September 27, 2023

ADDENDUM # 4

Five (5) Pages
Attachment(s) – Twenty Four (24) pages

RE: RFT 2023-15 – DRAYTON PUMPHOUSE UPGRADES

Dear Sir / Madam:

Please find enclosed Addendum #4 for the above noted contract. Confirmation that this addendum has been received shall be indicated on your bid submission.

Please treat this as an original. No follow up copy will be provided.

Sincerely,

CIMA Canada Inc.

Adam Moore, P.Eng.
Project Engineer, Infrastructure
adam.moore@cima.ca

Encl.

cc: Stuart Winchester, CIMA+
Jamie Morgan, Township of Mapleton

900–101 Frederick Street, Kitchener ON N2J 6R2 CANADA **T** 519-772-2299 **F** 519-772-2298
cima.ca

TOWNSHIP OF MAPLETON

DRAYTON PUMPHOUSE UPGRADES

RFT 2023-15

ADDENDUM NO. 4

ISSUE DATE: September 27, 2023

This addendum is issued for the purpose of clarifying, amending, or revising certain information contained in the Contract Documents. This Addendum No. 4 shall form an integral part of the Contract Documents. The closing date remains unchanged.

The following changes, clarifications, additions and/or substitutions shall be incorporated into the pertinent portions of the Contract Documents as follows:

1 ATTACHMENTS

1.1 Section 15900 – HVAC Controls

1.2 Section 15500 – Heating, Ventilation and Air Conditioning

1.3 Drawing M101 – Mechanical and Plumbing Plan

1.4 Drawing A102 – Elevations, Sections & Door/Louver Details

2 QUESTIONS AND ANSWERS

2.1 **Question:** 15900 HVAC Controls VS 15500 section 1.3.3) Starters, controls and wiring will be by Division 16. Please clarify so you end up with a project that runs well, the requirements for the HVAC Controls requirement has been specified in two different specification sections.

Answer: Remove sections 15900 and 15500 and insert revised sections 15900 and 15500.

Section 15500 – Heating, Ventilation and Air Conditioning

Remove section 1.3.3 and insert revised text “All equipment for this section shall be provided by Division 15. Installation of starters, controls and wiring will be by Division 16.”

Remove section 1.19.1 and insert revised text “Unless otherwise noted, all starters, all power and all control wiring shall be supplied and installed under Division 16.”

Remove section 2.9.1 and insert revised text, “Supply all low voltage, (under 120 VAC), control devices wiring, conduit, transformers, contractors and hardware required to control the heating and ventilating systems included in this section. Installation of this equipment is by Division 16.”

Remove section 2.9.2 and insert revised text, “Supply all thermostats shown on the drawings or specified.”

Section 15900 - HVAC Controls

Remove section 1.2.2 and insert revised text, “Supply low voltage electrical wiring for components furnished under this section. This includes wiring between control components and wiring from such components to electrical control circuits of fans, and other related HVAC equipment. Installation of this wiring is by Division 16.”

Remove section 2.4.1 and insert revised text, “Supply load relays capable of switching 10 amps at 120/1/60.”

Remove section 2.5.3 and insert revised text, “Supply equipment, field devices, systems that are rated to suit the area classifications shown on the electrical drawings.”

Remove section 2.5.4 and insert revised text, “Supply all required wiring in accordance with Division 16 requirements.”

Remove section 2.5.5 and insert revised text, “Supply enclosures for all control system components.”

Remove section 3.1.1 and insert revised text, “Install all equipment and accessories in a neat manner by skilled and qualified work persons using the latest standard practices of the industry. Conduit and interconnecting wiring to be installed under Division 16.”

Remove section 3.1.8 and insert revised text, “In accordance with Division 16, install all electrical wiring in conformance with the requirements of the local electrical authority, and the Ontario Building Code.”

Remove section 3.1.9 and insert revised text “In accordance with Division 16, install low voltage wiring in accordance with the control manufacturer's recommendations. Run all wiring in a protective conduit. Where indicated, wiring shall be suitable for classified areas. Include all conduit & sealing as required by code.”

2.2 **Question:** Please advise if it will be acceptable to provide a stand-alone ATS and connect to MCC/SWBD by cable? One of the suppliers can offer the following:

Section #1 - The main breaker and utility section (SWBD design) - cable out to ATS

Section #2 - Standalone ATS (Cable in/out)

Section #3 - Main lugs only MCC + Feeder Sections.

Answer: Configuration with a standalone ATS as noted above is not acceptable.

2.3 **Question:** What is the meaning of LE/101A, LIT/101 and LE/101B in the Drawing E103?

Answer: LE stands for Level Element and is the level sensor that goes in the reservoir. LIT stands for Level Indicating Transmitter and is the transmitter that the level elements analog signal cables connect to.

2.4 **Question:** Based on the drawing A102 the dimension of the window is 380000x299999. Can you please clarify these numbers?

Answer: Remove Drawing A102 and insert revised drawing A102. The window dimensions should be H 919mmx W 1524mm (300mm less in height for the louver). However, the dimensions must be site verified.

2.5 **Question:** Provide ducting work drawing for the existing and new duct work.

Answer: Remove Drawing M101 and insert revised drawing M101. The existing ventilation system consists of a fresh air opening and an exhaust opening only, no ductwork is currently installed at the site.

2.6 **Question:** What is the dimension of existing louver opening that is required for removal and replacement?

Answer: The existing louver is approximately 4’ x 5’.

2.7 **Question:** Please clarify the project name since all Addendums show RFT 2023-15, but the Project Specifications and other documents show RFT 2023-05.

Answer: Please see addendum 1.

2.8 **Question:** In Ontario, section 30 of the Occupational Health and Safety Act requires that a project owner identify designated substances on the project and provide a list to prospective constructors. Please provide a designated substances report for the structures on site so that we can proceed with quoting the work.

Answer: A Designated Substances Survey (DSS) report will be provided prior to construction to the awarded contractor. For the tender quote, assume no hazardous substances are present.

2.9 **Question:** Is submitting the bid by email acceptable?

Answer: Submitting the bid by email is not acceptable. Please see the Information for Tenderers.

Addendum No. 4

The Bidder shall sign this Addendum in the space provided below, shall affix his seal hereto, and shall submit this Addendum in the same envelope as the tender.

Except as and to the extent that they are amended by the foregoing, all terms and conditions of the tender documents remain in full force and effect.

_____

Signature of Tenderer

Affix Corporate Seal Above

1 GENERAL

1.1 Intent of Section

1.1.1 This section covers the supply and installation of heating, ventilation, and air conditioning systems as shown and/or specified. In general, the major divisions of the work are:

.1 Exhaust fans

.2 Control Dampers

.3 Ductwork and louvers

1.1.2 Units shown on the drawings are based on the first unit named in the specification on the list of "Acceptable Manufacturers".

1.1.3 If the Contractor chooses to carry the other acceptable manufacturers, he shall be responsible for all the HVAC, electrical, mechanical, structural, and architectural costs required to accommodate the change at no extra cost to the contract.

1.2 General

1.2.1 Provide a ventilation system to suit the Well Station, in accordance with the drawings and specified herein.

1.2.2 All products and equipment supplied under Division 15 shall include a two (2) year warranty that will begin once the respective equipment is commissioned and free of any deficiencies. The warranty shall cover all parts and labour.

1.2.3 Provide necessary hardware and supports to suit the installation of all HVAC equipment, including ducting, control panels, field devices, sensors and fans.

1.3 Work Included

1.3.1 Provide new ventilation systems for the following areas:

.1 Chemical Room

.2 Process Room

1.3.2 Provide exhaust fans including all louvers, control dampers and dedicated thermostats to suit the chemical room and the process room ventilation system.

1.3.3 All equipment for this section shall be provided by Division 15. Installation of starters, controls and wiring will be by Division 16.

1.3.4 Perform air balancing of all completed ventilation systems and provide a report detailing the results. Provide field adjustments of the HVAC equipment to achieve the required air flow performance.

1.4 Related Sections

1.4.1 Section 01330 - Submittals

1.4.2 Section 01780 - Closeout Submittals

1.4.3 Section 01820 - Demonstration and Training

1.5 Codes And Standards

1.5.1 The Ontario Building Code - Latest Revision

1.5.2 Canadian Standards Association (CSA).

1.5.3 Air Moving and Control Association (AMCA).

1.5.4 Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - HVAC Metal Duct Construction Standards.

1.5.5 National Standard of Canada CAN/CGSB-41.22-93 Fibreglass Reinforced Plastic (FRP) Corrosion-Resistant Equipment.

1.5.6 American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE) - Systems and Equipment Handbook 2008.

1.6 Bylaws And Regulations

1.6.1 Obey all Government, Municipal, Electric Utility, C.S.A. and Underwriters Regulations. Perform the work in accordance with the requirements of bylaws and regulations in force in the area where the building is to be erected.

1.7 Submittals

1.7.1 Submit shop drawings and product data for review in accordance with Division one, Section 01330.

1.7.2 Illustrate the following:

.1 Equipment and material

.2 Operating voltage and rating

.3 Control wiring Schematics

.4 Dimensions

.5 Blade, linkage and damper motor arrangements

.6 Performance curves

1.7.3 Indicated fabrication and installation details including anchorage, accessories and finishes.

1.7.4 Provide shop drawings for the following:

.1 Fans

.2 Control dampers

.3 Ductwork accessories

.4 Grilles, register and diffusers

.5 Pressure and temperature sensors

.6 Louvers

.7 Thermostats

.8 Vibration Isolators

.9 Electrical and control schematics and wiring diagrams for all equipment

1.8 Drawings

1.8.1 The drawings show approximate location of equipment in diagrammatic form. Obtain any information involving accurate dimensioning in relation to structure, fixture locations, etc. from architectural and structural drawing or on the site.

1.8.2 Equipment dimensioning to be obtained from reviewed shop drawings.

1.8.3 Make, without additional charge to the Owner, any necessary change to ductwork to accommodate structural conditions and headroom. Obtain the Engineer's approval prior to making any changes required due to conflict of trades.

1.9 Record Drawings

1.9.1 As the job progresses the Contractor shall mark a set of tender drawings in red pen to accurately document them as constructed installation. The set of white prints used for the purpose of as construction documentation shall be available for inspection at the site at all times. Submit a set of as constructed white prints to the Consultant at completion of the project.

1.9.2 Provide closeout submittals in accordance with Division one, Section 01780.

1.10 Workmanship

1.10.1 Use only new and best quality materials and equipment. Install and rig all equipment in workmanlike manner.

1.11 Examination Of Site

1.11.1 Visit and examine the site, no allowance will be made for any expense incurred due to failure to make this examination.

1.12 Cooperation

1.12.1 Confer with all other trades installing equipment which may affect the work of these sections and arrange equipment in proper relation with other apparatus such as lighting fixtures, with the building construction and architectural finish, and with all work specified under the mechanical division.

1.13 Protection

1.13.1 Protect all the work of these sections from construction dirt or damage from any cause. Especially cover all sills and jambs of windows and doors when bringing materials into the building and during installation.

1.14 Conveniences

1.14.1 Maintain workshop, tool sites, office space, etc. as required under the General Conditions and Index to General Conditions.

1.15 Clean-Up

1.15.1 Upon completion, clean up and remove from premises all surplus materials, debris, tools, etc. Leave all working in a neat, tidy and in perfect working order to the Engineer's satisfaction.

