	— SANITARY BELOW GRADE /		ROOM NUMBER (REFER TO
	FLOOR SANITARY ABOVE GRADE / FLOOR	102	ARCHITECTURAL DRAWINGS)
	<ul> <li>STORM BELOW GRADE / FLOOR</li> <li>STORM ABOVE GRADE / FLOOR</li> </ul>		REDUCE/ INCREASER UNION
GRS	GREASE INTERCEPTOR REMOTE SUCTION LINE	— <del>•</del> ———————————————————————————————————	BALL VALVE GATE VALVE
	DOMESTIC COLD WATER     DOMESTIC HOT WATER	<del>-</del>	CHECK VALVE (ARROW INDICATION OF FLOW)
	FILTERED COLD WATER LINE	<del>-</del> N-	DOUBLE CHECK VALVE ASSEMB ARROW INDICATES FLOW DIRECTION
110	DOMESTIC HOT WATER @110 ' F HOT WATER RECIRCULATION LINE	—-  <sub>6</sub> 7   <sub>6</sub> 7 —	DUAL CHECK VALVE
<u>—</u> О—	PIPE DOWN PIPE UP		REDUCED PRESSURE B.F.P. ARE INDICATES FLOW DIRECTION
RD •	ROOF DRAIN	G 	GAS PIPING GAS VALVE
<del></del>	ELECTRIC HEAT TRACING	WH <del>-×I</del>	WALL HYDRANT
<b></b>	HUB DRAIN	+ -	TEE FITTING
Q	FLOOR DRAIN	8I <del></del>	LINE CLEANOUT FLOOR CLEAN OUT
♦	FUNNEL FLOOR DRAIN	1	NOTE BUBBLE INDICATING THAT DRAWING NOTE APPLIES. REFER NOTES
— <b></b> SP	DRY-TYPED SIDEWALL SPRINKLER HEAD	$\bowtie$	THERMOSTAT MIXING VALVE
⊗ SP	DRY-TYPE PENDANT SPRINKLER HEAD	M	WATER METER
♦ SP	SEMI-RECESSED SPRINKLER HEAD	P	TRAP PRIMER
○ SP	UPRIGHT SPRINKLER HEAD	<u></u> 000	FILTRATION SYSTEM
•→ FW-1	PEX SUPPLY PIPING EQUIPMENT CONNECTION POINT. FW-1: FEED MANIFOLD (13mm UNO)	⊗ <sub>FEA</sub>	MULTI-PURPOSE ABC DRY CHEMICAL FIRE EXTINGUISHER 2A:10BC RATING
FW-1	PEX SUPPLY PIPING MANIFOLD OR BUILT UP DISTRIBUTION POINT FW-1: FILTERED WATER #1	CTE	CONNECT TO EXISTING

NOTE: NOT ALL SYMBOLS APPLY, CONTRACTOR TO REFER TO FLOOR PLANS.

	HVAC	LEGEN	D
	SQUARE SUPPLY AIR DUCT UP		VOLUME DAMPER
	SQUARE SUPPLY AIR DUCT DOWN	VD	BACK DRAFT DAMPER
	SQUARE RETURN OR EXHAUST AIR DUCT UP	BDD	SPLITTER DAMPER
	SQUARE RETURN OR EXHAUST AIR DUCT DOWN	SD	FIRE DAMPER
	ROUND RETURN OR EXHAUST AIR DUCT UP	FD	FIRE FLAP
	ROUND RETURN OR EXHAUST AIR DUCT DOWN	—— FF	UNDER CUT DOOR 19mm
	FLEXIBLE DUCT	U/C —	SUPPLY AIR A. INDICATES TYPE OF DIFFUSER. B. INDICATES SIZE OF DIFFUSER & NECK
$\sim$ $\sim$		A.	(150Ø NECK) C. INDICATES CAPACITY FOR EACH
150Ø	NEW RIGID DUCT	B. C.	
— EX-150Ø —	EXISTING RIGID DUCT	A — B	RETURN AIR A. INDICATES TYPE GRILLES/REGISTERS B. INDICATES SIZE OF GRILLES/REGISTERS
	BAFFLE ONE SIDE OF DIFFUSER	•	
T	THERMOSTAT (ELECTRIC OR PNEUMATIC) G-GUARD	OBD	OPPOSED BLADE DAMPER
Н	HUMIDISTAT	S	TEMPERATURE SENSOR
©	CO2 SENSOR	<u> </u>	CONTROL DAMPER
102	ROOM NUMBER (REFER TO ARCHITECTURAL DRAWINGS)	1	NOTE BUBBLE INDICATING THAT A DRAWING NOTE APPLIES. REFER TO NOTES
• ¥	SPRINKLER HEAD - PENDANT / SIDEWALL	0 @	SPRINKLER HEAD - UPRIGHT / CONCEALED

	DRAWING LIST
DRAWING NO.	DRAWING NAME
M1	DRAWING LIST AND MECHANICAL LEGENDS
M2	DETAILS
M3.0	PLUMBING & DRAINAGE DEMOLITION LAYOUT
M3.1	PLUMBING PLAN
M3.2	SANITARY PLAN
M4.0	HVAC DEMOLITION LAYOUT
M4.1	HVAC LAYOUT
M5	ROOF PLAN
M6	SCHEDULES
M7	MECHANICAL SPECIFICATIONS



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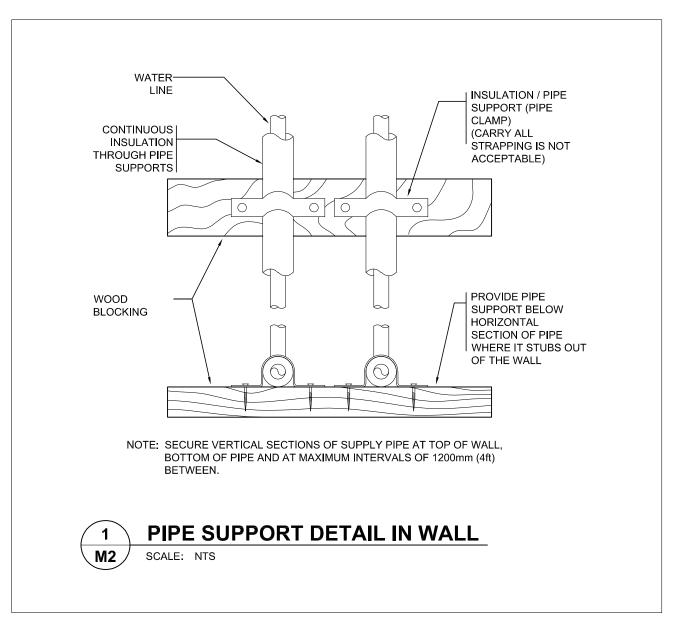
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-	2	2021-07-15	NOC #1	RS		
-	1	2021-04-22	ADDENDUM #2	RS		
-	#	Date	Description	Dwn		
Ī	DRAWING TITLE:					

DRAWING LIST & LEGENDS

PRINT DATE: 2021/07/21 DRAWING NO: DRAWN BY: CHECKED BY:

PROJECT NO:



AIR FLOW

DIRECTION

SUPPLY AIR DUCT

WITH MASTIC SEALER, MARK LOCATION OF BALANCING DAMPER

> AFTER BALANCING DUCT TO DIFFUSER-

TYPICAL BRANCH TAKE-OFF

SPIN IN COLLAR WITH DAMPER AND

SCALE: NTS

100X100X300 LONG |

WOLMANIZED WOOD SLEEPERS

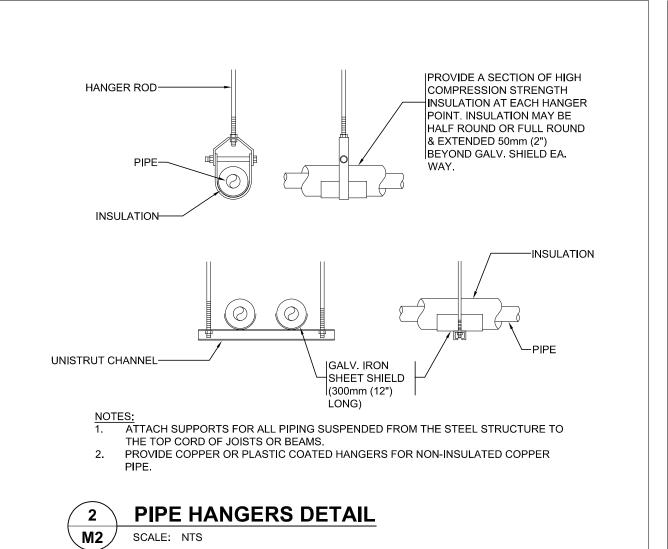
STRAPPED TO GAS PIPING @

3m INTERVALS ALONG ENTIRE

LENGTH OF GAS PIPING

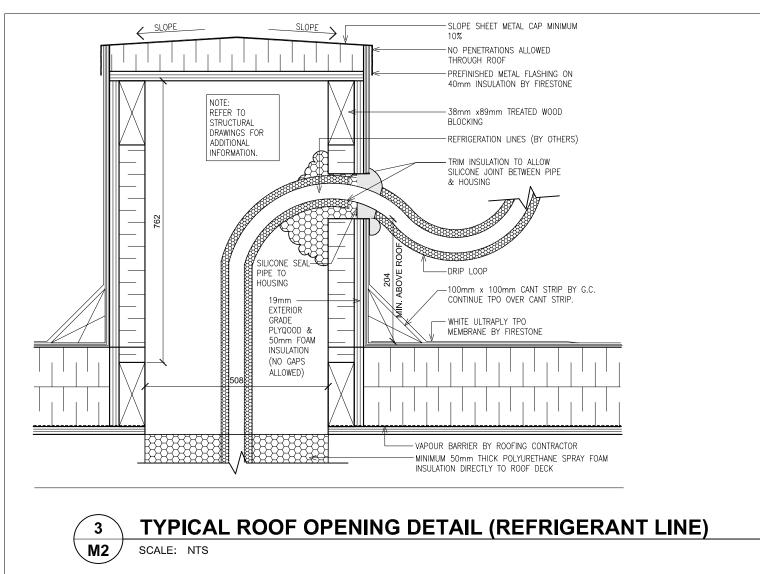
VOLUME EXTRACTOR. SEAL JOINT

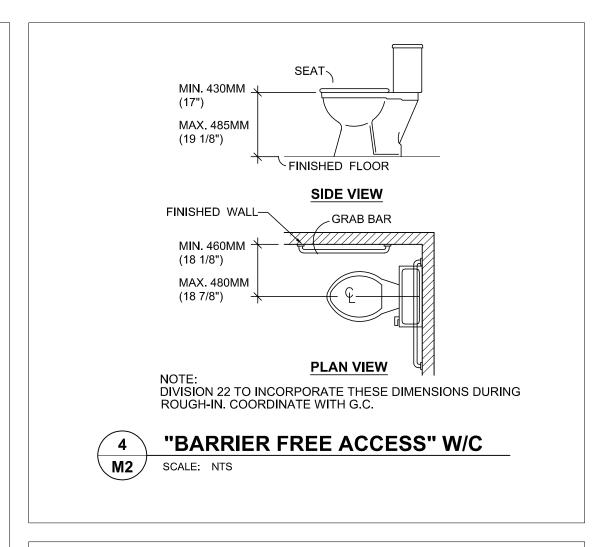
**M2** ∕ SCALE: NTS

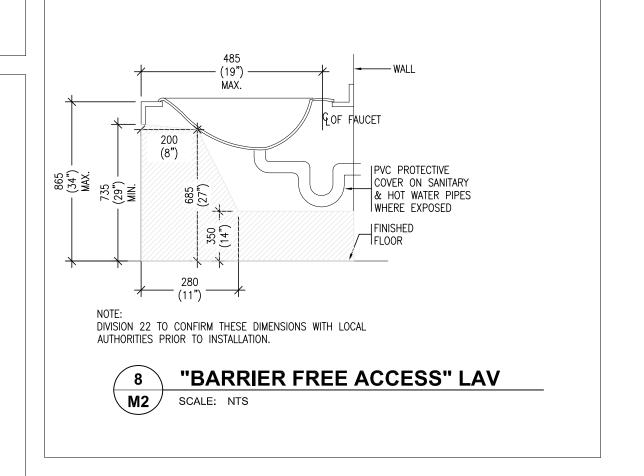


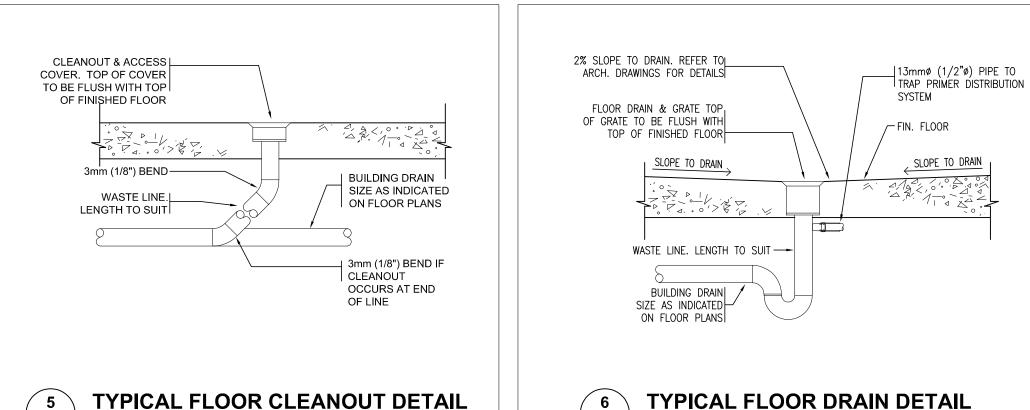
6—

7



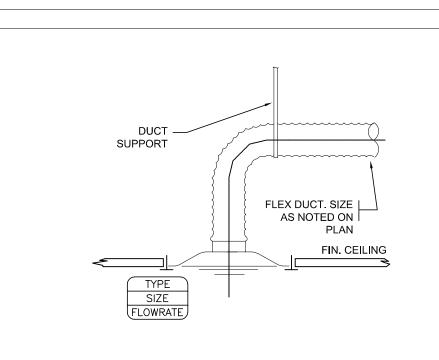




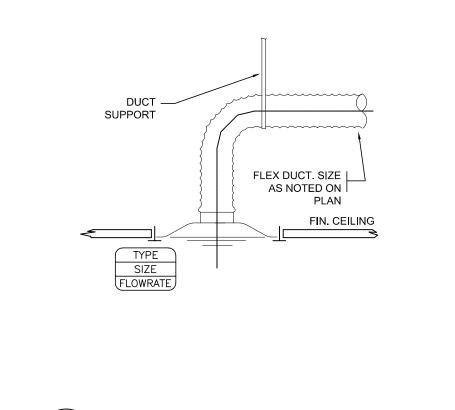


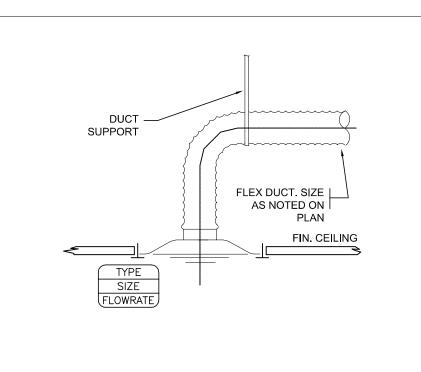
50X300 WOOD

」50 THK STYROFOAM

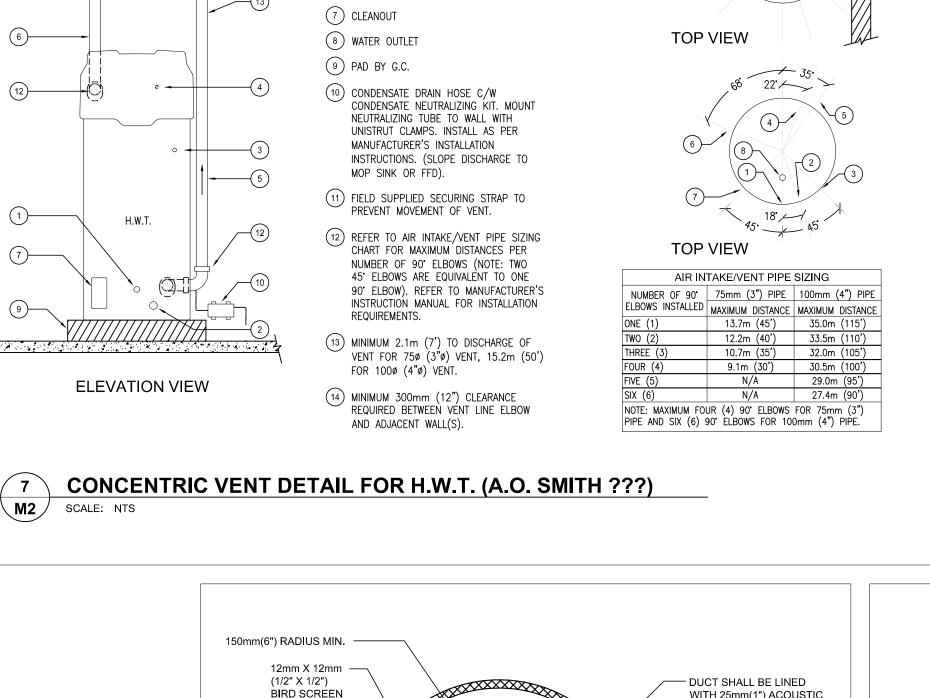


M2 / SCALE: NTS









1) WATER INLET

(3) T&P RELIEF

(4) GAS CONNECTION

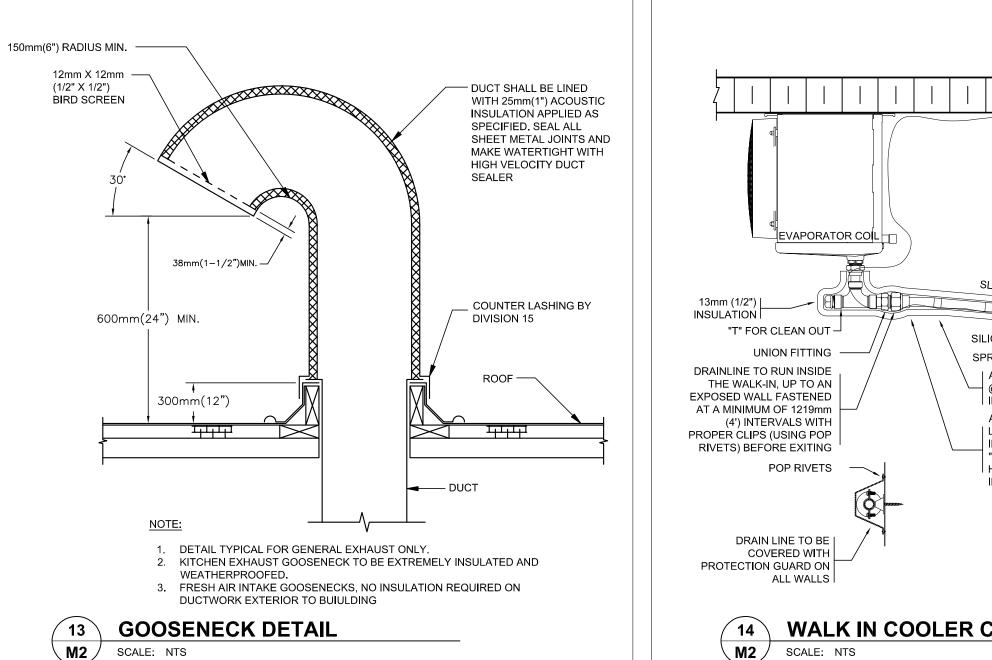
(5) 75ø (3"ø) OR 100ø (4"ø) ULC S636

(6) 75ø (3"ø) OR 100ø (4"ø) ULC S636

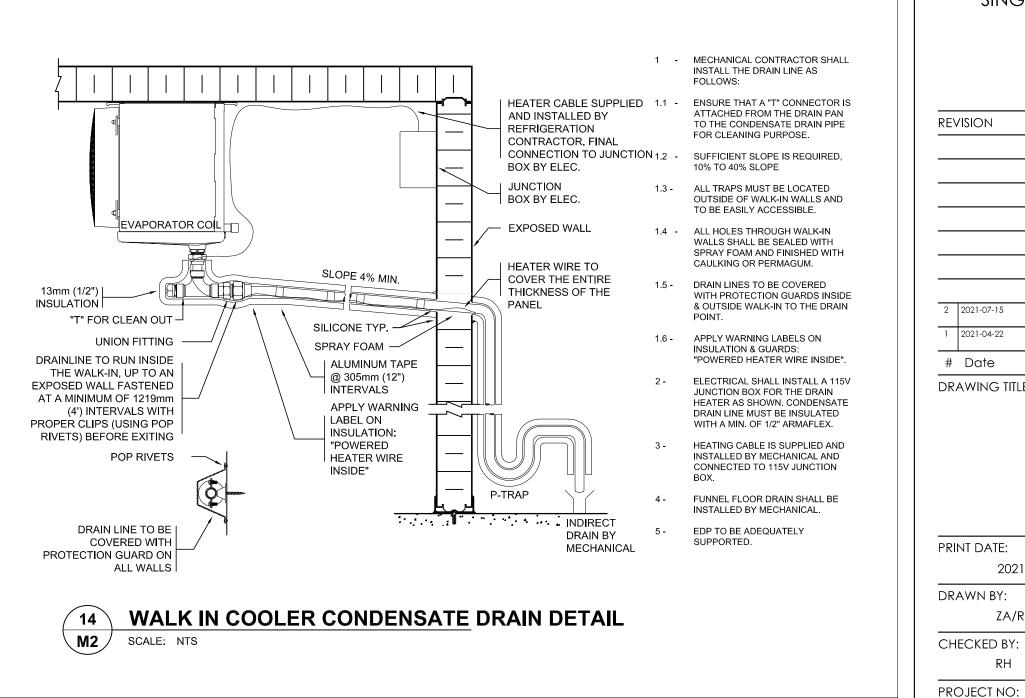
LISTED PVC/CPVC AIR INTAKE.

LISTED PVC/CPVC AIR VENT.

2 DRAIN CONNECTION



25mm MAX \_\_\_\_\_\_6





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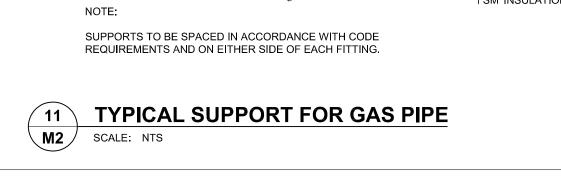
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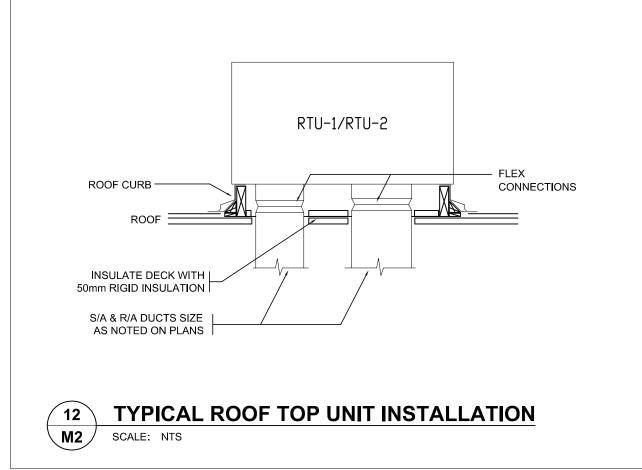
DETAILS

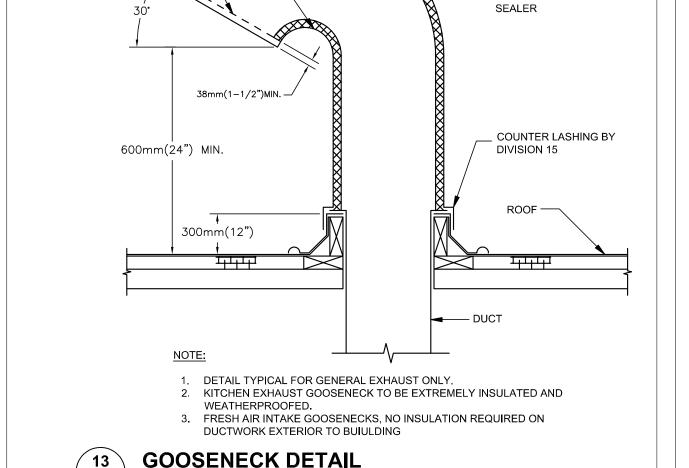
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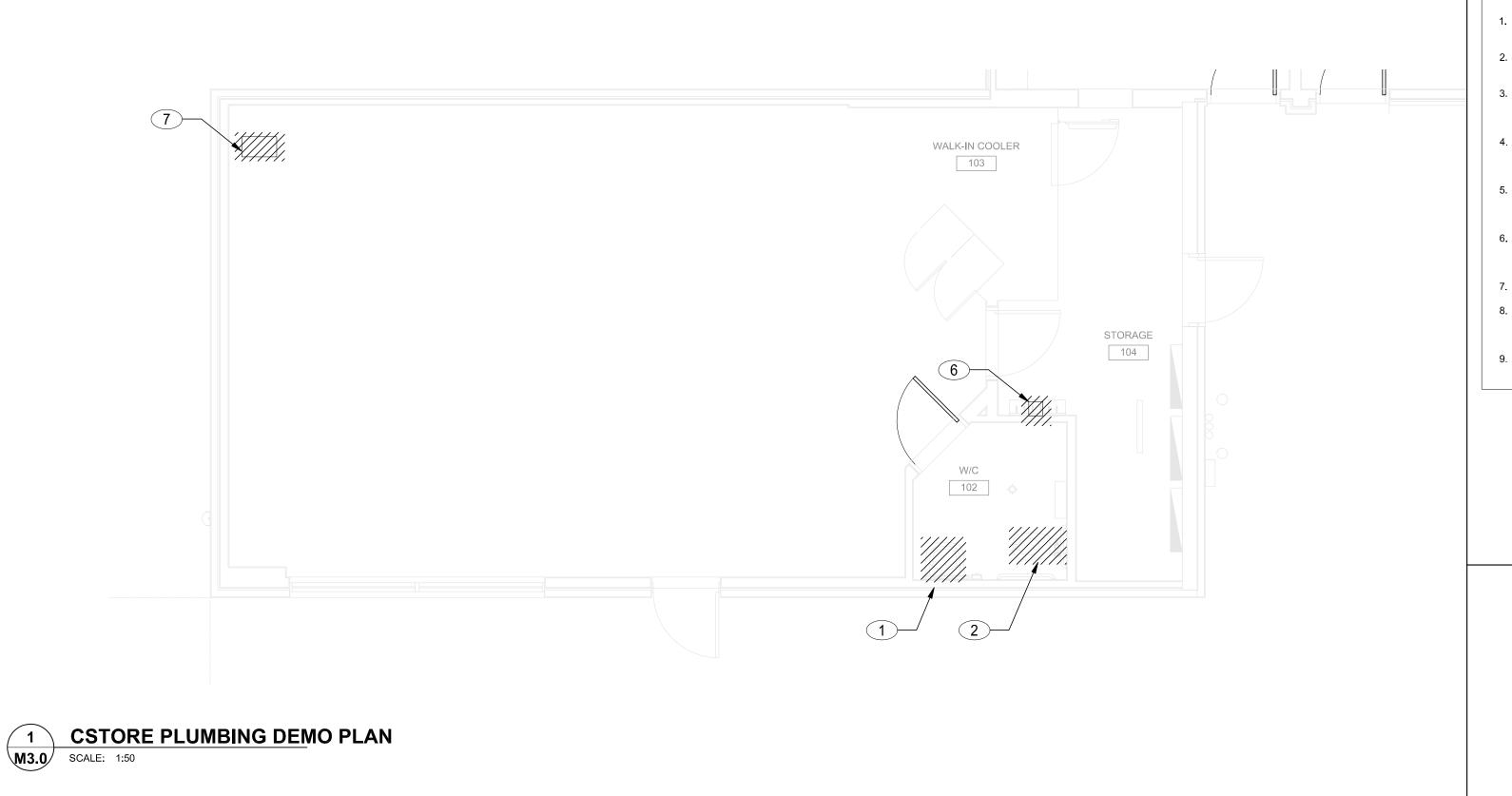
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SCALE: NTS



## **DRAWING NOTES**

- 1. EXISTING LAVATORY TO BE REMOVED COMPLETE WITH ALL ASSOCIATED APPURTENANCES; DOMESTIC HOT AND COLD WATER SUPPLY LINES, SANITARY LINE, VENT LINE, ETC. TO BE REMOVED IN THEIR ENTIRETY.
- 2. EXISTING WATER CLOSET TO BE REMOVED COMPLETE WITH ALL ASSOCIATED APPURTENANCES; DOMESTIC COLD WATER SUPPLY LINE, SANITARY LINE, VENT LINE, ETC. TO BE REMOVED IN THEIR ENTIRETY.
- EXISTING SHOWER HEAD AND SHOWER DRAIN TO BE REMOVED COMPLETE WITH ALL ASSOCIATED APPURTENANCES; DOMESTIC HOT AND COLD WATER SUPPLY LINES, SANITARY LINE, VENT LINE, ETC. TO BE
- 4. EXISTING HOT WATER TANK TO BE REMOVED COMPLETE WITH ALL ASSOCIATED APPURTENANCES; DOMESTIC HOT AND COLD WATER SUPPLY LINES, RELIEF DRAIN LINE, VENT LINE, GAS LINE, ETC. TO BE REMOVED IN THEIR
- 5. EXISTING WATER FILTRATION AND TREATMENT TO BE REMOVED COMPLETE WITH ALL ASSOCIATED APPURTENANCES; DOMESTIC COLD WATER SUPPLY LINE, SANITARY LINE, VENT LINE, ETC. TO BE REMOVED IN
- 6. EXISTING JANITOR FAUCET TO BE REMOVED COMPLETE WITH ALL ASSOCIATED APPURTENANCES; DOMESTIC COLD WATER SUPPLY LINE, SANITARY LINE, VENT LINE, ETC. TO BE REMOVED IN THEIR ENTIRETY.
- 7. EXISTING PLUMBING DISTRIBUTION SERVING COFFEE MACHINE TO BE REMOVED

MOTEL XXX

- 8. PRICE IN TENDER FOR THE REMOVAL OF SIX (6) WASHROOMS IN THE EXISTING MOTEL AREA; WATER CLOSET, LAVATORY, SHOWER. REMOVE ALL ALL ASSOCIATED APPURTENANCES; DOMESTIC HOT AND COLD WATER SUPPLY LINES, SANITARY LINES, VENT LINES, ETC IN THEIR ENTIRETY.
- 9. REMOVE EXISTING PLUMBING CONNECTIONS SERVING THE CLOTHES WASHER IN THEIR ENTIRETY, DOMESTIC HOT AND COLD WATER CONNECTIONS, DRAIN LINE, VENT LINE, ETC.

## **GENERAL NOTES**

- A. GENERAL NOTE ALL DIMENSIONS ARE SHOWN IN MILLIMETERS ONLY.
- B. ALL PIPING; SANITARY, VENT, DOMESTIC WATER, GAS, ETC AND ANY EQUIPMENT IN THE BASEMENT LEVEL BELOW TO BE REMOVED IN THEIR ENTIRETY



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PLUMBING & DRAINAGE DEMOLITION LAYOUT

PRINT DATE:

PROJECT NO:

DRAWING TITLE:

DRAWING NO: DRAWN BY: CHECKED BY:

20-XXXX

MOTEL PLUMBING DEMO PLAN
SCALE: 1:50

### PLUMBING NOTED DEVICES

- 1. CONNECT NEW 38Ø DOMESTIC COLD WATER LINE TO EXISTING CAPPED CONNECTION IN THIS AREA AND EXTEND UP TO CEILING SPACE AND AS INDICATED.
- 2. SUPPLY AND INSTALL NEW DOMESTIC HOT WATER TANK COMPLETE WITH ALL ASSOCIATED APPURTENANCES INSTALL ON SHELF SUPPORTED FROM WALL, PROVIDE 25Ø DOMESTIC COLD WATER LINE DOWN TO HOT WATER HEATER AND 25Ø DOMESTIC HOT WATER LINE UP FROM HOT WATER HEATER TO HIGH LEVEL. REFER TO DETAIL ON DRAWING M2
- 3. SUPPLY AND INSTALL NEW FLOOR MOUNTED FLUSH TANK WATER CLOSET <u>WC-1</u>, PROVIDE 13Ø DOMESTIC COLD WATER LINE DOWN IN WALL TO SERVE NEW WATER CLOSET.
- 4. SUPPLY AND INSTALL NEW SHOWER HEAD, PROVIDE 13Ø DOMESTIC HOT AND COLD WATER LINES COMPLETE WITH THERMOSTATIC MIXING VALVE TO SERVE NEW SHOWER HEAD.
- 5. SUPPLY AND INSTALL NEW WALL MOUNTED LAVATORY COMPLETE WITH FIXTURE CARRIER, PROVIDE 13Ø DOMESTIC HOT AND COLD WATER LINES DOWN IN WALL TO SERVE NEW LAVATORY FAUCET.
- 6. SUPPLY AND INSTALL NEW SINK, PROVIDE 13Ø DOMESTIC HOT AND COLD WATER LINES DOWN IN WALL TO SERVE THE NEW SINK AND EXTEND 13Ø DOMESTIC HOT AND COLD WATER LINES IN WALL OVER TO NEW MOP SINK
- 7. SUPPLY AND INSTALL NEW MOP SINK ON FLOOR, EXTEND NEW 13Ø DOMESTIC HOT AND COLD WATER LINES FROM SINK <u>S-1</u> IN WALL TO SERVE NEW MOP SINK FAUCET.
- 8. PROVIDE NEW 32Ø CAPPED AND VALVED DOMESTIC COLD WATER LINE IN CEILING SPACE TO SERVE FUTURE

### PLUMBING GENERAL NOTES

- A. GENERAL NOTE ALL DIMENSIONS ARE SHOWN IN MILLIMETERS ONLY.
- B. GENERAL NOTE DIVISION 22 TO PURGE AND FLUSH ALL LINES PRIOR TO HOOK UP.
- C. GENERAL NOTE THERMOSTATIC MIXING VALVE TO BE MOUNTED BELOW SINK. SET FOR 43°C (110°F)
  AND CONNECT TO THE HOT WATER INLET OF THE FAUCET FOR ALL LAVATORY L-1, L-2 AND SHOWER
- D. GENERAL NOTE ALL OPENINGS THAT RESULT FROM THE REMOVAL OF EQUIPMENT, DEVICES AND/OR SERVICES SHALL BE INFILLED BY THE GENERAL CONTRACTOR. DIVISION 22 IS RESPONSIBLE FOR ANY CUTTING AND PATCHING REQUIRED TO SUIT THE INSTALLATION OF ANY NEW EQUIPMENT. ALL PATCHING SHALL BE WITH NEW MATERIALS TO SUIT EXISTING AND NEW CONSTRUCTION TO THE
- SATISFACTION OF THE ENGINEER.

