

HWDSB

Hamilton - Wentworth District School Board

P01957 Hill Park Learning Centre

Boiler Room Renovation and HVAC Upgrades

465 East 16th Street,  
Hamilton, ON

DRAWING LIST	
SHEET	ARCHITECTURAL DRAWINGS
A0.00	COVER PAGE
A0.01	SITE LOCATION, GENERAL NOTES, KEY PLAN, & LEGENDS
A1.01	DEMOLITION FLOOR PLANS
A1.02	GROUND FLOOR DEMOLITION PLAN
A2.01	BOILER ROOM PLAN , GROUND FLOOR PLAN, DOOR & DOOR FRAME TYPE, DOOR SCHEDULE, SECTION DETAILS
MECHANICAL DRAWINGS	
M-100	LEGENDS, SCHEDULES AND DETAILS
M-101	SPECIFICATIONS
M-102	CONTROLS SPECIFICATIONS
M-103	DETAILS & CONTROLS
M-300	BASEMENT PLAN - MECHANICAL DEMOLITION
M-310	BOILER ROOM UPGRADES - PLUMBING, HYDRONIC AND HVAC NEW CONSTRUCTION
M-311	GROUND FLOOR - MECHANICAL NEW CONSTRUCTION
M-312	SECOND FLOOR - MECHANICAL NEW CONSTRUCTION
ELECTRICAL DRAWINGS	
E000	GENERAL NOTES, LEGENDS, DRAWING LIST & SCHEDULES
E050	SPECIFICATIONS
E100	BASEMENT FLOOR SITE PLAN
E101	FIRST FLOOR SITE PLAN
E102	SECOND FLOOR SITE PLAN
E200	DEMOLITION BOILER ROOM FLOOR PLAN
E300	PROPOSED ELECTRICAL BOILER FLOOR PLAN
E400	PRE-EXISTING MCC DETAILS
E401	UPDATED MCC DETAILS
STRUCTURAL DRAWINGS	
S1	BOILER ROOM UPGRADES & HOUSEKEEPING PADS
S2	PART GROUND FLOOR AND ROOF FRAMING PLAN

project number	DRAWING NO.
24-25	A0.00

NOTES AND SPECIFICATIONS

1. GENERAL:

THE PROJECT SCOPE INCLUDES PARTIAL RENOVATION OF THE BOILER ROOM & GENERAL PURPOSE RM 1026 AT 465 EAST 16TH STREET, HAMILTON ON AS REQUIRED FOR THE COMPLETE REDESIGN OF THE HVAC BOILER SYSTEM AND DOMESTIC HOT WATER SYSTEM.

TOTAL AREA OF WORK IS 207 SQ. M.

FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION AND MAKE MODIFICATIONS TO SUIT EXISTING SITE CONDITIONS.

FOR THE FULL SCOPE OF WORK, REFER ALSO TO THE MECHANICAL, ELECTRICAL & STRUCTURAL DRAWINGS INCLUDED IN THE PACKAGE.

CONTRACTOR TO PROTECT EXISTING CONDITIONS TO REMAIN FROM DAMAGE DURING CONSTRUCTION.

CONTRACTOR SHALL FULLY ENCLOSE CONSTRUCTION AREA AND COORDINATE ALL DEMOLITION AND NEW WORK IN SUCH MANNER NOT TO DISTURB DAY-TO-DAY OPERATION OF THE SURROUNDING AREAS.

CONTRACTOR TO COORDINATE THEIR WORK WITH THE ABATEMENT CONTRACTOR FOR WORK LOCATED WITHIN BUT NOT LIMITED TO 'GENERAL PURPOSE RM 1026'.

2. DEMOLITION:

REFER TO DEMOLITION PLAN AND NOTES INCLUDED WITHIN THE ARCHITECTURAL DRAWING SET AND ALSO MECHANICAL, ELECTRICAL & STRUCTURAL DEMOLITION DRAWINGS AND NOTES.

REPAIR AND MAKE GOOD EXISTING FLOORS AND WALLS DAMAGED DURING DEMOLITION PROCESS AND NEW SERVICE INSTALLATION. PATCH ALL FLOORS AS REQUIRED.

PATCH AND REPAIR WALL AS REQUIRED AT ALL LOCATIONS WHERE EX THERMOSTATS HAVE BEEN REPLACED WITH NEW. INSTALL STAINLESS STEEL COVER PLATE ON ALL THERMOSTAT LOCATIONS THAT HAVE BEEN ABANDONED. COORDINATE THIS WORK WITH MECHANICAL AND ELECTRICAL DRAWINGS.

3. EXISTING MECHANICAL ROOM:

ONCE DEMOLITION IS COMPLETED, THOROUGHLY CLEAN ALL EXISTING SURFACES IN (WALLS, CEILINGS, FLOORS) AND PREPARE FOR PAINTING.

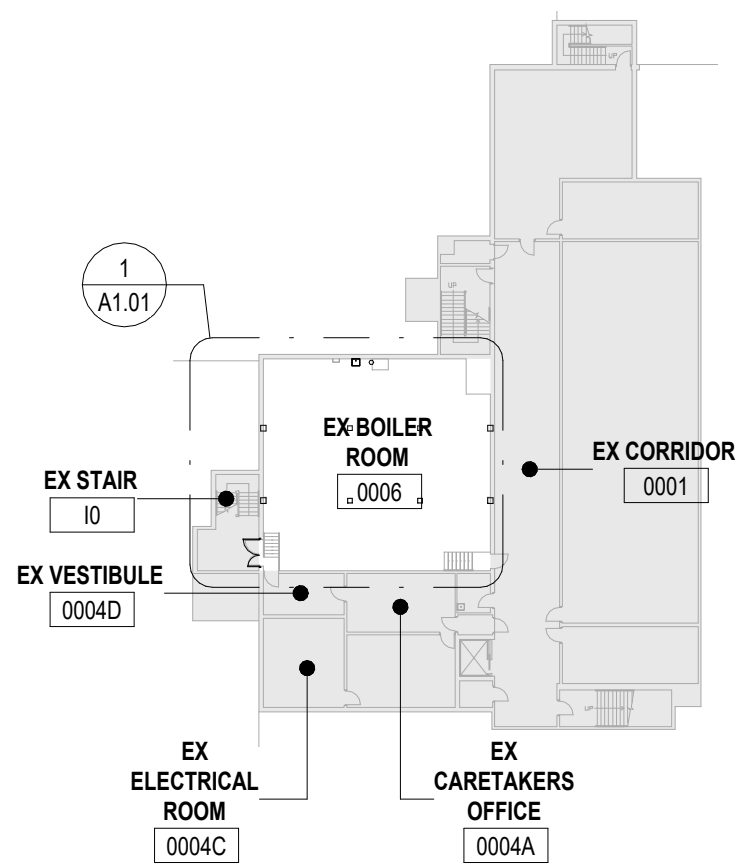
PAINT ALL NEW AND EXISTING SURFACES: WALLS, CEILINGS AND DOORS/FRAME BOTH SIDES AND EXPOSED PIPING, CONDUITS AND DEVICES WITHOUT FACTORY FINISH COAT.

APPLY PRIME COAT TO NEW SURFACES AND 2 FINISH COATS ON ALL ITEMS TO BE PAINTED.

COLOUR TO MATCH EXISTING.

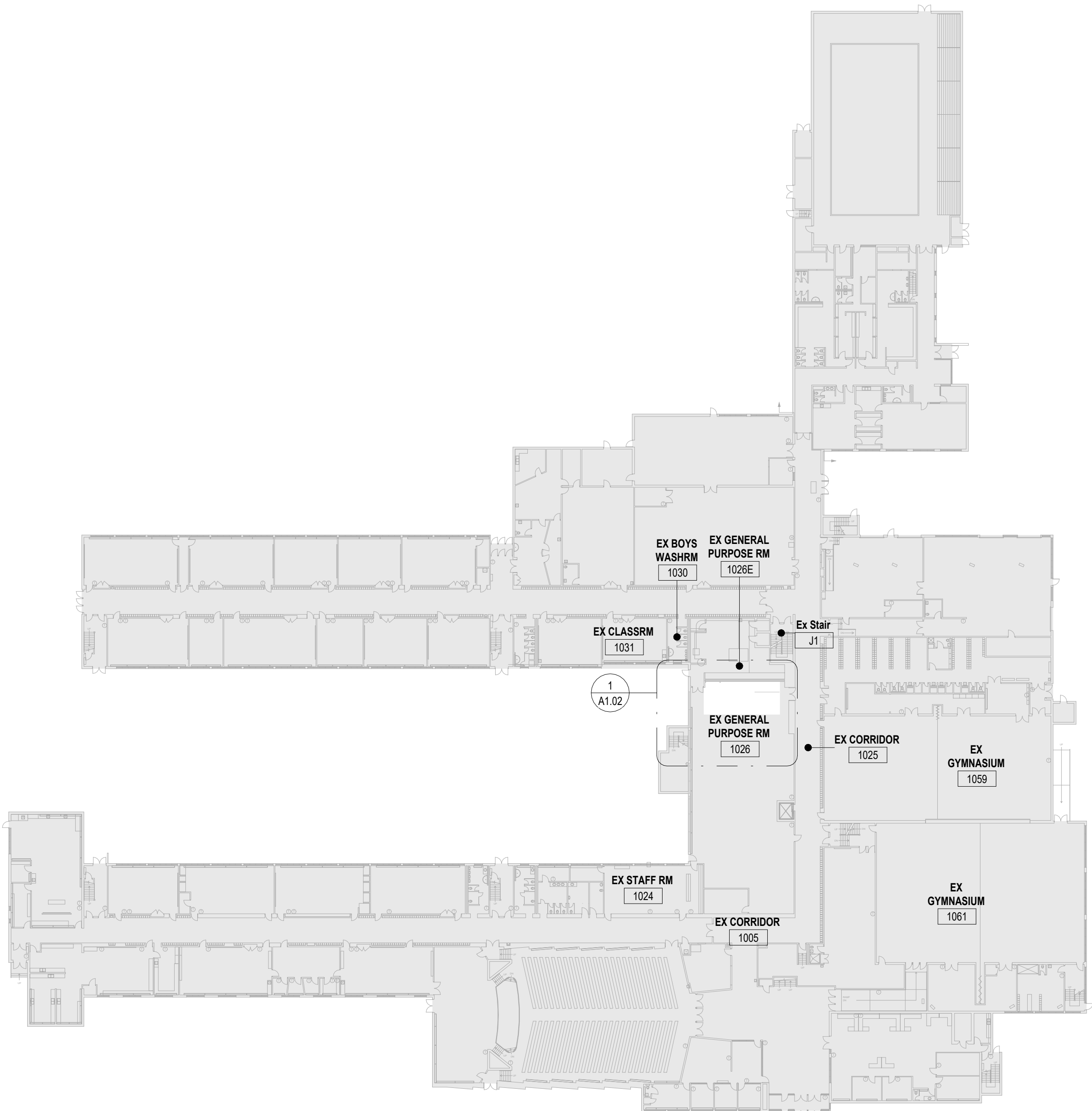
4. ROOFING:

ROOFING SCOPE IS THROUGH THE CASH ALLOWANCE.



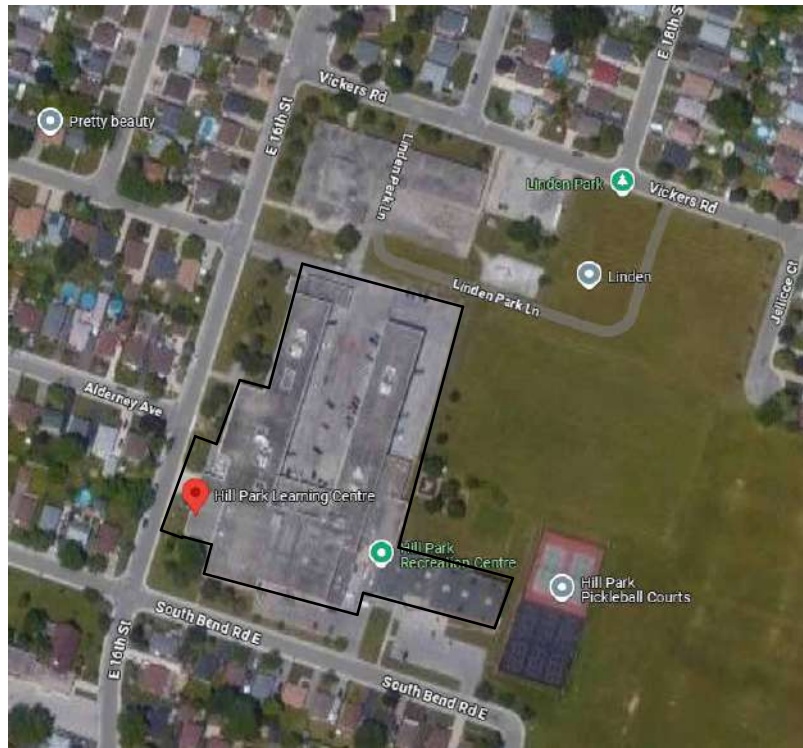
EX BASEMENT KEYPLAN  
SCALE: 1 : 500

2  
A0.01



EX GROUND FLOOR KEYPLAN  
SCALE: 1 : 500

1  
A0.01



SITE LOCATION

DRAWING LEGEND

	EXISTING
	AREA OF WORK
	NEW HOUSEKEEPING PADS (SEE STRUCTURAL DWGS FOR MORE DETAILS)

SYMBOL LEGEND

	STRUCTURAL GRID		SPOT ELEVATION
	ELEVATION REFERENCE		DEMOLITION / CONSTRUCTION TAG
	SECTION REFERENCE		ROOM TAG
	DETAIL REFERENCE		DOOR TAG
	EXTERIOR ELEVATION REFERENCE		WALL TAG
	INTERIOR ELEVATION REFERENCE		WINDOW / SCREEN TAG
			FLOOR TAG
			ROOF TAG
			REVISION TAG

ABBREVIATION LEGEND

STANDARDS	MATERIAL
A.F.F. ABOVE FINISHED FLOOR	ACT ACOUSTICAL CEILING TILE
c/w COMPLETE WITH	CAR CARPET
DN DOWN	CMU CONCRETE MASONRY UNIT
EL ELEVATION	CONC CONCRETE
EX EXISTING	GB GYPSUM BOARD
EXP EXPOSED	GW GEORGIAN WIRE
FIN FINISHED	HM HOLLOW METAL
FTG FOOTING	INT INTEGRAL
G.C. GENERAL CONTRACTOR	PT PAINT
GL GRID LINE	RB RUBBER BASE
G/R GUARDRAIL	SC SOLID CORE
HR HANDRAIL	SHT SHEET
H.D.G. HOT DIPPED GALVANIZED	S.S. STAINLESS STEEL
N.I.C. NOT IN CONTRACT	ST STAIN
N.T.S. NOT TO SCALE	TG TEMPERED GLASS
SIM SIMILAR	VCT VINYL COMPOSITE TILE
STRU. STRUCTURE	
T/ TOP OF	
TYP. TYPICAL	
us UNDERSIDE	

PARTITION SCHEDULE

		<b>SHAFT WALL ASSEMBLY</b> <ul style="list-style-type: none"><li>• 16mm TYPE X GWB</li><li>• 64mm C-H STUDS 25 GAUGE @ 610mm O.C.</li><li>• 25mm GYPSUM LINER PANEL</li></ul> <p>1 HR FIRE RESISTANCE RATING AS PER ULC ASSEMBLY No. W452, SYSTEM A</p> <p>NOTE: EXPOSED FACE OF SHAFT WALL TO BE PRIMED AND PAINTED</p>
--	--	--

DO NOT SCALE DRAWING. DIMENSIONS ARE TO BE CHECKED AND VERIFIED BY THE CONTRACTOR ON SITE.  
ALL DRAWINGS, SPECIFICATIONS, AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE ARCHITECT AND MUST BE RETURNED UPON REQUEST. REPRODUCTION OF DRAWINGS, SPECIFICATIONS, AND RELATED DOCUMENTS IN WHOLE OR IN PART IS STRICTLY FORBIDDEN WITHOUT THE ARCHITECT'S WRITTEN PERMISSION.



No.	DESCRIPTION	DATE
2	ISSUED FOR TENDER	03/11/2025
1	ISSUED FOR PRE-TENDER REVIEW	02/20/2025
0	ISSUED FOR PERMIT	01/31/2025

REVISIONS

SEAL:

**HWDSB**

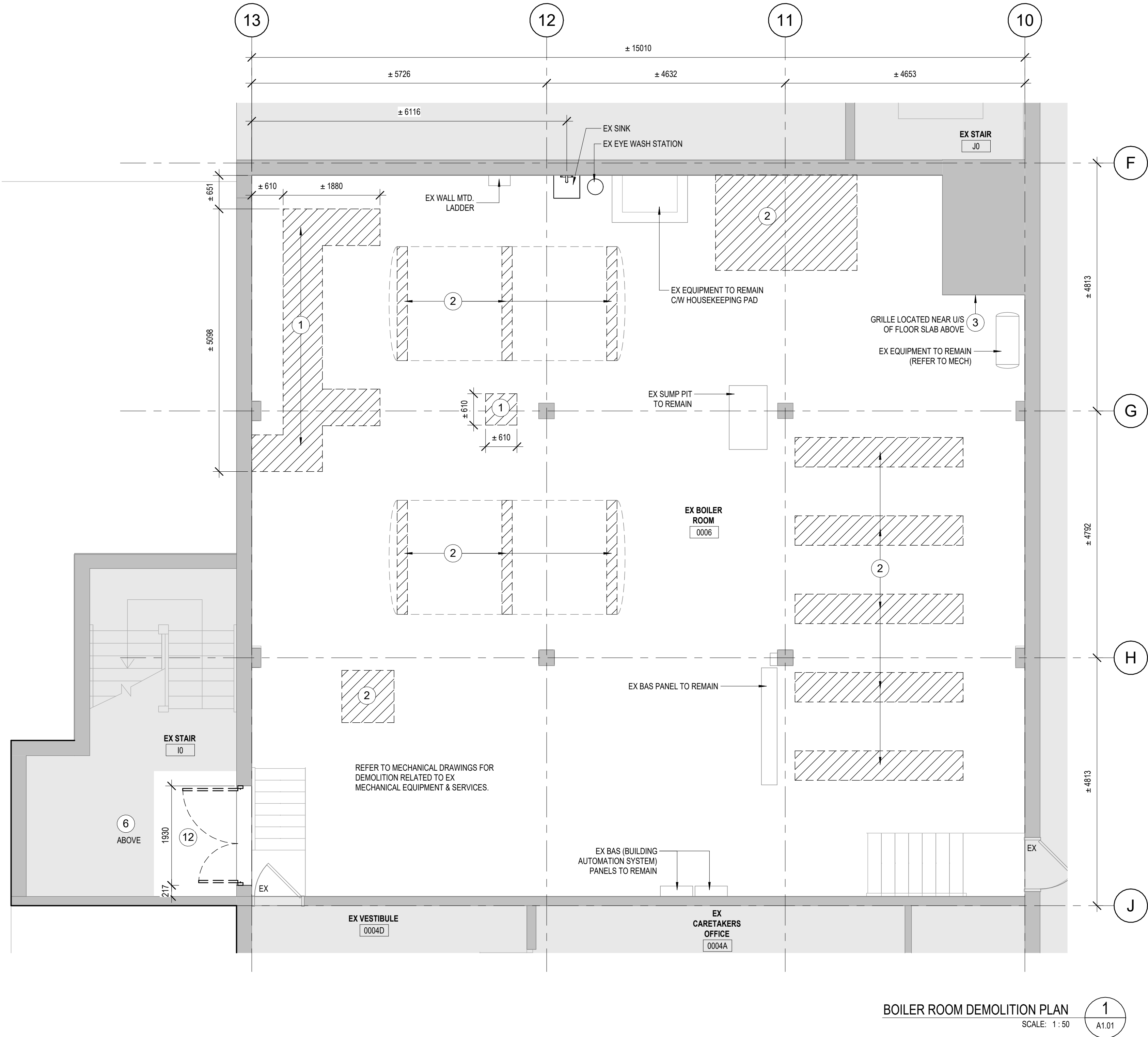


project:  
Hamilton - Wentworth District School Board  
P01957 Hill Park Learning Centre  
Boiler Room Renovation and HVAC Upgrades  
465 East 16th Street, Hamilton, ON

drawing:  
SITE LOCATION, GENERAL NOTES, KEY PLAN, & ELEVATIONS

draw: RMC	scale: As indicated
date: 09/2024	project number: 24-25
checked: SG	DRAWING NO: A0.01
date: 03/2025	2





BOILER ROOM DEMOLITION PLAN

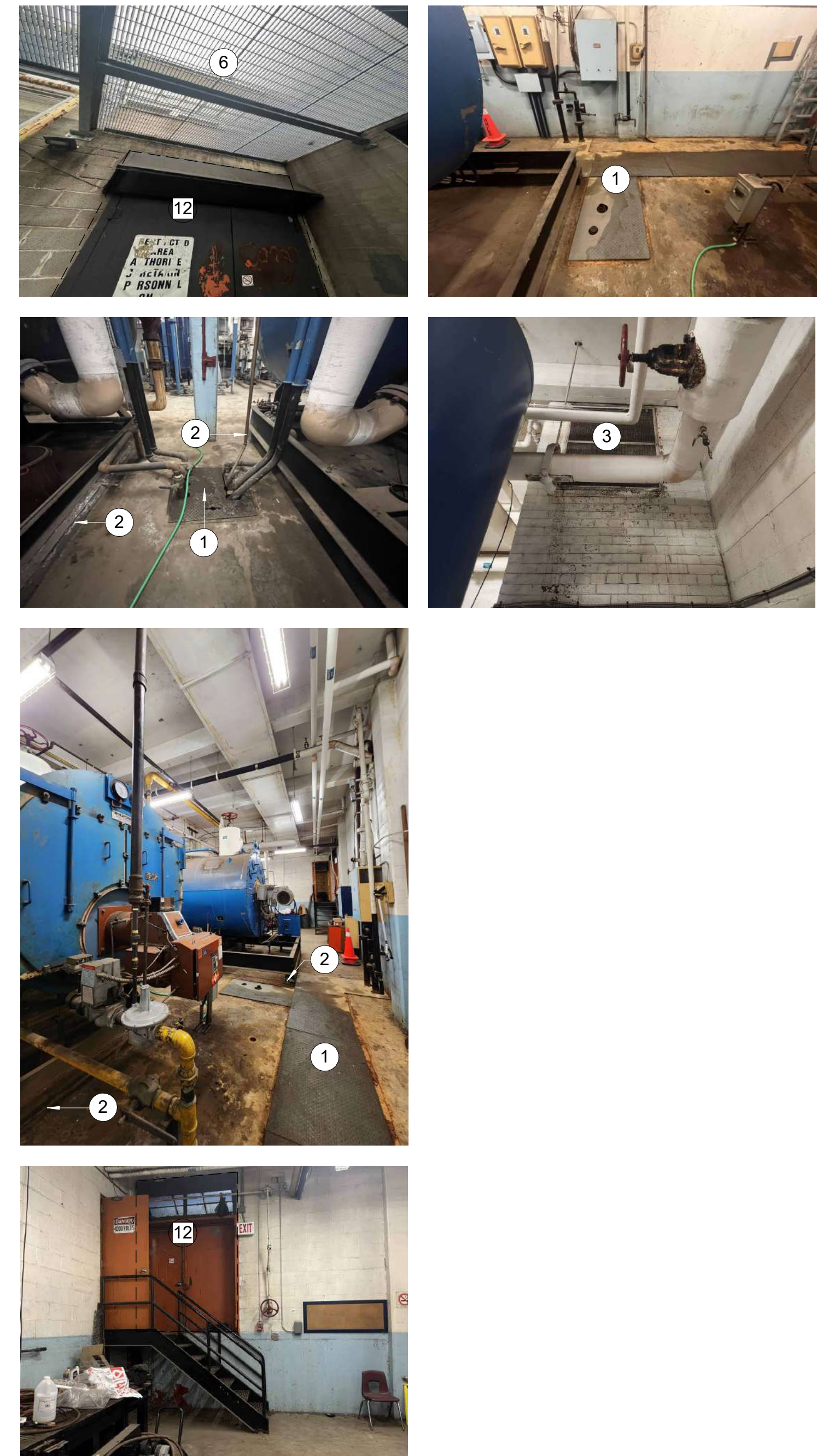
SCALE: 1 : 50

1  
A1.01

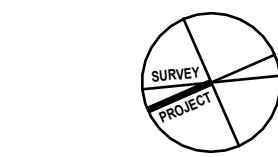
DEMOLITION NOTES

- 1 REMOVE EXISTING METAL FLOOR PLATES OVER FLOOR TRENCHES. REFER TO STRUCTURAL DRAWINGS FOR DETAILS REGARDING CONCRETE INFILL OF EX FLOOR TRENCHES.
- 2 DEMOLISH EXISTING CONCRETE HOUSEKEEPING PADS & EQUIPMENT FOUNDATIONS. PATCH EX FLOOR TO REMAIN AS REQUIRED TO MAINTAIN A SMOOTH & FLAT FLOOR SURFACE.
- 3 REMOVE EX AIR INTAKE GRILLE. CLEAN & PREP OPENING FOR BLOCK INFILL. REFER TO MECHANICAL DRAWINGS.
- 4 REMOVE EXISTING FLOOR MOUNTED STAINLESS STEEL RAILING. PATCH EXISTING FLOORING AS REQUIRED WITH CONCRETE & GRIND SMOOTH TO BE LEVEL WITH EXISTING FLOOR.
- 5 REMOVE EXISTING STAINLESS STEEL CAFETERIA TRAY SUPPORT IN ITS ENTIRETY.
- 6 CAREFULLY REMOVE EXISTING STEEL FLOOR GRATING, SUPPORT FRAMING, GUARDRAILS, ETC. COVERING EXTERIOR STAIRWELL AS REQUIRED TO BRING NEW MECHANICAL EQUIPMENT INTO THE BOILER ROOM. RE-INSTALL TO ITS EXISTING CONDITION FOLLOWING CONSTRUCTION. MAKE GOOD ALL EX ADJACENT SURFACES TO REMAIN AFFECTED BY ITS REMOVAL AND RE-INSTALLATION.
- 7 CUT HOLE IN EX CONC FLOOR SLAB & TERRAZZO FLOOR TO ACCOMMODATE MECH VENTING TO ROOF. COORDINATE W/ MECHANICAL AND STRUCTURAL DRAWINGS.
- 8 CORE HOLES IN EX CONC FLOOR SLAB & TERRAZZO FLOOR TO ACCOMMODATE MECH VENTING TO ROOF. COORDINATE W/ MECHANICAL AND STRUCTURAL DRAWINGS.
- 9 REMOVE EX CEILING TILES AS REQUIRED TO MAKE NECESSARY MECHANICAL ROOF PENETRATIONS & CONSTRUCT SHAFT WALL. COORDINATE WORK W/ ABATEMENT CONTRACTOR.
- 10 REMOVE EX MECH GRILLE. CLEAN & PREP OPENING FOR WALL INFILL. REFER TO MECHANICAL DRAWINGS.
- 11 PROVIDE ROOF PENETRATIONS TO ACCOMMODATE MECH VENTING FROM BOILER ROOM. COORDINATE W/ MECHANICAL AND STRUCTURAL DRAWINGS.
- 12 REMOVE EXISTING METAL DOORS & FRAME C/W ABOVE DOOR LOUVER & CRANK MECHANISM AND EXTERIOR AWNING. MAKE GOOD EXISTING & PREPARE OPENING FOR NEW DOOR.

