MOVE CONSOLIDATION
INTERIOR RENOVATION
GR, 8TH, 9TH, 10TH & 11TH FLOORS

Centre for Addiction and Mental Health
Centre de toxicomanie et de santé mentale

CAMH AT 250 COLLEGE ST.

250 COLLEGE STREET
TORONTO, ON M5T 1R8

CONTENT	ISSUED FOR	DATE	FILE No.
MECHANICAL DRAWINGS	ISSUED FOR TENDER	AUGUST 4, 2023	GPY-27135

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MECHANICAL CONSULTING ENGINEERS
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GPY + Associates Engineering Inc.

LEGEND – HVAC

SYMBOL	DESCRIPTION
	NEW SUPPLY AIR DUCT
	SUPPLY AIR DUCT UP
	SUPPLY AIR DUCT DOWN
	RETURN/EXHAUST AIR DUCT UP
	RETURN/EXHAUST AIR DUCT DOWN.
	ROUND DUCT UP
	ROUND DUCT DOWN
	ACCOUSTICALLY LINED DUCTWORK
	SILENCER
	FLEXIBLE DUCT CONNECTION
	FLEXIBLE DUCT COMPLETE WITH SPIN–ON
	SQUARE SUPPLY AIR DIFFUSER
	ROUND SUPPLY AIR DIFFUSER
	RETURN OR EXHAUST AIR DIFFUSER
	LINEAR DIFFUSER
	SIDEWALL GRILLE
U/C	UNDERCUT
V/D	VOLUME DAMPER
B/D	BACKDRAFT DAMPER
M/D	MOTORIZED DAMPER
F/D	FIRE DAMPER
F.S/D	FIRE/SMOKE DAMPER
Ⓣ	THERMOSTAT
T	TEMPERATURE SENSOR
Ⓗ	HUMIDISTAT
H	HUMIDITY SENSOR
■	STARTER
	DIFFUSER OR GRILLE SIZE TYPE AIR QUANTITY
	MAXIMUM AIR QUANTITY BOX SIZE (VAV) MINIMUM AIR QUANTITY
	TYPE (RADIATION) SIZE (RADIATION) CAPACITY
	TURNING VANES
	VOLUME EXTRACTOR

LEGEND – PLUMBING

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
G	GAS		BACKWATER VALVE
G	GAS (HIGH PRESSURE)	CO CO	CLEANOUT
	PIPE ANCHOR	V	VENT
	EXPANSION JOINT	○ VTR VTR	VENT THRU ROOF
	PIPE GUIDE	–	DOMESTIC COLD WATER
	PUMP	T	TEMPERED WATER
	GATE VALVE	NFWH	NON–FREEZE WALL HYDRANT
	GLOBE VALVE	HB	HOSE BIBB
	BUTTERFLY VALVE	□ ○ FD	FLOOR DRAIN
	BALL VALVE	FFD	FUNNEL FLOOR DRAIN
	PLUG VALVE	HD	HUB DRAIN
	DRAIN COCK	SD	SCUPPER DRAIN
	CHECK VALVE	○ RD	ROOF DRAIN
	PRESSURE REDUCING VALVE		UNION
	PRESSURE RELIEF VALVE		CAPPED CONNECTION
	TWO–WAY CONTROL VALVE		PIPE UP, PIPE DOWN
	CIRCUIT BALANCING VALVE		TOP RUNOUT CONNECTION
	THREE–WAY CONTROL VALVE		BOTTOM RUNOUT CONNECTION
	STRAINER	ST	BURIED STORM
	THERMOMETER	ST	STORM (P.ST. DENOTES PUMPED STORM)
	BACKWATER VALVE		BURIED SANITARY
CO CO	CLEANOUT		SANITARY (P.SAN. DENOTES PUMPED SANITARY)
V	VENT		TRAP
○ VTR VTR	VENT THRU ROOF	CO	RUNNING TRAP
–	DOMESTIC COLD WATER	DCW LZ	DOMESTIC COLD WATER LOW ZONE
T	TEMPERED WATER	DHW LZ	DOMESTIC HOT WATER LOW ZONE
NFWH	NON–FREEZE WALL HYDRANT	DHW RECIRC. LZ	DOMESTIC HOT WATER RECIRCULATION LOW ZONE
HB	HOSE BIBB	DCW HZ	DOMESTIC COLD WATER LOW ZONE
□ ○ FD	FLOOR DRAIN	DHW HZ	DOMESTIC HOT WATER LOW ZONE
FFD	FUNNEL FLOOR DRAIN	DHW RECIRC. HZ	DOMESTIC HOT WATER RECIRCULATION HIGH ZONE
HD	HUB DRAIN		
SD	SCUPPER DRAIN		
○ RD	ROOF DRAIN		

LEGEND – HYDRONIC

SYMBOL	DESCRIPTION
T	TEMPERAUTRE WELL
	FLOW MEASURING DEVICE
	UNION
	CAPPED CONNECTION
	AIR VENT
	PIPE UP, PIPE DOWN
	TOP RUNOUT CONNECTION
	BOTTOM RUNOUT CONNECTION
ST	BURIED STORM
ST	STORM (P.ST. DENOTES PUMPED STORM)
	BURIED SANITARY
	SANITARY (P.SAN. DENOTES PUMPED SANITARY)
	TRAP
CO	RUNNING TRAP
DCW LZ	DOMESTIC COLD WATER LOW ZONE
DHW LZ	DOMESTIC HOT WATER LOW ZONE
DHW RECIRC. LZ	DOMESTIC HOT WATER RECIRCULATION LOW ZONE
DCW HZ	DOMESTIC COLD WATER LOW ZONE
DHW HZ	DOMESTIC HOT WATER LOW ZONE
DHW RECIRC. HZ	DOMESTIC HOT WATER RECIRCULATION HIGH ZONE
HS	HEATING SUPPLY
HR	HEATING RETURN
C	CONDENSATE

LEGEND – FIRE PROTECTION

SYMBOL	DESCRIPTION
▼	SIDEWALL SPRINKLER HEAD
▽	SIDEWALL SPRINKLER HEAD (DRY TYPE)
▽ EX	SIDEWALL SPRINKLER HEAD (EXTENDED COVERAGE)
⊙	PENDENT CONCEALED SPRINKLER HEAD
SP	SPRINKLER LINE
F	FIRE STANDPIPE
	SIAMESE CONNECTION
	FIRE HYDRANT
F.E. / F.E.	FIRE EXTINGUISHER / FIRE EXTINGUISHER AND RECESSED CABINET
SV–	SUPERVISED VALVE
FS–	FLOW SWITCH
PS–	PRESSURE SWITCH
	WET ALARM VALVE COMPLETE WITH TRIM
○	UPRIGHT SPRINKLER HEAD
●	PENDENT SPRINKLER HEAD
	PENDENT SPRINKLER HEAD (DRY TYPE)

LEGEND – MOTOR CONTROL

SYMBOL	DESCRIPTION
	FUSE
	TRANSFORMER
	GROUND
	NORMALLY CLOSED CONTACT
	NORMALLY OPEN CONTACT
	MOMENTARY CONTACT SWITCH NORMALLY CLOSED
	MOMENTARY CONTACT SWITCH NORMALLY OPEN
'HAND' 'OFF' 'AUTO'	HAND–OFF–AUTO SELECTOR SWITCH
□	INDICATES REMOTE CONNECTION
O/L	OVERLOAD
BAS	BUILDING AUTOMATION SYSTEM
FA	FIRE ALARM
FR	FIRE ALARM FAN SHUTDOWN RELAY
PS	PRESSURE SWITCH
PD	PRESSURE DIFFERENTIAL SWITCH
DES	DAMPER END SWITCH
HL	HIGH LIMIT TEMPERATURE DETECTOR
LL	LOW LIMIT TEMPERATURE DETECTOR
T	THERMOSTAT

LEGEND – EMCS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
D	DAMPER OPERATOR	AO	ANALOG OUTPUT
LL	LOW LIMIT THERMOSTAT	AI	ANALOG INPUT
HL	HIGH LIMIT THERMOSTAT	DI	DIGITAL INPUT
PS	PRESSURE SWITCH	DO	DIGITAL OUTPUT
PS	TEMPERATURE SENSOR	T	TEMPERATURE SENSOR
	CONTROL DAMPER	T	TEMPERATURE SENSOR WITH WELL
VSC	PUMP WITH VARIABLE SPEED CONTROLLER		DIFFERENTIAL PRESSURE SENSOR (WATER)
		NO	NORMALLY OPEN
WF -- BTU	RADIATOR TAG	NC	NORMALLY CLOSED
		SF	SUPPLY FAN
CHU–	CHU TAG	RF	RETURN FAN
RH–	REHEAT COIL TAG	EF	EXHAUST FAN
			FAN
		H C	HEATING COIL
		C C	COOLING COIL
			FILTER

CONVERSION TABLE – METRIC/IMPERIAL (SOFT CONVERSION 1"=25mm)

INCHES (")	MILLIMETERS (mm)	INCHES (")	MILLIMETERS (mm)	INCHES (")	MILLIMETERS (mm)	INCHES (")	MILLIMETERS (mm)	INCHES (")	MILLIMETERS (mm)
1/2	12	11	275	44	1100	78	1950	112	2800
5/8	15	12	300	46	1150	80	2000	114	2850
3/4	20	14	350	48	1200	82	2050	116	2900
1	25	16	400	50	1250	84	2100	118	2950
1–1/4	32	18	450	52	1300	86	2150	120	3000
1–1/2	40	20	500	54	1350	88	2200	122	3050
2	50	22	550	56	1400	90	2250	124	3100
2–1/2	65	24	600	58	1450	92	2300	126	3150
3	75	26	650	60	1500	94	2350	128	3200
3–1/2	90	28	700	62	1550	96	2400	130	3250
4	100	30	750	64	1600	98	2450	132	3300
5	125	32	800	66	1650	100	2500	134	3350
6	150	34	850	68	1700	102	2550	136	3400
7	175	36	900	70	1750	104	2600	138	3450
8	200	38	950	72	1800	106	2650	140	3500
9	225	40	1000	74	1850	108	2700	142	3550
10	250	42	1050	76	1900	110	2750	144	3600

DRAWING LIST

DRAWING NO.	DESCRIPTION	SCALE	ISSUED FOR PERMIT	ISSUED FOR PRICING	ISSUED FOR TENDER
	COVER SHEET				
M–100	MECHANICAL LEGEND & DRAWING LIST	N.T.S.	●	●	●
M–101	MECHANICAL SPECIFICATION	N.T.S.	●	●	●
M–102	MECHANICAL DETAILS & EQUIPMENT SCHEDULES	N.T.S.	●	●	●
M–103	MECHANICAL DETAILS & EQUIPMENT SCHEDULES	N.T.S.	●	●	●
M–104	VRF SYSTEM REFRIGERANT PIPING & CONTROL SCHEMATIC	N.T.S.	●	●	●
M–200	MECHANICAL PLAN – GROUND NORTH PLAN	1/8" – 1'–0"	●	●	●
M–201	MECHANICAL PLAN – GROUND SOUTH PLAN	1/8" – 1'–0"	●	●	●
M–202	MECHANICAL DEMOLITION PLAN – 8TH FLOOR PLANS	1/8" – 1'–0"	●	●	●
M–203	MECHANICAL DEMOLITION PLAN – 8TH & 10TH FLOOR PLANS	1/8" – 1'–0"	●	●	●
M–300	MECHANICAL NEW PLAN – 8TH & 9TH FLOOR PLANS	1/8" – 1'–0"	●	●	●
M–301	MECHANICAL NEW PLAN – 10TH & 11TH FLOOR PLANS	1/8" – 1'–0"	●	●	●
M–302	ROOF PLAN & PENTHOUSE PLAN	1/8" – 1'–0"	●	●	●

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NO	ACTION	DY MO YR
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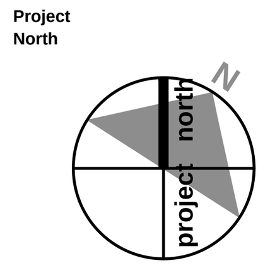
1	ISSUED FOR TENDER	2023-08-08

Client:
CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:
CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

Sheet Title:
MECHANICAL LEGEND & DRAWING LIST

Project North


Stamp
LICENSED PROFESSIONAL ENGINEER
G.P. YOUDELIS
08.08.23
PROVINCE OF ONTARIO

Date: DEC 2022
Project No.: 25136
Scale: N.T.S.
Drawn: K.J
Checked: G.P.Y

Drawing Number:
M-100

MECHANICAL SPECIFICATIONS

1. GENERAL

1.1. COMPLETE THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE LATEST EDITIONS OF THE ONTARIO BUILDING CODE, ONTARIO FIRE CODE, C.S.A. STANDARDS, U.L.C., N.F.P.A., O.S.H.A. AND OTHER CODES AS REQUIRED.

1.2. WHEREVER THE WORDS "PROVIDE" OR "SUPPLY AND INSTALL" ARE USED, IT SHALL BE UNDERSTOOD TO MEAN "PROVIDE AND INSTALL, INCLUSIVE OF ALL LABOUR, MATERIALS, INSTALLATION, TESTING, AND CONNECTIONS" FOR THE ITEM TO WHICH IT REFERENCES.

1.3. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, C.S.A. CERTIFIED AND MANUFACTURED TO THE STANDARDS SPECIFIED.

1.4. MAKE SITE VISIT(S) AS NECESSARY BEFORE TENDER TO ESTABLISH AND VERIFY ALL EXISTING CONDITIONS. MAKE ALLOWANCE FOR ANY NEW OR EXISTING SERVICE AND EQUIPMENT RELOCATIONS NECESSARY TO COMPLETE THE WORK AND INCLUDE IN THE TENDER PRICE. NO CLAIM FOR EXTRA PAYMENT SHALL BE MADE FOR EXISTING WORK MADE NECESSARY BY CIRCUMSTANCES ENCOUNTERED DUE TO CONDITIONS WHICH WERE VISIBLE UPON, OR REASONABLY INFERABLE FROM AN EXAMINATION OF THE SITE PRIOR TO SUBMISSION OF THE BID.

1.5. THE DRAWINGS FOR THE MECHANICAL WORK ARE DIAGRAMMATIC PERFORMANCE DRAWINGS ONLY, INTENDED TO SHOW THE GENERAL INTENT OF THE WORK, NOT THE DETAILS OF INSTALLATION. CO-ORDINATE THE ROUTING AND INSTALLATION OF ALL MECHANICAL SERVICES WITH ALL EXISTING CONDITIONS, STRUCTURE AND THE WORK OF ALL OTHER TRADES.

1.6. PROVIDE SLEEVING DRAWINGS SHOWING ALL OPENINGS IN THE STRUCTURE WITH ALL REQUIRED DIMENSIONS.

1.7. PROVIDE INSTALLATION DRAWINGS OF ALL WORK WITH DIMENSIONS, DRAWN TO SCALE AND CO-ORDINATED WITH ALL TRADES AND DIVISIONS. SHOW ALL REQUIREMENTS FOR EQUIPMENT INSTALLED, AREA ACCESS, CLEARANCES AND CONNECTIONS BY OTHER TRADES.

1.8. PROVIDE STRUCTURAL LOADS WITH ALL DETAILS NECESSARY FROM INSTALLATION OF INSERTS AND ALL CONCRETE CONSTRUCTION ITEMS INCLUDING PADS, CURBS, SILLS, BASINS, ANCHORS, INSERTS ETC.

1.9. DO NOT SCALE MECHANICAL DRAWINGS. REFER TO ARCHITECTURAL OR INTERIOR DESIGN DRAWINGS FOR THE EXACT LOCATION OF ANY DEVICES, FIXTURES, ETC. OBTAIN ALL SITE DIMENSIONS FROM SITE MEASUREMENTS.

1.10. MAKE APPLICATION, PROVIDE, OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND INSPECTIONS.

1.11. ENSURE THAT FEDERAL TAXES ARE INCLUDED WHERE REQUIRED, H.S.T. TO BE SHOWN AS EXTRA.

1.12. PROVIDE A COMPLETE ITEMIZED BREAKDOWN OF MATERIAL, LABOUR, OVERHEAD, PROFIT, ETC. WHEN SUBMITTING QUOTATIONS FOR CHANGE NOTICES ON THIS PROJECT. THE HOURLY LABOUR RATE SHALL BE INCLUSIVE OF ALL CHARGES FOR SUPERVISION, VARIABLE LABOUR FACTORS, HAND TOOLS, PAYROLL BURDENS, HEIGHT FACTORS, WARRANTIES, STORAGE, RENTALS, ADDITIONAL BONDING, PARKING, CLEAN-UP, AS-BUILT DRAWINGS, HOISTING, FREIGHT AND DELIVERY, BUT EXCLUSIVE OF OVERHEAD AND PROFIT.

1.13. PROVIDE A WRITTEN WARRANTY FOR ALL MATERIALS, EQUIPMENT AND LABOUR FOR A ONE-YEAR PERIOD TO BEGIN AT THE TIME WHEN THE WORK IS DESIGNATED ACCEPTABLE BY THE CONSULTANT.

1.14. PROVIDE SHOP DRAWINGS (4 COPIES) OF ALL PRODUCTS FOR REVIEW.

1.15. CO-ORDINATE ALL SHUTDOWNS OF EXISTING BASE BUILDING SYSTEMS WITH THE OWNER OR REPRESENTATIVE. ADVISE THE OWNER OR REPRESENTATIVE AT LEAST 48 HOURS PRIOR TO ANY SHUTDOWN AND PAY FOR ANY COSTS INCURRED INCLUDING PREMIUM TIME OUTSIDE OF NORMAL WORKING HOURS.

1.16. PROVIDE FOR DRAIN DOWN OF PLUMING PIPING SYSTEMS, OR, PROVIDE FOR LOCAL FREEZING OF SAID PIPING SYSTEMS, AS REQUIRED, TO ACCOMMODATE NEW CONNECTIONS OR ALTERATIONS TO THESE PIPING SYSTEMS.

1.17. CO-ORDINATE THE MECHANICAL WORK WITH ALL OTHER TRADES.

1.18. PROVIDE IN THE TENDER PRICE ANY COSTS FOR PREMIUM TIME OUTSIDE OF NORMAL WORKING HOURS TO COMPLETE THE WORK ON SCHEDULE AND TO MAINTAIN ALL EXISTING MECHANICAL SYSTEMS IN OPERATION. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY INTERRUPTIONS OR DISRUPTIONS TO THE EXISTING SERVICES. ALL EXISTING BUILDING SERVICES MUST BE KEPT OPERATIONAL AT ALL TIMES. INTERRUPTIONS SHALL BE PERFORMED ONLY AFTER REGULAR OFFICE HOURS. ARRANGE WORK SUCH THAT INTERRUPTIONS IN SERVICES OCCUR ONLY AT SCHEDULED TIMES SUITABLE TO THE LANDLORD.

1.19. CHECK AND VERIFY EXISTING ELECTRICAL VOLTAGE AND ENSURE THAT ALL MECHANICAL EQUIPMENT SUPPLIED IS SUITABLE FOR THE AVAILABLE VOLTAGE.

1.20. ALL POWER WIRING BY ELECTRICAL CONTRACTOR, CONTROL AND INTERLOCK WIRING BY MECHANICAL CONTRACTOR. VERIFY LOCATIONS OF ALL MECHANICAL EQUIPMENT WITH ELECTRICAL CONTRACTOR BEFORE WORK COMMENCES.

1.21. PROVIDE STARTERS WITH REQUIRED OVERLOAD PROTECTION FOR ALL MECHANICAL EQUIPMENT. PROVIDE LINE VOLTAGE REVERSE ACTING THERMOSTATS WHERE SPECIFIED. STARTERS AND LINE VOLTAGE THERMOSTATS SHALL BE TURNED OVER TO DIVISION 16 FOR INSTALLATION. WHERE SWITCHES ARE USED ON FINISHED WALLS PROVIDE TO MATCH LIGHTING SWITCH AND TYPE.

1.22. PROVIDE ALL DEMOLITION, CLEAN-UPS, STORAGE, LIFTING, FLASHING, DRILLING, CUTTING AND PATCHING AS REQUIRED. ALL CUTTING AND PATCHING REQUIRED TO THE EXISTING BUILDING STRUCTURE FOR THE WORK SHALL BE INCLUDED UNDER THIS CONTRACT, AND BE ACCEPTABLE TO THE LANDLORD. PROVIDE X-RAY OF SLAB PRIOR TO CORING AND CUTTING OF FLOOR, AND OBTAIN APPROVAL FROM BASE BUILDING STRUCTURAL ENGINEER PRIOR TO DRILLING. SUBMIT WRITTEN CONFIRMATION THAT X-RAY HAS BEEN PERFORMED, AND THAT RESULTS HAVE BEEN ACCEPTED BY BASE BUILDING STRUCTURAL ENGINEER. OBTAIN WRITTEN APPROVAL FROM THE LANDLORD BEFORE ANY CUTTING IS CARRIED OUT.

1.23. PROVIDE PROTECTION OF ALL HEATING ELEMENTS AND ENCLOSURES (INCLUDING TOE KICK AREA AND SUPPLY GRILLES, AND ALL PERIMETER INDUCTION UNITS, (INCLUDING ENCLOSURE, INTAKE AIR GRILLES, AND SUPPLY AIR GRILLES) FROM ALL CONSTRUCTION DEBRIS, AND DUST.

1.24. PROVIDE TEMPORARY FILTER MEDIA ON ALL BASE BUILDING RETURN AIR DUCTS AND TRANSFER DUCTS, AT THE DEMISING WALLS OF THE WORK SPACE, FOR THE DURATION OF CONSTRUCTION.

1.25. PROVIDE ALL EQUIPMENT PADS, CURBS, SILLS, BASINS, ANCHORS, INSERTS, SUPPORTS, SLEEVES, ETC. AS REQUIRED FOR MECHANICAL EQUIPMENT AND PIPING.

1.26. PROVIDE ALL LABOUR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY FOR COMPLETE FIRESTOPPING AND SEALING OF ALL PIPE SLEEVES AND PIPE PENETRATIONS REQUIRED FOR THE WORK OF THIS DIVISION.

1.27. PROVIDE ACCESS AS REQUIRED IN WALLS AND CEILINGS. ENSURE THAT ACCESS IS PROVIDED FOR ALL EQUIPMENT. PROVIDE ACCESS DOORS COMPATIBLE WITH THE ADJACENT FINISHES AND WITH FIRE RATING EQUAL TO SURFACES IN WHICH INSTALLED. PROVIDE ACCESS PANELS IN PLASTER AND DRYWALL SURFACES WITH RECESSED DOOR WITH WELDED METAL LATH READY TO ACCEPT PLASTER/ DRYWALL INSERT AND WITH A PLASTER GROMMET FOR DOOR KEY ACCESS. MIFAB SERIES CAD-DW OR EQUIVALENT.

1.28. RE-USE AND RELOCATE EXISTING MATERIALS SUCH AS PIPING, FIXTURES, DUCTWORK, DIFFUSERS, EQUIPMENT ETC. WHERE SHOWN. CAP AND DISCONNECT ALL EXISTING PIPING AND DUCTWORK NOT REQUIRED AT CEILING, WALLS OR FLOOR, OR TO A LOCATION AS DIRECTED BY THE LANDLORD. MAINTAIN INTEGRITY OF ALL INSULATION INCLUDING VAPOUR BARRIERS WHEN CONNECTING TO EXISTING SERVICES. MAINTAIN THE INTEGRITY OF ALL EXISTING SYSTEMS ASSOCIATED WITH THE BUILDING SYSTEM IN PLACE. UNLESS NOTED OTHERWISE OBTAIN PERMISSION FROM THE LANDLORD AND REMOVE FROM THE SITE ALL MATERIALS WHICH ARE NOT TO REMAIN OR BE RE-USED.

1.29. ADJUST THE LOCATION OF DEVICES AND/OR EQUIPMENT (UP TO 10'-0" IN ANY DIRECTION) AS DIRECTED BY THE OWNER AND / OR THE ARCHITECT AND / OR INTERIOR DESIGNER WITHOUT ADJUSTMENT TO THE CONTRACT PRICE, PROVIDED THAT THE CHANGES ARE REQUESTED BEFORE INSTALLATION.

1.30. NO ALTERNATIVES FOR EQUIPMENT SHALL BE ACCEPTED WITHOUT WRITTEN APPROVAL OF THE CONSULTANT.

1.31. IDENTIFY ALL SYSTEMS AND LABEL ALL EQUIPMENT WITH LAMACOID LABELS. IDENTIFY REMOTE CONTROLS FOR ALL PERTINENT EQUIPMENT INCLUDING ALL ASSOCIATED DISCONNECTS.

