

















						WILCOX ARCHITECTS INC. 74 LINDSAY ST. SOUTH LINDSAY, ONTARIO PHONE: 705-328-0175 wilcox.off@gmail.com
	1-9 5/8"+ (550mm)				ARCHITECTS Z	PROJECT NORTH
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T	*				FOR TENDER & PERMIT	JULY 04, 2025 DATE:
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VINYL BASE ¢ OR WALL					DRAWING TITLE:	CTION DETAILS
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<b>EW WINDOV</b> CALE:    /2" =  '-0"	<u>V SEC</u>	<u>tion</u>			SCALE: AS NOTED DRAWN BY: JH CHECKED BY: GW	DRAWING NUMBER:

#### 15100 BASIC REQUIREMENTS

- 1.0 SCOPE OF WORK
- 1.1 The work includes the supply and installation of materials, equipment and services to modify and upgrade the plumbing and HVAC systems for the Class Room Renovations at Notre Dame CES, Cobourg, as shown on the drawings.
- 1.2 Upon completion of the work leave all systems in proper operating order and the premises in a clean and tidy condition to the satisfaction of the Consultant.
- 2.0 REGULATIONS, CODES AND STANDARDS
- 2.1 The work shall accord strictly with all rules, regulations, by-laws and the requirements and interpretations of all authorities having iurisdiction.
- 2.2 Drawings and specifications should not conflict with the above regulations, but where there are apparent discrepancies the Contractor shall notify the Consultant in writing and obtain clarification before proceeding with the work.
- 2.3 The work of the mechanical division shall conform to the following Codes, Regulations and Standards including, unless referenced otherwise, latest revisions issued up to date of tender submission.
  - 1. The Ontario Building Code. 2. NFPA 90A with respect to Air Conditioning and Ventilating Systems.
  - 3. NFPA 90B with respect to Warm Air Heating and Air Conditioning Systems. 4. ASHRAE Guide and Data Books.
  - 5. SMACNA "HVAC Duct Construction Standards"
  - 6. All other codes, standards, regulations referred to in the above documents, adopted by the authorities having jurisdiction and/or applicable to the work of this Division as shown on the contract documents. 7. Ontario Natural Gas Utilization Code CGA/CSA B149.1.
- 3.0 EXAMINATION OF SITE
- 3.1 The actual location of existing services shall be verified in the field before work is commenced.
- 4.0 DRAWINGS, CHANGES AND INSTALLATIONS
- 4.1 The drawings shall be considered to show the general character and scope of the work and not the exact details of the installation. The installation shall be complete with all accessories required for a complete and operative installation. The Consultant reserves the right to make reasonable changes required to accommodate conditions arising during the progress of the work, at no extra cost to the Owner.
- 5.0 <u>RECORD DRAWINGS</u>
- 5.1 The Contractor shall clearly mark, as the job progresses, all changes and deviations from that shown on contract drawings. On project completion, the Contractor shall forward to the Consultant one set of drawings indicating the as-built conditions.
- 6.0 SHOP DRAWINGS
- 6.1 Submit three copies of shop drawings or digital pdfs which indicate clearly the materials and/or equipment actually being supplied, all details of construction, accurate dimensions, capacity, operating characteristics and performance shall be submitted to the Consultant for approval. Each shop drawing shall give the identifying number of the specific pump, fan, etc. for which it was prepared (e.g. Fan F-7) Shop Drawings in pdf format are acceptable.
- 6.2 Prior to submission to the Consultant, THE CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS AND APPROVE THEM, indicating that the drawings have been checked and the described equipment has been co-ordinated.
- 6.3 Installation of any equipment shall not be commenced until after shop drawings have been reviewed by the Consultant.
- 6.4 Bind one complete set of reviewed Shop Drawings into each operating and maintenance instruction manual.
- 7.0 QUALIFICATION OF TRADESMEN
- 7.1 The Contractor shall maintain at the job site, at all times, qualified personnel and supporting staff, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.
- 8.0 PRODUCT DELIVERY, STORAGE AND HANDLING
- 8.1 Inspect products delivered to the site, and before acceptance ensure that the product is: new, the best of its respective kind, free from defects, is as specified, and is as per reviewed shop drawings, all in accordance with the Contract Documents.
- 8.2 Store materials only in designated areas and protect as necessary to maintain materials in new condition.
- 8.3 Any unpainted steel surface shall be prime coated under this Division.
- 9.0 WARRANTY

9.1 The Contractor shall provide a warranty of one year for all systems and equipment installed under this contract. The Contractor agrees to correct promptly, at his own expense, defects or deficiencies in the Work which appear prior to and during the period of one year from the date of acceptance by the Owner of the Work or portions of the work.

10.0 OPERATION AND MAINTENANCE INSTRUCTIONS

- 10.1 Three (3) copies of complete operating and maintenance instructions for all mechanical equipment and systems, bound in hard covered manuals, shall be supplied.
- 11.0 INSTRUCTIONS TO OWNER
- 11.1 Instruct the Owner's representative(s) in all respects of the operation and maintenance of systems and equipment. Obtain in writing from the Consultant a list of the Owner's representative(s) qualified to receive instructions.

15200 BASIC MATERIALS AND METHODS

- 1.0 <u>MATERIALS</u>
- 1.1 Make and quality of materials in the construction of this project shall be subject to the approval of the Consultant.
- 1.2 Materials and equipment supplied by this Division shall be new and free from defects and shall be equivalent in physical characteristics and performance to that specified by the manufacturer's name and catalogue number.
- 2.0 CUTTING, PATCHING, SLEEVES AND ESCUTCHEONS
- 2.1 The Contractor shall co-ordinate on site the position of all sleeves and openings required for the work.
- 2.2 Openings shall be made at the expense of the mechanical division, except for louver openings which shall be co-ordinated with the general contractor. Cutting of structural members shall not be permitted without specified written approval by the Consultant.
- 2.3 All drilling for hangers, rod inserts and work of similar nature shall be done under this contract. 2.4 It shall be the responsibility of the mechanical division to locate and provide anchor bolts, equipment bases and curbs.
- 3.0 HANGERS AND EQUIPMENT SUPPORTS
- 3.1 Piping and equipment provided under the mechanical division shall be complete with all necessary supports and hangers required for a safe and workmanlike installation. Auxiliary structural members shall be provided under the mechanical section concerned, where piping, ducts or equipment must be suspended between the joists or beams of the structure.
- 4.0 ELECTRICAL CHARACTERISTICS
- 4.1 Electric motors for all driven equipment supplied under the mechanical division shall be provided and installed under this Division. 4.2 Motors shall have the following electrical characteristics, unless otherwise specified: For 1/3 HP or larger — 208 volt — 3 ph — 60 Hz
- For 1/4 HP and smaller 120 volt 1 ph 60 Hz
- 5.0 ACCESS PANELS AND ACCESSIBILITY
- 5.1 All parts of the installation requiring periodic maintenance shall be accessible. Wherever valves, dampers, etc. are concealed by the building construction, access doors or panels shall be furnished by this section and installed under this contract. The mechanical division shall be responsible for their proper location.
- 6.0 <u>CLEANING</u>
- 6.1 Clean thoroughly all fixtures and equipment from grease, dirt, plaster or any other foreign material. Any dirt, rubbish or grease on walls, floors or fixtures accumulated from the work of the mechanical division shall be removed promptly from the premises by this division.
- 7.0 COOPERATION WITH OTHER DIVISIONS
- 7.1 Each section shall confine itself to installing all materials in the spaces shown without encroaching upon space for materials installed under other sections or divisions. Where the space allotted to another section or division is encroached upon, the materials shall be relocated to their proper space allotments in such a manner to complete the work using space allotted to the various sections and divisions. Relocation of materials and work involved shall be paid for by the section responsible for the encroachment at no extra cost to the Owner.
- 8.0 NAMEPLATES & SIGNS
- 8.1 Each piece of mechanical equipment shall be complete with a lamacoid nameplate securely fastened in a conspicuous place on the equipment. The nameplate shall be 3/32" thick laminated phenolic plastic 3-3/8" long x 1-5/8" wide with black face and white

- 9.0 MAINTENANCE MATERIALS

# 10.0 DUCT CLEANING

- 1.3 –

- 1.1 Reference: Ontario Building Code
- CAN/CSA-B137.10

- 2.0 <u>Execution</u>

- to trap seal primer.

