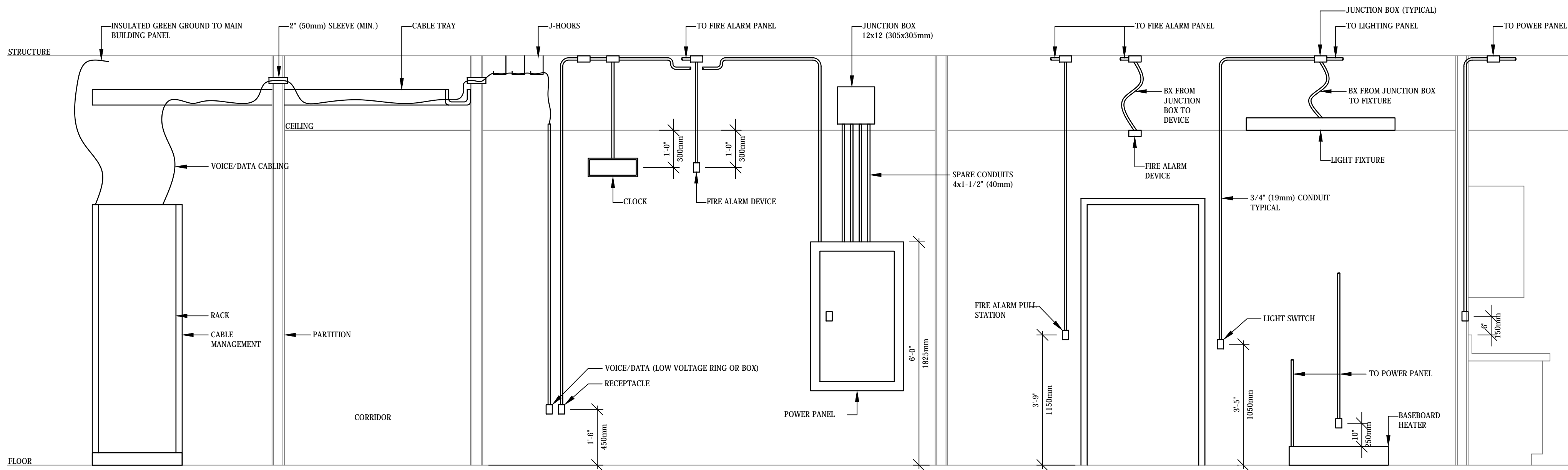


[illegible]