1.32. PRODUCTS NOT SPECIFICALLY SPECIFIED SHALL BE OF A QUALITY CONSISTENT WITH THE REMAINDER OF THE SPECIFICATION.

1.33. PROVIDE OVERSIZED PIPE HANGERS AND INSULATION SHIELDS FOR INSULATED COLD PIPE. PROVIDE PLASTIC COATED PIPE HANGERS WHERE HANGER IS IN DIRECT CONTACT WITH COPPER PIPE.

1.34. PROVIDE ALL MISCELLANEOUS METALS REQUIRED FOR MECHANICAL WORK.

1.35. PROVIDE DI-ELECTRIC FITTINGS TO SEPARATE ALL DISSIMILAR METALS.

1.36. PROVIDE AND INSTALL PIPING WITH ALL NECESSARY EXPANSION LOOPS, OFFSETS, GUIDES, JOINTS, ANCHORS ETC. AS MAY BE REQUIRED SO THAT PIPING WILL NOT BE OVERSTRESSED DURING EXPANSION AND CONTRACTION.

1.37. PROVIDE FLASHING AND COUNTER FLASHING FOR ALL DUCTS, PIPES, ETC., PASSING THROUGH WALLS AND WATERPROOF FLOORS.

1.38. PATCH AND SEAL ALL OPENINGS IN FLOORS, WALLS AND PARTITIONS. SEAL ALL VERTICAL SLEEVES AND CORE DRILLED OPENINGS THROUGH ROOF, MECHANICAL ROOMS AND FLOORS ETC, WITH PERMANENTLY RESILIENT WATERPROOF SILICONE BASE SEALING COMPOUND.

1.39. PROVIDE ALL CONCRETE REQUIRED FOR MECHANICAL WORK.

1.40. IDENTIFY ALL PIPING WITH STENCILLED LETTERS OR COLOUR CODES AND DIRECTIONAL ARROWS.

2. COMPLETION OF CONTRACT

2.1. ALL EQUIPMENT MUST BE CLEANED AND TESTED BEFORE FINAL ACCEPTANCE BY CONSULTANT.

2.2. PRIOR TO CONTACTING THE CONSULTANT FOR FINAL INSPECTION, THE CONTRACTOR MUST CORRECT ALL DEFICIENCIES AS SPECIFIED ON THE DEFICIENCY LIST.

2.3. PROVIDE A WRITTEN WARRANTY FOR ONE YEAR CONVERING ALL EQUIPMENT, MATERIALS AND WORKMANSHIP FROM THE DATE OF ACCEPTANCE OF THE INSTALLATION BY THE OWNER. INCLUDE IN THE OPERATION AND MAINTENANCE MANUAL.

2.4. ANY DEFECTS OR DEFICIENCIES WHICH ORIGINATE OR BECOME EVIDENT DURING THE WARRANTY PERIOD MUST BE REPAIRED OR CORRECTED AT NO COST TO THE OWNER.

3. AS-BUILT DRAWINGS

3.1. AT THE COMPLETION OF WORK AND BEFORE FINAL ACCEPTANCE, PROVIDE AS-BUILT DRAWINGS OF THE INSTALLATION IN AUTO CAD FORMAT. DRAWING FILES CAN BE OBTAINED FROM THE CONSULTANT.

3.2. INCORPORATE ALL CHANGES AND DEVIATIONS FROM THE TENDER DRAWINGS, UTILIZING NORMAL RECOGNIZED DRAFTING PROCEDURES THAT MATCH THE ORIGINAL DRAFTING METHODOLOGY.

3.3. ALL CONCEALED PIPING RUNS, VALVE AND DAMPER LOCATIONS, SERVICE LOCATIONS, ETC. MUST BE REFLECTED ON THE DRAWINGS.

3.4. REMOVE THE MECHANICAL ENGINEER'S STAMP AND COMPANY NAME FROM ALL DRAWINGS.

3.5. CLEARLY INDICATE THE WORDS "AS-BUILT" IN THE TITLE BLOCK COLUMN OF THE DRAWINGS AS WELL AS THE MECHANICAL CONTRACTOR'S NAME AND ADDRESS.

3.6. SUBMIT A PRINT TO CONSULTANT TO REVIEW. WHEN FOUND ACCEPTABLE BY THE CONSULTANT, SUBMIT THREE (3) SETS OF PRINTS TOGETHER WITH AUTO CAD DISKS FOR PRESENTATION TO LANDLORD AND TENANT.

4. OPERATION AND MAINTENANCE MANUALS

4.1. PROVIDE THREE (3) SETS OF OPERATION AND MAINTENANCE MANUALS TO THE OWNER'S REPRESENTATIVE, ONE COPY IS TO BE PROVIDED TO THE OWNER. INCLUDE THE FOLLOWING INFORMATION IN THE OPERATION AND MAINTENANCE MANUALS:

- TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS, COMPONENT ILLUSTRATIONS, EXPLODED VIEWS, TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS. ADVERTISING OR SALES LITERATURE IS NOT ACCEPTABLE.
- THE CONSULTANTS REVIEWED SHOP DRAWINGS.
- CERTIFICATE(S) OF ACCEPTANCE FROM AUTHORITIES HAVING JURISDICTION.
- VERIFICATION REPORTS AND CERTIFICATE(S) FOR ANY NEW LIFE SAFETY COMPONENTS OR TIE-INS TO ANY BASE BUILDING SYSTEMS.
- AIR AND WATER BALANCING REPORTS
- WRITTEN GUARANTEE.
- AS-BUILT DRAWINGS.

4.1. REVIEW INFORMATION PROVIDED IN THE MAINTENANCE INSTRUCTIONS AND MANUALS WITH THE OWNER'S OPERATING PERSONNEL WHERE BASE BUILDING SYSTEMS ARE REVISED, TO ENSURE A COMPLETE UNDERSTANDING OF THE MECHANICAL EQUIPMENT AND SYSTEMS AND THEIR OPERATION.

5. PLUMBING

5.1. PROVIDE COMPLETE PLUMBING AND DRAINAGE SYSTEMS INCLUDING ALL NECESSARY LABOUR, SERVICES, PRODUCTS, MATERIALS AND EQUIPMENT.

5.2. PROVIDE ALL WORK IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO PLUMBING CODE AND ALL AUTHORITIES HAVING JURISDICTION INCLUDING ALL APPLICABLE BY-LAWS.

5.3. PROVIDE FOR DRAIN DOWN OF DOMESTIC COLD WATER, DOMESTIC HOT WATER, AND DOMESTIC HOT WATER RECIRCULATION PIPING SYSTEM, OR, PROVIDE FOR LOCAL FREEZING OF SAID PIPING SYSTEMS, AS REQUIRED, TO ACCOMMODATE NEW CONNECTIONS TO DOMESTIC COLD WATER, DOMESTIC HOT WATER, AND DOMESTIC HOT WATER RECIRCULATION SYSTEMS, OR ALTERATIONS OF SAID PIPING SYSTEMS.

5.4. WHEN PIPING SYSTEM INSTALLATION IS COMPLETE, PRESSURE TEST ALL DOMESTIC WATER PIPING SYSTEMS AS REQUIRED BY THE ONTARIO BUILDING CODE. PROVIDE WATER PRESSURE TEST OR AIR PRESSURE TEST. WATER PRESSURE TESTING SHALL CONFIRM THAT PIPING SYSTEMS WITHSTAND A WATER PRESSURE OF MINIMUM 1000 KPA (145 PSI) FOR MINIMUM 1 HOUR WITH NO LOSS OF PRESSURE. AIR PRESSURE TESTING SHALL CONFIRM THAT PIPING SYSTEM WITHSTANDS AN AIR PRESSURE OF MINIMUM 700 KPA (102 PSI) FOR MINIMUM 2 HOUR WITH NO DROP IN AIR PRESSURE.

5.5. SANITARY DRAINAGE AND VENT PIPING 3" AND LARGER SHALL BE CSA CLASS 4000 CAST IRON SOIL PIPE AND FITTINGS MECHANICAL JOINTS AND STAINLESS STEEL COUPLINGS. SYSTEM XFR 15-50 PIPING AND FITTINGS BY IPEX IN ACCORDANCE WITH CAN/ULC S102.2 AND CSA B181.2. IS ACCEPTABLE IN LIEU OF CAST IRON PIPING ABOVE GRADE, PROVIDE APPROVED FIRESTOP DEVICES AND MATERIALS WHERE PENETRATING FLOORS. PVC DR 35 PIPING WITH SOLVENT JOINTS IS ACCEPTABLE FOR BURIED DRAIN PIPING.

5.6. ABOVE GROUND SANITARY DRAINAGE AND VENT PIPING 2" AND SMALLER SHALL BE DWV COPPER PIPE WITH DRAINAGE FITTINGS AND 95/5 TIN/ANTIMONY SOLDER JOINTS. SYSTEM XFR 15-50 PIPING AND FITTINGS BY IPEX IN ACCORDANCE WITH CAN/ULC S102.2 AND CSA B181.2. IS ACCEPTABLE IN LIEU OF COPPER DRAINAGE PIPING, PROVIDE APPROVED FIRESTOP DEVICES AND MATERIALS WHERE PENETRATING FLOORS. PVC DR 35 GRAVITY SEWER PIPE WITH SOLVENT JOINTS IS ACCEPTABLE FOR BELOW GRADE DRAINAGE PIPING.

5.7. INSTALL CLEANOUTS IN SANITARY DRAINAGE PIPING AS REQUIRED BY PLUMBING CODES AND ALL AUTHORITIES HAVING JURISDICTION. INSTALL CLEANOUTS AT THE BASE OF ALL STACKS AND AT EACH MAJOR CHANGE OF DIRECTION ON HORIZONTAL PIPE RUNS. PROVIDE ACCESS PANELS IN DRYWALL ENCLOSURES TO ACCESS CLEANOUTS AT BASE OF ALL STACKS.

5.8. WHERE ROOMS ARE PROVIDED WITH NEW FLOOR FINISHES, PROVIDE SUITABLE EXTENSIONS TO RAISE ALL EXISTING CLEANOUT COVERS AND FLOOR DRAIN GRATES TO MATCH THE NEW FINISHED FLOOR ELEVATION. REFER TO ARCHITECTURAL DRAWINGS TO DETERMINE WHERE NEW FLOOR FINISHES ARE PROVIDED.

5.9. PROVIDE TRAP SEAL PRIMERS FOR ALL FLOOR DRAINS INCLUDING ALL NECESSARY PIPING AND APPURTENENCES AND CONNECT TO NEAREST AVAILABLE DOMESTIC COLD WATER SUPPLY IN ACCORDANCE WITH LOCAL AUTHORITY STANDARDS.

5.10. ABOVE GROUND DOMESTIC WATER PIPING SHALL BE TYPE "L" HARD COPPER WITH WROUGHT COPPER FITTINGS AND 95/5 TIN/ANTIMONY SOLDER JOINTS. TYPE 'K' PIPING SHALL BE USED BELOW GROUND.

5.11. PROVIDE BALL VALVES AT PIPING CONNECTIONS TO ALL EQUIPMENT TO ALLOW EQUIPMENT TO BE REMOVED FOR SERVICING. PROVIDE BALL VALVES ON ALL MAIN AND BRANCH DOMESTIC WATER PIPING LINES. PROVIDE GLOBE VALVES ON ALL HOT WATER RECIRCULATING PIPING LINES AND EQUIPMENT. PROVIDE CHECK VALVES ON SUPPLY SIDE OF EQUIPMENT.

5.12. PROVIDE ALL PLUMBING VENT PIPING IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONTARIO BUILDING CODE. COORDINATE LOCATION OF NEW PLUMBING VENTS WITH ARCHITECTURAL DRAWINGS, ALL VENT PIPING SHALL BE CONCEALED WITHIN WALLS OR ABOVE CEILINGS. TERMINATE PLUMBING VENTS MINIMUM 1.0 M ABOVE, AND MINIMUM 3.5 M FROM ALL OPENABLE WINDOWS OR DOORS, AND AIR INTAKES.

5.13. SHOCK STOPS

.1 PROVIDE PRE-CHARGED HARD DRAWN COPPER SHOCK ABSORBER WITH BRASS PISTON, EPDM O-RING SEALS, AND MAKE IPS CONNECTION.

.2 SUITABLE FOR PRESSURES UP TO 150 PSI, AND TEMPERATURES TO 180 F.

.3 UNIT SIZING AS PER MANUFACTURERS INSTRUCTIONS. CONFIRM FOLLOWING SIZING TABLE WITH MANUFACTURER, USE MANUFACTURERS SIZING GUIDELINES WHERE DISCREPANCIES EXISTING BETWEEN THE FOLLOWING TABLE:

FIXTURE UNITS	ARRESTOR SIZING
1-11	CONNECTION: ½", HEIGHT: 5" DIAMETER: 1-7/16"

6. FIRE PROTECTION

6.1. ALL LIFE SAFETY, STANDPIPE, SPRINKLERS AND FIRE PROTECTION SERVICES MUST BE MAINTAINED IN OPERATION AT ALL TIMES.

7. HEATING, VENTILATING, AIR CONDITIONING

7.1. PROVIDE ALL DUCTWORK IN ACCORDANCE WITH THE STANDARDS OF GOOD WORKMANSHIP AND THE LATEST GUIDELINES OF ASHRAE AND SMACNA. SEAL DUCTWORK TO CLASS C WITH TRANSVERSE JOINTS AND CONNECTIONS TREATED WITH SEALING COMPOUND. SEAL EXPOSED DUCTWORK (LOCATED IN FINISHED SPACES) INTERNALLY AND WITH A MINIMUM AMOUNT OF SEALANT EXPOSED ON THE OUTSIDE.

7.2. PROVIDE BALANCING DAMPERS FOR ALL NEW DUCTWORK AT THE BRANCH CONNECTIONS. PROVIDE VOLUME DAMPERS FOR ALL SUPPLY AIR DIFFUSERS. PROVIDE SPIN-ON FITTING WITH BALANCING DAMPER AT EACH FLEXIBLE DUCT CONNECTION AT SUPPLY DUCT TAKE-OFF.

7.3. PROVIDE DUCT ACCESS DOORS FOR ALL COILS, FIRE, CONTROL AND BALANCING DAMPERS, AS REQUIRED.

7.4. PROVIDE FLEXIBLE DUCTS EQUAL TO FLEXMASTER UNINSULATED TRIPLE LOCK ALUMINUM FASTENED WITH STAINLESS STEEL GEAR DRIVE CLAMPS. MAXIMUM LENGTH OF FLEXIBLE DUCTS SHALL BE 10 FT.

7.5. PROVIDE RIGID OPEN END TRANSFER DUCTS COMPLETE WITH 1" THICK ACOUSTIC INSULATION WHERE SHOWN WITHIN THE CEILING SPACE. DIMENSIONS OF DUCTS ON THE DRAWINGS ARE INSIDE CLEAR SIZES. INCREASE DUCTWORK SIZES TO SUIT ACOUSTIC INSULATION.

7.6. PROVIDE ULC LABELLED FIRE DAMPERS IN DUCTWORK WHERE SHOWN AND WHERE REQUIRED BY CODES AND BY AUTHORITIES HAVING JURISDICTION. FIRE DAMPERS SHALL BE TYPE 'B', UNLESS NOTED OTHERWISE. FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS FOR THE TYPE OF FIRE DAMPER USED AND FOR THE WALL OR FLOOR ASSEMBLY THAT THE FIRE DAMPER IS INSTALLED WITHIN.

7.7. PROVIDE DIFFUSERS, GRILLES AND REGISTERS AS REQUIRED, SELECTED FOR LOW NOISE LEVELS, COMPATIBLE WITH CEILING TYPES AND FINISHES. RELOCATE AND RE-USE EXISTING DIFFUSERS AND GRILLES AS REQUIRED. PROVIDE SUPPORT GRID FOR DIFFUSERS AND GRILLES WHERE REQUIRED.

8. DUCT AND PIPE INSULATION

8.1. PROVIDE AND COVER ALL DOMESTIC WATER PIPING, VALVES, FITTINGS, APPURTENANCES, ETC. WITH RIGID PREFORMED FIBRE GLASS INSULATION. PROVIDE VAPOUR BARRIER FOR COLD WATER PIPING. INSULATION SHALL BE 1" THICK FOR COLD WATER PIPING AND FOR HOT WATER AND HOT WATER RECIRCULATING PIPING. DO NOT USE STAPLES. ENSURE COMPLETE COVERAGE AND SEAL WITH AN APPROVED VAPOUR BARRIER CEMENT. MAINTAIN THE INTEGRITY OF ALL EXISTING THERMAL INSULATION WHEN CONNECTING NEW PIPING TO EXISTING PIPING. PROVIDE PVC JACKETTING FOR ALL EXPOSED PIPE INSULATION.

8.2. APPLY ONE-PIECE MOULDED TYPE PVC JACKET TO ALL INSULATED PIPING SERVICES IN EXPOSED AREAS. USE SOLVENT WELD ADHESIVE COMPATIBLE WITH INSULATION TO SEAL LAP AND JOINTS. JACKETTING TO BE PAINTED BY GENERAL TRADES.

8.3. ALL PIPE INSULATION AND VAPOUR BARRIER (FOR COLD PIPING) SHALL BE CONTINUOUS AND NOT INTERRUPTED BY PIPE HANGERS, OR UNISTRUT SUPPORTS. PROVIDE OVERSIZED CLEVIS HANGERS AND INSULATION SHIELDS FOR INSULATED PIPING. WHERE INSULATED PIPING IS SUPPORTED BY UNISTRUT SUPPORTS, PROVIDE UNISTRUT CUSH-A-THERM INSULATED PIPE CLAMPS TO MAINTAIN CONTINUOUS INULATION AND VAPOUR BARRIER.

9. TESTING, BALANCING, ADJUSTING AND COMMISSIONING

9.1. PROVIDE TESTING, BALANCING AND COMMISSIONING OF ALL SYSTEMS. COMMISSIONING SHALL INCLUDE PUTTING INTO SERVICE, ADJUSTING, CALIBRATING AND VERIFYING ALL SYSTEMS, BOTH NEW AND EXISTING.

9.2. PROVIDE AN INDEPENDENT BALANCING COMPANY ACCEPTABLE TO THE CONSULTANT TO TEST, BALANCE AND ADJUST THE AIR AND WATER SYSTEMS.

9.3. AIR SYSTEMS:

1. PROVIDE AN AIR BALANCE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWINGS AND AABC STANDARDS. AIR BALANCING SHALL BE PERFORMED WITH CLEAN FILTERS INSTALLED. MECHANICAL CONTRACTOR SHALL CLEAN ALL AIR SYSTEM FILTERS (NEW AND EXISTING) PRIOR TO AIR BALANCING. SUBMIT THREE (3) COPIES OF THE AIR BALANCE REPORT TO THE CONSULTANT FOR REVIEW.
2. PROVIDE BALANCING AND ADJUSTING OF ALL AIR SYSTEMS TO ACHIEVE SPECIFIED DESIGN VALUES (+5%).
3. PROVIDE DATA IN THE BALANCING REPORT WHICH INDICATES AIR VOLUMES AT EACH OUTLET, STATIC PRESSURES, FAN DATA, MOTOR DATA AND COIL DATA.
4. PROVIDE DUCT TRAVERSE READINGS FOR EACH AIR HANDLING UNIT AND FAN (WITH DUCTED CONNECTIONS AND EXCEEDING 1000 CFM).
5. IDENTIFY PRESSURE DROP ACROSS FILTERS FOR ALL AIR HANDLING UNITS.
6. ADJUST THE AIR PATTERN FOR ALL DIFFUSERS AS INDICATED ON THE DRAWINGS OR AS DIRECTED BY THE CONSULTANT.
7. VERIFY THE OPERATION OF ALL CONTROL DEVICES, INCLUDING VARIABLE VOLUME BOXES.
8. PRE-CONSTRUCTION AIR READINGS: PRIOR TO COMMENCEMENT OF HVAC DEMOLITION, CONDUCT PRE-CONSTRUCTION AIRFLOW READINGS TO CONFIRM EXISTING HVAC SUPPLY AIR CAPACITIES. PROVIDE AIRFLOW READINGS IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWINGS AND AABC STANDARDS. PROVIDE AIRFLOW READINGS FOR ALL EXISTING SUPPLY AIR DIFFUSERS, FOR VAV SYSTEMS, READINGS SHALL BE TAKEN WITH VAV BOX IN FULLY OPEN POSITION. RECORD ALL EXISTING AIR DIFFUSER LOCATIONS AND AIRFLOW READINGS AND SUBMIT REPORT TO CONSULTANT FOR REVIEW. MECHANICAL CONTRACTOR SHALL PERFORM A COMPLETE VISUAL INSPECTION OF THE EXISTING SUPPLY AIR DUCT SYSTEM AND REPORT ANY FINDING OF OPEN DUCT BRANCHES, MISSING CAPPED CONNECTIONS, OPENING IN MAIN AND BRANCH DUCTS, BLOCKAGE AND LOOSE CONNECTIONS TO ENGINEER PRIOR TO PRE-TESTING OF AIR SYSTEM. ALL OPENINGS, BLOCKAGES ETC. ARE TO BE RECTIFIED PRIOR TO PRE-BALANCING. PROVIDE FINAL AIR BALANCING AFTER COMPLETION OF MECHANICAL WORK, INCLUDING ADJUSTING OF DAMPERS AND GRILLES. AIR BALANCING SHALL BE PER FORMED WITH CLEAN FILTERS INSTALLED. SUBMIT THREE (3) COPIES OF THE AIR BALANCE REPORT TO THE CONSULTANT FOR REVIEW

10. CONTROLS

10.1. PROVIDE ALL CONTROLS, INCLUDING WIRING, APPROVED PLENUM CABLE, FITTINGS, THERMOSTATS, RELAYS, AUTOMATIC CONTROL VALVES, TRANSFORMERS, DAMPERS, FIRE STATS, FREEZE STATS, SWITCHES AND ACCESSORIES AS REQUIRED FOR COMPLETELY OPERATIONAL SYSTEMS. PROVIDE ALL NECESSARY CONNECTIONS, INTERLOCKS AND COMPONENTS TO ALL DEVICES AS REQUIRED.

10.2. ALL EXPOSED WIRING SHALL BE INSTALLED IN RIGID CONDUIT. WIRING INSTALLED ABOVE ACCESSIBLE CEILINGS SHALL BE SECURED TO STRUCTURAL MEMBERS. WIRING SHALL NOT BE SECURED TO MECHANICAL OR ELECTRICAL EQUIPMENT OR DEVICES, AND SHALL NOT BE REST ON CEILING TILES. ALL THERMOSTAT WIRING LOCATED WITHIN PARTITION WALLS SHALL BE INSTALLED IN RIGID CONDUIT.

10.3. THERMOSTATS LOCATED IN A BARRIER-FREE PATH OF TRAVEL SHALL BE INSTALLED IN ACCORDANCE WITH OBC 3.8.1.5.(1) (a) and (b). THERMOSTATS SHALL BE LOCATED 1,200 MM ABOVE FINISHED FLOOR. THEMOSTATS SHALL BE INSTALLED ON THE WALL CENTERED ON EITHER AN 810 MM SECTION OF CLEAR FLOOR SPACE (FRONT APPROACH), OR CENTERED ON A 1,370 MM SECTION OF CLEAR FLOOR SPACE (SIDE APPROACH). REFER TO ARCHITECTURAL DRAWINGS TO IDENTIFY ALL BARRIER-FREE PATHS OF TRAVEL, AND INSTALL THERMOSTATS ACCORDINAGLY. THIS CLAUSE SUPERCEDES LOCATIONS THAT MAY BE INDICATED ON THE MECHANICAL DRAWINGS.

10.4. THERMOSTATS FOR INDIVIDUAL DEVICES MAY BE LOCATED IN THE CEILING SPACE AND MUST BE RELOCATED AND EXTENDED DOWN WALLS TO FINAL LOCATIONS UNDER THE TENANT CONTRACT. THERMOSTATS SHALL BE INSTALLED AT 1,200 MM ABOVE FINISHED FLOOR.

10.5. PROVIDE ALL CONNECTIONS AND DEVICES NECESSARY TO INTERLOCK OR MAINTAIN THE INTENT OF ALL PERIMETER HVAC SYSTEMS AND ASSOCIATED ZONE CONTROL OF PERIMETER HEATING SYSTEM AS REQUIRED.

10.6. VERIFY OPERATION OF ALL THERMOSTATS AND CONTROLS AFTER RELOCATION OF THERMOSTATS AND DEVICES.

10.7. THERMOSTATS ARE NOT TO BE LOCATED ABOVE ELECTRICAL DIMMER SWITCHES OR ADJACENT TO HEAT PRODUCING DEVICES. ADJUST HEIGHT OF THERMOSTATS TO AVOID INTERFERENCE WITH SYSTEMS FURNITURE OR OTHER FURNISHINGS AS REQUIRED.