#### 15600 SHEET METAL DUCTWORK AND SPECIALTIES

- TFAPB-M

#### 15700 FANS

1.0 <u>GENERAL</u>

1.2 <u>SUBMITTALS</u>

1.3 QUALIFICATIONS

manufacturer

centre, 7/32" high lettering shall be engraved through to the white lamination with the following – - Equipment type and number. E.g., Fan. No.1, Pump No. 2 etc.

9.1 Lubricating oils, greases, spare parts, replacement parts and special maintenance and service tools where called for in the specifications shall be presented to the Owner during the instruction period.

10.1 The interiors of all new plenums, casings and ductwork, shall be certified as clean by the mechanical contractor before final air balancing is performed. Copy to be sent to the Consultant.

15300 INSULATION AND LININGS

1.1 Acoustic Lining to be 1" thick rigid, coated liner conforming to NFPA 90A and 90B. Increase duct sizes to compensate for increased thickness. Fasten lining with welded pins and self locking washers. Install lining where indicated on drawings and on all supply and return ductwork to air handling units, furnaces, etc., up to and including the first elbow or a minimum total length of

1.2 Pipe insulation to be rigid pre-formed fibre glass with factory applied vapour barrier and self seal lap joint equal to John Mansville Microlok HP. Insulation thickness to be as follows: Pipe up to and including 2":  $1\frac{1}{2}$ " thick

1.4 Insulation must be dust free, fibre free and resist mold and mildew.

1.5 Insulation materials to have a conductivity of .27 BTU-in/hr-ft2 and have a flame -spread index of less than 25 and a smoke developed index of less than 50. 1.6 Fresh air supply and exhaust ducting to the outdoors is to be insulated with 2" rigid blanket fibreglass with foil and vapour barrier backing. Tape all joints with foil backed tape. Hold in place with metal pins and wire. 1.7 Exposed supply ducting from the ERV and from the air handlers is to be insulated with 1" thick .75# fibreglass, equal to Manson Alley Wrap FSK, unless the ducting is accoustically lined. Fasten with wire bands at 12" centres. Tape all joints with foil tape.

15400 PLUMBING SPECIFICATIONS

1.2 Submit product data for plumbing fixtures, floor drains, etc.

1.3 Architectural drawings to govern the number and location of fixtures, except for floor drains. 1.4 Fixtures to be the product of one manufacturer and of the same type.

1.5 Trim in any one washroom to be the product of one manufacturer. 1.6 Exposed plumbing brass to be chrome plated.

1.7 DCW and DHW above ground main piping to be copper tube, hard drawn, type L to ASTM B88M. Bronze or copper fittings, soldering with lead free solder. Branch piping 1" or less into classrooms, and into washrooms may be PEX piping to

1.8 Isolation valves: Class 150, screwed or soldered, bronze body, chrome plated brass ball, PTFE teflon adjustable packing, brass gland, PTFE teflon seat, plastic coated steel handle.

1.9 Check valves: 200 lb, class, bronze body, Watts CV or equal. 1.10 Below Grade Sanitary: PVC to CAN/CSA B181.2, solvent welded to ASTM D2235.

1.11 Above Grade Sanitary and Venting: PVC to CAN/CSA B182.2, solvent welded to ASTM D2235 with a flame spread rating of 25 or less. Pipe to be IPEX System 15. Pipe in ceiling space acting as a return ar plenum is to be plenum rated with a flame spread of 25 and smoke developed of less than 50. Pipe to be equal to IPEX XFR. 1.12 Domestic water pipe insulation to be 1" thick preformed rigid fibre glass with factory applied vapour barrier and self seal lap joint eaual to Manson Alley K with APT jacket. Use premolded PVC covers for fittings over 1" in size.

2.1 Install buried pipe on a 6" bed of clean washed sand, shaped to accommodate fittings and to line and grade as indicated. Backfill with a further 6" laver of sand.

2.2 Install clean-outs as indicated and as required by code and at the base of soil stacks. 2.3 Sanitary and floor drains are to be trap seal primed from the nearest cold potable water supply. Provide trap seal primer to all

hub drains for fan coil units. Trap seal primers must be installed with a backflow preventer suitable for "severe" duty, meeting the requirements of CSA B64.10-187. Options are vacuum breakers, reduced pressure preventers or electronic primers. 2.4 Assemble piping using Code and ANSI standards. Maintain straight lines along walls for pipe routing.

2.5 Install isolation valves on each plumbing fixture supply line. 2.6 Pipe hot water relief lines to nearest floor drain or janitor's sink. Provide drain and vent if no floor drain is nearby.

2.7 Insulate all plumbing supply lines with fibrous glass split sectional pipe insulation as per 15300. 2.8 Flush out and rinse systems. Clean out aerator screens and strainers. Leak test according to plumbing code before plumbing is

closed in or buried. Notify Consultant 48 hours in advance. 2.9 Connect trap seal primer to floor drains from nearby faucet. Provide metering valve. Provide backflow protection device in supply

2.10 Seal all penetrations through fire separations (walls between suites, floors and ceilings) to Code and ULC requirements, Use fire proof caulking equal to Hilti FS-1. 2.11 PVC pipe penetrations through fire separations are to be protected with firestop collars, caulking, etc. and be ULC rated for the rating specified. Acceptable manufacturers are Hilti, 3M. Shop drawings are to be provided for all firestopping details.

1.1 Make all ductwork, unless specifically noted otherwise, of galvanized sheet steel to ASTM A525-83, and according to the requirements of SMACNA for a 1" was pressure class and a seal class of 'C'. Provide reinforcements fabricated from angles, zees, or channels as per SMACNA. Support ducts with hangers and tie-rods. 1.2 Where ductwork passes through a wall or floor, other than when a fire damper is required, pack around the duct using a fire

resistant material to ensure a sound and air-tight joint. 1.3 Make changes in direction of horizontal ducts with elbows having an inside radius not less than the width of the duct. Make a

change of direction from horizontal to vertical duct with elbows having an inside radius equal to the depth of the duct. Where this is not possible due to the building construction, use turning vanes. These shall be hollow "Duro Vane Rail" manufactured by Duro Dyne or similar turning vanes acceptable to the Consultant. Square throat elbows are not acceptable. 1.4 Provide flexible connections at each air handling unit and fan to duct connection. The frame shall be galvanized sheet metal with fire—resistant neoprene coated glass fabric, clenched by double locked seams. Temperature rating shall be -40oF to 190oF.

1.5 Provide access panels at all gravity dampers, fire dampers, motorized dampers, coils, fan bearings or similar equipment requiring occasional maintenance or inspections Panels shall be 1" thick, insulated, low leakage, cam lock closure, and equal to Nailor Series 0800. Minimum size to be 6x12 or 2" less than the duct width squared. 1.6 For duct expansions, the angle formed at each side of the duct shall not exceed 20°. For contractions, the angle formed at each side of the duct shall not exceed 30°. 1.7 Provide take-off boots and balancing dampers at all branches according to SMACNA standards.

1.8 Grilles and Diffusers: Refer to schedules on drawings for size, colour and supplier.

1.9 Insulated flexible ducting is to be used to connect ductwork to ceiling diffusers. Maximum length of the flex ducting to be four feet. Ducting and insulation to meet NFPA requirements for to flame spread and smoke developed, 25/ 50. Support flexible ducting a minimum of every 5 feet. Flex ducting to have aluminum core and be accoustically treated, equal to Peppertree

1.10 Fire Dampers (FD) shall be installed at all fire separations. Dampers shall have a 1650F fusible link, be Type B, ULC listed and be rated for 1½ hours. Where necessary, provide access doors (minimum the height of the ducting squared or 8"x8" whatever is greater) in the ductwork for resetting the dampers. Where necessary, provide drywall access doors, minimum 10" square.