1.28.1.	PHASING	THE CONTRACTOR SHALL REVIEW THE PHASING AS INDICATED ON ALL PLANS. THIS INCLUDES ARCHITECTURAL, MECHANICAL PLANS ETC IN THE ENTIRE DRAWING PACKAGE.	2.10.0.	TRANSFORMERS	2.9.3.3. GANG BOXES SHALL BE USED AT LOCATIONS WHERE DEVICES ARE GROUPED, PROVIDE BARRIERS AS REQUIRED.
		1.28.2. THE CONTRACTOR SHALL INCLUDE FOR TEMPORARY CONNECTIONS AS REQUIRED TO FACILITATE THE WORK.			2.9.3.4. BLANK COVER PLATES FOR BOXES WITHOUT WIRING DEVICES.
		1.28.3. THE CONTRACTOR SHALL INCLUDE FOR ALL WEEKEND AND PREMIUM TIME REQUIRED TO FACILITATE THE PHASING AS INDICATED IN THE PLANS PACKAGE.			2.10.1. TRANSFORMERS SHALL BE COMPLETE WITH COPPER WINDINGS AND MEET THE REQUIREMENTS OF CSA 802.2 CURRENT EDITION FOR ENERGY EFFICIENCY.
2.	PRODUCTS		2.10.2.	TRANSFORMERS SHALL BE GENERAL PURPOSE, SUITABLE FOR SPRINKLER LOCATION WITH DELTA-WYE CONFIGURATION 600/120/208V, 3PH, 4W SECONDARY C/W THREE (3) COPPER WINDINGS.	
2.1.	ELECTRICAL EQUIPMENT	2.1.1. EQUIPMENT SHALL HAVE 1.0m (39") CLEARANCE IN FRONT OF SAID EQUIPMENT	2.10.3.	MOUNT DRY TYPE TRANSFORMER UP TO 75kVA ON WALL WITH ANGLE IRON FRAME SECURELY SUPPORTED FROM STRUCTURE AND VIBRO-ACOUSTIC ISOLATORS, UNO.	
		2.1.2. ELECTRICAL EQUIPMENT RATED AT 1200A AND OVER SHALL HAVE 1.5m (59") CLEARANCE IN FRONT OF SAID EQUIPMENT.	2.10.4.	MOUNT DRY TYPE TRANSFORMER 75kVA AND ABOVE ON 4" CONCRETE PAD C/W VIBRO-ACOUSTIC ISOLATORS, UNO.	
		2.1.3. ALL EQUIPMENT INSTALLED IN SPRINKLERED AREAS ARE TO BE COMPLETE WITH DRIP SHIELDS.	2.10.5.	ACCEPTABLE MANUFACTURERS: HAMMOND POWER SOLUTIONS (HPS), MARCUS AND REX POWER MAGNETICS.	
2.2.	PANEL BOARDS		2.11.	WIRING DEVICES	
2.2.1.	PANEL BOARDS: TO C.S.A. C22.2, NO. 29. LOADCENTRES ARE NOT ACCEPTABLE.		2.11.1.	SUPPLY AND TERMINAL DEVICES AS INDICATED COMPLETE WITH COVERPLATES.	
2.2.2.	PANEL BOARDS ARE TO BE THE PRODUCT OF ONE (1) MANUFACTURER		2.11.2.	SPLITTER MANUALLY OPERATED GENERAL PURPOSE, AC, SPECIFICATION GRADE, TOTAL ENCLOSED BODY, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.3.	220/208V 3 PHASE 4 WIRE PANEL BOARDS: BUS AND BREAKERS RATED FOR MINIMUM 10,000A (SYMMETRICAL) INTERRUPTING CAPACITY OR AS INDICATED ON THE DRAWINGS.		2.11.3.	RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.5.	SEQUENCE PHASE BUSSING WITH ODD NUMBERED BREAKERS ON LEFT AND EVEN ON RIGHT, WITH EACH BREAKER IDENTIFIED BY PERMANENT NUMBER IDENTIFICATION AS TO CIRCUIT NUMBER.		2.11.4.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.6.	PANEL BOARDS: MAINS, NUMBER OF CIRCUITS, AND NUMBER AND SIZE OF BRANCH CIRCUIT BREAKERS AS INDICATED		2.11.5.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.7.	TWO (2) KEYS FOR EACH PANEL BOARD AND KEY PANEL BOARDS ALIKE.		2.11.6.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.8.	COPPER BUS WITH FULL SIZE COPPER MAINS AND NEUTRAL.		2.11.7.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.9.	MAINS FOR BOLT-ON BREAKERS.		2.11.8.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.10.	FINISH TRIM AND DOOR RAKES GRAY ENAMEL, PAINT TYPED SAME AS DOOR.		2.11.9.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.11.	COMPLETE CIRCUIT DIRECTORY WITH TYPED/PRINTED LEGEND SHOWING CIRCUIT LABEL, AMPERAGE AND PANEL LOCATION UNDER PLASTER COVER.		2.11.10.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.12.	EATON CUTLER HAMMER, SQUARE D, SIEMENS CANADA MANUFACTURER.		2.11.11.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.2.13.	[PROVIDE A COORDINATION STUDY TO CONFIRM BREAKER INTERRUPTING CAPACITY PRIOR TO SUBMITTING SHOP DRAWINGS FOR PANELS.]		2.11.12.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.3.	BREAKERS GENERAL		2.11.13.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.3.1.	BOLT-ON MOLDED CASE CIRCUIT BREAKER, FULL MODULE (1" MINIMUM WIDTH), QUICK-MAKE, QUICK-BREAK TYPE, FOR MANUAL AND AUTOMATIC OPERATION WITH TEMPERATURE COMPENSATION FOR 400C AMBIENT AIR BREAKERS, OR ACCEPTABLE		2.11.14.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.3.2.	MAGNETIC INSTANTANEOUS TRIP ELEMENTS TO BE PROVIDED TO OPERATE ONLY WHEN THE VALUE OF CURRENT REACHES SET POINT.		2.11.15.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.	DISCONNECT SWITCHES FUSED AND UNFUSED		2.11.16.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.1.	ENCLOSED MANUAL AIR BREAK SWITCH, NON-HAZARDOUS LOCATION, TO C.S.A. C22.2 NO. 4.		2.11.17.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.2.	FUSE HOLDER ASSEMBLIES TO C.S.A. C22.2 NO. 4.		2.11.18.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.3.	FUSIBLE AND NON-FUSIBLE DISCONNECT SWITCHES AS INDICATED.		2.11.19.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.4.	PROVISION FOR PADLOCKING OFF SWITCH POSITION BY THREE LOCKS		2.11.20.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.5.	