1.16 Instruction

1.16.1 Instruct the Owner's representatives in the operation of the various systems and equipment.

1.17 Completion

1.17.1 After work is completed, operate the systems and adjust all damper controls, as required by the Engineer or Owner.

1.18 Sleeves, Floor Plates, Inserts, Access Panels, Etc.

1.18.1 All sleeves, floor plates, inserts, access panels, supports, etc. required for equipment supplied and installed under this division shall be supplied and installed by this Contractor.

1.19 Electrical

1.19.1 Unless otherwise noted, all starters, all power and all control wiring shall be installed under Division 16.

1.19.2 All motors required for equipment supplied by this division shall be supplied and installed by this Contractor except as noted above.

1.19.3 Supply a list of all motors with electrical characteristics to the Electrical Contractor.

1.19.4 Provide wiring schematics to suit all equipment that is provided with integral motor starters and controls.

1.20 Support And Hangers

1.20.1 Provide all frames and supports for the proper erection of the work. Fabricate from structural steel any supporting sections and frames required. Provide chamfered edges on all concrete bases. All support hangers shall be stainless steel.

1.21 Cutting And Patching

1.21.1 Provide all cutting and patching required for work under this section.

1.22 Noise And Vibration Control

1.22.1 Use the type of isolators on equipment to obtain optimum results, consult with the isolator manufacturer to provide installation instructions for their product.

2 PRODUCTS

2.1 Roof Mounted Upblast Centrifugal Exhaust Fan

2.1.1 Provide roof mounted, direct drive, centrifugal exhaust fan as shown on drawings.

2.1.2 Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Laboratories (UL 705) and UL listed for Canada (cUL 705). Fan shall bear the AMCA Certified Ratings Seal for Sound and Air Performance.

2.1.3 Constructed of heavy gauge aluminum includes exterior housing, curb adapter, hinged curb cap, windband, and motor compartment housing. Galvanized material is not acceptable.

2.1.4 Housing shall have a rigid internal support structure. Windband to be one piece uniquely spun aluminum construction and maintain original material thickness throughout the housing.

2.1.5 Motor enclosures: Open type

2.1.6 Motor to be a DC electronic commutation type motor (ECM) specifically designed for fan applications. AC induction type motors are not acceptable. Examples of unacceptable motors are: Shaded Pole Permanent Split Capacitor (PSC), Split Phase, Capacitor Start and 3 phase induction type motors.

2.1.7 Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase.

2.1.8 Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor

2.1.9 Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled by either a potentiometer dial mounted at the motor or by a 0-10 VDC signal.

2.1.10 Unit shall be supplied with integral wiring box and disconnect receptacle shall be standard.

2.1.11 Unit shall be shipped in ISTA Certified Transit Tested Packaging.

2.1.12 Wheel shall be centrifugal backward inclined type, constructed of aluminum. Wheel shall be balanced in accordance with AMCA Standard 204-05, Balance Quality and Vibration Levels for Fans.

2.1.13 Motor shall be open drip proof type with permanently lubricated bearings, built-in thermal overload protection and disconnect plug. Motor shall be furnished at the specified voltage.

2.1.14 Basis of design is Greenheck CUE series.

2.2 Inline Centrifugal Fans

2.2.1 Provide inline centrifugal fan as shown on drawings.

2.2.2 Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Laboratories (UL 705) and UL listed for Canada (cUL 705). Fan shall bear the AMCA Certified Ratings Seal for Sound and Air Performance.

2.2.3 Construction shall be galvanized steel.

2.2.4 Motor shall be mounted on rubber vibration isolators.

2.2.5 Unit shall be supplied with integral wiring box and disconnect receptacle shall be standard.

2.2.6 Unit shall be shipped in ISTA Certified Transit Tested Packaging.

2.2.7 Wheel shall be centrifugal backward inclined type, constructed of aluminum. Wheel shall be balanced in accordance with AMCA Standard 204-05, Balance Quality and Vibration Levels for Fans.

2.2.8 Motor shall be open drip proof type with permanently lubricated bearings, built-in thermal overload protection and disconnect plug. Motor shall be furnished at the specified voltage.

2.2.9 Basis of design is Greenheck SQ series.

2.3 Sheet Metal Ductwork And Accessories

2.3.1 Ductwork Systems - Reference Standards:

.1 Provide ducts, fittings, accessories and supports conforming to the construction details as described in the latest editions of the following publications, except as modified hereinafter:

.1 Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - "HVAC Duct Construction Standards - Metal and Flexible"

.2 SMACNA - "Guidelines for Welding Sheet Metal"

.3 SMACNA - "Testing Balancing and Adjusting of Environmental Systems"

.4 NFPA - "Standard for Installation of Air Conditioning and Ventilation Systems" - NFPA 90A

2.3.2 General Workmanship and Material:

.1 Provide materials as detailed below:

.1 Sheet Metal - mill galvanized steel sheets of lock forming quality:

.1 Steel sheet - ASTM A-527

.2 Galvanized coating - ASTM A525 G90

.2 Reinforcing Steel

.1 Steel ASTM A-123

.2 Zinc coating ASTM A-123

.3 Fasteners

.1 Nuts and bolts ASTM A-307 and A-563, respectively

.2 Zinc coating ASTM A-153

.2 Provide a minimum SMACNA Class 'C' seal for all ductwork.

.3 Maintain all ductwork free of dust and debris during construction. Clean interior of ductwork prior to operating any equipment.

.4 Reinforce ductwork at all penetrations for thermometers, manometers, thermostats, gauges, etc. and provide extended collars for instruments installed in insulated ductwork.

.5 Make all necessary provisions and allowances when installing ductwork for the structural building framing and transform or divide ducts as required. Maintain free area.

.6 Protect open ends of ducts during installation with suitable closures to preclude dirt and debris from entering.

.7 Where ducts connect to masonry openings and along the edges of all plenums at walls, provide continuous 38 x 38 x 5mm galvanized angle iron, bolted to the structure, made airtight by caulking. Bolt the sheet metal at these locations to the angle framing.

.8 Provide air ducts, casings, plenums, etc. of galvanized steel sheets unless otherwise specified or indicated free of blisters, pits, imperfectly coated spots and of gauges indicated.

.9 Slope all horizontal ductwork from outside air louvers and from exhaust hoods back to outlet or to drain; provide all bottom seams and minimum 25mm bottom of vertical seams with 50/50 solder joints. The bottom joints and 200mm of vertical joints of the outside air intake and outlet ducts shall be soldered and made watertight. Provide drain connection on outside air intake ducts. Run copper drain pipe to the nearest floor drain or through a primed trap to process drainage system.

.10 Ductwork leakage shall be less than 5 per cent of fan air flow capacity.

2.3.3 Rectangular Ductwork:

.1 Fabricate ductwork of the following minimum thickeners with joints and bracing:

Nominal Thickness Millimeters	Millimeters	Type of Transverse Joint Connections	Bracing
0.55	0-300	S Cleat or Drive Cleat on 2440mm centres	None

.2 Cross-break all flat un-installed sheet metal ductwork having any side are 300mm, except immediately upstream and downstream of splitter dampers.

.3 Provide longitudinal duct seams as follows:

.1 Corners

.1 Pittsburgh or double corner seams

.2 Mid-section

.1 Grooved seam or

.2 Inside standing seam up to 500 Pa

.3 Construct tees, bends or elbows with a centreline radius of not less than 1.5 times the width of the duct. Where space does not permit the specified radius, use square throat fitting with double thickeners turning vanes.

2.3.4 Ductwork Support:

.1 Support rectangular ducts 1530mm and less in width or depth with 25mm wide 1.3mm or heavier galvanized bent hangers fastened to the side and bottom of the duct at a spacing of not greater than 2240mm using bolts, rivets, or metal screws.

.2 Support round ducts up to 910mm with 25mm wide, 1.0mm thick single galvanized steel traps and 9mm diameter rods.

2.3.5 Flexible Connections

.1 Connect ductwork to fan casings with 150mm wide heavy fireproof, moisture and ambient air resistant, approved fabric securely fastened to the fan rings and to ductwork by galvanized iron band equipped with tightening screws.

.2 All flexible connections to be airtight and free from any strain.

.3 Bridge each flexible connection with No.8 AWG base copper wire conductor.

.4 Approved manufacturer:

.1 Mercer Rubber Co. - Duct type expansion joint

2.3.6 Access Doors:

.1 Provide access panels in ductwork to allow cleaning next to outside air intakes and outlets and equipment casings to facilitate maintenance and cleaning of all components.

.2 Construct access panels from double thickness 20 gauge galvanized steel sheets or aluminium in equal strength where required, 25mm apart, with necessary reinforcing inside for rigidity.

.3 Fill the 25mm space with glass fibre insulation.

.4 Make panels airtight with a continuous rubber gasket.

.5 Provide openings in ductwork or casings with continuous galvanized (or aluminium where required) reinforcing bars. Extend reinforcing bars to face of insulation where necessary.

.6 Provide small panels with at least two (2) brass window sash fasteners, and larger panels with at least two (2) brass pin hinges and two (2) fasteners.

.7 Provide brass drawer-type handles on all panels.

2.3.7 Fire Stopping:

.1 Retain angles all around duct, on both sides of fire separation.

.2 Fire stopping material and installation shall not distort duct.

2.3.8 Sealant and Tape:

.1 Sealant: Oil resistant, polymer type flame resistant high velocity duct sealing compound. Temperature range of 22°F to + 200°F.

.2 Acceptable Manufacturers:

.1 Foster 30-02

.2 Duro Dyne S-2

.3 Tape: Polyvinyl treated, open weave fibreglass tape, two inch wide.

.4 Acceptable Manufacturer:

.1 Duro Dyne Ft-2

2.4 Grilles, Register, And Diffusers

2.4.1 Provide grilles, registers, and diffusers of the types as shown on the drawings.

2.4.2 Construction to be extruded aluminium.

2.5 Flexible Connectors

2.5.1 Equipment Connectors

.1 75mm minimum length, unless otherwise called for Duro-Dyne Durolon 700 gr/m³.

.2 Provide flexible connections between air handling equipment and ducting applications.

2.6 Outside Air Louvers

2.6.1 Aluminum extrusions: AA6063-T52 alloy.

2.6.2 Fastenings: Aluminum or stainless steel.

2.6.3 Louvres: stationary, 150 mm deep unless otherwise indicated, drainable louvres by Construction Specialties Inc., or equivalent product by K.N. Crowder, E.H. Price, Ventex. Unless otherwise shown, provide concealed mullions.

2.6.4 Louvres that are to be installed in masonry shall not be provided with flanges, but installed between masonry faces and caulked around perimeter.

2.6.5 Sill extension: extruded aluminum, depth to suit wall condition, concealed slip anchors, drip deflectors at sill ends.

2.6.6 Insulated blank-off panels: 50 mm thick rigid insulation core, faced both sides with 0.8 mm thick aluminum sheet. Panel perimeter framed with extruded aluminum sections. Closed cell PVC perimeter gaskets.

2.6.7 Finish for louvres and blank-off panels: fluoropolymer coating PPG Duranar, or clear anodised, colours selected by Engineer.

2.6.8 Screens

.1 Diamond mesh 19mm galvanized expanded metal screens.

.2 Bird Screen: 12mm mesh, 1.5mm double crimped aluminum wire; extruded aluminum frame, corners mitered.

