  
OF 11



ELECTRICAL LAYOUT  
SAME AS SUITE #202

ELECTRICAL LAYOUT  
SAME AS SUITE #202

ONE BEDROOM SUITE  
200 -TYPE 'A2'  
REV.

ONE BEDROOM  
B.F SUITE 210  
-TYPE 'B1'

COMMON ROOM 142-  
OPEN TO BELOW

ACTIVITY RM  
237

ONE BEDROOM  
SUITE 211 -TYPE  
'A3'

ACTIVITY RM  
231

CENTRAL  
CORRIDOR  
234

JAN. RM  
235

B.F WASHRM  
236

LAUNDRY RM  
238

LOUNGE  
233

STAIR No.3  
227

ACTIVITY RM  
240

LOBBY 154 OPEN  
TO BELOW

ELECTRICAL LAYOUT  
SAME AS SUITE #211

ELECTRICAL LAYOUT  
SAME AS SUITE #211

ONE BEDROOM  
SUITE 224  
-TYPE 'A3'

ONE BEDROOM  
SUITE 223  
-TYPE 'A3' REV.

CONTROLLED BY:  
- 3-GANG LIGHT SWITCH SHALL CONTROL  
CORRIDOR LIGHTING AS FOLLOWS:  
- 1 SWITCH FOR TYPE 'D' POTLIGHTS ON  
CCTAL-10  
- 1 SWITCH FOR TYPE 'D2' LIGHT FIXTURES  
ON CCTAL-12 NOT CONTROLLED BY  
OCCUPANCY SENSOR  
- 1 SWITCH FOR TYPE 'D2' LIGHT FIXTURES  
ON CCTAL-12 CONTROLLED BY  
OCCUPANCY SENSOR

OPEN TO ABOVE  
GARDEN TERRACE

PANEL SCHEDULE									
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E4 SCALE: N.T.S.

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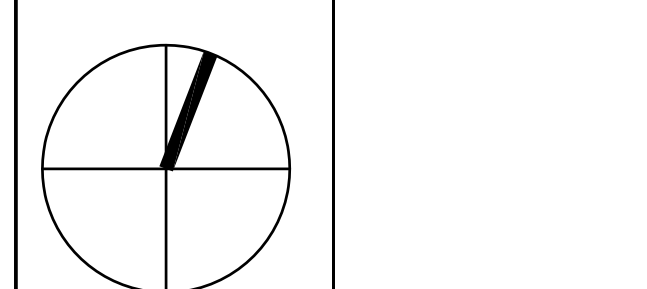
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490 Harry Walker Parkway South Unit #3  
Newmarket, Ontario L3Y 0B3  
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SENIORS RESIDENCE  
100 MCKAY STREET

CANNINGTON ONTARIO

ELECTRICAL

PROJECT NO. 18-860

DRAWING TITLE

PART SECOND FLOOR  
POWER, LIGHTING AND LIFE  
SAFETY PLAN

DATE 2018

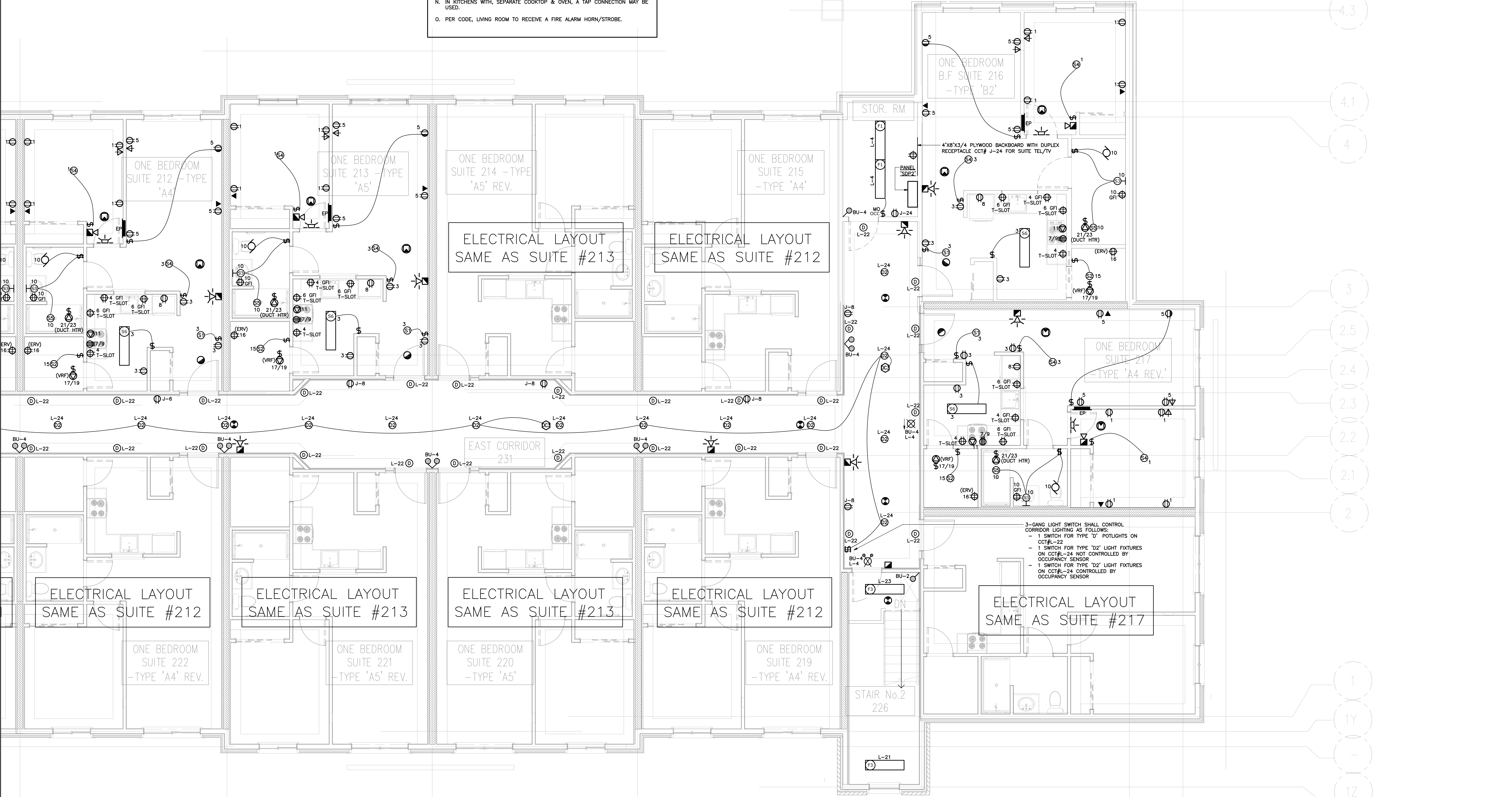
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SCALE 1:50 OF 11

PANEL SCHEDULE									
PANEL	AMPS	VOLTAGE	PHASE	WIRE	CIRCUIT	TYPE	MOUNTING	NOTES	
A	100	120/240	1	3	24	NEW	RECESSED		
NOTES:									
TYPICAL SUITE PANEL									
420W	BEDROOM 1	15A	1	2	15A	SPARE		400W	
340W	ENTRANCE/DINING	15A	3	4	20A	KITCHEN T-SLOTS		400W	
400W	LIVING ROOM	15A	5	6	20A	KITCHEN T-SLOTS		500W	
5500W	STOVE	40A	7	8	15A	FRIDGE		340W	
300W	STOVE EXHAUST	15A	9	10	15A	BATHROOM		100W	
	BEDROOM 2 OR SPARE	15A	11	12	15A	OUTDOOR			
100W	STORAGE	15A	13	14	15A	SPARE			
150W	VRP	15A	15	16	15A	ERV UNIT			
	DUCT HEATER	2P	17	18		SPACE			
		2P	19	20					
		2P	21	22					
		2P	23	24					

1 TYPICAL SUITE PANEL SCHEDULE  
E5 SCALE: N.T.S.

- SUITE LAYOUT NOTES:**
- SUITES ARE FULLY SPRINKLERED.
  - COORDINATE SUITE PANEL LOCATIONS WITH LATEST ARCHITECTURAL DRAWINGS AND PLUG/SWITCH LAYOUT WITH LATEST INTERIOR DESIGN/MARKETING PLANS.
  - OUTLETS/DEVICES MAY BE MOVED WITHIN A 3.0m RADIUS OF LOCATION SHOWN, AT NO EXTRA COST TO THE CONTRACT IF RELOCATED PRIOR TO FINAL INSTALLATION.
  - CONFIRM ALL LUMINAIRE TYPES & LOCATIONS WITH CLIENT PRIOR TO ROUGH IN, DO NOT INSTALL LIGHTS IN CEILING AREAS WHERE THE CEILING FINISH CHANGES.
  - INSTALL A RECESSED MOUNTED COMMUNICATIONS JUNCTION BOX IN EACH SUITE, SHARED FOR TELEPHONE AND TV. EXACT LOCATION OF JB TO BE DETERMINED ON SITE AND COORDINATED WITH ARCHITECT & CLIENT. RUN TWO 3/4" CONDUITS WITH PULL STRING, FROM JB BACK TO ELECTRICAL CLOSET IN CORRIDOR. MARK SUITE NUMBER ON EACH CONDUIT.
  - CONFIRM KITCHEN MILLWORK LAYOUT PRIOR TO PLUG LAYOUT & REVISE ROUGH IN TO SUIT. INSTALL PLUG IN KITCHEN ISLAND ONLY IF ISLAND IS PERMANENTLY FIXED.
  - PROVIDE ADDITIONAL OUTLETS AS MAY BE REQUIRED TO MEET ELECTRICAL CODES, WHETHER SPECIFICALLY SHOWN ON DRAWINGS OR NOT. ELECTRICAL CONTRACTOR TO CONFIRM FINAL SUITE LAYOUTS & PROVIDE ADDITIONAL RECEPTACLES AS PER CODE AS REQUIRED. ALL EXTRA RECEPTACLES REQUIRED BY CODE SHALL BE INCLUDED IN TENDER PRICE.
  - KITCHEN COUNTER RECEPTACLES TO BE 20A T-SLOT, GFI WHERE REQUIRED.
  - ALL DWELLING UNITS TO HAVE TAMPER PROOF RECEPTACLES.
  - ALL BRANCH CIRCUITS SHALL BE ARC FAULT CIRCUIT INTERRUPTER "AFI" TYPE
  - COMBINATION SMOKE/CO ALARMS SHALL BE INSTALLED WITH PERMANENT CONNECTION TO PANEL WITH NO DISCONNECT SWITCH BETWEEN THE OVER CURRENT DEVICE AND THE SMOKE/CO ALARM. THE ALARMS SHALL BE WIRED SO THAT IF ONE ALARM IN A SUITE SOUNDS, ALL ALARMS IN THE SAME SUITE WILL SOUND, AS PER CODE, ONE SMOKE IN EACH BEDROOM AND ONE OUTSIDE IN THE DWELLING UNIT. CO/SMOKE IS TO BE C/W STROBE LIGHT.
  - ELECTRICAL CONTRACTOR SHALL SUPPLY DRYER CURRENT SENSE RELAY. CONFIRM LOCATION OF DRYER BOOSTER FAN PRIOR TO ROUGH IN.
  - ONLY GROUND FLOOR BALCONIES AND TERRACES TO RECEIVE LIGHT FIXTURE.
  - IN KITCHENS WITH SEPARATE COOKTOP & OVEN, A TAP CONNECTION MAY BE USED.
  - PER CODE, LIVING ROOM TO RECEIVE A FIRE ALARM HORN/STROBE.



NO.	DATE	DESCRIPTION
5	DEC 14/18	ISSUED FOR CONSTRUCTION
4	AUG 13/18	ADDENDUM #2
3	JUL/16/2018	ISSUED FOR PERMIT & TENDER
2	JUN/12/2018	ISSUED FOR REVIEW
1	APR/19/2018	ISSUED FOR REVIEW

THIS DRAWING SHALL BE USED ONLY FOR THE PURPOSE INDICATED IN THE LATEST ISSUED COLUMN ABOVE.

ALL DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE DESIGNER AND MAY NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION. DRAWINGS MUST NOT BE SCALED. CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ERRORS AND OMISSIONS TO THE DESIGNER. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION UNLESS COUNTERSIGNED BY THE DESIGNER.

THESE DRAWINGS ARE NOT TO BE SCALED

CONSTRUCTION NORTH

**B K**

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CANNINGTON ONTARIO

ELECTRICAL

PART SECOND FLOOR  
POWER, LIGHTING AND LIFE  
SAFETY PLAN

DATE: 2018  
DRAWN BY: TH  
SCALE: 1:50

PROJECT No: 18-660  
E-8  
OF 11





CONSULTING INC.