BOILER ROOM - PHOTO REFERENCES



DO NOT SCALE DRAWING. DIMENSIONS ARE TO BE CHECKED AND VERIFIED BY THE CONTRACTOR ON SITE. ALL DRAWINGS, SPECIFICATIONS, AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE ARCHITECT AND MUST BE RETURNED UPON REQUEST. REPRODUCTION OF DRAWINGS, SPECIFICATIONS, AND RELATED DOCUMENTS IN WHOLE OR IN PART IS STRICTLY FORBIDDEN WITHOUT THE ARCHITECT'S WRITTEN PERMISSION.



No.	DESCRIPTION	DATE
2	ISSUED FOR TENDER	03/11/2025
1	ISSUED FOR PRE-TENDER REVIEW	02/20/2025
0	ISSUED FOR PERMIT	01/31/2025

REVISIONS

SEAL:

HWDSB

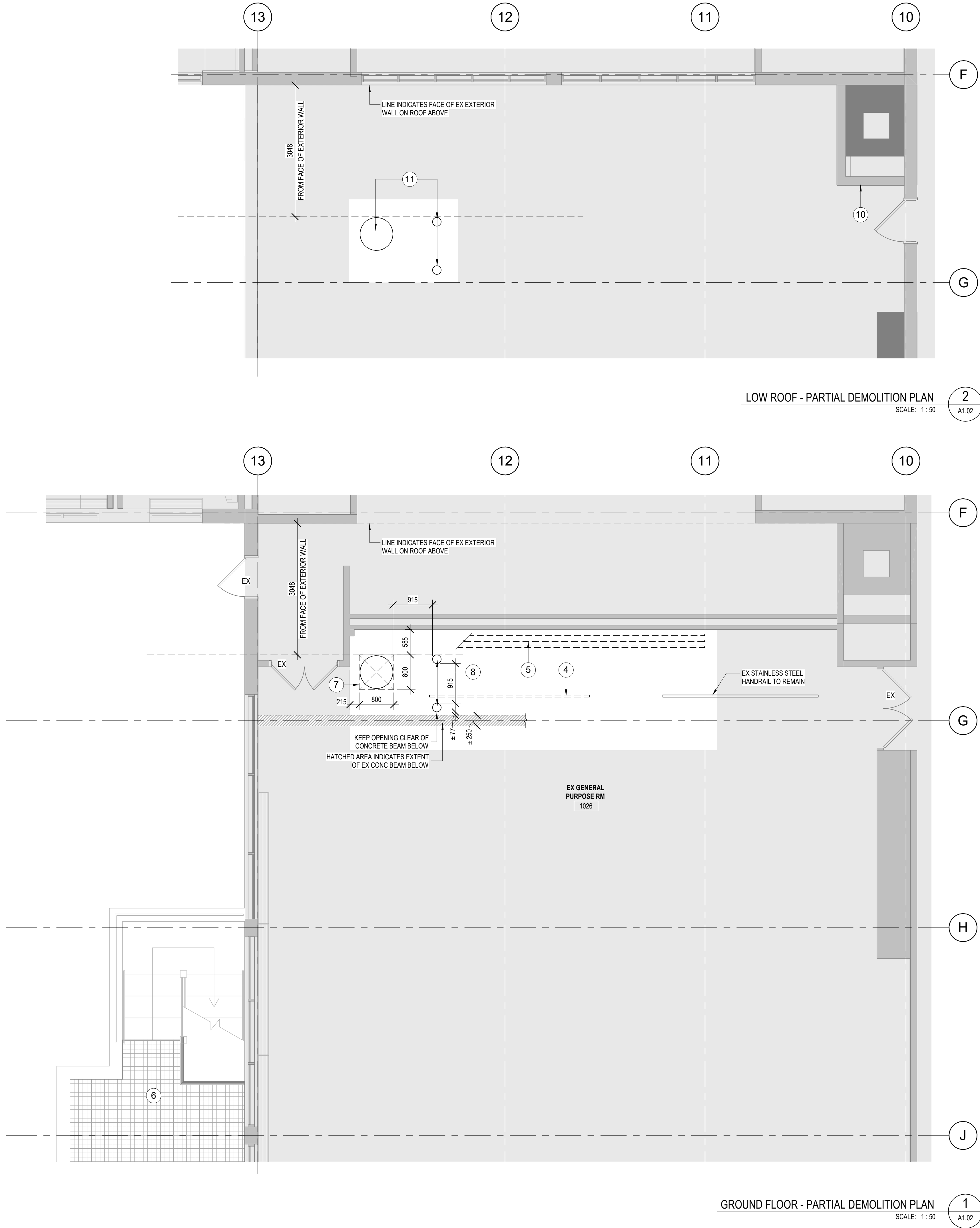
AMRA J  
ARCHITECTS INC.  
www.sja.design | info@sja.design | 905.920.5121

project:  
Hamilton - Wentworth  
District School Board  
P01957 Hill Park Learning Centre  
Boiler Room Renovation and HVAC  
Upgrades  
465 East 16th Street, Hamilton, ON

drawing:  
DEMOLITION FLOOR PLANS

draw: RMC	scale: As indicated
date: 09/2024	project number: 24-25
checked SG	DRAWING NO: A1.01
date: 03/2025	2



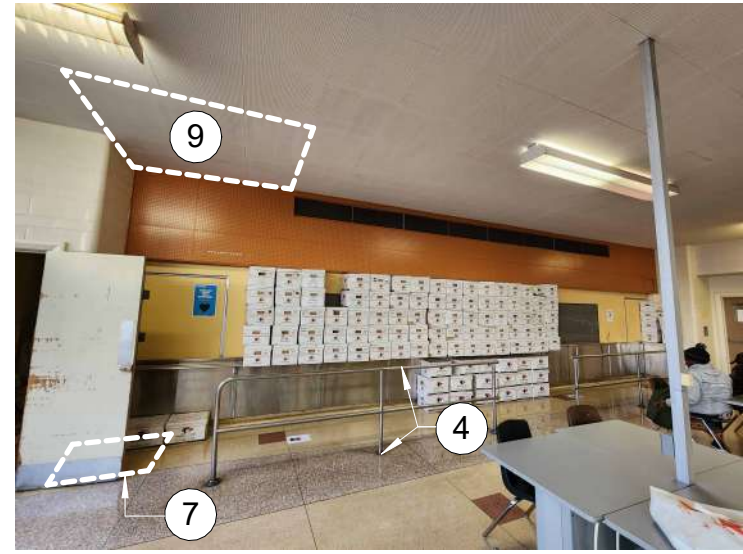
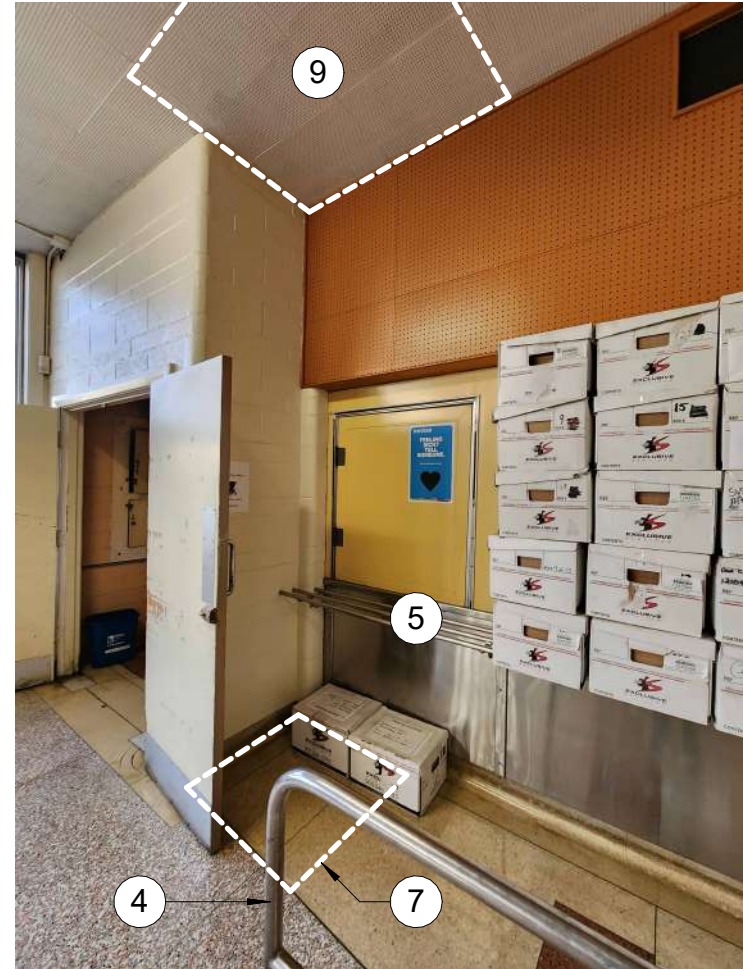


## DEMOLITION NOTES

- 1 REMOVE EXISTING METAL FLOOR PLATES OVER FLOOR TRENCHES. REFER TO STRUCTURAL DRAWINGS FOR DETAILS REGARDING CONCRETE INFILL OF EX FLOOR TRENCHES.
- 2 DEMOLISH EXISTING CONCRETE HOUSEKEEPING PADS & EQUIPMENT FOUNDATIONS. PATCH EX FLOOR TO REMAIN AS REQUIRED TO MAINTAIN A SMOOTH & FLAT FLOOR SURFACE.
- 3 REMOVE EX AIR INTAKE GRILLE. CLEAN & PREP OPENING FOR BLOCK INFILL. REFER TO MECHANICAL DRAWINGS.
- 4 REMOVE EXISTING FLOOR MOUNTED STAINLESS STEEL RAILING. PATCH EXISTING FLOORING AS REQUIRED WITH CONCRETE & GRIND SMOOTH TO BE LEVEL WITH EXISTING FLOOR.
- 5 REMOVE EXISTING STAINLESS STEEL CAFETERIA TRAY SUPPORT IN ITS ENTIRETY.
- 6 CAREFULLY REMOVE EXISTING STEEL FLOOR GRATING, SUPPORT FRAMING, GUARDRAILS, ETC, COVERING EXTERIOR STAIRWELL AS REQUIRED TO BRING NEW MECHANICAL EQUIPMENT INTO THE BOILER ROOM. RE-INSTALL TO ITS EXISTING CONDITION FOLLOWING CONSTRUCTION. MAKE GOOD ALL EX ADJACENT SURFACES TO REMAIN AFFECTED BY ITS REMOVAL AND RE-INSTALLATION.
- 7 CUT HOLE IN EX CONC FLOOR SLAB & TERRAZZO FLOOR TO ACCOMMODATE MECH VENTING TO ROOF. COORDINATE W/ MECHANICAL AND STRUCTURAL DRAWINGS.
- 8 CORE HOLES IN EX CONC FLOOR SLAB & TERRAZZO FLOOR TO ACCOMMODATE MECH VENTING TO ROOF. COORDINATE W/ MECHANICAL AND STRUCTURAL DRAWINGS.
- 9 REMOVE EX CEILING TILES AS REQUIRED TO MAKE NECESSARY MECHANICAL ROOF PENETRATIONS & CONSTRUCT SHAFT WALL. COORDINATE WORK W/ ABATEMENT CONTRACTOR.
- 10 REMOVE EX MECH GRILLE. CLEAN & PREP OPENING FOR WALL INFILL. REFER TO MECHANICAL DRAWINGS.
- 11 PROVIDE ROOF PENETRATIONS TO ACCOMMODATE MECH VENTING FROM BOILER ROOM. COORDINATE W/ MECHANICAL AND STRUCTURAL DRAWINGS.
- 12 REMOVE EXISTING METAL DOORS & FRAME C/W ABOVE DOOR LOUVER & CRANK MECHANISM AND EXTERIOR AWNING. MAKE GOOD EXISTING & PREPARE OPENING FOR NEW DOOR.

DO NOT SCALE DRAWING. DIMENSIONS ARE TO BE CHECKED AND VERIFIED BY THE CONTRACTOR ON SITE.  
ALL DRAWINGS, SPECIFICATIONS, AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE ARCHITECT AND MUST BE RETURNED UPON REQUEST. REPRODUCTION OF DRAWINGS, SPECIFICATIONS, AND RELATED DOCUMENTS IN WHOLE OR IN PART IS STRICTLY FORBIDDEN WITHOUT THE ARCHITECT'S WRITTEN PERMISSION.

## PHOTO REFERENCES



No.	DESCRIPTION	DATE
2	ISSUED FOR TENDER	03/11/2025
1	ISSUED FOR PRE-TENDER REVIEW	02/20/2025
0	ISSUED FOR PERMIT	01/31/2025

## REVISIONS

SEAL:

HWDSB

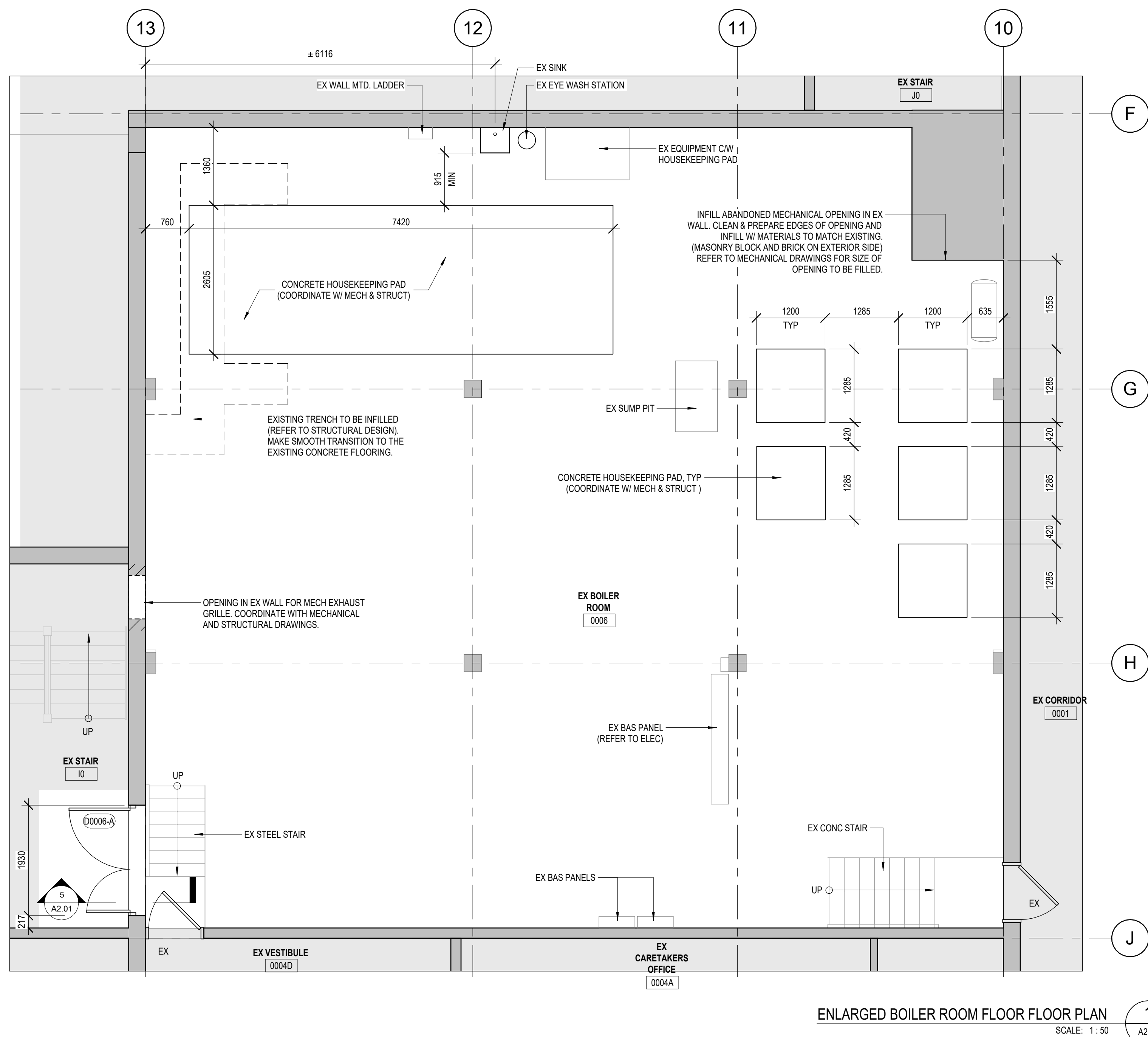
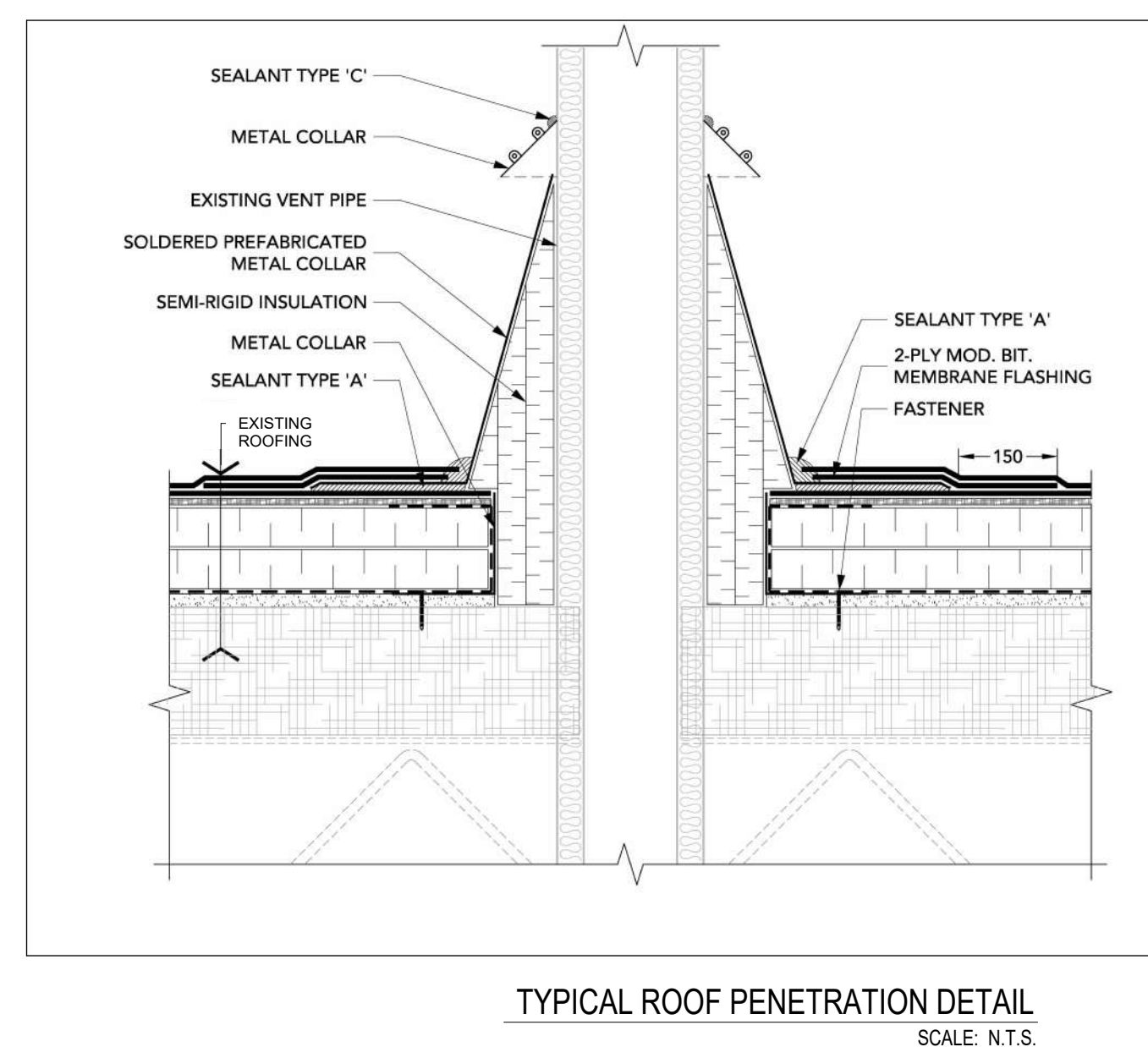
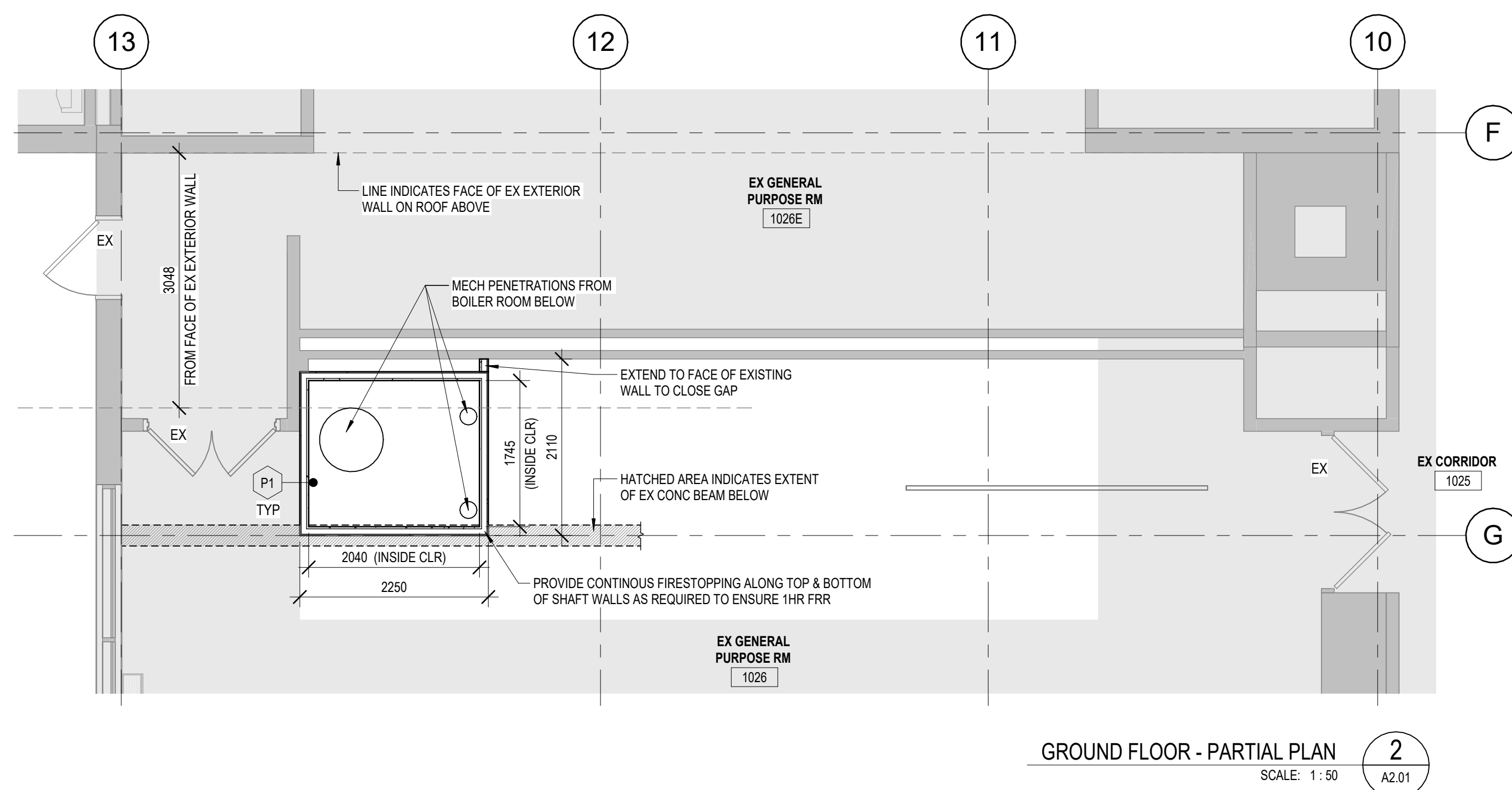
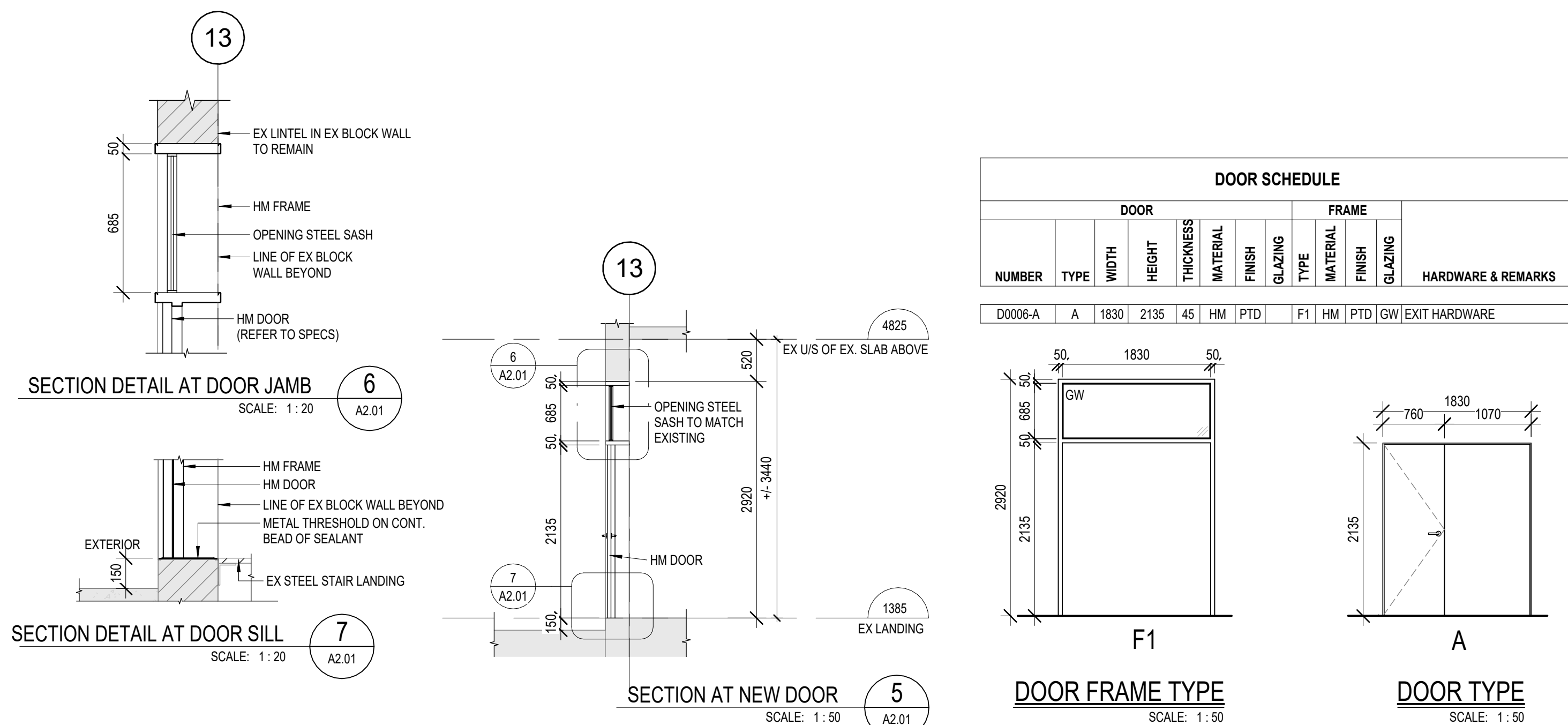