MECHANICALLY-INTERLOCKED TO PREVENT OPENING WHEN HANDLE IN "ON" POSITION		2.11.21.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.6.	QUICK-MAKE, QUICK-BREAK ACTION.		2.11.22.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.7.	ON/OFF POSITION INDICATION ON FRONT ENCLOSURE COVER.		2.11.23.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.8.	C.S.A. ENCLOSED MANUFACTURER'S LISTED OTHERWISE.		2.11.24.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.4.9.	EATON CUTLER HAMMER, SQUARE D, SIEMENS CANADA MANUFACTURER.		2.11.25.	OTHER RECEPTACLES: 3 WIRE, U-GROUND, PREMIUM SPECIFICATION GRADE COMPLETE WITH 15 AMPERES, 150V, 20 AMPERES MINIMUM OR AS REQUIRED BY CIRCUIT COMPLETE WITH WHITE PLATE DESIGNER SERIES TOGGLE (ROCKER)	
2.5.	CONDUCTORS		2.16.	ACCEPTABLE MANUFACTURERS: BURNER PASS & SEYMOUR AND COOPER	
2.5.1.	ALL CONDUCTORS SHALL BE APPROVED AND INDICATED OTHERWISE.		2.12.		
2.5.2.	CONDUCTORS #10 AND SMALLER SHALL BE SOLID. CONDUCTORS #8 AND LARGER SHALL BE STRANDED.		2.13.	ROOF	
2.5.3.	CONDUCTORS SHALL BE SIZE #12 AWG MINIMUM, EXCEPT FOR CONTROL CIRCUITS WHERE #14 AWG MINIMUM. SIZE IS PERMITTED. FEEDER SIZES AS INDICATED		2.13.1.	CONDUCTORS ARE BASED ON DESIGN LOADS PROVIDED IN MECHANICAL DRAWINGS. CONTRACTOR SHALL CONFIRM THE FEEDER SIZES AND BREAKERS ON SHOP DRAWINGS PRIOR TO ROUGH-IN AND PURCHASE OF MATERIAL/EQUIPMENT TO POWER UP SYSTEM. DISCREPANCIES ARE TO BE NOTED TO THE ENGINEER.	
2.5.4.	FEEDER LENGTHS SHALL BE CONTRACTOR VERIFIED FOR LENGTH EXPOSED FROM PANEL SO AS NOT TO EXCEED 3' VOLTAGE DROP ON SUSPENDED FEEDER. THE LENGTH OF THE ALLOWABLE IMPACT SHALL BE NOTED TO THE ENGINEER PRIOR TO BEGINNING ANY ROUGH-INS.		2.2.	PROVIDE MAINTENANCE RECEPTACLES AS REQUIRED BY ISA. COORDINATE WITH MECHANICAL. SHOULD NOT INCLUDE A MAINTENANCE RECEPTACLE AS AN OPTION. THE CONTRACTOR SHALL INCLUDE TO PROVIDE A 15/200 GF1 RECEPTACLE AND A 1P-20A BREAKER FROM THE LOCAL PANEL FOR EACH GROUP OF UNITS. MORE THAN 50' OF APART SHALL HAVE ITS OWN RECEPTACLE. RECEPTACLE SHALL BE MOUNTED TO A PEDESTAL OR ROOF CURB AND SEALED WATERTIGHT. PROVIDE AN IN-USE COVER FOR THE RECEPTACLE.	
2.5.5.	CONDUCTORS FOR A 2% MAXIMUM VOLTAGE DROP FROM OVERCURRENT DEVICE TO TEST OUTLET.		3.	LIGHTING	
2.5.6.	CIRCUIT INSULATION RATED FOR 600V MINIMUM UNLESS OTHERWISE NOTED.		3.1.	MANUFACTURERS OPERATIONAL TESTS:	
2.5.7.	CONDUCTOR TYPES:		3.1.1.	TEST FIXTURE FOR ACCEPTANCE OF LAMP MADE TO MAXIMUM TOLERANCE AS REQUIRED IN A.S.I. STANDARDS.	
2.5.7.1.	TWTS, TWU TO C.S.A. #C22.2, NO. 4.		3.1.1.1.	TEST FIXTURES WITH RATED LAMPS FOR STARTING AND OPERATION.	
2.5.7.2.	RW90, RW90 (XLP) TO C.S.A. #C22.2, NO. 38		3.1.1.2.	CHECK WIRING FOR AGREEMENT WITH DESIGN CIRCUIT.	
2.5.7.3.	TWTS, RW90 (XLP) - INSIDE BUILDING.		3.1.1.3.	TEST FOR SHORT CIRCUITS AND IMPROPER GROUNDS.	
2.5.7.4.	TWU, RW90 (XLP) - CONDUCTORS DIRECTLY MOUNTED OR IN CONDUIT OUTSIDE BUILDING.		3.2.	HANGERS AND FITTINGS	
2.5.7.5.	ARMOUR (CABLE) IS PERMITTED FOR FIXTURE DROPS IN ACCOUSTIC CEILINGS (MAX 15' 0") AND IN HOLLOW PARTITION SWITCH (A) RECEPTACLE OR SUSPENDED CEILING. FEEDER DROPS (A) ANY DROPS SHALL NOT EXCEED 3.0m (10' 0"). AC-50, ARMOUR IS NOT TO BE INSTALLED IN OPEN PLACES OR AS USED APPLICATION. ALL CABLES ARE TO BE PROTECTED BY BUILDING STRUCTURE IN A NEAT AND PROFESSIONAL MANNER. USE OF AC-90 IN METAL STUD CONSTRUCTION PARTITION IS LIMITED TO A MAXIMUM OF 3.0m (10' 0") EXCESS. USE OF AC-90 IN PARTITION OF THE ENGINEER WILL REQUIRE ELECTRICAL CONTRACTOR TO PROVIDE ALL NEW WIRING WITH PROPER CONDUIT AND TO BE AT CONTRACTOR'S EXPENSE.		3.2.1.	SUPPORT FIXTURES AS SHOWN ON THE DRAWINGS. LEVEL, PLUMB AND TRUE WITH THE STRUCTURE AND OTHER EQUIPMENT, AND IN A HORIZONTAL OR VERTICAL POSITION AS INTENDED.	
2.6.	FALL/TECH SUPPORTS		3.2.2.	WALL OR DISE BRACKET MOUNTED FIXTURE HOUSINGS SHALL BE RIGIDLY INSTALLED AND ADJUSTED TO GIVE A NEAT FLUSH FIT TO THE SURFACE ON WHICH IT IS MOUNTED.	
2.6.1.	SUPPORT EQUIPMENT, CONDUIT CABLES USING CLIPS, SPRING-LOADED BOLTS, CABLE CLAMP, USED AS SUPPORT TO BASIC CHANNEL MEMBERS.		3.3.	SUPPORTS:	
2.6.2.	INSTALLATIONS AND ACCESSORIES AS REQUIRED FOR EACH TYPE OF EQUIPMENT CABLES AND CONDUIT IN ACCORDANCE WITH MANUFACTURERS INSTALLATION.		3.3.1.	SUPPORT FIXTURES BY HANGERS AND MOUNTING ARRANGEMENTS WHICH WILL NOT CAUSE THE FIXTURE FRAME, HOUSING, SIDES OR LENS FRAME TO BE DISTORTED; OR PREVENT COMPLETE ADJUSTMENT OF SEVERAL LAMPS IN A ROW.	
2.7.	CONDUITS		3.3.2.	MOUNTING METHODS FOR FIXTURES ON OR IN SUSPENDED CEILINGS ARE TO BE AS FOLLOWS:	
2.7.1.	RIGID, GALVANIZED STEEL, THREADED CONDUIT TO C.S.A. C22.2, NO. 45, SIZE AS INDICATED.		3.3.3.	WHERE LIGHTING FIXTURES ARE RECESSED INTO SUSPENDED CEILINGS, THESE FIXTURES ARE TO BE SUPPORTED INDEPENDENTLY OF THE CEILING USING #12 JACK CHAIN HANGERS. EACH CHAIN IS TO BE SECURED SEPARATELY TO THE STRUCTURE ABOVE SO THAT NO WEIGHT FALLS ON THE CEILING SUSPENSION SYSTEM.	
