Addendum # 2
Bid Opportunity: 25-7706-RFT - Glenview Park Secondary School Elevator and Science Laboratory Renovation
Closing Date: Monday, April 7th, 2025 2:00 PM

The following issued by the Board shall form part of the Bid / Proposal Solicitation document. The revisions and additions noted herein along with any attachments shall be read in conjunction with all other related documents. This Addendum shall, take precedence over the previously issued documents where differences occur. Receipt of this addendum must be acknowledged in the Bidding System, bids&tenders.

If you have already submitted a Bid / Proposal, it will be automatically withdrawn as a result of this addendum. You must resubmit the Bid / Proposal acknowledging all addenda and revising your Bid / Proposal to comply with all addenda.

Question 1:

Could you clarify the new roof system, specs say 2 ply but drawings show a 3 ply. Please advise.

Answer 1: Roof to be 3 ply as per attached specifications.

Question 2:

We are submitting for the following be an approved alternate
Equipment Tag: BS-1A,BS-1B,BS-1C
BS-2A,BS-2B,BS-2C
CU-4A1,CU-4A2,
CU-4B1,CU-4B2
Basis of Design: Daikin
Proposed Equal: LG
Notes: VRF | HVAC | LG Canada Business

Answer 2: Yes, alternate included in addendum 02 prepared by DEI Engineers attached.

Question 3:

We are submitting for the following be an approved alternate
Equipment Tag: HVAC-5
Basis of Design: Daikin
Proposed Equal: Envent
Notes: Canadian Made. Air Handling

Answer 3: No, this is not on WRDSB's list of approved manufacturers.

Question 4:

Fume hood is shown on Drawing 8.A3.3 with very little info. Mech connections shown on Mech Dwg M3.4. Is there a specification for the fume hoods? What type of cabinets are required below the fume hood? Acid cabinets or flammable cabinets?

Answer 4: Fume hood specifications attached. Millwork to be the same as the new millwork in the science rooms.

Question 5:

Drawing A3.3- Tops are specified as 1" phenolic, as "SURF-1" – Phenolic, 1" , carbon black. But they are under heading "SOLID SURFACE". Spec. Section 12 36 61.16 – SOLID SURFACE COUNTERTOPS – which describes SURF-1 as "Cast, non porous, filled polymer, with through body color" – by Dupont, Formica or Hanex (i.e. Corian or similar). Please clarify if we are to go by the drawings that call for 1" thick Solid Phenolic. Also note, Corian tops are not recommended for science rooms.

Answer 5: Refer to attached specifications the Laboratory Work Surfaces.

Question 6:

Please provide a roofing specification for the new elevator addition.

Answer 6: Roofing specifications attached.

Question 7:

On behalf of a roofing contractor:

There is only a roof assembly on the drawing and basically no specification for the roof. Is cold applied SBS roof system acceptable? this eliminate the kettle from the ground.

Proposed system:
• Vapour barrier self-adhered
• Insulation set-in adhesive
• Tapered insulation set in adhesive Base sheet self-adhered
• Cap sheet torch applied

Answer 7: Roofing specifications attached.

Question 8:

Please confirm if the cash allowance includes for the supply and install of the entire data, communication, and audio-visual scopes of work.

Answer 8: Correct, includes for data, communication and audio-visual scopes of work within the 2 renovated classrooms.

Question 9:

Can you clarify the specifications and drawings for this project. The spec section indicates 2-different project No. and name. eg: Section 01 79 00 indicates 25-7706-RFT with the project noting Glenview Park Secondary School Elevator and Science Laboratory Renovation but section 02 41 19 indicates Glenview Park SS HAVAC IMPROVEMENTS Project No. 2024-081. The drawings indicates Glenview Park Secondary School HVAC IMPROVEMENTS throughout. Can you clarify this.

Answer 9: This is for the same project.

Question 10:
In drawing A3.1, fourteen (14) demolition keynotes are listed; however, the only scope shown in demolition plans for biology and chemistry labs is note 13, and removal of acoustical ceilings. Confirm this is correct.

Answer 10: Refer to updated A3.1 with added demolition keynotes to plans. Including the demo of existing millwork and whiteboards / tackboard.

Question 11:
In drawing A4.1 note D08 read ...Carefully removed and reisntall AC-tile and ceiling mounted components to accommodate mechanicak work; however the Asbestos Audit report indicates that in rooms A116, A119, A120, A122a the ceiling is transite (asbestos cement) panels. Please confirm if there is an asbestos containing ceiling (likely Gyproc) above the acoustical ceiling system in these rooms.

Answer 11: Refer to Asbestos Audit report for all locations of asbestos. If ceiling contains asbestos, it is to be removed and replaced. Similar to any ceiling tiles that have asbestos. They are to be removed and replaced with new tiles.

Question 12:
Please clarify if sprinkler system is required. As per OBC matrix the building IS NOT SPRINKLERED; however RCP note 5 read...EXTENT OF NEW AND/OR EXISTING SPRINKLER SYSTEM NOT SHOWN. GENERAL CONTRACTOR TO SUPPLY AND INSTALL SPRINKLER SYSTEM TO APPLICABLE CODES TO SUIT PLANS. GENERAL CONTRACTOR TO SUPPLY SHOP DRAWINGS FOR SPRINKLER SYSTEM TO THE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

Answer 12: Sprinklers are not required.

Question 13:
Stainless steel ductwork for fume hood looks to be acoustically lined? (page M4.3) Is there a specific acoustic liner specified that is fume hood rated?
With the discontinuation of R410A refrigerant will there be an updated schedule released reflecting relevant model numbers for the refrigeration scope ?

Answer 13: Acoustic lining on fume hood exhaust duct to be deleted from scope. Please refer to updated DEI drawings attached. VRF systems can remain 410A until end of December 2025. Per contract, all VRF equipment shall be on site/in storage prior to end of December 2025.

Question 14:
Please provide a specification for the spray fireproofing. Ceiling assembly CA1 on drawing A0.2 calls for 1 hour spray fireproofing, but there is no specification for this item.

Answer 14: Specification for spray fireproofing attached.

Question 15:
Please consider extending this closing by one week.

Answer 15: Tender will be extended to April 7th. Question deadline will be moved to April 2nd. There will be no further extensions permitted.

Question 16:
Can you provide specification for fire spray please

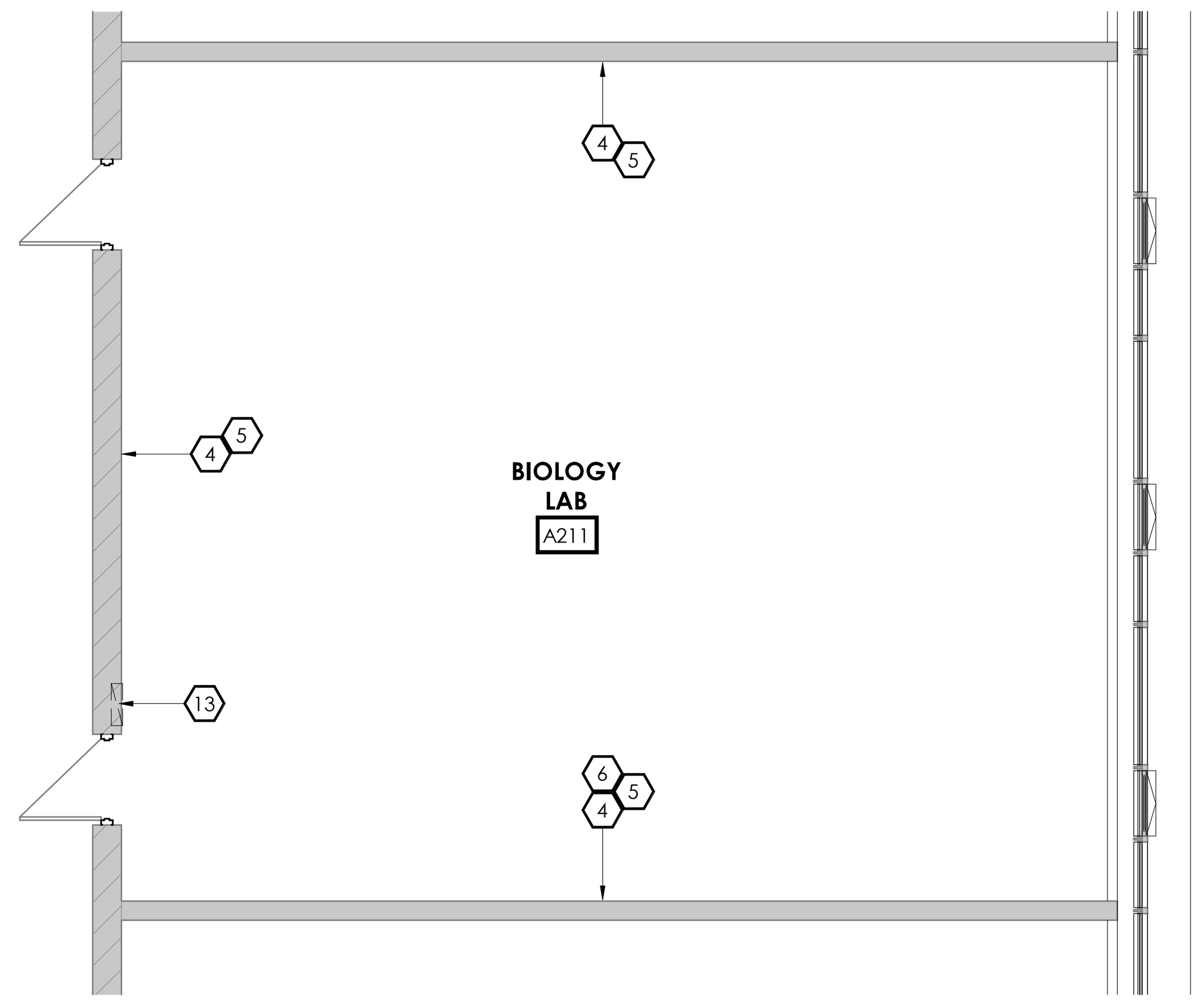
Answer 16: Specification for spray fireproofing attached.

Question 17:
Should be do the removal of existing ceiling tile and suspension system (note D1) under asbestos abatement procedures knowing that the Gyproc (Note D3) lath ceiling above is asbestos containing? It is likely that dust from the ceiling above (Gyproc) has accumulated on top of suspended ceiling below.

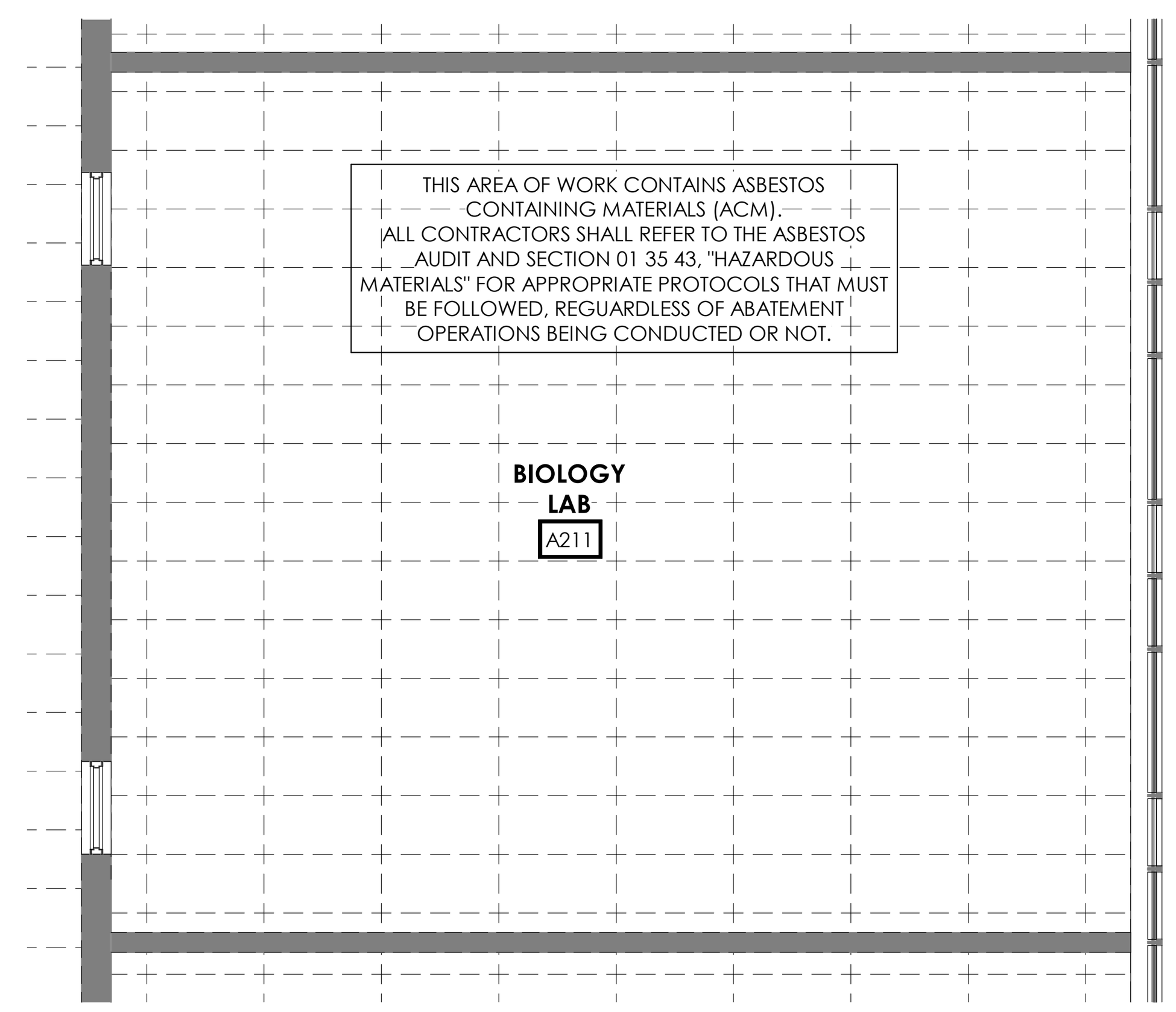
Answer 17: This should be taken into consideration when allowing for mechanical work. Ceiling tiles will need to be removed and replaced. Refer to Answer 11 above.

Clarifications:

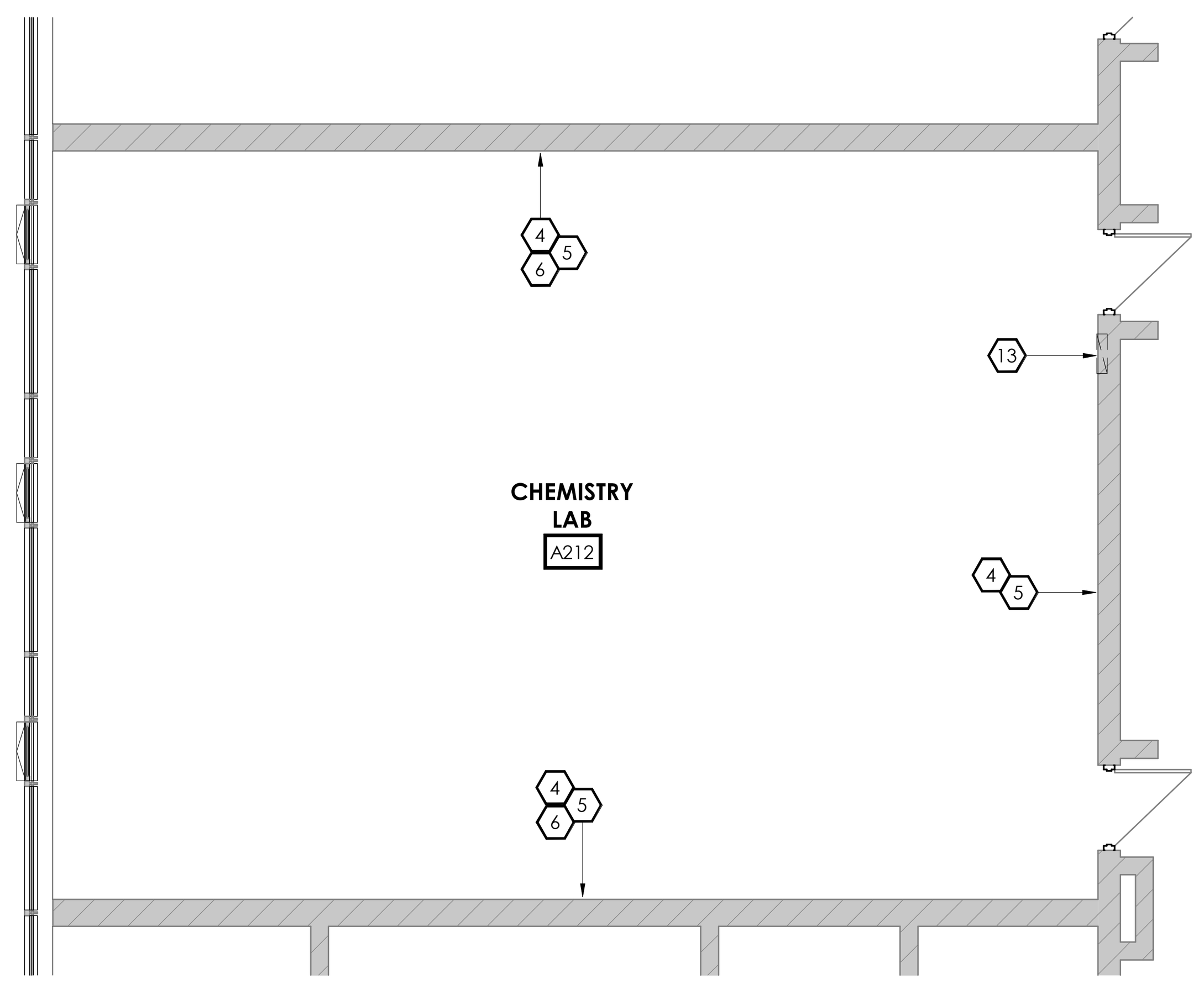
Refer to attached Addendum 2 prepared by DEI Engineering for changes and clarifications to mechanical and electrical scopes.



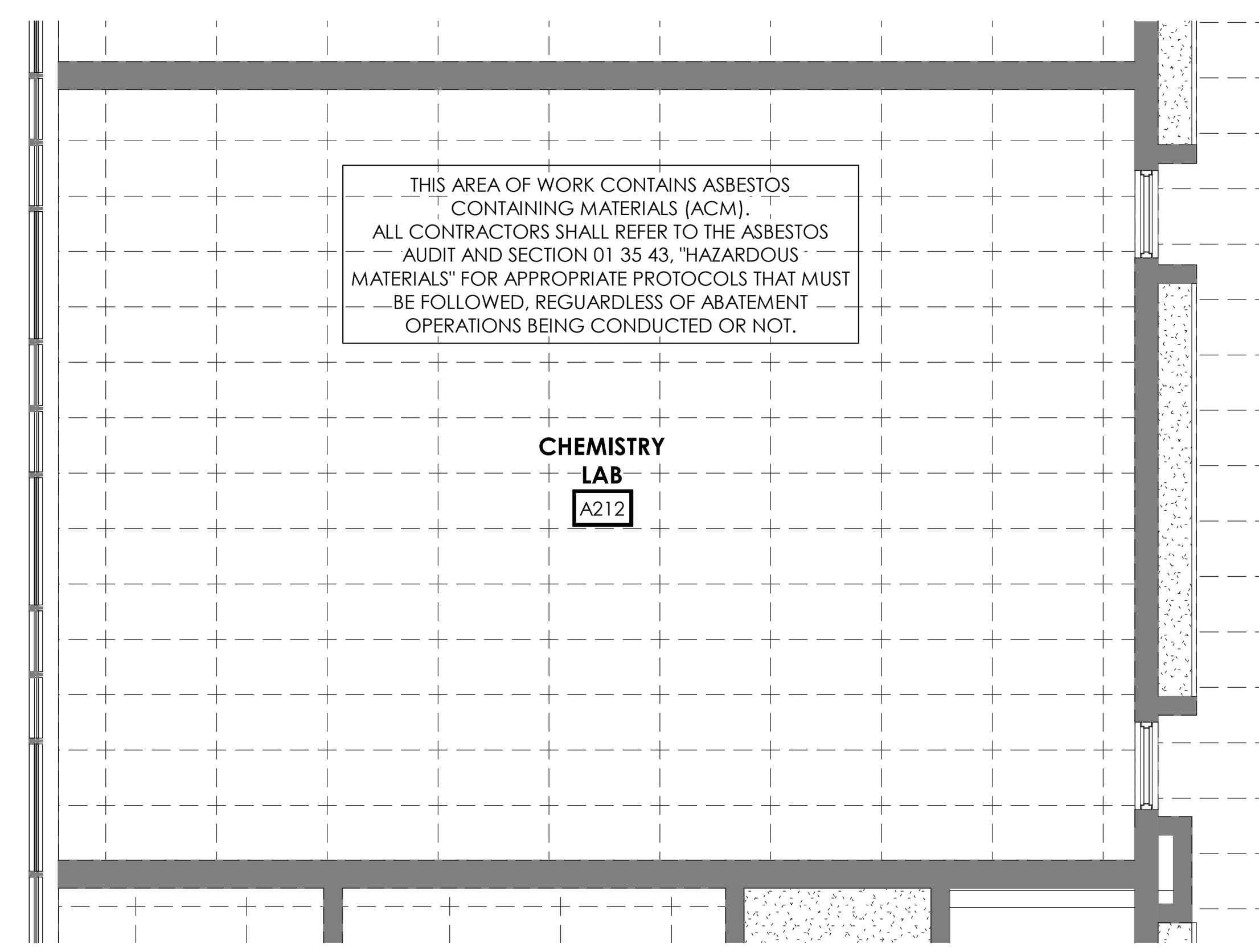
1 / A3.1 BIOLOGY LAB DEMOLITION PLAN 1 : 75



2 / A3.1 BIOLOGY LAB RCP DEMOLITION PLAN 1 : 75



3 / A3.1 CHEMISTRY LAB DEMOLITION PLAN 1 : 75



4 / A3.1 CHEMISTRY LAB RCP DEMOLITION PLAN 1 : 75

DEMOLITION PLAN LEGEND

- EXISTING WALL TO REMAIN (SHOWN SHADED)
- EXISTING WALL TO BE DEMOLISHED
- EXISTING DOOR AND FRAME TO REMAIN
- EXISTING DOOR AND FRAME TO BE DEMOLISHED
- EXISTING WINDOW AND FRAME TO REMAIN
- EXISTING WINDOW AND FRAME TO BE DEMOLISHED
- DENOTES EXISTING BUILDING
- DENOTES AREA N.I.C. UNLESS NOTED OTHERWISE

DEMOLITION KEYNOTES

1. DEMOLISH EXISTING WALLS INDICATED IN THEIR ENTIRETY AND DISPOSE OF FROM SITE. MAKE GOOD AFFECTED WALLS, CEILINGS AND FLOORS THAT ARE TO REMAIN.
2. DISMANTLE/DEMOLISH EXISTING DOORS, FRAMES AND ALL ASSOCIATED HARDWARE INDICATED AND DISPOSE OF FROM SITE.
3. REMOVE EXISTING FLOORING. PATCH AND GRIND SMOOTH EXISTING CONCRETE SUBFLOOR AND MAKE READY TO RECEIVE NEW FINISHES. CARE IS TO BE TAKEN TO NOT DAMAGE TERRAZZO TILE AT DOORWAY FLOORING TRANSITIONS.
4. REMOVE ALL EXISTING WHITEBOARDS,TACKBOARDS AND CHALKBOARDS FROM WALL AND DISPOSE OF FROM SITE. PATCH AND MAKE GOOD WALLS TO REMAIN THAT ARE AFFECTED BY DEMOLITION.
5. REMOVE ALL EXISTING WALL MOUNTED EQUIPMENT. PATCH AND MAKE GOOD WALLS AFFECTED BY DEMOLITION. STORE ANY EQUIPMENT SCHEDULED FOR REUSE OR TO BE TURNED OVER TO THE OWNER IN A SAFE, DRY PLACE. REFER TO MECH. AND ELEC. DWGS FOR ANY EQUIPMENT INTEGRAL TO THOSE DISCIPLINES.
6. REMOVE EXISTING MILLWORK. PATCH AND MAKE GOOD FLOORS/WALLS AFFECTED BY DEMOLITION THAT ARE TO REMAIN, AND PREPARE FOR NEW FINISHES.
7. REMOVE EXISTING PLUMBING FIXTURES AND DISPOSE OF FROM SITE. CAP ANY PLUMBING SERVICES NOT TO BE REUSED. REFER TO MECH. DWGS.
8. DEMOLISH KNEE WALL IN IT'S ENTIRETY AND DISPOSE OF FROM SITE. MAKE GOOD AFFECTED WALLS, CEILINGS AND FLOORS THAT ARE TO REMAIN.
9. REMOVE EXISTING RAD COVERS IN THEIR ENTIRETY AND REWORK ELEMENT TO SUIT NEW PARTITIONS. REFER TO MECHANICAL DRAWINGS. STORE RAD COVERS IN A SAFE, DRY PLACE FOR FUTURE RE-INSTALLATION.
10. REMOVE OPERABLE WINDOW PANEL AND PREP FOR INSTALLATION OF FIXED GLAZING PANEL.
11. REMOVE EXISTING WOOD STAGE IN IT'S ENTIRETY AND DISPOSE OF FROM SITE. PATCH AND MAKE GOOD FLOORS/WALLS TO REMAIN THAT ARE AFFECTED BY DEMOLITION.
12. RELOCATE DATA HUB AND DEMOLISH EXISTING DATA HUB MILLWORK IN IT'S ENTIRETY. REFER TO ELEC. DWGS.
13. EXISTING ELECTRICAL PANEL TO BE REMOVED (REFER TO ELEC DWGS)
14. DEMOLISH EXISTING WINDOWS IN THEIR ENTIRETY AND DISPOSE OF FROM SITE.

DEMOLITION NOTES

1. DISPOSE OF REMOVED ITEMS IN A LAWFUL MANNER IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE MUNICIPALITY HAVING JURISDICTION.
2. ALL EXISTING WALLS AND ITEMS TO BE REMOVED ARE SHOWN DASHED.
3. ALL EXISTING WALLS TO REMAIN ARE SHOWN SHADED.
4. OWNER TO HAVE THE RIGHT TO FIRST REFUSAL OF ALL ITEMS REMOVED. ITEMS TO BE STORED IN A DRY AND SECURE LOCATION. ALL REMOVED ITEMS SHALL BE DISPOSED OF AS PER NOTE No. 1.
5. COORDINATE WITH STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS ALL RELATED COMPONENTS OF DEMOLITION, MODIFICATION AND NEW INSTALLATION.
6. REMOVE, RELOCATE AND/OR RE-ROUTE ALL MECHANICAL AND ELECTRICAL SERVICES AND CONNECTIONS AS REQUIRED TO ACCOMMODATE DEMOLITION OR AS NECESSARY AS A RESULT OF DEMOLITION.
7. SUPPLY AND INSTALL ALL NECESSARY SHORING AND/OR BRACING AS REQUIRED FOR TEMPORARY SUPPORT OF EXISTING STRUCTURE. COORDINATE WITH A STRUCTURAL ENGINEER AS REQUIRED.
8. ENSURE ALL FLOOR AREAS ARE FREE OF HAZARDS AFTER DEMOLITION IS COMPLETE. LEVEL, PATCH, FILL AND GRIND FLOOR AS REQUIRED TO ACHEIVE A SMOOTH SANITARY SURFACE READY TO RECEIVE FLOOR FINISH.
9. CARE SHALL BE TAKEN TO MINIMIZE DAMAGE TO EXISTING ABUTTING WALLS, SURFACES AND FINISHES TO REMAIN.
10. PROTECT SALVAGED AND/OR ITEMS TO REMAIN FROM DAMAGE. PROVIDE ADEQUATE COVERINGS AND/OR STORAGE AS REQUIRED.
11. EXISTING EXIT SIGNAGE, FIRE ALARM SYSTEM AND EMERGENCY LIGHTING TO BE LEFT IN OPERATION DURING DEMOLITION AND DURATION OF CONTRACT OR UNTIL NEW INSTALLED.
12. COORDINATE WITH OWNER AREA(S) FOR WASTE BIN LOCATION. SUPPLY AND MAINTAIN PROTECTIVE MEASURES TO ENSURE THE PUBLIC'S SAFETY.
13. COORDINATE WITH THE OWNER ANY STAGING OF WORK AND/OR DISRUPTIONS TO PARKING AND TRAFFIC FLOWS.
14. SHOULD MATERIAL RESEMBLING SPRAY OR TROWEL APPLIED ASBESTOS OR OTHER TOXIC OR HAZARDOUS MATERIALS BE ENCOUNTERED IN THE COARSE OF DEMOLITION, STOP WORK, TAKE PREVENTATIVE MEASURES AND NOTIFY ARCHITECT AND/OR OWNER IMMEDIATELY. DO NOT PROCEED UNTIL WRITTEN INSTRUCTIONS HAVE BEEN RECEIVED.
15. CONTRACTOR TO EXAMINE EXISTING CONDITIONS ON SITE AFFECTING DIVISION OF WORK. NO CLAIM FOR PAYMENT SHALL BE MADE FOR EXTRA WORK MADE NECESSARY BY CIRCUMSTANCES ENCOUNTERED DUE TO CONDITIONS WHICH WERE VISIBLE UPON, OR REASONABLY INFERABLE, FROM AN EXAMINATION OF THE SITE PRIOR TO SUBMISSION OF THE BID. THIS INCLUDES BUT IS NOT LIMITED TO THE SERVICES ABOVE THE CEILING.
16. CONTRACTOR MUST OBTAIN DEMOLITION PERMITS REQUIRED BY RELEVANT AUTHORITIES BEFORE THE COMMENCEMENT OF THE WORK.
17. DURING DEMOLITION, CONTRACTOR TO PREVENT DUST, DIRT AND DEBRIS FROM RISING OR MIGRATING TO OTHER AREAS BY HANGING 0.5mm POLY SHEETS BETWEEN AREAS OF CONSTRUCTION. PROTECT EXISTING HVAC UNITS FROM CONTAMINATION AND REPLACE FILTERS UPON COMPLETION OF DEMOLITION.
18. CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN THE INTEGRITY OF THE BUILDING CORE.
19. DEMOLITION OCCURING BEYOND THE SCOPE IDENTIFIED IS TO BE REPAIRED OR REPLACED TO ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
20. CONTRACTOR TO PATCH CEILING, ADJACENT WALLS AND FLOOR SURFACES AS REQUIRED AFTER DEMOLITION. ALL STRIPPED SURFACES TO BE LEFT IN SMOOTH CONDITION SUITABLE TO RECEIVE NEW FINISHES.
21. ELECTRICAL SERVICES TO BE REMOVED ARE TO BE SAFELY CAPPED, COMPLIANT WITH THE APPLICABLE CODES.
22. ALL CUTTING AND PATCHING OF EXISTING FINISHES WILL BE DONE TO THE HIGHEST STANDARD.
23. GENERAL CONTRACTOR TO ENSURE ALL FLOOR AREAS ARE FREE OF HAZARDS AFTER DEMOLITION AND DURING CONSTRUCTION.
24. SAWCUT AND REMOVE THE EXISTING SLAB ON GRADE TO FACILITATE ANY BURIED MECHANICAL AND/OR ELECTRICAL ITEMS. PATCH AND MAKE GOOD SLAB ON GRADE AFTER NEW SERVICES ARE IN PLACE. COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS.
25. DISCONNECT ALL EXISTING EXTERIOR SIGNAGE TO BE REMOVED AND PROVIDE FINAL CONNECTIONS FOR NEW AND/OR REPLACED SIGNAGE. COORDINATE WITH ELECTRICAL DRAWINGS.
26. CONTRACTOR TO REFER TO GENERAL CONDITIONS AS OUTLINED IN SPECIFICATIONS FOR NEW CONSTRUCTION.

PROJECT NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
JOSHUA O.P. BEDARD
LICENCE
7407

No.	REVISIONS	DATE

CHRONOLOGY	DATE
ISSUED FOR BUILDING PERMIT / TENDER	2025.03.05

aba architects inc.
101 Randall Drive, Unit B, Waterloo ON. TEL 519 884 2711 www.abarchitect.ca

CLIENT
WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME
GLENVIEW PARK SECONDARY SCHOOL HVAC IMPROVEMENTS
55 McKay St., Cambridge, ON, N1R 4G8

DRAWING TITLE
LEVEL 2 - SCIENCE ROOM DEMOLITION PLAN

SCALE: As indicated
SHEET SIZE: 24X36
PROJECT NUMBER: 2024-081
DRAWING NUMBER: A3.1

2025-03-25 9:41:52 AM C:\Users\AnneC\Documents\2024-081 GPSS Science Classroom_Central_aclaessens@abarchitect.ca.rvt

1 General

1.1 SECTION INCLUDES

.1 Built-up membrane roofing, cold-applied method.

1.2 REFERENCES

.1 ASTM D4601: Standard Specification for Asphalt-Coated Glass Fibre Base Sheet Used In Roofing.

.2 CSA A123.4: Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems.

.3 CGSB 37-GP-9Ma: Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.4 CGSB 37-GP-52M: Roofing and Waterproofing Membrane, Sheet Applied, Elastomeric.

.5 CAN/CGSB-51.33: Vapour Barrier Sheet, Excluding Polyethylene, for Use In Building Construction.

.6 CAN/ULC-S704: Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

.7 CAN/ULC-S706: Standard for Wood Fibre Thermal Insulation for Buildings.

.8 Must be in compliance with Ontario Building Code Act: sections 3.1.15 (Roof Covering) and 5.2.2.2. (Determination and Wind Load) or Part 11 (Renovations); and all support sections. Submit evidence if requested of compliance by a Third Party Verified Listed Assembly (such as Underwriters Laboratory; Factory Mutual or Florida Building Code).

1.3 SYSTEM DESCRIPTION

.1 Roofing System: three ply cold-applied built-up roofing system with vapor barrier, rigid board insulation, composite ply roofing membranes, roof pavers and aggregate surfacing

.2 Provide Products that are compatible with one another under field conditions, as demonstrated by roofing manufacturer.

.3 Provide watertight roofing system capable of resisting specified uplift pressures, thermally induced movement and exposure to weather without failing during the specified warranty period.

1.4 SUBMITTALS

.1 Make Submittals in accordance with Division 01.

.2 Product Data

.1 Submit Product data for each major component, including membrane, vapour retarder, rigid board insulation, pavers and adhesives. Highlight critical criteria for proper installation.

.3 Shop Drawings

.1 Submit Shop Drawings for prefabricated work and details.

.2 Include plans, sections, details in accordance with performance requirements, and for attachment to other portions of the Work.

.3 Sloped Insulation, if required: Indicate degree of slope and layout of sloping insulation on roof surfaces. Ensure positive drainage to roof drains.

1.5 CERTIFICATES

.1 Manufacturer Certificates: Signed by roofing manufacturer verifying that installer is approved, authorized or licensed by manufacturer to install specified Products.

.2 Installer Certificates: Signed by installer verifying that they have the specified qualifications described below.

1.6 TEST REPORTS

.1 Submit test reports as specified in Section 01 00 00.

.2 Product Test Reports: based on the evaluation of comprehensive tests conducted by an independent testing agency of the specified roofing Products.

.3 Manufacturer Field Inspection Reports: manufacturer's written acceptance of roofing installation based on regular inspections.

1.7 QUALITY ASSURANCE

.1 Manufacturer: qualified manufacturer having roofing systems listed by UL and approved for use by Factory Mutual.

.2 Installer: a company and persons specializing in the application of built up roofing, with minimum 8 years documented experience and approved to apply roofing system by manufacturer.

.3 Conform to CRCA Roofing Specifications and roofing membrane manufacturer's instructions.

1.8 PRE-INSTALLATION MEETINGS

.1 Conduct pre-installation meeting.

.2 Meeting: prior to commencement of deck installation, review and document methods and procedures related to roof deck and roofing system construction, including the following:

.1 representatives of the Owner,

.2 authorized architect, engineer, general contractor

.3 roofing Subcontractor, roofing manufacturer, and installers of roof accessories and roof-mounted equipment.

.3 Review methods and procedures related to roofing installation, including manufacturer's written installation instructions.

.4 Review construction schedule and confirm availability of Products, Subcontractor personnel, equipment and facilities.

.5 Review deck installation criteria and finishes for conformance with roofing system criteria, including issues of flatness and fastening.

.6 Review structural loading conditions and limitations of roof deck both during and after roofing application.

.7 Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and other conditions affecting roofing installation.

.8 Review governing regulatory requirements, and requirements for insurance and certificates as applicable.

.9 Review safety requirements, including temporary fall-arrest measures.

.10 Review field quality control procedures.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Deliver and store Products undamaged in original containers with manufacturer's labels and seals intact.

.2 Store Products in designated areas elevated off the ground and protected from ultra-violet radiation, inclement weather and construction activities.

.3 Store solvent-based liquids away from excessive heat and open flame.

.4 Store adhesives and sealants at temperature above 5 degrees Celsius.

.5 Store membrane rolls on end, dry, and protected from moisture and damage. Cover rolls, insulation and other moisture-sensitive Products with tarpaulins.

.6 Store Products on roof deck in a manner to prevent overloading the structure and properly secured to prevent movement due to wind or other forces.

1.10 ENVIRONMENTAL REQUIREMENTS

.1 Do not apply any roofing materials during inclement weather.

.2 Comply with manufacturer's recommendations for minimum and maximum temperatures and humidity during application.

.3 Do not install Products when temperatures are below -10 degrees C.

.4 Consider effects of wind chill on adhesives and ensure they will not prematurely set before proper adhesion takes place.

.5 Keep water-based Products from freezing. Do not apply water-based Products if temperatures are below 5 degrees C.

1.11 WARRANTY

.1 Submit extended warranties in accordance with the General Conditions of the Contract.

.2 Installer's Extended Warranty: standard OIRCA 2 year warranty, commencing from the date of Substantial Performance of the Work.

.3 Manufacturer's Extended Warranty: The Manufacturer shall issue a non-prorated warranty for a period of Twenty Years. All components including the vapor retarder, insulation, cover board, membrane, flood coat, perimeter flashings including metal shall be covered under this warranty. Wind uplift warranty shall cover wind velocity up to a maximum wind speed of not greater than 117km/h (73 mph).

.4 Warranty shall include inspections in years 2, 5 ,10 & 15 of the warranty. The following duties shall be carried out at no extra cost to the Owner as required, by the Manufacturer.

.1 Sealing of flashing seam

.2 Filling of pitch pockets

.3 Repairs to blisters and ridges

.4 Caulking at metal details as required

.5 Written inspection report

.6 Removal of light debris from roof

.7 Cleaning of drain screens

1.12 ADDITIONAL WARRANTY SERVICES

.1 The manufacturer shall provide to the owner access to an Online Data Base.

.2 All pertinent details regarding this project shall be entered on the data base such as:

.1 Store roof plans, roof dimensional information, roof assembly types, roof inspection reports, roofing budgets, roof specs, etc. all per building.

.2 Generate roof replacement budgets and capital plans

.3 Schedule inspections and recommended roof replacements

.4 Provide designated Board employees secure access to this inventory system through a username and password. Once access is granted, all information and functions should be accessible and retrievable to the Board employee.

.5 Provide training to the Board employee to use the Online Roof Management Program.

.6 The supplier must provide examples of web-based roof inventory systems they have created for other clients.

.7 Roof condition by category

.8 Construction of the roof system including all components.

.9 Inspection schedule (warranty requirements)

.10 Substantial completion date.

.11 Accurate future budgetary reports for a minimum of 20 years

.12 Condition photos on a per roof basis

.13 Aerial images via Google Satellite

.14 Service Activity – what was done and by whom

.15 Warranty information

.16 Leak history/sensitivity

.17 Leak reporting service

.18 Square footage reports of all roof areas

.19 CAD Drawings

.20 Specifics on drainage, perimeter and interior projection flashings, slope and drainage.

.21 Supporting documents.

.22 Emergency Leak call service.

.23 Hand Held Infra-red analysis reports.

2 Products

2.1 ROOF SYSTEM MANUFACTURERS

.1 Products and systems specified herein are based on the BurMastic Cold-Applied system by Tremco Canada.

2.2 MATERIALS

.1 Primer: non-fibrated, asbestos free, water-based, low-VOC formulation; to CGSB 37-GP-9Ma; equivalent to Tremco Improved Tremprime WB or approved equal.

.2 Roof Vapour Retarder: Self adhering 1.0 mm (40 mil) thick, self adhered air and vapour control membrane consisting of SBS rubberized asphalt laminated to slip-resistant, cross-laminated polyethylene surface film, with release paper backing. Provide substrate primer as recommended by manufacturer. AVC Membrane and Primer by Tremco Canada or approved equal.

.3 Roof Insulation: Polyisocyanurate rigid board; to CAN/ULC-S704, Type 3, Class 2, closed cell type:

.1 Board Size: (4-0" x 4-0") 1220 x 1220mm.

.2 Long Term Thermal Resistance (CAN/ULC-S770): (R6.0) RSI 1.04 per (1") 25mm thickness of board.

.3 Compressive Strength: (20psi) 140kPa minimum.

.4 Dimensional Stability (ASTM D2126): < 2 percent linear change.

.5 Water Absorption (ASTM C209): < 1 percent by volume.

.6 Edges: square.

.7 Faces: non-asphaltic, fibre-reinforced felt facers both sides.

.8 Combustibility: meets CAN/ULC-S107-M87 and CAN/ULC-S126-M86.

.9 Thickness: minimum one layer required, total thickness: (3") 75 mm.