16945 Leslie Street, Unit 20, Newmarket, ON L3Y 9A2  
T 905.773.0200 F 1.866.411.8257

**Detailed Electrical Load Calculations per OESC**

JOBNAME: **Cannington** Job No: **18-660**

**Largest Suite:** 60 sq.m.  
1st 45 m2 @ 3.5kw: 1500 w  
2nd 45m2 @ 1.5kw: 450 w  
Balance @ 1.0kw/45m2: 450 w  
Range: 6000 w  
Duct heater @ 25%: 1000 w  
**Total: 12.0 kw**

**Total number of Suites:** 50  
1st unit @ 100%: 12.0 kw  
Next 2 units @ 65%: 15.6 kw  
Next 2 units @ 40%: 9.6 kw  
Next 15 units @ 25%: 36.0 kw  
Remainder @ 10%: 118.2 kw  
**Total: 118.2 kw**

**Total A/C Load (assuming 0.75tons/suite):** 118.2 T  
**Estimated Load:** 118.2 kw

**Electric heat in suites @ 100%:** 118.2 kw  
**General Lighting & Power:** 75 kw @ 75%  
**Electric vehicle supply equipment:** 17 kw @ 100%  
**Ramp Heating:** 1 kw  
**Elevator:** 6 kw  
**Fresh Air:** 1 kw  
**Mechanical Equipment:** 75 kw @ 75%  
**Mechanical Equipment Electric heat:** 173 kw @ 100%  
**Total: 173 kw**

**Grand Total: 291.2 kw**  
**Total kva @ .95pf = 306.5 kva**

**Total amperage x 1.25:** 1064.3 amps @ 120/208v

**Design is for an 1200 amp 120/208V 3phase service**

PANEL SCHEDULE table with columns: PANEL M, AMPS, VOLTAGE, PHASE, WIRE, CIRCUIT, TYPE, MOUNTING. Includes notes and load calculations for various equipment like heaters, compressors, and fans.

PANEL SCHEDULE table with columns: PANEL L, AMPS, VOLTAGE, PHASE, WIRE, CIRCUIT, TYPE, MOUNTING. Includes notes and load calculations for interior lighting panels.

PANEL SCHEDULE table with columns: PANEL E, AMPS, VOLTAGE, PHASE, WIRE, CIRCUIT, TYPE, MOUNTING. Includes notes and load calculations for exterior lighting panels.

PANEL SCHEDULE table with columns: PANEL A, AMPS, VOLTAGE, PHASE, WIRE, CIRCUIT, TYPE, MOUNTING. Includes notes and load calculations for a typical suite panel.

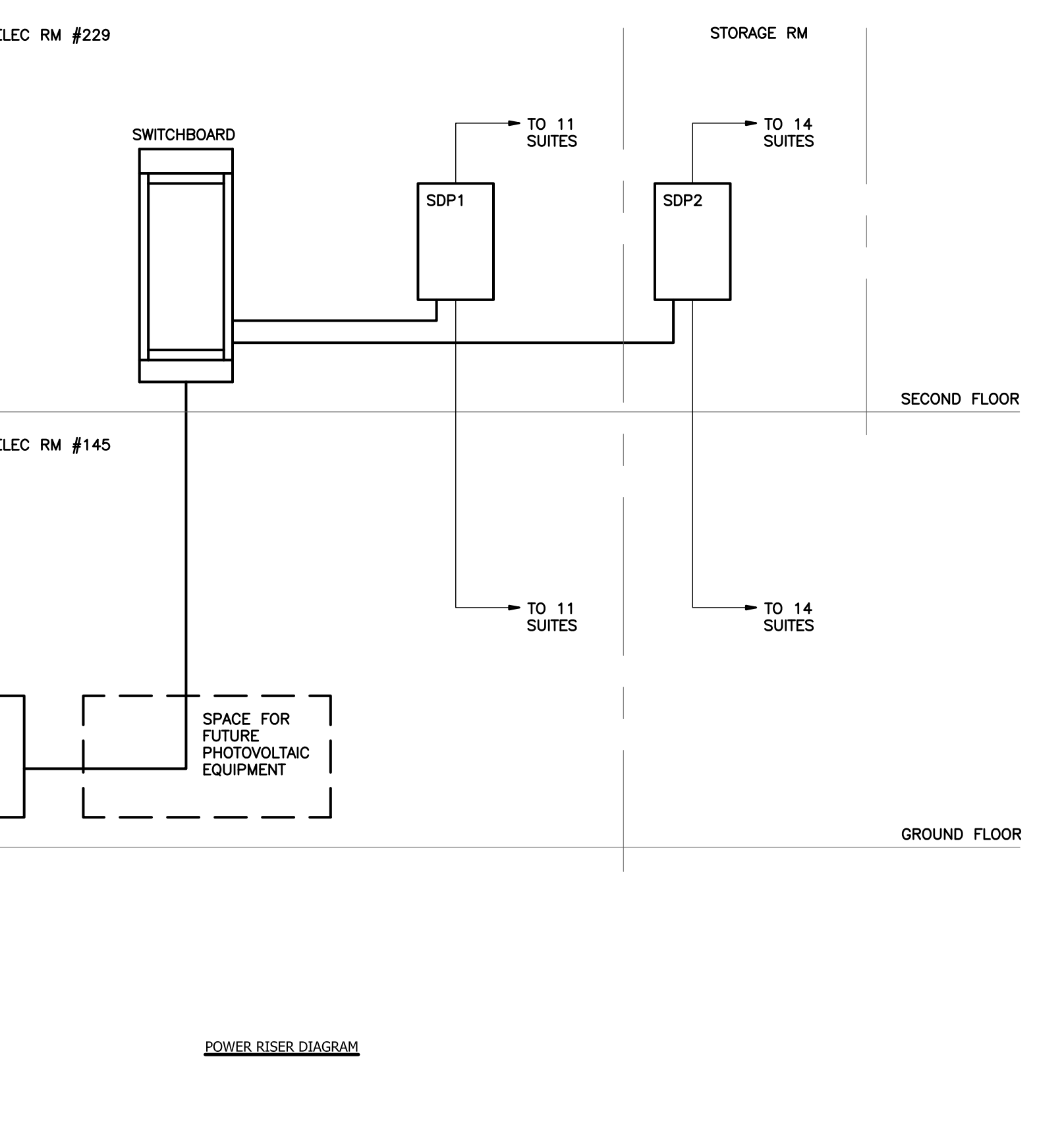
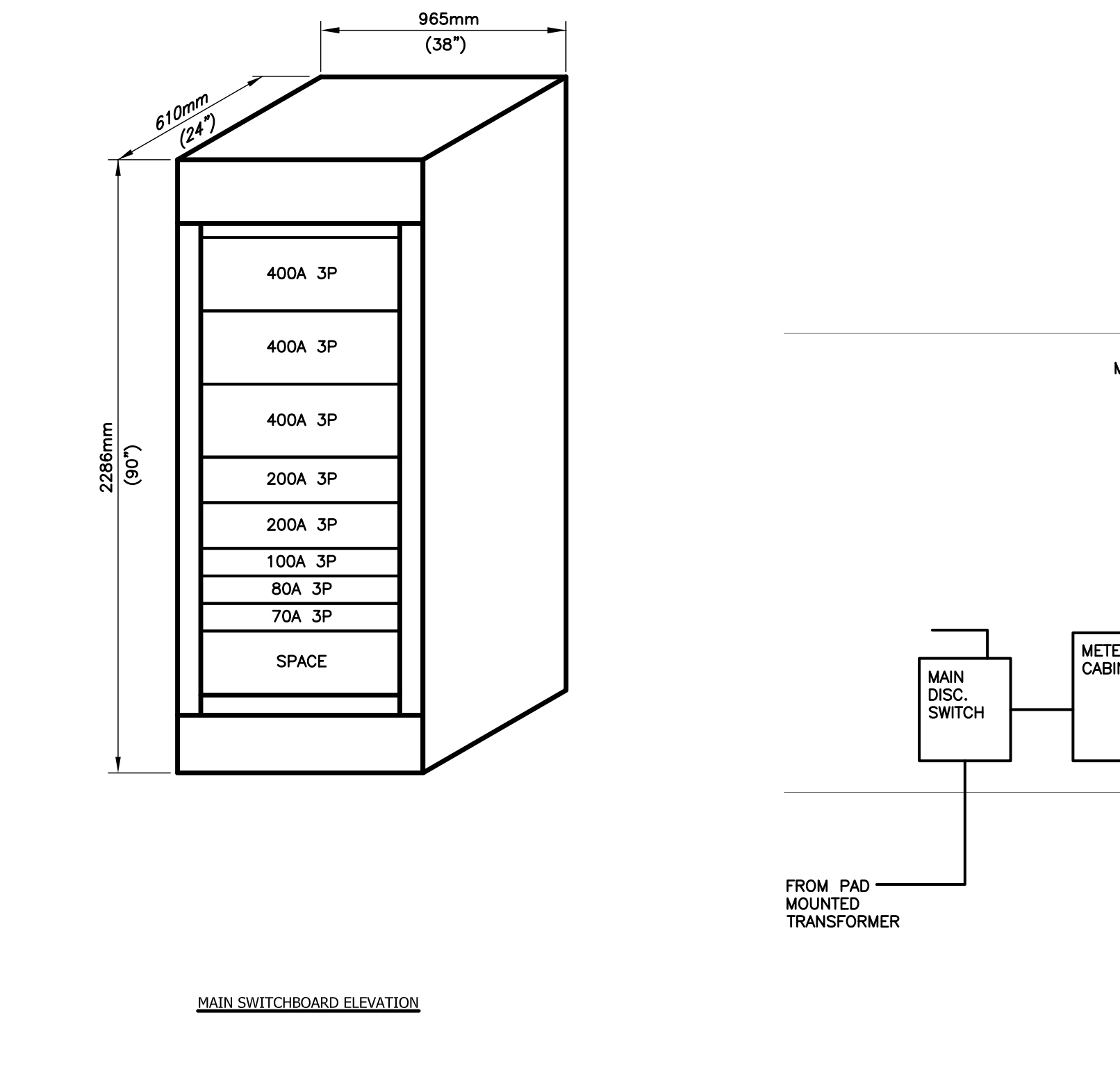
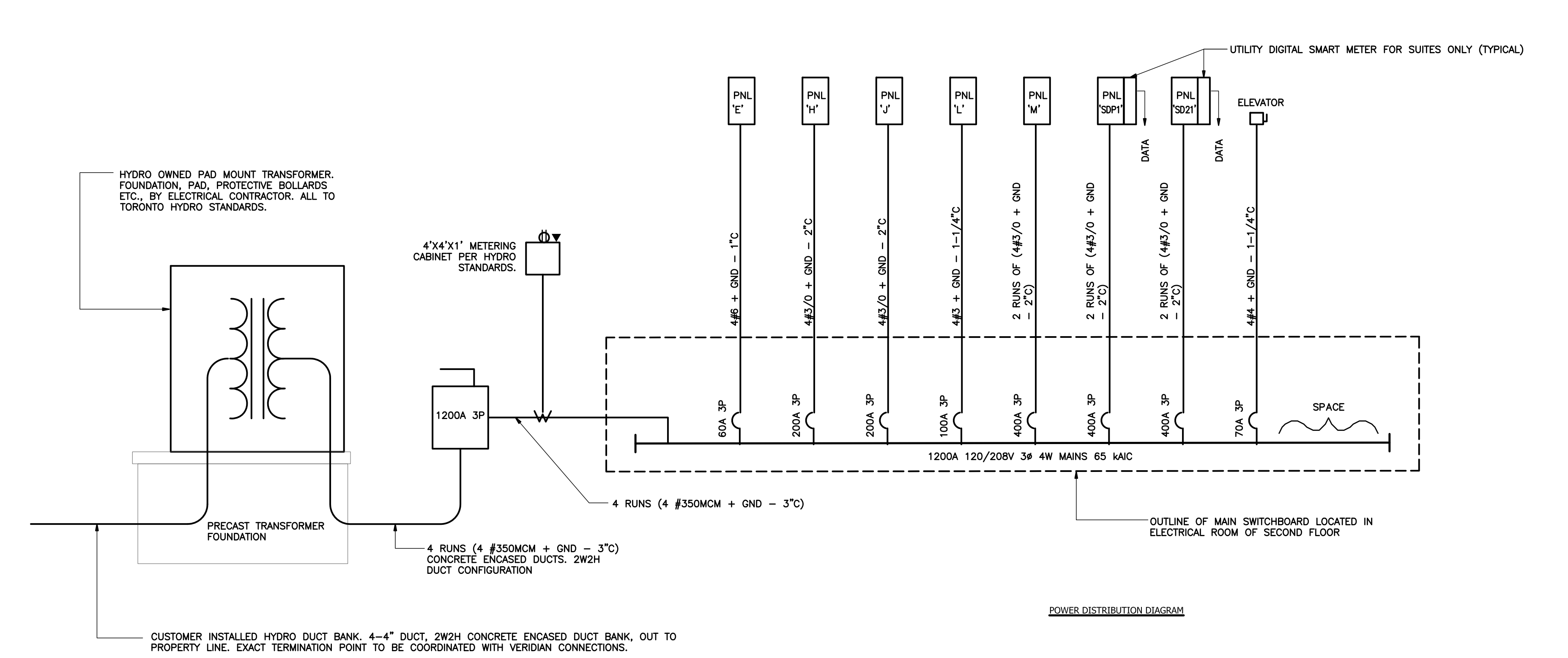
PANEL SCHEDULE table with columns: PANEL H, AMPS, VOLTAGE, PHASE, WIRE, CIRCUIT, TYPE, MOUNTING. Includes notes and load calculations for ground floor house panels.

