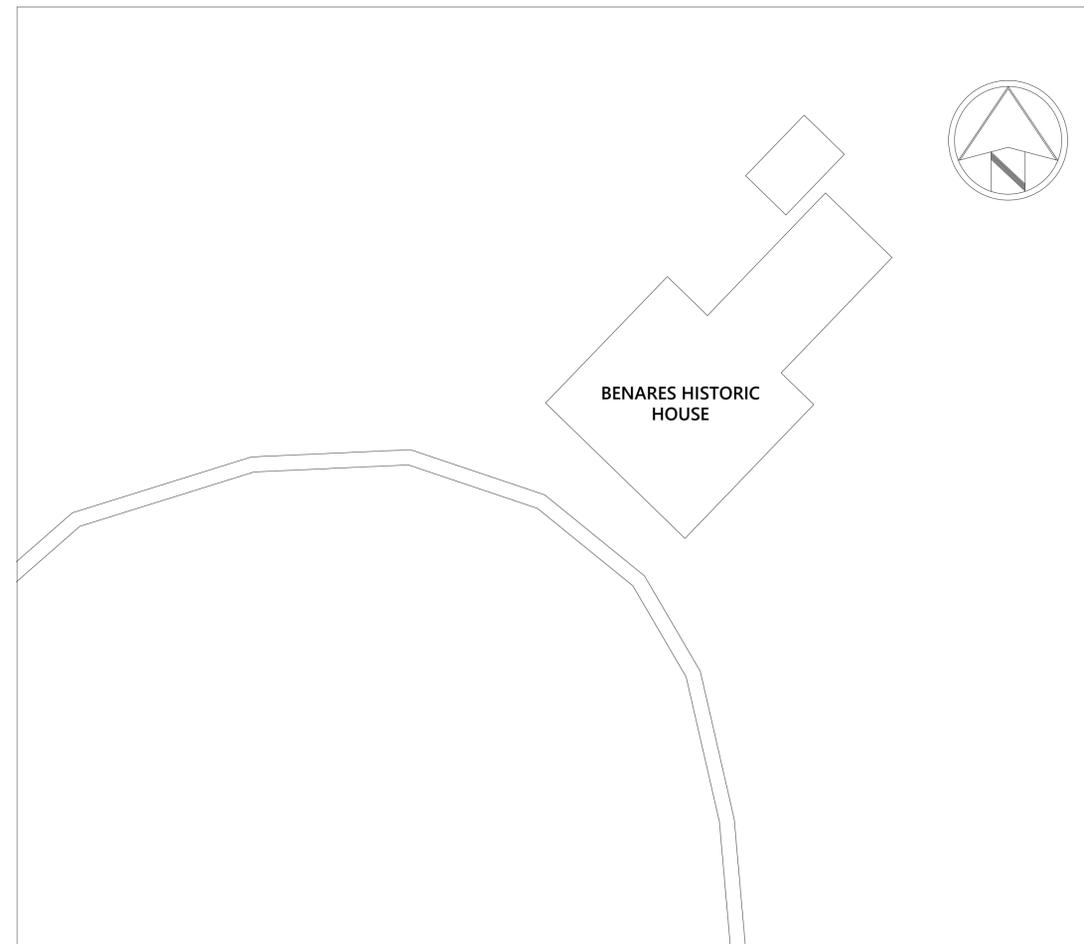
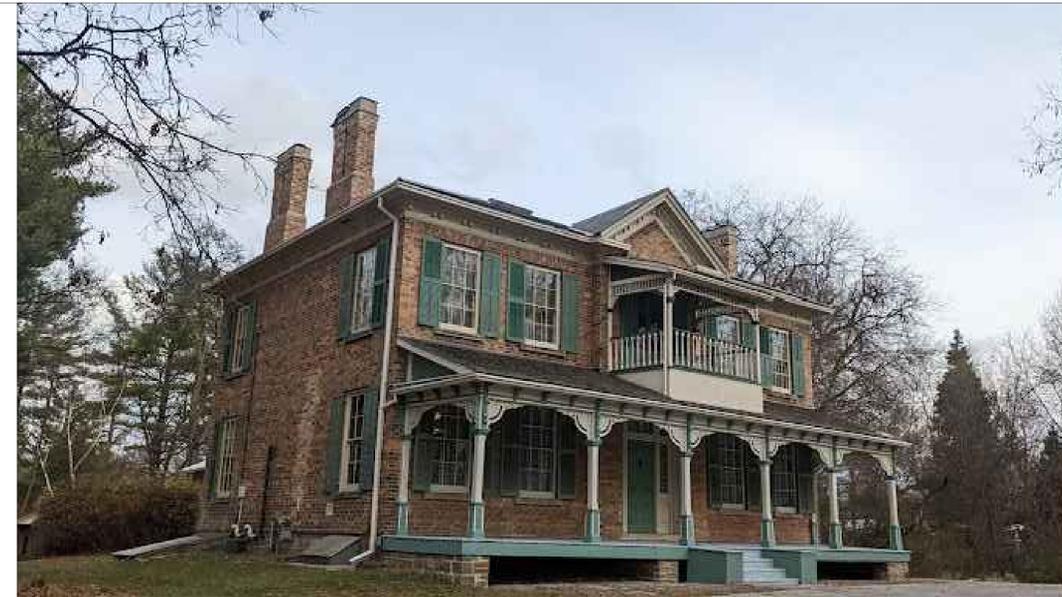


**CITY OF MISSISSAUGA
BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE**

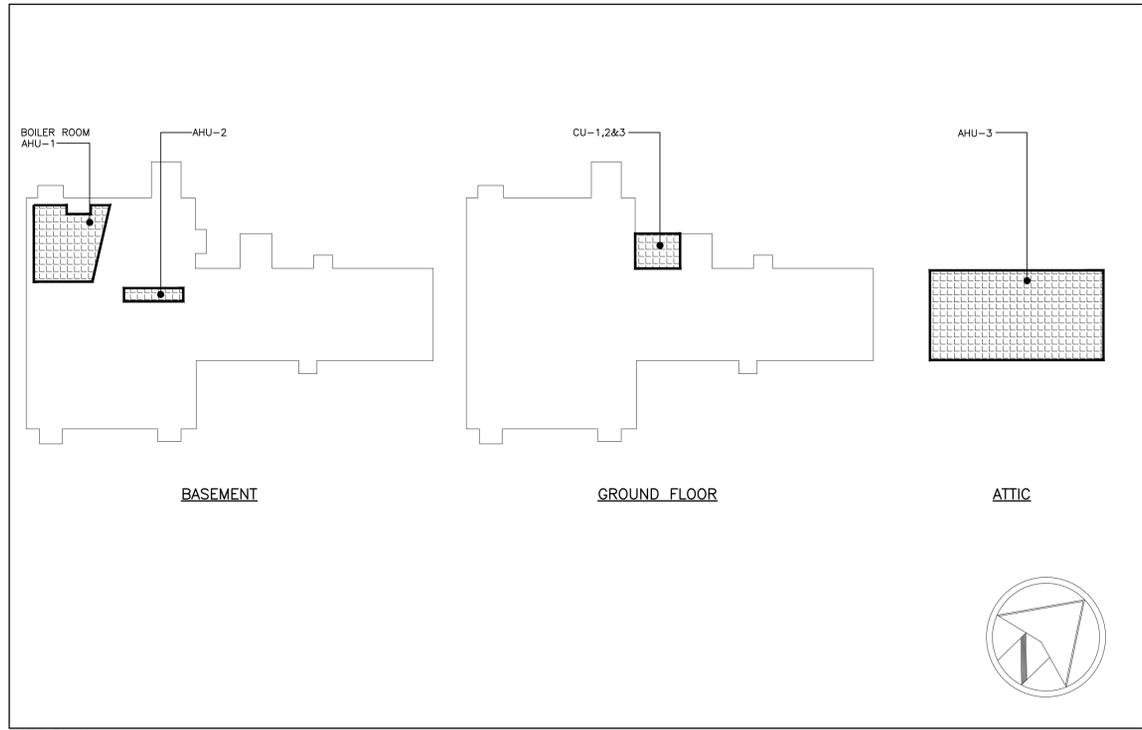
1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

ISSUED FOR TENDER
DECEMBER, 2023



DRAWING LIST

NO.	DRAWING TITLE
M-1	KEY PLAN, SYMBOLS, SCHEDULES & DETAILS – MECHANICAL
M-2	BASEMENT FLOOR – EQUIPMENT, DUCTWORK & PIPING LAYOUT – EXISTING & DEMOLITION – MECHANICAL
M-3	GROUND FLOOR – EQUIPMENT, DUCTWORK & PIPING LAYOUT – EXISTING & DEMOLITION – MECHANICAL
M-4	SECOND FLOOR & ATTIC – EQUIPMENT, DUCTWORK & PIPING LAYOUT – EXISTING & DEMOLITION – MECHANICAL
M-5	BASEMENT FLOOR – EQUIPMENT, DUCTWORK & PIPING LAYOUT – NEW WORK – MECHANICAL
M-6	GROUND FLOOR – EQUIPMENT, DUCTWORK & PIPING LAYOUT – NEW WORK – MECHANICAL
M-7	SECOND FLOOR & ATTIC – EQUIPMENT, DUCTWORK & PIPING LAYOUT – NEW WORK – MECHANICAL
M-8	CONTROL DIAGRAMS – MECHANICAL
E-1	KEY PLAN, SYMBOLS, EQUIPMENT WIRING SCHEDULE & NOTES – ELECTRICAL
E-2	EQUIPMENT LAYOUT – EXISTING & DEMOLITION – ELECTRICAL
E-3	EQUIPMENT LAYOUT – NEW WORK – ELECTRICAL



KEY PLAN
N.T.S.

SCHEDULE OF AIR HANDLING UNITS UNITS

TAG	SERVING	SUPPLY FAN PERFORMANCE			COOLING PERFORMANCE				HYDRONIC HEATING PERFORMANCE				WEIGHT KG [LBS]	POWER SUPPLY (V/PH/Hz)	FLA (AMPS)	MOCP (AMPS)	EQUIPMENT SIZE (HxLxW, MM)	REMARKS		
		AIR FLOW (CFM)	E.S.P. Pg [IN]	HP	TOTAL CAP. kW [MBH]	SENS. CAP. kW [MBH]	EDBT/EBWT	TEMP °C [°F]	LDBT/LWBT	EAT °C [°F]	LAT °C [°F]	EWI °C [°F]							LWT °C [°F]	WATER FLOW (L/S) [GPM]
AHU-1	GROUND FLOOR	600	248.8 [1]	1/2	8.3 [28.2]	5.2 [17.8]	26.7/20 [80/67]	11.6/10.5 [53/51]	21.1 [70]	39.9 [103.9]	82.2 [180]	60.0 [140]	0.063 [1]	6.43 [21.95]	67.5 [149]	240/1/60	4.26	15	1147x486x745	
AHU-2	GROUND FLOOR	600	248.8 [1]	1/2	8.3 [28.2]	5.2 [17.8]	26.7/20 [80/67]	11.6/10.5 [53/51]	21.1 [70]	39.9 [103.9]	82.2 [180]	60.0 [140]	0.063 [1]	6.43 [21.95]	67.5 [149]	240/1/60	4.26	15	1147x486x745	
AHU-3	SECOND FLOOR	1000	248.8 [1]	1.0	14.3 [48.7]	9.0 [30.8]	26.7/20 [80/67]	11.6/10.5 [53/51]	21.1 [70]	39.9 [103.9]	82.2 [180]	56.1 [133]	0.094 [1.5]	10.7 [36.64]	79.4 [175]	240/1/60	7.73	15	425x825x1050	

SCHEDULE OF HEAT PUMPS

TAG	COOLING CAP. TONS [kW]	REFRIGERANT	CONNECTION SIZES RL (MM/IN) RG (MM/IN)	EQUIPMENT SIZE (HxLxW, MM)	POWER SUPPLY (V/PH/Hz)	MCA (A)	MOCP (A)	WEIGHT KG (LB)	REMARKS
CU-1	1.5 [5.27]	R410A	10/[3/8] 19/[1/2]	830x750x830	240/1/60	15	25	78.9 [174]	WORKS WITH AHU-1, HEAT PUMP PROVIDES HEATING & COOLING
CU-2	1.5 [5.27]	R410A	10/[3/8] 19/[1/2]	830x750x830	240/1/60	15	25	78.9 [174]	WORKS WITH AHU-2, HEAT PUMP PROVIDES HEATING & COOLING
CU-3	3 [10.6]	R410A	10/[3/8] 22/[7/8]	950x870x950	240/1/60	18	30	90.2 [132]	WORKS WITH AHU-3, HEAT PUMP PROVIDES HEATING & COOLING

- NOTES:
 1. PROVIDE ALL INTERCONNECTED REFRIGERANT LINES BETWEEN INDOOR AND OUTDOOR UNITS.
 2. ALL THE FINAL SIZE FOR THE REFRIGERATION PIPES TO BE BY THE UNIT/ SYSTEM MANUFACTURER BASED ON FINAL ROUTING.
 3. MANUFACTURER TO PROVIDE DETAILED PIPE SIZE AND SCHEMATIC AS PART OF SHOP DRAWINGS SUBMITAL.
 4. C/W FULL CHARGE OF REFRIGERANT AND OIL.

SCHEDULE OF PUMPS

TAG	SYSTEM	TYPE	CAPACITY L/S [GPM]	HEAD kPa [FT]	RPM	MOTOR HP	ELECTRICAL (V/PH/FLA)	REMARKS
P-1	RAD HTG. CIRC.	VERTICAL IN-LINE PUMP	1.26 [20.0]	134.5 [45]	1,750	1.5	120/1/-	C/W VFD
SP-1	SUMP PUMP	SUBMERSIBLE PUMP	1.26 [20.0]	110.6 [37]	3,450	1.0	120/1/12	C/W CONTROL PANEL, POWER VIA RECEPTACLE

SCHEDULE OF HUMIDIFIERS

TAG	AREA SERVED	STEAM CAPACITY KG/HR [LBS/HR]	INPUT kW [MBH]	DUCT/AHU WHX MM [IN]	STEAM OUTLET DIAMETER MM [IN]	POWER (V/PH/FLA)	FUSE (A)	OPERATING WEIGHT KG [LBS]	REMARKS
HU-3	SECOND FLOOR	2.7 [6]	2 [6.8]	600x300 [24x12]	35 [1-3/8]	240/1/8.5	15	36 [79]	WORKS WITH AHU-3, C/W DISPERSION TUBE AND CONTROLS

SCHEDULE OF DEHUMIDIFIERS

TAG	AREA SERVED	REMOVAL CAPACITY KG/HR [LBS/HR]	PROCESS VOLUME L/S [CFM]	POWER (V/PH/FLA)	FUSE (A)	OPERATING WEIGHT KG [LBS]	REMARKS
DHU-1	BASEMENT KITCHEN	2.17 [4.8]	70.8 [150]	240/1/14.4	30	31.8 [70]	C/W WITH DAMPERS ON SUPPLY AND EXHAUST

GENERAL MECHANICAL NOTES:

- SCOPE OF WORK
 BIDDERS FOR THIS PROJECT SHALL INCLUDE FOR ALL LABOR, MATERIAL, EQUIPMENT AND ALL OTHER RELATED COST INCLUDING ALL APPLICABLE TAXES TO PROVIDE THE MECHANICAL WORK SPECIFIED IN THE SPECIFICATIONS AND SHOWN ON THE MECHANICAL DRAWINGS, AND ALL MECHANICAL WORK NOTED IN THE SPECIFICATIONS AND SHOWN ON THE DRAWINGS FOR OTHER DIVISIONS OF THIS CONTRACT AS BEING THE RESPONSIBILITY OF DIVISION 23. IN ADDITION TO THE ITEMS SPECIFIED HEREIN AND SHOWN ON THE DRAWINGS, SUPPLY AND INSTALL ALL ITEMS THAT ARE OBVIOUSLY NECESSARY TO DELIVER FULLY FUNCTIONAL MECHANICAL SYSTEMS.
- SITE EXAMINATION
 PRIOR TO SUBMITTING THE TENDER PRICE, THE CONTRACTOR SHALL CAREFULLY EXAMINE THE SITE, EXISTING UTILITIES AND THE LOCAL CONDITIONS AFFECTING THE WORK AND THE DRAWINGS OF RELATED DISCIPLINES. ANY INTERFERENCES NOTED BETWEEN THE PROPOSED DESIGN AND THE EXISTING BUILDING UTILITIES/SITE UTILITIES ELEMENTS SHALL BE PROMPTLY BROUGHT TO THE ATTENTION OF THE CONSULTANT. NO ADDITIONAL COSTS SHALL BE INCURRED BY THE OWNER FOR FAILURE TO EXAMINE THE SITE AND THE DRAWINGS OF RELATED DISCIPLINES OR TO REPORT INTERFERENCES TO THE CONSULTANT PRIOR TO THE SUBMISSION OF THE TENDER PRICE.
- EXECUTION OF WORK
 BEFORE COMMENCING WORK, CHECK AND VERIFY THE LOCATION OF BUILDING ELEMENTS; ALL PIPES AND DUCTS TO ENSURE PROPER AND CORRECT INSTALLATION OF THE WORK.
 WHEREVER DIFFERENCES OCCUR BETWEEN PLANS, SPECIFICATIONS, RISER DIAGRAMS OR SCHEMATICS AND DRAWINGS, THE MAXIMUM CONDITIONS SHALL GOVERN AND THE BID SHALL BE BASED ON WHICHEVER INDICATES THE GREATER COST.
 INSTALL ALL MECHANICAL SERVICES INCLUDING BUT NOT EXCLUSIVE TO DRAINS, PIPES, AND DUCTS, TO CONSERVE HEADROOM AND INTERFERE AS LITTLE AS POSSIBLE WITH THE FREE USE OF THE SPACE THROUGH WHICH THEY PASS. ALL DRAINS, PIPES, DUCTS, ETC., PARTICULARLY THOSE WHICH MAY INTERFERE WITH THE INSIDE TREATMENT OF THE BUILDING, OR CONFLICTING WITH OTHER TRADES, SHALL BE INSTALLED ONLY AFTER THE LOCATIONS HAVE BEEN APPROVED BY THE CONSULTANT. SPECIAL CARE SHALL BE TAKEN IN THE INSTALLATION OF ALL MECHANICAL SERVICES INCLUDING, BUT NOT EXCLUSIVE TO DRAINS, PIPES, AND DUCTS, WHICH ARE TO BE CONCEALED TO SEE THAT THEY COME WITHIN THE FINISHED LINES OF FLOORS, WALLS, AND CEILINGS. WHERE SUCH DRAINS, PIPES, DUCTS, ETC., HAVE BEEN INSTALLED IN SUCH A MANNER AS TO CAUSE INTERFERENCE, THEY SHALL BE REMOVED AND RE-INSTALLED IN SUITABLE LOCATIONS WITHOUT EXTRA COST TO THE OWNER.
- CLEANING
 DURING THE PERFORMANCE OF THE WORK AND ON THE COMPLETION, REMOVE FROM THE PLACE OF THE WORK ALL DEBRIS, RUBBISH AND WASTE MATERIALS CAUSED BY THE PERFORMANCE OF THE WORK FOR DIVISION 15. REMOVE ALL TOOLS AND SURPLUS MATERIALS AFTER COMPLETION AND ACCEPTANCE OF THE WORK.
- CODES, PERMITS, FEES AND CONNECTIONS
 CONFORM TO FEDERAL, PROVINCIAL AND MUNICIPAL REGULATIONS AND PERFORM WORK IN ACCORDANCE WITH REQUIREMENTS OF BY-LAWS AND REGULATIONS IN FORCE IN AREA WHERE THE BUILDING IS TO BE ERRECTED.
 APPLY FOR, OBTAIN, AND PAY FOR PERMITS, FEES AND SERVICE CONNECTIONS FOR THE WORK OF THIS DIVISION AND THE INSPECTIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION IN THE AREA WHERE THE BUILDING IS TO BE ERRECTED.
- MATERIALS
 WHERE MATERIALS, EQUIPMENT, APPARATUS, OR OTHER PRODUCTS ARE SPECIFIED BY THE MANUFACTURER, BRAND NAME, TYPE OR CATALOGUE NUMBER, SUCH DESIGNATION IS TO ESTABLISH STANDARDS OF DESIRED QUALITY STYLE OR DIMENSIONS AND SHALL BE THE BASIS OF THE BID. MATERIALS SO SPECIFIED SHALL BE FURNISHED UNDER THIS CONTRACT, UNLESS CHANGED BY MUTUAL AGREEMENT.
 SHOULD THE BASE MECHANICAL SUBCONTRACTOR PROPOSE TO FURNISH MATERIAL AND EQUIPMENT OTHER THAN THOSE SPECIFIED, HE SHALL APPLY IN WRITING TO THE CONSULTANT FOR APPROVAL OF EQUIVALENTS AT LEAST FOURTEEN DAYS PRIOR TO OPENING OF BIDS, SUBMITTING WITH HIS REQUEST FOR APPROVAL COMPLETE DESCRIPTIVE AND TECHNICAL DATA ON THE ITEM OR ITEMS HE PROPOSES TO FURNISH. APPROVAL FOR CHANGES IN BASE BID SPECIFICATIONS WILL BE CONSIDERED ONLY UPON INDIVIDUAL REQUESTS OF THE SUBCONTRACTORS. NO BLANKET APPROVAL FOR EQUIPMENT WILL BE GIVEN TO SUPPLIERS, DISTRIBUTORS OR CONTRACTORS.

SYMBOLS

	DOMESTIC COLD WATER
	HOT WATER SUPPLY
	HOT WATER RETURN
	REFRIGERANT GAS
	REFRIGERANT LIQUID
	PIPE DN
	PIPE UP
	PUMP
	PRESSURE REDUCING VALVE
	STRAINER
	GATE VALVE
	BALANCING VALVE
	CHECK VALVE
	DEMOLITION
	THERMOMETER
	PRESSURE GAUGE
	AIR VENT
	CUT POINT OF EXISTING SERVICE
	CONNECT TO EXISTING
	FLOOR/FUNNEL FLOOR DRAIN
	BALANCING DAMPER
	MANUAL CONTROL VALVE
	THREE WAY VALVE
	SHEET METAL DUCT - FIRST FIGURE INDICATES DIMENSION SHOWN
	SHEET METAL RISER UP - SUPPLY
	SHEET METAL RISER UP - RETURN AND EXHAUST
	SHEET METAL RISER DOWN - SUPPLY
	SHEET METAL RISER DOWN - RETURN AND EXHAUST
	FLEXIBLE CONNECTION

GENERAL NOTES :

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2. ISSUED FOR TENDER	04/12/23
1. ISSUED FOR 75% REVIEW	27/10/23
No. REVISION	DD/MM/YY

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal

SAB ENGINEERING Inc.

588 EDWARD AVE. UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
 TEL. (905)-787 8885 FAX (905)-787 8771

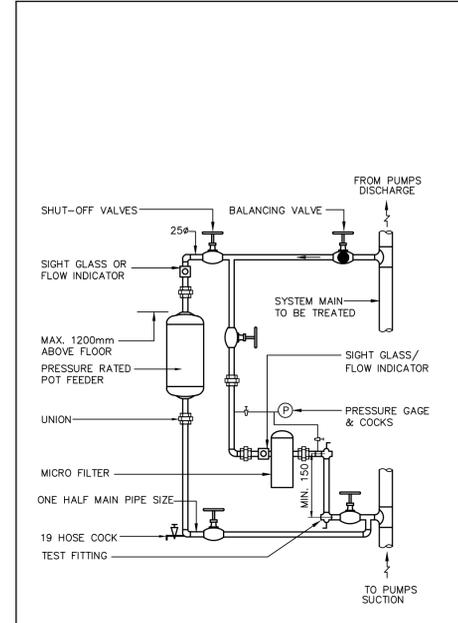
MISSISSAUGA

Project
BENARES HISTORIC HOUSE
 HVAC SYSTEM UPGRADE

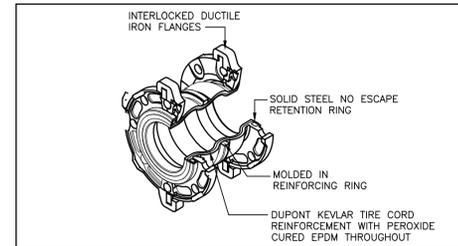
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 MISSISSAUGA, ON L5J 2W8

Drawing Title
KEY PLAN, SYMBOLES, SCHEDULES & DETAILS - MECHANICAL

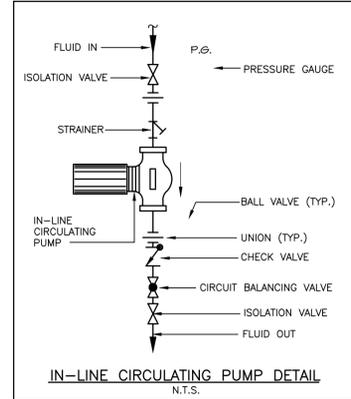
Checked: O.S.	Date: OCT 2023
Drawn: K.L.	Scale: N.T.S.
File Number: 2023-66	Dwg Number: M-1



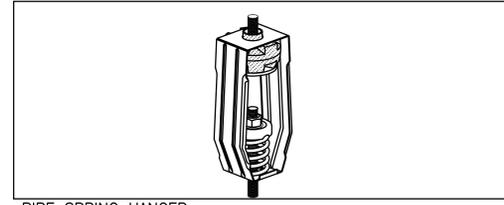
CHEMICAL TREATMENT FOR CLOSED WATER LOOP
N.T.S.



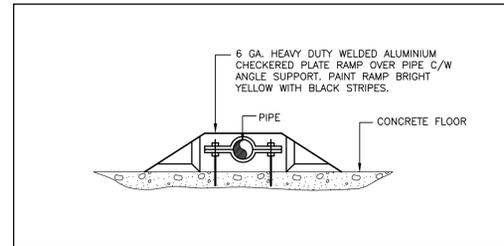
PIPING FLEXIBLE CONNECTOR - INDOOR
N.T.S.



IN-LINE CIRCULATING PUMP DETAIL
N.T.S.



PIPE SPRING HANGER
N.T.S.



PIPE RAMP DETAIL
N.T.S.

GENERAL NOTES :

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DEMOLITION NOTES:

THESE NOTES SHALL BE READ IN CONJUNCTION WITH, AND SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS.

PRIOR TO COMMENCING THE DEMOLITION WORK, EXAMINE CAREFULLY THE ELEMENTS OF HEATING AND COOLING SYSTEM ALONG WITH OTHER DEVICES TO BE REMOVED. FOR REASONS OF CLARITY, THE DRAWINGS DO NOT SHOW ALL BUILDING SERVICES LOCATED IN THE GROUND FLOOR OR ALL STRUCTURAL ELEMENTS. ALL BUILDING SERVICES AND OTHER UTILITIES NOT AFFECTED BY THIS WORK SHALL REMAIN OPERATIONAL. ANY DAMAGE TO BUILDING SERVICES AND UTILITIES NOT AFFECTED BY THE WORK SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR, AT NO COST TO THE OWNER.

ALL TEMPORARY INTERRUPTION OF SERVICES SHALL BE COORDINATED WITH THE CITY OF MISSISSAUGA.

PROTECT EXISTING STRUCTURE, ENSURE THAT WORK IS DONE WITH MINIMAL ALTERATION TO EXISTING BUILDING.

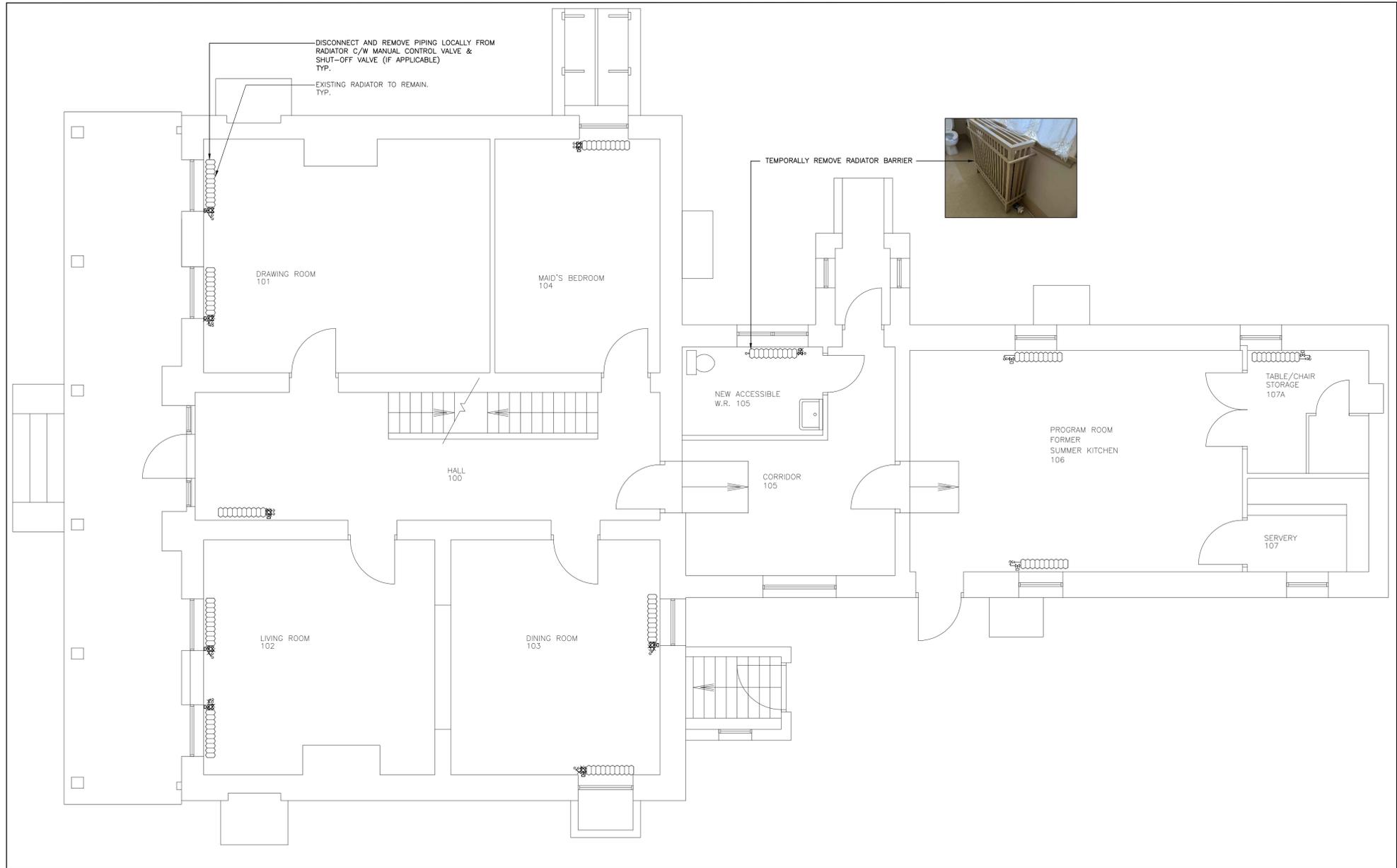
REMOVE CONDENSER UNITS LOCATED OUTSIDE C/W REFRIGERANT PIPING UP TO AIR HANDLING UNIT SERVED.