2.7.2.	ELECTRICAL METALLIC TUBING (EMT) WITH COUPLINGS AND EXPANDED ENDS AS REQUIRED TO C.S.A. C22.2, NO. 83, SIZE AS INDICATED.		3.3.4.	IN NO CASE WILL REINFORCEMENT OF THE CEILING SUSPENSION SYSTEM BE CONSIDERED TO BE ADEQUATE SUPPORT FOR THE LIGHTING FIXTURES.	
2.7.3.	RIGID PVC (UNPLASTICIZED) CONDUIT FOR EXPOSED, ABOVE GROUND WORK, TO C.S.A. #C22.2, NO. 211.2, SIZE AS INDICATED. FLEXIBLE PVC IS NOT PERMITTED.		3.3.5.	WHERE CROSS MEMBER SUPPORTS ARE REQUIRED ABOVE THE CEILING TO PROVIDE SUPPORT POINTS, THESE ARE TO BE STEEL CHANNELS OR ANGLES.	
2.7.4.	THE METAL CONDUIT AND LIQUID-TIGHT FLEXIBLE METAL CONDUIT TO C.S.A. C22.2, NO. 56.		3.4.	INSTALLATION:	
2.7.5.	EMT CONDUIT FITTINGS, IE. CONNECTORS, COUPLINGS, TO C.S.A. C22.2, NO. 18. ZINC-PLATED STEEL/MALLEABLE IRON CONSTRUCTION. ALL CONNECTIONS AND COUPLINGS TO BE SET SCREW TYPE, IE. CONCRETE TIGHT.		3.4.1.	INSTALLATION OF ALL LIGHTING EQUIPMENT SHALL COMPLY WITH THE RELEVANT SECTIONS OF THE ONTARIO ELECTRICAL SAFETY CODE.	
2.7.6.	CONDUIT SIZES SHALL BE A MINIMUM OF 3/4" AND CONFORM TO ELECTRICAL SAFETY CODE. WHERE SIZES ARE INDICATED AND THEY EXCEED CODE, THEY SHALL NOT BE REDUCED.		3.4.2.	CLUSTER OF RECESSED FIXTURES SHALL BE WIRED WITH BX90 OR R90 WIRE IN FLEXIBLE STEEL CONDUIT TO ADJACENT OUTLET BOXES PLACED ABOVE THE FINISHED CEILING, WITHIN REACH OF THE FIXTURE HOUSING. MAIN HOME RUNS TO BE EMT FROM JUNCTION BOX AT CLUSTER OF FIXTURES TO PANEL.	
2.7.7.	USE RIGID, GALVANIZED STEEL, THREADED CONDUIT WHERE CONDUIT IS SUBJECT TO MECHANICAL INJURY.		3.4.3.	AT THE COMPLETION OF CONSTRUCTION AND ACCEPTANCE OF WORK, ALL LIGHTING FIXTURES SHALL BE CLEAN, COMPLETE WITH ALL NECESSARY ACCESSORIES AND PROVIDED WITH THE REQUIRED OPERATING LAMP(S).	
2.7.8.	RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES.		3.4.4.	FIXTURES AS SHOWN ON THE ELECTRICAL DRAWINGS ARE APPROXIMATE LOCATIONS ONLY. INSTALLATION OF FIXTURES SHALL BE IN ACCORDANCE WITH REFLECTED CEILING PLANS, DETAILS AND/OR FIELD INSTRUCTIONS ISSUED BY THE ARCHITECT.	
2.7.9.	USE EMT FOR ALL WIRING FROM OUTLET BOX TO SOURCE.		3.4.5.	ALL 347V FIXTURES TO HAVE LOCAL DISCONNECT TO COMPLY WITH THE ONTARIO ELECTRICAL SAFETY CODE.	
2.7.10.	INSTALL NYLON FISH RING IN EMPTY CONDUITS AND TERMINATE UNDER SCREW LEAVING 12" SLACK. TAG FISH RING IDENTIFYING SYSTEM.		3.4.6.	UPON COMPLETION CLEAN LIGHTING REFLECTORS, LENSES AND OTHER LIGHTING SURFACES THAT HAVE BEEN EXPOSED TO CONSTRUCTION DUST AND DIRT.	
2.7.11.	DO NOT LOCATE CONDUITS LESS THAN 3" (75 MM) PARALLEL TO STEAM OR HOT WATER LINES WITH A MINIMUM OF 1" (25 MM) AT CROSS-OVERS.		3.4.7.	THE MOUNTING HEIGHTS OF BUILDING MOUNTED FIXTURES SHALL BE CONFIRMED PRIOR TO ROUGH-IN. REVIEW ARCHITECTURAL PLANS/ELEVATIONS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN PLANS AND INDICATED MOUNTING HEIGHTS IN SCHEDULES/PLANS BETWEEN METRIC AND IMPERIAL DESIGNATED HEIGHTS.	
2.7.12.	IN SLAB CONDUIT; LOCATE TO SUIT REINFORCING STEEL. INSTALL IN CENTRE 1/2 OF SLAB.		4.	GROUND FAULT CIRCUIT INTERRUPTERS - CLASS "A"	
2.7.13.	PROVIDE AND INSTALL 4-38mm (1 1/2") SPARE CONDUITS UP TO CEILING SPACE FROM EACH FLUSH MOUNTED CONDUIT PANEL. TERMINATE IN 300mm x 300mm (12"x12") JUNCTION BOXES IN ACCESSIBLE CEILING SPACE.		4.1.	GENERAL:	
2.8.	JUNCTION AND PULL BOXES		4.1.1.	COMPONENTS COMPRISING GROUND FAULT PROTECTIVE SYSTEM TO BE OF SAME MANUFACTURER.	
2.8.1.	WELDED STEEL CONSTRUCTION WIRE SCREW-ON FLAT COVERS FOR SURFACE MOUNTING.		4.2.	BREAKER TYPE GROUND FAULT INTERRUPTER	
2.8.2.	COVERS WITH 1" (25 MM) MINIMUM EXTENSION ALL AROUND, FOR FLUSH-MOUNTED PULL AND JUNCTION BOXES.		4.2.1.	SINGLE POLE GROUND FAULT CIRCUIT INTERRUPTER FOR 15A, 120V, 1 PHASE CIRCUIT C/W TEST AND RESET FACILITIES.	
2.8.3.	INSTALL PULL BOXES IN CONDUIT RUNS SO AS NOT TO EXCEED 30 M OF CONDUIT RUN OR THE EQUIVALENT OF TWO (2) 90° BENDS BETWEEN PULL BOXES.		4.2.2.	SINGLE POLE GROUND FAULT CIRCUIT INTERRUPTER FOR 30A, 120V, 1 PHASE CIRCUIT C/W TEST AND RESET FACILITIES.	
2.9.	OUTLET AND CONDUIT BOXES:		4.3.	INSTALLATION:	
2.9.1.	ALL LIGHTING FIXTURES, RECEPTACLES AND OTHER WIRING DEVICES FOR ANY CONDUIT SYSTEM SHOWN SHALL BE PROVIDED WITH AN OUTLET BOX.		4.3.1.	DO NOT GROUND NEUTRAL ON LOAD SIDE OF GROUND FAULT RELAY.	
2.9.2.	4" (102 MM) OCTAGON OR SQUARE OUTLET BOXES OR LARGER, COMPLETE WITH FITTINGS AND LIGHTING FIXTURES AND AS REQUIRED FOR SPECIAL DEVICES.		4.3.2.	PASS PHASE CONDUCTORS INCLUDING NEUTRAL THROUGH ZERO SEQUENCE TRANSFORMERS.	
2.9.3.	WALL OUTLET BOXES SHALL BE:				
2.9.3.1.	NO. 1104 SERIES, FLUSH MOUNTED IN DRYWALL PARTITIONS, U.N.O.				
2.9.3.2.	NBS SERIES MASONRY BOXES (DRYWALL MOUNTED STEEL) FLUSH MOUNTED IN MASONRY WALLS (BLOCK WALLS).				