.3 Screens to be mounted in extruded aluminium frame which can be easily removed for cleaning purposes.

.4 Fastening to be with corrosion proof stainless steel screws.

2.6.9 Insect Screens

.1 Insect screens to be mounted in extruded aluminium re-wireable frames mesh to be 18" x 14" aluminium.

.2 Note: Insect screen to be installed on all air intake and exhaust openings and shall be removable for the purpose of cleaning.

2.7 Motorized Dampers

2.7.1 Dampers

.1 Damper frames and blades shall not be less than 12 gauge, 0.081" (2.1mm) extruded aluminium. Channel frame to be 4" (101.6mm) deep.

.2 Blades to be single unit; internally reinforced and connected to frame with a 7/16" hexagon rod. Internal hollows to be insulated with 7/8" thick polyurethane foam with Y factor of 5.0 per inch. Blades shall be thermally broken.

.3 Blade and frame seals to be extruded synthetic rubber secured in an integral slot within the blade extrusion.

.4 Frame shall be insulated with polystyrene, R factor of 5.0 per inch.

.5 Bearings to be comprised of Celcon inner bearing fixed onto a hexagon rod rotating within a polycarbonate outer bearing inserted into frame, resulting in no metal to metal contact.

.6 Linkage hardware to be out of airstream and constructed of aluminium and corrosion resistant zinc plated steel, equipped with cup-point trunnion screw for slip-proof grip.

.7 Dampers shall be suitable for operating in temperatures ranging between - 40 degrees Fahrenheit (-40 C) and 165 degrees Fahrenheit (731 C).

.8 Leakage shall not exceed 0.6% of the rated air flow at 10" WG differential static pressure across the damper.

.9 Approved Product:

.1 Greenheck HCD-240

2.7.2 Damper Motors (Non-Modulating)

.1 Two position spring return

.2 Operating Voltage: 120V AC

.3 Maximum Operating Torque: (133 in-lb)

.4 Adjustable Stroke: 95° of rotation (-5° to 90°)

.5 Built-in auxiliary switches (two)

.6 Timing: 30 to 60 seconds

.7 CSA approved.

.8 Approved Product:

.1 Belimo Model AF120-S

.2 Approved equal

2.8 Air Balancing

2.8.1 Scope

.1 Balance, adjust and test air systems and equipment, and submit reports as specified.

.2 Obtain sound level reading and submit reports.

.3 Co-operate with the commissioning process.

2.8.2 Quality Assurance

.1 Testing and balancing shall be performed by an agency that specializes in this type of work. Provide proof that the agency has successfully completed five projects of similar size and scope.

.2 Prior to undertaking the testing and balancing tasks, provide a listing of the instruments used including make, model, serial no. range, and calibration date. All instruments must have been calibrated within 6 months of date of use. Reported balancing and testing data shall include all of the data indicated in the Associated Air Balance Council Manual (Chapter 26).

.3 Begin testing and balancing after systems have been completed and are in full working order. Place systems and equipment into full operation and continue operation during each working day of testing and balancing.

.4 Carry out testing, adjusting and demonstrating of work prior to takeover by the owners.

.5 Have all work performed solely by persons with proven ability and thoroughly versed in the type of testing and balancing. Submit names, complete with experience, record and references for review of the Consultant prior to work being carried out.

.6 Witnessing of all tests by the Consultant and/or owner shall be at their option. Advise the consultant and/or owner of the time and location of tests.

.7 Have all records signed for accuracy by all witnesses and forward to consultant for their review.

.8 Bind a complete set of test records in each Owner's manual issued and note those records for which tests have been witnessed by Authorities having jurisdiction.

2.8.3 Balancing Procedure

.1 Submit balancing procedure for approval within 30 days of Award of contract. Start balancing work after procedure has been approved. Include descriptive data, procedure data, and sample forms in procedure.

.2 Prior to commencement of balancing, review with the Consultant method and instruments to be used in balancing. Discussion shall include descriptive data, procedures data, and sample forms.

.3 Provide a general description of each system including associated equipment and different operation cycles, listing of flow and terminal measurements to be performed, select points for proposed sound measurements.

.4 Provide procedures for converting test measurements to establish compliance with requirements, specify type of instrument to be used, method of instrument application (by sketch) and correction factors.

.5 Provide sample forms showing

2.8.4 Balance Report

.1 Submit electronic copy (PDF) of reports described to the Consultant prior to final acceptance of project.

.2 Stamp reports by a Registered Professional Engineer or Certified Technologist in this Province certifying adherence to agenda, calculation procedures, and final summaries.

.3 Include types, serial number, and dates of calibration of instruments.

2.8.5 System Data

.1 Submit report forms to the Consultant for review. Additional information may be required.

2.8.6 Instruments

.1 Use accurate instruments for measurement. The agency shall have the instruments necessary to complete the work. The agency shall, when called upon to do so, prove out the correct calibration of the instruments used, or alternatively produce a calibration report from a recognized testing laboratory. All instruments used on the project shall have been re-calibrated within the previous six months.

.2 Provide calibration histories for each instrument. Recalibration or use of other instruments may be requested when accuracy of readings is questionable.

2.8.7 General Procedures

.1 Balance air quantities for supply, and exhaust systems to not less than design and not more than 105 per cent of the design requirements and position vane outlets to give the required pattern. The balancing shall be achieved by the use of variable speed motor controllers for each of the exhaust fans.

.2 Permanently mark settings on dampers and other adjustment devices.

.3 Subsequent to correctional work, take measurements to verify balance had not been disrupted or that any such disruption has been rectified.

.4 The agency shall check for malfunctions during balancing and where these arise the agency shall advise so that the appropriate trade or supplier can be informed.

.5 It is not intended that this work shall, in any way, replace normal factory start-up service for such equipment as air handling units and chiller plant, or relieve the Contractor or their sub-trades of their responsibility for providing a first-class installation in satisfactory work order.

2.8.8 Site Visits

.1 The testing and balancing agency shall become familiar with the building contract documents and specifications for this project.

.2 The agency shall ensure he is aware of all change orders, instructions and inspection reports that affect their work.

2.8.9 Air System Procedure

.1 Balance air quantities, supply, and exhaust systems to not less than design and not more than 105 per cent of the design requirement and vane outlets to give the required pattern. The balance shall be achieved by the use of Variable speed motor controllers for each of the exhaust fans.

.2 Adjust fan speed or blade angle where this is adjustable, to produce design volume. This agency shall rebalance as necessary to obtain design requirements.

.3 Make air quantity measurements in ducts by "Pitot Tube" traverse of entire cross-sectional area of duct.

.4 Measure air quantities at each air inlet and outlet.

.5 Check operation of outside, supply and exhaust dampers.

.6 Seal all holes used for flow and pressure measurements after testing with approved plugs or caps. An air tight seal must be maintained.

.7 Verify the operation of all:

.1 Thermostats operating valves or boxes

.2 On/off switches on equipment

.3 Interlocks between equipment.

2.9 Controls

2.9.1 Supply all low voltage, (under 120 VAC), control devices wiring, conduit, transformers, contractors and hardware required to control the heating and ventilating systems included in this section. Installation of this equipment is by Division 16.

2.9.2 Supply all thermostats shown on the drawings or specified.

.1 Line voltage SPDT switch.

.2 Wall mount

.3 Acceptable manufacturer: Honeywell T631A

2.9.3 Heating Thermostat - Unit Heaters:

.1 Control Voltage: 24 VAC

.2 Type: Snap action on falling temperature, heating only.

.3 Sequence: Single Stage

2.9.4 Damper Actuators

.1 Provide electric actuators of the enclosed reversible gear drive type that can accept on / off control signals as required. Actuators using balance relays or mechanical travel limiting switches are not acceptable.

.2 Provide damper actuators that develop sufficient force to maintain damper rated leakage characteristics. Supply actuator with limit switch for position proving as required in sequence of operation.

.3 Electric damper actuators shall be spring return 24 VAC power.

.4 Acceptable products are BELIMO AF120-S for two positions.

2.10 Metal Sleeves

2.10.1 One piece 16 gauge (1.6mm) spun aluminium by Thaler Roofing Specialities Products Inc., or fabricated from 16 oz. (454gms) copper or 26 gauge (.457mm) stainless steel, fabricated, minimum 12" (300mm) high above finished roof surface, with 5" (125mm) flange as approved by Consultant. All seams to be continuous and soldered.

3 EXECUTION

3.1 Installation - General

3.1.1 Install equipment in accordance with manufacturer's instructions, and regulations of authorities having jurisdiction.

3.1.2 Test and balance all air flow systems. Provide Engineer written report of test and balancing results.

3.1.3 Provide a start-up report for all new HVAC equipment that is prepared by a representative of the equipment manufacturer.

3.1.4 Install thermostats 1200 mm above finished floor.

3.1.5 Provide training in accordance with Section 01820.

3.1.6 Provide closeout submittals in accordance with Section 01780.

3.2 Field Installation

3.2.1 Install fans as indicated, complete with resilient mountings and flexible electrical leads.

3.3 Louver Installation

3.3.1 Install louvres plumb and level and securely fasten to adjacent building elements.

3.3.2 Except where exposed mullions are indicated, provide concealed mullions. Space mullions as required to keep louvre blades within specified deflection limit.

3.3.3 Allow for expansion and contraction of metal components without detrimental effects.

3.3.4 Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or other means as approved by Engineer.

3.3.5 Install bird screens at all louvres.

3.3.6 Install sill extensions. Where shown install trim matching louvre material and finish.

3.3.7 Install insulated blank-off panels at unused portions of louvres, except where louvres are designated to be left open.

3.4 Start-Up

3.4.1 Co-ordinate and supervise the start-up of the various pieces of equipment and systems. Utilize the start-up services of the manufacturer's representative. Ensure that the equipment is operating in a satisfactory manner. Check the following items:

.1 Direction of rotation.

.2 Grease and lubricants

.3 Noise

.4 Seals

3.5 Operation And Testing

3.5.1 Test the operation of the individual components and systems. Go through each step of the sequence of operation and verify that each component operates correctly. Direct and ensure that all trades involved make the required changes and adjustments to affect the proper

operation of all components and systems. Document the operations and sequences. See Commissioning tests.

3.5.2 In conjunction with the Balancing Contractor document the performance of each component. Verify the operating point of equipment with respect to certified performance data. Review the results with suppliers.

3.5.3 Test records sheets shall be reviewed by the Consultant prior to commencement of testing. The record sheets shall include a list of all specialist personnel, and specialized equipment required for the test to ensure that these are available on the testing date.

3.5.4 Carry out operational tests for the current season and simulate operation of summer, winter and intermediate seasons.

3.6 Documentation

3.6.1 Provide documentation of the commissioning process for inclusion into the maintenance manuals. These are to include check out sheets, report forms, start-up certificates from Suppliers involved in start-up, documentation concerning demonstration to the Owner. Include all record and result sheets from tests specified herein.

3.6.2 Maintain a daily log of key operating parameters, problems encountered, solutions employed and verification of effectiveness of solutions.

3.6.3 Prepare detailed progress reports to coincide with regular commissioning meetings.

3.7 Pressure Tests

3.7.1 Provide equipment, materials and labour for tests and pay expenses. Use test instruments by approved laboratory or manufacturer and furnish certificate showing degree of accuracy. Install permanent gauges and thermometers used for tests just prior to tests to avoid possible changes in calibration.