REMOVE ALL REDUNDANT POWER WIRING AND DISCONNECTS ASSOCIATED WITH THE EQUIPMENT TO BE DEMOLISHED.

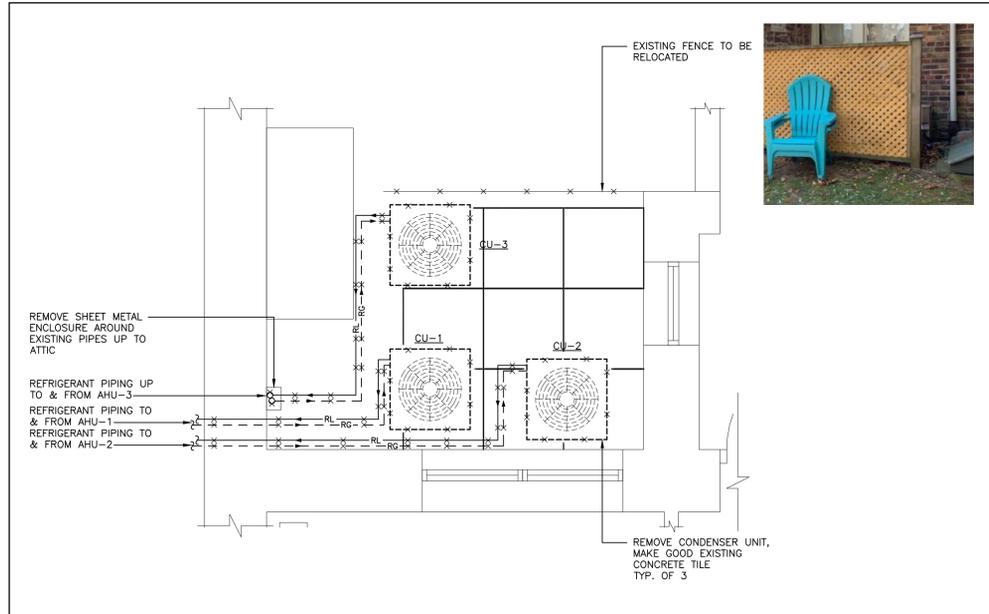
CUT & REMOVE LOCALIZED PIPING AROUND RADIATOR TO ALLOW FOR REMOVAL OF VALVES. ENSURE THAT RADIATOR AND FLOOR IS PROTECTED DURING CONSTRUCTION.

CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL REMOVED EQUIPMENT AND MATERIALS.

EQUIPMENT & PIPING LAYOUT SHOWN ON THE DRAWINGS IS APPROXIMATE. CONTRACTOR TO VERIFY ALL LOCATIONS ON SITE PRIOR TO COMMENCING WORK.



GROUND FLOOR INTERIOR – EQUIPMENT & PIPING LAYOUT – EXISTING & DEMOLITION WORK – MECHANICAL
SCALE: 1:50



GROUND FLOOR EXTERIOR – EQUIPMENT & PIPING LAYOUT – EXISTING & DEMOLITION WORK – MECHANICAL
SCALE: 1:25

2. ISSUED FOR TENDER	04/12/23
1. ISSUED FOR 75% REVIEW	27/10/23
No. REVISION	DD/MM/YY

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North Arrow

Professional Seal

SAB ENGINEERING Inc.

588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

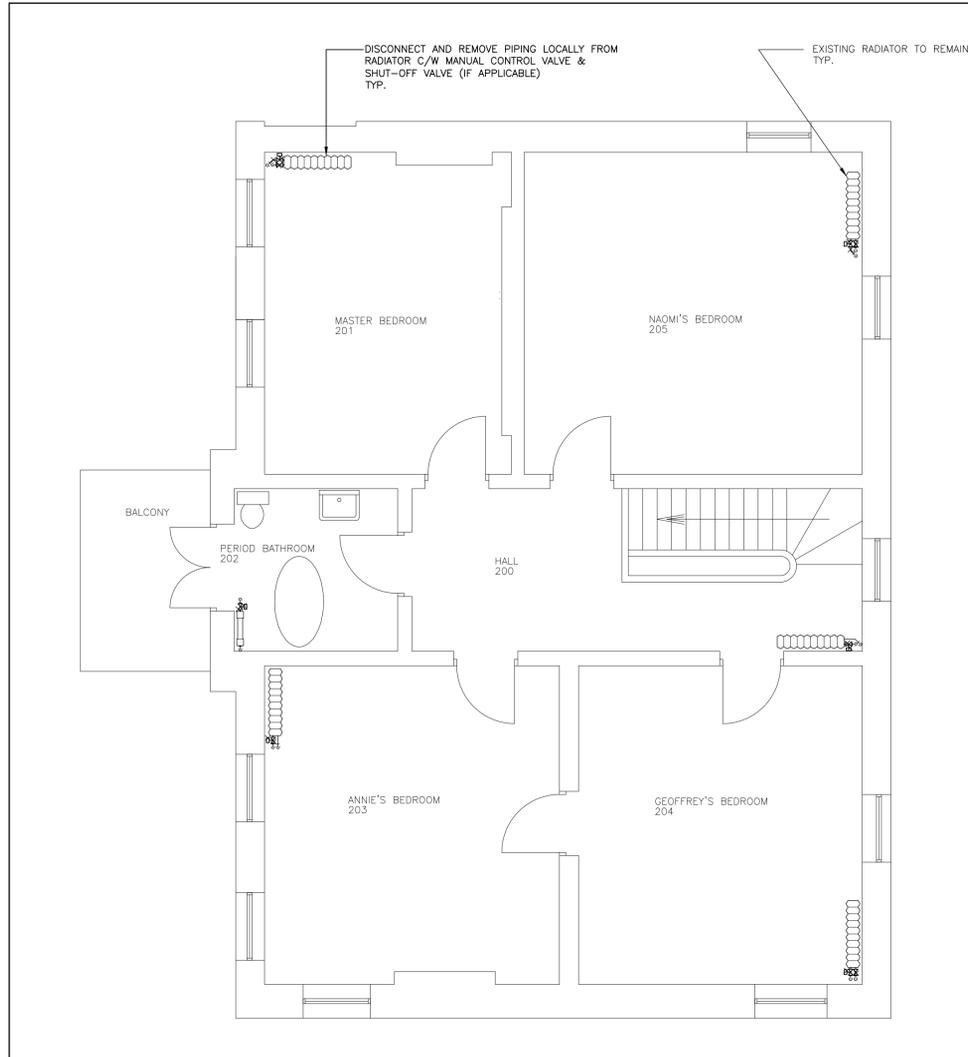


Project
**BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE**

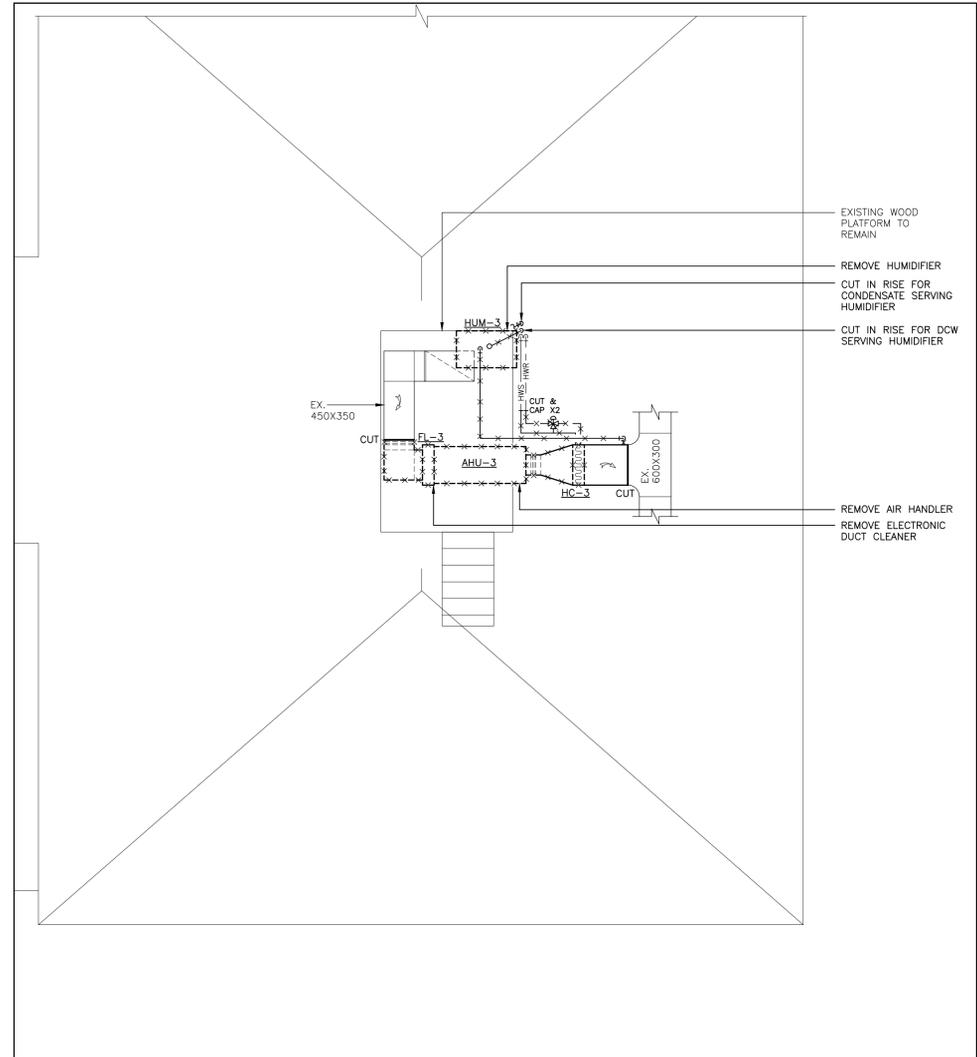
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1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

Drawing Title
**GROUND FLOOR - EQUIPMENT,
DUCTWORK & PIPING LAYOUT - EXISTING
& DEMOLITION - MECHANICAL**

Checked: O.S.	Date: OCT 2023
Drawn: K.L.	Scale: AS NOTED
File Number: 2023-66	Dwg Number: M-3



SECOND FLOOR - EQUIPMENT & PIPING LAYOUT - EXISTING & DEMOLITION WORK - MECHANICAL
SCALE: 1:50



ATTIC - EQUIPMENT, DUCTWORK & PIPING LAYOUT - EXISTING & DEMOLITION WORK - MECHANICAL
SCALE: 1:50

DEMOLITION NOTES:

THESE NOTES SHALL BE READ IN CONJUNCTION WITH, AND SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS.

PRIOR TO COMMENCING THE DEMOLITION WORK, EXAMINE CAREFULLY THE ELEMENTS OF THE BOILER ROOM AND CUBBY UNDER STAIRS ALONG WITH OTHER DEVICES TO BE REMOVED. FOR REASONS OF CLARITY, THE DRAWINGS DO NOT SHOW ALL BUILDING SERVICES LOCATED IN THE ATTIC/SECOND FLOOR OR ALL STRUCTURAL ELEMENTS. ALL BUILDING SERVICES AND OTHER UTILITIES NOT AFFECTED BY THIS WORK SHALL REMAIN OPERATIONAL. ANY DAMAGE TO BUILDING SERVICES AND UTILITIES NOT AFFECTED BY THE WORK SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR, AT NO COST TO THE CITY OF MISSISSAUGA.

ALL TEMPORARY INTERRUPTION OF SERVICES SHALL BE COORDINATED WITH THE CITY OF MISSISSAUGA.

PROTECT EXISTING STRUCTURE, ENSURE THAT WORK IS DONE WITH MINIMAL ALTERATION TO EXISTING BUILDING.

REMOVE AIR HANDLING UNIT LOCATED IN THE ATTIC C/W WITH ELECTRONIC AIR FILTER AND REFRIGERANT PIPING DOWN TO CONDENSING UNITS LOCATED OUTSIDE ON GRADE. REMOVE LOCALIZED SUPPLY AND RETURN DUCTING.

REMOVE HEATING COILS C/W ALL RELATED PIPING AND ACCESSORIES.

REMOVE LOCALIZED PIPING AROUND RADIATOR TO ALLOW FOR REMOVAL OF VALVES. ENSURE THAT RADIATOR AND FLOOR IS PROTECTED DURING CONSTRUCTION.

CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL REMOVED EQUIPMENT AND MATERIALS.

REMOVE HUMIDIFIER C/W LOCAL DOMESTIC COLD WATER SUPPLY AND CONDENSATE PIPING, REMOVE STEAM PIPING UP TO INJECTION LOCATION AT DUCTWORK.

THE WORK SHALL INCLUDE PARTIAL DRAINING OF THE EXISTING SYSTEM AND THE SUBSEQUENT RE-FILL, AFTER THE NEW EQUIPMENT IS INSTALLED. REFER TO SPECIFICATIONS FOR CHEMICAL TREATMENT REQUIREMENTS.

CUT POINTS SHOWN ON THE DRAWINGS ARE APPROXIMATE. EXACT CUTTING POINTS FOR EXISTING DUCTWORK AND PIPING TO BE DETERMINED ON SITE BY THE CONTRACTOR.

GENERAL NOTES :

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2.	ISSUED FOR TENDER	04/12/23
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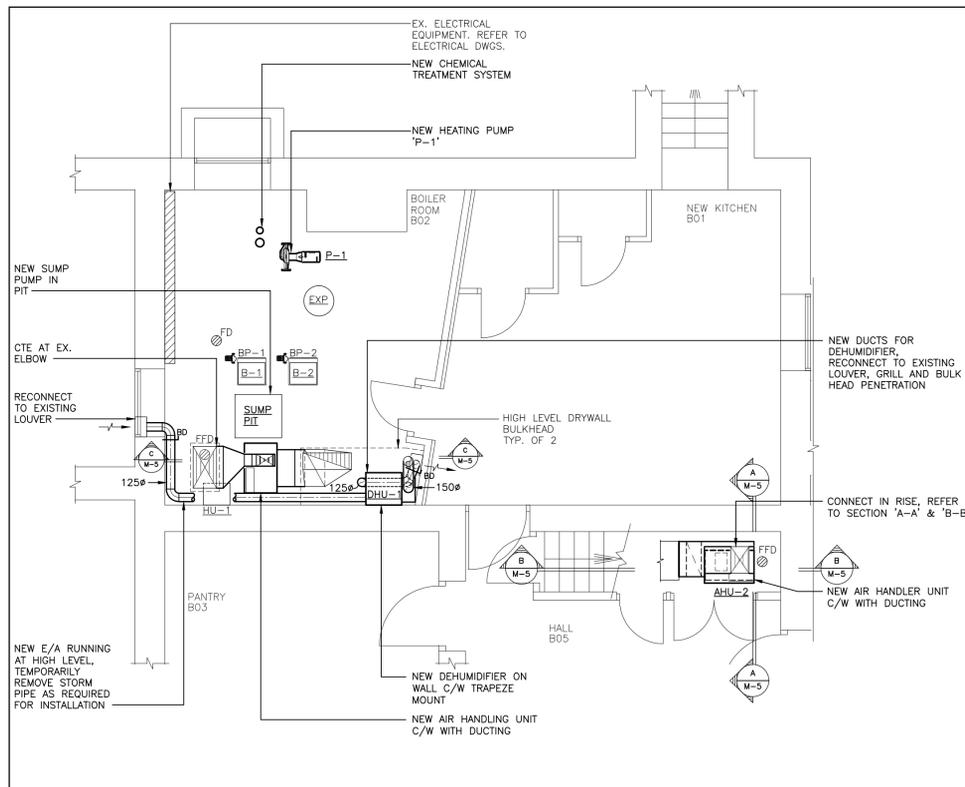