PANEL SCHEDULE table with columns: PANEL J, AMPS, VOLTAGE, PHASE, WIRE, CIRCUIT, TYPE, MOUNTING. Includes notes and load calculations for second floor house panels.

- 1) UNLESS NOTED OTHERWISE, ALL WIRING SHALL BE TYPE THW INSULATION COPPER CONDUCTOR.
- 2) PROVIDE ISOLATION DISCONNECT SWITCHES AT ALL EQUIPMENT/MOTORS.
- 3) ELECTRICAL CONTRACTOR TO OBTAIN COPIES OF ALL EQUIPMENT SHOP DRAWINGS PRIOR TO ROUGH IN AND CONFIRM ALL POWER REQUIREMENTS. ADJUST CIRCUITING/WIRING TO SUIT.
- 4) ELECTRICAL CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER DIVISIONS TO CONFIRM POWER REQUIREMENTS, POWER LOCATIONS AND CONNECTION POINTS. ADJUST CIRCUITING/WIRING TO SUIT.
- 5) ALL LINE VOLTAGE INTERLOCKING SHALL BE BY ELECTRICAL CONTRACTOR. CONFIRM REQUIREMENTS WITH OTHER TRADES AS REQUIRED.
- 6) ELECTRICAL CONTRACTOR SHALL PROVIDE A DISTRIBUTION COORDINATION, SHORT CIRCUIT AND ARC FLASH STUDY TO CONFIRM THAT ALL EQUIPMENT OFFERED IS SUITABLY RATED FOR THIS PROJECT. THIS REPORT SHALL BE SIGNED BY A P.ENG. ALLOW TO PROVIDE THE COORDINATION SHORT CIRCUIT STUDY WITH THE DISTRIBUTION SHOP DRAWING SUBMISSION OF ALL EQUIPMENT. SHOW ALL SWITCHGEAR AND DISTRIBUTION FROM THE SERVICE ENTRY TO THE LAST PANEL. OBTAIN DETAILS FROM UTILITY AND INCORPORATE INTO STUDY.
- 7) CONFIRM ALL POWER REQUIREMENTS WITH SHOP DRAWINGS AND/OR NAMEPLATE DATA PRIOR TO ROUGH IN. ADJUST BREAKER SIZE AND/OR WIRE/CONDUIT SIZE AS REQUIRED.
- 8) PROVIDE 4/0 AL GROUND WIRE FROM MAIN ELECTRICAL ROOM TO GROUND BUS IN EACH ELECTRICAL ROOM.
- 9) FIRE RATED ENCLOSURE- ALL AREAS TO BE 2 HR FIRE RATED - OR ENCLOSED BY GENERAL CONTRACTOR

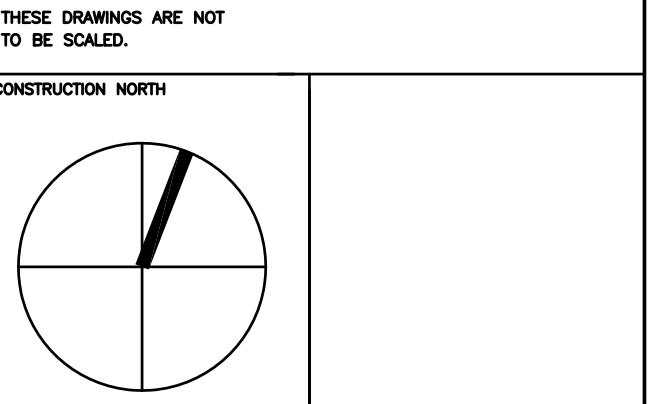
SUITE DISTRIBUTION PANEL SCHEDULE table with columns: TYPE, VOLTAGE, MAINS, BREAKER, FEEDER. Lists details for SDP1 and SDP2.

\* FOR ELECTRONIC METERING



Revision table with columns: NO., DATE, DESCRIPTION. Lists revisions from 1 to 5.

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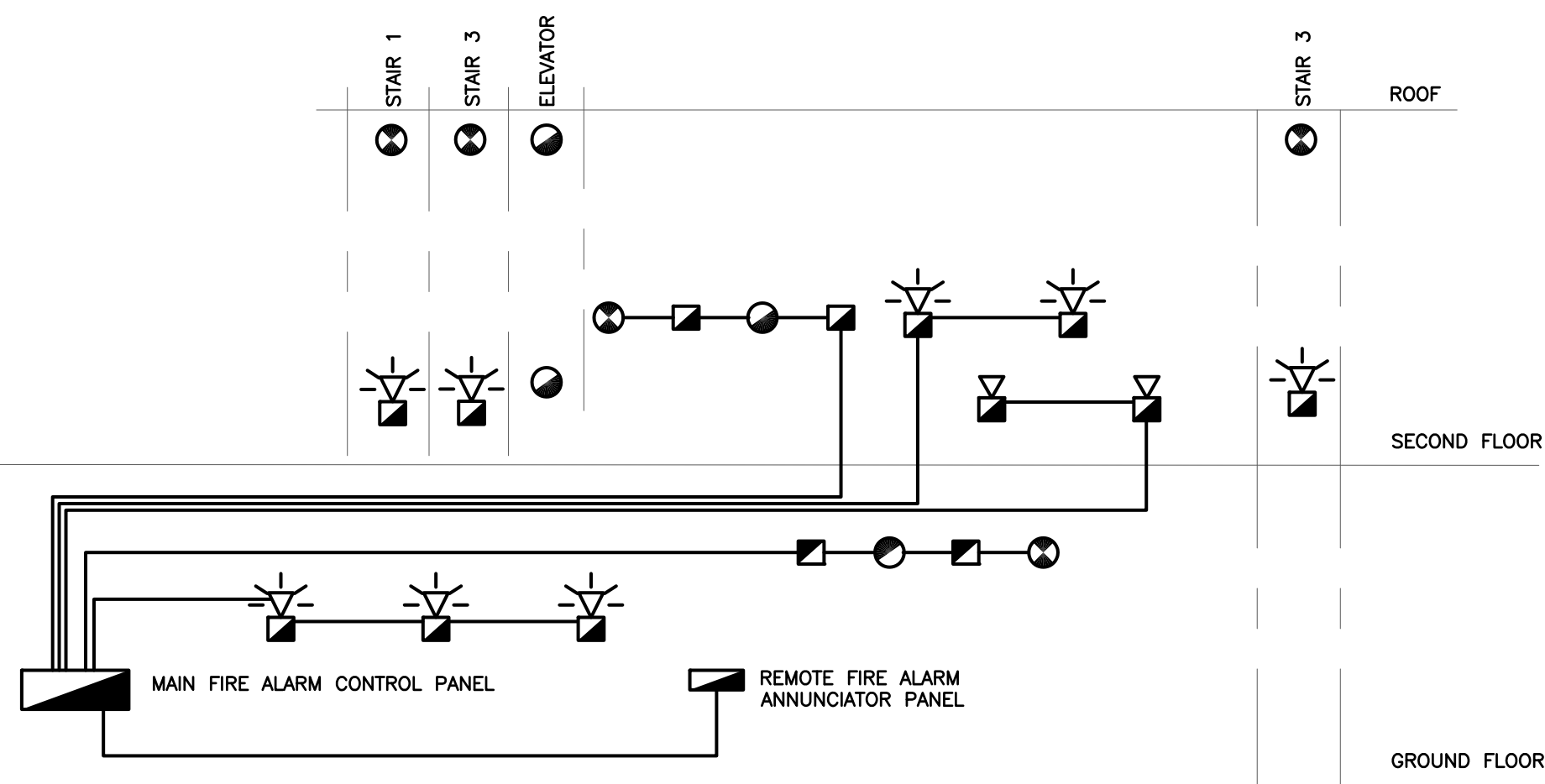
CANNINGTON ONTARIO

ELECTRICAL

PROJECT No: 18-660

SINGLE LINE DIAGRAM, SCHEDULES

DATE: 2018  
DRAWN BY: TH  
SCALE: N.T.S.  
PROJECT No: 18-660  
E-9  
OF 11



FIRE ALARM RISER DIAGRAM

- CONTRACTOR IS RESPONSIBLE FOR CO-ORDINATION AND COMPLIANCE WITH REQUIREMENTS OF LOCAL AUTHORITY HAVING JURISDICTION PRIOR TO COMMENCING ANY CONSTRUCTION. NOTE: FOR EXACT NUMBER AND LOCATION OF DETECTORS, DEVICES, PANELS, REFER TO FLOOR PLANS.
- CONTRACTOR TO MAKE HIM/HERSELF COMPLETELY FAMILIAR WITH THE REQUIREMENTS FOR FIRE ALARM SYSTEMS AS REQUIRED BY ALL CODES, AND THESE FORM PART OF THE CONTRACT DOCUMENTS WHETHER SPECIFICALLY INDICATED OR NOT. REFERENCES INCLUDE BUT ARE NOT LIMITED TO O.B.C., ONTARIO FIRE CODE, CAN/ULC-5524-M91, ELEC. SAFETY AUTHORITY, ETC.
- CONTRACTOR SHALL SUBMIT A REFERENCE SET OF ELECTRICAL DRAWINGS TO THE LOCAL FIRE DEPT. FOR COMMENT PRIOR TO COMMENCING CONSTRUCTION ALTHOUGH DRAWINGS ARE SUBMITTED DURING THE PERMIT PROCESS FOR REVIEW BY ALL LOCAL AUTHORITIES, IT IS STILL THE CONTRACTORS RESPONSIBILITY TO CO-ORDINATE WITH LOCAL AUTHORITIES AT COMMENCEMENT OF CONTRACT. ALL ADDITIONAL DEVICES THAT MAY BE REQUIRED FORM PART OF THIS CONTRACT.
- ALL CO-ORDINATION WITH FINAL SPRINKLER ZONING AND SUPERVISED VALVE SCHEDULE, INCLUDING ADDITIONAL ZONES AS MAY BE REQUIRED, ALL FORMS PART OF THIS BASE CONTRACT.

ZONE	DESCRIPTION	LOCATION
SV#1	MAIN SHUT OFF	
SV#2	BACK FLOW PREVENTER VALVE #1	
SV#3	BACK FLOW PREVENTER VALVE #2	
SV#4	BY-PASS BACK FLOW PREVENTER VALVE #1	
SV#5	BY-PASS BACK FLOW PREVENTER VALVE #2	
SV#6	LOSS OF POWER TO EXCESS PRESSURE PUMP	
SV#7	LOW PRESSURE ALARM VALVE	
SV#8	1ST FLOOR ZONE VALVE	
SV#9	2ND FLOOR ZONE VALVE	
SV#10	GARBAGE ROOM & GARBAGE CHUTE ZONE VALVE	

NOTES ON FIRE ALARM.

- COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATIONS, QUANTITIES AND NAMES OF ALL SUPERVISED VALVES.
- FINAL NAMING OF FIRE ALARM ZONES TO BE COORDINATED WITH ARCHITECTURAL DRAWINGS AND AS APPROVED BY LOCAL AUTHORITY HAVING JURISDICTION.