.10 Acceptable Products: Trisotech G Roof Insulation by Tremco Canada or approved equal.

.4 Overlay Board: (1/2") 13mm thick asphalt-coated fiberboard, to CAN/ULC-S706, Type I, Grade 1.

.5 Roofing Ply Membrane: polyester-glass-polyester tri-laminate reinforced asphalt-coated sheet, (0.055") 1.4mm thick, (31 lb/100ft^2) 1.5 kg/m^2 weight, to ASTM D4601, Type II; BURmastic Composite Ply HT by Tremco Canada or approved equal.

.6 Flexible Flashing Membrane: (0.045") 1.14 mm thick, reinforced EPDM/SBR elastomeric sheeting; TRA by Tremco Canada or approved equal.

.7 Aggregate Ballast: pea gravel free of fines, long splinters, dust or foreign matter, nominal (3/8") 10mm diameter.

2.3 ACCESSORIES

.1 Adhesive for Roof Insulation Boards and Overlay Boards: Two component (1:1 ratio) solvent free, elastomeric urethane adhesive. Asbestos free, low odor and does not contain any bitumen or VOC's. Tremco Low Rise Foam Adhesive or approved equal.

.2 Adhesive for Aggregate Ballast and Roofing Plies: Asbestos-free, cold-process asphalt adhesive; Tremco BurMastic Adhesive or approved equal.

.3 Adhesive for Flashing Membranes: Single-component, bitumen-modified, moisture cure polyurethane; Tremlar –LRM-V by Tremco Canada or approved equal.

.4 Mechanical Fasteners: Flat-head, countersunk, self-tapping screws; size, type and length in accordance with FMG; corrosion resistant coating in accordance with FM 4470, with locking plastic or metal plates.

.5 Pavers: (24" x 24" x 2" thick) 610 x 610 x 50mm thick, precast concrete paver units; diamond surface pattern; color as selected by Owner.

.6 Stack Flashings: to CSA-B272, insulated aluminum stack jacks complete with bitumen protection dam and screw-secured cover;

.1 SJ-26/SJ-27, by Thaler Metal Industries Ltd., Mississauga ON.

.2 Flash-Tite VSC-S Series, by Lexcor, Etobicoke ON.

.7 Roof Penetration Flashings: to CSA-B272, insulated aluminum, complete with bitumen protection dam and screw-secured cover;

.1 Thaler Metal Industries Ltd., Mississauga ON, or

.2 Flash-Tite™, by Lexcor, Etobicoke ON.

.8 Irregular Roof Protrusion Flashings: Pre-fabricated mastic sealer pockets; (5") 127mm high x appropriate diameter to exceed diameter or width of protrusion by (2") 50mm. Pockets to be sealed with pourable self-leveling sealant;

.1 Chemlink Advanced Construction Products.

.2 Hi-Tuff TPO Molded Sealant Pockets by Lexcan Limited.

2.4 ROOF DRAINS: AS SPECIFIED IN SECTION 22 14 26.

.1 Prefinished Sheet Metal: for flashing & copings exposed to view, (24ga.) 0.7mm minimum base thickness commercial quality sheet steel to CSA-S136, hot-dip galvanized to CAN/CSA-G164, prefinished with factory applied 2-coat silicon-modified polyester system, Stelco 8000 Series finish; color as selected by Owner.

.2 Miscellaneous Sheet Metal: for hook strips, fastening strips, metal bellows, and other flashings generally concealed from view; (22ga.) 0.93mm galvanized steel.

.3 Cant Strips: purpose made asphalt-impregnated fiberboard, (3" x 3") 75 x 75 mm size.

.4 Stripping Membrane: Vinyl-coated fiberglass mesh; Burmesh by Tremco Canada or approved equal.

.5 Stripping Adhesive: Single-component bitumen modified polyurethane, vertical grade, Tremlar LRM-V by Tremco Canada or approved equal.

.6 Pitch Pan: pre-manufactured type; (24 gauge) 0.7mm thick galvanized steel sheet, minimum (4") 100mm high.

.7 Pitch Pan Filler: Quick set grout. Tremseal PP Sealer by Tremco or approved equal.

.8 Sealants: as specified in Section 07 92 00.

.9 Termination Bar: (1/8") 3mm thick aluminum bar, (1") 25mm wide profile, pre-drilled for mechanical attachment.

.10 Prefabricated Control or Expansion Joint Flashing: sheet butyl reinforced with closed cell urethane foam backing, seamed into metal flashing flanges, including sheet butyl counter flashing each side.

3 Execution

3.1 EXAMINATION

.1 Inspect existing conditions to ensure they are suitable for roofing work to begin. Do not proceed until unacceptable conditions are corrected.

.2 Ensure substrate is solid, clean, dry and free of any contaminants prior to commencing any roofing work.

.3 Ensure Products are dry prior to installation. Replace damaged Products.

3.2 PREPARATION

.1 Protect existing roofing from damage with minimum (1/2") 13 mm thick plywood runways.

.2 Prime metal and concrete surfaces designated to be covered with asphaltic Products.

.3 Apply primer at an average rate of (200 ft^2/gal.) 4.9 m^2/litre. Allow to cure.

.4 Ensure primer does not enter building through cracks and other openings.

3.3 VAPOUR RETARDER

.1 Adhere roof vapour retarder to existing substrate with approved adhesive at manufacturer's recommended rate.

.2 Overlap vapour retarder minimum (4") 100mm for side laps and (6") 150mm for end laps.

.3 Extend vapour retarder under cant strips and blocking. Extend to perimeter and deck protrusions.

.4 Seal roof vapour retarder to wall air/vapour barrier system with flexible flashing membranes to ensure continuity of building air/vapour barrier envelope.

3.4 INSULATION AND OVERLAY BOARD

.1 Install insulation boards to maintain continuity of thermal envelope. Minimize joints.

.2 Adhere base layer of roof insulation to vapour retarder with approved adhesive at manufacturer's recommended rate.

.3 Fit insulation tight to roof penetrations.

.4 Firmly butt insulation boards. Do not jam or deform boards.

.5 Minimize lipping between adjacent boards.

.6 Stagger joints minimum (12") 300 mm.

.7 Adhere single layer of overlay board over roof insulation with approved adhesive at manufacturer's recommended rate.

.8 Stagger overlay board seams with base layer insulation board seams.

3.5 CANT STRIPS

.1 Install cant strips at intersections of roofing and vertical surfaces.

.2 Embed in a continuous bed of approved adhesive applied to overlay boards.

.3 Lay true to line, level and with flush, butt joints and accurately mitred corners.

3.6 ROOF MEMBRANE

.1 Install three plies of roof membrane in shingle fashion, starting at roof low point. Apply membrane perpendicular to overlay board joints. Conform to manufacturer's recommended method.

.2 Overlap starter strips (26") 660mm with first ply, then overlap each succeeding ply (25") 625mm.

.3 Place ply sheets to ensure water will flow over or parallel to, but not against, exposed edges.

.4 Shingle in direction to shed water. Extend ply membranes over and terminate beyond cants and cut evenly.

.5 Embed plies in approved adhesive, at manufacturer's recommended rate, and solidly coating each ply for full width.

.6 Ensure complete and continuous seal and contact between adhesive and ply membranes, including ends, edges and laps without wrinkles, fish mouths or blisters.

.7 Do not step or walk on felts during or immediately after application until adhesive has set.

.8 Install each ply so that it shall be firmly and uniformly set, without voids, into adhesive. Thoroughly and effectively broom or roll each membrane application to ensure full adhesion.

.9 Lap ply membrane ends (6") 150 mm. Stagger end laps (39") 1 metre minimum.

.10 Overlap previous day's work (24") 600 mm, as required.

.11 Terminate all ply layers to outer edge of roof perimeter.

3.7 ELASTOMERIC FLASHINGS

.1 Provide membrane flashings in accordance with manufacturer's written installation guidelines.

.2 Install flashings to ensure the roof is watertight at the end of each working day.

.3 Extend flashing membrane minimum (6") 150 mm over roof membrane.

.4 Extend flashing membranes minimum (10") 250 mm up vertical surfaces.

.5 Secure flashings at (8") 200 mm OC. Secure vertical flashings through termination bar.

.6 Overcoat lap edges with end lap stripping adhesive and membrane.

.7 Tie-in leading edge of elastomeric sheet flashing with stripping ply membrane embedded between alternate courses of stripping ply adhesive.

.8 Canted Eave:

.1 Extend reinforced elastomeric sheeting over outside face of cant and extend minimum (1") 25 mm below blocking. Mechanically fasten with (1½") 38mm common roofing nails, (8") 200 mm OC.

.2 Extend reinforced elastomeric sheeting down over cant strip and embed in flashing adhesive from top of cant to at least (6") 150 mm beyond toe of cant onto roof.

.3 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends (4") 100 mm and adhere with flashing adhesive.

.9 Canted Eave with Fascia

.1 Extend reinforced elastomeric sheeting over outside face of cant and fascia and secure to underside of fascia. Mechanically fasten with (1½") 38mm common roofing nails, (8") 200 mm OC.

.2 Extend reinforced elastomeric sheeting down over cant strip and embed in flashing adhesive onto roof surface a minimum of (6") 150 mm.

.3 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends (4") 100 mm and adhere with flashing adhesive.

.10 Low Parapet Wall Flashing

.1 Seal exposed joint between the wall and roof deck for airtight seal.

.2 Adhere elastomeric sheeting completely to flashing surface, cant, and roofing with flashing adhesive.

.3 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with flashing adhesive.

.4 Extend elastomeric sheeting up and over parapet at least (1½") 38mm and face nail with 38 mm common roofing nails, (8") 200 mm OC.

.11 Gravel Stop

.1 Prior to setting and nailing horizontal flanges of edge flashings, uniformly trowel a (0.060") 1.5 mm thick layer of cold flashing adhesive to roofing surface designated to receive metal flange.

.2 Install metal gravel stop with formed drip edge, incorporating lock-type joints to allow expansion and contraction. Set flange in cold flashing adhesive.

.3 Nail interior portion of flange to wood blocking (3") 75mm OC, staggered.

.4 Prime metal flange with asphaltic primer.

.5 Fully adhere a sufficiently wide strip of elastomeric sheeting to flashing with flashing adhesive. Ensure complete bond and continuity without wrinkles or voids lap sheeting ends (4") 100mm and adhere with flashing adhesive. Elastomeric sheeting to cover gravel stop completely and overlapping onto adjacent roof minimum (6") 150mm.

.6 Seal edge of flashing membrane at metal upturn.

.12 Wall Flashing

.1 Seal exposed joint between the wall and roof deck for airtight seal.

.2 Adhere elastomeric sheeting completely to flashing surface, cant and roofing with flashing adhesive.

.3 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with flashing adhesive.

.4 Elastomeric sheeting width: sufficient to extend at least (6")150 mm beyond toe of cant onto roof surface and (8") 200 mm above the roof surface.

.5 Secure top of elastomeric sheeting to vertical plane with termination bar. Mechanically fasten (12") 300 mm OC. Overcoat bar with end lap stripping adhesive and membrane.

.13 Building Expansion Joints

.1 Fill joint with loose insulation.

.2 Provide 3/4" (19) mm thick plywood to top of wood blocking, secured one side only; as specified in Section 06 10 00.

.3 Apply foam rubber or (1") 25 mm thick mineral fibre insulation to top of plywood.

.4 Install elastomeric sheeting centred over expansion joint.

.5 Fully adhere sheeting to horizontal and vertical blocking surfaces with flashing adhesive. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.

.6 Elastomeric Sheeting Width: Sufficient to extend onto adjacent roofing minimum (6") 150 mm.

.7 Lap sheeting ends (4") 100 mm and adhere with flashing adhesive.

.14 Expansion Joint at Wall

.1 Extend vapour retarder from deck level up wall sufficiently and secure to wall.

.2 Fill joint with loose insulation.

.3 Install blocking, sheathing and compressible insulation as detailed on Drawings and as specified in Section 06 10 00.

.4 Adhere elastomeric sheeting completely to flashing surface, cant and roofing with flashing adhesive.

.5 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends (4") 100 mm and adhere with flashing adhesive.

.6 Elastomeric Sheeting Width: sufficient to extend at least 150 mm beyond toe of cant onto roof surface and (8") 200 mm above the roof surface.

.7 Secure top of elastomeric sheeting to vertical plane with a termination bar. Mechanically fasten (12") 300 mm OC. Overcoat bar with end lap stripping adhesive and membrane.

.15 Curb Flashing

.1 Fully adhere sheeting to horizontal and vertical blocking surfaces with flashing adhesive. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.

.2 Elastomeric Sheeting Width: Sufficient to extend from top of curb down onto adjacent roofing minimum (6") 150mm. Mechanically fasten sheeting on top face of curb.

.3 Lap sheeting ends (4") 100 mm and adhere with flashing adhesive.

.4 If membrane does not completely cover sleeper, secure top edge with a termination bar. Mechanically fasten (12") 300 mm OC. Overcoat bar with end lap stripping adhesive and membrane.

.16 Projection Flashing

.1 Apply flashing adhesive to prepared area and Provide aluminum base over pipe and set into the flashing adhesive.

.2 Select proper step of rubber cap and cut off above index ring.

.3 Install cap onto base collar and press edge to ensure proper seal.

.4 Provide clamp around pipe and rubber cap. Prime flange.

.5 Install elastomeric sheeting with stripping ply adhesive and membrane.

.6 Cover flange completely. Extend flashing minimum (4") 100 mm onto adjacent roofing. Remove wrinkles and voids. Lap flashing ply ends (4") 100 mm.

.17 Cartwheel and Collar

.1 Provide cartwheel and collar flashing around projection using elastomeric sheeting and flashing adhesive.

.18 Pitch Pans

.1 Uniformly apply a (1/8") 3mm thick layer of flashing adhesive to surfaces designated to receive metal flange.

.2 Install pre-manufactured pitch pan into adhesive. Prime flange prior to installation.

.3 Ensure minimum (2") 50mm clearance between projection and side wall.

.4 Fully adhere elastomeric sheeting to flashing surface with flashing adhesive. Cover flange completely. Extend flashing at least (4") 100 mm onto adjacent roofing. Ensure complete bond and continuity without wrinkles and voids. Lap sheeting ends minimum (4") 100 mm.

.5 Fill pitch pan (1") 25mm from top with pitch pan base filler.

.6 Fill remainder with rubberized elastomer mastic. Crown top of mastic to ensure water run-off.

.19 Roof Drain

.1 Install drain assembly in accordance with manufacturer's written installation guidelines.

.2 Plug and seal drain to prevent water entry until service connection is completed.

.3 Provide (24" x 24") 600mm x 600mm size elastomeric sheeting reinforcement, centered over drain; and fully adhered with flashing adhesive. Remove wrinkles and entrapped air.

.4 Apply mastic to exposed edge of membrane inside the drain opening.

.5 Re-clamp flashing collar to drain in bed of flashing adhesive.

.6 Trim excess sheeting within drain.

.20 Roof Drain Insert

.1 Cut (9") 225 mm OD opening through membrane and insulation; coinciding with existing drain opening.

.2 Install roof drain insert into existing drain pipe in accordance with drain insert manufacturer's written installation guidelines.

.3 Adhere drain flange to membrane with flashing adhesive.

.4 Provide (36" x 36") 914mm x 914mm size elastomeric sheeting reinforcement, centered over drain; and fully adhere sheeting with flashing adhesive. Remove wrinkles and entrapped air.

.5 Trim excess sheeting within drain.

.6 Seal leading edge of sheet with reinforcing membrane embedded between alternate continuous courses of flashing adhesive.

3.8 SURFACING

.1 Install concrete pavers on pedestals where indicated on Drawings.

.2 Flood coat roof surface with cold-process asphalt adhesive, applied at manufacturer's recommended rate.

.3 Immediately broadcast aggregate ballast into cold adhesive at a rate of (416 lb/sq) 20 kg/m^2, covering flood coat completely.

.4 Do not use power buggies or heavy equipment to distribute ballast.

.5 Rake out aggregate to a neat, even surface.

3.9 FIELD QUALITY CONTROL

.1 Contractor Inspection: Prior to application aggregate surfacing, inspect completed membrane and flashing for punctures, tears, and discontinuously sealed seams.

.2 Apply additional layer of membrane over punctures and tears, extending minimum (12") 300mm beyond damaged area in all directions, and seal seams.

.3 Manufacturer's Field Service: arrange for manufacturer's technical representative to regularly (daily) inspect the roofing application and confirm that the roofing system installation is in strict accordance with manufacturer's recommendations.

3.10 CLEANING

.1 Clean drains, gutters and downspouts of debris, ensuring free drainage.

.2 Clean adjacent roof surfaces, levels and ground level areas of debris and excess Products.

3.11 PROTECTION

.1 Adequately protect Products and work from damage by weather, traffic and other causes.

.2 At the end of each Working Day, seal exposed edges of roofing membrane to be watertight.

.3 Protect adjacent Work from damage. Repair damage.

END OF SECTION

1 General

1.1 SUMMARY

.1 Provide all labour, materials, equipment and services necessary for the complete and proper installation of all sprayed fire protection and related work as shown on the drawings or where specified herein, and in accordance with all applicable requirements of the Contract Documents, and having a fire resistance rating of the following:

.1 One hour, unless otherwise indicated as two hours on the Drawings.

.2 Work of this Section includes, but is not limited to the following:

.1 Application of applied fireproofing to prepared acceptable substrate, complete with approved fireproofing sealer, and;

.2 Work required to patch, repair and make good after installation of adjacent materials that may cause damage to completed work of this Section.

.3 The material and installation shall conform to the applicable building code requirements of all authorities having jurisdiction.

.4 Structural steel elements that are protected by masonry, concrete, or a rated gypsum board assemblies do not require protection using materials specified in this Section provided that the applied fireproofing system meets required fire resistance ratings for the application, as determined from the latest edition of the local Building Code.

1.2 REFERENCE STANDARDS

.1 The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.

.2 All reference amendments adopted prior to the bid closing date of this Project shall be applicable to this Project.

.3 All materials, installation and workmanship shall comply with all applicable requirements and standards.

.4 Applicable Standards:

.1 American Society for Testing of Materials (ASTM):

.1 ASTM C423, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

.2 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

.3 ASTM E119 Standard Method for Fire Tests of Building Construction and Materials.

.4 ASTM E136, Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C.

.5 ASTM E605/E605M, Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members.

.6 ASTM E736/E736M, Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.

.7 ASTM E759/E759M, Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.

.8 ASTM E760/E760M, Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members.

.9 ASTM E761/E761M, Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members.

.10 ASTM E859/E859M, Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members.

.11 ASTM E937/E937M, Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members.

.2 National Fire Protection Association (NFPA):

.1 NFPA 251, Standard Methods of Fire Tests of Building Construction and Materials.

.3 Underwriters Laboratories of Canada (ULC):

.1 CAN/ULC S101, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.2 CAN/ULC S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.3 CAN/ULC S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials.

.4 ULC List of Equipment and Materials.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Construction Conference: Arrange a site meeting, to coincide with regular bi-weekly site meetings, attended by the Contractor, Subcontractor(s), Consultant, Supplier(s), and other relevant personal before commencement of Work for this Section.

.2 Coordinate installation of the following, prior to installation of applied fireproofing identified in this Section:

.1 Hangers, inserts, clips and similar items to surfaces needing protection;

.2 Ducts, pipes, conduits and similar items that could obstruct spraying operations.

.3 Coordinate patching of fireproofing after installation of materials installed subsequent to installation of fireproofing.

.4 Delegated Design:

.1 When required to identify design intent, provide engineered judgements and certification for work performed by this Section in accordance with requirements of Authority Having Jurisdiction.

1.4 SUBMITTALS

.1 Provide required information in accordance with Division 01.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data: Submit product data including certified copies of test reports verifying fire resistant material applied to substrate as constructed on project will meet or exceed requirements of specification.

.2 Installation Schedule: Submit schedule listing surfaces to which fire resistant material is to be applied indicating minimum thickness required a minimum of two (2) weeks prior to scheduled application of applied fireproofing material.

.3 Informational Submittals: Provide the following submittals when requested by the Consultant:

.1 Certificates: Submit test results in accordance with CAN/ULC S101 for fire endurance and CAN/ULC S102 for surface burning characteristics.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: Use materials and methods required to achieve fire resistance ratings required for the Project to the satisfaction of the Authority Having Jurisdiction, latest edition of the local Building Code and in accordance with referenced standards.

.2 Qualifications: Provide proof of qualifications when requested by Consultant:

.1 Applicator: Use applicators that are licensed or approved by manufacturer of fire resistant material.

.2 Materials: Use materials produced under label service of an agency that has tested material, or assemblies containing material, in accordance with specified test standards.

.3 Air Quality: Provide ventilation in areas receiving fire resistant material during and twenty-four (24) hours after application to dry material; maintain non-toxic, unpolluted working area; provide temporary enclosure to prevent spray from contaminating air.

.3 Certifications: Provide the following during the course of the Work:

.1 Provide compliance certification from manufacturer indicating tested performance requirements required by Authorities Having Jurisdiction.

1.6 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Delivery and Acceptance Requirements:

.1 Deliver in original undamaged sealed containers with manufacturer's labels, application instructions, and labelling agency's labels intact.

.2 Storage and Handling Requirements:

.1 Store materials in dry protected area, raised off ground and away from damp surfaces and conditions that have deleterious effect on materials.

.2 Keep materials dry until ready for use.

.3 Discard material that has been exposed to water before actual use, and use stock before its expiration date.

.3 Protection:

.1 Restrict traffic by other trades during installation.

.2 Provide adequate protection of completed Work of this Section, to prevent damage by other trades.

1.7 SITE CONDITIONS

.1 When the prevailing outdoor temperature at the building is less than 4°C (40°F), a minimum substrate and ambient temperature of 4°C (40°F) shall be maintained prior to, during, and a minimum of twenty-four (24) hours after application of spray-applied fire resistive material.

.2 If necessary for job progress, provide enclosures and heat to maintain proper temperatures and humidity levels.

.3 Provide ventilation to allow proper drying of the sprayed fire protection during and subsequent to its application.

.1 Ventilation must not be less than four (4) complete air exchanges per hour until the material is dry. When spraying in enclosed areas such as basements, stairwells, shafts, and small rooms, additional air exchanges may be necessary.

1.8 SEQUENCING AND SCHEDULING

.1 Complete all fire protection work on a single area prior to proceeding to the next area.

.2 Cooperate in the coordination and scheduling of fire protection work to avoid delays in job progress.

2 Products

2.1 MANUFACTURERS

.1 Basis-of-Design products are named in this Section; additional manufacturers offering similar spray-applied fire resistive materials (SFRM) may be incorporated into the work provided they meet the performance requirements established by the named products.

.2 Acceptable Materials Manufacturers: Subject to compliance with requirements specified in this Section and as established by the Basis-of-Design Materials, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:

.1 Isolatek International Inc., Cafco Industries Limited

.2 Carboline Company, A/D Fire Protection Systems Inc.

.3 Grace Construction Products

2.2 DESIGN CHARACTERISTICS

.1 Adhesion: Provide materials that meet or exceed adhesion requirements in accordance with ASTM E736.

.2 Thickness and Weight: Determine application thickness and weight of fireproofing based on tests of assemblies in accordance with CAN/ULC S101, ASTM E119 or NFPA 251; apply same thickness of fireproofing material to all structural components forming a part of the assembly including; but not limited to, cross bracing, support angles and hangers.

.3 Spray-applied fire resistive materials shall contain no detectable asbestos. Material manufacturer shall provide certification of such upon request.

.4 Defection: When tested in accordance with ASTM E759, the material shall not crack or delaminate when the non-concrete topped galvanized deck to which it is applied is subjected to a one time vertical centerload resulting in a downward defection of 1/120th of the span.

.5 Bond Impact: When tested in accordance with ASTM E760, the material shall not crack or delaminate from the concrete topped galvanized deck to which it is applied.

.6 Density: When tested in accordance with ASTM E605, the material shall meet the minimum individual and average density values as listed in the appropriate UL / ULC design or as required by the authority having jurisdiction.

.7 Air Erosion: When tested in accordance with ASTM E859, the material shall not be subject to losses from the finished application greater than 0.025 grams per sq. ft. (0.27 grams per square meter).

.8 Corrosion Resistance: When tested in accordance with ASTM E937, the material shall not promote corrosion of steel.

.9 Non-combustibility: When tested in accordance with CAN/ULC-S114, the material shall be non-combustible.

.10 Surface Burning Characteristics: When tested in accordance with CAN/ULC-S102, the material shall exhibit the following surface burning characteristics:

.1 Flame Spread: 0

.2 Smoke Developed: 0

.11 Engineered Judgements: When required, provide engineered judgment acceptable to Authority Having Jurisdiction where assembly being protected differs from the tested assembly used to determine thickness.

.1 Engineered Judgements are not required when a tested assembly, published by ULC or cUL, is identified for the application in question.

2.3 STANDARD/COMMERCIAL DENSITY APPLIED FIREPROOFING

.1 Gypsum Based, Standard/Commercial Density Spray-Applied Fire Resistive Material (SFRM):

.1 Durable, wet mix, commercial density spray-applied fire resistive material (SFRM) designed to provide fire protection to concealed floor and roof assemblies, steel beams, columns, joists and concrete assemblies in building construction projects.

.2 Material Characteristics:

.1 Density (ASTM E605): 15 pcf (240 kg/m^3).

.2 Cohesion/Adhesion (bond strength): When tested in accordance with ASTM E736, the material applied over uncoated or galvanized steel shall have an average bond strength of 150 psf (7.2 kPa).

.3 Compressive Strength: When tested in accordance with ASTM E761, the material shall not deform more than 10 percent when subjected to a crushing force of 1,440 psf (68.9 kPa).

.4 Acoustical Performance when tested to ASTM C423:

.1 25mm (1”) thickness (NRC): 0.50

.5 Thermal Performance: 0.30 BTU in/hr ft2°F @ 75°F (0.043 W/mK @ 24°C): R-1.85/inch.

.3 Basis of Design Material: CAFCO 300 / ISOLATEK Type 300 spray-applied fire resistive material by Isolatek International Inc., or approved equivalent.

2.4 APPLIED FIREPROOFING ACCESSORIES

.1 Water: Clean, fresh, suitable for domestic consumption, and free from such amounts of mineral or organic substance as would affect set of fire resistant material.

.2 Primer/Adhesive and Applied Fireproofing Sealer:

.1 Water based sealer, as recommended by applied fireproofing manufacturer, allowing installation of approved coloured surface coatings or spray foam insulation to applied fireproofing.

.2 Basis of Design Material: CAFCO® BOND-SEAL / ISOLATEK TYPE EBS by Isolatek International Inc.

3 Execution

3.1 EXAMINATION

.1 Verification of Conditions:

.1 Verify that environmental conditions and surfaces receiving fireproofing meet manufacturer's requirements before beginning installation products specified in this Section.

.2 All unsuitable substrates must be identified by the installer and made known to the General Contractor and corrected prior to application of the spray-applied fire resistive material.

.3 Installation of products will denote acceptance of site conditions.

3.2 PREPARATION

.1 Protection of Existing Conditions:

.1 Provide and maintain temporary enclosures to prevent spray from marring adjacent construction, close off and seal installed duct work to prevent contamination of air supply system.

.2 Provide and maintain masking, drop cloths and polyethylene coverings to protect surfaces exposed in final construction from over spray.

.2 Surface Preparation:

.1 All surfaces to receive spray-applied fire resistive material shall be free of oil, grease, loose mill scale, dirt, paints/primers or other foreign materials which would impair satisfactory bonding to the surface.

.2 Prime surfaces as required by manufacturer to achieve bond of fireproofing materials to substrates.

.3 Cleaning of surfaces to receive sprayed fire protection, shall be the responsibility of the General Contractor.

.3 Coordinate installation of the following materials and/or systems prior to the application of spray-applied fire resistive materials identified in this Section:

.1 Installation of clips, hangers, supports, sleeves and other attachments to the substrate;

.2 Installation of concrete work onto steel floor decks scheduled to receive spray-applied fire resistive materials on the underside of the deck;

.3 Installation of roofing materials is complete and mechanical units have been installed.

.1 Prohibit roof traffic in areas above application of spray-applied fire resistive materials.

.4 Coordinate installation of the following materials and/or systems after the application of spray-applied fire resistive materials identified in this Section:

.1 Installation of ducts, piping, conduit or other suspended equipment in the area where spray-applied fire resistive materials is scheduled to be installed.

3.3 APPLICATION

.1 Application of spray-applied fire resistive material shall not commence until certification has been received by the General Contractor that surfaces to receive sprayed fire protection have been inspected by the applicator and are acceptable to receive spray-applied fire resistive material.

.2 Provide masking, drop cloths or other suitable coverings to prevent overspray from coming in contact with surfaces not intended to be sprayed. Apply fireproofing in accordance with manufacturers written installation requirements and as required to obtain fire resistance ratings indicated for the Project.

.3 Apply fireproofing in coats not exceeding recommended by manufacturer for fire resistance ratings indicated for the Project.

.4 Mix each batch of material separately in accordance with manufacturer's instructions to achieve required density and thickness; do not re-temper material or use frozen, caked, or lumpy material. Apply fireproofing sealer as per the appropriate UL/ULC fire resistance design and manufacturer’s written recommendations.

3.4 SITE QUALITY CONTROL

.1 Site Testing and Inspections: Site testing and inspections will be performed in accordance with requirements specified in Division 01and as follows:

.1 Appoint third party inspection and testing agency to confirm that installation of fireproofing materials meets requirements of ASTM E605 and ASTM E736.

.2 One series of tests will be performed using both laboratory and site testing for each 1000 m^2 of floor area sprayed; patch and repair inspection locations after completion of cut tests. Testing Agency shall distribute test results to Consultant, Contractor and Subcontractor at completion of each floor.

.2 Non-Conforming Work: Repair deficiencies identified in test results; patch damage to fireproofing caused by other work of the Project before fireproofing is concealed; or if exposed, before substantial performance.

3.5 CLOSEOUT ACTIVITIES

.1 Patching and Repair:

.1 Perform all patching and repair of damaged spray-applied fire resistive material, under this Section, and paid for by the trade responsible for the damage.

.2 Repair damage to fire resistant material caused by installation of subsequent Work.

.2 Cleaning: Remove equipment and clean exposed wall and floor areas to remove deposits of sprayed fireproofing materials after completion of fireproofing work.

END OF SECTION

1 General

1.1 SUMMARY

.1 Supply and install the following miscellaneous specialties, including all associated supports, fasteners and accessories required to provide a complete installation:

.1 Vertical Sash Fume Hood

1.2 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Shop drawings:

.1 Indicate the following: Methods of anchoring, thickness and finishes of materials, relationship of work of other sections, including all required cutouts, and all other pertinent data and information.

.3 Maintenance data: Three copies of instructions covering cleaning, replacement and other relevant maintenance data.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Package or crate, and brace products to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.

1.4 ELECTRICAL CO-ORDINATION

.1 Electrical Requirements: Coordinate wiring requirements and power characteristics of work with building electrical system. Do wiring in strict conformity with requirements of the Electrical Code and Electrical Sections.

.1 Work by Electrical Sections: Supply and installation of disconnect switch/junction box and power to the disconnect switch/junction box.

.2 Work by This Section: Wiring and connection at and from disconnect switch/junction box to motors, starters, switches, controls, safety devices and other items requiring power.

.2 Employ licensed electrician to wire and interconnect all operational and safety components for the Work. Terminate wiring required for connection to control circuitry and power at NEMA enclosures. Ground all control wiring.

.3 Electrical Components, Devices, and Accessories: CSA certified and labelled.

2 Products

2.1 MATERIALS

.1 Provide reinforcing, fastenings, and anchorage required for building in.

.2 Insulate between dissimilar metals, and metal and incompatible materials to prevent electrolysis with bituminous paint or other approved means.

.3 Do not attach manufacturer's name or trademark, plates, imprints or labels to products unless approved by Consultant.

2.2 FABRICATION

.1 Verify site dimensions prior to fabrication. Fabricate work true to dimensions and square.

.2 Finished work shall be free from distortion and defects detrimental to appearance and performance.

2.3 MISCELLANEOUS SPECIALTIES

.1 Refer to drawings and schedules for items required but not specified herein.

2.4 VERTICAL SASH FUME HOOD

.1 Designed to meet laboratory Constant Air Volume (CAV) or Variable Air Volume (VAV) requirements.

.2 Description:

.1 Designed to mount on 762 mm (30”) deep countertop.

.2 Automatic compensating upper by-pass.

.3 Field-convertible to Restricted By-Pass for VAV use.

.4 Alower airfoil by-pass with electrical cord notches.

.5 UL/CSA approved fluorescent light fixture complete with bulbs.

.6 Two UL/CSA approved duplex receptacles for 120V service - one receptacle on each corner post.

.7 Both corner posts pre-punched to accept a maximum of 5 plumbing fittings per post.

.8 Removable interior access panel in each side wall and removable exterior side panels.

.9 Stainless steel cable suspension system.

.10 Fume hoods with type 316 stainless steel radiused corner interiors are manufactured with integral stainless steel wood core top.

.3 Basis of Design Material: Pro Bench Vertical Sash Fume Hoods by Mott Manufacturing, or approved equivalent.

3 Execution

3.1 EXAMINATION

.1 Examine substrate surfaces to receive the Work of this Section and ensure that work done as part of the Work of other Sections is complete and that there are no conditions which will adversely affect the performance of this Work.

.2 Do not proceed with work until unsatisfactory conditions have been corrected.

.3 Commencement of work implies acceptance of surfaces and conditions.

3.2 INSTALLATION

.1 Securely fasten work level and plumb in the locations shown on the drawings and as specified herein.

.2 Coordinate installation with the work of Sections providing adjacent construction as required.

.3 Execute electrical work by qualified electricians and in compliance with the Canadian Electrical Code and other requirements of authorities having jurisdiction.

3.3 ADJUSTMENT

.1 Upon completion of the work or when directed, remove all traces of protective coatings or paper.

.2 Test operation, adjust, lubricate and ensure that accessories are in perfect working order.

3.4 PROTECTION

.1 Promptly upon completion of work and following preliminary review by the Consultant, cover finished products and protect exposed corners and areas vulnerable to damage by persons or by the movement of materials, tools or equipment.

.2 Maintain protective coverings in good order until the Consultant instructs that they be removed.

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes requirements for the supply and installation of Solid Phenolic Compact (SPC) Laboratory Work Surfaces suitable for use on laboratory-grade casework and as shelving and backsplashes.

1.2 REFENECE STANDARDS

.1 ASTM International (ASTM):

.1 ASTM E84/UL 723 - Standard Test Method for Surface Burning Characteristics

1.3 SUBMITTALS

.1 Provide product information in accordance with Division 01.

.1 Product Data: Manufacturer's data sheets on each product to be used, including:

.1 Preparation instructions and recommendations.

.2 Storage and handling requirements and recommendations.

.3 Installation methods.

.2 Shop Drawings:

.1 Submit plan, section, elevation and perspective drawings necessary to describe and convey layout, profiles, and product components, including edge conditions, joints, fitting and fixture locations, anchorage, accessories, and finish colors.

.2 Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on Shop Drawings.

.3 Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

.3 Samples:

.1 Selection samples: For each finish product specified, submit complete set of color chips representing manufacturer's full range of standard colors.

.2 Verification samples: For each finish product specified, submit samples representing actual product color; supplied product color and gloss may vary slightly from supplied samples.

.4 Maintenance Data:

.1 Submit manufacturer’s care and maintenance data, including care, repair and cleaning instructions. Include in Project closeout documents.

.5 Quality Control Submittals:

.1 Test Reports: Certified test reports or recognized evaluation reports showing compliance with specified performance characteristics and physical properties.

1.4 QUALITY ASSURANCE

.1 Manufacturer Qualifications:

.1 Primary products furnished by single manufacturer with minimum 10 years documented experience in work of this Section.

.2 Products manufactured in ISO 9001 certified facility.

.3 Installer Qualifications: Minimum 5 years documented experience in work of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver components to project when areas are ready for installation.

.2 Storage and Handling Requirements:

.1 Store components indoors in heated conditions similar to the area of installation until ready for installation; handle materials to prevent damage to finished surfaces; provide protective coverings to prevent physical damage or staining following installation until just prior to Substantial Performance for the Project.

1.6 WARRANTY

.1 Manufacturer Warranty:

.1 Provide manufacturer's standard 10 year warranty against defects in materials and workmanship; including material and labour to repair or replace defective materials.

2 Products

2.1 MANUFACTURERS

.1 Basis-of-Design products are named in this Section; additional manufacturers offering similar setting systems may be incorporated into the work provided they meet the performance and aesthetic requirements established by the named products.

.2 Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

.1 Durcon Inc., or approved equivalent.

2.2 MATERIALS

.1 Solid Surfacing Sheet (SURF-1):

.1 Chemical Resistant SPC: Self-supporting flat panel based on thermosetting resins, homogeneously reinforced with cellulose fibers and manufactured under high pressure.

.2 Panels are comprised of a pigmented resin core with a decorative surface that is electron-beam cured.

.3 Thickness: 25mm (1”), unless otherwise indicated on the Drawings.

.4 Colour: Carbon Black, Matte Finish.

.5 Basis of Design: Durcon SPC Work Surfaces; Model: Carbon BlackCLAM-4x4-Y01-4 by Durcon Inc.

2.3 ACCESSORIES

.1 Joint Adhesive:

.1 Manufacturers recommended adhesive designed to create chemically bonded, inconspicuous, nonporous joints.

.2 Sealant:

.1 Mildew resistant, silicone sealant, as specified in Section 07 92 00.

.2 Colour: As selected by the Consultant from the manufacturer’s standard product line.

.3 Sink Mounting Hardware:

.1 Manufacturers recommended clips, inserts and fasteners for attachment of under mount sinks.

2.4 FABRICATION

.1 Fabricated tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 8.

.2 Solid Phenolic Compact Worksurfaces:

.1 Check each sheet at factory for required thickness.

.2 Maximum variation in thickness: Plus or minus 1.6mm (1/16”) from corner to corner.

.3 Warpage:

.1 Inspect tops for warpage prior to fabrication by placing on true flat surface.

.2 Maximum allowable warpage: 1.5mm (1/16”) in 900mm (36”) span.

.4 Shop fabricate in longest practical lengths.

.5 Bond joints with highly chemical resistant cement with properties and color similar to base material.

.6 Provide 3 mm (1/8”) drip groove at underside of exposed edges, set back 13 mm (1/2”) from face.

.7 Edge treatment: As indicated on the Drawings.

.8 Fabricate tops flat with 6mm (1/4”) raised epoxy resin marine edge, unless otherwise indicated on the Drawings.

.9 Corner treatment: Exposed corners shall be eased slightly for safety.

.10 Back and end splashes:

.1 Supplied loose for field installation.

.2 Same material and thickness as worksurfaces.

.3 100mm (4”) high unless otherwise indicated.

.4 Back and end splashes: Furnish loose end splashes where worksurfaces abut adjacent construction and locations indicated on Drawings.

.11 Joints:

.1 Maximum 2mm (1/8”), bonded with epoxy grout.

.2 Make joints between two benches level.

.3 Locate joints away from sinks and over or near supports.

2.5 MISCELLANEOUS MATERIALS

.1 Cleaner:

.1 Type recommended by manufacturer.

.2 Fasteners:

.1 Use fasteners provided by the work surface manufacturer.

.2 Self-threading screws are acceptable for permanent installations.

.3 Provide threaded metal inserts for applications requiring frequent disassembly such as light fixtures.

.4 Use threaded rods and bolts to suit application.

3 Execution

3.1 EXAMINATION

.1 Examine substrates, areas, and conditions where installations of solid phenolic composite materials occur, with installer present, for compliance with manufacturer’s requirements.

.2 Verify that substrates and conditions are satisfactory for installation and comply with requirements specified.

3.2 INSTALLATION

.1 Install work surface components plumb and level, in accordance with shop drawings and manufacturers written installation requirements.

.2 Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.

.3 Adhere under mount sinks to countertops using manufacturer's recommended adhesive and mounting hardware.

.4 Install backsplashes and end splashes as indicated on Drawings; adhere to countertops using manufacturer's standard colour matched silicone sealant.

.5 Coordinate plumbing connections and electrical requirements with affected Sections of work.

3.3 CLEANING AND PROTECTION

.1 Keep components and hands clean during installation; remove adhesives, sealants and other stains as work progresses; keep components clean until Substantial Performance for the Project.

.2 Repair or replace damaged work that cannot be repaired to match installed work at no additional cost to the Owner.

END OF SECTION

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC

55 Northland Rd.
Waterloo, ON N2V 1Y8

Tel: 519-725-3555
www.deiassociates.ca

March 24, 2025

Client: ABA Architects Inc.
101 Randall Drive, Unit B
Waterloo, ON N2V 1C5

RE: Glenview Park Secondary School
Elevator & Science Laboratory Renovation
Cambridge, ON

Job #: 24162

Attn: Anne Ceballo, Architectural Project Manager

ADDENDUM 02

MECHANICAL

Item 1

1.0 Reference Specification Section 20 02 41 'Mechanical Allowances'

.1 Revise Sentence 1.2.7.3.1 as follows:
"Storage of all VRF related equipment from December 2025 through July 2026, for loading/unloading, delivery to/from storage facility, insurance, etc."

Item 2

2.0 Reference Attached Issued Specification Section 22 06 33 'Heat Tracing for Plumbing & Drainage'

.1 Refer to attached Specification Section 22 06 33.

Item 3

3.0 Reference Attached Issued Specification Section 23 66 15 'Air-Source Variable Refrigerant Flow (VRF) System'

.1 Refer to attached Specification Section 23 66 15.

Item 4

4.0 Reference Attached Reissued Specification Section 25 40 11 'Building Control System'

.1 BAS schematic to be added to the end of Specification Section 25 40 11.