3.7.2 Low pressure ducts: Test for tightness such that leakage is inaudible and not detectable by feel.

3.7.3 Low pressure ducts: Test at a static pressure of 500 Pa in excess of specified duct pressure.

3.7.4 Should tests indicate defective work or variance with specified requirements, make changes immediately to correct the defect. Correct leaks by re-making joints in screwed fittings, cutting out and re-welding welded joints, re-making joints in copper lines. Do not caulk.

3.8 Performance Tests

3.8.1 Conduct performance tests to demonstrate equipment and systems meet specified requirements after mechanical installations are completed and pressure tested. Conduct tests as soon as conditions permit. Make changes, repairs, adjustments, and replacements requested as tests may indicate prior to operating tests.

3.8.2 Lubricate bearings.

3.8.3 Calibrate and adjust thermostats, thermometers, gauges, linkage and dampers. Control valves shall operate freely

3.8.4 Operate and test motors and speed switches for correct wiring and sequences. Check overload heaters in motor starters.

3.8.5 Replace and clean filters. Clean fan wheels and coils.

3.8.6 Fasten loose and rattling pieces of equipment. Unit heaters, pumps and other equipment shall operate quietly.

3.8.7 Brine or corrosive chemicals shall not be used for testing any systems.

3.8.8 Eliminate any noise and vibration if such is not acceptable to the Consultant and Owner at no expense to the Owner.

3.9 Trial Usage

3.9.1 The Owner has the privilege of the trial usage of mechanical system or parts thereof for the purposed of testing and learning the operational procedures.

3.9.2 Carry out the operations only with the express knowledge and under supervision of the Sub-Contractor who shall not waive any responsibility because of trial usage.

3.9.3 Trial usage shall not be construed as acceptance by the Owner.

END OF SECTION

1 GENERAL

1.1 Description

1.1.1 This section describes the requirements for the HVAC control systems including digital control systems, sensors, actuators and other control devices such as thermostats.

1.2 Scope of Work

1.2.1 Provide a dedicated HVAC control systems to manage the operation of the following systems:

.1 Chemical Room HVAC systems.

.2 Process Room HVAC systems.

1.2.2 Supply low voltage electrical wiring for components furnished under this section. This includes wiring between control components and wiring from such components to electrical control circuits of fans, and other related HVAC equipment. Installation of this wiring is by Division 16.

1.2.3 Provide all motorized control dampers as required by the sequences of operation, and not specified as an integral part of equipment specified under other sections of this Division.

1.3 General

1.3.1 Furnish all labour, materials, tools and equipment required to implement a ventilation control system to suit the description of operation described herein and shown on the drawings.

1.3.2 The system shall be suitable for long-term stable operation.

.1 Manual balancing dampers and gravity dampers are not covered by this section.

1.3.3 Meet the requirements of Division 16 and referenced standards therein.

2 PRODUCTS

2.1 Control Sequence

2.1.1 Chemical Room 1 heating and ventilation

.1 The Chemical Room heating and ventilation system consists of Exhaust Fan EF-01, fresh air intake damper MD-01, exhaust damper MD-02 and unit heater UH-01.

.2 The Chemical Room ventilation system is designed for single-speed operation.

.3 The system will operate be interlocked with the light switch for the chemical room, as well as thermostat and programmable timer control.

.4 Room Temperature Control:

.1 Monitor the zone temperature. Initial temperature setpoint shall be 10 °C for heating, 26 °C for cooling.

.2 Below the heating setpoint, the electric unit heater UH-01 shall operate to maintain the heating setpoint.

.3 Above the cooling setpoint, exhaust fan EF-01 shall run.

.5 Timer control:

.1 Exhaust fan EF-01 shall be programmed to run daily, with adjustable frequency and duration, initially set to once per day for 5 minutes at noon.

2.1.2 Process/Electrical Room Heating and Ventilation

.1 The Process/Electrical Room heating and ventilation system consists of the heat pump system, exhaust fan EF-02, fresh air intake damper MD-03, exhaust damper MD-04 and the existing unit heaters in the space. The Process Room ventilation system is designed for single speed operation.

.2 The system will operate continuously.

.3 Room Temperature Control:

.1 Monitor the zone temperature. Initial temperature setpoint shall be 10°C for heating and 24°C for cooling.

.2 Below the heating setpoint, the heat pump system will operate in heating mode to maintain the set point. Below 5°C the unit heaters will operate to maintain the space temperature.

.3 Below the heating set point, the exhaust fan shall power off.

.4 Above the cooling set point the supply and exhaust dampers will open and the exhaust fan will operate to maintain the temperature set point. Above 28°C the supply and exhaust dampers will close, the exhaust fan will power off and the heat pump system will operate in cooling mode to maintain the temperature set point.

2.2 General

2.2.1 Devices located in a classified area (Class 1, div 1 or div 2) shall be appropriately rated by CSA for operation in these areas. All wiring & installation methods shall conform to the electrical safety code for this type of area.

2.3 Temperature Switches

2.3.1 Temperature sensing element shall be liquid, vapour or bimetallic type.

2.3.2 Supply adjustable setpoint and differential.

2.3.3 Snap action type rated at 120 volts, 15 amps or 24 volts DC as required.

2.3.4 Sensors shall operate automatically and reset automatically. Temperature switches shall be of the following types:

2.3.5 Room type suitable for wall mounting on standard electrical box with or without protective guard. Enclosure rated to suit area classification.

2.3.6 General Purpose Duct Type suitable for insertion into air ducts, insertion length of 450 mm (18 inches).

2.3.7 Strap-on-Type complete with helical screw stainless steel clamps.

2.4 Control Relays

2.4.1 Supply load relays capable of switching 10 amps at 120/1/60.

2.4.2 Acceptable manufacturer:

.1 Entrelec

.2 Approved equal

2.5 Electrical Wiring

2.5.1 All wiring shall be in accordance with the governing electrical authority.

2.5.2 Conform with the electrical requirements of the area classifications

2.5.3 Supply equipment, field devices, systems that are rated to suit the area classifications shown on the electrical drawings.

2.5.4 Supply all required wiring in accordance with Division 16 requirements.

2.5.5 Supply enclosures for all control system components.

2.5.6 The control system shall be installed in a wall mounted control panel rated NEMA 12. Control enclosure shall be constructed of corrosion resistant material. Control panel is to be in the electrical room.

3 EXECUTION

3.1 General

3.1.1 Install all equipment and accessories in a neat manner by skilled and qualified work persons using the latest standard practices of the industry. Conduit and interconnecting wiring to be installed under Division 16.

3.1.2 Unless otherwise specified, meet manufacturer's latest printed instructions for materials, planned maintenance and installation methods.

3.1.3 Notify Construction Manager in writing of any conflict between these specifications and manufacturer's instructions.

3.1.4 Retain, at no additional cost to the Owner, original equipment product Products to provide contacts that are required in the sequences specified. Provide the necessary relays and transformers required to interconnect equipment.

3.1.5 All equipment installed shall be mechanically stable and, as necessary, fixed to wall or floor. Anti-vibration mounts to be provided, if required, for the proper isolation of equipment.

3.1.6 Install equipment to allow for easy maintenance access. Ensure equipment does not interfere in any way with access to adjacent equipment and personal traffic in the surrounding space.

3.1.7 Install equipment in locations providing ventilation and ambient conditions for its specified function.

3.1.8 In accordance with Division 16, install all electrical wiring in conformance with the requirements of the local electrical authority, and the Ontario Building Code

3.1.9 In accordance with Division 16, install low voltage wiring in accordance with the control manufacturer's recommendations. Run all wiring in a protective conduit. Where indicated, wiring shall be suitable for classified areas. Include all conduit & sealing as required by code.

3.2 Installation

3.2.1 Install all equipment in accordance with manufacturer's published instructions.

3.2.2 Supply equipment to be installed by other divisions in accordance with their work schedule.

3.2.3 Coordinate final location of all sensors with consultant's field representative prior to installation.

3.2.4 Sensor assemblies and elements must be readily accessible. Provide access doors as required to allow for easy replacement and servicing.

3.2.5 Support field mounted transmitters and sensors on pipe stands or channel brackets.

3.2.6 Locate all sensing elements to correctly sense measured variable. Isolate elements from vibrations and temperatures which could affect measurement.

3.2.7 Install averaging type RTDs in serpentine configuration with adequate provision for the mechanical protection of the sensor. Support along its entire length.

3.2.8 Modifications to existing plenum and ductwork must achieve the intent of the Contract Documents and adhere to the following:

3.2.9 Mount sensors with extension necks such that access to sensors is not restricted by insulation.

3.2.10 Keep cutting to a minimum and perform in a neat and workmanlike manner.

3.2.11 Provide patches and access covers of the same material and thickness as adjoining ductwork. Provide necessary reinforcing and fastening materials.

3.2.12 Provide gaskets, seals and insulation to restore to, or exceed as found conditions in areas where this contractor has made modifications.

3.2.13 All damper actuators shall be rigidly mounted and supplied with heavy duty linkage consisting of a crankarm, pushrod and swivel balljoint to connect to the damper shaft. Secure linkages in such a manner as to prevent slipping under normal operating torque.

3.2.14 Modifications to existing plenum and ductwork must achieve the intent of the Contract Documents and adhere to the following:

.1 Keep cutting to a minimum and perform in a neat and workmanlike manner.

.2 Provide patches and access covers of the same material and thickness as adjoining ductwork. Provide necessary reinforcing and fastening materials.

.3 Provide gaskets, seals and insulation to restore to, or exceed as found conditions in areas where this Contractor has made modifications.

3.2.15 Install and/or locate all HVAC system equipment, in the field prior to the installation of any raceways.

3.3 Identification

3.3.1 Identify each piece of equipment, including sensors, controlled devices and control panels, with a nameplate identifying the equipment and functions with a letter and number designation.

3.3.2 Nameplates shall be minimum size 3" x 1" and 1/8" thick laminated plastic with black face and white centre and ¼" deep engraved lettering. Nameplate shall be securely attached to the equipment.

3.3.3 Printed name tags are acceptable for cabinet mounted components providing they are securely attached.

3.4 Site Acceptance Testing

3.4.1 Controls Contractor requests completion acceptance in writing and advises Owner's authorized representative of situations that prevent a complete testing of overall system performance.

3.4.2 Prior to online operation, the Owner's authorized representative gives written approval of start-up of the FMS for online operation.

3.4.3 After completion of installation and in cooperation with other involved Contractors, make adjustments to each control device and component to ensure that the operations are in accordance with the sequences of operation specified.

3.4.4 Upon completion of system start-up, the Owner's authorized representative shall be requested in writing to inspect and approve the satisfactory operation of the Control and Facilities Management System.

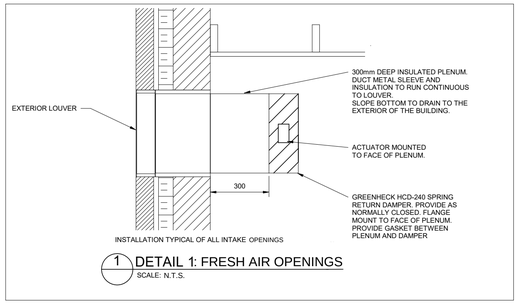
3.4.5 Upon receipt of a detailed system adjustment list from the Owner's authorized representative, review and implement all necessary corrections. After all items appearing on the adjustment list are completed, request approval from the Owner's authorized representative. As each or all items are approved, written confirmation shall be issued.