Project
BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE

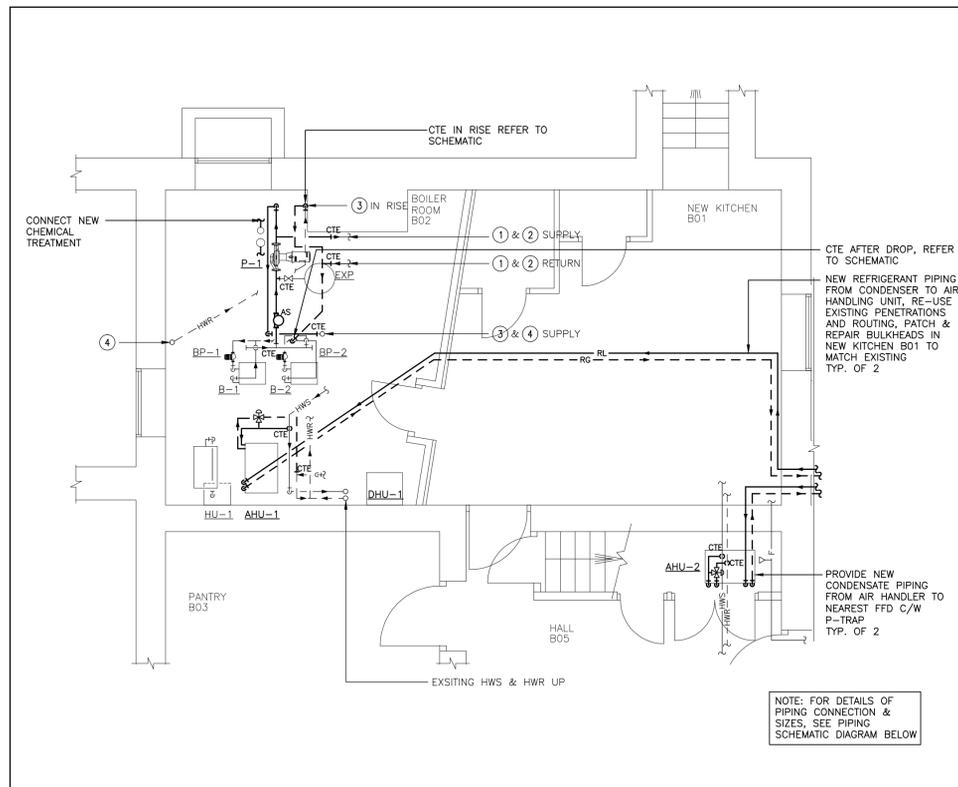
Location
1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

Drawing Title
**SECOND FLOOR & ATTIC - EQUIPMENT,
DUCTWORK & PIPING LAYOUT - EXISTING
& DEMOLITION - MECHANICAL**

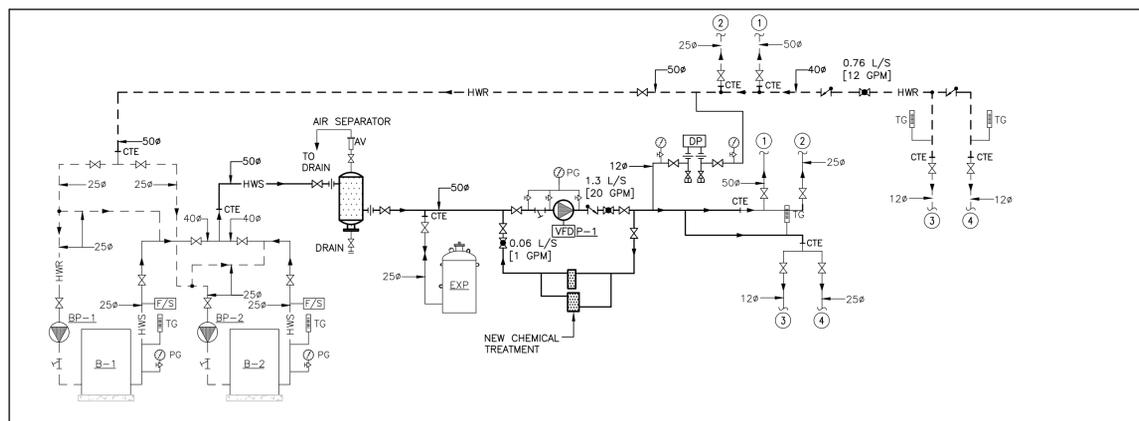
Checked:	O.S.	Date:	OCT 2023
Drawn:	K.L.	Scale:	1: 50
File Number:	2023-66	Dwg Number:	M-4



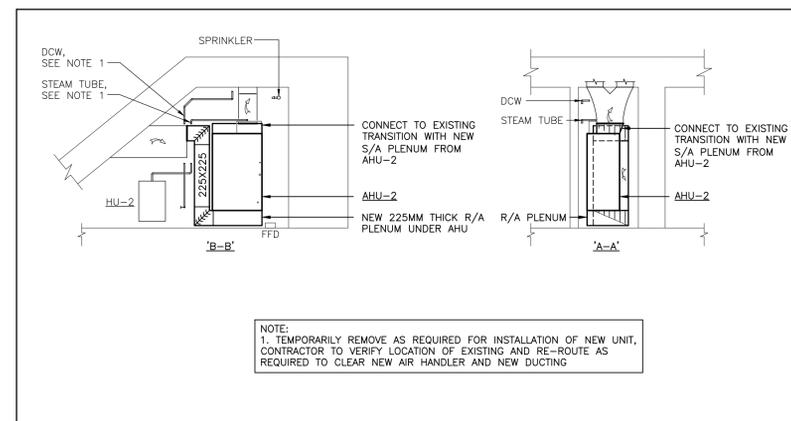
BASEMENT FLOOR - EQUIPMENT & DUCTWORK LAYOUT - NEW WORK - MECHANICAL
SCALE: 1:50



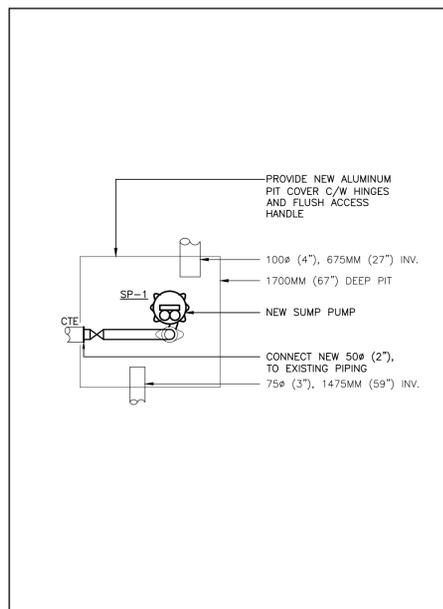
BASEMENT FLOOR - PIPING LAYOUT - NEW WORK - MECHANICAL
SCALE: 1:50



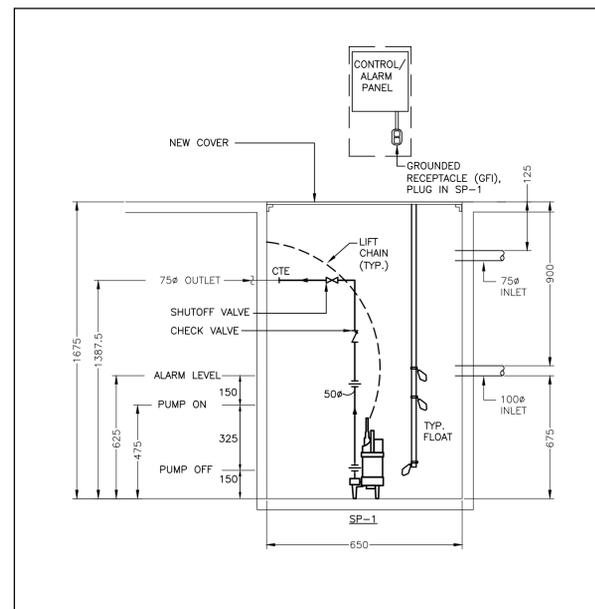
NEW PIPING SCHEMATIC DIAGRAM
SCALE: N.T.S.



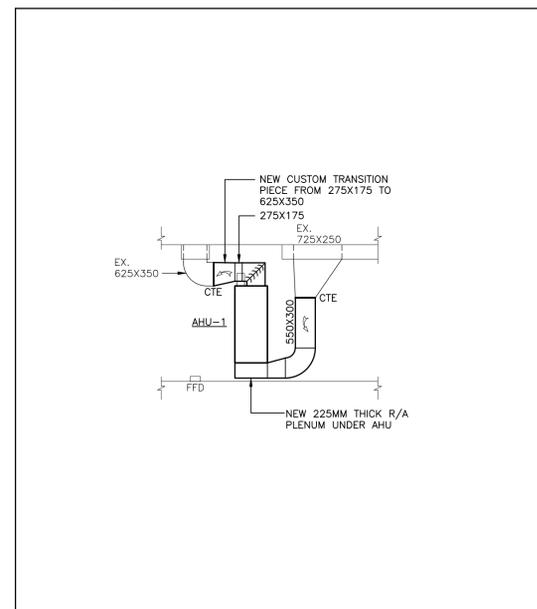
SECTION 'A-A' & 'B-B'
SCALE: 1:50



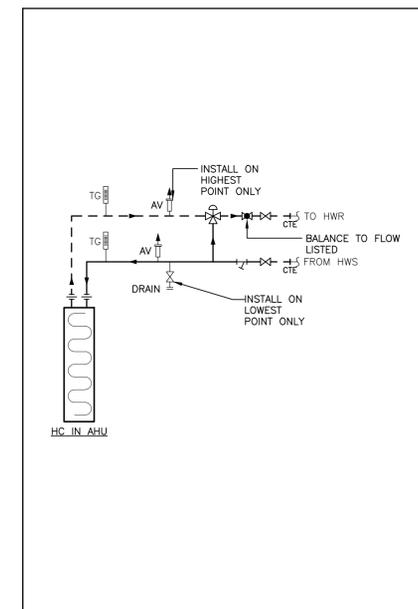
SUMP PIT CALLOUT - NEW
SCALE: 1:16



SUMP PIT DETAIL
SCALE: N.T.S.



SECTION 'C-C'
SCALE: 1:50



TYPICAL HEATING COIL SCHEMATIC DIAGRAM - NEW
SCALE: N.T.S.

NEW WORK NOTES:

THESE NOTES SHALL BE READ IN CONJUNCTION WITH, AND SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS.
FOR REASONS OF CLARITY, THE LAYOUT DRAWINGS DO NOT SHOW ALL VALVES, FITTINGS AND SENSORS/GAUGES. FOR FULL EXTENT OF FITTINGS AND INSTRUMENTATION, REFER TO THE NEW PIPING SCHEMATIC. THE DRAWINGS DO NOT SHOW ALL STRUCTURAL ELEMENTS AND BUILDING SERVICES LOCATED IN THE BUILDING. INSTALL THE NEW PIPING SUCH AS TO AVOID INTERFERENCE WITH THE EXISTING BUILDING SERVICES AND OTHER UTILITIES LOCATED IN THE ROOM. RELOCATE EXISTING SERVICES IF SO REQUIRED TO ACCOMMODATE THE NEW PIPING, DUCTWORK AND EQUIPMENT, AT NO ADDITIONAL COST TO THE CITY OF MISSISSAUGA.

SUPPORT NEW PIPING AND EQUIPMENT FROM FLOOR OR CEILING, AS WARRANTED BY EXISTING STRUCTURE AND LOCAL CONDITIONS; CONTRACTOR TO PROVIDE AND INSTALL CUSTOM STEEL SUPPORTS AS REQUIRED FOR SUPPORTING ALL PIPING, DUCTING AND EQUIPMENT. ANCHOR ALL SUPPORTS TO THE FLOOR, WALLS OR STRUCTURAL CEILING SLAB. ALL SUPPORTS TO BE FROM THE FLOOR OR WALLS.
AT THE CONCLUSION OF THE WORK, RE-FILL THE HOT WATER LOOPS AND DEAERATE COMPLETELY. FLUSH ALL PIPING AS SPECIFIED AND PROVIDE CHEMICAL TREATMENT.

PROVIDE THE NECESSARY POWER SUPPLY TO THE NEW PIPING INCLUDING WIRING, CONDUITS AND STARTERS. MOUNT THE NEW ELECTRICAL DEVICES AS SHOWN ON THE ELECTRICAL DRAWINGS. MAINTAIN THE CODE-PREScribed CLEARANCES. ALSO REFER TO THE ELECTRICAL DRAWINGS.

PRIOR TO SHEET METAL FABRICATION, ALL EXISTING DIMENSIONS SHALL BE SITE VERIFIED. CONTRACTOR IS RESPONSIBLE FOR ALL SITE COORDINATION IN ORDER TO ENSURE EQUIPMENT, PIPING, DUCTWORK CAN BE INSTALLED WHILE MAINTAINING ALL REQUIRED CLEARANCES. SOME NEW DUCT DIMENSIONS AND NEW LAYOUT MAY NEED TO BE ADJUSTED FROM WHAT IS SHOWN ON THE DESIGN DRAWINGS. CONTRACTOR SHALL CARRY ALL COSTS ASSOCIATED WITH MODIFICATION/ADJUSTMENT OF NEW DUCTWORK AND PIPING LAYOUTS TO EXISTING DESIGN AS REQUIRED TO MATCH SITE CONDITIONS.

PROVIDE AND INSTALL NEW AIR HANDLING UNITS APPROXIMATELY AS SHOWN AND AS PER THE PERFORMANCE LISTED IN THE EQUIPMENT SCHEDULE. AHU-1 & AHU-2 ARE VERTICAL UNITS TO BE INSTALLED ON A CUSTOM FABRICATED PLENUM/STAND. SIZE OF STAND TO BE COORDINATED WITH EQUIPMENT MANUFACTURER AND SITE CONDITIONS. CONNECT NEW UNITS TO POWER AND CONTROLS. REFER TO ELECTRICAL DRAWINGS FOR DETAILED ELECTRICAL SCOPE.

RE-CONNECT THE NEW AIR HANDLERS TO EXISTING SUPPLY AND RETURN DUCTWORK APPROXIMATELY AS SHOWN. MANUFACTURE SHEET METAL TRANSITIONS AS REQUIRED BY THE NEW SIZE AND LOCATION OF UNITS' OPENINGS AND NEW DUCTWORK LOCATION. PROVIDE FLEXIBLE DUCT CONNECTIONS AT INLETS AND OUTLETS.

PROVIDE NEW REFRIGERANT PIPING APPROXIMATELY AS SHOWN. RUN NEW PIPING FROM THE INDOOR AIR HANDLER TO THE OUTDOORS, APPROXIMATELY AS SHOWN. EXACT ROUTING TO BE DETERMINED ON SITE BY THE CONTRACTOR. ALLOW FOR REMOVAL AND RE-INSTALLMENT OF DRYWALL CEILING/BULKHEAD AS REQUIRED FOR THE INSTALLATION OF NEW REFRIGERATION PIPING. CONNECT PIPING TO NEW OUTDOOR HEAT PUMPS. PROVIDE ALL REQUIRED REFRIGERANT ACCESSORIES. REFER TO M-6 FOR OUTDOOR UNIT LAYOUT.

PROVIDE DRAIN PIPING FOR AIR HANDLER COIL AS REQUIRED BY THE MANUFACTURER. INSTALLATION AND CONNECTION TO THE UNITS TO BE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATION WHICH WILL SUPERSEDE ANY DETAIL OR NOTES ON THIS DRAWINGS.

