

**GENERAL DRAWING NOTES**  
(APPLICABLE TO ALL DRAWINGS)

- CONTRACTOR IS TO VISIT THE SITE AND BECOME FULLY FAMILIAR WITH EXTENT OF THE WORK PRIOR TO TENDER CLOSING.
- ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH CODES, BULLETINS ETC. AND REQUIREMENTS OF ALL INSPECTION AUTHORITIES FOR THE CITY OF LONDON.
- ALL DRAWINGS ARE INTEGRATED WITH THE SPECIFICATIONS WHICH ACCOMPANY THEM. NEITHER IS TO BE USED ALONE. ANY ITEM OR SUBJECT OMITTED FROM ONE BUT IMPLIED IN THE OTHER IS FULLY AND PROPERLY REQUIRED. WHEREVER DIFFERENCE OCCURS, THE MOST ONEROUS CONDITION GOVERNS.
- DUE TO INCONSISTENT RECORDS OF EXISTING SERVICES NOT ALL SERVICES MAY BE SHOWN, OR IF SHOWN MAY NOT BE ACCURATE. IT IS CONTRACTOR RESPONSIBILITY TO FIELD CONFIRM ALL SERVICES.
- PENETRATIONS OF CONCRETE SHALL BE SAW-CUT OR CORE BORED - IMPACT HAMMERS ARE NOT ALLOWED. SEAL ALL DUCTWORK & SLEEVES TO PREVENT LEAKAGE THROUGH FLOOR. DO NOT SCALE DRAWINGS FOR INSTALLATION PURPOSES. OBTAIN ALL DIMENSIONS FROM ARCHITECTURAL PLANS, MANUFACTURER'S SHOP DRAWINGS, AND ON SITE INSPECTIONS.
- MECHANICAL AND ELECTRICAL TRADES SHALL WORK IN CONJUNCTION WITH ONE ANOTHER SO AS TO AVOID INTERFERENCE'S BETWEEN PIPING, DUCTWORK, CONDUIT, LIGHTING FIXTURES, ETC.
- ALL SHUTDOWN OF ANY PORTION OF EXISTING BUILDING SYSTEMS SHALL BE PERFORMED WITH THE OWNER'S CONSENT. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR TIME AND DURATION OF SERVICE INTERRUPTIONS. INCLUDE COST OF PREMIUM TIME IN THE CONTRACT PRICE FOR WORK PERFORMED DURING NIGHTS, WEEK-ENDS OR OTHER TIME OUTSIDE NORMAL WORKING HOURS AS NECESSARY TO MAINTAIN MECHANICAL SERVICES IN OPERATION.
- CONTRACTOR IS TO ENSURE THAT ALL EXISTING SERVICES IN EXISTING AREAS REMAIN IN SERVICE UNTIL THESE AREAS ARE RECONNECTED TO NEW OR EXISTING SERVICES.
- CHECK AND VERIFY LOCATION OF ALL PIPES, DUCTS AND EQUIPMENT WITH ALL OTHER TRADES TO PREVENT INTERFERENCE. REMOVAL OR RELOCATION OF ANY SUCH WORK INTERFERING WITH WORK OF OTHER TRADES IS THE RESPONSIBILITY OF THE MECHANICAL TRADE CONCERNED UNLESS OTHERWISE APPROVED IN WRITING.
- THE CONTRACTOR SHALL, WITH APPROVAL OF THE OWNER AND AT NO ADDITIONAL CONTRACT COST, REMOVE, REARRANGE AND/OR RELOCATE ANY OBSTRUCTIONS WHICH INTERFERE WITH INSTALLATION OF NEW WORK.
- AVOID ANY DIRECT CONTACT BETWEEN ANY PIPING, DUCTING AND ELECTRICAL CONDUIT SYSTEMS, TO PREVENT SOUND TRANSMISSION.
- EXACT SIZE AND EXACT LOCATION OF ALL EXISTING SERVICES IS TO BE CONFIRMED ON SITE.
- WORK SHALL BE CO-ORDINATED THROUGH THE GENERAL CONTRACTOR PRIOR TO INSTALLATION OF ANY EQUIPMENT, DUCTWORK AND CONTROLS. CO-ORDINATE WITH ARCHITECTURAL ELEVATIONS FOR ARCHITECTURAL, MECHANICAL, AND ELECTRICAL SPACE ALLOCATIONS.
- REFER TO ARCHITECTURAL FOR OWNER SUPPLIED EQUIPMENT. CONFIRM ALL MECHANICAL REQUIREMENTS AND PROVIDE TO SUIT.
- REVIEW ARCHITECTURAL AND ELECTRICAL DRAWINGS AND PROVIDE ON SITE INSPECTIONS TO DETERMINE FULL EXTENT OF PROJECT PRIOR TO SUBMITTING BID.
- INSTALLATION SHALL BE COMPLETE AND FULLY FUNCTIONAL. PROVIDE ALL LABOR, MATERIALS, TOOLS, SERVICES, EQUIPMENT, ETC. AS REQUIRED.
- PROVIDE ACCESS FOR SERVICING EQUIPMENT AS INDICATED, AS REQUIRED BY CODE AND AS RECOMMENDED BY THE MANUFACTURER.
- PROVIDE ACCESS DOORS AS NECESSARY FOR ACCESS TO HUB DRAINS AND/OR OPEN END DRAINS, VALVES, DAMPERS, AND OTHER COMPONENTS REQUIRING MONITORING, INSPECTION, AND MAINTENANCE.
- IN ALL INSTANCES THE NEED FOR ACCESS DOORS IN GYPSUM BOARD CEILINGS SHOULD BE AVOIDED IF POSSIBLE. WHERE INSTALLATION OF COMPONENTS WHICH REQUIRE ACCESS CANNOT BE AVOIDED, SUBMIT (DIMENSIONED) LAYOUT ON ARCHITECTURAL REFLECTED CEILING PLANS TO CONSULTANTS FOR APPROVAL PRIOR TO INSTALLATION OF COMPONENT.
- FOR CUTTING AND PATCHING OF EXISTING STRUCTURE REFER TO MECHANICAL SPECIFICATION SECTION.
- ALL FIRE DAMPERS, CLEAN OUTS, VALVES, DAMPER CONTROLS, ACCESS DOORS, TEST PORTS, AND FILTERS TO BE LOCATED SO THAT THEY ARE EASILY ACCESSIBLE. ALL GAUGES TO BE LOCATED AT EYE LEVEL.
- INSTALL EQUIPMENT, DUCTS, AND PIPES PARALLEL TO OR PERPENDICULAR TO BUILDING LINES. PROVIDE SPACE, UNIONS AND FLANGES FOR DISASSEMBLY, SERVICING AND REMOVAL OF EQUIPMENT.
- WHEN A CONFLICT OCCURS BETWEEN INSTALLATION DETAILS, DIAGRAMS, ETC. INDICATED IN THE CONTRACT DOCUMENTS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS, THE MANUFACTURER'S INSTRUCTIONS SHALL GOVERN AND SHALL BE FOLLOWED.
- EXISTING MECHANICAL SERVICES SHOWN ON THESE DRAWINGS WERE TAKEN FROM THE ORIGINAL CONTRACT DRAWINGS AND ARE NOT WARRANTED TO BE COMPLETE NOR CORRECT. NOTE THAT ALL MECHANICAL SERVICES MAY NOT BE SHOWN ON THE DRAWING. THE CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION OF ALL CONNECTION POINTS TO EXISTING SERVICES RELEVANT TO THE SCOPE OF WORK ON SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT IS REQUIRED DUE TO ACTUAL CONDITIONS, NOTIFY THE ARCHITECT IN WRITING FOR A RESOLUTION BEFORE SUBMITTING A FINAL BID, ENTERING INTO A CONTRACT, AND FABRICATION/INSTALLATION. FAILURE TO PROVIDE THE NOTIFICATION WILL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE THE WORK MEETING THE DESIGN INTENT AT NO ADDITIONAL COST TO THE OWNER.
- PROVIDE CONCRETE PADS FOR MECHANICAL EQUIPMENT IN BASEMENT

**GENERAL PLUMBING NOTES**  
(APPLICABLE TO ALL DRAWINGS)

- FOR MOUNTING HEIGHT OF ALL PLUMBING FIXTURES REFER TO ARCHITECTURAL ELEVATION DRAWINGS.
- CONTRACTOR IS TO CO-ORDINATE LOCATION OF NEW PIPING WITH EXISTING OR NEW SERVICES (PIPING, DUCTWORK, ELECTRICAL CONDUITS, LIGHTS AND BUILDING STRUCTURE), IF REQUIRED REMOVE EXISTING SERVICES AND REINSTALL. TEST SERVICES AFTER WORK IS COMPLETED.
- CONTRACTOR IS TO CLEAR EXISTING DUCTWORK WHEN INSTALLING NEW PIPING. CLEARANCES TO BE VERIFIED ON SITE.
- ALL PLUMBING PIPING SYSTEMS AND FIXTURES SHALL BE INSTALLED AS PER ONTARIO BUILDING CODE.
- PROVIDE A CLEANOUT FROM EACH PLUMBING FIXTURE WHERE REQUIRED BY ONTARIO BUILDING CODE, PART 7 - PLUMBING.
- ALL PLUMBING FIXTURES INCLUDING FLOOR DRAINS (HUB, FUNNEL FLOOR DRAINS) TO BE TRAPPED AND VENTED AS REQUIRED BY ONTARIO BUILDING CODE, PART 7 - PLUMBING.
- CONTRACTOR IS TO REMOVE ALL OBSOLETE PIPING WHEREVER POSSIBLE.
- PROVIDE SIGN IDENTIFYING LOCATION OF ALL VALVES INSTALLED IN CEILING SPACE.
- WHENEVER COLD AND HOT WATER DISTRIBUTION TO LAVATORIES IS TO RUN UNDER COUNTER, PIPING DISTRIBUTION IS TO BE INSTALLED AS TIGHT TO UNDER SIDE OF THE COUNTER AS POSSIBLE.
- ALL WATER, SANITARY, SEWER AND VENT COPPER PIPING WITH SOLDER JOINTS SHALL BE LEAD FREE.
- DO NOT INSTALL WATER LINES IN OUTSIDE WALL WHERE THEY MAY FREEZE, UNLESS BOTH THE WALL AND THE PIPES ARE PROPERLY INSULATED.
- EACH GROUP OF PLUMBING FIXTURES SHALL BE EQUIPPED WITH WATER SHUT-OFF VALVES IN THE CEILING SPACE.
- INSTALL SHUT-OFF VALVES AT EACH PLUMBING FIXTURE C/W ACCESS DOOR IF CONCEALED.
- ALL PIPES CONNECTED TO EQUIPMENT SHALL BE PROVIDED WITH SHUT-OFF VALVES TO ISOLATE EQUIPMENT FOR MAINTENANCE.
- PROVIDE ALL BACKFLOW PREVENTERS AND VACUUM BREAKERS REQUIRED BY ONTARIO BUILDING CODE AND AUTHORITIES HAVING JURISDICTION. PROVIDE HAMMER ARRESTORS ON DOMESTIC WATER PIPES.
- CO-ORDINATE THE INSTALLATION OF CLEANOUTS AND ACCESS TO DOORS WITH ARCHITECTURAL FINISHES TO AVOID INTERFERENCE WITH BASE DETAILS.
- ALL EXISTING ROOF DRAINS, FLOOR DRAINS AND PIPING WHICH IS TO REMAIN, MUST BE CLEANED OUT AND FLUSHED BY THIS CONTRACT.

**GENERAL HVAC NOTES**  
(APPLICABLE TO ALL DRAWINGS)

- CONTRACTOR TO TAKE ALL MEASUREMENTS NECESSARY TO DETERMINE CURRENT SYSTEMS PERFORMANCE IN AREAS THAT WILL CONTINUE TO BE SERVED BY EXISTING AIR HANDLING EQUIPMENT AND SHALL REPORT ALL MEASUREMENTS MADE PRIOR TO START OF DEMOLITION.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR CO-ORDINATION OF GRILLES, DIFFUSERS AND OTHER ELEMENTS.
- CONTRACTORS SHALL COORDINATE ALL CEILING FINISHES WITH ARCHITECTURAL DRAWINGS. CONTRACTOR SHALL REVIEW MECHANICAL DRAWINGS, ARCHITECTURAL REFLECTED CEILING PLANS AND ARCHITECTURAL ROOM FINISH SCHEDULES AS SOON AS CONTRACT DOCUMENTS ARE SIGNED. ADVISE CONSULTANT OF ANY CONFLICTS BETWEEN CEILING TYPE AND DIFFUSER/GRILLE TYPE.
- CONTRACTOR AND DIFFUSER/GRILLE SUPPLIER ARE RESPONSIBLE TO PROVIDE ALL PLASTER AND FINISHING FRAMES, MOUNTING HARDWARE, AND ACCESSORIES TO SUIT ARCHITECTURAL CEILING TYPES. MECHANICAL CONTRACTOR SHALL CO-ORDINATE AND PROVIDE DETAILS OF MOUNTING REQUIREMENTS OF DIFFUSERS AND GRILLES IN DRYWALL CEILINGS TO DRYWALL TRADE AND ENSURE EDGES OF OPENINGS ARE FRAMED BY DRYWALL TRADE TO SUPPORT DIFFUSERS AND GRILLES PROPERLY. DIFFUSERS AND GRILLES MUST NOT BE SUPPORTED SOLELY BY HANGER WIRES.
- PROPERLY SUPPORT CEILING MOUNTED EQUIPMENT AND ANY OTHER EQUIPMENT INDEPENDENT OF CEILING SUPPORT SYSTEM. COORDINATE WITH STRUCTURAL CONSULTANT. REFER TO ARCHITECTURAL DETAILS AND CO-ORDINATE WITH STRUCTURAL TRADE.
- CONTRACTOR TO CARRY FOR ADDITIONAL DUCTS AND DUCT FITTING REQUIRED TO CLEAR THE INTERFERENCES IN THE CEILING SPACE.
- CONTRACTOR IS TO RECONNECT ALL TAKE-OFFS / BRANCH LINES FROM MAINS BEING REMOVED TO NEW MAINS INSTALLED UNDER THIS CONTRACT. EXACT SIZE, LOCATION AND NUMBER OF TAKE-OFFS TO BE VERIFIED ON SITE.
- WHERE EQUIPMENT IS SHOWN TO BE DEMOLISHED, ALL SERVICES TO EQUIPMENT SHALL CAPPED BACK AT MAIN DUCTS.
- LOCATION OF THERMOSTATS TO BE COORDINATED WITH FINAL LOCATION OF FURNITURE AND EQUIPMENT. TYPICAL FOR ALL INDICATED.

**HVAC LEGEND**

SYMBOL	DESCRIPTION
	POSITIVE PRESSURE (SUPPLY) DUCT DOWN
	POSITIVE PRESSURE (SUPPLY) DUCT DOWN
	NEGATIVE PRESSURE (RETURN) DUCT DOWN
	NEW DUCTWORK
	DEMOLITION/REMOVAL OF DUCTWORK
	INTERNALLY LINED DUCTWORK
	FULL RADIUS DUCT CONNECTION
	TAP-IN DUCT CONNECTION
	ROUND DUCT CONNECTION
	SUPPLY AIR DIFFUSER (SQUARE)
	RETURN/EXHAUST GRILLE
BDD	BACKDRAFT DAMPER
BD	VOLUME DAMPER
	THERMOSTAT
BD	FIRE DAMPER
	PIPING RISER DOWN
TYP.	TYPICAL
C/W	COMPLETE WITH
AFF	ABOVE FINISHED FLOOR
REF.	REFRIGERANT
RL	REFRIGERANT LIQUID PIPE
RS	REFRIGERANT SUCTION PIPE
<p>HOT WATER RADIATION TAG EQUIPMENT DESIGNATION RADIATION FINNED LENGTH (INCH) TOTAL RADIATION OUTPUT (MBH) (REFER TO SCHEDULES FOR INFO)</p> <p>TYPE - IP, L, ET, D, MBH</p>	
<p>DIFFUSER TAG DIFFUSER/GRILLE SIZE (AND NECK SIZE WHERE APPLICABLE) AIR VOLUME (CFM OR l/s AS INDICATED) DIFFUSER/GRILLE DESIGNATION (REFER TO SCHEDULE FOR TYPE)</p> <p>2x1, 20 ???</p>	
NOTE: NOT ALL SYMBOLS USED IN THIS PROJECT	

**PLUMBING LEGEND**

SYMBOL	DESCRIPTION
	GATE VALVE
	CLEANOUT
	PIPE RISER
	PIPET CAP
	RISE OR DROP
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
SAN	SANITARY
CTE	CONNECT TO EXISTING
----	BELOW FLOOR PIPING
----	DOMESTIC COLD WATER (DCW)
----	DOMESTIC HOT WATER (DHW)
-----	DOMESTIC HOT WATER RETURN
—ST—	STORM DRAIN
—SAN—	SANITARY DRAIN
—G—	NATURAL GAS
	GAS VALVE
	PRESSURE REDUCING VALVE
	BACKFLOW PREVENTER
—C <sup>CO</sup> —	FLOOR CLEAN OUT
—H <sup>CO</sup> —	WALL CLEAN OUT
—H <sup>CO</sup> —	HOSE BIB
	FROST PROOF WALL HYDRANT
FD @ C	FLOOR DRAIN
	FIRE EXTINGUISHER
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1	ISSUED FOR PERMIT	2024-03-29

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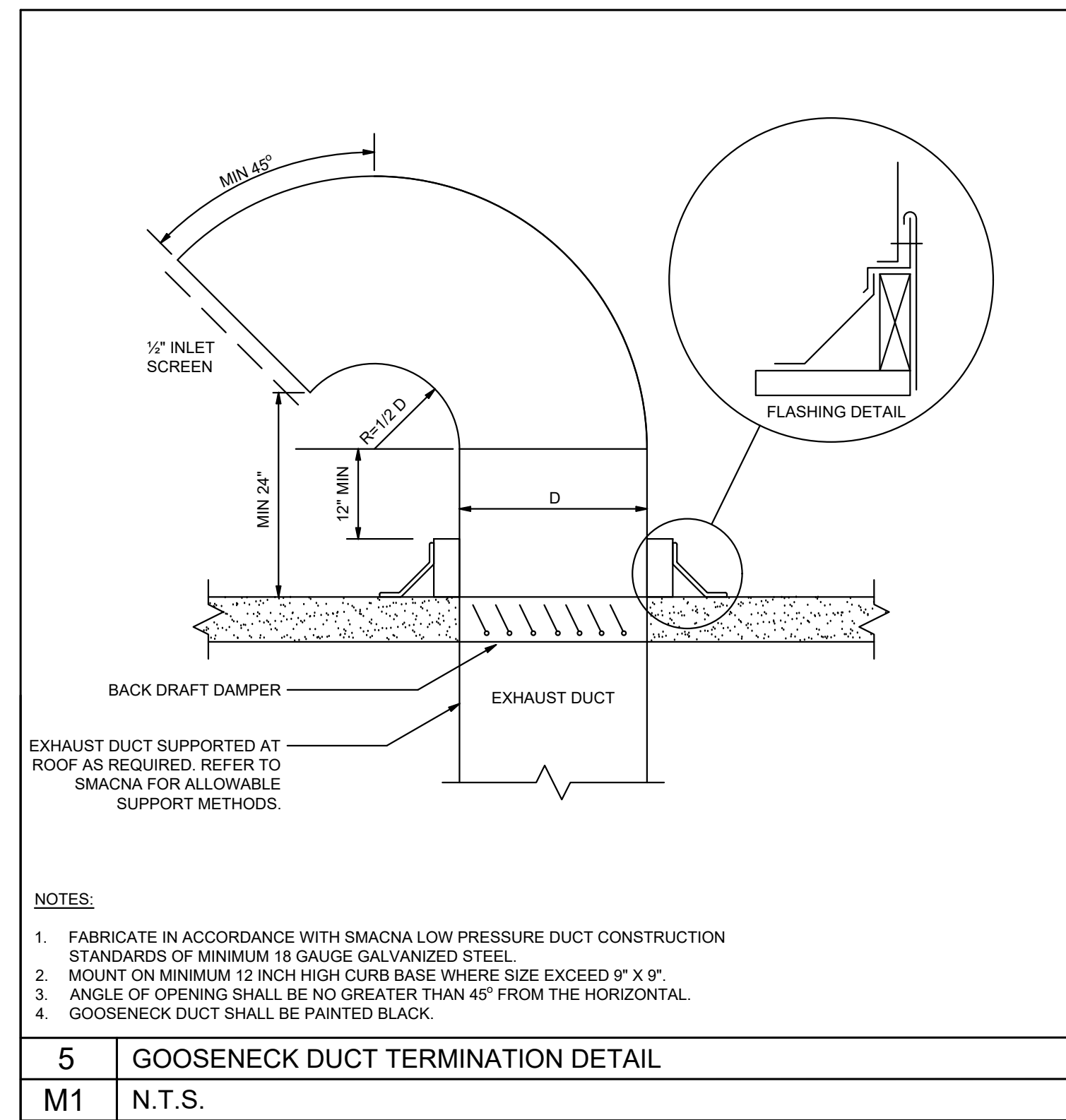
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PROJECT NAME  
**1300 FANSHAWE PARK RD. E.  
CRU-3**

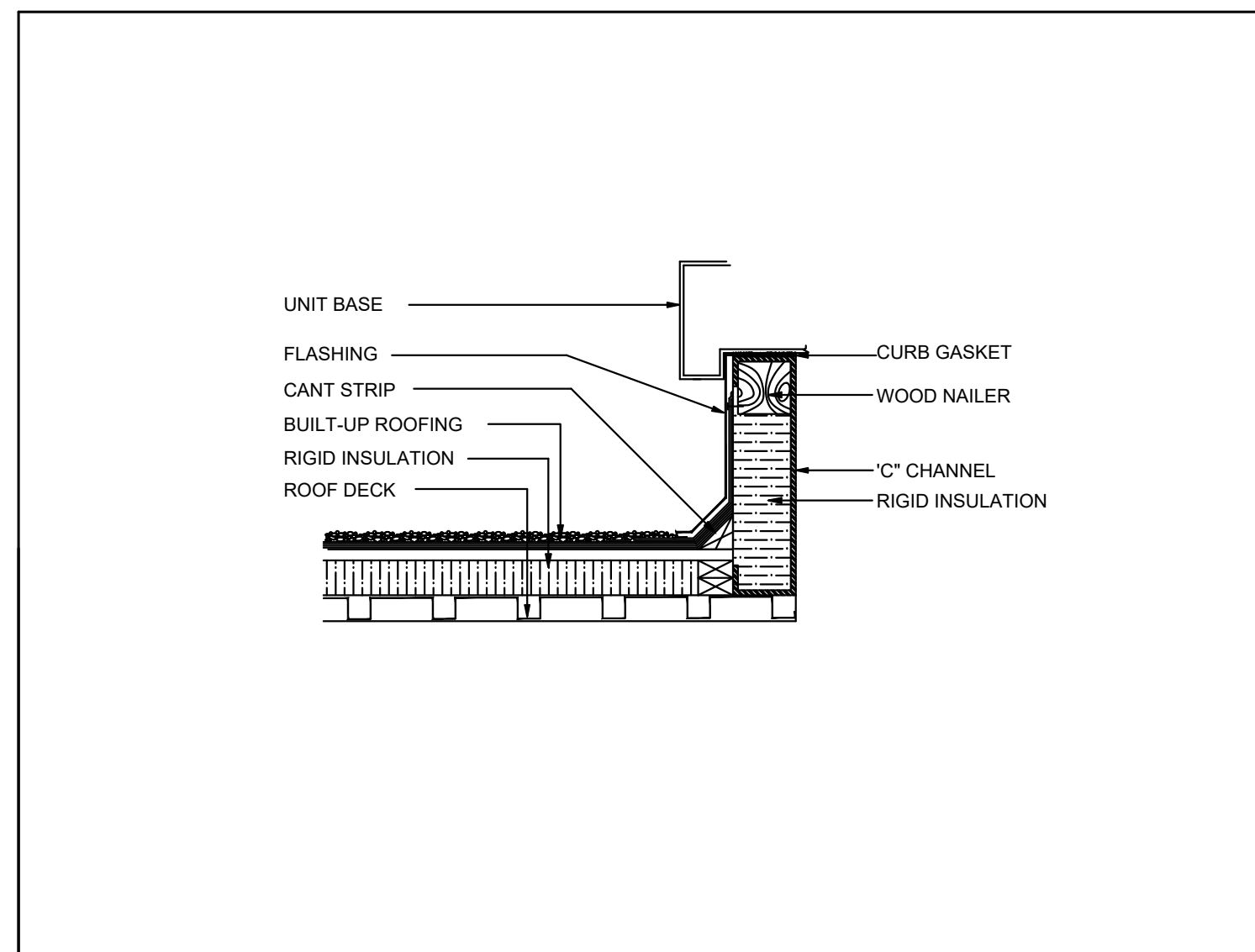
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SHEET TITLE  
**MECHANICAL  
LEGEND AND NOTES**

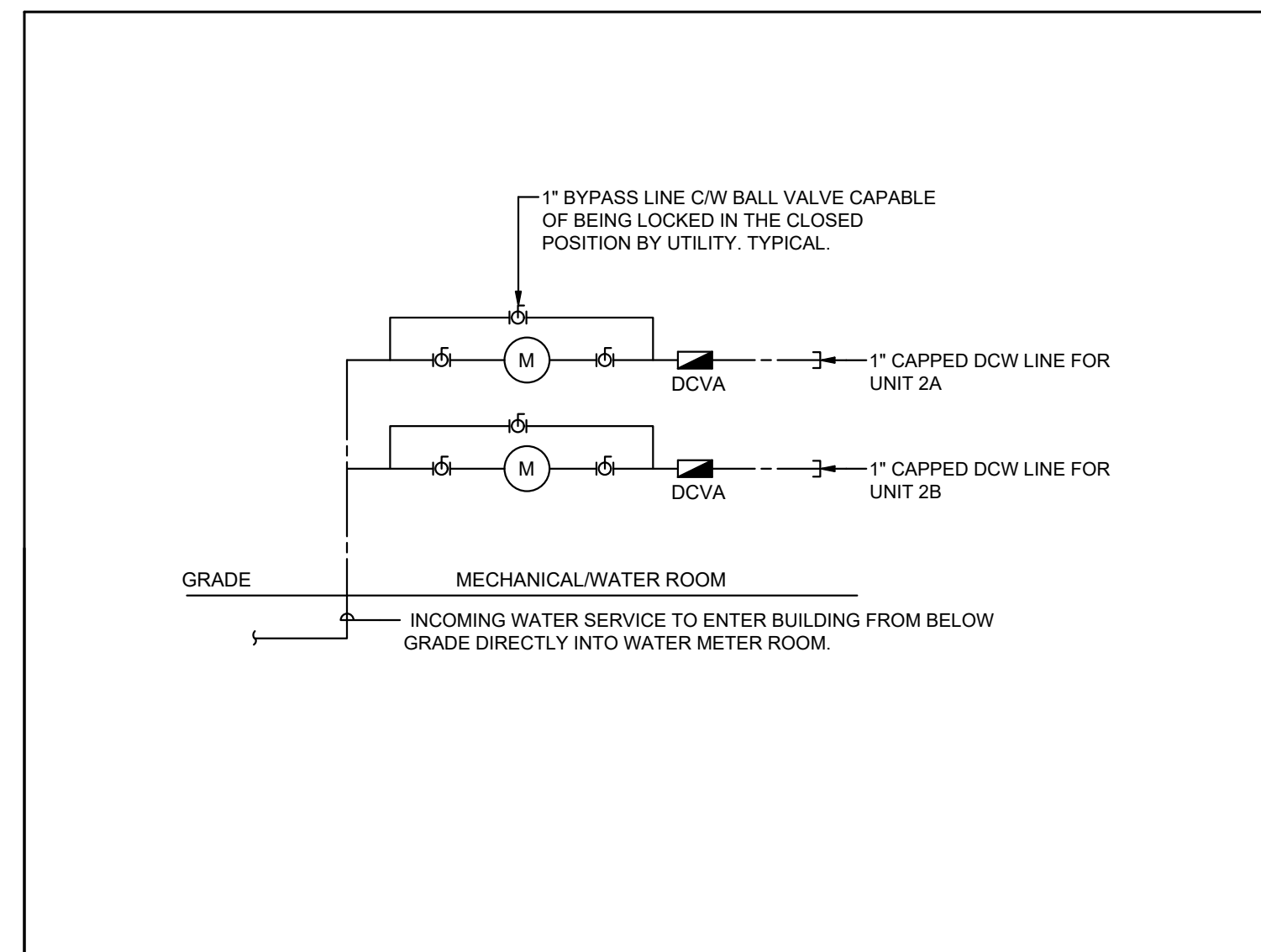
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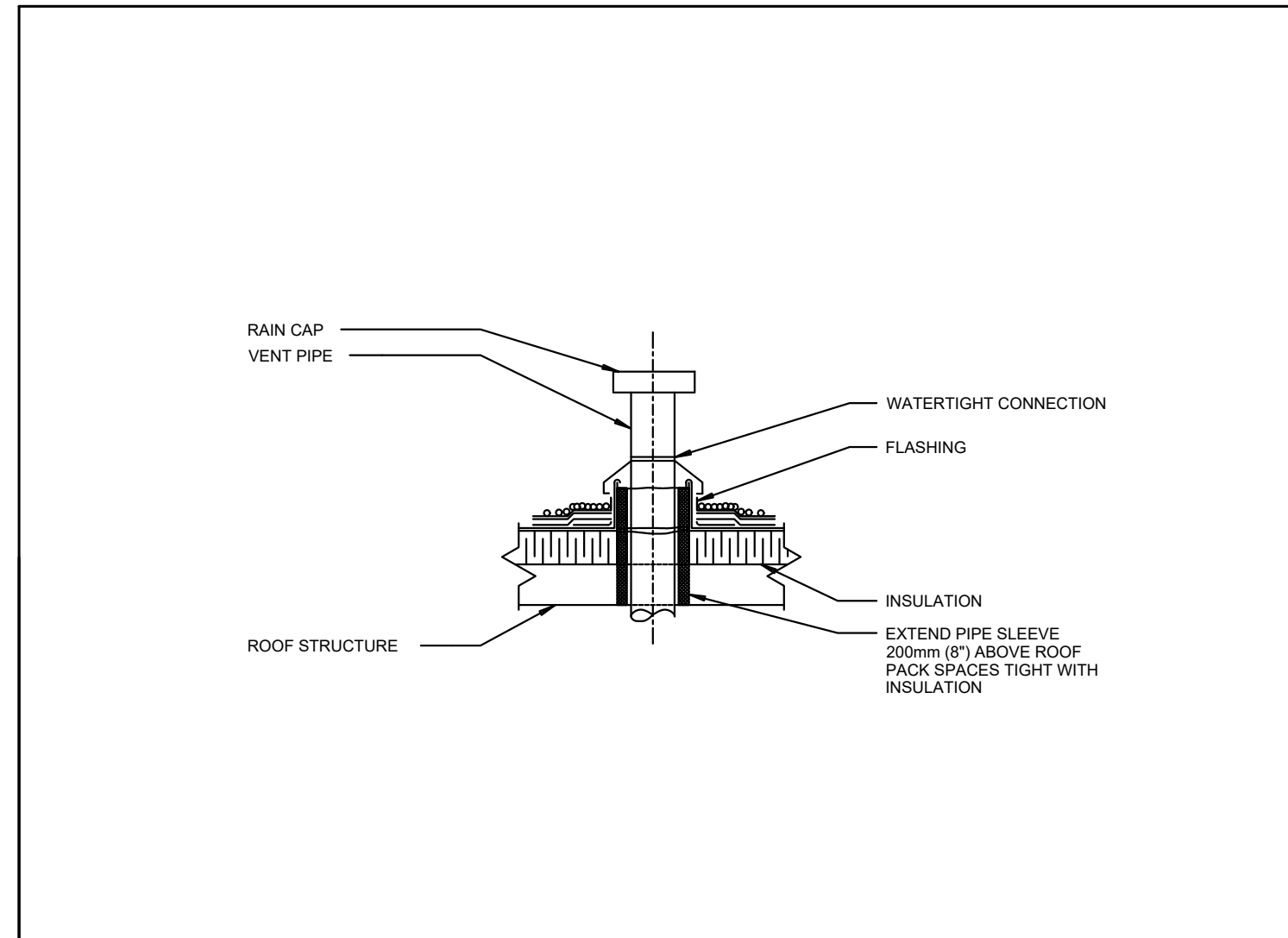
5	GOOSENECK DUCT TERMINATION DETAIL
M1	N.T.S.



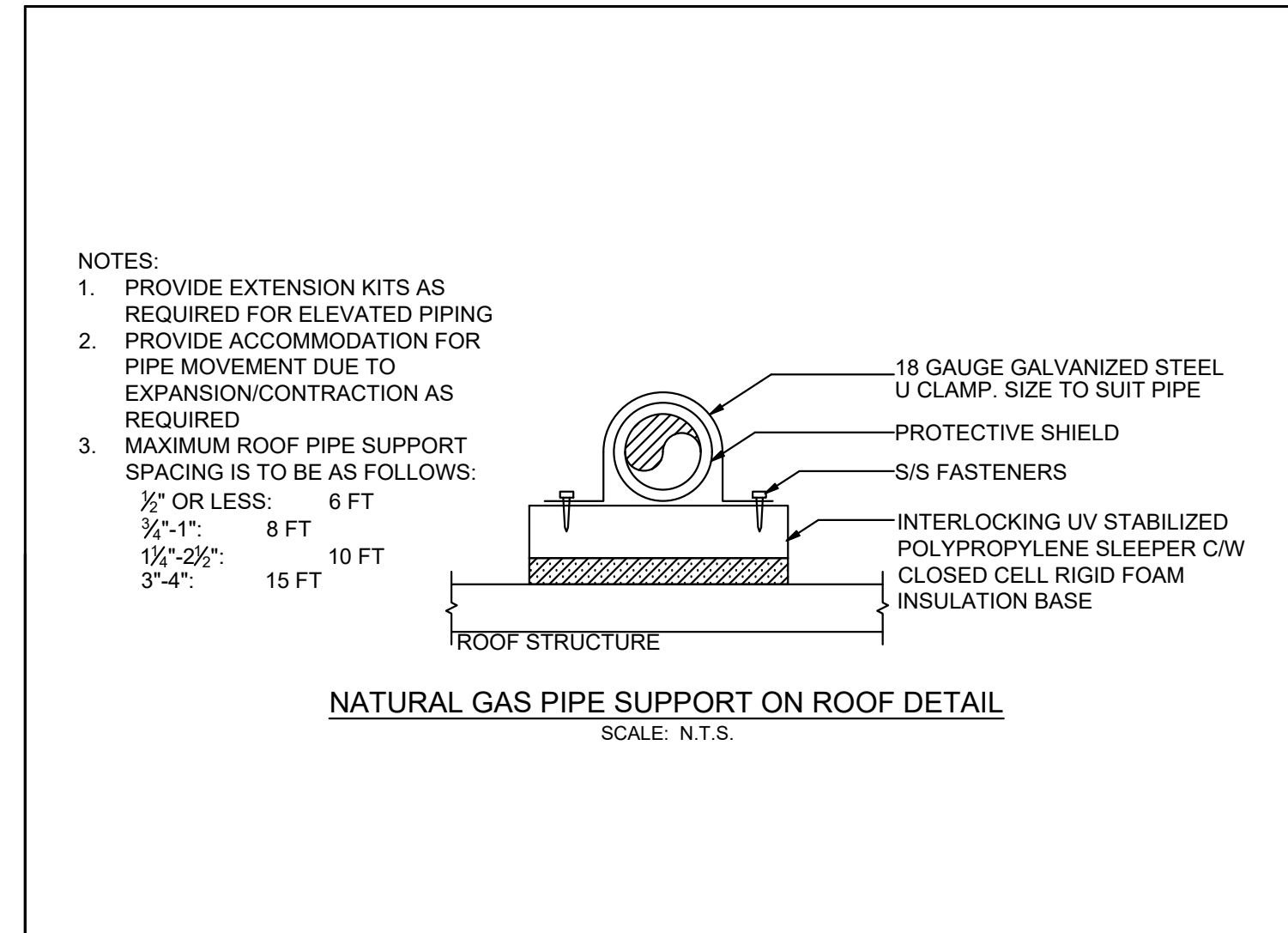
3	INSULATED ROOF CURB DETAIL
M1	N.T.S.



1	CRU COMMERCIAL SPACE TENANT WATER METER DETAIL
M1	N.T.S.



4	VENT PENETRATION THROUGH ROOF DETAIL
M1	N.T.S.



2	NATURAL GAS PIPE SUPPORT ON ROOF DETAIL
M1	N.T.S.

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**PLUMBING FIXTURE SCHEDULE**

DWG REF	DESCRIPTION	HOT	COLD	DRAIN
FD	FLOOR DRAIN- EPOXY COATED CAST IRON FLOOR DRAIN WITH ANCHOR FLANGE, REVERSIBLE CLAMPING COLLAR WITH PRIMARY AND SECONDARY WEEPHOLES, ADJUSTABLE ROUND NICKEL BRONZE STRAINER, AND NO HUB (STANDARD) OUTLET. WATTS DRAINAGE - MODEL: FD-100-A	--	--	3"
RD	ROOF DRAIN - EPOXY COATED CAST IRON BODY WITH DEEP SUMP, WIDE SERRATED FLASHING CLAMP, LOCKING DUCTILE IRON DOME, DECK CLAMP AND SEDIMENT BUCKET. SET WEIRS AS NOTED ON DRAWINGS. WATTS DRAINAGE - MODEL: RD-100-A-ADJ	--	--	AS INDICATED ON DWGS

**EXHAUST FAN SCHEDULE**

TAG	SERVICE	MANUF.	MODEL	AIRFLOW CFM	ELECTRICAL		REMARKS
					H.P.	VOLTAGE	
EF-1	UTILITIES	BROAN	AER110C	110	FHP	120V/1PH/60HZ	CONTROL WITH SWITCH, BY ELEC DIVISION. PROVIDE FAN C/W HANGING ROD AND VIBRATION ISOLATION, DISCONNECT SWITCH AND BACK DRAFT DAMPER

**WALL BOX AND LOUVER SCHEDULE**

DWG REF	SERVING	MANUF.	MODEL	SIZE [WxH, IN]	AIR FLOW [CFM]	PRESS. DROP [IN W.C.]	REMARKS
WB-1	EF	REVERSOMATIC	SWBL-8	8x8	--	--	EXTRUDED ALUMINUM WALL BOX C/W BIRDSCREEN. COLOUR TO BE SELECTED BY ARCHITECT.

**PACKAGED ROOF TOP UNIT SCHEDULE**

DWG REF	MANUF.	MODEL	COOLING ENTERING AIR TEMP [DB/WB, °F] [DB/WB, °C]	SENS. COOLING [MBH] [KW]	TOTAL COOLING [MBH] [KW]	HEATING INPUT [MBH] [KW]	HEATING OUTPUT [MBH] [KW]	EXTERNAL STATIC PRESSURE [in.wg] [PA]	TOTAL AIR FLOW [CFM] [L/S]	MOTOR [HP]	EFF.	ELECTRICAL			ACCESSORIES	WEIGHT [LBS] [KG]	REMARKS
												VOLTAGE	MCA [A]	MOCP [A]			
RTU-1	CARRIER	48FCEA09A3A1	80 / 67 (27/19.4)	79.63 (23.3)	100.05 (29.3)	180 (52.8)	148 (43.4)	0.5 (124)	3400 (1605)	-	14 IEER	575/3/60	15	20	1,4,6,8,11,12	1074 (487.2)	8.5-TON PACKAGED ROOF TOP UNIT
RTU-2	CARRIER	48FCEA09A3A1	80 / 67 (27/19.4)	79.63 (23.3)	100.05 (29.3)	180 (52.8)	148 (43.4)	0.5 (124)	3400 (1605)	-	14 IEER	575/3/60	15	20	1,4,6,8,11,12	1074 (487.2)	8.5-TON PACKAGED ROOF TOP UNIT

PROJECT NAME  
**1300 FANSHAW PARK RD. E. CRU-3**

1300 FANSHAW PARK RD. E  
LONDON, ONTARIO

SHEET TITLE  
**MECHANICAL DETAILS AND SCHEDULES**

SCALE	SEE DRAWING	DRAWING NO.	<b>M1</b>
DRAWN BY	SEE DRAWING		
CHECKED BY	SEE DRAWING		
DATE	SEE DRAWING		
FILE NAME	SEE DRAWING		

**GENERAL DWG NOTES**

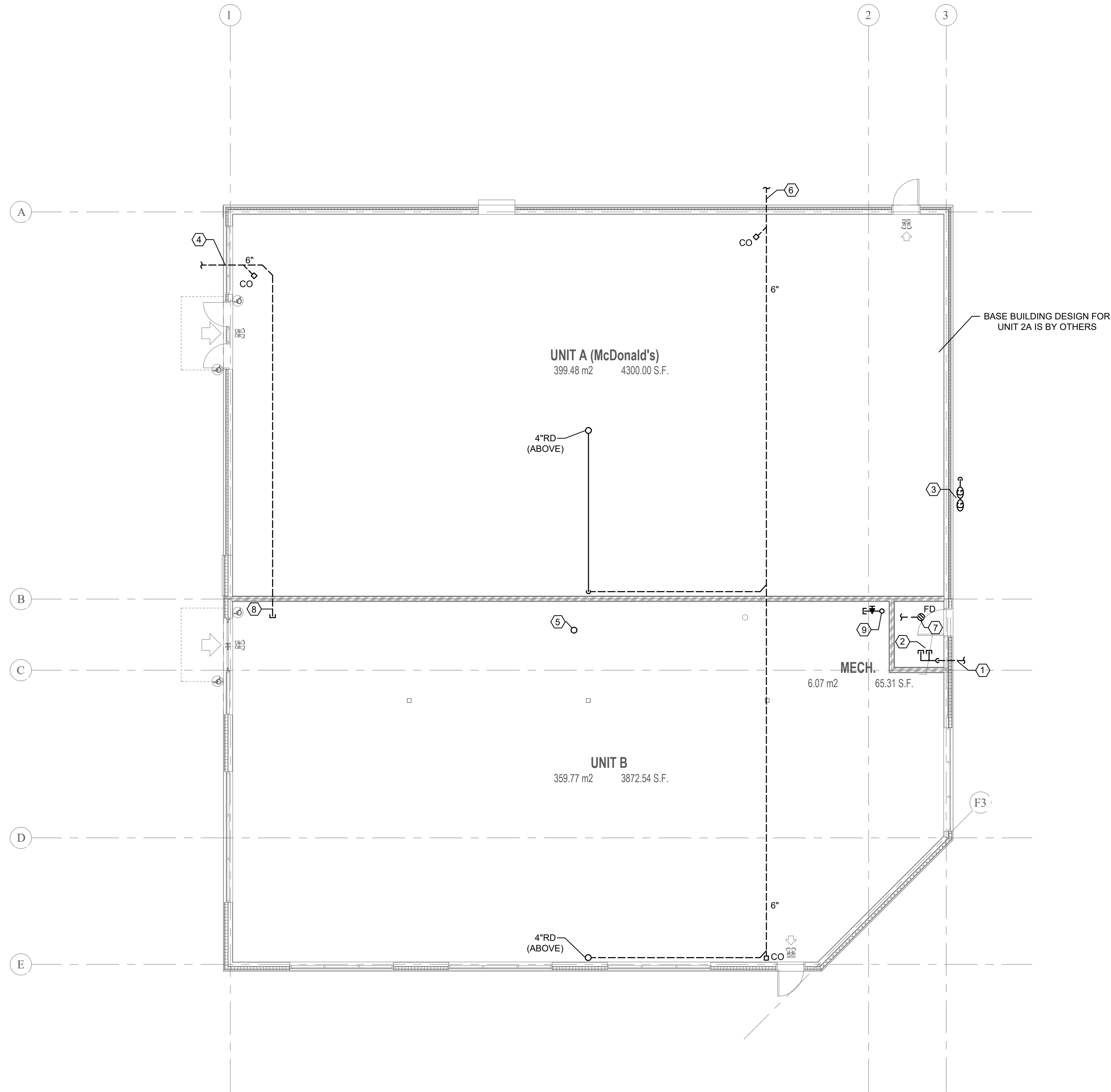
- CONTRACTOR TO REQUEST TENANT DRAWINGS FOR COORDINATION PRIOR TO INSTALLING ANY PLUMBING ROUGH-INS.
- CONTRACTOR TO REQUEST TENANT DRAWINGS FOR COORDINATION OF ALL ROOF PENETRATIONS PRIOR TO CONSTRUCTION.
- EXTERNALLY INSULATE ALL STORM PIPING USING WHITE PVC INSULATION.

**DWG KEY NOTES**

1. CONNECT TO INCOMING 8" DCW SERVICE. CO-ORDINATE WITH SITE SERVICES.
2. REFER TO COMMERCIAL SPACE TENANT WATER METER DETAIL.
3. NEW BUILDING GAS METER BANK. CO-ORDINATE WITH LOCAL UTILITY FOR CONNECTION TO 3,500 MBH @ 7" WC. GAS SERVICE. A TOTAL OF 2 METERS ARE REQUIRED. CAP CRU3A GAS LINE AT METER FOR FUTURE CONNECTION BY OTHERS:
  - 2,500MBH @ 7" FOR UNIT#3A
  - 1,000MBH @ 7" FOR UNIT#3B
4. CONNECT TO INCOMING SANITARY SERVICE. CO-ORDINATE WITH SITE SERVICES.
5. PROVIDE 3" VENT THROUGH ROOF. CAP BELOW ROOF DECK FOR FUTURE TENANT CONNECTION.
6. CONNECT TO INCOMING STORM SERVICE. CO-ORDINATE WITH SITE SERVICES.
7. ROUTE FLOOR DRAIN TO NEAREST SANITARY.
8. PROVIDE 4" CAPPED SANITARY FOR FUTURE TENANT BUILDING CONNECTION.
9. GAS LINE FROM ABOVE CAPPED AS SHOWN.

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**1300 FANSHAWE PARK RD. E.**  
**CRU-3**

1300 FANSHAWE PARK RD. E  
LONDON, ONTARIO

**SHEET TITLE**  
**CRU-3 MECHANICAL**  
**PLUMBING PLAN**

SCALE	SEE DRAWING	DRAWING NO.	<b>M2</b>
DRAWN BY	SEE DRAWING		
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DATE	SEE DRAWING		
FILE NAME	SEE DRAWING		

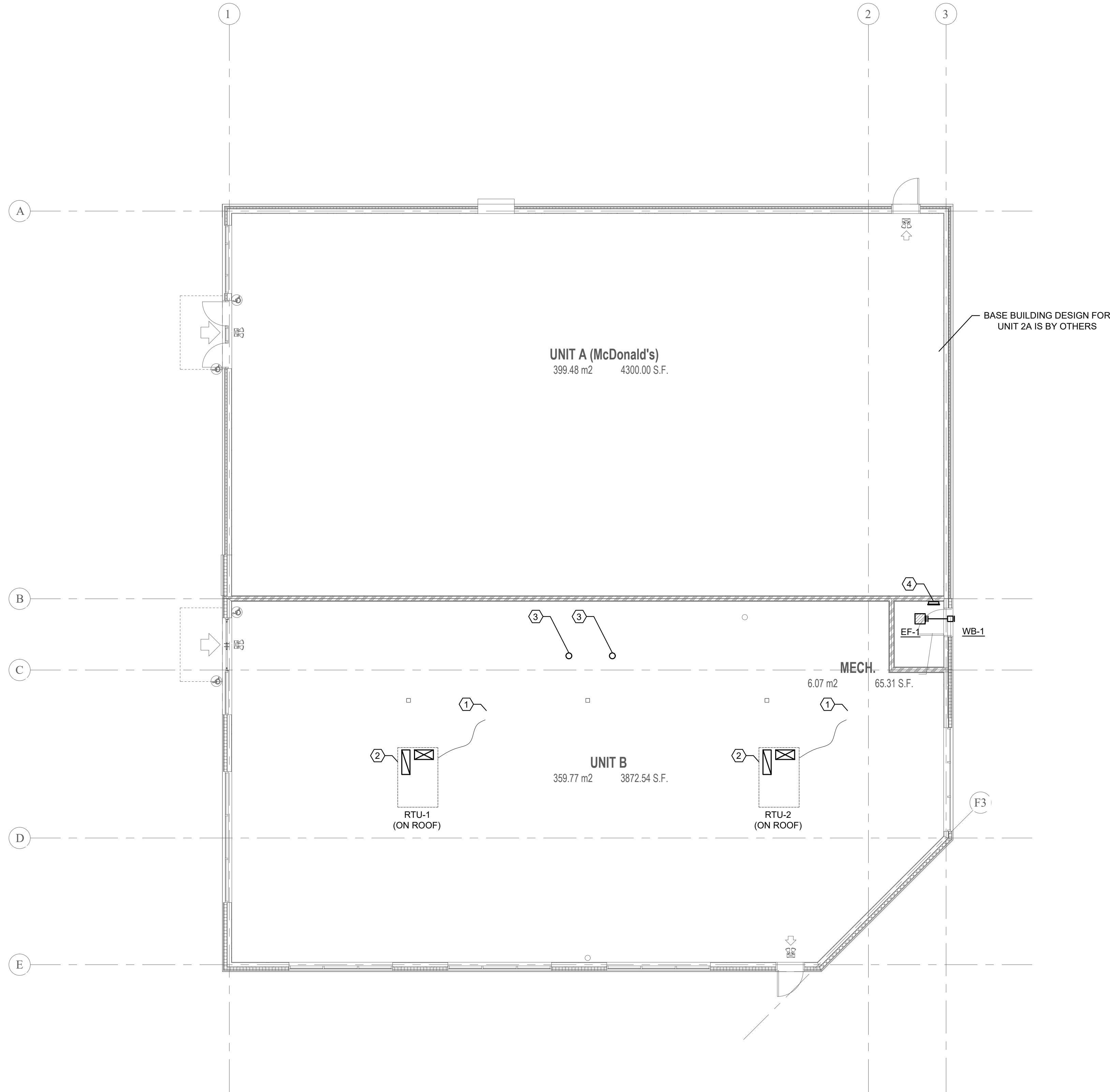
① CRU-3 PLUMBING PLAN  
1/8" = 1'-0"

**GENERAL DWG NOTES**

- EXTERNALLY INSULATE LAST 5'-0" OF EXHAUST AIR DUCTWORK.
- CONTRACTOR TO REQUEST TENANT DRAWINGS FOR COORDINATION PRIOR TO INSTALLING ANY PLUMBING ROUGH-INS.
- CONTRACTOR TO REQUEST TENANT DRAWINGS FOR COORDINATION OF ALL ROOF PENETRATIONS PRIOR TO CONSTRUCTION.

**DWG KEY NOTES**

1. PROVIDE SPACE TEMPERATURE SENSOR C/W 20m OF COILED CONTROL WIRE. HANG IN JOIST SPACE FOR FUTURE RELOCATION BY TENANT.
2. ROOF TOP UNIT ABOVE. TERMINATE SUPPLY AND RETURN DUCTWORK MIN. 24" BELOW ROOF DECK WITH OPEN END. DUCTWORK LAYOUT FINISH BY TENANT.
3. PROVIDE 6"Ø GOOSENECK DUCT THROUGH ROOF C/W B.D.D. AND BIRDSCREEN. CAP BELOW ROOF DECK FOR FUTURE FAN CONNECTION.
4. 2KW FFH BY ELEC.



① CRU-3 HVAC PLAN  
1/8" = 1'-0"

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**SHEET TITLE**  
**CRU-3 MECHANICAL**  
**HVAC PLAN**

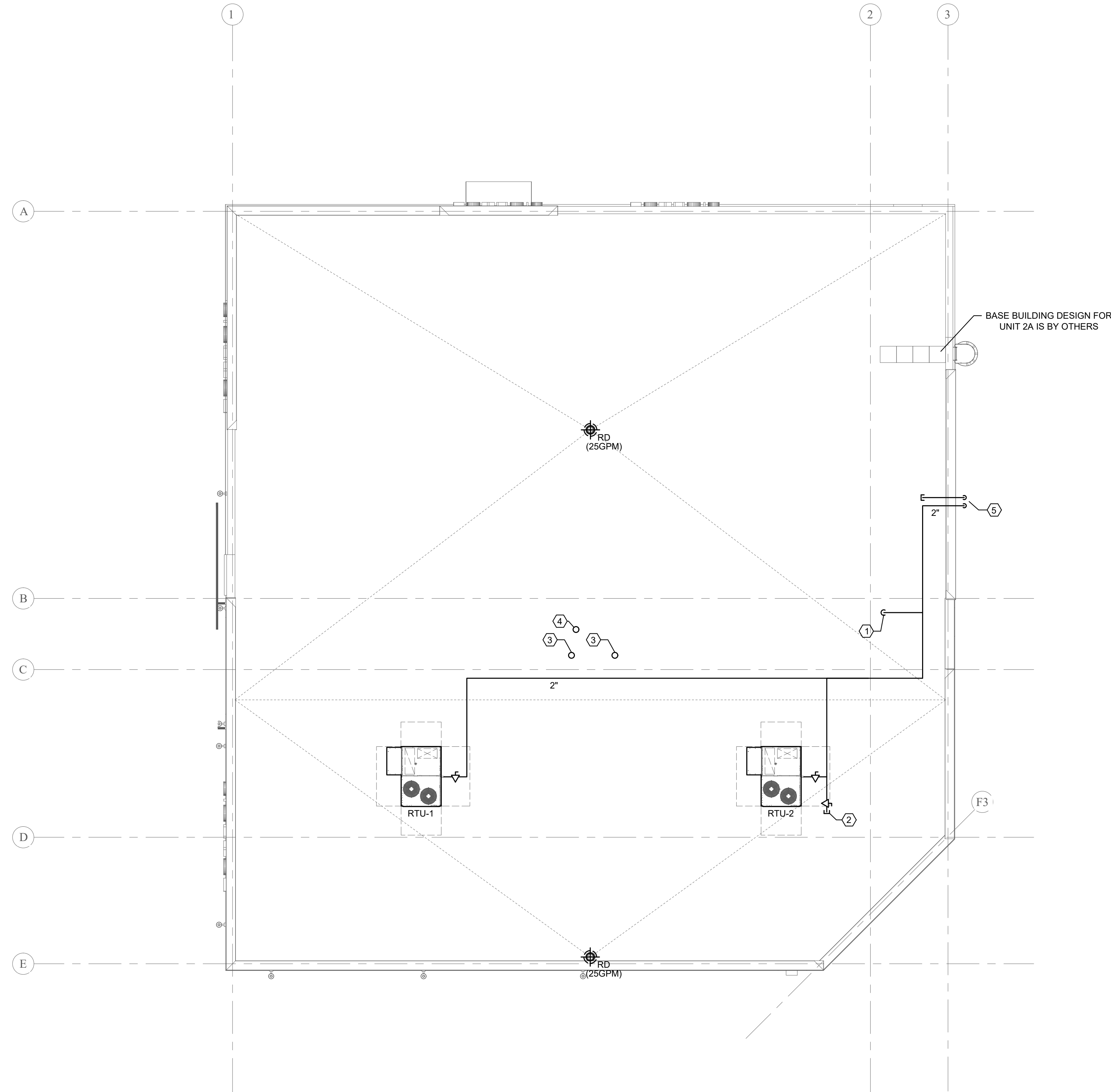
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GENERAL DWG NOTES

- CONTRACTOR TO REQUEST TENANT DRAWINGS FOR COORDINATION PRIOR TO INSTALLING ANY PLUMBING ROUGH-INS.
- CONTRACTOR TO REQUEST TENANT DRAWINGS FOR COORDINATION OF ALL ROOF PENETRATIONS PRIOR TO CONSTRUCTION.

DWG KEY NOTES

- GAS DOWN TO TENANT SPACE. REFER TO FLOOR PLAN FOR CONTINUATION.
- 2PSI TO 7"WC PRV.
- 6"Ø DUCT FROM BELOW. REFER TO GOOSENECK TERMINATION DETAIL.
- 3" VENT THROUGH ROOF. REFER TO DETAIL.
- GAS LINE FROM RESPECTIVE TENANT METER BELOW.



GENERAL NOTES

- DO NOT SCALE DRAWINGS
- CONTRACTOR MUST VERIFY ALL JOB DIMENSIONS, ALL DRAWINGS, DETAILS AND SPECIFICATIONS, AND REPORT ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.
- ALL DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF SERVICE AND ARE THE PROPERTY OF THE CONSULTANTS AND ARE INTENDED FOR THE COMPLETION OF THIS PROJECT ONLY
- ALL WORK MUST CONFORM TO THE ONTARIO BUILDING CODE (LATEST EDITION) OR ANY AUTHORITY HAVING JURISDICTION

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	2024-03-29

THESE DRAWINGS ARE PREPARED TO SHOW DESIGN INTENT ONLY. EXISTING CONDITIONS MAY NOT REFLECT EXACT LOCATIONS.



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PROJECT NAME  
**1300 FANSHAWE PARK RD. E.  
CRU-3**

1300 FANSHAWE PARK RD. E  
LONDON, ONTARIO

SHEET TITLE  
**CRU-3 MECHANICAL  
ROOF PLAN**

SCALE	SEE DRAWING	DRAWING NO.	<b>M4</b>
DRAWN BY	SEE DRAWING		
CHECKED BY	SEE DRAWING		
DATE	SEE DRAWING		
FILE NAME	SEE DRAWING		
	SEE DRAWING		

① CRU-3 MECHANICAL ROOF PLAN  
1/8" = 1'-0"

**MECHANICAL SPECIFICATIONS**

<p><b>1.1 GENERAL</b></p> <p>CODE REQUIREMENTS SHALL BE CONSIDERED AS PRIORITY AND TO APPLY IF THERE IS A CONFLICT WITH DRAWINGS.</p> <p>GENERAL CONTRACTOR IS RESPONSIBLE FOR SUB TRADES AND THEIR SCOPE OF WORK. EXTRAS WILL NOT BE CONSIDERED BASED ON THE DIFFERENCE IN INTERPRETATION OF SPECIFICATIONS AND DRAWINGS.</p> <p><b>1.2 WORK</b></p> <p>DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE. THE CONTRACT DOCUMENTS ESTABLISH SCOPE, MATERIAL AND QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS.</p> <p>THE MECHANICAL CONTRACTOR MUST VISIT THE SITE TO PRE-QUALIFY HIS/HER TENDER SUBMISSION. FAILURE TO COMPLY WITH THIS REQUIREMENT WILL RENDER HIS/HER PORTION (DIVISION 15) OF THE WHOLE TENDER AS UNQUALIFIED AND WILL BE REJECTED.</p> <p><b>1.3 WORK INTENT</b></p> <p>THESE SPECIFICATIONS MAY NOT COVER EACH AND EVERY ITEM REQUIRED FOR THE COMPLETE MECHANICAL INSTALLATION. THEREFORE, THE CONTRACTOR SHALL MAKE HIS OWN PROVISIONS FOR ALL LABOUR, MATERIALS AND EQUIPMENT DEEMED NECESSARY TO COMPLETE THE MECHANICAL SYSTEM AS THE INTENT IS TO PROVIDE OPERATIONAL SYSTEMS WITH GOOD QUALITY.</p> <p>ALL WORK TO CONFORM TO LATEST NATIONAL, PROVINCIAL, MUNICIPAL CODES, BYLAWS, REGULATIONS AND AUTHORITIES HAVING JURISDICTION.</p> <p>THE SPECIFICATIONS ARE INTEGRAL WITH THE DRAWINGS WHICH ACCOMPANY THEM. NEITHER IS TO BE USED ALONE. ANY ITEM OR SUBJECT OMITTED FROM ONE, BUT IMPLIED ON THE OTHER IS PROPERLY SPECIFIED.</p> <p>WHenever differences occur in the contract documents, the maximum condition will govern and be included in the contract price.</p> <p>CONFORM TO MANUFACTURER'S INSTRUCTIONS, DETAILS AND PROCEDURES FOR EQUIPMENT INSTALLATIONS.</p> <p>INSTALL EQUIPMENT IN LOCATIONS AND ROUTES SHOWN WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR TRADES. REMOVE AND REPLACE EQUIPMENT IMPROPERLY INSTALLED.</p> <p><b>1.4 LIABILITY</b></p> <p>THE CONTRACTOR IS RESPONSIBLE FOR LAYING OUT HIS WORK AND FOR ANY DAMAGE CAUSED TO OWNER PROPERTY.</p> <p>VERIFY EXISTING ELEVATIONS, DIMENSIONS, CLEARANCES AND BUILDING FEATURES PRIOR TO COMMENCING INSTALLATION.</p> <p><b>1.5 COORDINATION</b></p> <p>COORDINATE WORK WITH ALL OTHER SUBCONTRACTORS AND TRADES INVOLVED.</p> <p><b>1.6 SERVICE INTERRUPTION</b></p> <p>CONTINUITY OF SERVICES SHALL BE MAINTAINED TO ALL EXISTING SERVICES. INTERRUPTIONS SHALL BE COORDINATED WITH THE OWNER AS TO TIME AND DURATION DURING CONSTRUCTION</p> <p>THE CONTRACTOR SHALL INCLUDE IN HIS PRICE ANY COST FOR PREMIUM TIME OUTSIDE OF NORMAL WORKING HOURS TO COMPLETE THE WORK ON SCHEDULE AND TO MAINTAIN ALL EXISTING SYSTEMS IN OPERATION.</p> <p><b>1.7 PERMITS AND FEES</b></p> <p>CONTRACTOR TO OBTAIN ALL PERMITS AND PAY ALL FEES SO TO CARRY OUT ALL WORK REQUIRED.</p> <p>INSPECTIONS SHALL BE MADE PROMPTLY. IF ANY WORK IS COVERED UP WITHOUT CONSENT, IT SHALL, IF REQUIRED, BE UNCOVERED FOR EXAMINATION AND MAKE GOOD AT NO EXTRA COST TO OWNER.</p>	<p><b>1.8 PIPING AND DUCT IDENTIFICATION</b></p> <p>PROVIDE FOR IDENTIFICATION OF PIPING AND DUCTWORK WITH MARKERS SHOWING SERVICE AND DIRECTION OF FLOW. APPLY LABELS AT MAXIMUM 30-FT INTERVALS, AT ACCESS DOOR OPENINGS, AT EACH SHUT OFF VALVE AND ADJACENT TO EACH PIECE OF EQUIPMENT. MINIMUM 1-INCH LETTERING AND DRY ADHESIVE BACKING. PROVIDE 3M #76 ADHESIVE</p> <p>PROVIDE 2-INCH WIDE COLOUR BAND OF PLASTIC PRESSURE SENSITIVE TAPE FOR PIPING LAMICOID LABELS WITH 1/2-INCH LETTERS AND KEY WITH CONTROL SCHEMATICS.</p> <p>PROVIDE LAMICOID LABELS WITH 1/2-INCH LETTERS ON EQUIPMENT AND MOTOR STARTERS.</p> <p><b>1.9 CUTTING AND PATCHING</b></p> <p>MECHANICAL CONTRACTOR SHALL INCLUDE CUTTING, PATCHING AND MAKE GOOD ALL OPENINGS REQUIRED FOR THE MECHANICAL SERVICES. PROTECT EXISTING BUILDING, STRUCTURE AND FINISHES.</p> <p>PROVIDE SLEEVES, CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED SERVICES.</p> <p>PROVIDE EXPANSION BOLTS, HANGER RODS, BRACKETS AND SUPPORTS.</p> <p>DO NOT ALTER STRUCTURAL MEMBERS OF BUILDING WITHOUT OBTAINING APPROVAL FROM ARCHITECT.</p> <p><b>1.10 FLASHING</b></p> <p>DO ALL FLASHING AND COUNTER FLASHING WHERE DUCTS AND OTHER MECHANICAL PARTS ARE PASSING THROUGH WEATHER AND/OR WATER PROOF WALLS, FLOORS AND ROOFS PER APPLICABLE CODES. PROVIDE FIRE SEAL MATERIAL AND FIRE STOPPERS WHERE PIPES RUN THROUGH FIRE RATED WALLS</p> <p><b>1.11 PIPE HANGERS, SUPPORTS AND SLEEVES</b></p> <p>HANGERS AND SUPPORTS SHALL SECURE PIPES IN PLACE, PREVENT VIBRATION, MAINTAIN GRADE BY ADJUSTMENT, PROVIDE FOR EXPANSION AND CONTRACTION AND SHALL BE DIRECTLY FROM THE STRUCTURE.</p> <p><b>1.12 TESTING</b></p> <p>TEST ALL EQUIPMENT AND MATERIALS WHERE REQUIRED BY SPECIFICATIONS OR AUTHORITIES HAVING JURISDICTION. TEST PROCEDURES SHALL BE IN ACCORDANCE WITH APPLICABLE PORTIONS OF THE ASME, ASHRAE, SMACNA, NFPA, CSA AND OTHER RECOGNIZED TEST CODES AS FAR AS FIELD CONDITIONS PERMIT.</p> <p>ALL GAS PIPING SHALL BE TESTED AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.</p> <p>ALL LOW VELOCITY DUCT SYSTEMS, INCLUDING SUPPLY, RETURN AND EXHAUST SHALL BE CHECKED FOR TIGHTNESS. ALL LEAKS SHALL BE REPAIRED BEFORE DUCTS ARE FURRED IN TO ENSURE TOTAL OUTLET CAPACITY IS WITHIN 5% OF THE QUANTITY BEING SUPPLIED BY THE AIR SYSTEMS.</p> <p><b>1.13 ELECTRIC MOTORS AND WIRING</b></p> <p>CONTRACTOR TO REVIEW ALL EQUIPMENT REQUIRING ELECTRICAL HOOK-UP WITH ELECTRICAL CONTRACTOR AND ELECTRICAL DRAWINGS PRIOR TO ORDERING EQUIPMENT. CONFIRM ALL ELECTRICAL CHARACTERISTICS AS REQUIRED.</p> <p>SUPPLY ALL MECHANICAL EQUIPMENT WITH ELECTRIC MOTORS AS REQUIRED.</p> <p>THE ELECTRICAL SUBCONTRACTOR SHALL BE RESPONSIBLE TO SUPPLY ALL MOTOR STARTERS AND DISCONNECT SWITCHES FOR ALL MOTORS FOR THE PROJECT. ALL LINE VOLTAGE WIRING TO STARTERS AND STARTERS TO MOTORS EXCEPT ON PREWIRED PACKAGED EQUIPMENT.</p> <p>CONTROLS (FAN SWITCHES) CONNECTED TO MECHANICAL EQUIPMENT SHALL BE SUPPLIED BY THE MECHANICAL TRADE AND SHALL BE INSTALLED, WIRED IN AND CONNECTED BY THE DIVISION 15 TRADES.</p>	<p><b>1.14 RECORD "AS-BUILT" DRAWINGS</b></p> <p>CONTRACTOR TO PROVIDE A SET OF AS BUILT DRAWINGS</p> <p><b>1.15 SHOP DRAWINGS</b></p> <p>SUBMIT A MINIMUM OF FOUR (4) COMPLETE SETS OF DRAWINGS AND DATA SHEETS COVERING ALL ITEMS OF EQUIPMENT FURNISHED AND INTENDED FOR INSTALLATION.</p> <p><b>1.16 STANDARD OF QUALITY</b></p> <p>MAKE AND QUALITY OF MATERIALS USED ARE SUBJECT TO APPROVAL BY THE ENGINEER AND SHALL BE FULLY OPERATIONAL AND ANY DEFICIENCIES SHALL BE IDENTIFIED TO ENGINEER.</p> <p>ALL DEFICIENCIES SHALL BE COMPLETED WITHIN 2 WEEKS AFTER SUBSTANTIAL COMPLETION.</p> <p><b>1.17 SERVICE CLEANUP</b></p> <p>DUCTS AND EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT, CUTTINGS AND OTHER FOREIGN SUBSTANCES. DISCONNECT, CLEAN AND RECONNECT WHENEVER NECESSARY.</p> <p>ALL MECHANICAL (DIVISION 15) MATERIALS TO BE DEMOLISHED SHALL BE REMOVED AND DISPOSED OF OFF-SITE BY THIS DIVISION AND IN ACCORDANCE WITH ALL LOCAL, PROVINCIAL AND FEDERAL ENVIRONMENTAL REGULATIONS.</p> <p><b>1.18 WARRANTY</b></p> <p>THE MECHANICAL SUBCONTRACTOR SHALL GIVE OWNER A WRITTEN GUARANTEE WARRANTING ALL APPARATUS FURNISHED UNDER THE CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF HIS WORK BY THE ARCHITECT AND ENGINEER.</p> <p>ATTEND IMMEDIATELY, AT NO COST TO OWNER, TO ANY AND ALL DEFECTS OCCURRING DURING THE WARRANTY PERIOD.</p> <p><b>1.19 OPERATION AND MAINTENANCE DATA</b></p> <p>PROVIDE THREE SETS OF OPERATING AND MAINTENANCE DATA FOR ALL EQUIPMENT AND SYSTEMS. DATA SHALL BE ASSEMBLED IN BOOK FORM WITH HARD COVER AND INDEX. IDENTIFY FRONT COVER WITH NAME AND LOCATION OF THE PROJECT, CONSULTING ENGINEER AND CONTRACTOR. PRIOR TO SUBSTANTIAL COMPLETION SUBMIT ONE COPY TO ENGINEER FOR APPROVAL.</p> <p><b>1.20 EQUIVALENT MATERIALS</b></p> <p>CONTRACTOR WISHES TO QUOTE ON EQUIVALENT MATERIALS AND EQUIPMENT, HE MUST QUOTE ON PRODUCTS APPROVED BY THE ENGINEER IN WRITING, AS AN EQUIVALENT TO THE PRODUCT SPECIFIED.</p> <p>THIS CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ADDITIONAL WORK OR MATERIALS REQUIRED TO ACCOMMODATE APPROVED EQUIVALENT MATERIALS OR EQUIPMENT.</p> <p><b>2.0 PLUMBING</b></p> <p><b>2.1 PIPE AND FITTINGS</b></p> <p>ALL PLUMBING WORK TO CONFORM TO OBC, ONTARIO WATER REGULATION ACT NO. 615/64, CONSTRUCTION SAFETY ACT AND REGULATIONS OF THE CITY AND LOCAL AUTHORITIES.</p> <p>CONTRACTOR SHALL VERIFY EXISTING PLUMBING AND DRAINAGE INVERTS BEFORE PROCEEDING WITH THE WORK. ALL EXISTING BURIED SERVICE LOCATIONS ON DRAWINGS ARE APPROXIMATE ONLY. REPORT ANY DISCREPANCIES TO THE MECHANICAL ENGINEER IMMEDIATELY.</p> <p>COORDINATE PIPE INSTALLATION WITH ELECTRICAL CONDUITS, DUCTS AND STRUCTURAL MEMBERS. OFFSET PIPE AS REQUIRED. ALL REVISIONS SHALL BE MARKED ON AS-BUILT DRAWINGS.</p> <p>CONTRACTOR TO CARRY OUT IN HIS PRICE A PIPING SYSTEM TEST PRIOR TO INSULATION OR COVERING OF PIPING SYSTEM. PROVIDE TEST REPORT.</p> <p>DRAINAGE AND VENT PIPING ABOVE GRADE SHALL BE DWV COPPER OR CAST IRON WITH MECHANICAL JOINTS OR APPROVED PVC PER CSA AND ULC APPROVED.</p>	<p>ALL BELOW GRADE STORM, SANITARY, DRAINS AND VENT STACKS SHALL BE ABS (DWV) PIPING TO CANCSA-B181 OR ULC APPROVED PVC MATERIAL.</p> <p>ALL PIPING 2"Ø OR SMALLER ABOVE GRADE SHALL BE TYPE "DMV" HARD DRAWN COPPER WITH CAST BRONZE OR WROUGHT COPPER FITTINGS. ALL PIPING 2½"Ø OR LARGER ABOVE GRADE SHALL BE TYPE CAST IRON OR PVC SCHEDULE 40.</p> <p>SANITARY DRAINS 1 1/2-INCH AND SMALLER MAY BE HARD TEMPERED COPPER DRAINAGE TUBE (DWV).</p> <p>DOMESTIC HOT AND COLD WATER PIPING ABOVE GRADE AND INSIDE BUILDING SHALL BE TYPE L HARD COPPER. DO NOT INSTALL HOT AND COLD WATER PIPES IN EXPOSED EXTERIOR WALLS.</p> <p>GAS PIPING SHALL BE CARBON STEEL, SCHEDULE 40, GRADE A, TO ASTM A-53. FITTINGS AND VALVES SHALL BE CGA APPROVED. PAINT ALL OUTSIDE EXPOSED GAS PIPING.</p> <p>GAS PIPING SHALL BE TESTED AND SUPPORTED IN ACCORDANCE WITH B149.1-05, NATURAL GAS AND PROPANE INSTALLATION CODE.</p> <p>GAS SERVICE VALVES SHALL BE LUBRICATED PLUG TYPE WITH SQUARE HEAD AND REMOVABLE OPERATING SPANNER FOR INSIDE AND OUTSIDE SERVICE OR CGA APPROVED BALL VALVES FOR INSIDE SERVICE ONLY.</p> <p>PROVIDE ALL VALVES AS SHOWN ON THE DRAWINGS OR REQUIRED BY B149.1-05, NATURAL GAS AND PROPANE INSTALLATION CODE AND AUTHORITIES HAVING JURISDICTION.</p> <p>PROVIDE PIPE SLEEVES FOR ALL PIPING PASSING THROUGH FLOOR SLAB. PIPE SLEEVES WILL PROJECT 2-INCH ABOVE FINISHED FLOOR LEVEL AND BE CAULKED TO MAKE WATER TIGHT PENETRATION.</p> <p>WHERE DISSIMILAR METALS ARE JOINED OR SUPPORTED, THE PIPING SHALL HAVE NON CONDUCTING TYPE CONNECTIONS OR HANGERS TO PREVENT GALVANIC CORROSION.</p> <p>ALL PIPING PASSING THROUGH FIRE SEPARATIONS TO BE FIRE STOPPED TO MAINTAIN ORIGINAL FIRE RATING.</p> <p>ALL PLUMBING ROUGH-INS SHALL BE INSPECTED BY THE ENGINEER. CONTRACTOR TO INFORM ENGINEER PRIOR TO CONCEALING.</p> <p><b>2.2 PIPE INSULATION</b></p> <p>PROVIDE INSULATION C/W VAPOUR BARRIER TO ALL DOMESTIC HOT AND COLD WATER LINES. PIPE INSULATION SHALL BE 1-INCH THICK, EXCEPT FOR ¾-INCH PIPE SIZES OR LESS, USE 1/2-INCH THICK INSULATION. COVER EXPOSED PIPES WITH PVC JACKETS.</p> <p>FINISH INSULATION NEATLY AT HANGERS, SUPPORTS AND OTHER PROTRUSIONS. INSULATE FITTINGS AND VALVES.</p> <p><b>2.3 CLEANOUTS</b></p> <p>PROVIDE CLEANOUTS WHERE SHOWN AND AT ALL LOCATIONS AS REQUIRED BY THE ONTARIO CODE AND GUIDELINE FOR PLUMBING</p> <p><b>2.4 FLOOR DRAINS</b></p> <p>PROVIDE FLOOR DRAINS WHERE SHOWN ON DRAWINGS.</p> <p>ALL DRAINS 3"Ø AND SMALLER SHALL SLOPE AT MINIMUM 2%. ALL DRAINS 4"Ø AND LARGER SHALL SLOPE AT 1% UNLESS NOTED OTHERWISE.</p> <p>ALL FLOOR DRAINS SHALL BE PRIMED, TRAPPED AND VENTED PER PART 7 OBC UNLESS NOTED OTHERWISE.</p> <p>FD-1: JAY R. SMITH 2005A FLOOR DRAIN, ALL DUCO COATED CAST IRON BODY. REVERSIBLE FLASHING CLAMP WITH SEEPAGE OPENINGS AND ADJUSTABLE 5" DIAMETER NICKEL BRONZE 1/4" THICK STRAINER, SECURED WITH S.S. SCREWS, 4" THROAT ON STRAINER.</p> <p>2.5 TRAP SEAL PRIMER SERVING 1 TO 4 DRAINS</p> <p>P.P.P. INC. MODEL PR-500 AUTOMATIC TRAP SEAL PRIMER VALVE, CAST BRASS BODY, SERVING INDIVIDUAL OR REMOTE AREA</p>	<p>DRAINS (PRIMER AUTOMATICALLY ACTIVATED WHEN THERE IS A PRESSURE DROP IN THE SYSTEM) WITH 1/2" (12.7MM) NPT (MTOF) CONNECTIONS WITH STRAINER AND INTEGRAL BACK FLOW PREVENTER &amp; VACUUM BREAKER.</p> <p><b>2.6 UNIVERSAL ACCESS DOOR FOR WALLS AND CEILINGS</b></p> <p>ACUDOR SERIES UF-5000 ACCESS DOORS, 14 GA. (1.7MM) STEEL, RUST RESISTANT, CONTINUOUS CONCEALED HINGE, WITH POSITIVE AND SELF-OPENING SCREWDRIVER OPERATED LOCK. DOORS IN TILE WALLS SHALL BE STAINLESS STEEL AND SHALL SUIT TILE PATTERN. ALL OTHER PANELS SHALL BE PRIME PAINTED STEEL. MINIMUM SIZE OF PANELS SHALL BE 12" X 18" (300MM X 450MM), WHEREVER POSSIBLE 24" X 24" (600MM X 600MM) PANELS SHALL BE USED.</p> <p><b>3.0 HVAC</b></p> <p><b>3.1 DUCTWORK</b></p> <p>ALL DUCTWORK IS LOW PRESSURE</p> <p>PROVIDE ALL DUCTWORK SHOWN, MAKE ALL NECESSARY CONNECTIONS TO COMPLETE THE SYSTEM</p> <p>ALL NEW DUCTWORK SHALL BE GALVANIZED STEEL FABRICATED AND INSTALLED TO LATEST STANDARDS PUBLISHED IN ASHRAE AND SMACNA</p> <p>DUCTWORK SHALL BE FREE FROM NOISE AND VIBRATION AND WITH ALL NECESSARY REINFORCEMENT BRACKETS AND GASKETING. SEAL ALL CONNECTIONS WITH DUCT SEALANT</p> <p>ALL FLEXIBLE DUCTWORK SHALL BE FLEXIBLE ALUMINUM TYPE MANUFACTURED BY CANADIAN DUCTING LTD OR EQUIVALENT. FLEX DUCT TO RUN A MAXIMUM OF 8 FT</p> <p>WHERE BRANCH DUCTS EXCEED MAXIMUM LENGTH OF FLEXIBLE DUCT, INSTALL REMAINDER IN RIGID DUCT</p> <p>DUCTWORK SHALL BE THERMALLY INSULATED WITH MIN. 1" THICK FIBREGLASS INSULATION AND APPLIED IN FULL ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS WHERE INDICATED. DUCT SIZES SHOWN ARE INSIDE DIMENSIONS TO PROVIDE MINIMUM FREE AREA</p> <p>PROVIDE 1" THICK ACOUSTIC INSULATION IN SUPPLY AND RETURN MAINS AT LEAST 10' FROM AIR HANDLING UNITS</p> <p>NOTE THAT DUCT, GRILLE OR LOUVRE DIMENSIONS ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. WHERE ACOUSTIC LINING IS REQUIRED INCREASE DIMENSIONS ACCORDINGLY. SEAL ALL JOINTS IN SUPPLY DUCTWORK.</p> <p>THE MINIMUM SHEET METAL THICKNESS FOR DUCTS SHALL BE AS FOLLOWS:</p> <table border="1"> <tr> <td>RECTANGULAR DUCTS</td> <td>MAXIMUM WIDTH</td> <td>GAUGE</td> </tr> <tr> <td></td> <td>UP TO 12-INCH</td> <td>26</td> </tr> <tr> <td></td> <td>12 TO 30-INCH</td> <td>24</td> </tr> <tr> <td></td> <td>31 TO 55-INCH</td> <td>22</td> </tr> </table> <p>ROUND DUCTWORK SHALL BE SUSPENDED BY BAND IRON HANGERS.</p> <p>RECTANGULAR DUCTWORK SHALL BE SUPPORTED AT MAXIMUM 8-FT SPACING.</p> <p>ALL FLEX DUCT CONNECTIONS SHALL BE ULC LISTED, MAXIMUM 8'-0" LONG.</p> <p>ALL DUCTS ASSOCIATED WITH FANS AND OTHER MACHINERY SHALL BE INSTALLED WITH CANVAS FLEXIBLE CONNECTIONS ON INLET AND OUTLET OPENINGS.</p> <p>ALL FANS AND AIR HANDLING UNITS SHALL BE MOUNTED WITH VIBRATION ISOLATORS.</p> <p><b>3.2 DAMPERS AND MOTORIZED DAMPERS</b></p> <p>PROVIDE AND INSTALL VOLUME DAMPERS FROM NAILOR</p> <p>ALL MOTORIZED DAMPERS TO BE SUPPLIED FROM VENTEX C/W BELIMO ACTUATORS</p>	RECTANGULAR DUCTS	MAXIMUM WIDTH	GAUGE		UP TO 12-INCH	26		12 TO 30-INCH	24		31 TO 55-INCH	22	<p>PROVIDE MULTI-BLADE OPPOSED BLADE BALANCING DAMPERS WHERE SHOWN.</p> <p>PROVIDE BALANCING DAMPERS, MANUALLY OPERATED OPPOSED BLADE TYPE, OR BUTTERFLY BLADE TYPE, FABRICATED FROM GALVANIZED STEEL SHEET WHERE INDICATED ON DRAWINGS AND AS REQUIRED TO ALLOW FOR SYSTEM BALANCING.</p> <p>PROVIDE FIRE DAMPERS OF HINGED, FUSIBLE LINK TYPE WITH CHANNEL FRAMES, BLADES AND HOUSING, ULC LABELED AND CONFORMING TO ANSINFFPA 90A-1996. FURNISH "TYPE B" FIRE DAMPERS FOR RECTANGULAR OR SQUARE DUCTWORK AND "TYPE C" FIRE DAMPERS FOR ROUND DUCTWORK. FIRE DAMPERS SHALL BE RATED FOR DYNAMIC OPERATION. PROVIDE WHERE INDICATED ON DRAWINGS.</p> <p>PROVIDE ACCESS DOORS IN DUCTWORK AND FOR PLENUMS TO ALLOW SERVICING, MAINTENANCE, AND INSPECTION OF CONTROL DAMPERS, FIRE DETECTORS, BOTH SIDES OF FIRE DAMPERS, CONTROL ELEMENTS, BEARINGS AND AS INDICATED ON DRAWINGS. FURNISH ACCESS DOORS AT LEAST 300 MM X 150 MM (12" X 6") UNLESS DUCT DIMENSIONS PREVENT.</p> <p><b>3.3 AIR OUTLETS</b></p> <p>PROVIDE ALL AIR OUTLETS COMPLETE WITH ACCESSORIES AS SPECIFIED HEREIN AND INDICATED ON THE DRAWINGS. COORDINATE LOCATIONS OF ALL AIR OUTLETS WITH LIGHTING AND CEILING GRID. THE POSITIONS INDICATED ARE APPROXIMATE ONLY. THIS CONTRACTOR SHALL CHECK THE LOCATION OF ALL OUTLETS AND SHALL MAKE SUCH ADJUSTMENTS IN POSITION AS NECESSARY TO CONFORM WITH ARCHITECTURAL FEATURES AT NO EXTRA COST TO OWNER.</p> <p>PROVIDE BALANCING DAMPERS NEAR EACH SUPPLY AIR OUTLET. SIZES AND AIR VOLUME AS SCHEDULED.</p> <p><b>3.4 AIR SYSTEM TESTING, BALANCING AND COMMISSIONING</b></p> <p>BALANCE SYSTEM FOR RATED AIR FLOW, ROOM TEMPERATURE CONTROL AND CURRENT DRAW AFTER INSTALLATION IS COMPLETE AND IN FULL WORKING ORDER. ADJUST CONTROL FOR CONTINUOUS AIR CIRCULATION AND MINIMUM ENERGY CONSUMPTION. ADJUST FAN SPEED AS REQUIRED TO OBTAIN SPECIFIC PERFORMANCES. CONTRACTOR TO BALANCE SYSTEM FOR OUTSIDE AIR AS GIVEN IN UNIT PERFORMANCE.</p> <p>COMMISSION ENTIRE MECHANICAL SYSTEM INCLUDE START UP REPORT IN MAINTENANCE MANUAL</p> <p>THE BALANCING CONTRACTOR SHALL MAKE NECESSARY ADJUSTMENTS, REPLACE MOTOR AND FAN SHEAVES AND BELTS UPON BALANCING OF EXISTING AND NEW AIR SYSTEMS.</p> <p><b>3.5 CONTROLS</b></p> <p>PROVIDE SYSTEM COMPONENTS CONSISTING OF THERMOSTATS, CONTROL VALVES, DAMPERS, OPERATORS, INDICATING DEVICES, INTERFACE EQUIPMENT AS REQUIRED TO OPERATE MECHANICAL SYSTEM AND TO PERFORM FUNCTIONS SPECIFIED.</p> <p>RELIEF DAMPERS TO BE ELECTRIC OR DDC.</p> <p>PROVIDE TEMPERATURE SENSORS WHERE SHOWN ON THE DRAWINGS.</p> <p>INSTALL MOTOR DAMPERS ON OUTSIDE OF DUCTS NOT IN AIRSTREAM.</p> <p>VERIFY LOCATION OF ALL THERMOSTATS AND SENSORS BEFORE INSTALLATION. LOCATE THERMOSTAT AT 47-INCHES AFF.</p> <p>DIVISION 15 TO PROVIDE ALL CONTROL COMPONENTS AND LOW VOLTAGE WIRING TO ENSURE A COMPLETE AND OPERATIONAL SYSTEM.</p> <p>ALL BOILERS, DHW, MAKEUP AIR UNITS TO BE PROVIDED WITH PACKAGED SMART CONTROLLERS.</p> <p>BOILER CONTROLLER TO BE INTERLOCKED WITH OUTDOOR TEMPERATURE SCHEDULE.</p> <p>MUA SUPPLY AIR TEMP TO BE 65F IN SUMMER AND 70F IN WINTER</p>
RECTANGULAR DUCTS	MAXIMUM WIDTH	GAUGE															
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CRU-3**

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