#### 1.1 Ceiling fans shall be as indicated on schedule.

1.2 Fan shall be with true centrifugal wheel, in acoustically insulated metal housing with integral back draft damper. 1.3 Fan shall be complete with disconnect consisting of cord plug and receptacle in fan casing. Fan, motor and wheel assembly shall be removable from casing without disturbing the housing. 1.4 Install where shown on drawings. Seal exhaust duct to prevent the escape of vapours.

15800 AIR CONDITIONING AND HEATING UNITS

1.1 This specification applies to all hvac air appliances and equipment.

1.2.1. Submit Shop drawings and product data in accordance with the specifications 1.2.2.Submittals shall include the following:

- Dimensioned plan and elevation view drawings, required clearances, and location of all field connections. - Summary of all auxiliary utility requirements, such as electricity, water, compressed air, etc. Summary shall indicate quality and quantity of each required utility - Single-line schematic drawing of the power field hookup requirements, indicating all items that are furnished. - Installation and maintenance manuals.

1.3.1 Equipment manufacturer must specialize in the manufacture of the type of products specified and have five years experience with similar equipment and refrigerant offered. 1.3.2 Regulatory Requirements: Comply with the codes and standards specified 1.3.3 Manufacturer's plant must be ISO Registered.

#### 1.4 DELIVERY AND HANDLING

1.4.1 Units shall be delivered to the job site assembled and charged with a holding charge of refrigerant and full oil charge by the 1.4.2 Comply with the manufacturer's instructions for rigging and handling equipment.

#### 1.5 DESIGN CONDITIONS

Summer Inside: 75oFDB, 50% RH, Summer Outside: 87oFDB, 73oFWB, 15801 VRF HEAT PUMP UNITS

#### 1.0 <u>GENERAL</u>

1.1 The VRF heat pump system shall be installed in the classrooms. Each system shall consist of an outdoor unit and an indoor air handling unit as per the schedule and as shown on the drawings.

- when part of a 1:1 (indoor/outdoor) system.
- 1.3 Submittals shall include the following: performance and capacity details of all units at specified indoor and outdoor conditions, estimated piping lengths, refrigerant charge per system, wiring diagrams, and warranty information.
- shall be in accordance with the Ontario Electric Code.
- 1.5 The system will be produced in an ISO 9001 and ISO 14001 facility, which are standards set by the International Standard Organization (ISO).
- 1.6 The system and the design shall be in compliance with CSA B52 Mechanical Refrigerant Code, and ASHRAE 15-2022 and 34-2022. 1.7 Acceptable manufacturer:
  - Mitsubishi equipment, distributed by MitsAir Conditioning Inc., Mississauga, ON. Contact Birty Rajapaksha, (905 - 362 - 5273)
  - Equivalent Daikin, distributed by DXS Ontario. Contact Curtis Metrow, HTS Engineering, Oshawa. 905–579–6700
- Equivalent Fujitsu equipment, distributed by Master Group, Vaughan, ON. Contact Kevin Noll (705–790–6970) 1.8 The warranty period on all parts and compressors shall commence on the date of initial start-up and shall continue for a period
- of ten (10) years from date of shipment. Proper maintenance of the equipment shall be conducted by certified technicians as per the manufacturer or manufacturer's representative requirements. Maintenance logs shall be supplied by the owner upon request.
- 1.9 All manufacturer warranty shall be for parts only. All diagnosis and labour warranty shall be carried out by installing contractor as per the warranty requirements of this project.
- Part 2- PRODUCTS
- 2.1 Outdoor Unit 2.1.1 Unit Cabinet:
- The casing shall be fabricated of galvanized steel, bonderized, finished with an electrostatically applied, thermally fused acrylic or

polyester powder coating for corrosion protection. 2.1.2 Fan:

- The unit shall be furnished with a direct drive, high performance propeller type fan.
- The condenser fan motor shall be a variable speed, direct current (DC) motor and shall have permanently lubricated bearings.
- Fan speed shall be switch automatically according to outdoor ambient temperature and indoor temperature demand.
- The fan motor shall be mounted with vibration isolation for quiet operation. - The fan shall be provided with a raised guard to prevent contact with moving parts. 2.1.3 Coil
- The outdoor unit coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing. - The coil shall be protected with an integral guard.
- Refrigerant flow from the outdoor unit to the indoor units shall be independently controlled by means of individual electronic linear expansion valves for each indoor unit.
- All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing, ARC Type, meeting ASTM B280 requirements, individually insulated in twin-tube, flexible, closed-cell, CFC-free (ozone depletion potential of zero), elastomeric material for the insulation of refriaerant pipes and tubes with thermal conductivity equal to or better
- than 0.27 BTU-inch/hour per Sq Ft / °F, - All refrigerant connections between outdoor and indoor units shall be flare type. 2.1.4 Compressor:
- The compressor shall be a high performance, hermetic, inverter driven, variable speed, dual rotary type. - The compressor motor shall be direct current (DC) type equipped with a factory supplied and installed inverter drive package.
- The outdoor unit shall be equipped with a suction side refrigerant accumulator. - The compressor will be equipped with an internal thermal overload - The compressor shall be mounted to avoid the transmission of vibration.
- 2.1.5 Electrical:
- The outdoor unit electrical power shall be 208/230 volts, 1-phase, 60 hertz. - The outdoor unit shall be controlled by the microprocessors located in the indoor unit and communicating digitally with microprocessors in the outdoor unit.

### 2.2 Indoor Units - AIR HANDLING UNIT

- 2.2.1 Indoor unit shall be a horizontal multi positional air handling unit with ECM motor type fan with auto CFM adjustment, for installation within a conditioned space. The unit shall have an end discharge air. The unit shall be suspended with sprin isolators from supports across the OWSJ.
- 2.2.2 Units shall have a width and depth of approx 22".
- 2.2.3 Condensate draining shall be made via gravity.
- 2.2.4 The cabinet shall be constructed with sound absorbing, foil-faced insulation to control air leakage. 2.2.5 The fan shall have a variable speed direct drive ECM type fan with statically and dynamically balanced impeller with 3 user-selectable fan speeds. The automatic fan speed mode shall allow the fan to vary between 5 speeds based on space
- load. The ECM controller shall continuously and automatically adjust to varying external static pressure on the system. 2.2.6 –
- 2.2.7 Unit shall be provided with a standard 1" pleated MERV8 filter field installed in the filter rack by contractor. 2.2.8 Power to be 208-1-60.
- 2.3 Equipment Controls:
- The control system shall consist of a minimum of one microprocessor on each indoor unit and one in the outdoor unit. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from the wired controller, providing emergency operation and controlling the outdoor unit.
- The system shall be capable of automatic restart when power is restored after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostics codes for indoor and outdoor units shall be displayed on the wired controller panel.
- 2.4 Wired Remote Controllers
- The Wired Remote Controller shall have a LCD display. There shall be a built-in weekly timer. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (\*F) or Celsius (\*C), and Temperature changes shall be by increments of 1°F (0.5°C).
- from the indoor unit shall be 12 VDC. Up to two wired controllers shall be able to be used to control one unit.