PROVIDE AND INSTALL NEW HEATING PUMP, CHEMICAL TREATMENT SYSTEM, AND MAIN HEATING PIPING APPROXIMATELY AS SHOWN. REFER TO PIPING SCHEMATIC.

PROVIDE NEW HEATING PIPING AND CONNECT TO NEW AIR HANDLER AS PER THE PIPING SCHEMATICS. PROVIDE AND INSTALL NEW 3-WAY CONTROL VALVE FOR EACH NEW AIR HANDLER.

INSULATE ALL NEW HEATING PIPING & REFRIGERANT PIPING, REFER TO SPECIFICATIONS FOR DETAILS.

PROVIDE ALL REQUIRED HANGERS AND SUPPORTS.
EXACT TIE IN POINTS FOR ALL NEW PIPING & DUCTWORK TO BE VERIFIED ON SITE BY THE CONTRACTOR.

PROVIDE AND INSTALL NEW DE-HUMIDIFIER UNIT AS PER EQUIPMENT SCHEDULE. CONNECT TO NEW AND EXISTING DUCTWORK, POWER, AND LOCAL CONTROLS.

PROVIDE AND INSTALL NEW SUMP PUMP AS NOTED ON THE DRAWINGS, AND AS PER THE PERFORMANCE VALUES LISTED IN THE MECHANICAL SCHEDULE.

PROVIDE NEW DISCHARGE PIPING FROM NEW PUMP AND RE-CONNECT TO EXISTING PIPING APPROXIMATELY AS SHOWN. CONTRACTOR TO VERIFY EXACT TIE-IN POINT ON SITE.

PROVIDE NEW SUMP PUMP CONTROLLER AND ALARM CONTROLLER AND WIRE NEW ITEMS TO THE RESPECTIVE PUMP.

PROVIDE NEW ACCESS DOORS AND FRAMES FOR EXISTING SUMP PUMP. ACCESS DOORS TO BE BARNES SERIES J-AL, OR SIMILAR.

PROVIDE NEW FLOATS APPROXIMATELY AS SHOWN ON EACH PIT DETAIL. CONNECT NEW FLOATS TO ALARM AND CONTROLLER OF NEW PUMP.

PROVIDE NEW GUIDE RAILS FOR EXISTING SUMP PIT. PROVIDE ADEQUATE SUPPORT BRACKETS FOR EACH NEW GUIDE RAIL.

GENERAL NOTES :

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2. ISSUED FOR TENDER	04/12/23
1. ISSUED FOR 75% REVIEW	27/10/23
No. REVISION	DD/MM/YY

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal



588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771



Project
BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE

Location
1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

Drawing Title
**BASEMENT FLOOR - EQUIPMENT,
DUCTWORK & PIPING LAYOUT - NEW
WORK - MECHANICAL**

Checked: O.S. Date: OCT 2023

Drawn: K.L. Scale: 1:50

File Number: 2023-66 Dwg Number: M-5

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

NEW WORK NOTES:

THE SIZES AND LOCATION OF PIPING, EQUIPMENT AND DUCTWORK SHOWN ON THE DRAWINGS WERE SITE MEASURED. MAKE ANY CHANGES REQUIRED TO SUIT THE ACTUAL SITE CONDITIONS AT NO COST TO THE CITY OF MISSISSAUGA.

PROVIDE NEW REFRIGERANT PIPES FROM THE HEAT PUMP UNIT TO THE NEW AIR HANDLING UNITS. FINAL ROUTING AND SIZE OF THE PIPES BE VERIFIED BY THE CONTRACTOR. PROVIDE ALL THE HANGERS AND SUPPORTS. PROVIDE FULL CHARGE OF REFRIGERANT. PROVIDE ALL REQUIRED REFRIGERANT PIPING ACCESSORIES AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

PROVIDE NEW FENCE TO CONCEAL CONDENSER UNITS AS PER CITY OF MISSISSAUGA'S REQUIREMENTS AND ENSURE CLEARANCE REQUIREMENTS OF UNITS ARE MET.

PROVIDE NEW THERMOSTATIC CONTROL VALVES AND SHUT OFF VALVES TO EXISTING RADIATOR. PAINT VALVES AND NEW PIPING TO MATCHING EXISTING COLOR.

AT THE COMPLETION OF THE WORK FILL THE ENTIRE SYSTEM, CLEAN AND PROVIDE THE REQUIRED CHEMICAL TREATMENT.

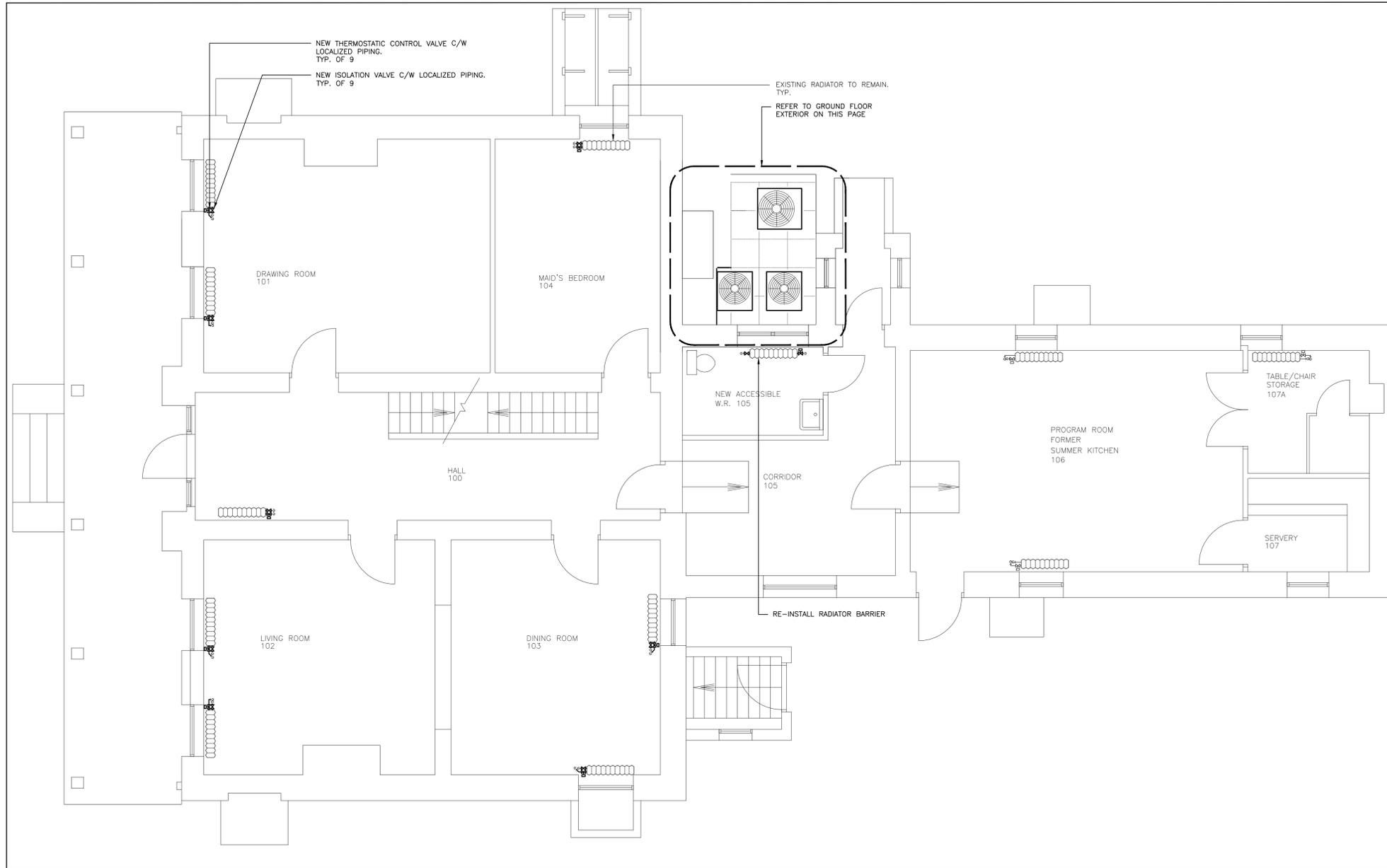
PROVIDE ADEQUATE SUPPORT FOR ALL NEW REFRIGERANT PIPING.

PROVIDE THE NECESSARY POWER SUPPLY TO THE NEW HEAT PUMP UNITS INCLUDING WIRING, CONDUITS AND LOCAL DISCONNECTS. MOUNT THE NEW ELECTRICAL DEVICES AS SHOWN ON THE ELECTRICAL DRAWINGS. MAINTAIN THE CODE-PRESCRIBED CLEARANCES. ALSO REFER TO THE ELECTRICAL DRAWINGS.

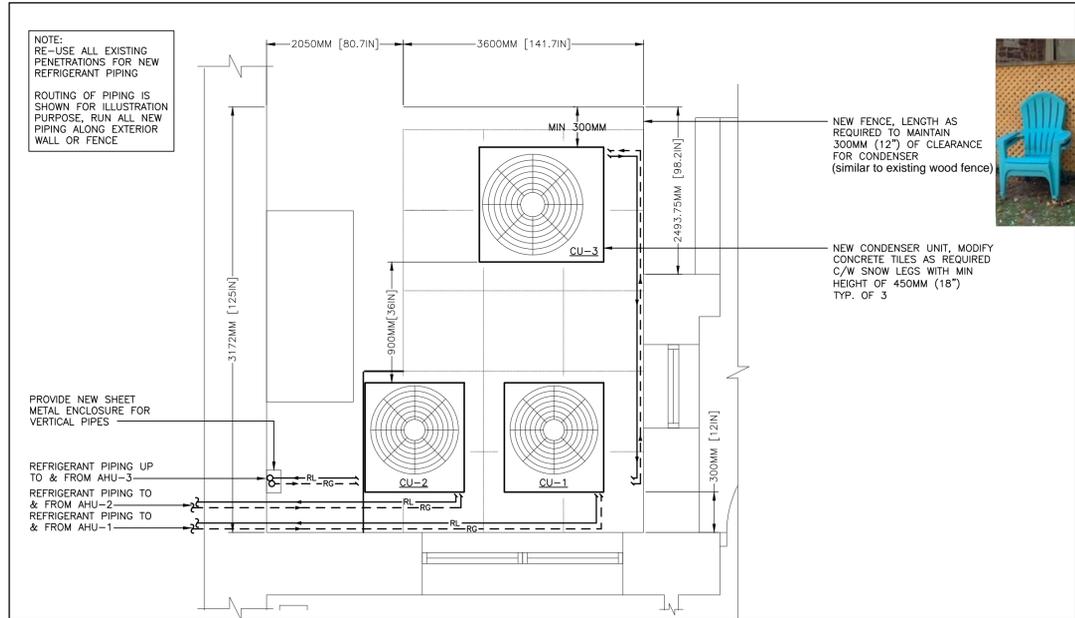
INSULATE ALL PIPES AS PER SPECIFICATIONS.

PROVIDE ALL REQUIRED HANGERS AND SUPPORTS.

PROVIDE NEW SHEET METAL ENCLOSURE FOR REFRIGERANT PIPES UP ALONG THE BUILDING'S EXTERIOR.



GROUND FLOOR INTERIOR – EQUIPMENT & PIPING LAYOUT – NEW WORK – MECHANICAL
SCALE: 1:50



GROUND FLOOR EXTERIOR – EQUIPMENT & PIPING LAYOUT – NEW WORK – MECHANICAL
SCALE: 1:25

2. ISSUED FOR TENDER	04/12/23
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SAB ENGINEERING Inc.

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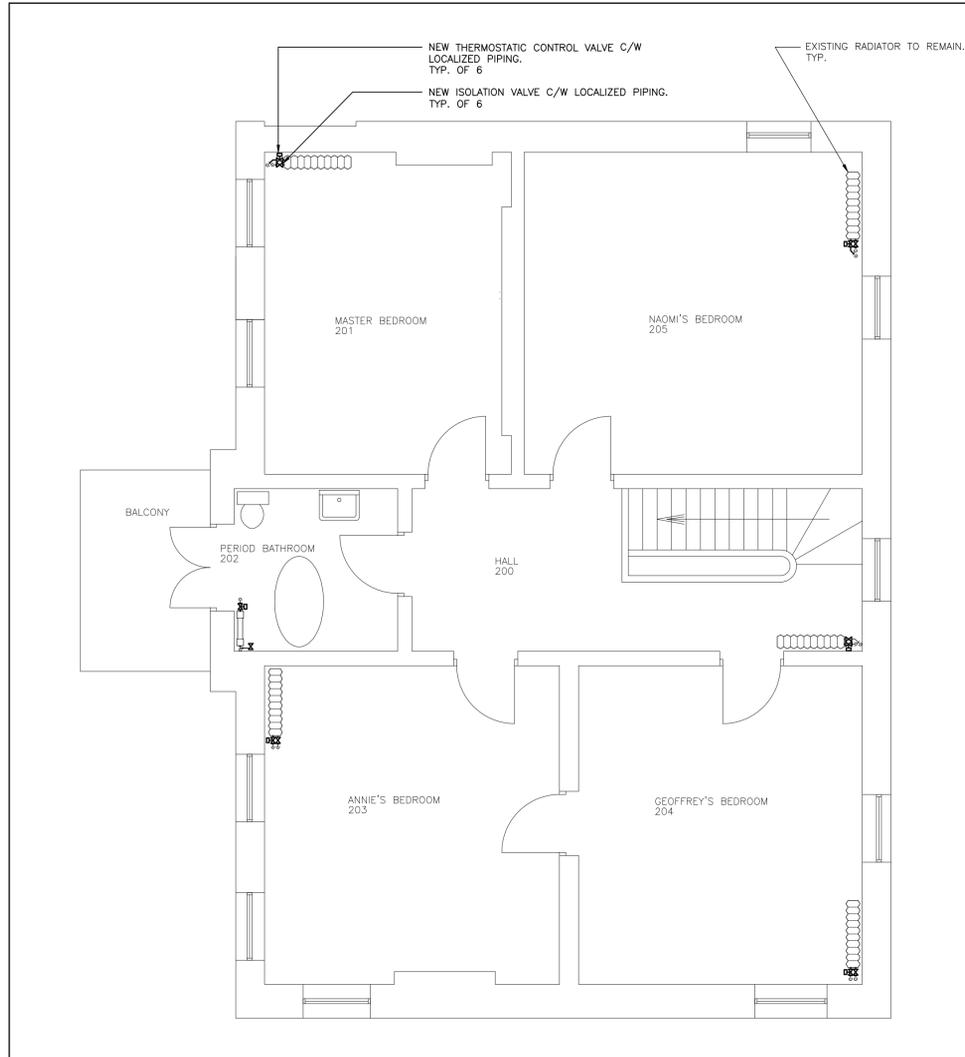


Project
**BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE**

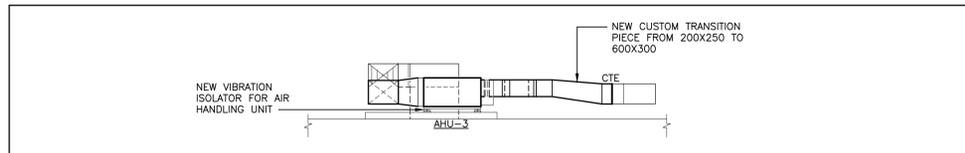
Location
1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