10.8. WHERE THERMOSTATS ARE TO BE INSTALLED ON CONCRETE COLUMNS, CONCRETE WALLS, ETC THAT ARE NOT FURRED OUT WITH DRYWALL FINISHES, PROVIDE WIRE MOULD OVER THERMOSTAT WIRING/ PNEUMATIC TUBING TO CONCEAL WIRING/ TUBING FROM CEILING PENETRATION TO THERMOSTAT LOCATION. REFER TO ARCHITECTURAL OR INTERIOR DESIGN DRAWINGS FOR WALL FINISHES.

10.9.

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Client:

CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

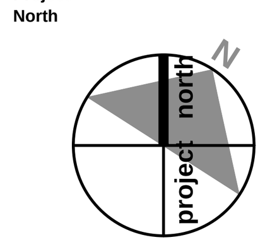
Project Title:

CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

Sheet Title:

MECHANICAL DETAILS & EQUIPMENT SCHEDULES

Project North



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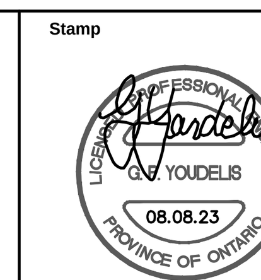

Date: DEC 2022

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Drawn: K.J

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M-101

VRE HEAT RECOVERY SPECIFICATIONS

VRF SPECIFICATIONS

MULTI EVAPORATOR, DIRECT EXPANSION (DX), AIR-COOLED, VARIABLE CAPACITY, SPLIT SYSTEM

PART 1 – GENERAL

1.01 SYSTEM DESCRIPTION

THE VARIABLE CAPACITY, MULTI-EVAPORATOR HEAT RECOVERY AIR CONDITIONING SYSTEM SHALL BE THE LENNOX VRF (VARIABLE REFRIGERANT FLOW) SYSTEM. EACH LENNOX VRF HEAT RECOVERY SYSTEM SHALL BE CAPABLE OF PROVING SIMULTANEOUS HEATING AND COOLING FOR UP TO 64 INDOOR UNITS.

1.02 QUALITY ASSURANCE

A. THE UNITS SHALL BE TESTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) IN ACCORDANCE WITH ANSI/UL 1995 – HEATING AND COOLING EQUIPMENT AND SHALL BEAR THE LISTED MARK.

B. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC).

C. THE SYSTEM SHALL BE RATED IN ACCORDANCE WITH AIR CONDITIONING REFRIGERATION INSTITUTE (AHRI) STANDARD 1230 AND BEAR THE AHRI LABEL.

D. THE SYSTEM SHALL BE MANUFACTURED IN AN ISO 9001 AND ISO 14001 FACILITY, WHICH ARE STANDARDS SET BY THE INTERNATIONAL STANDARD ORGANIZATION (ISO).

1.03 DELIVERY, STORAGE, AND HANDLING

1. EQUIPMENT SHALL BE STORED AND HANDLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.

PART 2 – WARRANTY

2.01 LIMITED WARRANTY

THE UNITS SHALL BE COVERED BY THE MANUFACTURER'S LIMITED WARRANTY FOR A PERIOD OF (10) YEAR, BEGINNING FROM THE DATE OF EQUIPMENT DELIVERY. FOR THE COMPRESSORS ONLY, THE UNITS SHALL BE COVERED BY THE MANUFACTURER'S LIMITED WARRANTY FOR A PERIOD OF (10) YEARS, BEGINNING FROM THE DATE OF EQUIPMENT DELIVERY.

2.02 INSTALLATION REQUIREMENTS

THE SYSTEM SHALL BE INSTALLED BY A LENNOX FACTORY TRAINED CONTRACTOR.

PART 3 – PERFORMANCE

3.01 PERFORMANCE

THE THREE-PHASE VRF SYSTEM PERFORMANCE SHALL BE RATED IN ACCORDANCE WITH AHRI 1230 TEST CONDITIONS.

THE VRF SYSTEM SHALL BE LISTED IN THE AHRI DIRECTORY.

THE SYSTEM EFFICIENCY SHALL MEET OR EXCEED THE FOLLOWING PERFORMANCE CRITERIA:

3.02 COOLING OPERATING RANGE

THE OPERATING RANGE OF THE LOW AMBIENT THREE-PHASE VRF SYSTEM IN THE COOLING MODE SHALL BE 5°F – 122°FDB. LOW AMBIENT COOLING KIT EXTENDS COOLING DOWN TO -10°FDB.

3.03 HEATING OPERATING RANGE

THE OPERATING RANGE OF THE LOW AMBIENT THREE-PHASE VRF SYSTEM IN THE HEATING MODE SHALL BE -22°F – 80°FDB.

3.04 SIMULTANEOUS HEATING/COOLING OPERATING RANGE

FOR HEAT RECOVERY VRF SYSTEMS, THE OPERATING RANGE FOR SIMULTANEOUS HEATING AND COOLING MODE SHALL BE 5°F – 80°F.

3.05 REFRIGERANT PIPING

ALL REFRIGERANT PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. NO ADDITIONAL SIGHT GLASSES OR FILTER/DRYERS SHALL BE REQUIRED. ALL FIELD INSTALLED REFRIGERANT PIPING SHALL BE NITROGENIZED ACR COPPER TUBING AND SHALL BE MEET ASTM B280. ALL BRANCH PIPING JOINTS SHALL BE APPROVED BY THE MANUFACTURER.

THE THREE-PHASE VRF SYSTEM SHALL BE CAPABLE OF THE FOLLOWING REFRIGERANT PIPING LENGTHS:

1. TOTAL SYSTEM PIPING LENGTH: 3,280 FT.
2. MAXIMUM PIPING LENGTH FROM REFRIGERANT PIPING BRANCH TO INDOOR UNIT: 132 FT.
3. MAXIMUM PIPING LENGTH FROM FIRST BRANCH TO FURTHEST INDOOR UNIT: UP TO 295 FT.
4. MAXIMUM VERTICAL SEPARATION FROM OUTDOOR UNIT TO INDOOR UNIT, WHEN OUTDOOR UNIT IS ABOVE: 360 FT.
5. MAXIMUM VERTICAL SEPARATION FROM OUTDOOR UNIT TO INDOOR UNIT, WHEN OUTDOOR UNIT IS BELOW: 230 FT.
6. MAXIMUM VERTICAL SEPARATION BETWEEN INDOOR UNITS ON THE SAME SYSTEM: 98 FT.

PART 4 – PRODUCTS

4.01 OUTDOOR UNIT

A. GENERAL

1. THE OUTDOOR UNIT SHALL BE FACTORY ASSEMBLED AND PRE-WIRED WITH ALL CONTROLS NECESSARY FOR OPERATION. SYSTEMS CONSISTING OF MULTIPLE INDIVIDUAL CONDENSING UNIT MODULES SHALL BE PIPED TOGETHER IN THE FIELD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. ALL REFRIGERANT PIPING LINES SHALL BE INSULATED SEPARATELY IN ACCORDANCE WITH THE ADOPTED STATE OR LOCAL ENERGY CODE REQUIREMENTS.

3. OUTDOOR UNIT SOUND PRESSURE LEVEL FOR AN INDIVIDUAL CONDENSING UNIT MODULE SHALL NOT EXCEED 63 DB(A). OUTDOOR UNIT SOUND PRESSURE LEVEL FOR AN INDIVIDUAL LOW AMBIENT CONDENSING UNIT MODULE SHALL NOT EXCEED 68 DB(A).

4. THE SYSTEM SHALL BE CAPABLE OF AUTOMATICALLY RESTARTING OPERATION WHEN POWER IS RESTORED AFTER A POWER FAILURE.
5. THE SYSTEM SHALL INCORPORATE AN AUTOMATIC OIL RETURN CYCLE.
6. THE SYSTEM SHALL SUPPORT NIGHTTIME OPERATION MODE THAT AUTOMATICALLY REDUCES THE SOUND LEVEL OF THE OUTDOOR UNIT TO A MINIMUM OF 45 DB(A).
7. THE OUTDOOR UNIT SHALL INCLUDE A BASE PAN HEATER THAT OPERATES WHEN OUTDOOR TEMPERATURES DROP BELOW 36°F AND STOPS OPERATING WHEN TEMPERATURES EXCEED 39°F.

B. UNIT CABINET

1. THE OUTDOOR UNIT CABINET SHALL BE CONSTRUCTED OF HEAVY GAUGE STEEL AND SHALL BE FINISHED WITH A WEATHERPROOF AND CORROSION RESISTANT BAKED ENAMEL FINISH.

C. FAN

1. THE OUTDOOR UNIT FAN MOTOR SHALL BE POWERED BY AN INVERTER DRIVE CAPABLE OF 18 STEPS OF FAN SPEED CONTROL. THE FAN MOTOR SHALL HAVE CERAMIC BEARINGS AND AN INSULATED ROTOR SHAFT.
2. THE OUTDOOR UNIT SHALL HAVE AN ASYMMETRICAL BLADE SELECTION, CONSISTING OF ONE THREE-BLADE FAN WHEEL AND ONE FOUR-BLADE FAN WHEEL TO REDUCE OUTDOOR UNIT SOUND LEVELS.
3. THE OUTDOOR UNIT FAN SHALL BE CAPABLE OF UP TO 0.24" OF STATIC PRESSURE.

D. CONDENSER COIL

1. THE CONDENSER COIL SHALL BE MANUFACTURED FROM COPPER TUBES WITH ALUMINUM FINS. THE FIN DENSITY OF THE COIL SHALL BE 16 FINS PER INCH. THE COPPER TUBING SHALL HAVE A RIFLED BORE TO ENSURE GREATER HEAT TRANSFER.
2. THE CONDENSER COIL SHALL BE FACTORY COATED WITH A HYDROPHILIC TREATMENT FOR INCREASED CORROSION RESISTANCE.

E. COMPRESSOR

1. THE VRF SYSTEM SHALL INCLUDE ONLY INVERTER DRIVEN COMPRESSORS; NO FIXED SPEED COMPRESSORS SHALL BE ACCEPTABLE. THE INVERTER SHALL BE CAPABLE OF OPERATING THE COMPRESSOR IN UP TO 40 CAPACITY STEPS. THE VRF SYSTEM LOGIC SHALL BE CAPABLE OF ADJUSTING THE COMPRESSOR SPEED EVERY 20 SECONDS IN RESPONSE TO CHANGING INDOOR UNIT CONDITIONS.

F. ELECTRICAL

1. THE POWER SUPPLY TO THE THREE-PHASE VRF OUTDOOR UNIT SHALL BE 208-230 VOLTS, 3 PHASE, 60 HZ +/- 10% (Y) OR 460 VOLTS, 3 PHASE, 60 HZ +/- 10% (G).
2. THE VOLTAGE OF COMMUNICATION WIRING SHALL BE 24VDC. THE COMMUNICATION WIRE SHALL BE 18 GAUGE, 3 CORE, STRANDED, AND SHIELDED. UNSHIELDED COMMUNICATION WIRE SHALL NOT BE ACCEPTED. CONTROL WIRE SHIELDING SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

G. REFRIGERANT

1. REFRIGERANT SHALL BE R-410A.
2. EACH CONDENSING UNIT MODULE SHALL BE PRE-CHARGED FROM THE FACTORY WITH A HOLDING CHARGE. ADDITIONAL REFRIGERANT SHALL BE ADDED IN THE FIELD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS BASED ON THE LENGTH AND DIAMETER OF REFRIGERANT PIPING IN THE SYSTEM.
3. THE REFRIGERANT OIL SHALL BE FVC68D POLYVINYL ETHER (PVE) OIL. POLYOLESTER (POE) SHALL NOT BE ACCEPTABLE.

G. MODE SELECTION (MS) BOXES FOR HEAT RECOVERY

1. MS BOXES SHALL BE REQUIRED FOR HEAT RECOVERY SYSTEMS.
2. MS BOXES SHALL BE AVAILABLE IN 2-, 4-, 6-, 8-, 10-, AND 12-PORT CONFIGURATIONS.
3. EACH MS BOX PORT SHALL HAVE A DEDICATED SUB-COOLING CIRCUIT.
4. THE MS BOX SHALL BE SUPPORT FIVE INDOOR UNITS OR 54,000 BTU/H PER INDIVIDUAL PORT.
5. THE MS BOX SHALL HAVE BRAZED CONNECTIONS FOR OUTDOOR AND INDOOR UNIT PIPING.
6. THE MS BOX SHALL HAVE EASILY REMOVABLE PANELS FOR MAINTENANCE.
7. THE MS BOX SHALL HAVE A VISIBLE LAMP/BULB TO INDICATE UNIT IS RECEIVING POWER.
8. A 1-INCH CONDENSATE DRAIN CONNECTION SHALL BE PROVIDED. WHEN REQUIRED BY THE ENGINEER, A CONDENSATE PUMP SHALL BE INSTALLED EXTERNAL TO THE MS BOX TO PROVIDE APPROPRIATE CONDENSATE REMOVAL.

H. ECOFOOT OUTDOOR UNIT SUPPORT STANDS

PROVIDE 18" HIGH DUAL ECOFOOT SUPPORT STANDS FOR EACH VRF OUTDOOR UNIT SYSTEM.

4.02 V22B COMPACT 360 CASSETTE INDOOR UNIT (NON-DUCTED)

A. GENERAL

1. THE LENNOX V22B COMPACT 360° CASSETTE INDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED AND TESTED. THE UNIT SHALL INCLUDE ALL WIRING, PIPING, ELECTRONIC EXPANSION VALVE, AND PRINTED CIRCUIT BOARDS NECESSARY FOR OPERATION.
2. THE UNIT SHALL AUTOMATICALLY RESTART AFTER POWER FAILURE.
3. THE UNIT SHALL HAVE A PRE-HEAT FUNCTION TO DELAY FAN OPERATION UNTIL THE INDOOR COIL HAS REACHED A FIELD-ADJUSTABLE TEMPERATURE.
4. THE AIR DISTRIBUTION PANEL SHALL ALLOW FOR COMPLETE 360° AIRFLOW FOR MORE UNIFORM TEMPERATURE DISTRIBUTION. A FOUR-WAY AIR DISTRIBUTION SHALL NOT BE ACCEPTABLE.
5. THE INDOOR UNTIL SHALL INCLUDE MOTOR-DRIVEN LOUVERS AND SHALL SUPPORT AUTOMATIC VERTICAL SWING FUNCTIONALITY.
6. THE UNIT SHALL INCLUDE A FACTORY-PROVIDED LED READOUT DISPLAY AND INFRARED RECEIVER PANEL. THE LED DISPLAY SHALL INDICATE THE CURRENT OPERATIONAL SET POINT OF THE INDOOR UNIT.
7. THE UNIT SHALL HAVE A FACTORY-INSTALLED 4-RELAY DRY CONTACT BOARD FOR CONTACT CLOSURE DEPENDING ON INDOOR UNIT OPERATION: COOLING THERMAL ON, HEATING THERMAL ON, FAN ON, AND AUXILIARY/ALTERNATIVE HEAT CONTROL. THE DRY CONTACT BOARD SHALL BE CAPABLE OF PROVIDING A DRY CONTACT OUTPUT FOR INTERLOCK SETTINGS WITH LENNOX VRF INDOOR UNITS.

B. UNIT CABINET

1. THE INDOOR UNIT SHALL BE CONSTRUCTED OF GALVANIZED STEEL.
2. THE UNIT MUST BE CAPABLE OF INSTALLING IN A 24 INCH BY 24 INCH LAY-IN CEILING GRID.
3. THE UNIT SHALL BE LOW PROFILE, WITH A MAXIMUM HEIGHT OF 8-1/4 INCHES.

C. FAN

1. THE INDOOR UNIT SHALL BE SUPPLIED WITH A TURBO FAN WITH BACKWARD CURVED BLADES.
2. THE INDOOR UNIT SHALL USE
3. THE FAN MOTOR SHALL BE A DIRECT-DRIVE MOTOR WITH A HIGH EFFICIENCY DC MOTOR CAPABLE OF OPERATING AT LOW, MEDIUM, AND HIGH FAN SPEED. THERE SHALL BE AN OPTIONAL SUPER HIGH FAN SPEED AVAILABLE BY RE-TAPPING THE FAN MOTOR IN THE FIELD.
4. THE FAN MOTOR SHALL BE THERMALLY PROTECTED.

D. COIL

1. THE INDOOR UNIT COIL SHALL BE RIFLED COPPER TUBING WITH HYDROPHILIC COATED ALUMINUM FINS, WITH 16 FINS PER INCH.
2. THE COIL SHALL HAVE A DESIGN PRESSURE OF 250 – 650 PSI.
3. THE COIL CONNECTIONS TO THE MAIN REFRIGERANT NETWORK SHALL BE FLARE FITTINGS.

E. FILTER

1. THE UNIT SHALL INCLUDE AN EASILY REMOVABLE, WASHABLE MESH FILTER.

F. ELECTRICAL

1. THE POWER SUPPLY TO THE INDOOR UNIT SHALL BE 208-230 VOLTS, 1 PHASE, 60 HZ +/- 10%.
2. THE CONTROL WIRING TO THE INDOOR UNIT SHALL BE 18-GAUGE, 3-CORE, STRANDED, AND SHIELDED. UNSHIELDED COMMUNICATION WIRE SHALL NOT BE ACCEPTED. CONTROL WIRE SHIELDING SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

G. CONDENSATE PUMP

1. THE UNIT SHALL INCLUDE AN INTEGRAL CONDENSATE LIFT PUMP CAPABLE OF 27-1/2 INCHES OF LIFT.

4.03 V33B 360 CASSETTE HIGH EFFICIENCY INDOOR UNIT (NON-DUCTED)

A. GENERAL

1. THE LENNOX V33B 360° CASSETTE INDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED AND TESTED. THE UNIT SHALL INCLUDE ALL WIRING, PIPING, ELECTRONIC EXPANSION VALVE, AND PRINTED CIRCUIT BOARDS NECESSARY FOR OPERATION.
2. THE UNIT SHALL AUTOMATICALLY RESTART AFTER POWER FAILURE.
3. THE UNIT SHALL HAVE A PRE-HEAT FUNCTION TO DELAY FAN OPERATION UNTIL THE INDOOR COIL HAS REACHED A FIELD-ADJUSTABLE TEMPERATURE.
4. THE AIR DISTRIBUTION PANEL SHALL ALLOW FOR COMPLETE 360° AIRFLOW FOR MORE UNIFORM TEMPERATURE DISTRIBUTION. A FOUR-WAY AIR DISTRIBUTION SHALL NOT BE ACCEPTABLE.
5. THE INDOOR UNTIL SHALL INCLUDE MOTOR-DRIVEN LOUVERS AND SHALL SUPPORT AUTOMATIC VERTICAL SWING FUNCTIONALITY.
6. THE UNIT SHALL INCLUDE A FACTORY-PROVIDED LED READOUT DISPLAY AND INFRARED RECEIVER PANEL. THE LED DISPLAY SHALL INDICATE THE CURRENT OPERATIONAL SET POINT OF THE INDOOR UNIT.
7. THE UNIT SHALL INCLUDE A BUILT-IN OCCUPANCY SENSOR ON THE CASSETTE PANEL.
8. THE UNIT SHALL HAVE A FACTORY-INSTALLED 4-RELAY DRY CONTACT BOARD FOR CONTACT CLOSURE DEPENDING ON INDOOR UNIT OPERATION: COOLING THERMAL ON, HEATING THERMAL ON, FAN ON, AND AUXILIARY/ALTERNATIVE HEAT CONTROL. THE DRY CONTACT BOARD SHALL BE CAPABLE OF PROVIDING A DRY CONTACT OUTPUT FOR INTERLOCK SETTINGS WITH LENNOX VRF INDOOR UNITS.

B. UNIT CABINET

1. THE INDOOR UNIT SHALL BE CONSTRUCTED OF GALVANIZED STEEL.

C. FAN

1. THE FAN MOTOR SHALL BE A DIRECT-DRIVE MOTOR WITH A HIGH EFFICIENCY DC MOTOR CAPABLE OF OPERATING AT LOW, MEDIUM, AND HIGH FAN SPEED. THERE SHALL BE AN OPTIONAL SUPER HIGH FAN SPEED AVAILABLE BY RE-TAPPING THE FAN MOTOR IN THE FIELD.
2. THE FAN MOTOR SHALL BE A DIRECT-DRIVE MOTOR CAPABLE OF OPERATING AT LOW, MEDIUM, AND HIGH FAN SPEED.
3. THE FAN MOTOR SHALL BE THERMALLY PROTECTED.

D. COIL

1. THE INDOOR UNIT COIL SHALL BE RIFLED COPPER TUBING WITH HYDROPHILIC COATED ALUMINUM FINS, WITH 16 FINS PER INCH.
2. THE COIL SHALL HAVE A DESIGN PRESSURE OF 250 – 650 PSI.

E. FILTER

1. THE UNIT SHALL INCLUDE AN EASILY REMOVABLE, WASHABLE MESH FILTER.

F. ELECTRICAL

1. THE POWER SUPPLY TO THE INDOOR UNIT SHALL BE 208-230 VOLTS, 1 PHASE, 60 HZ +/- 10%.
2. THE CONTROL WIRING TO THE INDOOR UNIT SHALL BE 18-GAUGE, 3-CORE, STRANDED, AND SHIELDED. UNSHIELDED COMMUNICATION WIRE SHALL NOT BE ACCEPTED. CONTROL WIRE SHIELDING SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

G. CONDENSATE PUMP

1. THE UNIT SHALL INCLUDE AN INTEGRAL CONDENSATE LIFT PUMP CAPABLE OF 29-1/2 INCHES OF LIFT.

4.04 VCFB CEILING/FLOOR MOUNTED INDOOR UNIT (NON-DUCTED)

A. GENERAL

1. THE LENNOX VCFB CEILING/FLOOR MOUNTED INDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED AND TESTED. THE UNIT SHALL INCLUDE ALL WIRING, PIPING, ELECTRONIC EXPANSION VALVE, AND PRINTED CIRCUIT BOARDS NECESSARY FOR OPERATION.
2. THE UNIT SHALL AUTOMATICALLY RESTART AFTER POWER FAILURE.
3. THE UNIT SHALL HAVE A PRE-HEAT FUNCTION TO DELAY FAN OPERATION UNTIL THE INDOOR COIL HAS REACHED A FIELD-ADJUSTABLE TEMPERATURE.
4. THE INDOOR UNTIL SHALL INCLUDE MOTOR-DRIVEN LOUVERS AND SHALL SUPPORT AUTOMATIC VERTICAL AND HORIZONTAL LOUVER SWING FUNCTIONALITY.
5. THE UNIT SHALL INCLUDE A FACTORY-PROVIDED LED READOUT DISPLAY AND INFRARED RECEIVER PANEL. THE LED DISPLAY SHALL INDICATE THE CURRENT OPERATIONAL SET POINT OF THE INDOOR UNIT.
6. THE UNIT SHALL BE CAPABLE OF VERTICAL OR HORIZONTAL ORIENTATION DURING INSTALLATION WITH NO FIELD MODIFICATION REQUIRED.
7. THE UNIT SHALL HAVE A FACTORY-INSTALLED 4-RELAY DRY CONTACT BOARD FOR CONTACT CLOSURE DEPENDING ON INDOOR UNIT OPERATION: COOLING THERMAL ON, HEATING THERMAL ON, FAN ON, AND AUXILIARY/ALTERNATIVE HEAT CONTROL. THE DRY CONTACT BOARD SHALL BE CAPABLE OF PROVIDING A DRY CONTACT OUTPUT FOR INTERLOCK SETTINGS WITH LENNOX VRF INDOOR UNITS.

B. UNIT CABINET

1. THE INDOOR UNIT SHALL BE CONSTRUCTED OF GALVANIZED STEEL.

C. FAN

1. THE FAN MOTOR SHALL BE A DIRECT-DRIVE MOTOR WITH A HIGH EFFICIENCY DC MOTOR CAPABLE OF OPERATING AT LOW, MEDIUM, AND HIGH FAN SPEED. THERE SHALL BE AN OPTIONAL SUPER HIGH FAN SPEED AVAILABLE BY RE-TAPPING THE FAN MOTOR IN THE FIELD.
2. THE FAN MOTOR SHALL BE THERMALLY PROTECTED.

D. COIL

1. THE INDOOR UNIT COIL SHALL BE RIFLED COPPER TUBING WITH HYDROPHILIC COATED ALUMINUM FINS, WITH 16 FINS PER INCH.
2. THE COIL SHALL HAVE A DESIGN PRESSURE OF 250 – 650 PSI.