#### EXECUTION

- 3.1 Install equipment where shown on drawings according to manufacturer's recommendations and performed by an approved manufacturer's contractor. Units shall be mounted straight and level, aligned with structure, for a neat and workmanlike arrangement.
- 3.2 Power wiring and disconnects shall be provided by Division 16, All power wiring by Division 16. <u>All</u> control wiring is by Division 15 and will be less than 50v. Refer to and follow the manufacturer's wiring requirements.
- 3.3 Provide 3/4" pvc drain line from the indoor unit to nearest drain, or supply and install condensate pump as needed. 3.4 Install wall mounted controller in location indicated. Mounting height to meet barrier free requirements (44"). One controller to
- control the three cassette units in the Library. 3.5 Route refrigerant tubing to condenser location outside and insulate with foam rubber. Size lines according to manufacturer.
- Contractor to verify installation distances meet manufacturer's requirements. Purge with nitrogen while welding. Firestop the penetrations at fire rated walls. 3.6 Mount outside heat pump on a 18" raised stand.
- 3.7 Configure unit controllers to suit the school's schedule.
- 3.8 Start-up the systems, and demonstrate the units to the Owner.

- Field wiring shall run directly from the indoor unit to the wired controller with no splices. The voltage to the wired controller

1.2 Each heat pump shall be factory assembled, wired and tested. Within the unit shall be all factory wiring, piping, electronic

modulating linear expansion device, control circuit board and DC fan motor. The unit shall have a self-diagnostic function, time delay mechanism, an auto restart function, an emergency operation function and test run function. Indoor unit refrigerant pipes shall be charged with dehydrated air before shipment from the factory. The unit shall be ETL certified. A dry air holding charge

shall be provided in the indoor section. Refrigerant to meet current regulations. System efficiency shall meet or exceed 18 SEER

DRAWING LIST - MECHANICAL

TITLE AND SPECIFICATIONS

MECHANICAL DEMOLITION

REFLECTED CEILING PLAN & DETAILS

- PLAN, SECTION OR DETAIL NUMBER

- DRAWING WHERE DETAILED

2. CONTRACTOR SHALL VERIFY SITE CONDITIONS AND

REPORT ANY DISCREPANCIES AND INCONSISTENCIES

LOCATION AND SETTING OUT IS THE RESPONSIBILITY

- EX = EXISTING SUPPLY OR RETURN

 $G_{-}$  = NEW GRILLE AS PER SCHEDULE

 $D_{-} = NEW DIFFUSER AS PER SCHEDULE$ 

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AB

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By | App

MAY 2025

UNLESS NOTED OTHERWISE, DIMENSIONS ARE IN

TO THE ENGINEER BEFORE PROCEEDING WITH THE

( - MEANS THIS DRAWING)

SCHEDULES

HVAC PLANS

ROOF PLANS

GENERAL NOTES

M2 —

OF THE CONTRACTOR.

<u>LEGEND</u>

- AIRFLOW, CFM

JUL 4 25 FOR PERMIT AND TENDER

Hastings, ON, Canada

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OROFESS/0

a Buchkowski

Z A.G.BUCHKOWSKI

JUL 3, 2025.

NCE OF ON

LIENT

ROJECT

TITIF

FILE No.

CLIENT FILE No.

MECHANICAL

0674-M1

Description

NOVADYNE

269 North Indian Road Tel: (705) 696-2119

CHK

SCALE:

CLASSROOM RENOVATIONS

NOTRE DAME CES, COBOURG, ON

TITLE & SPECIFICATIONS

AR

Peterborough Victoria

Northumberland and Clarington

Catholic District School Board

DWG. No.

M

Rev. No.

A. BUCHKOWSKI MAY 2025

AS NOTED

P3 JUN 1 25 90% SUBMISSION

EX 24x24 SIZE

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Date

Rev.

IMPERIAL UNITS.

PLUMBING PLANS

M1

М2

МЗ

Μ4

M5

M6

М7

WORK.

1.4 All units shall be listed and rated by ANSI/AHRI Standard 1230—2010 and meet all minimum IEER performance requirements as scheduled. The units shall be ANSI/UL STD 1995 listed and listed by Electrical Testing Labs (ETL) and bear the cETL label.All wiring