Drawing Title
**GROUND FLOOR - EQUIPMENT,
DUCTWORK & PIPING LAYOUT - NEW
WORK - MECHANICAL**

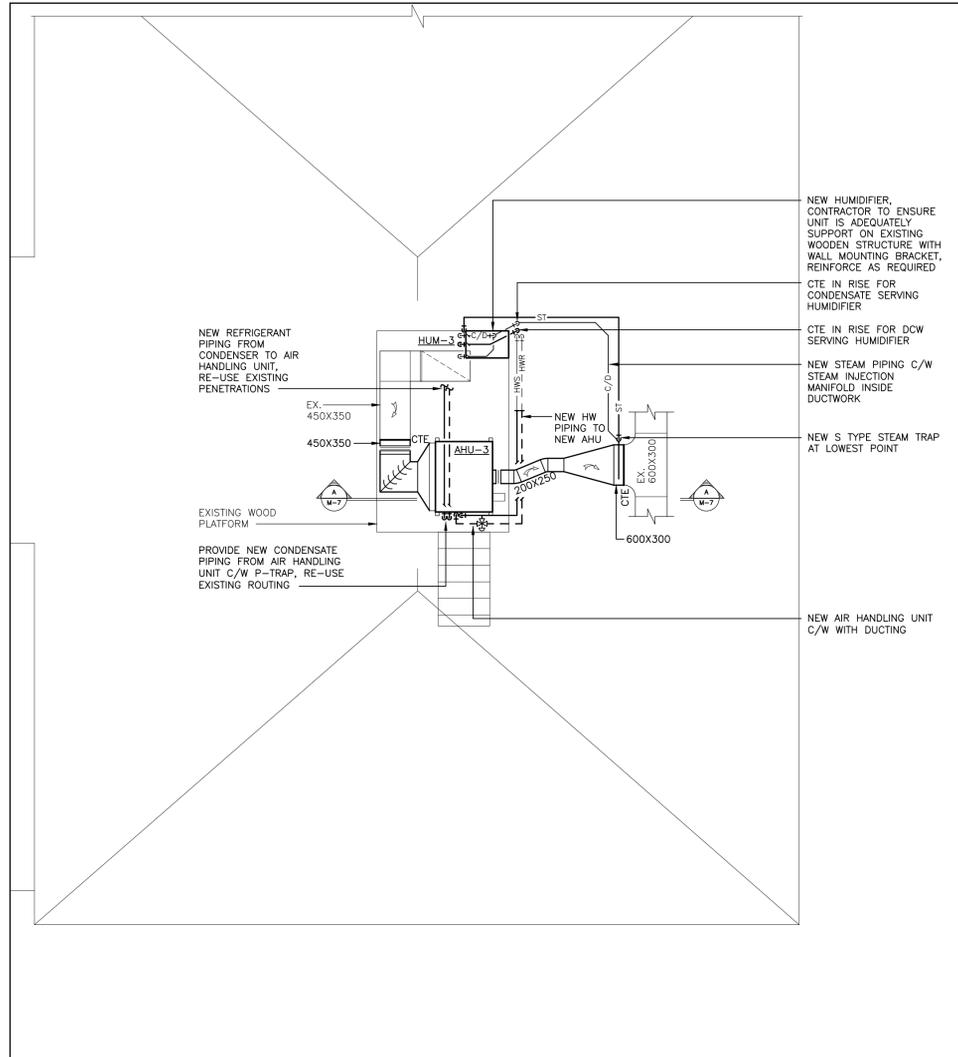
Checked: O.S.	Date: OCT 2023
Drawn: K.L.	Scale: 1:50
File Number: 2023-66	Dwg Number: M-6



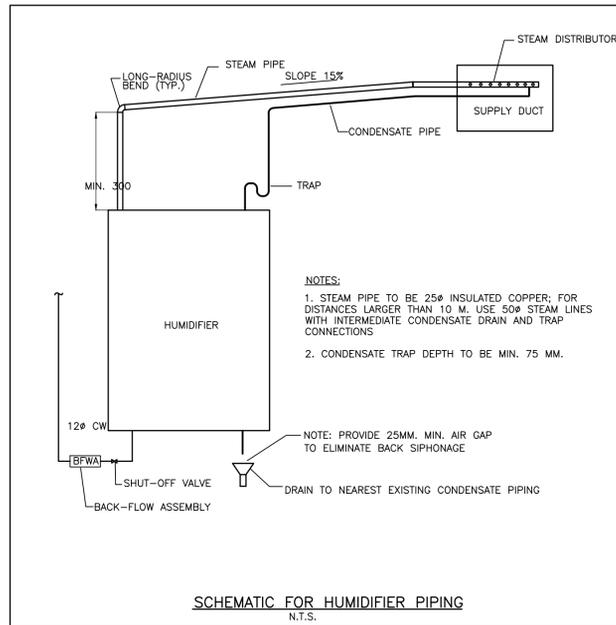
SECOND FLOOR - EQUIPMENT & PIPING LAYOUT - NEW WORK - MECHANICAL
SCALE: 1:50



SECTION 'A-A'
SCALE: 1:50



ATTIC - EQUIPMENT, DUCTWORK & PIPING LAYOUT - NEW WORK - MECHANICAL
SCALE: 1:50



SCHEMATIC FOR HUMIDIFIER PIPING
N.T.S.

NEW WORK NOTES:

- THE SIZES AND LOCATION OF PIPING, EQUIPMENT AND DUCTWORK SHOWN ON THE DRAWINGS WERE SITE MEASURED. MAKE ANY CHANGES REQUIRED TO SUIT THE ACTUAL SITE CONDITIONS AT NO COST TO THE CITY OF MISSISSAUGA.
- PROVIDE NEW CONTROL AND SHUT OFF VALVES TO EXISTING RADIATOR. PAINT VALVES AND NEW PIPING TO MATCHING EXISTING COLOR.
- AT THE COMPLETION OF THE WORK FILL THE ENTIRE SYSTEM, CLEAN AND PROVIDE THE REQUIRED CHEMICAL TREATMENT.
- PRIOR TO SHEET METAL FABRICATION, ALL EXISTING DIMENSIONS SHALL BE SITE VERIFIED. CONTRACTOR IS RESPONSIBLE FOR ALL SITE COORDINATION IN ORDER TO ENSURE EQUIPMENT, PIPING, DUCTWORK CAN BE INSTALLED WHILE MAINTAINING ALL REQUIRED CLEARANCES. SOME NEW DUCT DIMENSIONS AND NEW LAYOUT MAY NEED TO BE ADJUSTED FROM WHAT IS SHOWN ON THE DESIGN DRAWINGS. CONTRACTOR SHALL CARRY ALL COSTS ASSOCIATED WITH MODIFICATION/ADJUSTMENT OF NEW DUCTWORK AND PIPING LAYOUTS TO EXISTING DESIGN.
- PROVIDE AND INSTALL NEW AIR HANDLING UNITS APPROXIMATELY AS SHOWN AND AS PER THE PERFORMANCE LISTED IN THE EQUIPMENT SCHEDULE. AHU-3 SHALL BE INSTALLED ON EXISTING WOODEN PLATFORM. PROVIDE VIBRATION ISOLATORS AS PER SPECIFICATIONS. CONNECT NEW UNITS TO POWER AND CONTROLS. REFER TO ELECTRICAL DRAWINGS FOR DETAILED ELECTRICAL SCOPE.
- RE-CONNECT THE NEW AIR HANDLERS TO EXISTING SUPPLY AND RETURN DUCTWORK APPROXIMATELY AS SHOWN; MANUFACTURE SHEET METAL TRANSITIONS AS REQUIRED BY THE NEW SIZE AND LOCATION OF UNITS' OPENINGS AND NEW DUCTWORK LOCATION. PROVIDE FLEXIBLE DUCT CONNECTIONS AT INLETS AND OUTLETS.
- PROVIDE NEW REFRIGERANT PIPING APPROXIMATELY AS SHOWN. RUN NEW PIPING FROM THE INDOOR AIR HANDLER TO THE OUTDOORS, APPROXIMATELY AS SHOWN. EXACT ROUTING TO BE DETERMINED ON SITE BY THE CONTRACTOR. CONNECT PIPING TO NEW OUTDOOR HEAT PUMPS. PROVIDE ALL REQUIRED REFRIGERANT ACCESSORIES. REFER TO M-6 FOR OUTDOOR UNIT LAYOUT.
- PROVIDE DRAIN PIPING FOR AIR HANDLER COIL AS REQUIRED BY THE MANUFACTURER.
- INSTALLATION AND CONNECTION TO THE UNITS TO BE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATION WHICH WILL SUPERSEDE ANY DETAIL OR NOTES ON THIS DRAWINGS.
- PROVIDE NEW HEATING PIPING AND CONNECT TO NEW AIR HANDLER AS PER THE PIPING SCHEMATICS. PROVIDE AND INSTALL NEW 3-WAY CONTROL VALVE FOR EACH NEW AIR HANDLER.
- INSULATE ALL NEW HEATING PIPING, COLD WATER, STEAM, & REFRIGERANT PIPING. REFER TO SPECIFICATIONS FOR DETAILS.
- PROVIDE ALL REQUIRED HANGERS AND SUPPORTS.
- EXACT TIE IN POINTS FOR ALL NEW PIPING & DUCTWORK TO BE VERIFIED ON SITE BY THE CONTRACTOR.
- PROVIDE AND INSTALL NEW HUMIDIFIER UNIT AS PER EQUIPMENT SCHEDULE. CONNECT NEW HUMIDIFIER TO COLD WATER, STEAM, AND CONDENSATE PIPING. CONNECT TO POWER. REFER TO HUMIDIFIER DETAIL.
- PROVIDE NEW HEAT TRACING FOR ALL COLD WATER PIPING IN THE ATTIC SPACE.
- PROVIDE ALL THE DRAIN AND CONDENSATE PIPES FROM THE HUMIDIFIER AS NOTED AND AS REQUIRED BY THE MANUFACTURER.
- SLOPE ALL CONDENSATE PIPES AND INSULATE.
- ROUTING OF THE DOMESTIC COLD WATER SUPPLY AND DRAINS TO BE COORDINATED WITH EXISTING STRUCTURAL AND EXISTING SERVICES. FINAL ROUTING TO BE DETERMINED ON SITE.

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

2. ISSUED FOR TENDER	04/12/23
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No. REVISION	DD/MM/YY

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal



588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

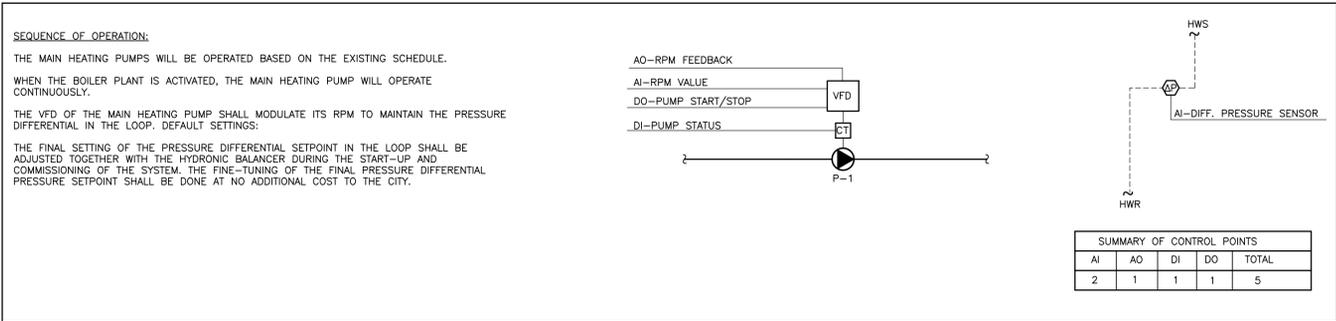


Project
BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE

Location
1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

Drawing Title
**SECOND FLOOR & ATTIC -
EQUIPMENT, DUCTWORK & PIPING
LAYOUT - NEW WORK - MECHANICAL**

Checked: O.S.	Date: OCT 2023
Drawn: K.L.	Scale: 1:50
File Number: 2023-66	Dwg Number: M-7

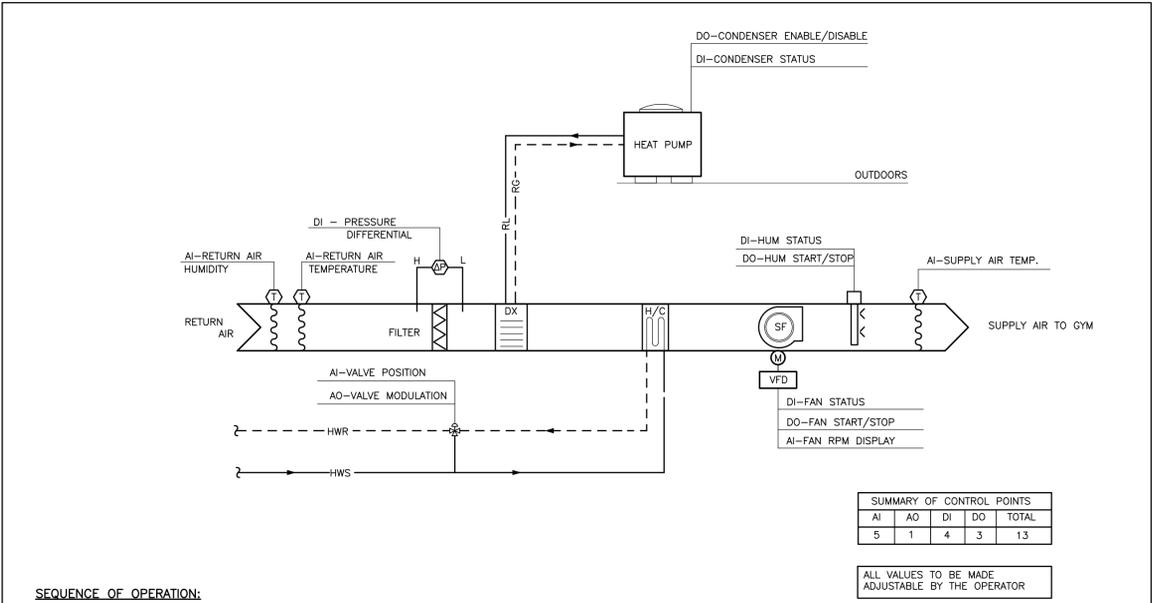


HEATING PUMPS CONTROL DIAGRAM
N.T.S.

NEW WORK NOTES:

BUILDING'S BAS SYSTEM SHALL BE A LOCAL SYSTEM. THERE IS NO CONNECTION TO THE CITY'S CENTRAL BAS NETWORK REQUIRED. GRAPHICS ARE NOT REQUIRED. GRAPHICS SHOWN ARE FOR INFORMATIONAL PURPOSES.

PROVIDE ALL REQUIRED SENSORS, CONTROLLERS, AND WIRING TO ACHIEVE THE CONTROL SEQUENCES AS NOTED.



SEQUENCE OF OPERATION:

HEATING AND COOLING MODES

THE AIR HANDLER & ASSOCIATED HEAT PUMP SHALL BE IN HEATING MODE WHEN THE HEATING PLANT IS ENABLED. AT ALL OTHER TIMES, THE AIR HANDLER SHALL BE IN COOLING MODE.

EQUIPMENT ON/OFF

THE AIR HANDLER SHALL BE ENABLED/DISABLED ON A SCHEDULE DETERMINED BY THE OWNER. WHEN DISABLED, THE SUPPLY AND RETURN FANS WILL STOP, THE 3-WAY MIXING VALVE SHALL TURN TO ITS DEFAULT POSITION.

EQUIPMENT ON HEATING MODE, OCCUPIED HOURS

THE SUPPLY FANS SHALL RUN CONTINUOUSLY.