  E. GENERAL NOTE -PROVIDE WOOD BLOCKING AS REQUIRED FOR FIXTURES AND PIPING.
- F. GENERAL NOTE ALL WATER LINES AND ACCESS POINTS ON THE WALL SHOULD PROPERLY TAGGED AND LABELED.
- G. GENERAL NOTE ALL DOMESTIC HOT, COLD AND RECIRC. PIPING TO BE INSULATED.



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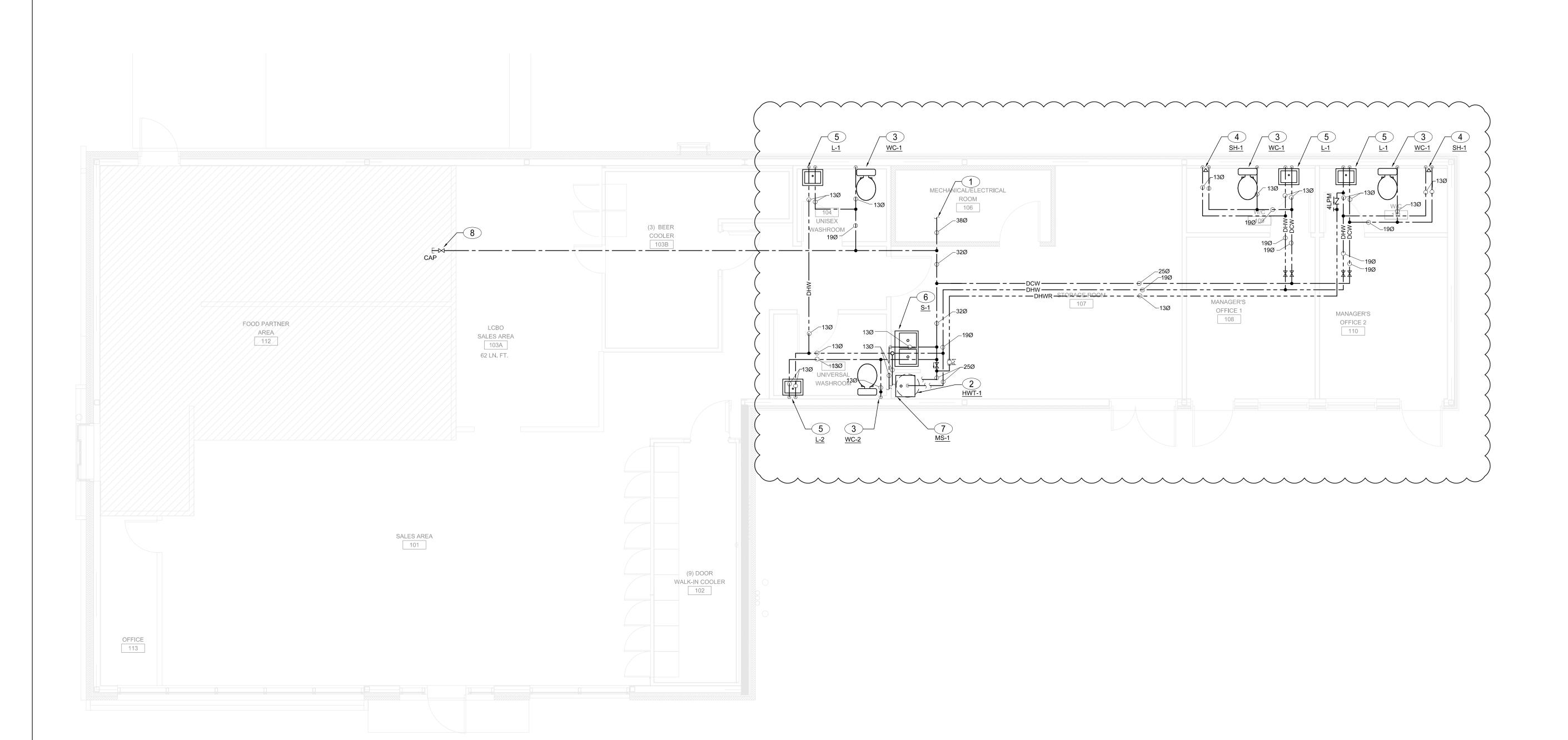
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PLUMBING PLAN

M3.1 SCALE: 1:50

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1 2021-04-22 ADDENDUM #2 RS

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PLUMBING PLAN

& NOTES

PRINT DATE:

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M3.1

# SANITARY GENERAL NOTES WRAPPED AND MARKED. HAND OVER(WATER, DRAINAGE), BY DIVISION 22. SANITARY VENT LINES ARE NOT SHOWN. VENT LINES TO BE INSTALLED IN NEAREST WALL, AND CONNECTED TO EXISTING BUILDING VENT SYSTEM. VENTING PROTOCOL IS TO BE IN ACCORDANCE WITH ONTARIO BUILDING CODE. **SANITARY NOTED DEVICES** APPROXIMATELY THIS LOCATION. VERIFY EXACT LOCATION OF EXISTING ON SITE. 2. NEW 32Ø SANITARY LINE DOWN FROM LAVATORY TO BELOW GRADE, 32Ø VENT LINE UP FROM LAVATORY TO CEILING SPACE. 3. NEW 75Ø SANITARY LINE DOWN FROM WATER CLOSET TO BELOW GRADE, 50Ø VENT LINE UP FROM LAVATORY TO CEILING SPACE. 4. NEW 32Ø SANITARY LINE DOWN FROM SINK, RUN IN WALL AND DROP TO BELOW GRADE AS INDICATED, 32Ø VENT LINE UP FROM SINK TO CEILING SPACE. 5. NEW 50Ø SANITARY LINE DOWN FROM MOP SINK TO BELOW GRADE, 32Ø VENT LINE UP FROM MOP SINK TO CEILING SPACE. NEW FUNNEL FLOOR DRAIN OUTSIDE THE WALK IN COOLER. REFER TO DETAIL ON DRAWING M2. MAINTAIN MINIMUM 3000mm FROM FRESH AIR INTAKES. ROOF PENETRATION TO BE SEALED WEATHER TIGHT. 9. PROVIDE ALL NEW FLOOR DRAINS TO BE COMPLETE WITH TRAPS AND TRAP PRIMERS. BUILDING OPENINGS OR OUTDOOR AIR INTAKES. 11. NEW VENT LINE TERMINATED ON ROOF WITH VENT TERMINAL FOR FUTURE TENANT USE. TERMINATE 450mm BELOW FINISHED DECK. ∕ 75Ø FD Ø100 SANITARY @ 1% SLOPE 25Ø —

- A. LOCATION, SIZE, AND DIRECTION OF FLOW FOR SANITARY LINES SHOULD BE CONFIRMED BY THE CONTRACTOR BEFORE COMMENCING CONSTRUCTION. STATUS OF INVERTS SHOULD ALSO BE
- B. ALL NEW DRAIN AND VENT LINES IN UNCONDITIONED SPACE TO BE SUITABLY HEAT TRACED,
- C. ALL PLUMBING AND SANITARY LINES TO BE PURGED AND FLUSHED PRIOR TO COMPLETION AND

- CONNECT NEW 100Ø SANITARY LINE TO EXISTING 100Ø CAPPED SANITARY CONNECTION AT

- 6. DISCHARGE PRESSURE RELIEF LINE FROM DOMESTIC HOT WATER HEATER OVER MOP SINK.
- . NEW INSULATED CONDENSATE DRAIN FROM COOLER EVAPORATOR UNIT, DISCHARGE OVER
- 8. PROVIDE A COMPLETE AND OPERATIONAL VENTING SYSTEM FOR ALL NEW FIXTURES, FIXTURES TO BE VENTED ACCORDING TO OBC AND LOCAL CODES HAVING JURISDICTION. COMBINE VENTS IN CEILING SPACE AND TERMINATE VENT THRU ROOF COMPLETE WITH NEW VENT TERMINAL,
- 10. PROPOSED LOCATION OF NEW VENT LINE UP TO ROOF. TERMINATE ON ROOF WITH VENT TERMINAL FOR SIZE REFER TO FLOOR PLAN. KEEP VENT TERMINAL MINIMUM 3000mm FOR ANY



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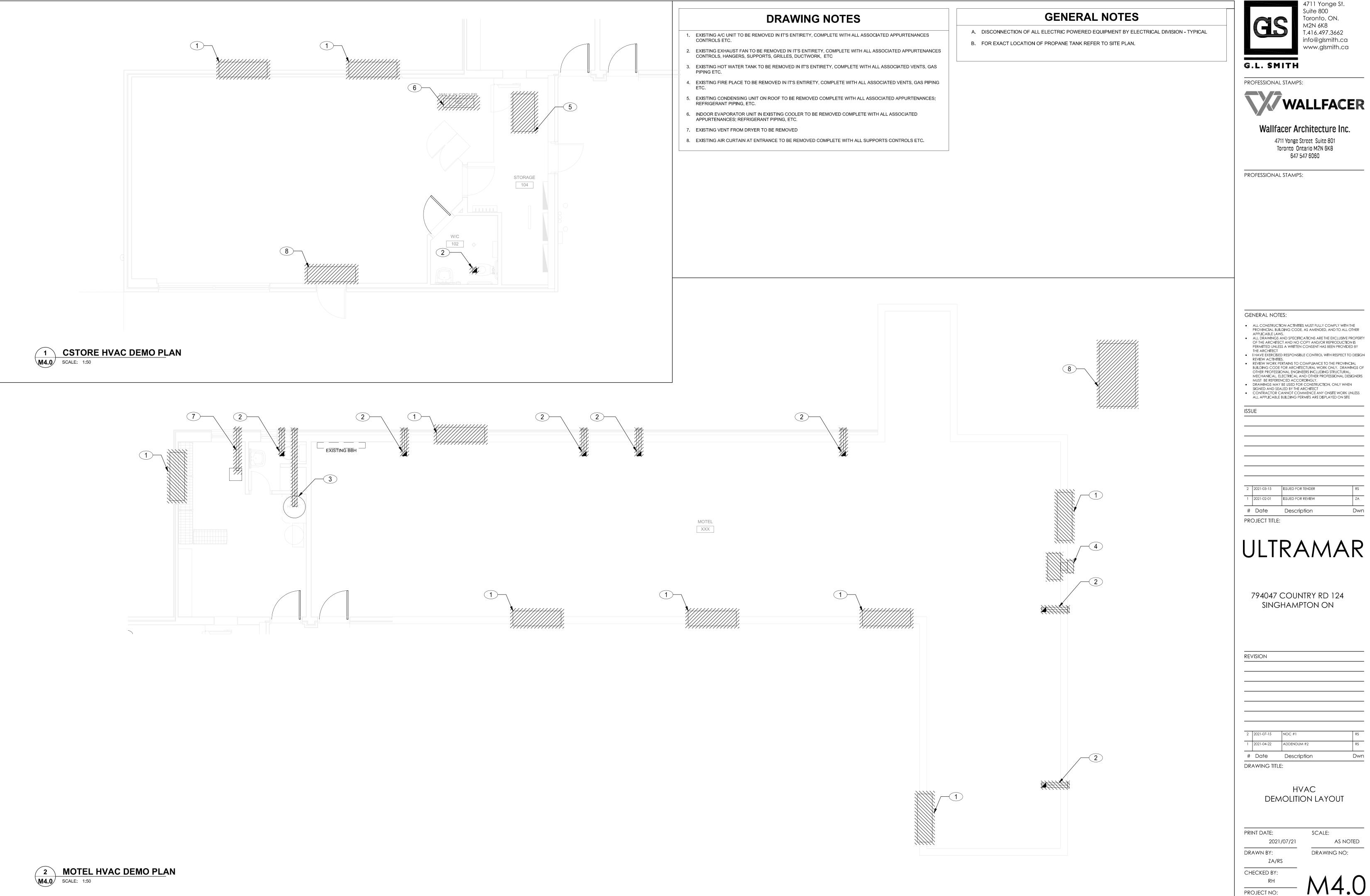
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SANITARY PLAN & NOTES

DRAWING NO:

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Toronto, ON. M2N 6K8 T.416.497.3662 info@glsmith.ca www.glsmith.ca

G.L. SMITH

PROFESSIONAL STAMPS:



Wallfacer Architecture Inc. 4711 Yonge Street Suite 801

Toronto Ontario M2N 6K8 647 547 6060

PROFESSIONAL STAMPS:

GENERAL NOTES:

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# Date Description

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HVAC DEMOLITION LAYOUT

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## **HVAC NOTED DEVICES**

- 1. NEW ROOF-TOP UNIT ON ROOF REFER TO MECHANICAL ROOF PLAN SUPPLY AND RETURN DUCT RISER SIZES TO MATCH UNIT OPENINGS.
- 2. SUPPLY AND INSTALL NEW AIR CURTAIN, INSTALL AIR CURTAIN ABOVE DOOR AS PER MANUFACTURER RECOMMENDATIONS. WIRING BY ELECTRICAL DIVISION.
- 3. INSTALL NEW 150Ø INTAKE / EXHAUST CONCENTRIC GAS VENT FROM DOMESTIC HOT WATER TANK UP THRU ROOF. SIZE AND INSTALL AS PER MANUFACTURERS RECOMMENDATIONS. MAKE ROOF PENETRATION WEATHER TIGHT.
- 4. SUPPLY AND INSTALL NEW EXHAUST FAN COMPLETE WITH HANGARS SUPPORTS, CONTROLS, ETC ROUTE DUCT FROM NEW EXHAUST FAN UP THROUGH ROOF AND TERMINATE MINIMUM 450mm ABOVE FINISHED ROOF COMPLETE WITH RAIN CAP. FOR DUCT SIZES REFER TO FLOOR PLAN. FAN TO BE INTERLOCKED WITH WASHROOM OCCUPANCY SENSOR.
- 5. SUPPLY AND INSTALL NEW EXHAUST FAN COMPLETE WITH HANGARS SUPPORTS, CONTROLS, ETC. ROUTE DUCT FROM NEW EXHAUST FAN UP THROUGH ROOF AND TERMINATE MINIMUM 450mm ABOVE FINISHED ROOF COMPLETE WITH RAIN CAP. FOR DUCT SIZES REFER TO FLOOR PLAN. EXHAUST FAN TO BE CONTROLLED BY REVERSE ACTING THERMOSTAT SET
- SUPPLY AND INSTALL NEW BASEBOARD HEATER COMPLETE WITH INTEGRATED THERMOSTATS ON WALL BELOW WINDOW. INSTALL HEATER APPROXIMATELY 100mm A.F.F. WIRING BY ELECTRICAL DIVISION.
- SUPPLY AND INSTALL NEW FAN FORCED HEATER COMPLETE WITH INTEGRATED THERMOSTATS RECESSED IN WALL BELOW. INSTALL HEATER APPROXIMATELY 300mm A.F.F. WIRING BY ELECTRICAL DIVISION.
- 8. SUPPLY AND INSTALL NEW INDOOR EVAPORATOR UNIT ON WALL COMPLETE WITH ALL ASSOCIATED APPURTENANCES HANGARS, SUPPORTS, CONTROLS, REFRIGERATION LINES ETC. INSTALL AS PER MANUFACTURERS RECOMMENDATIONS AND PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
- 9. NEW REFRIGERATION LINES UP THRU ROOF TO CONDENSING UNIT ABOVE, FOR CONTINUATION REFER TO ROOF PLAN.
- 10. SUPPLY AND INSTALL NEW THERMOSTAT, INSTALL THERMOSTAT 1200mm A.F.F. AT THIS LOCATION, COORDINATE EXACT LOCATION ON SITE WITH OWNER. IF THERMOSTAT IS MORE THEN 1500mm FROM PROPOSED LOCATION OBTAIN ENGINEER OF RECORD APPROVAL.
- 11. COIL THERMOSTAT WITH 9000mm AT CONTROL WIRING IN A POLY BAG AS SUSPEND FROM UNIT FOR FUTURE TENANT RELOCATION.
- 12. PROVIDE NEW 400 X 400 ACOUSTICALLY LINED SUPPLY.
- 13. 600 X 600 DUCTED RETURN GRILLE TO BE COMPLETE WITH ACOUSTICALLY LINED DUCTED RETURN PLENUM.
- 14. ROUTE NEW SUPPLY DUCT UP INTO JOIST AND EXTEND AS INDICATED TO FACILITATE CROSS WITH NEW RETURN DUCT. COORDINATE EXACT ROUTING ON SITE.
- 15. NEW REFRIGERATION LINES FROM ROOF TO SERVE WALK IN COOLER. ALL PIPING AND CONNECTION TO EVAPORATOR BY REFRIGERANT CONTRACTOR.FOR WALK IN COOLER, CONDENSER AND EVAPORATOR SPECIFICATIONS REFER TO ARCHITECTURAL DRAWINGS.
- 16. SUPPLY AND INSTALL NEW CEILING MOUNTED RETURN GRILLES ON BOTH SIDE OF WALL COMPLETE WITH DUCTED RETURN PLENUM, FOR SIZE REFER TO FLOOR PLAN.