13802 <u>REFRIGERANT STSTEMS</u>					PL	UMB	ING FIXTURE SCHEDULE
Pressure Fittings, ANSI B31.5, Refrigeration Piping, ASME Sec VIII, Boiler and Pressure Vessel Code for unfired vessels, ANSI ASHRAE 15 Safety Code for Mechanical Refrigeration, ASTM B280 Seamless Copper Tube for Air Conditioning and Refrigeration Field Service	REF.	FIXTURE NAME	нот	COLD	DRAIN	VENT	REMARKS
1.2 Install systems as per the manufacturer's requirements.	C.O.	CLEAN OUT	_	_	_	_	ZURN ZN-1602, ADJUSTABLE HEAD WITH BODY SLEEVE SEAL
1.3 Co-ordinate layout and installation of tubing with other trades.							
1.4 Support tubing $3/8$ " and under every 4'-0" and larger than $1/2$ " diameter every 6'-0".	LAV1	LAVATORY	1/5"	1⁄5"	11/3"	1¼"	ADA COMPLIANT LAVATORY: 22" X 21" LAVATORY REAR OVERFLOW, FIRE CLAY CHINA,
1.5 Use plastic coated straps on copper tubes.		(ACCESSIBLE)	/2	/-			WALL HUNG WITH CUTOUT TEMPLATE AND MOUNTING KIT. 4" CENTRES FOR FAUCET,
1.6 Insulate suction and liquid lines as per Section 15300.							AMERICAN STANDARD MURRO #0954 000. FAUCET TO BE POLISHED CHROME PLATE
1.7 All outside exposed refrigeration piping to be insulated and covered neatly with PVC jacketing.							HOT AND COLD INDICATORS. AERATOR LIMITED TO 4.5 L/MIN. EQUAL TO MOEN DURA
1.8 Seal all penetrations through fire separations (corridor walls and mechanical room walls) to Code and ULC requirements, Use fire proof caulking equal to Hilti FS-1.							#8279. DRAIN TO BE MCGUIRE #155wc CHROME PLATED BRASS, POLISHED DRAIN, OFFSET OPEN GRID STRAINER, CAST BRASS 1 <sup>1</sup> / <sub>4</sub> ". MCGUIRE #LF165 SUPPLIES, CHROME
15802 <u>ENERGY RECOVERY VENTILATORS</u>							HOSES. MCGUIRE #8088 C.P. POLISHED P TRAP, CAST BRASS, 1 <sup>‡</sup> " WITH CLEAN-OUT AND ESCUTCHEON.
1.0 <u>GENERAL</u>							
1.1 Refer to section 15800.	LAV2	LAVATORY	1⁄2"	1⁄2"	1½"	1¼"	$18\frac{1}{4}$ " x $20\frac{1}{2}$ " WHITE VITREOUS CHINA WALL HUNG SINK, 3 HOLE, 4" CENTRES, FRONT
2.0 PRODUCTS: ERV-1		(BARRIER FREE)					FAUCET TO BE POLISHED CHROME PLATE FINISH, SOLID METAL CONSTRUCTION, GOOSENECK DESIGN, SMOOTH WRIST BLADE HANDLES, AERATOR LIMITED TO 4.5 L/MIN,
2.1.1 Capacities and sizes: refer to ERV schedule.							POLISHED DRAIN, OPEN GRID STRAINER CAST BRASS 11" MCGUIRE #155A CHROME PLATED,
2.1.2 The Energy Recovery Ventilators ERV-1 shall have the following characteristics:							CHROME PLATED, POLISHED SHORT RIGID ANGLE WITH ESCUTCHEONS AND BRAIDED
							FLEXIBLE HOSES. MCGUIRE #8872C C.P. POLISHED P TRAP, CAST BRASS, 1 <sup>‡</sup> " WITH
Casing: 22 Ga painted galvanized steel double wall cabinet with 1" insulation. Access doors to be hinged with quarter turn							CLEAN-OUT AND ESCUTCHEON.
Configuration: Vertical discharge and return. Extensions provided for vertical discharge and heating coils	WC1	WATER CLOSET	_		۲"	1 16"	BARRIER EREF HEIGHT, WHITE VITREOUS CHINA, ELONGATED BOWL, ELOOR MOUNTED AND
Mounting: Roof Mounted on insulated roof curbs supplied by manufacturer 14 for FRV-1		(ACCESSIBLE)				1/2	TANK WATER CLOSET, 4.8 LPF, AMERICAN STANDARD CADET 215AA.104 SEAT TO BE
Exchanger: High Latent recovery core, performance certified to AHRI 1060.							BEMIS HEAVY DUTY, SOLID WHITE PLASTIC, IMPACT RESISTANT, OPEN FRONT,
Blowers: Dynamically balanced with permanently sealed ball bearings.							STA-THE PLASTIC HINGES WITH SS POSTS. PLUMBER TO ADJUST LOCATION OF THE
Motors: TEFC premium efficiency motors on supply and exhaust. Motor size as per manufacturer's selection. Provide VFDs on the motors for adjusting speeds upon commissioning. VFDS are to be equivalent to ABB 580							REGULAR HEIGHT WHITE VITREOUS CHINA ROUND BOWL ELOOR MOUNTED WATER
Controls: 24v motor contactor with start-up from dry contact, 24v transformer for controls,	WC2	WATER CLOSET	-	1⁄2"	3"	1½"	CLOSET & TANK, 4.8 LPF TOILET, AMERICAN STANDARD CADET 215DA.104 OR EQUAL.
Defrost Control: Supply blower shuts down and outside damper closes. Exhaust air continues to operate to provide washroom exhaust.		(REGULAR)					SEAT TO BE BEMIS HEAVY DUTY, SOLID WHITE PLASTIC, IMPACT RESISTANT, OPEN FRONT, "STA-TITE" PLASTIC HINGES WITH SS POSTS. PLUMBER TO ADJUST LOCATION
Dampers: Include motorized dampers and actuators for supply and exhaust for night shutdown.							
Controls: Unit to have internal controls for selecting normal, defrost modes.	U	URINAL	—	1"	2"	1½"	VITREOUS CHINA FLUSHING RIM, SIDE SHIELDS, $\frac{3}{4}$ " TOP SPUD INLET, 2" OUTLET, WALL
Start-up/shut down to be by local timer.							HANGERS, EQUAL TO AMERICAN STANDARD WASHBROOKE 6590.001. FLUSH VALVE TO BE CHROME PLATED BRASS CONSTRUCTION HANDS FREE SENSOR OPERATED BATTERY
Dampers: Supply and exhaust motorized dampers to close on power failure and night shutdown, and defrost as above							POWERED WITH MANUAL OVERIDE BUTTON, FULLY ENCLOSED SENSOR, 24 HR NON-USE
Roof Curbs: Provided by manufacturer, as per schedule.							AUTOFLUSH, LOW BATTERY INDICATOR, 0.9 LPF (1 USGal/F), EQUAL TO AMERICAN
Filters: 2" Pleated Mery 8 on exhaust, 2" Pleated MERV 8 on supply, replaceable							STANDARD 6063051.002
Power: 208-3-60, Unit comes with non-fused disconnect.							
Hoods: Options include intake and exhaust hoods with bird screen.	S1	KITCHEN SINK	1/2"	1/2"	1½"	11/4"	20" X 20" X 8" DP. SINGLE COMPARTMENT, 20 GAUGE LEDGEBACK STAINLESS STEEL SINK, 3 HOLES,
Shipping: Include Freight to Site							SINGLE HANDLE, CHROME PLATED, 5.7 L/MIN (1.5 USGPM), EQUAL TO MOEN CHATEAU 7425.
Warranty: One year manufacturer's warranty on cores and equipment							
One year supplier on parts and labour	S2	WASH BASIN	1/2"	1⁄2"	1½"	1¼"	EXISTING BRADLEY STYLE WASH BASINS ARE TO BE RE-USED.
2.1.3 Acceptable Product: NuAir ERV to be supplied as per schedule, available from: Kevin Noll, Master Group district sales rep, 1—705—790—6970	S3	JANITOR'S SINK	1/2"	1/2"	2"	1½"	EXISTING JANITOR'S SINK TO REMAIN IN PLACE.
2.1.4 Note: Unit has been selected to provide 2400 cfm. The current requirement is for 1900 cfm; the increase will be required in a	HWT	HOT WATER TANK	3/4"	3/4"	-	-	41 IMP GAL (184 LITRE) ELECTRIC HOT WATER HEATER, 3000 WATTS, 240V POWER,
future renovation.							INSULATED WITH HIGH DENSITY FOAM INSULATION. AUTOMATIC TEMPERATURE
							CONTROLLER, DRAIN VALVE, $\frac{3}{4}$ " DIELECTRIC WATER CONNECTIONS, BOTTOM COLD WATER
							ENTRY, 6 YEAR LIMITED WARRANTY, AND BE LISTED BY CSA 22.2.
3.1 Install the unit according to the manufacturer's recommendations on roof curbs provided with units. Mount the units level and							INE UNIT SHALL BE EQUAL TO GIANT 152E-2F8M
true.				_ ,			
3.2 Pipe 🖥 condensate to roof.	TV1		3/4"	3/4"	-	-	ADJUSTABLE TEMPERATURE SETTING, CAST BRASS BODY, LEAD FREE, INTEGRAL CHECK
3.3 Connect ducting with flexible neoprene connections.		WIAING VALVE					WATTS/POWERS #LFLM491-1. MOUNT ON HOT WATER TANK AND SET FOR 110oF.
3.4 Controls Contractor to provide duct temperature controller to provide a 0-10v signal to duct heater. Refer to detail on Dwg M11.			-				· · · · · · · · · · · · · · · · · · ·
3.5 Air balance contractor to set fan speeds.	нD	HUB DRAIN	-	-	1½"	1¼"	PVC HUB DRAIN FOR LOCATED NEAR FLOOR FOR INDIRECT DRAIN.
3.6 Units to be started by 24/ 7 timer provided with units.			_				
<ul><li>3.7 Start-up by the manufacturer's representative the systems.</li><li>3.8 Demonstrate the unit to the Owner.</li></ul>	RD	ROOF DRAIN	-	-	4"	-	DURA-COATED, CAST IRON BODY, WITH COMBINATION MEMBRANE FLASHING CLAMP &GRAVEL GUARD AND POLYDOME, EQUAL TO ZURN Z-100. CONTRACTOR TO SELECT OPTIONS TO SUIT MEMBRANE ROOF.

- 15715 ELECTRIC DUCT HEATER
- 1.1 Provide an electric duct heater for warming make-up air.
- 2.1 Coils to be of high grade nickel-chrome alloy and shall be insulated by ceramic bushings. Coil terminal pins to be SS.
- 2.2 Heaters to be slip in design with flange for side mounting on a duct.
- 2.3 Duct heaters to be equipped with fail—safe, auto reset, manual reset disc type thermal cutouts.
- 2.4 Heaters shall be CSA approved.
- 2.5 Heaters to be equipped with magnetic contactors, 24v transformer, airflow sensor, duct thermostat/sensor, SCR (proportional) control, load fuses, solid state relay, contactors, pilot lights, protective screens, built—in disconnect, etc.
- 2.6 Unit to be 30kW, to be installed in a 30x16 duct. Air flow to be 1900 cfm. Unit to operate on 208-3-60 power.
- 2.7 Unit to be supplied by Thermolec, Montreal, QC, 1-514-336-9130
- 3.0 Install where indicated and according to manufacturer's instructions.
- 3.1 Unit to be supplied and installed by Division 15, wired by Division 16.

#### 15900 <u>Controls</u>

- 1.1 The work of this section includes the following:
- installation of new control components including wall mounted heat pump controls.
- 2.1 All equipment supplied under this section shall be installed complete with all required electric control wiring by Division 15.
- 2.2 All control wiring will be less than 50 volts and shall be a minimum of #18 gauge wire and be plenum rated. 2.3 All control wiring, conduit, accessories, etc. shall be installed by the controls contractor in accordance with requirements specified
- by local electrical authority. all control wiring shall be concealed behind walls or ceilings. Where exposed in public spaces (classrooms) it shall be run in wiremold or painted conduit.
- 2.4 Control wiring in mechanical rooms can be exposed but must be neatly arranged and tied. All control wiring shall be labeled.
- 2.5 All power wiring shall be done by Division 16 and meet the requirements of the Ontario Electric Code.
- 2.6 Mount thermostats and temperature controllers 44" above finished floor to meet barrier free requirements.