project:  
Hamilton - Wentworth District School Board  
P01957 Hill Park Learning Centre  
Boiler Room Renovation and HVAC Upgrades  
465 East 16th Street, Hamilton, ON

drawing:  
GROUND FLOOR DEMOLITION PLAN

draw: SG	scale: As indicated	2
date: 12/03/24	project number: 24-25	
checked: SG	DRAWING NO: A1.02	Revised:
date: 03/20/25		





DO NOT SCALE DRAWING. DIMENSIONS ARE TO BE CHECKED AND VERIFIED BY THE CONTRACTOR ON SITE.

ALL DRAWINGS, SPECIFICATIONS, AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE ARCHITECT AND MUST BE RETURNED UPON REQUEST. REPRODUCTION OF DRAWINGS, SPECIFICATIONS, AND RELATED DOCUMENTS IN WHOLE OR IN PART IS STRICTLY FORBIDDEN WITHOUT THE ARCHITECT'S WRITTEN PERMISSION.



2	ISSUED FOR TENDER	03/11/2022
1	ISSUED FOR PRE-TENDER REVIEW	02/20/2022
0	ISSUED FOR PERMIT	01/31/2022
No.	DESCRIPTION	DATE

SEAL

**HWDSB**

project  
Hamilton - Wentworth  
District School Board  
P01957 Hill Park Learning Centre  
Boiler Room Renovation and HVAC  
Upgrades  
465 East 16th Street, Hamilton, ON

drawing  
title: BOILER ROOM PLAN, GROUND  
FLOOR PLAN, DOOR & DOOR  
FRAME TYPE, DOOR SCHEDULE  
SECTION DETAILS

drawn by: RMC date : 10/2024	scale : As indicated project number: 24-25
checked by: SG date : 03/2025	DRAWING NO: <b>A2.01</b>



CONTRACTOR TO COORDINATE LOCATION OF HOUSEKEEPING PADS, NEW LINTEL OPENINGS AND FLUE VENT FRAMING ON SITE

### CONCRETE NOTES

- ALL STRUCTURAL CONCRETE ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA STANDARD CAN/CSA A23.3. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH CSA STANDARD CAN/CSA A23.1.
- MINIMUM CONCRETE STRENGTH AT 28 DAYS SHALL BE:
  - SLAB ON GRADE: 25 MPa TYPE C1
  - AGGREGATE SHALL BE 20 MAXIMUM.
  - AIR ENTRAINMENT TO BE  $6\% \pm 1\%$  WHEN EXPOSED TO EXTERIOR.
  - CONTRACTOR TO SUBMIT CONCRETE MIX DESIGN FOR REVIEW
- THE DEFORMED REINFORCING STEEL SHALL CONFORM TO CSA STANDARD C30.18M-09 GRADE 300R FOR STIRRUPS AND TIES AND GRADE 400R FOR ALL OTHER REINFORCING. UNLESS OTHERWISE NOTED THE REINFORCING LAP LENGTH SHALL BE 'CLASS B' IN SPLICES. ALL REINFORCING HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH A23.1.
- THE REINFORCING COVER FOR CONCRETE SHALL BE:
  - 75mm FOR CONCRETE AGAINST EARTH
  - 40mm FOR FORMED CONCRETE EXPOSED TO EARTH OR WEATHER WHERE THE REINFORCING BAR IS 15M OR SMALLER
  - 50mm FOR FORMED CONCRETE EXPOSED TO EARTH OR WEATHER WHERE THE REINFORCING BAR IS 20M OR LARGER
- THE FOOTING DESIGN IS BASED ON INFORMATION AVAILABLE AT THE TIME OF DESIGN. THE FOOTING DESIGN MAY BE ALTERED DURING CONSTRUCTION, IF THE SITE CONDITIONS WARRANT, BUT ONLY WITH THE EXPRESS PERMISSION OF THE ENGINEER.

### GENERAL NOTES

- CHECK ALL DIMENSIONS ON THESE DRAWINGS WITH ALL OTHER DRAWINGS, INCLUDING BUT NOT LIMITED TO DRAWINGS PREPARED ARCHITECTURAL, MECHANICAL OR ELECTRICAL CONSULTANTS. REPORT ANY INCONSISTENCIES TO THE ENGINEER PRIOR TO COMMENCING WITH THE WORK. DO NOT SCALE THE DRAWINGS.
- THE DESIGN LIVE LOADS ARE INDICATED ON THE DRAWINGS. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN LOADS.
- THE COMPLETED STRUCTURE IS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY BRACING, SHORING AND ANY OTHER TEMPORARY OR PERMANENT MEASURES AS REQUIRED DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY SUPPORT OF EXISTING OR ADJACENT STRUCTURES AS REQUIRED. ALL BRACING AND SHORING IS THE RESPONSIBILITY OF THE CONTRACTOR.
- CONSTRUCTION FEATURES NOT FULLY SHOWN ARE COMPARABLE TO SIMILAR CONDITION DETAILS.
- ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE LATEST ONTARIO BUILDING CODE, LATEST APPLICABLE REGULATIONS AND GOOD CONSTRUCTION PRACTICES.
- THE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DRAWINGS AND SPECIFICATIONS.
- CLARIFY ANY QUERIES WITH THE ENGINEER REGARDING THE INTERPRETATION OF THE DRAWINGS, PRIOR TO THE COMMENCEMENT OF ANY WORK.

### LOADING SUMMARY DESIGN STANDARDS

- ONTARIO BUILDING CODE, 2012, PART 4: STRUCTURAL DESIGN
- CAN/CSA-S16-14, LIMIT STATES DESIGN OF STEEL STRUCTURES
- CAN/CSA-086-14, ENGINEERING DESIGN IN WOOD

#### SNOW, ICE AND RAIN LOADS

- APPLIED PER OBC, PART 4, SECTION 4.1.6
- IMPORTANCE FACTOR,  $I_s$ : 1.1 (SLS) 1.15 (ULS)
  - GROUND SNOW LOAD,  $S_g$ : 1.5 kPa (31.3 PSF)
  - ASSOCIATED RAIN LOAD,  $S_r$ : 0.4 kPa (8.4 PSF)
  - WIND EXPOSURE FACTOR,  $C_w$ : 1.0
  - ROOF SNOW LOAD,  $S$ : 1.15 kPa (23.9 PSF)
  - DRIFT LOADS PER CLAUSE 4.1.6.2.8
  - SLOPE FACTORS PER CLAUSE 4.1.6.2.(5) TO (7)

#### WIND LOADS

- APPLIED PER OBC, PART 4, SECTION 4.1.7
- IMPORTANCE FACTOR,  $I_w$ : 0.75 (SLS) 1.00 (ULS)
  - REFERENCE VELOCITY PRESSURE FOR STRUCTURAL MEMBERS: 0.46 kPa 1/50 YEAR PROBABILITY (9.6 PSF)
  - REFERENCE VELOCITY PRESSURE FOR CLADDING & NON-STRUCTURAL MEMBERS: 0.36 kPa 1/10 YEAR PROBABILITY (7.5 PSF)
  - GUST FACTORS  $C_g$ :
    - 2.0 FOR WHOLE & MAIN STRUCTURAL MEMBERS
    - 2.5 FOR SMALL ELEMENTS INCLUDING CLADDING
    - 2.0 FOR INTERNAL PRESSURES
  - BUILDING INTERNAL PRESSURE CATEGORY 2 PER NBC 2010 STRUCTURAL COMMENTARY (PART B), COMMENTARY B.

#### SEISMIC LOADS

- APPLIED PER OBC, PART 4, SECTION 4.1.8
- IMPORTANCE FACTOR,  $I_e$ : 1.3 (ULS)
  - $S_a(0.2)$ : 0.260
  - $S_a(0.5)$ : 0.129
  - $S_a(1.0)$ : 0.081
  - $S_a(2.0)$ : 0.028
  - $P_GA$ : 0.168
  - SOIL CLASS: C (ASSUMED)
  - $F_a$ : 1.00

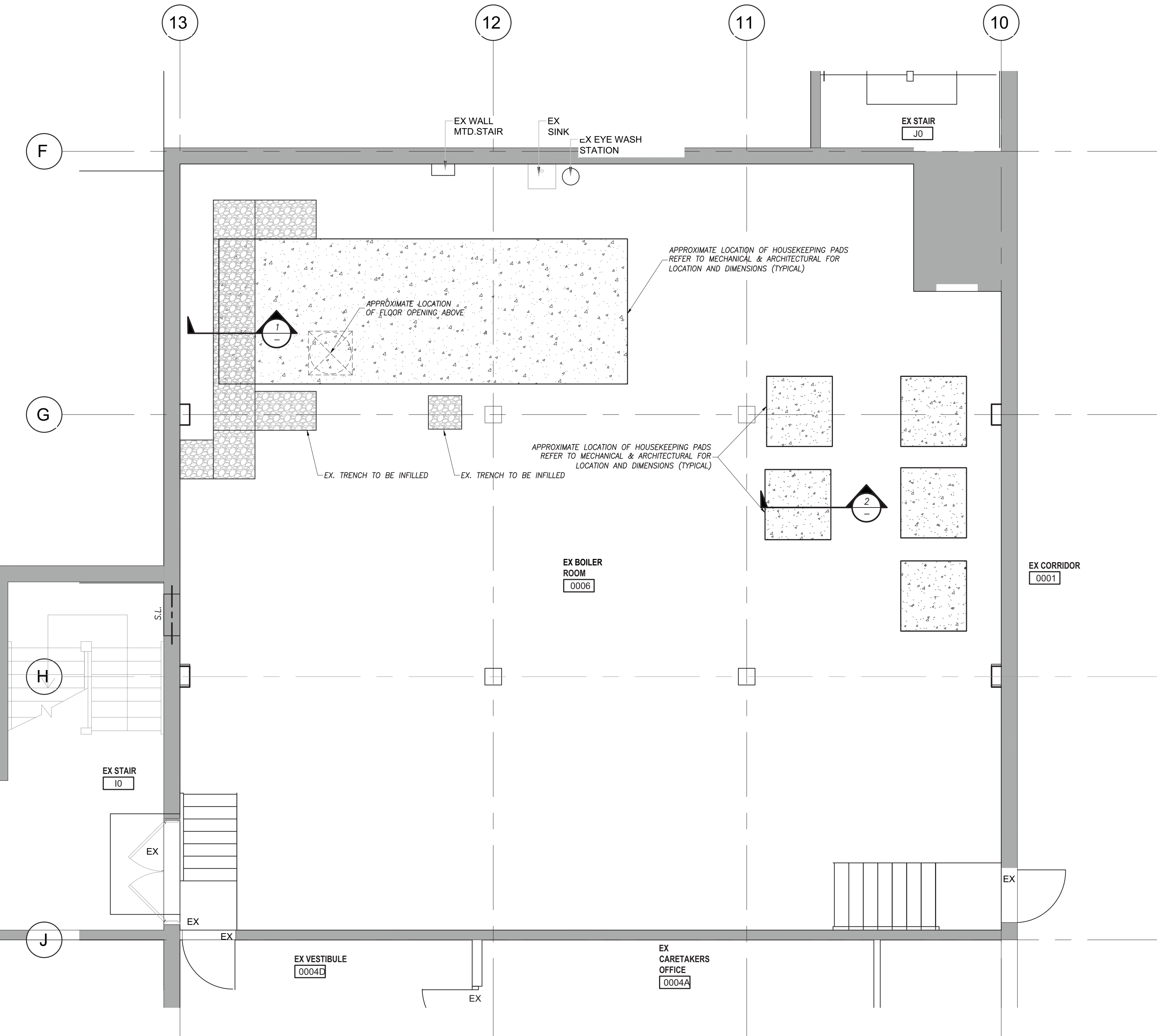
#### SEISMIC SWAY BRACING

ARTICLE 4.1.8.18(2) OF THE ONTARIO BUILDING CODE NOTES THAT IF THE PRODUCT OF  $I_e \cdot F_a \cdot S_a(0.2)$  IS LESS THAN 0.35, THE REQUIREMENTS NOTED ABOVE NEED NOT APPLY. THESE VALUES ARE EXPLORED BELOW. THIS EXEMPTION IS NOT APPLICABLE TO POST-DISASTER BUILDINGS.

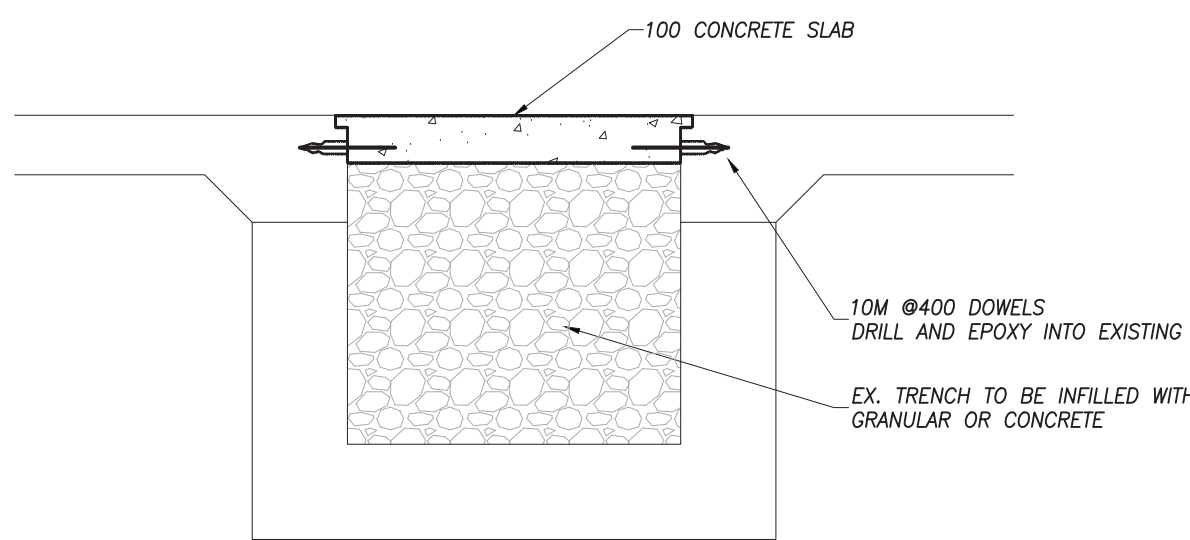
BASED ON THE ABOVE NOTED VALUES, THE PRODUCT OF  $I_e \cdot F_a \cdot S_a(0.2) = 1.3 \cdot 1.00 \cdot 0.26 = 0.338$ . GIVEN THIS IS LESS THAN THE THRESHOLD OF 0.35, THE APPLICATION OF THE LATERAL FORCE ( $V_p$ ) TO ALL ELEMENTS AND COMPONENTS AND SWAY BRACING IS NOT REQUIRED.

### SUBMITTALS

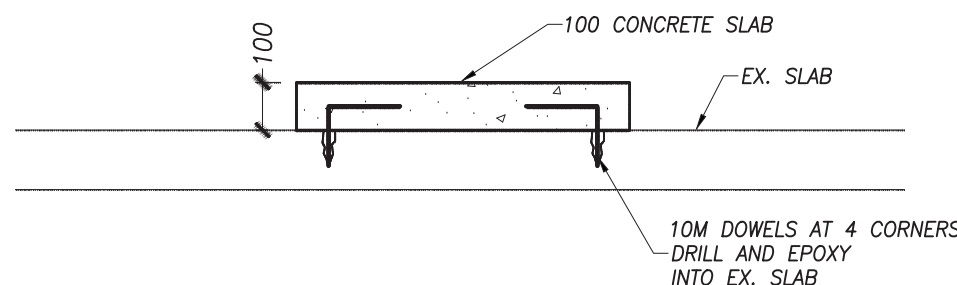
- SUBMIT FOR REVIEW BY THE CONSULTANT, DETAILED SHOP DRAWINGS FOR ALL STRUCTURAL WORK INCLUDING, BUT NOT LIMITED TO STRUCTURAL STEEL AND TEMPORARY SHORING.
- THE SCALE OF THE DRAWINGS SHALL BE SUCH THAT THE DETAILS OF THE STRUCTURAL WORK ARE CLEARLY SHOWN, AND IN NO CASE SMALLER THAN 1:50 ( $\frac{1}{4}''=1'-0''$ ).
- THE STRUCTURAL DRAWINGS SHALL NOT BE REPRODUCED, IN WHOLE OR IN PART, FOR USE AS SHOP DRAWINGS.
- EACH DRAWING SUBMITTED FOR STRUCTURAL STEEL AND TEMPORARY SHORING SHALL BEAR THE SEAL AND SIGNATURE OF A QUALIFIED PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
- CONTRACTOR SHALL ALLOW FOR A 5 WORKING DAY TURN AROUND TIME FOR STRUCTURAL CONSULTANT TO REVIEW THE SHOP DRAWINGS.



**BASEMENT BOILER ROOM**  
SCALE 1:50



**TRENCH INFILL DETAIL**  
SCALE NTS



**HOUSEKEEPING PAD DETAIL**  
SCALE NTS

CLEAR SPAN	140 WALL	190 WALL
UP to 1200	2Ls 75x65x8	2Ls 90x90x8
1200 to 1800	2Ls 90x65x8	2Ls 125x90x8
1800 to 2100	2Ls 90x65x10	2Ls 150x90x8

CLEAR SPAN	240 WALL	290 WALL
UP to 1200	2Ls 100x100x8	3Ls 90x90x8
1200 to 1800	2Ls 150x100x8	3Ls 125x90x8
1800 to 2100	2Ls 150x100x8	3Ls 150x90x8

FOR LINTELS IN 90 VENEER, USE 1 ANGLE OF THAT NOTED FOR 190 WALL ON SIMILAR SPAN.  
DOUBLE ANGLES TO BE STITCH WELDED BACK TO BACK.

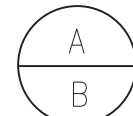
**TYPICAL STEEL LINTEL DETAIL**  
NOT TO SCALE

DRAWINGS REFERENCED USING INFORMATION FROM EX. DRAWINGS PREPARED BY:  
MOELLER & HASSELL ARCHITECT AND ENGINEER INC.  
DATED JANUARY 1998

No	Revisions	Date
3	RE-ISSUED FOR PERMIT AND TENDER	2025-03-17
2	RE-ISSUED FOR PERMIT AND TENDER	2025-02-21
1	ISSUED FOR PERMIT	2025-01-30
No	Revisions	Date
Orientation	Seal	



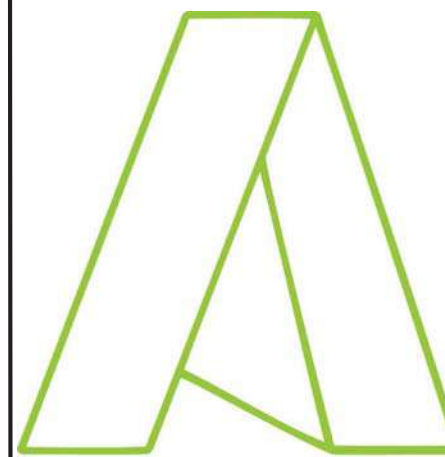
The Contractor shall check and verify all dimensions and report all errors and omissions to the IO-Owner's/MBS Designee (as applicable) for his/her written direction before proceeding with the Work.



