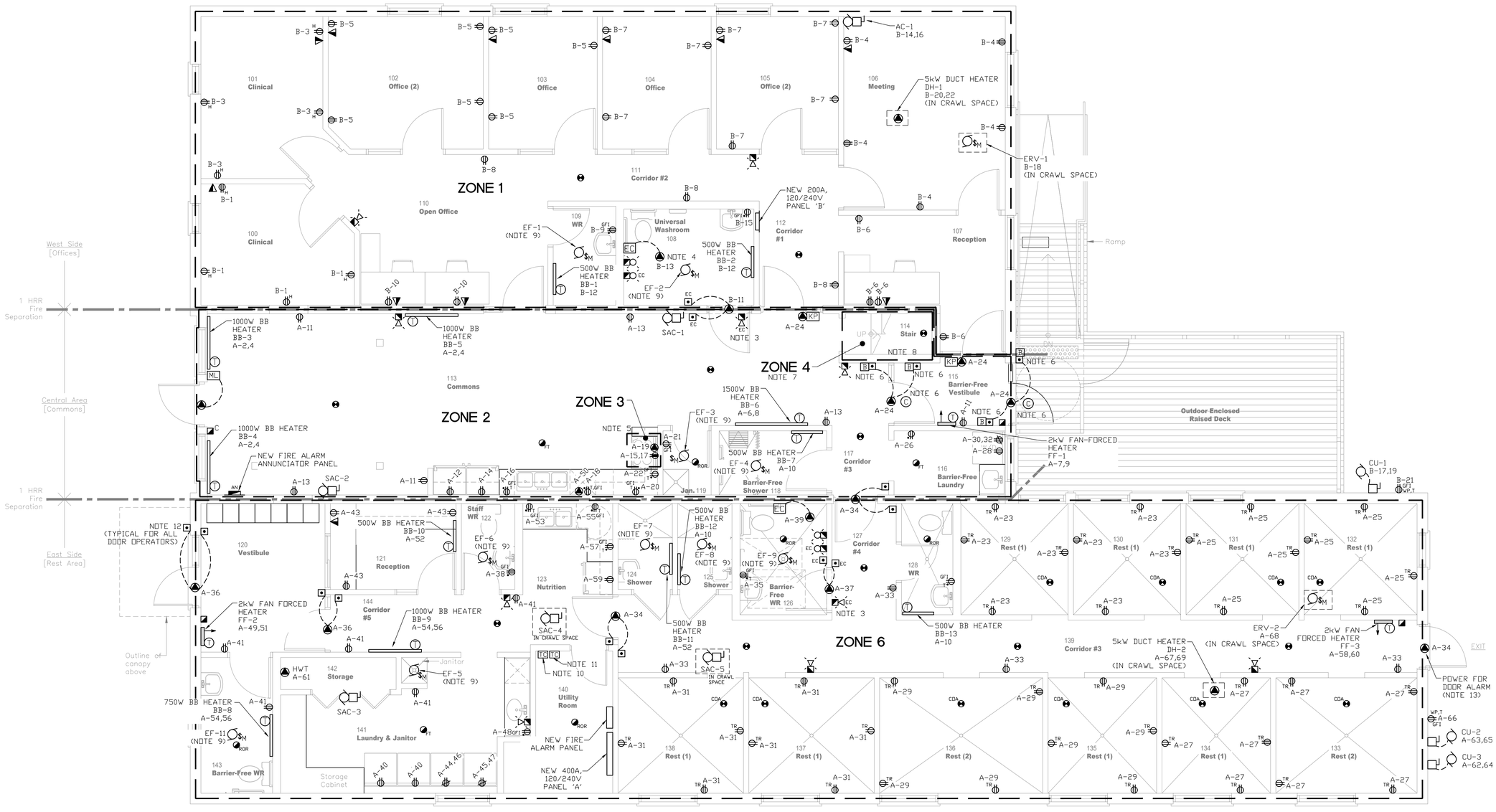
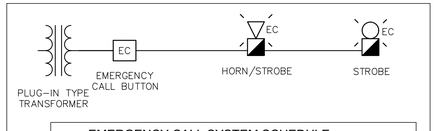


1 E1 POWER LAYOUT PLAN
SCALE: 1/4" = 1'-0"

NOTES:

1. RECEPTACLES IN PATIENT CARE AREAS TO BE HOSPITAL GRADE, WIRING TO BE MINIMUM 12AWG. ALL CIRCUITS SHALL BE 2-WIRE CIRCUITS WITH INSULATED GROUND (AS PER SECTION 24 OF THE ONTARIO ELECTRICAL SAFETY CODE).
2. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF MICROWAVE RECEPTACLE WITH MILLWORK (IF REQUIRED).
3. EMERGENCY CALL SYSTEM VISUAL AND AUDIBLE ALARM OVER DOOR
4. EMERGENCY CALL SYSTEM TRANSFORMER.
5. DISCONNECT POWER TO ELECTRIC STOVES UPON ACTIVATION OF FIRE SUPPRESSION SYSTEM.
6. COORDINATE EXACT LOCATIONS, REQUIREMENTS AND MOUNTING HEIGHTS WITH SECURITY COMPANY.
7. FIRE ALARM ZONE 4 IS FOR STAIR ZONE. SUPPLY AND INSTALL A SMOKE DETECTOR AT THE TOP OF THE STAIRS.
8. FIRE ALARM ZONE 5 WILL BE FOR THE SECOND FLOOR. SUPPLY AND INSTALL ONE PULL STATION AND ONE HEAT DETECTOR ON THE SECOND FLOOR.
9. EXHAUST FAN IS CONNECTED TO ROOM LIGHTING SWITCH.
10. 7-DAY/24 HOUR TIMER ON WALL FOR ERV-1. SUPPLIED BY MECHANICAL, INSTALLED BY ELECTRICAL.
11. 7-DAY/24 HOUR TIMER ON WALL FOR ERV-2. SUPPLIED BY MECHANICAL, INSTALLED BY ELECTRICAL.
12. COORDINATE EXACT LOCATION AND MOUNTING HEIGHTS OF ALL DOOR OPERATOR PUSH-BUTTONS WITH ARCHITECTURAL DRAWINGS.
13. COORDINATE WITH SECURITY FOR CONNECTION POINTS.



EMERGENCY CALL SYSTEM SCHEDULE		
MODEL NUMBER	PROVIDER	DESCRIPTION
NC-P24VDC	MIRCOM	120:24V TRANSFORMER, PLUG-IN TYPE
EC-116	MIRCOM	EMERGENCY PUSH BUTTON STATION
P2W-P	MIRCOM	EMERGENCY HORN/STROBE

2 E1 EMERGENCY CALL SYSTEM SINGLE LINE DIAGRAM
SCALE: N.T.S.

PUSHBUTTON SHALL BE MOUNTED AT A HEIGHT BETWEEN 900mm AND 1100mm.