FIRE ALARM MAIN ANNUNCIATOR PANEL AND REMOTE PANELS

TROUBLE PANEL

ITEM NO.	DESCRIPTION	TEST
1	SPRINKLER COMPRESSOR LOSS OF POWER	<input type="checkbox"/>
2	WET SPRINKLER LOSS OF WATER PRESSURE	<input type="checkbox"/>
3	FLOW SWITCH #1 (GROUND FLOOR)	<input type="checkbox"/>
4	FLOW SWITCH #2 (SECOND FLOOR)	<input type="checkbox"/>
5	FLOW SWITCH #3 (GARBAGE ROOM & GARBAGE CHUTE)	<input type="checkbox"/>

FIRE ALARM ZONE

NO.	COMMON ZONES	ALARM	ALERT
1	ELECTRICAL ROOM	<input type="checkbox"/>	<input type="checkbox"/>
2	STAR 1	<input type="checkbox"/>	<input type="checkbox"/>
3	STAR 2	<input type="checkbox"/>	<input type="checkbox"/>
4	STAR 3	<input type="checkbox"/>	<input type="checkbox"/>
5	GROUND FLOOR	<input type="checkbox"/>	<input type="checkbox"/>
6	GROUND FLOOR ELEVATOR LOBBY	<input type="checkbox"/>	<input type="checkbox"/>
7	SECOND FLOOR	<input type="checkbox"/>	<input type="checkbox"/>
8	SECOND FLOOR ELEVATOR LOBBY	<input type="checkbox"/>	<input type="checkbox"/>
9	ELEVATOR SHAFT	<input type="checkbox"/>	<input type="checkbox"/>
10	ELEVATOR PIT	<input type="checkbox"/>	<input type="checkbox"/>
11	ELEVATOR MACHINE ROOM	<input type="checkbox"/>	<input type="checkbox"/>
12	SPARE	<input type="checkbox"/>	<input type="checkbox"/>
13	SPARE	<input type="checkbox"/>	<input type="checkbox"/>
14	SPARE	<input type="checkbox"/>	<input type="checkbox"/>
15	SPARE	<input type="checkbox"/>	<input type="checkbox"/>
16	SPARE	<input type="checkbox"/>	<input type="checkbox"/>
17	SPARE	<input type="checkbox"/>	<input type="checkbox"/>
18	SPARE	<input type="checkbox"/>	<input type="checkbox"/>

TROUBLE

FIRE ALARM SYSTEM

- PROVIDE A COMPLETE ELECTRICALLY SUPERVISED NON-CODED CLOSED CIRCUIT FIRE ALARM SYSTEM WITH ONE-YEAR FACTORY WARRANTY.
- PROVIDE A REMOTE ANNUNCIATOR PANEL IN THE MAIN LOBBY WITH EACH STATION ZONE IDENTIFIED AND SET BEHIND TAMPERPROOF WINDOWS.
- PROVIDE A TROUBLE INDICATOR COMPLETE WITH AUDIBLE SIGNAL.
- THE OPERATION OF ANY ONE OF THE MANUAL STATIONS OR AUTOMATIC DEVICES OR OTHER ULC APPROVED ALARM INITIATING DEVICES IN THE SYSTEM WILL CAUSE ALL FIRE ALARM SIGNALS TO OPERATE CONTINUOUSLY AND THE ZONE ON THE ANNUNCIATOR WILL ILLUMINATE UNTIL SUCH TIME AS THE OPERATED DEVICE IS RESET OR REPLACED AND THE CONTROL PANEL RESET.
- PROVIDE SIGNAL DEVICES RATED AT LEAST 90dBa AT 3.0M. AUDIBLE THROUGHOUT THE BUILDING AND TO SUIT THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- PROVIDE MINIMUM TWO SIGNAL CIRCUITS AND WIRE ALL ALTERNATIVELY SO THAT SIGNALS ON SAME CIRCUIT SHALL NOT BE HORIZONTALLY ADJACENT TO EACH OTHER. USE NUMBER OF HORNS PER SIGNAL CIRCUIT AS RECOMMENDED BY MANUFACTURER. END-OF-LINE RESISTOR DIODE TO BE INSTALLED AT THE LAST SIGNAL OF EACH CIRCUIT. IDENTIFY THE LOCATION OF END-OF-LINE RESISTOR.
- INSTALL WIRING IN EMT CONDUIT AND CONFIRM TO ELECTRICAL CODE + CAN/ULC-524 REQUIREMENTS. EQUIP ALL RACEWAYS WITH A SEPARATE GREEN GROUND WIRE AND CONNECT AT EACH OUTLET BOX. CONNECT THE GROUND WIRES DIRECTLY TO THE BUILDING GROUND SYSTEM. RUN IN SEPARATE FIRE RATED ENCLOSURE FROM OTHER BLDG. POWER CABLES.
- PROTECT ALL INITIATING AND ALARM CIRCUITS WITH LIGHTING PROTECTION UNITS.

SMOKE AND HEAT DETECTORS IN PUBLIC AREAS

- PROVIDE PHOTO-ELECTRIC SMOKE DETECTORS CONNECTED TO FIRE ALARM SYSTEM IN THE CORRIDORS AND EXIT STAIRS SHAFTS IN ACCORDANCE WITH LATEST NBC AND O.B.C. SECTION 3.2.4. WHERE TWO CORRIDORS INTERSECT INSTALL A SMOKE DETECTOR IN THE CENTER OF INTERSECTION. CONFIRM WITH CITY INSPECTOR WHICH STAIR LEVELS REQUIRE SMOKE DETECTORS. PRIOR TO COMMENCING ANY INSTALLATION.
- PROVIDE IONIZATION TYPE SMOKE DETECTOR COMPLETE WITH A SENSITIVITY ADJUSTER IN ELECTRICAL ROOMS AND CONNECT TO THE FIRE ALARM SYSTEM ZONE SEPARATELY AND PROVIDE INDICATOR LIGHTS IN THE ANNUNCIATOR PANEL.
- PROVIDE HEAT DETECTORS IN AREAS WHERE MAKE-UP AIR UNITS ARE LOCATED AND IN ALL OTHER ROOMS NOT WITHIN A SUITE. MAIN MECHANICAL ROOM TO HAVE RATE OF COMPENSATION HEAT DETECTOR.
- HEAT DETECTOR: USE A 57 DEGREE TYPE RATE OF RISE AND FIXED TYPE HEAT DETECTORS IN ALL ROOMS OR AREAS EXCEEDING 3600m AND AMBIENT TEMPERATURE NOT EXCEEDING 38 DEGREES C IF SUCH ROOMS OR AREAS ARE NOT COVERED BY A SPRINKLER SYSTEM.
- PROVIDE A SMOKE DETECTOR AT EVERY THIRD LANDING IN STAIRWELLS.

ARC FAULT INTERRUPTERS

ALL BRANCH CIRCUITS SUPPLY RECEPTACLES INSTALLED IN SLEEPING AREAS OF A DWELLING UNIT SHALL BE PROTECTED BY AN ARC FAULT CIRCUIT INTERRUPTER. "AFCI" MEANS A DEVICE INTENDED TO PROVIDE PROTECTION FROM THE EFFECTS OF ARC-FAULTS BY RECOGNIZING CHARACTERISTICS UNIQUE TO ARCING AND FUNCTIONING TO DE-ENERGIZE THE CIRCUIT WHEN AN ARC FAULT IS DETECTED. THE ELECTRICAL CONTRACTOR MUST MAKE HIMSELF FAMILIAR WITH THIS ELECTRICAL CODE REQUIREMENT AND PROVIDE AND INSTALL ALL DEVICES ETC. REQUIRED TO MEET THIS CODE REQUIREMENT.

SMOKE ALARM AND HEAT DETECTORS IN UNITS

- CONFORM TO NBC-5531, SECTION 3.2.4 OF THE ONTARIO BLDG CODE AND CAN/ULC-5524.
- INSTALL A SMOKE ALARM IN EACH ROOM/AREA AS INDICATED ON PLAN. ALL SMOKE ALARMS MUST BE ULC LABELED, DUAL CHAMBER IONIZATION SINGLE STATION TYPE WHERE ONLY ONE IS REQUIRED, AND OF THE INTER-CONNECTABLE TYPE WHERE MORE THAN ONE ALARM IS REQUIRED, SO THAT THE ACTIVATION ONE ALARM WILL CAUSE ALL ALARMS WITHIN THE BUILDING TO SOUND.
- LOCATE ALARMS AS INDICATED.
- INSTALL SMOKE ALARMS BY PERMANENT CONNECTIONS TO PANEL WITH NO DISCONNECT SWITCH BETWEEN THE OVER CURRENT DEVICE AND THE SMOKE ALARM. POST MAINTENANCE INSTRUCTIONS IN A CONVENIENT LOCATION.
- INSTALL A HEAT DETECTOR IN EACH SUITE IN COMPLIANCE WITH O.B.C. SECTION 3.2.4 AND CONNECT TO BUILDING FIRE ALARM.

FIRE ALARM GENERAL NOTES

THE SYSTEM SHALL BE EQUIPPED WITH ADDITIONAL CONTROLS THAT ARE CAPABLE OF STOPPING MAKE-UP AIR UNITS AS REQUIRED BY FIRE CODE (INCL. HRV-UNITS).

WHEN A SIGNAL ORIGINATES FROM A SPRINKLER, THE ANNUNCIATOR SHALL INDICATE THE TYPE OF SIGNAL AS WELL AS THE ZONE OF THE ORIGIN.

FOR EXACT NUMBER OF LOCATION OF ELECTRICALLY SUPERVISED VALVES, FLOW SWITCHES, AND MONITORS, REFER TO MECHANICAL DRAWINGS. CONTRACTOR MUST CO-ORDINATE.

SMOKE DETECTORS FOR PUBLIC CORRIDORS AND TOP OF STAIRWELLS SHALL BE "PHOTOELECTRIC" TYPE. PROVIDE + INSTALL WHETHER SHOWN ON PLAN OR NOT.

SMOKE DETECTORS FOR ELECTRICAL ROOMS SHALL BE "IONIZATION" TYPE.

FIRE ALARM TO CONFORM TO O.B.C., CON/ULC-5524, CSA, FIRE CODE, ALL LATEST EDITION.

SUBMIT FINAL ZONING SCHEDULE TO FIRE DEPT. FOR APPROVAL PRIOR TO COMMENCING ANY INSTALLATION. ADJUSTMENTS REQUIRED BY FIRE DEPT. FORM PART OF THIS CONTRACT.

PROVIDE ADDITIONAL ALARM, SUPERVISED, AND/OR MONITORED ZONES AS MAY BE REQUIRED BY THE FIRE DEPT. AS PART OF THE BASE CONTRACT. THIS CONTRACTOR IS RESPONSIBLE FOR FULL CO-ORDINATION WITH THE FIRE DEPT. PRIOR TO COMMENCING ANY INSTALLATION.

THIS CONTRACTOR IS RESPONSIBLE FOR MAKING HIMSELF FAMILIAR WITH ALL THE REQUIREMENTS OF THE LATEST CODES, AND IMPLEMENT THESE REQUIREMENTS DURING THE INSTALLATION OF THE FIRE ALARM SYSTEM. WHETHER THESE REQUIREMENTS ARE SPECIFICALLY STATED, INDICATED, OR IMPLIED BY THE DRAWINGS AND SPECIFICATIONS. THIS INCLUDES CLASS 'A' WIRING WHERE REQUIRED, SILENCERS FOR FIRE ALARM DEVICES, ECT. IT IS REQUIRED THAT THIS CONTRACTOR BE FAMILIAR WITH AND HAVE EXPERIENCE WITH SUCH.

THIS CONTRACTOR IS RESPONSIBLE FOR FULL CO-ORDINATION WITH DIV. 15 SPRINKLER/STANDPIPE DRAWINGS AND INCLUDE FOR ADDITIONAL ZONES (ALARM, SUPERVISE OR MONITOR) AS MAY BE REQUIRED BY THE FINAL DESIGN (BY OTHERS) ALL AS PART OF THIS BASE CONTRACT; DIV 16 TO CARRY ADDITIONAL FUNDS TO COVER THIS.

FIRE ALARM SYSTEM

- SHALL BE OPERATED AS SINGLE STAGE ADDRESSABLE FIRE ALARM SYSTEM.
- AUDIBLE SIGNAL DEVICES WITHIN DWELLING UNITS SHALL BE WIRED ON SEPARATE SIGNAL CIRCUIT. IN SUITE SILENCING SWITCHES ARE NOT REQUIRED.
- VISUAL DEVICES SHALL BE INSTALLED IN LIVING ROOMS.

SEQUENCE OF OPERATION

- ALARM ON ANY FLOOR LEVEL.
- ALL FLOOR LEVELS TO RECEIVE ALARM SIGNAL.
  - ELEVATORS AUTOMATICALLY RECALL TO GROUND FLOOR.
  - AIR HANDLING UNITS TO SHUT DOWN.
  - SIGNAL SENT TO CENTRAL STATION AND FRONT DESK.