IF THE OUTDOOR AIR TEMPERATURES IS > OR EQUAL TO 0°C FOR MORE THAN 15 MINUTES:

THE CONTROLLER SHALL MODULATE THE HEATING OUTPUT OF THE OUTDOOR HEAT PUMP AS REQUIRED TO MAINTAIN A RETURN AIR TEMPERATURE OF 22°C (ADJUSTABLE). THE 3-WAY CONTROL VALVE SHALL BE CLOSED TO THE COIL. THE HEAT PUMP SHALL RUN FOR A MINIMUM 5 MINUTES TO AVOID SHORT CYCLING.

IF THE OUTDOOR AIR TEMPERATURE IS < 0°C FOR MORE THAN 15 MINUTES:

THE OUTDOOR HEAT PUMP SHALL BE DISABLED. THE 3-WAY CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN A RETURN AIR TEMPERATURE OF 22°C (ADJUSTABLE).

EQUIPMENT ON HEATING MODE, UNOCCUPIED HOURS

AT THE BEGINNING OF THE UNOCCUPIED PERIOD, THE AIR HANDLER SHALL BE DISABLED.

EQUIPMENT ON COOLING MODE, OCCUPIED HOURS

THE SUPPLY FAN SHALL RUN CONTINUOUSLY.

WHEN ENABLED, THE HEAT PUMP UNIT SHALL MODULATE AND HAVE THE UNIT CONTROLLER OPERATE THE DX CIRCUITS AS REQUIRED TO MAINTAIN THE RETURN AIR AT 24°C SUBJECT TO A LOW LIMIT DISCHARGED AIR TEMPERATURE OF 12°C. STAGE MODULATION SHALL BE PROVIDED BY THE INTEGRAL CONTROLS OF THE UNIT, AS REQUIRED TO MAINTAIN THE TARGET SETPOINT. PROVIDE FEEDBACK TO BAS ON EACH STAGE STATUS.

EQUIPMENT ON COOLING MODE, UNOCCUPIED HOURS

DURING THE COOLING MODE UNOCCUPIED PERIODS, THE AIR HANDLER SHALL BE DISABLED.

HUMIDITY CONTROL

THE HUMIDITY IN THE RETURN AIR SHALL BE MAINTAINED AT THE CURRENT SET VALUE (45%) DURING HEATING PERIOD BY ENERGIZING THE HUMIDIFIER ASSOCIATED WITH EACH AIR HANDLER. THE HUMIDIFIER WILL MODULATE AS REQUIRED.

ALARMS

THE BAS SHALL GENERATE ALARMS IN CASE OF:

ANY FAN FAILURE;

AIR HANDLER CONTROL DIAGRAM
N.T.S.

GENERAL NOTES :

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No.	REVISION	DD/MM/YY

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588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771



Project
**BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE**

Location
1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

Drawing Title
CONTROL DIAGRAMS - MECHANICAL

Checked: O.S.	Date: OCT 2023
Drawn: K.L.	Scale: N.T.S.
File Number: 2023-66	Dwg Number: M-8

GENERAL NOTES :

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ELECTRICAL GENERAL NOTES

GENERAL

EXAMINE ARCHITECTURAL, STRUCTURAL AND MECHANICAL CONDITIONS AND AVAILABLE DRAWINGS BEFORE PROCEEDING WITH THE WORK. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS MUST BE REFERRED TO THE PRIME CONSULTANT BEFORE ANY AFFECTED WORK IS COMMENCED.

ALL MATERIALS USED THROUGHOUT SHALL BE NEW, OF BEST QUALITY CSA APPROVED AND OF ONE MANUFACTURER.

OBTAIN AND PAY FOR APPROVALS AND PERMITS FROM AUTHORITIES HAVING JURISDICTION.

PROVIDE ALL CONDUIT, WIRING, BOXES, SWITCHES, OUTLETS, DEVICES, ETC, AS REQUIRED. MAKE UP TO THE LAST 3 FT OF FINAL CONNECTIONS TO ROTATING EQUIPMENT WITH LIQUID TIGHT FLEXIBLE CONDUIT.

CONTRACTORS SHALL NOTE THAT THIS CONTRACT IS AN ALTERATION TO AN EXISTING BUILDING AND SHALL THOROUGHLY INVESTIGATE THE EXISTING ELECTRICAL INSTALLATION AND CONDITIONS. DEMOLITION, REMOVE POWER CONNECTIONS AS SHOWN ON DRAWINGS C/W CONDUIT AND WIRING TO SOURCE.

CONDUCTORS AND CABLES

CONDUCTORS AND CABLES SHALL BE IN ACCORDANCE WITH NEMA WC-70 AND AS SPECIFIED HEREIN.

CONDUCTORS SHALL BE ANNEALED COPPER, STRANDED FOR SIZES NO. 8 AWG AND LARGER, SOLID FOR SIZES NO. 10 AWG AND SMALLER. CONDUCTORS SHALL BE MINIMUM SIZE NO. 12 AWG, EXCEPT WHERE SMALLER SIZES ARE SPECIFICALLY SHOWN ON THE DRAWINGS. MINIMUM SIZE WIRING FOR DC WIRING SHALL BE #10 GAUGE.

ALL WIRING SHALL BE 600 VOLT TYPE RW90 AND RUN IN METALLIC CONDUIT EXCEPT WHERE ALLOWED IN FLEXIBLE LIQUID-TIGHT FLEXIBLE ENCLOSURE (SEE SECTION 15241). MAXIMUM VOLTAGE DROP SHALL NOT EXCEED 2%. PROVIDE GROUND WIRES WITH ALL FEEDERS AND BRANCH CIRCUITS IN ACCORDANCE WITH APPLICABLE CODES AND ONTARIO ELECTRICAL SAFETY CODE REQUIREMENTS. PROVIDE MAIN GROUND TO ESA APPROVAL.

INSULATION:

THHN-THWN SHALL BE IN ACCORDANCE WITH NEMA WC-70, UL 44, AND UL 83.

CONDUITS

ALL CONDUIT SHALL BE RIGID ALUMINUM (OUTDOORS) OR EMT THINWALL (INDOORS) WITH STEEL SET SCREW COUPLINGS AND CONNECTORS WITH INSULATED THROATS UNLESS OTHERWISE NOTED. RUN CONDUITS PARALLEL TO BUILDING LINES AND CONCENTRIC RIGHT ANGLE BENDS ONLY SHALL BE USED.

SEAL ALL PENETRATIONS THROUGH FLOOR SLABS WITH AN APPROVED NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT.

NEW CONDUIT HANGERS SHALL BE SUPPORTED FROM BUILDING STRUCTURE AND INDEPENDENTLY FROM OTHER EXISTING ELEMENTS SUCH AS DUCTWORK, CONDUITS, PIPING ETC.

POWER DISTRIBUTION SYSTEM

THE POWER DISTRIBUTION SYSTEM SHALL BE MODIFIED AS SHOWN ON THE PLANS AND AS HERINAFTER SPECIFIED. BREAKERS RATING SHALL MATCH EXISTING EQUIPMENT TO WHICH THEY ARE INSTALLED.

SPLICES AND JOINTS

IN ACCORDANCE WITH UL 486A, C, D, E, AND NEC.

CONNECTORS: SOLDERLESS, SCREW ON, REUSABLE PRESSURE CABLE TYPE, RATED 600 V, 220° F [105° C], WITH INTEGRAL INSULATION, APPROVED FOR COPPER CONDUCTORS. THE INTEGRAL INSULATOR SHALL HAVE A SKIRT TO COMPLETELY COVER THE STRIPPED WIRES. THE NUMBER, SIZE, AND COMBINATION OF CONDUCTORS, AS LISTED ON THE MANUFACTURER'S PACKAGING, SHALL BE STRICTLY FOLLOWED.

CONNECTORS SHALL BE INDENT, HEX SCREW, OR BOLT CLAMP TYPE OF HIGH CONDUCTIVITY AND CORROSION RESISTANT MATERIAL, LISTED FOR USE WITH COPPER AND ALUMINUM CONDUCTORS. FIELD-INSTALLED COMPRESSION CONNECTORS FOR CABLE SIZES 250 MCM AND LARGER SHALL HAVE NOT FEWER THAN TWO CLAMPING ELEMENTS OR COMPRESSION INDENTS PER WIRE.

INSULATE SPLICES AND JOINTS WITH MATERIALS APPROVED FOR THE PARTICULAR USE, LOCATION, VOLTAGE, AND TEMPERATURE. SPLICE AND JOINT INSULATION LEVEL SHALL BE NOT LESS THAN THE INSULATION LEVEL OF THE CONDUCTORS BEING JOINED. PLASTIC ELECTRICAL INSULATING TAPE: PER ASTM D2304, FLAME-RETARDANT, COLD AND WEATHER RESISTANT.

LOW VOLTAGE FUSED AND NON-FUSED DISCONNECT SWITCHES RATED 600 AMPERES AND LESS

IN ACCORDANCE WITH UL 98, NEMA KS1, AND NEC. SHALL HAVE NEMA CLASSIFICATION GENERAL DUTY (GD) FOR 240 V SWITCHES AND NEMA CLASSIFICATION HEAVY DUTY (HD) FOR 600 V SWITCHES. SHALL BE HP RATED.

LOCATE IN THE PROXIMITY OF THE EQUIPMENT SERVED, IN ACCORDANCE WITH NEC REQUIREMENTS.

SHALL HAVE THE FOLLOWING FEATURES:

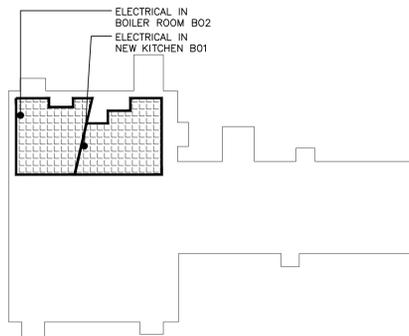
- SWITCH MECHANISM SHALL BE THE QUICK-MAKE, QUICK-BREAK TYPE.
- COPPER BLADES, VISIBLE IN THE OFF POSITION.
- AN ARC CHUTE FOR EACH POLE.
- EXTERNAL OPERATING HANDLE SHALL INDICATE ON AND OFF POSITION AND HAVE LOCK OPEN PADLOCKING PROVISIONS.
- MECHANICAL INTERLOCK SHALL PERMIT OPENING OF THE DOOR ONLY WHEN THE SWITCH IS IN THE OFF POSITION, DEFEATABLE TO PERMIT INSPECTION.
- FUSE HOLDERS FOR THE SIZES AND TYPES OF FUSES SPECIFIED (WHERE APPLICABLE).
- WHERE APPLICABLE, FUSIBLE DISCONNECT SWITCHES SHALL BE FURNISHED COMPLETE WITH FUSES. ARRANGE FUSES SUCH THAT RATING INFORMATION IS READABLE WITHOUT REMOVING THE FUSE.
- SOLID NEUTRAL FOR EACH SWITCH BEING INSTALLED IN A CIRCUIT WHICH INCLUDES A NEUTRAL CONDUCTOR.
- GROUND LUGS FOR EACH GROUND CONDUCTOR.

ENCLOSURES:

SHALL BE THE NEMA TYPES SHOWN ON THE DRAWINGS FOR THE SWITCHES. WHERE THE TYPES OF SWITCH ENCLOSURES ARE NOT SHOWN, THEY SHALL BE THE NEMA TYPES MOST SUITABLE FOR THE AMBIENT ENVIRONMENTAL CONDITIONS. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL OUTDOOR SWITCHES SHALL BE NEMA 3R. SHALL BE FINISHED WITH MANUFACTURER'S STANDARD GRAY BAKED ENAMEL PAINT OVER PRE-TREATED STEEL (FOR THE TYPE OF ENCLOSURE REQUIRED).

LEGEND

	DIRECT POWER OUTLET FOR USE AS NOTED INCLUDING FINAL CONNECTION.
	NON-FUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	COMBINATION MAGNETIC MOTOR STARTER WITH DISCONNECT SWITCH
	COMBINATION MAGNETIC MOTOR STARTER WITH DISCONNECT SWITCH & OVER CURRENT PROTECTION
	20A, 120V U-GROUND DUPLEX RECEPTACLE
	SINGLE PHASE TOGGLE SWITCH
	VARIABLE FREQUENCY DRIVE
EX	DENOTES EXISTING TO REMAIN
R	DENOTES EXISTING TO BE REMOVED ENTIRELY U.N.O.
N	DENOTES NEW EQUIPMENT/WIRING
GFI	DENOTES GROUND FAULT CIRCUIT INTERRUPTER
WP	DENOTES WEATHER PROOF



BASEMENT



KEY PLAN

N.T.S.

MECHANICAL EQUIPMENT WIRING SCHEDULE

EQUIPMENT DESCRIPTION	POWER SOURCE	STARTER TYPE	MCA/HP/ KW/AMP	VOLTS/PH/ FREQUENCY	BREAKER SIZE OR FUSE SIZE	FEEDER SIZE	REMARKS
AHU-1	PANEL #3	VFD	5.33 MCA	240/1/60	15A	3#AWG12+G-16mmC	PROVIDE NEW BREAKER FOR EACH AIR HANDLER UNIT IN THE NEW PANEL #3 LOCATED IN 'NEW KITCHEN B01'. ALL NEW WIRING TO BE IN METALLIC CONDUIT EXCEPT THE LAST 1,000MM WHICH SHALL BE FLEXIBLE METALLIC CONDUIT IN ACCORDANCE WITH SPECIFICATIONS. PROVIDE ALL NEW WIRING FROM PANEL TO NEW AIR HANDLERS VIA LOCAL DISCONNECT.
AHU-2	PANEL #3	VFD	5.33 MCA	240/1/60	15A	3#AWG12+G-16mmC	
AHU-3	PANEL #3	VFD	9.66 MCA	240/1/60	15A	3#AWG12+G-16mmC	
PUMP (P-1)	PANEL #3	VFD	1.5 HP	120/1/60	40A	2#AWG8+G-21mmC	PROVIDE NEW BREAKER FOR PUMP IN THE NEW PANEL #3 LOCATED IN 'NEW KITCHEN B01'. ALL NEW WIRING TO BE IN METALLIC CONDUIT EXCEPT THE LAST 1,000MM WHICH SHALL BE FLEXIBLE METALLIC CONDUIT IN ACCORDANCE WITH SPECIFICATIONS. PROVIDE ALL NEW WIRING FROM PANEL TO PUMP VIA NEW VFD.
SUMP PUMP (P-1)	PANEL #3	PUMP CONTROLLER	1 HP	120/1/60	20A	2#AWG10+G-21mmC	PROVIDE NEW BREAKER FOR SUMP PUMP CONTROLLER IN THE NEW PANEL #3 IN 'NEW KITCHEN B01'. NEW WIRES IN CONDUIT FROM THE DISCONNECT TO THE NEW PUMP CONTROLLER FOR PUMP. PROVIDE NEW WIRING FROM CONTROLLER TO NEW PUMP IN PIT. CONDUIT TO BE METALLIC EXCEPT FOR LAST 1,000MM WHICH SHALL BE IN FLEXIBLE LIQUID-TIGHT CONDUIT. PROVIDE NEW WIRES FOR THE FLOAT CONTROL FROM THE CONTROL PANEL TO THE FLOATS. PROVIDE NEW GFI 120V DUPLEX RECEPTACLE AND CONNECT SUMP PUMP'S POWER CORD.
DEHUMIDIFIER (DHU-1)	PANEL #3	INTEGRAL	14.4 AMP	240/1/60	30A	3#AWG10+G-21mmC	PROVIDE NEW BREAKER FOR DEHUMIDIFIER IN THE NEW PANEL #3 IN 'NEW KITCHEN B01'. ALL NEW WIRING TO BE IN METALLIC CONDUIT EXCEPT THE LAST 1,000MM WHICH SHALL BE FLEXIBLE METALLIC CONDUIT IN ACCORDANCE WITH SPECIFICATIONS. PROVIDE ALL NEW WIRING FROM PANEL TO NEW DEHUMIDIFIER VIA LOCAL DISCONNECT.
HUMIDIFIER (HU-3)	PANEL #3	INTEGRAL	8.5 AMP	240/1/60	15A	3#AWG12+G-16mmC	PROVIDE NEW BREAKER FOR DEHUMIDIFIER IN THE NEW PANEL #3 IN 'NEW KITCHEN B01'. ALL NEW WIRING TO BE IN METALLIC CONDUIT EXCEPT THE LAST 1,000MM WHICH SHALL BE FLEXIBLE METALLIC CONDUIT IN ACCORDANCE WITH SPECIFICATIONS. PROVIDE ALL NEW WIRING FROM PANEL TO HUMIDIFIER VIA LOCAL DISCONNECT.
HEAT PUMP #1 (CU-1)	PANEL #3	INTEGRAL	15 MCA	240/1/60	25A	3#AWG12+G-16mmC	PROVIDE NEW BREAKER FOR EACH CONDENSER IN THE NEW PANEL #3 LOCATED IN 'NEW KITCHEN B01'. ALL NEW WIRING TO BE IN METALLIC CONDUIT EXCEPT THE LAST 1,000MM WHICH SHALL BE FLEXIBLE METALLIC CONDUIT IN ACCORDANCE WITH SPECIFICATIONS. PROVIDE ALL NEW WIRING FROM PANEL TO NEW CONDENSERS VIA LOCAL WEATHERPROOF DISCONNECT.
HEAT PUMP #2 (CU-2)	PANEL #3	INTEGRAL	15 MCA	240/1/60	25A	3#AWG12+G-16mmC	
HEAT PUMP #3 (CU-3)	PANEL #3	INTEGRAL	18 MCA	240/1/60	30A	3#AWG10+G-21mmC	