A Detail No  
B Sheet No where detailed



300 YORK BLVD HAMILTON, ONTARIO L8R 3K6  
905-333-9119 www.kaloseng.ca  
PROJECT NO. 24224



**AMRA J**  
ARCHITECTS INC.

STOWBRIDGE CRESCENT  
HAMILTON, ON, CANADA

L9G 5E1  
EMAIL: INFO@AJA.DESIGN  
TEL: +1 905 920 5121



Ministry PSF Number

Project  
**HILL PARK  
LEARNING CENTRE**

Location  
**465 EAST 16TH STREET  
HAMILTON, ONTARIO**  
10 Project No 24224 Site No Building No

Client  
**HAMILTON-WENTWORTH DISTRICT S.B.**

Drawing Title  
**BOILER ROOM UPGRADES  
HOUSEKEEPING PADS**

Scale  
**AS NOTED**

Project Start Date

Drawn by  
**QN**

Substantial Performance Date

Designed by

Drawing No

Approved by  
**HAPH**

Floor No

**S1** of **2**

CADD File NAME





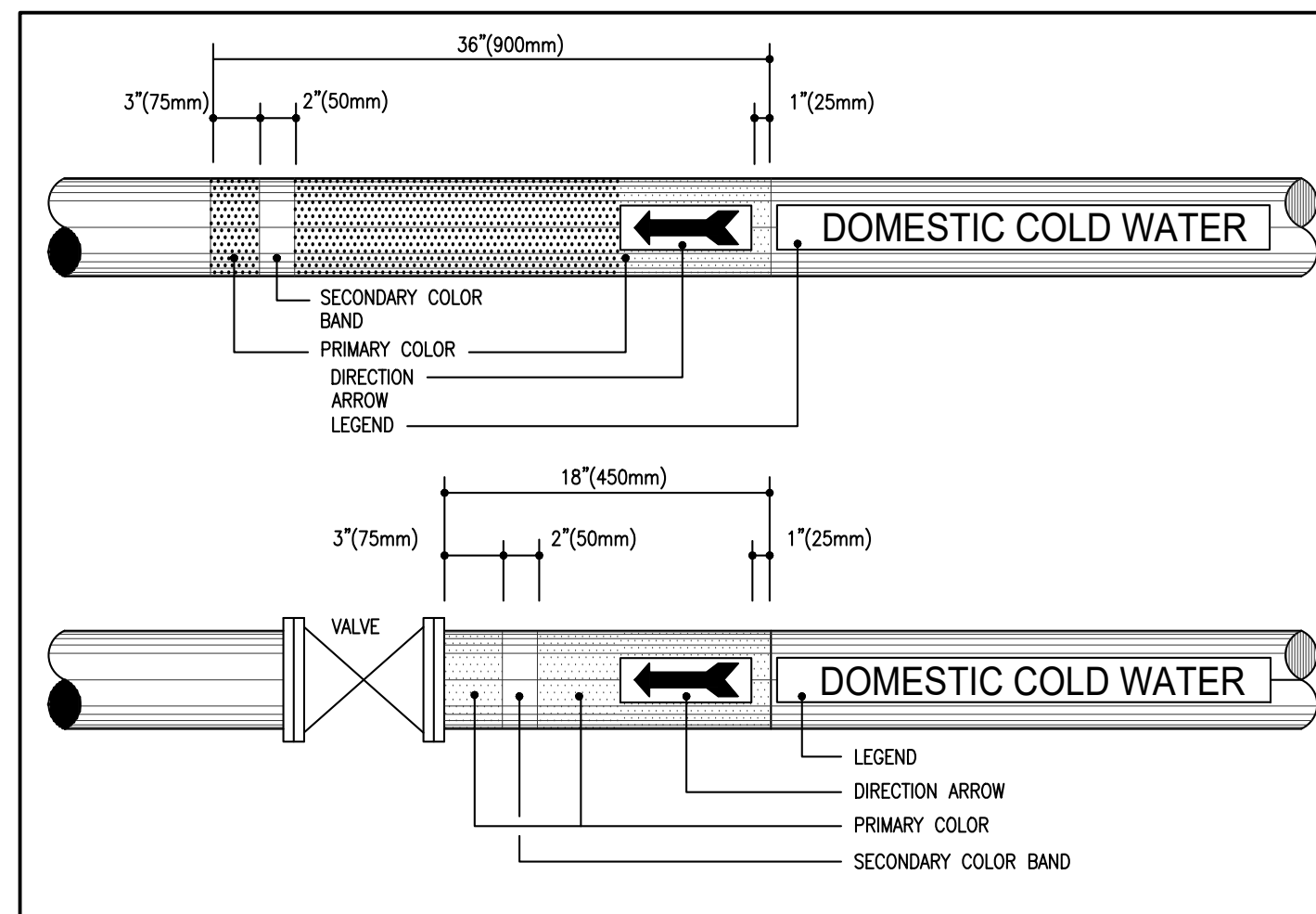


LEGEND — HVAC			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—HWS	HEATED WATER SUPPLY	=====	SINGLE LINE RIGID DUCT
—HWR	HEATED WATER RETURN	=====	SINGLE LINE DUCT WITH ACOUSTIC LINING
—RWS	RADIATION WATER SUPPLY	=====	SINGLE LINE FLEXIBLE DUCT
—RWR	RADIATION WATER RETURN		DOUBLE LINE FLEXIBLE DUCT
—CWS	CHILLED WATER SUPPLY		SUPPLY AIR DIFFUSER
—CWR	CHILLED WATER RETURN		RETURN AIR GRILLE
—CWS	CONDENSER WATER SUPPLY		NUMBER/OFF NECK SIZE DIP TYPE/SUPPLY AIR CFM
—CWR	CONDENSER WATER RETURN	—FD	FIRE DAMPER (IN RISER)
S	STEAM WAT. (PRESSURE AS INDICATED)	—SD	SMOKE DAMPER
C	CONDENSATE RETURN	—MD	MOTORIZED DAMPER
FOS	FUEL OIL SUPPLY	—BD	MANUAL BALANCING DAMPER
FOR	FUEL OIL RETURN	—BOD	BACK DRAFT DAMPER
FL	REFRIGERANT LIQUID	—FS	MOTORIZED COMBINATION FIRE AND SMOKE DAMPER
RD	REFRIGERANT DISCHARGE		FIRE DAMPER (IN RISER)
RS	REFRIGERANT SUCTION		SMOKE & FIRE DAMPER (IN RISER)
GS	GLYCOL SUPPLY		BALANCING DAMPER (IN RISER)
GR	GLYCOL RETURN		MOTORIZED DAMPER (IN RISER)
	SUPPLY OR OUTSIDE AIR DUCT		THERMOSTAT
	RETURN OR EXHAUST DUCT		HUMIDISTAT
	SUPPLY DUCT DOWN	UC	DOOR UNDERCUT
	RETURN DUCT DOWN	DG	DOOR GRILLE
	ROUND DUCT UP	QA	OUTDOOR AIR
	ROUND DUCT DOWN	RA	RETURN AIR
	DUCT WITH ACOUSTIC LINING	RF	RELIEF AIR
	DOUBLE LINE DUCT	SA	SUPPLY AIR
	SOUND ATTENUATOR		

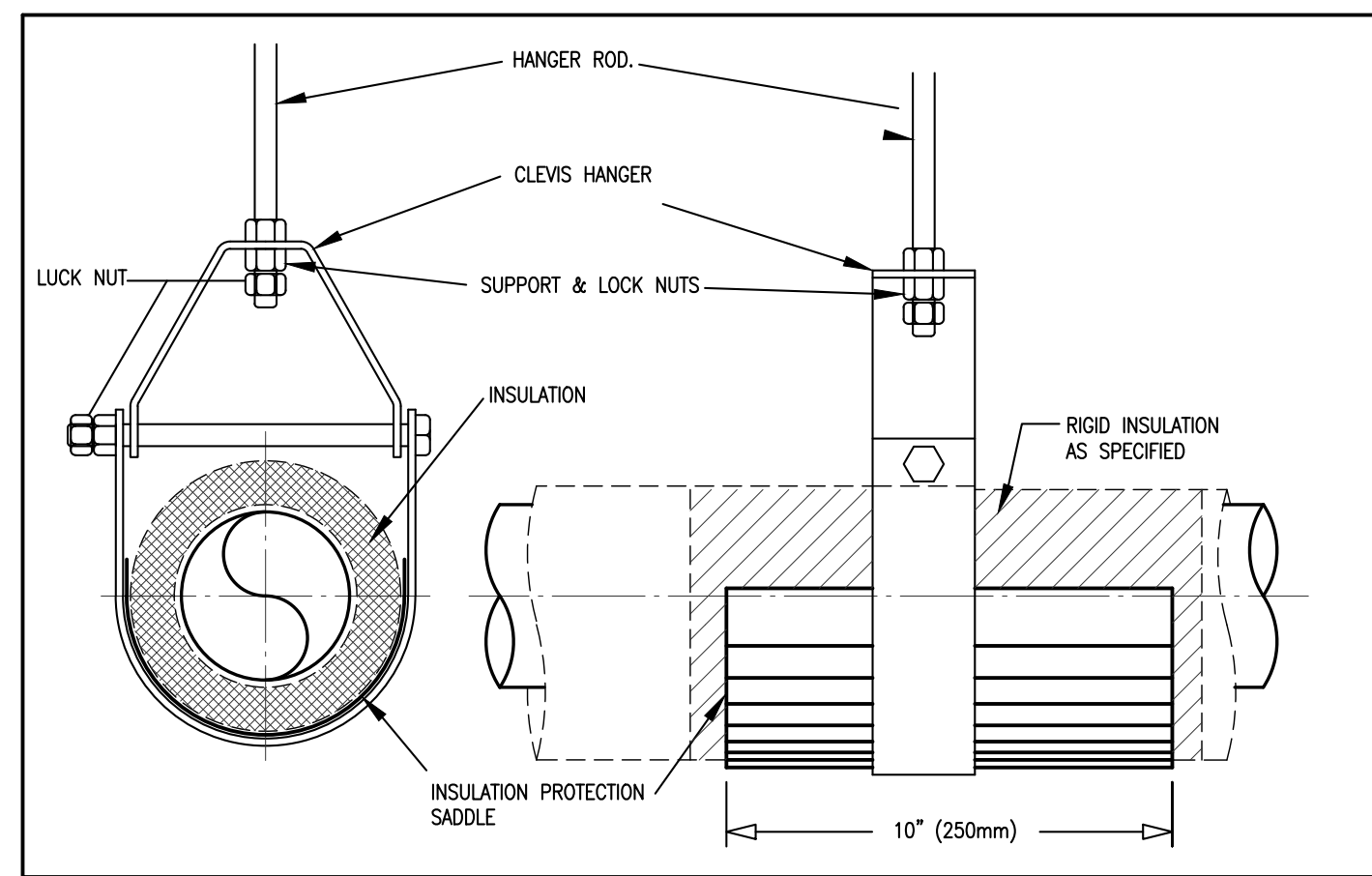
LEGEND — GENERAL			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	ISOLATION VALVE		PIPE UP
	GLOBE VALVE		PIPE DOWN
	LOCKABLE FLOW CONTROL VALVE		CAPPED PIPE
	BALL VALVE		DIRECTION OF FLOW
	CHECK VALVE		PIPE SLEEVE
	FLOAT VALVE		CONTINUOUS PIPE
	WASTE-END DRAIN VALVE		METER
	MOORE AND CAPPED PROVISION		UNION
	GATE VALVE AND FLOW SWITCH		STRAINER
	SHUT-OFF VALVE AND ACCESS PANEL		BWP
	BUTTERFLY VALVE		WFA
	LOCKSHIELD VALVE		FLEXIBLE PIPE CONNECTION
	PLUGS		EXPANSION COMPENSATOR
	PRESSURE REDUCING VALVE		PIPE ANCHOR
	FLOW SWITCH		PUMP
	FLOW METER, VENTURI		PRESSURE GAUGE WITH COOK
	SOLENOID VALVE		THERMOMETER
	CIRCUIT BALANCING VALVE		STRAINER
	BALANCING VALVE (PLUS)		FAN SPEED CONTROLLER
	NEEDLE VALVE		SLEEVE THROUGH BEAM
	PRESSURE DIFFERENTIAL VALVE		SLEEVE THROUGH WALL
	SAFETY RELIEF VALVE		DOWN THROUGH FLOOR
	AUTOMATIC CONTROL VALVE		CONNECT TO EXISTING
	3 WAY BUTTERFLY CONTROL VALVE		ACCESS PANEL
	MOTORIZED BUTTERFLY VALVE		ACCESS DOOR
	VALVE IN RISER		
	BACKWATER VALVE INLINE		
	BACKWATER VALVE WITH		

AIR SEPARATOR SCHEDULE													
TAG	LOCATION	BELL & GOSSETT MODEL	SERVICE	MAX FLOW		DESIGN FLOW		SIZE		SHIPPING WEIGHT		TYPE	REMARKS
				LPS	GPM	LPS	GPM	MM	INCH	KG	LBS		
AS-1	BOILER ROOM [006]	R-18FB	BUILDING HEATING	72.5	1149.0	64.3	1018.5	450	18	1451.5	3200.0	CENTRIFUGAL, WITH STRAINER	NOTES 1, & 2
NOTES: 1. ACCEPTABLE ALTERNATES SUBJECT TO SHOP DRAWING REVIEW. 2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS.													

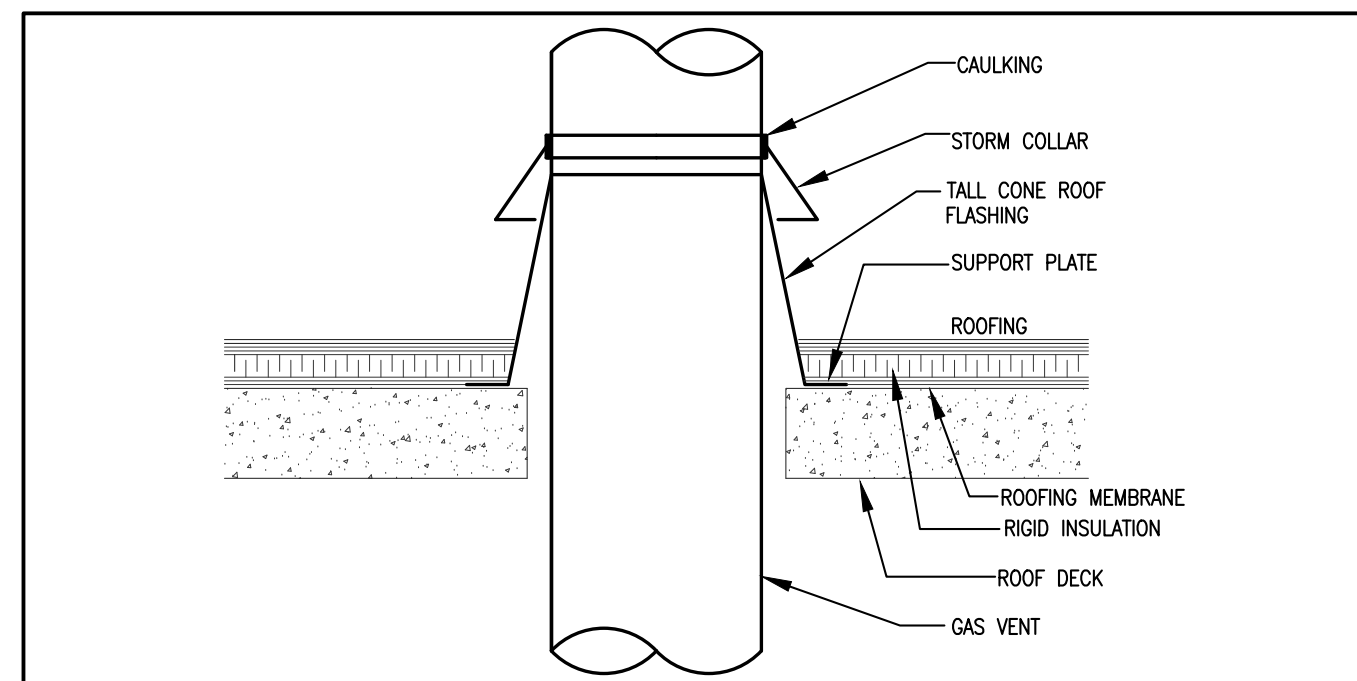
**NOTES:**  
1. ACCEPTABLE ALTERNATES SUBJECT TO SHOP DRAWING REVIEW  
2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS.



1 PIPE IDENTIFICATION DETAIL  
M-100 SCALE: N.T.S.



2 PIPE HANGER DETAIL  
M-100 SCALE: NTS



3 GAS VENT THROUGH ROOF  
M-100 SCALE: N.T.S.

**GENERAL NOTES:**

1. PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST EDITION OF ALL APPLICABLE CODES, ORDINANCES AND BUILDINGS, AND TO THE LOCAL AUTHORITIES' REQUIREMENTS.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND CHECK FOR CONFLICTS BETWEEN THE EXISTING RECORD DRAWINGS AND FIELD CONDITIONS PRIOR TO BEGINNING CONSTRUCTION. ANY CHANGES AND/OR DISCREPANCIES SHALL BE REPORTED AND REVIEWED BY THE ENGINEER AND/OR PROJECT MANAGER PRIOR TO PROCEEDING.
3. INFORMATION FROM THE EXISTING DRAWINGS HAS BEEN TAKEN IN GOOD FAITH FROM THE DRAWINGS LISTED BELOW AND RANDOM VISUAL FIELD REVIEW. ARE DEVELOPED TO BE USED AS A GUIDE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OMISSIONS AND/OR ERRORS.
4. P.I. & PLUCK, DATED FEBRUARY 1963.
  - a. CRAWFORD & ASSOCIATES, DATED FEBRUARY 1978.
  - b. WICKER, ECK & ELLIOTT LTD., DATED APRIL 1972.
  - c. P.I.T. ENGINEERING, DATED MARCH 1974.
  - d. P.I.T. ENGINEERING, DATED MARCH 1994.
5. THE DRAWING IS NOT TO BE USED FOR CONSTRUCTION OF THE SPECIFICATIONS AND THE QUANTITIES PERTAINING TO THE WORK OF OTHER TRADES.
6. OBTAIN PERMISSION FROM SITE MEASUREMENTS. DO NOT SCALE THESE DRAWINGS.
7. FURNISHMENTS OF EITHER THE FIRE OR SMOKE BARBERS SHALL BE PROVIDED AGAINST THE PRESSURE OF FLAME AND/OR SMOKE WITH A SUITABLE NON-COMBUSTIBLE MATERIAL TO THE CONSTRUCTION FENCED.
8. CHECK THE LOCATIONS OF ALL PIPES, DUCTWORK AND EQUIPMENT WITH THE WORK OF OTHER TRADES TO PREVENT INTERFERENCE. REMOVAL AND RELOCATION OF ANY SUCH WORK SHALL BE AT THE CONTRACTOR'S RISK AND WITHOUT RESPONSIBILITY OF THE MECHANICAL TRADERS, UNLESS OTHERWISE STATED.
9. PROVIDE ACCESS DOORS AS REQUIRED FOR ALL CONCEALED SERVICEABLE COMPONENTS, LOCATED ABOVE, BEHIND OR BELOW ACCESS PANELS.
10. EXISTING EQUIPMENT AND ASSOCIATED COMPONENTS SHALL BE REMOVED AND DEPOSITED IN AN APPROPRIATE MANNER.
11. ALL SYSTEMS AND SUBSTITUTIONS MUST BE APPROVED BY THE CONTRACTOR'S RESPONSIBILITY TO INSURE NEW SYSTEMS ARE CONFIGURED/INSTALLED WITHIN THE EXISTING AVAILABLE SPACE.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE "REQUEST FOR TENDER" DOCUMENTS RELATING TO ALTERNATES AND/OR SUBSTITUTIONS. THE IPT DOCUMENTS WILL SUPERSEDE THE REQUIREMENTS NOTED ON THESE DRAWINGS.

DRAWING LIST	
DWG NO	DRAWING TITLE
M-100	LEGENDS, SCHEDULES AND DETAILS
M-101	SPECIFICATIONS
M-102	CONTROLS SPECIFICATIONS
M-103	CONTROLS
M-300	BOILER ROOM - HVAC AND PLUMBING DEMOLITION
M-310	BOILER ROOM - HVAC AND PLUMBING NEW CONSTRUCTION
M-311	FIRST FLOOR - MECHANICAL, NEW CONSTRUCTION
M-312	SECOND FLOOR - MECHANICAL, NEW CONSTRUCTION

IMPERIAL TO METRIC SIZING CONVERSION			
1/8"	3mm	1 1/2"	40mm
1/4"	8mm	2"	50mm
3/8"	10mm	2 1/2"	65mm
1/2"	15mm	3"	80mm
3/4"	20mm	4"	100mm
1"	25mm	6"	150mm
1 1/4"	32mm	8"	200mm

BOILER SCHEDULE															
TAG	LOCATION	PATTERSON KITTEL MODEL	INPUT		OUTPUT		EWT		LWT		FLOW		REMARKS		
			KW	MBH	KW	MBH	°C	°F	°C	°F	L/S	us gpm			
B-1	BOILER ROOM	PK STORM ST-3500	1,024.8	3500	994.1	3395.0	82.2	180	71.1	160	21.4	339.5	WATER	208/30/60 20.0 1257.4 2772.0	NOTES 1, 2, + 3
B-2	BOILER ROOM	PK STORM ST-3500	1,024.8	3500	994.1	3395.0	82.2	180	71.1	160	21.4	339.5	WATER	208/30/60 20.0 1257.4 2772.0	NOTES 1, 2, + 3
B-3	BOILER ROOM	PK STORM ST-3500	1,024.8	3500	994.1	3395.0	82.2	180	71.1	160	21.4	339.5	WATER	208/30/60 20.0 1257.4 2772.0	NOTES 1, 2, + 3

NOTES:

1. ACCEPTABLE ALTERNATES, SUBJECT TO SHOP DRAWING REVIEW ARE LOCHINVAR AND VESSMANN.

2. REFER TO PANS, ELEVATIONS, DETAILS, AND CONTROLS.

3. COMPLETE WITH FUSED DISCONNECT, CIRCULATING PUMP INTERLOCK(S), TEMPERATURE & PRESSURE RELIEF VALVE, LOW WATER CUTOFF, FLOW SWITCH, TEMPERATURE SENSORS, MODULATING BURNER, VARIABLE SPEED PUMP CONTROL, ACID NEUTRALIZER, AND BAROMETRIC DAMPER.

NOTES:

1. ACCEPTABLE ALTERNATES, SUBJECT TO SHOP DRAWING REVIEW ARE LOCHINVAR AND VEISSMANN.
2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS
3. COMPLETE WITH FUSED DISCONNECT, CIRCULATING PUMP INTERLOCK(S), TEMPERATURE & PRESSURE RELIEF VALVE, LOW WATER CUTOFF, FLOW SWITCH, TEMPERATURE SENSORS, MODULATING BURNER, VARIABLE SPEED PUMP CONTROL, AND NEUTRALIZER, AND BAROMETRIC DAMPER.

PUMPS														
TAG	SERVICE	LOCATION	BELL & GOSSETT MODEL	FLUID	FLOW				EFF. %	BPM @ DUTY PT.	ELECTRICAL DATA			REMARKS
					L/S	USGPM	M	FL			VOLTAGE	KW	HP	
P-01	DHWR	BOILER ROOM	E-90-1.5AB 6.750" IMPELLER	POTABLE WATER	1.5	24.0	12.2	40.0	48.7	1536	208/3/60	1.12	1.50	NOTES 1, 2, + 3
BP-01	B01	BOILER ROOM	E-1510-340 6.375" IMPELLER	WATER	21.4	339.5	5.9	19.6	--	--	208/3/60	2.24	3.00	NOTES 1, 2, + 3
BP-02	B02	BOILER ROOM	E-1510-340 6.375" IMPELLER	WATER	21.4	339.5	5.9	19.6	--	--	208/3/60	2.24	3.00	NOTES 1, 2, + 3
BP-03	B03	BOILER ROOM	E-1510-340 6.375" IMPELLER	WATER	21.4	339.5	5.9	19.6	--	--	208/3/60	2.24	3.00	NOTES 1, 2, + 3
CP01A CP01B	EAST BUILDING	BOILER ROOM	E-1510-480 7.625" IMPELLER	WATER	28.4	450.0	9.1	30.0	82.2	1469	208/3/60	5.60	7.50	NOTES 1, 2, + 3
CP02A CP02B	GYMNASIUM	BOILER ROOM	E-1510-240-ES 5.700" IMPELLER	WATER	4.8	76.0	9.1	30.0	70.1	1742	208/3/60	0.75	1.00	NOTES 1, 2, + 3
CP03A CP03B	OFFICE	BOILER ROOM	E-1510-240-ES 5.375" IMPELLER	WATER	7.6	120.0	9.1	30.0	78.6	1659	208/3/60	1.12	1.50	NOTES 1, 2, + 3
CP04A CP04B	WEST BUILDING	BOILER ROOM	E-1510-340 6.375" IMPELLER	WATER	15.1	240.0	9.1	30.0	80.3	1643	208/3/60	2.24	3.00	NOTES 1, 2, + 3
CP05A CP05B	FANS	BOILER ROOM	E-1510-340 7.000" IMPELLER	WATER	25.2	400.0	9.1	30.0	82.9	1663	208/3/60	3.73	5.00	NOTES 1, 2, + 3

NOTES:  
1. SCHEDULE IS BASED ON BELL & GOSSETT. ACCEPTABLE ALTERNATES SUBJECT TO SHOP DRAWING REVIEW: S. A. ARMSTRONG, TACO, AND WILCO.  
2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS.  
3. COMPLETE WITH VARIABLE SPEED DRIVE, AND VIBRATION ISOLATION.

DOMESTIC WATER HEATER SCHEDULE																		
TAG	LOCATION	A.O. SMITH MODEL	INPUT		OUTPUT		RISE		RECOVERY		FLOW		FLUID	ELECTRICAL		WEIGHT		REMARKS
			KW	MBH	KW	MBH	"CAT	"FAT	LPH	GPH	LPS	GPM		VOLTAGE	MCA	KG	LBS.	
QHW01	BOILER ROOM	CYCLONE 8TH-150A	43.9	150.0	43.0	147.0	55.6	100.0	1256.8	445.0	379	100.0	POTABLE WATER	120/1/80	5.0	613.7	1353.0	NOTES 1, 2, + 3
QHW02	BOILER ROOM	CYCLONE 8TH-150A	43.9	150.0	43.0	147.0	56.6	100.0	1256.8	445.0	379	100.0	POTABLE WATER	120/1/80	5.0	613.7	1353.0	NOTES 1, 2, + 3

NOTES:

1. ACCEPTABLE ALTERNATES, SUBJECT TO SHOP DRAWING REVIEW, RHEEM.
2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS.
3. COMPLETE WITH FUSED DISCONNECT, TEMPERATURE & PRESSURE RELIEF VALVE, MODULATING BURNER, ACID NEUTRALIZER, BACKDRAFT DAMPER, AND CONTROLS.