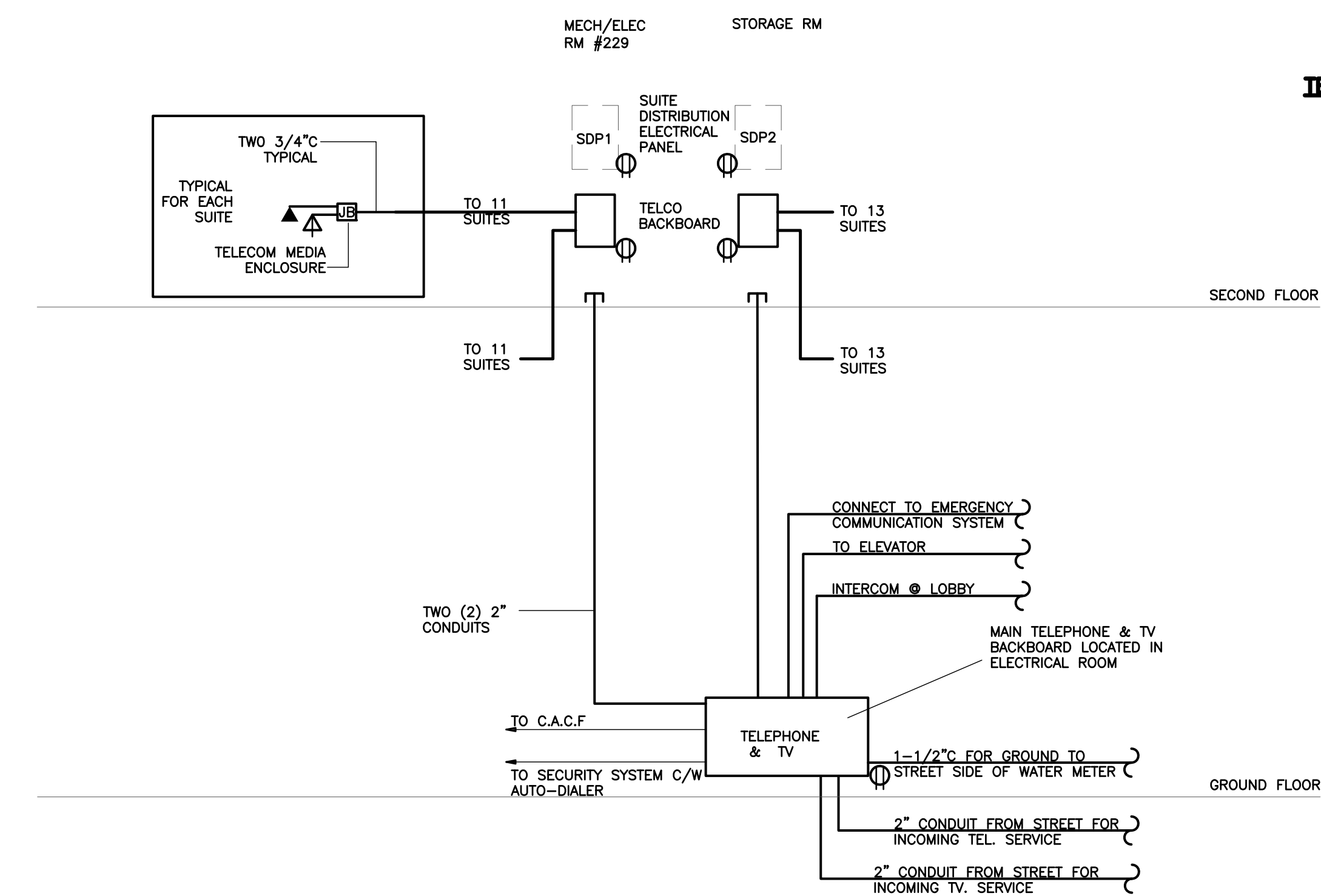
NOTE:

FIRE ALARM SYSTEM SHALL BE EQUIPPED WITH A MICROPHONE FOR AN ALL CALL PAGING

NOTES ON FIRE ALARM.

- COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATIONS, QUANTITIES AND NAMES OF ALL SUPERVISED VALVES.
- FINAL NAMING OF FIRE ALARM ZONES TO BE COORDINATED WITH ARCHITECTURAL DRAWINGS AND AS APPROVED BY LOCAL AUTHORITY HAVING JURISDICTION.
- THE REMOTE FIRE ALARM ANNUNCIATOR PANELS LOCATED IN EACH OF THE 2 LOBBIES OF THE GROUND FLOOR ARE TO BE A DUPLICATE DISPLAY OF THE MAIN FIRE ALARM ANNUNCIATOR PANEL.
- THE SYSTEM SHALL BE EXPANDABLE TO ACCOMMODATE ANOTHER (2) REMOTE ANNUNCIATOR PANELS FOR FUTURE STRUCTURES B & C.

TELEPHONE AND CABLE TV RISER DIAGRAM



- CONTRACTOR IS RESPONSIBLE FOR CO-ORDINATION AND COMPLIANCE WITH REQUIREMENTS OF LOCAL AUTHORITY HAVING JURISDICTION PRIOR TO COMMENCING ANY CONSTRUCTION. SUBMIT DWGS TO LOCAL AUTHORITY PRIOR TO COMMENCING ANY CONSTRUCTION. ANY CHANGES FORM PART OF THIS CONTRACT.
- FOR EXACT NUMBER OF OUTLETS, REFER TO FLOOR PLANS.
- CONTRACTOR TO CARRY IN HIS PRICE FOR THE COMPLETE SUPPLY AND INSTALLATION OF ALL CONDUIT, PHONE/DATA CABLES, BOXES, OUTLETS, BACKBOARDS, CONNECTION EQUIPMENT, ACCESSORIES, ETC. AS MAY BE REQUIRED BY THE LOCAL AUTHORITY. FOR A COMPLETE AND FULLY FUNCTIONAL SYSTEM. ALLOW FOR ALL RELATED COSTS FOR FINAL CONNECTIONS THAT MAY NEED TO BE UNDERTAKEN BY SUPPLY AUTHORITY.
- TYPICAL DISTRIBUTION WITHIN SUITES TO BE AS DIRECTED BY LOCAL SUPPLY COMPANY.
- CO-ORDINATION WITH ELEVATOR SUPPLIER IS REQUIRED. PROVIDE ALL PHONE LINES, CONNECTIONS, CONDUITS AS MAY BE REQUIRED TO MEET ELEVATOR CODE REQUIREMENTS.
- PROVIDE INTERCOM SYSTEM THROUGHOUT.
- CONDUITS IN ELECTRICAL/TELECOM CLOSETS INCLUDING EMT CONDUIT IS TO BE FIRE STOPPED. SMOKE SEAL IS NOT TO BE USED IN LIEU OF FIRE STOP.
- MINIMUM CONDUIT SIZE FOR SUITE RUNS IS 3/4" C.

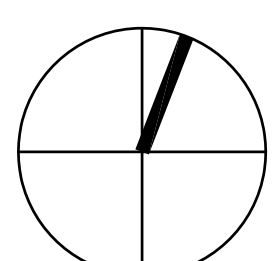
NO.	DATE	DESCRIPTION
5	DEC 14/18	ISSUED FOR CONSTRUCTION
4	AUG 13/18	ADDENDUM #2
3	JUL/16/2018	ISSUED FOR PERMIT & TENDER
2	JUN/12/2018	ISSUED FOR REVIEW
1	APR/19/2018	ISSUED FOR REVIEW

THIS DRAWING SHALL BE USED ONLY FOR THE PURPOSE INDICATED IN THE LATEST ISSUED COLUMN ABOVE.

ALL DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE DESIGNER AND MAY NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION. DRAWINGS MUST NOT BE SCALED. CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ERRORS AND OMISSIONS TO THE DESIGNER. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION UNLESS COUNTERSIGNED BY THE DESIGNER.

THESE DRAWINGS ARE NOT TO BE SCALED

CONSTRUCTION NORTH



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**SENIORS RESIDENCE**  
100 MCKAY STREET

CANNINGTON ONTARIO

ELECTRICAL

PROJECT No. 18-660

DRAWING TITLE

FIRE ALARM & TEL/TV SYSTEMS RISER DIAGRAMS

DATE 2018

DRAWN BY TH E-10

SCALE N.T.S. OF 11

ELECTRICAL SPECIFICATIONS

- COMPLY WITH ALL DIVISION 1 GENERAL CONDITIONS.
- OBTAIN ALL APPROVALS FROM PUBLIC AUTHORITIES HAVING JURISDICTION, BEFORE COMMENCING WORK AND PAY ALL INSPECTOR FEES AND ALL FEES COMPLY WITH THE REQUIREMENTS OF THE FURTHERSATION THROUGH THE FLOORING, C.S.A. STANDARDS, ONTARIO BUILDING CODES, ELECTRICAL SAFETY CODE, APPLICABLE U.L.C. STANDARDS AND THE OWNERS' REQUIREMENTS. SUBMIT CERTIFICATE OF INSPECTION AND APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION, DO NOT REDUCE THE STANDARDS ESTABLISHED BY THE DRAWINGS OR SPECIFICATIONS BY APPLYING ANY OF THE CODES REFERRED TO HEREIN. SUBMIT ALL NECESSARY DRAWINGS TO HYDRO FOR THEIR APPROVAL.
- PROVIDE PROOF OF PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE COVERAGE AND AMOUNT. SUBMIT WITH TENDER.
- DRAWINGS - EXAMINE ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS BEFORE PROCEEDING WITH THE WORK. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS MUST BE REFERRED TO THE ARCHITECT BEFORE ANY AFFECTED WORK IS COMMENCED. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING LOCATIONS OF ALL LIGHT FIXTURES & DEVICES.
- ENSURE THAT ALL ELECTRICAL EQUIPMENT SUPPLIED BY OTHER TRADES IS SUITABLE FOR THE RESPECTIVE VOLTAGE, CURRENT POWER REQUIREMENTS OF ALL OWNER SUPPLIED EQUIPMENT.
- ALL CUTTING AND PATCHING REQUIRED FOR THE WORK OF THIS DIVISION SHALL BE CARRIED OUT BY THIS DIVISION. NO CHASING BLOCKING WILL BE ALLOWED. ALLOW TO SCAN THE FLOOR PRIOR TO CUTTING. IN LOCATION OF EXISTING SERVICES, PROVIDE DUCT CONTROL, MEASURES DURING CUTTING, DO NOT LEAVE ANY FLOOR TRENCHES OPEN DURING THE DAY. USE TRIP FREE COVERS WITH BEVELLED EDGES.

BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BUILDING INCURRED BY WORK OF THIS DIVISION.