RECEPTACLE LEGEND	
	RECEPTACLE
	DRYER RECEPTACLE
	STOVE RECEPTACLE
•	MOUNTED ABOVE COUNTER
GFI	GROUND FAULT INTERRUPTED
T	20A T-SLOT
TR	TAMPER RESISTANT
WP	WEATHERPROOF
H	HOSPITAL GRADE

POWER LEGEND	
	DATA/PHONE OUTLET
	DIRECT CONNECTION
$M	MOTOR RATED SWITCH
	SINGLE PHASE MOTOR
	THREE PHASE MOTOR
	DISCONNECT SWITCH
	ELECTRICAL PANEL
B	BUZZER
KP	KEYPAD
ML	MAGLOCK
C	CAMERA
	POWER DOOR OPERATOR

FIRE ALARM LEGEND	
	PULL STATION
C	PULL STATION C/W AUXILLARY CONTACTS
	SMOKE DETECTOR
	FIRE ALARM HORN/STROBE
	FIRE ALARM STROBE
ROR	RATE OF RISE HEAT DETECTOR
CDA	INTEGRATED 3-IN-1 LED STROBE AND TALKING SMOKE & CO ALARM

Rev.	Date	Description	By	App.
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–	–	–	–	–
1	25/03/26	ISSUED FOR TENDER	PGB	–
0	25/02/27	ISSUED FOR PERMIT	PGB	–

BERTHELOT ENGINEERING LTD
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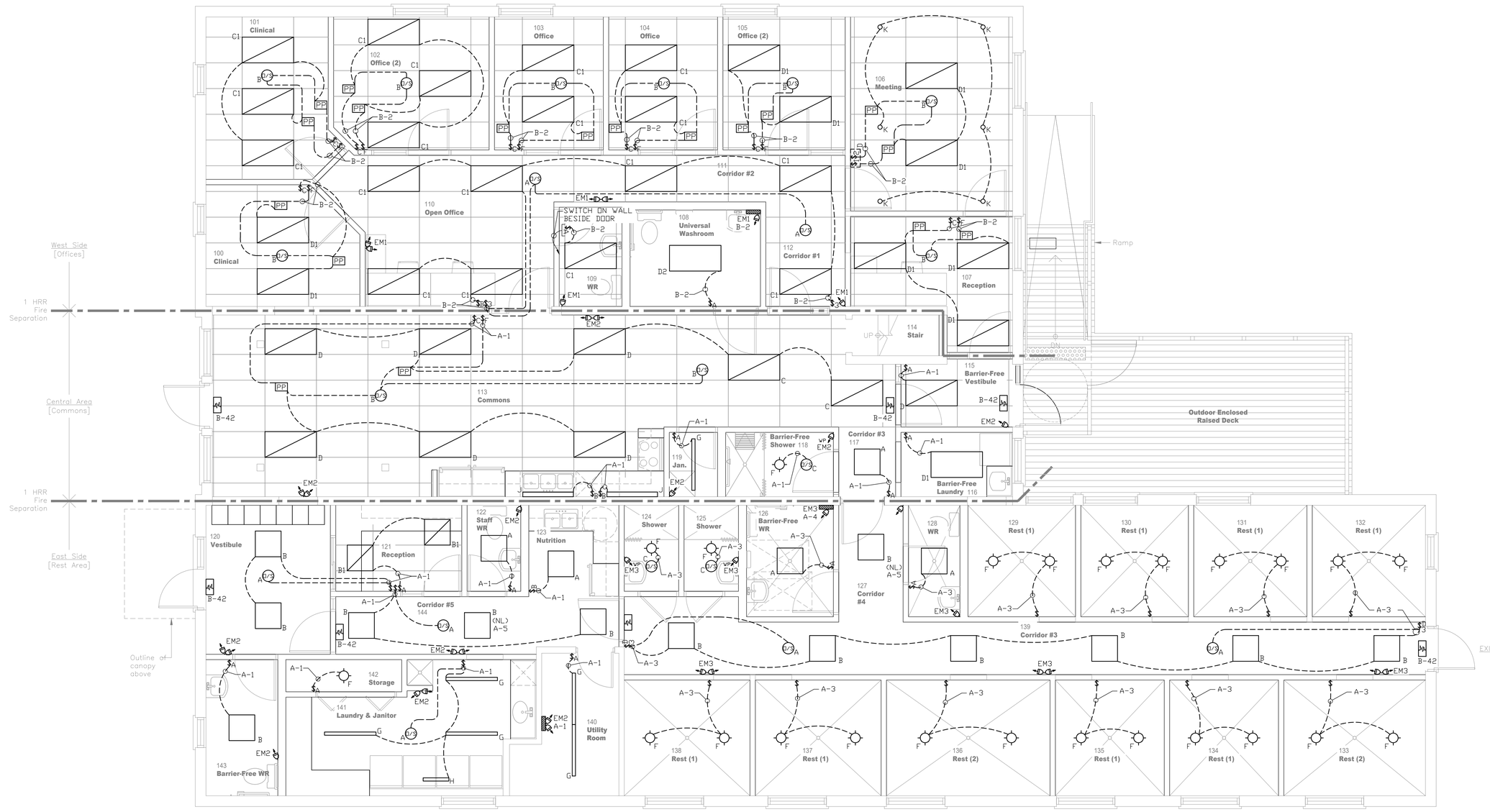
LICENSED PROFESSIONAL ENGINEER P.G.P. BERTHELOT Feb. 27/25 PROVINCE OF ONTARIO
ELECTRICAL BCIN 23396

DWN. T. ST. JEAN
CHK. P. BERTHELOT
DSN. PGB/TMS
SCALE: AS NOTED

PROJECT
JOHN HOWARD SOCIETY
22 Peel Street
Lindsay, Ontario

TITLE
POWER LAYOUT PLAN

FILE No. 683
DWG. No. E1



1 / E2 LIGHTING LAYOUT PLAN
SCALE: 1/4" = 1'-0"

LIGHTING LEGEND	
$	DECORA SWITCH
$3	3-WAY DECORA SWITCH
SEE DRAWING E3 FOR LIGHTING AND CONTROLS SCHEDULE	

EMERGENCY LIGHTING & EXIT SCHEDULE

SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION
EM1	12ESLxx/xxx	EMERGILITE OR APPROVED EQUAL	EMERGENCY LIGHTING UNIT, BATTERY CAPACITY AS LISTED IN TABLE ON THIS DRAWING, 12VDC, 10 YEAR BATTERY, C/W MR16 LED HEADS AS LISTED AND MOUNTING SHELF
	EF9DM-LI	EMERGILITE OR APPROVED EQUAL	DUAL REMOTE HEAD, 12VDC, 5W, MR16 LED
	EF9M-LI	EMERGILITE OR APPROVED EQUAL	SINGLE REMOTE HEAD, 12VDC, 5W, MR16 LED
WP	RMMW-1-12-24V-5W-LA-LED	AIMLITE OR APPROVED EQUAL	WEATHERPROOF, SINGLE REMOTE HEAD, 12VDC, 5W, MR16 LED
	EA SERIES	EMERGILITE OR APPROVED EQUAL	SELF POWERED RUNNING EXIT SIGN, SINGLE FACE, WALL OR CEILING MOUNT AS INDICATED, ARROWS AS INDICATED, LED LAMPS FOR 120VAC, CSA-C860-11 LISTED & CERTIFIED

Rev.	Date	Description	By	App.
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SCALE: AS NOTED