LOUVRE/PENTHOUSE SCHEDULE														
TAG	SYSTEM	VENTEX MODEL	AIRFLOW		FREE AREA	LOUVRE DIMENSIONS				PENTHOUSE DIMENSIONS				REMARKS
			LPS	CFM		LENGTH X WIDTH		LENGTH X WIDTH		LENGTH X WIDTH X HEIGHT		LENGTH X WIDTH X HEIGHT		
						MM	MM	INS	INS	MM	MM	MM	INS	
L-1	COMB./VENT. AIR	2625	708	1500	50.8	762	762	30	30	--	--	--	--	NOTES 1 + 2
NOTES:														
1. ACCEPTABLE ALTERNATES SUBJECT TO SHOP DRAWING REVIEW. VENTEX, E.H. PRICE AND GREENHECK.														
2. COMPLETE WITH INSECT SCREEN, BURGlar BARS, AND STANDARD FINISH. COLOUR TO BE SELECTED AT SHOP DRAWING REVIEW.														

NOTES:

1. ACCEPTABLE ALTERNATES SUBJECT TO SHOP DRAWING REVIEW: VENTEX, E.H. PRICE, AND GREENHECK.
2. COMPLETE WITH INSECT SCREEN, BURGLAR BARS, AND STANDARD FINISH. COLOUR TO BE SELECTED AT SHOP DRAWING REVIEW.

PRESSURE REDUCING VALVE SCHEDULE															
TAG	SERVICE	FISCHER MODEL	INLET PIPE SIZE		INLET PRESSURE		OUTLET PIPE SIZE		OUTLET PRESSURE		ORIFICE SIZE	CAPACITY	DEMAND	REMARKS	
			MM	INS	KPa	PSI	MM	INS	KPa	PSI	MM	INS	GPH	GPM	
PRV-1	OWHD1 + OWHD2	CS80 - 1.25IN BODY	25	1	13.79	2	32	1.25	3.48	0.505	6	0.25	684.0	300	NOTES 1 + 2
PRV-2	B01	CS80 - 2IN BODY	51	2	13.79	2	76	3	3.48	0.505	35	1.375	3600.0	3500	NOTES 1 + 2
PRV-3	B02	CS80 - 2IN BODY	51	2	13.79	2	76	3	3.48	0.505	35	1.375	3600.0	3500	NOTES 1 + 2
PRV-4	B03	CS80 - 2IN BODY	51	2	13.79	2	76	3	3.48	0.505	35	1.375	3600.0	3500	NOTES 1 + 2

NOTES:

1. ALTERNATES ARE SUBJECT TO SHOP DRAWING REVIEW.

2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS.

**NOTES:**  
1. ALTERNATES ARE SUBJECT TO SHOP DRAWING REVIEW.  
2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS.

EXPANSION TANK SCHEDULE														
TAG	LOCATION	BELL & GOSSETT MODEL	SERVICE	CONNECTIONS			VOLUME		ACCEPTANCE VOLUME		SHIPPING WEIGHT		TYPE	REMARKS
				MM	INS	L	MM	INS	MM	INS	KG	LEBS		
ET-1	BOILER ROOM [006]	D180	BUILDING HEATING	40	1.50	340.7	90	276.3	73	128	283		ASME DAMPFRAGM	NOTES 1, & 2
ET-2	BOILER ROOM [006]	PTA-180V	POTABLE WATER	40	1.50	234.7	62	129.1	34.1	40.5	89		DAMPFRAGM	NOTES 1, & 2
NOTES: 1. ACCEPTABLE ALTERNATES, SUBJECT TO SHOP DRAWING REVIEW: S.A. ARMSTRONG AND AFLA LARAL. 2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS.														

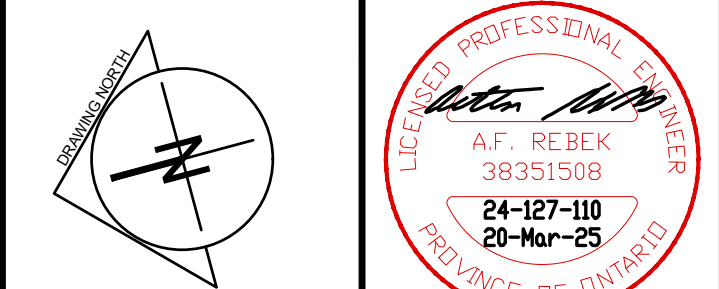
NOTES:  
1. ACCEPTABLE ALTERNATES, SUBJECT TO SHOP DRAWING REVIEW: S.A. ARMSTRONG AND AFLA LAYAL.  
2. REFER TO PLANS, ELEVATIONS, DETAILS, AND CONTROLS.

GENERAL NOTES[illegible]

5	RE-ISSUED FOR PERMIT AND TENDER	MAR 20, 2025	S.H.
4	RE-ISSUED FOR PERMIT AND TENDER	MAR 14, 2025	S.H.
3	RE-ISSUED FOR PERMIT AND TENDER	MAR 04, 2025	S.H.
2	RE-ISSUED FOR PERMIT AND TENDER	FEB 18, 2025	S.H.
1	ISSUED FOR PERMIT AND TENDER	JAN 31, 2025	S.H.

No.	DESCRIPTION	DATE	BY
REVISIONS			

## REVISIONS



1100 South Service Rd., #417  
Stoney Creek ON L8E 0C5  
T • (905) 643-8530  
F • (905) 643-8510

PROJECT:

HILL PARK LEARNING  
CENTRE - HVAC  
AND PLUMBING UPGRADES

465 EAST 16TH STREET,  
HAMILTON, ONTARIO L9A 4K6

START DATE:	DRAWN BY:	DESIGNED BY:
2024 09 11	O.L.	S.H.

DRAWING TITLE:

LEGENDS, SCHEDULES  
AND DETAILS

SCALE: NTS	DRAWING No.:  <b>M-100</b>
PROJECT: 24-127-110	



			GENERAL NOTES		
1.1. The scope of work is to demolish and replace the HVAC boiler system and domestic hot water system in the boiler room of Hill Park Learning Centre. Perform all mechanical work detailed on these drawings to provide a complete and fully functional operating system to the satisfaction of the owner and mechanical consultant.					
1.2. Where there is discrepancy between specified, or scheduled equipment, and information indicated elsewhere on the drawings, the most stringent shall apply.					
1.3. Where there is apparent discrepancy of any kind, between any drawings, equipment tables, schedules, specifications, or other bid documents, submit questions via the bidding platform, for direction and clarification during the tender period.					
1.4. Consideration will not be granted for misunderstanding the intent of the contractual documents, the extent of work to be performed, or the intent required to provide complete and fully operational and controlled systems upon completion installation.					
1.5. Specified work described or indicated on drawings does not delegate function to any specified subcontractor or identify absolute contractual limits between mechanical or subcontractors.					
1.6. Arrange for milestone inspections. Contact AEC Engineering Tel: (905) 643-8530 E-mail: contact@arcongeenring.ca.					
1.7. As a minimum, base building standards shall form the basis for this construction. Comply with Landlord's requirements for system shutdown and connection.					
1.8. Coordinate all work with base building work. Refer to base building drawings and specifications.					
1.9. Codes and bylaws shall be strictly adhered to. Obtain necessary permits, approvals and inspections from the authorities having jurisdiction.					
1.10. Permits and fees required by the authorities having jurisdiction shall be obtained and paid for by this contractor. Include all applicable taxes.					
1.11. It is the Contractor's responsibility to verify and check the existing construction prior to and during construction. Contractor shall conduct ongoing reviews during demolition and construction and immediately notify the consultants of any deviations from drawing dimensions/details/schedules. Failure to do so shall not relieve contractor of full contract responsibility.					
1.12. Cutting, patching and core drilling required by this trade shall be paid for by this contractor. Provide details of new opening through structural components for engineer's approval. Incor all costs related for structural approval.					
1.13. Fire stop shall be ULC listed for the required separation and provided at all pipe and duct penetrations through rated assemblies.					
1.14. Premium time costs shall be included for work outside of normal working hours. Comply with construction schedule prepared by Management.					
1.15. Flashing and counter flashing for exterior penetrations or water-proofed floors shall be provided under this contract.					
1.16. Shop drawings shall be complete with contractors reviewed stamp. Submit four (4) copies and/or one (1) electronic copy of all shop drawings. Allow one (1) week for consultant's review.					
1.17. Base bid equipment and suppliers in Base Building Mechanical Specifications shall apply to this contract.					
If the Contractor chooses to submit alternates:					
1.18.1. Contractor to submit alternates in addition to base bid products, and show savings by utilizing alternates. Where modifications to the work of Other Trades are required as a result or part of the alternative offered, include the cost of said modifications in the alternative price offered.					
1.18.2. Contractor responsible for ensuring alternate equipment meets physical requirements of existing site conditions to remain and proposed design with respect to but not limited to: size, weight, service access clearances, duct connection arrangement, & air intake clearances.					
1.18.3. Contractor responsible for ensuring alternate equipment meets functions and performance specifications specified in schedule and/or shown on Drawings.					
1.19. Equipment substitutions offer award of contract will not be considered without written explanation and consultant's written authorization. The quality and performance characteristics of substituted product shall be equivalent to the specified product. All substitute products shall be approved by consultants. Any additional costs incurred by all trades for substituted equipment installation must be incurred by this contract.					
1.20. Control wiring and devices shall be provided under this contract.					
1.21. Electrical devices shall be provided for all Division 15 equipment, including load side wiring, starters, disconnect, etc. Verify and coordinate voltage, phase, and short circuit interrupting capacity with the electrical contractor prior to ordering equipment. Provide conduit and wiring materials and methods in strict accordance with Division 15 requirements.					
1.22. Access doors shall be provided for all inaccessible mechanical equipment and services requiring inspection or service. Finish shall suit architect/designers requirements. Access doors shall be recessed as required to suit wall finish (e.g., 96).					
1.23. Architect/Designer/Owner approval of air terminal, thermostat, and access door locations must be obtained prior to installation.					
1.24. One (1) year written warranty shall be provided for the complete mechanical installation from date of acceptance.					
As-built drawings shall be submitted in PDF format and AutoCAD format. Record accurately installed work.					
1.26. Operating and maintenance manuals containing approved shop drawings, air and water balancing reports, equipment data sheets, written warranty, operating instructions and maintenance procedures shall be submitted to consultant for review electronically. Manuals shall be separated with dividers in appropriate sections. Make all corrections requested by consultant and resubmit for review.					
1.27. Provide one (1) electronic copy of the operating and maintenance manuals referenced in section 1.27 to the building owner in PDF format.					
1.28. Change Notice Questions shall be submitted complete with cost breakdown of labour and materials. Failure to provide will result in rejection. All Mechanical Change Notices shall be priced in accordance with "MECHANICAL CONTRACTORS ASSOCIATION" (MCA) labour units strictly for labour.					
2. DEMOLITION					
2.1. Provide labour, materials, products, equipment and services required to complete the demolition work specified herein.					
2.2. Dispose, off site, of all debris in accordance with the jurisdictional authorities.					
2.3. Removal and storage of salvageable items as directed by this specification section and the Owner of their representative.					
2.4. Mechanical demolition work associated with this building is indicated on the demolition drawings and generally consists of the following: <ul style="list-style-type: none"><li>– Plumbing and Drainage</li><li>– HVAC systems and equipment</li><li>– Hydronic systems and equipment</li><li>– Building Control Systems</li></ul>					
2.5. Disposed materials which have not been designated for salvage from the demolition shall become the property of the Contractor. Remove all material and debris from the site as quickly as possible and dispose of legally. Burning of debris or selling of materials on the site will not be permitted.					
2.6. Present to the Owner existing equipment removed but not identified for salvage on site. Acceptance of removed equipment is at the discretion of the Owner. Remove such items from site when deemed unsuitable.					
2.7. Conform to requirements of municipality's Works Department regarding disposal of waste materials.					
2.8. Materials prohibited from municipality waste management facilities shall be removed from site and disposed to recycling companies specializing in recyclable materials.					
2.9. Contractor shall be responsible for all fees required for the disposal of demolished materials, equipment, etc.					
2.10. Store materials only in areas designated by the Owner and as permitted by the local jurisdictional authorities.					
HVAC PIPING SYSTEMS					
3.1. Piping material for hydronic hot water heating and chilled water systems to 2068 kPa [300 psig] operating pressure use ASTM A-53 or A-106 schedule 40 black carbon steel, seamless or ERW with the following fittings:					
3.1.1. For small bore, 50 mm [2 in.] and under to [ 1034 kPa][150 psi] use 1034 kPa [150 psi] screwed black malleable iron or 125g cast iron fittings.					
3.1.2. For large bore 65 mm [2-1/2 in.] and over to 1034 kPa [150 psi] use schedule 40 black carbon steel welded fittings.					
3.2. Use of copper piping for small branches and run-outs is acceptable for 20mm [3/4 in.] and below, with type L pipe, wrought copper fittings, and soldered joints for pressures up to 100 psig and silver soldering for higher pressures.					
3.3. Valves: (port numbers listed):					
3.3.1. To 1379 kPa [200 psig] working pressure, up to 50mm [2 in.] – soldered or threaded					
3.3.1.1. Gate Valves – 125S/200 W.O.G. rated, bronze body to ASTM-B62, solid wedge disc, bronze trim, rising stem. (Soldered – Kitz 44, Threaded – Kitz 24)					
3.3.1.2. Globe Valves – 125S/200 W.O.G. rated, bronze body to ASTM-B62, bronze trim, rising stem. (Soldered – Kitz 12, Threaded – Kitz 11)					
3.3.1.3. Ball Valves – 150/600 W.O.G. rated, two piece full port brass body (C37700), solid chrome plated brass ball, PTFE seats, double o-ring stem seals, lever operated. (Soldered – Kitz 59, Threaded – Kitz 50)					
3.3.1.4. Check Valves – 125S/200 W.O.G. rated, bronze body to ASTM B62 , bronze trim, Y pattern. (Soldered – Kitz 23, Threaded – Kitz 22)					
3.3.2. To 1379 kPa [200 psig], 65mm [2-1/2 in.] and larger – flanged					
3.3.2.1. Gate Valves – 125S/200 W.O.G. rated, cast iron body to ASTM A126 class B, bronze trim, OS&Y (Kitz 72)					
3.3.2.2. Globe Valves – 125S/200 W.O.G. rated, cast iron body to ASTM A126 class B, bronze trim, OS&Y (Kitz 76)					
3.3.2.3. Ball Valves – 125S/200 W.O.G. rated, two piece full port, cast iron ASTM 126 class B body, epoxy coated to NSF 61, latten fused ball, RPTFE seats, seals and packing, lever or gear operated.					
3.3.2.4. Butterfly Valves – 200 psi rated, ductile iron body, aluminum bronze disc, stainless steel stem, moulded or cartridge style seats (EPDM). Valve to be rated for full dead end service with the downstream flanged removed. Lever operated to 6", gear operated 8" and over, ULG pattern. (Lever operated – Kitz 61223). Gear operated – Kitz 61225)					
3.3.2.5. Check Valves – 125S/200 W.O.G. rated, cast iron body to ASTM A126, bronze trim, bolted bonnet. (Flanged – Kitz 78)					
3.4. Butterfly valves are to be molded or cartridge style only.					
3.5. Ball valves are to be solid ball style only.					
3.6. Provide ball or butterfly valves for all shut-off requirements. Gate valves will not be approved.					
3.7. Provide 20 mm [3/4" in.] hose end drain valves with cap and chain at all system low points.					
3.8. Provide di-electric couplings for connection of dissimilar piping materials.					
3.9. Provide circuit balancing valves as required to balance water flow. Circuit balancing valves shall be Armstrong Model C9M – Y pattern style, all metal, with soldered or screwed connections, built-in drain connection with shut off valve and protective caps and integral valve insulation. Provide for each valve: <ul style="list-style-type: none"><li>– Versar type handwheel settings for precision flow balancing.</li><li>– Positive shut off valve with no drip seat and plug type stem with Teflon disc.</li><li>– Tamper proof hidden memory.</li></ul>					
3.10. Select circuit balancing valve size to give a pressure drop at 100% open between 3.0 kPa [1 ft.] and 21 kPa [7 ft.]. Select valves location remote from the pumps in the circuit near minimum pressure drop and those located near the pumps at higher pressure drops.					
3.11. Provide safety and relief valves for all closed water systems. Pipe relief to nearest floor drain. Provide Watts 174A valves rated at 1035 kPa [150 psig] at 99°C [170°F] ASTM rated, cast iron body bronze disc and seat, steel spindle assembly, carbon steel spring.					
3.12. Provide strainers upstream of each pump and where indicated on drawings. Strainers shall be bronze body type with screwed connections, stainless steel screens with 1.6 mm [1/16 in.<.] perforations and capable of system pressure of 860 kPa [125 PSI].					
3.13. Automatic air vents and collecting chambers Spirax 13W shall be provided at all high points of piping system. Ensure ratings are compatible with system pressure.					
3.14. Insulation shall be provided to match base building standards or refer to insulation section.					
3.15. Flush clean all HVAC piping systems. Bypass and isolate any equipment that may be damaged during the flushing process. After flushing process, clean all strainers and check all low points to ensure removal of all loose dirt. Chemically clean all piping systems utilizing low foaming chemical detergents which shall not adversely affect system components. After flushing and cleaning, pressure test all HVAC piping systems.					
16. Provide ULC classified firestopping products by 3M or Hilti which have been tested in accordance with CAN4-S115, install firestopping systems in accordance with the appropriate ULC system number for the products and type of penetration.					
17. Ensure that fire ratings of floors and walls are maintained, fill spaces between openings and pipes passing through fire separations.					
4. CHEMICAL TREATMENT					
4.1. Cleaning and water treatment services are to be performed by Aquarian Chemicals Inc., in accordance with owner's standard and as specified herein.					
4.2. After completion of flush cleaning and pressure testing, chemically clean all piping systems utilizing low foaming chemical detergents which shall not adversely affect system components.					
4.3. Provide each closed system with a 7.6 Litre [2 US Gal.] capacity bi-pass chemical feeder. Pipe across pumping system and locate not more than (1m) [3 ft.] above floor. Pipe to floor drain, using 20mm [3/4"] pipe c/w ball valves. Provide feeders with pressure rating suitable for the system working pressure.					
4.4. To compensate for initial losses of chemicals and water during startup of system, provide twice as much corrosion inhibitor and biocide as are necessary to treat systems.					
4.5. Maintain chemical levels from the time the system is filled after cleaning, up to Substantial Performance of the Contract.					
4.6. The water treatment specialist shall supply all necessary supervision during installation and shall check the systems during construction.					
4.7. Provide a service program from a specialist with the water treatment supplier/contractor for a period of one year from Substantial Completion. Include initial water analysis and recommendations, service startup training of operating personnel and laboratory and technical assistance.					
4.8. Provide service visits as required to stabilize and commission the systems and a minimum of one visit per month by the Water Treatment Specialist for the year following Substantial Completion to ensure that a proper treatment program is maintained. Perform corrosion tests to verify performance requirements are being achieved. Document recommendations and submit a written report to the Owner's representative after each visit.					
5. GAS PIPING SYSTEMS					
5.1. Provide all labour, materials, products, equipment and services to supply and install the natural gas piping system indicated on the Drawings and specified in this Section of the Specifications.					
5.2. Install natural gas system only with filters certified to Natural Gas and Propane Installation Code requirements.					
5.3. If necessary, arrange and pay for a gas service to the building, including regulating station gas meter, and associated accessories.					
5.4. Provide all equipment and materials required for the building natural gas distribution systems in accordance with the requirements of the current version of Natural Gas and Propane Installation Code.					
5.5. Provide complete natural gas system, to CSA and CGA requirements					
5.6. Steel gas piping:					
5.6.1. Piping: ASTM A-53 schedule 40 seamless					
5.6.2. Joining Material: screwed fittings with galvanized lead paste for [12mm] [1/2"] to [50mm] [2"]; welded to CSA W47.1 for [65mm] [2-1/2"] and over					
5.6.3. Fittings:					
5.6.3.1. Malleable iron: screwed to ANSI B16.3, Class 150 for service pressures up to and including 861 kPa.					
5.6.3.2. Unions: malleable iron, brass to iron, ground seat, to ASTM A47M.					
5.6.3.3. Nipples: schedule 40, to ASTM A53.					
5.7. Flange gaskets shall me non-metallic flat type;					
5.8. Manual shut-off valves shall be Full port, forged brass ball valve for two piece body construction complete with the following blow-out-proof stem, adjustable packing gland, chrome-plated ball, class 150 WSP, 600 WOG, CGA 3.16 approved. Provide complete with CRN, lever handle and ANSI B1.20.1 NPT end connections.					
5.9. Provide pressure reducing, regulating and relief valving required for compatibility between equipment and building natural gas distribution system.					
5.10. Provide gas pressure reducing station(s) where noted on Drawings and where required to reduce building distribution system pressures to appliance operating pressure ranges.					
5.11. Pressure regulators shall be spring-loaded self-operated design and shall be tight closing with replaceable orifices and discs and concealed accessible manual adjustment. Valve bodies shall be cast iron rated for [1034 kPa] [150 psig] gas pressure and all valve materials shall be epoxy pointed to resist corrosive ambient conditions.					
5.12. Provide gas pressure relief stations downstream of all pressure reducing stations where required.					
5.13. Provide relief valves of spring-loaded design with throttling characteristics to reduce system pressure surges. Valve bodies shall be cast iron rated for [1034 kPa] [150 psig] gas pressure with replaceable orifices and discs and concealed accessible manual adjustment. All valve materials shall be epoxy pointed to resist corrosive ambient conditions.					
5.14. Install natural gas service to meet Natural Gas and Propane Installation Code and all authorities having jurisdiction.					
5.15. Provide 25mm [1"] opening at the top and bottom of any chase containing a gas pipe.					
5.16. Distribute gas within the building at [14 kPa] [2 psig].					
5.17. Select pressure reducing valves to maintain downstream pressures within +5% range of setting. Submit sizing data for each valve with Shop Drawings.					
5.18. Select pressure relief valves for the maximum capacity of the pressure reducing station served plus not less than 25%. Submit sizing data for each valve with Shop Drawings.					
5.19. Pipe of relief vents individually to outdoors. Size piping for a maximum pressure drop of 10% of the pressure reducing valve setpoint gauge pressure with a 25% capacity safety factor.					
5.20. Provide upstream and downstream isolating valves and pressure gauges complete with gauge cocks at all pressure reducing stations. Connect relief valves so that they cannot be isolated from the appliances which they serve.					
5.21. Provide supports (roof supports Duro Block or pressure treated wood blocks complete with rigid insulation at bottom of block) at maximum spacing as follows: 20mm [3/4 in.] – 25mm [1 in.]; 2.4m [8 ft.] 30mm [1-1/4 in.] – 65mm [2-1/2 in.]; 3m [10 ft.]					
5.22. Anchor gas piping supports as per OGC, CSA, and seismic requirements.					
5.23. Connect gas piping to all gas fired equipment.					
5.24. Point gas service piping to meet code requirements.					
5.25. PLUMBING SYSTEM					
5.1. EXISTING SANITARY DRAIN locations and invert elevations shall be verified on site prior to commencement of work.					
5.2. PIPING MATERIALS:					
5.2.1. Domestic hot and cold water piping – type "L" copper with copper fittings use 95/5 tin/antimony solder. Provide type "N" soft copper piping with joints below ground.					
5.2.2. Drainage and Vent Piping (60mm [2-1/2"] and smaller):					
5.2.2.1. Sanitary piping, above ground – DWV copper pipe with drainage fittings and 50/50 solder joints.					
5.2.2.2. Sanitary piping, below ground – Type L copper with 50/50 solder joints.					
5.2.2.3. Vent piping, above ground – DWV copper pipe with drainage fittings, 50/50 solder joints.					
5.2.2.4. Vent piping, below ground – Type L copper pipe with wrought copper fittings and 50/50 solder joints.					
5.2.3. Drainage and Vent Piping (75mm [3"] and larger):					
5.2.3.1. Sanitary piping, above ground – CSA class 4000 cast iron soil pipe and fittings, with mechanical joints.					
5.2.3.2. Sanitary piping, below ground – CSA class 4000 cast iron soil pipe and fittings, with mechanical joints.					
5.2.3.3. Vent piping, above ground – CSA class 4000 cast iron soil pipe and fittings, with mechanical joints.					
5.2.3.4. Vent piping, below ground – CSA class 4000 cast iron soil pipe and fittings, with mechanical joints.					
5.3. Butterfly valves are to be molded or cartridge style only.					
5.4. Ball valves are to be solid ball style only.					
5.5. Provide ball or butterfly valves for all shut-off requirements. Gate valves will not be approved.					
5.6. Provide all bronze ball type shut off valves on main and branch lines and isolating valves for each individual plumbing fixture served.					
5.7. Plumbing fixtures shall be new, of first quality, in perfect condition and installed in best workmanlike manner. Verify plumbing fixture quantities and locations with Architect's/Designer's drawings. Reuse of domestic water heater is not permitted.					
5.8. Hot water heaters shall be as indicated on drawings and in schedule.					
5.9. Provide di-electric couplings for connection of dissimilar piping materials.					
5.10. Trap seal primer must be provided on all new Floor Drains, Flush Floor Drains and Hub Drains.					
5.11. Exposed piping and fittings within washrooms shall be chrome plated. Provide chrome plated escutcheons on all piping passing through finished surfaces and millwork.					
5.12. Stainless steel water hammer arrestors equal to Zurn Shockrol shall be provided on all lines serving groups of fixtures, quick closing valves and flush valves.					
5.13. Provide ULC classified firestopping products by 3M or Hilti which have been tested in accordance with CAN4-S115, install firestopping systems in accordance with the appropriate ULC system number for the products and type of penetration.					
5.14. Ensure that fire ratings of floors and walls are maintained, fill spaces between openings and pipes passing through fire separations.					
6. INSULATION					
6.1. Provide all labour, materials, products, equipment and services to supply and install thermal insulation, vapour barriers and finishes for mechanical work as indicated on the drawings and specified in this section of these specifications.					
6.2. PIPING INSULATION:					
6.2.1. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics and insulating cements.					
6.2.2. Insulation materials must be manufactured at facilities certified and registered with an approved Registrar to conform to ISO 9000 quality standard.					
6.2.3. All insulation pertaining to Division 15 shall be carried out by one firm specializing in insulation work. Do not mix similar products of multiple manufacturers.					
6.2.4. Acceptable insulation manufacturers are Owens Corning Canada, Johns Manville, Manson Insulation Inc. Knaf Fiber Glass and Certainteed.					
6.2.5. Provide insulation and covers in strict accordance with authorities governing combustibility and fireproofing of materials and in accordance with manufacturer's recommendations.					
6.2.6. Provide non-combustible insulation, jackets and finishes having a Flame Spread/Smoke Developed rating of 25/50 or less.					
6.2.7. Provide insulation materials with a minimum thermal conductivity of 0.248WU/(hr. sq.ft) at 100°F mean temperature.					
6.2.8. On hot piping applications, hold insulation in place with flare type staples (avoid pinch).					
6.2.9. Apply pipe insulation over 1-1/2" thickness in two layers with joints staggered.					
6.2.10. Insulate fittings with fabricated milled or preformed sections of specified insulation.					
6.2.11. Insulate over flanges and mechanical couplings with specified insulation and thickness, sized to suit flange dimensions. Fill spaces between insulation and adjoining pipe insulation with similar material.					
6.2.12. Insulate valves and isolate components with flexible insulation density (3/4 lb./cu.ft.) compressed not more than 50% of original thickness. Build up to specified thickness with approved asbestos free finishing cement.					
6.2.13. Do not insulate terminal unit automatic control valves installed in hot piping.					
6.2.14. Under all domestic cold water, provide an insert between support shield and piping for piping 1-1/2" or larger.					
6.2.15. Provide the following pipe insulation type as indicated in the pipe insulation table below. Type P1 – Owens Corning Fiberglas Pipe Insulation, Johns Manville Micro-Lok Pipe Insulation, Manson Aluma-Pipe Insulation or Knaf Earthwool 100T Pipe Insulation with factory applied purpose vapour barrier jacket where scheduled. Type P2 – ArmoCell AC Accoflex fiber-free piping insulation, painted with WB Finish where installed indoors.					
7. TESTING, ADJUSTING, AND BALANCING					
7.1. Balancing contractor shall be qualified by the following:					
7.1.1. Associated Air Balance Council (AABC) National Standards for Total System Balancing, NM-1					
7.1.2. National Balancing Council (NBC) Certified Air Balancing Specifications and Certified Hydraulic Balancing Specifications					
7.1.3. National Environmental Balancing Bureau (NEBB) TABES Procedural Standard for Testing, Adjusting, and Balancing Environmental Systems					
7.1.4. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) HVAC TAB HVAC Systems – Testing, Adjusting and Balancing					
7.1.5. National Building Comfort Testing Association (NBCTA)					
7.2. Balancing contractor shall be one of: <ul style="list-style-type: none"><li>– Troop Engineering Services Inc.</li><li>– Air Audit</li><li>– Dynamic</li><li>– T.M.A. Balancing Inc.</li></ul>					
7.3. List selected balancing contractor on tender form. Balancing scope of work shall include water and air side balancing of all equipment, ductwork and terminal devices provided as part of this contract, as well as base building equipment revised by this contract.					
7.4. Balance as listed on mechanical drawings.					
7.5. Balance to the following tolerances of design values:					
7.5.1. Hydraulic System: +/- 10%					
7.5.2. Measured volumes to be accurate to within 2% of actual volumes.					
7.6. Instruments					
7.6.1. Prior to balancing, submit to owner representation a list of instruments to be used together with matching serial numbers.					
7.6.2. Calibrate instruments in accordance with requirements of most stringent of referenced standard for applicable system.					
7.6.3. Calibrate instruments with (3) months of balancing and provide certificate of calibration to owner's representative.					
7.7. Submit balancing report in triplicate to the consultant and the owner, indicating terminal design and measured flow rates.					
8. VALVE TAGS					
8.1. Provide 40 mm dia., 1 mm thick lamacod tags with 10mm high die-stamped block letters, except for fire and sprinkler systems, provide non lamacod tags with white letters in lieu of brass tags.					
8.2. Attach to valves with 100 mm long brass chains.					
8.3. Tag all valves except for small valves isolating a single piece of equipment such as a unit heater, fan coil unit, terminal reheat coil and radiation section.					
9. EQUIPMENT NAMEPLATES					
9.1. Identify equipments, starters, and remote control devices in a manner consistent with the Drawings.					
9.2. Use solid block capitalized lettering 100 mm high.					
9.3. Where equipment size does not permit stencil identification, use lamacod labels, engraved white on black, mechanically fastened to the equipment. Minimum lettering size 10 mm.					