# **HVAC GENERAL NOTES**

- A. ALL 90° SUPPLY & RETURN ELBOWS SHALL HAVE SMOOTH RADIUSES. SQUARE ELBOWS SHALL BE COMPLETE WITH TURNING VANES.
- B. UNLESS NOTES OTHERWISE, MEASUREMENTS ARE IN METRIC UNITS, SUCH AS LITERS PER SECOND (AIR FLOW) AND MILLIMETERS (DISTANCE).
- C. FOR VENTS AND DUCTWORK PASSING THROUGH FIRE RATED ASSEMBLY, DIVISION 23 SHALL PROVIDE FIRE CLOSURE(S) SUCH AS DAMPERS, CAULKING, AND FIRE DONUTS BY LOCAL BUILDING CODE. ALL FIRE CLOSURE RATINGS SHALL MATCH THE RATING OF THE FIRE RATED ASSEMBLIES THROUGH WHICH THEY ARE DESIGNED TO PASS THROUGH.
- D. ALL THERMOSTATS SHALL BE SITUATED AT A HEIGHT OF 1200mm AFF, AT THE LOCATION SPECIFIED ON PLAN. COORDINATION BETWEEN THE PROFESSIONS IS RECOMMENDED TO AVOID ANY POSSIBLE OBSTRUCTIONS.
- RECOMMENDED TO AVOID ANY POSSIBLE OBSTRUCTIONS.

  E. ALL SUPPLY AIR DUCTWORK SHALL BE WRAPPED WITH 25MM THERMAL DUCT
- F. REFER TO ELECTRICAL DRAWINGS FOR ELECTRICAL-RELATED INFORMATION IN REGARDS TO MECHANICAL EQUIPMENT.
- G. ACOUSTIC LINED SUPPLY & RETURN DUCTWORK FROM RTU UNITS TO HAVE CLEAR FREE AREA INSIDE DIMENSION.
- H. ALL EXHAUST DUCTWORK TO BE THERMALLY INSULATED.

INSULATOR.



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HVAC PLAN & NOTES

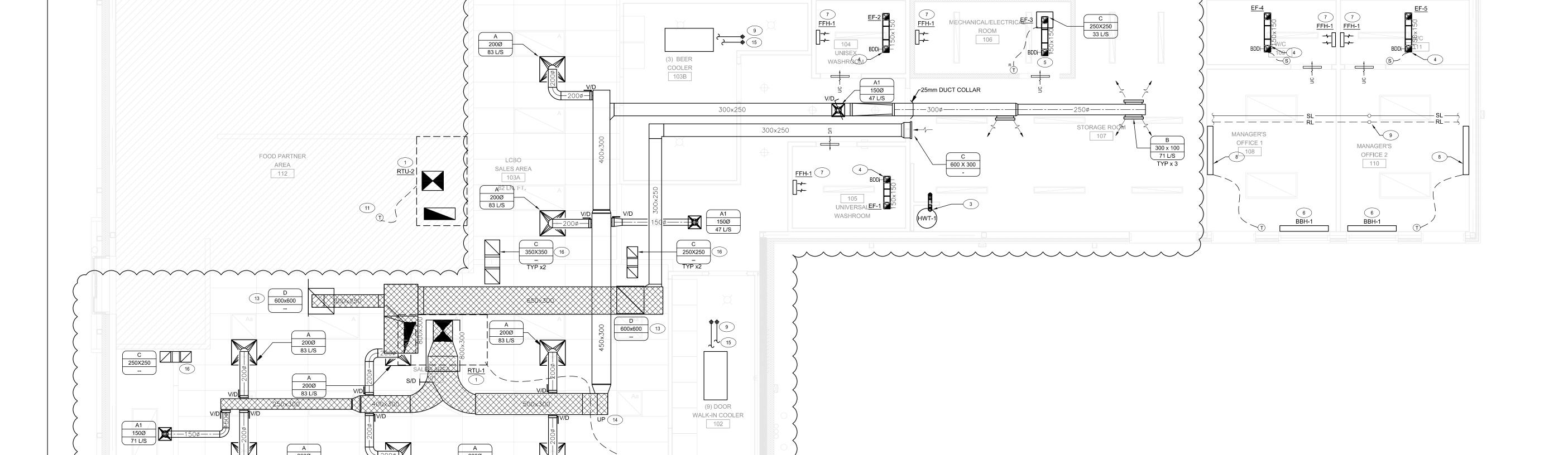
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AIR CURTAIN

# **ROOF NOTED DEVICES**

- WITH GOOSENECK, GOOSENECK OUTLET TO BE MINIMUM 600mm ABOVE FINISHED ROOF AND COMPLETE WITH BIRD SCREEN.
- 2. SUPPLY AND INSTALL NEW ROOF TOP UNIT COMPLETE WITH NEW 450mm ROOF

NEW 150mm EXHAUST DUCT FROM CEILING SPACE BELOW, TERMINATE ON ROOF

- NEW 100mm INTAKE / EXHAUST CONCENTRIC GAS VENT FROM <u>HWT-1</u> BELOW INSTALL AND TERMINATE ON ROOF AS PER MANUFACTURERS RECOMMENDATIONS.
- 4. NEW REFRIGERATION LINES FROM CEILING SPACE OF FLOOR BELOW UP TO ROOF THROUGH NEW REFRIGERATION DOG HOUSE.
- 5. SUPPLY AND INSTALL NEW CONDENSING UNIT CU-1 ON ROOF.
- 6. SUPPLY AND INSTALL NEW CONDENSING UNIT ON ROOF SERVING NEW BEER COOLER BELOW. REFRIGERANT CONTRACTOR TO PROVIDE AND INSTALL ALL REFRIGERANT PIPING BETWEEN INDOOR EVAPORATOR UNIT AND CONDENSING UNIT. FOR WALK IN COOLER, CONDENSER AND EVAPORATOR SPECIFICATIONS REFER TO ARCHITECTURAL DRAWINGS.
- 7. NEW PLUMBING VENT TERMINAL FROM BELOW. (TYPICAL)
- 8. NEW 32Ø PROPANE GAS LINE UP TO ROOF FROM RELOCATED PROPANE STORAGE TANK BELOW - REFER TO SITE PLAN FOR EXACT LOCATION OF RELOCATED PROPANE TANK. PRICE IN TENDER FOR ALL ASSOCIATED COSTS PERTAINING TO THE RELOCATION OF THE EXISTING PROPANE TANK.
- 9. NEW 25Ø PROPANE GAS LINE DOWN TO CEILING SPACE BELOW TO SERVE DOMESTIC HOT WATER TANK.
- 10. NEW 25Ø PROPANE GAS LINE LINE DOWN TO CEILING SPACE BELOW TO SERVE FUTURE TENANT EQUIPMENT.
- 11. REWORK THE EXISTING GAS VENTS FROM BELOW TO SUIT NEW ROOF. CONTRACTOR TO VERIFY EXACT ROUTING ON SITE.

# **GENERAL NOTES**

- A. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
- B. REFER TO STRUCTURAL DRAWING FOR ROOFTOP UNIT SETTING AND INSTALLATION DETAIL.
- C. FOR EXACT LOCATION, CONFIGURATION AND SIZE OF DUCTWORK REFER TO HVAC PLAN AND SHOP DRAWING.
- D. ALL MECHANICAL EQUIPMENT AND INSTALLATION TO MEET CSA, BCBC AND STANDARD REQUIREMENTS.
- E. CONTRACTOR SHALL REFER TO RTU-1 MANUFACTURER'S STRUCTURAL INSTALLATION.
- F. ALL PENETRATION THROUGH WALL/FLOOR REQUIRE FINE SEPARATION (WALL OR CEILING/FLOOR) BY MECHANICAL COMPONENTS TO BE PROTECTED BY FINE DAMPER OR APPROVED FINE BLOCK MATERIALS.
- G. CAP ALL EXHAUST FAN GOOSENECKS AND ALSO FAN VENTS WITH VENT ROOF CAP.

J. ROUTE CONDENSATE DRAIN AS REQUIRED PER BC BUILDING CODE.

- H. CONTRACTOR SHALL PROVIDE GAS LINE, PRESSURE REGULATOR, BALL VALVE, PIPING SUPPORTS IN ACCORDANCE WITH NFPA 54AND /OR REQUIRED PER BCBC.
- ADJUST PRESSURE REGULATOR AS REQUIRED PER EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTION.
- K. GAS PIPING SIZED FOR MAXIMUM 0.25PSI 0.5PSI IN ACCORDANCE WITH NFPA. VERIFY EXACT PRESSURE WITH LOCAL CODE UTILITY PRIOR TO COMMENCEMENT OF ANY WORK. ADJUST PIPE SIZES IF REQUIRED FOR LOCAL PRESSURE.
- ADJUST PRESSURE REGULATOR AS REQUIRED PER EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS. M. VENT DISCHARGE TO PENETRATE THROUGH ROOF, VENT DISCHARGE TO BE AT LEAST 3000mm AWAY FROM ANY FRESH
- AIR INTAKES, TO AVOID ODOR CONTAMINATION CONCERNS, VENTING PROTOCOLS TO BE IN ACCORDANCE WITH



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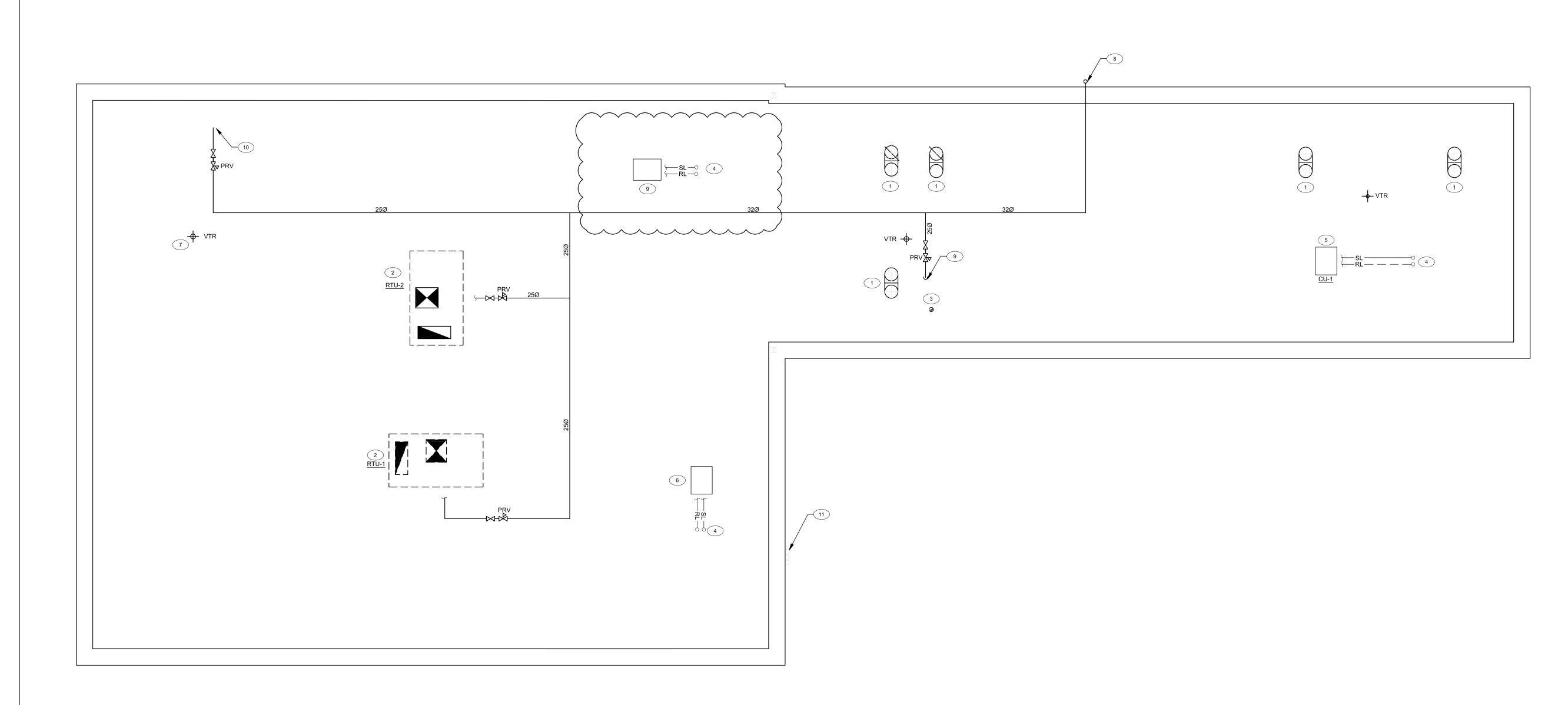
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**ROOF PLAN** 

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# PACKAGED ROOF TOP UNIT

	SERVICE/					SUPPLY AIR		O/A			HEATING COIL					COOLING COIL				EL	ECTRICAL				PHYSICAL		
TAG	SERVICE/ LOCATION	TYPE	MANUFACTURER	MODEL	FLOW (CFM)	ESP ("W.G.)	MOTOR (HP)	FLOW (CFM)	EAT (°F)	LAT (°F)	INPUT (MBH)	OUTPUT (MBH)	EFF.	EAT (°F) DB/WB	LAT (°F) DB/WB	EER	GROSS (MBH)	NET (MBH)	V/Ph/Hz	MCA	МОСР	EMERGENCY (Y/N)	LENGTH (IN.)	WIDTH (IN.)	HEIGHT (IN.)	SOUND POWER (dBA)	WEIGHT (LBS)
RTU-1	CONVENIENCE / LCBO (ROOFTOP)	ROOFTOP UNIT	LENNOX	LGH074H4T	2400	0.50	0.67	400			108	86	0.8			-	-	-	575/3/60	11	15	N	85.25	47	46.875	82	939
RTU-2	FUTURE TENANT - TDL (ROOFTOP)	ROOFTOP UNIT	LENNOX	LGH036H4E	1200	0.50	0.33	240			65	52	0.8				-	-	575/3/60	8	15	N	85.25	47	46.875	75	760

NOTES

INTERNALLY ISOLATED BLOWER AND MOTOR

CONVIENIENCE OUTLET, SEPERATLEY WIRED

GASKETED & HINGED DOUBLE WALLED ACCESS DOORS WITH LEVER HANDLES

PROPANE KIT

					EXHAUST FAN	SCHEDULE					
TAG	SERVICE	TYPE	MANUFACTURER	MODEL	FLOW (CFM)	ESP ("W.G.)	RPM	MOTOR (HP)	VOLTAGE	WEIGHT (LBS)	REMARKS
EF-1, EF-2, EF-4, EF-5	NEW WASHROOMS	EXHAUST FAN	GREENHECK	SP-AP	105	0.25	1550	0.1	115/1/60	26	
EF-3	ELECTRICAL ROOM	EXHAUST FAN	GREENHECK	SP-A	200	0.25	1470	0.1	115/1/60	59	

REMARKS

NOTES

- THIS CONTRACTOR SHALL VERIFY THE VOLTAGES OF ALL MECHANICAL EQUIPMENT WITH DIVISION 26 PRIOR TO ORDERING.

- ALL ROOF MOUNTED FANS TO BE SUPPLIED C/W ROOF CURB, BIRD-SCREENS & WEATHERPROOF HOUSING.

	AIR TERMINALS SCHEDULE	
TAG	DESCRIPTION	NOTES
A / A1	PRICE MODEL 'SPD', 24x24 FACE SIZE ALUMINUM CONSTRUCTION ADJUSTABLE SQUARE PLAQUE CEILING DIFFUSERS, REFER TO DRAWING FOR SIZES. REFER TO ARCHITECTURAL CEILING PLANS FOR MOUNTING REQUIREMENTS. DIFFUSERS TAGGED A1 TO BE 12"X12" FACE SIZE	1
В	PRICE MODEL '520D'. DOUBLE DEFLECTION @ 45°, STEEL CONSTRUCTION, 20mm SPACING C/W OPPOSED BLADE DAMPER. FRONT BLADE PARALLEL TO LONG DIMENSION. REFER TO DRAWING FOR GRILLE SIZES. REFER TO ARCHITECTURAL CEILING PLANS FOR MOUNTING REQUIREMENTS.	1
С	PRICE MODEL 'ATG1/ATG2'. REFER TO DRAWING FOR TRANSFER GRILLE SIZES. REFER TO ARCHITECTURAL CEILING PLANS FOR MOUNTING REQUIREMENTS.	1,4
D	PRICE MODEL '80D'. REFER TO DRAWING FOR GRILLE SIZES. REFER TO ARCHITECTURAL CEILING PLANS FOR MOUNTING REQUIREMENTS.	1
NOTES:	•	
1.	CONCEALED FASTENERS	
2.	C/W OPPOSED BLADE DAMPER	
3.	RETURN DIFFUSER USED FOR LOW VELOCITY SUPPLY (KITCHEN MUA ONLY)	
4.	CUSTOM COLOR TO SUIT ARCHITECT	

			NEW S	PLIT SYS	STEM				
	SERVICE/		MANUFACTU-RE		coo	LING		ELECTRICAL	
TAG	LOCATION	TYPE	R R	MODEL	FLOW (CFM)	втин	V/Ph/Hz	MCA	MOCP
AC-1 & AC-2	MANAGER OFFICES	SPLIT SYSTEM	MITSUBISHI	MSZ-FH12NA	398	12,000	208/1/60	1	-
CU-1	ROOF	CONDENSING UNIT	MITSUBISHI	MXZ-3C24NAHZ	-	23,600	208/1/60	30	40

1 UNIT TO BE COMPLETE WITH LOW AMBIENT KIT CAPABLE OF OPERATION TO -40°F

No.	MANUFACTURER	MODEL	WATTAGE	LENGTH	VOLTAGE	THERMOSTAT	MOUNTING HEIGHT	REMARKS
FFH-1	STELPRO	RWF0501	500	225mm	120/1/60	INTEGRATED	12" AFF	1, 2
BBH-1	STELPRO	DBI12101	1000	1200mm	120/1/60	INTEGRATED	4" AFF	1
OTES & REMAR	RKS							