E. FILTER

1. THE UNIT SHALL INCLUDE AN EASILY REMOVABLE, WASHABLE MESH FILTER.

F. ELECTRICAL

1. THE POWER SUPPLY TO THE INDOOR UNIT SHALL BE 208-230 VOLTS, 1 PHASE, 60 HZ +/- 10%.
2. THE CONTROL WIRING TO THE INDOOR UNIT SHALL BE 18-GAUGE, 3-CORE, STRANDED, AND SHIELDED. UNSHIELDED COMMUNICATION WIRE SHALL NOT BE ACCEPTED. CONTROL WIRE SHIELDING SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

4.05 VWMB WALL MOUNTED INDOOR UNIT (NON-DUCTED)

A. GENERAL

1. THE LENNOX VWMB WALL MOUNTED INDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED AND TESTED. THE UNIT SHALL INCLUDE ALL WIRING, PIPING, ELECTRONIC EXPANSION VALVE, AND PRINTED CIRCUIT BOARDS NECESSARY FOR OPERATION.
2. THE UNIT SHALL AUTOMATICALLY RESTART AFTER POWER FAILURE.
3. THE UNIT SHALL HAVE A PRE-HEAT FUNCTION TO DELAY FAN OPERATION UNTIL THE INDOOR COIL HAS REACHED A FIELD-ADJUSTABLE TEMPERATURE.
4. THE INDOOR UNTIL SHALL INCLUDE MOTOR-DRIVEN LOUVERS AND SHALL SUPPORT AUTOMATIC VERTICAL LOUVER SWING FUNCTIONALITY. THE UNIT SHALL INCLUDE HORIZONTAL LOUVERS THAT ARE MANUALLY ADJUSTABLE.
5. THE UNIT SHALL INCLUDE A FACTORY-PROVIDED LED READOUT DISPLAY AND INFRARED RECEIVER PANEL. THE LED DISPLAY SHALL INDICATE THE CURRENT OPERATIONAL SET POINT OF THE INDOOR UNIT.

B. UNIT CABINET

1. THE INDOOR UNIT SHALL BE CONSTRUCTED OF GALVANIZED STEEL.

C. FAN

1. THE FAN MOTOR SHALL BE A DIRECT-DRIVE MOTOR WITH A HIGH EFFICIENCY DC MOTOR CAPABLE OF OPERATING AT LOW, MEDIUM, AND HIGH FAN SPEED. THERE SHALL BE AN OPTIONAL SUPER HIGH FAN SPEED AVAILABLE BY RE-TAPPING THE FAN MOTOR IN THE FIELD.
2. THE FAN MOTOR SHALL BE THERMALLY PROTECTED.
3. THE INDOOR UNIT SHALL BE SUPPLIED WITH A DC MOTOR.

D. COIL

1. THE INDOOR UNIT COIL SHALL BE RIFLED COPPER TUBING WITH HYDROPHILIC COATED ALUMINUM FINS, WITH 16 FINS PER INCH.
2. THE COIL SHALL HAVE A DESIGN PRESSURE OF 250 – 650 PSI.

E. FILTER

1. THE UNIT SHALL INCLUDE AN EASILY REMOVABLE, WASHABLE MESH FILTER.

F. ELECTRICAL

1. THE POWER SUPPLY TO THE INDOOR UNIT SHALL BE 208-230 VOLTS, 1 PHASE, 60 HZ +/- 10%.
2. THE CONTROL WIRING TO THE INDOOR UNIT SHALL BE 18-GAUGE, 3-CORE, STRANDED, AND SHIELDED. UNSHIELDED COMMUNICATION WIRE SHALL NOT BE ACCEPTED. CONTROL WIRE SHIELDING SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

4.06 VMDB MEDIUM STATIC HIGH EFFICIENCY INDOOR UNIT (DUCTED)

A. GENERAL

1. THE LENNOX VMDB DUCTED INDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED AND TESTED. THE UNIT SHALL INCLUDE ALL WIRING, PIPING, ELECTRONIC EXPANSION VALVE, AND PRINTED CIRCUIT BOARDS NECESSARY FOR OPERATION.
2. THE UNIT SHALL AUTOMATICALLY RESTART AFTER POWER FAILURE.
3. THE UNIT SHALL HAVE A PRE-HEAT FUNCTION TO DELAY FAN OPERATION UNTIL THE INDOOR COIL HAS REACHED A FIELD-ADJUSTABLE TEMPERATURE.
4. THE UNIT SHALL INCLUDE A FACTORY-PROVIDED LED READOUT DISPLAY AND INFRARED RECEIVER PANEL.
5. THE UNIT SHALL HAVE A FACTORY-INSTALLED 4-RELAY DRY CONTACT BOARD FOR CONTACT CLOSURE DEPENDING ON INDOOR UNIT OPERATION: COOLING THERMAL ON, HEATING THERMAL ON, FAN ON, AND AUXILIARY/ALTERNATIVE HEAT CONTROL. THE DRY CONTACT BOARD SHALL BE CAPABLE OF PROVIDING A DRY CONTACT OUTPUT FOR INTERLOCK SETTINGS WITH LENNOX VRF INDOOR UNITS.

B. UNIT CABINET

1. THE INDOOR UNIT SHALL BE CONSTRUCTED OF GALVANIZED STEEL.
2. THE FACTORY RETURN AIR CONNECTION SHALL BE FROM THE REAR OF THE UNIT. THE UNIT SHALL SUPPORT A BOTTOM RETURN AIR CONFIGURATION BY USE OF AN INTERCHANGEABLE BLANK OFF PANEL.

C. FAN

1. THE FAN MOTOR SHALL BE A DIRECT-DRIVE MOTOR WITH A HIGH EFFICIENCY DC MOTOR CAPABLE OF OPERATING AT LOW, MEDIUM, AND HIGH FAN SPEED. THERE SHALL BE AN OPTIONAL SUPER HIGH FAN SPEED AVAILABLE BY RE-TAPPING THE FAN MOTOR IN THE FIELD.
2. THE FAN MOTOR SHALL BE THERMALLY PROTECTED.

D. COIL

1. THE INDOOR UNIT COIL SHALL BE RIFLED COPPER TUBING WITH HYDROPHILIC COATED ALUMINUM FINS, WITH 16 FINS PER INCH.
2. THE COIL SHALL HAVE A DESIGN PRESSURE OF 250 – 650 PSI.

E. FILTER

1. THE UNIT SHALL INCLUDE A SECTIONAL, FOLDABLE FILTER.
2. THE FILTER SHALL BE REMOVABLE FROM BOTH SIDES OF THE UNIT.
3. FIELD INSTALLED 2" FILTER RACKS SUPPLIED FOR EACH DUCTED INDOOR UNIT. MERV13 FILTERS SUPPLIED AND INSTALLED IN THE FIELD BY MECHANICAL CONTRACTOR FOR EACH DUCTED INDOOR UNIT.

F. ELECTRICAL

1. THE POWER SUPPLY TO THE INDOOR UNIT SHALL BE 208-230 VOLTS, 1 PHASE, 60 HZ +/- 10%.
2. THE CONTROL WIRING TO THE INDOOR UNIT SHALL BE 18-GAUGE, 3-CORE, STRANDED, AND SHIELDED. UNSHIELDED COMMUNICATION WIRE SHALL NOT BE ACCEPTED. CONTROL WIRE SHIELDING SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

G. CONDENSATE PUMP

1. THE UNIT SHALL INCLUDE AN INTEGRAL CONDENSATE LIFT PUMP CAPABLE OF 29-1/2 INCHES OF LIFT.

PART 5 – CONTROLS

5.01 LENNOX VRF LOCAL CONTROLLERS

A. WIRED PROGRAMMABLE LOCAL CONTROLLER (V0STAT51P-3)

1. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF CONTROLLING 16 INDOOR UNITS (DEFINED AS 1 GROUP). THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE APPROXIMATELY 3.1" X 7.5" IN SIZE AND BLACK IN COLOR WITH AN AUTO-TIMEOUT TOUCH SCREEN LCD DISPLAY. LCD DISPLAY OF THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE A MINIMUM OF 6.2 INCHES. THE PROGRAMMABLE LOCAL CONTROLLER SHALL HAVE A USB PORT FOR SAVING SETTINGS, LOADING SETTINGS, AND LOADING SOFTWARE CHANGES.
2. THE PROGRAMMABLE LOCAL CONTROLLER SHALL SUPPORT TEMPERATURE DISPLAY OF FAHRENHEIT OR CELSIUS. THE PROGRAMMABLE LOCAL CONTROLLER SHALL CONTROL THE FOLLOWING OPERATIONS: ON/OFF, OPERATION MODE (COOL, HEAT, AUTO, DRY, AND FAN, TEMPERATURE SET POINT, FAN SPEED SETTING, AND LOUVER SWING SETTING. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF SETTING TEMPERATURE SET POINT IN THE RANGE OF 62°F – 86°F.
3. THE PROGRAMMABLE LOCAL CONTROLLER SHALL SUPPORT SCHEDULING UP TO 8 TIMES IN A DAY IN 10 AND 7-DAY SCHEDULING OPTIONS. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF SETTING CUSTOM HOLIDAYS BY DATE OR DAY.
4. THE PROGRAMMABLE LOCAL CONTROLLER SHALL HAVE A SERVICE MENU WHICH IS PASSWORD PROTECTED. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF LOCKING THE FOLLOWING USER FUNCTIONS: ON/OFF, TEMPERATURE SETTINGS, OPERATION MODE, SWING, AND SCHEDULING.
5. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF DISABLING OR REMOVING FUNCTIONS FROM THE HOME SCREEN DEPENDING ON SYSTEM TYPE.
6. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF CALIBRATING THE ROOM TEMPERATURE SENSOR BY +/- 4°F.
7. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF DISPLAYING INDOOR UNIT SENSOR READINGS, EXV POSITION, SYSTEM MONITORING CODES, AND STATUS OF CONNECTED DRY CONTACTS.
8. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF LIMITING THE SET POINT FOR COOLING AND HEADING INDIVIDUALLY. THE ROOM TEMPERATURE SHALL BE SENSED AT THE PROGRAMMABLE LOCAL CONTROLLER BY DEFAULT AND SHALL BE CAPABLE OF CHANGING TO INDOOR UNIT SENSOR VIA THE PROGRAMMABLE LOCAL CONTROLLER. THE PROGRAMMABLE LOCAL CONTROLLER SHALL HAVE THE HISTORY OF THE LAST 10 ERROR CODES.
9. THE PROGRAMMABLE LOCAL CONTROLLER SHALL CONNECT USING FOUR-WIRE, STRANDED, AND SHIELDED CONDUCTOR CABLE TO XYE CONNECTION TERMINAL ON THE INDOOR UNIT.
10. THE PROGRAMMABLE CONTROLLER SHALL INCLUDE A BUILT-IN OCCUPANCY SENSOR FOR ZONE CONTROL.
11. THE PROGRAMMABLE LOCAL CONTROLLER SHALL BE CAPABLE OF SETTING A HUMIDITY SET POINT IN ADDITION TO TEMPERATURE SET POINT. TO ACHIEVE HUMIDITY SET POINT, THE CONTROLLER SHALL REDUCE FAN SPEED TO LOWEST SETTING AND INITIATE COOLING UNTIL HUMIDITY SET POINT IS ACHIEVED. THE CONTROLLER SHALL RESET FAN SPEED TO THE ORIGINAL SETTING AND INITIATE COOLING OR HEATING MODE AS REQUIRED ONCE HUMIDITY SET POINT IS ACHIEVED.

5.02 ZONE CONTROL ACCESSORIES

A. HHE HEAT RELAY KIT (V0CTRL92P-3)

1. THE HHE RELAY KIT SHALL HAVE SIX DRY CONTACTS FOR CONTACT CLOSURE DEPENDING ON INDOOR UNIT OPERATION: COOLING THERMAL ON, HEATING THERMAL ON, FAN ON, AUXILIARY HEAT/ALTERNATIVE HEAT CONTROL, AND DEHUMIDIFICATION. THE DRY CONTACT BOARD SHALL BE CAPABLE OF PROVIDING A DRY CONTACT OUTPUT FOR INTERLOCK SETTINGS WITH LENNOX VRF INDOOR UNITS.
2. STATUS INDICATION OF EACH DRY CONTACT SHALL BE DISPLAYED BY THE LOCAL CONTROLLER.

5.03 BUILDING MANAGEMENT SYSTEM INTEGRATION

LENNOX VRF CONTROLS SHALL BE CAPABLE OF SUPPORTING INTEGRATION WITH BUILDING AUTOMATIONS SYSTEMS (BAS).

A. BACNET GATEWAY (V0CTRL95P-3)

THE LENNOX VRF BACNET® GATEWAY SHALL COMMUNICATE WITH BUILDING AUTOMATION SYSTEMS THAT SUPPORT THE BACNET® PROFILE USING RJ45 FOR BACNET® IP PROTOCOL. THE BACNET® GATEWAY SHALL SUPPORT A MAXIMUM OF 256 INDOOR UNITS. OPERATION AND MONITORING POINTS INCLUDE, BUT ARE NOT LIMITED TO, OPERATION MODE, FAN SPEED, SET POINT CONTROL, LOUVER DIRECTION, PROTECTION CODE AND ERROR CODE. THE BACNET GATEWAY SHALL HAVE AN EMERGENCY STOP CONTROL POINT FOR THE OUTDOOR UNIT.

5.04 INSTALLATION REQUIREMENTS

THE LENNOX VRF SYSTEM SHALL BE INSTALLED BY CONTRACTOR APPROVED AND TRAINED BY LENNOX. THE SYSTEM SHALL BE COMMISSIONED BY A LENNOX FACTORY DIRECT FIELD TECHNICIAN WHO WILL PERFORM THE INITIAL VRF SYSTEM START-UP AND PROVIDE A WRITTEN START-UP REPORT TO THE OWNER AND ENGINEER THAT APPROVES THE INSTALLATION AND INDICATES THAT THE SYSTEM MEETS LENNOX' INSTALLATION AND COMMISSIONING REQUIREMENTS. LENNOX RESERVES THE RIGHT TO PERFORM THIS COMMISSIONING AS REMOTE ASSISTANCE.

REFRIGERANT PIPING SPECIFICATIONS

PART 1 GENERAL

1.1 SUMMARY

SPEC NOTE: DO NOT USE THE FOLLOWING PARAGRAPH FOR FEDERAL GOVERNMENT PROJECTS.

.1 SECTION INCLUDES:

.1 MATERIALS AND INSTALLATION FOR COPPER TUBING AND FITTINGS FOR REFRIGERANT SYSTEM.

SPEC NOTE: SUSTAINABLE: EXPAND THE FOLLOWING PARAGRAPH TO INCLUDE SPECIFIC SUSTAINABLE REQUIREMENTS OF THIS SECTION OR CO-ORDINATE WITH SECTION 01 47 15 – SUSTAINABLE REQUIREMENTS: CONSTRUCTION AND SECTION 01 47 17 – SUSTAINABLE REQUIREMENTS: CONTRACTOR'S VERIFICATION.

.2 SUSTAINABLE REQUIREMENTS FOR CONSTRUCTION AND VERIFICATION.

1.2 REFERENCES

SPEC NOTE: EDIT THE FOLLOWING PARAGRAPH FOR THE SPECIFIC PROJECT.

.1 AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

.1 ASME B16.22_[01], WROUGHT COPPER AND COPPER ALLOY SOLDER _ JOINT PRESSURE FITTINGS.

.2 ASME B16.24_[02], CAST COPPER PIPE FLANGES AND FLANGED FITTINGS: CLASS 150, 300, 400, 600, 900, 1500 AND 2500.

.3 ASME B16.26_[88], CAST COPPER ALLOY FITTINGS FOR FLARED COPPER TUBES.

.4 ASME B31.5_[01], REFRIGERATION PIPING AND HEAT TRANSFER COMPONENTS.

.2 AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL (ASTM)

.1 ASTM A307_[04], STANDARD SPECIFICATION FOR CARBON STEEL BOLTS AND STUDS, 60,000 PSI TENSILE STRENGTH.

.2 ASTM B280_[03], STANDARD SPECIFICATION FOR SEAMLESS COPPER TUBE FOR AIR CONDITIONING AND REFRIGERATION FIELD SERVICE.

.3 CANADIAN STANDARDS ASSOCIATION (CSA INTERNATIONAL)

.1 CSA B52_[99], MECHANICAL REFRIGERATION CODE.

.4 ENVIRONMENT CANADA (EC)

.1 EPS 1/RA/1_[96], ENVIRONMENTAL CODE OF PRACTICE FOR THE ELIMINATION OF FLUOROCARBON EMISSIONS FROM REFRIGERATION AND AIR CONDITIONING SYSTEMS.

.5 HEALTH CANADA / WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

.1 MATERIAL SAFETY DATA SHEETS (MSDS).

1.3 SUBMITTALS

.1 PRODUCT DATA:

.1 SUBMIT MANUFACTURER'S PRINTED PRODUCT LITERATURE, SPECIFICATIONS AND DATASHEET FOR PIPING, FITTINGS AND EQUIPMENT.

.2 INDICATE VOC'S FOR ADHESIVE AND SOLVENTS DURING APPLICATION AND CURING.

.2 TEST REPORTS: SUBMIT CERTIFIED TEST REPORTS FROM APPROVED INDEPENDENT TESTING LABORATORIES INDICATING COMPLIANCE WITH SPECIFICATIONS FOR SPECIFIED PERFORMANCE CHARACTERISTICS AND PHYSICAL PROPERTIES.

.3 CERTIFICATES: SUBMIT CERTIFICATES SIGNED BY MANUFACTURER CERTIFYING THAT MATERIALS COMPLY WITH SPECIFIED PERFORMANCE CHARACTERISTICS AND PHYSICAL PROPERTIES.

.4 INSTRUCTIONS: SUBMIT MANUFACTURER'S INSTALLATION INSTRUCTIONS.

.5 CLOSEOUT SUBMITTALS: SUBMIT MAINTENANCE AND ENGINEERING DATA FOR INCORPORATION INTO MANUAL SPECIFIED IN SECTION 15010.

1.4 QUALITY ASSURANCE

.1 PRE-INSTALLATION MEETING:

.1 VERIFY PROJECT REQUIREMENTS.

.2 REVIEW INSTALLATION AND SITE CONDITIONS.

.3 CO-ORDINATION WITH OTHER BUILDING SUBTRADES.

.4 REVIEW MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WARRANTY REQUIREMENTS.

1.5 DELIVERY, STORAGE AND HANDLING

.1 WASTE MANAGEMENT AND DISPOSAL:

.1 SEPARATE WASTE MATERIALS FOR RECYCLING IN ACCORDANCE WITH INDUSTRY STANDARD.

.2 REMOVE FROM SITE AND DISPOSE OF PACKAGING MATERIALS AT APPROPRIATE RECYCLING FACILITIES.

.3 COLLECT AND SEPARATE FOR DISPOSAL PAPER, PLASTIC, POLYSTYRENE, CORRUGATED CARDBOARD, PACKAGING MATERIAL, ETC. IN APPROPRIATE ON-SITE BINS FOR RECYCLING.

.4 SEPARATE FOR REUSE AND RECYCLING AND PLACE IN DESIGNATED CONTAINERS STEEL, METAL AND PLASTIC WASTE.

.5 DIVERT UNUSED METAL MATERIALS FROM LANDFILL TO METAL RECYCLING FACILITY AS REQUIRED.

PART 2 PRODUCTS

SPEC NOTE ENVIRONMENT: CHOOSE PRODUCTS AND MATERIALS WITH RECYCLED CONTENT OR RESOURCE EFFICIENT CHARACTERISTICS.

2.1 MATERIALS

.

.1 PROVIDE MATERIALS AND RESOURCES REQUIRED TO COMPLETE THE INSTALLATION AND ACHIEVE A FULL OPERATIONAL SYSTEM.

2.2 TUBING

.1 PROCESSED FOR REFRIGERATION INSTALLATIONS, DEOXIDIZED, DEHYDRATED AND SEALED.

.1 HARD COPPER: TO ASTM B280, TYPE ACR OR B.

.2 ANNEALED COPPER: TO ASTM B280, WITH MINIMUM WALL THICKNESS AS PER CSA B52 AND ASME B31.5.

2.3 FITTINGS

.1 SERVICE: DESIGN PRESSURE 2070 KPA AND TEMPERATURE 121 DEGREES C.

.2 BRAZED:

.1 FITTINGS: WROUGHT COPPER TO ASME B16.22.

.2 JOINTS: SILVER SOLDER, 15% AG_80% CU-5%P OR COPPER_PHOSPHOROUS, 95% CU_5%P AND NON_CORROSIVE FLUX.

.3 FLANGED:

.1 BRONZE OR BRASS, TO ASME B16.24, CLASS 150 AND CLASS 300.

.2 GASKETS: SUITABLE FOR SERVICE.

.3 BOLTS, NUTS AND WASHERS: TO ASTM A307, HEAVY SERIES.

.4 FLARED:

.1 BRONZE OR BRASS, FOR REFRIGERATION, TO ASME B16.26.

2.4 PIPE SLEEVES

.1 HARD COPPER OR STEEL, SIZED TO PROVIDE 6 MM CLEARANCE AROUND BETWEEN SLEEVE AND UNINSULATED PIPE OR BETWEEN SLEEVE AND INSULATION.

2.5 VALVES

.1 22 MM AND UNDER: CLASS 500, 3.5 MPA, GLOBE OR ANGLE NON_DIRECTIONAL TYPE, DIAPHRAGM, PACKLESS TYPE, WITH FORGED BRASS BODY AND BONNET, MOISTURE PROOF SEAL FOR BELOW FREEZING APPLICATIONS, BRAZED CONNECTIONS.

.2 OVER 22 MM: CLASS 375, 2.5 MPA, GLOBE OR ANGLE TYPE, DIAPHRAGM, PACKLESS TYPE, BACK_SEATING, CAP SEAL, WITH CAST BRONZE BODY AND BONNET, MOISTURE PROOF SEAL FOR BELOW FREEZING APPLICATIONS, BRAZED CONNECTIONS.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 COMPLIANCE: COMPLY WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS OR SPECIFICATIONS, INCLUDING PRODUCT TECHNICAL BULLETINS, HANDLING, STORAGE AND INSTALLATION INSTRUCTIONS, AND DATASHEET.

3.2 GENERAL

.1 INSTALL IN ACCORDANCE WITH CSA B52, EPS1/RA/1 AND ASME B31.5.

3.3 BRAZING PROCEDURES

.1 BLEED INERT GAS INTO PIPE DURING BRAZING.

.2 REMOVE VALVE INTERNAL PARTS, SOLENOID VALVE COILS, SIGHT GLASS.

.3 DO NOT APPLY HEAT NEAR EXPANSION VALVE AND BULB.

3.4 PIPING INSTALLATION

.1 GENERAL:

.1 SOFT ANNEALED COPPER TUBING: BEND WITHOUT CRIMPING OR CONSTRICTION.

.2 HARD DRAWN COPPER TUBING: DO NOT BEND. MINIMIZE USE OF FITTINGS.

.3 PROVIDE THERMAL INSULATION FOR ALL REFRIGERANT LINES, PROVIDE PVC JACKETING AND ALUMINUM COVERING FOR ALL PIPING.

.4 PROVIDE OVERSIZED HANGERS IN ORDER TO ALLOW FOR CONTINUOUS THERMAL INSULATION OF ALL REFRIGERANT PIPES AND JACKETING.

.5 FOR PIPING LOCATED TO OUTDOORS PROVIDE ALUMINUM JACKETING ON TOP OF THE THERMAL INSULATION AND PVC JACKETING.

.6 PROVIDE REFRIGERANT PIPING SUPPORT AS REQUIRED.

.2 HOT GAS LINES:

.1 PITCH AT LEAST 1:240 DOWN IN DIRECTION OF FLOW TO PREVENT OIL RETURN TO COMPRESSOR DURING OPERATION.

.2 PROVIDE TRAP AT BASE OF RISERS GREATER THAN 2400 MM HIGH AND AT EACH 7600 MM THEREAFTER.

.3 PROVIDE INVERTED DEEP TRAP AT TOP OF RISERS.

.4 PROVIDE DOUBLE RISERS FOR COMPRESSORS HAVING CAPACITY MODULATION.

.1 LARGE RISER: INSTALL TRAPS AS SPECIFIED.

.2 SMALL RISER: SIZE FOR 5.1 M/S AT MINIMUM LOAD. CONNECT UPSTREAM OF TRAPS ON LARGE RISER.

.5 PROVIDE SIGHT GLASS FOR NEW REFRIGERANT PIPING.

.6 PROVIDE ALL REQUIRED EXPANSION LOOP FOR NEW REFRIGERANT PIPING.

.7 PROVIDE WALL SLEEVE AND REQUIRED INSULATION, WATERTIGHT CAULKING ETC. WHEN PENETRATING EXTERIOR WALLS.

.8 PROVIDE ADDITIONAL REFRIGERANT GAS TO THE SYSTEM AS REQUIRED.

3.5 PRESSURE AND LEAK TESTING

.1 CLOSE VALVES ON FACTORY CHARGED EQUIPMENT AND OTHER EQUIPMENT NOT DESIGNED FOR TEST PRESSURES.