Item 5

5.0 Reference Drawing M1.1 and Attached Sketch ADD02-M01

.1 In 'Grille Schedule (Phase 1)', add type R3 grille as per attached sketch ADD02-M01.
.2 In 'Fan Schedule (Phase 1)', revise EF-7 as per attached sketch ADD02-M01.
.3 In 'Fan Schedule (Phase 1)', add EF-8 as per attached sketch ADD02-M01.
.4 In 'Air Cooled Condensing Unit Schedule', revise CU numbering to CU-3A1, CU-3A2, CU-3B1, and CU-3B2 respectively.
.5 In 'VVT Control Damper Schedule (Phase 1)', delete VVT-5.28 in its entirety.
.6 Delete 'Indoor Air Conditioning Unit Schedule (Phase 1)' in its entirety.
.7 Delete 'Condensing Unit Schedule (Phase 1)' in its entirety.
.8 In 'Semi-Custom Indoor Air Handling Unit Schedule (Phase 2)', add Haakon and Engineered Air as acceptable manufacturers.

.9 In 'Semi-Custom Indoor Air Handling Unit Schedule (Phase 2)', revise total cooling capacity to 504+/- MBH.

Item 6

6.0 Reference Attached Reissued Drawings M2.1 through M2.4

.1 Revise pneumatic to DDC upgrades as per attached reissued drawings M2.1, M2.2, M2.3, and M2.4.

Item 7

7.0 Reference Drawing M3.3

.1 In Elevator Machine Room, delete DS-3 an associated refrigerant piping, doghouse, and condensing unit in its entirety.

Item 8

8.0 Reference Drawing M4.1, M4.3 and Attached Sketches ADD02-M02 and ADD02-M03

.1 In Elevator Machine Room, provide exhaust fan and transfer as per attached sketch ADD02-M02.

.2 In Corridor leading to Woodworking N117, revise ductwork as per attached sketch ADD02-M03.

.3 In Chemistry Lab A212, delete acoustic lining from stainless steel exhaust ductwork serving the fume hood.

Item 9

9.0 Reference Drawing M5.1 and Attached Sketch ADD02-M04

.1 Delete CU-3 and associated refrigerant piping, and doghouse associated with DS-3.

.2 Revise location of CU-3A and CU-3B condensing units as per attached sketch ADD02-M04.

.3 Terminate heat-traced condensate drains from condensing units over existing roof drain as per attached sketch ADD02-M04.

Item 10

10.0 Reference Drawing M6.1, Attached Reissued Drawing M6.2, and Attached Sketch ADD02-M05

.1 Revise existing unit heater controls as per ADD02-M05.

.2 In 'Mechanical Room – Ventilation Demolition (Phase 2)' and 'Mechanical Room – Ventilation Renovation (Phase 2)' revise ductwork as per attached reissued drawing M6.2.

Item 11

11.0 Reference Drawings M7.1 and Attached Sketch ADD02-M06

.1 Add 'Brick Vent Detail' as per attached sketch ADD02-M06.

.2 Add 'Neutralizing Tank At Science Sink' detail as per attached sketch ADD02-M06. Provide unions at inlet and outlet of neutralizing tank as indicated.

ELECTRICAL

Item 1

1.0 Reference Attached Reissued Drawing E101

.1 Legend updated.

Item 2

2.0 Reference Attached Reissued Drawing E103

.1 EWS updated.

Item 3

3.0 Reference Attached Reissued Drawing E204

.1 Condensing Unit CU-3 deleted.

.2 20A rooftop receptacle deleted.

.3 Circuiting requirements revised for rooftop Exhaust Fan EF-7.

.4 Provide 208V 1PH power for additional heat tracing provided on piping between CU-3A2 and CU-3B2 units.

Item 4

4.0 Reference Attached Reissued Drawing E303

.1 Fire smoke dampers added in elevator wing. Refer to detail E/E303 for further details.

.2 AC Unit DS-3 deleted, along with interconnection requirement to rooftop Condensing Unit CU-3. Refer to detail E/E303 for further details.

.3 Exhaust Fan EF-8 added complete with reverse acting thermostat (to be supplied and installed by electrical contractor). Refer to detail E/E303 for further details.

Item 5

5.0 Reference Attached Reissued Drawing E401

.1 Minor updates made to distribution riser diagram. See drawing for details.

Item 6

6.0 Reference Attached Reissued Drawing E402

.1 Panel schedule 'Panel E' updated. Revised to 60 circuits.

.2 Panel schedule 'Panel MP' updated.

.3 Panel PS and Panel PV revised to 42 circuits.

Item 7

7.0 Reference Attached Reissued Drawing E501

.1 Minor updates made to fire alarm riser diagram and annunciator schedule. See drawing for details.

Steve Oatley
Lead Designer, Partner
24162 Addendum 02 (M&E-Various)(various reissued dwgs) Mar 24 25.docx
so/jb/smb

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 REFERENCES

.1 Heating cable must conform to CSA 22.2 No.130-03 (latest edition).

1.3 SUMMARY

.1 Section includes heat tracing for fire-suppression piping with self-regulating, parallel resistance.

1.4 SUBMITTALS

.1 Product Data: For each type of product.

.2 Include:

- .1 Heating cable data sheet.
- .2 Connection kits and accessories data sheet.
- .3 Controller data sheet.
- .4 Controller wiring diagram.

.3 Include rated capacities, operating characteristics, and furnished specialties and accessories.

.4 Schedule heating capacity, length of cable, and electrical power requirement for each electric heating cable required.

.5 Include heat loss calculations for each pipe including pipe and insulation characteristics, heat loss, and watts per foot supplied by the heating cable.

.6 Shop Drawings: For electric heating cable.

- .1 Include plans, elevations, and sections.
- .2 Include diagrams for power, signal, and control wiring.
- .3 Manufacturer to produce detailed design as described below.

.7 Minimum heat trace capacity shall be 8 watts per foot irrespective of heat loss calculation.

.8 Pipe Freeze Protection Detail Drawings: Project-specific Detail Drawings, including details showing:

- .1 Installation and positioning of all components.
- .2 Proper amounts of tracing for valves, pumps, flanges, fittings, instruments, etc.
- .3 Junction box layouts.

.9 Control Panel Drawings: Drawings for each control panel shall include the following:

- .1 Physical arrangement and detail drawings.

.2 Complete power and control wiring diagrams showing all internal wiring connections for electrical and instrument components in each control panel. All wires, terminals, and devices shall be numbered and tagged in accordance with system elementary diagrams.

.10 System Wiring Diagram: Project-specific drawings including:

.1 Interconnect of all major components.

.2 Assignment of circuiting.

.3 Connection of circuit wiring in terminal blocks.

.4 Connection of sensor wiring.

.5 Connection of external alarm wiring.

.11 Controller Setpoint Schedule showing the following:

.1 Circuit addresses.

.2 Circuit set points.

.12 Testing Instructions and Reporting Form: Provide documentation for use in preinstallation testing of heat-tracing system.

1.5 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: For electric heating cables to include in operation and maintenance manuals.

.2 Testing: Completed system test report.

1.6 QUALITY ASSURANCE

.1 Manufacturer Qualifications:

.1 ISO-09001 registered.

.2 Provide products consistent with UL 515A, CSA 22.2 No 130-16, and IEEE 515.1 requirements.

.2 Installer Qualifications:

.1 System Installer to have complete understanding of product and product literature from manufacturer or authorized representative prior to installation.

.2 Electrical connections to be performed by licensed electrician.

.3 Certification: System (Heating Cable and Connection Kits): c-UL-us Listed for freeze protection of standpipes, mains, and branch fire sprinkler piping.

1.7 DELIVERY, STORAGE, AND HANDLING

.1 Deliver products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying the following:

.1 Product and Manufacturer.

.2 Length/Quantity.

.3 Lot Number.

.4 Installation and operation Manual.

.5 Material Safety Data Sheet (MSDS).

.2 Store heating cable in clean, dry location with a temperature range of -18° to 60 C (0 to 140 F).

.3 Protect heating cable ends from moisture ingress until final termination of the heating cable is complete.

1.8 WARRANTY

.1 Manufacturer Limited Warranty: Manufacturer agrees to repair or replace heat tracing products listed below that fail in materials or workmanship within specified warranty period.

.2 Covered Products Include:

.1 Heating cables, connection kits, and accessories.

.2 Thermostats, controllers, panels, contactors, sensors, and accessories.

.3 Warranty Period: Two years from date of Ready for Takeover.

.4 Manufacturer's Extended Warranty: Provide Owner an extended product warranty for heat-tracing products for a period of 10 years from date of Ready for Takeover.

Part 2 Products

2.1 SYSTEM DESCRIPTION

.1 Complete pipe freeze protection system for insulated pipes exposed to the risk of freezing. System consists of a self-regulating heating cable, connection kits, accessories, and energy-efficient control and monitoring controller. The heating cable shall have a polyolefin jacket for aboveground fire sprinkler piping, including standpipes, mains, and branch fire sprinkler piping. The monitoring controller must be suitable for integration into the BAS.

2.2 PERFORMANCE REQUIREMENTS

.1 Manufacturer to design complete and functional heat-tracing system. Design must be signed and sealed by a professional engineer.

2.3 SELF-REGULATING, PARALLEL-RESISTANCE HEATING CABLES (TYPE-1)

.1 Basis of design product: Raychem or nVent XL-Trace.

.2 Comply with UL 515A, CSA 22.2 No 130-16, and IEEE 515.1 requirements.

.3 Heating Element: Pair of parallel No. 16 AWG, nickel-coated, stranded copper bus wires embedded in crosslinked conductive polymer core, which varies heat output in response to temperature along its length. Cable shall be capable of crossing over itself once without overheating.

.4 Electrical Insulating Jacket: Flame-retardant modified polyolefin.

.5 Ground Braid: Tinned-copper braid. Minimum 70 percent for ground path and mechanical ruggedness.

.6 Outer Jacket: Modified polyolefin with ultraviolet inhibitor**.** Outer jacket to be printed with cable model number, agency listings, batch number, and meter marks (for ease of installation within maximum circuit length).

.7 Maximum Operating Temperature (Power On): 68 C (154 F) for and **8 W/ft. (26 W/m)** or 12 W/ft was required to suit load.

.8 Maximum Exposure Temperature (Power Off): 85 C (185 F).

.9 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

.10 Capacities and Characteristics:

.1 Nominal Heat Output at 10 C (50 F): 8 W/ft. (26° W/m) minimum. Provide higher as required based on heat loss calculations.

.2 Piping Diameter: Refer to plans.

.3 Electrical Characteristics for Single-Circuit Connection:

.1 Volts: 208

.2 Phase: Single.

2.4 HEATING CABLE CONNECTION KITS

.1 Basis-of-Design Product: RAYCHEM; RayClic.

.2 Provide power connections, splices/tees, and end seal kits to properly connect and terminate heating cable circuit along specified length of piping.

.3 Install splices, tees, and crosses underneath pipe insulation with service loops installed to allow for future service of piping.

.4 Connection kits shall be rated NEMA 4X to prevent water ingress and corrosion. All components shall be UV stabilized and shall not require cutting into heating-cable core to expose bus wires.

.5 Certification: c-UL-us Listed

.6 Locate connection kits above grade for buried applications.

2.5 ACCESSORIES

.1 Cable Installation Accessories: Fiberglass tape, cable ties, connection kits, and end seals all furnished by manufacturer or as recommended in writing by manufacturer.

.2 Identification: Provide and install "Electric Heat Traced" labels on exterior of pipe insulation every 10 ft. (3m) on opposite sides of pipe, and on all splices, tees, crosses, and power connections for the entire length of heat traced piping.

.3 Thermal Pipe Insulation:

.1 Pipes to be thermally insulated in accordance with manufacturer's written requirements.

.2 Insulation shall be closed-cell in areas subject to freezing and have a flame/smoke spread rating of 25/50.

2.6 APPROVED MANUFACTURERS

.1 Approved manufacturers shall be:

.1 Chromalox
.2 Raychem
.3 3M
.4 Serge Baril
.5 Heron Cable Ind.
.6 Easy Heat (Emerson)

Part 3 Execution

3.1 INSTALLED LOCATIONS

.1 Install heat trace in all areas indicated on drawings and where subject to freezing. This includes, but is not limited to:

.1 Water piping exposed to freezing.
.2 Sanitary piping exposed to freezing.
.3 Sanitary trap exposed to freezing.
.4 Piping placed in an outside wall.

3.2 EXAMINATION

.1 Examine surfaces and substrates to receive electric heating cables for compliance with requirements for installation tolerances and other conditions affecting performance.

.1 Prior to installation of heating cable system, verify that all piping, to be heat traced has passed all hydrostatic/pressure test and is signed off by plumbing inspector.
.2 Ensure surfaces and pipes in contact with electric heating cables are free of burrs and sharp protrusions.

.2 Preinstallation Testing:

.1 Prior to installation of heating cable on piping, an insulation resistance test shall be performed by installing contractor to ensure integrity of heating cable as describe in installation and maintenance manual.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

.1 Protect all heating cable ends from moisture ingress until cable is terminated with end seals.

.1 Basis-of-Design Product: RAYCHEM; RayClic-E end seals.

3.4 INSTALLATION

.1 Install electric heating cable where indicated and in accordance with NFPA 70 and NFPA 13.

.2 All heat-tracing components including power connections, splices, tees, and crosses or end seal, must be installed above grade and protected from abuse or damage. In accordance with NEC and CEC, electrical connections are not permitted to be installed below grade.

.3 In the field, all heating cables shall be meggered with a minimum of 2,500 V dc for self-regulating cable. The following field megger readings shall be taken on each heating cable:

.1 Heating cable shall be meggered when received at Project site before installation.

.2 Heating cable shall be meggered after installation, but before insulation is installed.

.3 Heating cable shall be meggered after insulation is installed.

.4 Heating cable shall be meggered at final commissioning prior to being energized.

.5 Insulation resistance must exceed 1.000 megohms at 2,500 V dc.

.6 All results must meet manufacturer's specification.

.7 Test cables for electrical continuity during installation.

.8 Test insulation integrity before energizing.

.9 Test cables to verify rating and power input. Energize and measure voltage and current simultaneously.

.4 Install electric heating cables after piping has passed all hydrostatic pressure testing and before insulation is installed.

.5 Install electric heating cables in accordance with IEEE 515.1.

.6 Install insulation over piping with electric cables.

.7 Install warning tape on piping insulation where piping is equipped with electric heating cables.

.8 Set field-adjustable switches and circuit-breaker trip ranges.

.9 All heat trace cable shall be fastened to the steel pipes with plastic cable ties or fibreglass tape.

.10 The cable shall run the entire length of each pipe linearly.

.11 Power connection kits shall be installed in a weatherproof surface mounted junction box (suitable to house the connection kit) in the location shown on the drawings.

.12 Provide two runs of cable along the length of piping for all piping greater than or equal to 150 mm (6" diameter). Run cable along top and bottom of entire pipe length or as per manufacturer’s recommendations.

.13 Electrical division shall provide power to junction box adjacent to heat trace circuit power connection. All other wiring shall be by this contractor to the standards of the electrical division.

3.5 MONITOR AND CONTROL PANEL

.1 Install in accordance with manufacturer’s instructions.

.2 Locate panel as indicated and mount securely. Plumb, true and square, to adjoining surfaces.

.3 Mount panel at working height. Maintain 1m clearance in front of panel.

3.6 CONNECTIONS

.1 Ground equipment to the requirements of the Electrical Division.

.2 Connect wiring in accordance with the requirements of the Electrical Division.

.3 Connect heat-tracing controls to fire-alarm system in accordance with NFPA 13. Comply with requirements of the Electrical Division.

3.7 FIELD QUALITY CONTROL

.1 Manufacturer's Field Service: Initial start-up and field testing (commissioning) of system shall be performed by factory technician.

.1 System shall be commissioned in accordance with manufacturer's installation and operation manual.

.2 Field Visits to be scheduled at the following intervals:

.1 Preinstallation training.

.2 Final electrical insulation resistance (megger) testing of heating cable after insulation has been installed.

.3 Final commissioning including controller programming (if applicable).

.3 Technician to verify:

.1 Controller parameters are set to the application requirements.

.2 Controller alarm contacts are properly connected to the BMS, as applicable.

.4 Test cables for electrical continuity during installation.

.5 Test insulation integrity before energizing.

.6 Test cables to verify rating and power input. Energize and measure voltage and current simultaneously.

.2 Repeat tests for continuity, insulation resistance, and input power after applying thermal insulation on pipe-mounted cables.

.3 Cables will be considered defective if they do not pass tests and inspections in accordance with manufacturer's testing requirements.

.4 Prepare test and inspection reports.

3.8 PROTECTION

.1 Protect installed heating cables, including non-heating leads, from damage and moisture ingress during construction.

.2 Remove and replace damaged heat-tracing cables.

END OF SECTION

Part 1 General

1.1 CERTIFICATION

.1 System shall be HRAI certified.

.2 The units shall be listed by Electrical Laboratories (ETL) and bear the cETL label.

.3 All wiring shall be in accordance with the Electrical Code.

.4 The system will be produced in an ISO 9001 and ISO 14001 facility, which are standards set by the International Standard Organization (ISO). The system shall be factory tested for safety and function.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings and product data in accordance with Mechanical General Requirements Section.

.2 Indicate the following: complete specifications; wiring diagrams (showing all interconnections); weight; performance details.

.3 Provide data for inclusion in the Operating and Maintenance manuals in accordance with Mechanical General Requirements Section.

1.3 START UP

.1 The system must be installed by a contractor/dealer who was trained by the VRF manufacturer in their specific products. The bidders shall be required to submit training certification proof prior to commencing work. The mechanical contractor's installation price shall be based on the systems installation requirements. The mechanical contractor bids shall only be by those staff with complete knowledge of the VRF system requirements.

.2 The manufacturer shall provide a factory trained service technician to start-up each unit. Manufacturer shall provide instruction to the owners' personnel on proper unit operation and maintenance.

1.4 WARRANTY

.1 The warranty period shall commence on project substantial completion and shall continue for a period of two (2) years.

.2 The warranty period shall include for all labour and materials.

.3 The warranty period shall include for full diagnostics of the system in both heating demand seasons and cooling demand seasons.

Part 2 Products

2.1 SYSTEM TYPE

.1 Provide a heat recovery air source heat pump system with variable volume refrigerant flow (VRF) as indicated on the drawings and schedules.

.2 Indoor fan coils: as indicated on the drawings.

.3 Outdoor units: air source.

.4 Functions simultaneously in both heating and cooling mode at the same time.

.5 Heating: direct expansion.

.6 Cooling: direct expansion.

.7 System shall operate heating in low ambient condition as per schedule but not less than -30°C (-22°F).

.8 System shall support refrigerant run lengths as indicated on drawings but not less than 100 m (300 ft).

.9 System shall be supported by the manufacturer's electronic controls and thermostats.

.10 All components must be by the same manufacturers.

2.2 SYSTEM DESCRIPTION

.1 The system shall consist of multiple evaporators, piping, joints and headers, branch selector boxes, a refrigeration distribution system using PID control, and outdoor unit. The outdoor unit is a direct expansion (DX), air cooled, heat recovery, multi-zone air-conditioning system with variable speed inverter driven compressors. Indoor-air cooled fan coil units may have a total connected indoor evaporator capacity of up to 150% of the rated outdoor condensing unit capacity.

.2 System shall permit simultaneous heating and cooling of each indoor unit. Multiple indoor units connected to a single branch selector port shall operate in the same mode (heating or cooling), similar to a two-pipe heat pump system. Refer to the controls section of this specification for any central controller and/or mode switchover sequence that may be required.

2.3 REFRIGERANT PIPING

.1 Y style piping joints and headers provided by the manufacturer shall be used to ensure proper refrigerant balance and flow for optimum system capacity and performance.

.2 T style joints and/or joints provided by the installing contractor **shall not be acceptable**.

.3 Refer and comply to the refrigerant piping specifications herein specified. Also, include the special considerations for VRF refrigerant piping requirements referenced by the manufacturer's recommendations.-

.4 Continuously purge refrigerant lines with NITROGEN during all brazing operations.

.5 The entire refrigerant piping system shall be cleaned, vacuum tested, and certified before making final connections to manufacture's equipment.

.6 System shall be properly charged with refrigerant quantity as recommended by the manufacturer.

2.4 AIR HANDLING UNIT INTEGRATION

.1 DX COIL

.1 Certification - Acceptable refrigerant coils are to be certified in accordance with ARI Standard 410 and bear the ARI label. Coils exceeding the scope of the manufacturer's certification and/or the range of ARI's standard rating conditions will be considered provided the manufacturer is a current member of the ARI Air-Cooling and Air-Heating Coils certification programs and that the coils have been rated in accordance with ARI Standard 410. Manufacturer must be ISO 9002 certified.

.2 VRF systems, where indicated, are to be integrated with make-up air unit(s), utilizing a factory installed VRF DX coil, electronic expansion valves and appropriate controls. VRF manufacturer shall provide the DX coil(s), electronic expansion valves and controllers.

.3 Coils designed for use with Refrigerant R-410A. Fins shall have a minimum thickness of 0.0075" of aluminum plate construction with full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Tubes shall be mechanically expanded into the fins to provide a continuous primary-to-secondary compression bond over the entire finned length for maximum heat transfer rates. Bare copper tube shall not be visible between fins.

.4 Refrigerant coils shall be provided with round seamless 3/8" O.D. copper tubes on 1-1/2" centers, staggered in the direction of airflow. All joints shall be brazed.

.5 Sweat type copper suction connections located at the bottom of the suction headers for gravity oil drainage. Coils shall be uniformly circuited in a counterflow manner for interlaced face split capacity reduction. Pressure type liquid distributors used. Coils shall be tested with 315 pounds air pressure under warm water, and suitable for 250 psig working pressure.

.2 EXPANSION VALVE

.1 VRF system shall monitor and maintain the unit superheat (cooling mode) or subcooling (heating mode) using a computerized PID control. Internal unit components shall be factory wired and piped, and complete with electronic proportional expansion valve, flare connections, condensate drain pan, self-diagnostics, and auto-restart function.

.2 Expansion valve shall be the diaphragm and spring-loaded type with external equalizers, and bulb and capillary tubing. Valve shall be equipped with an external superheat adjustment along with a seal cap. Internal equalizers may be utilized where flowing refrigerant pressure drop between outlet of the valve and inlet to the evaporator coil is negligible and pressure drop across the evaporator is less than the pressure difference corresponding to 1°C (2°F) of saturated suction temperature at evaporator conditions. Pilot-operated valves shall have a characterized plug to provide required modulating control.

.3 Electronic expansion valves shall be brass body, needle valve with floating needle and machined seat, stepper motor drive and compatible with R410A and PVE oil.

.4 Electronic expansion valves shall have a temperature operation of -40°F to 300°F.

.5 Electronic expansion valves shall have a working pressure of 550 psig and should be able to handle up to 700psig

.6 The access port of the expansion valve must be on the valve body and not on the piping

.7 Electronic expansion valves shall be able to handle the flow without any pressure drop

.8 Electronic expansion valves shall be able to work with bi-directional flows.

2.5 AIR COOLED OUTDOOR UNIT

.1 The outdoor unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish. The unit shall be modular in design and shall allow for side-by-side installation with minimum spacing requirements.

.2 Units shall be factory assembled and pre-wired with all necessary electronic and refrigerant controls. The refrigeration circuit of the condensing unit shall consist of scroll compressors, motors and fans, condenser, electronic expansion valves, solenoid valves, 4-way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service ports and refrigerant regulator.

.3 The system shall automatically restart operation after a power failure and will not cause any settings to be lost, thus eliminating the need for reprogramming.

.4 The unit shall incorporate an auto-charging feature and a refrigerant charge check function.

.5 To ensure the liquid refrigerant does not flash when supplying to the various fan coil units, the circuit shall be provided with a sub-cooling feature.

.6 The inverter scroll compressors (semi-hermetic) shall be variable speed (PAM inverter) controlled which are capable of changing speed to follow the variations in total cooling and heating load as determined by the suction gas pressure as measured in the condensing unit. In addition, samplings of evaporator and condenser temperatures shall be made so that the high/low pressures detected are read every 20 seconds and calculated. With each reading, the compressor capacity shall be controlled to eliminate deviation from target value.

.7 Neodymium magnets shall be adopted in the rotor construction to yield a higher torque and efficiency in the compressor instead of the normal ferrite magnet type. At complete stop of the compressor, the neodymium magnets will position the rotor into the optimum position for a low torque start.

.8 The following safety devices shall be included in the condensing unit; high pressure switch, control circuit fuses, crankcase heaters, fusible plug, high pressure switch, overload relay, inverter overload protector, thermal protectors for compressors and motors, over current protection for the inverter and anti-recycling timers.

.9 Oil separators shall be standard with the equipment together with an intelligent oil management system. Oil recovery cycle shall be automatic occurring 2 hours after start of operation and then every 8 hours of operation.

.10 In the case of multiple condenser modules, conjoined operation hours of the compressors shall be balanced by means of the **Duty Cycling Function**, ensuring sequential starting of each module at each start/stop cycle, completion of oil return, completion of defrost or every 8 hours.

.11 The outdoor unit shall be capable of heating operation at -30°C (-22°F) dry bulb ambient temperature without additional low ambient controls. The system shall continue to provide heat to the indoor units in heating operation while in the defrost mode.

.12 The fan motor shall have inherent protection and permanently lubricated bearings. The motor shall be provided with a fan guard to prevent contact with moving parts. The condensing unit shall consist of one or more propeller type, direct-drive 350 and 750 W fan motors that have multiple speed operation via a DC (digitally commutating) inverter. Motors shall be capable of delivering design air at high external static pressures up to 0.32 in WG to accommodate field applied duct for indoor mounting of condensing units.

.13 Night setback control of the fan motor for low noise operation by way of automatically limiting the maximum speed shall be a standard feature.

.14 Units sized 8-12 ton shall contain a minimum of two (2) compressors, 14-20 ton units shall contain a minimum of 4 compressors. In the event of compressor failure the remaining compressors shall continue to operate and provide heating or cooling as required at a proportionally reduced capacity. The microprocessor and associated controls shall be designed to specifically address this condition.

.15 The heat exchanger on the condensing units shall be manufactured from Hi-X seamless copper tube with N-shape internal grooves mechanically bonded on to aluminum fins to an e-Pass Design. The fins are to be covered with an anti- corrosion acrylic resin and hydrophilic film type E1.

.16 Heat Recovery VRF (Cold Climate)

.1 The outdoor unit shall be capable of heating operation down to -30°C ambient temperature. Tested factory data on heating capacity and efficiency shall be available.

.2 Continuous heating shall be provided during defrost mode for multi-module systems.

.3 The outdoor unit shall be capable of cooling operation down to +23°F without any additional low ambient controls.

.4 The system shall have a factory standard technical cooling option to allow simultaneous heating and cooling down to -4°F. Manufacturers that cannot guarantee simultaneous heating and cooling down to -4°F, even when the system is cooling-dominant, shall provide separate systems for zones requiring year-round cooling.

.17 Accessories:

.1 Wind Shield

2.6 BRANCH SELECTOR BOX

.1 Selector box cabinets shall have a galvanized steel plate casing and shall house multiple electronic expansion valves and a sub-cooling loop. The unit shall contain sound absorption thermal insulating material made of flame and heat resistant foamed polyethylene.

.2 Branch selector boxes shall not require drain pan and drain connections. Manufacturers with branch selector boxes requiring secondary drain pans and drain connections shall coordinate with the installing contractor at no extra cost to the owner.

.3 Manufacturers with branch selector box sizes, arrangements, or locations that differ from what is specified shall make the necessary arrangements to ensure their alternative branch selector boxes both fit in the space and that ASHRAE 15 compliance is still met.

.4 Manufacturers shall provide sound data for all branch selector boxes. If sound data is unavailable or exceeds the values below, or if branch boxes make use of solenoid valves instead of electronic expansion valves, necessary precautions shall be taken. Precautions shall include the supply and install of sound blankets, or the relocation of branch boxes away from the occupied spaces, or extra insulation to the ceilings and walls around the branch selector boxes, all at no extra cost to the owner.

2.7 CONTROLS

.1 Contractor to provide a complete control system. For control of all indoor terminal units and outdoor condensing units complete with individual zone controllers. Each indoor unit shall be capable of satisfying set temperatures via individual zone controllers and permit heating or cooling of each indoor unit.

.2 Control system to be complete with BACNet module to allow full integration with BAS system as described in Section 25 20 04.

.3 Indoor terminal units shall be equipped with individual zone controllers.

.4 Individual zone controllers shall be complete with and provide functionality as follows:

.1 The controller shall have dual or single Cool and Heat setpoints for occupied periods, and independent setback setpoints for unoccupied periods.

.2 The controller shall have individual button lockouts.

.3 The controller shall have a self-diagnosis function that constantly monitors the system for malfunctions (total of 80 components).

.4 An LCD digital display will allow the temperature to be set in 1°F units.

.5 The controller shall be equipped with a thermostat sensor.

.6 The controller shall have the ability to automatically changeover the mode of operation with dual or single setpoints.

.7 Controller shall have built-in 7 day, weekday plus Saturday Sunday (5+1+1), weekday plus weekend (5+2) and everyday (1) scheduler.

.8 Controller shall have a simple display mode, displaying only the operation mode, the setpoint(s), and the room temperature.

.5 All horizontal fan coils shall be provided with a field installed adaptor board for control of auxiliary heat. Adapter shall have dry contacts for field connection of a remote 24VAC control relay, or of a 24VAC hot water valve (1A max allowable current). Install of adaptor boards, wiring of components, supply and install of relays, 24VAC source and/or transformer shall be by installing contractor.

.1 The adaptor boards shall be installed to operate in one of the following sequences:

.1 Simultaneous: when the fan coil is in heating mode, the adaptor board closes a set of dry contacts to engage auxiliary heat. The fan coil remains in heating mode.

.2 Second Stage: when the fan coil is in heating mode, and if the space temperature falls 3.5°C (adjustable, for most fan coils, to certain presets) below the heating set point, the adaptor board closes a set of dry contacts to engage auxiliary heat. The fan coil remains in heating mode.

.3 Dual Fuel Optimization: the Second Stage sequence is used until the outside air temperature drops below a certain value (adjustable at the outdoor unit). Below this value, heat pump heating is disabled, and the adaptor board engages and controls auxiliary heat with a 1°F deadband. The transition temperature allows for optimization of operating costs.

2.8 ELECTRICAL

.1 The power supply to the cassettes, fan coil units and/or condensing units will be by the electrical contractor as per the equipment wiring schedule.

.2 Electrical power for coils and branch selector boxes (where specified) shall be: as indicated on the drawings. The unit shall be capable of operation within the limits of 187 volts to 253 volts. The minimum circuit amps (MCA) shall be 0.1 and the maximum fuse amps (MFA) shall be 15.

~~.3~~ Electrical power for condensing units shall as indicated on the drawings.

.4 The control voltage between the indoor and outdoor unit shall be 16VDC non-shielded 2 conductor cable.

.5 The control wiring shall be a two-wire multiplex transmission system, making it possible to connect multiple indoor units to one outdoor unit with one 2-cable wire, thus simplifying the wiring operation.

.6 Control wiring shall be installed in a daisy chain configuration from indoor unit to indoor unit then to the branch selector box and outdoor unit. Control wiring shall run from the indoor unit terminal block to the specific controller for that unit.

2.9 ACCEPTABLE MAUFACTURERS

.1 Daikin

.2 Mitsubishi

.3 LG

Part 3 Execution

3.1 INSTALLATION

.1 Install the entire system as per manufacturer's recommendations.

.2 Install fan coil units on a flat surface level within 1/8 inch. Provide intermediate supports as recommended by the equipment manufacturer.

.3 Install outdoor units on structural metal stands fastened to the roof structure. Fasten units to the structural stand and with neoprene isolation.

.4 For ceiling hung installations, provide a reinforced steel framework to adequately support all unit sections.

.5 Provide certified wiring schematics to the site for associated power wiring methods and control wiring methods.

.6 Provide all necessary control-wiring to make the system operable.

3.2 REFRIGERANT PIPING

.1 Refer to refrigerant piping specification section for materials and methods of installation.

.2 Purge all refrigerant piping during brazing operation with Nitrogen.

.3 Contact distributer or manufacturer's representative to review and confirm piping sizing, piping layout and lengths prior to installation.

.4 Use refrigeration best practice to allow pipes to expand and contract freely. Review manufacturer installation instructions to ensure expansion joints are properly designed.

.5 Pressure test ALL systems to 550 PSI after system was vacuumed and held to below 500 microns for at least two hours. Review manufacturer installation instructions for proper pressure test procedures.

.6 Support refrigerant piping using a Unistrut modular support system or equal.

3.3 REFRIGERANT PIPING INSULATION

.1 Refer to insulation section for methods and types.

.2 High/low pressure gas line, liquid and suction lines must be individually insulated between the outdoor and indoor units.

.3 All outdoor refrigerant piping shall be re-covered in aluminium jacket to protect insulation from UV light.

3.4 TESTING

.1 Test system under full load during summer and winter seasons. Submit test results to Owner and Consultant. Two (2) heating and two (2) cooling with the two (2) year warranty.

.2 Provide testing of all drain pans and condensate pumps to ensure positive drainage. Repair same as required. Provided written confirmation that all condensate drain pans and pump systems are draining to manufacturer's requirements.

3.5 START UP

.1 Ensure system has been leak tested and holds the refrigerant charge.

.2 Ensure proper refrigerant charge installed into the system as per manufacturer's recommendations.

.3 Confirm all electrical and control wiring is done properly.

.4 Start units in the presence of the manufacturer.

.5 Correct any errors or omissions found.

.6 Submit satisfactory operating start up reports to the Owner, Consultant, and in the maintenance manuals.

END OF SECTION

PART 1 General

1.1 GENERAL REQUIREMENTS

.1 Conform to General Conditions for Mechanical Trades.

.2 Related Work Specified Elsewhere.
- .1 General Conditions for Mechanical Trades
- .2 Plumbing & Drainage
- .3 Heating, Ventilation & Air Conditioning
- .4 Heating, Ventilation & Air Conditioning Equipment
- .5 Electrical

1.2 DESCRIPTION OF SYSTEM

.1 Furnish and install all components, devices and control wiring for a fully integrated Energy Management and Environmental Control System incorporating Direct Digital Control (DDC), and equipment monitoring. The system shall control/monitor HVAC and plumbing equipment and systems as specified in this section. The work shall include but is not limited to the following:
- .1 All necessary hardware, software, control panels, control wiring, field devices, installation, documentation, and owner training as specified.
- .2 The installed system shall incorporate electronic and digital control devices to perform the control sequences and monitoring outlined herein. Specific control sequence requirements are as detailed elsewhere in this Section of the specification.
- .3 Control and monitoring of the equipment and systems shown on the drawings (refer also to 'Sequence of Operation' for additional details).
- .4 Control valves shall be supplied by this Trade but installed in the piping system by the Mechanical Trade complete with transitions and unions as required.
- .5 Testing, debugging, calibrating, adjustment, programming, and confirmation of total system operation.

1.3 MANUFACTURER AND INSTALLING CONTRACTOR

.1 The temperature control/programmable device manufacturer shall be Distech, integrated to the WRDSB TAC Vista server/BAS system automation.

.2 Energy Controls, the local Distech integrator is available at phone 519-893-2638.

.3 Any new building must be a seamless extension of the current Energy Management and Building Control System.
- .1 The existing TAC Vista software is, and shall continue to be, the only head-end BAS server for the entire School Board.
- .2 The head-end server contains the secure Energy Management Settings (i.e. Master Setpoints & Schedules) that are sent to all schools in real-time. The control system must be an extension of the head-end server and be able to be managed exclusively through the Vista head-end server.

.3 Monitoring of all school board control systems are done in real-time and must be presented at the exclusive Vista head-end server as first-priority data.

.4 The Vista head-end server has all the required controller databases and software to be able to centrally maintain and modify network configuration and controller software for the entire School Board. The Vista head-end server is the only system that can access the LacNet programming variables inside the controllers for real-time configuration of setpoint and time scheduling parameters.

.5 The graphics and controller database must be presented inside the Vista head-end server in its native format in order to preserve the real-time speed, integrity and multi-site administration of the entire system.

1.4 SCOPE OF WORK

.1 Refer to drawings and specification for complete scope.
.2 New indoor AHU with DX heating & cooling connected to remote rooftop VRF air source heat pump with backup hydronic hot water coil connected to existing hydronic loop.
.3 Removal of existing pneumatic and/or electric thermostats and TCV's with new DDC thermostats and TCV's in renovation spaces.
.4 Remove any redundant or obsolete pneumatic tubing in the area of construction.
.5 Upgrade existing controls in the area of construction.
.6 New intake/exhaust louver motorized dampers/actuators.
.7 New fume hood control.
.8 Heat loss alarm.
.9 Thermostat rough-in by Electrical Contractor.
.0 Ventilation lockout.
.11 Minimum outside air schedule.
.12 CO2 controls
.13 Mechanical cooling 24.5degC (+/- 1degC).
.14 New VVT damper control.
.15 Trending.
.16 Summary page in graphics (fan status, MAT, SAT, CO2, Schedule).
.17 Revision summary control drawings.
.18 Controller locations shown on graphics.
.19 Standby schedule for all systems.
.20 Global humidity used on economizers.

QUALITY ASSURANCE

.1 The system components shall be listed by Underwriters Laboratories Inc. and Canadian Standards Association.

.2 The system control products shall be stored and handled according to manufacturer' recommendations.

.3 The work shall be performed by skilled technicians all of whom shall be properly trained and qualified for this work.

1.6 SUBMITTALS

.1 Prior to the installation of any equipment, the Contractor shall provide the Consultant with shop drawings and specifications for all devices and equipment used for the complete system installation. Shop drawings shall include the following:

.1 Identified schematic control diagrams for all systems, each diagram indicating or referencing input / output connection points, control components, component catalogue numbers, operation sequence, interlocking and RPU's to which they are connected.

.2 Complete network schematic indicating all programmable controllers and data connections.

.3 Detailed listing of inputs and outputs of each programmable controller.

.4 Control damper schedule indicating damper size, required torque and blade type.

.5 Technical data sheets / manufacturer application manuals of each system component.

.2 Upon completion of the installation and prior to acceptance and Owner training, the Contractor shall furnish the Consultant with three copies of installation and operation manuals for the system. Each manual shall include:

.1 Record drawings, including plan layout indicating major device locations and wiring diagrams as finally installed.

.2 All shop drawings, incorporating all required revisions to reflect as-built conditions.

.3 The Contractor shall also keep one copy of backup programs for the system archived in a software storage vault at their business location.

Part 2 Products

2.1 GENERAL

.1 The control system shall be a Tour Andover (TAC) Xenta/Distech building automation system (BAS).

.2 The system shall integrate the operation of intelligent building management controllers distributed into the network.

.3 The DDC System shall be generally comprised of the following devices to achieve the control functions described in this section:

.1 Xenta/Distech programmable controllers

.2 Distech input/ output programmable I/O modules.

.3 Control relays.

.4 Control dampers and valves.

.5 Sensors, actuators and other input/output devices.

.4 Controllers shall execute the application programs, calculations, and commands to provide the control function specified for that unit. Each controller shall include its own micro-computer controller, power supply, input/output modules, termination modules and real time clock.

.5 Controllers shall be capable of full control functionality and alarm reporting independently or as a part of the DDC network.

.6 The system shall be stored in flash ram so no batteries are required.

.7 Each control device shall be modular and expandable to provide additional inputs and outputs and control functionality for that device.

.8 Each controller shall be able to transfer and receive data via the network for performance of control functions.

.9 The system shall be modular, permitting expansion by adding hardware and software without changes in communication or processing equipment.

.10 The complete system shall be capable of communication over a LonWorks network.

.11 The controllers shall monitor the status of all overrides and include this information in logs and summaries to inform the operator that automatic control has been inhibited.

.12 Controllers shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all subsidiary equipment and provide both local and remote annunciation of any component failures.

.13 Controllers shall activate an orderly shutdown of their operation in the event of loss of normal electrical power. Non-volatile memory shall be incorporated for all controller configuration data. The controllers shall automatically resume full operation without manual intervention.

.14 The controllers shall have sufficient memory to support their own operating system and data bases including:

- .1 control processes
- .2 energy management applications
- .3 alarm management
- .4 trend data
- .5 operator input/output
- .6 remote communications
- .7 manual override monitoring

.15 Controllers shall incorporate the following software features:

- .1 Energy management:
  - .1 Time of Day Scheduling
  - .2 Calendar Based Scheduling
  - .3 Holiday Scheduling

.4 Optimal Start and Stop
.5 Demand Limiting
.6 Heating/Cooling Interlock

.2 Alarm Management:
.1 Alarm Management shall be provided to monitor, buffer and direct alarm reports to operator devices and memory files. The controllers shall perform alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, minimize network traffic and prevent alarms from being lost.
.2 All alarm or point change report shall include the points English language description and the time and date of occurrence.
.3 The user shall be able to define the specific reaction for each point, the priority level (3 in total) and ability to inhibit alarm reporting for each point.
.4 The user shall be able to define conditions under which point changes need to be acknowledged by an operator and logged for analysis at a later date.
.5 The user shall be able to print, display or store a unique 60 character alarm message to more fully describe the alarm condition or direct operator response. The message shall be customizable to describe each individual alarm.
.6 In web access applications only critical alarms shall initiate a call to a remote operator device, otherwise call activity shall be minimized by time stamping and saving reports until a manual request is received or until the buffer space (minimum 50 alarms) is full.