- SUBMIT 4 COPIES OF SHOP DRAWINGS FOR REVIEW AND RECORDS.
- ALL MATERIALS THROUGHOUT SHALL BE NEW OF BEST QUALITY C.S.A. APPROVED AND OF ONE MANUFACTURER. WHEREVER TRADE NAMES ARE NOT USED TO DESCRIBE MATERIALS, THESE MATERIALS SHALL BE OF BEST AVAILABLE QUALITY AND MANUFACTURE. ON-AN-ON AUTO-FIT SWITCH TO PERMIT MANUAL OPERATION OF THE INDIVIDUAL CONTACTOR.
- PROVIDE ALL CONDUIT, WIRING, BOXES, SWITCHES, OUTLETS, DEVICES, ETC., AS REQUIRED, MAKE FINAL CONNECTIONS TO VIBRATING EQUIPMENT WITH FLEXIBLE CONDUIT.
- PROVIDE ALL HANGERS, INSERTS AND SUPPORTS OF APPROVED TYPES REQUIRED FOR THE WORK OF THIS DIVISION. PROVIDE CONDUIT FOR ALL SERVICES PENETRATING THE FLOORING. USE THE FASTENERS THROUGH THE FLOORING SLABS WITH AN APPROVED NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT APPROVED BY ARCHITECT. CARE TO BE TAKEN WHILE RUNNING CONDUITS THROUGH EXISTING WALL AND TENSAP SPACES. ALL CONDUITS TO BE ABOVE BOTTOM CHORD OF COSTS.
- ALL CONDUIT SHALL BE RIGID STEEL THICK WALLED OR EMT THINWALL WITH STEEL SET SCREW COUPLINGS AND CONNECTORS WITH INSULATED THROATS UNLESS OTHERWISE NOTED. ALL CONDUITS SHALL BE CONCEALED UNLESS OTHERWISE NOTED. EXPOSED CONDUITS AND UNWELDED CHANGES SHALL BE NEAT IN APPEARANCE, RUN PARALLEL TO BUILDING LINES AND CONCENTRIC RIGHT ANGLE BENDS ONLY SHALL BE USED. EMT MAY NOT BE USED.
- ALL EMPTY CONDUITS SHALL BE COMPLETE WITH NYLON FISH WIRE.
- ALL WIRING SHALL BE MINIMUM #12 GAUGE COPPER, EXCEPT AS OTHERWISE NOTED. ALL WIRING SHALL BE 600 VOLT TYPE RHWB. BE CABLE MAY BE USED WHERE PERMITTED BY CODE IN CEILING SPACE FOR FINAL CONNECTION TO LIGHT FIXTURE AND FROM CEILING DOWN PARTITION TO RECEPTABLES ONLY. MINIMUM SIZE WIRING FOR DC WIRING & FLOOR OUTLETS SHALL BE #10 GAUGE. MAXIMUM VOLTAGE DROP SHALL NOT EXCEED 2 PERCENT AT ALL FINAL OUTLET LOCATIONS.
- PROVIDE GROUND WIRES WITH ALL FEEDERS AND CIRCUITS IN ACCORDANCE WITH APPLICABLE CODES AND HYDRO REQUIREMENTS. PROVIDE ALL REQUIRED BONDING AS REQUIRED BY CODE.
- CO-ORDINATE WITH OTHER TRADES IN LAYING OUT OF THE WORK SO AS NOT TO CONFLICT WITH THE WORK OF OTHER TRADES. CARRY OUT WORK PROMPTLY WHICH MAY INTERFERE WITH THE WORK SCHEDULE OF OTHER TRADES. IN PARTICULAR, FLOOR OUTLETS TO BE CENTRED IN FLOOR TILES.
- MECHANICAL TRADES WIRING: PROVIDE ALL CONDUIT, WIRING, SPLITTERS, OUTLET BOXES AND DISCONNECT SWITCHES AS SHOWN. ALL MOTORS, STARTERS AND CONTROL WIRING PROVIDED UNDER DIVISION 15. DIV-16 SHALL INSTALL ALL STARTERS AND WIRE COMPLETE.
- CLEARLY MARK ALL EXPOSED CONDUIT, PULL BOXES, JUNCTION BOXES, ETC., TO INDICATE THE NATURE OF THE SERVICE.
- MERGE ALL LIGHTING AND POWER CIRCUITS TO MEET CODES.
- PROVIDE LAMACOD NAMEPLATES FOR ALL ELECTRICAL DISTRIBUTION EQUIPMENT INDICATING SOURCE OF POWER AND EQUIPMENT BEING FED. PROVIDE TYPEWRITTEN DIRECTORIES FOR ALL PANELS.

20. AFTER COMPLETION OF THE WORK, PROVIDE THE LANDLORD WITH A SET OF "REPRODUCIBLE AS-BUILT" RECORD DRAWINGS. INCORPORATE ALL CHANGES AS NOTED ON AUTOCAD 2000.

- PROVIDE FOLLOWING DOCUMENTS:
- CERTIFICATE OF FIRE ALARM VERIFICATION
  - HYDRO INSPECTION CERTIFICATE
  - EMERGENCY LIGHTING TEST REPORT

21. CLEAN AND TEST ALL EQUIPMENT BEFORE FINAL ACCEPTANCE IS GIVEN FOR THE WORK.

22. AFTER THE WORK IS COMPLETED, GIVE A WRITTEN GUARANTEE FOR ONE YEAR COVERING WORKMANSHIP AND MATERIALS. REPAIR OR REPLACE, WITHOUT EXPENSE TO THE OWNER, ANY DEFECTS DUE TO WORKMANSHIP OR MATERIALS WHICH IN THE OWNER'S OPINION, ARE NOT DUE TO MISUSE OR NEGLECT.

23. IT/COMMUNICATIONS SYSTEMS

SUPPLY AND INSTALL THE REQUIRED RACEWAY SYSTEM COMPLETE WITH CONDUITS, PULLBOXES, PANELS, OUTLET BOXES, COVER PLATES, SUITABLE FOR THE INSTALLATION OF IT AND COMMUNICATIONS CABLES AND ASSOCIATED EQUIPMENT. RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY, IN ALL OTHER LOCATIONS, EMT MAY BE USED. MINIMUM CONDUIT SIZE TO BE 19MM CONDUIT TO BE 12MM CONDUIT AND CSA 1530. ALL FLOOR OUTLETS SHALL BE WIRED WITH CAT5E CABLES AND TERMINATED @ BOTH ENDS. USE A BOX BLOCK IN TELEPHONE ROOMS & R445 OUTLETS IN FLOORS. CERTIFY ALL CABLES AT END OF INSTALLATION.

UNLESS OTHERWISE SHOWN, STEEL PULLBOXES SHALL BE INSTALLED EVERY 30M OR LESS OF STRAIGHT CONDUIT RUN. EVERY 50M OR LESS OF STRAIGHT CONDUIT RUN AND ONE 90 DEG. BEND OR EQUIVALENT; EVERY TWO 90 DEG. BENDS OR EQUIVALENT.

DISTRIBUTION FEEDERS SHALL BE SIZED AS DETAILED. SUBSTITUTION OF FEEDERS EITHER IN MATERIAL OR ROUTING WILL NOT BE PERMITTED UNLESS ENGINEER'S WRITTEN APPROVAL IS OBTAINED. FEEDERS SHALL HAVE MAXIMUM VOLTAGE DROP OF 3% AT FULL LOAD AT THE PANELS SUPPLIED. ALL FEEDERS SHALL BE BALANCED UNDER FULL LOAD CONDITIONS TO WITHIN 5% BETWEEN PHASES. ALL PHASES AND NEUTRALS SHALL BE IDENTIFIED AND MAINTAINED IN THEIR CORRECT ORDER WHEN RUNNING LEFT TO RIGHT THROUGHOUT THE BUILDING.

EACH PANEL BOARD SHALL BE COMPLETE WITH A DIRECTORY GIVING THE NUMBER AND DESCRIPTION OF EACH CIRCUIT CONTROLLED. THE DIRECTORIES SHALL BE CLEARLY TYPED, LEGIBLE AND OF AMPLIFIED SIZE AND SHALL BE MOUNTED IN A METAL FRAME WITH A CLEAR PLASTIC COVER ON THE INSIDE OF THE DOOR. THE CIRCUIT BREAKERS SHALL BE CONNECTED TO THE PANEL BY BULGED CONNECTIONS. ALL BUS BARS, LUGS AND BREAKER TERMINALS SHALL BE SILVER PLATED AT CONNECTION POINTS. THE INTERRUPTING CAPACITY OF EACH BOARD SHALL BE DETERMINED BY THE CO-ORDINATION STUDY OR AS PER DRAWINGS, MINIMUM 10 KA FOR 208 VOLT PANELS, AND 14KA FOR 347/600 VOLT PANELS.

ALL TWO OR THREE POLE BREAKERS SHALL OPERATE WITH A COMMON TRIP AND WITH A SINGLE HANDLE. TWO POLE CIRCUIT BREAKERS CONSISTING OF TWO SINGLE POLE BREAKERS WITH A HANDLE, TWIN BREAKERS AND SERIES RATED BREAKERS WILL NOT BE ACCEPTED.

ALL PANEL BOARDS SHALL BE SPRINKLERPROOFED AS REQUIRED TO MEET LOCAL AND HYDRO CODES.

26. COVER PLATES: COVER PLATES FOR RECEPTABLES, SWITCHES, PILOT LIGHTS, TELEPHONE OUTLETS AND OTHER DEVICES REQUIRING COVER PLATES FOR FLUSH MOUNTED BOXES SHALL BE METAL, STAINLESS STEEL #18-8 TYPE 302.

WEATHERPROOF COVER PLATES SHALL BE WEAR CORROSION RESISTANT ALUMINUM TYPE WITH TWO SEPARATE LIDS FOR DUPLEX RECEPTABLES SUITABLE FOR MOUNTING ON F.S. TYPE BOXES. ALL WEATHERPROOF COVER PLATES SHALL HAVE RUBBER OR NEOPRENE GASKETS.

PLATES FOR SURFACE MOUNTED CAST BOXES SHALL BE GALVANIZED FORMED STEEL TYPE.

COVER PLATES FOR FLUSH MOUNTED EQUIPMENT SHALL BE SUPPLIED OF QUALITY AND PERFORMANCE SPECIFIED BY THE MANUFACTURER OF THE EQUIPMENT.

COVER PLATES SHALL NOT CARRY MANUFACTURER'S NAME.

COVER PLATES OF QUALITY SPECIFIED SHALL BE PASS & SEYMOUR, BRYANT LEVTON, SMITH & STONE OR HARVEY HUBBELL.

27. LIGHT SWITCHES: SWITCHES SHALL BE, UNLESS OTHERWISE INDICATED, BRYANT QUIET TYPE WITH WHITE SPECIFICATION GRADE FOR 120V AND HEAVY DUTY GRADE FOR 347V.

LIGHT SWITCHES OF QUALITY AS MANUFACTURED BY BRYANT, P & S, ARROW HART, LEVTON AND HUBBELL SHALL BE CONSIDERED AS ACCEPTABLE AS SPECIFIED ALTERNATES.

DIMMERS SHALL BE LUTRON SPECIFICATION GRADE OR APPROVED ALTERNATE.

28. RECEPTABLES: RECEPTABLES SHALL BE, UNLESS OTHERWISE INDICATED, U GROUND TYPE, WHITE SCREW TERMINAL TYPE. RECEPTABLES SHALL BE SPECIFICATION GRADE.

29. DISTRIBUTION COORDINATION STUDY, SHORT CIRCUIT STUDY AND COMMISSIONING REPORT: ALLOW TO COMPLETE COORDINATION AND SHORT CIRCUIT STUDY TO CONFIRM THAT ALL EQUIPMENT OFFERED IS SUITABLY RATED FOR THIS PROJECT. THIS REPORT TO BE SIGNED BY A P. ENG. ALLOW TO PROVIDE THE COORDINATION SHORT CIRCUIT STUDY WITH THE DISTRIBUTION SHOP DRAWINGS SUBMISSION. SHOW ALL SWITCHGEAR AND DISTRIBUTION FROM THE SERVICE ENTRY TO THE LAST PANEL. OBTAIN DETAILS FROM UTILITY AND INCORPORATE INTO STUDY.

ALLOW TO FULLY COMMISSION THE SWITCHGEAR AND AT THE END OF THE PROJECT, WORK TO BE DONE BY AN INDEPENDENT SPECIALIST. RETROQUE ALL CONNECTIONS. FOR SERVICES 1200 AMPS AND OVER, ALLOW TO CARRY OUT AN INFRA RED SCAN OF THE ENTIRE DISTRIBUTION.

30. AUTOMATIC CONTROL OF EXTERIOR LIGHTS: CONTACTORS, PHOTO-ELECTRIC CONTROLS AND TIME SWITCHES SHALL BE USED TO CONTROL THE EXTERIOR LIGHTS. IF THE PHOTOCELL IS NOT INSTALLED ON THE DRAWINGS, OBTAIN THE LOCATION FROM THE CONSULTANT.

THE PHOTO-ELECTRIC CELL AND TIME CLOCKS SHALL BE WIRED SO AS TO CONTROL A MAGNETIC CONTACTOR. EACH CONTACTOR SHALL HAVE AN "ON-OFF-AUTO" SWITCH TO PERMIT MANUAL OPERATION OF THE INDIVIDUAL CONTACTOR. CONTACTORS TO BE MINIMUM 20 AMP HD LIGHTING DUTY. TIME CLOCKS TO BE DIGITAL WITH 96 HOUR SPRING CARRYOVER.

CONTACTORS SHALL HAVE LAMACOD NAMEPLATES INDICATING THAT CONTROL CIRCUIT IS SUPPLIED FROM A DIFFERENT SOURCE.

31. SERVICE ENTRANCE BOARD: THE SERVICE ENTRANCE BOARD SHALL CONSIST OF A COMPLETELY METAL ENCLOSED FREE-STANDING STRUCTURE. CONSISTING OF A MAIN SWITCH COMPARTMENT, HYDRO METERING AS REQUIRED, METERING PANEL DISTRIBUTION SECTIONS AND THROUGH FLOOR/WALL BUS DUCT TO THE VAULT COMPLETE WITH FIRE BARRIER. DETAILS OF MAIN INCOMING (600V) SERVICE TO BE VERIFIED WITH HYDRO PRIOR TO SUBMISSION OF SHOP DRAWINGS.

BUSWORK SHALL BE BRACED TO WITHSTAND AVAILABLE SHORT CIRCUIT ON THE SYSTEM AND BREAKERS AND FUSES SHALL HAVE ADEQUATE INTERRUPTING CAPACITY AND SHALL BE FULLY CO-ORDINATED WITH OTHER EQUIPMENT ON THE LOAD AND LINE SIDE.