.2 LEAK TEST TO CSA B52 BEFORE EVACUATION TO 2MPA AND 1MPA ON HIGH AND LOW SIDES RESPECTIVELY.

.3 TEST PROCEDURE: BUILD PRESSURE UP TO 35 KPA WITH REFRIGERANT GAS ON HIGH AND LOW SIDES. SUPPLEMENT WITH NITROGEN TO REQUIRED TEST PRESSURE. TEST FOR LEAKS WITH ELECTRONIC OR HALIDE DETECTOR. REPAIR LEAKS AND REPEAT TESTS.

3.6 FIELD QUALITY CONTROL

.1 SITE TESTS/INSPECTION:

.1 CLOSE SERVICE VALVES ON FACTORY CHARGED EQUIPMENT.

.2 AMBIENT TEMPERATURES TO BE AT LEAST 13 DEGREES C FOR AT LEAST 12 HOURS BEFORE AND DURING DEHYDRATION.

.3 USE COPPER LINES OF LARGEST PRACTICAL SIZE TO REDUCE EVACUATION TIME.

.4 USE TWO_STAGE VACUUM PUMP WITH GAS BALLAST ON 2ND STAGE CAPABLE OF PULLING 5PA ABSOLUTE AND FILLED WITH DEHYDRATED OIL.

.5 MEASURE SYSTEM PRESSURE WITH VACUUM GAUGE. TAKE READINGS WITH VALVE BETWEEN VACUUM PUMP AND SYSTEM CLOSED.

.6 TRIPLE EVACUATE SYSTEM COMPONENTS CONTAINING GASES OTHER THAN CORRECT REFRIGERANT OR HAVING LOST HOLDING CHARGE AS FOLLOWS:

.1 TWICE TO 14 PA ABSOLUTE AND HOLD FOR 4 H.

.2 BREAK VACUUM WITH REFRIGERANT TO 14 KPA.

.3 FINAL TO 5 PA ABSOLUTE AND HOLD FOR AT LEAST 12 H.

.4 ISOLATE PUMP FROM SYSTEM, RECORD VACUUM AND TIME READINGS UNTIL STABILIZATION OF VACUUM.

.5 SUBMIT TEST RESULTS TO CONSULTANT FORE REVIEW.

.7 COORDINATE FOR TSSA INSPECTION AND PAY FOR ALL APPLICABLE FEES. INCLUDE SUCH FEES IN THE TENDER PRICE. SUBMIT TSSA REPORT TO CONSULTANT FOR REVIEW AND RECORD.

.8 CHARGING:

.1 CHARGE SYSTEM THROUGH FILTER_DRIER AND CHARGING VALVE ON HIGH SIDE. LOW SIDE CHARGING NOT PERMITTED.

.2 WITH COMPRESSORS OFF, CHARGE ONLY AMOUNT NECESSARY FOR PROPER OPERATION OF SYSTEM. IF SYSTEM PRESSURES EQUALIZE BEFORE SYSTEM IS FULLY CHARGED, CLOSE CHARGING VALVE AND START UP. WITH UNIT OPERATING, ADD REMAINDER OF CHARGE TO SYSTEM.

.3 RE_PURGE CHARGING LINE IF REFRIGERANT CONTAINER IS CHANGED DURING CHARGING PROCESS.

.9 CHECKS:

.1 MAKE CHECKS AND MEASUREMENTS AS PER MANUFACTURER'S OPERATION AND MAINTENANCE INSTRUCTIONS.

.2 RECORD AND REPORT MEASUREMENTS TO CONSULTANT.

.10 MANUFACTURER'S FIELD SERVICES:

.1 HAVE MANUFACTURER OF PRODUCTS, SUPPLIED UNDER THIS SECTION, REVIEW WORK INVOLVED IN THE HANDLING, INSTALLATION/APPLICATION, PROTECTION AND CLEANING, OF ITS PRODUCT AND SUBMIT WRITTEN REPORTS, IN ACCEPTABLE FORMAT, TO VERIFY COMPLIANCE OF WORK WITH CONTRACT.

.2 PROVIDE MANUFACTURER'S FIELD SERVICES CONSISTING OF PRODUCT USE RECOMMENDATIONS AND PERIODIC SITE VISITS FOR INSPECTION OF PRODUCT INSTALLATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

.3 SCHEDULE SITE VISITS, TO REVIEW WORK, AT STAGES LISTED:

.1 UPON COMPLETION OF THE WORK, AFTER CLEANING IS CARRIED OUT.

.4 OBTAIN REPORTS, WITHIN 3 DAYS OF REVIEW, AND SUBMIT, IMMEDIATELY, TO CONSULTANT.

3.7 CLEANING

.1 PERFORM CLEANING OPERATIONS AS REQUIRED AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

.2 ON COMPLETION AND VERIFICATION OF PERFORMANCE OF INSTALLATION, REMOVE SURPLUS MATERIALS, EXCESS MATERIALS, RUBBISH, TOOLS AND EQUIPMENT.

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Client:

CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:

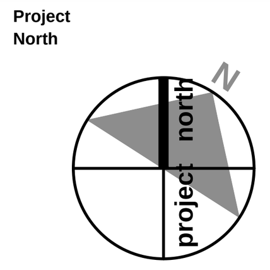
CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -

INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

Sheet Title:

MECHANICAL DETAILS & EQUIPMENT SCHEDULES

Project North



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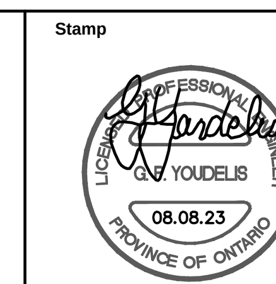


Date: DEC 2022

Project No.: 25136

Scale: N.T.S.

Drawn: K.J

Checked: G.P.Y

Drawing Number:

M-102

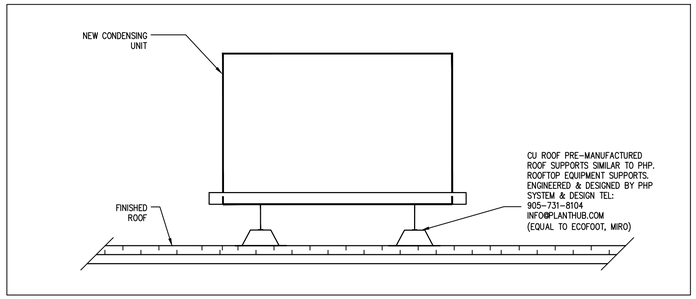
VRF HEAT PUMP AIR CONDITIONING SCHEDULE

BASIS OF DESIGN: LENNOX
EQUAL IN: DAIKIN, MITSUBISHI

No.	AREA SERVED	MANUFACTURER	MODEL No.	AIRFLOW (CFM)	E.S.P. (IN.WG)	DX COOLING COIL PERFORMANCE TOT / SENSIBLE		DX HEATING COIL PERFORMANCE		SOUND	ELECTRICAL DATA			SHIPPING WEIGHT (LBS)	HEAT RECOVERY BRANCH SELECTOR BOX			
						TOT (BTU/H)	KW SENS. (BTU/H)	KW TOT (BTU/H)	COP	DBA	ELEC.	MCA	MAX FUSE		MODEL No.	ELEC.	MCA	MOP
AC-1	MEETING ROOM 1141	LENNOX	VWMB018H4-3P WALL MOUNTED	450	0.0	19,000	14,250	21,500	--	42.0	208-230V 1PH/60Hz	0.42A	15.0A	51	--	--	--	--
AC-2	MEETING ROOM 1031	LENNOX	VWMB018H4-3P WALL MOUNTED	450	0.0	19,000	14,250	21,500	--	42.0	208-230V 1PH/60Hz	0.42A	15.0A	51	N/A			
AC-3	MEETING ROOM 1026	LENNOX	VWMB015H4-3P WALL MOUNTED	400	0.0	15,000	11,250	17,100	--	38.6	208-230V 1PH/60Hz	0.34A	15.0A	38	N/A			
AC-4	MEETING ROOM 1022	LENNOX	VWMB018H4-3P WALL MOUNTED	450	0.0	19,000	14,250	21,500	--	42.0	208-230V 1PH/60Hz	0.42A	15.0A	51	N/A			
AC-5	MEETING ROOM 1053	LENNOX	VWMB030H4-3P WALL MOUNTED	700	0.0	30,000	22,500	34,100	--	--	208-230V 1PH/60Hz	0.65A	15.0A	51	N/A			
AC-6	MEETING ROOM 947	LENNOX	VWMB018H4-3P WALL MOUNTED	450	0.0	19,000	14,250	21,500	--	42.0	208-230V 1PH/60Hz	0.42A	15.0A	51	N/A			
AC-7	MEETING ROOM 958	LENNOX	VWMB030H4-3P WALL MOUNTED	700	0.0	30,000	22,500	34,100	--	--	208-230V 1PH/60Hz	0.65A	15.0A	51	N/A			

NO.	MODEL NO.	LOCATION	ELEC. DATA	CLG CAPACITY (BTU)@95°F	HTG CAPACITY (BTU)	BASIS OF DESIGN	REFRIGERANT	WEIGHT LBS
CU-1	THIS CONDENSING UNIT IS COMPRISED OF ONE (1) INDEPENDENT MODULE							
	CU-01 VPB120H4M-3Y	ROOF	208V/3PH/60Hz MCA-54 A MOCP-60 A	120,000	129,000	LENNOX	R-410A	794

NOTE:
1. COOLING CAPACITIES ARE BASED ON 25C db, 18C wb E.A.T. 35C OAT.
2. HEATING CAPACITIES ARE BASED ON -25C OUTDOOR AIR TEMPERATURE.
3. PROVIDE PREFABRICATED STEEL SUPPORTS FOR CONDENSING UNITS EQUAL TO EFMD6-PB6CB483. ELEVATED FOOT STANDS C/W RUBBER ISOLATION UNDER ALL CONDENSING UNITS.
4. PROVIDE FACTORY INSTALLED WEATHERPROOF DISCONNECT SWITCHES FOR ALL CONDENSING UNITS. (BY CONTRACTOR)
5. PROVIDE ALL NECESSARY DISTRIBUTION JOINT KITS, AND BALL VALVE KITS, ALL NECESSARY INTERCONNECTING CONTROL WIRING, TEMPERATURE SENSORS, AND CONTROL INTERCONNECTS BETWEEN INDOOR FAN COIL UNITS AND THE CONDENSING UNITS AS REQUIRED TO FORM A COMPLETE AND OPERATIONAL SYSTEM
6. PROVIDE (Y) BRANCHES FOR AC UNITS AS INDICATED ON THE FLOOR PLANS AND SCHEMATIC DIAGRAM.
7. PROVIDE WALL MOUNTED CONTROLLER FOR ALL AC UNITS.
8. 10 YEAR WARRANTY FOR ALL PARTS ON AC UNITS, CU UNITS AND BRANCH BOXES.
9. PROVIDE CONDENSATE PUMP FOR WALL MOUNTED AC UNIT. SIMILAR TO MINILIME.
10. LOW AMBIENT COOLING PERFORMANCE FOR CU-1, DURING WINTER SEASON.



6 M-103 ROOF MOUNTED CONDENSING UNIT DETAIL
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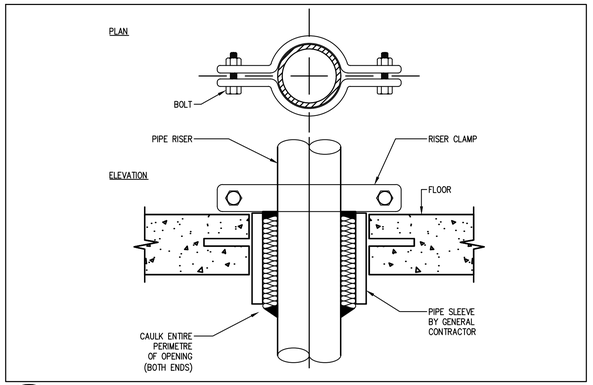
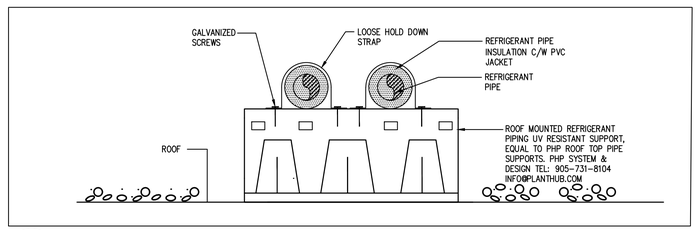


4 M-103 PIPE SUPPORT DETAIL AT FLOOR
N.T.S.



7 M-103 DETAIL OF REFRIGERANT PIPING SUPPORT ON ROOF
N.T.S.

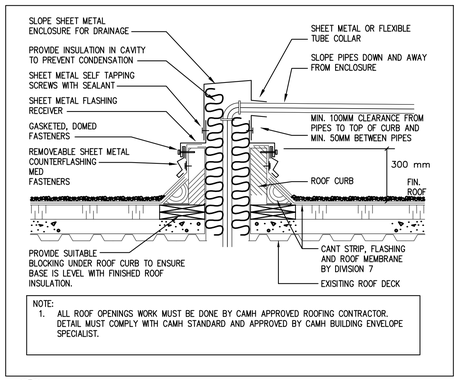
EXHAUST FAN SCHEDULE

BASIS OF DESIGN: CARNES,
EQUAL IN: LOREN COOK, GREENHECK, PENN, ZONEX

NO.	SERVICE	TYPE	AIRFLOW (CFM)	STATIC PRESS. (IN.W.G.)	MOTOR WATTS (HP)	VOLTAGE	NOTES:
EF-1	STORAGE 1145	CEILING MOUNTED VCDD030C	253	0.25	172 WATTS	120/1	① ② ④ ⑨
EF-2	PRINTER 1024	CEILING MOUNTED VCDD030C	253	0.25	172 WATTS	120/1	① ② ④ ⑨
EF-3	STORAGE 1048	CEILING MOUNTED VCDD030C	253	0.25	172 WATTS	120/1	① ② ④ ⑨

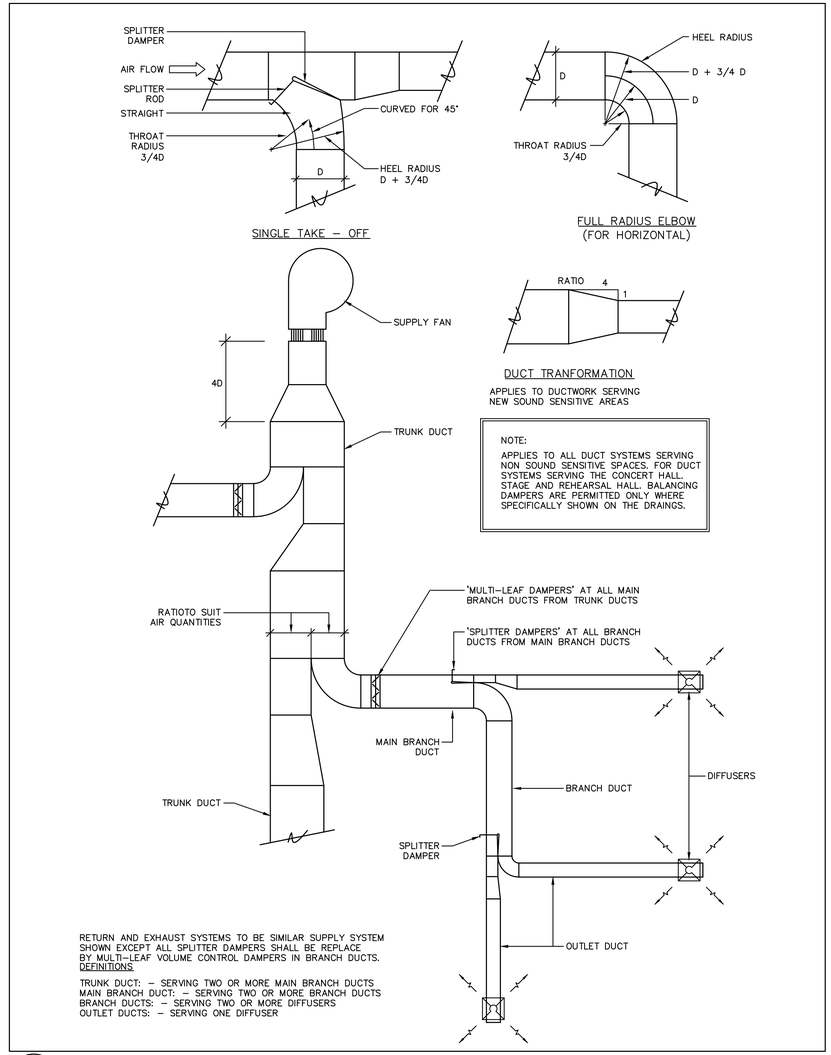
NOTES:
① WALL MOUNTED STARTER
② UNIT MOUNTED VARIABLE SPEED CONTROLLER
③ RUBBER IN SHEAR ISOLATORS
④ WHITE PAINTED STEEL GRILLE
⑤ REVERSE ACTING LINE VOLTAGE THERMOSTAT, SET TO ENERGIZE FAN ABOVE 75F°
⑥ BACK DRAFT DAMPER
⑦ ROOF CURB
⑧ MOTORIZED DAMPER
⑨ UNIT MOUNTED DISCONNECT SWITCH

8 M-103 WALKER/PAVER DETAIL
N.T.S.



NOTE:
1. ALL ROOF OPENINGS WORK MUST BE DONE BY CAMH APPROVED ROOFING CONTRACTOR. DETAIL MUST COMPLY WITH CAMH STANDARD AND APPROVED BY CAMH BUILDING ENVELOPE SPECIALIST.

5 M-103 DETAIL OF PIPE PENTRATION THRU ROOF
N.T.S.



1 M-103 DUCTWORK FITTINGS AND BALANCING DAMPER DETAILS
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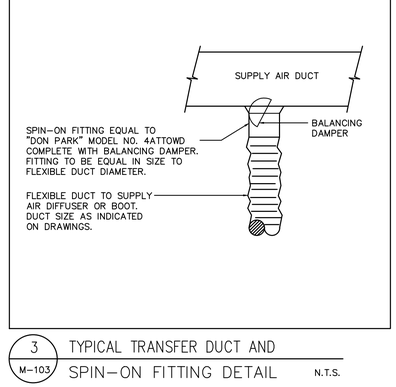

3 M-103 TYPICAL TRANSFER DUCT AND SPIN-ON FITTING DETAIL
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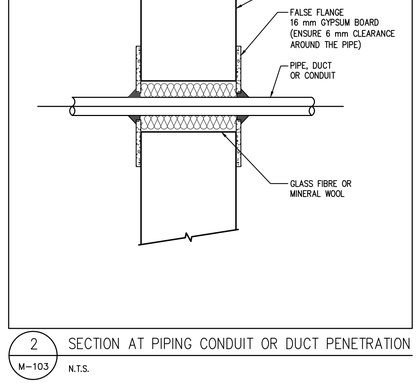

2 M-103 SECTION AT PIPING CONDUIT OR DUCT PENETRATION
N.T.S.

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Client:

CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:

CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

Sheet Title:

MECHANICAL DETAILS & EQUIPMENT SCHEDULES

Project North

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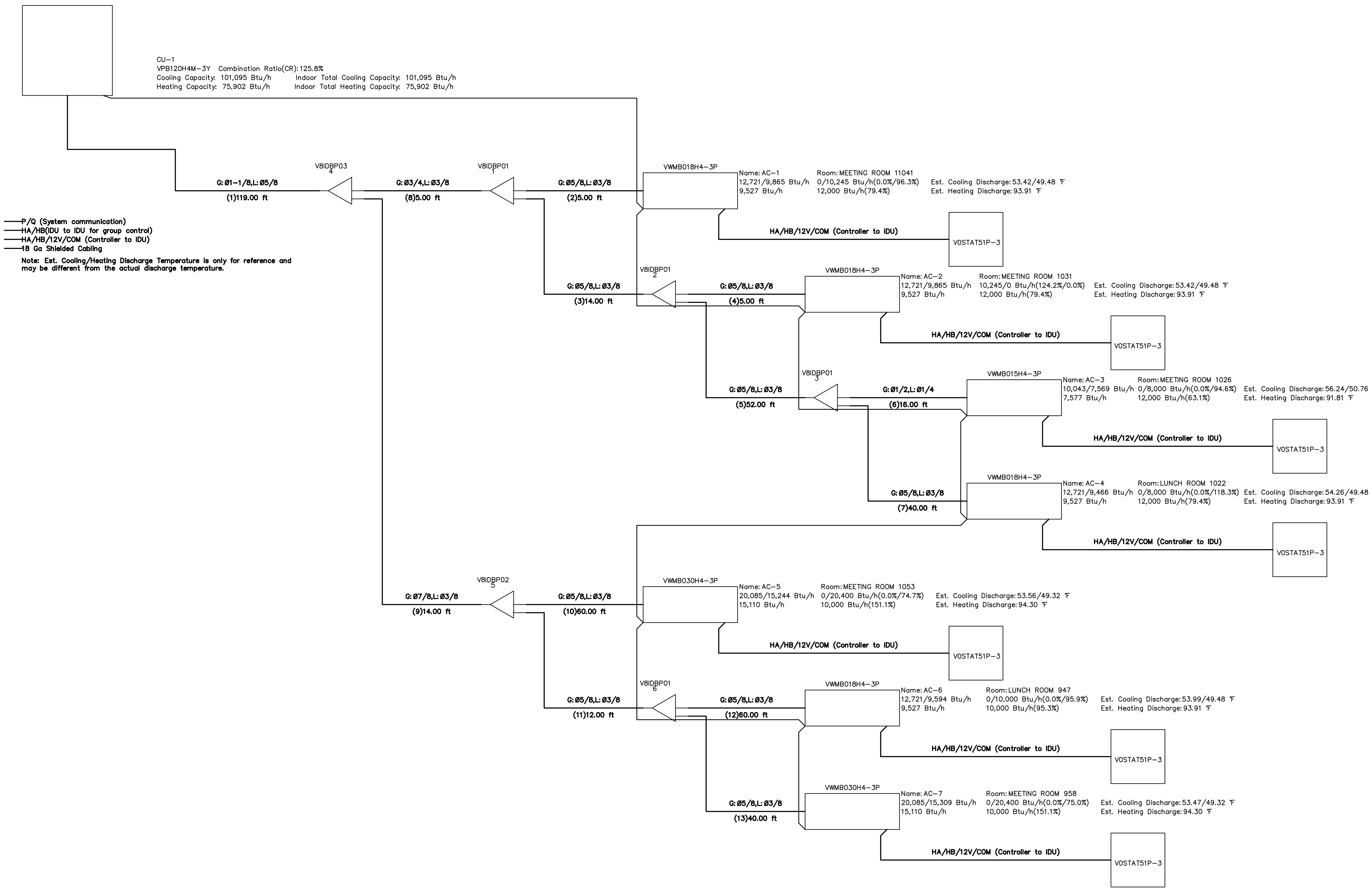
LICENSED PROFESSIONAL ENGINEER YOUDELIS 08.08.23 PROVINCE OF ONTARIO

Date:	Project No.:	
DEC 2022	25136	
Scale: N.T.S.	Drawn: K.J	Checked: G.P.Y

Drawing Number:

M-103

No.	Name	Model	Quantity	Unit	Description
1	Heat Pump (208/230V)	VPB120H4M-3Y	1		Heat Pump (208/230V)
2	VWMB-Wall Mounted	VWMB018H4-3P	4		VWMB-Wall Mounted
3	VWMB-Wall Mounted	VWMB015H4-3P	1		VWMB-Wall Mounted
4	VWMB-Wall Mounted	VWMB030H4-3P	2		VWMB-Wall Mounted
5	Branch Joint	V8IDBP02	1		Branch
6	Branch Joint	V8IDBP03	1		Branch
7	Branch Joint	V8IDBP01	4		Branch
8	Pipe	Ø1/4	16.0	ft	Copper pipe
9	Pipe	Ø3/8	307.0	ft	Copper pipe
10	Pipe	Ø1/2	16.0	ft	Copper pipe
11	Pipe	Ø5/8	407.0	ft	Copper pipe
12	Pipe	Ø3/4	5.0	ft	Copper pipe
13	Pipe	Ø7/8	14.0	ft	Copper pipe
14	Pipe	Ø1-1/8	119.0	ft	Copper pipe
15	Touchscreen Programmable Controller	V0STAT51P-3	7		Touchscreen Programmable Controller
16	R410A refrigerant	R410A	33.19	lbs	Extra Refrigerant Added



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Client:

**CAMH
CENTRE FOR ADDICTION
AND MENTAL HEALTH**

Project Title:

**CAMH 250 COLLEGE STREET
MOVE CONSOLIDATION -**

INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

Sheet Title:

VRF SYSTEM REFRIGERANT PIPING & CONTROL SCHEMATIC

Project North

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LICENSED PROFESSIONAL ENGINEER
G. YOUDELIS
08.08.23
PROVINCE OF ONTARIO
[illegible]

Date: DEC 2022
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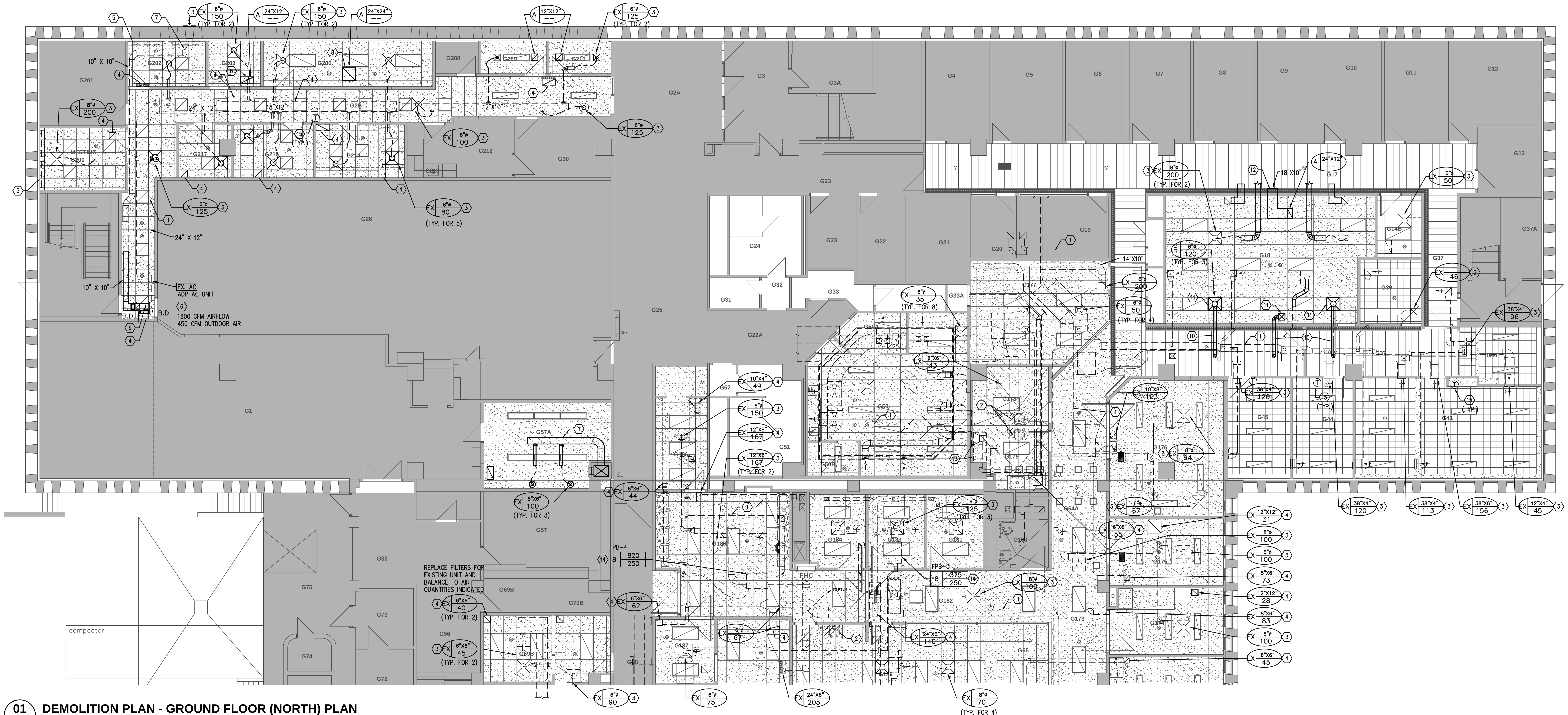

01
M-200

DEMOLITION PLAN - GROUND FLOOR (NORTH) PLAN

1/8"=1'-0"

GENERAL NOTES

1. CONTRACTOR SHALL INFORM TO THE MECHANICAL ENGINEER OF ANY DISCREPANCIES PRIOR TO SUBMITTING BID.
2. CONTRACTOR TO COORDINATE WORK ON SITE WITH EXISTING MECHANICAL, STRUCTURAL AND ELECTRICAL SERVICES IN ORDER TO SUIT NEW INSTALLATION.
3. ALL EXISTING PLUMBING PIPING SHALL BE REMOVED AND CAPPED BEHIND NEW / EXISTING FINISHED SURFACES.
4. EXISTING PLUMBING SERVICES THAT CONTINUE TO SERVE AS A RISER SHALL BE RELOCATED AND /OR OFFSET WITHIN 10 FEET AS INSTRUCTED BY THE CONSULTANT, CLIENT AND OR ARCHITECT WITH NO EXTRA TO THE CONTRACT. CONTRACTOR SHALL ALLOW IN HIS PRICE FOR 10 RISERS OFFSET INCLUDING, 4" SANITARY DRAIN, 3" SANITARY VENT PIPING, 1-1/2" CW & HW LINES C/W THERMAL INSULATION.
5. PROVIDE ALL REQUIRED PIPING SUPPORTS AND OVERSIZED PIPING CLIPS / HANGERS TO ALLOW FOR A CONTINUOUS PIPE INSULATION WITH NO INTERRUPTIONS.
6. BALANCE ALL NEW SUPPLY AIR DIFFUSERS, RETURN AIR GRILLES TO AIR QUANTITIES INDICATED ON FLOOR PLANS AND MECHANICAL SCHEDULES.

DEMOLITION DRAWING NOTES

1. EXISTING SUPPLY AND RETURN AIR DUCTWORK SYSTEM TO REMAIN. EXISTING SUPPLY AND RETURN AIR GRILLES SHALL BE BALANCED TO THE AIR QUANTITIES INDICATED ON THE DRAWINGS. (TYPICAL)
2. EXISTING SINK AND CABINET TO BE REMOVED. REMOVE EXISTING SANITARY DRAIN, VENT AND DOMESTIC CW & HW AND CAP PIPING BEHIND NEW / EXISTING FINISHES AS REQUIRED.
3. EXISTING SUPPLY AIR GRILLES AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL) BALANCE SUPPLY AIR TO AIR QUANTITIES INDICATED.
4. EXISTING RETURN AIR GRILLE AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL)
5. EXISTING HYDRONIC PERIMETER HEATING RADIATOR TO REMAIN.
6. BALANCE EXISTING AC UNIT TO AIR QUANTITIES AS INDICATED. REPLACE FILTERS PRIOR TO COMPLETE AIR BALANCING.
7. CONTRACTOR TO THOROUGHLY VACUUM & CLEAN EXISTING INTAKE AIR LOUVER/GRILLE. EXTEND FRESH AIR DUCT TO EXISTING AC UNIT RETURN SECTION & SECURE TO DUCT COLLAR.
8. PROVIDE NEW RETURN AIR GRILLE IN THE EXISTING T-BAR CEILING.
9. PROVIDE NEW BALANCING DAMPERS TO NEW OUTDOOR AIR DUCT AND RETURN AIR DUCT. CONNECT BOTH DUCTS AT THE NEW PLENUM AT THE RETURN SECTION OF AC UNIT.

DEMOLITION DRAWING NOTES

10. PROVIDE NEW SUPPLY AIR DUCT C/W BALANCING DAMPER AND CONNECT TO EXISTING AS SHOWN.
11. PROVIDE NEW SUPPLY AIR GRILLE C/W SPIN-ON FITTING, FLEXIBLE DUCT BALANCING DAMPER & CONNECT TO NEW BRANCH DUCT. BALANCE NEW DIFFUSER TO AIR QUANTITIES INDICATED.
12. PROVIDE NEW TRANSFER AIR DUCT C/W 1" THICK INTERNAL ACOUSTIC INSULATION AND TRANSFER AIR GRILLE AS SHOWN.
13. REMOVE EXISTING WASHER/DRYER. REMOVE ALL ASSOCIATED PIPING AND CAP BEHIND EXISTING FINISHES/CEILING SPACE. REMOVE EXHAUST AIR DUCT AND CAP IN CEILING SPACE.
14. EXISTING FAN POWER BOX AT THIS LOCATION TO REMAIN C/W ASSOCIATED THERMOSTAT.
15. EXISTING WALL MOUNTED THERMOSTAT TO REMAIN.

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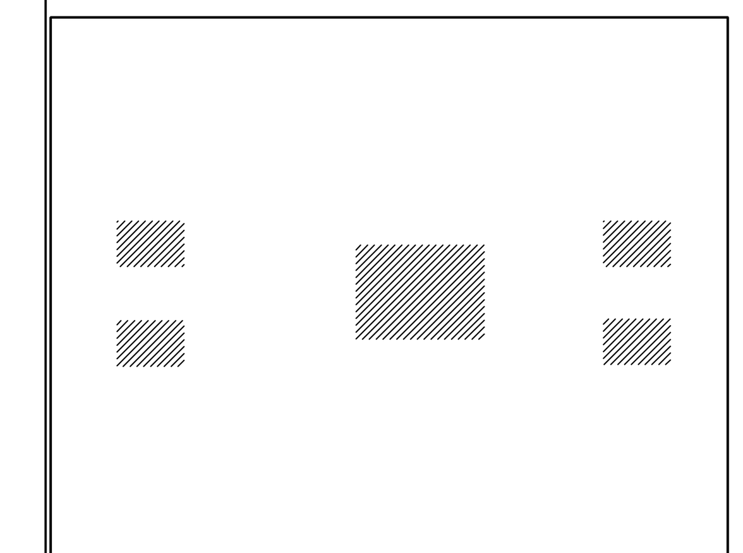

KEY PLAN
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Client:

CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

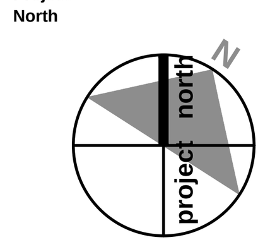
Project Title:

CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

Sheet Title:

MECHANICAL PLAN – GROUND NORTH PLAN

Project North



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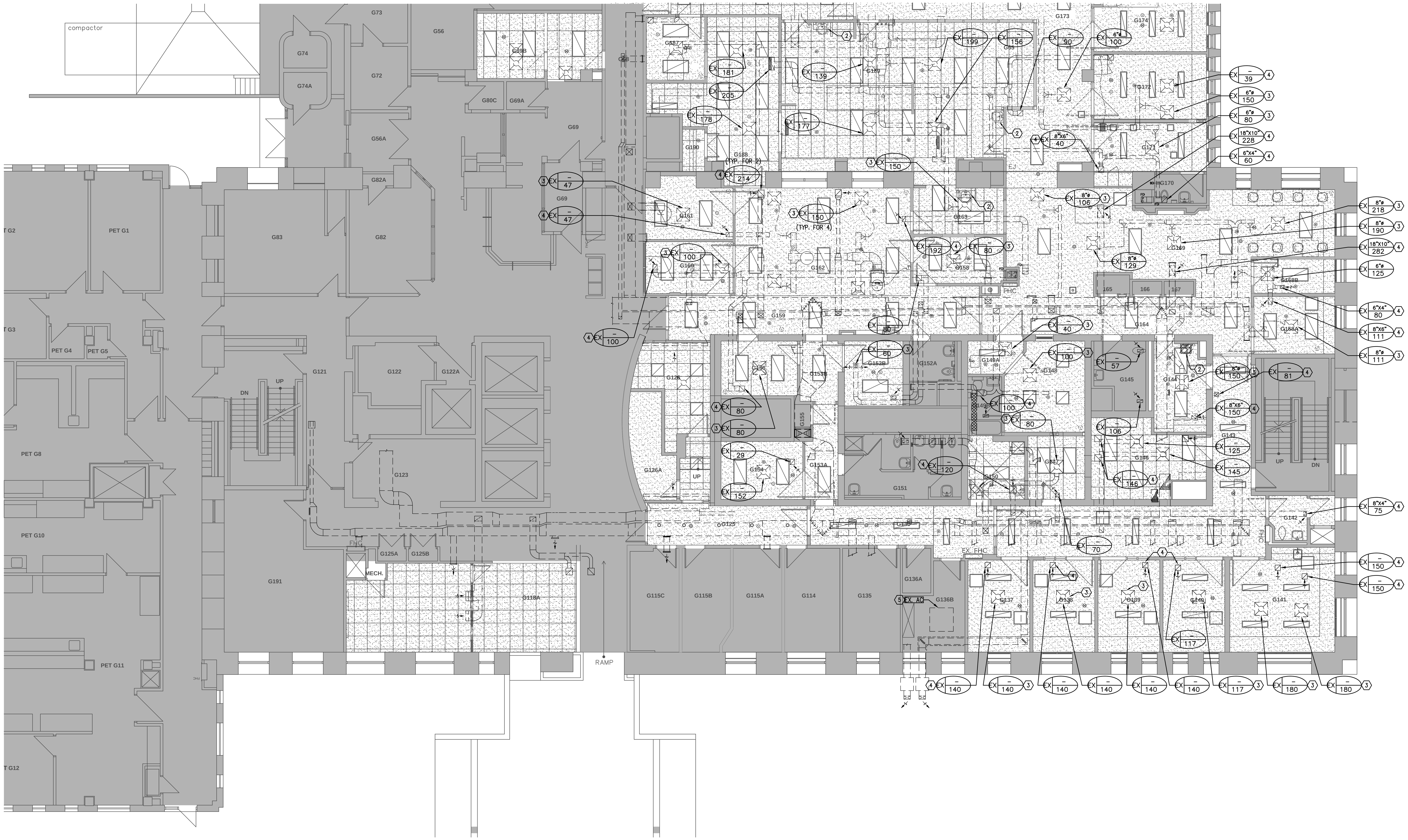
LICENSED PROFESSIONAL ENGINEER
G.F. YOUDELIS
08.08.23
PROVINCE OF ONTARIO

Date:	Project No.:	
DEC 2022	25136	
Scale: 1/8"=1'-0"	Drawn: K.J	Checked: G.P.Y

Drawing Number:

M-200



01 DEMOLITION PLAN - GROUND FLOOR (SOUTH) PLAN
M-201
1/8"=1'-0"

NOTE

1. CONTRACTOR TO THOROUGHLY CLEAN RTU-1 COIL & REPLACE FILTERS WITH NEW ONES, PRIOR TO COMPLETE AIR BALANCING.
2. EXISTING TRANE UNIT OUTDOOR AIR DAMPER TO BE ADJUSTED TO 25% OPEN OF THE TOTAL AIRFLOW. CONTRACTOR TO REPLACE EXISTING DAMPER ACTUATOR AND RECTIFY UNIT AS REQUIRED.
3. WHERE EXHAUST GRILLES ARE BLOCKED CONTRACTOR SHALL CLEAR THEM AND BALANCE EXHAUST GRILLES AS REQUIRED.
4. BALANCE ALL FAN POWER BOXES TO AIR QUANTITIES INDICATED FOR PRIMARY AIR.

GENERAL NOTES

1. CONTRACTOR SHALL INFORM TO THE MECHANICAL ENGINEER OF ANY DISCREPANCIES PRIOR TO SUBMITTING BID.
2. CONTRACTOR TO COORDINATE WORK ON SITE WITH EXISTING MECHANICAL, STRUCTURAL AND ELECTRICAL SERVICES IN ORDER TO SUIT NEW INSTALLATION.
3. ALL EXISTING PLUMBING PIPING SHALL BE REMOVED AND CAPPED BEHIND NEW / EXISTING FINISHED SURFACES.
4. EXISTING PLUMBING SERVICES THAT CONTINUE TO SERVE AS A RISER SHALL BE RELOCATED AND /OR OFFSET WITHIN 10 FEET AS INSTRUCTED BY THE CONSULTANT, CLIENT AND OR ARCHITECT WITH NO EXTRA TO THE CONTRACT. CONTRACTOR SHALL ALLOW IN HIS PRICE FOR 10 RISERS OFFSET INCLUDING, 4" SANITARY DRAIN, 3" SANITARY VENT PIPING, 1-1/2" CW & HW LINES C/W THERMAL INSULATION.
5. PROVIDE ALL REQUIRED PIPING SUPPORTS AND OVERSIZED PIPING CLIPS / HANGERS TO ALLOW FOR A CONTINUOUS PIPE INSULATION WITH NO INTERRUPTIONS.
6. BALANCE ALL NEW SUPPLY AIR DIFFUSERS, RETURN AIR GRILLES TO AIR QUANTITIES INDICATED ON FLOOR PLANS AND MECHANICAL SCHEDULES.

DEMOLITION DRAWING NOTES

1. EXISTING SUPPLY AND RETURN AIR DUCTWORK SYSTEM TO REMAIN. EXISTING SUPPLY AND RETURN AIR GRILLES SHALL BE BALANCED TO THE AIR QUANTITIES INDICATED ON THE DRAWINGS. (TYPICAL)
2. EXISTING SINK AND CABINET TO BE REMOVED. REMOVE EXISTING SANITARY DRAIN, VENT AND DOMESTIC CW & HW AND CAP PIPING BEHIND NEW / EXISTING FINISHES AS REQUIRED.
3. EXISTING SUPPLY AIR GRILLES AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL) BALANCE SUPPLY AIR TO AIR QUANTITIES INDICATED.
4. EXISTING RETURN AIR GRILLE AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL)
5. BALANCE EXISTING AC UNIT TO AIR QUANTITIES AS INDICATED. REPLACE FILTERS PRIOR TO COMPLETE AIR BALANCING.
6. EXISTING FAN POWER BOX AT THIS LOCATION TO REMAIN C/W ASSOCIATED THERMOSTAT.
7. EXISTING WALL MOUNTED THERMOSTAT TO REMAIN.

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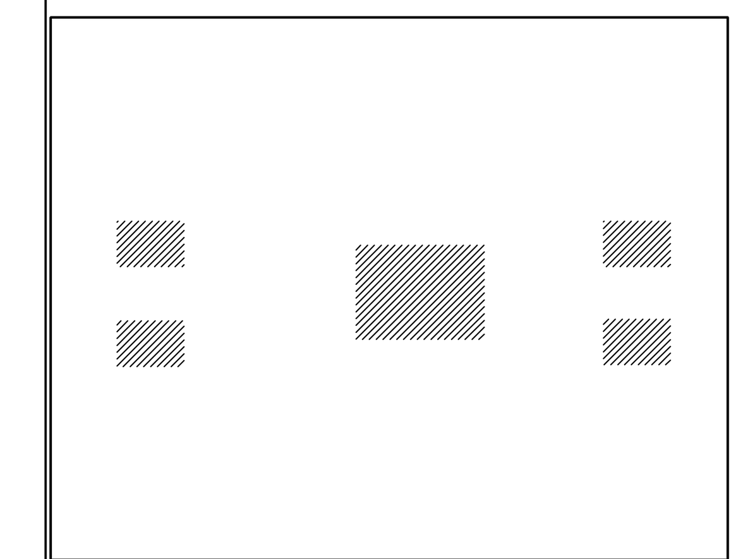

KEY PLAN
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1	ISSUED FOR TENDER	2023-08-08

Client:
CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:
CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

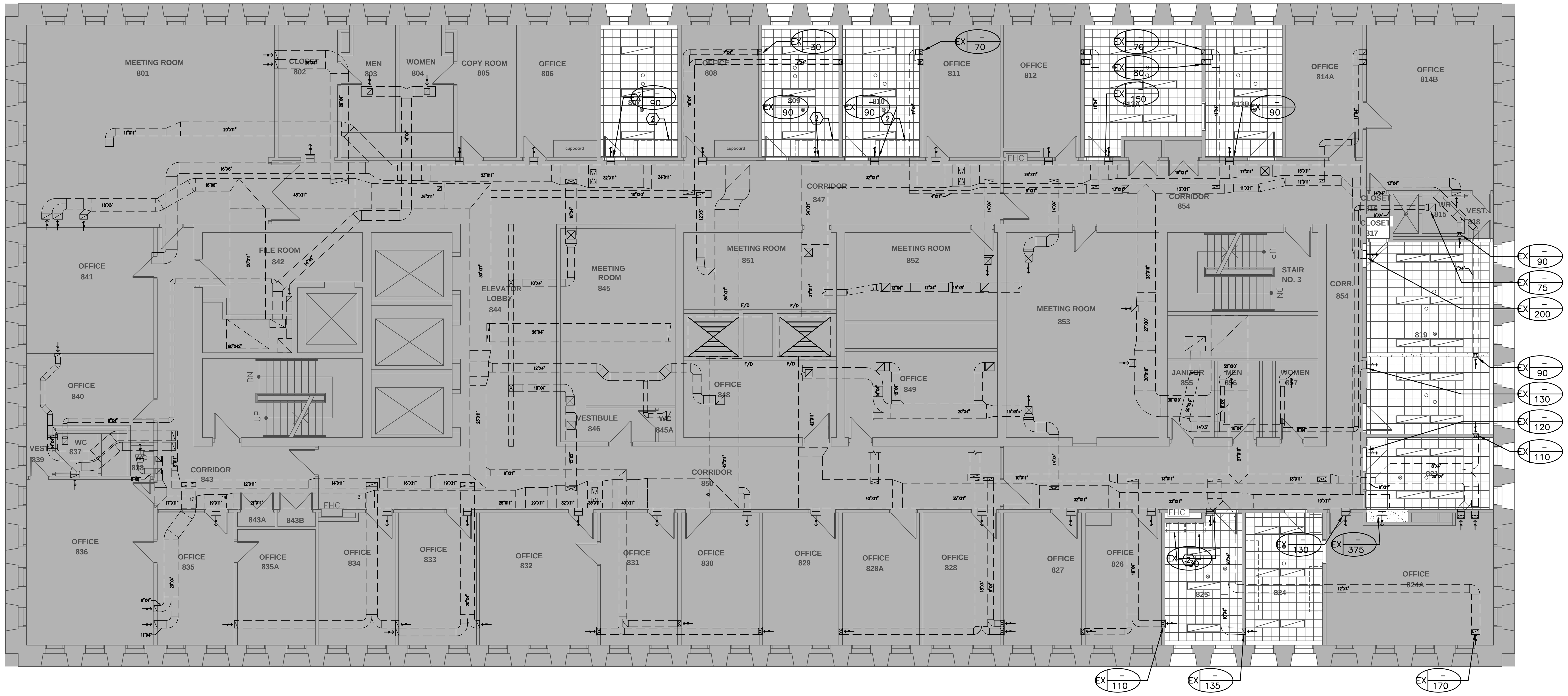
Sheet Title:
MECHANICAL PLAN – GROUND SOUTH PLAN

Project North: project north N

Stamp: LICENSED PROFESSIONAL ENGINEER G.P. YOUDELIS 08.08.23 PROVINCE OF ONTARIO

Date:	Project No.:	
DEC 2022	25136	
Scale: 1/8"=1'-0"	Drawn: K.J	Checked: G.P.Y

Drawing Number:
M-201



01
M-202
DEMOLITION PLAN - EIGTH FLOOR PLAN
1/8"=1'-0"

GENERAL NOTES

1. CONTRACTOR SHALL INFORM TO THE MECHANICAL ENGINEER OF ANY DISCREPANCIES PRIOR TO SUBMITTING BID.
2. CONTRACTOR TO COORDINATE WORK ON SITE WITH EXISTING MECHANICAL, STRUCTURAL AND ELECTRICAL SERVICES IN ORDER TO SUIT NEW INSTALLATION.
3. ALL EXISTING PLUMBING PIPING SHALL BE REMOVED AND CAPPED BEHIND NEW / EXISTING FINISHED SURFACES.
4. EXISTING PLUMBING SERVICES THAT CONTINUE TO SERVE AS A RISER SHALL BE RELOCATED AND /OR OFFSET WITHIN 10 FEET AS INSTRUCTED BY THE CONSULTANT, CLIENT AND OR ARCHITECT WITH NO EXTRA TO THE CONTRACT. CONTRACTOR SHALL ALLOW IN HIS PRICE FOR 10 RISERS OFFSET INCLUDING, 4" SANITARY DRAIN, 3" SANITARY VENT PIPING, 1-1/2" CW & HW LINES C/W THERMAL INSULATION.
5. PROVIDE ALL REQUIRED PIPING SUPPORTS AND OVERSIZED PIPING CLIPS / HANGERS TO ALLOW FOR A CONTINUOUS PIPE INSULATION WITH NO INTERRUPTIONS.
6. BALANCE ALL NEW SUPPLY AIR DIFFUSERS, RETURN AIR GRILLES TO AIR QUANTITIES INDICATED ON FLOOR PLANS AND MECHANICAL SCHEDULES.