.3 Trend Logs:
.1 Controllers shall provide an automatic roll-over trend log, which stores records up to an operator-selected number at an operator-selected sampling rate and then overwrites the oldest record with each new record.
.2 Sample intervals shall be from one (1) minute to 24 hours.
.3 Provide graphical and tabular displays.

.4 Runtime Totalization:
.1 The controllers shall automatically accumulate and store runtime hours for binary points with a sampling resolution of 1 minute. The user shall have the ability to define a warning limit to trigger maintenance or user-defined messages.

.5 Custom Programming:
.1 The controllers shall permit user defined custom control processes based on:
.1 any system measured data or status
.2 any calculated data
.3 any results from other processes
.4 Boolean logic
.2 The custom processes may be triggered by:
.1 Time-of-day
.2 calendar date
.3 events (point alarm etc.)

.16 The control strategy for each control loop shall be performed by software within the controller. The sequence of events required for each control loop is described for each system in the control sequence.

.17 Outdoor air temperature indication shall be available at each controller as an integral part of the control strategies for that controller. Should the network transmission of the common outdoor air temperature (or any other common value) fail, then each controller shall use the last good value received.

.18 Controls and Requirements for VVT Systems

.1 Where VVT controls are specified, units are to operate as part of a Variable Volume/Variable Temperature System complete with all necessary controls including zone dampers, temperature sensors, static pressure sensor probes and bypass damper.

2.2 NETWORK ARCHITECTURE

.1 The controllers on the local network shall communicate via a two (2) wire LonTalk TP/FT-10 network.

2.3 CONTROL PANELS

.1 Control panels shall be fully enclosed cabinets with all steel construction. Cabinets shall have a hinged door with locking latch or bolt-on cover plate. All cabinet locks shall be common keyed. Cabinets shall be finished with two coats of paint.

2.4 TEMPERATURE SENSORS

.1 Provide thermistor temperature sensors, not requiring transmitters, to measure temperature.

.2 Accuracy shall be +/-0.2°C from 0 to 70°C.

.3 Temperature sensors shall be Greystone EC200 series.

.4 Space sensors in occupied areas shall be type AE or equal having an integral push button for unoccupied override and an integral slider to adjust set point (LED display not required).

.5 In corridors and where noted on the drawings, provide stainless steel plate type sensors (push button override and LED display not required), type AS.

.6 Duct temperature sensors shall be type B having a stainless steel probe length to suit application and ABS enclosure. Duct averaging temperature sensors shall be type FD having an element length to suit application, copper probe and ABS enclosure.

.7 Immersion temperature sensors shall be type C having a ¼" OD stainless steel probe, 4" long and ABS enclosure. Immersion sensors shall be complete with thermowells. Thermal conductive compound shall be added inside the thermowell to provide optimum thermal transfer from the fluid to sensor. Stainless steel thermowells shall be used for steel pipe and brass thermowells shall be used in copper pipe.

2.5 CARBON DIOXIDE SENSORS

.1 Sensors shall Greystone CDD series or equal having the following features:
- .1 0-2000 ppm factory default detection range, field adjustable.
- .2 Non-dispersive infrared sensing element with self-calibration algorithm.
- .3 Guaranteed 5 year calibration interval.
- .4 Powered by either AC or DC source.
- .5 Accuracy: within 50 ppm or 3% of reading (whichever is greater).
- .6 Operating humidity range: 0-95% RH.
- .7 Operating temperature range: 0 to 50°C or greater.
- .8 Stability: less than 2% full scale in 15 years
- .9 Response time: less than 2 minutes for 90% step change.

.2 Duct mounted sensors shall be complete with ABS enclosure complete with sampling tube.

.3 Space mounted sensors shall be executive space type without LCD display.

2.6 MOTORIZED CONTROL DAMPERS (PROVIDED BY BAS, INSTALLED BY MECH.)

.1 Control dampers shall be the parallel or opposed blade type as below or as scheduled on drawings.
- .1 Outdoor and/or return air mixing dampers and face and bypass (F & BP) dampers shall be parallel blade, arranged to direct air-streams toward each other.
- .2 Other modulating dampers shall be the opposed blade type.
- .3 Two-position shutoff dampers may be parallel or opposed blade type with blade and side seals.

.2 Damper frames shall be 13 gauge galvanized steel channel or 1/8 in. extruded aluminum with reinforced corner bracing.

.3 Damper blades shall not exceed 20 cm (8 in.) in width or 125 cm (48 in.) in length. Blades are to be suitable for medium velocity performance (10 m/s [2000 fpm]). Blades shall be not less than 16 gauge.

.4 Damper shaft bearings shall be as recommended by manufacturer for application, oil impregnated sintered bronze or better.

.5 All blade edges and top and bottom of the frame shall be provided with replaceable butyl rubber or neoprene seals. Side seals shall be spring-loaded stainless steel. The blade seals shall provide for a maximum leakage rate of 50 L/s m^2 (10 cfm per ft^2) at 1000 Pa (4 in. w.g.) differential pressure. Provide air foil blades suitable for a wide-open face velocity of 7.5 m/s (1500 fpm).

.6 Individual damper sections shall not be larger than 125 cm x 150 cm (48 in. x 60 in.). Provide a minimum of one damper actuator per section.

.7 Modulating dampers shall provide a linear flow characteristic where possible.

.8 Dampers shall have exposed linkages.

2.7 WATER CONTROL VALVES

.1 Heating and cooling control valves shall be Belimo CCV series characterized ball valves, complete with chrome plated brass trim and NPT female pipe connections. Radiation valves shall be complete with non-spring return modulating actuators. Control valves for coils heating a portion of outdoor air shall have spring return modulating actuators.

.2 Control valves shall be sized to provide approximately one half the circuit branch pressure drop to obtain good modulation control but they shall be no smaller than two pipe sizes less than the pipe they are installed in.

Part 3 Execution

3.1 INSTALLATION

.1 Installation

- .1 All controllers and components in the system and on the network shall be installed according to manufacturer recommendations, general installation standards for digital controls and in accordance with the approved shop drawings.
- .2 Locate room sensors in the locations shown on the mechanical drawings. All sensors shall be mounted at barrier free height (3'-11" (1175 mm) above finished floor).
- .3 All control components for off site system access shall be located where noted on the drawings. The Electrical Contractor shall provide all required connections / cabling for off site access to the web access components.
- .4 All programmable controllers, web access components, relays and other control components shall be located within control panels. Control Panels shall be wall mounted and shall be located within suspended ceiling spaces or other locations approved by the Consultant.
- .5 The Electrical Contractor will provide hand-off-auto switches in all starters controlled by the BAS.

.2 Generally duct mount carbon dioxide sensors shall be used where specified for air handling units; but, for gyms and single zone libraries, a wall mount carbon dioxide sensor shall be mounted next to the room temperature sensor.

.3 All carbon dioxide levels which are measured by the carbon dioxide sensors shall be made available to the Owner in the form of trend logs. Record readings at 10 minute intervals and keep them for at least 30 days.

.4 Freeze-stats shall be installed so that their sensing element runs horizontally across the coil face (not diagonally) with no more than 12" vertical drops at the outside coil frame. The full face of the coil shall be covered with no horizontal runs being more than 12" apart. The top and bottom horizontal run shall be within 6" of the coil frame. If more than one freezestat is required they shall be wired in series in order to detect a low temperature in portion of the coil. The sensing elements shall be firmly secured in place to avoid vibration without added air restriction.

3.2 SYSTEM START-UP AND ACCEPTANCE

.1 Upon completion of installation, test, adjust and calibrate controls provided under this Section.

.2 On system completion, a demonstration of complete system operation shall be made to the Owner's authorized representative and Consultant.

.3 The Consultant shall verify through the Owners representatives that the entire system is complete and operating to the satisfaction of the Owner before final acceptance is approved.

3.3 TRAINING

.1 The Contractor shall provide competent instructors to give full instruction to designated personnel in the adjustment, operation and maintenance of the system installed rather than a general training course. Instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. All training shall be held during normal work hours of 8:00 a.m. to 4:30 p.m. weekdays as follows:

.2 Provide 4 hours of training for Owner's operating personnel. Training shall include:
- .1 Explanation of drawings, operations, and maintenance manuals
- .2 Explanation of web access program
- .3 Explanation of adjustment procedures
- .4 Trend Analysis

3.4 WARRANTY

.1 Warranty Start Date:
- .1 Warranty period starts as of the date of Ready for Takeover.
- .2 Warranty start dates based on shipment date, start up date, substantial completion date, etc. are not applicable.

.2 Warranty Duration:
- .1 Warrant in writing, all provided equipment, accessories, installations, software and firmware against defects in workmanship and materials for a period of two (2) years commencing from the date of Ready for Takeover.
- .2 Maintain the affected parts operational during repair of defective equipment covered by the warranty.

.3 Provide warranty service at no cost to the owner for the guarantee period, this shall include, but not limited to the following:
- .1 Emergency repair service on regular working hour basis during warranty.
- .2 Replacing defective parts and components as required.
- .3 Servicing by factory trained and employed service representatives of system manufacture.
- .4 System software support.

.4 Supplier shall have an in-place support facility within 32 km (20 miles) of the site with technical staff, spare parts inventory and all necessary test and diagnostic equipment.

.3 Warranty Coverage:
Applies to parts and labour.

3.5 IDENTIFICATION

.1 Provide system identification and provide nameplates identifying the following (nameplates shall be keyed to the wiring diagrams):
- .1 Duct mounted sensors.
- .2 Control panels (identify as to equipment / systems controlled). Each panel shall include an as-built drawing showing all the connected control points.

3.6 TESTING AND BALANCING

.1 During the system testing and balancing by the Testing and Balancing Agency, demonstrate the operation of all controls. During balancing procedures, set controls to a fixed mode (bypass damper locked fully closed and all zone dampers locked fully open) to prevent any changes during the balancing procedure.

3.7 ELECTRICAL WIRING

.1 All wiring shall be installed to the standards specified in the Electrical Division.

.2 Use Echelon recommended jacket cable for all network wiring, colour-coded to WRDSB standards.

.3 Run all wiring in EMT conduit where exposed, where running within new concrete block walls and where required by the Ontario Electrical Code. Plenum rated cable shall be used in return air ceiling plenums.

.4 Control relays necessary for BAS operation shall be provided by the Temperature Control Contractor but all contactors and their power supplies handling power wiring to the equipment shall be by the Electrical Contractor.

Part 4 Sequence of Operation

4.1 GENERAL

.1 All setpoints shall be adjustable.

.2 Outdoor air temperature shall be broadcasted to all controllers.

.3 Heating mode: Heating is enabled between October 15 and April 15 or if the outdoor air temperature is below 10°C. This heating mode is used in all controllers for the building.

.4 Cooling Mode: Mechanical cooling is enabled if the outdoor air temperature is above 18°C.

.5 Occupancy mode shall be determined by a weekly schedule with an annual holiday schedule. Each system shall have this schedule but there shall be provision for operating under a general (to the building) schedule as well. An adjustable parameter shall be available to select the local or general schedule for each system.

.6 Lead/lag: Devices designed for lead lag operation shall operate in automatic lead/lag mode to equalize run time. If the lead unit fails the lag shall automatically start and an alarm shall be generated. The lead unit shall be advanced through the series of devices in sequence every Tuesday at noon.

.7 Guidance Office heating:
- First stage heat: perimeter radiation
- First stage heating through RTU: supply air discharge temperature set to 20degC (lock out on cooling)
  -heat provided from heatpump down to 5 deg C
  -below 5 deg C heat is provided by 2 stages of gas heat.

4.2 EQUIPMENT SERVICES

.1 See the graphical sequence of operations attached (for reference only) at the end of this specification for equipment and systems. Please note that this is not a complete representation of all equipment and systems. Controls contractor to review all drawings and specifications and provide complete controls and sequence.

END OF SECTION

Zone	Room	Size	Width (in)	Height (in)	Area (ft²)	Required Torque (in·lb)	Blade Type	Actuator	Rad	Notes
Z5.1	Classroom A215 & Fashion Art A217	400x350	16	14	1.56	10.9	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.2	Business A213	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		share temp [TS15]
Z5.3	Business A213	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		and CO2 [AQ1]
Z5.4	Biology Lab A211	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		share temp [TS15]
Z5.5	Biology Lab A211	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		and CO2 [AQ1]
Z5.6	Computers A209	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		share temp [TS15]
Z5.7	Computers A209	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		and CO2 [AQ1]
Z5.8	Department Head A207	175x150	7	6	0.29	2.0	Parallel	Belimo LMB24-SR-T		share temp [TS15]
Z5.9	Department Head A207	175x150	7	6	0.29	2.0	Parallel	Belimo LMB24-SR-T		and CO2 [AQ1]
Z5.10	Art & Marketing A205	400x300	16	12	1.33	9.3	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.11	Dark Room N200	300x200	12	8	0.67	4.7	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.12	Art A216 & Art A218	500x350	20	14	1.94	13.6	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.13	Chemistry Lab A212	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		share temp [TS15]
Z5.14	Chemistry Lab A212	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		and CO2 [AQ1]
Z5.15	Chemistry Lab A210	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		share temp [TS15]
Z5.16	Chemistry Lab A210	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		and CO2 [AQ1]
Z5.17	Prep Room A208	250x225	10	9	0.63	4.4	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.18	Biology A206	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		share temp [TS15]
Z5.19	Biology A206	350x200	14	8	0.78	5.5	Parallel	Belimo LMB24-SR-T		and CO2 [AQ1]
Z5.20	Prep Room A204	250x225	10	9	0.63	4.4	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.21	Physics A202	250x200	10	8	0.56	3.9	Parallel	Belimo LMB24-SR-T		share temp [TS15]
Z5.22	Physics A202	250x200	10	8	0.56	3.9	Parallel	Belimo LMB24-SR-T		and CO2 [AQ1]
Z5.23	Workroom A118	250x100	10	4	0.28	2.0	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.24	Tech Office A118A	250x100	10	4	0.28	2.0	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.25	Storage A114C	250x100	10	4	0.28	2.0	Parallel	Belimo LMB24-SR-T		slave zone [TS16]
Z5.26	Edit A118B	250x100	10	4	0.28	2.0	Parallel	Belimo LMB24-SR-T		single zone [TS15]
Z5.27	Storage A114A	250x100	10	4	0.28	2.0	Parallel	Belimo LMB24-SR-T		slave zone [TS16]
Z5.28	N116	300x250	12	10	0.83	5.8	Parallel	Belimo LMB24-SR-T		slave zone [TS16]
*condence zones that share stats and have two dampers to save space on controllers								Total Zones:		**20**
Z5.0A	HVAC-5 Bypass	900x300	35	12	2.92	20.4	Parallel	Belimo LMB24-SR-T		
Z5.0B	HVAC-5 Bypass	900x300	35	12	2.92	20.4	Parallel	Belimo LMB24-SR-T		
	Biology Lab A211	400x300	16	12	1.33	9.3	Parallel	Belimo LMB24-SR-T		interlock with EF-6
	Chemistry Lab A212	600x350	24	14	2.33	16.3	Parallel	Belimo LMB24-SR-T		interlock with EF-5/7

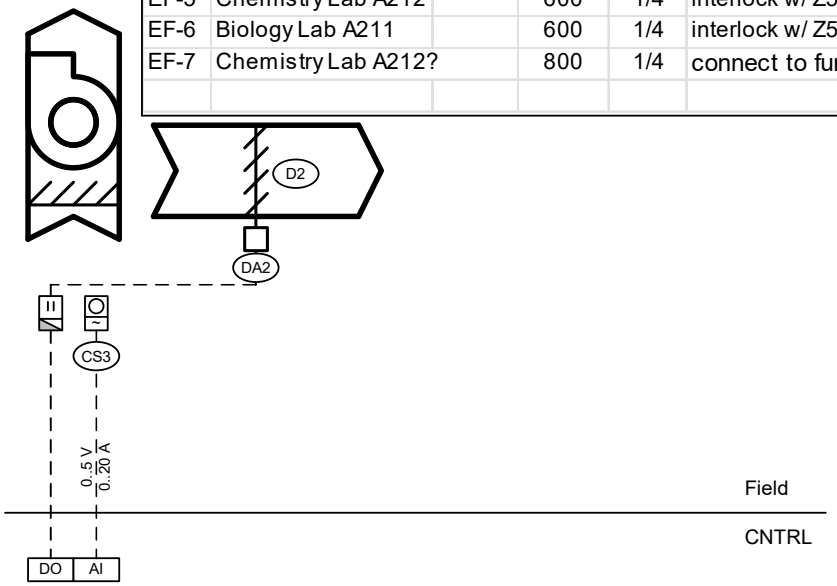
NOTES:
1) Rectangular dampers are Nailor Industries low leakage model 1010 c/w blade and edge seals. Use low profile dampers for height less than 12 in. Dampers with height less than 10 in. will be single blade.
2) Round dampers are Nailor Industries model 1090 c/w blade gaskets.

	Job:	Owner:	Drawn By:	Title: **HVAC-5 Zones**	
	Job Name: Glenview Park SS 2025 Renovations (Phase I)	Waterloo Region District School Board	Revision Date: March 21, 2025		1

EXHAUST FANS

Pennbarry FX12BH/FX08B

Unit	Serves	CNTRL	Fan	Size	Comments
			(cfm)	(hp)	
EF-5	Chemistry Lab A212		600	1/4	interlock w/ Z5.13/5.14
EF-6	Biology Lab A211		600	1/4	interlock w/ Z5.4/5.5
EF-7	Chemistry Lab A212?		800	1/4	connect to fumehood



SEQUENCE OF OPERATION

Exhaust fan operate according to the time schedule.

Alarms:
An alarm is generated at the BAS if the fan status does not match the start/stop signal.

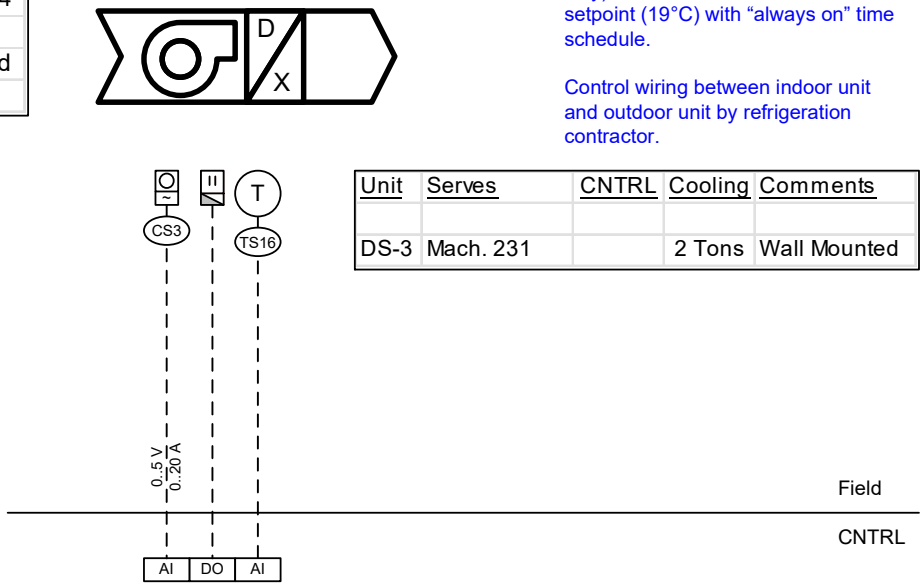
DUCTLESS SPLIT AC UNIT

LG LSN243HLV

Install wall controller high on the wall near the indoor unit (for service use only). Set local controls for low setpoint (19°C) with "always on" time schedule.

Control wiring between indoor unit and outdoor unit by refrigeration contractor.

Unit	Serves	CNTRL	Cooling	Comments
DS-3	Mach. 231		2 Tons	Wall Mounted



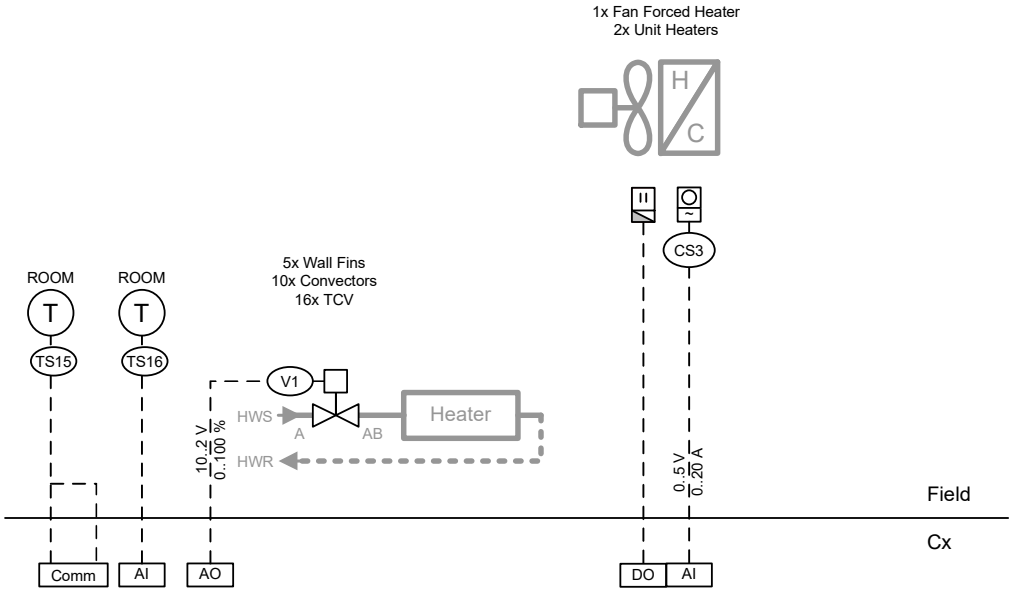
SEQUENCE OF OPERATION

Unoccupied Mode
The system is off. If the pushbutton on the room sensor is pressed, the system will switch to the occupied mode for a period of 2 hours (adjustable).

Occupied Mode
Zone temperature sensor TS15 cycles the ductless split to maintain the occupied cooling setpoint. Setpoint adjust of +/-2°C is provided. The unit is disabled when the outside air temperature is below the global mechanical cooling disable setpoint (initially 12/14°C). A minimum off-time of 5 minutes is provided.

Alarms
An alarm is generated at the BAS if the zone temperature exceeds programmed alarm limits or if the fan status does not match the start/stop signal.

EXISTING PERIMETER RADIATION, FAN FORCED HEATERS, UNIT HEATERS



SEQUENCE OF OPERATION

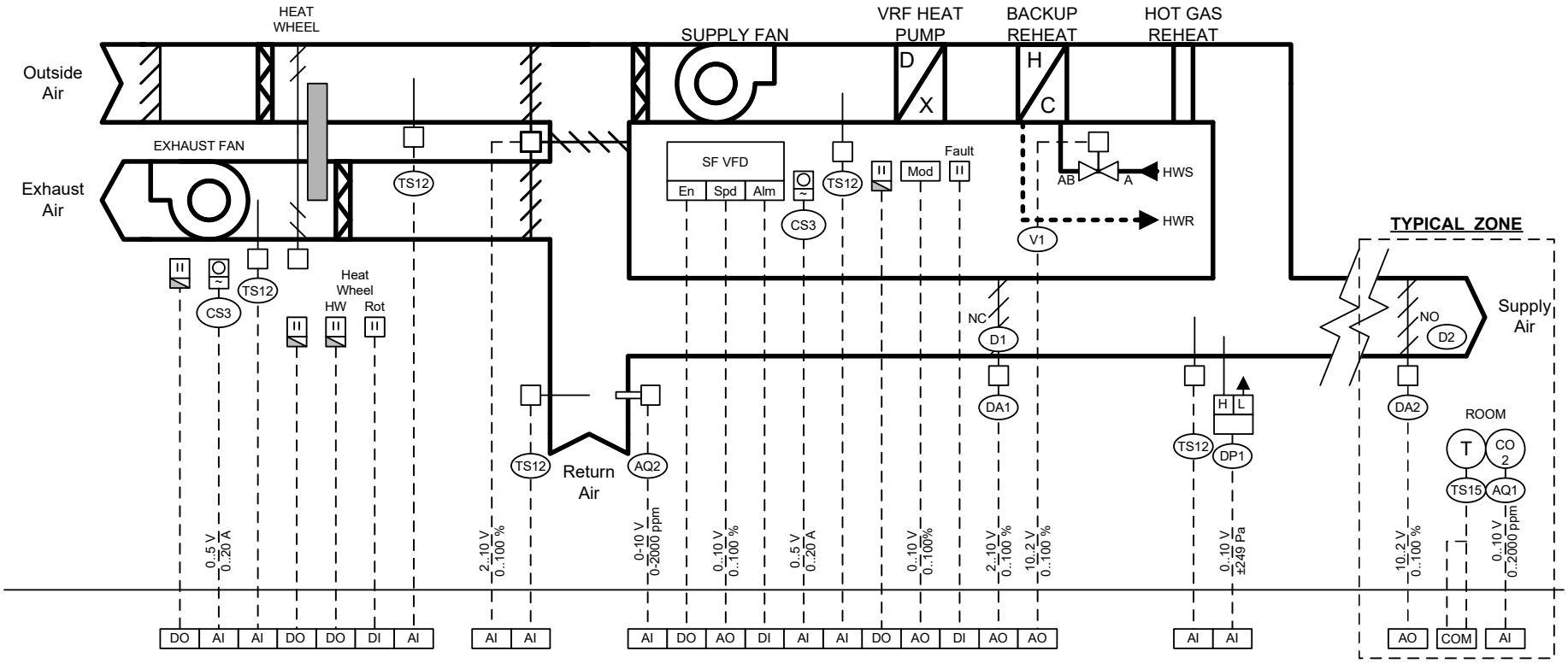
Room sensor modulates the heating valve or starts the fan to maintain room temperature setpoint, which is reduced during unoccupied hours. Local setpoint adjust and pushbutton override is provided (where applicable).

Alarms:
And alarm is generated at the BAS if the room temperature is too high (38/36°C) to too low (14/16°C).

32 Systems as Shown					
Room	Valve (MBh)	Stat	Valve	CNTRL	Notes
First Floor					
Corridor 8101F	--	TS16	V1		Ex WF
Corridor 8101E	--	TS16	--		Ex FF
Stairs 912	40	TS16	V1		Ex C
Tech. Office 109A	--	TS15	--		
Classroom 109B [Comm]	--	TS15	2x V1		2x Ex WF, Ex UH
Classroom 111 [Woodw orking]	40	TS15	V1		TCV, Ex UH
Classroom 112	40	TS15	V1		
Classroom 114 [Computer]	40	TS15	2x V1		
Classroom 115 [Computer]	40	TS15	V1		
Office 116 [116A]	--	TS15	V1		Ex WF
Classroom 118	40	TS15	V1		
Classroom 119 [Computer]	40	TS15	V1		
Book Return 178A	40	TS16	V1		Ex C
Boys Washroom 181	40	TS16	V1		Ex C
Second Floor					
Corridor 8206B	--	TS16	V1		Ex WF
Corridor 8215	40	TS16	V1		
Classroom 211 [Physics Lab]	40	TS15	V1		
Instructor Office 215A	40	TS15	V1		Ex C
Classroom 218	40	TS15	V1		
Classroom 219 [English Media]	40	TS15	V1		
Classroom 220	40	TS15	V1		
Classroom 221	40	TS15	V1		
Classroom 222	40	TS15	V1		
Classroom 223	40	TS15	V1		
Classroom 224	40	TS15	V1		
Custodial Room 231A	40	TS16	V1		4x EF controls, Ex C
Girls' Change Room 271	40	TS16	V1		Share a thermostat Ex C
Girls' Washroom 271C	40	--	V1		
Instructor Office 271D	40	TS15	V1		Ex EF, Ex C
Girls' Washroom 273	40	TS16	V1		Ex C
Washroom 274	40	TS16	V1		Ex C
Boys' Washroom 275	40	TS16	V1		Ex C

HVAC-5 SUPPLY AND EXHAUST FAN WITH ERV VVT SYSTEM

DAIKIN, AAON



Serves	Fan (cfm)	Vent. (cfm)	SF (hp)	RF (hp)	Zones	DX Cooling	Heating (MBh)	Heat Recov. (MBh) Cooling	Heat Recov. (MBh) Heating	CNTRL	Comments
Classrooms	15,000	1650	15	2@6.1	28	453	789	197	471		

	Job:	Owner:	Drawn By:	Title: **HVAC-5 Control Schematics**	4
	Job Name: Glenview Park SS 2025 Renovations (Phase II)	Waterloo Region District School Board	Revision Date: March 21, 2025		

SEQUENCE OF OPERATION

UNOCCUPIED MODE

The supply fan is off, the exhaust fan is off, the mixing dampers are in the 0% outside air position, the heating is off and the cooling is off. The bypass damper is in the 100% open position. The zone dampers are in the 50% open position. The system cycles on a call for unoccupied heating, with the supply air static pressure setpoint increased by 20%. If an override pushbutton is pressed, the system will switch to the occupied mode for 2 hours (adjustable).

OCCUPIED MODE

Fan Operation

The supply fan operates continuously. An optimized start routine is provided for heating and cooling. The mixing dampers are open to the minimum outside air position for ventilation air. Supply fan speed is controlled according to static air pressure. Exhaust fans are controlled according to the outside air damper position. The heat wheel operates when the exhaust fan is running (unless the system is operating in the free cooling mode).

Zone Damper

The room sensor modulates the zone damper between min. and max. settings to maintain setpoint. The setpoint is adjustable +/-1°C at the sensor. The control is reverse acting when the supply air temperature is more than 1°C above room temperature and direct acting when the supply air temperature is more than 1C below room temperature. If the system mode is different from the zone mode (e.g. system is in heating mode but zone requires cooling), the zone damper closes to a reduced minimum position to minimize overheating/overcooling.

System Heating/Cooling Decision Process

The system mode is determined by the number of zones that deviate from their respective zone heating/cooling setpoints. If the total number of zones requesting heating outnumber (or are equal to) the total number of zones requesting cooling, the system will go to heating mode. If the total number of zones requesting cooling outnumber the total number of zones requesting heating, the system will go to cooling mode. Once in the heating or cooling mode, the reference zone becomes the zone with the greatest call. The system will lock-in the selected mode until all zones are satisfied. If any zone is deprived of ventilation air for more than 20 minutes, the system will "unlock", go into forced ventilation mode for 5 minutes, and then reselect the required mode of operation. Zones designated as "slave zones" (typically corridors) cannot request heating or cooling, but will utilize heating/cooling when it is available.

Ventilation Mode

The system operates in ventilation mode (no heating or cooling) under the following conditions:

1) No zones are calling for heating or cooling.
2) System is switching between heating and cooling (system operates in ventilation mode for 5 minutes).
3) One or more zones have been operating at a reduced minimum position for more than 20 minutes (system operates in forced ventilation mode for 5 minutes).

System Heating Control

The supply air temperature sensor modulates the gas heating to maintain setpoint, which is reset from the reference zone deviation from setpoint as follows:

Supply Air Temp.	Reference Zone Deviation from Setpoint
45°C	-1.5°C
30°C	-0.5°C

The supply air temperature setpoint is also reset from outside air temperature (to a max. of 53°C).
Heating is disabled when the outside air temperature exceeds global heating disable setpoint (initially 18°C, 2°C differential). A supply air high limit control ensures the supply air temperature does not exceed 68°C.

GRILLE SCHEDULE (PHASE 1)

CAPACITY INDICATED ON SCHEDULE REFER TO SPECIFICATION FOR CONSTRUCTION STANDARDS, ACCESSORIES AND ADDITIONAL INFORMATION.

Item	Type	Equalizing Grid	Volume Damper	Acceptable Manufacturer	Description
D1	SQUARE CEILING DIFFUSER	NO	NONE	KRUEGER 1400A	4–CONE, FULLY ADJUSTABLE, 24x24, STEEL CEILING DIFFUSER W/ROUND NECK. SUITABLE FOR LAY–IN T–BAR CEILING, OR DRYWALL CEILING WHEN C/W FRAME.
R1	CEILING RETURN GRILLE (NON–DUCTED)	NO	NONE	KRUEGER EG–5	1/2x1/2x1/2 ALUMINUM EGGCRATE CORE, C/W CHANNEL BORDER FOR LAY–IN T–BAR CEILING.
R2	CEILING RETURN GRILLE (DUCTED)	NO	NONE	KRUEGER S580	FIXED BLADE AT 45°, 1/2" SPACING, EXTRUDED ALUMINUM AIRFOIL BLADES PARALLEL TO LONG DIMENSION, C/W 1 1/4" FLAT BORDER & SCREWED FASTENING FOR SURFACE MOUNTING.
R3	SIDEWALL RETURN	NO	NONE	KRUEGER S85	FIXED BLADE AT 45°, 1/2" SPACING, EXTRUDED ALUMINUM AIRFOIL BLADES PARALLEL TO LONG DIMENSION, C/W 1 1/4" FLAT BORDER & SCREWED FASTENING FOR SURFACE MOUNTING.

GENERAL DIFFUSER/GRILLE NOTES:
1. ACCEPTABLE MANUFACTURERS: EH PRICE, NAILOR, TITUS, KRUEGER, CARNES, METALAIRE, TUTTLE & BAILEY
2. GRILLE COLOURS ARE SELECTED BY ARCHITECT FROM STANDARD COLOUR CHART, UNLESS OTHERWISE NOTED.
3. PAINT INTERIOR OF DUCTWORK BEHIND GRILLE MATT BLACK (WHERE VISIBLE THRU GRILLE).

FAN SCHEDULE (PHASE 1)

CAPACITY INDICATED ON SCHEDULE REFER TO SPECIFICATION FOR CONSTRUCTION STANDARDS, ACCESSORIES AND ADDITIONAL INFORMATION.

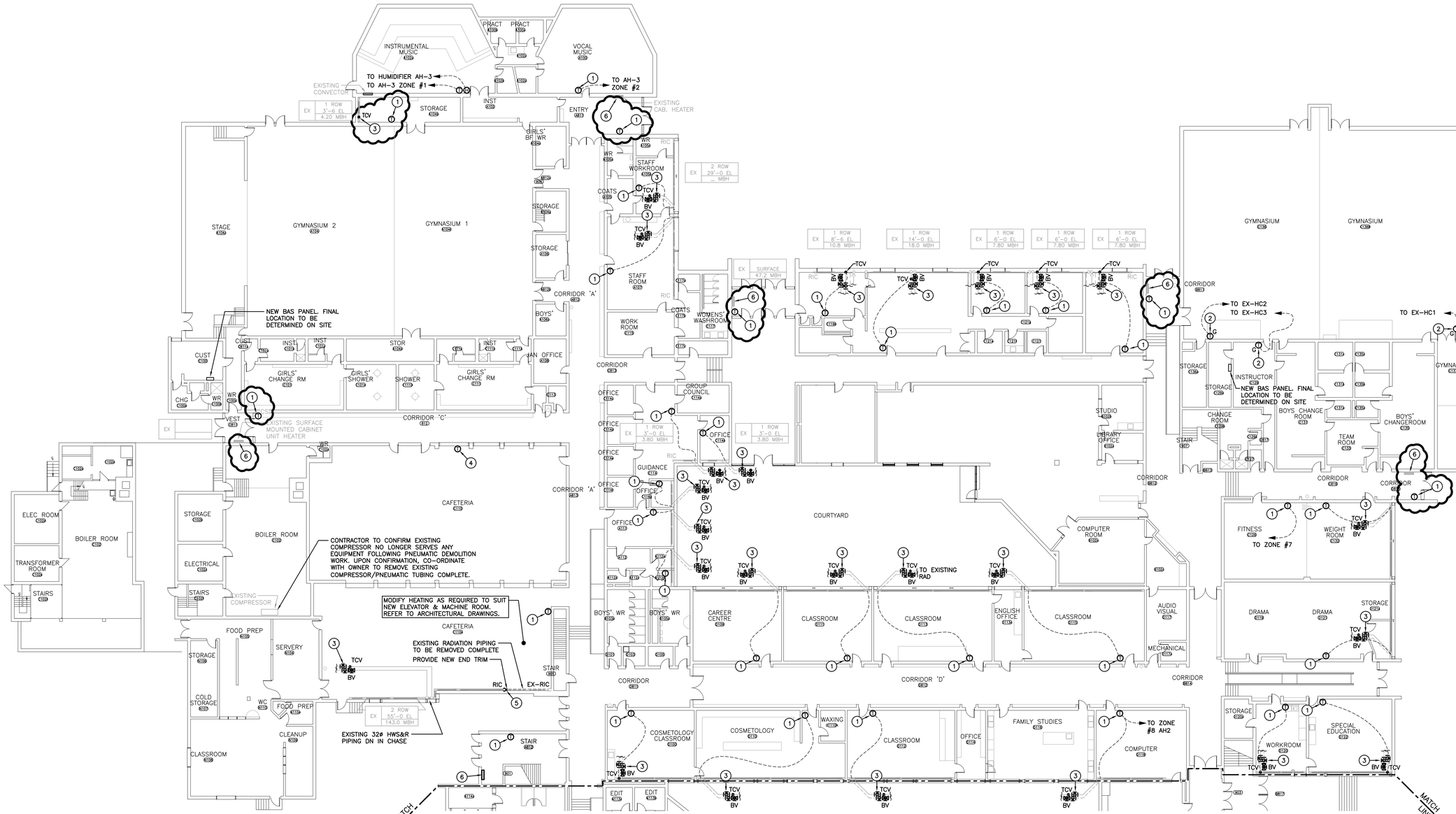
Item	Type	Capacity cfm	ESP in wc	Fan Speed rpm	Motor		Acceptable Manufacturer	Description
					hp	Voltage		
EF–5	ROOF UPBLAST EXHAUST FAN (CHEMISTRY)	1200	0.375	1375	1/4	120/1/60	PENN BARRY 12BH	SPUN ALUMINUM MOTOR COVER & FAN SHROUD, UPBLAST, W/BELT DRIVE CENTRIFUGAL BACKWARD INCLINED FAN, GALV BIRD SCREEN, 24" HIGH INSULATED ROOF CURB, & BACKDRAFT DAMPER
EF–6	ROOF UPBLAST EXHAUST FAN (BIOLOGY)	1200	0.375	1375	1/4	120/1/60	PENN BARRY 12BH	SPUN ALUMINUM MOTOR COVER & FAN SHROUD, UPBLAST, W/BELT DRIVE CENTRIFUGAL BACKWARD INCLINED FAN, GALV BIRD SCREEN, 24" HIGH INSULATED ROOF CURB, & BACKDRAFT DAMPER
EF–7	ROOF UPBLAST EXHAUST FAN (FUME HOOD)	800	1.0	3135	3/4	208/3/60	PENN BARRY VPLUME 090–6	CONNECT TO FUMEHOOD. SPUN ALUMINUM MOTOR COVER & FAN SHROUD, UPBLAST, W/BELT DRIVE FAN, GALV BIRD SCREEN, 24" HIGH INSULATED ROOF CURB, & BACKDRAFT DAMPER
EF–8	ROOFTOP EXHAUST	1000	0.25	800	1/4	120/1/60	PENN BARRY DX11B	SPUN ALUMINUM MOTOR COVER & FAN SHROUD, UPBLAST, W/BELT DRIVE FAN, GALV BIRD SCREEN, 24" HIGH INSULATED ROOF CURB, & BACKDRAFT DAMPER

GENERAL FAN NOTES:
1. ACCEPTABLE MANUFACTURERS: GREENHECK, PENN–BARRY, COOK, CARNES, ACME, TWIN CITY, JENCO, BUFFALO.
2. PROVIDE 24" TALL PREFABRICATED, INSULATED ROOF CURB FOR ALL ROOF MOUNTED FANS.

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555 Project No.: 24162

GLENVIEW PARK SS
REFERENCE DRAWING M1.1

AD02–M01



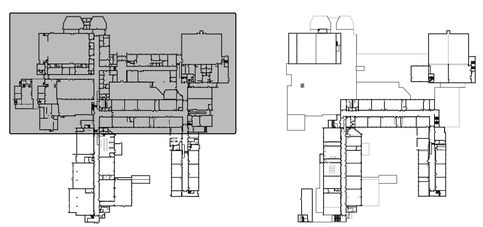
FIRST FLOOR PART PLAN – BLOCK A BAS (PHASE 1)

SCALE: 1:200

ALL EXISTING PNEUMATIC PIPING/TUBING SHOWN OR OTHERWISE SHALL BE REMOVED COMPLETE WHERE ACCESSIBLE WITH CEILINGS OR EXPOSED.

IDENTIFIED PRICE WORK

ALL WORK SHOWN TO REPLACE THE EXISTING PNEUMATIC CONTROLS WITH DDC CONTROLS IS AN IDENTIFIED PRICE.



GROUND FLOOR SECOND FLOOR

KEY PLAN

SCALE: N.T.S.

GENERAL DEMOLITION NOTES

- EXISTING MECHANICAL ITEMS NOT SHOWN SHALL REMAIN UNLESS NOTED OTHERWISE.
- EXISTING MECHANICAL ITEMS SHOWN BUT NOT NOTED AS BEING REMOVED OR RENOVATED SHALL REMAIN AS PRESENTLY INSTALLED AND OPERATING.
- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ON SITE ALL LOCATIONS AND SIZES OF ALL SERVICES & EQUIPMENT PRIOR TO THE COMMENCEMENT OF WORK.
- ALL OPENINGS THAT RESULT FROM THE REMOVAL OF EQUIPMENT OR SERVICES SHALL BE NEATLY PATCHED WITH SUITABLE NEW MATERIALS TO SUIT EXISTING CONSTRUCTION.
- REMOVAL OF EXISTING PIPING, OR DUCT SYSTEMS INCLUDES REMOVAL OF ALL HANGERS, INSULATION, FITTINGS, ETC.
- MAINTAIN INTEGRITY OF EXISTING SYSTEMS THAT ARE TO REMAIN OR BE MODIFIED.
- INSTALL NEW SYSTEM OR SERVICES WHERE REQUIRED TO MAINTAIN SYSTEM OPERATION PRIOR TO DEMOLITION OF EXISTING SERVICES.
- THIS CONTRACTOR IS TO REMOVE & REPLACE CEILINGS AS REQUIRED FOR REMOVAL/REPLACEMENT OF SERVICES.

