



## OVERALL KEY PLAN

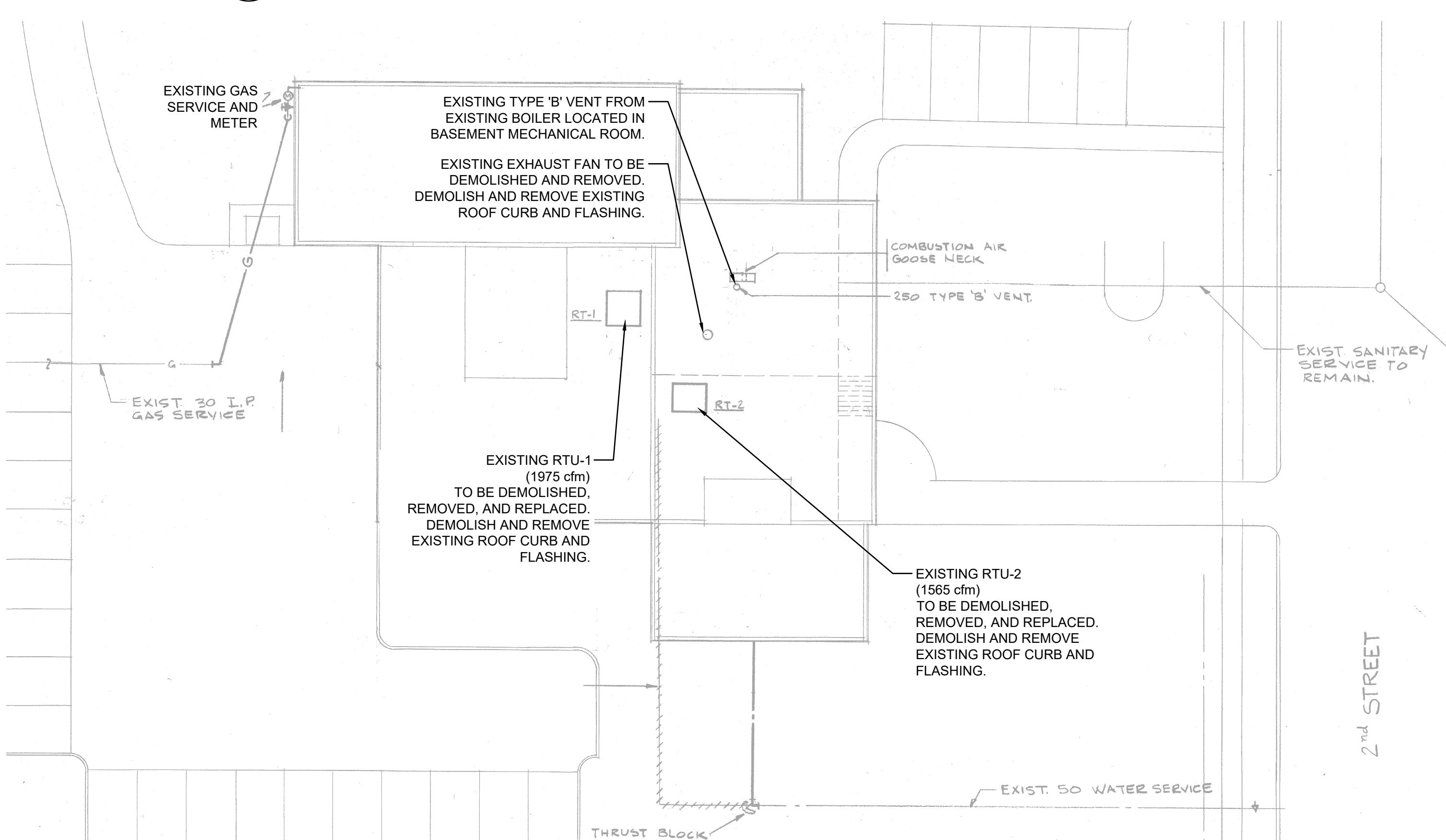
M0.0

SCALE: N.T.S.

MECHANICAL DRAWING LIST	
DWG. NO	TITLE
M0.0	MECHANICAL KEY PLAN, LEGEND & GENERAL NOTES
M1.0	PLUMBING FOUNDATION PLANS
M1.1	PLUMBING DEMO AND RENO PLANS
M2.0	HVAC DEMO AND RENO PLANS
M3.0	MECHANICAL DETAILS & SCHEDULES
M4.0	MECHANICAL SCHEDULES
M5.0	MECHANICAL SPECIFICATIONS

GAS LOAD TABLE		
UNIT NUMBER	DESCRIPTION	MBH
RTU-1	NEW RTU SERVING DAYCARE SPACES	240
RTU-2	NEW RTU SERVING DAYCARE AND MISC. SPACES	240
TOTAL		480

CONTRACTOR TO VERIFY EXISTING GAS METER CAPACITY AND REPORT BACK TO ENGINEER TO VERIFY CAPACITY.



## MECHANICAL ROOF AND SITE PLAN

M0.0

SCALE: N.T.S.

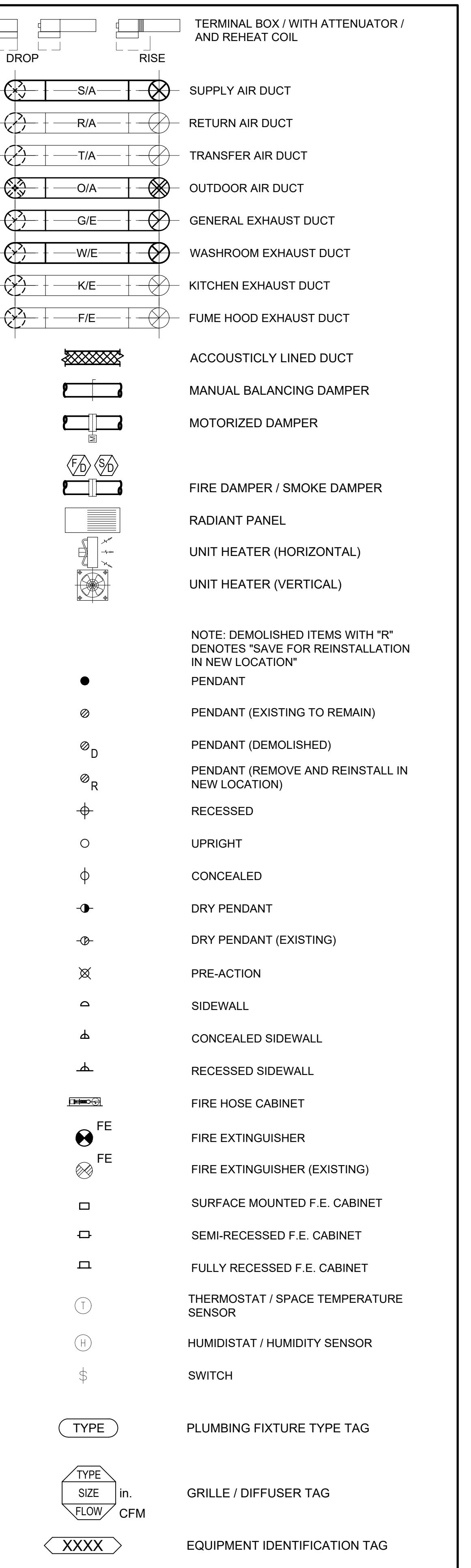
PLUMBING GENERAL NOTES:	
1. PIPE ROUTING IS SHOWN DIAGRAMMATICALLY AND INDICATES DESIGN INTENT. CONFIRM EXACT ROUTING AND CO-ORDINATE WITH DUCTWORK, PIPING, HANGERS, EQUIPMENT, ELECTRICAL AND STRUCTURE ON SITE. PROVIDE OFFSETS AND ADJUST ROUTING AS REQUIRED.	
2. CONTRACTOR TO PROVIDE APPROPRIATE FIRE CLOSURE (CAULKING, FIRE DONUT) AS APPROVED BY LOCAL AUTHORITIES FOR ALL PIPING PASSING THROUGH FIRE RATED ASSEMBLY. RATING OF FIRE CLOSURE TO MATCH RATING OF FIRE RATED ASSEMBLY THROUGH WHICH IT PASSES.	
3. CONTRACTOR TO INSTALL ALL DRAINS AND VENTS AS PER LOCAL AND NATIONAL BUILDING CODES.	
4. VENT ALL FIXTURES IN ACCORDANCE WITH THE NATIONAL PLUMBING CODE.	
5. ALL PLUMBING FIXTURES TO BE CONNECTED USING BRAIDED HOSE AND SHUT-OFF VALVES. INCLUDE ACCESS PANELS TO BE COORDINATED WITH ARCHITECT.	
6. CONTRACTOR TO INSTALL TRAP PRIMERS ON ALL SANITARY FLOOR DRAINS.	
7. PROVIDE WATER HAMMER ARRESTOR AT ALL QUICK CLOSING VALVES.	
8. PROVIDE A COLD WATER LINE TO EACH SUITE FRIDGE FROM THE NEAREST COLD WATER.	

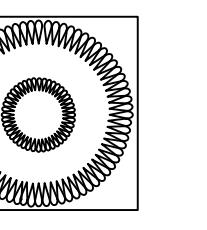
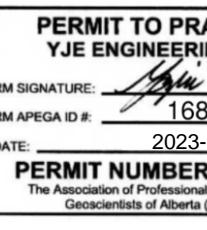
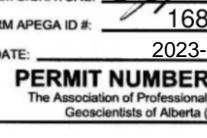
  

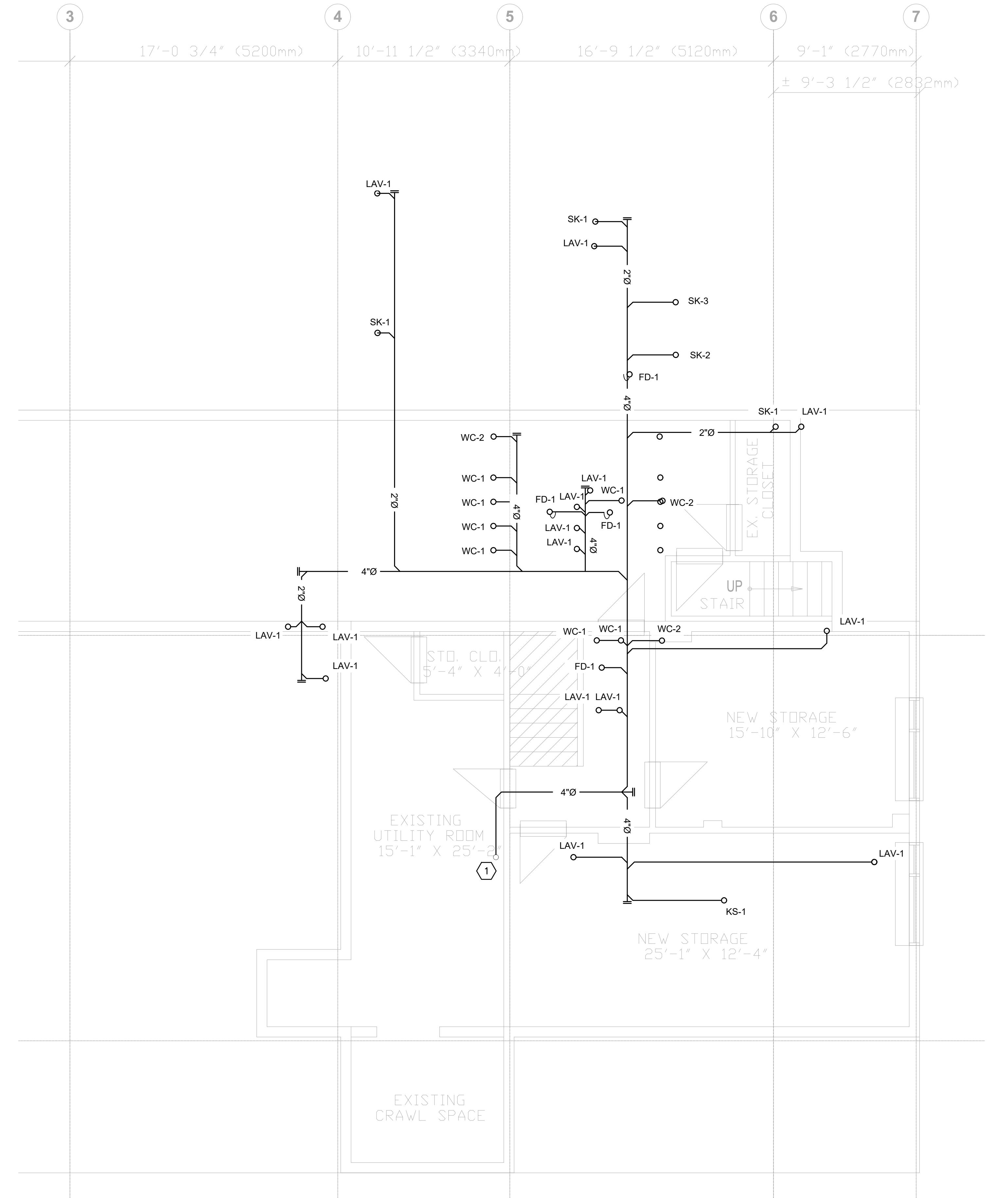
FIRE PROTECTION GENERAL NOTES:	
1. FIRE EXTINGUISHERS SHALL BE PROVIDED AND INSTALLED PER NFPA 10 REQUIREMENTS.	

DUCTWORK GENERAL NOTES:	
1. DUCT ROUTING INDICATES DESIGN INTENT. CONFIRM EXACT ROUTING AND CO-ORDINATE WITH DUCTWORK, PIPING, EQUIPMENT, ELECTRICAL AND STRUCTURE ON SITE. PROVIDE OFFSETS AND ADJUST ROUTING AS REQUIRED.	
2. DUCTWORK SIZES INDICATE CLEAR INSIDE DIMENSIONS.	
3. BALANCE ALL GRILLES AND DIFFUSERS IN PROJECT AREA TO VOLUMES INDICATED.	
4. INSTALL INTAKE & RETURN GRILLES A MIN OF 3.0M APART.	
5. CONTRACTOR TO PROVIDE APPROPRIATE FIRE DAMPER AS APPROVED FOR ALL VENT OR DUCT PASSING THROUGH FIRE RATED ASSEMBLY. RATING OF FIRE CLOSURE TO MATCH RATING OF FIRE RATED ASSEMBLY THROUGH WHICH IT PASSES.	
6. PROVIDE BALANCING DAMPER AND BALANCE ALL GRILLES, DIFFUSERS, SUPPLY AIR OPENINGS IN PROJECT AREA TO VOLUMES INDICATED.	
7. CONTRACTOR TO PROVIDE APPROPRIATE FIRE DAMPERS AS APPROVED BY LOCAL AUTHORITIES FOR ALL DUCTWORK PASSING THROUGH FIRE RATED ASSEMBLY. RATING OF FIRE DAMPER TO MATCH RATING OF FIRE RATED ASSEMBLY THROUGH WHICH IT PASSES.	

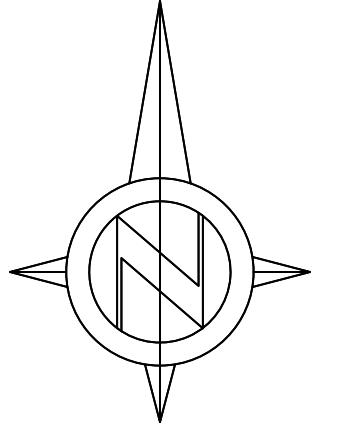
LEGEND	
DCW	EXISTING DOMESTIC COLD WATER
DHW	EXISTING DOMESTIC HOT WATER
DHWR	EXISTING DOMESTIC HOT WATER RECIRC.
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
SAN	SANITARY DRAINAGE
SAN	SANITARY DRAINAGE (BELOW)
V	SANITARY VENT
STW	STORM WATER DRAINAGE
STW	STORM WATER DRAINAGE (BELOW)
G	NATURAL GAS - LOW PRESSURE
GATE VALVE	GATE VALVE
TWO-WAY CONTROL VALVE	TWO-WAY CONTROL VALVE
PRV	PRESSURE REDUCING VALVE
90 DEGREE ELBOW	90 DEGREE ELBOW
45 DEGREE ELBOW	45 DEGREE ELBOW
ELBOW UP	ELBOW UP
ELBOW DOWN	ELBOW DOWN
PIPE CAP	PIPE CAP
TEE	TEE
TEE UP	TEE UP
TEE DOWN	TEE DOWN
BOTTOM BRANCH	BOTTOM BRANCH
TOP BRANCH	TOP BRANCH
GAS METER	GAS METER
WATER METER	WATER METER
HEAT TRACE (INSULATED)	HEAT TRACE (INSULATED)
HEAT TRACE (NON-INSULATED)	HEAT TRACE (NON-INSULATED)
PIPEWORK SHORTENED FOR CLARITY	PIPEWORK SHORTENED FOR CLARITY
PIPE FLOW ARROW (SMALL)	PIPE FLOW ARROW (SMALL)
PIPE FLOW ARROW (LARGE)	PIPE FLOW ARROW (LARGE)
FUNNEL FLOOR DRAIN	FUNNEL FLOOR DRAIN
SQUARE FLOOR DRAIN	SQUARE FLOOR DRAIN
FLOOR DRAIN / WITH TRAP	FLOOR DRAIN / WITH TRAP
HUB DRAIN / WITH TRAP	HUB DRAIN / WITH TRAP
ROOF DRAIN	ROOF DRAIN
CLEAN OUT PLUG	CLEAN OUT PLUG
CLEAN OUT FLOOR	CLEAN OUT FLOOR
P-TRAP / SINK TRAP / P-TRAP BELOW GRADE	P-TRAP / SINK TRAP / P-TRAP BELOW GRADE
HOT / DRAIN / COLD CONNECTIONS	HOT / DRAIN / COLD CONNECTIONS
RADIATION EQUIPMENT TAG	RADIATION EQUIPMENT TAG



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Mechanical & Electrical:	
 <p>YJE ENGINEERING YJE Engineering Ltd. #405 - 1331 MacLeod Tr S.E. Calgary, Alberta T2G 1E1 Ph: (587) 435-1622 yjeeng.com</p>	
Project:	
PROPOSED <b>CHILD CARE TENANCY</b> 710 2ND STREET STRATHMORE, AB	
LEGAL DESCRIPTION: LOT 3, BLOCK 29, PLAN 5276 AV	
Revisions: 2023-04-24 ISSUED FOR BP 2023-05-16 ISSUED FOR BP	
Drawing Title:	
<b>MECHANICAL COVER PAGE</b>	
JOB No. 23-003 DATE: MARCH 17, 2023 DRAWN: AC	
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<b>M0.0</b>	



PLUMBING FOUNDATION PLAN  
M1.0  
SCALE: 1/8" = 1'-0"



DRAWING KEY NOTES:  
 1) TIE-IN NEW SANITARY LINE INTO EXISTING MAIN SANITARY STACK. COORDINATE EXACT LOCATION ON SITE.

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Project:

## PROPOSED CHILD CARE TENANCY

710 2ND STREET  
STRATHMORE, AB

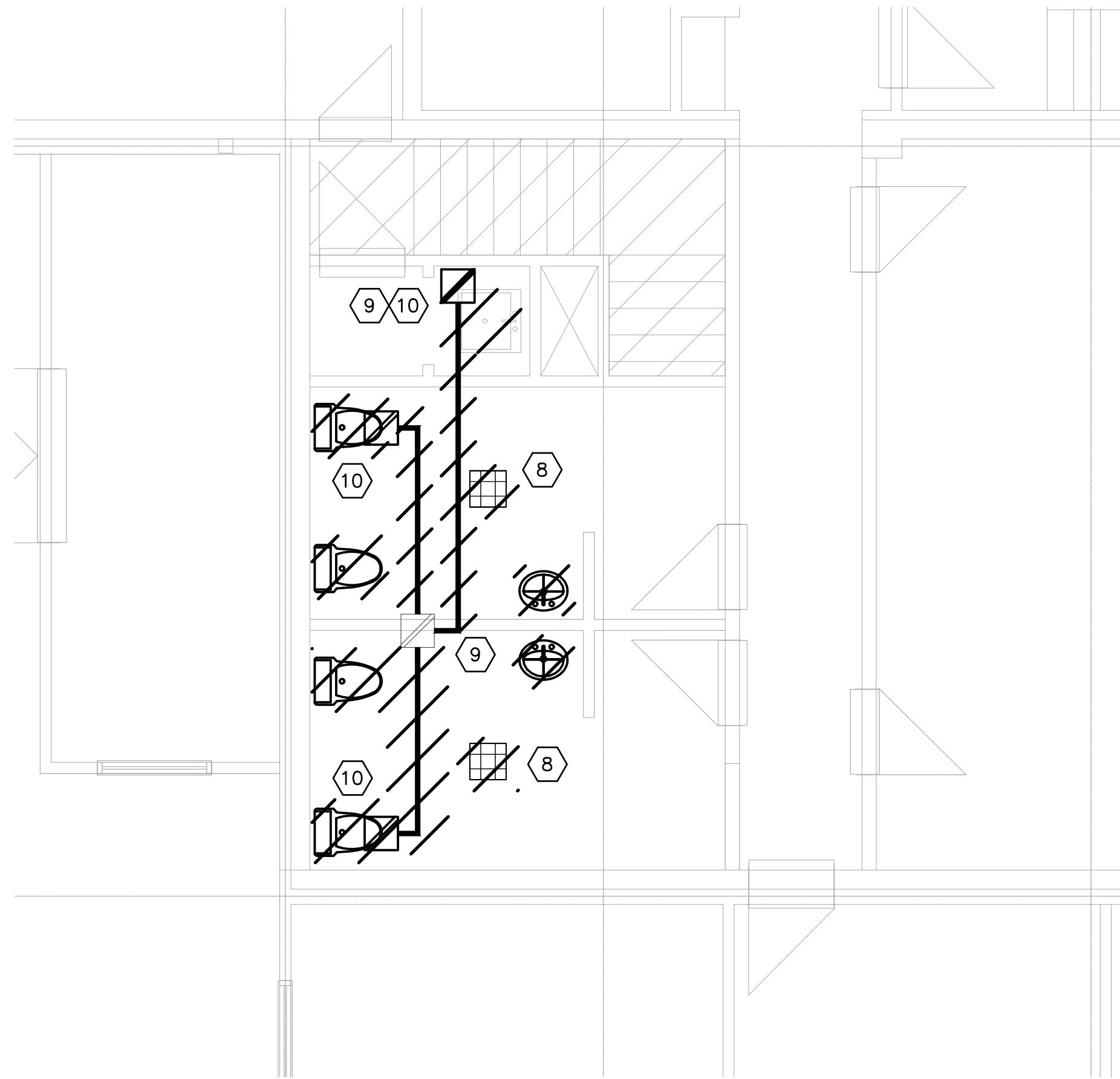
LEGAL DESCRIPTION: LOT 3, BLOCK 29, PLAN 5276 AV

Revisions:  
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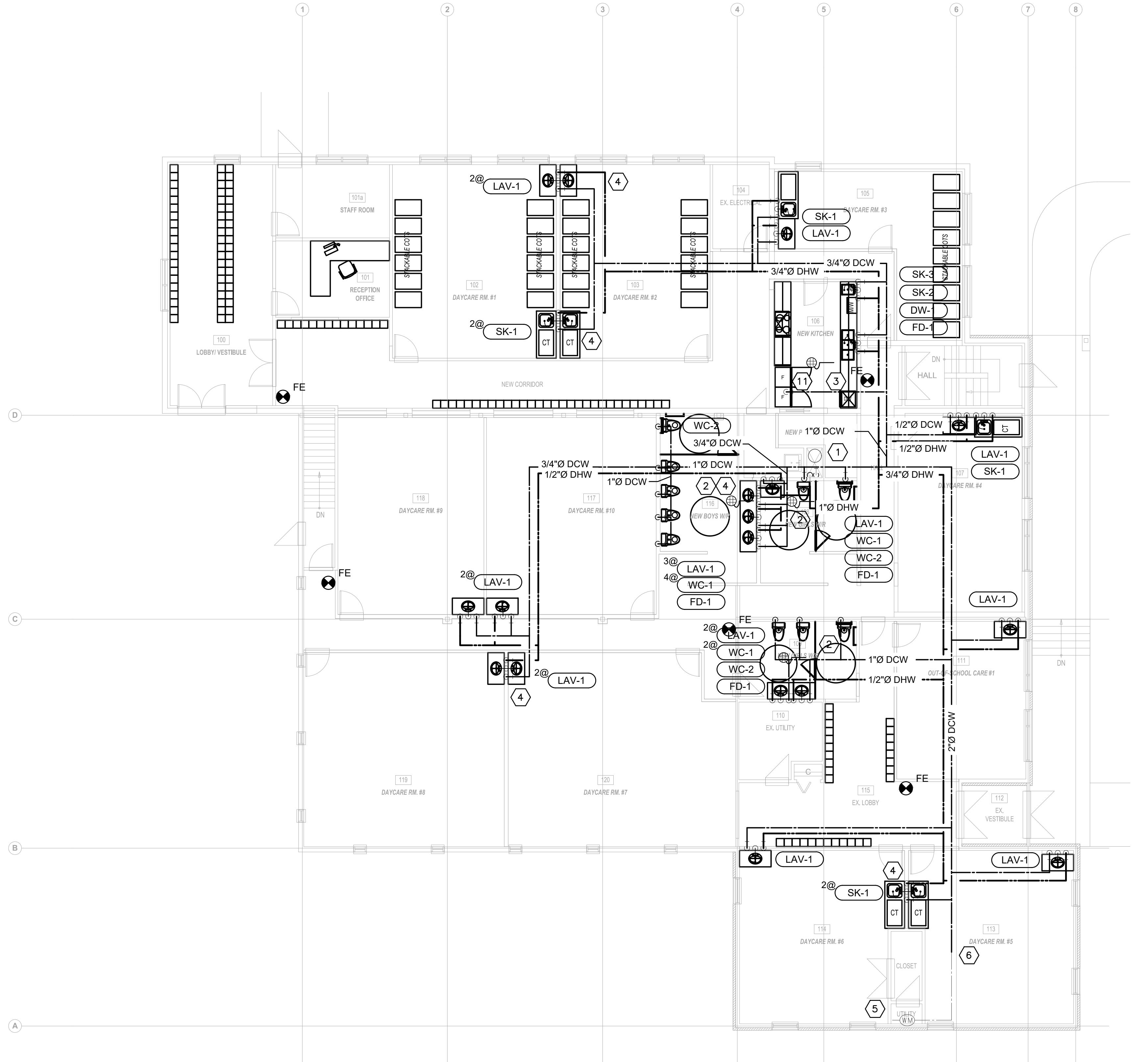
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**PLUMBING  
FOUNDATION PLAN**

JOB No. 23-003  
 DATE: MARCH 17, 2023  
 DRAWN: AC

**M1.0**



1  
M1.1 WASHROOM DEMO DETAIL  
SCALE: 1/4" = 1'-0"



3  
M1.1 PLUMBING RENOVATION PLAN  
SCALE: 1/8" = 1'-0"

## PROPOSED CHILD CARE TENANCY

710 2ND STREET  
STRATHMORE, AB

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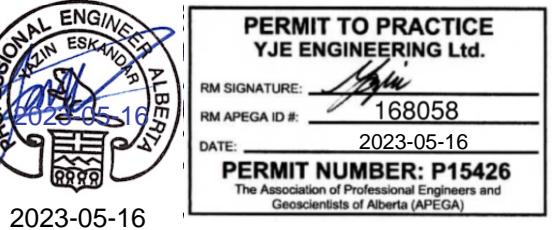
Revisions:  
2023-04-24 ISSUED FOR BP  
2023-05-16 ISSUED FOR BP

Drawing Title:  
**PLUMBING DEMO AND  
RENOVATION PLANS**

JOB No. 23-003  
DATE: MARCH 17, 2023  
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**M1.1**

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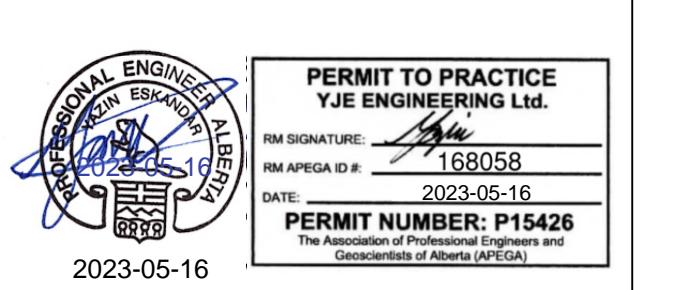
  
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Revisions:  
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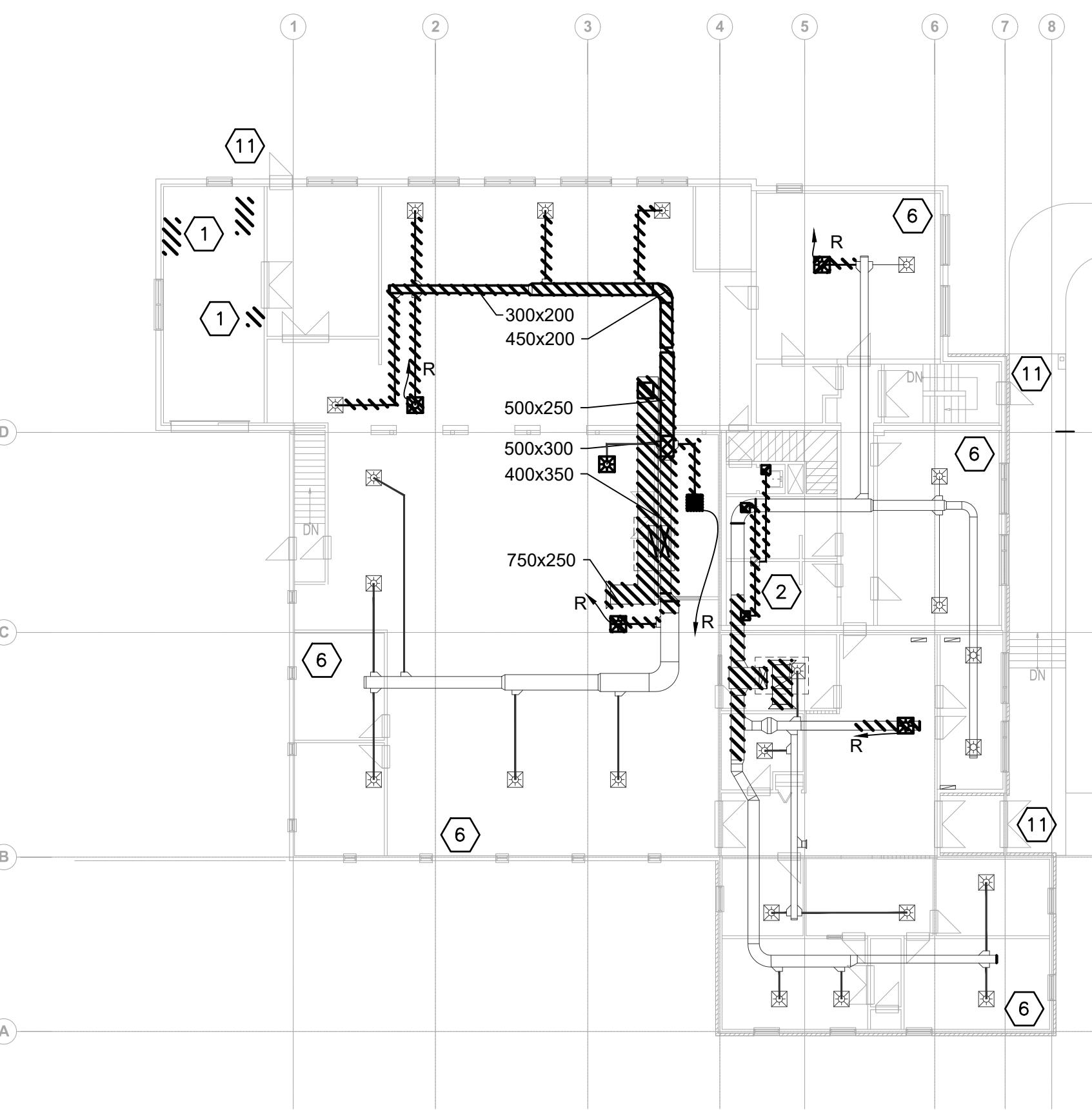
Drawing Title:

### HVAC DEMO AND RENOVATION PLANS

JOB No. 23-003  
DATE: MARCH 17, 2023  
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M2.0

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1 HVAC DEMOLITION PLAN

M2.0

SCALE: 1/16" = 1'-0"

DRAWING KEY NOTES:

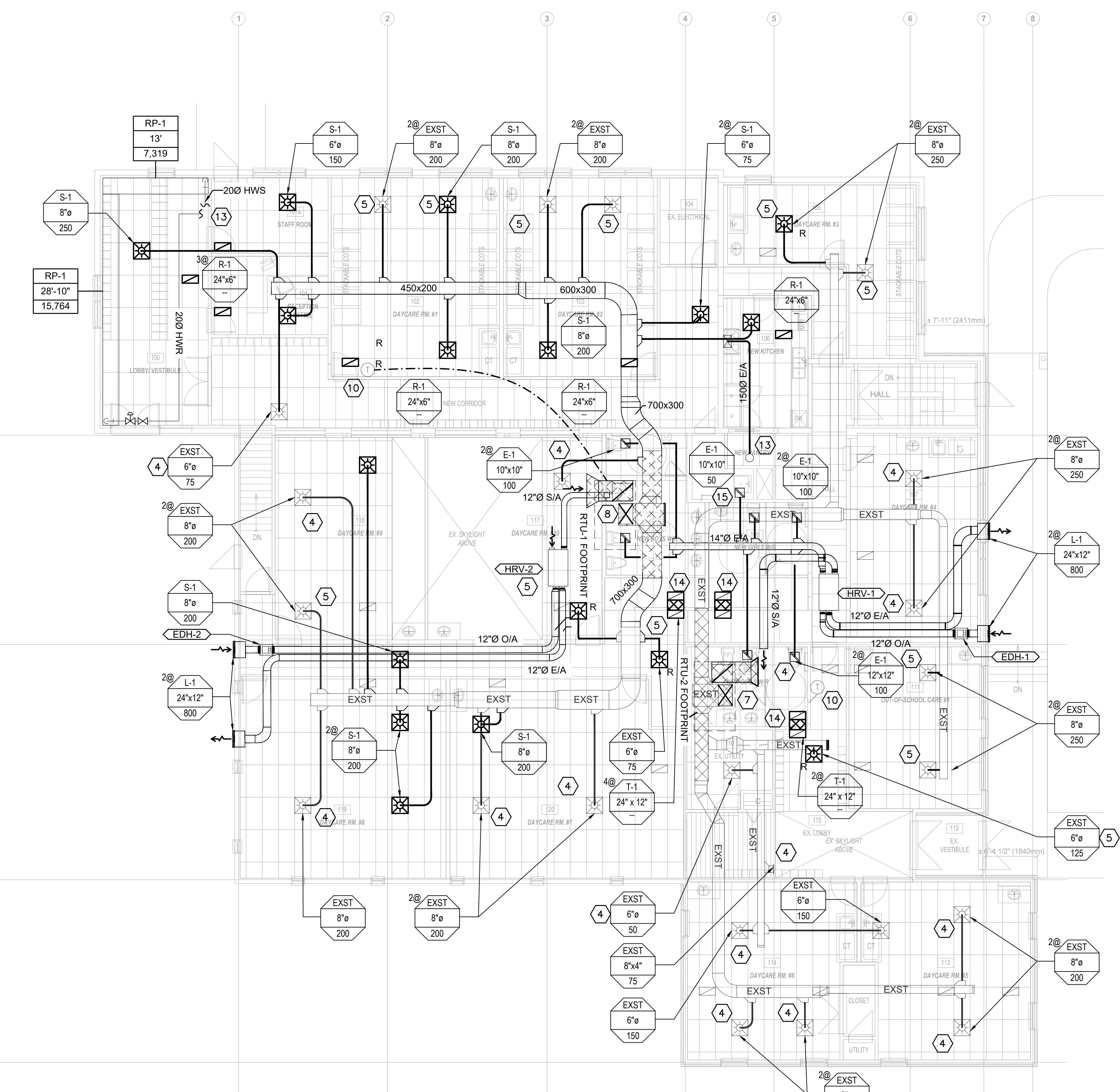
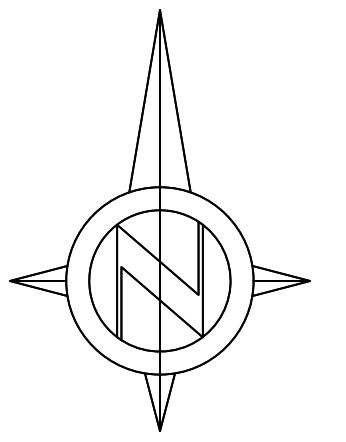
- DEMOLISH AND REMOVE EXISTING EXHAUST FAN E-2 AND ASSOCIATED DUCTWORK AND CO DETECTOR. DEMOLISH AND REMOVE EXISTING UNIT HEATER UH-1. CUT AND CAP HWS/HVR PIPING BACK TO CEILING.
- EXISTING WASHROOM EXHAUST SYSTEM TO BE DEMOLISHED AND REMOVED INCLUSIVE OF GRILLES, DUCTWORK, AND ROOFTOP FAN.
- EXISTING THERMOSTAT TO REMAIN AS IS WHERE IS.
- EXISTING DIFFUSER TO REMAIN WHERE IS. REBALANCE PER TAG.
- EXISTING FORCE FLOW UNIT AND ASSOCIATED THERMOSTAT TO REMAIN AS IS WHERE IS.
- EXISTING PERIMETER BASEBOARD HEATING SYSTEM TO REMAIN IN PLACE THROUGHOUT BUILDING.

DRAWING KEY NOTES (CONT'D):

- PROVIDE 36" x 18" BELLMOUTH OPENING FOR RETURN AIR. ROUTE HRV-1 SIA NEAR TO OPENING AND BALANCE TO 600 CFM.
- PROVIDE 48" x 18" BELL MOUTH OPENING FOR RETURN AIR. CONNECT HRV-1 SIA DIRECTLY INTO RTU RETURN DUCTWORK AND BALANCE TO 900 CFM.
- PROVIDE TRANSFER AIR GRILLES CONNECTED WITH ACOUSTICALLY LINED ELBOWS FOR WASHROOMS.
- PROVIDE FIRE DAMPER IN DUCTS PENETRATING THROUGH FIRE RATED WALLS.

DRAWING KEY NOTES (CONT'D):

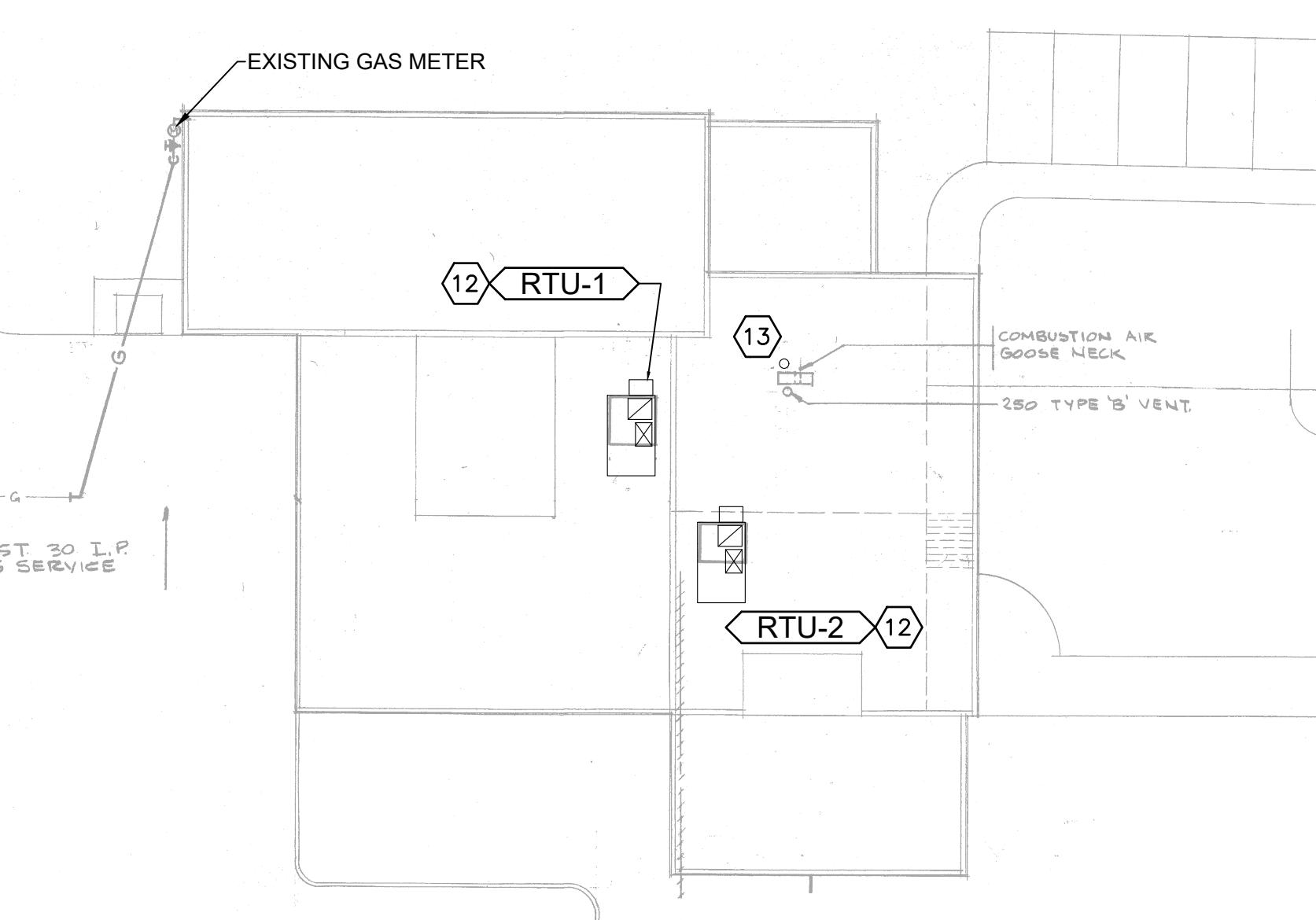
- PROVIDE NEW 6" Ø EA DUCT FROM STOVE TOP HOOD. RUN OVER TO EXISTING SHAFT AS INDICATED AND UP TO ROOF. TERMINATE ON ROOF WITH GOOSENECK AND PROVIDE BIRD SCREEN.
- PROVIDE NEW GAS CONNECTIONS TO ROOF TOP UNITS FROM EXISTING GAS LINES ON ROOF. INSTALL PER DETAIL.



3 HVAC RENOVATION PLAN

M2.0

SCALE: 1/8" = 1'-0"



2 MECHANICAL ROOF PLAN

M2.0

SCALE: N.T.S.

23-003

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Calgary, Alberta T2H 0G4  
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**PROPOSED CHILD CARE TENANCY**  
710 2ND STREET STRATHMORE, AB

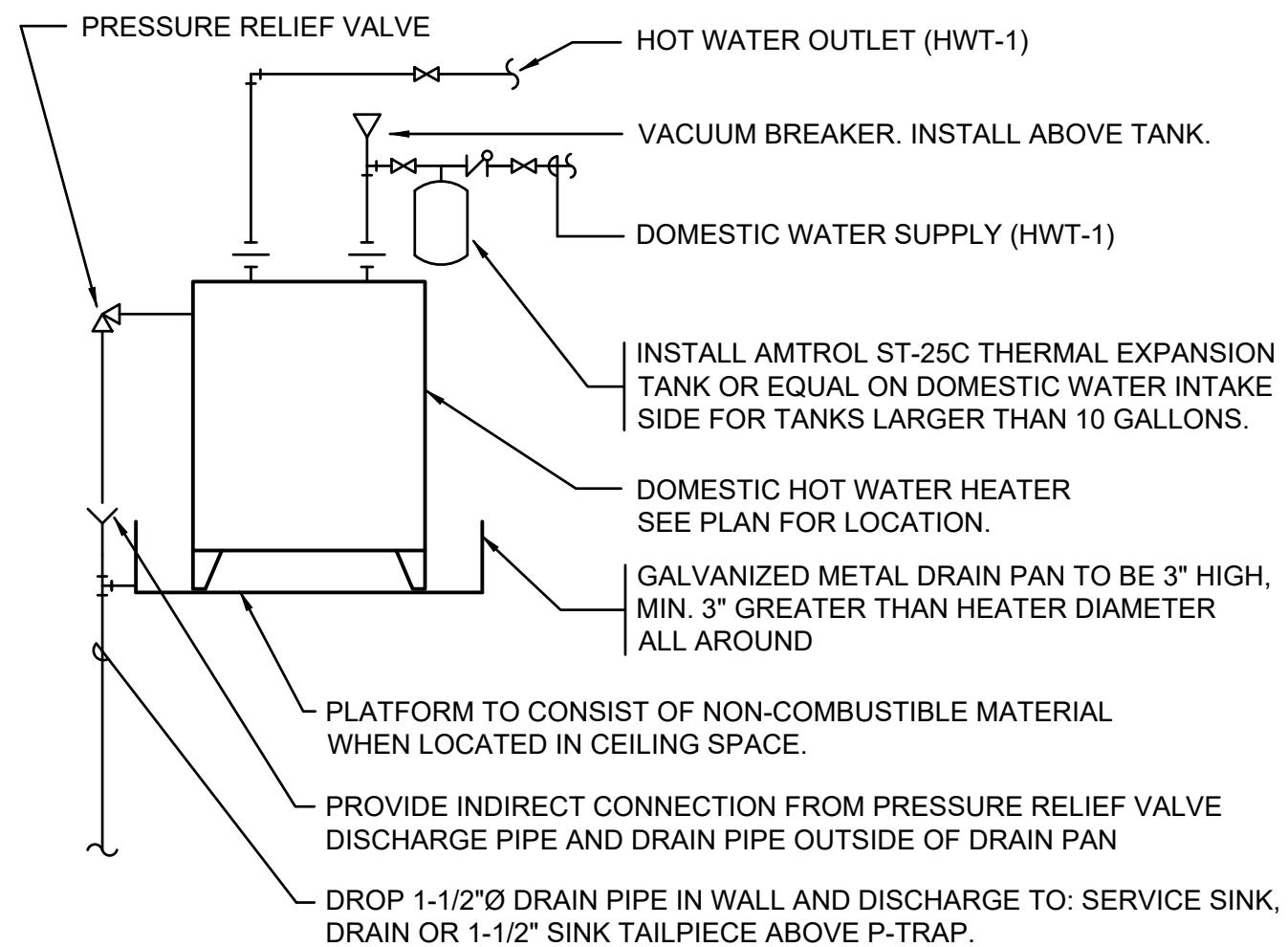
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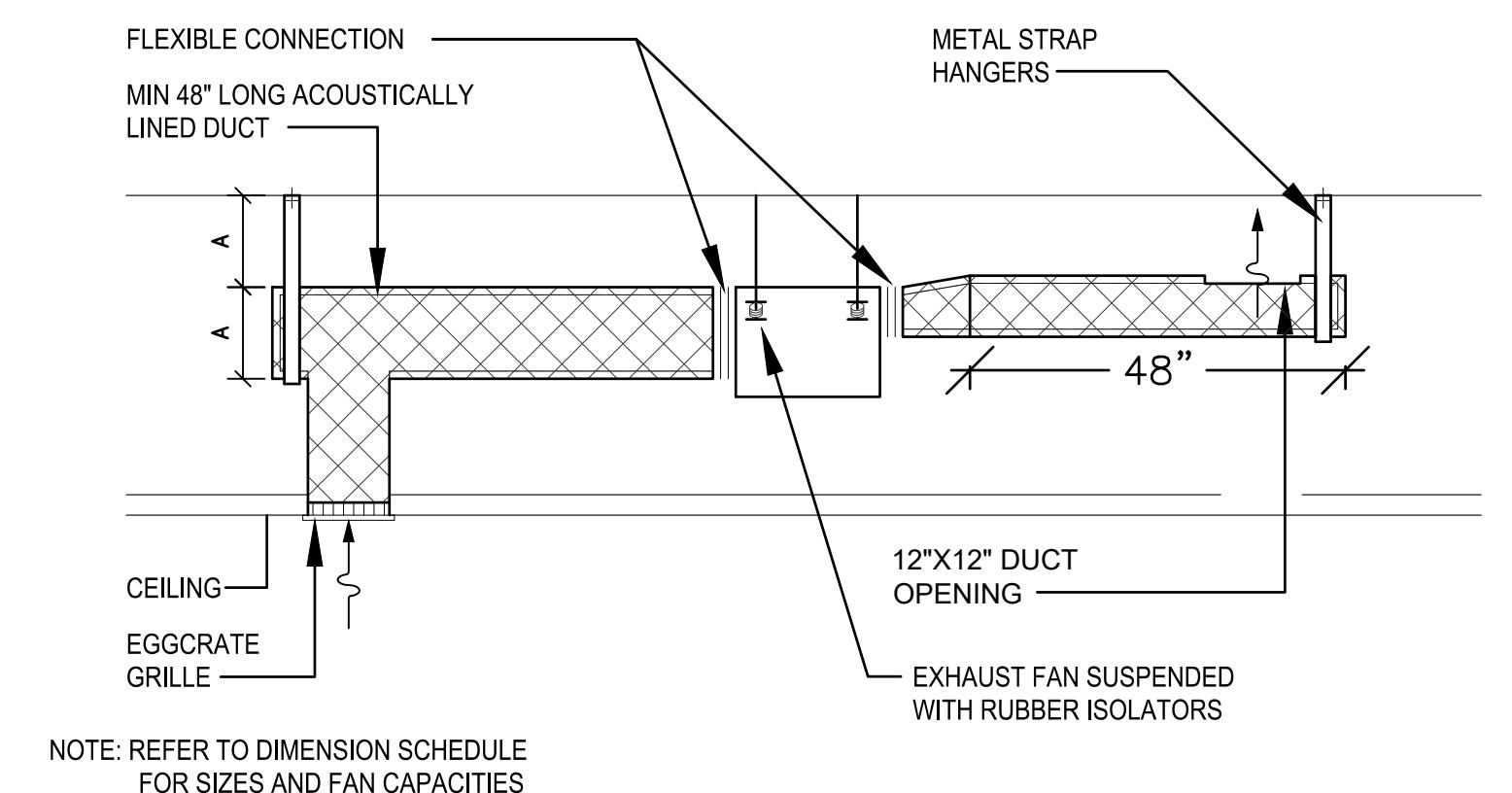
Drawing Title:  
**MECHANICAL DETAILS AND SCHEMATICS**

JOB No.: 23-003  
DATE: MARCH 17, 2023  
DRAWN: AC

**M3.0**

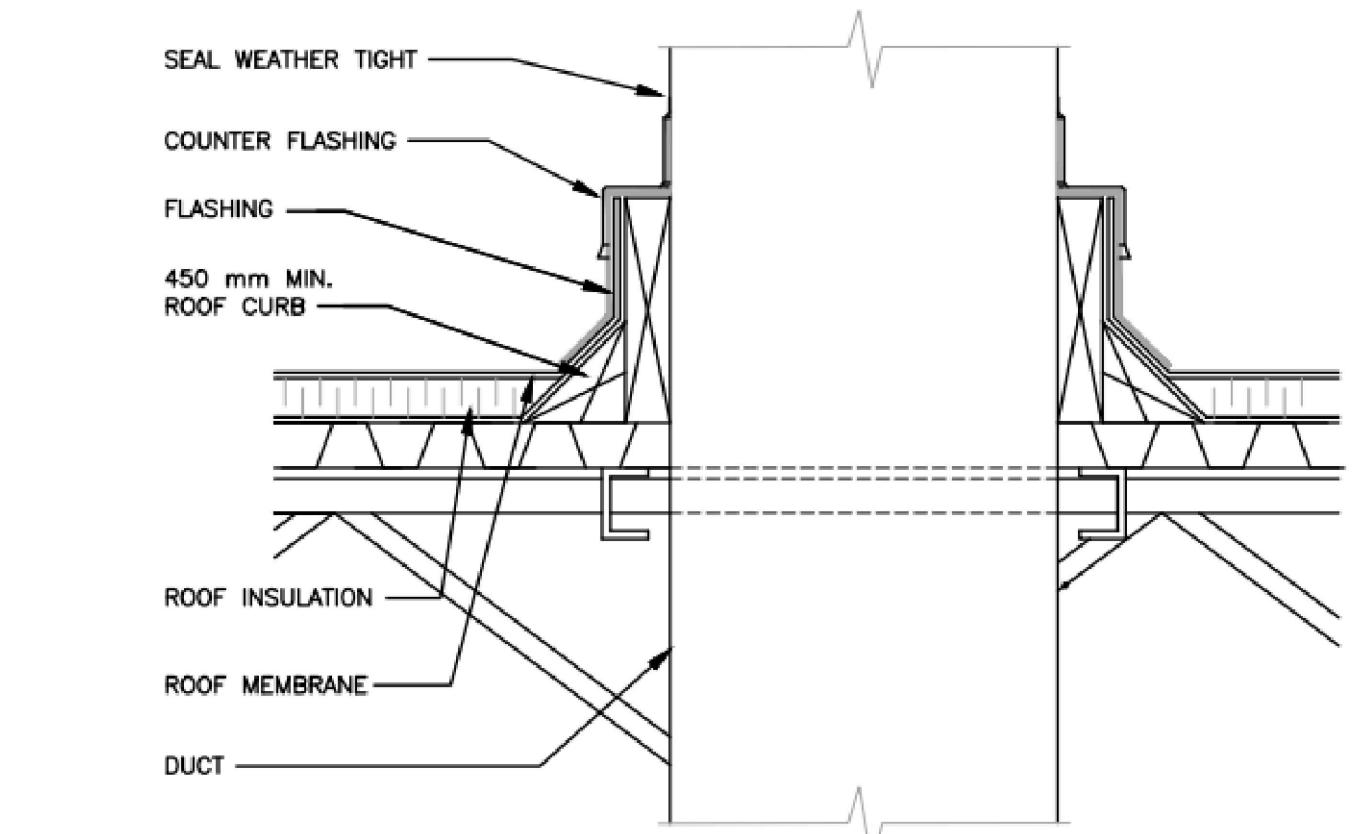


**DOMESTIC WATER TANK SUPPORT DETAIL**  
M3.0  
SCALE: N.T.S.

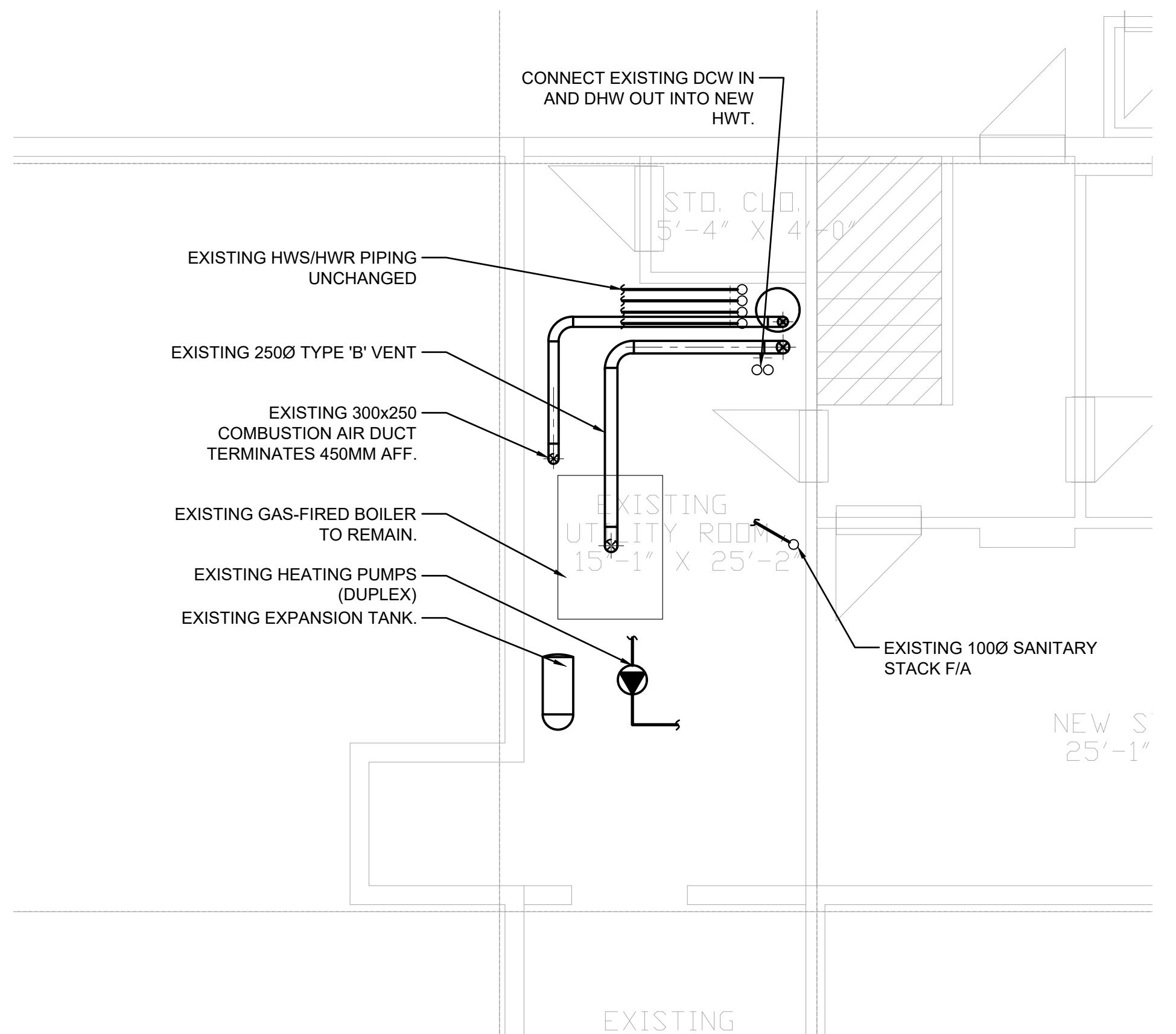


**INLINE HRV DETAIL**  
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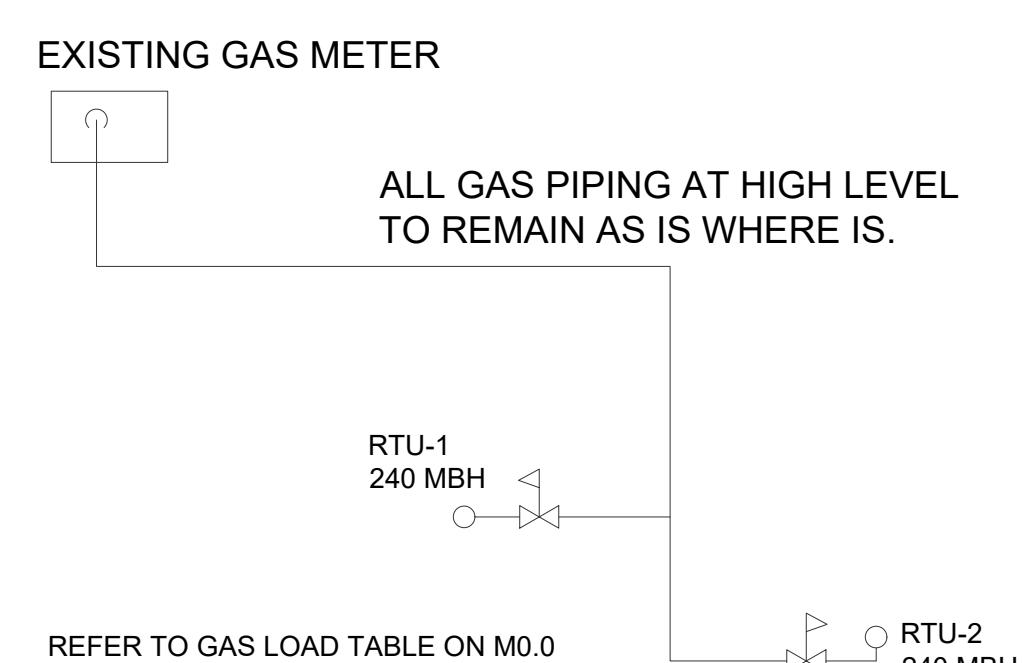
**GAS-FIRED EQUIPMENT PIPING SCHEMATIC**  
M3.0  
SCALE: N.T.S.



**DUCT THROUGH ROOF DETAIL**  
M3.0  
SCALE: N.T.S.



**BASEMENT MECHANICAL ROOM DETAIL**  
M3.0  
SCALE: 1/4" = 1-0'





## 1. GENERAL PROVISIONS

- 1.1. PERMITS AND FEES: APPLY FOR, OBTAIN AND PAY FOR ALL REQUIRED PERMITS, LICENSES, INSPECTIONS AND NEW UTILITY CONNECTION APPLICATIONS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION, INCLUDE ALL TAXES.
- 1.2. CODES: CONFORM TO REQUIREMENTS OF THE LATEST ALBERTA BUILDING CODE AND ALL OTHER AUTHORITIES HAVING JURISDICTION.
- 1.3. ALL MATERIAL INSTALLED IN NON-COMBUSTIBLE BUILDINGS AND IN RETURN AIR CEILING PLENUMS SHALL MEET 25%/50 FLAME/SMOKE SPREAD/DEVELOPMENT REQUIREMENTS.
- 1.4. THE WORD "PROVIDE" SHALL MEAN "SUPPLY, INSTALL, CONNECT AND TEST".
- 1.5. TENDER SUBMISSION
- 1.5.1. INCLUDE ALL LABOUR AND MATERIAL REQUIRED FOR FULLY FUNCTIONING AND APPROVED MECHANICAL SYSTEMS. REFER TO OTHER SECTIONS OF THE SPECIFICATION FOR ANY ADDITIONAL REQUIREMENTS.
  - 1.5.2. MECHANICAL CONTRACTOR SHALL CARRY THE COST OF ALL REQUIRED SUB-TRADES.
  - 1.5.3. THE DRAWINGS, SITE, THE INTENT OF THE DESIGN, MECHANICAL CONTRACTOR MUST VISIT THE SITE, PRIOR TO TENDER, TO DETERMINE SUITABILITY OF DESIGN GIVEN THE EXISTING SITE CONDITIONS, ALLOW FOR TIME AND MATERIAL NECESSARY TO ACCOMMODATE INSTALLATION CHALLENGES.
  - 1.5.4. REPORT TO ENGINEER OF ANY AMBIGUITIES AND DISCREPANCIES WITHIN THE TENDER DOCUMENTS. MINIMUM THREE (3) DAYS PRIOR TO TENDER CLOSING, ALLOW FOR THE INSTALLATION OF THE MORE COSTLY SCENARIO OR OPTION IN THE TENDER BID.
  - 1.5.5. INCLUDE ANY ALTERNATIVE PLACEMENT OF NEW SYSTEMS TO ACCOMMODATE SITE CONDITIONS SUCH AS STRUCTURAL BEAMS, JOISTS, EXISTING DUCTS, EXISTING PIPES, EXISTING EQUIPMENT, AND SO ON, IN THE TENDER BID. EXTRAS FOR TIME AND MATERIAL SHALL NOT BE MADE FOR COORDINATION TIME AND ITEMS THAT THE CONTRACTOR SHOULD BE FAMILIAR WITH.
  - 1.5.6. UNLESS NOTED OTHERWISE ON THE PLANS, GENERAL INTENT OF THE DESIGN IS TO CLEAN AND REUSE EXISTING DIFFUSERS, GRILLES, TERMINAL UNITS, THERMOSTAT, SPRINKLER HEADS, ETC. WITHIN REASON, IT IS THIS CONTRACTOR'S RESPONSIBILITY TO TABULATE MECHANICAL ITEMS THAT ARE TO BE RE-USED, RELOCATED AND/OR REINSTALLED.
  - 1.5.7. ALTERNATE/SUBSTITUTION OF EQUIPMENT AND PRODUCTS OTHER THAN SPECIFIED MAY BE PROPOSED.
  - 1.5.8. EQUIPMENT SPECIFIED BY NAME, MODEL AND SIZE OR TYPE OF MATERIAL TO BE USED SETS A STANDARD OF QUALITY AND SHALL BE USED AS A STANDARD FOR THE CONTRACTOR FOR PROPOSALS. BIDDING SHALL BE BASED ON THE EQUIPMENT AND MATERIAL LISTED. UNLESS MANUFACTURER WISHES TO TENDER EQUIPMENT, HE MUST MAKE AN APPLICATION IN WRITING TOGETHER WITH COMPLETE DETAILED TECHNICAL SUBMISSION TO HAVE HIS EQUIPMENT APPROVED. INFORMATION OF A GENERAL NATURE WILL NOT BE ACCEPTED. REQUESTS FOR APPROVAL SHALL BE MADE TO THE CONSULTANT DURING THE TENDERING PERIOD AND TEN (10) DAYS PRIOR TO CLOSING OF THE SUBCONTRACTOR'S TENDERS.
  - 1.5.9. FOR PRODUCTS SPECIFIED ONLY BY REFERENCE TO STANDARDS, SELECT ANY PRODUCT WHICH MEETS THE STANDARD, MADE BY ANY MANUFACTURER.
  - 1.5.10. FOR PRODUCTS SPECIFIED BY NAMING ONE OR SEVERAL PRODUCTS OR ACCEPTABLE MANUFACTURERS, SELECT ANY PRODUCT NAMED, IF A STANDARD ALSO REFERENCED, VERIFY THAT THE PRODUCT SELECTED MEETS THE STANDARD.
  - 1.5.11. FOR PRODUCTS SPECIFIED BY NAMING ONE PRODUCT THERE IS NO OPTION UNLESS THE CONSULTANT HAS ACCEPTED AN ALTERNATIVE PROPOSAL SUBMITTED PRIOR TO SIGNING OF THE CONTRACT.
  - 1.5.12. WHERE THE SPECIFICATION PROVIDES FOR SELECTION OF AN OPTION WHICH IS NOT EXPLAINED, CONSULTANT WITH THE DRAWINGS AND SCHEDULES (AS IN THE CASE OF A PIECE OF EQUIPMENT WHICH DIFFERS FROM THE EQUIPMENT DETAILED IN DIMENSIONS, STATED CAPACITIES, FLUID FLOW RATES, HEAT TRANSFER RATES, SOUND POWER, ELECTRICAL SERVICE REQUIREMENTS, LOADS IMPOSED ON STRUCTURES, ETC.) THE CONTRACTOR SHOULD ELECT TO USE THAT OPTION, AGREES TO COORDINATE THE EQUIPMENT WITH THE CONSULTANT IN ORDER TO WORK WITHIN THE CONTRACTOR'S SCOPE OF WORK AS MAY BE REQUIRED TO ACCOMMODATE THE OPTION AND HE WILL BEAR RESPONSIBILITY AND WAIVES ALL CLAIMS FOR ADDITIONAL COMPENSATION FOR COSTS WHICH SUBSEQUENTLY BECOME APPARENT ARISING OUT OF THE OPTION, INCLUDING COSTS OF RE-DESIGN, AND PREPARATION OF DRAWINGS AND DETAILS.
  - 1.5.13. THE MECHANICAL DIVISION AND SUPPLIER SHALL BE HELD ENTIRELY RESPONSIBLE IN ENSURING THAT THE PRODUCT SHALL IN EVERY RESPECT BE EQUIVALENT TO AND MEET THE SAME STANDARDS, QUALITY AND PERFORMANCE AS PROVIDED FOR THIS PROJECT AND MODIFICATIONS TO THE EQUIPMENT AND/OR CHANGES OF PRODUCT REQUIRED BY THE CONSULTANT TO MEET SPECIFIED REQUIREMENTS AT THE TIME OF THE FINAL SHOP DRAWING REVIEW SHALL BE PROVIDED BY THE SUPPLIER AND THE MECHANICAL DIVISION WITHOUT ANY EXTRA CHARGE TO THE OWNER.
  - 1.5.14. PRODUCTS WHICH ARE APPROVED AS EQUIVALENT IN DESIGN CHARACTERISTICS SHALL ALL CONFORM TO THE AVAILABLE INSTALLATION SPACE AND ACCESS REQUIREMENTS OF THE PROPOSED ALTERNATIVES.
  - 1.5.15. MECHANICAL CONTRACTOR MUST ACCEPT ALL COSTING REQUIRED USING ANY ALTERNATIVE EQUIPMENT. THIS INCLUDES ANY RE-DESIGN, COORDINATION AND ADJUSTMENT OF THE INSTALLATION COSTS. MECHANICAL CONTRACTOR MUST ENSURE THAT PROPOSED EQUIPMENT MEETS THE DESIGN PERFORMANCE CRITERIA PER MECHANICAL SCHEDULES.
  - 1.5.16. MAKE REVISIONS TO RECORD DRAWINGS, INCORPORATING ALTERNATES AND/OR SUBSTITUTES AND ALL RELATED CHANGES.
- 1.6. GENERAL SCOPE AND COORDINATION
- 1.6.1. SITE AUDIT: PERFORM A THOROUGH SITE AUDIT OF THE EXISTING SYSTEM INCLUDING, BUT NOT LIMITED TO, EXISTING EQUIPMENT SIZE/LOCATION, DUCT SIZE/LOCATION, PLUMBING PIPE SIZE/LOCATION/INVERT, ERROR TO ORDERING MATERIAL AND COMMENCING WORK. VERIFY ALL EXISTING SERVICES THAT ARE BEING MOVED/RECONNECTED, VERIFY ROUTING OF ALL PROPOSED NEW SERVICES. REFER TO ENGINEER WITH ANY DISCREPANCIES BETWEEN THE DRAWINGS AND SITE CONDITIONS. DETERMINE EXACT DIMENSIONS AND OTHER RESTRICTIVE CONDITIONS ON SITE, NOT FROM DRAWINGS.
  - 1.6.2. REPORT TO ENGINEER OF ANY EXISTING NON-CODE COMPLIANT INSTALLATIONS.
  - 1.6.3. COORDINATE WITH ALL TRADES TO DETERMINE INSTALLATION FEASIBILITY AND CLEARANCE REQUIREMENTS PRIOR TO COMMENCING WORK. REVIEW MECHANICAL, ELECTRICAL AND ARCHITECTURAL DRAWINGS TO BECOME FAMILIAR WITH ALL APPURTENANT COMPONENTS. ISSUES WITH INSTALLATION DUE TO LACK OF COORDINATION WILL RESULT IN THE CONTRACTOR HAVING TO RELOCATE NEWLY INSTALLED ITEMS AT THE CONTRACTOR'S OWN COST.
  - 1.6.4. COORDINATE ALL CORE DRILLING LOCATIONS AND CHECK FOR EMBEDDED SERVICES WITH THE LANDLORD AND THE STRUCTURAL ENGINEER. X-RAY FLOOR AND FURNISH PRINTS OF THE RESULTS FOR REVIEW BY THE LANDLORD AND THE STRUCTURAL ENGINEER.
  - 1.6.5. PIPE SLEEVES: SHALL BE PROVIDED FOR ALL PIPES THROUGH WALLS AND FLOORS. SLEEVE SHALL BE STANDARD WEIGHT STEEL PIPE WITH SMOOTH EDGE. FLOOR SLEEVE SHALL EXTEND ABOVE FINISHED FLOOR BY 2"(50mm) MINIMUM. SEAL WATER TIGHT.
  - 1.6.6. FIRE STOP: ALL PIPES AND DUCTS PENETRATING RATED WALLS/FLOORS WITH APPROVED AND ULC CAD 25115 LISTED MATERIAL. ACCEPTABLE MANUFACTURERS, "HILT" AND "3M". SEAL WATER TIGHT. THE CONTRACTOR IS REQUIRED TO USE A QUALIFIED TRADE.
  - 1.6.7. BUILDING SYSTEM TIE-IN: COORDINATE WITH THE LANDLORD FOR ALL NECESSARY SHUTDOWN OF SYSTEMS. INCLUDE OVERTIME/AFTER-HOUR COSTS IN THE TENDER FOR SYSTEM TIE-INS AND WORK REQUIRED WITHIN ADJACENT TENANT SPACES.
  - 1.6.8. SITE UTILITY TIE-IN: COORDINATE WITH THE LANDLORD, UTILITY COMPANIES, AUTHORITIES, AND THE CONSULTANTS TO INTERRUPT, RE-ROUTE AND/OR CONNECT TO WATER, SEWER, STORM DRAINAGE, OR GAS SYSTEMS WITH MINIMAL INTERRUPTIONS. CONTACT RESPECTIVE UTILITY COMPANY AND INFORM SERVICES INTERRUPTION TIMELINE TO PARTIES INVOLVED.
  - 1.6.9. PERFORM CUTTING/PATCHING TO ACCESS/INSTALL MECHANICAL SERVICES. INCLUDE THIS SCOPE IN THE TENDER.
  - 1.6.10. ACCESS PANELS: COORDINATE SIZE, LOCATION AND REQUIRED NUMBER WITH THE GENERAL CONTRACTOR. CONCEALED HINGE PANELS, ACUDOR OR EQUAL. MATCH FIRE RATING OF WALL/CEILING.
  - 1.6.11. NEW EQUIPMENT AND MATERIALS SHALL MATCH OR EXCEED BASE BUILDING STANDARDS. PROVIDE HIGHER STANDARD OF EQUIPMENT AND MATERIAL WHEN SPECIFIED. REMOVE UNACCEPTABLE MATERIALS AND INSTALL SUITABLE MATERIAL IN THEIR PLACE.
  - 1.6.12. HIGH-STANDARD, UNIFORM AND CONSISTENT WORKMANSHIP IS EXPECTED THROUGHOUT THE PROJECT. REMOVE AND REINSTALL SUB-STANDARD INSTALLATIONS AS PER THE DISCRETION OF THE ENGINEER, DESIGNER, ARCHITECT AND THE CLIENT.
  - 1.6.13. PROTECT ALL EXISTING INSTALLATIONS AND SYSTEMS. REPAIR ANY DAMAGES CAUSED BY THIS TRADE AND ITS SUB-TRADES.
  - 1.6.14. DISPOSE OF ANY REMOVED EXISTING MECHANICAL ITEMS THAT ARE NOT WANTED BY THE LANDLORD.
  - 1.6.15. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL FIXTURES, HVAC EQUIPMENT, DIFFUSERS/GRILLES, VALVES, BACK-FLOW PREVENTERS, FIRE EXTINGUISHERS, THERMOSTATS, ETC. TO THE LANDLORD AND ENGINEER UNTIL SHOP DRAWINGS ARE REVIEWED BY THE ENGINEER. ALLOW MINIMUM FIVE (5) BUSINESS DAYS FOR REVIEW BY THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY LONG LEAD ITEMS AND SUBMIT SHOP DRAWINGS TO THE ENGINEER IN A TIMELY MANNER.
  - 1.6.16. HANGERS AND INSTALLATION
  - 1.6.17. ALL MECHANICAL ITEMS SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDED INSTALLATION PRACTICES AND BE COMPLETE WITH MIGRATION ISOLATORS.
  - 1.6.18. PROVIDE ALL REQUIRED RIGGING, SUPPORT, DRILLING, APPROVED INSERTS, HANGERS AND AUXILIARY STRUCTURAL SUPPORT MEMBERS NECESSARY FOR MOUNTING AND HANGING EQUIPMENT.
  - 1.6.19. SUSPENSION FROM METAL DECK, OTHER DUCTS/PIPES, ONE HANGER FROM ANOTHER ARE NOT PERMITTED.
  - 1.6.20. PROVIDE DI-ELECTRIC SEPARATION BETWEEN NON-FERROUS MATERIAL AND STEEL HANGER MATERIALS. COPPER PLATED HANGERS, PLASTIC DIPPED HANGERS, OR WRAPPED PIPES ARE ACCEPTABLE FOR COPPER PLUMBING PIPES.
  - 1.6.21. ALL EQUIPMENT SHALL BE HORIZONTALLY MOUNTED AND LEVELLED ACCOMMODATING ANY SLOPES C/W MOUNTING PAD/ROOF CURB AND VIBRATION ISOLATORS, UNLESS NOTED OTHERWISE.
  - 1.6.22. ALL PROVIDE OVERSIZED HANGERS TO PASS OVER INSULATION SHIELDS ON ALL COLD AND CHILLED WATER PIPING.
  - 1.6.23. PROVIDE 1" (25mm) THICK DISPOSABLE MEDIA FILTER OVER ALL EXISTING HVAC R/A OPENINGS AND T/A DUCTS, INCLUDING PACKAGED TERMINAL UNITS, TO PROTECT FROM CONSTRUCTION DUST AND FOULING. REPLACE DISPOSABLE FILTERS EVERY TWO (2) WEEK INTERVALS. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO CLEAN ANY FOULED EXISTING HVAC SYSTEMS. DISPOSE OF THE MEDIA FILTER UPON COMPLETION OF WORK AND REPLACE ALL NEW EXISTING HVAC UNIT FILTERS WITH NEW.
  - 1.6.24. COORDINATION WITH DIVISION 16
  - 1.6.25. ALL STARTERS, CONTROLS RELAYS, 120V-24V STEP-DOWN TRANSFORMERS AND LOW VOLTAGE CONTROLS WIRING BY DIVISION 15, ALL POWER WIRING BY DIVISION 16, UNLESS NOTED OTHERWISE.
  - 1.6.26. LINE VOLTAGE CONTROL SWITCHES SUCH AS FAN VARIABLE SPEED CONTROLLER AND REVERSE ACTING THERMOSTAT SUPPLIED BY DIVISION 15, INSTALLED BY DIVISION 16. COORDINATE ALL LOCATIONS.
  - 1.6.27. SUPPLY OF CONTROL PANELS, LOCATION OF CONTROL PANELS AND REQUIRED 120V-24V STEP-DOWN TRANSFORMER BY DIVISION 15. POWER WIRING TO CONTROL PANEL BY DIVISION 16.

## NOT PERMITTED.

- 1.6.28. PROVIDE DI-ELECTRIC SEPARATION BETWEEN NON-FERROUS MATERIAL AND STEEL HANGER MATERIALS. COPPER PLATED HANGERS, PLASTIC DIPPED HANGERS, OR WRAPPED PIPES ARE ACCEPTABLE FOR COPPER PLUMBING PIPES.
- 1.6.29. ALL EQUIPMENT SHALL BE HORIZONTALLY MOUNTED AND LEVELLED ACCOMMODATING ANY SLOPES C/W MOUNTING PAD/ROOF CURB AND VIBRATION ISOLATORS, UNLESS NOTED OTHERWISE.
- 1.6.30. ALL PROVIDE OVERSIZED HANGERS TO PASS OVER INSULATION SHIELDS ON ALL COLD AND CHILLED WATER PIPING.
- 1.6.31. PROVIDE 1" (25mm) THICK DISPOSABLE MEDIA FILTER OVER ALL EXISTING HVAC R/A OPENINGS AND T/A DUCTS, INCLUDING PACKAGED TERMINAL UNITS, TO PROTECT FROM CONSTRUCTION DUST AND FOULING. REPLACE DISPOSABLE FILTERS EVERY TWO (2) WEEK INTERVALS. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO CLEAN ANY FOULED EXISTING HVAC SYSTEMS. DISPOSE OF THE MEDIA FILTER UPON COMPLETION OF WORK AND REPLACE ALL NEW EXISTING HVAC UNIT FILTERS WITH NEW.
- 1.6.32. COORDINATION WITH DIVISION 16
- 1.6.33. ALL STARTERS, CONTROLS RELAYS, 120V-24V STEP-DOWN TRANSFORMERS AND LOW VOLTAGE CONTROLS WIRING BY DIVISION 15, ALL POWER WIRING BY DIVISION 16, UNLESS NOTED OTHERWISE.
- 1.6.34. LINE VOLTAGE CONTROL SWITCHES SUCH AS FAN VARIABLE SPEED CONTROLLER AND REVERSE ACTING THERMOSTAT SUPPLIED BY DIVISION 15, INSTALLED BY DIVISION 16. COORDINATE ALL LOCATIONS.
- 1.6.35. SUPPLY OF CONTROL PANELS, LOCATION OF CONTROL PANELS AND REQUIRED 120V-24V STEP-DOWN TRANSFORMER BY DIVISION 15. POWER WIRING TO CONTROL PANEL BY DIVISION 16.

## 2. SHEET METAL AND DUCTWORK

- 2.1. PROVIDE DUCTWORK IN ACCORDANCE WITH ALL APPLICABLE CODES INCLUDING, BUT NOT LIMITED TO, LATEST SMACNA AND ASHRAE STANDARDS, NFPA 90A AND NFPA 90B, AND NFPA 96 FOR KITCHEN EXHAUST SYSTEMS. DUCTS SHALL BE CONSTRUCTED AT STATIC PRESSURE OF SPECIFIED EQUIPMENT. COORDINATE ALL INTERFENCES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
- 2.2. ALL DUCT SIZES INDICATE INSIDE CLEAR DIMENSIONS. PROVIDE ACOUSTIC LINING AS SPECIFIED ON THE INSULATION SECTION. PROVIDE DUCT TRANSITIONS TO REGULAR DUCTS AFTER MINIMUM 15FT (4.5m) OF LINED DUCTS.
- 2.3. DUCT TRANSITIONS, ELBOWS, AND BRANCH TAKE-OFFS.
- 2.3.1. LOW PRESSURE DUCT: MAXIMUM 25° TRANSITION SHORT RADIUS ELBOW OR HARD 90° ELBOW C/W SINGLE THICKNESS TURNING VANE, ROUND SPIN-IN TAKE-OFF C/W BALANCING DAMPER, LESS THAN 10° (250°).
- 2.3.2. MEDIUM PRESSURE DUCT: MAXIMUM 15° TRANSITION, SMOOTH LONG RADIUS ELBOW OR HARD 90° ELBOW C/W DOUBLE THICKNESS TURNING VANE, CONICAL TAKE-OFF C/W BALANCING DAMPERS, LESS THAN THE TAKE-OFF SERVES VAV BOXES.
- 2.4. RECTANGULAR DUCTS: MAXIMUM ASPECT RATIO OF 4:1, ALL TAKE-OFFS TO BE COMPLETED WITH SPLIT DAMPER OR BALANCING DAMPER.
- 2.5. ROUND DUCTS
- 2.5.1. 10" (250°) AND SMALLER: SEALED SNAP-LOCK, 12" (300°) AND LARGER: SPIRAL LOCK-SEAM.
- 2.5.2. ALL EXPOSED ROUND DUCTS AND MEDIUM PRESSURE DUCTS: SPIRAL LOCK-SEAM, REGARDLESS OF SIZE.
- 2.5.3. SUBSTITUTION OF ROUND DUCTS FROM RECTANGULAR DUCTS SHALL ONLY OCCUR ON DUCTS WITHOUT ACOUSTIC LINING, AND AFTER EXAMINING SITE INTERFENCES. CONTRACTOR MUST PROVIDE PROPOSED ROUND DUCT LAYOUT TO ENGINEER IN HAND SKETCH FORMAT COMPLETE WITH SIZES FOR APPROVAL PRIOR TO INSTALLATION.
- 2.6. EXPOSED DUCTWORK OUTSIDE OF BUILDING: PROVIDE HIGH POINT AT CENTRE OF ALL EXPOSED DUCTS TO PREVENT WATER FROM POOLING. HAMMER OUT ALL DENTS PRIOR TO INSTALLATION. WATER PROOF ALL JOINTS WITH TWO COATS OF BRUSH-ON HEAVY WEATHER PROOFING SEALANT. STANDING FLANGED DUCT JOINTS SHALL BE SEALED WITH ELASTOMER GASKET AND SHEET METAL COPPER FLASHING COVER. PROTECT 3-SIDED COUNTER FLASHING TO ALL DUCT CONNECTIONS TO EXPOSED AIR HANDLING UNITS. SEAL ALL SCREW HOLES. REFER TO INSULATION SECTION.
- 2.7. DUCT SEALANT: SEAL ALL TRANSVERSE JOINTS IN SUPPLY, RETURN, AND EXHAUST DUCTWORK WITH TWO COATS OF HEAVY BRUSH-ON HIGH VISCOSITY DUCT SEALER (BAKELITE 530 – 59 OR EQUIVALENT) TO ACHIEVE LESS THAN 5% AIR LEAKAGE. SOFT ELASTOMER BUTYL GASKET WITH ADHESIVE BACKING IS ACCEPTABLE FOR FLANGED JOINTS. DUCT TAPE IS NOT ACCEPTABLE.
- 2.8. FLEXIBLE CONNECTIONS: UL-C LISTED AND LABELED, NEOPRENE COATED, GLASS FABRIC, FACTORY FABRICATED AS APPROVED BY LOCAL AUTHORITIES. CONNECTION MUST NOT BE UNDER TENSION. MINIMUM 4" WIDE, MAXIMUM 6" WIDE.
- 2.9. FIRE DAMPERS: ULC S112 AND S505 LISTED CUT-OF-PIPE STREAM (TYPE 'B') STATIC-TYPE, DYNAMIC-TYPE SPRINGS LOADED FIRE DAMPERS TO BE USED FOR PRESURIZED DUCTS IN LIFE-SAFETY SYSTEMS. PROVIDE LATCHED ACCESS DOORS IN DUCTWORK FOR ACCESS TO ALL FIRE DAMPERS. PROVIDE FIRE DAMPERS IN DUCT PENETRATIONS THROUGH RATED ASSEMBLIES.
- 2.10. BACK-DRAFT DAMPERS: PROVIDE R10 INSULATED BLADE TYPE GRANITY BACK DRAFT DAMPER FOR ALL EXHAUST AND OUTDOOR AIR LOUVERS AND ROOF GOOSENECK CONNECTIONS.
- 2.11. PROVIDE 1-1/2"X1-1/2"X1/8" (38X38X3) ANGLED STEEL FRAME ON EITHER SIDES OF ALL DUCT PENETRATIONS THROUGH FLOORS, ROOFS AND PARTITIONS. SEAL ALL PENETRATIONS AIR TIGHT. PROVIDE WATER PROOFING AS REQUIRED.

## 3. PIPING

- 3.1. MECHANICAL PIPES
- 3.1.1. UNLESS BASE BUILDING STANDARDS ARE MORE STRINGENT, MECHANICAL PIPING MATERIALS SHALL BE:
- 3.1.1.1. HEATING AND CHILLED WATER (150PSI RATING):
- 3.1.1.1.1. FROM 3/4" (20°) TO 2" (50°): TYPE 'L' HARD COPPER AND FITTINGS WITH 95-5 TIN-ANTIMONY SOLDER OR SILVER, SCHEDULE 40 THREADED BLACK STEEL PIPE TO ASTM A53.
- 3.1.1.1.2. 2-1/2" (65°) AND LARGER: SCHEDULE 40 BLACK STEEL PIPE TO ASTM A53 C/W VICTAULIC OR WELDED JOINTS/FITTINGS.
- 3.1.1.2. CONDENSER AND HEAT PUMP WATER (150PSI RATING):
- 3.1.1.2.1. FROM 3/4" (20°) TO 2" (50°): SCHEDULE 40 THREADED BLACK STEEL PIPE TO ASTM A53.
- 3.1.1.2.2. 2-1/2" (65°) AND LARGER: SCHEDULE 40 BLACK STEEL PIPE TO ASTM A53 C/W VICTAULIC OR WELDED JOINTS/FITTINGS.
- 3.1.1.3. REFRIGERANT: TYPE 'L' HARD COPPER, LONG RADIUS ELBOWS AND BRAZED FITTINGS. PIPE SIZING BY MANUFACTURER.
- 3.2. PLUMBING PIPES
- 3.2.1. DOMESTIC WATER, INSIDE BUILDING: TYPE 'L' HARD COPPER MARKED AND CERTIFIED FOR COMPLIANCE WITH ASTM B80 STANDARD WITH WROUGHT COPPER OR CAST BRONZE PRESSURE SOLDER FITTINGS TO ANSI B22.18 – 1973 AND ANSI B16.13–73 RESPECTIVELY. LEAD, ANTIMONY, CADMIUM, AND ZINC FREE SOLDER COMPOSED OF TIN, COPPER, SILVER OR NICKEL COMPOUNDS.
- 3.2.2. DOMESTIC WATER, BURIED INSIDE BUILDING: TYPE 'K' SOFT COPPER OR PEW.
- 3.2.3. DOMESTIC WATER, BURIED OUTSIDE BUILDING: TYPE 'K' SOFT COPPER OR CLASS 150 PVC.
- 3.2.4. SANITARY AND STORM DRAINAGE: CAST IRON PIPE AND FITTINGS TO CSA B70 – M1978. PVC-DWV ACCEPTABLE FOR BURIED INSTALLATION. ABS NOT ACCEPTED. 'K'X'R PVC SHALL ONLY BE CONSIDERED IF, AND ONLY IF, THE BASE BUILDING ALLOWS IT AND SUBMITTED AS A SEPARATE COST SAVING OPTION ON THE TENDER BID FORM. ALL BASE BID SHALL BE CAST IRON FOR ABOVE GRADE INSTALLATION. MISSION HILL HEAVY DUTY COUPLING ON PIPES LARGER THAN 4".
- 3.2.5. VENT: DWV COPPER AND FITTING.
- 3.2.6. GRAVITY/PUMPED CONDENSATE DRAIN AND MISCELLANEOUS DRAIN: TYPE 'L' HARD COPPER OR DWV COPPER.
- 3.3. FIRE PROTECTION PIPES: SCHEDULE 40 BLACK STEEL WITH VICTAULIC JOINTS/FITTINGS.
- 3.4. NATURAL GAS PIPES: 2" (50°) OR LESS, THREADED SCHEDULE 40 BLACK STEEL, 2-1/2" (65°) AND LARGER, WELDED SCHEDULE 40 BLACK STEEL. PAINT WITH TWO COATS OF RUST INHIBITING YELLOW PAINT FOR EXPOSED APPLICATIONS. PROVIDE IDENTIFICATION EVERY 30FT (10m). GAS PIPES IN RETURN AIR PLENUMS MUST BE SLEVED AND VENTED, OR WELDED IN ACCORDANCE WITH LOCAL REQUIREMENTS. BURIED GAS PIPES SHALL BE COMPLETE WITH CATHODIC PROTECTION.
- 3.5. DI-ELECTRIC COUPLINGS: PROVIDE DI-ELECTRIC COUPLINGS WHEN TWO DISSIMILAR METAL PIPES ARE CONNECTED TO EACH OTHER.
- 3.6. PROVIDE EXPANSION LOOPS AND JOINTS.

## 3.7. PROVIDE UNIONS TO PIPES 2" (50°) OR LESS CONNECTING TO EQUIPMENT. PROVIDE FLANGES TO PIPES LARGER THAN 2-1/2" (65°) CONNECTING TO EQUIPMENT.

- 3.8. PROVIDE DRAINS AND DRAIN VALVES AT ALL LOW POINTS OF THE SYSTEM.
- 3.9. PROVIDE AIR VENTS AT ALL HIGH POINTS OF HYDRONIC SYSTEMS.

## 4. INSULATION

- 4.1. INSULATION TO BE TO THERMAL INSULATION ASSOCIATION OF CANADA (TIAC): NATIONAL INSULATION STANDARDS
- 4.2. UNLESS BASE BUILDING STANDARDS ARE MORE STRINGENT, INSULATION SHALL BE:
- 4.2.1. S/A DUCTS: 1" (25mm) THICK, EXTERNAL.
- 4.2.2. EXPOSED S/A DUCTS INSIDE BUILDING: NO INSULATION.
- 4.2.3. EXPOSED S/A AND R/A DUCTS OUTSIDE OF BUILDING: 2" (50mm) THICK, EXTERNAL OR 1" (25mm) THICK EXTERNAL WHEN INTERNAL INSULATION IS REQUIRED. PROVIDE PVC OR ALUMINUM WEATHER PROOF JACKET.
- 4.2.4. S/A, R/A AND E/A DUCTS FROM ANY AIR HANDLING EQUIPMENT AND FANS: 1" (25mm) THICK, MINIMUM 15FT (4.5m) LENGTH FROM EQUIPMENT, ACOUSTIC.
- 4.2.5. T/A DUCTS: 1" (25mm), ACOUSTIC.
- 4.2.6. E/A PLENUMS: 2" (50mm) THICK, INTERNAL THERMAL.
- 4.2.7. O/A PLENUMS: 2" (50mm) THICK, EXTERNAL.
- 4.2.8. E/A DUCTS FROM WALL LOUVERS AND PERIMETER WALLS: 1" (25mm) THICK, EXTERNAL, MINIMUM 15FT (4.5m) LENGTH.
- 4.2.9. O/A DUCTS FROM WALL LOUVERS AND PERIMETER WALLS: 2" (50mm) THICK, EXTERNAL, FOR ENTIRE LENGTH OF DUCT.
- 4.2.10. CHILLED WATER PIPES: 1" (25mm) THICK.
- 4.2.11. HEATING WATER PIPES LESS THAN 1-1/2": 1-1/2" (40mm) THICK.
- 4.2.12. HEATING WATER PIPES 1-1/2" AND UP: 2" (50mm) THICK.
- 4.2.13. REFRIGERANT PIPES: 3/4" (20mm) THICK CLOSED CELL ARMAFLEX INSULATION GLUED AND TIED DOWN EVERY 12" (300mm). INSULATE LIQUID LINE FOR COOLING ONLY APPLICATION. INSULATE BOTH LINES FOR HEAT PUMP AND VRV APPLICATIONS. ARMACELL "OKABEL" ALUMINIZED STEEL JACKET FOR ALL REFRIGERANT PIPES OUTSIDE OF THE BUILDING ENVELOPE.

- 4.2.14. DOMESTIC/COLD/HOT AND REIRC. PIPES: 1" (25mm) THICK.
- 4.2.15. STORM PIPE: 1" (25mm) THICK.
- 4.2.16. VENT PIPE: 1" (25mm) THICK, WITHIN 10FT (3m) FROM ROOF.
- 4.2.17. CONDENSATE PIPE: 3/4" (20mm) THICK, WITHIN 15FT (4.5m) FROM HVAC EQUIPMENT.

- 4.3. EXTERNAL INSULATION: BE PRE-FORMED FIBREGLASS TYPE AS MANUFACTURED BY FIBREGLAS CANADA INC. OR, EQUAL 5.5LB DENSITY GLASS FIBRE C/W FACTORY APPLIED FIRE RETARDANT, AND REINFORCED ALUMINUM FOIL VAPOUR BARRIER, OR KITCHEN EXHAUST THERMAL WRAP, WHERE APPLICABLE.

- 4.4. INTERNAL INSULATION: FIBREGLASS WITH NEOPRENE COATING. SEAL ALL CUT EDGES WITH BAKELITE 200-32, OR APPROVED EQUAL, TO ENSURE FIBREGLASS DOES NOT COME INTO CONTACT WITH STEEL. REFER TO SECTION 2.3. EXTERNAL INSULATION MAY BE DELETED IF THE DUCT IS INTERNALLY THERMALLY LINED.