3.4.6 Return to the site to perform additional tests and/or adjustments, if required, to prove system performance during the warranty period.

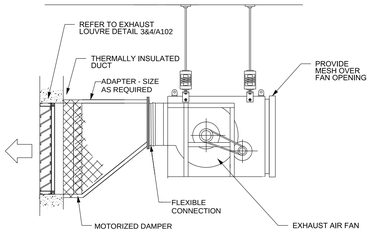
3.5 Commissioning

3.5.1 Perform commissioning in accordance with Section 01820.

END OF SECTION



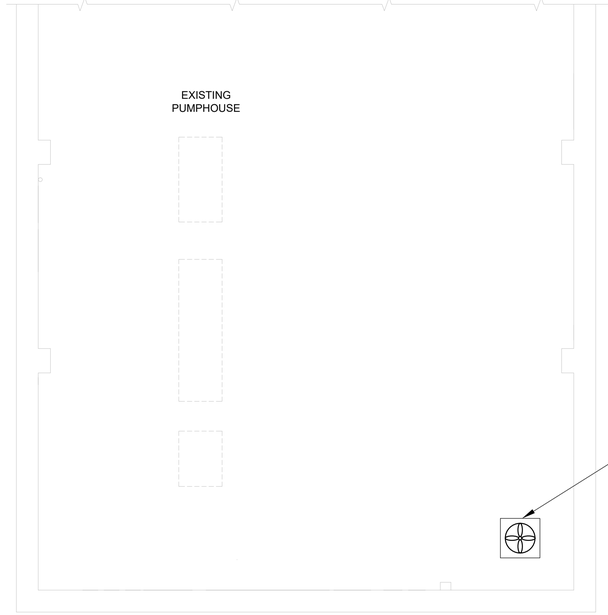
1 DETAIL 1: FRESH AIR OPENINGS
SCALE: N.T.S.



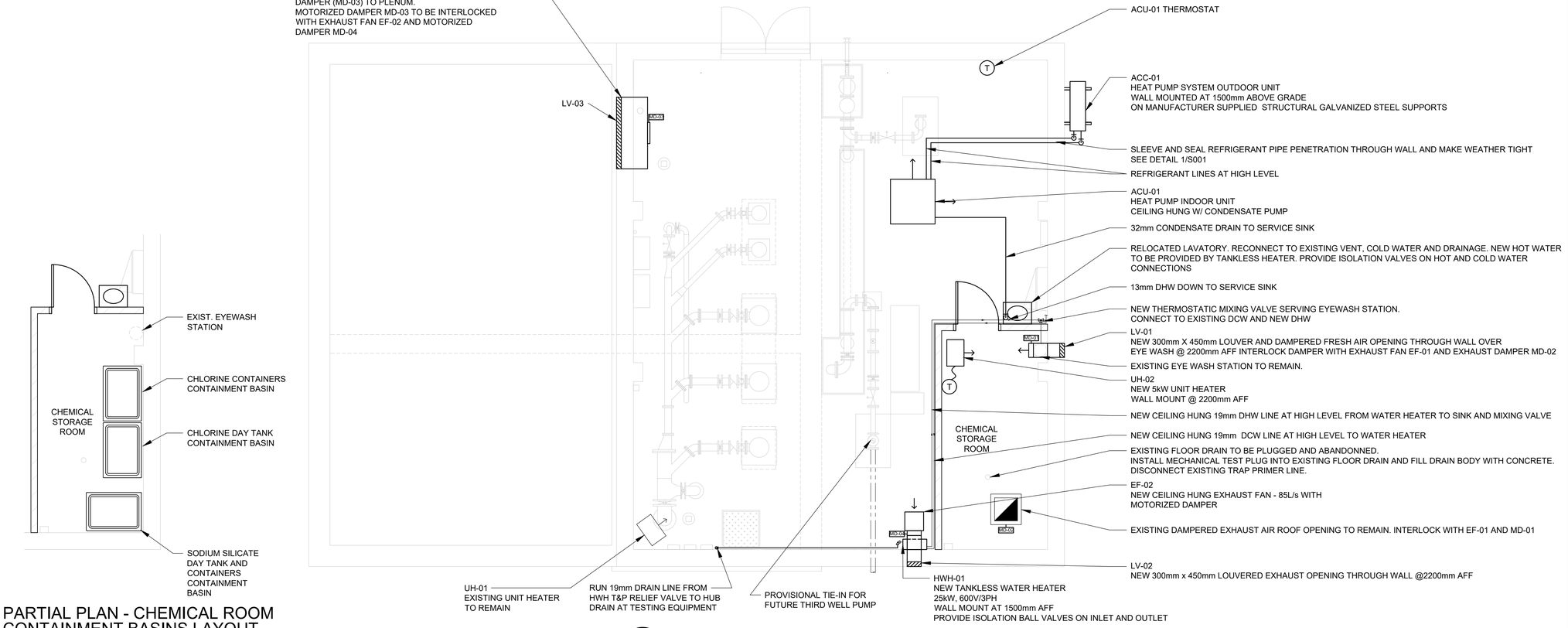
NOTE:

1. EXHAUST AIR FAN TO BE PROPERLY MOUNTED WITH CEILING HANGERS AND SUPPORTS TO PREVENT NOISE AND VIBRATION. FAN TO BE SUSPENDED MINIMUM 2200MM ABOVE FINISHED FLOOR.

2 DETAIL 2: PROCESS ROOM EXHAUST FAN
SCALE: N.T.S.



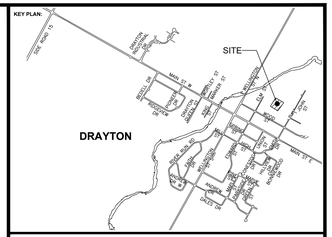
2 PARTIAL PLAN - EXISTING PUMPHOUSE ROOFTOP
SCALE: 1:50



1 PLAN - EXISTING PUMPHOUSE GROUND FLOOR
SCALE: 1:50

3 PARTIAL PLAN - CHEMICAL ROOM CONTAINMENT BASINS LAYOUT
SCALE: 1:50

KEY PLAN:



BENCHMARK:

TOP NUT OF HYDRANT AT ENTRANCE TO DRAYTON PARKS OPERATION BUILDING AND WATER TREATMENT PLANT.

ELEV: 403.604

NOTES:

1. SITE IS WITHIN GRCA REGULATED AREA AND GRCA FLOODPLAIN OF 402.39m CGVD28.

No.	Date	Description	By
1	SEPT 2023	ISSUED FOR ADDENDUM 4	AM
0	JUL 2023	ISSUED FOR TENDER	AM

STAMPS:

LICENSED PROFESSIONAL ENGINEER — 2023/09/26 — G. R. BOOTH — 100553662 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — 09/27/2023 — A. W. MOORE — 100198167 — PROVINCE OF ONTARIO

ENGINEER:

C2 Architecture

415 BASELINE ROAD WEST, 2ND FLOOR
BOWMANVILLE, ON L1C 5M2
CANADA
www.cima.ca

CLIENT:

Mapleton

PUBLIC WORKS DEPARTMENT AND ENGINEERING SERVICES
7275 SIDEROAD 16
DRAYTON, ONTARIO
N0G 1P0
(519) 638-3313

PROJECT NAME:

DRAYTON WATER SUPPLY PUMPHOUSE UPGRADES
Contract No. RFT 2023-15

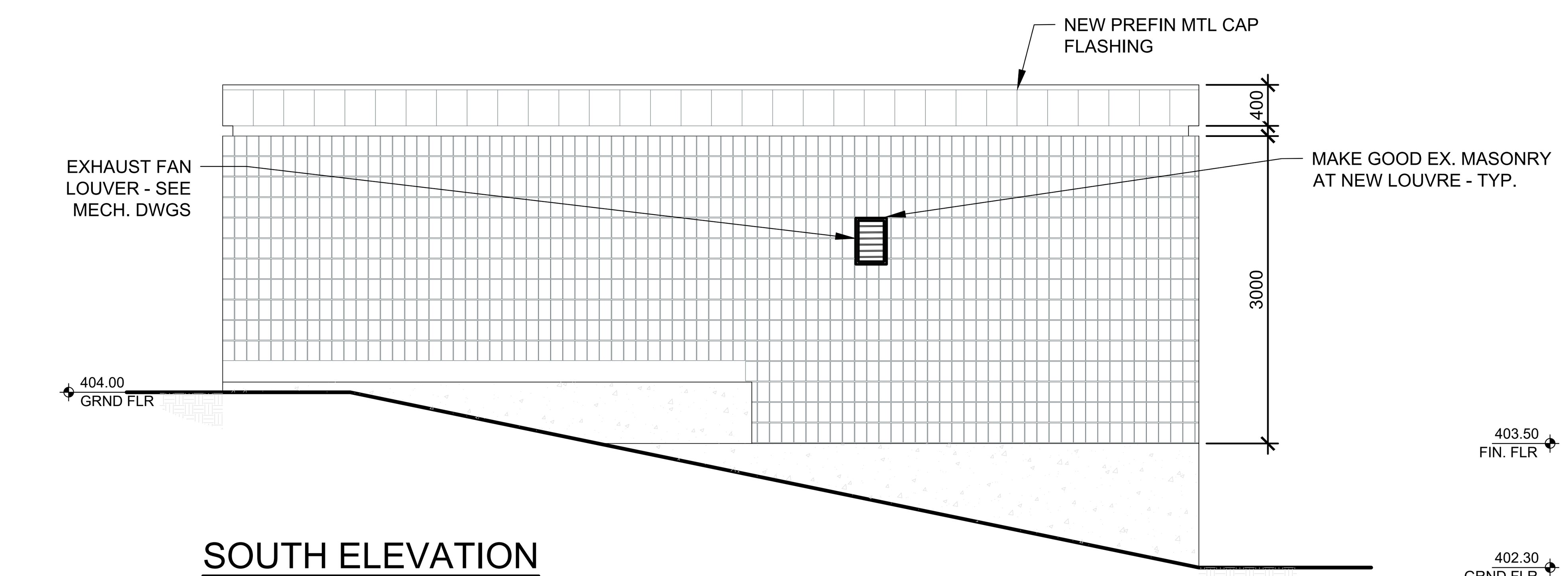
SHEET TITLE:

MECHANICAL AND PLUMBING PLAN

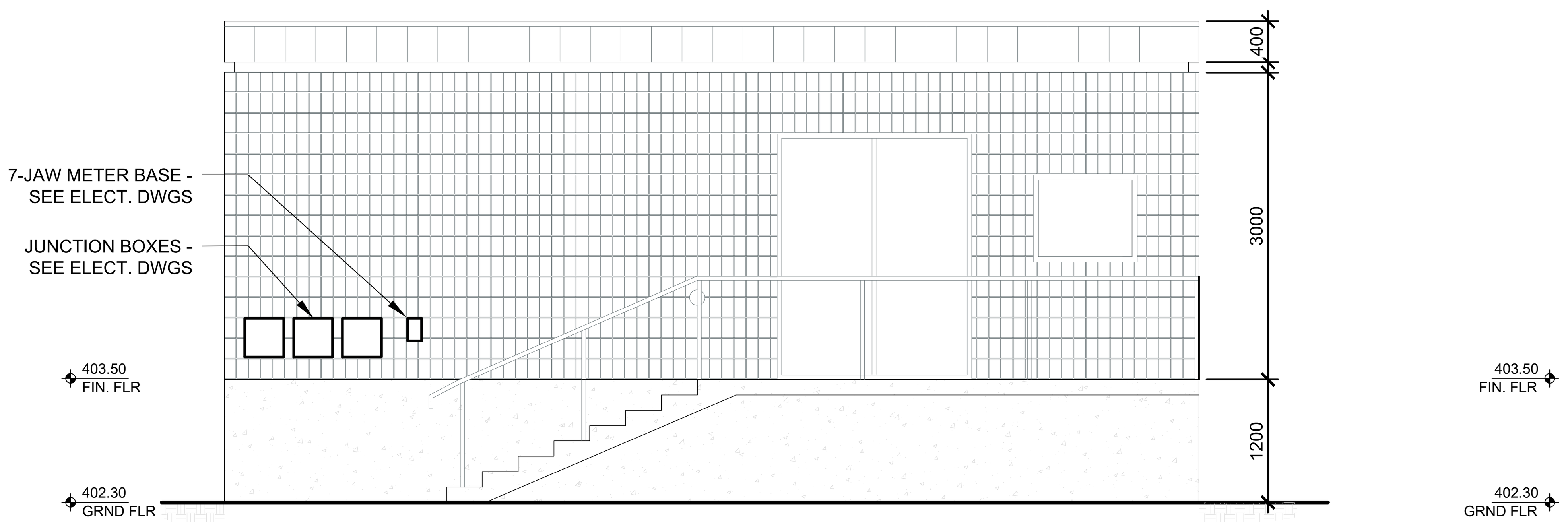
DISCIPLINE:

MECHANICAL

DRAFTER: GB	SCALE: 1:50
DESIGNER: GB	DATE: MARCH 2023
APPROVER: GB	CHECKER: JG
PROJECT No: T000974D	DRAWING No: M101
SHEET No: 9 of 30	



SOUTH ELEVATION
SCALE: 1:50



NORTH ELEVATION
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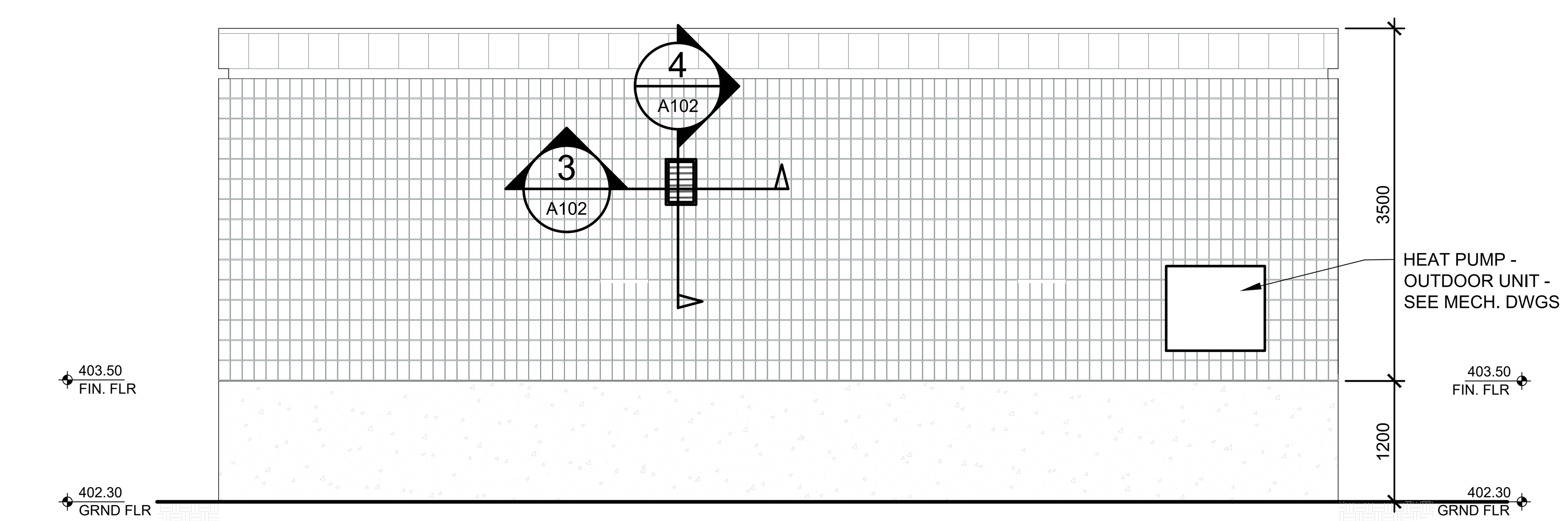

EAST ELEVATION
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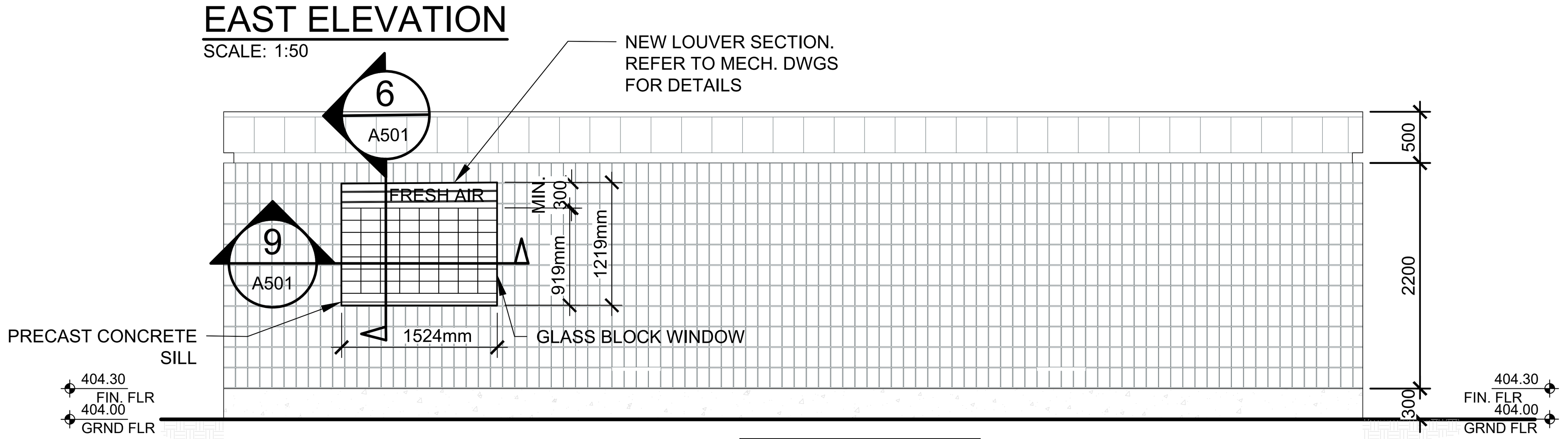
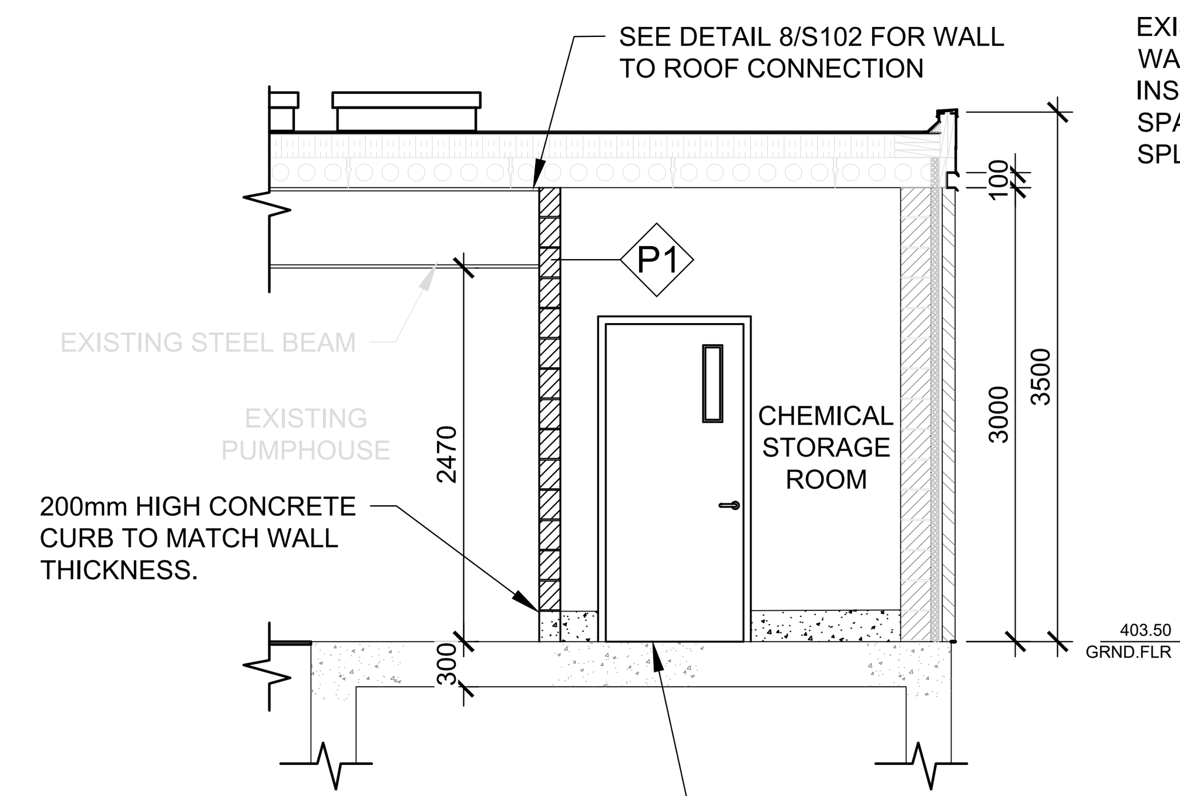