--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

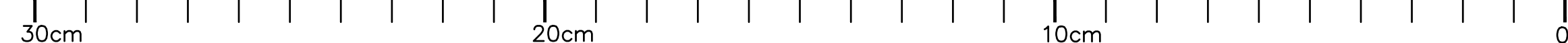




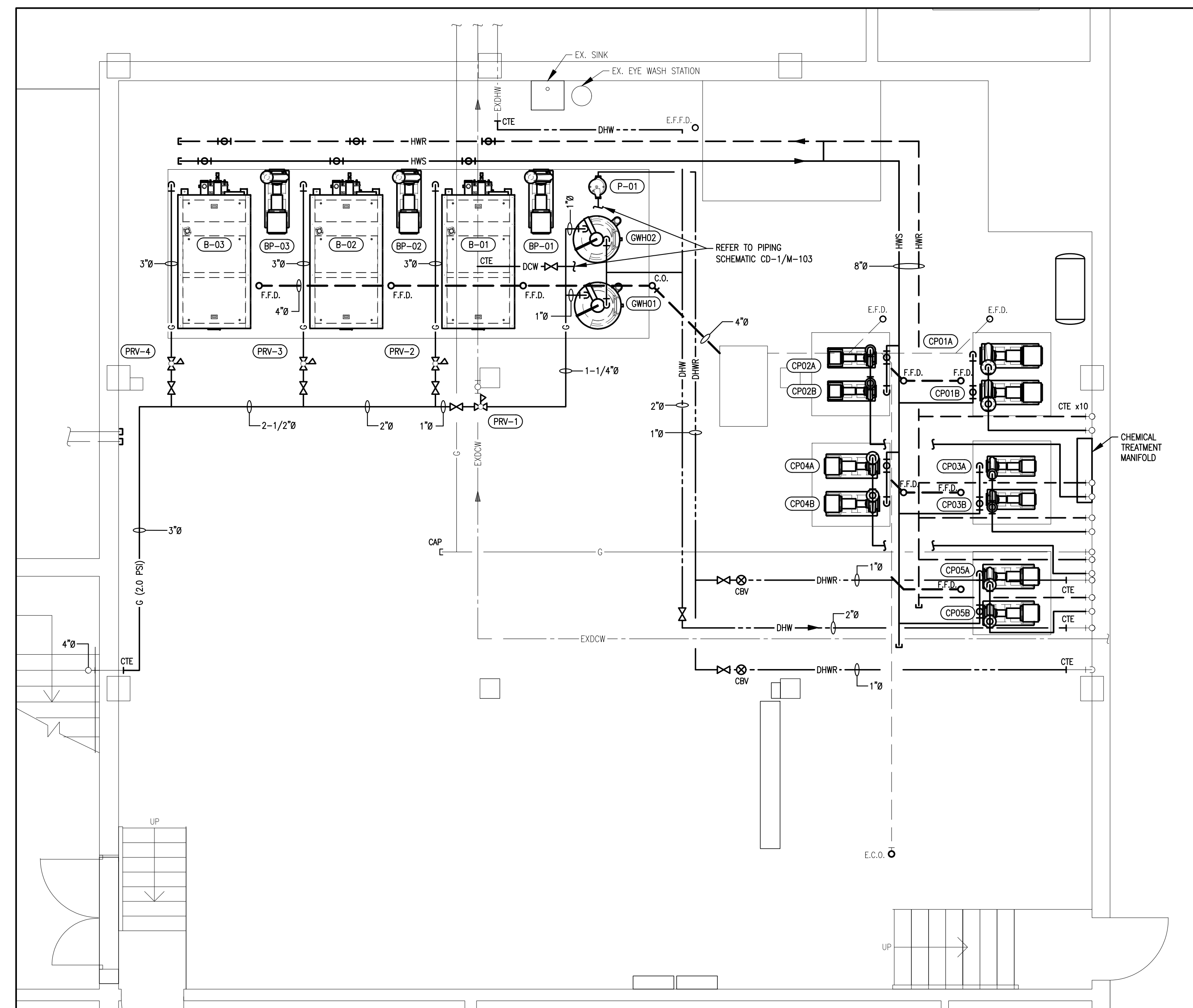




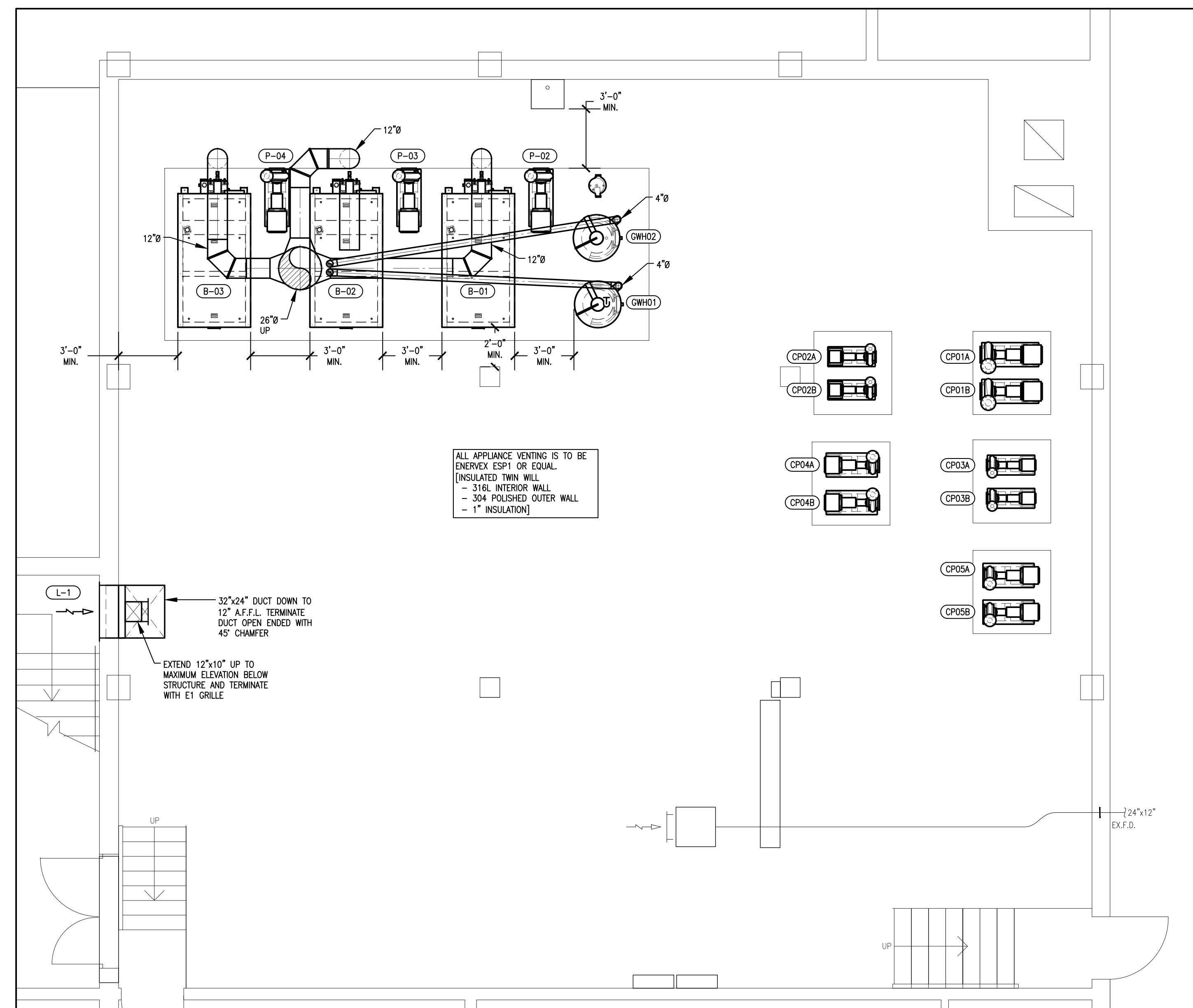
- [illegible]







1 BASEMENT - BOILER ROOM [006] PLUMBING & HYDRONIC NEW CONSTRUCTION  
M-310 1/4" = 1'-0"

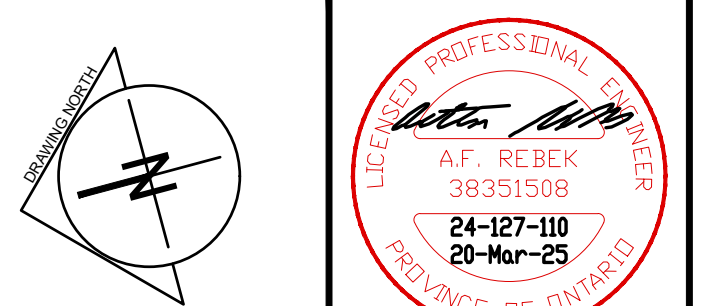


2 BASEMENT - BOILER ROOM [006] DUCTWORK NEW CONSTRUCTION  
M-310 1/4" = 1'-0"

## GENERAL NOTES

5	RE-ISSUED FOR PERMIT AND TENDER	MAR 20, 2025	S.H.	
4	RE-ISSUED FOR PERMIT AND TENDER	MAR 14, 2025	S.H.	
3	RE-ISSUED FOR PERMIT AND TENDER	MAR 04, 2025	S.H.	
2	RE-ISSUED FOR PERMIT AND TENDER	FEB 18, 2025	S.H.	
1	ISSUED FOR PERMIT AND TENDER	JAN 31, 2025	S.H.	
No.	DESCRIPTION	DATE	BY	

## REVISIONS



1100 South Service Rd., #417  
Stoney Creek ON L8E 0C5  
T • (905) 643-8530  
F • (905) 643-8510

www.arcengineering.ca  
contact@arcengineering.ca

PROJECT:

**HILL PARK LEARNING  
CENTRE - HVAC  
AND PLUMBING UPGRADES**

465 EAST 16TH STREET,  
HAMILTON, ONTARIO L9A 4K6

START DATE:	DRAWN BY:	DESIGNED BY:
2024 09 11	O.L.	S.H.

DRAWING TITLE:

BOILER ROOM UPGRADES -  
PLUMBING, HYDRONIC, AND  
HVAC NEW CONSTRUCTION

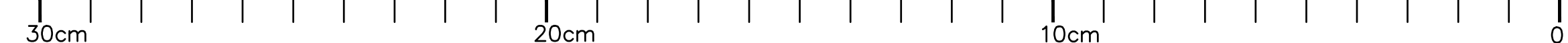
SCALE:

DRAWING No.:

**M-310**

24-127-110

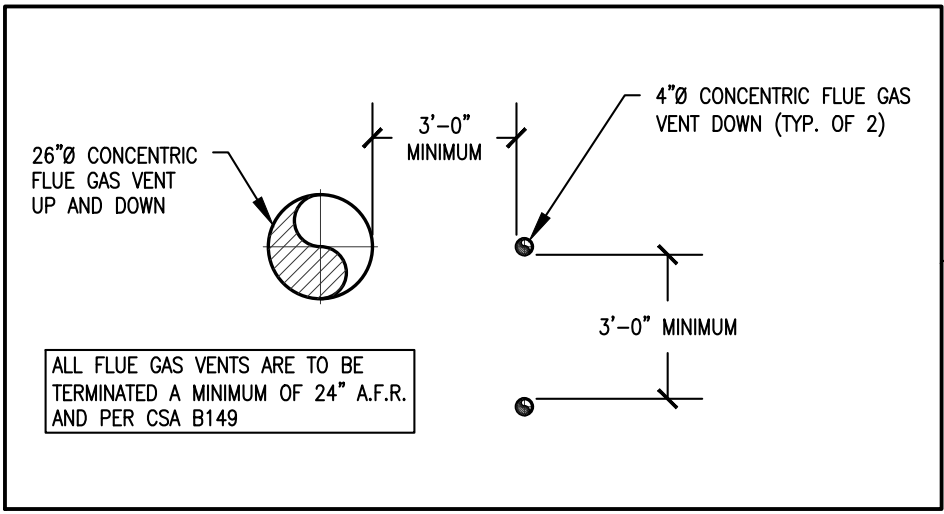
24-127-110











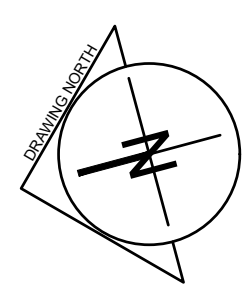
GENERAL NOTES

[illegible]

5	RE-ISSUED FOR PERMIT AND TENDER	MAR 20, 2025	S.H.
4	RE-ISSUED FOR PERMIT AND TENDER	MAR 14, 2025	S.H.
3	RE-ISSUED FOR PERMIT AND TENDER	MAR 04, 2025	S.H.
2	RE-ISSUED FOR PERMIT AND TENDER	FEB 18, 2025	S.H.
1	ISSUED FOR PERMIT AND TENDER	JAN 31, 2025	S.H.

No.	DESCRIPTION	DATE	BY
-----	-------------	------	----

## REVISIONS



1100 South Service Rd., #417  
Stoney Creek ON L8E 0C5  
T • (905) 643-8530  
F • (905) 643-8510

www.arcengineering.ca  
contact@arcengineering.ca

---

PROJECT

# HILL PARK LEARNING CENTRE - HVAC AND PLUMBING UPGRADES

465 EAST 10TH STREET,  
HAMILTON, ONTARIO L9A 4K6

START DATE:	DRAWN BY:	DESIGNED BY:
024 09 11	O.L.	S.H.

RAWING TITLE

SECOND FLOOR -  
MECHANICAL  
NEW CONSTRUCTION

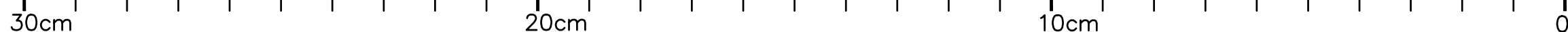
SCALE:

 $16'' = 1'-0''$ 

PROJECT:

DRAWING No.:

**M-312**









- 1.1. THIS SPECIFICATION SHALL APPLY TO AND GOVERN ALL WORK OF SUBSECTION 16. THE ELECTRICAL CONTRACTOR SHALL BE A DISCREETOR TO THE GENERAL CONTRACTOR AND HIS BID SHALL BE TENDERED TO THE GENERAL CONTRACTOR. THE CONTRACTOR SHALL SUPPLY, INSTALL, WIRE AND CONNECT ALL EQUIPMENT, ACCESSORIES, DEVICES ETC SHOWN UNLESS SPECIFICALLY NOTED OTHERWISE. THE CONTRACTOR SHALL BE UNSURE, THEY ARE TO SUBMIT A QUESTION PRIOR TO TENDER CLOSE TO HAVE AN ADDENDUM ISSUED TO CLARIFY THE DEVICE, EQUIPMENT OR WORK SCOPE IN QUESTION.

1.2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL DRAWINGS AND SPECIFICATIONS PRIOR TO TENDER. SUBMITTAL ELECTRICAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS. ANY DISCREPANCIES BETWEEN THE SPECIFICATIONS AND THE DRAWINGS THAT CAUSES DOUBT AS TO THE TRUE MEANING OF INTENT OF THE DRAWINGS AND SPECIFICATIONS, A RULING SHALL BE OBTAINED FROM THE OWNER. THE CONTRACTOR SHALL NOT ALLOWANCE WILL BE MADE FOR FAILURE TO DO SO. IF CLARIFICATION CAN NOT BE OBTAINED IN TIME, THE CONTRACTOR SHALL INCLUDE FOR THE MORE COSTLY INSTALLATION IN THEIR BID.

1.3. **LIABILITY INSURANCE:** OBTAIN AND CARRY PROPER INSURANCE TO FULLY PROTECT BOTH THE OWNER AND HIMSELF FROM ANY AND ALL CLAIMS DUE TO ACCIDENTS, MISFORTUNES, ACTS OF GOD, ETC.

1.4. **CODES, PERMITS AND INSPECTION.**

1.4.1. BE RESPONSIBLE FOR AND OBTAIN ALL PERMITS, INSPECTION, ETC AS REQUIRED BY ALL AUTHORITIES HAVING JURISDICTION OVER THIS WORK AND PAY FOR ALL FEES RELATED TO SAME.

1.4.2. DELIVER ALL PERMITS TO THE ENGINEER AS SOON AS THEY BECOME AVAILABLE.

1.5. **CLOSE OUT DOCUMENTS AND AS-BUILT DRAWINGS:**

1.5.1. THE CONTRACTOR SHALL SUBMIT AN ENQUIRY TO THE ARCHITECT/OWNER TO OBTAIN THE FINAL ROOM NAMES AND NUMBERS TO BE USED PRIOR TO TENDER. CLOSE OUT DOCUMENTS, REPORTS, FIRE ALARM/NURSE CALL PROGRAMMING, PANEL SCHEDULES ETC. FAILURE TO USE THE FINAL NAMES AND NUMBERS WILL REQUIRE THE CONTRACTOR TO REPLACE DOCUMENTATION/REPROGRAM AS REQUIRED AT THEIR EXPENSE. THEY SHALL KEEP A SEPARATE SET OF WHITE PRINTS ON THE SITE AND NOTE ALL CHANGES AND DEVIATIONS FROM THE ORIGINAL DESIGN. DEVICES ETC NOTED AS "EX" (EXISTING) AND "REL" (RELOCATED) ARE TO HAVE THE CIRCUIT TRACED AND DESIGNATED ON THE DRAWINGS. DEVICES ETC DESIGNATED AS CONNECT TO EXISTING CIRCUIT IN AREA ARE TO HAVE THE CIRCUIT INDICATED ON THE PLANS. PROVIDE AS-BUILT DRAWINGS IN AUTOCAD FORMAT (MIN. RELEASE 2010), PDF FORMAT AND (2) TWO SETS OF THESE PLANS SHOWING ALL AS-BUILT CONDITIONS TO THE OWNER AT THE COMPLETION OF THIS CONTRACT AND BEFORE APPLYING FOR FINAL PAYMENT. (INCLUDE IN-SLAB CONDUIT RUNS). SHOULD THE WORK BE REQUIRED TENDER AND/OR SEALED PLANS BY THE ENGINEER WILL NOT BE ACCEPTED.

1.5.2. CLOSE OUT BINDERS SHALL BE PROVIDED WITH ALL TEST RESULTS, WARRANTY LETTERS AND SHOP DRAWINGS. A PDF COPY SHALL BE PROVIDED ALONG WITH THE HARD COPY VERSIONS. PDF VERSION SHALL BE ASSEMBLED VERSIONS WHERE POSSIBLE. SHOULD A DOCUMENT REQUIRE SCANNING, IT SHALL BE PROVIDED IN HIGH RESOLUTION AND BE CLEARLY LEGIBLE. ILLEGIBLE DOCUMENTS WILL NOT BE ACCEPTED.

1.6. **CODES AND STANDARDS:** (CURRENT EDITIONS)

1.6.1. DO COMPLETE INSTALLATION IN ACCORDANCE WITH C.S.A C22.1 EXCEPT WHERE SPECIFIED OTHERWISE.

1.6.2. COMPLY WITH C.S.A. ELECTRICAL BULLETINS IN FORCE AT TIME OF TENDER SUBMISSION, WHICH NOT IDENTIFIED AND SPECIFIED BY NUMBER IN THIS DIVISION, ARE TO BE CONSIDERED AS FORMING PART OF RELATED C.S.A. PART II STANDARD.

1.6.3. DO OVERHEAD AND UNDERGROUND SYSTEMS IN ACCORDANCE WITH C.S.A. C22.3 NO. 1 EXCEPT WHERE SPECIFIED OTHERWISE.

1.6.4. ABBREVIATIONS FOR ELECTRICAL TERMS: TO C.S.A. 285.

1.6.5. COMPLY ALSO WITH THE FOLLOWING CODES:

1.6.5.1. ONTARIO ELECTRICAL SAFETY CODE

1.6.5.2. NATIONAL BUILDING CODE

1.6.5.3. ONTARIO BUILDING CODE

1.6.5.4. LOCAL HYDRO UTILITY REQUIREMENTS

1.6.5.5. CAN/ULC S524, S537 AND S1001

1.7. **VISITING THE SITE:** VISIT THE SITE OF THE PROJECT AND BECOME FAMILIAR WITH THE SITE CONDITIONS. REPORT ANY DEVIATION AND/OR CONFLICTS BETWEEN TENDER DOCUMENTS AND SITE CONDITIONS.

1.8. **LOCATION OF OUTLETS:** CHANGE LOCATION OF OUTLETS, EQUIPMENT AT NO EXTRA COST OR CREDIT, PROVIDING DISTANCE FROM NOT EXCEEDING 10'-0" (3m) AND INFORMATION IS GIVEN BEFORE INSTALLATION.