### 15950 BALANCING AND TESTING & COMMISSIONING

- 1.0 Hire an independent balancing contractor and balance and test the new HVAC systems according to the most recent SMACNA standards. Prepare a written air balance report and submit for approval. All air flows are to be measured on forced air systems, along with motor HP, rpm, amperage draw, static pressures, fresh air intake, exhaust air, etc.
- 2.0 <u>Start-Up and Commissioning</u>
- 2.1 Start up of equipment shall be as per the manufacturer's instructions.
- 2.2 Once the equipment is commissioned to requirements, the contractor shall arrange for a demonstration and training of the equipment with the Owner and Consultant to verify that the equipment is operating satisfactory. This shall form part of the requirements for project completion before any holdback is released.
- 3.0 <u>Documentation</u>
- 3.1 Provide final maintenance manuals and as-built drawings. Final holdback will not be paid until this documentation has been received.

#### <u>NOTES</u>

Item

EF-1

EF-2

1. ERV-1 IS 100% FRESH AIR AND 100% EXHAUST. 2. In this design fire smoke dampers are not specified ERV system also acts as a smoke exhaust system sin movement or air is continuous, and the configuration air handling system prevents the recirculation of exha return air under fire emergency conditions as per 3.1.8.8A, item 1(c) .

# FAN SCHEDULE

Name	Airflow (cfm)	ESP (wc")	Motor	Power (v-ph-hz)	Model	Description
WC EXHAUST FAN	90	.25	30 watts 1161 rpm	120-1-60	PANASONIC WHISPER CEILING FV—11VQ5	LOW NOISE CEILING MOUNTED EXHAUST FAN, CENTRIFUGAL, DIRECT DRIVE, HOUSING MADE OF GALVANIZED STEEL, INTEGRAL BACKDRAFT DAMPER, PLASTIC GRILLE, 4 POLE PLUG-IN MOTOR, 6" DUCT OUTLET, AMCA RATED. INSTALL ON CEILING AND OPERATE BY WALL TIMER BY DIV 16

	HEAT PUMP SCHEDULE														
System	Item	Cooling	Heating	Electric Heat	Air Flow	F	Powe	r	Noise	Weight	Model**	Remarks			
			(BIU/nr)	(kW)	(cfm)	MCA	Fuse	Volt		(10.)					
CLASSROOM	AH-1	33,000	38,000	10 kW	1000 CFM AT 0.8"WC	5.6	15	208/ 230	43	175	MITSUBISHI PVA-A36AA7	VERTICAL CLOSET AIR HANDLER			
#107	C-1		AT I/OF	feed)		26	42	208/ 230	51	290	MITSUBISHI PUZ-HA36NKAA	ROOF MOUNTED			
CLASSROOM	AH-1	33.000	38,000	10 kW	1000 CFM AT 0.8"WC	5.6	15	208/ 230	43	175	MITSUBISHI PVA-A36AA7	VERTICAL CLOSET AIR HANDLER			
#107	C-1		AI 1/of	feed)		26	42	208/ 230	51	290	MITSUBISHI PUZ-HA36NKAA	ROOF MOUNTED			
CLASSROOM	AH-1	33.000	38,000	10 kW	1000 CFM AT 0.8"WC	5.6	15	208/ 230	43	175	MITSUBISHI PVA-A36AA7	VERTICAL CLOSET AIR HANDLER			
#107	C-1		AI 170F	(separate feed)		26	42	208/ 230	51	290	MITSUBISHI PUZ-HA36NKAA	ROOF MOUNTED			
CLASSROOM	AH-1	33,000	38,000	10 kW	1000 CFM AT 0.8"WC	5.6	15	208/ 230	43	175	MITSUBISHI PVA-A36AA7	VERTICAL CLOSET AIR HANDLER			
#107	C-1	AT 17oF		(separate feed)		26	42	208/	51	290	MITSUBISHI PUZ-HA36NKAA	ROOF MOUNTED			

- INDOOR SYSTEMS TO BE SUPPLIED WITH THE FOLLOWING ACCESSORIES: WIRED CONTROLLER PROGRAMMABLE 24/7 THERMOSTAT PAR-41MAA & WALL BRACKET TO CONTROL ALL AIR HANDLER. MERV 11 AIR FILTER. - PROVIDE OPTIONAL 10 KW ELECTRIC HEATER EH10-MPA-LB, WITH SEPARATE POWER FEED. ELECTRIC HEATER CONTROLLED BY AIR HANDLER

- OUTDOOR UNITS TO BE SUPPLIED WITH: 18" HIGH MOUNTING STAND,

- \*\*EQUIVALENT DAIKIN OR FUJITSU UNITS ARE ACCEPTABLE.

	BASEBOARD HEATERS											
Item	Heat (watts)	Length (inches)	Model	Remarks								
BB-1, BB-2	2000	96"	OUELLET OFM2008	WHITE ELECTRIC BASEBOARD HEATER, 208 VOLTS, c/w LINE VOLTAGE TAMPERPROOF BUILT-IN THERMOSTAT SUPPLIED AND INSTALLED BY DIVISION 15 AND WIRED BY DIV 16.								

Item	Capacity	Model	Remarks
CH-1	3kW/208-1PH	OUELLET OAC 04000-T	ELECTRIC CABINET HEATER, SS TUBULAR ELEMENTS, SURFACE MOUNT, WHITE, 208/1/60 POWER, c/w TAMPERPROOF BUILT-IN THERMOSTAT, SUPPLIED AND INSTALLED BY DIVISION 15 AND WIRED BY DIV 16.
CH-2, CH-3	2kW/208-1PH	OUELLET OLI 2008	ELECTRIC CABINET CONVECTOR, SS TUBULAR ELEMENTS, WHITE CABINET, 208/1/60 POWER, c/w TAMPERPROOF BUILT-IN THERMOSTAT, SUPPLIED AND INSTALLED BY DIVISION 15 AND WIRED BY DIV 16.

			DIFFU	SER SCHEDULE						
ltem	Size	Nozzle	Colour	EH Price Model	Remarks	0	JUL 4 25	FOR PERMIT AND TENDER	AB	-
						P3	JUN 1 25	90% SUBMISSION	AB	
D1	24x24	6"	WHITE	6/24x24/SCD/3/3C/B12		Rev	. Date	Description	By	Apr
D2	<del>24X24</del>	8"	WHITE	8/24x24/SCD/3/3C/B12				·		
D3	24X24	10"	WHITE	10/24x24/SCD/3/3C/B12						
D4	12X12	6"	WHITE	6/12x12/SCD/3/3C/B12			1	NOVADYNE		

		GRILLE	E SCHEDULE	
Item	Туре	Colour	EH Price Model	Remarks
G1	RET	WHITE	24x24/80/F/A/B12	WITH BALANCING DAMPER
G2	RET	WHITE	12x12/80/F/A/B12	WITH BALANCING DAMPER
G3	RET	WHITE	18x22/530/S/F/A/B12	WITH BALANCING DAMPER
G4	SUP	WHITE	14x10/520/L/F/A/B12	WITH BALANCING DAMPER
G5	RET	WHITE	16x16/80/F/A/B12	WITH BALANCING DAMPER

		ERV UNITS - ROOF MOUNTED												DUTDOOR	R SWITCH	CTORS	ECT	NOITO
as the nce the of the aust or ar OBC	Unit	Airflow (cfm)	Fresh Air (cfm)	Suppl E.S.P. ("wc)	y Fan	Exhau	ISt Fan	MCA	Electrical	Model No.	ENERGY WHE	/ERTICAL DI	4" ROOF CI	AOTORIZED ( AMPERS	ыктү ғістеғ	SMOKE DETE	VF DISCONNI	BMS CONNEC
	ERV-1	2400	100%	0.75"	1.0	0.75"	1.0	amps	208/3	NU-AIR 2540 MOTORS TO BE PREMIUM EFFICIENCY TEFC, POWERED VIA VFDS.	X	X	X	X	×		X	

- CONTRACTOR TO ENSURE THAT MANUFACTURER'S REFRIGERANT PIPING LENGTH AND SIZE REQUIREMENTS ARE MET.