DEMOLITION DRAWING NOTES

1. EXISTING SUPPLY AND RETURN AIR DUCTWORK SYSTEM TO REMAIN. EXISTING SUPPLY AND RETURN AIR GRILLES SHALL BE BALANCED TO THE AIR QUANTITIES INDICATED ON THE DRAWINGS. (TYPICAL)
2. EXISTING SINK AND CABINET TO BE REMOVED. REMOVE EXISTING SANITARY DRAIN, VENT AND DOMESTIC CW & HW AND CAP PIPING BEHIND NEW / EXISTING FINISHES AS REQUIRED.
3. EXISTING SUPPLY AIR GRILLES AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL)
4. EXISTING RETURN AIR GRILLE AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL)

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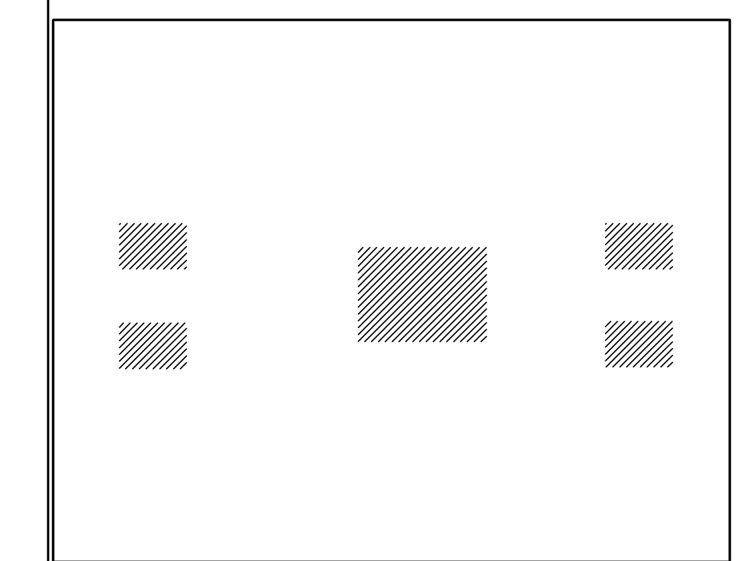

KEY PLAN
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1	ISSUED FOR TENDER	2023-08-08
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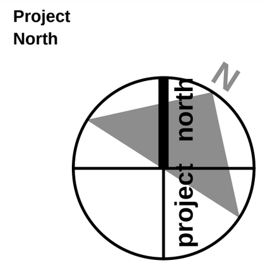
Client:
CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:
CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

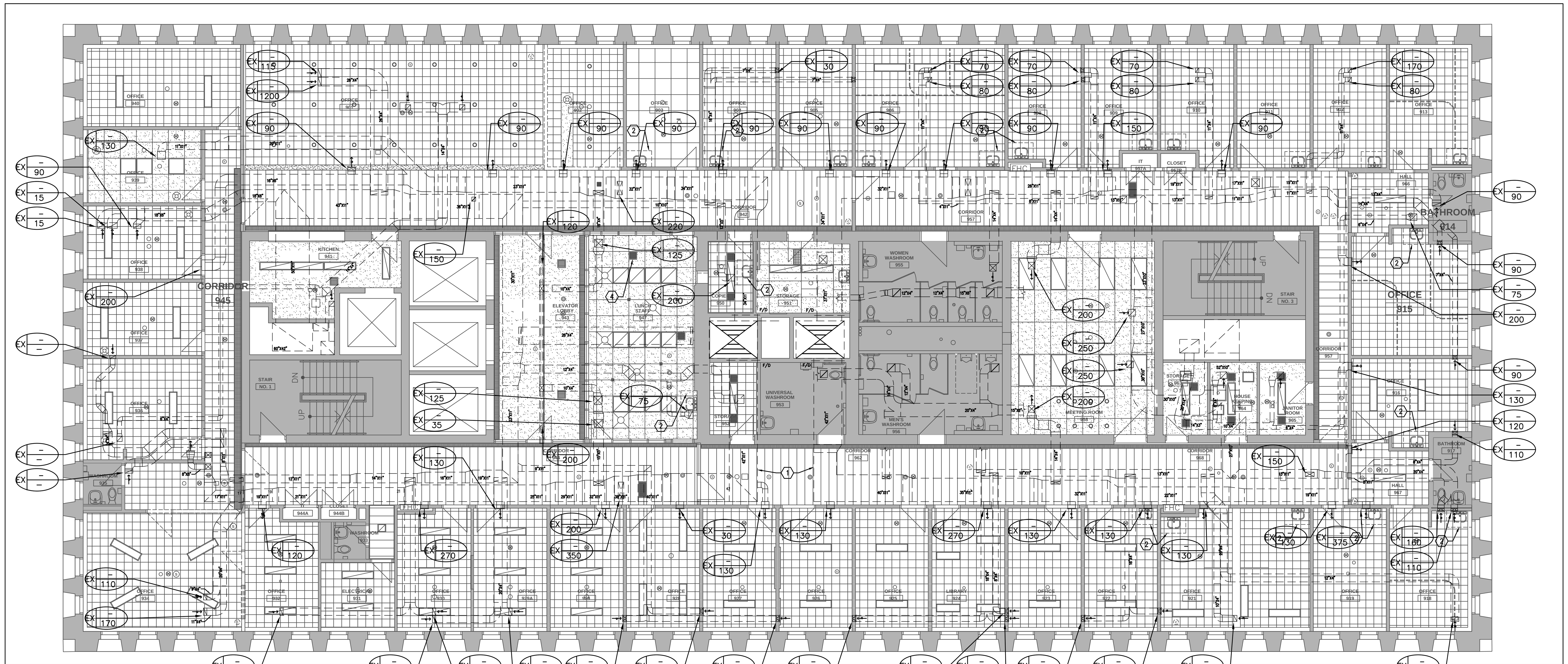
Sheet Title:
MECHANICAL DEMOLITION PLAN – 8TH FLOOR PLAN

Project North


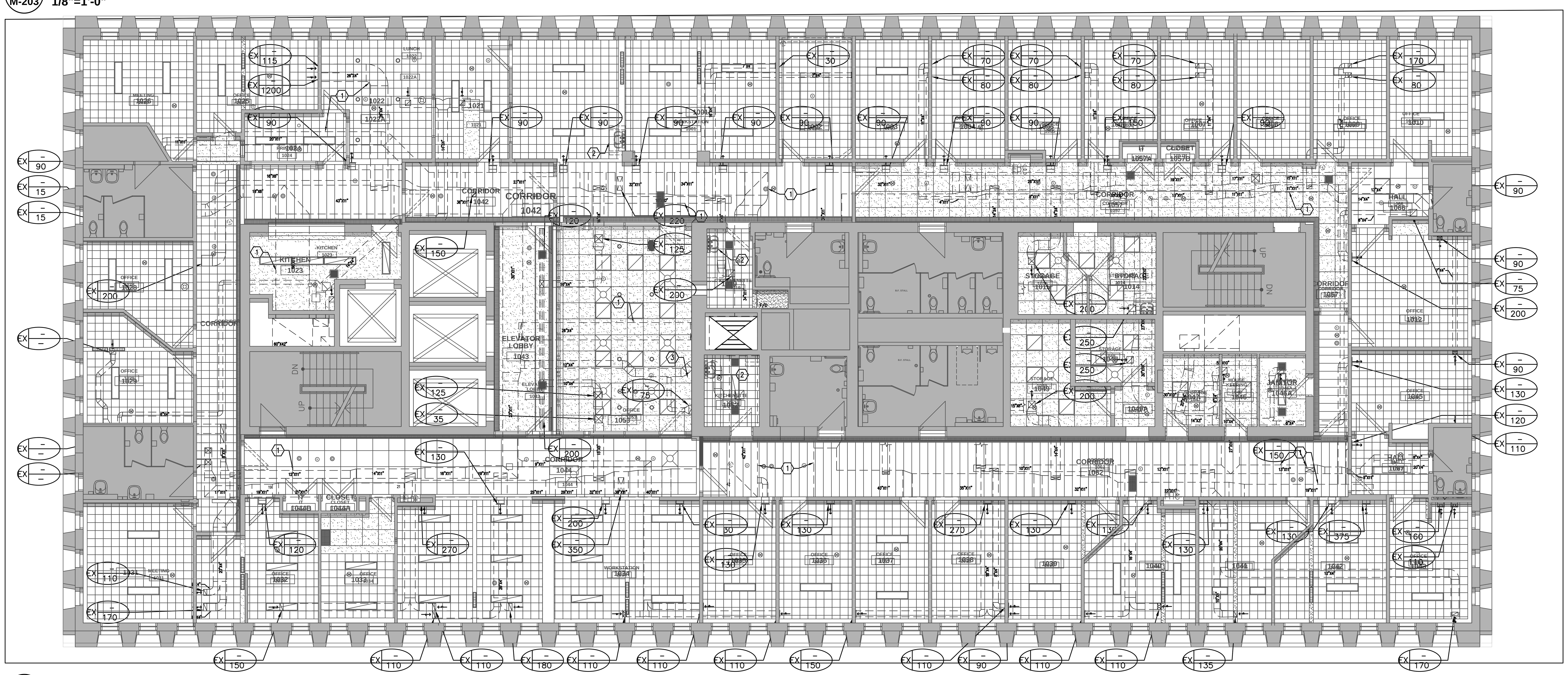
Stamp
LICENSED PROFESSIONAL ENGINEER
G.P. YOUDELIS
08.08.23
PROVINCE OF ONTARIO
[illegible]

Date: DEC 2022	Project No.: 25136	
Scale: 1/8"=1'-0"	Drawn: K.J	Checked: G.P.Y

Drawing Number:
M-202



01 DEMOLITION PLAN - NINTH FLOOR PLAN
M-203
1/8"=1'-0"



01 DEMOLITION PLAN - TENTH FLOOR PLAN
M-204
1/8"=1'-0"

GENERAL NOTES

1. CONTRACTOR SHALL INFORM TO THE MECHANICAL ENGINEER OF ANY DISCREPANCIES PRIOR TO SUBMITTING BID.
2. CONTRACTOR TO COORDINATE WORK ON SITE WITH EXISTING MECHANICAL, STRUCTURAL AND ELECTRICAL SERVICES IN ORDER TO SUIT NEW INSTALLATION.
3. ALL EXISTING PLUMBING PIPING SHALL BE REMOVED AND CAPPED BEHIND NEW / EXISTING FINISHED SURFACES.
4. EXISTING PLUMBING SERVICES THAT CONTINUE TO SERVE AS A RISER SHALL BE RELOCATED AND /OR OFFSET WITHIN 10 FEET AS INSTRUCTED BY THE CONSULTANT, CLIENT AND OR ARCHITECT WITH NO EXTRA TO THE CONTRACT. CONTRACTOR SHALL ALLOW IN HIS PRICE FOR 10 RISERS OFFSET INCLUDING, 4" SANITARY DRAIN, 3" SANITARY VENT PIPING, 1-1/2" CW & HW LINES C/W THERMAL INSULATION.
5. PROVIDE ALL REQUIRED PIPING SUPPORTS AND OVERSIZED PIPING CLIPS / HANGERS TO ALLOW FOR A CONTINUOUS PIPE INSULATION WITH NO INTERRUPTIONS.
6. BALANCE ALL NEW SUPPLY AIR DIFFUSERS, RETURN AIR GRILLES TO AIR QUANTITIES INDICATED ON FLOOR PLANS AND MECHANICAL SCHEDULES.

DEMOLITION DRAWING NOTES

1. EXISTING SUPPLY AND RETURN AIR DUCTWORK SYSTEM TO REMAIN. EXISTING SUPPLY AND RETURN AIR GRILLES SHALL BE BALANCED TO THE AIR QUANTITIES INDICATED ON THE DRAWINGS. (TYPICAL)
2. EXISTING SINK AND CABINET TO BE REMOVED. REMOVE EXISTING SANITARY DRAIN, VENT AND DOMESTIC CW & HW AND CAP PIPING BEHIND NEW / EXISTING FINISHES AS REQUIRED.
3. EXISTING SUPPLY AIR GRILLES AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL)
4. EXISTING RETURN AIR GRILLE AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL)

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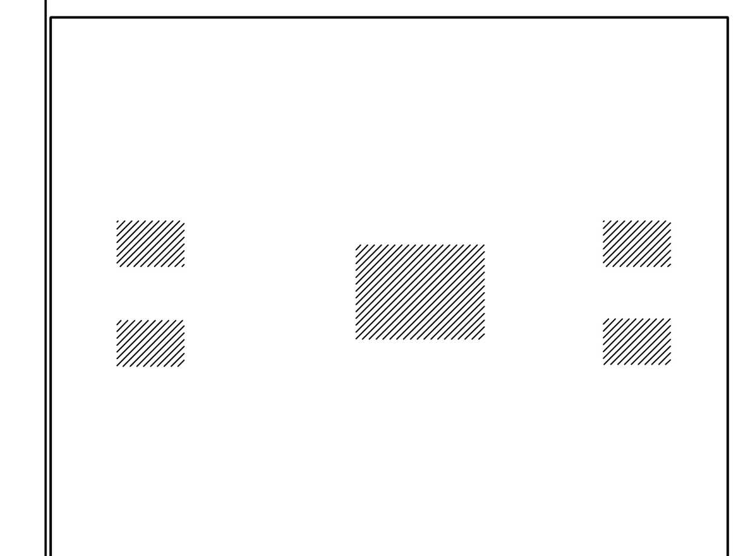

KEY PLAN
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1	ISSUED FOR TENDER	2023-08-08
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Client:
CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:
CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

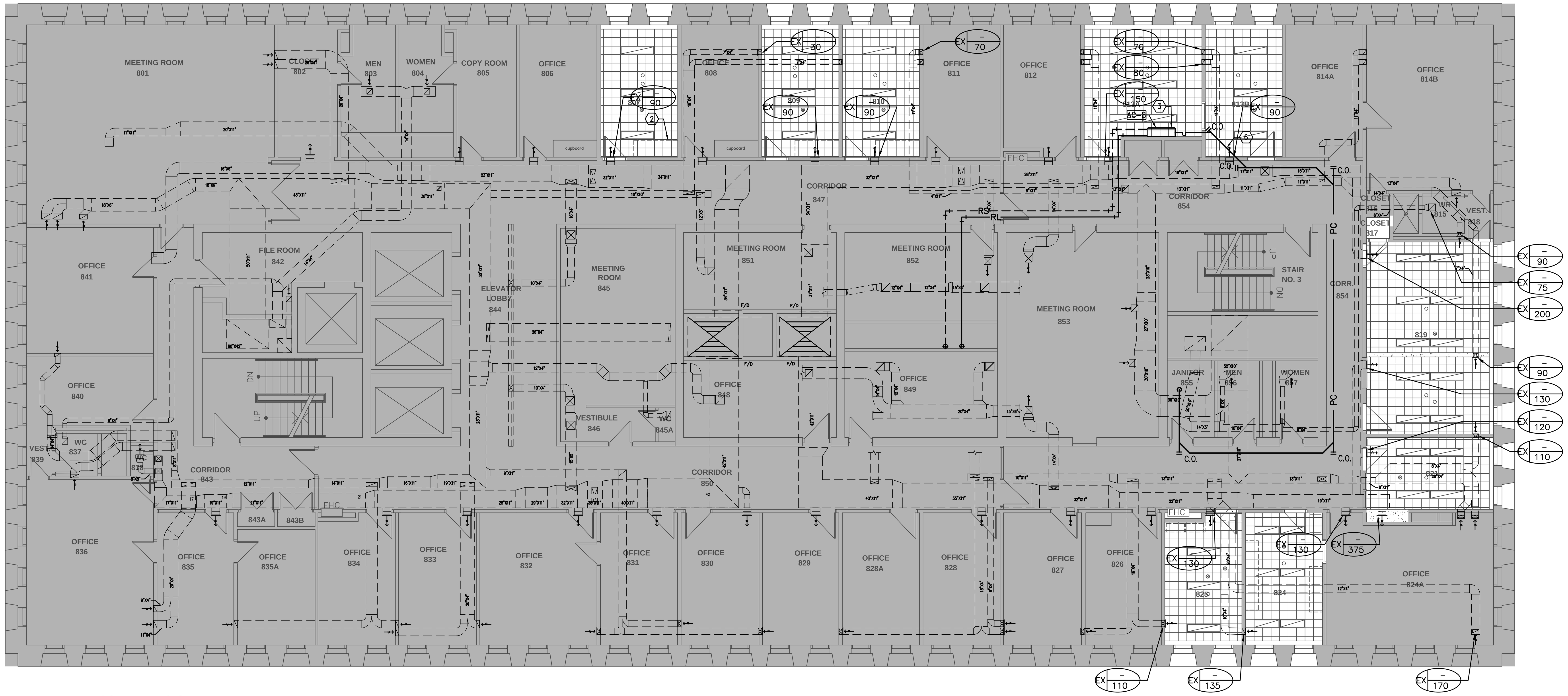
Sheet Title:
MECHANICAL DEMOLITION PLAN – 9TH & 10TH FLOOR PLAN

Project North

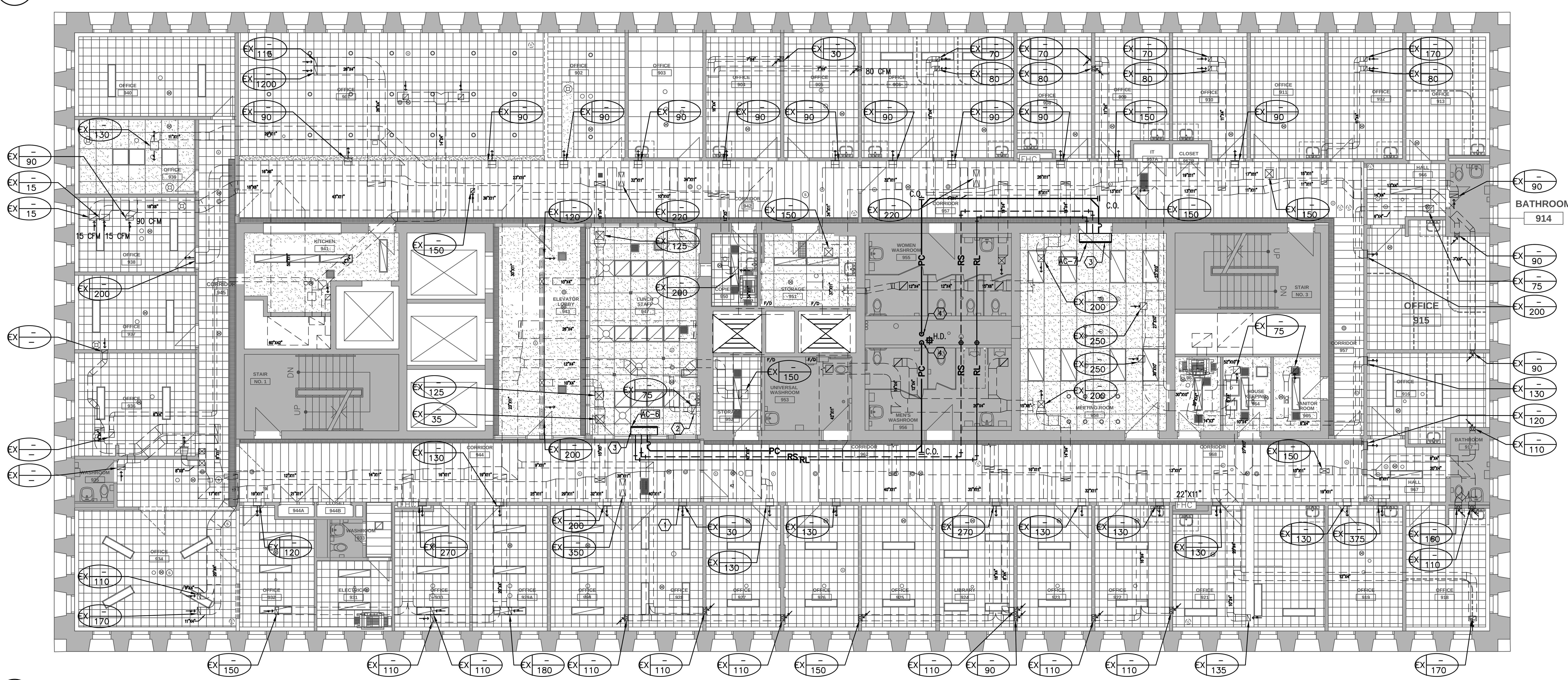
Stamp
G.P. YOUDELIS
08.08.23
PROVINCE OF ONTARIO

Date:	Project No.:	
DEC 2022	25136	
Scale: 1/8"=1'-0"	Drawn: K.J	Checked: G.P.Y

Drawing Number:
M-203



01 NEW PLAN - EIGTH FLOOR PLAN
M-300 1/8"=1'-0"



02 NEW PLAN - NINTH FLOOR PLAN
M-300 1/8"=1'-0"

GENERAL NOTES

1. CONTRACTOR SHALL INFORM TO THE MECHANICAL ENGINEER OF ANY DISCREPANCIES PRIOR TO SUBMITTING BID.
2. CONTRACTOR TO COORDINATE WORK ON SITE WITH NEW MECHANICAL, STRUCTURAL AND ELECTRICAL SERVICES IN ORDER TO SUIT NEW INSTALLATION.
3. BALANCE ALL NEW SUPPLY AIR DIFFUSERS, RETURN AIR GRILLES, OUTDOOR AIR TO AIR QUANTITIES INDICATED ON FLOOR PLANS AND MECHANICAL SCHEDULES.
4. ALL NEW REFRIGERANT PIPING ON THE ROOF SHALL BE PROVIDED WITH THERMAL INSULATION, PVC JACKETING AND ALUMINUM JACKETING.
5. LL REFRIGERANT PIPING SUPPORTS SHALL BE NON-PENETRATING PREMANUFACTURED SUPPORTS SIMILAR TO PHP SYSTEMS AND DESIGN C/W OVERSIZED HANGERS TO ALLOW FOR CONTINUOUS UNINTERRUPTED THERMAL INSULATION AND JACKETING.
6. PROVIDE ALL FIRE STOPPING REQUIRED WHEN PASSING THROUGH FIRE RATED WALLS, FLOORS AND CEILINGS.
7. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL CRANE WORK REQUIRED TO LIFT THE EQUIPMENT ON THE ROOF. CONTRACTOR IS RESPONSIBLE TO ENGAGE A STRUCTURAL ENGINEER LICENCED IN THE PROVINCE OF ONTARIO, IN ORDER TO REVIEW THE ADDITIONAL LOAD ON THE ROOF AND PROVIDE CONFIRMATION IN WRITING THAT THE ROOF WILL NOT BE OVERLOADED OR IF STRUCTURAL REINFORCEMENT IS REQUIRED. STRUCTURAL ENGINEER CAN SUGGEST IF THE LOCATION OF CU UNIT CAN BE REVISED TO AVOID ANY STRUCTURAL WORK IF OTHER SECTIONS OF THE ROOF CAN HANDLE THE LOAD.
8. BALANCE THE OUTDOOR AIR DAMPER OF MAIN AIR HANDLING UNIT IN THE PENTHOUSE LEVEL IN ORDER TO BRING IN AT LEAS 18% FRESH AIR OF THE TOTAL AIR FLOW.

DRAWING NOTES

1. EXISTING SUPPLY AIR GRILLE TO REMAIN. BALANCE TO AIR QUANTITY AS INDICATED (TYPICAL)
2. EXISTING RETURN AIR GRILLE AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL)
3. PROVIDE NEW WALL MOUNTED AC UNIT AT THIS LOCATION AS SHOWN C/W BUILT-IN CONDENSATE PUMP. PROVIDE ALL NECESSARY REFRIGERANT PIPING FROM AC UNIT TO BRANCH BOX C/W PIPING SUPPORTS AND THERMAL INSULATION, ETC AS REQUIRED.
4. PROVIDE CONDENSATE DRAIN AND TERMINATE DRAIN OVER HUB DRAIN AS SHOWN.
5. PROVIDE CEILING MOUNTED EXHAUST FAN AT THIS LOCATION AS SHOWN C/W WALL MOUNTED STARTER. PROVIDE NEW DUCTWORK AND DISTRIBUTE AS SHOWN.
6. CONTRACTOR TO REMOVE PORTION OF EXISTING CEILING TILES TO ALLOW FOR REFRIGERANT PIPING AND CONDENSATE DRAIN DISTRIBUTION. RE-INSTATE EXISTING CEILING TILE UPON COMPLETION OF WORK.

NOTE:

1. CONTRACTOR TO BALANCE ALL EXISTING SUPPLY AIR GRILLES & RETURN AIR GRILLES TO AIR QUANTITIES INDICATE ON THE FLOOR PLAN.
2. CONTRACTOR TO BALANCE OUTDOOR AIR DAMPER TO MINIMUM 18% PF TOTAL AIRFLOW FOR THE MAIN AHU UNITS AT MECHANICAL PENTHOUSE.