THE MAIN SWITCH COMPARTMENT SHALL CONTAIN BREAKER OF TYPE, FRAME AND SIZE OR FUSED DISCONNECT SWITCH WHICH SHALL BE APPROVED BY UTILITY. THE MAIN SWITCH COMPARTMENT SHALL HANDLE ALL SERVICES ENTERING THE SWITCH HANDLE SHALL PROJECT THROUGH AN OPENING IN THE DOOR. THE DOOR SHALL HAVE PROVISIONS FOR PADLOCKING.

MAIN SWITCH OR BREAKER SHALL BE EQUIPPED WITH GROUND FAULT RELAYS. IN ADDITION, PROVIDE GROUND FAULT EQUIPMENT WHERE INDICATED ON DRAWINGS OR AS REQUIRED BY CODE.

THE CURRENT TRANSFORMER COMPARTMENT WHERE REQUIRED SHALL HAVE A REMOVABLE STEEL MOUNTING PLATE AND SHALL BE EQUIPPED WITH ALL HARDWARE AND BUS DUCT TO RECEIVE THE LOCAL UTILITIES CURRENT AND POTENTIAL TRANSFORMERS. ALL CURRENT TRANSFORMERS SHALL BE OBTAINED FROM THE UTILITY AND INSTALLED IN THE COMPARTMENT BY THE SERVICE ENTRANCE BOARD MANUFACTURER OR AS PER UTILITIES STANDARD REQUIREMENTS.

THE ENTRANCE PANEL, BUSWORK AND CONNECTIONS SHALL TO THE UTILITIES APPROVAL. OBTAIN THEIR REQUIREMENTS PRIOR TO INSTALLATION.

SPRINKERBOARD SHALL BE SPRINKLERPROOFED AS REQUIRED TO MEET LOCAL AND HYDRO CODES.

32. LOCABLE HINGED SPARE FUSE CABINET: PROVIDE A LOCABLE HINGED SPARE FUSE CABINET IN EACH ELECTRICAL ROOM. PROVIDE A MINIMUM OF 3 SPARE FUSES OF EACH SIZED USED. PROVIDE AN INVENTORY MOUNTED ON THE INSIDE OF THE CABINET.

33. DRY TYPE DISTRIBUTION TRANSFORMERS SHALL BE INDOOR AIR COOLED TYPE RATED THREE PHASE 60 CYCLE, OF KV.A RATING SHOWN ON THE DRAWINGS. 600-250V/120V, 1.2 KV CLASS, AND CAPABLE OF WITHSTANDING A 10 KV BASIC IMPULSE RATING (BIL). ALL SHALL HAVE STANDARD PRIMARY PPTS. THE TRANSFORMER SHALL BE DESIGNED WITH A CLASS B OR H INSULATION SYSTEM.

THE SOUND LEVEL IN DECELS SHALL BE IN ACCORDANCE WITH NEMA TR CURRENT STANDARDS. THE TRANSFORMER SHALL BE EQUIPPED WITH TERMINAL BONDS, TAP CHANGING LUGS, SUITABLE SOLIDCORE CONNECTORS AND SHALL HAVE A VENTILATED GAUGE GAUGE STEEL ENCLOSURE COMPLETE WITH HINGED REMOVABLE EXPANDED METAL SIDE PANELS AND MOUNTING BRACKETS FOR FLOOR OR WALL MOUNTING AS SHOWN. MUST ALL TRANSFORMERS 270VA AND UNDER AT HIGH LEVEL IN LOCATION SHOWN UNLESS OTHERWISE NOTED.

THE COMPLETE ASSEMBLY SHALL BE PAINTED WITH A PRIMER COAT AND A FINISH COAT OF ASA #61 GRADE. THE TRANSFORMER SHALL CONFORM TO CSA - C9, NEMA TR AND CEMA L2 CURRENT STANDARDS EXCEPT WHERE NOTED AND SHALL BE APPROVED BY UTILITY. THE TRANSFORMER SHALL BE MOUNTED WITH HINGES AND TRANSFORMERS SHALL BE COMPLETED WITH COPPER WIRING & SPRINKLERPROOFED AS REQUIRED TO MEET LOCAL AND HYDRO CODES.

34. METERING CABINETS SHALL BE OF SIZE SHOWN ON DRAWING OR AS REQUIRED WITH REMOVABLE STEEL METER MOUNTING PLATE, TWO DOORS AND SEALING HASPS TO UTILITY APPROVAL. PROVIDE A CAT5E WIRED TELEPHONE LINE FROM EACH METER CABINET TO THE MAIN TELEPHONE ENTRY POINT.

THE CABINET SHALL BE MOUNTED ON THE WALL AS SHOWN ON THE DRAWINGS AND TO THE SATISFACTION OF THE LOCAL UTILITY.

METER SOCKETS SHALL BE TO APPROVAL OF UTILITY. PROVIDE ALL REQUIRED NEUTRAL WIRE TO METER AS PER LOCAL HYDRO'S REQUIREMENT.

35. CONFIRM ALL LOCATIONS AND OUTLETS PRIOR TO INSTALLATION. ALLOW TO RELOCATE ANY OUTLET WITHIN 5M OF SPECIFIED LOCATION, PRIOR TO INSTALLATION.

36. PROVIDE ALL CONCRETE WORK REQUIRED FOR ELECTRICAL WORK IN ACCORDANCE WITH ARCHITECTURAL DIVISION OF SPECIFICATION. THIS INCLUDES HOISTING UP 740 BELOW ALL FLOOR STANDING EQUIPMENT.

SUPPLY AND INSTALL ALL UNDERGROUND DUITS WHERE INDICATED. THESE SHALL BE INSPECTED AND APPROVED BY ALL LOCAL AUTHORITIES AS REQUIRED. AFTER COMPLETION OF INSTALLATION DUCTS SHALL BE CLEANED AND ENDS PLUGGED ORDER WHEN RUNNING LEFT TO RIGHT THROUGHOUT THE BUILDING.

IN ACCORDANCE WITH ARCHITECTURAL DIVISION OF SPECIFICATION. DUCTS TO BE PVC TYPE 11A CSA APPROVED AND TO BE SLOPED FROM BUILDING TO STREET.

PROVIDE AN UNDERGROUND 100MM DRAIN PIPE FROM EACH PADMOUNT TRANSFORMER TO THE CLOSEST CATCH BASIN.

38. TWO CABLE PULLING EYES ARE TO BE INSTALLED ABOVE CABLE DUCTS ON CEILING AND OVER DOOR AS DIRECTED BY LOCAL AUTHORITY INSPECTOR.

39. ALTERATIONS AND ADDITIONS: CONTRACTORS SHALL NOTE THAT THIS CONTRACT IS AN ALTERATION TO AN EXISTING BUILDING AND SHALL THOROUGHLY INVESTIGATE THE EXISTING ELECTRICAL INSTALLATION AND CONDITIONS.

CONTRACTORS ARE REQUIRED TO VISIT THE SITE AND ENSURE THAT ALL WORK ASSOCIATED WITH THE ELECTRICAL INSTALLATION REQUIRED TO BE REMOVED OR RELOCATED IS ALLOWED FOR IN THE TENDER PRICE. ALSO CONTRACTORS SHALL ENSURE THAT THE WORK CAN BE CARRIED OUT AS INDICATED ON THE DRAWINGS OR SHALL ADVISE THE ENGINEER IMMEDIATELY OF ANY ANTICIPATED PROBLEMS.

NO EXTRA WILL SUBSEQUENTLY BE ALLOWED TO COVER ANY SUCH ERROR, OMISSION AND/OR OVERSIGHT FOR NOT HAVING MADE A THOROUGH INSPECTION OF THE CONDITIONS, EXISTING CONDITIONS, DRAWINGS, SPECIFICATION AND DESIGN INTENT.

THE ELECTRICAL CONTRACTOR SHALL NOTE THAT THE EXISTING BUILDING WILL REMAIN IN OPERATION THROUGHOUT BUILDING OPERATIONS. THEY SHALL ACCORDINGLY ALLOW FOR ANY WORK REQUIRED TO BE DONE WHICH MAY AFFECT POWER SUPPLY AND OPERATION OF THE BUILDING TO BE CARRIED OUT AFTER HOURS OR AT A TIME CONVENIENT TO THE BUILDING MANAGEMENT. PROVIDE TEMPORARY SERVICES AS REQUIRED TO ENSURE CONTINUED OPERATION AT ALL TIMES.

40. DEMOLITION: REMOVE ALL EXPOSED CONDUITS, BRANCH WIRINGS, OUTLETS, LUMINAIREs, EMERGENCY LIGHTING, ETC. FROM CEILINGS AND WALLS BEING DEMOLISHED. REMOVE WIRING TO PANELBOARDS.

REMOVE ANY AND ALL PCB BALLASTS FROM LUMINAIREs. PLACE IN STORAGE DRUMS AND REMOVE AND DISPOSE OF OFF SITE. ALL WORK TO BE DONE IN ACCORDANCE WITH MINISTRY OF ENVIRONMENT RULES AND REGULATIONS.

REMOVE ALL REDUNDANT TELECOMMUNICATION WIRING, BACK TO THE ENTRY POINTS.

EXISTING FIRE ALARM SYSTEM TO REMAIN OPERATIONAL AT ALL TIMES. FOR ALTERATIONS AND ANY TIME WHEN FIRE ALARM IS INOPERATIVE ARRANGE FOR 24 HOUR SECURITY WATCH TO APPROVAL OF LOCAL FIRE DEPARTMENT.

ALL EXISTING EQUIPMENT BEING REMOVED SHALL BE FIRST OFFERED TO THE OWNER. ANY EQUIPMENT NOT REQUIRED BY THE OWNER, SHALL BE DISPOSED OF OFF SITE BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST.

ANY CONCRETE FOUNDATIONS OR OTHER SUPPORTS FOR ELECTRICAL EQUIPMENT SHALL BE REMOVED TO BELOW GROUND FROM FINISHED FLOOR.

ALL WORK TO BE DONE IN ACCORDANCE WITH HYDRO REGULATIONS.

41. SEISMIC RESTRAINTS: ALL WORK SHALL BE DONE IN ACCORDANCE WITH CODE AND BY LOCAL AUTHORITY. PROVIDE INDEPENDENT CERTIFICATION BY A P. ENGINEER AT THE END OF THE PROJECT TO CONFIRM SUITABILITY AND CONFIRMANCE.

42. EXCAVATION AND BACKFILL: EXCAVATE AND BACKFILL AS REQUIRED FOR THIS WORK BOTH INSIDE AND OUTSIDE THE BUILDING. ALL TRENCH EXCAVATION SHALL BE CARRIED OUT IN STRICT CONFORMITY WITH THE TRENCH EXCAVATION PROTECTION ACT AND AMENDMENTS, STATUTES OF ONTARIO AND REGULATIONS, AS REVISED AND AMENDED TO DATE.

1. ALL EXCAVATION AND BACKFILL SHALL BE PROVIDED BY THIS CONTRACTOR.

2. CAREFULLY CHECK AND AVOID DISTURBING OR DAMAGING ANY EXISTING UNDERGROUND PIPING, CONDUIT OR OTHER SERVICES UNCOVERED DURING CARRYING OUT OF WORK. MAKE GOOD ANY DAMAGE.

3. UNDERGROUND SEWERS AND OTHER SERVICES ARE INDICATED APPROXIMATELY ON THE SITE SERVICE, MECH. ELEC., OR ARCH. SITE PLANS. THE LOCATION OF SUCH SERVICES HAS BEEN DETERMINED FROM AVAILABLE INFORMATION BUT HAS NOT BEEN VERIFIED IN THE FIELD. CAREFULLY CHECK SUCH LOCATIONS, PERFORM ALL NECESSARY EXPLORATION BY TRENCHING AND REPORT ANY SERIOUS DISCREPANCY BEFORE PROCEEDING WITH ANY NEW WORK.

4. THE SERVICES OF LOCAL P.C., HYDRO, TELEPHONE AND GAS AUTHORITIES TO ACCURATELY DETERMINE LOCATION OF ANY UNDERGROUND UTILITIES.

5. EXCAVATIONS FOR ALL UNDERGROUND SERVICES SHALL BE OF THE REQUIRED DEPTH AND DIMENSION AND SHALL BE:

1. PREPARED AS REQUIRED, SO THAT NO PORTION OF ANY OF THE DUCT SHALL BEAR DIRECTLY AGAINST ANY ROCK OR OTHER HARD SURFACE.