	MANUFACTURERS RECOMMENDATIONS.	6. All designs and drawings are copyrighted and the property of Seguin Engineering Inc. Reproduction or use for any purpose other than that authorized by Seguin Engineering Inc. is forbidden.
4.4.	<u>FIELD QUALITY CONTROL</u> .	The drawing is not to be scaled. The Contractor shall verify and be responsible for all dimensions. Any errors or omissions shall be reported to Seguin Engineering Inc.
4.4.1.	PERFORM TESTS IN ACCORDANCE WITH SECTION 10010 - ELECTRICAL GENERAL REQUIREMENTS.	© COPYRIGHT 2026 – Seguin Engineering Inc.
4.4.2.	ARRANGE AND PAY FOR FIELD TESTING OF GROUND FAULT EQUIPMENT BY INDEPENDENT TESTING LABORATORY/ GROUND FAULT EQUIPMENT MANUFACTURER CONTRACTOR BEFORE COMMISSIONING SERVICE.	
4.4.3.	SUBMIT REPORT OF TESTS TO CONSULTANT AND A CERTIFICATE THAT SYSTEM AS INSTALLED MEETS CRITERIA SPECIFIED HEREIN.	
4.4.4.	DEMONSTRATE SIMULATED GROUND FAULT TESTS.	
5.	<u>TELECOMMUNICATIONS RACEWAY SYSTEM</u>	
5.1.	<u>SYSTEM DESCRIPTION</u>	
5.1.1.	TELECOMMUNICATIONS RACEWAYS SYSTEM CONSISTS OF OUTLET BOXES, COVER PLATES, TERMINAL DISTRIBUTION CABINETS, CONDUITS, PULL BOXES, SLEEVES AND CAPS, FISH WIRES, SERVICE POLES, SERVICE FITTINGS, CONCRETE ENCASED DUCTS.	
5.1.2.	<u>MATERIAL</u>	
5.1.2.1.	CONDUITS: REFER TO CONDUITS, CONDUIT FASTENINGS AND CONDUIT FITTINGS.	
5.1.2.2.	JUNCTION BOXES, CABINETS TYPE E: SPLITTERS, JUNCTION, PULL BOXES AND CABINETS.	
5.1.2.3.	OUTLET BOXES, CONDUIT BOXES AND FITTINGS: SPLITTERS, JUNCTION, PULL BOXES AND CABINETS.	
5.1.2.4.	FISH WIRE: POLYPROPYLENE TYPE.	
5.1.2.5.	BLANK STAINLESS STEEL PLATES FOR ALL UNUSED OUTLETS, WHICH DID NOT RECEIVE A DATA AND TELEPHONE JACKS SUPPLIED AND INSTALLED BY OWNER, AT SUBSTANTIAL COMPLETION OF THE PROJECT.	
5.1.3.	<u>INSTALLATION</u>	
5.1.3.1.	INSTALL RACEWAY SYSTEM, INCLUDING OVERHEAD DISTRIBUTION SYSTEM, FISH WIRE, TERMINAL CABINETS, OUTLET BOXES, FLOOR BOXES, PULL BOXES, COVER PLATES, CONDUIT, SLEEVES AND CAPS, SERVICE POLES, MISCELLANEOUS AND POSITIONING MATERIAL TO CONSTITUTE COMPLETE SYSTEM.	
5.1.3.2.	ALL SPECIFIED TELEPHONE AND DATA TERMINATION BOXES ARE TO BE FLUSH MOUNTED IN THE WALL 300mm ABOVE THE FLOOR UNLESS OTHERWISE SPECIFIED. THE WALL TERMINATION BOXES ARE TO BE 100mm X 54mm TO ACCOMMODATE 25mm CONDUIT. ALL CONDUIT FROM WALL TERMINATION BOXES IS TO BE 25mm UNLESS OTHERWISE SPECIFIED.	
5.1.3.3.	ALL CONDUIT RUNS ARE TO BE CONTINUOUS FROM THE SPECIFIED OUTLET LOCATION TO THE ELECTRICAL ROOM OR TELEPHONE BACKBOARD. ALL JUNCTION AND PULL BOXES ARE TO BE ACCESSIBLE.	
5.1.3.4.	ALL EMPTY CONDUIT IS TO HAVE BOTH ENDS OF THE CONDUIT RUN LABELLED AS ITS PURPOSE AND DESTINATION. ALL EMPTY CONDUIT RUNS ARE TO HAVE A FULL CORD INSTALLED THROUGH THEIR ENTIRE RUN WITH BOTH ENDS BUNG TIED OFF.	
5.1.3.5.	CONDUITS FROM EACH TELEPHONE AND DATA OUTLET TO BE 25mm (1") EMT INTO ACCESSIBLE CEILING SPACE OR AS SHOWN ON DRAWINGS.	
5.1.3.6.	INSTALL BLANK PLATES FOR ALL UNUSED OUTLETS.	
6.	<u>SURFACE RACEWAY SYSTEM</u>	
6.1.	<u>PRODUCT DATA</u>	
6.1.1.	SUBMIT PRODUCT DATA IN ACCORDANCE WITH SECTION 1.14	
6.1.2.	INDICATE TYPES OF RACEWAYS WITH TERMINOLOGY SIMILAR TO THAT USED IN THIS SECTION.	
6.1.3.	ALL WIRING IS TO BE FISHED IN WALLS WITH CONDUITS. SURFACE RACEWAY SHALL BE INSTALLED WHERE WALLS ARE NOT FISABLE (IE. STRUCTURAL CONCRETE) AND MUST BE DONE WITH PERMISSION OF THE OWNER/CONSULTANT UNLESS SPECIFICALLY NOTED AS SURFACE RACEWAY ON THE DRAWINGS.	
6.2.	<u>PRODUCTS</u>	
6.2.1.	LOW PROFILE RACEWAY	
6.2.1.1.	TWO PRICE, STEEL ASSEMBLY	
6.2.1.2.	FINISH: IVORY	
6.2.1.3.	NECESSARY SWITCH, RECEPTACLE, EXTENSION BOXES, ADAPTERS AND UTILITY FITTINGS REQUIRED FOR COMPLETE INSTALLATION.	
6.2.1.4.	HUBBELL 500 SERIES (WIREMOLD 500 SERIES) OR APPROVED EQUAL	
6.2.2.	TWO CHANNEL RACEWAY	
6.2.2.1.	TWO PRICE, STEEL ASSEMBLY, C/W CENTRE BARRIER.	
6.2.2.2.	FINISH: GRAY OR AS INDICATED BY ARCHITECT FROM STANDARD COLOUR CHOICE.	
6.2.2.3.	NECESSARY SWITCH, RECEPTACLE, EXTENSION BOXES, ADAPTERS AND UTILITY FITTINGS REQUIRED FOR COMPLETE INSTALLATION.	
6.2.2.4.	HUBBELL 4700 SERIES (WIREMOLD DS4000) OR APPROVED EQUAL	
6.3.	<u>FITTINGS</u>	
6.3.0.1.	ELBOWS, TEES, COUPLINGS AND HANGER FITTINGS: MANUFACTURED AS ACCESSORIES TO RACEWAY SUPPLIED.	
6.4.	<u>INSTALLATION</u>	
6.4.1.	INSTALL RACEWAYS BEFORE INSTALLATION OF WIRING. INSTALL COVERS FOR RACEWAYS AND FITTINGS AFTER INSTALLATION OR WIRING.	
6.4.2.	INSTALL CONDUIT FOR RACEWAY IN WALL. NO RACEWAY SHALL BE INSTALLED FROM THE CEILING TO FEED HORIZONTAL RUNS.	
6.4.3.	INSTALL SUPPORTING BRACKETS, ELBOWS, TEES, CONNECTORS, FITTINGS, BUSHINGS, ADAPTORS AS REQUIRED.	
6.4.4.	KEEP NUMBER OF ELBOWS, OFFSETS, CONNECTIONS TO MINIMUM.	
6.4.5.	USE WIRING WITH MECHANICAL PROTECTION IN CHANNEL RACEWAYS.	
6.4.6.	INSTALL BARRIERS IN RACEWAYS WHERE DIFFERENT VOLTAGE SYSTEMS ARE INDICATED.	
7.	<u>EXISTING FIRE ALARM SYSTEM</u>	
7.1.	GENERAL	
7.1.1.	THE EXISTING FIRE ALARM SYSTEM IS OF XXXXX MANUFACTURE TYPE XXXXX.	
7.1.2.	PROVIDE NEW FIRE ALARM SYSTEM OF XXXXX MANUFACTURE TYPE XXXXX. NEW SYSTEM AND DEVICES SHALL BE ULC LISTED, LABELED AND SUPPLIED BY SINGLE MANUFACTURER THROUGHOUT THE PROJECT.	
7.1.3.	ALL FIRE DETECTION AND SIGNALING DEVICES SHALL BE CONNECTED TO ZONES AS INDICATED ON PLANS.	
7.1.4.	SUPPLY AND INSTALL ADDITIONAL THERMAL DETECTORS, MANUAL PULL STATIONS, FIRE BELLS AND SMOKE DETECTORS. ALL AS SHOWN ON DRAWINGS. DEVICES WITH RELAY CONTACTS SHALL BE COMPLETE WITH WIRING BACK TO ASSOCIATED AUXILIARY SYSTEM (IE NURSECALL, DOOR HOLD OPENS, ELEVATOR SMOKE DETECTORS, ETC).	
7.1.5.	WIRE NEW AND RELOCATED DEVICES INTO FIRE ALARM ZONE IN THIS AREA.	
7.1.6.	ALL NEW WIRING FOR ALARM SYSTEM SHALL BE MINIMUM #14 RW90 RUN IN CONCEALED CONDUIT.	
7.1.7.	ELECTRICAL CONTRACTOR IS TO ENGAGE AN APPROVED TESTING COMPANY TO VERIFY THAT ALL NEW AND EXISTING FIRE ALARM DEVICES WITHIN SCOPE OF WORK AREA HAVE BEEN WIRED AND ARE OPERATING PROPERLY. PROVIDE A CERTIFICATE OF VERIFICATION AND TEST REPORT. ELECTRICAL CONTRACTOR TO PROVIDE ASSISTANCE TO TESTING COMPANY AS REQUIRED BY THEM. INCLUDE ALL COSTS IN TENDER PRICE.	
7.1.8.	SYSTEM TO BE INSTALLED IN ACCORDANCE WITH CAN/ULC 5-524 (CURRENT EDITION) AND (CFC-HUDM)	
7.1.9.	TESTS AND VERIFICATION TO BE PERFORMED IN ACCORDANCE WITH CAN/ULC 5537 (CURRENT EDITION).	
7.1.10.	WHERE FIRE PROTECTION AND LIFE SAFETY SYSTEMS, AND SYSTEMS WITH FIRE PROTECTION AND LIFE SAFETY FUNCTIONS ARE INTEGRATED WITH EACH OTHER, THE SYSTEMS SHALL BE TESTED AS A WHOLE IN ACCORDANCE WITH CAN/ULC-S1001, 'INTEGRATED SYSTEMS TESTING OF FIRE PROTECTION AND LIFE SAFETY SYSTEMS', TO VERIFY THAT THE SYSTEMS HAVE BEEN PROPERLY INTEGRATED.	
7.1.11.	PROVIDE 3/4"Ø CONDUIT DIRECTLY TO TELEPHONE BACKBOARD FOR TELEPHONE LINE AND CONNECTION BY MONITOR COMPANY.	
7.1.12.	PROVIDE #14 WIRES TO EACH ELEVATOR CONTROLLER FROM MAIN FIRE CONTROL PANEL FOR ELEVATOR RECALL.	
7.1.13.	SMOKE DETECTORS IN FRONT OF ELEVATOR DOORS SHALL BE C/W NORMALLY CLOSED CONTACTS THAT OPEN UPON ACTIVATION. DETECTORS SHALL BE COMPLETE WITH WIRING BACK TO ELEVATOR CONTROLLER. COORDINATE WORK WITH ELEVATOR INSTALLER.	
7.1.14.	PROVIDE AND INSTALL LAMACOID GRAPHICS BESIDE MAIN CONTROL PANEL AND ANNUNCIATOR PANEL.	
7.1.15.	PROVIDE OPERATION AND MAINTENANCE DATA FOR FIRE ALARM SYSTEM.	
7.1.16.	ARRANGE AND PAY FOR ON-SITE LECTURES AND DEMONSTRATIONS BY FIRE ALARM EQUIPMENT MANUFACTURER TO TRAIN OPERATIONAL PERSONNEL IN USE AND MAINTENANCE OF FIRE ALARM SYSTEM.	
7.1.17.	INCLUDE FOR ALL COSTS INVOLVED FROM BOTH MANUFACTURERS AND THE ELECTRICAL CONTRACTORS WORK IN TOTAL TENDER PRICE FROM THE ELECTRICAL CONTRACTOR.	
7.1.18.	THE CONTRACTOR SHALL INSURE THE VERIFICATION OF THE FIRE ALARM INCLUDES ANY SECURITY DOORS. THE CONTRACTOR AND FIRE ALARM COMPANY SHALL TEST THE DOORS TO ENSURE THEY CLOSE AND/OR UNLOCK ON LOCAL CONTROL AND ON FACILITY WIDE. THE DOORS ARE TO BE TESTED AS A COMPLETE SYSTEM WITH THE SECURITY AND FIRE ALARM DEVICES.	
7.1.19.	INDEPENDENT THIRD PARTY TESTING AND VERIFICATION: SUBMIT THE NAME AND ID NUMBER OF THE INDEPENDENT THIRD PARTY CERTIFIED INTEGRATED SYSTEM TESTING SERVICE PROVIDED/ PROPOSED FOR THE PROJECT, AND DOCUMENTATION TO CONFIRM SUCCESSFUL TESTING. N/A, COMMISSIONING.	