			PLUMBI	NG FIXTU	JRE SCHE	DULE				
TYPE	SPECIFICATION	TRIM	TRAPS & SUPPLIES EQUAL TO	CW	FW	HW	110	WASTE	VENT	REMARKS
MS-1	MOP SINK	FIAT TSB300	2" P-TRAP INTEGRAL STAINLESS STEEL DRAIN BODY, P-TRAP	1/2"	_	1/2"	_	2"	1 1/2"	REFER TO MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION REQUIREMENTS.
S-1	2-COMPARTMENT SINK WITH WALL MOUNT SWIVEL ARM & PRE-RINSE ASSEMBLY W/ ADD-ON, 12" SPOUT, TEE, ADAPTERS & MOUNTING KIT	M.K.E. EPS-36	1 1/2" P-TRAP C/W CLEANOUT	1/2"	_	1/2"	_	1 1/4"	1 1/4"	PRE-RINSE, FAUCETS & SINK TO BE INSTALLED BY DIV.22. CONFIRM FAUCET LOCATION BEFORE ROUGH-IN.
L-1	VITREOUS CHINA TYPE WITH REAR OVERFLOW - AMERICAN STANDARD, DECLYN 0321026.020		*TECK 33T290-1 OFFSET WASTE FLEXIBLE CHROME SUPPLIES WITH SCREW STOPS	1/2"	_	1/2"	_	1 1/4"	1 1/4"	PROVIDE MIXING VALVE ZURN ZW3870XLT*. INCLUDES PROTECTIVE COVER FOR EXPOSED PIPEWORK P-TRAP, HW & CW ANGLE STOPS AND SUPPLIES.
L-2	BARRIER FREE, VITREOUS CHINA TYPE WITH REAR OVERFLOW - AMERICAN STANDARD, MURRO 0955.001EC	TOTO TEL105-D10E#CP* 1.9 LPM, HYDRO-GENERATOR POWERED C/W 4" COVERPLATE THP3158#CP*	*TECK 33T290-1 OFFSET WASTE FLEXIBLE CHROME SUPPLIES WITH SCREW STOPS	1/2"	_	1/2"	-	1 1/4"	1 1/4"	PROVIDE CARRIER ZURN Z-1231* & MIXING VALVE ZURN ZW3870XLT*.
WC-1	ELONGATED WATER CLOSET, VITREOUS CHINA, SYPHON JET ACTION BOWL WITH FLANGE BOLTS, BOLT CAPS, FLOOR FLANGE & GASKET. -AMERICAN STANDARD, MADERA 3461001.020*	TOTO TET1LA32#CP* HYDRO-GENERATOR POWERED	INTEGRAL	1"	-	-	-	3"	2"	PROVIDE SEAT CENTOCO #500STSCC*
WC-2	VITREOUS CHINA, SYPHON JET ACTION BOWL	ZURN ZEMS6000AV-HET-YO* C/W P6000-HW6* HARDWIRE CONVERTER	INTEGRAL	1"	_	_	_	3"	2"	PROVIDE WHEELCHAIR SEAT CENTOCO #820STS* SEE MANUFACTURER'S INSTUCTIONS FOR AUTOMATIC CONTROL NOTES.

DENOTES THIS FIXTURE & ASSOCIATED FLUSH VALVE, FAUCET, CARRIER, ETC SHALL BE PURCHASED BY DIVISION 22 THROUGH HAINES, JONES & CADBURY CORPORATION (HJCC).

ALL FIXTURES SHALL BE SUPPLIED & INSTALLED BY DIVISION 22 UNLESS OTHERWISE NOTED. MAKE ALL CONNECTIONS WITH BRAIDED FLEXIBLE HOSE.

	NEW HOT WATER HEATER SCHEDULE												
No.	MANUFACTURER & MODEL	CAPACITY (GAL)	GAS INPUT (BTU/H)	TYPE	GAS PRESSURE (in.W.C.)	VOLTAGE	WATT/AMP	DIMENSIONS IN	WEIGHT (LBS)				
HWT-1	AO SMITH BTH-120	40 US GAL	120,000	PROPANE		120V/1Ø/60H	_		<del></del>				
NOTES & REMARKS													
ŀ	HOT WATER TANK TO BE COMPLETE WITH PR	OPANE KIT AND NEUTRALIZATION KIT.											



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### GENERAL

#### 1.1. CONTRACTOR RESPONSIBILITIES

- THE RESPONSIBILITY AND SCOPE OF EACH SUB-TRADE RESTS SOLELY WITH THE CONTRACTOR, EXTRAS WILL NOT BE CONSIDERED BASED ON THE GROUNDS OF DIFFERENCE IN INTERPRETATION OF SPECIFICATIONS AND DRAWINGS AS TO WHICH TRADE INVOLVED SHALL PROVIDE CERTAIN SPECIALTIES OR MATERIALS.
- 1.1.2 CONTRACTOR TO MAKE CERTAIN THAT ALL ADDENDA TO THE SPECIFICATIONS AND ALL REVISIONS TO THE DRAWINGS ARE INCLUDED IN THEIR QUOTATION.
- CONTRACTOR TO ENSURE THAT DELIVERY TIME OF ALL MECHANICAL EQUIPMENTS WILL NOT CAUSE DELAY IN THE SCHEDULING OF THIS PROJECT.
- ALL WORK AND MATERIALS SHALL COMPLY WITH THE CURRENT EDITION OF THE ONTARIO BUILDING CODE, LOCAL BUILDING REGULATIONS, AND ALL CODES AND AUTHORITIES HAVING JURISDICTION.
- PRIOR TO SUBMITTING A TENDER. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES AND BRING THEM TO THE ATTENTION OF THE ENGINEER FURTHER, THE CONTRACTOR IS TO EXAMINE THE SITE, CONDITIONS AND ALL ASSOCIATED SCOPES OF WORK THAT FALL UNDER THE CONTRACT AND DETERMINE THAT ALL COSTS FOR THE WORK ARE FULLY COVERED IN HIS TENDER SUBMISSION
- DURING CONSTRUCTION THE CONTRACTOR SHALL ENSURE THAT ALL MATERIAL AND EQUIPMENT IS NEW AND MEETS OR EXCEEDS THE QUALITY AS SET OUT IN THE SPECIFIED EQUIPMENT AND APPLICABLE CODES. THE INSTALLATION OF ALL EQUIPMENT AND MATERIALS SHALL BE OF THE HIGHEST WORKMANSHIP AND QUALITY. ATTENTION TO DETAIL, SAFETY, NEATNESS, ACCESS FOR MAINTENANCE, DURABILITY, ETC. IS EXPECTED AND REQUIRED.
- IF THE OWNER OR THEIR REPRESENTATIVE PRE-PURCHASES OR SUPPLIES EQUIPMENT OR MATERIALS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE INSTALLATION OF THEM AS PER MANUFACTURERS RECOMMENDATIONS. OWNER FURNISHED ITEMS MUST MEET THE COMPLIANCE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- ALL EQUIPMENT IS TO BE SET STRAIGHT AND SQUARE WITH THE STRUCTURE. PIPING AND DUCTWORK IS TO BE INSTALLED PARALLEL OR AT RIGHT ANGLES TO ALL WALLS AND STRUCTURAL MEMBERS, HANGER RODS, EQUIPMENT BASES. SUPPORTS AND ISOLATION ARE TO BE SET PLUMB AND SQUARE AND IN VERTICAL ALIGNMENT WHERE APPLICABLE. ALL WORK IS TO BE NEAT AND CLEAN UPON COMPLETION.
- THE CONTRACTOR SHALL MAKE NECESSARY REVISION, ALTERATIONS, CHANGES AND ADDITIONS TO ANY AND ALL WORK AS REQUIRED TO ACCOMMODATE OTHER TRADES SCOPE OF WORKS INCLUDING, ARCHITECTURAL, STRUCTURAL AND ELECTRICAL WITHOUT COST TO THE
- 1.1.10. THE TERM "SUPPLY". "PROVIDE". "INSTALL" SHALL MEAN TO SUPPLY AND INSTALL ALL NECESSARY LABOUR, MATERIALS, TOOLS AND EQUIPMENT AS MAY 1.6.2. BF NFCESSARY TO INSTALL SAME FOR THE COMPLETE AND FUNCTIONAL OPERATION OF THE MECHANICAL SYSTEMS FOR THIS PROJECT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TRANSPORTATION AND PROTECTION OF ALL EQUIPMENT AND MATERIAL PROVIDED FOR THIS PROJECT UNTIL THE OWNER HAS ACCEPTED THE BUILDING. THIS SHALL INCLUDE STORAGE OF SAME ON SITE AND REMOVAL OF ALL MATERIALS AND REFUSE AS
- 1.1.12. PROVIDE ALL NECESSARY SCAFFOLDING, LADDERS, HOISTS, RIGGING, ETC. AS REQUIRED FOR THE INSTALLATION OF THE WORK WITHIN THIS SCOPE. ALL HOISTING, SUPPORTS, DELIVERY, ETC OF EQUIPMENT AND MATERIAL FOR THIS PROJECT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR.
- 1,1,13. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF THE BUILDING. WORK OF OTHERS, ETC, DURING THE COURSE OF CARRYING OUT THE WORK AS INVOLVED IN THIS CONTRACT. THE CONTRACTOR SHALL MAKE GOOD AND/OR 1.8. PAY FOR ANY DAMAGES SUSTAINED. THE OWNER RESERVES THE RIGHT TO BACKCHARGE THE CONTRACTOR FOR THE REPAIR AND/OR REPLACEMENT OF ANY DAMAGES.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS AND PAY FOR ALL NECESSARY FEES OR OTHER COSTS ASSOCIATED WITH CARRYING OUT THE WORK HEREIN. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANY AND ALL CERTIFICATES AS REQUIRED TO ENSURE THAT THE INSTALLATION IS IN CONFORMANCE WITH, AND HAS BEEN APPROVED BY ALL AUTHORITIES HAVING JURISDICTION. ANY REVISIONS AND/OR CHANGES REQUIRED BY THE AUTHORIZED INSPECTOR SHALL BE DONE WITHOUT CHARGE TO THE OWNER AND SHALL BE DONE SO AS NOT TO AFFECT SCHEDULE OR THE WORK OF OTHERS, ALL PERMITS SHALL BE POSTED IN A CONSPICUOUS PLACE 1.8.3. ON SITE. UPON COMPLETION THIS CONTRACTOR IS TO PROVIDE THE OWNER WITH A CERTIFICATE OF FINAL APPROVAL FROM ALL AUTHORITIES INVOLVED IN THE SCOPE OF THIS WORK
- 1,1,15. IN CARRYING OUT THE WORK THE CONTRACTOR SHALL USE ONLY FULLY QUALIFIED TRADESPEOPLE RECOGNIZED UNDER MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS AND LICENSING
- 1.1.16. THE CONTRACTOR IS TO PROVIDE ALL NECESSARY INFORMATION ON REQUIRED OPENINGS, SLEEVES, AND CHASES AS MAY BE REQUIRED FOR HIS WORK TO ALL 1.8.5. OTHER TRADES INVOLVED SO THAT THE WORK MAY BE DONE IN A TIMELY AND COST EFFECTIVE MANNER, FAILURE TO DO SO WILL RESULT IN ANY COSTS. BEING CHARGED BACK TO THE CONTRACTOR. ALL DRILLING FOR HANGER RODS. 1.8.6. BRACKETS, SUPPORTS, SLEEVES, ETC. SHALL BE BY THIS CONTRACTOR. 1.1.17. INSTALL ALL PIPING, DUCTWORK, EQUIPMENT, ETC. GENERALLY IN THE ROUTES
- AND LOCATIONS AS SHOWN ON THE DRAWINGS. INSTALL ALL MATERIAL AND EQUIPMENT CLOSE TO STRUCTURE TO MINIMIZE, SHAFTS, FURRINGS, ETC. PIPING AND DUCTWORK THAT IS NOT INSTALLED PROPERLY SHALL BE REMOVED AND RE-INSTALLED AT NO EXTRA COST.
- 1.1.18. THIS CONTRACTOR IS TO CO-ORDINATE THE DETAILED INSTALLATION OF THE DUCTWORK, PIPING AND EQUIPMENT WITH ALL CONDUIT, CABLE TRAYS, STRUCTURAL ELEMENTS. AND OTHER WORK OF THE OTHER TRADES. NO ADDITIONAL COSTS WILL BE CONSIDERED FOR CHANGES AS THE RESULT OF INTERFERENCE WITH THE WORK OF OTHERS. THIS INCLUDES ANY ADDITIONAL MATERIAL REQUIRED TO CORRECT MINOR JOB CONFLICTS FOR NORMALLY ACCEPTED PROCEDURES OF ANY AND ALL TRADES.
- 1.1.19. THIS CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF ALL NECESSARY ISOLATION VALVES, SPRING ISOLATORS, SHUT-OFFS, UNIONS, COUPLINGS, ETC. AS MAY BE REQUIRED FOR THE SAFE OPERATION AND CONTINUED MAINTENANCE OF ALL SYSTEMS AND EQUIPMENT. THIS SHALL INCLUDE ALL NECESSARY COMPONENTS AS MAY BE REQUIRED BY THE MANUFACTURER AS NOTED IN THEIR RESPECTIVE LITERATURE AND INSTALLATION DETAILS.
- 1.1.20. THE CONTRACTOR MAY USE EQUIVALENT EQUIPMENT AND MATERIALS FROM AN APPROVED MANUFACTURER OTHER THAN THAT SPECIFICALLY SPECIFIED. THE USE OF SAME DOES NOT RELIEVE THE CONTRACTOR FROM CONFIRMING TO OTHER TRADES ALL AFFECTED RELEVANT INFORMATION SUCH AS DIMENSIONS ELECTRICAL, WEIGHT, ETC. ANY NECESSARY REVISIONS AS A RESULT SHALL BE 1.11.1. PAID FOR BY THIS CONTRACTOR. IF THE PROPOSED EQUIPMENT OR NECESSARY MODIFICATIONS ARE NOT TO THE SATISFACTION OF THE ENGINEER THAT THE END RESULT WILL BE THE SAME THE CONTRACTOR SHALL PROVIDE THE SPECIFIED EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER.
- 1.1.21. ALL EQUIPMENT AND MATERIAL SPECIFIED AND NOTED ON THE DRAWINGS IS SET AS A MINIMUM STANDARD FOR THE CONTRACTOR TO WORK TO. ALL SUBMITTED TENDERS SHALL BE BASED ON MATERIAL AND EQUIPMENT AS SPECIFIED. EQUIPMENT AND MATERIAL SUPPLIERS OTHER THAN THOSE SPECIFIED SHALL BE ACCOMPANIED WITH WRITTEN SUBMISSION FOR CONSIDERATION AS AN EQUAL OR ALTERNATE ALONG WITH ANY COST SAVINGS THAT MAY BE REALIZED AS A RESULT OF USING THIS EQUIPMENT, SUBMISSION FOR CONSIDERATION AS AN EQUAL SHALL BE MADE, ALONG WITH TECHNICAL INFORMATION, A MINIMUM OF 2 DAYS BEFORE CLOSE OF TENDER.
- THE CONTRACTOR SHALL NOT USE THE PERMANENT HEATING SYSTEM FOR TEMPORARY HEATING WITHOUT WRITTEN PERMISSION FROM THE OWNER/ENGINEER, ANY EQUIPMENT THAT IS USED SHALL BE CLEANED LUBRICATED AND NEW FILTERS INSTALLED PRIOR TO TURNING OVER TO OWNER FOR COMPLETION.
- 1.1.23. BEFORE FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING, MAKE CERTAIN THAT ALL ITEMS CAN BE INSTALLED AS SHOWN ON THE DRAWINGS WITHOUT INTERFERENCE WITH THE STRUCTURE OR THE WORK OF OTHER TRADES. IF ANY MATERIALS ARE FABRICATED OR INSTALLED PRIOR TO THE INVESTIGATION AND REACHING OF A SOLUTION TO POSSIBLE INTERFERENCE PROBLEMS, NECESSARY CHANGES SHALL BE MADE AT THE CONTRACTOR'S

## 1.2. EXAMINATION OF WORK

- DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE. THE CONTRACT DOCUMENTS ESTABLISH SCOPE, MATERIAL AND QUALITY AND ARE 1.13.2. NOT DETAILED INSTALLATION INSTRUCTIONS.
- THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE BUILDING, STRUCTURE 1.13.3. ATTEND IMMEDIATELY AT NO COST TO OWNER, TO ANY AND ALL DEFECTS AND THE WORKS OF THE OTHER TRADES INVOLVED. THIS CONTRACTOR SHALL WORK AND CO-OPERATE WITH THE OTHER TRADES TO ENSURE A QUALITY INSTALLATION, AND MINIMIZE CONFLICTS.

### 1.3. <u>INTENT</u>

IT IS THE INTENT OF THIS SPECIFICATION AND DRAWINGS TO PROVIDE FOR A COMPLETE AND FULLY OPERATING SYSTEM IN COMPLETE ACCORD WITH ALL APPLICABLE CODES. THESE SPECIFICATIONS MAY NOT COVER EACH AND EVERY

- ITEM REQUIRED FOR THE COMPLETE MECHANICAL INSTALLATION. THEREFORE. 1.14.2. THE CONTRACTOR SHALL MAKE HIS OWN PROVISIONS FOR ALL LABOUR. MATERIALS AND EQUIPMENTS DEEMED NECESSARY TO COMPLETE THE MECHANICAL SYSTEM.
- 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.
- WHENEVER DIFFERENCES OCCUR IN THE CONTRACT DOCUMENTS. THE MAXIMUM CONDITION WILL GOVERN AND BE INCLUDED IN THE CONTRACT CONFORM TO MANUFACTURER'S INSTRUCTIONS, DETAILS AND PROCEDURES
- CONFIRM ALL NEW EQUIPMENT LOADING AND SUPPORT WITH STRUCTURAL ENGINEER PRIOR TO INSTALLATION.