PROJECT
JOHN HOWARD SOCIETY
22 Peel Street
Lindsay, Ontario

TITLE
LIGHTING LAYOUT PLAN

FILE No. 683
DWG. No. E2

LIGHTING SCHEDULE

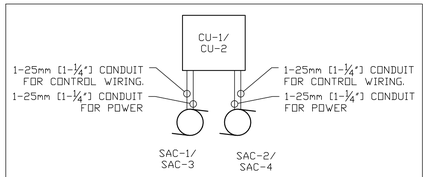
SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION
A	22FP2135 C/W DF-22W-U	COOPER-METALUX OR APPROVED EQUAL	2'x2' SURFACE MOUNTED LED FLAT PANEL LUMINAIRE, 2205 LUMENS 20.7W), 120V, 3500K, COMPLETE WITH DRYWALL FRAME KIT
B	22FP3235 C/W DF-22W-U	COOPER-METALUX OR APPROVED EQUAL	2'x2' SURFACE MOUNTED LED FLAT PANEL LUMINAIRE, 3307 LUMENS 29.2W), 120V, 3500K, COMPLETE WITH DRYWALL FRAME KIT
B1	22FP3235	COOPER-METALUX OR APPROVED EQUAL	2'x2' SURFACE MOUNTED LED FLAT PANEL LUMINAIRE, 3307 LUMENS 29.2W), 120V, 3500K
C	24FP3135	COOPER-METALUX OR APPROVED EQUAL	2'x4' SURFACE MOUNTED LED FLAT PANEL LUMINAIRE, 3553 LUMENS 29.3W), 120V, 3500K,
C1	24FP3140	COOPER-METALUX OR APPROVED EQUAL	2'x4' SURFACE MOUNTED LED FLAT PANEL LUMINAIRE, 3608 LUMENS 29.4W), 120V, 4000K,
D	24FP4735	COOPER-METALUX OR APPROVED EQUAL	2'x4' SURFACE MOUNTED LED FLAT PANEL LUMINAIRE, 4556 LUMENS 41.4W), 120V, 3500K
D1	24FP4740	COOPER-METALUX OR APPROVED EQUAL	2'x4' SURFACE MOUNTED LED FLAT PANEL LUMINAIRE, 4556 LUMENS 41.4W), 120V, 4000K
D2	24FP4740 C/W DF-24W-U	COOPER-METALUX OR APPROVED EQUAL	2'x4' SURFACE MOUNTED LED FLAT PANEL LUMINAIRE, 4556 LUMENS 41.4W), 120V, 4000K, COMPLETE WITH DRYWALL FRAME KIT
F	SMD12R-20-9S-WH-E C/W SMD12RTRMWH	COOPER HALO OR APPROVED EQUAL	12" ROUND SURFACE MOUNTED DOWNLIGHT, 2000 LUMENS (26.32W), 3500K, 90CRI, MATTE WHITE FINISH, COMPLETE WITH 12" ROUND SMD WHITE TRIM
G	4SNLED-LD5-58SL-LW-UNV-L840-CD1-U	COOPER-METALUX OR APPROVED EQUAL	4' SURFACE MOUNTED STRIP LIGHT, FULL FROST LENS, 5920 LUMENS (55W), 120V, 4000K, 0-10V DIMMING DRIVER
H	2SNLED-LD5-23SL-LW-UNV-L840-CD1-U	COOPER-METALUX OR APPROVED EQUAL	2' SURFACE MOUNTED STRIP LIGHT, FULL FROST LENS, 2453 LUMENS (21W), 120V, 4000K, 0-10V DIMMING DRIVER
J	HU30M-SCTD-48-P	COOPER HALO OR APPROVED EQUAL	24" LED UNDERCABINET LUMINAIRE, 1393.88 LUMENS (16.82W), 90 CRI, 3500K, WHITE IN COLOUR
K	SMD4R69SWH-SMD4RTRMxx C/W 4" COMPATIBLE HOUSING	COOPER-HALO OR APPROVED EQUAL	4" SURFACE LED DOWNLIGHT, 90CRI, 120V, WHITE, 4000K, 600 LUMENS (9W), WET LOCATION LISTED

LIGHTING CONTROLS SCHEDULE

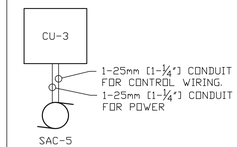
SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION
$A	LHMTS1	CURRENT OR APPROVED EQUAL	PASSIVE, DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR, 120V, WHITE IN COLOUR, PROGRAMMED AUTO-ON (WALL PLATE NOT INCLUDED)
$B	LHMTS1	CURRENT OR APPROVED EQUAL	PASSIVE, DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR, 120V, WHITE IN COLOUR, PROGRAMMED MANUAL-ON (WALL PLATE NOT INCLUDED)
$C	LVS-M-1-PL-WH	CURRENT OR APPROVED EQUAL	MANUAL ON/OVERRIDE OFF LOW VOLTAGE MOMENTARY SWITCH, WHITE IN COLOUR
PP	UVPP/UVPPM/MPSA	CURRENT OR APPROVED EQUAL	UNIVERSAL VOLTAGE POWER PACK/AUXILIARY PACK
A	OMNIDT2000BP1277	CURRENT OR APPROVED EQUAL	DUAL TECHNOLOGY, 360° CEILING MOUNTED SENSOR, LINE VOLTAGE, WHITE IN COLOUR
B	OMNIDT2000	CURRENT OR APPROVED EQUAL	DUAL TECHNOLOGY, 360° CEILING MOUNTED SENSOR, LOW VOLTAGE, WHITE IN COLOUR C/W MANUAL ON/OFF POWER PACK
C	WSP-LWO-SM-UNV C/W WSPLWO-L360-LM-WH	CURRENT OR APPROVED EQUAL	DIGITAL PASSIVE INFRARED (PIR) SINSOR, SURFACE MOUNT, WATER-TIGHT, 120V C/W WATER-TIGHT, 360° COVERAGE, LOW MOUNT LENS, WHITE IN COLOUR

ELECTRIC HEATING EQUIPMENT SCHEDULE

SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION
T	OAC02000-T C/W KIT-OAC-BS1	OUELLET OR APPROVED EQUAL	2kW COMMERCIAL FAN-FORCED HEATER, WHITE, 240V, C/W INTEGRAL TAMPERPROOF THERMOSTAT, COMPLETE WITH SURFACE MOUNT KIT
T	ODB0502-TB6	OUELLET OR APPROVED EQUAL	500W BASEBOARD HEATER, WHITE, 120V, C/W INTEGRAL THERMOSTAT
T	ODB0750-TB6	OUELLET OR APPROVED EQUAL	750W BASEBOARD HEATER, WHITE, 240V, C/W INTEGRAL THERMOSTAT
T	ODB1000-TB6	OUELLET OR APPROVED EQUAL	1000W BASEBOARD HEATER, WHITE, 240V, C/W INTEGRAL THERMOSTAT
T	ODB1500-TB6	OUELLET OR APPROVED EQUAL	1500W BASEBOARD HEATER, WHITE, 240V, C/W INTEGRAL THERMOSTAT