2. KEPT DRY AT ALL TIMES BY BAILING, PUMPING OR OTHER MEANS. SIDES AND BOTTOMS SHALL BE KEPT FROM FREEZING.

3. BOTTOMS OF EXCAVATION SHALL BE GRADED AS REQUIRED.

4. BANKS OF EXCAVATIONS SHALL BE EVENLY OUT AND/OR TRIMMED AND THEY SHALL BE SHORED AS REQUIRED TO PREVENT CAVING IN, AND THE MATERIAL USED SHALL BE CAREFULLY WITHDRAWN DURING BACKFILLING.

5. WIDTH OF EXCAVATION SHALL BE CAREFULLY CONTROLLED AND SHALL BE LIMITED TO TWICE THE O.D. OF DUCTS, CONDUITS OR DUCT BANK, AND AS SHOWN ON THE DRAWINGS.

6. EXCAVATING, DUCT LAYING, AND BACKFILLING SHALL BE EXECUTED IN LIMITED LENGTH AS DETERMINED BY PROJECT MANAGER TO ENSURE ALL PROTECTIVE MEASURES TO FUNCTION EFFICIENTLY AT ALL TIMES.

7. WHERE EXCAVATING IS NECESSARY IN CLOSE PROXIMITY TO AND BELOW ANY FOOTING LEVEL, BACKFILLING SHALL BE DONE WITH 2000# CONCRETE FURNISHED UNDER THIS SECTION TO THE TOP OF THE HIGHEST ADJACENT FOOTING.

8. ALL DUCTS ENTERING AND LEAVING THE BUILDING OR PASSING OTHER EXCAVATED AREAS SHALL BE SUPPORTED ON REINFORCED CONCRETE PAD RESTING AT BOTH ENDS ON AT LEAST 1.5M SOLID UNDISTURBED EARTH OR A CHESS IN A CONCRETE FOUNDATION WALL.

9. IN AREAS WHERE REINFORCED SUSPENDED SLAB IS INDICATED ON STRUCTURAL DRAWINGS, DUCTS SHALL BE SUPPORTED FROM REINFORCING RODS.

10. SHOULD THE EXCAVATION BY NEGLIGENCE OR ERROR, BE CARRIED TO GREATER DEPTH THAN SHOWN OR AUTHORIZED, SUCH EXTRA EXCAVATION SHALL BE REPLACED WITH WELL-COMPACTED GRANULAR B CRUSHED STONE FILL OR 2000# CONCRETE, AS REQUIRED TO GIVE A BEARING VALUE EQUAL TO THAT PROVIDED BY ADJACENT SOIL.

11. BACKFILLING SHALL NOT BE COMMENCED UNTIL INSTALLATION IS INSPECTED AND APPROVED. BACKFILLING SHALL BE CARRIED OUT CAREFULLY TO AVOID INJURY TO THE WORK AND UNDERGROUND SETTLEMENT AND SHALL BE EXECUTED AS FOLLOWS:

1. ALL BACKFILLING REQUIRED TO BRING LEVEL UP TO UNDERSIDE OF STONE FILL (UNDER PARKING AREAS, AND ROADS) AND TO UNDERSIDE OF SIDEWALK SHALL BE GRANULAR MATERIAL, SUPPLIED AND PLACED UNDER THIS SECTION AND TAMPED EVERY 150mm IN DEPTH TO CONSOLIDATE SAND FILL SHALL BE CLEAN. SHALL NOT HAVE PARTICLES OVER 50mm IN LARGEST DIMENSIONS, WITH NOT MORE THAN 2% PASSING A #200 SIEVE.

2. ALL BACKFILL PLACED UNDER PAVED AREAS (PARKING AREAS, DRIVEWAYS, SIDEWALKS, ETC.), SHALL BE COMPACTED IN 150MM TO 200MM LAYERS TO 80% SP0D (REFER TO GENERAL REQUIREMENTS OUTLINED IN SPECIFICATION SECTION 021315 & SOIL REPORT). TESTING AND INSPECTION OF SAND BACKFILL INCLUDING CHECKING THE PLACING AND COMPACTON OF FILL SHALL BE DONE BY AN INDEPENDENT INSPECTION TESTING CO. THE COST OF THE INSPECTION & TESTING OF THIS FILL WILL BE PAID BY OTHERS. ONE TEST SHALL BE MADE (EVERY 2 LAYERS OF FILL) FOR EACH 5000 SQ. FT. OR LESS OF FILLED AREAS FOR DRIVEWAYS, PARKING AREAS AND SIDEWALKS.

3. EXTERIOR BACKFILL IN AREAS TO RECEIVE SOIL OR SEED SHALL BE CLEAN FILL, FREE FROM ORGANIC MATERIAL AND BERRIS. PLACED IN MAXIMUM 300mm LAYERS AND COMPACTED TO ACHIEVE 80% DRY DENSITY AS DETERMINED BY THE STANDARD AG85O TEST. FROZEN EARTH SHALL NOT BE USED FOR BACKFILLING NOR SHALL ANY BACKFILLING BE PLACED ON OR AGAINST FROZEN GROUND.

4. BACKFILL TRENCHES WITHIN BUILDING WITH GRANULAR B CRUSHED STONE IN LAYERS AND COMPACT TO 100% STANDARD PROCTOR DENSITY.

5. SUPPLY AND INSTALL A 150mm wide plastic film 200mm below finished surface OR grade to MARK THE LOCATION OF DUCTS, CABLES AND CONDUITS. FILM SHALL BE MANUFACTURED BY GRIFFOULT OR EQUAL AND SHALL CONTAIN CONTINUOUS PRINTED WARNING AND MESSAGE DESIGNATING SERVICE BURIED. FILM SHALL BE ORANGE FOR POWER LINES AND GREEN FOR COMMUNICATION LINES.

6. IF SETTLEMENT OCCURS, IT SHALL BE MADE UP AS SOON AS POSSIBLE, SO THAT THE REGULAR TRAFFIC IN AND AROUND THE WORK WILL NOT BE INTERRUPTED. AFTER A PERIOD ASSESS TO REVEAL THAT SETTLEMENT HAS OCCURRED, IF ALL DEPRESSIONS TO RESTORE THE CORRECT GRADE.

7. PATCHING OF ALL PAVED AREAS, ROADS, WALKS, SOODING, ETC., DAMAGED BY NEW WORK WILL BE DONE BY ANOTHER CONTRACTOR. THE COST OF SUCH WORK SHALL BE THE RESPONSIBILITY OF THE OWNER.

8. BE RESPONSIBLE FOR MAKING GOOD ANY SUBSEQUENT SETTLEMENT OF FILL AND PAY ALL COSTS INCURRED IN MAKING GOOD PAVING, CURBS AND ALL OTHER SURFACES RESTORATIONS.

9. BACKFILLING TO SUBGRADE LEVEL BY THIS CONTRACTOR AND FINISH BACKFILL SHALL BE DONE BY PAVING CONTRACTOR.

EXCAVATED MATERIALS SHALL BE PILED, STORED AND/OR DISPOSED OF AS FOLLOWS:

1. DURING THE PROCESS OF THE CONTRACT, IN SUCH PLACES AND IN SUCH A MANNER THAT A MINIMUM OF DAMAGE OR DISBURSEMENT OF EXISTING GROUND WILL RESULT.

2. ON COMPLETION OF WORK, ALL EXCAVATED MATERIAL SHALL BE REMOVED & DISPOSED OFF SITE.

43. UNDERGROUND DUCT BANK: SUPPLY AND INSTALL UNDERGROUND CONCRETE ENCASED DUCT BANKS FOR CABLES INDICATED. CONCRETE WORK AS DETAILED HEREIN SHALL BE PROVIDED BY THIS SECTION. TRENCHING AND BACKFILLING SHALL BE DONE BY ANOTHER CONTRACTOR.

2. DUCT BANKS SHALL FOLLOW GENERAL ROUTE SHOWN ON THE DRAWINGS AND SHALL TERMINATE AT SPECIFIED LOCATIONS. EXACT LOCATION OF DUCT BANKS AND TERMINATING POINTS SHALL BE VERIFIED ON THE SITE PRIOR TO COMMENCEMENT OF WORK.

3. THE DUCT BANK SHALL CONSIST OF PARALLELED DUCTS ENCASED IN CONCRETE. THE NUMBER AND ARRANGEMENT OF DUCTS SHALL BE AS SHOWN ON THE DRAWINGS.


























4. DUCTS SHALL BE C.S.A. CERTIFIED TYPE 68II POLYMER FOR CONCRETE ENCASEMENT OR DIRECT BURIAL, WITH AN INTERIOR DIAMETER OF FOUR INCHES MINIMUM UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

5. BENDS SHALL GENERALLY BE AS FACTORY SUPPLIED OF APPROVED RADIUS. RADIUS OF SUCH BENDS SHALL NOT BE LESS THAN STANDARD FOR THE 100MM DIAMETER DUCT 1M.





6. THE DUCT LENGTHS SHALL BE JOINED TOGETHER WITH AN APPROVED COUPLING TO PROVIDE A SOUND JOINT. ADJACENT COUPLINGS SHALL BE "STAGGERED" BY AT LEAST 200MM JOINT JOINTMENT SHALL BE USED TO SEAL THE COUPLINGS.

7. WHERE TRENCH IS DRY AND FIRM, NO BED SHALL BE REQUIRED; WHERE TRENCH IS WET, SUPPLY AND INSTALL AT 150MM LAYER OF CRUSHED STONE IN THE BOTTOM. NO CONCRETE SHALL BE POURED IN TRENCHES CONTAINING WATER.

ELECTRICAL LEGEND

-  15A, 120V, SINGLE PHASE, 1" GROUND DUPLEX RECEPTACLE, MOUNTED @ 12" AFF U.N.O. DECORA STYLE
-  SAME AS ABOVE, BUT MOUNTED ABOVE COUNTER. MOUNTING HEIGHT AS SHOWN ON DRAWINGS. DECORA STYLE
-  15A, 120V, SINGLE PHASE, ISOLATED GROUND DUPLEX RECEPTABLE WITH FLUSH MOUNTED DUPLEX RECEPTACLE
-  HALF SWITCHED DUPLEX RECEPTACLE
-  SIMPLEX RECEPTACLE, CONFIGURATION AS REQUIRED.
-  SINGLE POLE DECORA SWITCH
-  SINGLE POLE LOW VOLTAGE SWITCH
-  3-WAY DECORA SWITCH
-  MASTER SWITCH
-  DIMMER SWITCH, LUTRON MASTRO U.N.O. CAPACITY AS REQ'D
-  OCCUPANCY SENSOR SWITCH CONFIGURED TO AUTO-ON. 'MO' DENOTES CONFIGURE TO MANUAL-ON OPERATION. LUTRON U.N.O.
-  OCCUPANCY SENSOR SWITCH WITH DUAL RELAY CONFIGURED TO MANUAL-ON (SIMILAR TO WATTSPOPPER PW-200)
-  CEILING MOUNTED OCCUPANCY SENSOR C/W POWER PACK CONFIGURED TO MANUAL-ON OPERATION (SIMILAR TO WATTSPOPPER W=1000 C/W 82-150)
-  WALL MOUNTED OCCUPANCY SENSOR (SIMILAR TO WATTSPOPPER DT-200)
-  CEILING MOUNTED OCCUPANCY SENSOR WITH LINEAR COVERAGE (SIMILAR TO WATTSPOPPER W-2000)
-  120 VOLT SINGLE PHASE OUTLET
-  208 VOLT SINGLE PHASE OUTLET
-  208 VOLT THREE PHASE OUTLET
-  600 VOLT THREE PHASE OUTLET
-  FAN MOTOR OUTLET
-  SINGLE PHASE MOTOR STARTER
-  THREE PHASE MOTOR STARTER
-  FUSED / UNFUSED DISCONNECT SWITCH
-  UNIT HEATER
-  ELECTRIC HEATER BY ELEC. CONTRACTOR REFER TO HEATER TABLE FOR SIZE/SPEC

TELECOMMUNICATIONS

-  COMBINATION OF VOICE/DATA OUTLET BACKBOX WITH 3/4" & PULL STRING STUBBED 6" ABOVE FINISH CEILING
-  VOICE TELEPHONE OUTLET BACKBOX WITH 3/4" & PULL STRING STUBBED 6" ABOVE FINISH CEILING
-  TELEVISION OUTLET BACKBOX WITH 3/4" & PULL STRING STUBBED 6" ABOVE FINISH CEILING
-  DATA OUTLET BACKBOX WITH 3/4" & PULL STRING STUBBED 6" ABOVE FINISH CEILING

EMERGENCY LIGHTING

SYMBOL	DESCRIPTION	NO.	DATE	DESCRIPTION