#### 1.4. QUALITY ASSURANCE

FOR EQUIPMENT INSTALLATIONS.

- COMPLY WITH ALL PROVINCIAL AND LOCAL CODES FOR PROVISION OF MATERIALS, LABOUR AND INSTALLATION.
- 1.4.2. USE TRADESMAN LICENSED BY PROVINCIAL AUTHORITIES FOR THE WORK SPECIFIED IN THIS SECTION.
- USE HIGHEST QUALITY PIPING CONFORMING TO THE APPROPRIATE ASTM AND CSA SPECIFICATIONS. ALL MUNICIPAL BYLAWS AND NFPA STANDARDS GOVERNING THE INSTALLATION
- SHALL BE STRICTLY ADHERED TO. CONCEALED OR INSULATED WORK SHALL REMAIN UNCOVERED UNTIL REQUIRED TESTS HAVE BEEN COMPLETED. BUT IF CONSTRUCTION SCHEDULE REQUIRES. ARRANGE FOR PRIOR TESTS ON PARTS OF SYSTEM AS APPROVED.

- THE CONTRACTOR MUST HAVE COMPREHENSIVE GENERAL LIABILITY INSURANCE COVERAGE OF NOT LESS THAN \$2,000,000,00 INCLUDING NON OWNED CAR COVERAGE, CONTRACTUAL LIABILITY AND CONTAINING A CROSS LIABILITY CLAUSE. COVERAGE SHALL INCLUDE LOSS OR DAMAGE CAUSED BY THE CONTRACTOR.
- 1.5.2. THE CONTRACTOR SHALL CARRY FULL EMPLOYEE'S LIABILITY INSURANCE IN ACCORDANCE WITH THE WORKER'S COMPENSATION ACT.

- 1.6.1 THIS CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR LAYING OUT HIS WORK AND FOR ANY DAMAGE CAUSED TO OWNER OR OTHER CONTRACTOR BY IMPROPER LOCATION OR CARRYING OUT HIS WORK.
- THIS CONTRACTOR SHALL PROTECT ALL FINISHED AND UNFINISHED WORK OF HIS OWN AND OTHER CONTRACTORS, INCLUDING EXISTING FROM DAMAGE DUE TO CARRYING OUT HIS WORK

#### 1.7. COORDINATION AND CO-OPERATION

- COORDINATE WORK WITH ALL OTHER SUBCONTRACTORS AND TRADES
- CONFIRM IN WRITING TO GENERAL CONTRACTOR/ENGINEER ANY EXISTING SERVICES OR WORKS DEEMED TO BE UNACCEPTABLE/DEFECTIVE PRIOR TO
- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL DRAWINGS. REPORT ANY DISCREPANCIES TO ENGINEER PRIOR TO TENDER CLOSE.

#### CERTIFICATES, FEES, ETC.

- GIVE ALL NOTICES, OBTAIN ALL PERMITS AND PAY ALL FEES SO THAT THE WORK SPECIFIED MAY BE CARRIED OUT. FURNISH ANY CERTIFICATES AT THE OWNER'S REQUEST AS EVIDENCE THAT WORK INSTALLED CONFORMS WITH THE LAWS AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTIONS CERTIFICATES/PERMITS ARE TO BE PROVIDED FOR QUALITY OF WORKMANSHIP AND WORKMAN QUALIFICATIONS.
- INSPECTIONS SHALL BE MADE PROMPTLY. IF ANY WORK IS COVERED UP WITHOUT CONSENT, IT SHALL, IF REQUIRED, BE UNCOVERED FOR EXAMINATION AND MADE GOOD AT NO EXTRA COST TO OWNER.
- GIVE NECESSARY NOTICES. OBTAIN NECESSARY PERMITS AND PAY REQUIRED. FEES AND TAXES IN ORDER THAT THE WORK UNDER THIS CONTRACT MAY BE
- BE RESPONSIBLE TO FILE THE NECESSARY PLANS. TO PREPARE FOR AND OBTAIN APPROVAL OF DOCUMENTS AS REQUIRED BY GOVERNMENT DEPARTMENTS HAVING JURISDICTION AND TO OBTAIN CERTIFICATES OF INSPECTION REQUIRED, DELIVER THESE TO THE CONSULTANT PRIOR TO
- REQUEST FOR ACCEPTANCE AND FINAL PAYMENT OF THE WORK. WORK AND MATERIALS SHALL BE IN COMPLETE ACCORDANCE WITH THE APPROVAL OF LOCAL CODES AND AUTHORITIES HAVING JURISDICTION.
- PROVIDE CHANGES THAT ARE REQUIRED BY THE AUTHORITIES HAVING JURISDICTION, AS PART OF THE CONTRACT AND GIVE IMMEDIATE NOTIFICATION 1.18. IDENTIFICATION OF SUCH CHANGES TO THE CONSULTANT.
- COMPLY WITH ALL CURRENT EDITIONS OF RELEVANT CODES AND REGULATIONS INCLUDING THE 2012 ONTARIO BUILDING CODE.
- STANDARD OF WORKMANSHIP AND MATERIALS
- MAKE AND QUALITY OF MATERIALS USED ARE SUBJECT TO APPROVAL BY THE ENGINEER. REMOVE CONDEMNED MATERIALS AND INSTALL SUITABLE MATERIALS IN THEIR PLACE.
- 1.9.2. MATERIAL SHALL BE NEW AND UNIFORM PATTERN THROUGHOUT. 1.9.3. EMPLOY ONLY TRADESMAN WITH PROPER LICENSE FOR WORK.

### 1.10. INSPECTIONS (SUBSTANTIAL COMPLETION)

- 1.10.1. NOTIFY CONSULTANT 5 DAYS PRIOR TO FINAL INSPECTION. ALL SYSTEMS SHALL 1.18.4. BE FULLY OPERATIONAL AND ANY DEFICIENCIES SHALL BE IDENTIFIED TO
- 1.10.2. ALL DEFICIENCIES SHALL BE COMPLETED WITHIN 2 WEEKS AFTER SUBSTANTIAL COMPLETION. FAILURE TO COMPLETE WORK WITHIN THE TIME FRAME WILL RESULT IN WORK BEING DONE BY THE OWNER AND THE COST BEAR BY THE CONTRACTOR.

- THE PRICE SUBMITTED FOR THIS CONTRACT SHALL BE BASED ON THE USE OF MATERIALS AND EQUIPMENTS SPECIFIED. IF THIS CONTRACTOR WISHES TO QUOTE ON FOUIVALENT MATERIALS AND FOUIPMENTS. HE MUST QUOTE ON PRODUCTS APPROVED BY THE ENGINEER IN WRITING, AS AN EQUIVALENT TO THE PRODUCT SPECIFIED.
- THIS CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ADDITIONAL WORK OR MATERIALS REQUIRED BY THE MECHANICAL TRADE OR OTHER CONTRACTORS TO ACCOMMODATE APPROVED EQUIVALENT MATERIALS OR EQUIPMENTS. EXTRAS SHALL NOT BE APPROVED TO COVER SUCH WORK.
- ALL MATERIALS AND EQUIPMENTS SHALL BE NEW. RECYCLED/OLD/REFURBISHED SHALL NOT BE ACCEPTED UNLESS PROVIDED BY 1.20.1. THE OWNER OR THE OWNERS REPRESENTATIVE AS OWNER SUPPLIED EQUIPMENT.

### 1.12. VALUATION OF CHANGES

- 1.12.1. FOR EACH CHANGE, SUBMIT A COMPLETE, ITEMIZED BREAKDOWN OF LABOUR AND MATERIAL AT NET COST, SHOWING QUANTITIES, UNIT COST, HOURS PER EACH ITEM INSTALLED, PROFIT, OVERHEAD ETC.,
- 1.12.2. ONLY THE NET DIFFERENCE BETWEEN AN EXTRA AND A CREDIT WILL BE SUBJECT TO OVERHEAD AND PROFIT MARK UP.

- THE MECHANICAL SUBCONTRACTOR, AS A CONDITION PRECEDENT TO FINAL PAYMENT AFTER COMPLETION OF HIS WORK, 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.
- BIND ALL GUARANTEE AND WARRANTY CERTIFICATES IN MAINTENANCE
- OCCURRING DURING THE WARRANTEE PERIOD. 1.14. SHOP DRAWINGS
- 1.14.1. BEFORE FABRICATION OF ANY MATERIALS OR EQUIPMENT, SUBMIT A COMPLETE SET OF SHOP DRAWINGS, DATA SHEETS AND ONE (1) ELECTRONIC COPY COVERING ALL ITEMS OF EQUIPMENT FURNISHED AND INTENDED FOR INSTALLATION.

- THE ENGINEER'S REVIEW SHALL NOT RELIEVE THIS CONTRACTOR FROM RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENTS IN ACCORDANCE WITH THE DESIGN INTENT AND CONTRACT DOCUMENTS. ALL DIMENSIONS AND SUITABILITY FOR SITE CONDITIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR, ALL ELECTRICAL CHARACTERISTICS MUST BE COORDINATED WITH THE ELECTRICAL SUB-CONTRACTOR.
- 1.14.3. DO NOT PURCHASE ANY EQUIPMENTS PRIOR TO APPROVAL OF SHOP
- 1.14.4. BE RESPONSIBLE FOR PRESENTING AND EXPEDITING THE PROCESSING OF SHOP DRAWINGS TO SUIT MANUFACTURING SCHEDULE OF EQUIPMENT AND CONSTRUCTION SCHEDULE OF BUILDING.
- EACH SHOP DRAWING SHALL INDICATE CLEARLY THE CORRECT NAME AND ADDRESS OF THE PROJECT. THE INTENDED USE AND LOCATION OF THE EQUIPMENT, AND THE SPECIFIED DESIGNATION NUMBER.

#### 1.15. RECORD "AS-BUILT" DRAWINGS

- KEEP IN THE JOB OFFICE AN EXTRA SET OF WHITE PRINTS AND SPECIFICATIONS ON WHICH ALL CHANGES AND DEVIATIONS SHALL BE RECORDED DAILY. AT COMPLETION OF THE PROJECT, TURN OVER TO THE ENGINEER THREE SETS OF NEAT AS-BUILT DRAWINGS AND SPECIFICATIONS
- UPON COMPLETION, THE CONTRACTOR SHALL SUPPLY TO THE OWNER ONE SET OF MARKED-UP RECORD DRAWINGS INDICATING ALL DIMENSIONS. INVERTS. DISTANCES FROM STRUCTURE, ETC. AS DONE ON SITE. PROVIDE 3 SETS OF OPERATION AND MAINTENANCE MANUALS THAT WILL INCLUDE APPROVED SHOP DRAWINGS, ETC. IN 3 RING BINDERS NEATLY BOUND AND LABELED.

- TEST ALL EQUIPMENTS AND MATERIALS WHERE REQUIRED BY SPECIFICATIONS OR AUTHORITIES HAVING JURISDICTION, TO DEMONSTRATE ITS PROPER OPERATION TO THE OWNER'S REPRESENTATIVE, 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
- 1.16.2. NOTIFY THE OWNER/ENGINEER PRIOR TO STARTING ANY TESTING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES THAT OCCUR AS A RESULT OF TESTING. HE SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH LIABILITY AND REPAIRS AS NECESSARY.
- ALL DEFECTS, LEAKS, ETC. SHALL BE REPAIRED OR REPLACED IMMEDIATELY UPON DISCOVERY. LEAKING JOINTS SHALL BE RE-DONE AND COMPLETED IN A
- PERFORMANCE TESTS SHALL BE CARRIED OUT UPON COMPLETION OF PRESSURE TESTS AND INSTALLATION. THE CONTRACTOR SHALL MAKE ALL NECESSARY CHANGES AND MODIFICATIONS AS REQUIRED TO DELIVER AN OPERATIONAL SYSTEM.
- ALL TESTS SHALL BE A MINIMUM OF THE REQUIREMENTS OF LOCAL INSPECTION 1.23.3.

DUCTWORK: SEE HVAC SECTION FOR LEAK TESTING STANDARD.

- HYDRONIC PIPING: TEST TO 1.5 TIMES MAXIMUM WORKING PRESSURE OR 1035 kPa (150 PSI) WATER PRESSURE MEASURED AT SYSTEM LOW POINT. FOR A MINIMUM OF 8 HOURS
- 1.16.8. DOMESTIC WATER PIPING: TEST TO 1.5 TIMES MAXIMUM WORKING PRESSURE OR 1035 kPa (150 PSI) WATER PRESSURE MEASURED AT SYSTEM LOW POINT. FOR A MINIMUM OF 8 HOURS.
- DRAINAGE SYSTEM: TEST BY FILLING WITH WATER TO PRODUCE WATER PRESSURE OF 3m (10ft) OF WATER COLUMN MINIMUM AND 10m (33ft) WATER COLUMN MAXIMUM FOR A DURATION OF 8 HOURS. CHECK FOR PROPER GRADE 2.1.2. AND OBSTRUCTION BY BALL TEST.
- 1.16.10. ALL TESTS SHALL BE MAINTAINED WITH NO APPRECIABLE LOSS OF PRESSURE. WHERE LEAKS DO OCCUR IMMEDIATELY REPAIR AND REPLACE. MECHANICAL CONTRACTOR IS TO TEST AND VERIFY IN WRITING ALL CONTROL

SYSTEMS ARE OPERATING AS PER SPECIFICATION

- 1.17. EQUIPMENT CLEANUP
- DUCTS AND EQUIPMENTS SHALL BE THOROUGHLY CLEANED OF DIRT, CUTTINGS AND OTHER FOREIGN SUBSTANCES. DISCONNECT, CLEAN AND RECONNECT WHENEVER NECESSARY FOR THE PURPOSE OF LOCATING AND REMOVING OBSTRUCTIONS. REPAIR WORK DAMAGED IN THE CAUSE OF REMOVING OBSTRUCTIONS, DUCTS SHALL BE PROFESSIONALLY VACUUM CLEANED PRIOR TO TURNING OVER TO OWNER.
- REPAIR ANY TEMPORARY EQUIPMENT USED FOR TEMPORARY HEAT, TO THE FULL SATISFACTION OF THE OWNER.
- 1.17.3. REMOVE ALL TOOLS, WASTE MATERIAL, GARBAGE, PACKAGING MATERIALS GENERATED FROM THIS SCOPE OF WORK FROM SITE, UPON COMPLETION ENSURE ALL SURFACES ARE CLEANED OF GREASE, DIRT, ETC. ONCE

COMPLETED THE FACILITY SHALL BE AVAILABLE FOR IMMEDIATE USE

THE MECHANICAL CONTRACTOR SHALL PROVIDE STANDARD MAINTENANCE WORK TO EXISTING PACKAGE AIR-CONDITIONING UNITS. THE WORK SHALL INCLUDE. BUT NOT LIMITED TO CLEANING AND REPLACEMENT OF FILTERS.

- PROVIDE FOR IDENTIFICATION OF PIPING AND DUCTWORK WITH MARKERS SHOWING SERVICE AND DIRECTION OF FLOW. APPLY LABELS AT MAXIMUM 15m (50ft) INTERVALS, BEFORE AND AFTER PASSING THROUGH WALLS, AT ACCESS DOOR OPENINGS. AT EACH SHUT OFF VALVE AND ADJACENT TO EACH PIECE OF EQUIPMENT. LABELS SHALL BE WATERPROOF AND HEAT RESISTANT WITH YELLOW BACKGROUND, MINIMUM 25mm (1") LETTERING AND DRY ADHESIVE BACKING. PROVIDE 3M #76 ADHESIVE IN ADDITION TO DRY ADHESIVE BACKING.
- PROVIDE 50mm (2") WIDE COLOUR BAND OF PLASTIC PRESSURE SENSITIVE TAPE FOR PIPING SYSTEMS. SPACING SHALL BE SAME AS LABELS.
- TAG AUTOMATIC CONTROLS, ELECTRIC SWITCHES, INSTRUMENTS AND RELAYS WITH LAMICOID LABELS WITH 15mm (1/2") LETTERS AND KEY WITH CONTROL
- PROVIDE LAMICOID LABELS WITH 15mm (1/2") LETTERS ON EQUIPMENT AND MOTOR STARTERS. 1.19. CUTTING AND PATCHING
- THE MECHANICAL CONTRACTOR SHALL INCLUDE AND BE RESPONSIBLE FOR CUTTING, PATCHING AND MAKE GOOD ALL OPENINGS REQUIRED FOR THE MECHANICAL SERVICES
- 1.19.2. LOCATE HOLES AND PROVIDE SLEEVES, CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED HOLES AND REPAIR WORK ACCORDINGLY.
- PROVIDE EXPANSION BOLTS, HANGER RODS, BRACKETS AND SUPPORTS.
- DO NOT ALTER STRUCTURAL MEMBERS OF BUILDING WITHOUT OBTAINING APPROVAL FROM ARCHITECT AND STRUCTURAL ENGINEER. PERFORM PATCHING OF FINISHED WORK IN ACCORDANCE WITH THE
- APPLICABLE SECTIONS OF SPECIFICATIONS.
- DO ALL FLASHING AND COUNTER FLASHING WHERE DUCTS AND OTHER MECHANICAL PARTS ARE PASSING THROUGH WEATHER AND/OR WATER PROOF WALLS, FLOORS AND ROOFS, ALL TO THE SATISFACTION OF THE OWNER.