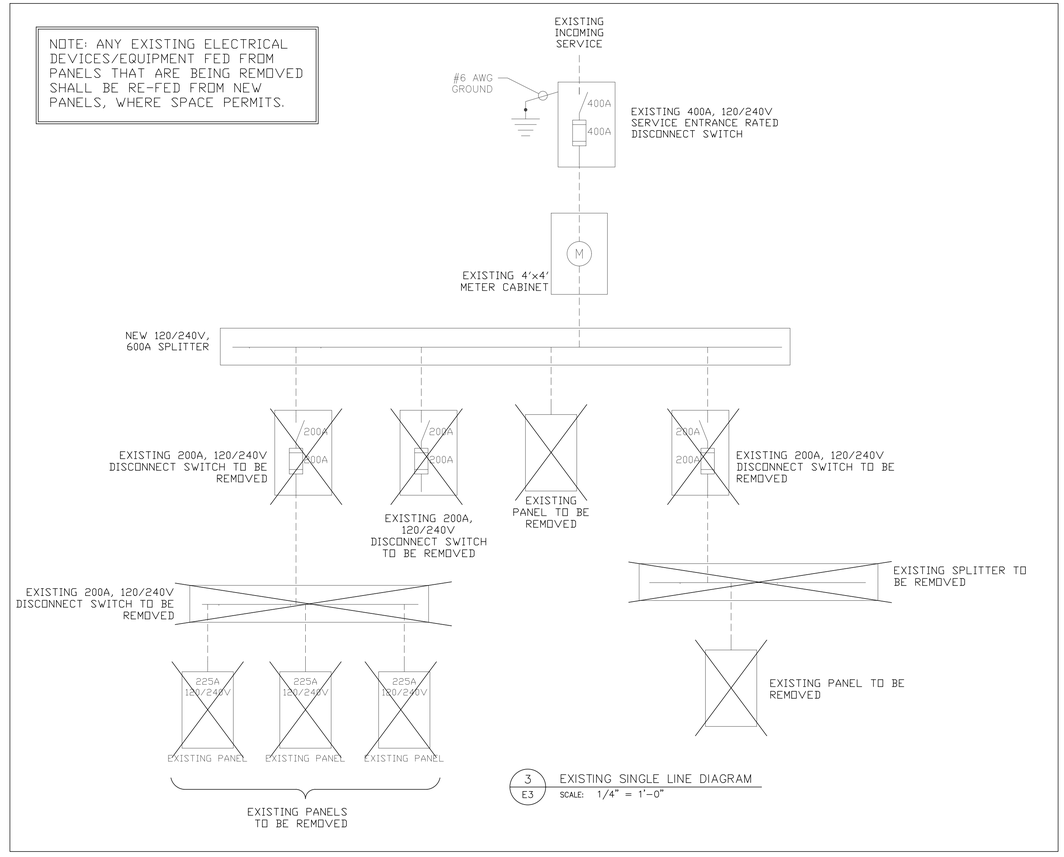


1 / E3 CU-1, SAC-1 & SAC-2 AND CU-2 SAC-3 & SAC-4 CONTROL SCHEMATIC
SCALE: N.T.S.



2 / E3 CU-3 & SAC-5 CONTROL SCHEMATIC
SCALE: N.T.S.

NOTE: ANY EXISTING ELECTRICAL DEVICES/EQUIPMENT FED FROM PANELS THAT ARE BEING REMOVED SHALL BE RE-FED FROM NEW PANELS, WHERE SPACE PERMITS.



3 / E3 EXISTING SINGLE LINE DIAGRAM
SCALE: 1/4" = 1'-0"

PANEL:	LOCATION:	CORRIDOR #1	VOLTAGE:	240/120V 1P 3W	IC RATING:	10kA
B	TYPE:	RECESSED	MAIN BUS:	225A	CIRCUITS:	42
	FED FROM:	DISCONNECT SWITCH	MAIN BREAKER:	200A		

CIRCUIT DESCRIPTION	LOAD (kVA)	CCT BKR	CCT #	PHASE	CCT #	CCT BKR	LOAD (kVA)	CIRCUIT DESCRIPTION
CLINICAL 100 RECEPTACLES	x	15A	1	a	2	15A	x	OFFICE LIGHTING
CLINICAL 101 RECEPTACLES	x	15A	3	b	4	15A	x	MEETING ROOM RECEPTACLES
OFFICE 102/OFFICE 103 REC.	x	15A	5	a	6	15A	x	RECEPTION RECEPTACLES
OFFICE 104/OFFICE 105 REC.	x	15A	7	b	8	15A	x	CORRIDOR RECEPTACLES
W/R 109 GFCI RECEPTACLE	x	15A	9	a	10	15A	x	OPEN OFFICE RECEPTACLES
UNIVERSAL W/R DOOR OP.	x	15A	11	b	12	15A	x	BB-1/BB-2
UNIVERSAL W/R E.C. SYS. TX	x	15A	13	a	14	30A	x	AC-1
UNIVERSAL W/R GFCI REC.	x	15A	15	b	16		x	
SAC-1	x	30A	17	a	18	15A	x	ERV-1
	x		19	b	20	30A	x	DH-1
SAC-1 CONVENIENCE REC.	x	20A	21	a	22		x	
x	x	x	23	b	24	x	x	x
x	x	x	25	a	26	x	x	x
x	x	x	27	b	28	x	x	x
x	x	x	29	a	30	x	x	x
x	x	x	31	b	32	x	x	x
x	x	x	33	a	34	x	x	x
x	x	x	35	b	36	x	x	x
x	x	x	37	a	38	x	x	x
x	x	x	39	b	40	x	x	x
x	x	x	41	a	42	15A	x	EXIT SIGNS [1]

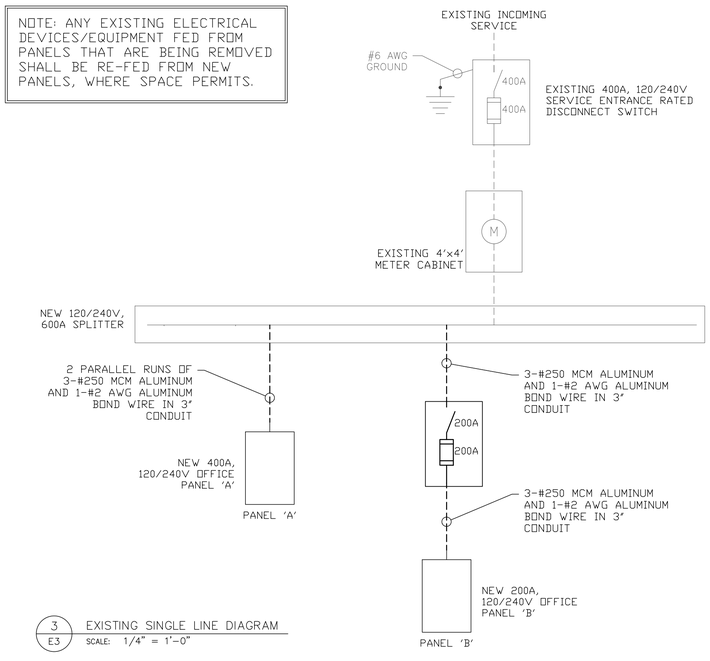
[1] BREAKER SHALL BE LOCKED AND PAINTED RED

PANEL:	LOCATION:	ELECTRICAL ROOM	VOLTAGE:	240/120V 1P 3W	IC RATING:	10kA
A	TYPE:	SURFACE MOUNTED	MAIN BUS:	400A	CIRCUITS:	84
	FED FROM:	EXISTING SPLITTER	MAIN BREAKER:	400A		