NOTE - ALL DIMENSIONS TO BE SITE VERIFIED

WEST ELEVATION
SCALE: 1:50



SECTION 1-1
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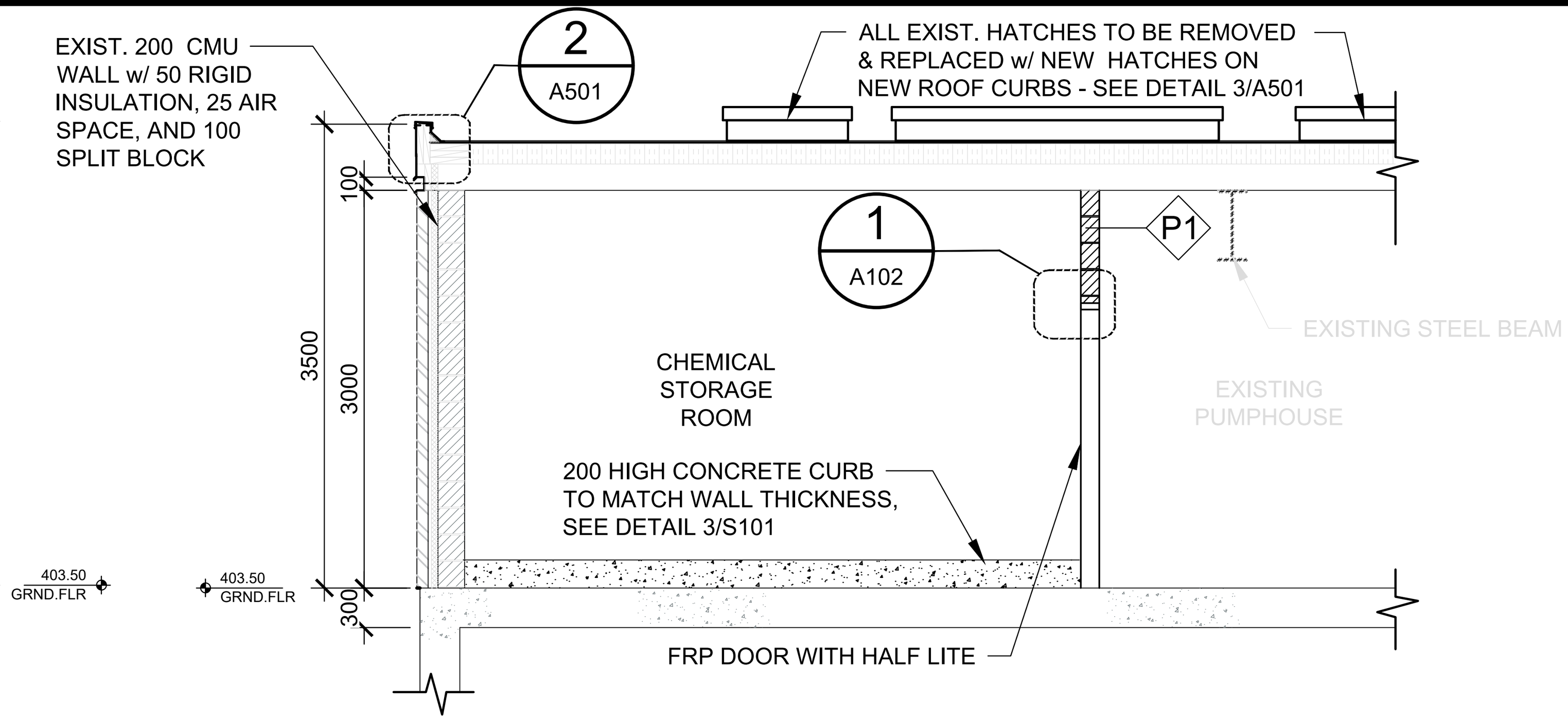

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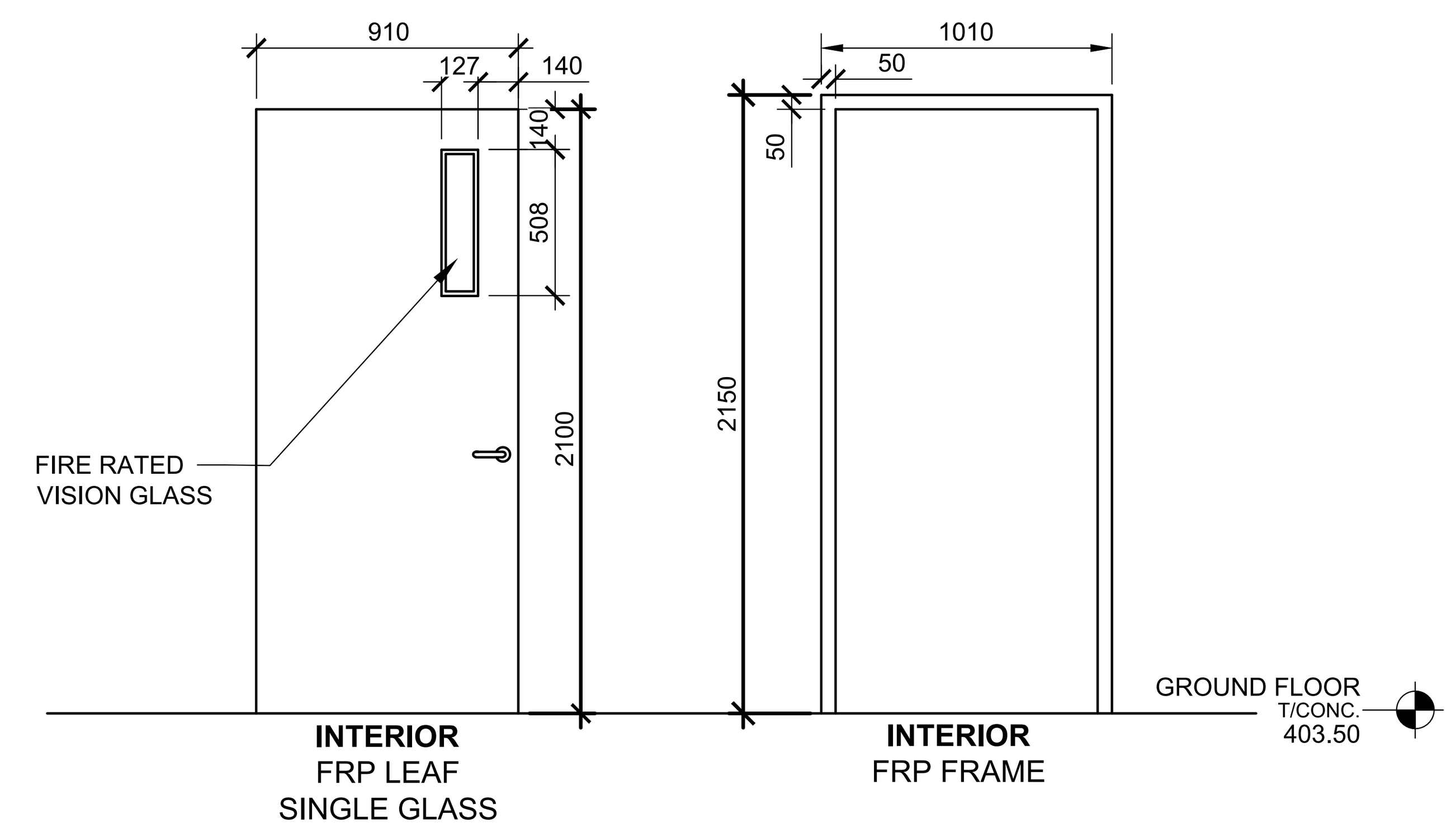
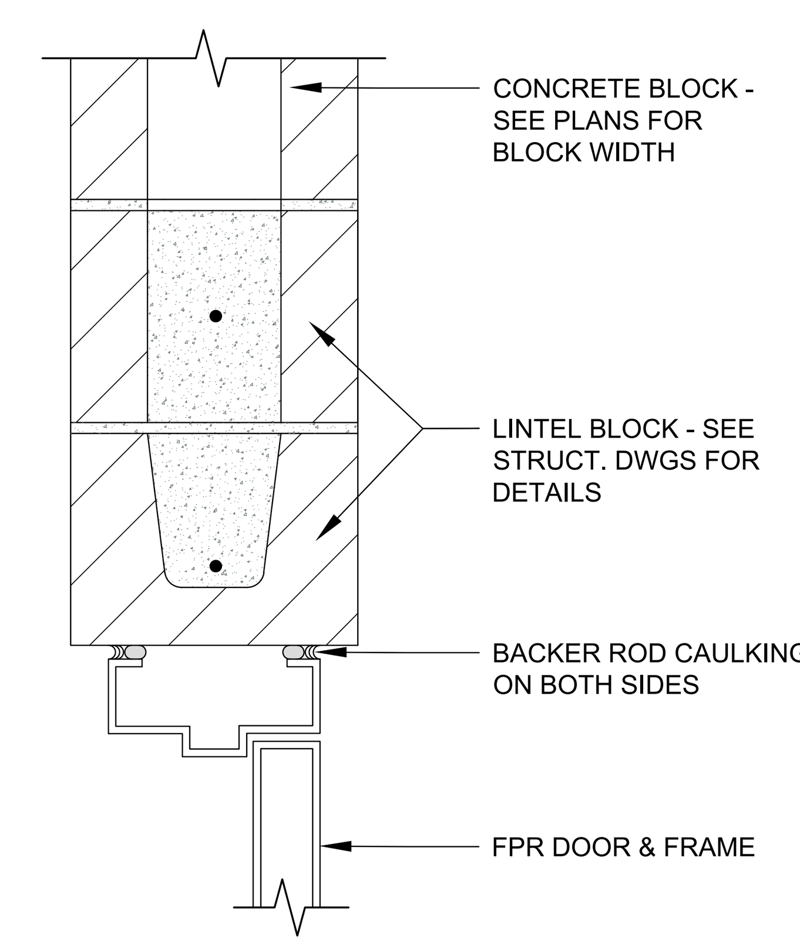


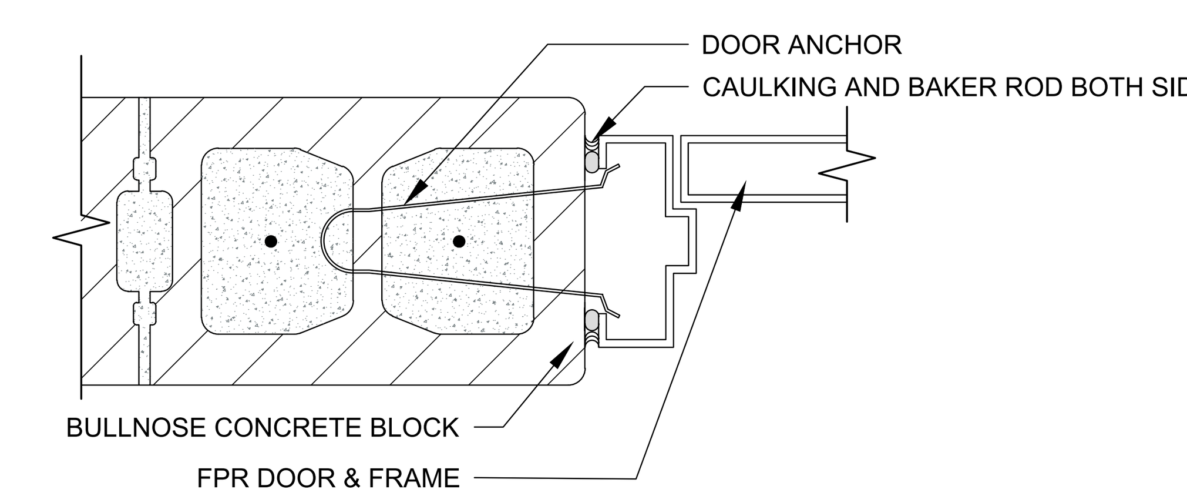
NOTES:

1. DOOR THICKNESS: 45mm OF FLUSH CONSTRUCTION.
2. STAINLESS STEEL HARDWARE - SEE SPEC 08710
3. DOOR TO BE AT LEAST 1.5 HR FIRE RATED
4. PROVIDE APPROPRIATE ANCHORAGE TO WALL CONSTRUCTION.
5. CAULK PERIMETER OF FRAMES BETWEEN FRAME AND ADJACENT MATERIAL.
6. DOORS AND FRAMES SHALL BE SUPPLIED WITH GRAY PRIMER COATED WITH MANUFACTURER'S STANDARD COLOURS.
7. COLOUR CHART TO BE PROVIDED FOR CLIENT SELECTION.