SPECIFIC DEMO/RENO NOTES

1. EXISTING PNEUMATIC THERMOSTAT/SENSOR TO BE REMOVED COMPLETE. REMOVE WIRING/TUBING BACK TO SOURCE. EXISTING PNEUMATIC TUBING TO BE SOLDERED/CRIMPED IN CONCEALED LOCATION. PROVIDE NEW DDC THERMOSTAT.
2. EXISTING THERMOSTAT CONTROLS TO BE REMOVED COMPLETE & REPLACED WITH NEW DDC CONTROLS (PLATE SENSOR) TO CONTROL NEW TCV IN MECH ROOM. NEW TCV TO BE SUPPLIED BY BAS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
3. EXISTING TCV, ISOLATION, & BALANCING VALVES TO BE REMOVED AND REPLACED WITH NEW. SIZE TO MATCH EXISTING.
4. EXISTING PNEUMATIC CONTROL VALVE(S) TO BE REMOVED FROM BOOSTER COIL(S) & REPLACED W/ NEW DDC CONTROL VALVE(S). NEW TCV(S) TO BE SUPPLIED BY BAS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
5. EXISTING RADIATION CABINET, PIPING & WALLFIN TO BE CUT & REMOVED BEYOND COMPLETE. PROVIDE NEW END TRIM TO MATCH EXISTING CABINET HEIGHT.
6. EXISTING STANDALONE CONTROL TO BE REMOVED COMPLETE. INTEGRATE EXISTING INTO NEW DDC BAS SYSTEM.

No.	REVISIONS	DATE
1	ISSUED FOR 75% REVIEW	2025.01.31
2	ISSUED FOR PERMIT & TENDER	2025.03.05
3	ISSUED FOR ADDENDUM 1	2025.03.20
4	ISSUED FOR ADDENDUM 2	2025.03.24

CHRONOLOGY	DATE

55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number: 24162

Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC

aba architects inc.
101 Randall Drive, Unit B, Waterloo ON, TEL 519 884 2711 www.abaarchitect.co

CLIENT

WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME

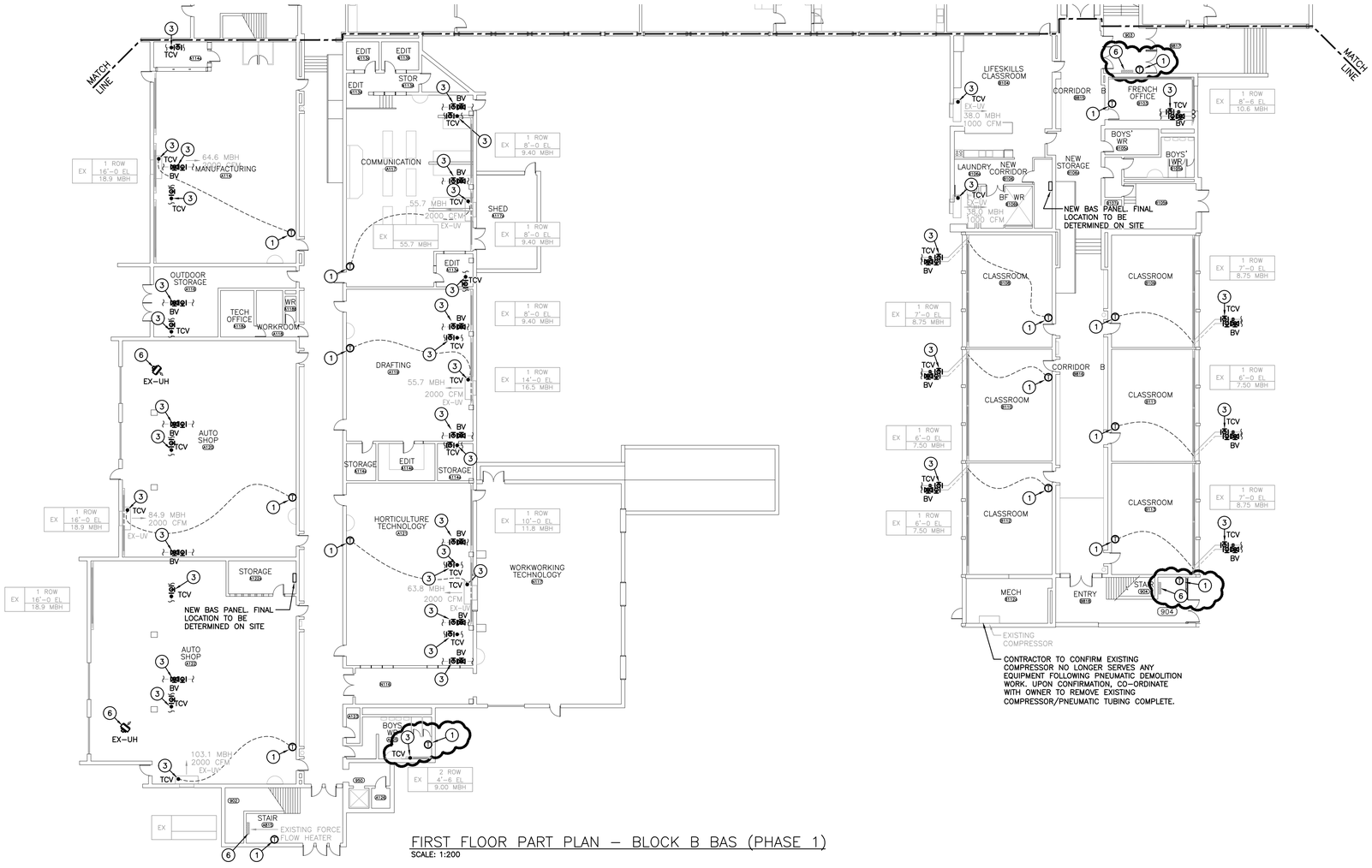
GLENVIEW PARK SECONDARY SCHOOL

55 McKay Street Cambridge, Ontario

DRAWING TITLE

FIRST FLOOR PART PLAN - BLOCK A BAS (PHASE 1)

SCALE	DRAWING NUMBER
AS NOTED	M2.1
SHEET SIZE: 24x36	
PROJECT NUMBER	

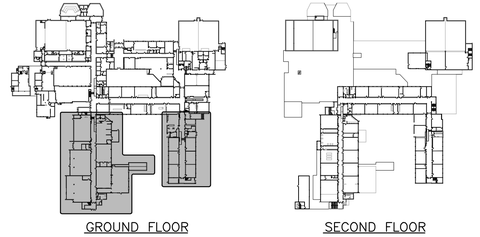


FIRST FLOOR PART PLAN – BLOCK B BAS (PHASE 1)
SCALE: 1:200

ALL EXISTING PNEUMATIC PIPING/TUBING SHOWN OR OTHERWISE SHALL BE REMOVED COMPLETE WHERE ACCESSIBLE WITH CEILINGS OR EXPOSED.

IDENTIFIED PRICE WORK

ALL WORK SHOWN TO REPLACE THE EXISTING PNEUMATIC CONTROLS WITH DDC CONTROLS IS AN IDENTIFIED PRICE.



KEY PLAN
SCALE: N.T.S.

GENERAL DEMOLITION NOTES

- EXISTING MECHANICAL ITEMS NOT SHOWN SHALL REMAIN UNLESS NOTED OTHERWISE.
- EXISTING MECHANICAL ITEMS SHOWN BUT NOT NOTED AS BEING REMOVED OR RENOVATED SHALL REMAIN AS PRESENTLY INSTALLED AND OPERATING.
- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ON SITE ALL LOCATIONS AND SIZES OF ALL SERVICES & EQUIPMENT PRIOR TO THE COMMENCEMENT OF WORK.
- ALL OPENINGS THAT RESULT FROM THE REMOVAL OF EQUIPMENT OR SERVICES SHALL BE NEATLY PATCHED WITH SUITABLE NEW MATERIALS TO SUIT EXISTING CONSTRUCTION.
- REMOVAL OF EXISTING PIPING, OR DUCT SYSTEMS INCLUDES REMOVAL OF ALL HANGERS, INSULATION, FITTINGS, ETC.
- MAINTAIN INTEGRITY OF EXISTING SYSTEMS THAT ARE TO REMAIN OR BE MODIFIED.
- INSTALL NEW SYSTEM OR SERVICES WHERE REQUIRED TO MAINTAIN SYSTEM OPERATION PRIOR TO DEMOLITION OF EXISTING SERVICES.
- THIS CONTRACTOR IS TO REMOVE & REPLACE CEILINGS AS REQUIRED FOR REMOVAL/REPLACEMENT OF SERVICES.

SPECIFIC DEMO/RENO NOTES

1. EXISTING PNEUMATIC THERMOSTAT/SENSOR TO BE REMOVED COMPLETE. REMOVE WIRING/TUBING BACK TO SOURCE. EXISTING PNEUMATIC TUBING TO BE SOLDERED/CRIMPED IN CONCEALED LOCATION. PROVIDE NEW DDC THERMOSTAT.
2. EXISTING THERMOSTAT CONTROLS TO BE REMOVED COMPLETE & REPLACED WITH NEW DDC CONTROLS (PLATE SENSOR) TO CONTROL NEW TCV IN MECH ROOM. NEW TCV TO BE SUPPLIED BY BAS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
3. EXISTING TCV, ISOLATION, & BALANCING VALVES TO BE REMOVED AND REPLACED WITH NEW. SIZE TO MATCH EXISTING.
4. EXISTING PNEUMATIC CONTROL VALVE(S) TO BE REMOVED FROM BOOSTER COIL(S) & REPLACED W/ NEW DDC CONTROL VALVE(S). NEW TCV(S) TO BE SUPPLIED BY BAS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
5. EXISTING RADIATION CABINET, PIPING & WALLFIN TO BE CUT & REMOVED BEYOND COMPLETE. PROVIDE NEW END TRIM TO MATCH EXISTING CABINET HEIGHT.
6. EXISTING STANDALONE CONTROL TO BE REMOVED COMPLETE. INTEGRATE EXISTING INTO NEW DDC BAS SYSTEM.

No.	REVISIONS	DATE
1	ISSUED FOR 75% REVIEW	2025.01.31
2	ISSUED FOR PERMIT & TENDER	2025.03.05
3	ISSUED FOR ADDENDUM 1	2025.03.20
4	ISSUED FOR ADDENDUM 2	2025.03.24

CHRONOLOGY	DATE

55 Northland Road,
Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number: 24162

Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC

aba architects inc.
101 Randall Drive, Unit B, Waterloo ON. TEL 519 884 2711 www.abaarchitect.co

CLIENT

WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME

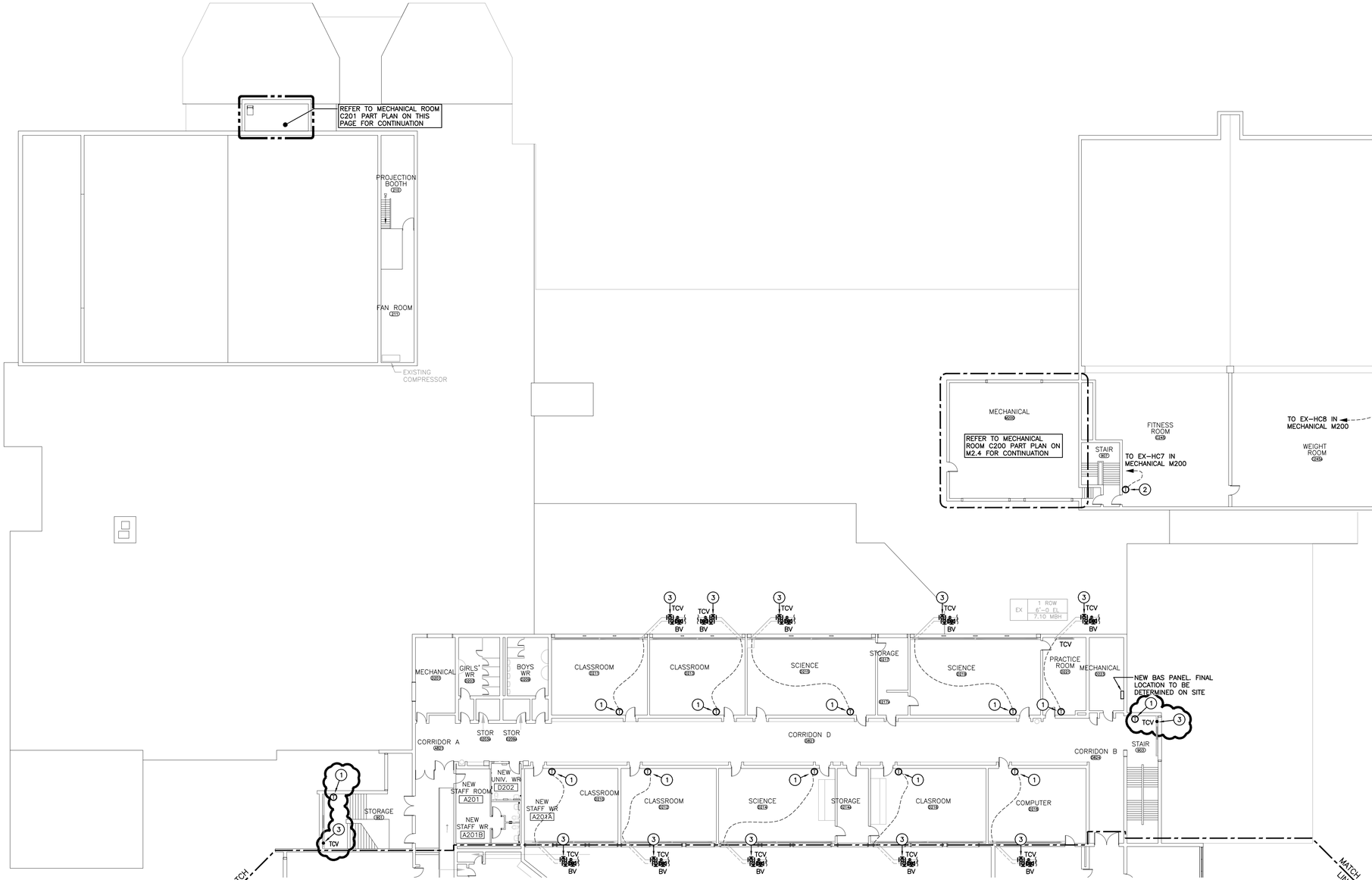
GLENVIEW PARK SECONDARY SCHOOL
55 McKay Street Cambridge, Ontario

DRAWING TITLE

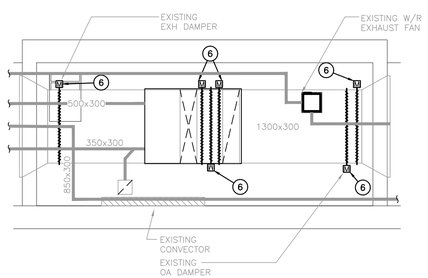
FIRST FLOOR PART PLAN - BLOCK B BAS (PHASE 1)

SCALE: AS NOTED
SHEET SIZE: 24x36
PROJECT NUMBER:

DRAWING NUMBER: M2.2



SECOND FLOOR PART PLAN – BLOCK A BAS (PHASE 1)
SCALE: 1:200

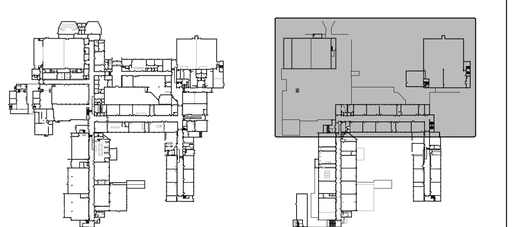


MECHANICAL ROOM C201 PART PLAN (PHASE 1)
SCALE: 1:50

ALL EXISTING PNEUMATIC PIPING/TUBING SHOWN OR OTHERWISE SHALL BE REMOVED COMPLETE WHERE ACCESSIBLE WITH CEILINGS OR EXPOSED.

IDENTIFIED PRICE WORK

ALL WORK SHOWN TO REPLACE THE EXISTING PNEUMATIC CONTROLS WITH DDC CONTROLS IS AN IDENTIFIED PRICE.



KEY PLAN
SCALE: N.T.S.

GENERAL DEMOLITION NOTES

- EXISTING MECHANICAL ITEMS NOT SHOWN SHALL REMAIN UNLESS NOTED OTHERWISE.
- EXISTING MECHANICAL ITEMS SHOWN BUT NOT NOTED AS BEING REMOVED OR RENOVATED SHALL REMAIN AS PRESENTLY INSTALLED AND OPERATING.
- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ON SITE ALL LOCATIONS AND SIZES OF ALL SERVICES & EQUIPMENT PRIOR TO THE COMMENCEMENT OF WORK.
- ALL OPENINGS THAT RESULT FROM THE REMOVAL OF EQUIPMENT OR SERVICES SHALL BE NEATLY PATCHED WITH SUITABLE NEW MATERIALS TO SUIT EXISTING CONSTRUCTION.
- REMOVAL OF EXISTING PIPING, OR DUCT SYSTEMS INCLUDES REMOVAL OF ALL HANGERS, INSULATION, FITTINGS, ETC.
- MAINTAIN INTEGRITY OF EXISTING SYSTEMS THAT ARE TO REMAIN OR BE MODIFIED.
- INSTALL NEW SYSTEM OR SERVICES WHERE REQUIRED TO MAINTAIN SYSTEM OPERATION PRIOR TO DEMOLITION OF EXISTING SERVICES.
- THIS CONTRACTOR IS TO REMOVE & REPLACE CEILINGS AS REQUIRED FOR REMOVAL/REPLACEMENT OF SERVICES.

SPECIFIC DEMO/RENO NOTES

1. EXISTING PNEUMATIC THERMOSTAT/SENSOR TO BE REMOVED COMPLETE. REMOVE WIRING/TUBING BACK TO SOURCE. EXISTING PNEUMATIC TUBING TO BE SOLDERED/CRIMPED IN CONCEALED LOCATION. PROVIDE NEW DDC THERMOSTAT.
2. EXISTING THERMOSTAT CONTROLS TO BE REMOVED COMPLETE & REPLACED WITH NEW DDC CONTROLS (PLATE SENSOR) TO CONTROL NEW TCV IN MECH ROOM. NEW TCV TO BE SUPPLIED BY BAS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
3. EXISTING TCV, ISOLATION, & BALANCING VALVES TO BE REMOVED AND REPLACED WITH NEW. SIZE TO MATCH EXISTING.
4. EXISTING PNEUMATIC CONTROL VALVE(S) TO BE REMOVED FROM BOOSTER COIL(S) & REPLACED W/ NEW DDC CONTROL VALVE(S). NEW TCV(S) TO BE SUPPLIED BY BAS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
5. EXISTING RADIATION CABINET, PIPING & WALLFIN TO BE CUT & REMOVED BEYOND COMPLETE. PROVIDE NEW END TRIM TO MATCH EXISTING CABINET HEIGHT.
6. EXISTING PNEUMATIC MOTORIZED DAMPER ACTUATOR TO BE REMOVED COMPLETE. PROVIDE NEW DDC ACTUATOR.

No.	REVISIONS	DATE
1	ISSUED FOR 75% REVIEW	2025.01.31
2	ISSUED FOR PERMIT & TENDER	2025.03.05
4	ISSUED FOR ADDENDUM 2	2025.03.24

PROJECT NORTH

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number: 24162

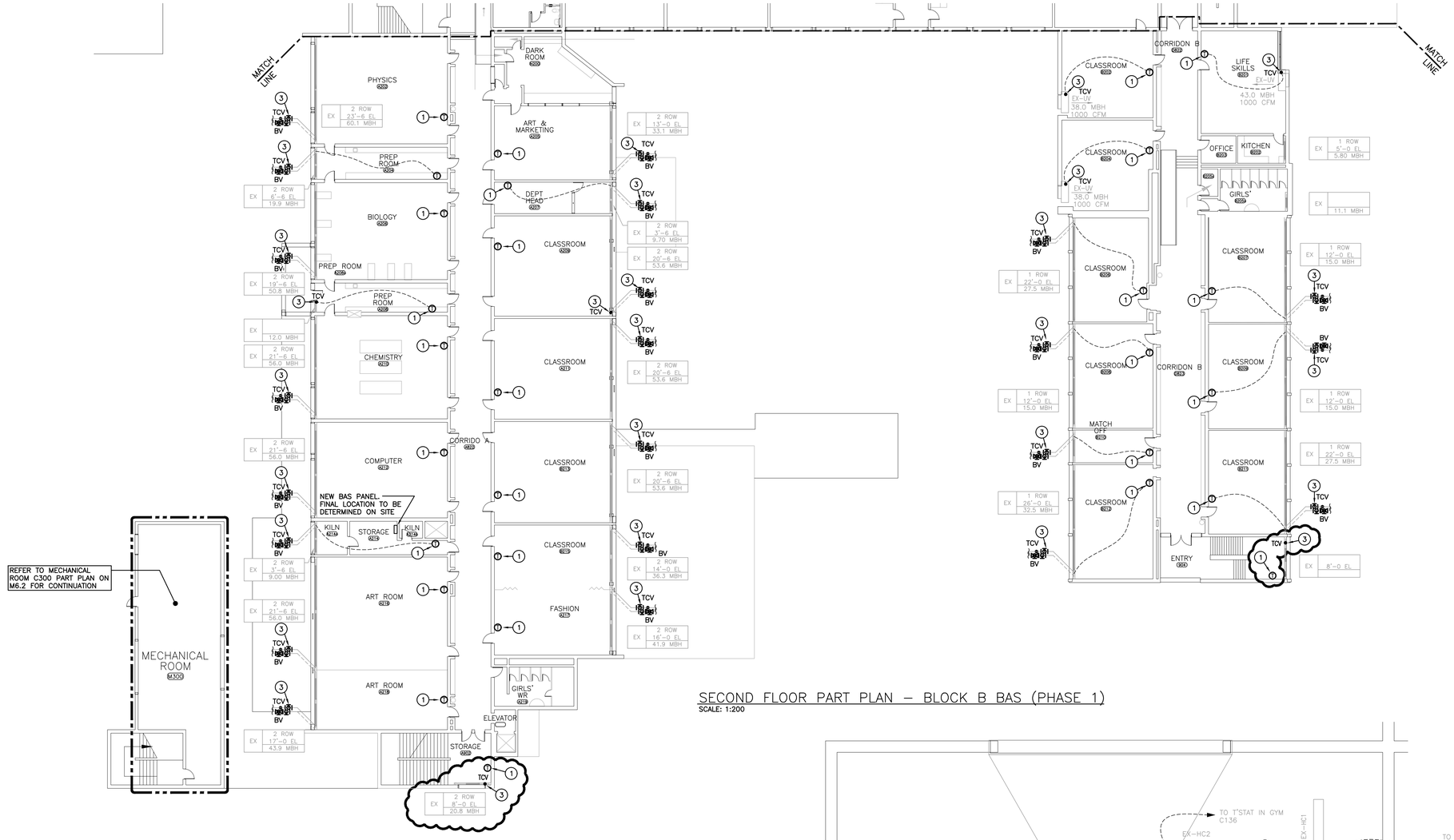
aba architects inc.
101 Randall Drive, Unit B, Waterloo ON. TEL 519 884 2711 www.abaarchitect.co

CLIENT
WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME
GLENVIEW PARK SECONDARY SCHOOL
55 McKay Street Cambridge, Ontario

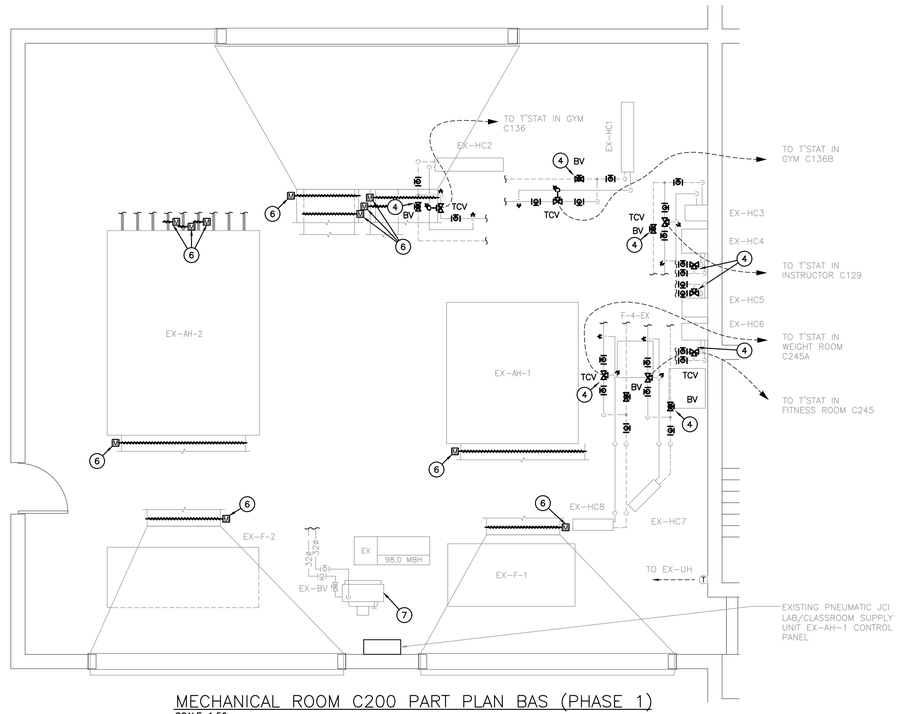
DRAWING TITLE
SECOND FLOOR PART PLAN - BLOCK A BAS (PHASE 1)

SCALE: AS NOTED
SHEET SIZE: 24x36
PROJECT NUMBER:
DRAWING NUMBER: M2.3



SECOND FLOOR PART PLAN – BLOCK B BAS (PHASE 1)

SCALE: 1:200



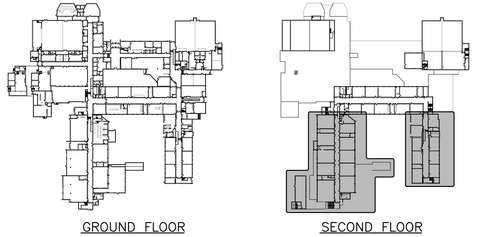
MECHANICAL ROOM C200 PART PLAN BAS (PHASE 1)

SCALE: 1:50

NOTE:
ALL EXISTING PNEUMATIC PIPING/TUBING SHOWN OR OTHERWISE SHALL BE REMOVED COMPLETE WHERE ACCESSIBLE WITH CEILINGS OR EXPOSED.

IDENTIFIED PRICE WORK

ALL WORK SHOWN TO REPLACE THE EXISTING PNEUMATIC CONTROLS WITH DDC CONTROLS IS AN IDENTIFIED PRICE.



KEY PLAN
SCALE: N.T.S.

GENERAL DEMOLITION NOTES

- EXISTING MECHANICAL ITEMS NOT SHOWN SHALL REMAIN UNLESS NOTED OTHERWISE.
- EXISTING MECHANICAL ITEMS SHOWN BUT NOT NOTED AS BEING REMOVED OR RENOVATED SHALL REMAIN AS PRESENTLY INSTALLED AND OPERATING.
- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ON SITE ALL LOCATIONS AND SIZES OF ALL SERVICES & EQUIPMENT PRIOR TO THE COMMENCEMENT OF WORK.
- ALL OPENINGS THAT RESULT FROM THE REMOVAL OF EQUIPMENT OR SERVICES SHALL BE NEATLY PATCHED WITH SUITABLE NEW MATERIALS TO SUIT EXISTING CONSTRUCTION.
- REMOVAL OF EXISTING PIPING, OR DUCT SYSTEMS INCLUDES REMOVAL OF ALL HANGERS, INSULATION, FITTINGS, ETC.
- MAINTAIN INTEGRITY OF EXISTING SYSTEMS THAT ARE TO REMAIN OR BE MODIFIED.
- INSTALL NEW SYSTEM OR SERVICES WHERE REQUIRED TO MAINTAIN SYSTEM OPERATION PRIOR TO DEMOLITION OF EXISTING SERVICES.
- THIS CONTRACTOR IS TO REMOVE & REPLACE CEILINGS AS REQUIRED FOR REMOVAL/REPLACEMENT OF SERVICES.

SPECIFIC DEMO/RENO NOTES

1. EXISTING PNEUMATIC THERMOSTAT/SENSOR TO BE REMOVED COMPLETE. REMOVE WIRING/TUBING BACK TO SOURCE. EXISTING PNEUMATIC TUBING TO BE SOLDERED/CRIMPED IN CONCEALED LOCATION. PROVIDE NEW DDC THERMOSTAT.
2. EXISTING THERMOSTAT CONTROLS TO BE REMOVED COMPLETE & REPLACED WITH NEW DDC CONTROLS (PLATE SENSOR) TO CONTROL NEW TCV IN MECH ROOM. NEW TCV TO BE SUPPLIED BY BAS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
3. EXISTING TCV, ISOLATION, & BALANCING VALVES TO BE REMOVED AND REPLACED WITH NEW. SIZE TO MATCH EXISTING.
4. EXISTING PNEUMATIC CONTROL VALVE(S) TO BE REMOVED FROM BOOSTER COIL(S) & REPLACED W/ NEW DDC CONTROL VALVE(S). NEW TCV(S) TO BE SUPPLIED BY BAS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
5. EXISTING RADIATION CABINET, PIPING & WALLFIN TO BE CUT & REMOVED BEYOND COMPLETE. PROVIDE NEW END TRIM TO MATCH EXISTING CABINET HEIGHT.
6. EXISTING PNEUMATIC MOTORIZED DAMPER ACTUATOR TO BE REMOVED COMPLETE. PROVIDE NEW DDC ACTATOR.
7. EXISTING UNIT HEATER TO BE INTEGRATED TO BAS. ALL EXISTING CONTROLS, ACTUATORS, AND SENSORS TO BE REPLACED COMPLETE.

No.	REVISIONS	DATE
1	ISSUED FOR 75% REVIEW	2025.01.31
2	ISSUED FOR PERMIT & TENDER	2025.03.05
3	ISSUED FOR ADDENDUM 1	2025.03.20
4	ISSUED FOR ADDENDUM 2	2025.03.24

PROJECT NORTH

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number: 24162

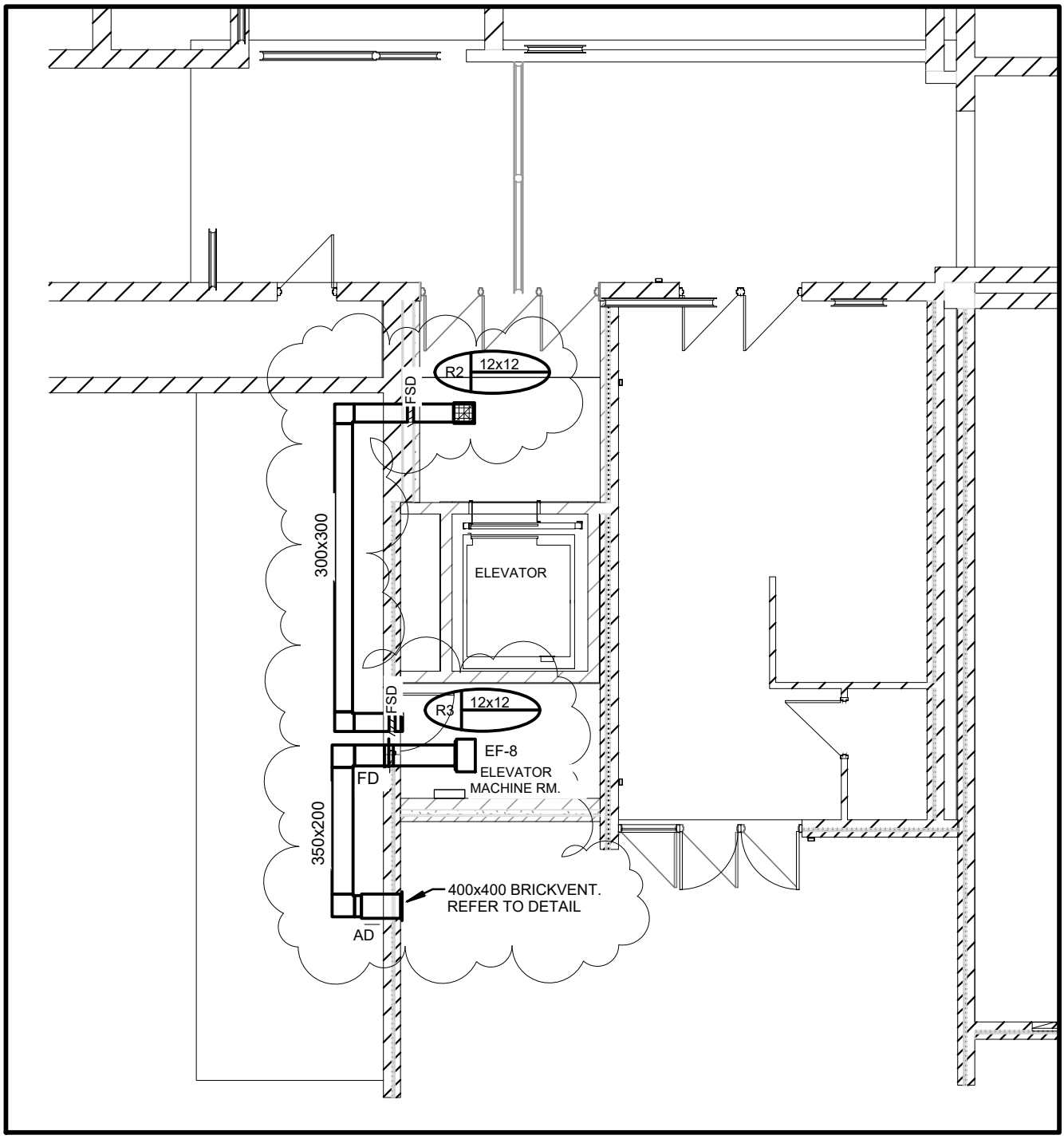
aba architects inc.
101 Randall Drive, Unit B, Waterloo ON, TEL 519 884 2711 www.abaarchitect.co

CLIENT
WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME
GLENVIEW PARK SECONDARY SCHOOL
55 McKay Street Cambridge, Ontario

DRAWING TITLE
SECOND FLOOR PART PLAN - BLOCK B BAS (PHASE 1)

SCALE: AS NOTED
SHEET SIZE: 24x36
PROJECT NUMBER:
DRAWING NUMBER: M2.4



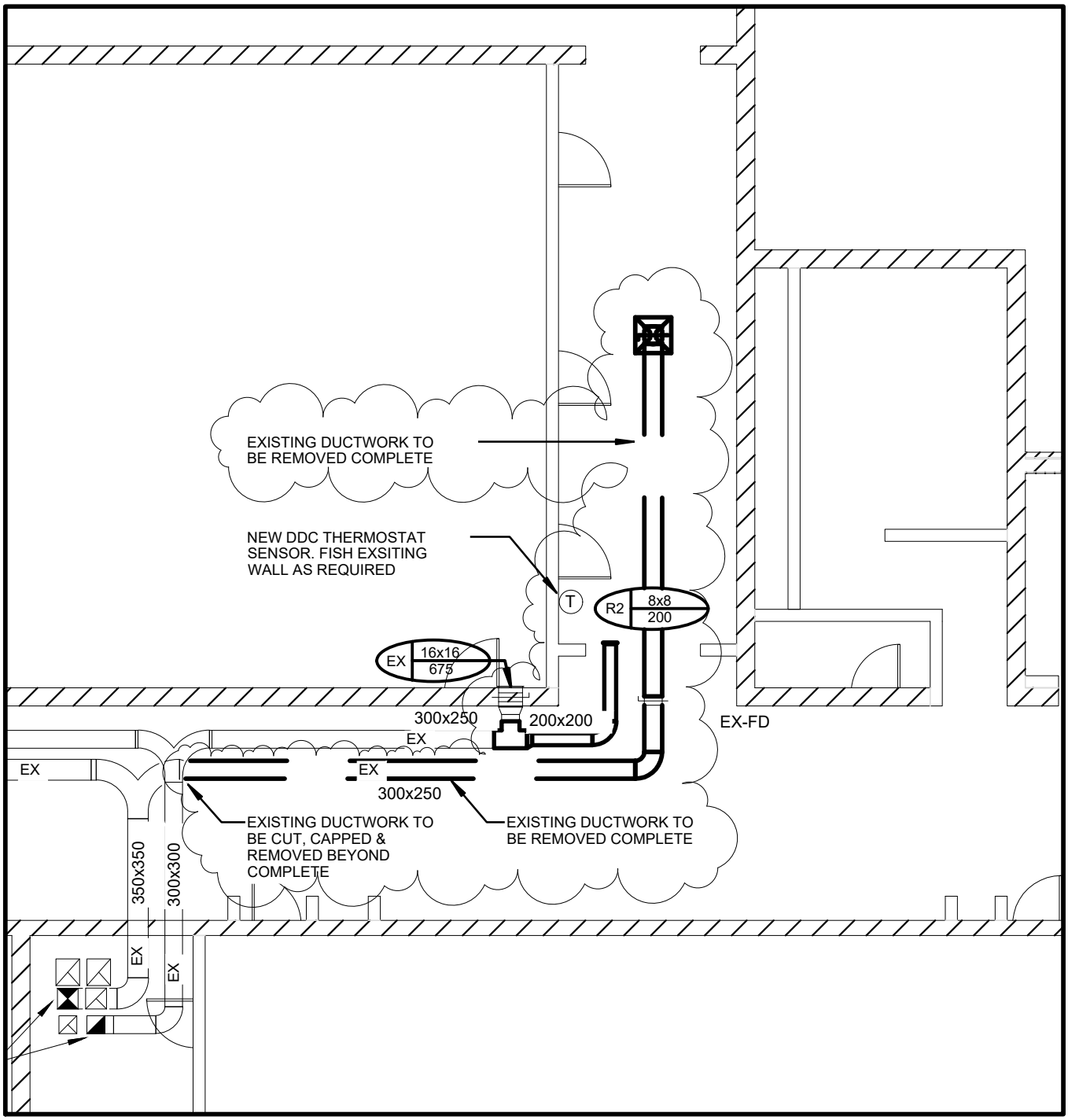
FIRST FLOOR PART PLAN – VENTILATION RENOVATION

SCALE: 1:100

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555 Project No.: M4-1.

GLENVIEW PARK SS
REFERENCE DRAWING M4.1

AD02-M02



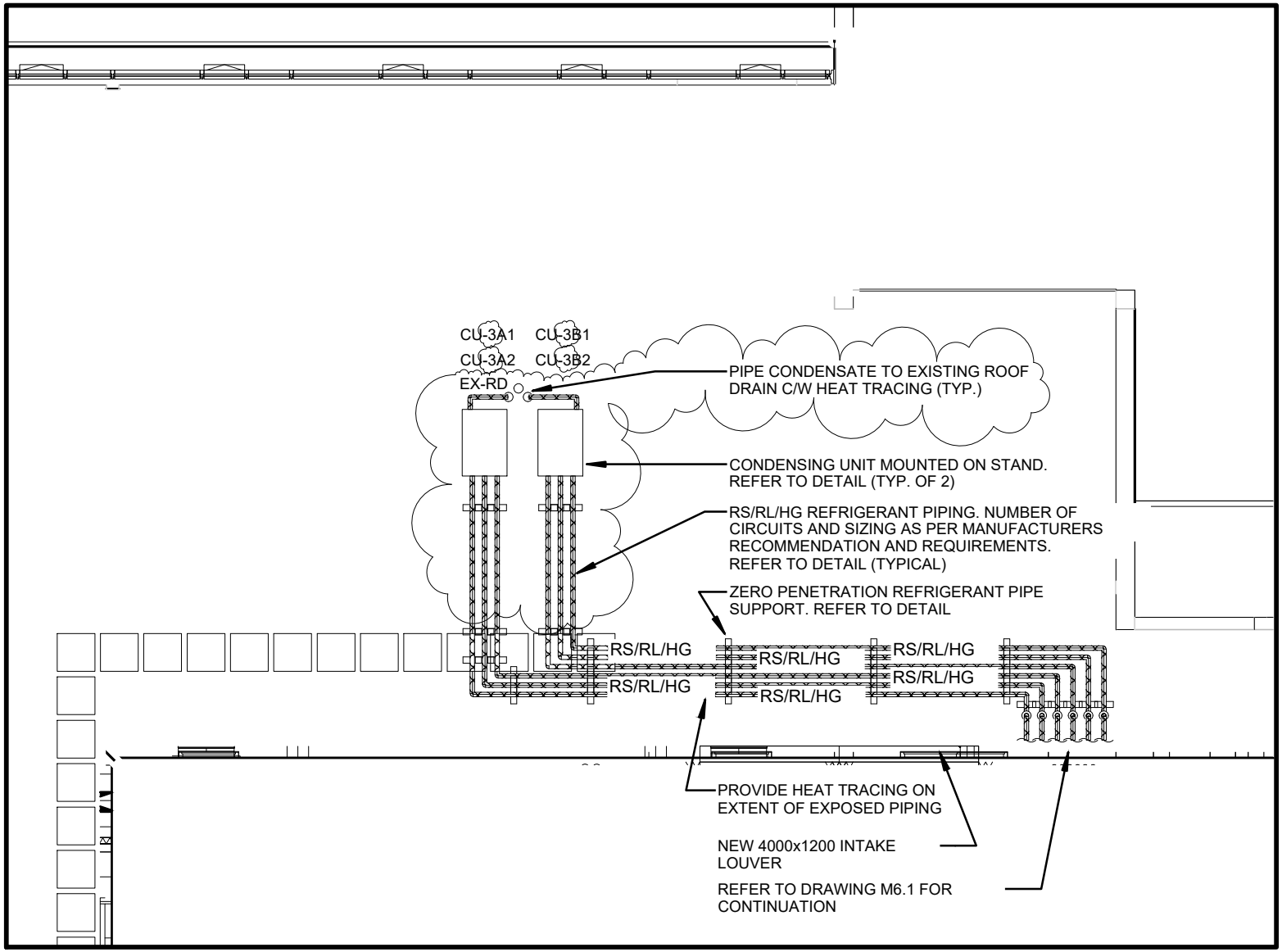
FIRST FLOOR PART PLAN – VENTILATION RENOVATION

SCALE: 1:100

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555 Project No.: M4-1.