CIRCUIT DESCRIPTION	LOAD (kVA)	CCT BKR	CCT #	PHASE	CCT #	CCT BKR	LOAD (kVA)	CIRCUIT DESCRIPTION
COMMONS/LAUNDRY/UTILITY LTG	x	20A	1	a	2	20A	x	BB-3/BB-4/BB-5
CORR #3/REST AREA LIGHTING	x	15A	3	b	4		x	
NIGHT LIGHTS	x	15A	5	a	6	15A	x	BB-6
FF-1	x	15A	7	b	8		x	
	x		9	a	10	20A	x	BB-7/BB-12/BB-13
COMMONS RECEPTACLES	x	15A	11	b	12	15A	x	FREEZER RECEPTACLE
COMMONS RECEPTACLES	x	15A	13	a	14	15A	x	REFRIGERATOR RECEPTACLE
STOVE	x	40A	15	b	16	20A	x	KITCHEN T-SLOT RECEPTACLE
	x		17	a	18	20A	x	KITCHEN T-SLOT RECEPTACLE
RANGE HOOD	x	15A	19	b	20	20A	x	KITCHEN T-SLOT RECEPTACLE
JANITOR RECEPTACLE	x	15A	21	a	22	20A	x	KITCHEN T-SLOT RECEPTACLE
REST 129/130 RECEPTACLES	x	15A	23	b	24	15A	x	KEY PAD/ELECTRIC STRIKES
REST 131/132 RECEPTACLES	x	15A	25	a	26	15A	x	LAUNDRY ROOM RECEPTACLE
REST 133/134 RECEPTACLES	x	15A	27	b	28	15A	x	WASHING MACHINE RECEPTACLE
REST 135/136 RECEPTACLES	x	15A	29	a	30	30A	x	DRYER
REST 137/138 RECEPTACLES	x	15A	31	b	32		x	
CORRIDOR #3 RECEPTACLES	x	15A	33	a	34	15A	x	DOOR ALARM/DOOR OPERATORS
BARRIER FREE WASHROOM REC.	x	15A	35	b	36	15A	x	DOOR OPERATORS
BARRIER FREE W/R DOOR OP.	x	15A	37	a	38	15A	x	STAFF WASHROOM GFCI REC
BARRIER FREE W/R E.C. SYS. TX	x	15A	39	b	40	15A	x	WASHING MACHINE REC.
VESTIBULE/CORRIDOR REC.	x	15A	41	a	42	15A	x	WASHING MACHINE REC.

CIRCUIT DESCRIPTION	LOAD (kVA)	CCT BKR	CCT #	PHASE	CCT #	CCT BKR	LOAD (kVA)	CIRCUIT DESCRIPTION
RECEPTION RECEPTACLES	x	15A	43	a	44	30A	x	DRYER
DRYER	x	30A	45	b	46		x	
	x		47	a	48	15A	x	LAUNDRY ROOM RECEPTACLE
FF-2	x	15A	49	b	50	15A	x	KITCHEN DISHWASHER
	x		51	a	52	15A	x	BB-10/BB-11
NUTRITION T-SLOT RECEPTACLE	x	20A	53	b	54	15A	x	BB-8/BB-9
NUTRITION T-SLOT RECEPTACLE	x	20A	55	a	56		x	
NUTRITION T-SLOT RECEPTACLE	x	20A	57	b	58	15A	x	FF-3
NUTRITION REFRIGERATOR REC.	x	15A	59	a	60		x	
HOT WATER TANK	x	15A	61	b	62	40A	x	CU-3
CU-2	x	30A	63	a	64		x	
	x		65	b	66	15A	x	CU-2 & CU-3 CONV. REC.
DH-2	x	30A	67	a	68	15A	x	ERV-2
	x		69	b	70	20A	x	SPARE
SPARE	x	15A	71	a	72	20A	x	SPARE
SPARE	x	15A	73	b	74	20A	x	SPARE
SPARE	x	15A	75	a	76	x	x	x
SPARE	x	15A	77	b	78	x	x	x
x	x	x	79	a	80	x	x	x
x	x	x	81	b	82	x	x	x
FIRE ALARM PANEL [1]	x	15A	83	a	84	x	x	x

NOTE: ANY EXISTING ELECTRICAL DEVICES/EQUIPMENT FED FROM PANELS THAT ARE BEING REMOVED SHALL BE RE-FED FROM NEW PANELS, WHERE SPACE PERMITS.



3 / E3 EXISTING SINGLE LINE DIAGRAM
SCALE: 1/4" = 1'-0"

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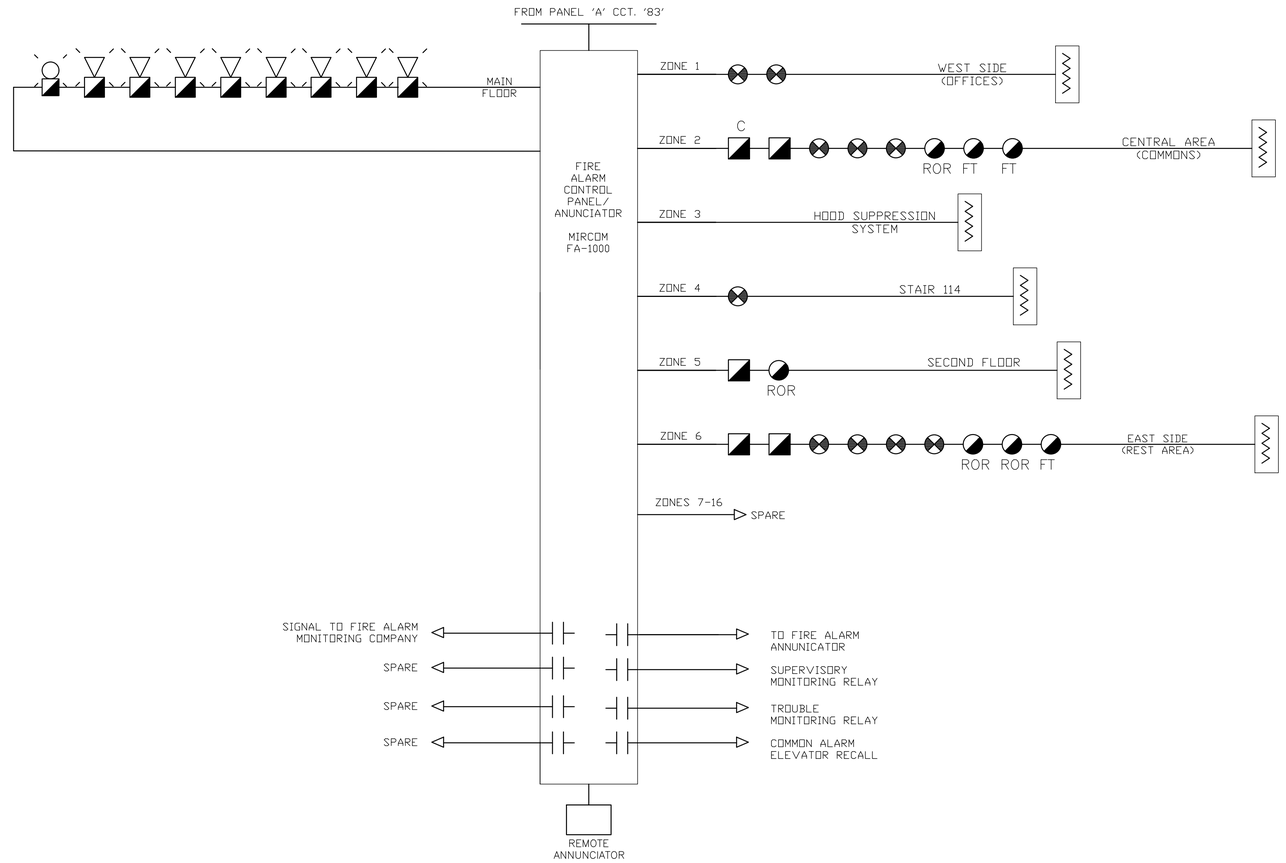
SCALE: AS NOTED

PROJECT
JOHN HOWARD SOCIETY
22 Peel Street
Lindsay, Ontario

TITLE
SCHEDULES AND DETAILS

FILE No. 683

DWG. No. E3



1 / E4 FIRE ALARM RISER DIAGRAM

SCALE: N.T.S.