# ELECTRIC CABINET HEATERS

269 North Indian Road Tel: (705) 696-2119 Hastings, ON, Canada KOL 1YO











M5 SCALE: 3/16"=1'-0"

REFLECTED CEILING PLAN



# 2 SECTION B-B M5 SCALE: 1/4"=1'-0"

0	JUL 4 25	FOR PERMIT & TENDER	AB	_
Ρ3	JUN 1 25	FOR CO-ORDINATION	AB	-
P2	MAY 15 25	FOR CO-ORDINATION	AB	_
P1	MAY 8 25	FOR DISCUSSION	AB	-
Rev.	Date	Description	Ву	App.

### NOVADYNE 269 North Indian Road Tel: (705) 696-2119 Hastings, ON, Canada K0L 1Y0 DWN. PROFESS/0 MAY 2025 AB Ban Buchkowski C CHK. ₩ A.G.BUCHKOWSKI DSN. JUL 3, 2025. A. BUCHKOWSKI MAY 2025 NCE OF ONTA SCALE: As Noted MECHANICAL CLIENT Peterborough Victoria Northumberland and Clarington Catholic District School Board PROJECT CLASSROOM RENOVATIONS NOTRE DAME CES, COBOURG, ON TITLE REFLECTED CEILING PLAN AND DETAILS FILE No. DWG. No. Rev. No. 0674-M5 M5 0 CLIENT FILE No.



				-
0	JUL 4 25	FOR PERMIT AND TENDER	AB	-
P2	MAY 15, 25	FOR CO-ORDINATION	AB	_
P1	MAY 8, 25	FOR DISCUSSION	AB	Ι
Rev.	Date	Description	Ву	App.

AB MAY 2025 A. BUCHKOWSKI MAY 2025 As Noted Peterborough Victoria Northumberland and Clarington Catholic District School Board CLASSROOM RENOVATIONS NOTRE DAME CES, COBOURG, ON DWG. No. Rev. No. 0



### <u>NOTES</u>

- IN WASHROOMS, REMOVE ALL FIXTURES: TOILETS, URINALS AND LAVATORIES (EXCEPT WASH BASINS AS NOTED). CUT BACK PLUMBING AND MODIFY
- 2. ANY UNDERFLOOR WATER SUPPLY PIPING IS TO BE ABANDONED. (EXCEPT INCOMING WATER SERVICE.)

				-
				-
				-
0	JUL 4 25	FOR PERMIT AND TENDER	AB	
Rev.	Date	Description	Вy	App.

NOVADYNE

### 269 North Indian Road Tel: (705) 696-2119 Hastings, ON, Canada K0L 1Y0 DWN. PROFESS/C JUN 25 AB Han Buchkows & 8 CHK. DSN. JUL 3, 2025. A. BUCHKOWSKI JUN 25 NCE OF ONT SCALE: As Noted MECHANICAL CLIENT 40 Peterborough Victoria Northumberland and Clarington Catholic District School Board PROJECT CLASSROOM RENOVATIONS NOTRE DAME CES, COBOURG, ON TITLE MECHANICAL DEMOLITION FILE No. DWG. No. Rev. No. 0674-M7 M7 0 CLIENT FILE No.





			LIGHT				
TROL PANEL DETAIL ON CONTROL PANEL ELECTRICAL FEAT GS FOR MOUNTING OF ELECTRICAL			LIGHT \$ <sub>K</sub>	ING LEGEND   KEYE	ED SWITCH		
00PER – METALUX 1'x4' SURF. LUMINAIRE,	ACE MOUNTED FLAT PANEL LED 3017 LUMENS (25.5W), 4000K, 120V						
OOPER – METALUX 1'x4' SURF. LUMINAIRE,	ACE MOUNTED FLAT PANEL LED 4226 LUMENS (38.6W), 4000K, 120V			_			
COOPER-HALO OR 6" SURFACE APPROVED EQUAL SET TO 750	LED DOWNLIGHT, 90CRI, 120V, WHITE, LUMENS, SET TO 4000K, 7.9W		_ _ _			_	
COOPER-HALO OR 6" SURFACE APPROVED EQUAL SET TO 120	LED DOWNLIGHT, 90CRI, 120V, WHITE, 0 LUMENS, SET TO 4000K, 13.8W	0 2	5/07/04	ISSUED FOR	PERMIT & TENDER	PGB	_
OOPER-METALUX OR APPROVED EQUAL DIMMING DE	E MOUNTED STRIP LIGHT, FULL FROST UMENS (62W), 120V, 4000K, 0–10V RIVER	Rev.	Date	Descr	iption	Ву	App.
OOPER-METALUX OR APPROVED EQUAL	E MOUNTED STRIP LIGHT, FULL FROST LUMENS (35W), 120V, 4000K, 0-10V		В	ERTI	HELOT		
LIGHTING E IT SCHE		E 2193 Pete K9K Ema	NG B Lynhav rborough 1W8 ill: pberth	INEE ren Rd., n, ON. nelot@berthe	RING L Tel: (705) 7	ΤI 775-18	<b>)</b> 517
TE OR EQUAL   IN TABLE ON THIS DR C/W MR16 LED HEADS	UNIT, BATTERY CAPACITY AS LISTED AWING, 12VDC, 10 YEAR BATTERY, AS LISTED AND MOUNTING SHELF		PROFESSI	ONAL	DWN.		
TE OR EQUAL DUAL REMOTE HEAD,	I2VDC, 5W, MR16 LED	ICENSED	Berthe		CHK. P. BERTHELOT		
TE OR EQUAL SINGLE REMOTE HEAD,	12VDC, 5W, MR16 LED	D P P	July 4/		DSN. PGB/TMS		
TE OR EQUAL SELF POWERED RUNNI CEILING MOUNT AS INT LAMPS FOR 120VAC, O	NG EXIT SIGN, SINGLE FACE, WALL OR DICATED, ARROWS AS INDICATED, LED DSA-C860-96 LISTED & CERTIFIED	ELECTF	RICAL E	0N11 BCIN 23396	SCALE: AS NOTE	D	
G CONTROLS SCHED	 LE						
N FACT RER DESCRIPTIO	N			1			
PROVED EQUAL MANUAL ON/O SWITCH, WHITE	VERRIDE OFF LOW VOLIAGE MOMENTARY IN COLOUR TECHNOLOGY WALL SWITCH OCCUPANCY	PROJE PROJEC	CT NORT		ΔΜΕΛΕς		
PROVED EQUAL SENSOR, 120V, MANUAL-ON (V	WHITE IN COLOUR, PROGRAMMED /ALL PLATE NOT INCLUDED)		CLAS	SROOM	RENOVATIO	ONS	;
CURRENT OR MANUAL ON/O PROVED EQUAL MOMENTARY D	VERRIDE OFF LOW VOLTAGE MMING SWITCH, WHITE IN COLOUR	TITLE		Cobour	rg, Ontario		
CURRENT OR	OGY, 360° CEILING MOUNTED SENSOR,		LIC	GHTING L	AYOUT PLAN	N	
CURRENT OR DUAL TECHNOL	OGY, 360° CEILING MOUNTED SENSOR,	FILE No	). -7 7	37	DWG. No.		2
PROVED EQUAL LINE VOLTAGE,	WHITE IN COLOUR		/ 3	<i>/ ر</i>			