- PROVIDE FIRE STOPPING AND SMOKE SEALS AROUND MECHANICAL SERVICE PIPING AND DUCT PENETRATIONS THROUGH FIRE RATED FLOORS AND ASSEMBLIES. CONFIRM EXTENT AND LOCATION OF FIRE SEPARATIONS WITH 2.3. PIPING CONNECTIONS ARCHITECTURAL DRAWINGS.
- A MANUFACTURER'S DIRECT REPRESENTATIVE TO BE ON SITE DURING INITIAL INSTALLATION OF FIRESTOP SYSTEMS TO TRAIN APPROPRIATE CONTRACTOR PERSONNEL IN PROPER SELECTION AND INSTALLATION PROCEDURES. MANUFACTURER'S SPECIFICATIONS AND TECHNICAL DATA FOR EACH MATERIAL

INCLUDING THE COMPOSITION AND LIMITATIONS, DOCUMENTATION OF ULC OR

CUL FIRESTOP SYSTEMS TO BE USED AND MANUFACTURER'S INSTALLATION

FIRESTOP SYSTEM INSTALLATION MUST MEET REQUIREMENTS OF

INSTRUCTIONS AND MSDS INFORMATION.

CAN/ULC-S115-M TESTED ASSEMBLIES.

- FOR THOSE FIRESTOP APPLICATIONS THAT EXIST FOR WHICH NO ULC OR CUL TESTED SYSTEM IS AVAILABLE THROUGH A MANUFACTURER, A MANUFACTURER'S ENGINEERING JUDGMENT DERIVED FROM SIMILAR ULC OR CUL SYSTEM DESIGNS OR OTHER TESTS WILL BE SUBMITTED TO LOCAL AUTHORITIES HAVING JURISDICTION FOR THEIR REVIEW AND APPROVAL PRIOR TO INSTALLATION ENGINEER JUDGMENT DRAWINGS MUST FOLLOW REQUIREMENTS SET FORTH BY THE INTERNATIONAL FIRESTOP COUNCIL CONTRACTOR IS RESPONSIBLE FOR ANY PROFESSIONAL STAMP REQUIRED BY THE LOCAL AUTHORITIES HAVING JURISDICTION.
- PROVIDE FIRESTOPPING COMPOSED OF COMPONENTS THAT ARE COMPATIBLE WITH EACH OTHER.

- FOR PENETRATIONS THROUGH A FIRE WALL OR HORIZONTAL FIRE SEPARATION PROVIDE A FIRESTOP SYSTEM WITH "FT" RATING AS DETERMINED BY ULC OR CUL WHICH IS EQUAL TO THE FIRE RESISTANCE RATING OF THE CONSTRUCTION 2.4.4. BEING PENETRATED. USE A LABEL TO IDENTIFY THE RATING OF THE PARTITION AND THE LISTED SYSTEM SELECTED.
- 1.21.8. SUBJECT TO COMPLIANCE WITH THROUGH PENETRATION FIRESTOP SYSTEMS 2.4.5. LISTED IN THE U.L.C FIRE RESISTANCE DIRECTORY B VOLUME III OR UL PRODUCTS CERTIFIED FOR CANADA (CUI ) DIRECTORY, PROVIDE PRODUCTS OF THE FOLLOWING MANUFACTURERS AS IDENTIFIED BELOW: HILTI CANADA
- MANUFACTURERS FIRE PROTECTION SPECIALIST TO WORK WITH CONSULTANT TO DETERMINE FREQUENCY OF SITE WALK THROUGHS TO BE SUBMITTED TO CONSTRUCTION MANAGER AND CONSULTANT.

### 1.22. PIPE HANGARS, SUPPORTS AND SLEEVES

- ALL HANGERS AND HANGER RODS SHALL BE SUPPLIED AND INSTALLED BY THIS 2.4.8. CONTRACTOR FOR THE INSTALLATION OF HIS WORK IN THIS DIVISION. HANGERS AND SUPPORTS SHALL SECURE PIPES IN PLACE, PREVENT VIBRATION, MAINTAIN GRADE BY ADJUSTMENT, PROVIDE FOR EXPANSION AND
- AND NOT FROM OTHER EQUIPMENTS, PIPING OR DUCTWORK, PROVIDE SUPPORTS AND CLEVIS TYPE HANGERS ON OUTSIDE OF INSULATION. INSTALLATION SHALL MEET THE REQUIREMENTS OF APPLICABLE CODES.

CONTRACTION, ALL SUPPORTS SHALL BE DIRECTLY FROM THE STRUCTURE,

- USE OF PERFORATED STRAP, WIRE OR CHAIN HANGERS IS NOT PERMITTED 1.22.5. STEEL PIPES UP TO AND INCLUDING 100mm (4") DIAMETER, USE HEAVY DUTY 2.5. CLEANOUTS
- CLEVIS OR LOOP TYPE HANGERS. COPPER PIPES. USE HANGERS IN COPPER PLATE FINISH OR STEEL LOOP
- HANGER W/ APPROVED ELECTROLYSIS BARRIER (POLY TAPE). CAST IRON PIPES USE HEAVY-DUTY CLEVIS OR LOOP TYPE HANGERS. 1.22.8. SUPPORT PIPES IN ACCORDANCE WITH THE CURRENT EDITION OF THE ONTARIO

BUILDING CODE, MANUFACTURER'S RECOMMENDATIONS, ASHRAE STANDARDS

PROVIDE HANGERS AND SUPPORTS FOR ALL DUCTWORK, IN ACCORDANCE WITH SMACNA - "H.V.A.C. DUCT CONSTRUCTION STANDARDS. - METAL AND FLEXIBLE", LATEST EDITION

## 1.23. ELECTRIC MOTORS AND WIRING

AND/OR APPLICABLE CODES.

- 1.23.1. SUPPLY ALL MECHANICAL EQUIPMENT WITH ELECTRIC MOTORS AS REQUIRED CONTROLS (FAN SWITCHES) CONNECTED TO MECHANICAL EQUIPMENTS SHALL BE SUPPLIED BY THE MECHANICAL TRADE AND SHALL BE INSTALLED. WIRED IN
- CONFIRM ELECTRICAL SERVICE VOLTAGE AND PHASE WITH ELECTRICAL ENGINEER, AND/OR CONTRACTOR PRIOR TO ORDERING OF MECHANICAL

AND CONNECTED BY THE CONTROL TRADE.

ALL MOTORS SUPPLIED WITH MECHANICAL EQUIPMENT SHALL OPERATE AT A MAXIMUM OF 1.750 RPM UNLESS OTHERWISE NOTED.

### PLUMBING & PIPING

- ALL SANITARY SEWERS SHALL HAVE A MINIMUM SLOPE OF 1% FOR LINES 100mm 2.7. PLUMBING FIXTURES (4"Ø) AND OVER. FOR LINES 75mm (3"Ø) AND UNDER USE MINIMUM 2% SLOPE. PLUMBING INSTALLATION SHALL COMPLY WITH LOCAL BUILDING REGULATIONS. SUCH REQUIREMENTS SHALL HAVE PRECEDENCE OVER THE DRAWINGS AND
- ALL PIPES SHALL BE LOCATED AWAY FROM AND PROTECTED FROM DAMAGE BY
- LOAD BEARING FOOTINGS. PROVIDE APPROVED BACKFLOW OR SIPHON PREVENTION DEVICES ON PLUMBING LINES WHERE CONTAMINATION OF POTABLE DOMESTIC WATER MAY OCCUR THESE DEVICES SHALL BE GENERALLY PROVIDED FOR JANITOR'S SINKS, HOSE BIBBS, AND WHERE REQUIRED BY CODE. PROTECTION DEVICES 2.8. PIPING SYSTEMS CLEANING AND CHEMICAL TREATMENT SHALL COMPLY WITH CSA B64. PROVIDE BACKFLOW TEST REPORTS TO
- ALL EXPOSED WATER PIPING CONNECTED TO PLUMBING FIXTURES IN FINISHED AREAS TO BE CHROME PLATED.

COPPER WITH WROUGHT COPPER, BRONZE OR CAST BRASS FITTINGS JOINED

WITH 95-5 "LEAD FREE" SOLDER, ALL PIPING SHALL MEET THE APPROVAL OF

JOINTS ON SITE.

- 2.2.1. DRAINAGE AND VENT PIPING ABOVE GRADE SHALL BE DWV COPPER OR CAST
- SANITARY DRAINS 40mm (1 1/2"Ø) AND SMALLER MAY BE HARD TEMPERED COPPER DRAINAGE TUBE (DWV). INSTALL CHROME PLATE WHERE EXPOSED. DOMESTIC WATER PIPING (DCW, DHW) ABOVE GRADE SHALL BE TYPE 'L' HARD
- LOCAL CODES AND AUTHORITIES HAVING JURISDICTION. LONGEST POSSIBLE LENGTHS OF COPPER SHOULD BE UTILIZED TO MINIMIZE
- JOINTS IN COPPER PIPE SHALL BE SOLDERED OR BRAZED. BOTH APPLICATIONS 3.1.1. SHALL BE CARRIED OUT TO THE REQUIREMENTS OF THE LOCAL CODE AND AS PER THE CANADIAN COPPER AND BRASS DEVELOPMENT ASSOCIATION RECOMMENDATIONS, INSTALL AS PER THE FOLLOWING PROCEDURES
- 2.2.5.a. REAM ENDS OF PIPES AND TUBES AND REMOVE BURRS. BEVEL PLAIN ENDS OF STEEL PIPE 2.2.5.b. REMOVE SCALE, SLAG, DIRT AND DEBRIS FROM INSIDE AND OUTSIDE OF PIPE FITTINGS BEFORE ASSEMBLY. 2.2.5.c. SOLDER JOINTS: APPLY ASTM B813, WATER-FLUSHABLE FLUX, UNLESS

OTHERWISE INDICATED TO TUBE END. CONSTRUCT JOINTS ACCORDING TO

THREADED JOINTS: THREAD PIPE WITH TAPERED PIPE THREADS ACCORDING TO

- ASTM B828 OR CDA'S "COPPER TUBE HANDBOOK", USING LEAD-FREE SOLDER ALLOY COMPLYING WITH ASTM B32 2.2.5.d. BRAZED JOINTS: CONSTRUCT JOINTS ACCORDING TO AWS'S "BRAZING IANDBOOK", "PIPE AND TUBE" CHAPTER, USING SIL-FOS 15 BRAZING FILLER METAL COMPLYING WITH AWS A5.8.
- THREADED PIPE ENDS TO REMOVE BURRS AND RESTORE FULL ID. JOIN PIPE FITTINGS AND VALVES AS FOLLOWS 2.2.6.a. APPLY APPROPRIATE TAPE OR THREAD COMPOUND TO EXTERNAL PIPE THREADS UNLESS DRY SEAL THREADING IS SPECIFIED. 2.2.6.b. DAMAGED THREADS: DO NOT USE PIPE OR PIPE FITTINGS WITH THREADS

ASME B1.20.1. CUT THREADS FULL AND CLEAN USING SHARP DIES. REAM

- CRACKED OR OPEN WELDS. 2.2.7. FLANGED JOINTS: SELECT APPROPRIATE GASKET MATERIAL, SIZE, TYPE AND THICKNESS FOR SERVICE APPLICATION. INSTALL GASKET CONCENTRICALLY POSITIONED, USE SUITABLE LUBRICANTS ON BOLT THREADS.
- WHERE DISSIMILAR METALS ARE JOINED OR SUPPORTED, THE PIPING SHALL HAVE NON CONDUCTING TYPE CONNECTIONS OR HANGERS TO PREVENT GALVANIC CORROSION. 2.2.9. UPON COMPLETION OF THE INSTALLATION OF THE POTABLE WATER SERVICE,
- FLUSH, CHLORINATE WITH SODIUM HYDROCHLORIDE TO AWWA C-601 SPECIFICATIONS AND LET STANDING FOR 24 HOURS. THOROUGHLY FLUSH AGAIN UNTIL AWWA STANDARD IS MET. 2.2.10. USE BALL VALVES ON ALL DOMESTIC WATER PIPING, 50mm (2"Ø) OR LESS IN
- PROVIDE BRONZE TYPE BALL VALVES ON MAIN AND BRANCH LINES AND ISOLATION VALVES FOR EACH PLUMBING FIXTURE SERVED.
- MAKE CONNECTIONS ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE

VALVE AND AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT,

. INSTALL FLANGES, IN PIPING NPS 2-1/2 (DN 65) AND LARGER, ADJACENT TO FLANGED VALVES AND AT FINAL CONNECTION TO EACH PIECE OF 2.3.1.c. WET PIPING SYSTEMS: INSTALL DIELECTRIC COUPLING AND NIPPLE FITTINGS TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS.

2.4. PIPE INSULATION

- ALL COVERINGS SHALL BE APPLIED IN A WORKMANLIKE MANNER BY A RED SEAL JOURNEYMAN INSULATION MECHANIC TO PRESENT A NEAT AND CLEAN APPEARANCE AT COMPLETION OF THE WORK TO THE SATISFACTION OF THE ENGINEER. INSULATION ASSEMBLIES SHALL COMPLY WITH CURRENT EDITION OF ONTARIO BUILDING REGULATIONS WITH FLAME SPREAD AND SMOKE DEVELOPED RATINGS NOT EXCEEDING 25 AND 50 RESPECTIVELY.
- ROOF DRAINS, RAINWATER LEADERS, DOMESTIC HOT AND COLD WATER LINES, CHILLED WATER AND HYDRONIC HEATING LINES. PIPE INSULATION SHALL BE MIN. 25mm (1") THICK, EXCEPT FOR PIPE SIZES 20mm (3/4") OR SMALLER USE 15mm (1/2") THICK INSULATION.

PROVIDE INSULATION C/W VAPOUR BARRIER AND ALL SERVICE JACKET FOR ALL

- FINISH INSULATION NEATLY AT HANGERS, SUPPORTS AND OTHER PROTRUSIONS. INSULATE FITTINGS AND VALVES.
- PROVIDE INSULATION AND COVERS IN ACCORDANCE WITH AUTHORITIES GOVERNING COMBUSTIBILITY AND FIRE PROOFING OF MATERIALS, AS PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
- PROVIDE NON COMBUSTIBLE INSULATION, JACKETS AND FINISHES HAVING A FLAME SPREAD/ SMOKE DEVELOPED RATING OF 25/50 OR LESS, MEETING CAN/ULC S-102 REQUIREMENTS.
- INSULATE FITTINGS WITH FABRICATED MITERED OR PREFORMED SECTIONS OF SPECIFIED INSULATION.
- INSULATE ALL HORIZONTAL VENT PIPING LOCATED IN CEILING SPACES BELOW ROOF DECK WITH 25mm (1") THINK FIBERGLASS HEAVY DENSITY INSULATION
- WITH ALL SERVICE JACKET. ALL DOMESTIC WATER (DCW, DHW) PIPING IS TO BE INSULATED THE FULL
- WHERE FIBERGLASS PIPE INSULATION IS USED, INSULATE ALL PIPE FITTINGS, ELBOWS, ETC. WITH PREFORMED FIBROUS GLASS INSULATION FITTINGS OR INSULATING CEMENT, TO THE SAME THICKNESS AS ADJACENT INSULATION. PIPE

WITH PVC FITTING COVERS, OR APPROVED EQUAL.

2.4.10. WHERE PIPING IS SUPPORTED AT EXTERIOR SURFACE OF INSULATION PROVIDE 300mm (12") LONG, SUPPORT SHIELD WITH HIGH DENSITY INSULATION UNDER SHIELD, AT EACH HANGAR LOCATION.

ELBOWS AND PIPE FITTINGS ON ALL EXPOSED INSULATION SHALL BE COVERED

- PROVIDE AND SET CLEANOUTS AT ALL POINTS REQUIRED BY CODES AND WHERE INDICATED ON THE DRAWINGS. ALL CLEANOUTS SHALL BE MADE ACCESSIBLE BY EXTENDING BRANCH CONNECTIONS TO FINISHED SURFACE
- CLEANOUTS IN CONCRETE SHALL BE ADJUSTABLE TYPE FOR LEVEL

VALVES SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS, AS SPECIFIED,

- 2.5.3. CLEANOUTS IN UNFINISHED AREAS SHALL BE WATTS CO-200-R OR EQUAL.
- 2.5.4. CLEANOUTS IN FINISHED AREAS SHALL BE WATTS CO-1200-R OR EQUAL.

AND AS REQUIRED TO ISOLATE ALL FIXTURES, EQUIPMENT, ETC.

PROVIDE ALL VALVES AS SHOWN ON THE DRAWINGS OR REQUIRED BY LOCAL 3.5. <u>AIR OUTLETS</u> BUILDING CODES AND AUTHORITIES HAVING JURISDICTION.

USE BALL VALVES ON ALL DOMESTIC WATER PIPING, 50mm (2"Ø) OR LESS IN

PROVIDE BRONZE TYPE BALL VALVES ON MAIN AND BRANCH LINES AND

ISOLATION VALVES FOR EACH PLUMBING FIXTURE SERVED.

ALL ISOLATION VALVES INSTALLED FOR SHUT-OFF PURPOSES TO BE RED AND WHITE #5044A BALL VALVES, UNLESS OTHERWISE SPECIFIED. PROVIDE CHROME PLATED RIGID OR FLEXIBLE SUPPLIES TO ALL PLUMBING

ALL FIXTURES SHALL BE FREE FROM FLAWS OR BLEMISHES AND SUBJECT TO

APPROVAL. ALL FINISHES SHALL BE CLEAR, SMOOTH AND BRIGHT AND

# TO WALL AND/OR FLOOR SURFACE.

GUARANTEED NOT TO CRAZE, COLOR OR SCALE.