File: P:\2026\26-088 3 Gym Lighting Upgrade
May 15, 2026 - 11:27am Plotted by: jrudv



DETAIL NOTES:

- DETAIL IS APPLICABLE FOR DEVICES SHOWN ON PLANS. ALL THE DEVICES INDICATED IN THE DETAIL MAY NOT OCCUR ON THE PLANS.
- CONDUIT SHALL BE PROVIDED IN ALL CASES UNLESS DENOTED AS BX OR AS ALLOWED IN THE SPECIFICATIONS.
- ALL CONDUITS FOR LOW VOLTAGE CABLING AND WIRING SHALL HAVE BUSHINGS INSTALLED TO PREVENT CHAFFING OF WIRE(S).
- ALL CONDUITS ARE TO GO DIRECTLY FROM THE OUTLET BOX UP THE WALL INTO THE CEILING SPACE. NO HORIZONTAL RUNS OF CONDUIT, OR GROUPING OF CONDUITS WITH OTHER SERVICES IN CLOSE PROXIMITY.
- CONDUITS ARE TO HAVE PULL ROPES INSTALLED AND LEFT BEHIND TO ALLOW THE PULLING OF ADDITIONAL SERVICES IN THE FUTURE.
- ALL BREACHES IN WALLS ARE TO BE FIRESTOPPED TO MAINTAIN THE FIRE SEPARATIONS.
- PROVIDE SUPPORTS FOR ALL CEILING MOUNTED ELEMENTS (IE CHAIN HANGERS FOR FIXTURES ETC.) DEVICES SHALL NOT BE SUPPORTED BY A CEILING TILE.