FIRE ALARM SYSTEM SCHEDULE

SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION
	FA-1000 SERIES	MIRCOM OR APPROVED EQUAL	F/A PANEL, SURFACE MOUNT, BATTERIES AND MODULES AS REQUIRED
AN	RA-1000 SERIES	MIRCOM OR APPROVED EQUAL	F/A ANNUNCIATOR PANEL C/W FLUSH TRIM, BATTERIES, MODULES AS REQUIRED
	MS-401	MIRCOM	PULL STATION
C	MS-400 SERIES	MIRCOM	PULL STATION C/W AUXILIARY CONTACTS
	FHS-400RR	MIRCOM	FIRE ALARM HORN/STROBE, 15 CANDELA, RED IN COLOUR
	FS-400RR	MIRCOM	FIRE ALARM STROBE
COA	P4010ACLEDSCOCA	KIDDE	120VAC INTEGRATED 3-IN-1 LED STROBE AND TALKING SMOKE & CO ALARM
	1451 SERIES	MIRCOM	IONIZATION TYPE SMOKE DETECTOR
ROR	CR 135	MIRCOM	RATE OF RISE TYPE HEAT DETECTOR
FT	CF 200	MIRCOM	FIXED TEMPERATURE HEAT DETECTOR

NOTES:

1. DEVICE COUNTS ARE SHOWN AS A GUIDE. CONTRACTOR TO CONFIRM, FROM FLOOR PLANS, EXACT NUMBER OF DEVICES PER ZONE.
2. SUPPLY AND INSTALL ENOUGH RELAYS FOR ALL EXPECTED DEVICES AS WELL AS MINIMUM 3 SPARE RELAYS.
3. PROVIDE PASSIVE GRAPHIC DISPLAY ADJACENT TO ANNUNCIATOR PANEL.
4. PROVIDE LOOP ISOLATION MODULES AS PER CODE.
5. ALL HORN COMBINATION HORN STROBE DEVICES SHALL BE CLASS 'A' CIRCUITS.
6. WALL MOUNTED HORNS AND HORNS/STROBES SHALL BE INSTALLED SUCH THAT THE ENTIRE LENS IS NOT LESS THAN 2300mm AND NOT MORE THAN 2400mm A.F.F.

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JOHN HOWARD SOCIETY
22 Peel Street
Lindsay, Ontario

TITLE
FIRE ALARM RISER

FILE No. 683

DWG. No. E4

Part 1 – General

1.1. General

1.1.1. This section covers the general requirements for the electrical work. Read all divisions of the contract documents.

1.1.2. All equipment shall be CSA approved.

1.1.3. All equipment, materials and installation methods shall conform to the best commercial standard practice, and in accordance with the Ontario Electrical Safety Code and all bulletins.

1.2. Outline Scope

1.2.1. The following major items of work shall be supplied and installed under the electrical contract:

1.2.1.1. Provide all labour, materials, equipment and services to complete the work of the electrical division as further specified and as shown on the drawings:
a. Supply and install light fixtures as detailed on the drawings.
b. Supply and install distribution panels as detailed on the drawings.
c. Supply and install exit, emergency lights, fire alarm equipment and receptacles as detailed on drawings.
d. Miscellaneous removals as required.

1.3. Contract Drawings

1.3.1. Drawings for electrical work are performance drawings, diagrammatic, intended to convey scope of work and indicate general arrangement and approximate location of apparatus, fixtures and wiring. Drawings do not show all conduits. Those shown are diagrammatic only.

1.3.2. Additional money over the contract price shall not be paid unless an approved change order is issued by the architect. Claims for extras shall be submitted with a complete breakdown of material, labour, hourly rates, etc.

1.4. Shop Drawings

1.4.1 Submit four reproducible copies of manufacturer's detailed shop drawings, which indicate clearly the materials and/or equipment actually being supplied, all details of construction, accurate dimensions, capacity, operating characteristics and performance for each piece of manufactured equipment and for items listed under each section for review.

1.4.2. Shop drawings submitted for approval that are not stamped and signed in accordance with the preceding requirements will be returned for resubmittal.

1.4.3. Installation of any equipment shall not commence until after shop drawings have been reviewed by the consultant.

1.4.4. Bind one set of approved shop drawings in each operating and maintenance instruction manual.

1.5. Co-Operation with Other Trades

1.5.1. The contractor shall co-operate fully with other trades in such a manner as not to interfere with other work being carried out at the job site. Where other work and equipment has to be installed along with work pertaining to this division, arrange with other trades to install this work to best suit the needs for the particular condition.

1.6. Warranty

1.6.1. The contractor shall guarantee all work for a period of one year after the date of issue of the final certificate by the engineer and for longer periods where specified. If any defects become evident within the guarantee periods all necessary repairs and replacements to the work shall be made without cost to the owner. The contractor shall pay for making good any other work damaged through defects in the work of this section during both construction and guarantee periods.

1.7. Insurance

1.7.1. The contractor shall maintain all necessary insurance to protect the owner and all trades from all possible claims.

1.8. Liability

1.8.1. The contractor shall assume full responsibility for layout of work and for any damage caused by improper location or carrying out of work of these sections.

1.9. Cutting and Patching

1.9.1. The contractor shall complete all required cutting and patching to perform the work of this contract. Cuttings shall be kept to a minimum and be performed with clean cut straight edges. Patching shall be neat, clean and restore to original finish conditions using similar types of materials. Use only trades personnel skilled in the various types of work required. Cutting of structural members shall not be permitted without written approval by the owner.

1.10. Record Drawings

1.10.1 The contractor shall maintain accurate records of changes to the drawings on the job site.
These shall include: all changes included in addenda to the tender documents; site instructions; and contract change notices. Upon project completion, the contractor shall forward to the consultant the set of drawings indicating the as-built conditions.

1.11. Existing Conditions

1.11.1. The contractor shall visit and examine the site and become familiar with all existing conditions affecting the work prior to submitting tender. No allowances in cost will be made by the owner for any difficulties encountered in the work arising out of conditions existing at the time of tendering.

1.12. Product Delivery, Storage and Handling

1.12.1. Inspect products delivered to the site and before acceptance, ensure that the product is: new; free from defects; is as specified; and is as per reviewed shop drawings, all in accordance with the contract documents. Store materials only in designated areas and protect as necessary to maintain materials in new condition.

1.13. Operations and Maintenance Instructions

1.13.1. Three (3) copies of complete operating and maintenance instructions for all electrical equipment and systems, bound in hard covered manuals shall be supplied.

1.14. Instructions to Owner

1.14.1. Instruct the owner's representative(s) in all respects of the operation and maintenance of systems and equipment. Obtain from the consultant a list of the owner's representative(s) qualified to receive instructions.

1.15. Clean-Up

1.15.1. At all times keep the premises free from accumulations of waste material or rubbish caused by employees or work. At the completion of the work, remove all rubbish and all tools, equipment and surplus materials from and about the work and leave the work "broom clean" or its equivalent, unless more exactly specified. All lighting fixtures, light switches, and other operable electrical devices shall be cleaned at the completion of work.