PANEL: LOCATION:	ELECTR	ICAL R	ООМ	VOLT	AGE:	208	3/120V 3P	4W <u>IC RATING:</u> 10kA		NDTE:								
A <u>TYPE:</u> A <u>FED_FROM:</u>	SURFAC _ EXISTIN	E MOU G	INTED	<u>MAIN</u> MAIN	BUS: BREAK	400 <u>ER:</u> 400	A A	<u>CIRCUITS:</u> 84		PROVIDE PRICE TO REMO NEW 400A, 120/208V, 84 BE FED FROM EXISTING (	VE EXI CIRCU FEED IF	STING IT PAN PRAC	PANEL EL. NE\ TICAL.	AND IN V PANE	ISTALL L SHAL	L		
CIRCUIT DESCRIPTION	LOAD (kVA)	CCT BKR	CCT #	PHASE	ССТ #	CCT BKR	LOAD (kVA) CI	IRCUIT DESCRIPTION	CIF	RCUIT DESCRIPTION	LOAD (kVA)	CCT BKR	ССТ #	PHASE	ССТ #	CCT BKR	LOAD (kVA)	CIRCUIT DESCRIPTION
	Х		1	a	2 \		×		CL	ASSROOM 7 RECEPTACLES	×	15A	43	a	44	15A	X	CLASSROOM 7 RECEPTACLES
ERV-1	Х	15A	(3	b	4)	100A	X DI	H-1	CL	ASSROOM 7 COUNTER REC.	×	20A	45	b	46	15A	X	CLASSROOM 8 RECEPTACLES
	Х		<b>\</b> 5	с	6		×		CL	ASSROOM 8 RECEPTACLES	×	15A	47	C	48	15A	×	CLASSROOM 8 COUNTER REC.
SPARE	×	20A	7	a	8	20A	X SF	PARE	CL	ASSROOM 8 PROJECTOR REC	×	15A	49	a	50	20A	×	SECRETARY OFFICE REC.
	х	204	(9	b	10	15 /	×	Ц 7	PR	INCIPAL'S OFFICE REC.	×	15A	51	b	52	15A	×	CORRIDOR RECEPTACLES
	X	ZUA	× 11	с	12	I IJA	x	11-7	ER	V-1 CONVENIENCE REC.	×	20A	53	с	54	15A	x	JANITOR ROOM GFCI REC.
	х	15 /	13	a	14	15 /	×		ST	AFF WASHROOM GFCI REC.	×	15A	55	a	56	20A	×	IT ROOM RECEPTACLE
AIT-0	X	IJA	<b>\</b> 15	b	16 <b>/</b>	IJA	x	11-9	IT	ROOM RECEPTACLE	×	20A	57	b	58	20A	×	IT ROOM RECEPTACLE
	×	15 /	(17	С	18	504	X	Н 7	IT	ROOM RECEPTACLE	×	20A	59	с	60	15A	×	CLASSROOM 10 RECEPTACLES
	X	IJA	<u>19</u> a	a	20/	JUA	×	Π-/	CL	ASSROOM 10 RECEPTACLES	×	15A	61	a	62	20A	×	CLASSROOM 10 COUNTER REC.
	X	504	o (21 b	b	22	504	X		CL	ASSROOM 9 RECEPTACLES	×	15A	63	b	64	15A	x	CLASSROOM 9 RECEPTACLES
	X	JUA	×23	С	24	JUA	X	Π-9	CL	ASSROOM 9 COUNTER REC.	×	20A	65	с	66	20A	x	CLASSROOM 7/8/CORR. LTG
DU 10	X	504	∧ <u>∕</u> 25 a	a	26	100	×	D 1	C.F	R. 9/10/PRINCIPAL'S OFF. LTG	×	15A	67	a	68	15A	X	EXTERIOR LIGHTING
	×	SUA	27	b	28	40A	X H	P-1	EX	IT SIGNS [1]	×	15A	69	b	70	15A	x	CLASSROOM 10 PROJECTOR
	X	40.4	(29	с	30	100	×				×	704	<b>1</b> 71	с	72	15A	x	SPARE
	X	40A	31	a	32	40A	X	P-3	BB	-1/BB-2	X	JUA	73	a	74	15A	x	SPARE
	X	40.4	133	b	34	20A	× H	P CONVENIENCE RECEPTACLE			X		/75	b	76	15A	x	SPARE
	Х	40A	35	с	36	20A	× H	P CONVENIENCE RECEPTACLE	СН	-2/CH-3	×	15A	(77	с	78	15A	×	SPARE
	Х		137	a	38		×				×		<b>\</b> 79	a	80	x	x	x
HWII	X	20A	<b>1</b> 39	b	40	1EX [2]		P-5	×		×	×	81	b	82	×	x	x
CLASSROOM 7 PROJECTOR RE	Сх	15A	41	с	42	15A	x CI	LASSROOM 8 PROJECTOR REC	×		×	×	83	с	84	x	×	x
[1] BREAKER SHALL BE LOCK [2] COORDINATE SIZE OF BRE	[1] BREAKER SHALL BE LOCKED AND PAINTED RED [2] COORDINATE SIZE OF BREAKER WITH EXISTING EQUIPMENT																	



2. EXISTING DE∨ICES ARE NOT SHOWN, BUT SHALL REMAIN ON EXISTING ZONES. 3. FIRE ALARM PANEL IS LOCATED IN EXISTING ELECTRICAL ROOM.

1 PARTIAL FIRE ALARM RISER DIAGRAM E3 SCALE: N.T.S.



MAN FACT RER	DESCRIPTION
MATCH EXISTING	FIRE ALARM HORN
MATCH EXISTING	PHOTOELECTRIC TYPE SMOKE DETECTOR
MATCH EXISTING	RATE OF RISE HEAT DETECTOR
MATCH EXISTING	FIXED TEMPERATURE HEAT DETECTOR

### 1. CONNECT NEW DEVICES TO EXISTING FLOOR ZONE.

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	_	_	_	_
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#### <u>Part 1 — General</u>

#### <u>1.1. General</u>

- 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.

#### <u>1.2. Outline Scope</u>

- 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.
- <u>1.3. Contract Drawings</u>
- 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.
- <u>1.4. Shop Drawings</u>
- 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.
- <u>1.5. Co-Operation with Other Trades</u>
- 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.

#### <u>1.6. Warranty</u>

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.

#### <u>1.7. Insurance</u>

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

#### <u>1.8. Liability</u>

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.

#### <u>1.9. Cutting and Patching</u>

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.
- <u>1.15. Clean-Up</u>
- 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. <u>1.16. Codes and Standards</u>
- 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.
- <u>Part 2 Basic Materials and Methods</u>

#### 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.

<u>2.5. Wiring Devices</u>

<u>Switches</u>

- 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.

## <u>Receptacles</u>

- 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.

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

- 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.

### <u>Mounting Heights</u>

- 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. <u>Cover Plates</u>
- 2.5.14.Cover plates from one manufacturer shall be used throughout the project and supplied for all wiring devices and any pullboxes.

<u>Equipment Nameplates</u>

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.

<u>Part 3 — Distribution</u>

- <u>3.1. Disconnect Switches</u>
- 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.
- <u>Part 4 Lighting Equipment</u>

<u>Luminaires</u>

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

- <u>Lighting</u> 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
    - 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. <u>Exit signs</u>
- 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.

performance, lights turn off only after space is vacated

- 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.

<u>Part 6 – Heating Equipment</u>

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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CLASSROOM	RENOVATIONS					
Cobou	rg, Ontario					
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SPECIFICATION						
FILE No.	DWG. No.					
737						



![](_page_17_Figure_1.jpeg)

1. DISCONNECT DEVICES SCHEDULED FOR REMOVAL OR RELOCATION. REMOVE EXISTING WIRING AND CONDUIT BACK TO SOURCE, WHERE PRACTICAL, AND MAKE SAFE.

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![](_page_17_Picture_9.jpeg)