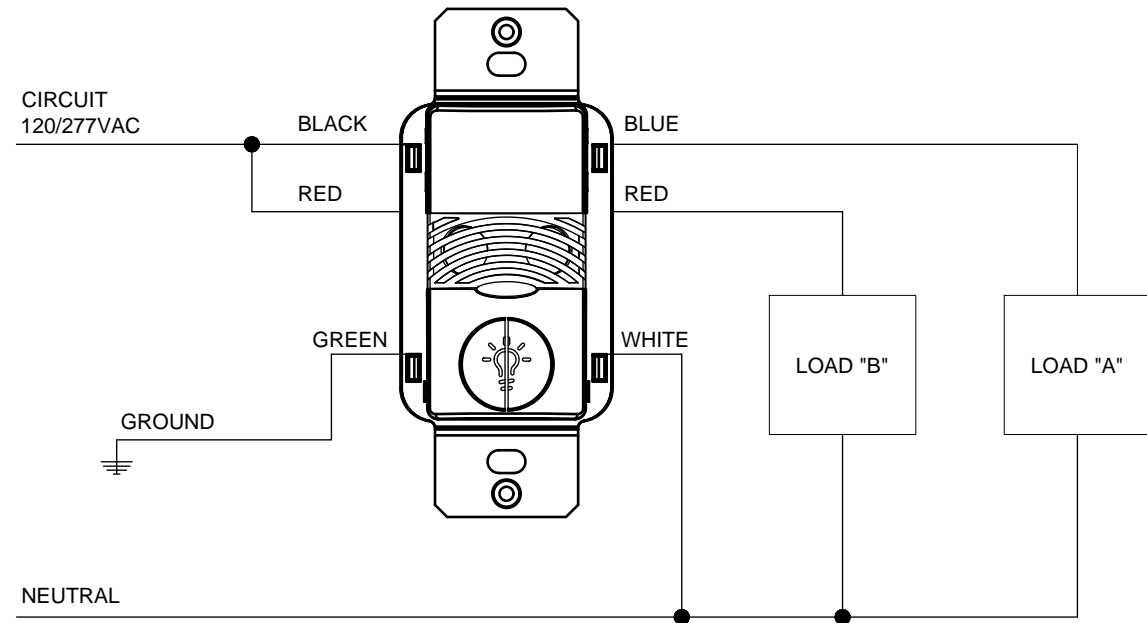
TYPICAL MOUNTING HEIGHTS/INSTALLATION DETAIL
SCALE:

ONW - MANUAL MODE

- SWITCHES ARE REQUIRED TO TURN LOADS ON.
- LOADS TURN OFF WHEN SENSOR TIMES OUT OR WITH SWITCHES.
- IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOADS WILL NOT TURN ON.

ONW - AUTOMATIC MODE

- WHEN SENSOR ACTIVATES LOADS TURN ON.
- SWITCHES CAN BE USED TO TURN LOADS ON OR OFF.
- IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOADS WILL NOT TURN ON.



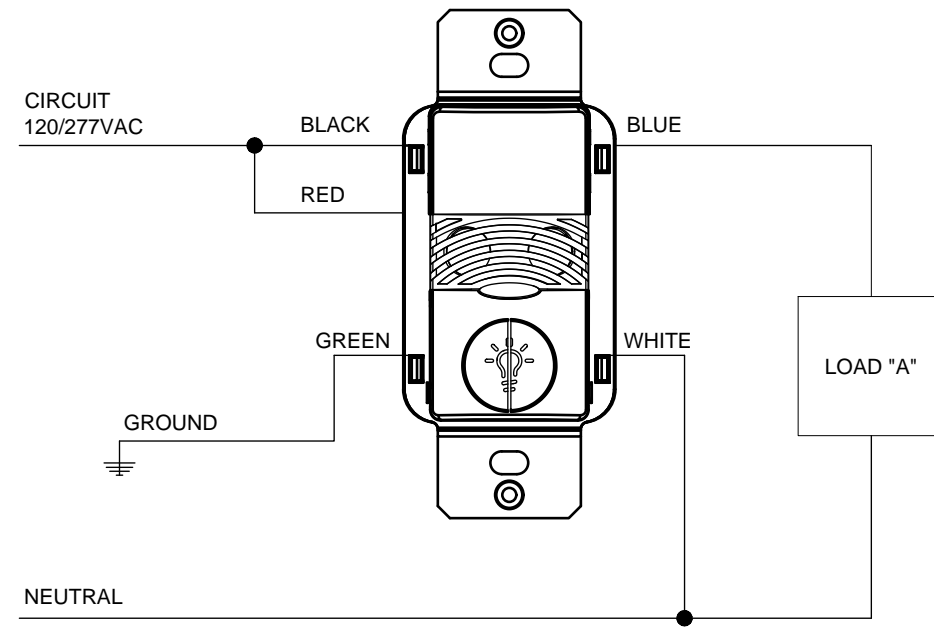
TYPICAL DUAL RELAY WALL SWITCH OCCUPANCY SENSOR DETAIL
SCALE: N.T.S.

ONW - MANUAL MODE

- SWITCHES ARE REQUIRED TO TURN LOADS ON.
- LOADS TURN OFF WHEN SENSOR TIMES OUT OR WITH SWITCHES.
- IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOADS WILL NOT TURN ON.

ONW - AUTOMATIC MODE

- WHEN SENSOR ACTIVATES LOADS TURN ON.
- SWITCHES CAN BE USED TO TURN LOADS ON OR OFF.
- IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOADS WILL NOT TURN ON.



TYPICAL SINGLE RELAY WALL SWITCH OCCUPANCY SENSOR DETAIL
SCALE: N.T.S.

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Notes:



Hamilton-Wentworth
Catholic District School Board
Believing, Achieving, Serving



Blessed Sacrament
Catholic Elementary
School



No.	Revision	Date	By
1	ISSUED FOR PRICING	2026.05.15	J.R.

SEI
Electrical Engineering
12 Argyle Street N., Caledonia, ON, N3W 1B6
www.sei-ee.com

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Project

HWCDSEB
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ELEMENTARY SCHOOL
315 EAST 37th STREET
HAMILTON, ON

Title

ELECTRICAL
TYPICAL DETAILS

Drawn By: J.R.	Designed By: J.R.	Approved By: K.S.	Date: MAY, 2026
Project No. 26-088B	Scale AS NOTED	Drawing No. E600	Revision 1