1.16. Codes and Standards

1.16.1. Provide equipment and materials, and do the work, in accordance with the following, and comply with relevant sections as adopted or amended by authorities having jurisdiction:
a. Canadian electrical code (Canada)
b. National Fire Protection Association
c. CAN/ULC Standards
d. Ontario Electrical Safety Code, including current bulletins and amendments.
e. Ontario Building Code
f. Worker's Compensation Board Regulations
g. Governing Fire Codes in the Province Of Ontario

1.17. Permit, Fees and Inspection

1.17.1 The contractor shall apply for, obtain and pay all permits, licenses, inspections, examinations and fees required. The contractor shall arrange for inspection of all work by the authorities having jurisdiction over the work. On completion of the work, present to the owner the final unconditional certificate of approval by the inspection authorities.

1.17.2 Before starting any work, submit the required number of copies of drawings and specifications to the authorities for their approval and comments. Comply with any changes requested as part of the contract, but notify the owner immediately of such changes, for proper processing of these requirements.

Part 2 – Basic Materials and Methods

2.1. Conduits, Conduit Fastenings and Conduit Fittings

2.1.1. Conduit systems shall be electrical metallic tubing, intermediate metal conduit, galvanized rigid steel conduit, or polyvinyl chloride. Minimum size shall be 1/2". Use EMT above-grade for indoor construction except where rigid conduit is required. Where galvanized rigid steel conduit is required, provide lock-nuts and bushing at terminations.

2.1.2. Type BX -90 flexible armoured cable may be used only for final connections to lighting fixtures. Use flexible conduit for final connections to motors and sensors. Lengths should not exceed 18". Use liquid tight PVC jacketed flexible conduit for connections to equipment outdoors or in damp locations.

2.1.3. Conduits shall be of sufficient size to permit easy removal of the conductors at any time. Use one hole steel straps to secure surface conduits 2" and smaller, and two hole steel straps for conduits larger than 2". Use beam clamps to secure conduits to expose steel work. Install fittings manufactured for use with the conduit supplied. Watertight connectors and couplings are required for EMT. Set screws are not acceptable.

2.1.4. Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass. Conduits shall be run exposed in service areas, but shall be concealed in finished rooms. Exposed conduits shall be installed parallel and perpendicular to walls and ceilings. Wherever conduits cross building expansion joints, approved means, such as conduit expansion joints or flexible conduit loops shall be provided as necessary to take care of the movement. Conduit shall not be run horizontally in partitions.

2.1.5. All conduits shall be properly supported with spacing not to exceed C.E.C. requirements. Approved electrical hardware, hangers, structural shapes, etc. Shall be used. Perforated strap handlers shall not be permitted. Where run exposed on concrete or masonry walls, conduits shall be supported using conduit clamps and lead anchors or approved preset concrete inserts and where run on building steel, beam clamps shall be used. Conduit clamps shall be heavy duty galvanized malleable iron. Factory "ells" shall be used where 90° bends are required for 1" or larger conduits. Make bends and offsets with a hickey or power bender without flattening or denting the conduits. Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter. Connect conduit lengths with only approved couplings or conduit unions.

2.1.6. Install conduits so that there is no interference with access openings in ceilings or access to equipment in the ceiling space. Install conduit to avoid proximity to water or heating pipes. Do not run within 6" of such pipes. Where crossings are unavoidable, maintain a minimum distance of 1" from the pipe covering.

2.1.7. Square-cut all conduit ends, ream and file to remove all burrs before installation and properly clean and cap all empty conduits. Install fish cord in empty conduits.

2.2. Wires and Cables

2.2.1. All conductors shall be copper, unless otherwise noted. Conductors shall be stranded for #8AWG and larger with 1000v insulation of chemically cross-linked thermo setting polyethylene. 600v insulation can be used for conductors smaller than #8AWG. Base the 600 volt RW 90 conductor ampacities on published CEC 90°C. Rating. Cables shall be loaded to not more than 75% (70% to 80%) of this rating. Minimum #12AWG wiring shall be used.

2.2.2. Neutrals of power systems, although connected to a common ground at the source, shall be electrically separated and isolated from each other beyond this point of origination. Feeders to two or more switches or panels and the tapoffs to same shall all be run using the same size conductors throughout.

2.2.3. All wires shall be carried full size from source to the load. Neutral wires shall be the same size as phase wires. Equipment Ground wires shall be one size smaller than phase wire, except that the conductor shall not be larger than a 4/0 and shall be no. 10 for 30 amp circuits and no. 12 for circuits less than 30 amps. Insulation shall be type RW 90. Multi-circuit branch circuits in same conduit require only one equipment ground wire.

2.3. Junction and Pullboxes

2.3.1. Junction and pullboxes should be of welded steel construction with screw-on flat covers for surface mounting. Install pullboxes in inconspicuous but accessible locations. Install junction and pullboxes so as not to exceed 30m of conduit run between pullboxes. All junction and pullboxes should be labelled to identify equipment or circuit numbers.

2.4. Outlet, Conduit Boxes and Fittings

2.4.1. Size boxes in accordance with CSA C22.1. 100 mm square or larger outlet boxes as required for special devices. Gang boxes where wiring devices are grouped. Provide blank cover plates for boxes without wiring devices. Support boxes independently of connecting conduits. Conduit boxes shall be cast FS boxes with factory threaded hubs and mounting feet for surface wiring. Provide correct size of opening in boxes for conduit and cables. Reducing washers are not allowed.

2.5. Wiring Devices

Switches

2.5.1. Locate light switches as shown on the drawings and on the latch side of doors. Install single throw switches with handle in "up" position when switch closed.

2.5.2 Install switches in gang type outlet box when more than one switch is required in one location.

2.5.3 Provide 20A, 125V single pole specification grade light switches as shown on the contract drawings.

Receptacles

2.5.4. Install receptacles in gang type outlet box when more than one receptacle is required in one location. Combination boxes with barriers shall be used where outlets for more than one system are grouped.

2.5.5 Provide 15A, 120V specification grade duplex convenience outlets as shown on the contract drawings.

2.5.6 Do not install outlets back to back in wall. Allow a minimum 150 mm horizontal clearance between boxes. Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm and information is given before installation.

Telephone/Cable T.V./Computer Raceway System, (etc.)

2.5.7. Empty conduit systems shall be provided for telephone from outlet box to accessible ceiling space, or as shown on the drawings.

2.5.8. Contractor is responsible for providing and/or coordinating the size, type and location of the incoming telephone conduit with the telephone company or the building owner.

2.5.9. All interior building raceways shall be EMT.

2.5.10.2 long radius 90 degree bends shall be the maximum allowed between pull boxes.

2.5.11. Pole cords shall be provided in each conduit for future pulling of wires.

2.5.12. Contractor shall provide necessary boxes and associated cover plates as required for the above systems.

Mounting Heights

2.5.13 Mounting heights for wiring devices shall be as follows unless otherwise indicated and shall be from centre line of outlet box to finished floor:
2.5.13.1. Duplex receptacles shall be mounted 300mm above finished floor or 150mm above counter top.