GLENVIEW PARK SS
REFERENCE DRAWING M4.1

AD02-M03



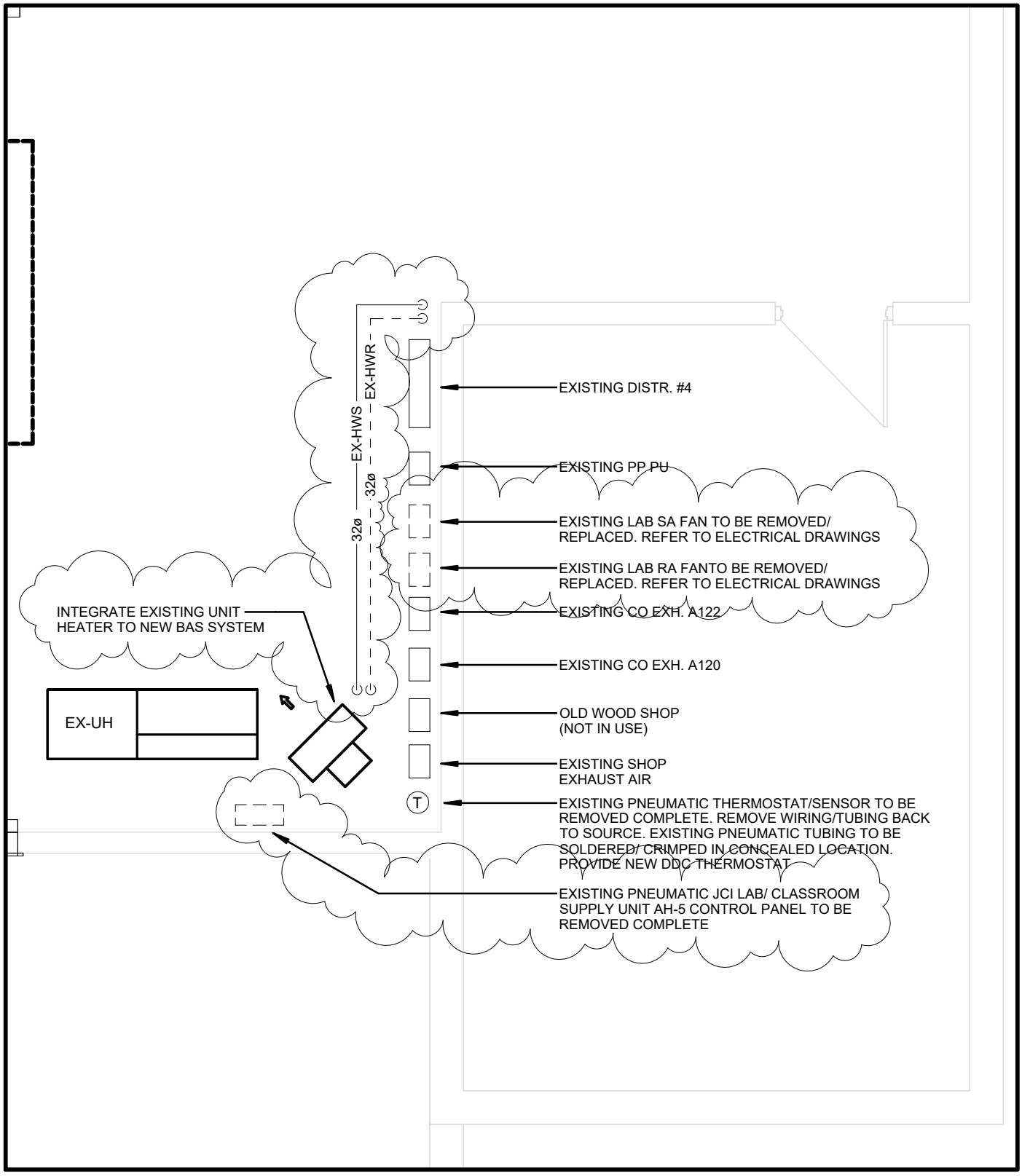
ROOF PART PLAN – RENOVATION (PHASE 1)

SCALE: 1:100

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555 Project No.: M5-1.

GLENVIEW PARK SS
REFERENCE DRAWING M5.1

AD02-M04



MECHANICAL ROOM PART PLAN – DEMOLITION (PHASE 2)

SCALE: 1:50

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555 Project No.: 24162

GLENVIEW PARK SS
REFERENCE DRAWING M6.1

AD02-M05

GENERAL DEMOLITION NOTES

- EXISTING MECHANICAL ITEMS NOT SHOWN SHALL REMAIN UNLESS NOTED OTHERWISE.
- EXISTING MECHANICAL ITEMS SHOWN BUT NOT NOTED AS BEING REMOVED OR RENOVATED SHALL REMAIN AS PRESENTLY INSTALLED AND OPERATING.
- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ON SITE ALL LOCATIONS AND SIZES OF ALL SERVICES & EQUIPMENT PRIOR TO THE COMMENCEMENT OF WORK.
- ALL OPENINGS THAT RESULT FROM THE REMOVAL OF EQUIPMENT OR SERVICES SHALL BE NEATLY PATCHED WITH SUITABLE NEW MATERIALS TO SUIT EXISTING CONSTRUCTION.
- REMOVAL OF EXISTING PIPING, OR DUCT SYSTEMS INCLUDES REMOVAL OF ALL HANGERS, INSULATION, FITTINGS, ETC.
- MAINTAIN INTEGRITY OF EXISTING SYSTEMS THAT ARE TO REMAIN OR BE MODIFIED.
- INSTALL NEW SYSTEM OR SERVICES WHERE REQUIRED TO MAINTAIN SYSTEM OPERATION PRIOR TO DEMOLITION OF EXISTING SERVICES.
- THIS CONTRACTOR IS TO REMOVE & REPLACE CEILINGS AS REQUIRED FOR REMOVAL/REPLACEMENT OF SERVICES.
- EXISTING PNEUMATIC THERMOSTAT/SENSOR TO BE REMOVED COMPLETE. REMOVE WIRING/TUBING BACK TO SOURCE. EXISTING PNEUMATIC TUBING TO BE SOLDERED/CRIMPED IN CONCEALED LOCATION. PROVIDE NEW DDC THERMOSTAT.

SPECIFIC DEMOLITION NOTES

1. EXISTING DUCTWORK TO BE CUT AND REMOVED BEYOND COMPLETE.
2. EXISTING FAN/UNIT TO BE REMOVED COMPLETE.
3. EXISTING DUCTWORK TO BE REMOVED COMPLETE.
4. EXISTING BLOCK WALL (BELOW LOUVER) TO BE TEMPORARILY REMOVED TO ACCOMMODATS INSTALLATION OF NEW UNIT INTO ROOM. REFER TO ARCHICTURAL DRAWINGS FOR EXTENT OF BLOCK WALL REMOVAL.
5. EXISTING LOUVER TO BE REMOVED COMPLETE.
6. EXISTING PNEUMATIC MOTORIZED DAMPER ACTUATOR TO BE REMOVED COMPLETE. EXISTING COMPRESSED AIR TUBING/ CONTROL TO BE REMOVED COMPLETE/ BACK TO SOURCE. EXISTING PNEUMATIC TUBING TO BE SOLDERED/CRIMPED IN CONCEALED LOCATION.
7. EXISTING PNEUMATIC MOTORIZED DAMPER TO BE REMOVED COMPLETE. EXISTING COMPRESSED AIR TUBING/ CONTROL TO BE REMOVED COMPLETE/ BACK TO SOURCE. EXISTING PNEUMATIC TUBING TO BE SOLDERED/CRIMPED IN CONCEALED LOCATION.
8. EXISTING OBSOLETE EXHAUST FAN TO BE REMOVED COMPLETEAND STORED ON SITE IN MECH ROOM FOR FUTURE USE BY OWNER.
9. EXISTING DUCTWORK TO BE CUT AT LOUVER/PLENUM AND REMOVED BEYOND COMPLETE.
10. EXISTING DUCT TO BE REMOVED COMPLETE. CAP IN CEILIING SPACE BELOW. COORDINATE FLOOR OPENING INFILL WITH GENERAL CONTRACTOR.

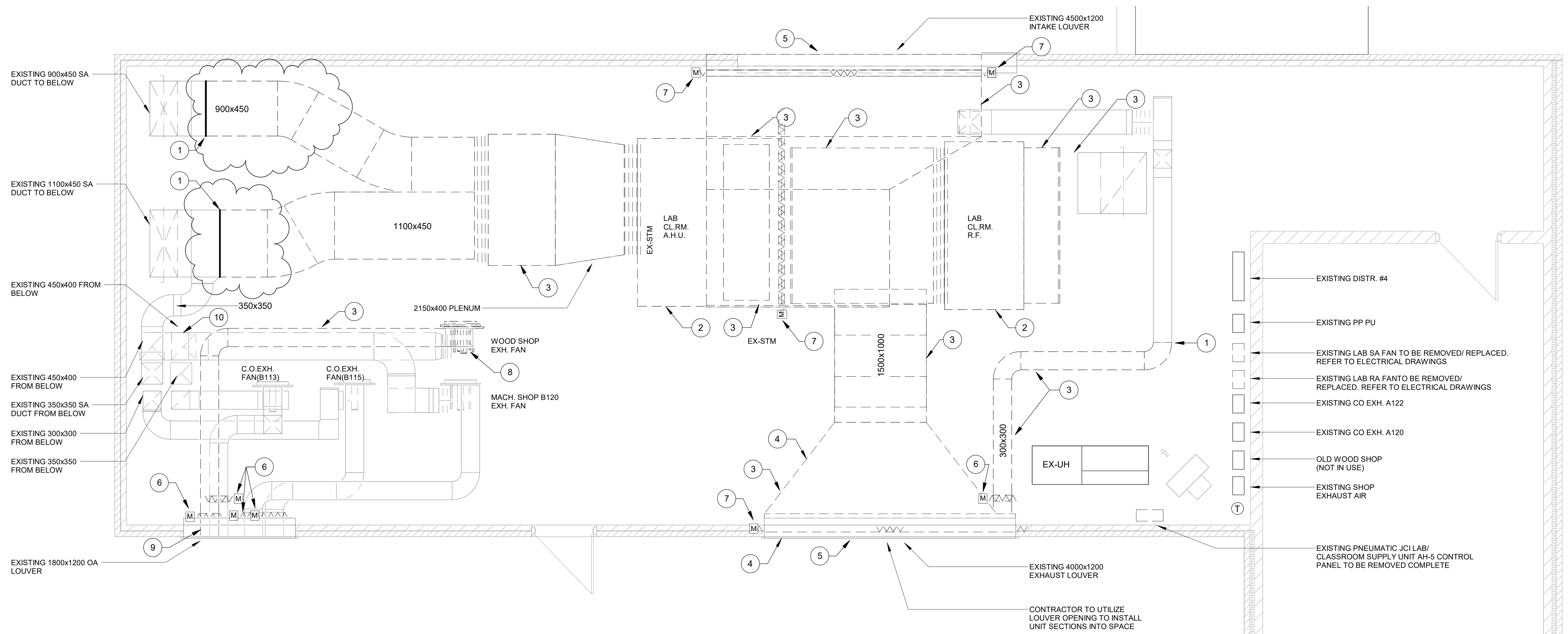
SPECIFIC RENOVATION NOTES

A. NEW DDC MOTORIZED DAMPER ACTUATOR. PROVIDE NEW CONTROL WIRING.

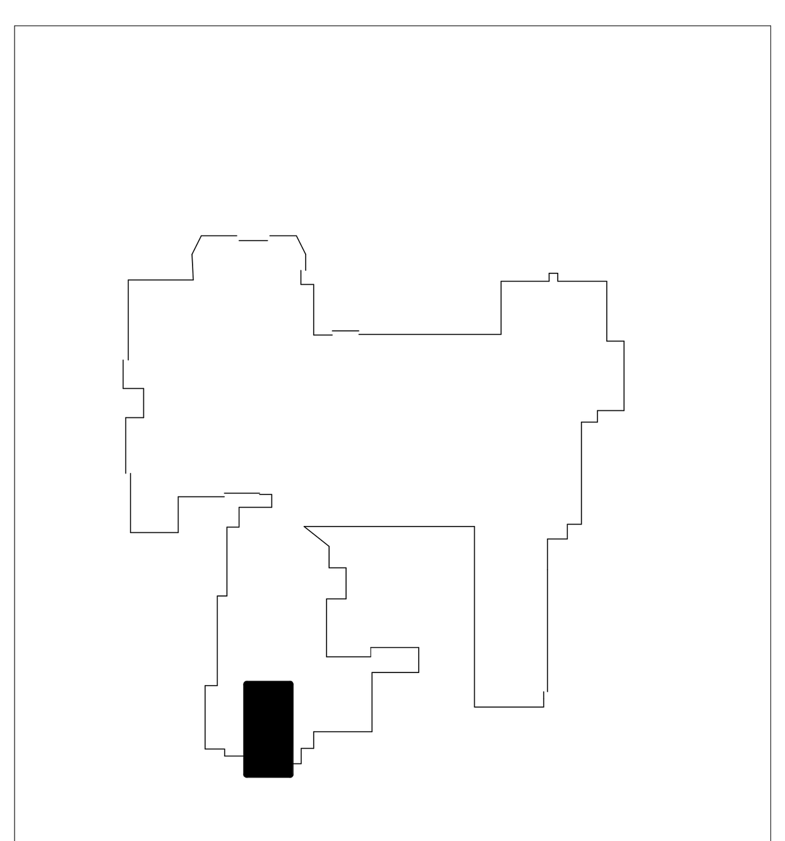
B. NEW MOTORIZED DAMPER & DDC ACTUATOR.

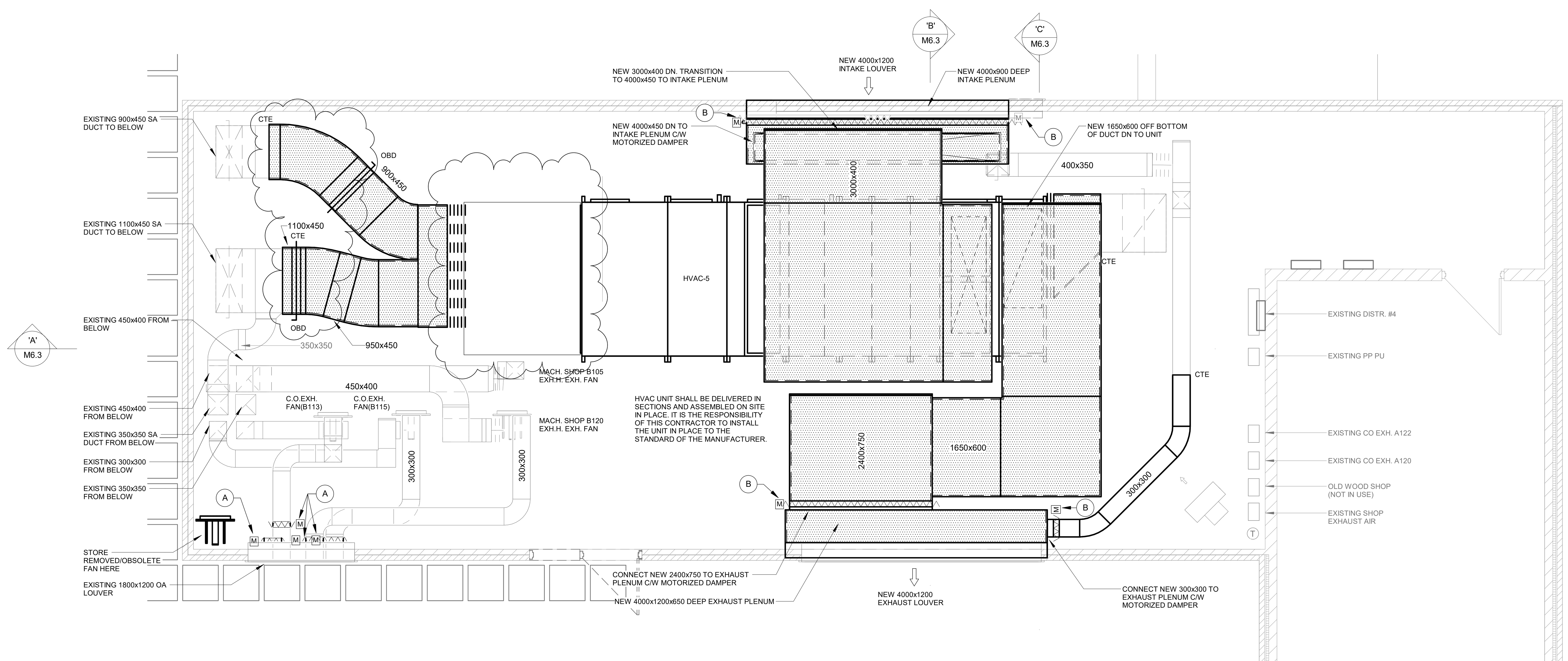
NOTE

HVAC UNIT SHALL BE DELIVERED IN SECTIONS AND ASSEMBLED ON SITE IN PLACE. IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO INSTALL THE UNIT IN PLACE TO THE STANDARDS OF THE MANUFACTURER



MECHANICAL ROOM - VENTILATION DEMOLITION (PHASE 2)
SCALE: 1 : 50





MECHANICAL ROOM - VENTILATION RENOVATION (PHASE 2)
SCALE: 1 : 50

PROJECT NORTH

No.	REVISIONS	DATE
1	ISSUED FOR 75% REVIEW	25.01.31
2	ISSUED FOR ADDENDUM 1	25.03.20
3	ISSUED FOR ADDENDUM 2	25.03.24

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8

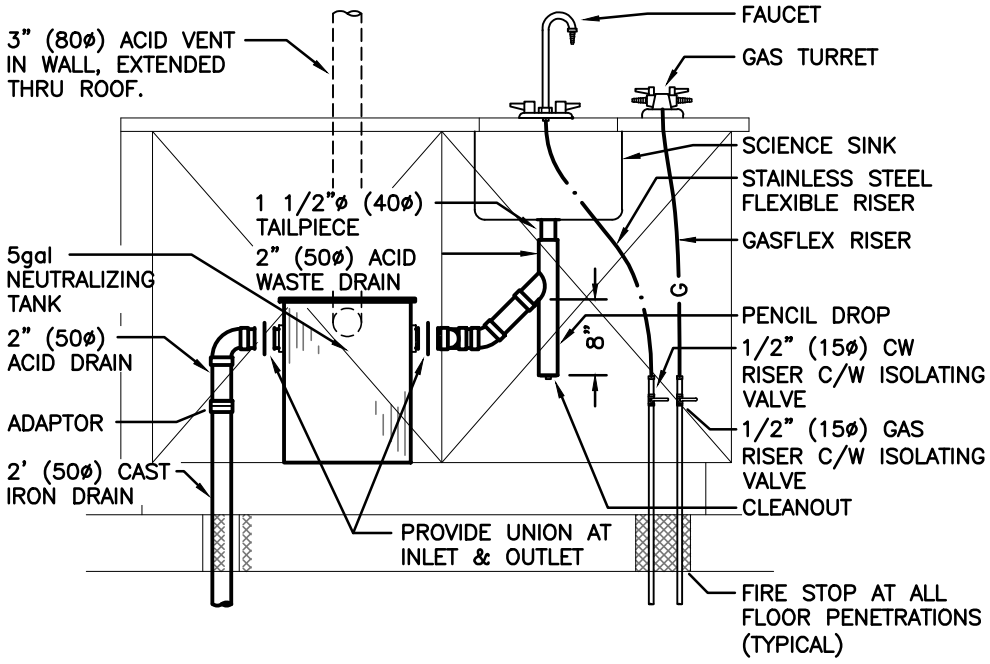
aba architects inc.

CLIENT
Waterloo Region District School Board

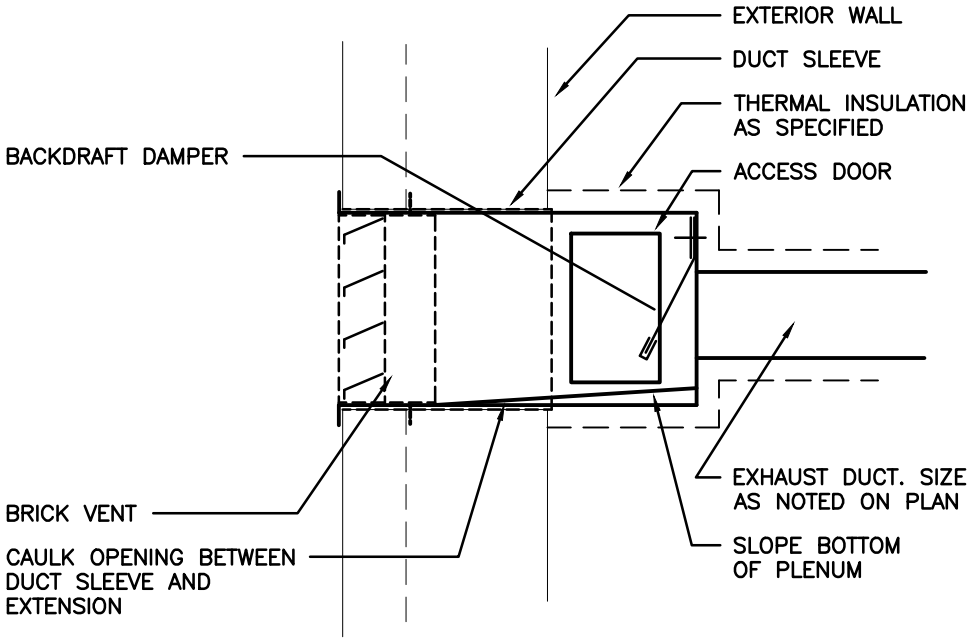
PROJECT NAME
Glenview Park SS - Science/Elevator Reno
55 McKay St, Cambridge, ON N1R 4G8

DRAWING TITLE
MECH ROOM - VENTILATION DEMO/RENO (PHASE 2)

SCALE: As indicated
SHEET SIZE: 24X36
PROJECT NUMBER: 24162
DRAWING NUMBER: M6.2



NEUTRALIZING TANK AT SCIENCE SINK



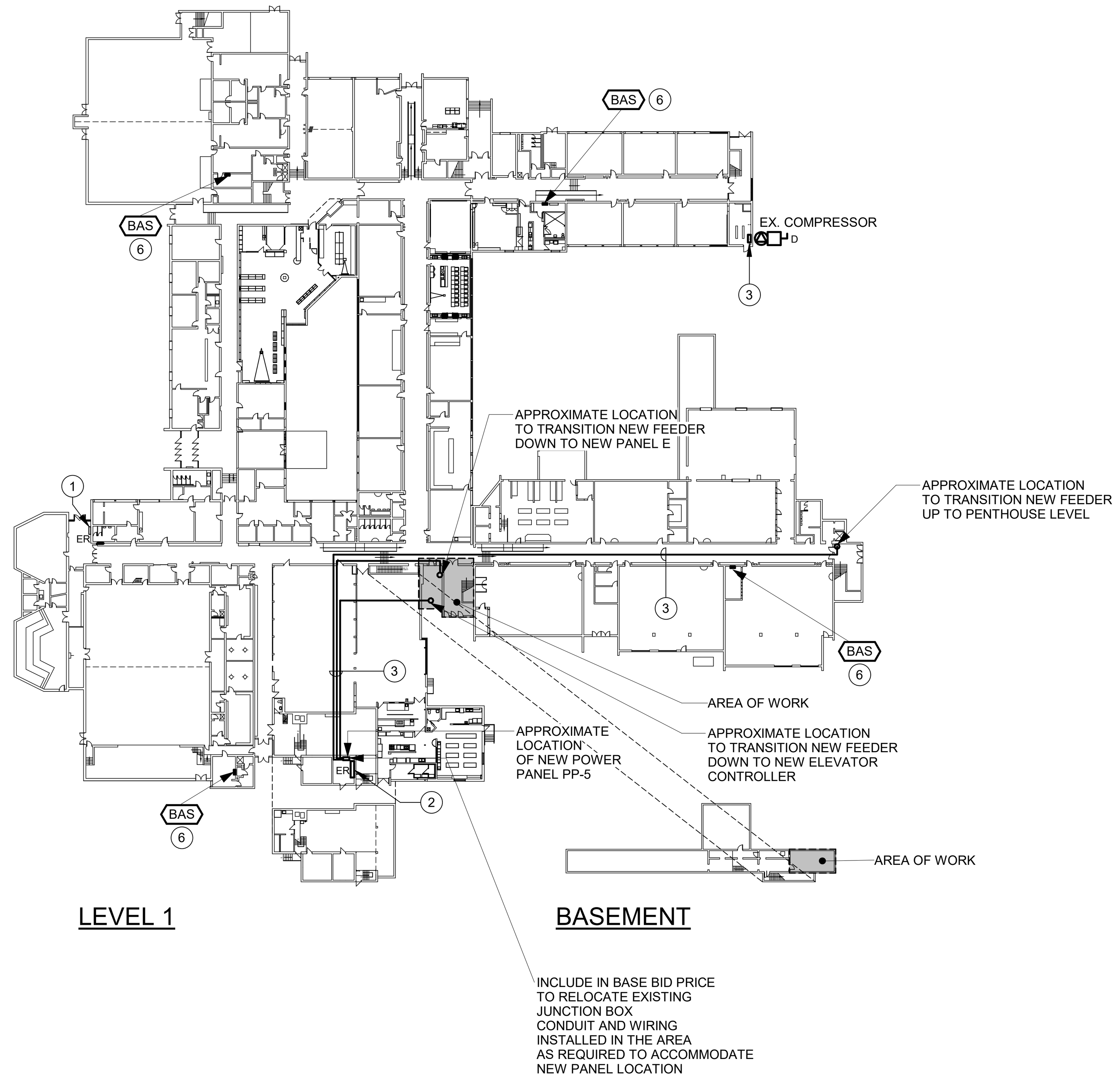
BRICK VENT

NOTE:
IN ALL STUDENT/INSTRUCTOR DESKS, ENSURE MILLWORK IS EQUIPPED WITH REMOVABLE SECTIONS TO ALLOW ACCESS TO GAS PIPING FOR FUTURE INSPECTION/MAINTENANCE.

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555 Project No.: 24162

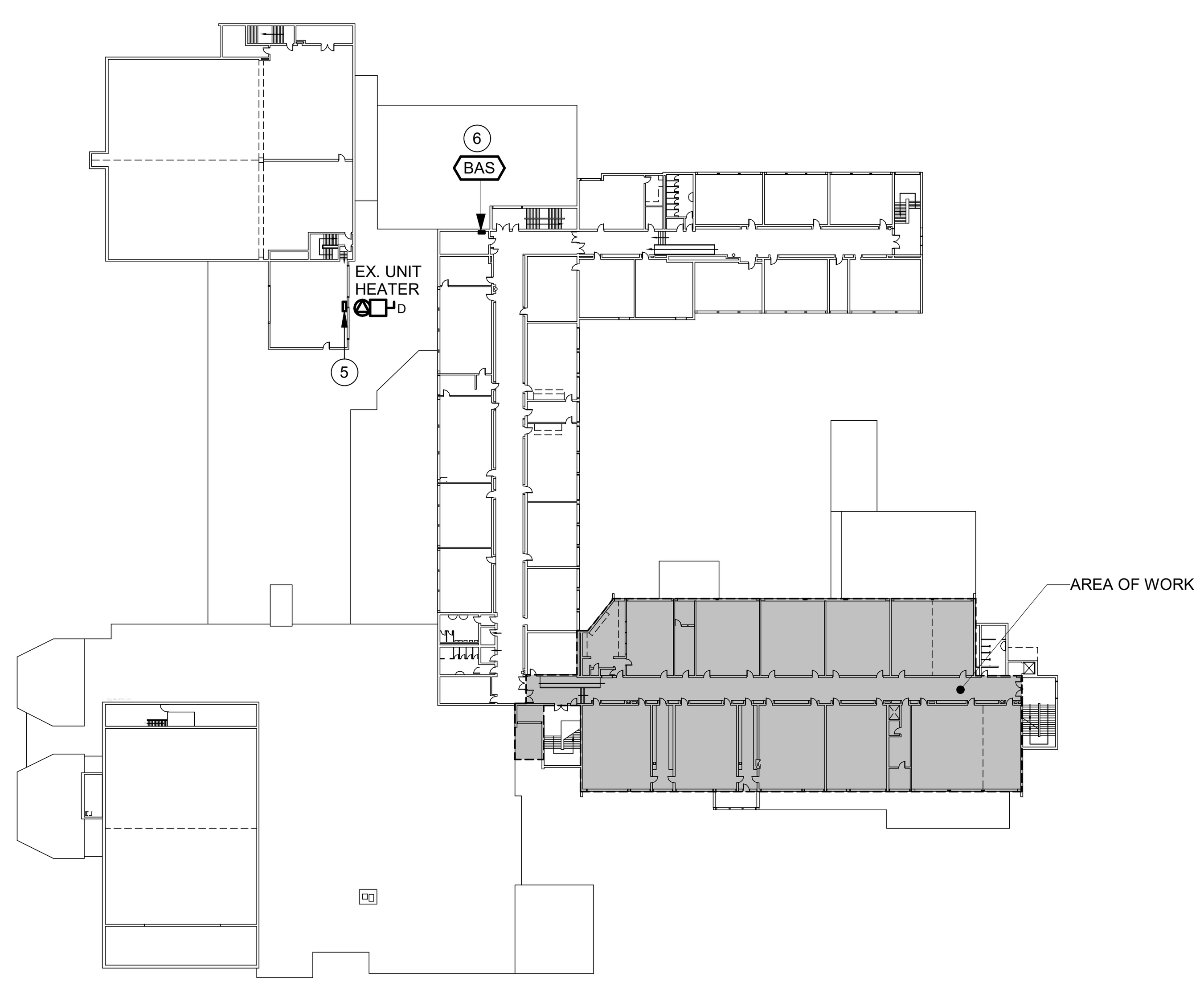
GLENVIEW PARK SS
REFERENCE DRAWING M7.1

AD02-M06

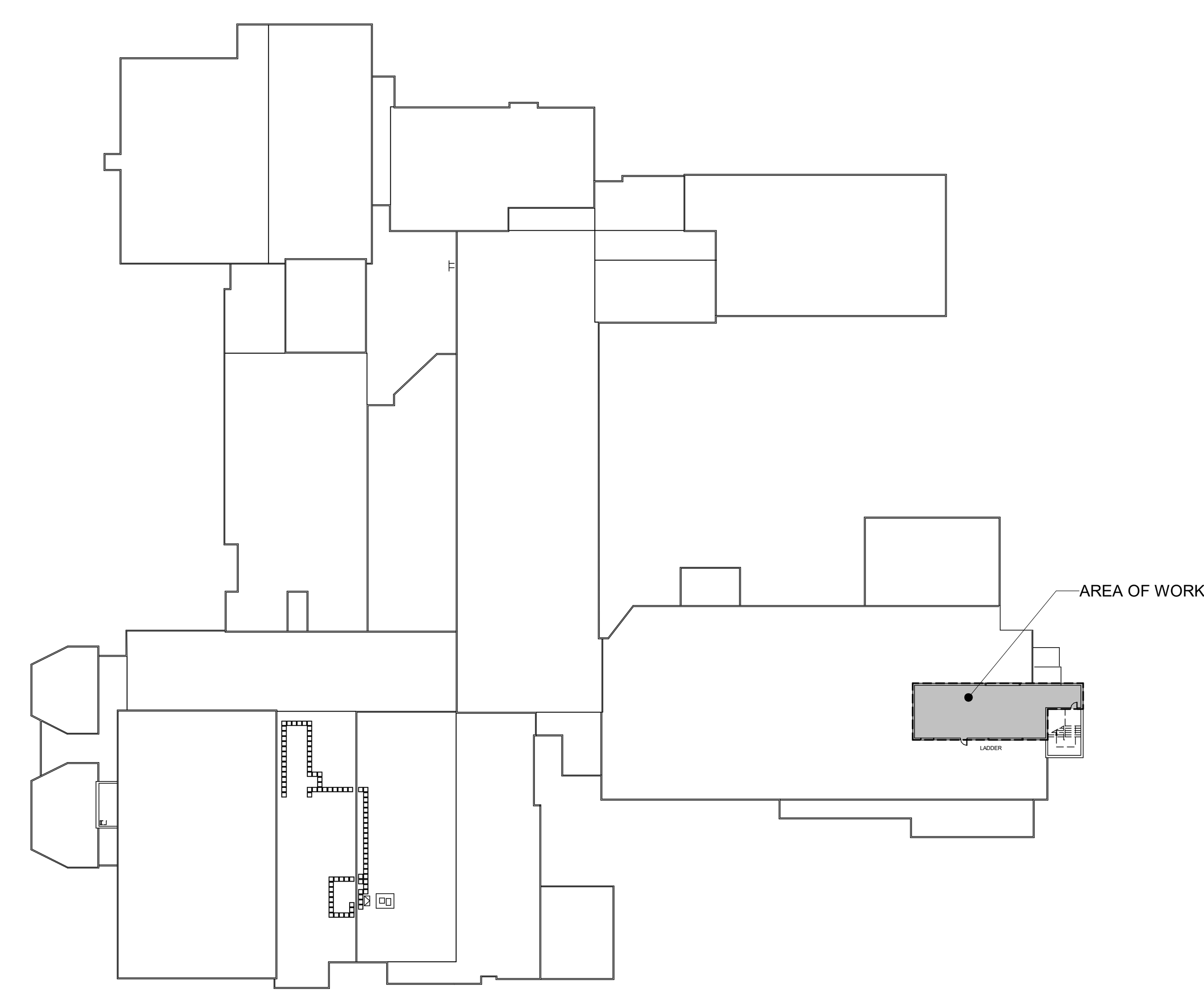


LEVEL 1

BASEMENT



LEVEL 2



ROOF LEVEL

OVERALL PLANS
SCALE: 1 : 750

GENERAL NOTES - KEYPLAN

-	'ER' INDICATES EXISTING ITEM TO REMAIN.
-	EXISTING ELECTRICAL EQUIPMENT NOT SHOWN SHALL REMAIN UNLESS OTHERWISE NOTED.
-	MAINTAIN SERVICE TO ALL EXISTING DEVICES TO REMAIN.
-	'D' INDICATES EXISTING ITEM TO BE DEMOLISHED. UNLESS OTHERWISE NOTED DISCONNECT AND REMOVE NOTED DEVICE AND WIRING BACK TO SOURCE.

SPECIFIC NOTES - OVERALL PLAN

1	INDICATES APPROXIMATE LOCATION OF EXISTING FIRE ALARM CONTROL PANEL - EDWARDS EST SERIES
2	INDICATES APPROXIMATE LOCATION OF EXISTING MAIN SWITCHBOARD 'SWBD-AA' - 120/208V, 3PH 4W, 2000A, 50kAIC, SCHNEIDER SQUARE D TYPE QED
3	INDICATES PROPOSED ROUTING OF NEW PANEL FEEDER TO BE INSTALLED ABOVE ACCESSIBLE CEILING SPACE. PROVIDE UNISTRUT TRAPEZE SECURED TO STRUCTURE ABOVE. REMOVE CEILING TILES IN EXISTING CORRIDOR TO SUIT DISTRIBUTION WORK AS REQUIRED. REPLACE ANY BROKEN TILES WITH NEW MATCHING EXISTING. EXACT ROUTING TO BE COORDINATED ON SITE.
4	INDICATES EXISTING COMPRESSOR UNIT TO BE REMOVED COMPLETE BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING CONDUIT AND WIRING BACK TO SOURCE PANEL AND MAKE SAFE. MARK BREAKER AS SPARE.
5	INDICATES EXISTING UNIT HEATER TO BE REMOVED COMPLETE BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING CONDUIT AND WIRING BACK TO SOURCE PANEL AND MAKE SAFE. MARK BREAKER AS SPARE.
6	INDICATES PROPOSED LOCATION FOR NEW BAS PANEL. PROVIDE 120V 15A RECEPTACLE AND DATA ROUGH-IN C/W 21mmC TO CEILING SPACE OR NEAREST CABLE MANAGEMENT SYSTEM. AS PART OF BASE BID PRICE (TO BE CARRIED AS AN ALLOWANCE) INCLUDE FOR 120V DEDICATED CIRCUIT C/W 15A-1P BREAKER AND 100' OF CONDUIT FROM NEAREST PANEL. EXACT LOCATION OF BAS PANEL TO BE CONFIRMED ON SITE WITH OWNER AND MECHANICAL CONTRACTOR. REFER TO ALLOWANCES IN ELECTRICAL SPECIFICATION SECTIONS 26 05 75 AND 26 27 26 FOR FURTHER DETAILS AND REQUIREMENTS.