1.9. **CUTTING AND PATCHING:** PROVIDE ALL CUTTING, PATCHING AND PAINTING FOR ELECTRICAL WORK, UNLESS NOTED OTHERWISE.

1.10. **EQUIPMENT AND MATERIAL:** ALL EQUIPMENT AND MATERIAL, UNLESS SPECIFICALLY NOTED OTHERWISE, SHALL BE NEW AND WITHOUT BLEMISH OR DEFECT. ALL MATERIAL AND EQUIPMENT SHALL BEAR U.L.C. OR C.S.A. LABELS.

1.11. **WARRANTY:** WARRANT ALL WORK AND APPARATUS INSTALLED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF SAME BY THE OWNER.

1.12. **MAINTENANCE OF SERVICE:** PROVIDE ALL LABOUR AND MATERIALS NECESSARY TO ENSURE THAT POWER, LIGHTING AND ALL OTHER MISCELLANEOUS ELECTRICAL SERVICES ARE MAINTAINED IN FULL OPERATING SCHEDULE THROUGHOUT THE EXISTING BUILDING, DURING THE CONSTRUCTION PERIOD. DISCONNECT, MOVE, RELOCATE, AND RECONNECT CONDUIT AND WIRING AS NECESSARY TO ACCOMMODATE THE NEW WORK AND MECHANICAL INSTALLATION.

1.13. **CLEANING**

1.13.1. DO FINAL CLEANING.

1.13.2. AT TIME OF FINAL CLEANING, CLEAN EQUIPMENT SURFACES THAT HAVE BEEN EXPOSED TO CONSTRUCTION DUST AND DIRT.

1.13.3. VACUUM INSIDE OF ALL PANEL BOARDS, ETC., ON COMPLETION OF THE PROJECT.

1.14. **SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

1.14.1. SUBMIT SHOP DRAWINGS, PRODUCT DATA AND/OR SAMPLES FOR ALL EQUIPMENT, POWER DISTRIBUTION, POWER DEVICES, COMMUNICATIONS DEVICES, RACEWAY, LIGHT FIXTURES AND ELECTRICAL MATERIALS. THE SHOP DRAWINGS ARE TO BE REVIEWED AND STAMPED BY BOTH THE GENERAL AND ELECTRICAL CONTRACTOR PRIOR TO SUBMITTAL.

1.14.2. SHOP DRAWINGS SHALL INCLUDE ALL RELEVANT SPECIFICATIONS AND LAYOUTS WHERE REQUESTED.

1.14.3. SHOP DRAWINGS THAT ARE ILLEGIBLE AND OF POOR QUALITY WILL BE REJECTED.

1.14.4. SHOP DRAWINGS WILL BE REVIEWED AND RETURN MARKED "REVIEWED", "REVIEWED AS MODIFIED" OR "REVISE AND RESUBMIT". SHOULD THE CONTRACTOR NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ITS ACCURACY OR FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS.

1.14.5. INSTALLATION OF ANY EQUIPMENT SHALL NOT START UNTIL AFTER FINAL REVIEW OF SHOP DRAWINGS BY THE CONSULTANT HAS BEEN OBTAINED.

1.14.6. INCOMPLETE OR INCORRECT SHOP DRAWINGS THAT ARE REJECTED, WHICH ADVERSELY CAUSE OR RESULT IN ANY DELAY OF THE PROJECT, SHALL BE REJECTED. ANY EQUIPMENT SHALL BE THE CONTRACTORS RESPONSIBILITY.

1.14.7. IF INCORRECT SHOP DRAWINGS ARE SUBMITTED AND REJECTED, ANY SUBSEQUENT DELIVERY DELAY WILL RESULT IN THE CONTRACTOR PROVIDING TEMPORARY FACILITIES UNTIL SAID EQUIPMENT IS DELIVERED AND INSTALLED AT NO EXTRA COST TO THE OWNER.

1.14.8. PROVIDE SPACE FOR SHOP DRAWING REVIEW STAMPS FOR THE CONTRACTOR AND CONSULTANT. THIS SPACE SHALL BE CLEAR OF ALL TECHNICAL INFORMATION AND SHALL NOT BE ON THE BACK OF ANY SHEETS.

1.14.9. SUBMIT SHOP DRAWINGS IN DIGITAL (PDF) FORMAT.

1.14.10. ONE (1) ORIGINAL COPY IN DIGITAL FORMAT (PDF) WILL BE RETURNED, ALL COPIES REQUIRED BY TRADES SUPPLIERS OR OTHER CONSULTANTS WILL BE PROVIDED AND/OR PRINTED BY THE CONTRACTOR.

1.14.11. FAILURE TO SUBMIT SHOP DRAWINGS WILL NOT RELIEVE THIS CONTRACTOR FROM ENSURING THAT ALL INSTALLED EQUIPMENT MEETS THE INTEND OF DESIGN DOCUMENTS. ALL COSTS ASSOCIATED WITH ANY ISSUES ASSOCIATED WITH ALTERNATE OR NOT SUBMITTED EQUIPMENT WILL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR.

1.14.12. SHOP DRAWING SUBMITTAL SHALL BE (BUT NOT LIMITED TO) FOR ANY EQUIPMENT AS LISTED;

1.14.12.1. HIGH VOLTAGE EQUIPMENT

1.14.12.2. SWITCHBOARD, METER CENTERS, PANEL BOARDS

1.14.12.3. FIRE ALARM SYSTEMS

1.14.12.4. LUMINAIRES INCLUDING LAMPS AND BALLASTS

1.14.12.5. LIGHTING CONTROLS

1.14.12.6. EMERGENCY BATTERY UNITS AND FIXTURES

1.14.12.7. ELECTRICAL HEATERS

1.14.12.8. SECURITY SYSTEM

1.14.12.9. MASTER CLOCK AND PROGRAM

1.14.12.10. INTERCOM SYSTEM

1.14.12.11. PUBLIC ADDRESS SYSTEM

1.14.12.12. MILLWORK

1.14.12.13. DEVICES

1.15. **DRAW BREAKDOWNS:**

1.15.1. THIS CONTRACTOR MUST SUBMIT A BREAKDOWN OF THE TENDER PRICE INTO SEPARATE CLASSIFICATION TO THE SATISFACTION OF THE CONSULTANT AND TOTALING THE TOTAL CONTRACT AMOUNT. EACH ITEM IS TO BE BROKEN INTO MATERIAL AND LABOUR COSTS.

1.15.2. PROGRESS DRAWS, WHEN SUBMITTED, ARE TO BE ITEMIZED AGAINST EACH OF THE DRAW BREAKDOWNS AND SHALL BE IN TABLE FORM IDENTIFYING CONTRACTOR AMOUNT, AMOUNT TO MATERIAL AND LABOUR COSTS, PERCENTAGE COMPLETE AND BALANCE.

1.15.3. BREAKDOWN SHALL FOLLOW, BUT NOT BE LIMITED TO;

1.15.3.1. PERMITS AND FEES

1.15.3.2. MOBILIZATION

1.15.3.3. DEMOLITION

1.15.3.4. DISTRIBUTION EQUIPMENT (IE. SWITCHBOARDS, PANELBOARDS, ETC.)

1.15.3.5. INCOMING FEEDERS AND CONDUITS

1.15.3.6. BRANCH WIRING CONDUITS

1.15.3.7. BRANCH WIRING

1.15.3.8. MECHANICAL EQUIPMENT WIRING

1.15.3.9. FIRE ALARM DEVICES

1.15.3.10. FIRE ALARM WIRING

1.15.3.11. FIRE ALARM VERIFICATION AND CERTIFICATION

1.15.3.12. EXIT AND EMERGENCY LIGHTING

1.15.3.13. LIGHTING

1.15.3.14. LIGHTING CONTROLS

1.15.3.15. VOICE AND COMMUNICATION CONDUITS

1.15.3.16. VOICE AND COMMUNICATION WIRING AND TERMINATIONS

1.15.3.17. ACCESS CONTROL AND SECURITY

1.15.3.18. MISCELLANEOUS AND SPECIALTY EQUIPMENT (IE. PUBLIC ADDRESS, SOUND, ETC.)

1.15.4. ABOVE BREAKDOWN MUST BE APPROVED BY THE CONSULTANT PRIOR TO SUBMISSION OF THE FIRST DRAW. MOBILIZATION AMOUNT MAY ONLY BE DRAWN WHEN ALL REQUIRED SHOP DRAWINGS HAVE BEEN REVIEWED BY THE CONSULTANT.

1.16. **REVISIONS TO CONTRACT:**

1.16.1. PROVIDE ITEMIZED LISTS OF MATERIALS/ASSOCIATED COSTS, LABOUR RATE/LABOUR FOR EACH ITEM, COPY OF MANUFACTURERS INVOICE, IF REQUESTED, FOR EACH ITEM GIVEN CHANGE NOTICE.

1.17. **ROOF AND WALL OPENINGS**

1.17.1. LOCATION OF CONDUITS PASSING THROUGH ROOF AND WALLS TO BE COORDINATED WITH DIVISION 15. ALL OPENINGS TO BE MADE WATERTIGHT.

1.18. **SCHEDULE OF CONSTRUCTION:**

1.18.1. CONSULT GENERAL DIVISION FOR SCHEDULE OF CONSTRUCTION BEFORE COMMENCING WORK AND COORDINATE WITH DESIGNER, OWNER AND ALL TRADES DURING CONSTRUCTION.

1.19. **DIRECTORIES AND LABELLING:**

1.19.1. IDENTIFY ALL ELECTRICAL EQUIPMENT. IDENTIFICATION SHALL CONSIST OF ENGRAVED LAMACON NAMEPLATES HAVING BLACK LETTERING AND LEVEL ON THE FACE. FASTEN NAMEPLATES TO DEVICE USING SELF-TAPPING COUNTERSUNK SCREWS. TAPE-TYPE NAMEPLATES WILL NOT BE ACCEPTED.

1.19.2. ALL RECEPTACLE COVER PLATES SHALL BE LABELLED WITH TAPE-TYPE NAMEPLATES. THE LABEL SHALL INDICATE THE PANEL DESIGNATION AND CIRCUIT NUMBER (IE. A19). TAPE SHALL BE NEATLY TRIMMED ON EACH END AND PLACED ABOVE AND BELOW THE TAPE-TYPE PLATE. LABELS SHALL HAVE A NEAT, CLEAN AND PROFESSIONAL APPEARANCE. LABELS NOT TRIMMED OR POORLY POSITIONED WILL NOT BE ACCEPTED.

1.19.3. ALL PANELS WITH CIRCUITS ADDED OR REMOVED SHALL HAVE NEW COMPUTER GENERATED PANEL SCHEDULES PLACED IN THEM. SCHEDULE SHALL INDICATE PANEL DESIGNATION, WHERE PANEL IS FED FROM, VOLTAGE, PHASE, BRANCH CIRCUIT NUMBERS, BREAKER AMPERAGE AND CIRCUIT DESCRIPTION.

1.20. **GROUNDING:**

1.20.1. GROUND ALL EQUIPMENT IN ACCORDANCE WITH CODE REQUIREMENTS AND AS INDICATED.

1.20.2. GROUNDING CONDUCTORS: COPPER, INSULATED (GREEN), SIZE PER CODE.

1.20.3. GROUNDING LUGS, CONNECTORS: APPROVED GROUNDING TYPE.

1.20.4. ALL GROUND CONDUCTORS #8AWG OR SMALLER SHALL BE RUN IN EMT.

1.21. **FIREPROOFING:**

1.21.1. WHERE CABLES PASS THROUGH FLOORS OR FIRE RATED WALLS, PASS THROUGH WALLS, THROUGH WALLS AND SLEEVE FULL WITH APPROVED RATED FIRE STOPS

3. **LOAD BALANCE:**
- 1.23.1. MEASURE PHASE CURRENT TO PANELBOARDS WITH NORMAL LOADS (LIGHTING) OPERATING AT TIME OF ACCEPTANCE. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO CORRECT THE BALANCE OF CURRENT BETWEEN PHASES AND RECORD CHANGES.
- 1.23.2. MEASURE PHASE VOLTAGES AT LOADS AND ADJUST TRANSFORMER TAPS TO WITHIN 2% OF RATED VOLTAGE OF EQUIPMENT.
- 1.23.3. SUBMIT, AT COMPLETION OF WORK, REPORT LISTING PHASE AND NEUTRAL CURRENTS ON PANELBOARDS, DRY-CORE TRANSFORMERS AND MOTOR CONTROL CENTRES, OPERATING UNDER NORMAL LOAD. STATE HOUR AND DATE ON WHICH EACH LOAD WAS MEASURED, AND VOLTAGE AT TIME OF TEST.
- 1.24. **CONDUIT AND CABLE INSTALLATION:**
- 1.24.1. INSTALL CONDUIT AND SLEEVES PRIOR TO POURING OF CONCRETE. SLEEVES THROUGH CONCRETE: SCHEDULE 40 STEEL PIPE, SIZED FOR FREE PASSAGE OF CONDUIT, AND PROTRUDING 2" (50mm).
- 1.24.2. IF PLASTIC SLEEVES ARE USED IN FIRE RATED WALLS OR FLOORS, REMOVE BEFORE CONDUIT INSTALLATION.
- 1.24.3. INSTALL CABLES, CONDUITS AND FITTINGS TO BE EMBEDDED OR PLASTERED OVER, NEATLY AND CLOSE TO BUILDING STRUCTURE SO FURRING CAN BE KEPT TO MINIMUM.
- 1.25. **DEFINITIONS:**
- 1.25.1. THE FOLLOWING ARE DEFINITIONS OF WORDS FOUND IN THE SPECIFICATION AND ON ASSOCIATED DRAWINGS:
- 1.25.1.1. "CONCEALED" - HIDDEN FROM NORMAL SIGHT IN FURRED IN SPACES, SHAFTS, CEILING SPACES, WALLS, UNDERFLOOR AND PARTITIONS.
- 1.25.1.2. "EXPOSED" - ALL ELECTRICAL WORK EXPOSED TO BUILDING OCCUPANTS. WIRE AND CABLEING SHALL BE IN CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE.
- 1.25.1.3. "PROVIDE" (AND ALL TENSES OF "PROVIDE") SUPPLY, INSTALL, WIRE AND CONNECT COMPLETE.
- 1.25.1.4. "INSTALL" (AND ALL TENSES OF "INSTALL") INSTALL, WIRE AND CONNECT COMPLETE, PRODUCTS AND SERVICES SPECIFIED.
- 1.25.1.5. "SUPPLY" SUPPLY ONLY.
- 1.25.1.6. "OR APPROVED EQUAL" MATERIAL OR EQUIPMENT PROPOSED BY THE CONTRACTOR IN LIEU OF THAT SPECIFIED AS APPROVED BY THE CONSULTANT AND/OR EQUIPMENT SHALL MEET OR EXCEED THE SAME QUALITY, MATERIAL, EFFICIENCY, ETC AS THE SPECIFIED PRODUCTS.
- 1.25.1.7. "AS INDICATED" AS SHOWN ON DRAWINGS AND/OR NOTED IN SPECIFICATIONS.
- 1.26. **PHASING**
- 1.26.1. THE CONTRACTOR SHALL REVIEW THE PHASING AS INDICATED ON ALL PLANS. THIS INCLUDES ARCHITECTURAL, MECHANICAL PLANS ETC IN THE ENTIRE DRAWING PACKAGE.
- 1.26.2. THE CONTRACTOR SHALL INCLUDE FOR TEMPORARY CONNECTIONS AS REQUIRED TO FACILITATE THE WORK.
- 1.26.3. THE CONTRACTOR SHALL INCLUDE FOR ALL WEEKEND AND PREMIUM TIME REQUIRED TO FACILITATE THE PHASING AS INDICATED IN THE PLANS PACKAGE.
2. **PRODUCTS**
- 2.1. **ELECTRICAL EQUIPMENT**
- 2.1.1. EQUIPMENT SHALL HAVE 1.0m (39") CLEARANCE IN FRONT OF EQUIPMENT.
- 2.1.2. ELECTRICAL EQUIPMENT RATED AT 1200A AND OVER SHALL HAVE 1.5m (59") CLEARANCE IN FRONT OF SAID EQUIPMENT.
- 2.1.3. ALL EQUIPMENT INSTALLED IN SPRINKLERED AREAS ARE TO BE COMPLETE WITH DRIP SHIELDS.
- 2.2. **PANEL BOARDS**
- 2.2.1. PANEL BOARDS: TO C.S.A. C22.2, NO. 29. LOADCENTRES ARE NOT ACCEPTABLE.
- 2.2.2. PANEL BOARD ARE TO BE THE PRODUCT OF ONE (1) MANUFACTURER
- 2.2.3. 120/208V-3 PHASE-4 WIRE PANEL BOARDS: BUS AND BREAKERS RATED FOR MINIMUM 10,000A (SYMMETRICAL) INTERRUPTING CAPACITY OR AS INDICATED ON THE DRAWINGS.
- 2.2.4. MAIN BREAKER SHALL OCCUPY A SEPARATE COMPARTMENT FROM BRANCH BREAKERS. PANELS WITH MAIN BREAKERS IN BRANCH BREAKER COMPARTMENT WILL NOT BE ACCEPTED.
- 2.2.5. SEQUENCE PHASE BUSSING WITH ODD NUMBERED BREAKERS ON LEFT AND EVEN ON RIGHT, WITH EACH BREAKER IDENTIFIED BY PERMANENT NUMBER IDENTIFICATION AS TO CIRCUIT NUMBER.
- 2.2.6. PANEL BOARDS: MAINS, NUMBER OF CIRCUITS, AND NUMBER AND SIZE OF BRANCH CIRCUIT BREAKERS AS INDICATED
- 2.2.7. TWO (2) KEYS FOR EACH PANEL BOARD AND KEY PANEL BOARDS ALIKE.
- 2.2.8. COPPER BUS WITH FULL SIZE COPPER MAINS AND NEUTRAL
- 2.2.9. MAINS FOR BOLT-ON BREAKERS.
- 2.2.10. FINISH TRIM AND DOOR BAKED GRAY ENAMEL PAINT TUB SAME AS DOOR.
- 2.2.11. COMPLETE CIRCUIT DIRECTORY WITH TYPED WRITTEN LEGEND SHOWING CIRCUIT LABEL, AMPERAGE AND PANEL LOCATION UNDER PLASTIC COVER
- 2.2.12. EATON CUTLER HAMMER, SQUARE D, SIEMENS CANADA MANUFACTURE.
- 2.3. **BREAKERS GENERAL**
- 2.3.1. BOLT-ON MOLDED CASE CIRCUIT BREAKER, FULL-MODULE (I.E., 1" MINIMUM WIDTH). QUICK-MAKE, QUICK-BREAK TYPE, FOR MANUAL AND AUTOMATIC OPERATION WITH TEMPERATURE COMPENSATION FOR 400C AMBIENT. (MINI-BREAKERS NOT ACCEPTABLE)
- 2.3.2. MAGNETIC INSTANTANEOUS TRIP ELEMENTS IN CIRCUIT BREAKERS, TO OPERATE ONLY WHEN THE VALUE OF CURRENT REACHES SETTING.
- 2.4. **DISCONNECT SWITCHES FUSED AND UNFUSED**
- 2.4.1. ENCLOSED MANUAL AIR BREAK SWITCHES IN NON-HAZARDOUS LOCATIONS: TO C.S.A. C22.2 NO. 4.
- 2.4.2. FUSE HOLDER ASSEMBLIES TO C.S.A. C22.2 NO. 39.
- 2.4.3. FUSIBLE AND NON-FUSIBLE DISCONNECT SWITCHES AS INDICATED.
- 2.4.4. PROVISION FOR PADLOCKING IN ON/OFF SWITCH POSITION BY THREE LOCKS
- 2.4.5. MECHANICALLY INTERLOCKED DOOR TO PREVENT OPENING WHEN HANDLE "ON" POSITION
- 2.4.6. QUICK-MAKE, QUICK-BREAK ACTION
- 2.4.7. ON/OFF SWITCH POSITION INDICATION ON SWITCH ENCLOSURE COVER.
- 2.4.8. C.S.A. ENCLOSURE 1 UNLESS NOTED OTHERWISE.
- 2.4.9. EATON CUTLER HAMMER, SQUARE D, SIEMENS CANADA MANUFACTURE.
- 2.5. **CONDUCTORS**
- 2.5.1. ALL CONDUCTORS SHALL BE COPPER UNLESS INDICATED OTHERWISE.
- 2.5.2. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS #8 AND LARGER SHALL BE STRANDED.
- 2.5.3. CONDUCTORS SHALL BE SIZED #12 AWG MINIMUM, EXCEPT FOR CONTROL CIRCUITS WHERE #14 AWG MINIMUM SIZE IS PERMITTED. FEEDER SIZES AS INDICATED.
- 2.5.4. PANEL FEEDER LENGTHS SHALL BE CONTRACTOR VERIFIED FOR LENGTH OF PROPOSED INSTALLATION PATH SO AS NOT TO EXCEED 3% VOLTAGE DROP ON INSTALLATION. FEEDERS EXCEEDING THE LENGTH OF THE ALLOWABLE AMPACITY SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BEGINNING ANY ROUGH-INS.

- 2.5.5. SIZE CONDUCTORS FOR A 2% MAXIMUM VOLTAGE DROP FROM OVERCURRENT DEVICE TO FARTHEST OUTLET.
- 2.5.6. CONDUCTOR INSULATION RATED FOR 600V MINIMUM UNLESS STATED OTHERWISE.
- 2.5.7. CONDUCTOR TYPES:
- 2.5.7.1. TW75, TWJ TO C.S.A. #C22.2 NO. 75
- 2.5.7.2. RW90, RWJ90 (XLPE) TO C.S.A. #C22.2 NO. 38
- 2.5.7.3. TW75, RW90 (XLPE) – INSIDE BUILDING.
- 2.5.7.4. TWJ, RWJ90 (XLPE) – CONDUCTORS DIRECTLY BURIED OR IN CONDUIT OUTSIDE BUILDING.
- 2.5.7.5. BX (ARMoured CABLE) IS ONLY PERMITTED FOR LIGHT FIXTURE DROPS IN ACCOUSTIC CEILINGS (MAX LENGTH 5'-0"), AND MAY BE USED IN HOLLOW PARTITIONS FOR SWITCH OR SUSPENDED CEILING FOR FIXTURE DROPS ONLY. ANY DROPS SHALL NOT EXCEED 3.0m (10'-0"). AC-90 (BX ARMoured CABLE) IS NOT TO BE INSTALLED IN OPEN CEILINGS OR ANY OTHER EXPOSED APPLICATION. ALL CABLES ARE TO BE PROPERLY FASTENED TO BUILDING STRUCTURE IN A NEAT AND PROFESSIONAL MANNER. EXCESSIVE USE OF AC-90, IN THE OPINION OF THE ENGINEER, WILL REQUIRE ELECTRICAL CONTRACTOR TO REPLACE ALL NEW WIRING WITH PROPER CONDUIT AND WIRE AT CONTRACTOR'S EXPENSE.
- 2.6. FASTENINGS AND SUPPORTS
- 2.6.1. SUPPORT EQUIPMENT, CONDUIT OR CABLES USING CLIPS, SPRING-LOADED BOLTS, CABLE CLAMPS DESIGNED AS ACCESSORIES TO BASIC CHANNEL MEMBERS.
- 2.6.2. INSTALL FASTENINGS AND SUPPORTS AS REQUIRED FOR EACH TYPE OF EQUIPMENT CABLES AND CONDUIT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION.
- 2.7. CONDUITS
- 2.7.1. RIGID, GALVANIZED STEEL THREADED CONDUIT TO C.S.A. #C22.2, NO. 45, SIZE AS INDICATED.
- 2.7.2. ELECTRICAL METALLIC TUBING (EMT) WITH COUPLINGS AND EXPANDED ENDS AS REQUIRED, TO C.S.A. #C22.2, NO. 83, SIZE AS INDICATED.
- 2.7.3. RIGID PVC (UNPLASTICIZED) CONDUIT FOR EXPOSED ABOVE GROUND WORK, TO C.S.A. #C22.2, NO. 211.2, SIZE AS INDICATED. FLEXIBLE PVC IS NOT PERMITTED.
- 2.7.4. FLEXIBLE METAL CONDUIT AND LIQUID-TIGHT FLEXIBLE METAL CONDUIT TO C.S.A. #C22.2, NO. 56.
- 2.7.5. EMT CONDUIT FITTINGS, I.E. CONNECTORS, COUPLINGS, TO C.S.A. #C22.2, NO. 18, ZINC-PLATED STEEL/MALLEABLE IRON CONSTRUCTION. ALL CONNECTIONS AND COUPLINGS TO BE SET SOREN TYPE, I.E. CONCRETE TIGHT.
- 2.7.6. CONDUIT SIZES SHALL BE A MINIMUM OF 3/4" AND CONFORM TO ELECTRICAL SAFETY CODE, WHERE SIZES ARE INDICATED AND THEY EXCEED CODE, THEY SHALL NOT BE REDUCED.
- 2.7.7. USE RIGID, GALVANIZED STEEL, THREADED CONDUIT WHERE CONDUIT IS SUBJECT TO MECHANICAL INJURY.
- 2.7.8. RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES.
- 2.7.9. USE EMT FOR ALL WIRING FROM OUTLET BOX TO SOURCE.
- 2.7.10. INSTALL NYLON FISH WIRE IN EMPTY CONDUITS AND TERMINATE UNDER SCREW LEAVING 12" SLACK. TAG FISH WIRE IDENTIFYING SYSTEM.
- 2.7.11. DO NOT LOCATE CONDUITS LESS THAN 3" (75 MM) PARALLEL TO STEAM OR HOT WATER LINES WITH A MINIMUM OF 1" (25 MM) AT CROSS-OVERS.
- 2.7.12. IN-SLAB CONDUIT: LOCATE TO SUIT REINFORCING STEEL. INSTALL IN CENTRE 1/2 OF SLAB.
- 2.7.13. PROVIDE AND INSTALL 4-38mm (4 1-1/2") SPARE CONDUITS UP TO CEILING SPACE FROM EACH FLUSH MOUNTED ELECTRICAL PANEL. TERMINATE IN 300mm X 300mm (12"x12") JUNCTION BOXES IN ACCESSIBLE CEILING SPACE.
- 2.8. JUNCTION AND PULL BOXES
- 2.8.1. WELDED STEEL CONSTRUCTION WIRE SCREW-ON FLAT COVERS FOR SURFACE MOUNTING.
- 2.8.2. COVERS WITH 1" (25 MM) MINIMUM EXTENSION ALL AROUND, FOR FLUSH-MOUNTED PULL AND JUNCTION BOXES.
- 2.8.3. INSTALL PULL BOXES IN CONDUIT RUNS SO AS NOT TO EXCEED 30 M OF CONDUIT RUN OR THE EQUIVALENT OF TWO (2) 90° BENDS BETWEEN PULL BOXES.
- 2.9. OUTLET AND CONDUIT BOXES:
- 2.9.1. ALL LIGHTING FIXTURES, RECEPTABLES AND OTHER WIRING DEVICES FOR ANY CONDUIT SYSTEM SHOWN SHALL BE PROVIDED WITH AN OUTLET BOX.
- 2.9.2. 4" (102 MM) OCTAGON OR SQUARE OUTLET BOXES OR LARGER, COMPLETE WITH FITTINGS FOR LIGHTING FIXTURES AND AS REQUIRED FOR SPECIAL DEVICES.
- 2.9.3. WALL OUTLET BOXES SHALL BE:
- 2.9.3.5. NO. 1104 SERIES, FLUSH MOUNTED IN DRYWALL PARTITIONS, U.N.O.
- 2.9.3.6. MBS SERIES MASONRY BOXES (GALVANIZED STEEL) FLUSH MOUNTED IN MASONRY WALLS (BLOCK WALLS).
- 2.9.3.7. GANG BOXES SHALL BE USED AT LOCATIONS WHERE DEVICES ARE GROUPED. PROVIDE BARRIERS AS REQUIRED.
- 2.9.3.8. BLANK COVER PLATES FOR BOXES WITHOUT WIRING DEVICES.