NOTES:

1. PROVIDE CONNECTION TO ALL EQUIPMENT TO ENABLE FULL OPERATION. FOR LOCATION OF MECHANICAL EQUIPMENT REFER TO MECHANICAL LAYOUTS.
2. PROVIDE SEPARATE BREAKERS FOR INDIVIDUAL MECHANICAL EQUIPMENT. SIZE TO MATCH EQUIPMENT SCHEDULE DATA.
3. STARTER AND DISCONNECT LOCATIONS IN THE BOILER ROOM SHALL BE VERIFIED AND COORDINATED ON SITE. ALL MAGNETIC STARTER SHALL BE C/W OVERLOAD PROTECTION, H/O/A SWITCH AND GREEN-RUN AND RED-STOP PILOT LAMPS.
4. GROUND ALL EQUIPMENT IN ACCORDANCE WITH THE CODE REQUIREMENTS AND MANUFACTURER RECOMMENDATIONS.
5. PROVIDE NEW CONNECTIONS FOR NEW HVAC UNITS TO FIRE ALARM SYSTEM. UPGRADE EXISTING FIRE ALARM DEVICES AS REQUIRED.

2. ISSUED FOR TENDER	04/12/23
1. ISSUED FOR 75% REVIEW	27/10/23
No. REVISION	DD/MM/YY

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal



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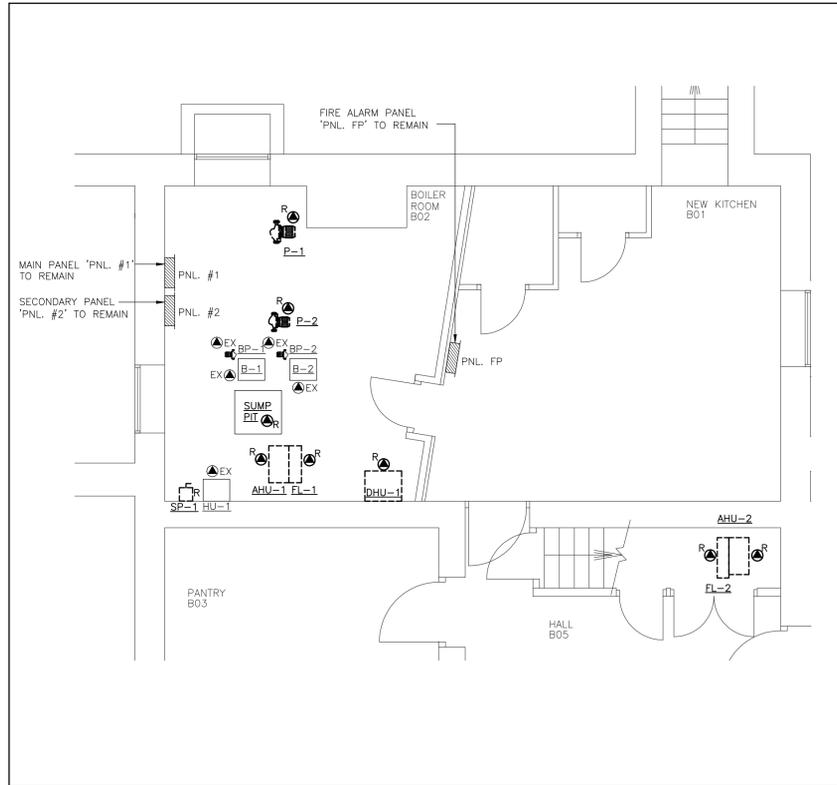


Project
BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE

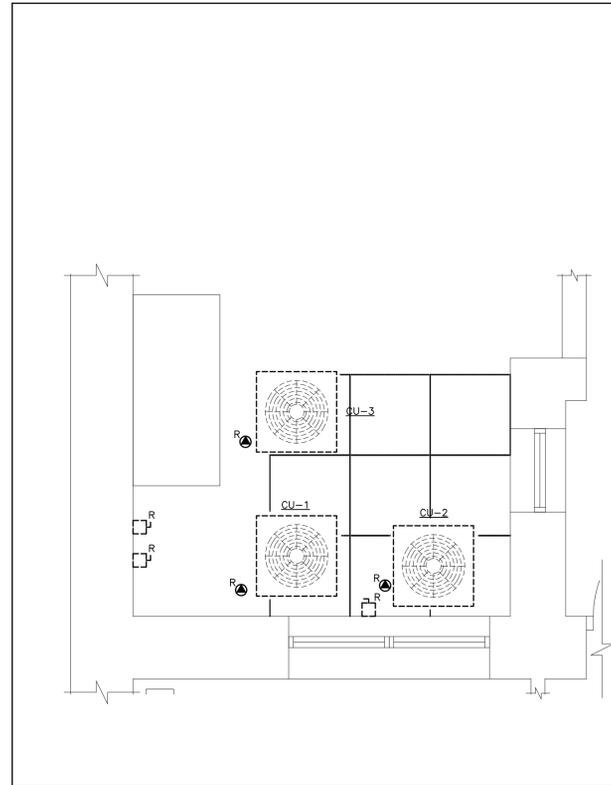
Location
1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

Drawing Title
KEY PLAN, SYMBOLS, EQUIPMENT
WIRING SCHEDULE & NOTES -
ELECTRICAL

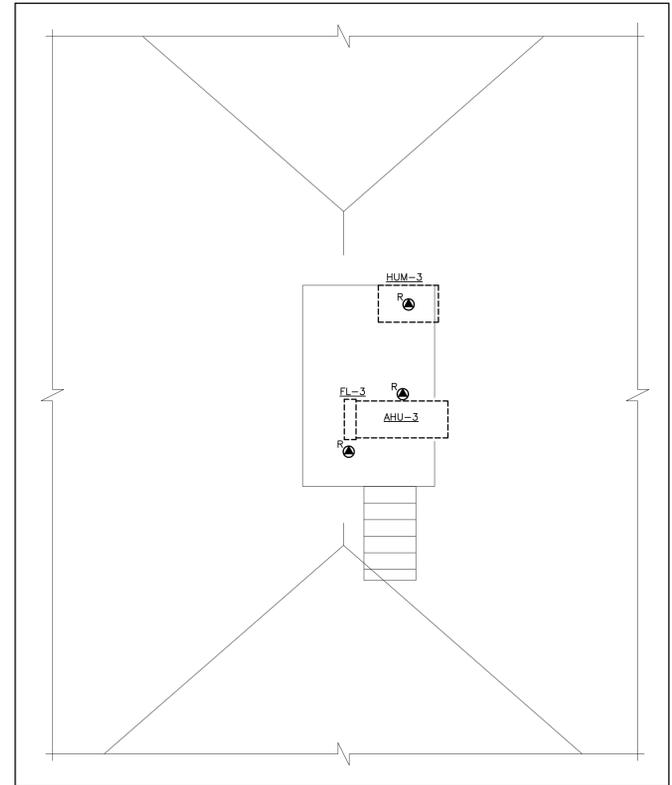
Checked: O.S.	Date: OCT 2023
Drawn: K.L.	Scale: N.T.S.
File Number: 2023-66	Dwg Number: E-1



BASEMENT FLOOR - EXISTING & DEMOLITION WORK - ELECTRICAL
SCALE: 1:50



GROUND FLOOR EXTERIOR - EXISTING & DEMOLITION WORK - ELECTRICAL
SCALE: 1:25



ATTIC - EXISTING & DEMOLITION WORK - ELECTRICAL
SCALE: 1:50

DEMOLITION NOTES:
THESE NOTES SHALL BE READ IN CONJUNCTION WITH, AND SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS.
DISCONNECT EXISTING EQUIPMENT FROM POWER APPROXIMATELY AS NOTED. REMOVE ALL WIRING BACK TO THE SOURCE AND MAKE SAFE ALL REDUNDANT WIRING.
REMOVE ALL REDUNDANT HANGERS & SUPPORTS.
REMOVE EXISTING CIRCUIT BREAKERS FROM EXISTING PANELS APPROXIMATELY AS SHOWN. CONTRACTOR TO MAINTAIN CIRCUITS FROM EQUIPMENT THAT IS NOT BEING REMOVED.
REMOVE ALL DISCONNECTS, PUMP CONTROLLERS/STARTERS APPROXIMATELY AS SHOWN.

GENERAL NOTES :

CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THE ENGINEER SHALL BE INFORMED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. DO NOT SCALE DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION. THIS DRAWING IS THE PROPERTY OF SAB ENGINEERING INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCTION CARRIES THEIR NAME. ALL INFORMATION SHOWN ON THIS DRAWING IS FOR USE ON THE SPECIFIED PROJECT ONLY AND SHALL NOT BE USED OTHERWISE WITHOUT WRITTEN PERMISSION OF SAB ENGINEERING INC.

2. ISSUED FOR TENDER	04/12/23
1. ISSUED FOR 75% REVIEW	27/10/23
No. REVISION	DD/MM/YY

Contractors shall verify all dimensions at the job.

North Arrow

Professional Seal

SAB ENGINEERING Inc.

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Project
**BENARES HISTORIC HOUSE
HVAC SYSTEM UPGRADE**

Location
1507 CLARKSON RD N,
MISSISSAUGA, ON L5J 2W8

Drawing Title
**EQUIPMENT LAYOUT - EXISTING &
DEMOLITION - ELECTRICAL**

Checked: O.S.	Date: OCT 2023
Drawn: K.L.	Scale: 1:50
File Number: 2023-66	Dwg Number: E-2

PANEL #2		TYPE: MAINS: 120V/240V, 1PH, 3W		MOUNTING: EXISTING	
120V/240V, 1PH, 3W		125 A		LOCATION: BOILER ROOM	
WATTS	DESCRIPTION	PROT.	CIRCUITS	PROT.	DESCRIPTION
	AIR CLEANER #1	15A	1	2	
	OUTSIDE AC	20A	2	40A	EXISTING STOVE
	ALARM SYSTEM	15A	3	4	
	OUTSIDE AC MAIN FL SOUTH	20A	5	15A	WINDOW PLUG
			6	15A	FIRE PLUG
			7	15A	EXISTING
			8	15A	EXISTING
	OUTSIDE AC	30A	9	15A	EXISTING
			10	15A	EXISTING
			11	15A	BASEMENT DISHWASH
	HUMIDIFIER NORTECH	20A	13	14	40A DISHWASHER
	PANTRY LIGHT	15A	15	16	
	EXISTING	15A	17	18	15A AIR CLEANER #2
	M. FL WASH FAN	15A	19	20	15A AIR CLEANER #2
	FRIDGE BASEMENT	15A	21	22	15A PLUG SERVERY
	SPLIT FLUE	15A	23	24	15A SPARE
	BASEMENT	15A	25	26	20A SERVERY FORCED FLOW HEATER
	MICROWAVE BASEMENT	15A	27	28	
	SPLIT BASEMENT	15A	29	30	15A PROGRAM ROOM LIGHTS
			31	32	15A HEAT TRACING SERVERY
			33	34	15A SPLIT SERVERY PLUG
			35	36	15A SPLIT SERVERY PLUG
	UNDER FRONT PORCH REC	50A	37	38	15A SPLIT SERVERY PLUG
			39	40	

** CONTRACTOR TO VERIFY POWER SOURCE PRIOR DEMOLISHING EQUIPMENT

PANEL #1		TYPE: MAINS: 120V/240V, 1PH, 3W		MOUNTING: EXISTING	
120V/240V, 1PH, 3W		200 A		LOCATION: BOILER ROOM	
WATTS	DESCRIPTION	PROT.	CIRCUITS	PROT.	DESCRIPTION
REMOVE	SUMP PUMP SP-1	15A	1	2	
REMOVE	SPARE	15A	3	4	20A HUMIDIFIER 2
REMOVE	BOILER B-1	15A	5	6	
REMOVE	2ND FLOOR PLUGS	15A	7	8	15A PUMP P-1
REMOVE			9	10	30A HOT WATER TANK
REMOVE			11	12	15A WASHER
REMOVE	OUTSIDE SHED LIGHTS	20A	13	14	15A DEHUMIDIFIERS
REMOVE			15	16	15A SPARE
REMOVE	GROUND FLOOR PLUGS	15A	17	18	15A EXISTING
REMOVE	AHU-3	15A	19	20	20A DEHUMIDIFIER DHU-1
REMOVE	2ND FLOOR PLUGS	15A	21	22	15A 2ND FLOOR LIGHTING
REMOVE	GRD. FLOOR PLUGS	15A	23	24	15A FIRE PUMP COMPRESSOR
REMOVE	AHU-1	15A	25	26	15A EXISTING
REMOVE	BASEMENT PLUGS	15A	27	28	20A EXISTING
REMOVE			29	30	15A AIR CLEANER #3
REMOVE	GRD. FLOOR PLUG	15A	31	32	15A OUTDOOR LIGHTS
REMOVE	OUTSIDE PLUG	15A	33	34	15A PUMP P-2
REMOVE	2ND FL. PLUGS	15A	35	36	15A AHU-2
REMOVE	2ND FL. PLUGS	15A	37	38	15A SPLIT PLUG KITCHEN
REMOVE	EMERGENCY BATTERY UNIT & GRD. FLOOR PLUGS	15A	39	40	15A HUMIDIFIER HUM-3
REMOVE	HEAT CONTROL PANEL	15A	41	42	
REMOVE	BASEMENT PLUGS	15A	43	44	
REMOVE	EXISTING	15A	45	46	
REMOVE	FIRE ALARM PANEL	-	47	48	
REMOVE	PANEL #2	100A	49	50	
REMOVE	SPLIT PLUG KITCHEN	15A	51	52	
REMOVE	HEAT TRACING ATTIC	15A	53	54	
REMOVE	OUTSIDE LIGHTS	20A	55	56	

REMOVE 100A BREAKER AND REPLACE WITH 80A. REFER TO NEW WORK.

** CONTRACTOR TO VERIFY POWER SOURCE PRIOR DEMOLISHING EQUIPMENT