ELECTRICAL SYMBOLS

NOTE: ALL SYMBOLS MAY NOT BE USED

LIGHTING		POWER	
X	LIGHT FIXTURE TYPE AS INDICATED		WALL MOUNTED RECEPTACLE (15A-120V)
X	LIGHT FIXTURE (HATCHING DENOTES NIGHTLIGHT)		WALL MOUNTED T-SLOT RECEPTACLE (20A-120V)
EM-X DC-X X-X	COMBINATION EMERGENCY/EXIT TYPE AS INDICATED (EM-X INDICATES BATTERY UNIT TYPE, DC-X INDICATES DC CIRCUIT AND X-X INDICATES AC SOURCE CIRCUIT)		T-SLOT RECEPTACLE MTD. ABOVE COUNTER (20A-120V)
		S	RECEPTACLE MTD. ABOVE COUNTER S = SPLIT (15A-120V)
	CEILING OR WALL MOUNTED LIGHT FIXTURE TYPE AS INDICATED		DIRECT CONNECTION
	WALL MOUNTED EXIT LIGHT SHADING INDICATES FACE	JB	JUNCTION BOX
	CEILING MOUNTED EXIT LIGHT ARROWS DENOTE DIRECTION SHADING INDICATES FACE		PANEL AS INDICATED
	SINGLE OR TWIN EMERGENCY LIGHTING FIXTURE		FUSED DISCONNECT
	RECESSED REMOTE EMERGENCY FIXTURES		UNFUSED DISCONNECT
BU	CEILING RECESSED BATTERY UNIT C/W INTEGRAL EMERGENCY FIXTURES	VFD	VARIABLE FREQUENCY DRIVE
BU EM-X DC-X X-X	BATTERY UNIT WITH INTEGRAL EMERGENCY FIXTURE (EM-X INDICATES BATTERY UNIT TYPE, DC-X INDICATES DC CIRCUIT AND X-X INDICATES AC SOURCE CIRCUIT)		PUSH-BUTTON STATION (QUANTITY OF BUTTONS AS PER PLANS)
		DVR	DUAL VOLTAGE RELAY
$	SINGLE POLE SWITCH (3=3 WAY, 4=4 WAY, P=PILOT LIGHT, K=KEYED, DM=DIMMER, M=MOTOR RATED)		MANUAL STARTER
$ OS	OCCUPANCY SENSOR (PASSIVE)		MAGNETIC STARTER
OSD/OSR $	OCCUPANCY SENSOR: OSD=DUAL TECHNOLOGY OSR=DUAL CIRCUIT/DUAL TECHNOLOGY		COMBINATION MAGNETIC STARTER
OS	CEILING MOUNTED MOTION SENSOR		SURFACE RACEWAY C/W DEVICES AS NOTED (REFER TO SPECIFICATIONS)
DR	DIGITAL ROOM CONTROLLER	RA T	THERMOSTAT (RA = REVERSE ACTING) HONEYWELL CAT. #T6051 SERIES
3B	DIGITAL WALL STATION, 'X' DENOTES NUMBER OF CONTROL BUTTONS IN SINGLE GANG	M	METER
	FIRE ALARM		UNISTRUT UPSTAND
	HEAT DETECTOR (135 DEGREE RATE OF RISE AND FIXED TEMPERATURE)		TRANSFORMER
S RL	SMOKE DETECTOR (RL=RELAY BASE)	SECURITY	
S	DUCT TYPE SMOKE DETECTOR	DC	DOOR CONTACT C/W 19mmC TO NEAREST SECURITY JUNCTION BOX (REFER TO DETAIL)
	ALARM BELL	ES	ELECTRIC STRIKE. CONFIRM ROUGHIN WITH DOOR HARDWARE.
FSD	FIRE SMOKE DAMPER	CR	CARD/FOB READER ROUGH-IN AS A SINGLE GANG BOX AT 1100mm AFF C/W 13mmC TO ELECTRIC STRIKE IN ADJACENT DOOR FRAME. CONFIRM ROUGH-IN WITH DOOR HARDWARE.
DATA			
	SINGLE WALL MOUNTED TELEPHONE OUTLET C/W 3/4" (21mm) C TO CABLE MANAGEMENT SYSTEM.	GENERAL	
	SINGLE COMPUTER OUTLET C/W 3/4" (21mm) C TO CABLE MANAGEMENT SYSTEM.	ER	INDICATES EXISTING ITEM TO REMAIN
	COMBINATION SINGLE VOICE/SINGLE COMPUTER OUTLET UNLESS OTHERWISE NOTED C/W 3/4" (21mm) C TO CABLE MANAGEMENT SYSTEM.	D	INDICATES EXISTING ITEM TO BE DEMOLISHED
		R	INDICATES EXISTING ITEM TO BE RELOCATED/ IN RELOCATED POSITION
WAP	WIRELESS ACCESS POINT. PROVIDE 3/4" (21mm) C TO CABLE MANAGEMENT SYSTEM.	GF	GROUND FAULT
C	HANGER SYSTEM (REFER TO DETAILS)	WP	WEATHERPROOF
	HANDSET (ND = NON DIAL STYLE)	CLG	CEILING MOUNTED
COMMUNICATIONS		X	NOTE INDICATOR
	CLOCK AS PER SPECIFICATIONS	X	MECHANICAL ITEM INDICATOR
	WALL MOUNTED SPEAKER (CS = COLUMN SPEAKER)	STANDARD CIRCUIT LABELLING	
	WALL MOUNTED SPEAKER C/W CALL IN SWITCH	A - 1 - 1	POWER PANEL LABEL / CIRCUIT INDICATION / SWITCH LEG (IF APPLICABLE)
S	CEILING MOUNTED SPEAKER		

6

SHEET LIST

PROJECT NORTH

No.	REVISIONS	DATE
1	ISSUED FOR 50% PROGRESS	2024.01.14
2	ISSUED FOR 75% REVIEW	2025.01.31
4	ISSUED FOR PERMIT/TENDER	2025.03.05
5	ISSUED FOR ADDENDUM 01	2025.03.20
6	ISSUED FOR ADDENDUM 02	2025.03.24

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number:24162

aba architects inc.
101 Randall Drive, Unit B, Waterloo ON. TEL 519 884 2711 www.abarchitect.ca

CLIENT
WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME
GLENVIEW PARK SECONDARY SCHOOL HVAC IMPROVEMENTS
55 McKay St., Cambridge, ON, N1R 4G8

DRAWING TITLE
LEGEND AND OVERALL PLANS

SCALE: As indicated
SHEET SIZE: 24X36
PROJECT NUMBER: 24162
DRAWING NUMBER: E101

2025-03-24 3:54:08 PM C:_Revit\24162 WRDSB Glenview Park SS Elec Central (RVT23)_jbinghamTLAL.rvt

EQUIPMENT WIRING SCHEDULE

E = ELECTRICAL
M = MECHANICAL
O = OTHERS

Description			Electrical Data				Starter						Ctrl Device				Isolating Device				Remote Items														Other		Interlock		
Mechanical Item	Description	Provided By	Voltage	Size hp/kW/Amps	Phase	MOCP	Magnetic	Manual	Combination	Contactor	VFD	ECM (No Separate Starter Device)	Hand/Off/Auto	On/Off Selector	High/Low/Off	Pilot Light	Disconnect	WP Disconnect	Breaker/Fuse	Starter/Device Wired by	Thermostat	RA Thermostat	Programmable Time Clock	Variable Speed Control	Current Sensor	Occ Sensor	Dual Voltage Relay	Interval Timer	VRF System Control Panel	Smoke Control System Panel	Control Panel	Wired by	Bldg Auto System	Wired By	Miscellaneous 1	Miscellaneous 2	Interlock to	Interlock by	Remarks
PHASE 1																																							PHASE 1
EF-5	ROOFTOP EXHAUST FAN (CHEMISTRY A212)	M	120	1/4 HP	1									E				E	E	E							M					M/E	M	M			MOT. DAMPER	M	PROVIDE INDICATING LIGHT. INTERLOCK TO MOTORIZED DAMPER
EF-6	ROOFTOP EXHAUST FAN (BIOLOGY A211)	M	120	1/4 HP	1									E				E	E	E							M					M/E	M	M			MOT. DAMPER	M	PROVIDE INDICATING LIGHT. INTERLOCK TO MOTORIZED DAMPER
EF-7	ROOFTOP EXHAUST FAN (CHEMISTRY A212 FUME HOOD)	M	208	3/4 HP	3		E							E				E	E	E												M/E	M	M			FUME HOOD & MOT. DAMPER	M/E	CONNECT TO SWITCH ON FUME HOOD. INTERLOCK TO MOTORIZED DAMPER
SP-1	ELEVATOR SUMP (SIMPLEX)	M	208	0.5 HP	3												E		E	E											M	M/E							PROVIDE RECEPTACLE FOR HIGH LEVEL ALARM. WIRE FLOATS THROUGH CONTROL PANEL
DS-3	DELETED																																						
CU-3	DELETED																																						
GSV	GAS SOLENOID VALVE	M	120	FHP	1														E	E							M					M/E	M	M					REFER TO PLANS FOR NUMBER & LOCATIONS
BAS	BAS PANEL	M	120	FHP	1												E		E	E													M	M					PROVIDE TWO DATA DROPS AND RECEPTACLE. REFER TO PLANS FOR NUMBER & LOCATIONS
NT	ACID NEUTRALIZING TANK	M	120	FHP	1												E		E	E																			PROVIDE RECEPTACLE
EF-8	ELEVATOR MACHINE ROOM EXHAUST	M	120	1/4 HP	1																	E					M												
PHASE 2																																							
HVAC-5-SF	INDOOR HVAC UNIT SUPPLY FAN	M	208	93.8 AMPS	3	150					M						E		E	E													M	M			CU-4A CU-4B		75 FLA. MOTOR C/W FACTORY PROVIDED EXTERNAL JUNCTION BOX. VFD INSTALL AND POWER CONNECTION BY ELECTRICAL DIVISION
HVAC-5-EF	INDOOR HVAC UNIT RETURN/EXHAUST FAN (X2)	M	208	2 @ 31.3 A	3	45					M						E		E	E													M	M					13.9 FLA (X2). ECM FANS FACTORY-WIRED TO CONTROL BOX. FIELD POWER TO POWER BLOCK BY ELECTRICAL DIVISION
HVAC-5-ERW	INDOOR HVAC UNIT ENERGY RECOVERY WHEEL	M	208	3.0 A	3	15					M						E		E	E													M	M					2.4 FLA. FACTORY WIRED TO FACTORY-INSTALLED VFD. FIELD POWER TO POWER BLOCK BY ELECTRICAL DIVISION
HVAC-5-UC	INDOOR HVAC UNIT CONTROLLER	M	120	FHP	1	15											E		E	E													M	M					FIELD SUPPLIED. INTERFACE TO ALL HVAC-5 COMPONENTS TO MANAGE UNIT FUNCTION
CU-3A1	CONDENSING UNIT	M	208	61.9 A	3	70												E	E	E													M	M			HVAC-5		CU-4A IS TWO MODULES. REFER TO PLANS FOR NUMBER & LOCATIONS.
CU-3A2	CONDENSING UNIT	M	208	61.9 A	3	70												E	E	E													M	M			HVAC-5		CU-4A IS TWO MODULES. REFER TO PLANS FOR NUMBER & LOCATIONS.
CU-3B1	CONDENSING UNIT	M	208	61.9 A	3	70												E	E	E													M	M			HVAC-5		CU-4B IS TWO MODULES. REFER TO PLANS FOR NUMBER & LOCATIONS.
CU-3B2	CONDENSING UNIT	M	208	61.9 A	3	70												E	E	E													M	M			HVAC-5		CU-4B IS TWO MODULES. REFER TO PLANS FOR NUMBER & LOCATIONS.
BS-	BRANCH SELECTOR BOX	M	208	0.4 A	1												E		E	E													M	M			HVAC-5, CU-4A, CU-4B		REFER TO PLANS FOR NUMBER & LOCATIONS. PROVIDE SEPARATE CIRCUIT FOR EACH SET (X6) OF BRANCH BOXES FOR EACH CONDENSING UNIT
CB-	CU CONTROL BOX	M	208	0.3 A	1												E		E	E													M	M			CU-4A CU-4B		REFER TO PLANS FOR NUMBER & LOCATIONS
P-10	HVAC-5 HEATING COIL CIRCULATION PUMP	M	208	0.5 HP	3				E				E			E	E		E	E													M	M					

Notes:

1 PROVIDE MAIN FEED TO UNIT. PROVIDE ADDITIONAL FEED FROM TERMINAL STRIPS WITHIN UNIT TO VARIABLE FREQUENCY DRIVE AND BACK TO UNIT (IN SEPARATE CONDUITS). COORDINATE CONDUCTOR SIZE TO AND FROM VARIABLE FREQUENCY DRIVE WITH MECHANICAL SHOP DRAWINGS.

The contractor shall verify all dimensions and report all errors and discrepancies to the Consultant before commencement of the work.
The drawings show general arrangement of services. Follow as closely as actual building construction will permit. Obtain approval for relocation of service from Consultant before commencement of the work.
The drawings do not indicate all offsets fitting and accessories which may be required. Provide the same to meet the required conditions.
Drawings and specifications, etc., prepared and issued by the Consultant are the property of the Consultant and must be returned at the completion of the project. These documents are not to be duplicated or copied without the consent of the Consultant.
Do not scale this drawing.

PROJECT NORTH

No.	REVISIONS	DATE
1	ISSUED FOR 50% PROGRESS	2024.01.14
2	ISSUED FOR 75% REVIEW	2025.01.31
4	ISSUED FOR PERMIT/TENDER	2025.03.05
5	ISSUED FOR ADDENDUM 01	2025.03.20
6	ISSUED FOR ADDENDUM 02	2025.03.24

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road,
Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number:24162

aba architects inc.

CLIENT

WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME

GLENVIEW PARK SECONDARY SCHOOL HVAC IMPROVEMENTS
55 McKay St., Cambridge, ON, N1R 4G8

DRAWING TITLE

EQUIPMENT WIRING SCHEDULE

SCALE

SHEET SIZE
24X36

PROJECT NUMBER
24162

DRAWING NUMBER
E103

2025-03-24 3:54:08 PM C:_Revit\24162 WRDSB Glenview Park SS Elec Central (RVT23)_jbingham7JLAL.rvt

FOR ALL ROOFTOP CONDENSING UNITS, INSTALL FEEDERS THROUGH DOGHOUSE ROOF PENETRATION AS DETAILED ON MECHANICAL DRAWINGS.

NEW FEEDERS TO FOLLOW SAME ROUTE AS MECHANICAL PIPING. COORDINATE DETAILS WITH MECHANICAL TRADE

NOTES: CIRCUIT LABELS

PROVIDE P-TOUCH LABELS INDICATING PANEL AND CIRCUIT LABEL ON ALL LIGHT SWITCH, LIGHTING CONTROL STATION, AND RECEPTACLE DEVICE FACEPLATES. INCLUDE SWITCH LEG INDICATION FOR LIGHTING CONTROLS AND SWITCHES.

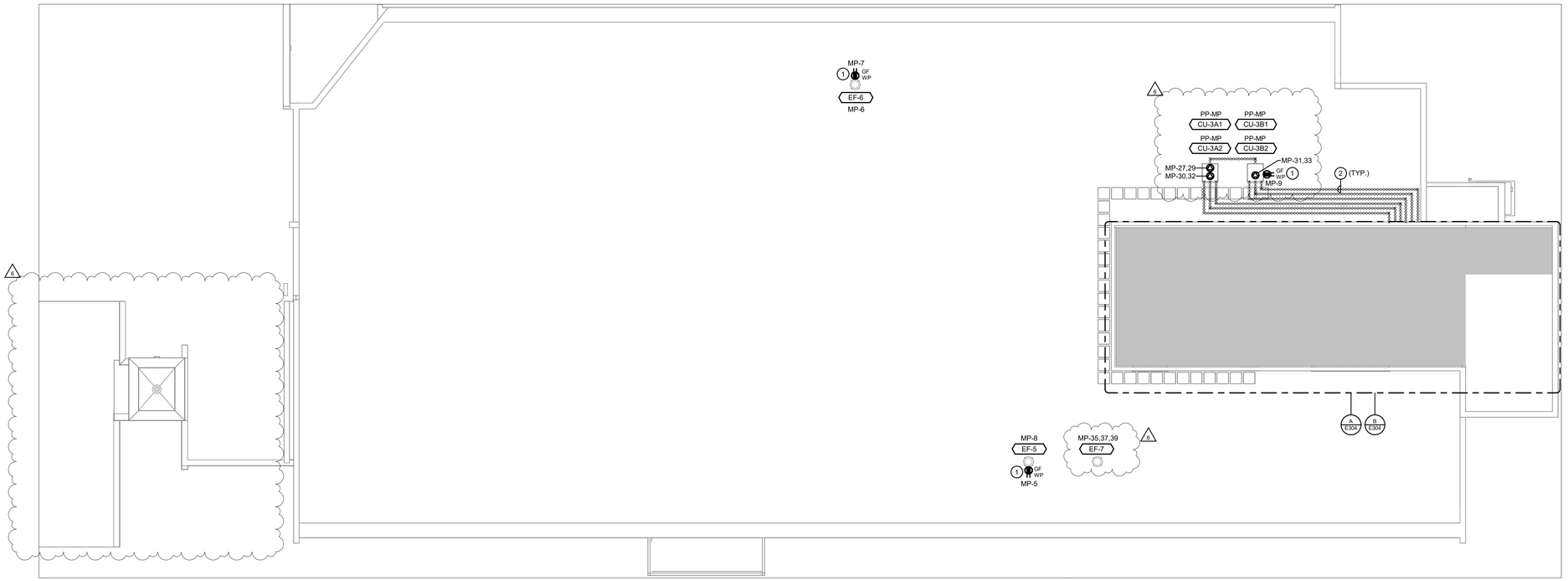
REFER TO SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.

GENERAL NOTES - RENOVATION

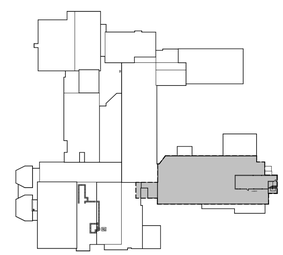
-	'ER' INDICATES EXISTING ITEM TO REMAIN.
-	'R' INDICATES EXISTING ITEM IN RELOCATED POSITION.
-	ALL DEVICES SHOWN ARE NEW UNLESS OTHERWISE NOTED.
-	EXISTING ELECTRICAL EQUIPMENT NOT SHOWN SHALL REMAIN UNLESS OTHERWISE NOTED.
-	MAINTAIN SERVICE TO ALL EXISTING DEVICES TO REMAIN.
-	REVISE PANEL DIRECTORIES TO SUIT CHANGES (TYPED).

SPECIFIC NOTES

1	PROVIDE T-SLOT GROUND FAULT RECEPTACLE COMPLETE WITH "EXTRA DUTY" IN-USE COVER. COORDINATE PLACEMENT WITH MECHANICAL CONTRACTOR. INDICATED DEVICE SHALL BE MOUNTED AT 915mm ABOVE FINISHED ROOF LEVEL. PROVIDE SUITABLE SUPPORT AT MECHANICAL EQUIPMENT (IF APPLICABLE).
2	INDICATES MECHANICAL PIPING TO BE HEAT TRACED BY MECHANICAL CONTRACTOR AND IS SHOWN FOR REFERENCE PURPOSES ONLY. ELECTRICAL CONTRACTOR SHALL PROVIDE 208V 1PH CIRCUIT C/W GFI PROTECTED BREAKER (30mA) FOR MECHANICAL PIPE HEAT TRACING. COORDINATE EXACT LOCATION TO PROVIDE POWER CONNECTIONS AND ALL OTHER REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO CARRYING OUT SCOPE OF WORK.



ROOF - SCIENCE WING - POWER & SYSTEMS RENOVATION PLAN
SCALE: 1 : 125



KEYPLAN - ROOF
SCALE: NTS

The contractor shall verify all dimensions and report all errors and discrepancies to the Consultant before commencement of the work.
The drawings show general arrangement of services. Follow as closely as actual building construction will permit. Obtain approval for relocation of service from Consultant before commencement of the work.
The drawings do not indicate all offsets fitting and accessories which may be required. Provide the same to meet the required conditions.
Drawings and specifications, etc., prepared and issued by the Consultant are the property of the Consultant and must be returned at the completion of the project. These documents are not to be duplicated or copied without the consent of the Consultant.
Do not scale this drawing.

PROJECT NORTH

No.	REVISIONS	DATE
2	ISSUED FOR 75% REVIEW	2025.01.31
4	ISSUED FOR PERMIT/TENDER	2025.03.05
6	ISSUED FOR ADDENDUM 02	2025.03.24

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-745-3555
Website: deiassociates.ca
Project Number:24162

aba architects inc.
103 Randall Drive, Unit 6, Waterloo ON, N2V 1Y7 www.abaarchitect.ca

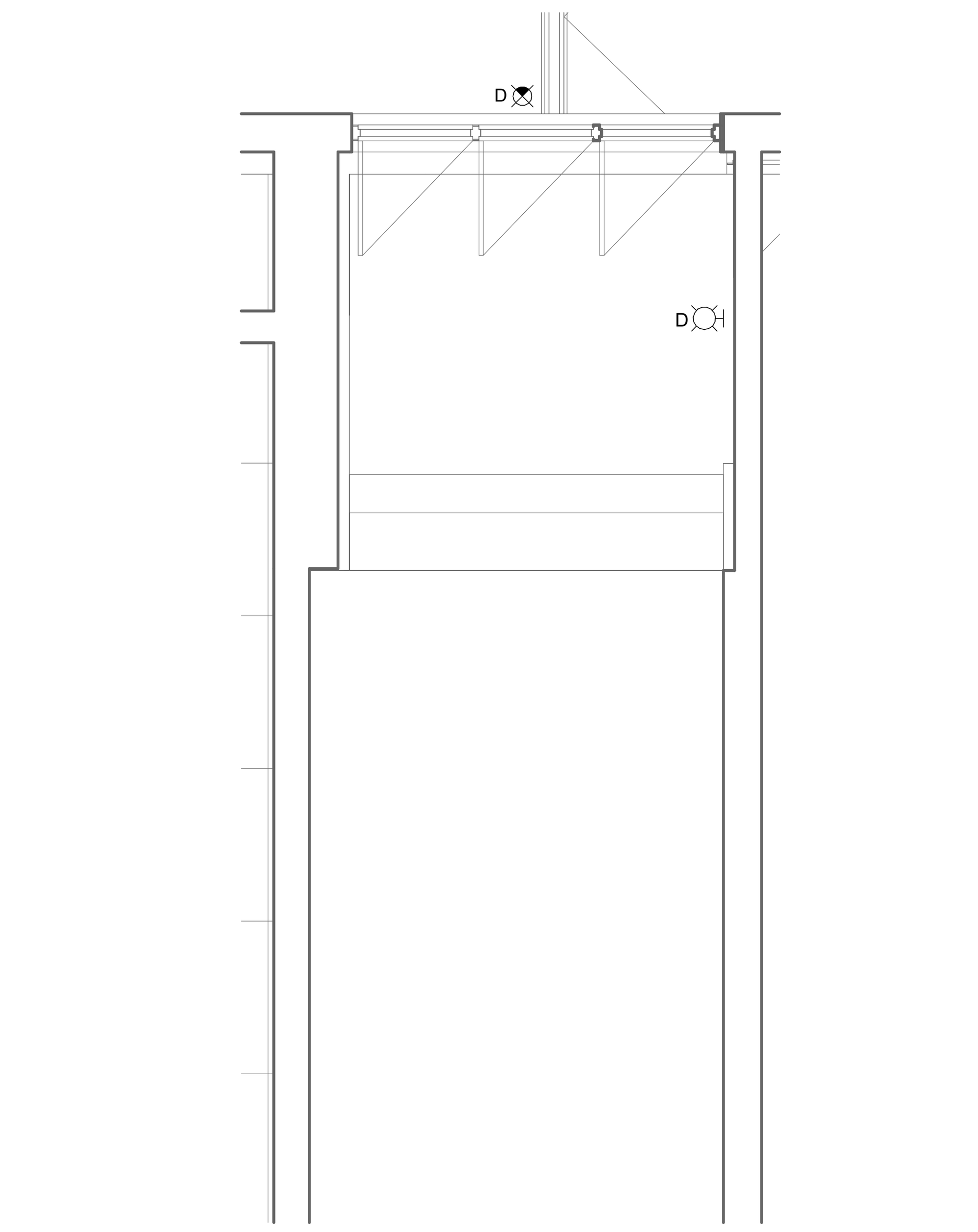
CLIENT
WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME
GLENVIEW PARK SECONDARY SCHOOL HVAC IMPROVEMENTS
55 McKay St., Cambridge, ON, N1R 4G8

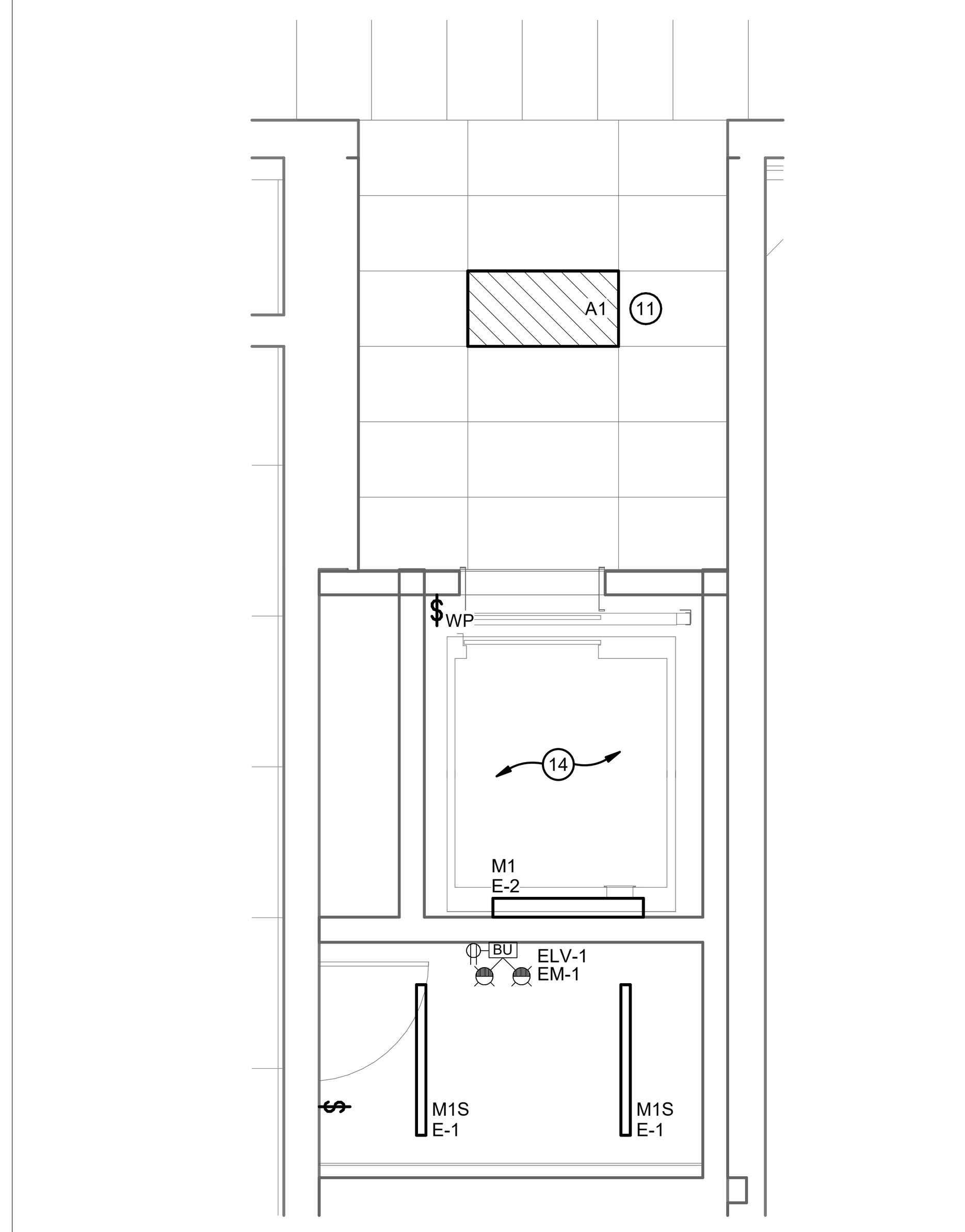
DRAWING TITLE
ROOF - SCIENCE WING - POWER & SYSTEMS RENOVATION PLAN

SCALE	As indicated
SHEET SIZE	24X36
PROJECT NUMBER	24162

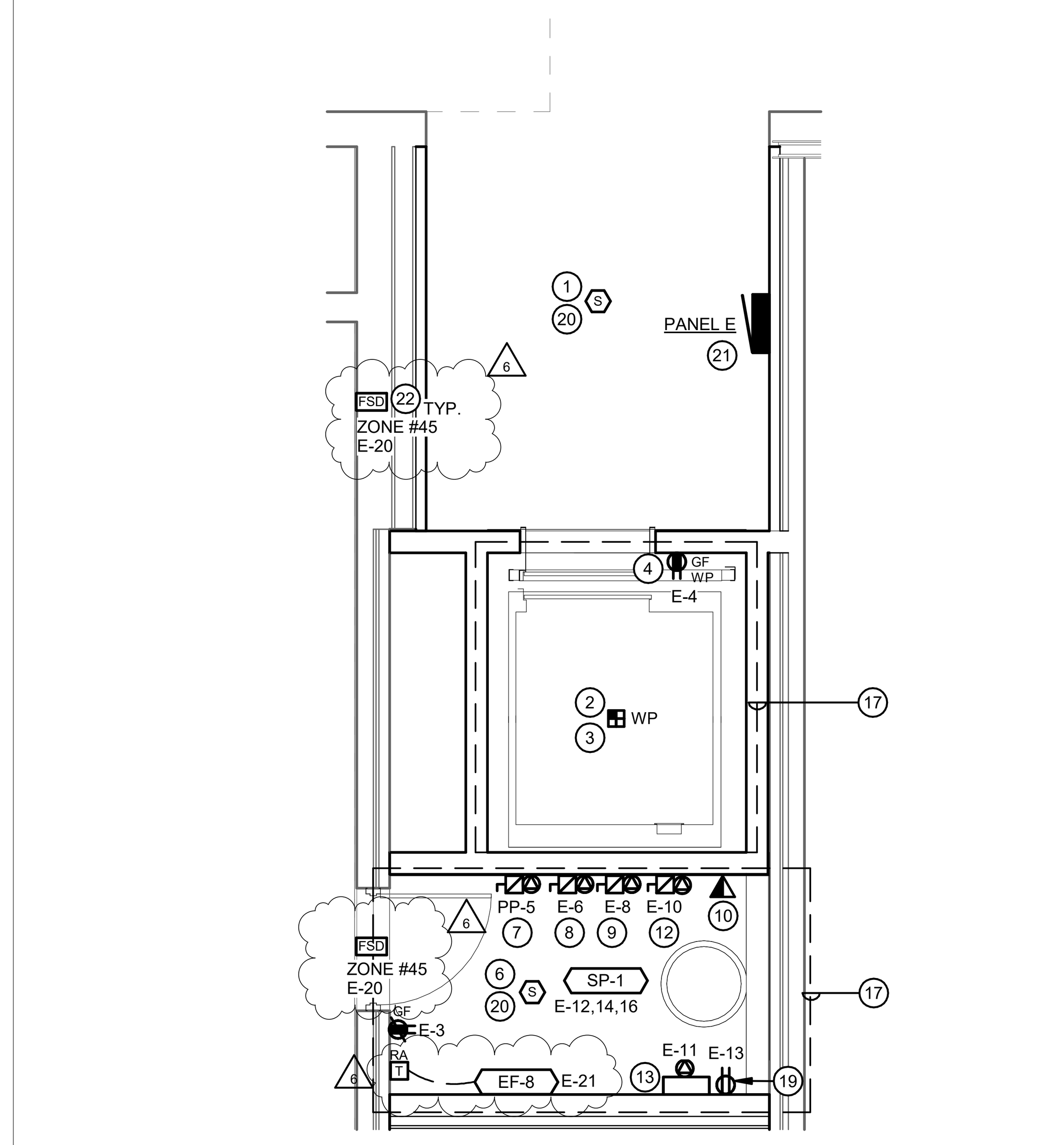
DRAWING NUMBER
E204



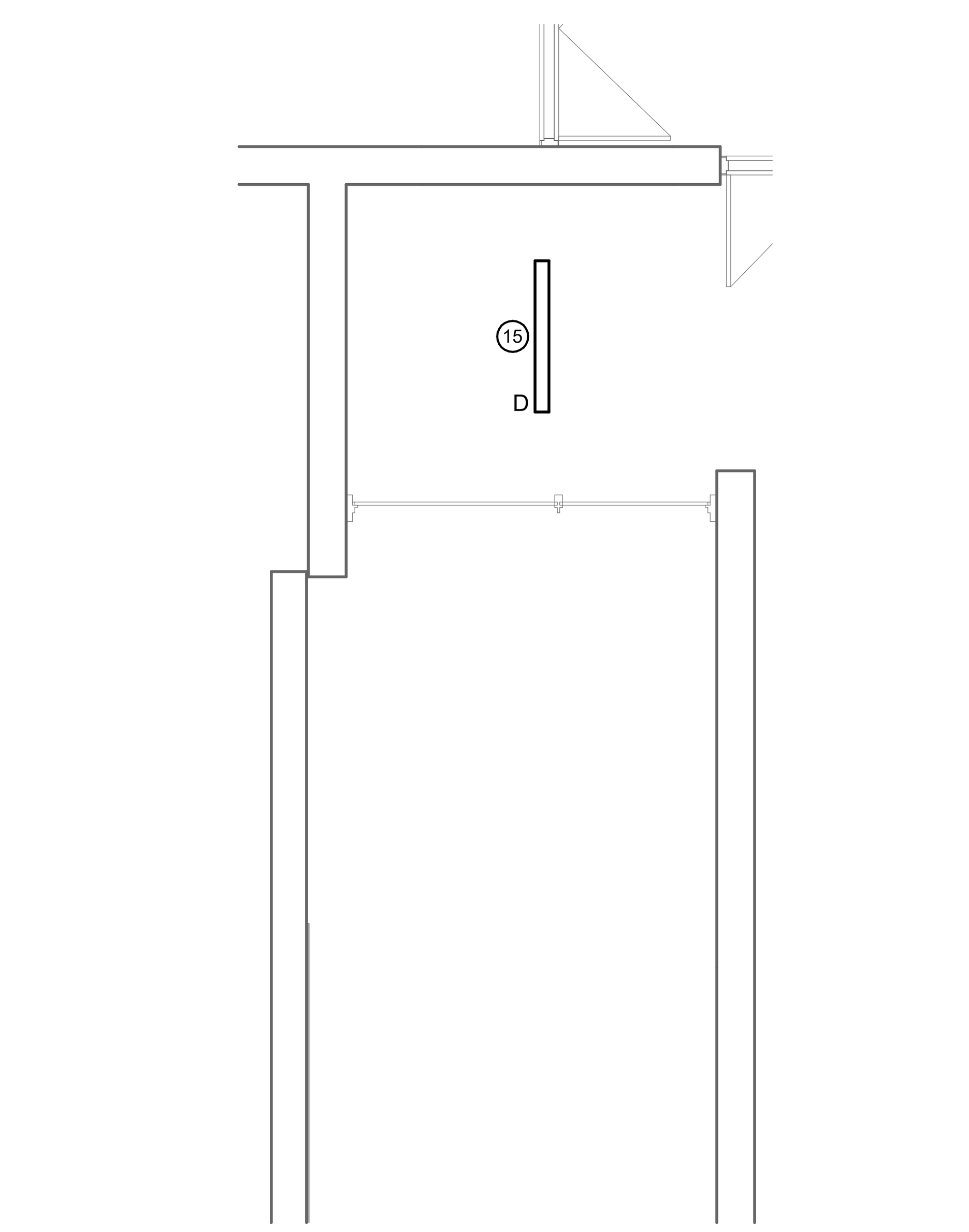
A - LIGHTING DEMOLITION PLAN - ELEVATOR LEVEL 1
SCALE: 1 : 50



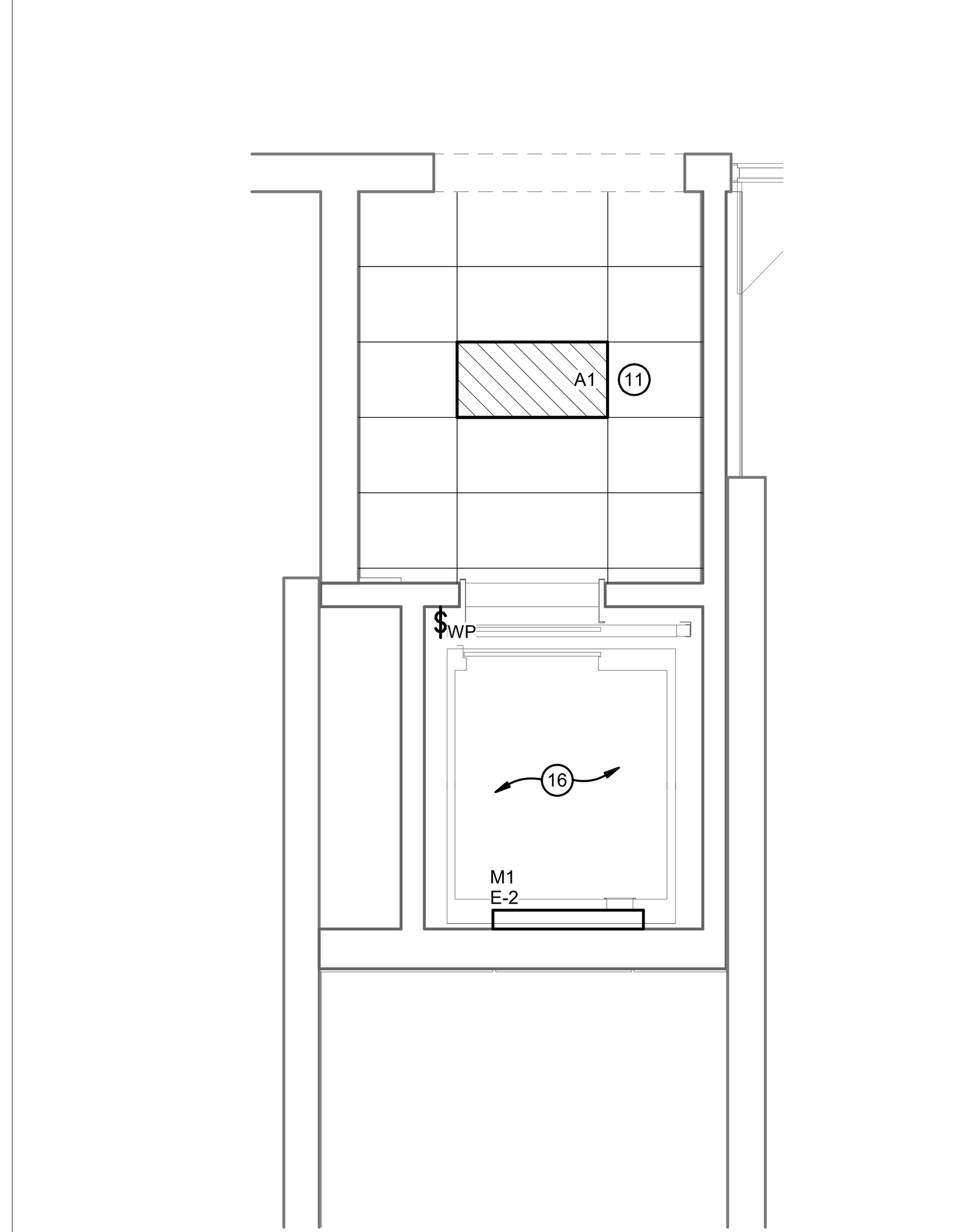
B - LIGHTING RENOVATION PLAN - ELEVATOR LEVEL 1
SCALE: 1 : 50



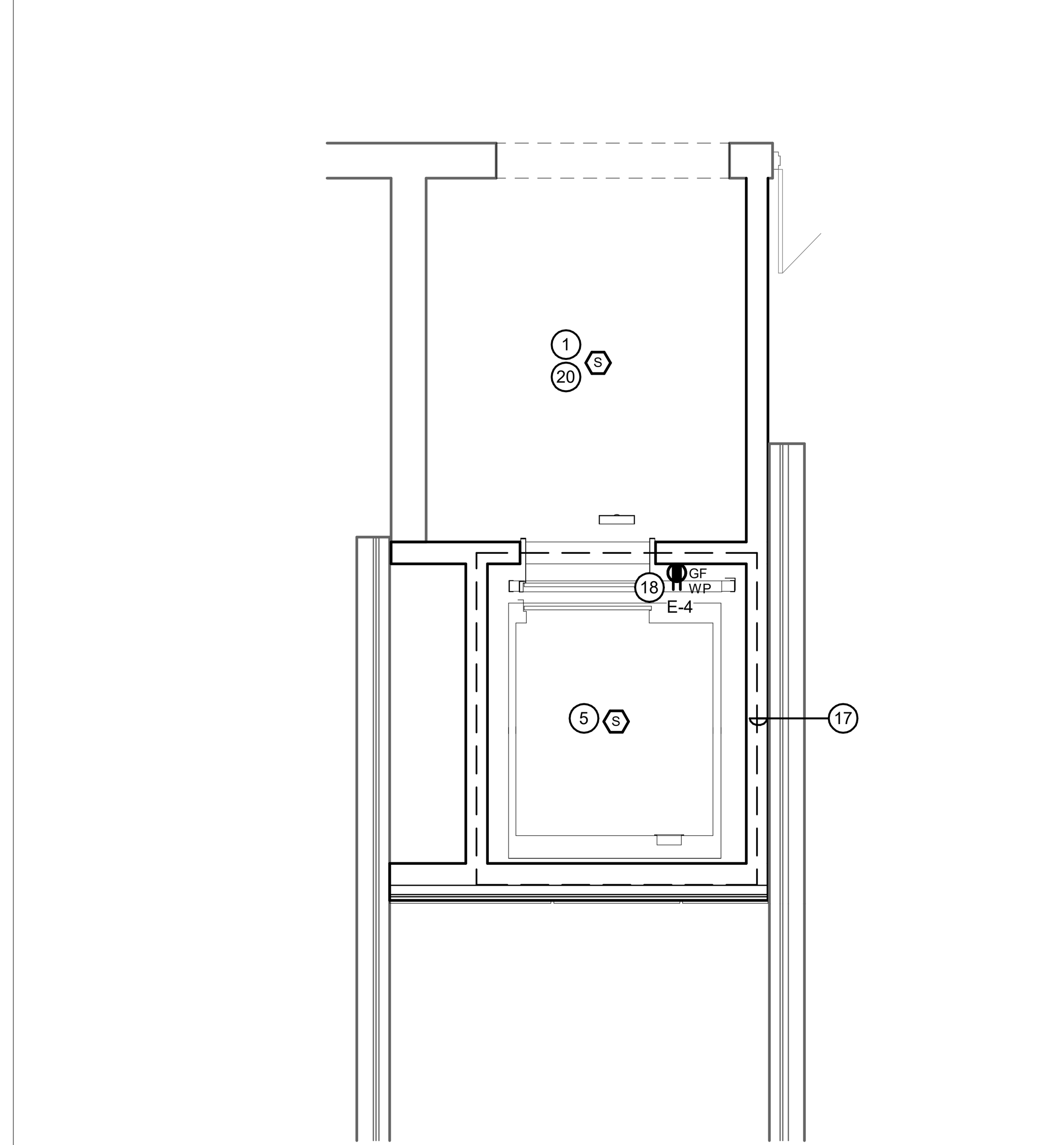
E - POWER & SYSTEMS RENOVATION PLAN - ELEVATOR LEVEL 1
SCALE: 1 : 50



C - LIGHTING DEMOLITION PLAN - ELEVATOR LEVEL 2
SCALE: 1 : 50



D - LIGHTING RENOVATION PLAN - ELEVATOR LEVEL 2
SCALE: 1 : 50



F - POWER & SYSTEMS RENOVATION PLAN - ELEVATOR LEVEL 2
SCALE: 1 : 50

GENERAL NOTES - DEMOLITION

-	'ER' INDICATES EXISTING ITEM TO REMAIN.
-	EXISTING ELECTRICAL EQUIPMENT NOT SHOWN SHALL REMAIN UNLESS NOTED OTHERWISE.
-	'R' INDICATES EXISTING ITEM TO BE RELOCATED. REFER TO RENOVATION DRAWINGS AND RELOCATE DEVICE AND WIRING TO SUIT. UNLESS OTHERWISE NOTED.
-	'D' INDICATES EXISTING ITEM TO BE DEMOLISHED. UNLESS OTHERWISE NOTED DISCONNECT AND REMOVE NOTED DEVICE AND WIRING BACK TO SOURCE.
-	ALL LIGHTING FIXTURES BEING RELOCATED SHALL BE CLEANED AND CHECKED PRIOR TO BEING REINSTALLED.

GENERAL NOTES - RENOVATION

-	'ER' INDICATES EXISTING ITEM TO REMAIN.
-	'R' INDICATES EXISTING ITEM IN RELOCATED POSITION.
-	ALL DEVICES SHOWN ARE NEW UNLESS OTHERWISE NOTED.
-	EXISTING ELECTRICAL EQUIPMENT NOT SHOWN SHALL REMAIN UNLESS OTHERWISE NOTED.
-	MAINTAIN SERVICE TO ALL EXISTING DEVICES TO REMAIN.
-	REVISE PANEL DIRECTORIES TO SUIT CHANGES (TYPED).