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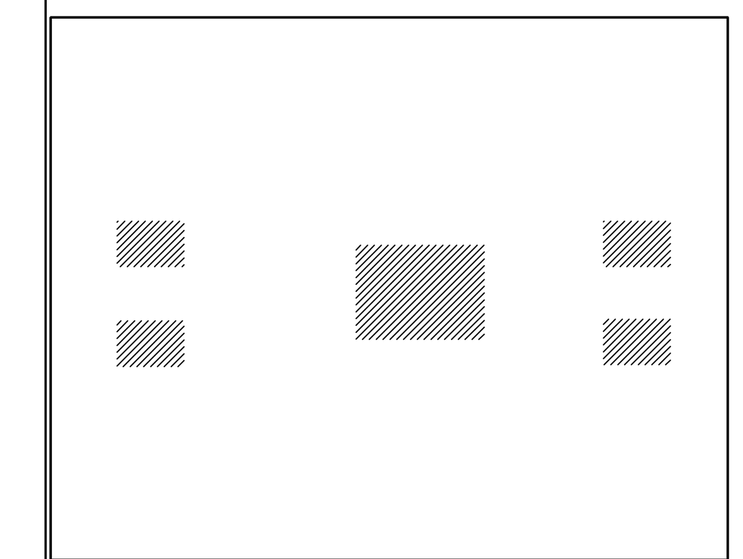

KEY PLAN
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1	ISSUED FOR TENDER	2023-08-08

Client:
CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:
CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

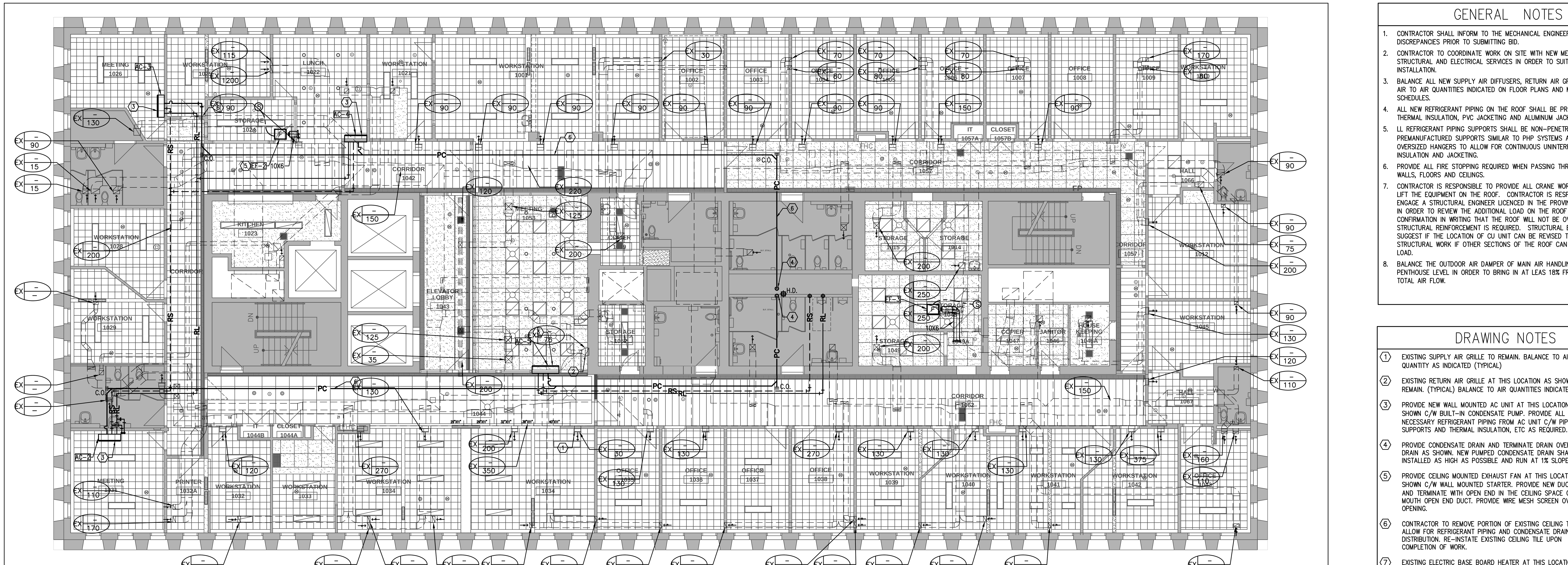
Sheet Title:
MECHANICAL NEW PLAN – 8TH & 9TH FLOOR

Project North: project north, N

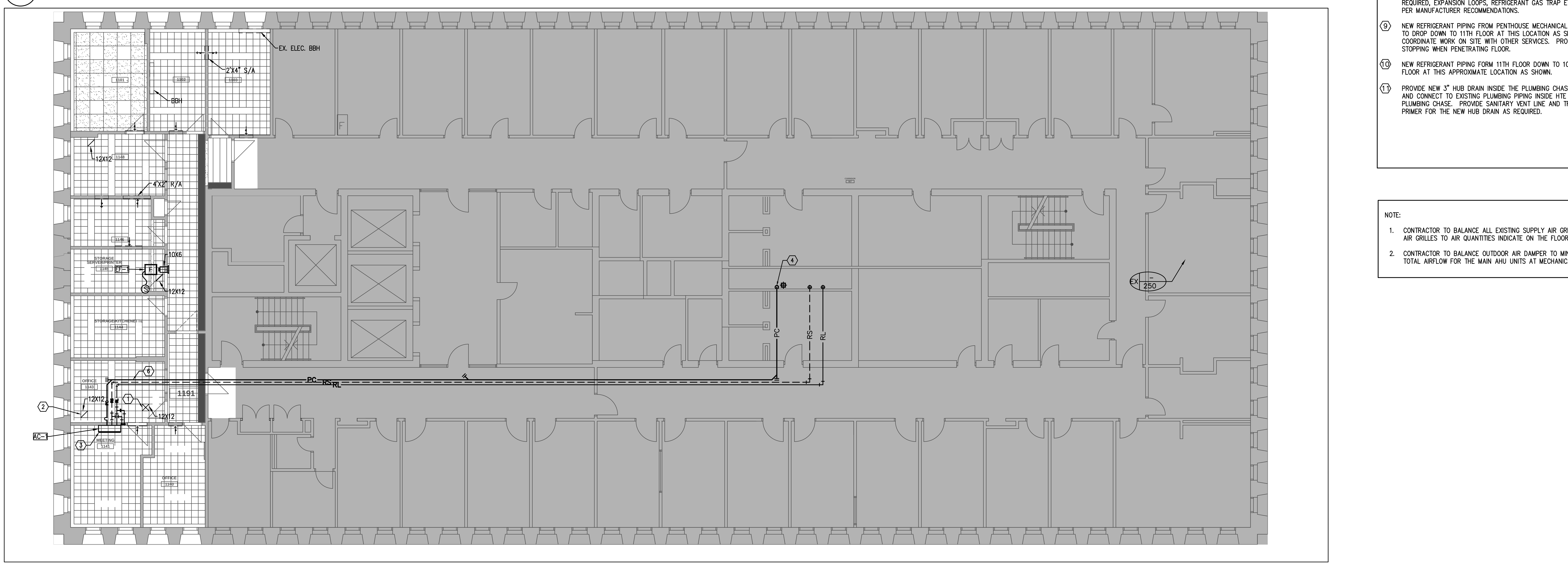
Stamp: LICENSED PROFESSIONAL ENGINEER, G.P. YOUDELIS, 08.08.23, PROVINCE OF ONTARIO

Date:	Project No.:	
DEC 2022	25136	
Scale: 1/8"=1'-0"	Drawn: K.J	Checked: G.P.Y

Drawing Number:
M-300



01 NEW PLAN - TENTH FLOOR PLAN
M-301 1/8"=1'-0"



02 NEW PLAN - ELEVENTH FLOOR PLAN
M-301 1/8"=1'-0"

GENERAL NOTES

1. CONTRACTOR SHALL INFORM TO THE MECHANICAL ENGINEER OF ANY DISCREPANCIES PRIOR TO SUBMITTING BID.
2. CONTRACTOR TO COORDINATE WORK ON SITE WITH NEW MECHANICAL, STRUCTURAL AND ELECTRICAL SERVICES IN ORDER TO SUIT NEW INSTALLATION.
3. BALANCE ALL NEW SUPPLY AIR DIFFUSERS, RETURN AIR GRILLES, OUTDOOR AIR TO AIR QUANTITIES INDICATED ON FLOOR PLANS AND MECHANICAL SCHEDULES.
4. ALL NEW REFRIGERANT PIPING ON THE ROOF SHALL BE PROVIDED WITH THERMAL INSULATION, PVC JACKETING AND ALUMINUM JACKETING.
5. LL REFRIGERANT PIPING SUPPORTS SHALL BE NON-PENETRATING PREMANUFACTURED SUPPORTS SIMILAR TO PHP SYSTEMS AND DESIGN C/W OVERSIZED HANGERS TO ALLOW FOR CONTINUOUS UNINTERRUPTED THERMAL INSULATION AND JACKETING.
6. PROVIDE ALL FIRE STOPPING REQUIRED WHEN PASSING THROUGH FIRE RATED WALLS, FLOORS AND CEILINGS.
7. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL CRANE WORK REQUIRED TO LIFT THE EQUIPMENT ON THE ROOF. CONTRACTOR IS RESPONSIBLE TO ENGAGE A STRUCTURAL ENGINEER LICENCED IN THE PROVINCE OF ONTARIO, IN ORDER TO REVIEW THE ADDITIONAL LOAD ON THE ROOF AND PROVIDE CONFIRMATION IN WRITING THAT THE ROOF WILL NOT BE OVERLOADED OR IF STRUCTURAL REINFORCEMENT IS REQUIRED. STRUCTURAL ENGINEER CAN SUGGEST IF THE LOCATION OF CU UNIT CAN BE REVISED TO AVOID ANY STRUCTURAL WORK IF OTHER SECTIONS OF THE ROOF CAN HANDLE THE LOAD.
8. BALANCE THE OUTDOOR AIR DAMPER OF MAIN AIR HANDLING UNIT IN THE PENTHOUSE LEVEL IN ORDER TO BRING IN AT LEAS 18% FRESH AIR OF THE TOTAL AIR FLOW.

DRAWING NOTES

1. EXISTING SUPPLY AIR GRILLE TO REMAIN. BALANCE TO AIR QUANTITY AS INDICATED (TYPICAL)
2. EXISTING RETURN AIR GRILLE AT THIS LOCATION AS SHOWN TO REMAIN. (TYPICAL) BALANCE TO AIR QUANTITIES INDICATED.
3. PROVIDE NEW WALL MOUNTED AC UNIT AT THIS LOCATION AS SHOWN C/W BUILT-IN CONDENSATE PUMP. PROVIDE ALL NECESSARY REFRIGERANT PIPING FROM AC UNIT C/W PIPING SUPPORTS AND THERMAL INSULATION, ETC AS REQUIRED.
4. PROVIDE CONDENSATE DRAIN AND TERMINATE DRAIN OVER HUB DRAIN AS SHOWN. NEW PUMPED CONDENSATE DRAIN SHALL BE INSTALLED AS HIGH AS POSSIBLE AND RUN AT 1% SLOPE.
5. PROVIDE CEILING MOUNTED EXHAUST FAN AT THIS LOCATION AS SHOWN C/W WALL MOUNTED STARTER. PROVIDE NEW DUCTWORK AND TERMINATE WITH OPEN END IN THE CEILING SPACE C/W BELL MOUTH OPEN END DUCT. PROVIDE WIRE MESH SCREEN OVER THE OPENING.
6. CONTRACTOR TO REMOVE PORTION OF EXISTING CEILING TILES TO ALLOW FOR REFRIGERANT PIPING AND CONDENSATE DRAIN DISTRIBUTION. RE-INSTATE EXISTING CEILING TILE UPON COMPLETION OF WORK.
7. EXISTING ELECTRIC BASE BOARD HEATER AT THIS LOCATION AS SHOWN TO REMAIN.
8. NEW REFRIGERANT PIPING C/W THERMAL INSULATION IN THE CEILING SPACE. PROVIDE ADDITIONAL REFRIGERANT GAS AS REQUIRED, EXPANSION LOOPS, REFRIGERANT GAS TRAP ETC AS PER MANUFACTURER RECOMMENDATIONS.
9. NEW REFRIGERANT PIPING FROM PENTHOUSE MECHANICAL ROOM TO DROP DOWN TO 11TH FLOOR AT THIS LOCATION AS SHOWN. COORDINATE WORK ON SITE WITH OTHER SERVICES. PROVIDE FIRE STOPPING WHEN PENETRATING FLOOR.
10. NEW REFRIGERANT PIPING FORM 11TH FLOOR DOWN TO 10TH FLOOR AT THIS APPROXIMATE LOCATION AS SHOWN.
11. PROVIDE NEW 3" HUB DRAIN INSIDE THE PLUMBING CHASE C/W AND CONNECT TO EXISTING PLUMBING PIPING INSIDE HTE PLUMBING CHASE. PROVIDE SANITARY VENT LINE AND TRAP SEAL PRIMER FOR THE NEW HUB DRAIN AS REQUIRED.

NOTE:

1. CONTRACTOR TO BALANCE ALL EXISTING SUPPLY AIR GRILLES & RETURN AIR GRILLES TO AIR QUANTITIES INDICATE ON THE FLOOR PLAN.
2. CONTRACTOR TO BALANCE OUTDOOR AIR DAMPER TO MINIMUM 18% PF TOTAL AIRFLOW FOR THE MAIN AHU UNITS AT MECHANICAL PENTHOUSE.

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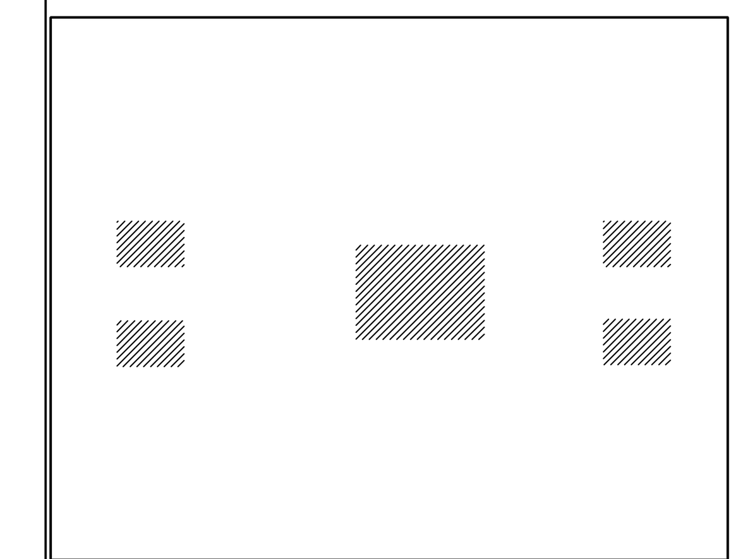

KEY PLAN
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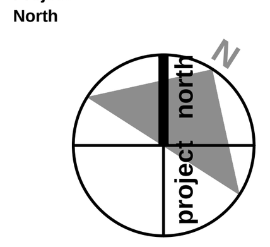
NO	ACTION	DY MO YR

Client:
CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:
CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

Sheet Title:
MECHANICAL NEW PLAN – 10TH & 11TH FLOOR

Project North



Stamp
LICENSED PROFESSIONAL ENGINEER
G.P. YOUDELIS
08.08.23
PROVINCE OF ONTARIO
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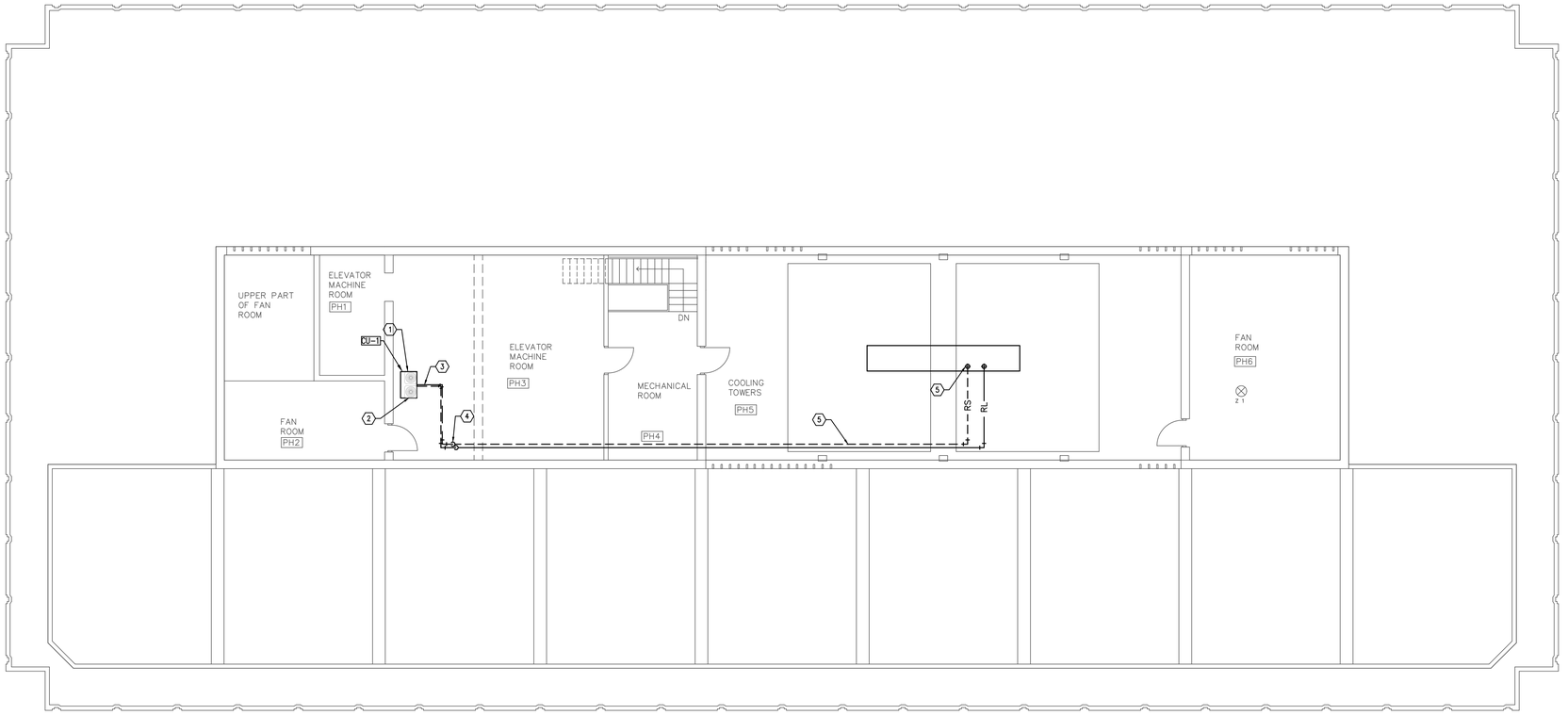
Date: DEC 2022	Project No.: 25136
Scale: 1/8"=1'-0"	Drawn: K.J / Checked: G.P.Y

Drawing Number:
M-301



01 **NEW PLAN - ROOF FLOOR PLAN**
M-302 **1/8"=1'-0"**

GENERAL NOTES

1. CONTRACTOR SHALL INFORM TO THE MECHANICAL ENGINEER OF ANY DISCREPANCIES PRIOR TO SUBMITTING BID.
2. CONTRACTOR TO COORDINATE WORK ON SITE WITH NEW MECHANICAL, STRUCTURAL AND ELECTRICAL SERVICES IN ORDER TO SUIT NEW INSTALLATION.
3. BALANCE ALL NEW SUPPLY AIR DIFFUSERS, RETURN AIR GRILLES, OUTDOOR AIR TO AIR QUANTITIES INDICATED ON FLOOR PLANS AND MECHANICAL SCHEDULES.
4. ALL NEW REFRIGERANT PIPING ON THE ROOF SHALL BE PROVIDED WITH THERMAL INSULATION, PVC JACKETING AND ALUMINUM JACKETING.
5. LL REFRIGERANT PIPING SUPPORTS SHALL BE NON-PENETRATING PREMANUFACTURED SUPPORTS SIMILAR TO PHP SYSTEMS AND DESIGN C/W OVERSIZED HANGERS TO ALLOW FOR CONTINUOUS UNINTERRUPTED THERMAL INSULATION AND JACKETING.
6. PROVIDE ALL FIRE STOPPING REQUIRED WHEN PASSING THROUGH FIRE RATED WALLS, FLOORS AND CEILINGS.
7. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL CRANE WORK REQUIRED TO LIFT THE EQUIPMENT ON THE ROOF. CONTRACTOR IS RESPONSIBLE TO ENGAGE A STRUCTURAL ENGINEER LICENCED IN THE PROVINCE OF ONTARIO, IN ORDER TO REVIEW THE ADDITIONAL LOAD ON THE ROOF AND PROVIDE CONFIRMATION IN WRITING THAT THE ROOF WILL NOT BE OVERLOADED OR IF STRUCTURAL REINFORCEMENT IS REQUIRED. STRUCTURAL ENGINEER CAN SUGGEST IF THE LOCATION OF CU UNIT CAN BE REVISED TO AVOID ANY STRUCTURAL WORK IF OTHER SECTIONS OF THE ROOF CAN HANDLE THE LOAD.
8. BALANCE THE OUTDOOR AIR DAMPER OF MAIN AIR HANDLING UNIT IN THE PENTHOUSE LEVEL IN ORDER TO BRING IN AT LEAS 18% FRESH AIR OF THE TOTAL AIR FLOW.

DRAWING NOTES

1. EXISTING ROOF MOUNTED EQUIPMENT TO REMAIN. CONTRACTOR TO COORDINATE THE LOCATION OF THE NEW CU UNIT ON THE ROOF WITH EXISTING SERVICES AND MAINTAIN PROPER CLEARANCES AS REQUIRED.
2. NEW VRF CU UNIT AT THIS APPROXIMATE LOCATION. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR THE EXACT DIMENSIONS AND LOCATION OF THE CU UNIT. INSTALL CU UNIT ABOVE NON-PENETRATING PREFABRICATED STANDS AS REQUIRED. PROVIDE CONCRETE PATIO STONE UNDER THE SUPPORTS. REFER TO DETAILS. INTERFACE VRF CONDENSING UNITS TO NEW VRF SYSTEM CENTRAL CONTROLLER. ADJUST ALL THERMOSTAT FOR OCCUPIED AND UNOCCUPIED HOURS AS PER END USER REQUIREMENT.
3. NEW REFRIGERANT PIPING ON THE ROOF C/W 2" THICK THERMAL INSULATION, PVC JACKETING AND ALUMINUM COVERING. PROVIDE NON-PENETRATING PREMANUFACTURED SUPPORTS SIMILAR TO PHP SYSTEMS AND DESIGN C/W OVERSIZED HANGERS TO ALLOW FOR CONTINUOUS UNINTERRUPTED THERMAL INSULATION AND JACKETING.
4. NEW REFRIGERANT PIPING PENETRATES ROOF AT THIS APPROXIMATE LOCATION AS SHOWN. PROVIDE OVERSIZE SUPPORTS IN ORDER TO ACHIEVE CONTINUOUS THERMAL INSULATION OF PIPES LOCATED OUTDOORS.
5. NEW REFRIGERANT PIPING RUNNING IN THE MECHANICAL PENTHOUSE BELOW ROOF AND DROPPING DOWN TO EXISTING PLUMBING SHAFT. CONTRACTOR TO COORDINATE EXACT PIPE ROUTING ON SITE WITH OTHER SERVICES ON ORDER TO SUIT SITE CONDITIONS. CONTRACTOR SHALL ALLOW FOR ALL PIPING OFFSET REQUIRED.

NOTE:

1. CONTRACTOR TO BALANCE ALL EXISTING SUPPLY AIR GRILLES & RETURN AIR GRILLES TO AIR QUANTITIES INDICATE ON THE FLOOR PLAN.
2. CONTRACTOR TO BALANCE OUTDOOR AIR DAMPER TO MINIMUM 18% PF TOTAL AIRFLOW FOR THE MAIN AHU UNITS AT MECHANICAL PENTHOUSE.

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KEY PLAN
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1	ISSUED FOR TENDER	2023-08-08

Client:
CAMH
CENTRE FOR ADDICTION AND MENTAL HEALTH

Project Title:
CAMH 250 COLLEGE STREET MOVE CONSOLIDATION -
INTERIOR RENOVATION
GROUND, 8TH, 9TH, 10TH & 11TH FLOOR

Sheet Title:
ROOF PLAN & PENTHOUSE PLAN

Project North

Stamp
LICENSED PROFESSIONAL ENGINEER
GEORGE YOUDELIS
08.08.23
PROVINCE OF ONTARIO

Date: DEC 2022
Project No.: 25136
Scale: 1/8"=1'-0"
Drawn: K.J
Checked: G.P.Y

Drawing Number:
M-302