- FIXTURE SUPPORT MUST BE SUCH THAT THEY WILL NOT COME LOOSE WITH ORDINARY USAGE AND THAT ANCHORING WILL BE RIGID. REINFORCE WALL BEHIND FIXTURES IF REQUIRED FOR PROPER SUPPORT. 2.7.3. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION.
  - PROVIDE FOR FLUSHING AND CLEANING OF HYDRONIC PIPEWORK. USE
- ACTIVE PENETRATING AGENTS. DISPERSANTS AND DETERGENTS AND SPECIFICALLY FORMULATED TO REMOVE OIL, MILL SCALE AND OXIDES FROM PIPING AND EQUIPMENT. 2.8.2. PROVIDE FOR FLUSHING AND DISINFECTION OF DOMESTIC WATER SYSTEMS. ALL DOMESTIC HOT COLD WATER SYSTEMS WILL BE REQUIRED TO BE FLUSHED AND DISINFECTED. ADD CHLORINE TO WATER IN SYSTEM TO 50 PPM AND LET STAND FOR 24 HOURS. CHECK CHLORINE CONTENT AFTER 24 HOURS AND

INSURE THE CONTENT IS NOT LESS THAN 20 PPM. IF LESS THAN 20 PPM REPEAT

PROCESS. FLUSH SYSTEM UNTIL THE CHLORINE CONTENT OF WATER BEING

DRAINED IS EQUAL TO THE CHLORINE CONTENT OF THE MAKE-UP WATER.

#### UTILIZE PLUMBING FIXTURES (I.E. LAV. SINKS, FLUSHOMETERS, ETC.) FOR DRAINAGE.

- DUCTWORK SHALL BE GALVANIZED STEEL AND SHALL BE LOCK FORMING QUALITY. ALL DUCTWORK SHALL BE CONSTRUCTED, BRACED, CONNECTED AND 4.1.2. JOINTED AS RECOMMENDED IN THE LATEST ISSUE OF ASHRAE GUIDE AND THE DUCT CONSTRUCTION STANDARDS ISSUED BY THE SHEET METAL NATIONAL ASSOCIATION INC. (SMACNA). ALL DUCTWORK SHALL BE INSTALLED TO CONFORM TO THE MOST CURRENT EDITION OF THE ONTARIO BUILDING CODE
  - NFPA PAMPHLETS 90A AND 91 AND IN ACCORDANCE WITH APPLICABLE CODES THE MINIMUM SHEET METAL THICKNESS FOR DUCTS SHALL BE AS FOLLOWS: 4.1.3. CTANGULAR DUCTS MAXIMUM WIDTH
- 0.48mm (26 GAUGE) 300 (12") TO 750mm (22") DUCT SIZES SHOWN ARE SHEET METAL SIZES, WHERE INTERNAL INSULATION IS SPECIFIED MAKE AN ALLOWANCE FOR INSULATION THICKNESS. MAINTAIN INTERNAL DUCT SIZES SHOWN. PRIOR TO FABRICATION, CHECK CEILING

SPACES, HEIGHTS AND CONFLICTIONS, WITH OTHER TRADES AT THE SITE AND

- REQUIRED, WITHOUT ADDITIONAL COST. DUCTS SHALL NOT, UNDER ANY CIRCUMSTANCES, BE SUPPORTED BY MEANS OF 3.1.3. PERFORATED BAND IRON, WIRE OR CHAIN, DUCTS SHALL NOT BE SUPPORTED
- FROM HANGERS SUPPLIED BY OTHER TRADES. THAT ARE CORRODED OR DAMAGED. DO NOT USE PIPE SECTIONS THAT HAVE 3.1.4. ROUND DUCTWORK SHALL BE SUSPENDED BY BAND IRON HANGERS.
  - 3.1.6 FLEXIBLE DUCTWORK SHALL BE FLEXMASTER MODEL FAB5M OR THERMAFLEX

RECTANGULAR DUCTWORK SHALL BE SUPPORTED AT MAXIMUM 2.4m (7'-10")

- FLEXIBLE DUCTWORK ALUMINUM HELICALLY WOUND, INSULATED AND ULC LISTED, MAXIMUM LENGTH IS TO BE 1m (3'-0") ALL EXPOSED DUCTWORK IS TO BE INTERNALLY SEALED AT DUCT
- CONNECTIONS TO PROVIDE A CLEAN FINISH. ALL JOINTS ARE TO BE CLEANED PRIOR TO JOB COMPLETION. 3.1.9. DUCTS TO BE GALVANIZED STEEL LOOK FORMING QUALITY. HAVING GALVANIZED COATING TO ASTM A525 C90 DESIGNATION FOR BOTH SIDES.

3.1.10. FASTENERS TO BE SHEET METAL SCREWS ON LOW PRESSURE DUCTS.

SLIPS TO LEAVE SMOOTH DUCT INTERIOR.

- SEALANT: WATER RESISTANT, FIRE RESISTIVE, COMPATIBLE WITH ADJACENT MATERIALS. ALL DUCT JOINTS ARE TO BE SEALED WITH SEALANT. 3.1.12. LAP METAL DUCTS IN DIRECTION OF AIR FLOW. HAMMER DOWN EDGES AND
- RIGIDLY CONSTRUCT METAL DUCTS WITH JOINTS MECHANICALLY TIGHT, 2.3.1.a. INSTALL UNIONS, IN PIPING NPS 2 (DN 50) AND SMALLER, ADJACENT TO EACH SUBSTANTIALLY AIR TIGHT, BRACED AND STIFFENED SO AS NOT TO BREATHE RATTLE, VIBRATE OR SAG. CAULK DUCT JOINTS AND CONNECTIONS WITH SEALANT AS DUCTS ARE BEING ASSEMBLED.
  - ALL HANGERS SHALL BE 6mm (1/4") RODS AND 25mm x 25mm x 6mm (1" x 1" x 1/4") DUCT CONNECTIONS AT AHU'S, EXHAUST FANS, SUPPLY FANS, FAN COIL UNITS, ETC. SHALL BE MADE WITH 150mm (6") LONG FLEXIBLE NEOPRENE, TO PREVENT
  - CONNECTIONS ARE LEAKPROOF. ALL DUCTS ASSOCIATED WITH FANS AND OTHER MACHINERY SHALL BE FITTED WITH CANVAS FLEXIBLE CONNECTIONS AT INLET AND OUTLET.

3.1.17. ACOUSTIC INSULATION TO BE 25mm (1") THICKNESS DUCT LINER.

TRANSMISSION OF VIBRATION. THE CONTRACTOR SHALL ENSURE THAT ALL

APPEARANCE AT COMPLETION OF THE WORK TO THE SATISFACTION OF THE

ALL COVERINGS SHALL BE APPLIED IN A WORKMANLIKE MANNER BY A RED SEAL JOURNEYMAN INSULATION MECHANIC TO PRESENT A NEAT AND CLEAN

- ENGINEER. INSULATION ASSEMBLIES SHALL COMPLY WITH CURRENT EDITION OF ONTARIO BUILDING REGULATIONS WITH FLAME SPREAD AND SMOKE DEVELOPED RATINGS NOT EXCEEDING 25 AND 50 RESPECTIVELY.
- APPLY 25mm (1") THICK INTERNAL ACOUSTIC INSULATION ON SUPPLY, RETURN, AND EXHAUST AIR DUCTWORK WHERE SHOWN BY CROSS HATCHING OF DUCTWORK ON THE DRAWING.
- APPLY 25mm (1") THICK FLEXIBLE FIBROUS GLASS INSULATION WITH FACTORY 3.2.3

APPLIED REINFORCED ALUMINUM FOIL VAPOUR BARRIER ON SUPPLY AIR

- DUCTWORK EXCEPT WHERE INTERNAL ACOUSTIC INSULATION IS PROVIDED. APPLY 50mm (2") THICK FLEXIBLE FIBROUS GLASS INSULATION WITH FACTORY APPLIED REINFORCED ALUMINUM FOIL VAPOUR BARRIER ON COMBUSTION AND
- OUTSIDE AIR INTAKE DUCTWORK INSULATE VENTILATION EQUIPMENT AND CABINET EXHAUST FAN CASINGS WITH 25mm (1") THICK RIGID FIBERGLASS INTERNAL DUCT INSULATION. INSULATION
- O BE FACTORY INSTALLED. INSULATION TO BE 25mm (1") THICK MINERAL FIBRE WITH VAPOUR BARRIER. INSULATE ALL SUPPLY AIR DUCTWORK EXCEPT WHERE ACOUSTICALLY LINED.

INSULATE EXHAUST DUCTWORK FOR A DISTANCE OF 1.5m (5'-0") UPSTREAM OF

ALL ADHESIVES. MASTICS. SEALANTS AND COATINGS USED INSIDE THE BUILDING WITH THE INSULATION SHALL BE FIRE RETARDING AND MEET ULC AND ABC STANDARDS WITH A FLAME SPREAD RATING OF NOT OVER 25 AND SMOKE

### 3.3. VOLUME DAMPERS

DEVELOPED CLASSIFICATION NOT OVER 50.

- 3.3.1. INSTALL WHERE SHOWN OR REQUIRED FOR BALANCING.
- 3.3.2. RECTANGULAR DUCTS SHALL HAVE OPPOSED BLADE VOLUME DAMPERS
- ROUND DUCTS SHALL HAVE SPLITTER DAMPERS OR BUTTERFLY DAMPERS. AND FITTING THEM WITH A SUITABLE ACCESS COVER TO ACCEPT FLOOR FINISH. 3.3.3. HAND BALANCING DAMPERS SHALL BE FABRICATED OF GALVANIZED IRON, TWO GAUGES HEAVIER THAN THAT OF THE DUCT IN WHICH THE DAMPER IS TO BE

ACCESS SHALL BE PROVIDED TO ALL MECHANICAL EQUIPMENT, BALANCING DAMPERS, VALVES AND ALL OTHER ITEMS REQUIRING SERVICING ACCESS. ACCESS PANELS SHALL BE FIRE-RATED AS REQUIRED, TO MEET CEILING, WALL

- PROVIDE ALL AIR OUTLETS COMPLETE WITH ACCESSORIES AS SPECIFIED HEREIN AND INDICATED ON THE DRAWINGS. COORDINATE LOCATIONS OF ALL AIR OUTLETS WITH LIGHTING. 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.

AND FLOOR RATINGS

VIBRATION ISOLATION REQUIREMENTS MOUNT MECHANICAL EQUIPMENT ON VIBRATION ISOLATORS TO MINIMIZE THE

INSTALL FLEXIBLE DUCT CONNECTIONS AT AIR HANDLING UNITS, FAN COIL

- ANSMISSION OF VIBRATION TO BUILDING STRUCTURE. FIXTURES WITH STOPS, REDUCERS, AND ESCUTCHEONS SECURELY ATTACHED 3.6.2. PROVIDE FLEXIBLE PIPE SECTIONS IN PIPING TO PREVENT THE TRANSMISSION OF VIBRATION TO THE BUILDING STRUCTURE.
  - UNITS, SUPPLY AND EXHAUST FANS TO PREVENT VIBRATION TRANSMISSION TO DUCTWORK 3.7. AIR SYSTEM TESTING, BALANCING AND COMMISSIONING
  - BALANCE SYSTEM FOR RATED AIR FLOW, AIR 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. BALANCE SYSTEM FOR OUTSIDE AIR AS GIVEN IN UNIT

PERFORMANCE, FAN SHEAVES SHALL BE ADJUSTED OR REPLACED AS

- ALL LOW VELOCITY DUCT SYSTEMS, INCLUDING SUPPLY, RETURN AND EXHAUST SHALL BE CHECKED FOR TIGHTNESS, ALL LEAKS SHALL BE REPAIRED BEFORE ALKALINE TYPE CLEANER CONSISTING OF A CONCENTRATED BLEND OF HIGHLY DUCTS ARE FURRED IN TO ENSURE TOTAL OUTLET CAPACITY IS WITHIN 5% OF THE QUANTITY BEING SUPPLIED BY THE AIR SYSTEMS.
  - ESTABLISHED BY THE ASSOCIATED AIR BALANCE COUNCIL. TESTING OF LOW VELOCITY DUCTWORK SHALL COMPRISE REPAIRING AND

AIR BALANCING SHALL BE CARRIED OUT BY AN INDEPENDENT AGENCY

SPECIALIZING IN THIS FORM OF WORK AND IN ACCORDANCE WITH GUIDELINES

### REPLACING ANY AND ALL AUDIBLE LEAKS OR THOSE THAT ARE NOTICEABLE BY MECHANICAL SYSTEMS SHALL NOT BE CONSIDERED READY FOR FINAL

REQUIRED, TO ACHIEVE DESIGN AIR FLOW.

### INSPECTION UNTIL BALANCING RESULTS ARE ACCEPTABLE TO CONSULTANT.

4. EQUIPMENT 4.1. GENERAL PROVIDE UNITS FROM MANUFACTURERS REGULARLY ENGAGED IN PRODUCTION

OF SUCH UNITS AND WHO ISSUE CATALOGUE DATA ON SUCH PRODUCTS.

ANY EQUIPMENT THAT THE MECHANICAL CONTRACTOR WISHES TO INSTALL AS

- AN ALTERNATE MUST BE SUBMITTED FOR APPROVAL BY ENGINEER BEFORE ORDERING AND INSTALLATION. IF NOT APPROVED BEFORE INSTALLATION THE ENGINEER MAY DEEM IT NECESSARY TO REPLACE THE INSTALLED EQUIPMENT WITH THAT WHICH WAS SPECIFIED AT THE COST OF THE CONTRACTOR.
- THE EQUIPMENT SPECIFIED IS TO BE MINIMUM STANDARD AND QUALITY REQUIRED. ANY ALTERNATE EQUIPMENT MUST MEET OR EXCEED THE STANDARD AND QUALITY OF THAT WHICH WAS SPECIFIED.

# 4.1.4. ALL ALTERNATES MUST BE SUBMITTED A MINIMUM OF SEVEN (7) DAYS PRIOR TO

- OFF DRAWINGS. PROVIDE ADDITIONAL OFFSETS AND CHANGES IN DIRECTION 5.1. GENERAL ALL CONTROLS FOR MECHANICAL EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR, COORDINATE INSTALLATION WITH G.C. AND ELECTRICAL CONTRACTOR WHERE REQUIRED. CARRY COST TO ADD FAN-COIL
  - TEMPERATURE SETPOINT, SUPPLY AIR TEMPERATURE, AND FANCOIL UNLESS OTHERWISE CALLED FOR, WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE PROVISION OF THERMOSTATS, CONTROLLERS, OPERATORS, SENSORS,

TRANSFORMERS. INTERFACE EQUIPMENT, CONTROL RELAYS, AND ALL OTHER

INSTALLATION OF CONTROL WORK BY THE ELECTRICAL TRADE SHALL BE DONE

INSTALLED CORRECTLY AND FUNCTION PROPERLY, AND THAT ALL MECHANICAL

UNIT CONTROLS ONTO EXISTING BAS SYSTEM, INCLUDING FILTER STATUS,

NECESSARY AUXILIARY DEVICES REQUIRED. THE ELECTRICAL TRADE SHALL SUPPLY AND INSTALL ALL ELECTRICAL LINE VOLTAGE WIRING AND CONDUIT REQUIRED BY THE MECHANICAL TRADE.

HEATING AND COOLING VALVE STATUS, FAN STATUS, SUPPLY AIR

UNDER THE SUPERVISION OF THE MECHANICAL TRADE. CONTROL WIRING, CONDUIT AND ELECTRICAL DEVICES SHALL COMPLY WITH THE REQUIREMENTS OF ELECTRICAL DIVISION.

IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO ENSURE

THAT, ALL CONTROL DEVICES SERVING MECHANICAL EQUIPMENT ARE

MECHANICAL CONTRACTOR IS TO COVER THIS SERVICE IN THEIR FEES.

EQUIPMENT OPERATES AS DESIGNED AND SPECIFIED, IN CONJUNCTION WITH THE CONTROLS.

5.1.7. UTILIZE BASE BUILDING CONTROLS CONTRACTOR FOR ALL NEW WORK.



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G.L. SMITH

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Professional stamps:

- GENERAL NOTES:
- ALL CONSTRUCTION ACTIVITIES MUST FULLY COMPLY WITH THE ROVINCIAL BUILDING CODE, AS AMENDED, AND TO ALL OTHER APPLICABLE LAWS. ALL DRAWINGS AND SPECIFICATIONS ARE THE EXCLUSIVE PROPERTY

REVIEW ACTIVITIES.
REVIEW WORK PERTAINS TO COMPLIANCE TO THE PROVINCIAL

ALL APPLICABLE BUILDING PERMITS ARE DISPLAYED ON SITE

- OF THE ARCHITECT AND NO COPY AND/OR REPRODUCTION IS PERMITTED UNLESS A WRITTEN CONSENT HAS BEEN PROVIDED BY THE ARCHITECT I HAVE EXERCISED RESPONSIBLE CONTROL WITH RESPECT TO DESIGN
- BUILDING CODE FOR ARCHITECTURAL WORK ONLY. DRAWINGS OF OTHER PROFESSIONAL ENGINEERS INCLUDING STRUCTURAL, MECHANICAL, ELECTRICAL AND OTHER PROFESSIONAL DESIGNERS MUST BE REFERENCED ACCORDINGLY. DRAWINGS MAY BE USED FOR CONSTRUCTION, ONLY WHEN SIGNED AND SEALED BY THE ARCHITECT CONTRACTOR CANNOT COMMENCE ANY ONSITE WORK UNLESS

ISSUED FOR TENDER 2021-03-15

# Date

PROJECT TITLE:

2021-04-22

DRAWING TITLE:

# Date

DRAWN BY:

ULTRAMAR

794047 COUNTRY RD 124

SINGHAMPTON ON

SSUED FOR REVIEW

Description

REVISION			

**SPECIFICATIONS** 

Description

PRINT DATE: SCALE: 2021/07/21 AS NOTED

CHECKED BY:

ZA/RS

PROJECT NO: 20-XXXX

DRAWING NO: