SPECIFICATIONS

GENERAL MECHANICAL CONDITIONS – SECTION 15A

1. Conform to Instructions to Bidders, General Conditions and General Requirements.
2. This Section 15A shall apply to all Division 15 Sections.
3. Before submitting tenders, examine site, existing services and all drawings. Extras will not be allowed for failure to do so.
4. Provide all labour, materials and equipment necessary to execute the work shown shown and described. Installation of materials shall meet all applicable Provincial, Federal and Municipal Requirements.
5. Obtain permits and pay all fees for work and required inspections.
6. Maintain Liability Insurance to protect Owner and the Contractor from any and all claims under the Worker's Compensation Act.
7. The drawings shall be considered diagrammatic only. All measurements shall be taken from building site and architect's drawings.
8. All materials shall conform to CSA, HEPC and CEC requirements and shall bear CSA label. Gas fired equipment shall bear CGA label.
9. All existing services must be maintained at all times during construction. This Contractor to provide all necessary temporary lines, etc. so as to carry out the above.
10. Temporary light, power and water by General Contractor.
11. All cutting and patching for mechanical work will be the responsibility of this sub-Contractor. Hire specialized trades to do this work.
12. Provide temporary buildings and material storage as required and be responsible for any loss or damage thereto.
13. Submit samples of materials when required.
14. Submit 7 copies of shop drawings for review covering major manufactured items, i.e. fans, plumbing fixtures, AC units, hot water tank, etc.
15. Where substitutions are made for equipment specified by name or model number, be fully responsible for capacities as well as physical fit of substituted materials.
16. Supply and locate all bases, supports, sleeves, curbs, etc. required for this work. Flashing by roof trades. Counterflashing by this Contractor.
17. Unless otherwise noted, all motors 1/2 HP and under shall be 115/1/60, motors over 1/2 HP shall be of 3 phase voltage available on project.
18. Supply proper starters with overload protection and disconnect switches for powered mechanical equipment and hand over to Electrical Contractor for installation. This does not include isolation switches, unless stated specifically.
19. All power wiring by electrical contractor, control and interlock wiring by mechanical contractor. Control wiring in return air ceiling spaces shall be FT-6 or installed in conduit.
20. Supply and install all necessary access doors for mechanical equipment including entering and leaving sides of all coils. Where necessary doors shall be rated to suit fire assembly rating.
21. Pipe hangers shall be Clevis split type with mild steel rods. For copper pipe use plastic inserts. Use oversized hangers and saddles for c.w. piping. Do not support equipment or piping from roof deck without permission from Architects. Supply and install necessary steel to transfer load to structural members.
22. All dissimilar metal (steel-copper, etc.) shall be separated using gaskets and insulating washers or Watts "Di-Electric" fittings.
23. Install chrome-plated escutcheons where branch pipes pass through finished surface.
24. Keep accurate record of "as-built" drawings and submit these before final certificate of completion. Buried services must be dimensioned.
25. All surfaces must be left clean and smooth, ready for painting by General Trades.
26. Identify all piping. Use stencils or colour codes and directional arrows.
27. Identify all fans, starters, remote control and all other equipment as to service by a black lamacoid engraved nameplate with white core, firmly affixed with screws to each unit.
28. On completion of the work, remove from the premises all tools, debris, surplus and waste materials resulting from operations under this section. Clean all equipment and leave all items in perfect order ready for operation.
29. After acceptance, instruct Owner in equipment operation and provide him with operating and maintenance manuals standards and extended warranty documents, inspection certificates and copies of shop drawings of installed equipment.
30. The contractor shall, before final payment is made, guarantee all materials and workmanship supplied by him in the performance of this contract for a period of one year from date of final acceptance and shall, when called upon, make good without further cost to the Owner such defects as may appear within this period.

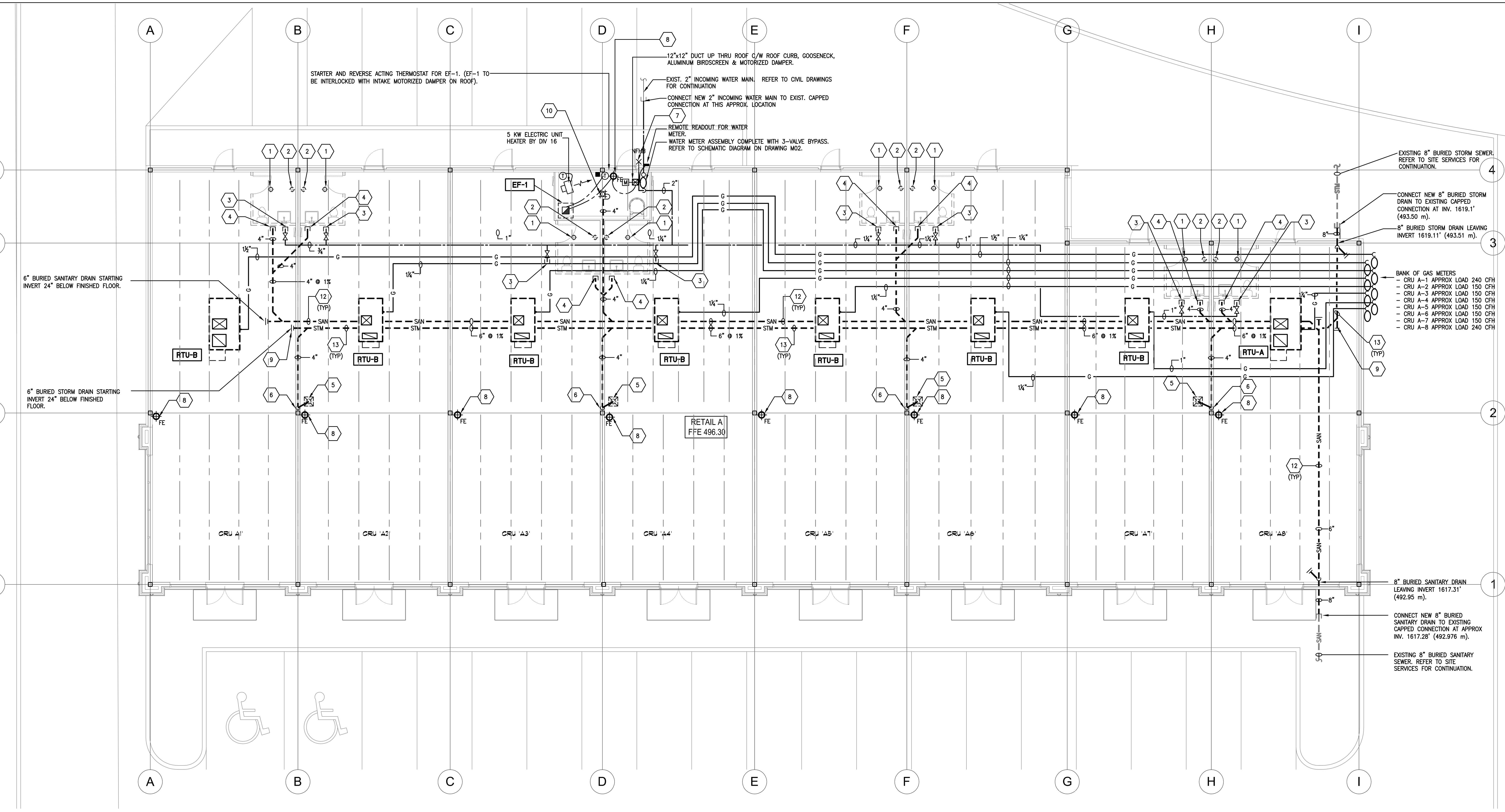
WARM AIR HEATING, VENTILATING & AIR CONDITIONING – SECTION 15B

1. Supply and install all heating, ventilation and air handling equipment as shown on drawings.
2. Supply and install ductwork as indicated on drawing. Ductwork shall be fabricated and installed in strict accordance with latest SMACNA standards and shall be manufactured of galvanized steel unless specifically noted otherwise.
3. Install manual balancing dampers at all branch takeoffs and in other locations where necessary for system balancing.
4. Flexible ducts shall be aluminum helically wound spiral duct, equal to Flexmaster T/L, maximum 10 ft. length. Provide acoustic flex equal to Flexmaster model T/L-A, where ducts are to be internally insulated.
5. Install UL labelled fire dampers and fire stop flaps where shown and where required. These shall be installed in accordance with ULC approved methods. For ducts under 12", use 100% free air dampers. Dampers in aluminum and stainless steel duct shall be manufactured of stainless steel. Advise drywall trades of approved installation methods in drywall partitions.
6. Install 6" approved flexible connector on duct connections to resiliently mounted fans.
7. Where shown, ductwork shall be lined internally with 1" faced flexible duct liner. Shown sizes are clear inside dimensions, increase duct size accordingly.

   Similarly line supply and return ducts 10 ft from all rooftop AC units and indoor air handler/and heat pumps.
8. Rooftop units shall be complete with trapped condensate drain. Extend drain so that condensate spills on roof, not on curb flashing.
9. Include for startup of rooftop units and all other air handling equipment.
10. Centrifugal fans shall be complete with belt guards with tachometer openings.
11. All backdraft and electric motorized dampers shall be low leakage type.
12. Supply and install gas vents for all gas fired equipment.
13. Exhaust ductwork within 5 ft. of a wall or roof, and all outside air intake ductwork, shall be externally insulated with 1 1/2" thick foil faced flexible fibreglas duct insulation (R-5). Apply using recommended adhesive and tape all joints using vapour barrier tape. All air conditioned air supply ductwork, unless specifically noted otherwise, shall be insulated in a similar manner using 1" material.
14. Provide all motorized dampers to open and close as respective fans start and stop.
15. Adjust all fan speeds to deliver shown air quantities. Balance all air systems and supply written air balancing reports in triplicate. Include necessary spare belts pulleys for field adjustment and replacement of filters. Set air systems controls and demonstrate operation to Owner's representative.
16. From rooftop units, extend supply and return air ducts 4'-0" down through roof for future tenant distribution.

PLUMBING & DRAINAGE INSIDE THE BUILDING – SECTION 15C

1. All work shall be executed by licensed plumbers.
2. All plumbing and drainage work shall be installed as required by Ontario Building Code, revised to date, and shall meet the requirements of all Provincial and Municipal authorities having jurisdiction.
3. Include all piping, fittings and equipment shown on drawings or described in specifications. All items not mentioned but understood to be necessary to complete the plumbing system shall be included.
4. Make all necessary connections to existing services.
5. All above ground sanitary and storm drainage piping shall be cast iron mechanical joint or DWV copper.
6. Above ground water piping shall be type "L" copper c/w 95/5 solder joints. For 2" and over, Vitaulic roll-grooved jointing will be accepted.
7. All above ground vent piping shall be cast iron with mechanical joint or DWV copper.
8. Valves up to 2" shall be full throat bronze ball valves. 2 1/2" and over shall be butterfly valves.
9. Supply and install all plumbing fixtures, cleanouts, hose bibbs, etc. as shown on drawings and listed in schedules.
10. Visible sink drainage traps and supply piping shall be chrome plated.
11. Cleanouts shall be installed as required by Code and where shown and shall suit finish material.
12. Provide approved backflow preventors on all inside and outside hose bibbs. On mechanical equipment connections, use reduced pressure type backflow preventors.
13. Domestic cold water piping shall be insulated with 1" thick fibreglas pipe insulation with ASJ. Use 1 1/2" material for piping 2" and over. Horizontal runs of sanitary and storm drains shall be insulated in a similar manner. In exposed areas finish with canvas or P.V.C. jacketting. Insulate also cold water meters. PVC drainage piping need not be insulated.
14. Supply and install all fire extinguishers as required by code.
15. See fixture schedule for plumbing fixture types.
16. Supply and install wheel handle or screw fixtures stop valve on the hot and cold water supply to every fixture on the job, in addition to the valve or faucet on the fixture itself.
17. Protect all fixtures until handed over to the Owner. All fixtures shall be c/w necessary trim, trap supplies, stops, tail pieces, traps, gaskets, etc.
18. Make all necessary arrangements, pay all charges and do all necessary work for the installation of a new gas service where shown on the drawings. Entire installation shall be as stated in Natural Gas and Propane Installation Code CAN/CSA B-149-1.00.
19. All exterior gas piping to be painted to match exterior wall and further identified as required by Gas Code. All gas piping on roof shall be painted yellow.
20. Roof drain bodies to be insulated, and areas exposed to be finished with canvas or PVC jacketing.

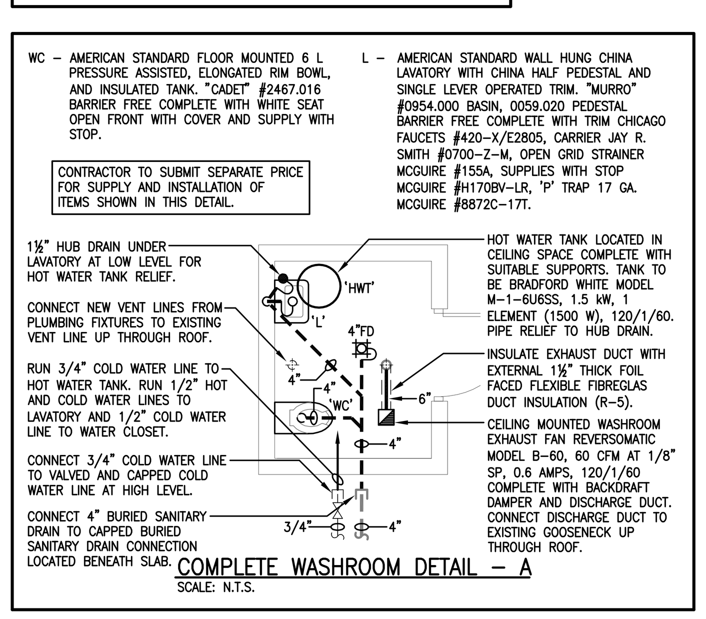


LEGEND

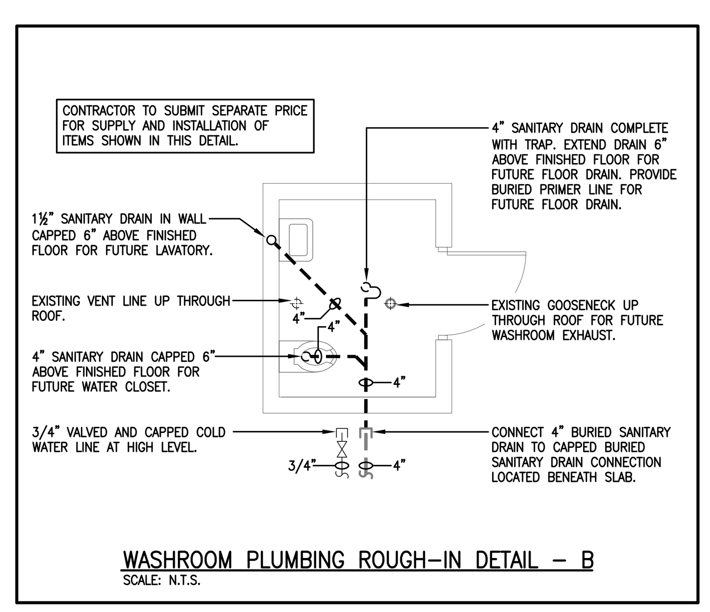
Symbol	Description
	EXISTING PIPING, DUCTWORK, EQUIPMENT
	NEW PIPING, DUCTWORK, EQUIPMENT
	DOMESTIC COLD WATER (DCW)
	DOMESTIC HOT WATER (DHW)
SAN	HUNG SANITARY DRAIN
SAN	BURIED SANITARY DRAIN
STM	HUNG STORM DRAIN
STM	BURIED STORM DRAIN
	VENT (PLUMBING)
G	NATURAL GAS LINE (LOW PRESSURE 7" WC)
G	FUTURE NATURAL GAS LINE (LOW PRESSURE 7" WC)
	PIPE CUT
	CUT
	PIPE UP
	PIPE DOWN
	SANITARY ROUGH-IN
	UNION
	DIELECTRIC CONNECTION
	CAP OR PLUG
	SHUT-OFF VALVE
	PRESSURE REDUCING VALVE OR REGULATOR
P	PRESSURE GAUGE COMPLETE WITH SHUT-OFF VALVE
	FLOOR DRAIN
	HUB DRAIN
	ROOF DRAIN
	TRAP
	CLEAN OUT
	BACKFLOW PREVENTER
	GAS OR WATER METER
NFHB	NON-FREEZE HOSE BIBB
FE	FIRE EXTINGUISHER COMPLETE WITH WALL BRACKET CHUBB MODEL 10ABC
T	THERMOSTAT
	STARTER
	DIRECTION OF AIR FLOW
	CEILING MOUNTED EXHAUST FAN
	ROOF FAN
	CONVECTOR OR FORCE FLOW HEATER

KEYED NOTES

1. – ROOF OPENING COMPLETE WITH CONE FLASHING AND CAP FOR FUTURE 6" EXHAUST.
2. – ROOF OPENING COMPLETE WITH CONE FLASHING AND CAP FOR FUTURE 4" PLUMBING VENT.
3. – 3/4" VALVED AND CAPPED WATER LINE AT HIGH LEVEL FOR FUTURE CONNECTION BY TENANT.
4. – 4" BURIED SANITARY DRAIN BELOW SLAB. TERMINATE AT FINISHED FLOOR WITH FLOOR CLEANOUT.
5. – 4" ROOF DRAIN, 1 WEIR, ZURN MODEL ZACF-121-CER.
6. – 4" RAINWATER LEADER DOWN ON BACKSIDE OF COLUMN.
7. – NON-FREEZE HOSE BIBB, ZURN MODEL ZN-1320.
8. – FIRE EXTINGUISHER COMPLETE WITH WALL BRACKET, CHUBB MODEL 10ABC.
9. – FLOOR CLEANOUT COMPLETE WITH SEAL PLUG. REFER TO TYPICAL FLOOR CLEANOUT DETAIL AND PLUMBING FIXTURE SCHEDULE.
10. – 4" FLOOR DRAIN. REFER TO PLUMBING FIXTURE SCHEDULE.



COMPLETE WASHROOM DETAIL – A
SCALE: N.T.S.



WASHROOM PLUMBING ROUGH-IN DETAIL – B
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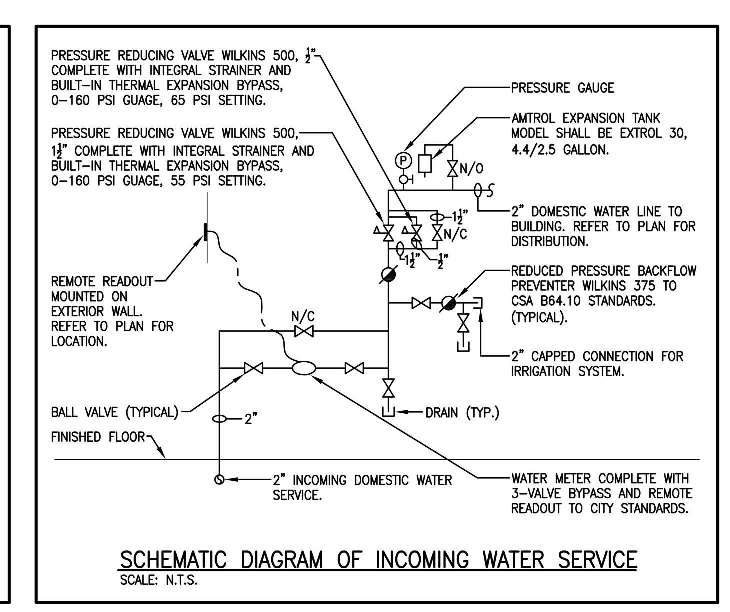
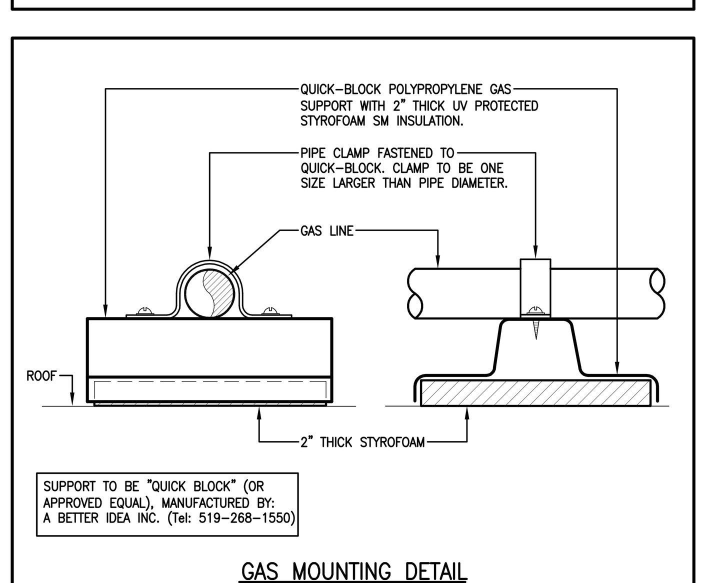
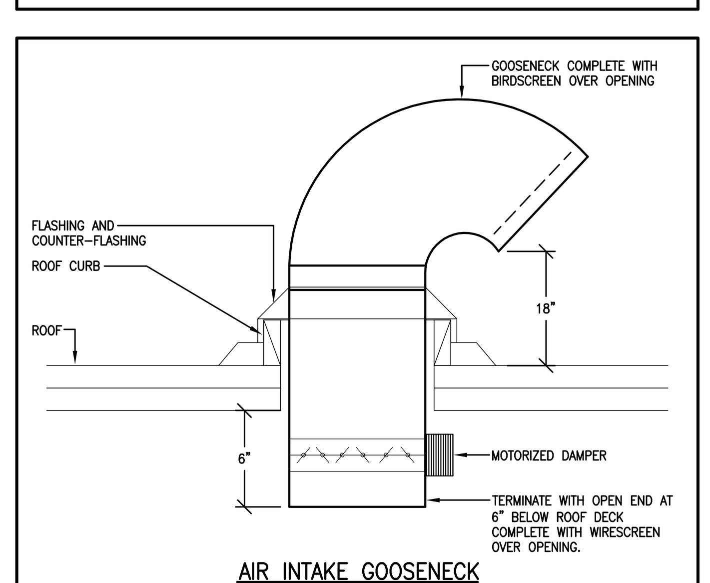


SCHEMATIC DIAGRAM OF INCOMING WATER SERVICE
SCALE: N.T.S.



GAS MOUNTING DETAIL
SCALE: N.T.S.



AIR INTAKE GOOSENECK
SCALE: N.T.S.

HVAC UNIT SCHEDULE

ITEM NO.	MANUFACTURER	MODEL	TONS (NOM.)	CFM	HEATING MBH INPUT (BTU/HR)	HEATING MBH OUTPUT (BTU/HR)	COOLING CAPACITY (BTU/HR)	COMPRESSOR QTY	COMPRESSOR RLA (TOTAL)	CONDENSER FANS QTY	CONDENSER FANS FLA (TOTAL)	BLOWER MOTOR HP	BLOWER MOTOR FLA	POWER EXHAUST QTY	POWER EXHAUST HP	POWER EXHAUST FLA (TOTAL)	MCA	UNIT VOLTAGE & PHASE	WEIGHT (LBS)	SERVICING	REMARKS
RTU-A	LENNOX	KGA092S4BH1J	7.5	3,000	240,000	192,000	88,900	2	8.8	2	2.0	2.0	2.7	---	---	---	15.0	575/3/60	1250	TENANT SPACE	LENNOX LANDMARK MODEL KG ROOFTOP UNIT COMPLETE WITH 14" HIGH CURB, R-410A REFRIGERANT, 7-DAY PROGRAMMABLE THERMOSTAT HONEYWELL TB8220U WITH 50' OF PLENUM-RATED WIRE, RELIEF AIR DAMPER, ECONOMIZER, AND WEATHER-PROOF DISCONNECT SWITCH.
RTU-B	LENNOX	KGA060S4BH1J	5	2,000	150,000	120,000	61,800	1	5.7	1	1.0	1.5	2.4	---	---	---	11.0	575/3/60	808	TENANT SPACE	

FAN SCHEDULE

ITEM NO.	MANUFACTURER	MODEL	CFM	MIN. SP	FAN HP	UNIT VOLTAGE & PHASE	ROOF OPENING SIZE	LOCATION	WEIGHT (LBS)	REMARKS
EF-1	DELHI	307	525	1/2"	1/4	120/1/60	---	MECH/ELEC ROOM	75	SEE NOTES: 1,2,3,4,5,6,7

NOTES:
1. BIRD SCREEN.
2. REVERSE-ACTING THERMOSTAT.
3. BACKDRAFT DAMPER.
4. MANUAL STARTER WITH PILOT LIGHT (WIRING BY DIVISION 16).
5. WEATHER-PROOF DISCONNECT SWITCH (WIRING BY DIVISION 16).
6. COMPLETE WITH ROOF CURB.
7. FAN TO BE INTERLOCKED WITH MOTORIZED DAMPERS.

PLUMBING FIXTURE SCHEDULE

ITEM NO.	EQUIPMENT	DESCRIPTION	COLD WATER	HOT WATER	DRAIN	MANUFACTURER/ MODEL
FD	FLOOR DRAIN	ø6" NICKEL BRONZE ROUND STRAINER COMPLETE WITH TRAP PRIMER CONNECTION.	---	---	4"	ZURN ZN415B-P-ø6
FCO	FLOOR CLEANOUT	ø5" NICKEL BRONZE ROUND FLOOR CLEANOUT COMPLETE WITH SEAL PLUG.	---	---	---	ZURN ZXN-1612-SP
RD	ROOF DRAIN	ø12" CONTROL-FLO ROOF DRAIN FOR DEAD LEVEL CONSTRUCTION COMPLETE WITH DURA-COATED CAST IRON BODY, 1 WEIR CONTROL-FLO, INTEGRAL MEMBRANE FLASHING CLAMP/GRAVEL GUARD, ALUMINUM DOME, UNDERDECK CLAMP, STATIC EXTENSION, AND ROOF SUMP RECEIVER. ALL DATA SHALL BE VERIFIED PROPORTIONAL TO FLOW RATES.	---	---	4"	ZURN ZACF121-CER
NFHB	NON-FREEZE HOSE BIBB	"ANTI-SIPHON" AUTOMATIC DRAINING WALL HYDRANT FOR FLUSH INSTALLATION COMPLETE WITH COPPER CASING, ALL BRONZE INTERIOR PARTS, 3/4" MALE PIPE THREAD INLET, NICKEL BRONZE BOX AND HINGED COVER WITH OPERATING KEY LOCK.	3/4"	---	---	ZURN Z1320

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Issue:	Rev:	Date:	Issue / Revision:	By
1		Aug 19/10	Issued for Permit	LEH

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PROFESSIONAL ENGINEER – L.S. PINKUS – MEMBER 11460 – SASKATCHEWAN – 10/8/19

LKM PROJECT No.: 2010-503222

Project: FAITHFULL AVENUE
SASKATOON, SASKATCHEWAN

Drawing Name: FLOOR PLAN - MECHANICAL

Proj no.:	2010-503222	Date:	
Drawn by:	CN	Scale:	1/8" = 1'-0"
Checked by:	LH/TC	Drawing No.:	M01