**Copyright Reserved**

All designs and drawings are copyrighted and the property of Seguin Engineering Inc. Reproduction or use for any purpose other than that authorized by Seguin Engineering Inc. is forbidden.

The drawing is not to be scaled. The Contractor shall verify and be responsible for all dimensions. Any errors or omissions shall be reported to Seguin Engineering Inc.

© COPYRIGHT 2025 – Seguin Engineering Inc.

**Notes:**

0	ISSUED FOR PERMIT/TENDER	2025.03.13	KS
No.	Revision	Date	By



Seal



## Project

## HILL PARK LEARNING CENTRE HVAC & PLUMBING UPGRADES

465 EAST 16TH STREET, HAMILTON, ONTARIO

## SPECIFICATIONS

Drawn By: KM	Designed By: SJ	Approved By: KS	Date: OCT 2024
Project No. 24-151		Scale NTS	
Drawing No. E050		Sheet 2 of 9	Revision 0



All designs and drawings are copyrighted and the property of Seguin Engineering Inc. Reproduction or use for any purpose other than that authorized by Seguin Engineering Inc. is forbidden.

© COPYRIGHT 2025 – Seguin Engineering Inc.

0	ISSUED FOR PERMIT/TENDER	2025.03.13	KS
No.	Revision	Date	By



**HILL PARK LEARNING CENTRE  
HVAC & PLUMBING UPGRADES**

**465 EAST 16TH STREET, HAMILTON, ONTARIO**

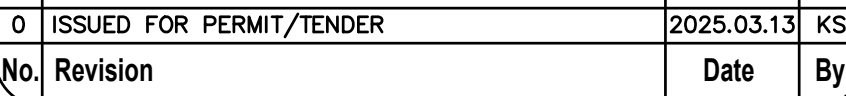
<b>BASEMENT FLOOR SITE PLAN</b>			
Drawn By: KM	Designed By: SJ	Approved By: KS	Date: OCT 2024
Project No. 24-151		Scale 1" = 30'-0"	
Drawing No. <b>E100</b>		Sheet <b>3 of 9</b>	Revision <b>0</b>



All designs and drawings are copyrighted and the property of Seguin Engineering Inc. Reproduction or use for any purpose other than that authorized by Seguin Engineering Inc. is forbidden.

The drawing is not to be scaled. The Contractor shall verify and be responsible for all dimensions. Any errors or omissions shall be reported to Seguin Engineering Inc.

**Notes:**



## HILL PARK LEARNING CENTRE HVAC & PLUMBING UPGRADES

**Title**

## FIRST FLOOR SITE PLAN

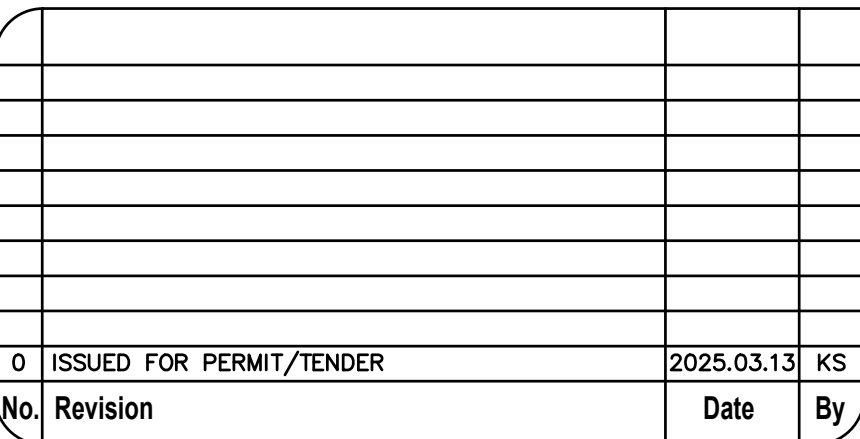
ORIGINAL SHEET - ARCH D



All designs and drawings are copyrighted and the property of Seguin Engineering Inc. Reproduction or use for any purpose other than that authorized by Seguin Engineering Inc. is forbidden.

The drawing is not to be scaled. The Contractor shall verify and be responsible for all dimensions. Any errors or omissions shall be reported to Seguin Engineering Inc.

**Notes:**



465 EAST 16TH STREET, HAMILTON, ONTARIO

Drawn By: KM	Designed By: SJ	Approved By: KS	Date: OCT 2024
Project No. 24-151		Scale 1" = 30'-0"	
Drawing No. E102		Sheet 5 of 9	Revision 0

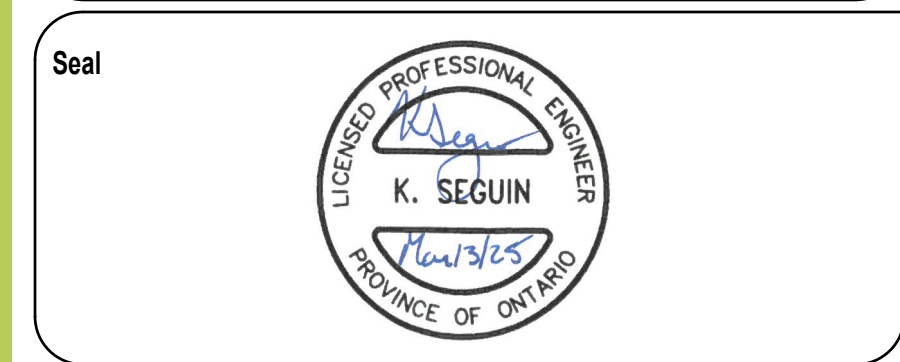


- ① EXISTING NATURAL GAS FIRED BOILER AND ASSOCIATED CIRCULATION PUMPS AND DISTRIBUTION EQUIPMENT TO BE DISCONNECTED AND REMOVED BY THE MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO DISCONNECT AND REMOVE ALL POWER AND CONTROLS WIRING BACK TO SOURCE.
- ② ELECTRICAL CONTRACTOR TO DISCONNECT AND REMOVE EXISTING BOILER DISCONNECT SWITCHES.
- ③ EXISTING FUEL OIL CONTROL PANEL TO BE DISCONNECTED AND REMOVED BY THE MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO DISCONNECT AND REMOVE ALL POWER AND CONTROLS WIRING BACK TO SOURCE.
- ④ EXISTING PNEUMATIC CONTROL AIR COMPRESSOR TO BE DISCONNECTED AND REMOVED BY THE MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO DISCONNECT AND REMOVE ALL POWER AND CONTROLS WIRING BACK TO SOURCE.
- ⑤ EXISTING GAS FIRED HOT WATER HEATER TO BE DISCONNECTED AND REMOVED BY THE MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO DISCONNECT AND REMOVE ALL POWER AND CONTROLS WIRING BACK TO SOURCE.
- ⑥ EXISTING CIRCULATION PUMP TO BE DISCONNECTED AND REMOVED BY THE MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO DISCONNECT AND REMOVE ALL POWER AND CONTROLS WIRING BACK TO SOURCE.
- ⑦ EXISTING DHWR PUMP TO BE DISCONNECTED AND REMOVED BY THE MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO DISCONNECT AND REMOVE ALL POWER AND CONTROLS WIRING BACK TO SOURCE.
- ⑧ EXISTING CUTLER-HAMMER FREEDOM 2100 MOTOR CONTROL CENTER TO REMAIN. ELECTRICAL CONTRACTOR TO DISCONNECT AND REMOVE ALL POWER AND CONTROLS DEVICES, STARTERS, AND ASSOCIATED WIRING IN ALL MCC BUCKETS FEEDING EQUIPMENT THAT ARE BEING REMOVED FROM THE FACILITY. FOR SEQUENCE WORK, REFER TO DETAIL ON SHEET #400 FOR EXISTING MCC LAYOUT.

All designs and drawings are copyrighted and the property of Seguin Engineering Inc. Reproduction or use for any purpose other than that authorized by Seguin Engineering Inc. is forbidden.

© COPYRIGHT 2025 – Seguin Engineering Inc.

0	ISSUED FOR PERMIT/TENDER	2025.03.13	KS
No.	Revision	Date	By



Title <b>DEMOLITION BOILER ROOM FLOOR PLAN</b>			
Drawn By: <b>KM</b>	Designed By: <b>SJ</b>	Approved By: <b>KS</b>	Date: <b>OCT 2024</b>
Project No. <b>24-151</b>		Scale <b>1/4" = 1'-0"</b>	
Drawing No. <b>E200</b>		Sheet <b>6 of 9</b>	Revision <b>0</b>

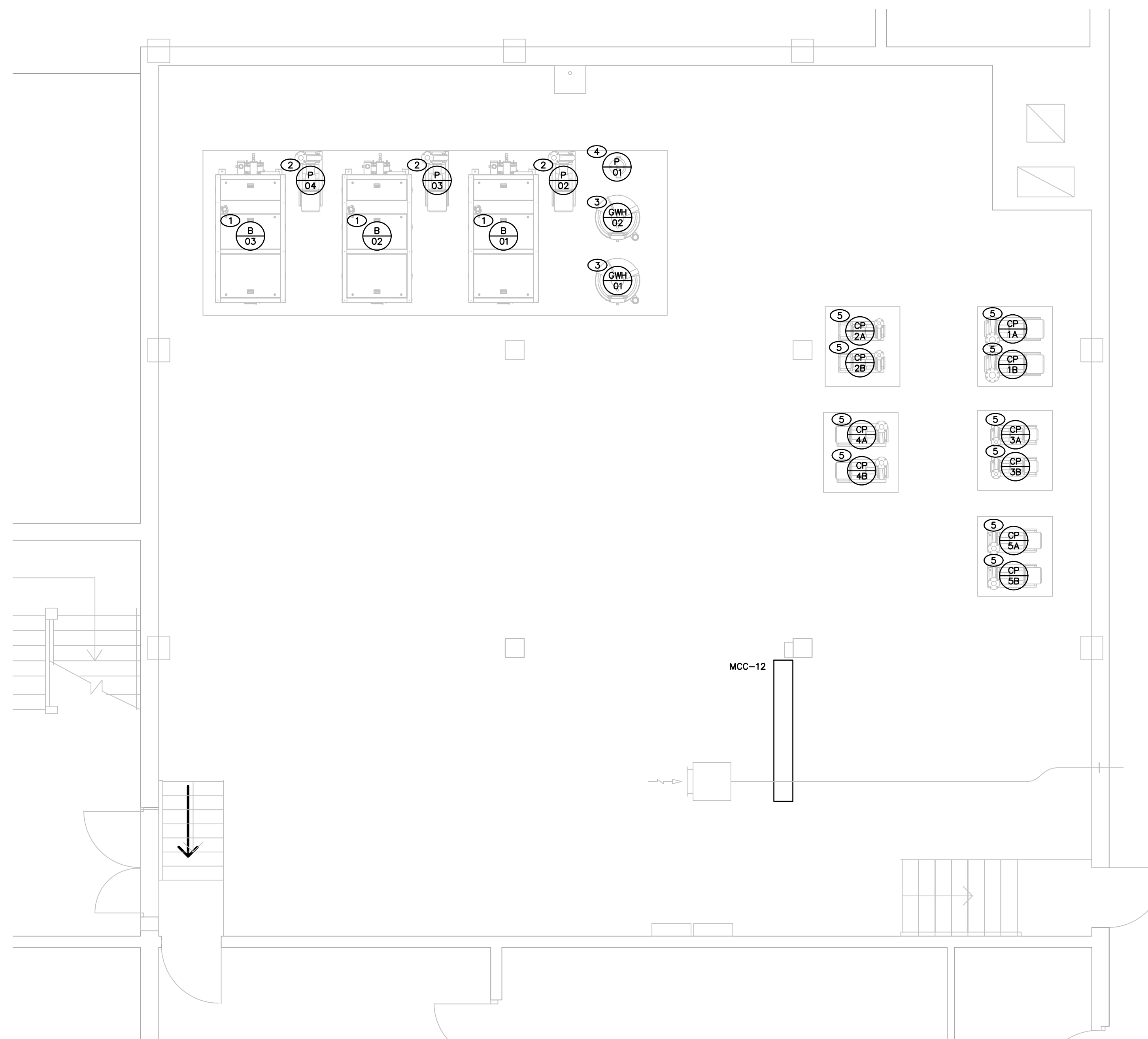


- ① NEW BOILER TO BE INSTALLED BY MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR TO COORDINATE TO INSTALL NEW POWER AND CONTROLS WIRING. NEW POWER CONNECTIONS TO BE PROVIDED FROM EXISTING MCC-12, REFER TO DRAWING E-401 FOR DETAILS.
- ② NEW BOILER CIRCULATION PUMP TO BE INSTALLED BY MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR TO COORDINATE TO INSTALL NEW POWER AND CONTROLS WIRING. NEW POWER AND MOTOR STARTER CONNECTIONS TO BE PROVIDED FROM EXISTING MCC-12, REFER TO DRAWING E-401 FOR DETAILS.
- ③ NEW WATER HEATER TO BE INSTALLED BY MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR TO COORDINATE TO INSTALL NEW POWER AND CONTROLS WIRING. NEW POWER CONNECTIONS TO BE PROVIDED FROM EXISTING MCC-12, REFER TO DRAWING E-401 FOR DETAILS.
- ④ NEW WATER HEATER CIRCULATION PUMP TO BE INSTALLED BY MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR TO COORDINATE TO INSTALL NEW POWER AND CONTROLS WIRING. NEW POWER AND MOTOR STARTER CONNECTIONS TO BE PROVIDED FROM EXISTING MCC-12, REFER TO DRAWING E-401 FOR DETAILS.
- ⑤ NEW CIRCULATION PUMP TO BE INSTALLED BY MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR TO COORDINATE TO INSTALL NEW POWER AND CONTROLS WIRING. NEW POWER AND MOTOR STARTER CONNECTIONS TO BE PROVIDED FROM EXISTING MCC-12, REFER TO DRAWING E-401 FOR DETAILS.

All designs and drawings are copyrighted and the property of Seguin Engineering Inc. Reproduction or use for any purpose other than that authorized by Seguin Engineering Inc. is forbidden.

The drawing is not to be scaled. The Contractor shall verify and be responsible for all dimensions. Any errors or omissions shall be reported to Seguin Engineering Inc.

**Notes:**



0	ISSUED FOR PERMIT/TENDER	2025.03.13	KS
No.	Revision	Date	By



**HILL PARK LEARNING CENTRE  
HVAC & PLUMBING UPGRADES**

465 EAST 16TH STREET, HAMILTON, ONTARIO

<b>PROPOSED BOILER ROOM FLORAL PLAN</b>			
Drawn By: KM	Designed By: SJ	Approved By: KS	Date: OCT 2024
Project No. 24-151		Scale 1/4" = 1'-0"	
Drawing No. <b>E300</b>		Sheet <b>7 of 9</b>	Revision <b>0</b>



All designs and drawings are copyrighted and the property of Seguin Engineering Inc. Reproduction or use for any purpose other than that authorized by Seguin Engineering Inc. is forbidden.

© COPYRIGHT 2025 – Seguin Engineering Inc.



SEI  
 12 ARGYLE STREET N., CALEDONIA, ON, N3W 1B6  
 www.sei-ee.com

# HILL PARK LEARNING CENTRE

## HVAC & PLUMBING UPGRADES

465 EAST 16TH STREET, HAMILTON, ONTARIO

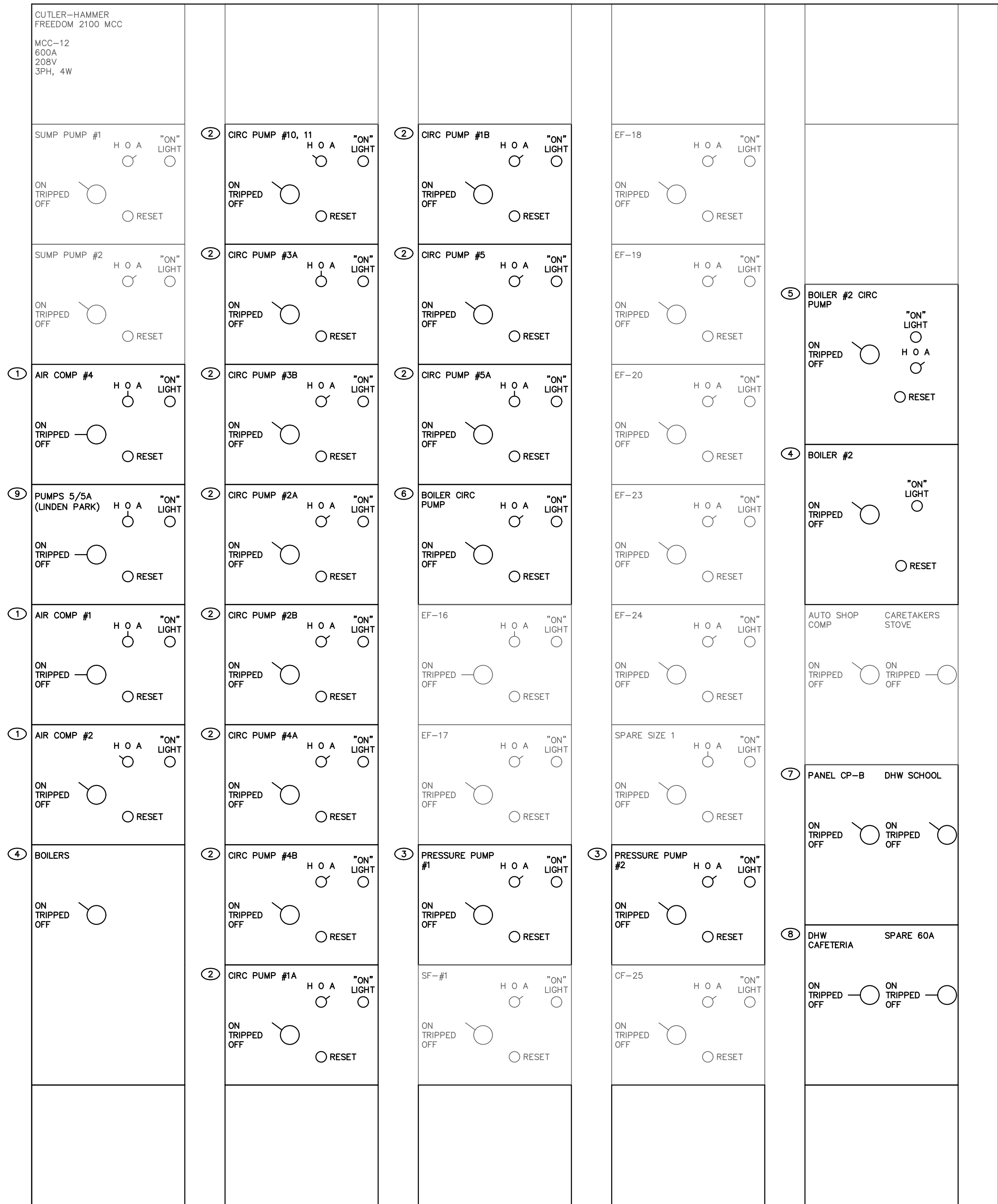
<b>PRE-EXISTING MCC DETAILS</b>			
Drawn By: KM	Designed By: SJ	Approved By: KS	Date: OCT 2024
Project No. 24-151		Scale NTS	
Drawing No. <b>E400</b>		Sheet <b>8 of 9</b>	Revision <b>0</b>

A. REFER TO EXISTING MOTOR CONTROL CENTER, MCC-12, EXISTING LAYOUT. ALL EXISTING LOADS NOT BEING REPLACED AS PART OF THIS PROJECT (SHOWN DIMMED) ARE TO REMAIN AS CURRENTLY INSTALLED. ALL EXISTING LOADS THAT ARE BEING REPLACED AS PART OF THIS PROJECT (SHOWN IN BOLD) ARE TO HAVE NEW REPLACEMENT BUCKETS AND INTERNAL COMPONENTS PROVIDED AS PART OF THE PROJECT SCOPE.

**DRAWING NOTES:**

- 1 MCC BUCKET FOR EXISTING AIR COMPRESSOR TO BE REMOVED AND REPLACED.
- 2 MCC BUCKET FOR EXISTING CIRCULATION PUMP TO BE REMOVED AND REPLACED.
- 3 MCC BUCKET FOR EXISTING PRESSURE PUMP TO BE REMOVED AND REPLACED.
- 4 MCC BUCKET FOR EXISTING BOILER TO BE DISCONNECTED AND MARKED AS SPARE.
- 5 MCC BUCKET FOR EXISTING BOILER CIRCULATION PUMP 1 TO BE REMOVED AND REPLACED.
- 6 MCC BUCKET FOR EXISTING BOILER CIRCULATION PUMP 2 TO BE DISCONNECTED AND MARKED AS SPARE.
- 7 MCC BUCKET FOR EXISTING PANEL CP-B FEED AND SCHOOL WATER HEATER IS TO REMAIN AND BE REUSED. BREAKER AND POWER CONNECTIONS FOR SCHOOL WATER HEATER ARE TO BE DISCONNECTED AND REMOVED. SPARE CIRCULATION PUMP FOR MCC BUCKET BELOW TO BE RELOCATED INTO SPACE PREVIOUSLY USED FOR SCHOOL WATER HEATER. UPDATE BUCKET LABEL AS NECESSARY.

⑨ MCC BUCKET FOR EXISTING LINDEN PARK PUMPS TO BE DISCONNECTED AND MARKED AS SPARE.





**TABLE NOTES:**

1. THE TABLE ABOVE SUMMARIZES THE BREAKER AND STARTER REQUIREMENTS WITHIN EACH OF THE REPLACEMENT MCC BUCKETS FOR THE REPLACED MECHANICAL EQUIPMENT. BREAKER AND STARTER SIZES ARE BASED ON THE MECHANICAL DESIGN, AT TIME OF SHOP DRAWING SUBMITTAL, BREAKER AND STARTER SIZES ARE TO BE COORDINATED WITH SUBMITTED MECHANICAL EQUIPMENT.
2. ELECTRICAL CONTRACTOR TO INCLUDE ALL MATERIAL REQUIRED TO COMPLETELY REPLACE EACH MCC BUCKET IN THE PROJECT SCOPE. THESE MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO: STAB ASSEMBLY, BUCKET ASSEMBLY, DOOR GASKETS, BUCKET DOORS, CONTROLLER DEVICES, RELAY DEVICES, BREAKERS, STARTERS, DISCONNECTS AND WIRING.



Project **HILL PARK LEARNING CENTRE  
HVAC & PLUMBING UPGRADES**

**465 EAST 16TH STREET, HAMILTON, ONTARIO**

Title  
**UPDATED MCC DETAILS**

Drawn By: KM	Designed By: SJ	Approved By: KS	Date: OCT 2024
Project No. 24-151		Scale NTS	
Drawing No. E401		Sheet 9 of 9	Revision 0