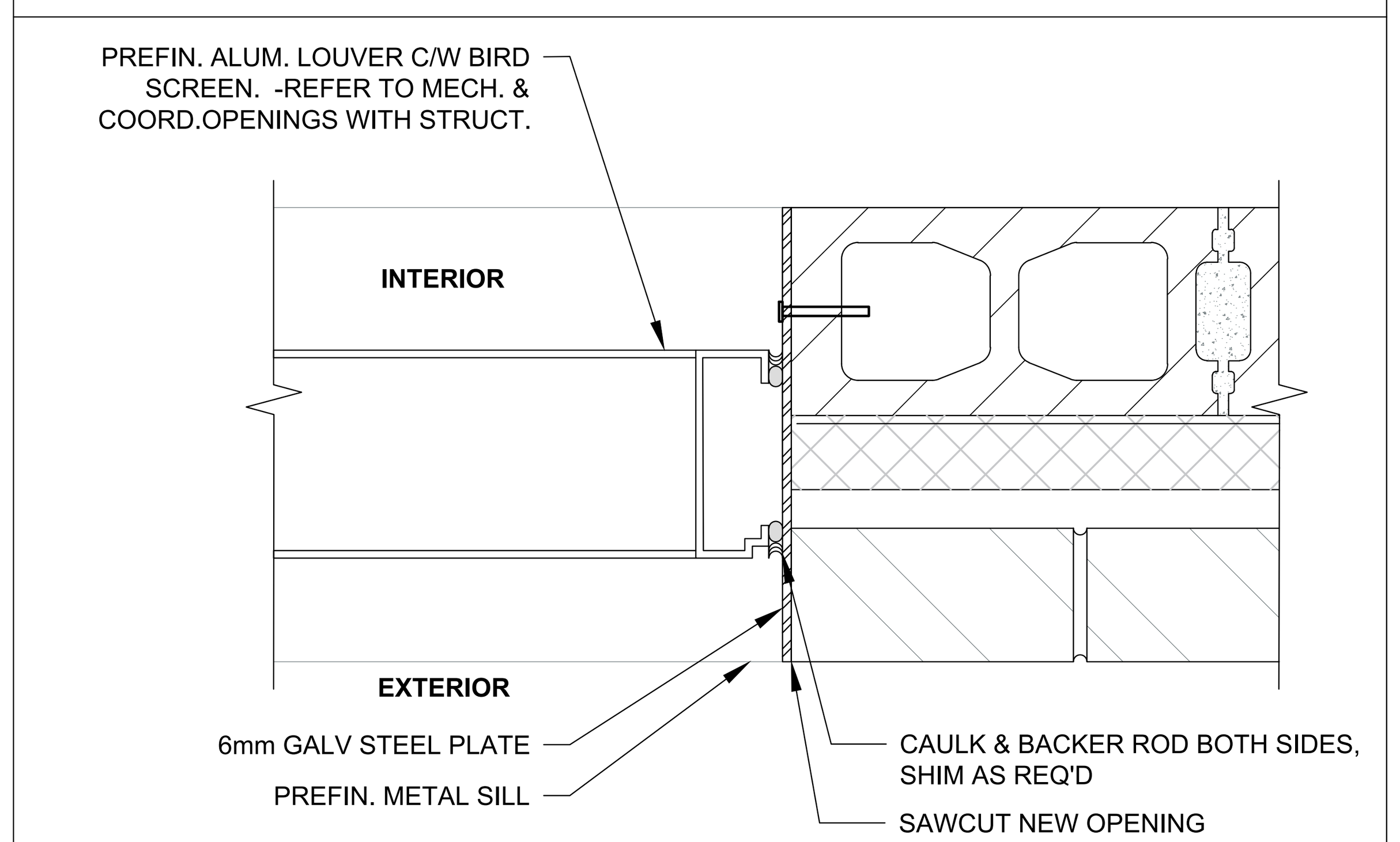
DOOR SCHEDULE



1 DOOR HEAD DETAIL
SCALE: 1:5

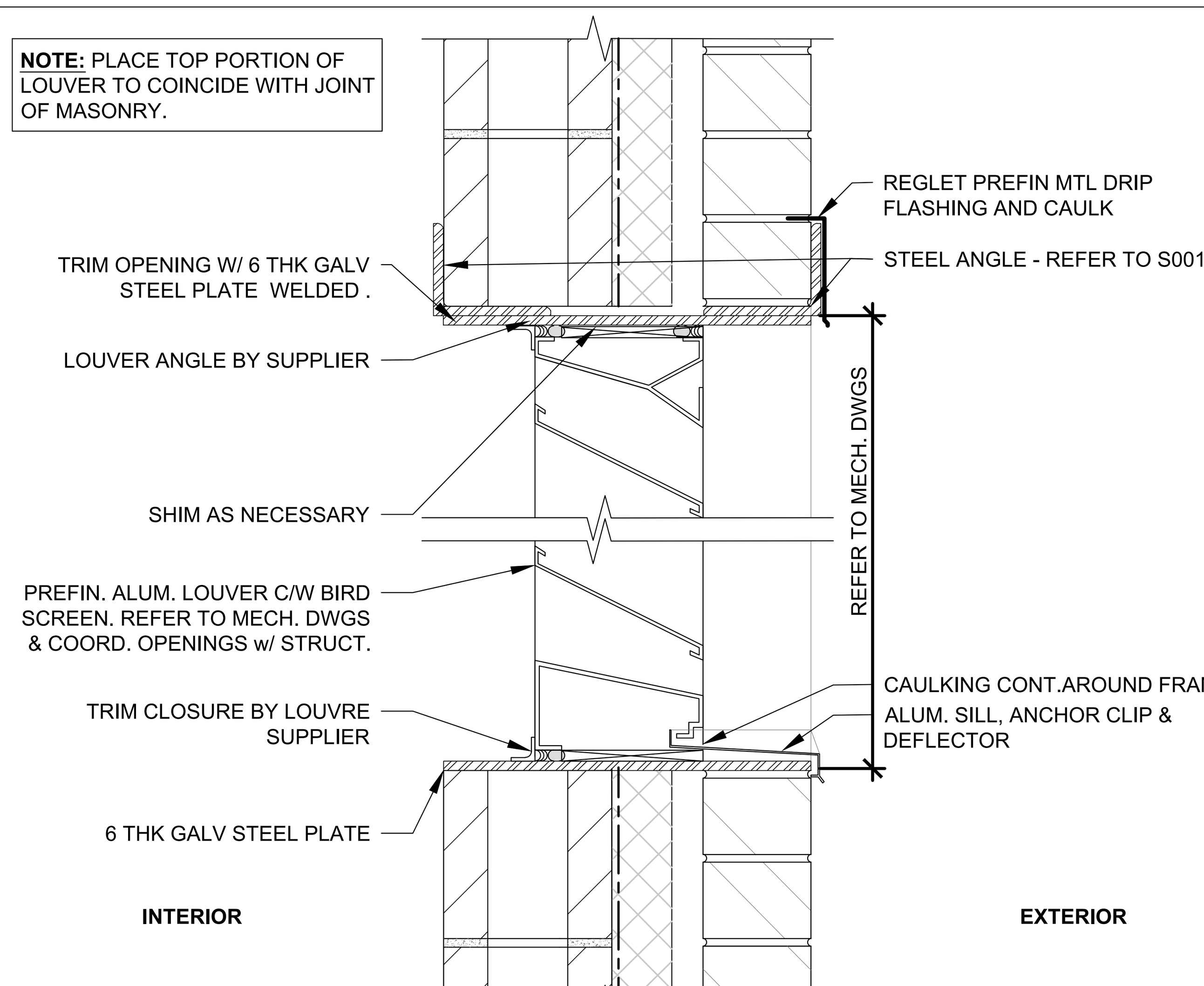


2 DOOR JAMB DETAIL
SCALE: 1:5



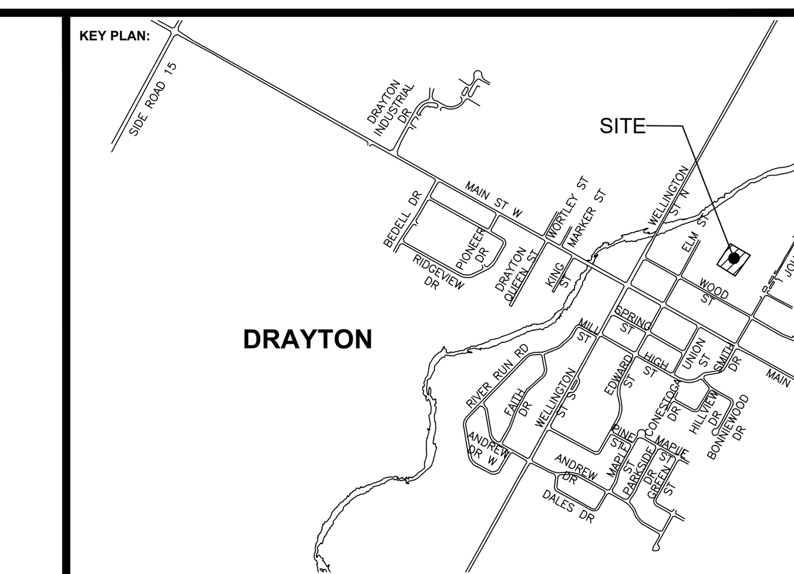
3 LOUVER JAMB DETAIL
SCALE: 1:5

NOTE: PLACE TOP PORTION OF LOUVER TO COINCIDE WITH JOINT OF MASONRY.



4 LOUVER HEAD/SILL DETAIL
SCALE: 1:5

KEY PLAN:



BENCHMARK:
TOP NUT OF HYDRANT AT ENTRANCE TO DRAYTON PARKS OPERATION BUILDING AND WATER TREATMENT PLANT.
ELEV: 403.604

NOTES:
1. SITE IS WITHIN GRCA REGULATED AREA AND GRCA FLOODPLAIN OF 402.39m CGVD28.

No.	Date	Description	By
1	SEPT 2023	ISSUED FOR ADDENDUM 4	AM
0	JUL 2023	ISSUED FOR TENDER	AM

STAMPS:
ONTARIO ASSOCIATION OF ARCHITECTS
09/26/2023
GUY L CUDLIP
LICENCE
4813

ENGINEER:
C2Architecture
415 BASELINE ROAD WEST, 2ND FLOOR
BOWMANVILLE, ON L1C 5M2
CANADA
www.cima.ca

CLIENT:
Mapleton
PUBLIC WORKS DEPARTMENT AND ENGINEERING SERVICES
7275 SIDEROAD 16
DRAYTON, ONTARIO
N0G 1P0
(519) 638-3313

PROJECT NAME:
DRAYTON WATER SUPPLY PUMPHOUSE UPGRADES
Contract No. RFT 2023-15

SHEET TITLE:
ELEVATIONS, SECTIONS & DOOR/LOUVER DETAILS

DISCIPLINE:
ARCHITECTURE

DRAFTER: JS	SCALE: VARIES
DESIGNER: JS	DATE: MARCH 2023
APPROVER: LC	CHECKER: MB
PROJECT No: T000974D	DRAWING No: A102
SHEET No: 04 of 30	