2.5.13.2. Light switches shall be mounted at no less than 900mm and no more than 1100mm above finished floor.

2.5.13.3. Disconnect switches shall be mounted 1200mm above finished floor.

2.5.13.4. Exit lights shall be mounted 300mm above door trim.

2.5.13.5. Emergency lights shall be mounted 2300mm above finished floor, unless otherwise specified or minimum 150mm clearance from ceiling.

2.5.13.6. Panelboards shall be mounted 1200mm above finished floor.

Cover Plates

2.5.14. Cover plates from one manufacturer shall be used throughout the project and supplied for all wiring devices and any pullboxes.

Equipment Nameplates

2.5.15. Nameplates shall be provided for all pieces of electrical equipment including panelboards, junction boxes, pull boxes, splitters, control panels, disconnect switches and motor starters. Nameplates shall be black laminated rigid plastic with 0.25 inch high white engraved letters. Nameplates shall be fastened to equipment in a conspicuous location on equipment. A list of the exact engraving of nameplates shall be submitted for approval prior to fabrication. Nameplates for disconnect switches shall indicate name of equipment being controlled and circuit and panel from which they are fed.

Part 3 – Distribution

3.1. Disconnect Switches

3.1.1. Disconnect switches shall be horsepower rated, quick-make, quick break, with handle interlocked so that switch door cannot be opened unless switch is in de-energized position. Disconnect Switches shall be fusible and nonfusible as indicated on the drawings. Switches shall be heavy duty having visible blade construction, positive pressure fuse clips, and silverplated current carrying parts. Provision shall be made for padlocking switch in "OFF" position. Switches shall have on-off switch position indication on switch enclosure cover.

3.2. Panelboards

3.2.1. Use panelboards of one manufacturer throughout the project. The supplier shall install circuit breakers in panelboards before shipment. Sequence phase bussing shall have odd numbered breakers on left and even on right with each breaker identified by permanent number identification as to circuit number. All panelboards shall have a copper bus. Single phase lighting and distribution panelboards shall have a solid neutral of same ampere rating as mains. Mains shall be suitable for bolt-on breakers. Enclosures shall be EEMAC type 1 surface mounted with trim and floor finish grey.

3.2.2. Complete circuit directory with typewritten legend showing location and load of each circuit. The directory shall be updated from the contract drawings to include all addenda, site instructions, contract change orders and any other circuit changes. Supply two keys for each panelboard and key panelboards alike.

3.2.3. Main breaker shall be separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker. Lock on devices for certain breakers shall be provided for items such as exit, emergency and night light circuits.

3.2.4. Locate panelboards as indicated and mount securely, plumb, true and square to adjoining surfaces. Install surface mounted panelboards on steel angle or channel framing or on fire rated painted plywood backboards.

Part 4 – Lighting Equipment

Luminaires

4.1. Locate and install luminaires as indicated on contract drawings and connect luminaires to lighting circuits.

Lighting Control

4.2. Locate and install lighting control devices as indicated on the contract drawings, and in accordance with ASHRAE Standard 90.1-2010, Section 9, Lighting.

4.3. Contractor shall provide functional testing of the lighting control system as per Section 9.4.4. (Functional Testing), of ASHRAE Standard 90.1-2010.

4.3.1. 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.

4.3.2. When occupant sensors, time switches, programmable schedule controls, or photosensors are installed, at a minimum, the following procedures shall be performed:
a. Confirm that the placement, sensitivity, and time-out adjustments for occupancy sensors yield acceptable performance, lights turn off only after space is vacated and do not turn on unless space is occupied.
b. Confirm that the time switches and programmable schedule controls are programmed to turn the lights off.
c. Confirm that photosensor controls reduce electric light levels based on the amount of usable daylight in the space as specified.

4.3.3. The party 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. Certification shall be specific enough to verify conformance.

Emergency lighting

4.4. Install unit equipment and remote mounted fixtures as indicated.

4.5. Emergency lighting shall be installed in such a manner that it will be automatically actuated upon failure of the power supply to the normal lighting in the area covered by that unit equipment.

4.6. Emergency lighting shall have a supply voltage of 120VAC, and an output voltage of 12VDC, and be able to assume the electrical load automatically for a minimum of 30 minutes.

Exit signs

4.7. Install exit signs as per the contract drawings.

4.8. Exit signs shall consist of a green pictogram and white graphic symbol meeting the visibility specifications referred to in ISO 3864-1.

4.9. Exit signs shall be continuously illuminated.

PART 5 – FIRE ALARM SYSTEM

5.1. Contractor shall provide all material, equipment, and labour as required for the complete and adequate installation of the fire alarm system, as shown on the contract drawings, and as described below. Where an existing fire alarm system is present, all new devices shall match the existing system.

5.2. Contractor is responsible for the submittal of shop drawings for the complete system. At a minimum, the following shall be submitted:
5.2.1. Layout of equipment;
5.2.2. Zoning;
5.2.3. Wiring diagrams for connections and devices;
5.2.4. Methods or operation;
5.2.5. Fire alarm device make, model number, and type.

5.3. All components of the system, its installation and the system as a whole shall be ULC listed and labeled and shall meet the requirements of all authorities having jurisdiction of the application. The entire installation shall be carried out in accordance with CAN/ ULC S524 and shall be verified in accordance with CAN/ ULC S537.

5.4. Fire alarm control and booster panel breakers shall be of the lockable type, and shall be painted red.

5.5. Separate circuits from the control panel to each zone of initiating devices shall be provided.

5.6. Fire alarm system shall be single stage operation.
5.2.1. Single stage fire alarm system shall, upon the operation of any manual pull station or fire detector, cause an alarm signal to sound on all audible signal devices in the system.

5.7. The sound pattern of an alarm signal shall conform to the temporal pattern defined in Clause 4.2. of ISO 8201.

5.8. Fire alarm device zones to be clearly indicated on control panel.

5.9. Power supply is 120VAC, 60hz input, 24VDC output from rectifier to operate alarm and signal circuits with standby power gell cell batteries. Minimum expected life of four years, sized in accordance with NBC.

5.10. Fire alarm system riser diagram shall be provided in fire alarm control panel.

5.11. Arrange and pay for on-site lecture and demonstration by fire alarm equipment manufacturer to train operational personnel in use and maintenance of fire alarm system.

5.12. Synchronization modules for strobe lights shall be coordinated as necessary with fire alarm system manufacturer.

5.13. Sufficient output modules shall be provided in fire alarm control panel.

5.14. Output modules shall be provided in the fire alarm control panel as needed.

5.15. All fire alarm junction boxes shall be painted red.

Part 6 – Heating Equipment

6.1. Electrical heaters will be supplied and installed by division 15. Division 16 will be responsible for providing power connections to heating equipment.

Part 7 – Mechanical Equipment

7.1. Provide power and connections to all mechanical equipment as detailed on the drawings.

7.2. Ensure all equipment is properly protected with disconnect switches.

7.3. Confirm with mechanical trade for exact locations of equipment and connection points.

7.4. Verify all motor connections for proper phase rotation.

Part 8 – Removals

8.1. Contractor shall disconnect and remove all existing electrical devices and equipment, as per the contract documents.

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1	25/03/26	ISSUED FOR TENDER	PGB	–
0	25/02/27	ISSUED FOR PERMIT	PGB	–
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CHK. P. BERTHELOT
DSN. PGB/TMS
SCALE: AS NOTED

PROJECT
JOHN HOWARD SOCIETY
22 Peel Street
Lindsay, Ontario

TITLE
SPECIFICATION

FILE No. 683

DWG. No. E5