SPECIFIC NOTES

1	PROVIDE PROGRAMMING TO INITIATE ELEVATOR RECALL SEQUENCE WHEN ELEVATOR LOBBY SMOKE DETECTOR IS ACTIVATED. PROVIDE REQUIRED COMPONENTS, WIRING ACCESSORIES TO ELEVATOR CONTROLLER.
2	PROVIDE PROGRAMMING TO INITIATE ELEVATOR RECALL SEQUENCE WHEN ELEVATOR PIT HEAT DETECTOR IS ACTIVATED. PROVIDE REQUIRED COMPONENTS, WIRING ACCESSORIES TO ELEVATOR CONTROLLER.
3	INDICATES NEW HEAT DETECTOR TO BE TIED INTO EXISTING FIRE ALARM SYSTEM. CONTRACTOR SHALL RE-WORK AND EXTEND EXISTING LOCAL INITIATING CIRCUIT AND CONNECT TO NEW DEVICE FOR A COMPLETE WORKING SYSTEM. MOUNT HEAT DETECTOR OFF BACK WALL OF ELEVATOR PIT. PROVIDE PROTECTIVE CAGE.
4	INDICATES RECEPTACLE TO BE MOUNTED IN ELEVATOR PIT. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT ON SITE WITH ELEVATOR CONTRACTOR PRIOR TO ROUGH-IN.
5	INDICATES NEW SMOKE DETECTOR TO BE TIED INTO EXISTING FIRE ALARM SYSTEM. CONTRACTOR SHALL RE-WORK AND EXTEND EXISTING LOCAL INITIATING CIRCUIT AND CONNECT TO NEW DEVICE FOR A COMPLETE WORKING SYSTEM. MOUNT SMOKE DETECTOR INDICATED AT TOP OF ELEVATOR SHAFT.
6	PROVIDE PROGRAMMING TO INITIATE ELEVATOR RECALL SEQUENCE WHEN ELEVATOR MACHINE ROOM SMOKE DETECTOR IS ACTIVATED. PROVIDE REQUIRED COMPONENTS, WIRING ACCESSORIES TO ELEVATOR CONTROLLER.
7	PROVIDE 208V 3PH POWER ALONG WITH FUSED DISCONNECT (C/W TWO SETS OF AUXILIARY CONTACTS) FOR ELEVATOR CONTROLLER. REFER TO DISTRIBUTION RISER DIAGRAM FOR FURTHER DETAILS AND REQUIREMENTS. COORDINATE WITH ELEVATOR SHOP DRAWINGS PRIOR TO ROUGH-IN. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR CONNECTION TO ELEVATOR CONTROLLER.
8	PROVIDE 120V POWER ALONG WITH 30A-1P FUSIBLE DISCONNECT C/W 15A CLASS 'J' FUSE FOR ELEVATOR CAB LIGHTING. COORDINATE WITH ELEVATOR SHOP DRAWINGS PRIOR TO ROUGH-IN.
9	PROVIDE 30A-1P FUSIBLE DISCONNECT C/W 15A FUSE FOR ELEVATOR COMMUNICATION DISCONNECT. CONNECT TO CIRCUIT INDICATED. CONFIRM EXACT LOCATION/REQUIREMENTS WITH ELEVATOR SHOP DRAWINGS PRIOR TO ROUGH-IN.
10	PROVIDE TELEPHONE/DATA OUTLET (ROUGH-IN ONLY) TO SUIT ELEVATOR SUPPLIER'S REQUIREMENTS. COORDINATE EXACT LOCATION OF TELEPHONE/DATA OUTLET WITH ELEVATOR SHOP DRAWINGS PRIOR TO ROUGH-IN.
11	INDICATES NEW NIGHT LIGHT FIXTURE TO BE ON 24/7. CONNECT FIXTURE TO UNSWITCHED SIDE OF EXISTING LOCAL LIGHTING CIRCUIT.
12	PROVIDE 30A-1P FUSIBLE DISCONNECT C/W 15A FUSE FOR ELEVATOR TANK COOLER DISCONNECT. CONNECT TO CIRCUIT INDICATED. CONFIRM EXACT LOCATION/REQUIREMENTS WITH ELEVATOR SHOP DRAWINGS PRIOR TO ROUGH-IN.
13	INDICATES ELEVATOR SUMP PUMP CONTROL PANEL. COORDINATE DETAILS AND REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.
14	INDICATES LIGHT FIXTURE AND SWITCH TO BE MOUNTED IN ELEVATOR PIT. COORDINATE EXACT LOCATION TO MOUNT FIXTURE AND SWITCH ON SITE WITH ELEVATOR CONTRACTOR.
15	INDICATED FIXTURE SHALL BE DISCONNECTED AND REMOVED COMPLETE. MAINTAIN, REWORK AND EXTEND EXISTING CIRCUIT AS REQUIRED TO SUIT NEW FIXTURES AS SHOWN ON RENOVATION DRAWINGS FOR A COMPLETE WORKING SYSTEM.
16	INDICATES LIGHT FIXTURE AND SWITCH TO BE MOUNTED AT TOP OF ELEVATOR SHAFT. COORDINATE EXACT LOCATION TO MOUNT FIXTURE AND SWITCH ON SITE WITH ELEVATOR CONTRACTOR.
17	CONTRACTOR TO UPDATE EXISTING ANNUNCIATOR ZONE SCHEDULE AND PASSIVE GRAPHICS WITH NEW ZONE. REFER TO ANNUNCIATOR ZONE SCHEDULE AND FIRE ALARM RISER DIAGRAM FOR FURTHER DETAILS. ALL NEW FIRE ALARM DEVICES SHALL BE INSTALLED IN CONFORMANCE WITH CAN/ULC-S524 "INSTALLATION OF FIRE ALARM SYSTEMS" AND VERIFIED IN CONFORMANCE WITH CAN/ULC-S537 "VERIFICATION OF FIRE ALARM SYSTEMS TO ENSURE SATISFACTORY OPERATION.
18	INDICATES RECEPTACLE TO BE MOUNTED AT TOP OF ELEVATOR SHAFT. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT ON SITE WITH ELEVATOR CONTRACTOR PRIOR TO ROUGH-IN.
19	INDICATES RECEPTACLE TO BE PROVIDED BY ELECTRICAL CONTRACTOR FOR SUMP PUMP HIGH LEVEL ALARM. COORDINATE EXACT LOCATION AND DETAILS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
20	CONNECT NEW FIRE ALARM INITIATING DEVICE TO EXISTING LOCAL INITIATING CIRCUIT.RE-VERIFY PORTIONS OF ALARM SYSTEM TO CAN/ULC-S537. REFER TO SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
21	INDICATES NEW PANEL TO BE RECESSED INTO BLOCK WALL. COORDINATE DETAILS AND REQUIREMENTS WITH ARCHITECT PRIOR TO ROUGH-IN.
22	PROVIDE 120V POWER AND FIRE ALARM CONNECTIONS TO FIRE/SMOKE DAMPER C/W INTEGRAL SMOKE DETECTOR. REFER TO FIRE ALARM SPECIFICATIONS AND TO RISER DIAGRAM FOR FURTHER DETAILS. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

6

NOTES: CIRCUIT LABELS

PROVIDE P-TOUCH LABELS INDICATING PANEL AND CIRCUIT LABEL ON ALL LIGHT SWITCH, LIGHTING CONTROL STATION, AND RECEPTACLE DEVICE FACEPLATES. INCLUDE SWITCH LEG INDICATION FOR LIGHTING CONTROLS AND SWITCHES.

REFER TO SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.

PROJECT NORTH

No.	REVISIONS	DATE
1	ISSUED FOR 50% PROGRESS	2024.01.14
2	ISSUED FOR 75% REVIEW	2025.01.31
4	ISSUED FOR PERMIT/TENDER	2025.03.05
6	ISSUED FOR ADDENDUM 02	2025.03.24

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road,
Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number:24162

aba architects inc.

CLIENT

WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME

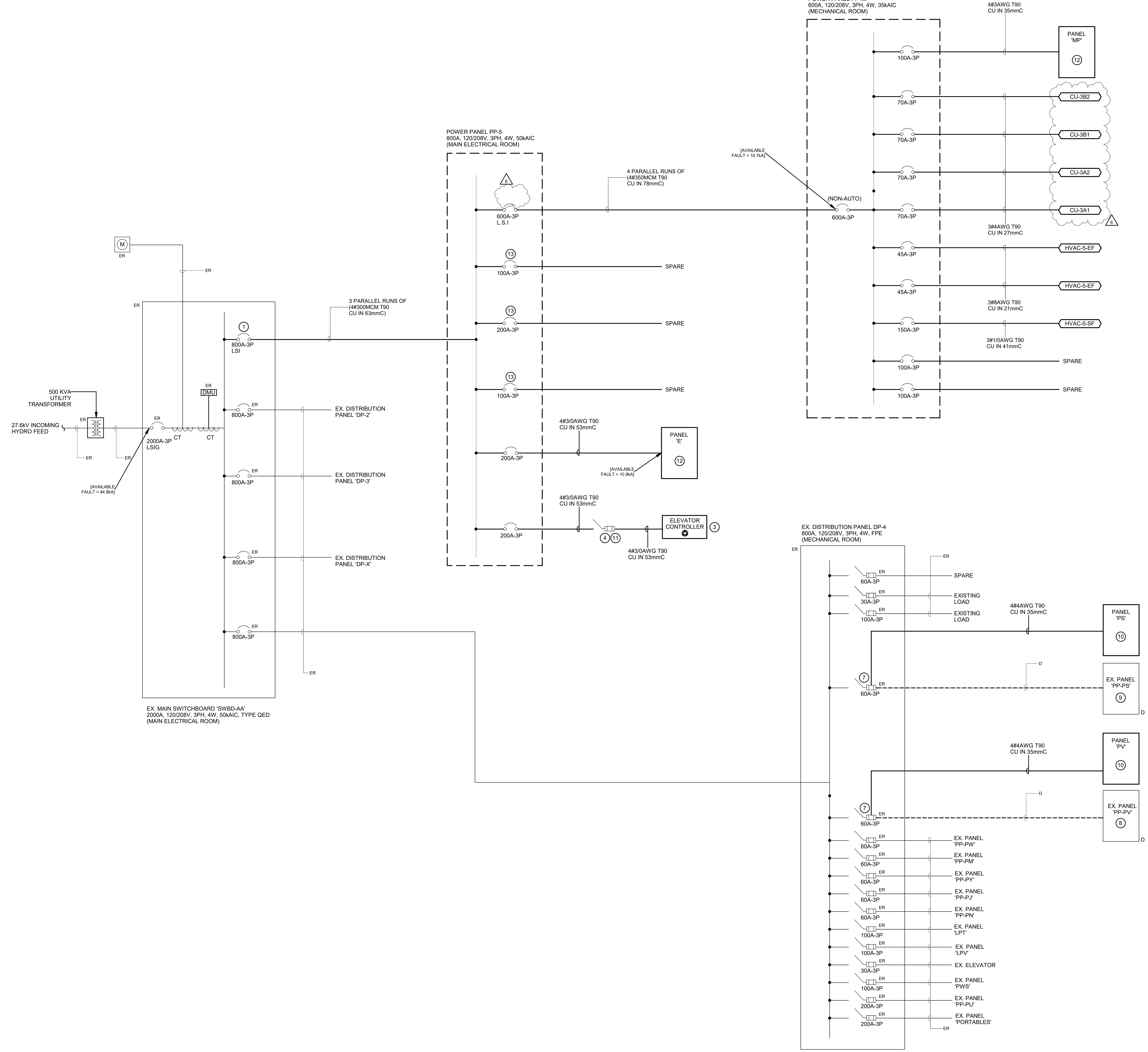
GLENVIEW PARK SECONDARY SCHOOL HVAC IMPROVEMENTS
55 McKay St., Cambridge, ON, N1R 4G8

DRAWING TITLE

ENLARGED PLANS (3 OF 4)

SCALE 1 : 50
SHEET SIZE 24X36
PROJECT NUMBER 24162
DRAWING NUMBER E303

2025-03-24 3:54:09 PM C:_Revit\24162 WRDSB Glenview Park SS Elec Central (RVT23)_jbinghamTULA.rvt



GENERAL NOTES - DISTRIBUTION RISER

A	RISER IS DIAGRAMMATIC ONLY. REFER TO FLOOR PLANS FOR LOCATION OF ALL DISTRIBUTION EQUIPMENT AND FURTHER REQUIREMENTS.
B	REFER TO SPECIFICATIONS FOR FURTHER INFORMATION REGARDING MOULDED CASE CIRCUIT BREAKERS.
C	PROVIDE GROUND WIRE IN ALL BRANCH CIRCUITS AND FEEDERS TO SUIT THE ONTARIO ELECTRICAL SAFETY CODE.
D	ALL LIGHTING CIRCUITS SHALL BE PROVIDED WITH SEPARATE NEUTRALS. SIZE BRANCH CONDUITS ACCORDINGLY.
E	ALL DISTRIBUTION EQUIPMENT SHALL BE PROVIDED WITH WARNING LABELS CONFORMING TO THE ONTARIO ELECTRICAL SAFETY CODE RULE #2-306(1)(2).
F	REFER TO PANEL SCHEDULES FOR QUANTITY OF CIRCUITS AND FURTHER DETAILS.
G	ALL CONDUCTORS FOR THE FIRE ALARM SYSTEM SHALL BE INSTALLED IN A SEPARATE ENCLOSED CONDUIT SYSTEM.

SPECIFIC NOTES

1	PROVIDE NEW BREAKER INDICATED C/W NEW REQUIRED MOUNTING HARDWARE TO ACCOMMODATE WIRE SIZE INDICATED. PROCURE FOR THE SERVICES OF SCHNEIDER FIELD SERVICES GROUP TO REWORK, MODIFY AND RECERTIFY PANEL BUS AS REQUIRED TO FACILITATE INSTALLATION OF NEW BREAKER PROVIDED AS PART OF THIS SCOPE OF WORK.
2	NOT USED.
3	CONNECTIONS TO THE LINE SIDE OF ELEVATOR CONTROL PANEL SHALL BE UNDER THE DIRECT GUIDANCE OF THE ELEVATOR CONTRACTOR. CONFIRM ALL POWER, DISCONNECT SWITCH AND CONTROL WIRING REQUIREMENTS WITH ELEVATOR SHOP DRAWINGS PRIOR TO PROCURING AND INSTALLING ELECTRICAL REQUIREMENTS.
4	DISCONNECT SWITCH INDICATED FOR ELEVATOR CONTROL PANEL MUST BE LOCKABLE (I.E EQUIPPED WITH MEANS FOR LOCKING IT IN THE OPEN POSITION). PROVIDE TWO (2) SETS OF ELEVATOR RATED AUXILIARY CONTACTS TO SUIT THE ELEVATOR CONTRACTOR. COORDINATE EXACT LOCATION TO MOUNT DISCONNECT SWITCH ON SITE WITH ELEVATOR CONTRACTOR.
5	NOT USED.
6	NOT USED.
7	PROVIDE NEW 60A-3P FUSES IN EXISTING 60A-3P FUSIBLE DISCONNECT SWITCH INDICATED.
8	CONTRACTOR SHALL SWING OVER TEN (10) EXISTING CIRCUITS AS REQUIRED FROM PANEL PP-PV TO NEW PANEL PV PROVIDED AS PART OF THIS SCOPE OF WORK TO MAINTAIN EXISTING SERVICES. REFER TO RENOVATION PLAN FOR LOCATION OF NEW PANEL. EXISTING TO REMAIN SERVICES TO BE IDENTIFIED DURING CONSTRUCTION AND ARE NOT SHOWN ON THE DRAWINGS. PROVIDE NEW BREAKERS AND EXTEND EXISTING CONDUIT AND WIRE FEEDING EXISTING BRANCH DEVICES AND TIE INTO RESPECTIVE CIRCUITS RELOCATED TO NEW PANEL PV.
9	CONTRACTOR SHALL SWING OVER TEN (10) EXISTING CIRCUITS AS REQUIRED FROM PANEL PP-PS TO NEW PANEL PS PROVIDED AS PART OF THIS SCOPE OF WORK TO MAINTAIN EXISTING SERVICES. REFER TO RENOVATION PLAN FOR LOCATION OF NEW PANEL. EXISTING TO REMAIN SERVICES TO BE IDENTIFIED DURING CONSTRUCTION AND ARE NOT SHOWN ON THE DRAWINGS. PROVIDE NEW BREAKERS AND EXTEND EXISTING CONDUIT AND WIRE FEEDING EXISTING BRANCH DEVICES AND TIE INTO RESPECTIVE CIRCUITS RELOCATED TO NEW PANEL PS.
10	INDICATES RECEPTACLE PANEL - 120/208V, 3PH/4W, 100A MAINS, 10KAIC
11	INDICATES 208V 3 PHASE 200A DISCONNECT SWITCH C/W 150A CLASS D FUSES.
12	INDICATES RECEPTACLE PANEL - 120/208V, 3PH/4W, 225A MAINS, 25KAIC
13	INDICATES PREPARED SPACE FOR FUTURE BREAKER. PROVIDE ALL REQUIRED MOUNTING HARDWARE AND ACCESSORIES.

PROJECT NORTH

No.	REVISIONS	DATE
1	ISSUED FOR 50% PROGRESS	2024.01.14
2	ISSUED FOR 75% REVIEW	2025.01.31
4	ISSUED FOR PERMIT/TENDER	2025.03.05
5	ISSUED FOR ADDENDUM 01	2025.03.20
6	ISSUED FOR ADDENDUM 02	2025.03.24

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road,
Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number:24162

aba architects inc.
101 Randall Drive, Unit B, Waterloo ON. TEL 519 884 2711 www.abarchitect.ca

CLIENT
WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME
GLENVIEW PARK SECONDARY SCHOOL HVAC IMPROVEMENTS
55 McKay St., Cambridge, ON, N1R 4G8

DRAWING TITLE
DISTRIBUTION RISER DIAGRAM - RENOVATION

SCALE	1 : 1
SHEET SIZE	24X36
PROJECT NUMBER	24162
DRAWING NUMBER	E401

2025-03-24 3:54:09 PM C:_Revit\24162 WRDSB Glenview Park SS Elec Central (RVT23)_jbingham7L6L.rvt

2025-03-24 3:54:09 PM C:_Revit\24162 WRDSB Glenview Park SS Elec Central (RVT23)_jbinghamZTL6L.rvt

PANEL E

MAINS: 225 A **VOLTAGE:** 120/208V 3PH4W **INTERRUPTING CAPACITY:** 25 kAIC
MOUNTING: SURFACE **NEUTRAL BUS:** 100% **ENCLOSURE:** TYPE 2

CKT	Load Name	Type	Rating	Poles	A	B	C	Poles	Rating	Type	Load Name	CKT
1	ELEV. MACHINE RM LIGHTING		15 A	1				1	15 A		ELEVATOR PIT LIGHTING	2
3	ELEV MACHINE RM RECEPTACLE		20 A	1				1	20 A		ELEVATOR PIT / SHAFT RECEPTACLES	4
5								1	15 A		ELEVATOR CAB LIGHTING	6
7								1	15 A		ELEVATOR CAB COMMUNICATION	8
9								1	15 A		TANK COOLER	10
11	SUMP PUMP CONTROL PANEL		15 A	1				3	15 A		SUMP PUMP (SP-1)	12
13	SUMP PUMP ALARM RECEPTACLE		15 A	1								14
15	DOOR OPERATOR LEVEL 1 STAIR		15 A	1								16
17	DOOR HOLD OPEN		15 A	1				1	20 A		NEUTRALIZING TANK RECEPTACLE A118	18
19	FIRE SMOKE DAMPER - RM A205		15 A	1				1	15 A		FIRE SMOKE DAMPER - ELEVATOR WING	20
21	EXHAUST FAN (EF-8)		15 A	1								22
23												24
25												26
27												28
29												30
31												32
33												34
35												36
37												38
39												40
41												42
43												44
45												46
47												48
49												50
51												52
53												54
55	SPARE	--	15 A	1				1	20 A	--	SPARE	56
57	SPARE	--	15 A	1				1	20 A	--	SPARE	58
59	SPARE	--	15 A	1				1	20 A	--	SPARE	60

NOTES:

PANEL PS

MAINS: 100 A **VOLTAGE:** 120/208V 3PH4W **INTERRUPTING CAPACITY:** 10 kAIC
MOUNTING: SURFACE **NEUTRAL BUS:** 100% **ENCLOSURE:** TYPE 2

CKT	Load Name	Type	Rating	Poles	A	B	C	Poles	Rating	Type	Load Name	CKT
1	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	2
3	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	4
5	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	6
7	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	8
9	WALL RECEPTACLES		15 A	1				1	15 A		GAS SOLENOID VALVE	10
11	CEILING RECEPTACLE		15 A	1				1	15 A		BAS PANEL	12
13	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	14
15	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	16
17	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	18
19	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	20
21	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	22
23	FIRE SMOKE DAMPER		15 A	1								24
25												26
27												28
29												30
31												32
33												34
35												36
37	SPARE	--	20 A	1				1	15 A	--	SPARE	38
39	SPARE	--	20 A	1				1	15 A	--	SPARE	40
41	SPARE	--	20 A	1				1	15 A	--	SPARE	42

NOTES:

PANEL PV

MAINS: 100 A **VOLTAGE:** 120/208V 3PH4W **INTERRUPTING CAPACITY:** 10 kAIC
MOUNTING: SURFACE **NEUTRAL BUS:** 100% **ENCLOSURE:** TYPE 2

CKT	Load Name	Type	Rating	Poles	A	B	C	Poles	Rating	Type	Load Name	CKT
1	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	2
3	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	4
5	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	6
7	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	8
9	WORKBENCH RECEPTACLES		20 A	1				1	20 A		WORKBENCH RECEPTACLES	10
11	WALL RECEPTACLES		15 A	1				1	15 A		CEILING RECEPTACLE	12
13	GAS SOLENOID VALVE		15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	14
15	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	16
17	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	18
19	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	20
21	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A	--	EXISTING BRANCH CIRCUIT	22
23	EXISTING BRANCH CIRCUIT	--	15 A	1				1	15 A		FIRE SMOKE DAMPER	24
25												26
27												28
29												30
31												32
33												34
35												36
37	SPARE	--	15 A	1				1	20 A	--	SPARE	38
39	SPARE	--	15 A	1				1	20 A	--	SPARE	40
41	SPARE	--	15 A	1				1	20 A	--	SPARE	42

NOTES:

PANEL MP

MAINS: 225 A **VOLTAGE:** 120/208V 3PH4W **INTERRUPTING CAPACITY:** 25 kAIC
MOUNTING: SURFACE **NEUTRAL BUS:** 100% **ENCLOSURE:** TYPE 2

CKT	Load Name	Type	Rating	Poles	A	B	C	Poles	Rating	Type	Load Name	CKT
1	BRANCH SELECTOR CU-4A		15 A	2				2	15 A		BRANCH SELECTOR CU-4B	2
3												4
5	ROOF MAINTENANCE RECEPTACLE		20 A	1				1	15 A		ROOF EXHAUST FAN (EF-6)	6
7	ROOF MAINTENANCE RECEPTACLE		20 A	1				1	15 A		ROOF EXHAUST FAN (EF-5)	8
9	ROOF MAINTENANCE RECEPTACLE		20 A	1				2	15 A		CONTROL BOX CB	10
11	HVAC UNIT CONTROLLER (HVAC-5-UC)		15 A	1								12
13	HVAC ENERGY RECOVERY WHEEL (HVAC-5-ERW)		15 A	3				1	20 A		MECH. ROOM RECEPTACLE	14
15												16
17								2	15 A		CONTROL BOX CB	18
19	CONTROL BOX CB		15 A	2								20
21								2	15 A		CONTROL BOX CB	22
23	CONTROL BOX CB		15 A	2								24
25								2	15 A		CONTROL BOX CB	26
27	MECHANICAL PIPE HEAT TRACING	GFI	20 A	2								28
29								2	20 A	GFI	MECHANICAL PIPE HEAT TRACING	30
31	MECHANICAL PIPE HEAT TRACING	GFI	20 A	2								32
33								3	15 A		HVAC-5 CIRCULATION PUMP (P-10)	34
35	ROOF EXHAUST FAN (EF-7)		15 A	3								36
37												38
39												40
41												42
43												44
45												46
47												48
49												50
51												52
53												54
55												56
57												58
59												60
61												62
63												64
65												66
67	SPARE	--	15 A	1				1	20 A	--	SPARE	68
69	SPARE	--	15 A	1				1	20 A	--	SPARE	70
71	SPARE	--	15 A	1				1	20 A	--	SPARE	72

NOTES:

PROJECT NORTH

No.	REVISIONS	DATE
2	ISSUED FOR 75% REVIEW	2025.01.31
4	ISSUED FOR PERMIT/TENDER	2025.03.05
5	ISSUED FOR ADDENDUM 01	2025.03.20
6	ISSUED FOR ADDENDUM 02	2025.03.24

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road, Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number:24162

aba architects inc.
101 Randall Drive, Unit B, Waterloo ON, TEL 519 884 2711 www.abarchitect.ca

CLIENT
WATERLOO REGION DISTRICT SCHOOL BOARD

PROJECT NAME
GLENVIEW PARK SECONDARY SCHOOL HVAC IMPROVEMENTS
55 McKay St., Cambridge, ON, N1R 4G8

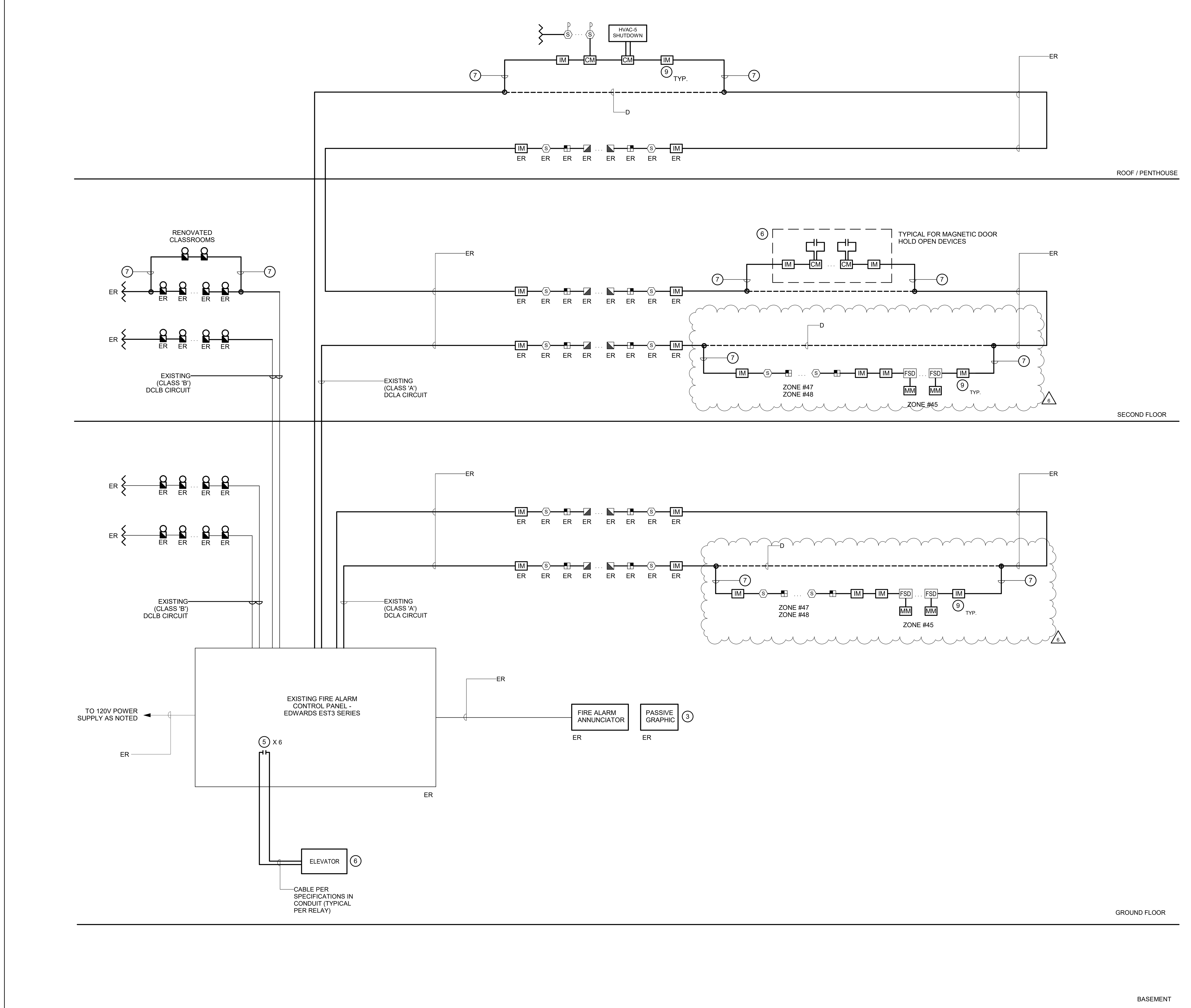
DRAWING TITLE
PANEL SCHEDULES

SCALE

SHEET SIZE 24X36

PROJECT NUMBER 24162

DRAWING NUMBER E402



EXISTING FIRE ALARM RISER NOTES

1	REFER TO FLOOR PLANS FOR EXACT LOCATION AND QUANTITY OF DEVICES.
2	RISER IS DIAGRAMMATIC ONLY. PROVIDE QUANTITY OF HARDWARE, MODULES, ACCESSORIES AND MODIFY EXISTING INITIATING & SIGNALING CIRCUITS AS REQUIRED TO SUIT NEW ADDITIONAL DEVICES ADDED FOR A COMPLETE WORKING SYSTEM.
3	CONTRACTOR TO UPDATE PASSIVE GRAPHICS WITH NEW ZONES AS SHOWN ON EXISTING ANNUNCIATOR SHCEDULE.
4	PROVIDE CONTROL ZONE RELAY MODULE FOR MAGNETIC DOOR HOLD OPEN DEVICES. REFER TO FLOOR PLANS FOR LOCATION AND ADDITIONAL REQUIREMENTS.
5	DRY CONTACTS WITHIN ELEVATOR CONTROLLER SHALL BE PROVIDED BY THE ELEVATOR SUPPLIER. COORDINATE AND CONNECT ACCORDINGLY.
6	WITHIN THE FIRE ALARM CONTROL PANEL, PROVIDE 6 NORMALLY OPEN DRY CONTACTS RATED FOR 1.0A AT 120VAC. PROVIDE WIRING AND CONNECTION FROM FIVE (5) OF THESE CONTACTS TO THE ELEVATOR CONTROLLER AS ONE CONTACT FOR EACH OF THE FOLLOWING (ONE SPARE CONTACT). THESE CONTACTS ARE TO CLOSE WHEN THE RESPECTIVE DEVICE(S) ARE INITIATED. A) GENERAL BUILDING B) RECALL LANDING C) TOP OF SHAFT D) BOTTOM OF SHAFT (PIT) E) MACHINE ROOM
7	INDICATES NEW FIRE ALARM DEVICES TO BE TIED INTO EXISTING FIRE ALARM SYSTEM. PROVIDE POWER, CONDUIT, BACKBOX AND WIRING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MINIMUM CONDUIT SIZE 21mmC.
8	REFER TO FIRE ALARM SYSTEM ANNUNCIATOR ZONE SCHEDULE FOR ADDITIONAL REQUIREMENTS. PROVIDE ZONE MODULES, CONTACTORS, ENCLOSURES AND DVRS AS REQUIRED.
9	PROVIDE LINE ISOLATOR MODULES TO ISOLATE DCLA SEGMENTS ON A PER FIRE ALARM ZONE BASIS, ON A PER FLOOR BASES AND AS REQUIRED BY THE MANUFACTURER AND ONTARIO BUILDING CODE. PROVIDE ADDITIONAL LINE ISOLATORS AS REQUIRED OVER AND ABOVE THOSE SHOWN ON RISER DIAGRAM TO SATISFY ISOLATION REQUIREMENTS.
10	NDICATES 120V POWER AND FIRE ALARM CONNECTIONS TO SMOKE/FIRE DAMPER WITH INTEGRAL SMOKE DETECTOR. REFER TO FIRE ALARM SPECIFICATIONS. COORDINATE EXACT LOCATION/CONNECTION REQUIREMENTS WITH MECHANICAL CONTRACTOR. SMOKE/FIRE DAMPER AND ASSOCIATED INTEGRAL SMOKE DETECTOR TO BE PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR. PROVIDE MONITORING MODULE(S) PER SMOKE/FIRE DAMPER TO 120V POWER SUPPLY CONNECTION TO THE DAMPER ACTUATOR AND INTEGRAL SMOKE DETECTOR ALARM AS SIGNAL. A TROUBLE CONDITION SHALL BE ACTIVATED DUE TO THE LOSS OF AC POWER AT THE MAIN CONTROL PANEL, CONSISTING OF AUDIBLE AND VISUAL TROUBLE SIGNAL UNTIL ACKNOWLEDGED BY OPERATOR. REFER TO DETAIL A/E501.

EXISTING FIRE ALARM ANNUNCIATOR SCHEDULE

ZONE	DESCRIPTION	ALARM	SUPERVISORY	NEW	EXISTING
1	CAFETERIA BOILER RM GIRLS GYM	•			•
2	MAIN OFFICE	•			•
3	BOYS GYM AREA	•			•
4	1ST FLOOR CORR D1 AND BASEMENT	•			•
5	TECHNOLOGY WING	•			•
6	ENGLISH WING B1	•			•
7	2ND FLOOR ACADEMIC B2/D2	•			•
8	2ND FLOOR A2	•			•
9	FOOD SERVICES	•			•
10	SPRINKLER FLOW FOOD SERVICES		•		•
11	SPRINKLER FLOW WOODWORKING		•		•
12	KITCHEN CO2 SYSTEM		•		•
13	SPARK ARRESTOR		•		•
14	SPARE				
15	SPARE				
16	SPARE				
17	SPARE				
18	ELEV CORR & ELEV MACH RM				•
19	ELEC SHAFT				•
20	SPARE				
21	SPARE				
22	SPARE				
23	SPARE				
24	PORTABLES	•			•
25	SPARE				
26	SPARE				
27	SPARE				
28	SPARE				
29	SPARE				
30	SPARE				
31	SPARE				
32	SPARE				
33	SPARE				
34	SPARE				
35	SPARE				
36	SPARE				
37	SPARE				
38	SPRINKLER FOOD SERVICES TAMPER		•		•
39	SPRINKLER WOOD SHOP TAMPER		•		•
40	SPARK ARRESTOR TROUBLE		•		•
41	SPRINKLER MAIN INCOMING TAMPER		•		•
42	HVAC-5 DUCT SMOKE DETECTOR	•		•	
43	SPARE	•		•	
44	DAMPER POWER LOSS		•		•
45	FIRE SMOKE DAMPERS - 1ST FLOOR	•		•	
46	SPARE				
47	ELEVATOR PIT/SHAFT	•		•	
48	ELEVATOR MACHINE RM	•		•	
49	FIRE SMOKE DAMPERS - 2ND FLOOR	•		•	

FIRE ALARM PARTIAL SEQUENCE OF OPERATION – SINGLE STAGE:

FIRE ALARM PARTIAL SEQUENCE OF OPERATION – SINGLE STAGE:

THE EXISTING FIRE ALARM SYSTEM INCLUDES MODIFICATIONS WHICH CONSIST OF NOTIFICATION DEVICES, ALARM INITIATING DEVICES AND ANCILLARY CONNECTIONS AS INDICATED ON ELECTRICAL DESIGN DRAWINGS AND SPECIFICATIONS.

ALARM ACTIVATION

1 UPON ACTIVATION OF ANY ALARM INITIATING DEVICE (MANUAL STATION, HEAT DETECTOR, SMOKE DETECTOR, DUCT ETC.) SHALL CAUSE THE FOLLOWING FIRE ALARM SYSTEM ALARM ACTIONS:
- A ACTIVATE THE RESPECTIVE RED ALARM LED AT THE CONTROL PANEL(S) AND REMOTE ANNUNCIATOR PANEL(S).
- B CAUSE ZONE OF ALARM INITIATING DEVICE TO BE INDICATED AT THE CONTROLPANEL(S) AND REMOTE ANNUNCIATOR PANEL(S).
- C CAUSE AUXILIARY CONTACTS TO ACTIVATE AND INITIATE ELEVATOR RECALL PER CSA-B44 (EXCLUDING ALARM INITIATED BY MANUAL PULL STATIONS).
- D CAUSE AUXILIARY CONTACTS TO ACTIVATE AIR-HANDLING UNIT SHUT DOWN
- E CAUSE AUXILIARY CONTACTS TO ACTIVATE AND ELECTRO-MAGNETICALLY HELD OPEN DOORS TO CLOSE AUTOMATICALLY.
- G ACTIVATE THE COMMON ALARM POINT TO SIGNAL THE LOCAL FIRE DEPARTMENT OR APPROVED CENTRAL MONITORING AGENCY OF THE ALARM CONDITION.
- H CAUSE THE ALARM AUDIBLE NOTIFICATION DEVICES TO SOUND A TEMPORAL 3 PATTERN THROUGHOUT THE BUILDING UNTIL SILENCED.
- I CAUSE THE VISUAL NOTIFICATION DEVICES TO ACTIVATE THROUGHOUT THE BUILDING UNTIL AUDIBLE ALARM IS SILENCED OR SYSTEM RESET.
- J LOG THE ALARM EVENT IN THE HISTORICAL EVENT LOG FILE.

TROUBLE ACTIVATION

1 OPERATION OF ANY SYSTEM OR DEVICE TROUBLE SIGNAL SHALL CAUSE THE FOLLOWING FIRE ALARM SYSTEM TROUBLE ACTIONS:
- A CAUSE AN AUDIBLE AND VISUAL TROUBLE SIGNAL AT THE CONTROL PANEL(S) AND REMOTE TROUBLE INDICATOR(S).
- B ACTIVATE THE COMMON TROUBLE POINT TO SIGNAL THE LOCAL FIRE DEPARTMENT OR APPROVED CENTRAL MONITORING AGENCY OF THE TROUBLE CONDITION.
- C LOG THE ALARM EVENT IN THE HISTORICAL EVENT LOG FILE.
- D DESCRIBE THE NATURE OF THE TROUBLE ON THE CONTROL PANEL(S) LCD DISPLAY AND REMOTE ANNUNCIATOR PANEL(S). THE FOLLOWING SYSTEM AND DEVICE TROUBLE CONDITIONS SHALL BE MONITORED:
  - I OPEN CIRCUIT FAULT IN THE FIELD WIRING OF AN ADDRESSABLE LOOP, ADDRESSABLE DETECTION, SIGNAL MODULE, OR A SHORT CIRCUIT ON AN ADDRESSABLE LOOP, CONVENTIONAL DETECTION OR SIGNAL CIRCUIT.
  - II DISCONNECTION OR FAILURE OF THE STANDBY BATTERIES.
  - III A GROUND FAULT CONDITION ON A LOOP OR SIGNAL CIRCUIT FIELD WIRE.
  - IV FAILURE OF THE MAIN 120VAC POWER SUPPLIED TO THE PANEL.
  - V REMOVAL OR MALFUNCTION OF ANY ADDRESSABLE FIELD DEVICE OR ANY SUPERVISED PANEL MODULE OR COMPONENT.
  - VI FIRE/SMOKE DAMPER MONITOR MODULE SIGNAL FOR LOSS OF AC POWER TO DAMPER ASSEMBLY

SYSTEM SILENCE

1 THE AUDIBLE NOTIFICATION DEVICES SHALL CONTINUE TO SOUND DURING ALARM CONDITIONS UNTIL MANUALLY OR AUTOMATICALLY SILENCED. AUTOMATIC SILENCING SHALL NOT BE POSSIBLE DURING THE FIRST 5 MIN OF ALARM OPERATION.

2 THE CONTROL PANELS AND REMOTE BUZZERS SHALL BE SILENCED BY OPERATION OF THE PANELS ACKNOWLEDGE SWITCH.

SYSTEM RESET

1 THE ALARM, SUPERVISORY AND TROUBLE CONDITIONS SHALL BE CLEARED ONLY UPON ACTIVATION OF THE FIRE ALARM CONTROL PANEL RESET SWITCH, AFTER THE DEVICE THAT INITIATED THE ALARM HAS BEEN CLEARED OR RESTORED.

PROJECT NORTH

No.	REVISIONS	DATE
4	ISSUED FOR PERMIT/TENDER	2025.03.05
6	ISSUED FOR ADDENDUM 02	2025.03.24

CHRONOLOGY	DATE

DEI Consulting Engineers
MECHANICAL | ELECTRICAL | AQUATIC
55 Northland Road,
Waterloo, ON, N2V 1Y8
Phone: 519-725-3555
Website: deiassociates.ca
Project Number:24162

aba architects inc.

CLIENT

PROJECT NAME

GLENVIEW PARK SECONDARY SCHOOL HVAC IMPROVEMENTS

55 McKay St., Cambridge, ON, N1R 4G8

DRAWING TITLE

PARTIAL FIRE ALARM RISER DIAGRAM AND ANNUNICIATOR SCHEDULE

SCALE 1 : 100

SHEET SIZE 24X36

PROJECT NUMBER 24162

DRAWING NUMBER E501

2025-03-24 3:54:10 PM C:_Revit\24162 WRDSB Glenview Park SS Elec Central (RVT23)_jbinghamTL4.rvt