GENERAL MECHANICAL SYMBOLS

- REVISION NUMBER - SHOWN ON PLANS
- CTE — POINT WHERE NEW CONNECTS TO EXISTING
- NUMBER OF DETAIL ON SHEET
- NUMBER OF SHEET WHERE DETAIL APPEARS
- KEYNOTE
- CONTINUATION SYMBOL
- Room / 8 — ROOM NAME AND NUMBER
- ITEM TO BE DEMOLISHED
- AREA NOT IN CONTRACT

ABBREVIATIONS

ø	DIAMETER	MFR	MANUFACTURER
AD	AREA DRAIN	MIN	MINIMUM
ADD	ADDENDUM	MISC	MISCELLANEOUS
AFF	ABOVE FINISHED FLOOR	MTR	MOTOR
AP	ACCESS PANEL	MU/A	MAKE-UP/AIR
BFF	BELOW FINISHED FLOOR	NC	NOISE CRITERIA
CAP	CAPACITY	NC	NORMALLY CLOSED
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CLG	CEILING	NO, #	NUMBER
CO	CLEAN OUT	NO	NORMALLY OPEN
CW	COLD WATER	NTS	NOT TO SCALE
DB	DRY BULB	O	OXYGEN
DIA	DIAMETER	O/A	OUTSIDE AIR
DN	DOWN	OBV	OBVERT (BOTTOM OF DUCT/PIPE)
EAT	ENTERING AIR TEMPERATURE	ORD	OVERFLOW ROOF DRAIN
ELEC	ELECTRICAL	PD	PRESSURE DROP
EQUIP	EQUIPMENT	PRV	PRESSURE REDUCING VALVE
EWT	ENTERING WATER TEMPERATURE	PWR	POWER
E/A	EXHAUST AIR	R	DUCT RISER
EX.	EXISTING	R/A	RETURN AIR
F	DEGREES FAHRENHEIT	RD	ROOF DRAIN
FCO	FLOOR CLEAN OUT	REC	RECESSED
FD	FLOOR DRAIN	RH	RELATIVE HUMIDITY
FDC	FIRE DEPARTMENT CONNECTION	RL/A	RELIEF AIR
FL	FLOOR	RM	ROOM
FO	FUEL OIL	RPM	REVOLUTIONS PER MINUTE
FOV	FUEL OIL VENT	RW	RAIN WATER
FOR	FUEL OIL RETURN	RWL	RAIN WATER LEADER
FOS	FUEL OIL SUPPLY	S/A	SUPPLY AIR
FPM	FEET PER MINUTE	SAN	SANITARY
FS	FLOOR SINK	SD	SMOKE DAMPER
FTR	FIN TUBE RADIATION	SP	STANDPIPE
GAL	GALLON	SP	STATIC PRESSURE
GC	GENERAL CONTRACTOR	STM	STEAM
GPM	GALLONS PER MINUTE	T	THERMOSTAT
GW	GREASE WASTE	ΔT	TEMPERATURE DIFERENCE/DELTA
HB	HOSE BIB	TEMP	TEMPERATURE
HP	HORSE POWER	TYP	TYPICAL
HTG	HEATING	UG	UNDERGROUND
HTR	HEATER	UH	UNIT HEATER
HW	HOT WATER	VAC	VACUUM
HYD	HYDRANT	V	VENT
INV	INVERT	VAV	VARIABLE AIR VOLUME
LAT	LEAVING AIR TEMPERATURE	VTR	VENT THROUGH ROOF
LP	LOW PRESSURE	W	WASTE
LVR	LOUVER	WB	WET BULB
LWT	LEAVING WATER TEMPERATURE	WCO	WALL CLEAN OUT
M/A	MIXED AIR	WH	WALL HYDRANT
MAX	MAXIMUM		
MD	MOTORIZED DAMPER		

* NOTE *

ALL OF GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET.THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

PIPING AND DUCTWORK SYSTEMS

18x18 S/A	SUPPLY AIR
18x18 O/A	OUTSIDE AIR
18x18 R/A	RETURN AIR
18x18 T/A	TRANSFER AIR
18x18 E/A	EXHAUST AIR
18x18 S/E	SANITARY EXHAUST AIR
18x18 K/E	KITCHEN EXHAUST AIR
18x18 SE/A	SMOKE EXHAUST AIR
6ø FLUE	EXHAUST GAS FLUE
6ø CB/A	COMBUSTION AIR
18x12	DUCT C/W THERMAL INSULATION
18x12	DUCT C/W 2 HR FIRE
18x12	DUCT C/W ACCOUSTIC LINING
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHW-R	HOT WATER RECIRCULATION
G	NATURAL GAS - LOW PRESSURE
G (xPSI)	NATURAL GAS - x PSI
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
CD	CONDENSATE DRAINAGE
CHGS	CHILLED GLYCOL SUPPLY
CHGR	CHILLED GLYCOL RETURN
HGS	HEATING GLYCOL SUPPLY
HGR	HEATING GLYCOL RETURN
REF-L	REFRIGERANT - LIQUID SUPPLY
REF-S	REF - RETURN - LOW TEMP
REF-S	REF - RETURN - MEDIUM TEMP
REF-HG	REFRIGERANT - HOT GAS
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
SAN	SANITARY SEWER
SAN-P	PUMPED SANITARY SEWER
SAN(G)	GREASE WASTE
ST	STORM DRAINAGE
ST-P	PUMPED STORM DRAINAGE
OST	OVERFLOW STORM DRAINAGE
V	SANITARY VENT
WT	WEEPING TILE
GW	GROUND WATER DRAINAGE
GW-P	PUMPED GROUND WATER
STM (xPSI)	STEAM - x PSI
CDR	CONDENSATE RETURN
STM-HP	STEAM - HIGH PRESSURE
CA	COMPRESSED AIR

PIPING & PLUMBING SYMBOLS

SIZE & SYSTEM	2"Ø DCW
SIZE & SYSTEM & ARROW	≠4"Ø DHW
SIZE & SYSTEM & SLOPE & ARROW	4"Ø SAN (1% SLOPE)
PIPE SPOT INVERT	SAN INV. 149.82 m
CAP	DHW
PIPE BREAK	DHW
PLUMBING TRAP	≠4"Ø SAN (1% SLOPE)
CLEANOUT	≠4"Ø SAN (1% SLOPE)
FLOOR CLEANOUT	≠4"Ø SAN (1% SLOPE)
SHUT-OFF VALVE	DCW
BALANCING VALVE	DCW
CHECK VALVE	2"Ø DCW
BUTTERFLY VALVE	DCW
CIRCUIT SETTER	2"Ø DCW
2-WAY CONTROL VALVE	M, DCW
GATE VALVE	DCW
GLOBE VALVE	DCW
PRESSURE REDUCING	2"Ø DCW
STRAINER	2"Ø DCW
VIBRATION ISOLATION	DCW
BACKFLOW PREVENTER DOUBLE CHECK VALVE	2"Ø DCW, RPZ
BACKFLOW PREVENTER REDUCED PRESSURE C/W DRAIN	2 1/2"Ø DCW, RPZ
TRAP PRIMER	DCW, TP
HEAT TRACING	≠4"Ø SAN, DCW
3 WAY MOTORIZED CONTROL VALVE	M, 2"Ø DCW
THERMOSTATIC MIXING VALVE	T/P, 1 1/4"Ø DCW, 1 1/4"Ø DHW
DOMESTIC WATER METER	DCW, WM
METER	HWS, M
GAS METER ASSEMBLY	2 1/2"Ø G (xPSI), GM, 2 1/2"Ø G
VERTICAL INLINE PUMP	6"Ø HWR, 6"Ø HWS
FLOOR DRAIN	FD
FUNNEL FLOOR DRAIN	FFD-X
HUB DRAIN	HD-1
SCUPPER DRAIN	SD-X
AREA DRAIN	AD-1
AREA DRAIN - STORM	AD-1 (100 L)
STORM DRAIN	RD-1 (100 L/15min)
TRENCH DRAIN	TD-2
CATCH BASIN	CB-x
HOSE BIBB	HB
ROOF HYDRANT	RHB
NON-FREEZE EXTERIOR WALL HYDRANT	NFHB
INCOMING DOMESTIC WATER ASSEMBLY - 6"ø	WM, GV

HVAC SYMBOLS

SIZE & SYSTEM	12x12 S/A
LOUVERED DOUBLE DEFLECTION GRILLE	'A' - 12x8, 85 CFM
LINEAR BAR GRILLE	'A' - 24x2, 53 CFM
3-CONE DIFFUSER	'A' - 4ø, 53 CFM / 600x600
PLAQUE FACE DIFFUSER	'B' - 4ø, 53 CFM / 600x600
LINEAR SLOT DIFFUSER WITH PLENUM BOX	'A' - 4ø, 53 CFM / 900
EGGCRATE RETURN GRILLE	'B' - 12x8, 85 CFM
RETURN LINEAR SLOT	'R', -- / 900
LOUVERED GRILLE	'B' - 12x8, 85 CFM
AIR INTAKE LOUVER	'C' - 28x16, 530 CFM
EXHAUST AIR LOUVER	'C' - 28x16, 530 CFM
EXHAUST BOX	'D' - 5ø, 53 CFM / 250x250
WALL BOX	
SMOKE DAMPER	S/A, SD
FIRE DAMPER	S/A, FD
COMB. FIRE/SMOKE DAMPER	S/A, FSD
MANUAL BALANCING DAMPER	S/A, BD
BACKDRAFT DAMPER	S/A, BDD
MOTORIZED DAMPER	S/A, MD
CO2 DETECTOR	CO2
CO DETECTOR	CO
NO2 DETECTOR	NO2
O2 DETECTOR	O2
HUMIDISTAT	H
HUMIDITY SENSOR	HS
INDOOR ENVIRONMENT QUALITY SENSOR	IEQ
TEMPERATURE SENSOR	TS
THERMOSTAT	T
SWITCH	S
STARTER	
INLINE FAN	SF-XX, 1600 CFM, EQUIP. ID., AIRFLOW
WALL FAN	EF-XX, 3500 CFM, EQUIP. ID., AIRFLOW
VAV BOX	NECK SIZE 6, 127 CFM, 40 CFM, MAX FLOW, MIN FLOW
BASEBOARD HEATER	BBH-1, 0.5 kW, EQUIP. ID., HEAT CAPACITY
ROOFTOP UNIT	RTU-XX, 4 ton, 866 CFH, 949 lb, EQUIP. ID., COOLING CAPACITY, FUEL FLOW, WEIGHT

PROJECT GENERAL NOTES

1. ALL DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY TO EACH OTHER; ALL MATERIALS, EQUIPMENT AND METHODS OF INSTALLATION OUTLINED IN THE DRAWINGS AND/OR SPECIFICATIONS SHALL BE CONSIDERED ESSENTIAL TO THE CONTRACT. REVIEW AND COORDINATE WITH ALL CONTRACT DRAWINGS (ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL, ELECTRICAL, INTERIOR DESIGN AND LANDSCAPE) AND SPECIFICATIONS PRIOR TO CONSTRUCTION.
2. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE APPLICABLE BUILDING CODES AND THE AUTHORITY HAVING JURISDICTION.
3. UNLESS SPECIFICALLY NOTED OTHERWISE THE CONTRACTOR IS TO PROVIDE COMPLETE FULLY FUNCTIONING, TESTED AND COMMISSIONED MECHANICAL SYSTEMS.
4. ALL EQUIPMENT IS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURERS RECOMMENDATIONS. THE CONTRACTOR IS TO PROVIDE ALL VALVES, CONTROLS AND ACCESSORIES AS REQUIRED BY THE EQUIPMENT SUPPLIERS/MANUFACTURERS TO ALLOW FOR PROPER OPERATION, SERVICEABILITY AND WARRANTY.
5. DO NOT SCALE DRAWINGS. THE DRAWINGS ARE DIAGRAMMATIC AND LOCATIONS OF EQUIPMENT PIPING AND DUCTWORK ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND MAKE ALLOWANCE FOR INSULATION, SUPPORTS AND ALL CLEARANCES.
6. REVIEW LOCATIONS FOR ALL MECHANICAL SYSTEMS AND EQUIPMENT PRIOR TO INSTALLATION AND COORDINATE WITH ALL OTHER TRADES. CONFLICTS THAT CANNOT BE RESOLVED THROUGH SITE COORDINATION SHOULD BE IDENTIFIED AND REFERRED TO THE MECHANICAL CONSULTANT PRIOR TO INSTALLATION. PROVIDE AT NO ADDITIONAL COST ALL OFFSETS, ACCESS PANELS, LOW POINT DRAINS ETC. REQUIRED TO MAINTAIN CLEARANCE ABOVE CEILINGS.
7. ANY EQUIPMENT, PIPE OR DUCTWORK INSTALLED BELOW THE SPECIFIED CEILING OR MINIMUM CLEARANCE HEIGHT (2100MM) (6' 10") WITHOUT PRIOR WRITTEN APPROVAL WILL BE REMOVED AND REPAIRED AT THE CONTRACTORS COST.
8. INSULATION, ADHESIVES, VAPOR-BARRIER MATERIALS, AND OTHER ACCESSORIES INSTALLED ON MECHANICAL SYSTEMS SHALL HAVE MAX 25 FLAME SPREAD RATING AND MAX 50 SMOKE DENSITY RATING.
9. THE GENERAL AND THE SUBCONTRACTOR(S) ARE TO REVIEW AND STAMP ALL SHOP DRAWINGS PRIOR TO SUBMISSION TO THE MECHANICAL CONSULTANT FOR REVIEW. CONTRACTOR REVIEWS SHALL BE BASED ON COMPLIANCE WITH DESIGN EQUIPMENT AND SPECIFIED ACCESSORIES (COMPLIANCE WITH APPROVED EQUALS LIST, CAPACITY, DIMENSIONS, WEIGHT, POWER REQUIREMENTS, ETC.) THE CONTRACTOR SHALL FLAG, FOR APPROVAL DEVIATIONS FROM THE ORIGINALLY SPECIFIED EQUIPMENT. NO EQUIPMENT IS TO BE ORDERED UNTIL THE SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED.
10. THE CONTRACTOR IS TO OBTAIN WRITTEN APPROVAL FROM THE MECHANICAL CONSULTANT PRIOR TO PURCHASING EQUIPMENT OR INSTALLING MATERIALS THAT DEVIATE FROM THE SPECIFICATIONS OR APPROVED EQUALS. FAILURE TO DO SO MAY RESULT IN THE CONTRACTOR BEARING THE FULL COST OF REMOVING THE ALTERNATE PRODUCTS AND REPLACING THEM WITH THE SPECIFIED EQUIPMENT OR MATERIALS.10.THE CONTRACTOR IS TO OBTAIN WRITTEN APPROVAL FROM THE MECHANICAL CONSULTANT PRIOR TO PURCHASING EQUIPMENT OR INSTALLING MATERIALS THAT DEVIATE FROM THE SPECIFICATIONS OR APPROVED EQUALS. FAILURE TO DO SO MAY RESULT IN THE CONTRACTOR BEARING THE FULL COST OF REMOVING THE ALTERNATE PRODUCTS AND REPLACING THEM WITH THE SPECIFIED EQUIPMENT OR MATERIALS.
11. REPLACE ALL FILTERS IN AIR HANDLING SYSTEMS AT COMPLETION OF PROJECT.
12. SUBMIT SLEEVING SHOP DRAWINGS TO THE STRUCTURAL CONSULTANT FOR APPROVAL.

MECHANICAL SHEET INDEX

M000	MECHANICAL TITLE SHEET
M001A	SCHEDULES
M001B	MECHANICAL DETAILS
M001C	MECHANICAL DETAILS
M001D	PLUMBING FIXTURE SCHEDULES
M002A	MECHANICAL SPECIFICATIONS
M002B	MECHANICAL SPECIFICATIONS
M101	LEVEL 1 HVAC PLAN
M102	SITE WATER METER ROOM & UTILITY ROOM ENLARGED VIEW - HVAC
M200	UNDERFLOOR PLUMBING PLAN
M201	LEVEL 1 PLUMBING PLAN
M202	SITE WATER METER ROOM & UTILITY ROOM ENLARGED VIEW - PD
M203	ROOF PLAN

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#	DATE	DESCRIPTION	BY
3	2023-07-14	ISSUED FOR TENDER AND PERMIT	DJ
2	2023-06-16	ISSUED FOR PERMIT	DJ
1	2023-04-12	ISSUED FOR COORDINATION	DJ

RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5

WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

DRAWING
MECHANICAL TITLE SHEET

PROJECT NO. 22-000-176
PROJECT DATE Issue Date
DRAWN BY D.C.
CHECKED BY R.R.
SCALE N.T.S.

LICENSED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M000
REV. 3

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ELECTRIC HEATER SCHEDULE

HEATER	MANFACTURER	MODEL	STYLE	CAPACITY (MBH)	CAPACITY (kW)	AIR FLOW (CFM)	AIR FLOW (L/s)	ELECTRICAL (V/Ph/Hz)	WEIGHT (LBS)	WEIGHT (KG)	MOUNTING	CONTROLS	COMMENTS
FFH-1	OUELLET	OAC04008-T	FORCE FLOW	13.6	4.0	160	76	208/1/60	24	10.9	SURFACE	REMOTE THERMOSTAT	

NOTES: - REFER TO ARCHITECTURAL DRAWINGS FOR UNIT FINISH, MOUNTING AND COLOUR REQUIREMENTS IF SHOWN.
- PROVIDE ALL SUPPORTS TO HANG/SUSPEND/MOUNT UNIT AS REQUIRED.
- ACCEPTABLE ALTERNATE MANUFACTURERS: STELPRO, CHROMALOX
- ALL REMOTE THERMOSTATS SHALL BE LOW VOLTAGE AND UNITS SHALL BE COMPLETE WITH FACTORY SUPPLIED TRANSFORMER.

EXHAUST FAN SCHEDULE

ITEM	SERVICE	LOCATION	MANUFACTURER	MODEL	TYPE	CAPACITY (CFM)	CAPACITY (L/s)	EXTERNAL STATIC PRESSURE (in.H2O)	EXTERNAL STATIC PRESSURE (Pa)	MOTOR POWER (HP)	MOTOR POWER (kW)	ELECTRICAL V/P/Hz	WEIGHT (LBS)	WEIGHT (Kg)	CONTROLS	COMMENTS
EF-1	MECHANICAL ROOM	ROOF TOP	COOK	ACE 90C15DL	DOWNBLAST	200	94	0.50	124	1/8	0.10	120/1/60	43	20	MANUAL STARTER	
EF-2	SITE WATER METER ROOM	ROOF TOP	COOK	ACE 100C15DM	DOWNBLAST	375	176	0.50	124	1/8	0.10	120/1/60	44	20	MANUAL STARTER	
EF-3	CIBC - WASHROOMS	ROOF TOP	COOK	ACE 100C15DM	DOWNBLAST	320	150	0.50	124	1/8	0.10	120/1/60	44	20	MANUAL STARTER	
EF-4	CIBC - PERSONNEL ROOM	ROOF TOP	COOK	ACE 100C15DM	DOWNBLAST	320	150	0.50	124	1/8	0.10	120/1/60	44	20	MANUAL STARTER	

NOTES: - PROVIDE LOCAL DISCONNECTS AND STARTERS FOR ALL FANS.
- FANS TO BE COMPLETE WITH BACKDRAFT DAMPERS.
- PROVIDE ALL SUPPORTS FOR ROOF TOP FANS AS REQUIRED INCLUDING VIBRATION ISOLATION.

DX SPLIT AC UNIT SCHEDULE

AIR HANDLING UNIT (INDOOR)

AC #	LOCATION	MANUFACTURER	MODEL	SUPPLY FLOW (CFM)	SUPPLY FLOW (L/S)	COOLING CAPACITY TOTAL (MBH)	COOLING CAPACITY TOTAL (KW)	COOLING CAPACITY SENSIBLE (MBH)	COOLING CAPACITY SENSIBLE (KW)	FLUID	ELECTRICAL POWER (V/PH/HZ)	ELECTRICAL MOTOR (HP)	ELECTRICAL MOTOR (KW)	ELECTRICAL MOTOR TYPE	WEIGHT (LBS)	WEIGHT (KG)
AC-1	GARBAGE ROOM	DAIKIN	FTK24AXVJU	716	338	24.00	7.0	15.67	4.6	R-410A	208/1/60	0.047	0.035	DIRECT DRIVE	31	14.074

CONDENSING UNIT (OUTDOOR)

CU #	LOCATION	MANUFACTURER	MODEL	COOLING CAPACITY (MBH)	COOLING CAPACITY (KW)	ELECTRICAL POWER (V/PH/HZ)	ELECTRICAL MCA (A)	ELECTRICAL MOP (A)	ELECTRICAL RLA (A)	EFFICIENCY EER	EFFICIENCY SEER	WEIGHT (LBS)	WEIGHT (KG)	REMARKS
CU-1	ROOF	DAIKIN	RK24AXVJU	24	7.0	208/60/1	13.4	20	13	12.2	19	106	48	

NOTES: - PROVIDE DIGITAL PROGRAMMABLE WALL MOUNTED THERMOSTAT FOR EACH INDOOR UNIT COMPLETE WITH TAMPER PROOF COVER.
- PROVIDE 18" (457 MM) STRUCTURAL SUPPORTS FOR ALL EXTERIOR CONDENSING UNITS. SUPPORTS TO SIT ON TOP OF ROOF PAVERS ON TOP OF 1" (25 MM) RIGID BOARD INSULATION.
- PROVIDE LOW AMBIENT KIT WHERE SPECIFIED SUITABLE OF PROVIDING COOLING PERFORMANCE AT AMBIENT TEMPERATURE OF (-40°F) (-40°C)
- PROVIDE WEATHERPROOF DISCONNECT SWITCH AT CONDENSER.
- COOLING CAPACITY BASED ON AMBIENT 95°F DB / 75°F WB (35.0°C DB / 23.9°C WB)
- COOLING CAPACITY BASED ON INDOOR AIR 80°F DB / 67°F WB (26.7°C DB / 19.4°C WB).
- SELECT INDOOR UNITS FOR MEDIUM OR LOW SPEED.
- PIPE CONDENSATE TO NEAREST SUITABLE DRAIN.

ROOF TOP UNIT SCHEDULE

UNIT

RTU	SERVICE	MANUFACTURER	MODEL	NOMINAL CAPACITY (TONS)	POWER (V/PH/HZ)	POWER MCA (A)	POWER MOCP (A)	EFFICIENCY ARI EER (%)	MIN O/A (CFM)	MIN O/A (L/S)	ECONOMIZER (Y/N)	DISCHARGE ORIENTATION	SIZE LENGTH (IN)	SIZE LENGTH (MM)	SIZE WIDTH (IN)	SIZE WIDTH (MM)	SIZE HEIGHT (IN)	SIZE HEIGHT (MM)	SIZE WEIGHT (LBS)	SIZE WEIGHT (KG)
RTU-1	UNIT 1	LENNOX	LGT120H4E	10	575/3/60	20	25	12	600	283.0	Y	DOWN	85.25	2165	47	1194	47	1194	1470	667.4
RTU-2	UNIT 2	LENNOX	LGT060H4E	5	575/3/60	11	15	12.2	350	165.1	Y	DOWN	85.25	2165	47	1194	47	1194	1060	481.2
RTU-3	UNIT 3	LENNOX	LGT036H4E	3	575/3/60	8	15	13.3	120	56.6	Y	DOWN	85.25	2165	47	1194	47	1194	869	394.5
RTU-4	UNIT 3	LENNOX	LGT048H4E	4	575/3/60	11	15	12.8	400	188.7	Y	DOWN	85.25	2165	47	1194	47	1194	879	399.1
RTU-5	UNIT 3	LENNOX	LGT060H4E	5	575/3/60	11	15	12.2	350	165.1	Y	DOWN	85.25	2165	47	1194	47	1194	1060	481.2

SUPPLY FAN / COOLING

RTU	SUPPLY FAN CAPACITY (CFM)	SUPPLY FAN CAPACITY (L/S)	ESP (IN. H2O)	ESP (KPA)	POWER (HP)	POWER (KW)	VARIABLE FLOW	TOTAL COOLING (MBH)	TOTAL COOLING (KW)	SENSIBLE COOLING (MBH)	SENSIBLE COOLING (KW)	REFRIG.	EAT DB (°F)	EAT DB (°C)	EAT WB (°F)	EAT WB (°C)	LAT DB (°F)	LAT DB (°C)	LAT WB (°F)	LAT WB (°C)
RTU-1	4000	1886.79	0.6	0.15	3.75	2.80	MSAV	121.9	35.73	89	26.08	R-410A	80	26.7	67	19.4	58.5	14.7	56.9	13.8
RTU-2	2000	943.40	0.6	0.15	1.2	0.90	MSAV	59.2	17.35	43.4	12.72	R-410A	80	26.7	67	19.4	57.2	14.0	56.5	13.6
RTU-3	1200	566.04	0.6	0.15	0.5	0.37	MSAV	37	26.60	43.4	12.72	R-410A	80	26.7	67	19.4	59.6	15.3	57.2	14.0
RTU-4	1600	754.72	0.6	0.15	1	0.75	MSAV	49.6	14.54	34.7	10.17	R-410A	80	26.7	67	19.4	60.5	15.8	57.3	14.1
RTU-5	2000	943.40	0.6	0.15	1.2	0.90	MSAV	59.2	17.35	43.4	12.72	R-410A	80	26.7	67	19.4	57.2	14.0	56.5	13.6

HEATING

RTU	HEATING INPUT (MBH)	HEATING INPUT (KW)	HEATING OUTPUT (MBH)	HEATING OUTPUT (KW)	HEAT SOURCE	REMARKS
RTU-1	240	70.34	194	56.86	NAT. GAS	
RTU-2	150	43.96	121	35.46	NAT. GAS	
RTU-3	108	31.65	81	23.74	NAT. GAS	
RTU-4	150	43.96	121	35.46	NAT. GAS	
RTU-5	150	43.96	113	33.12	NAT. GAS	

NOTES: - PROVIDE FACTORY SUPPLIED 24" ROOF CURB AND ALL REQUIRED MISCELLANEOUS SUPPORTS. RTU TO BE INSTALLED LEVEL TO FLOOR LEVEL BELOW.
- PROVIDE FACTORY INSTALLED 20A GFCI. ALL WIRING TO BE FIELD INSTALLED FROM INDEPENDENT 120V POWER SOURCE. OUTLET TO REMAIN OPERATIONAL WHEN POWER TO RTU IS SHUT OFF.
- PROVIDE 2" MERV 13 FILTERS, WEATHERPROOF DISCONNECT, BAROMETRIC RELIEF DAMPER, DUAL ENTHALPY ECONOMIZER, CO2 ZONE SENSORS (DEMAND CONTROLLED VENTILATION) AND DIGITAL PROGRAMMABLE 7-DAY THERMOSTAT.

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3	2023-07-14	ISSUED FOR TENDER AND PERMIT	DJ
2	2023-06-16	ISSUED FOR PERMIT	DJ
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RIO CAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5

WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

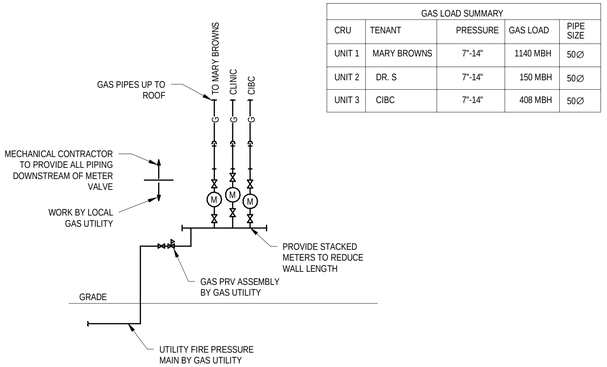
DRAWING
SCHEDULES

PROJECT NO. 22-000-176
PROJECT DATE Issue Date
DRAWN BY Author
CHECKED BY Checker
SCALE

LICENSED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

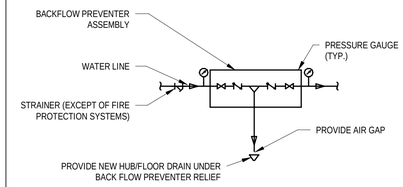
DRAWING NO. M001A
REV. 3

7/13/2023 2:02:12 PM



GAS LOAD SUMMARY				
CRU	TENANT	PRESSURE	GAS LOAD	PIPE SIZE
UNIT 1	MARY BROWNS	7"-14"	1140 MBH	50Ø
UNIT 2	DR. S	7"-14"	150 MBH	50Ø
UNIT 3	CIBC	7"-14"	408 MBH	50Ø

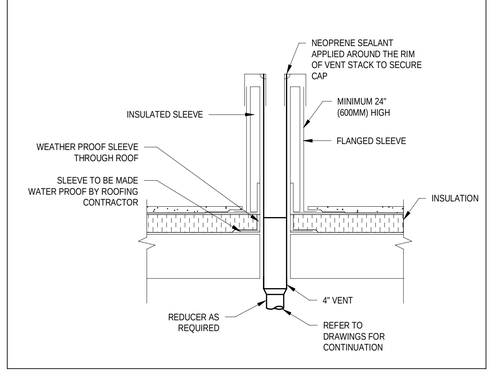
1 M001B GAS METER SCHEMATIC
NTS



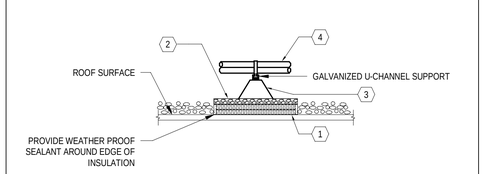
NOTE:

- DRAIN TO NEAREST SUITABLE SIZE HUB DRAIN TO SUIT FULL RELIEF FLOW
- PROVIDE AIR GAP BETWEEN RELIEF AND DRAIN
- INSTALL BFP TO ALLOW FOR TESTING / INSPECTION
- ALL ISOLATION VALVES SERVING FIRE PROTECTION SYSTEMS TO BE SUPERVISED
- BFP AND INSTALLATION TO BE IN ACCORDANCE WITH LATEST VERSION OF CSA B64.10

2 M001B RPZ BACKFLOW PREVENTER DETAIL
NTS



3 M001B SANITARY VENT
NTS

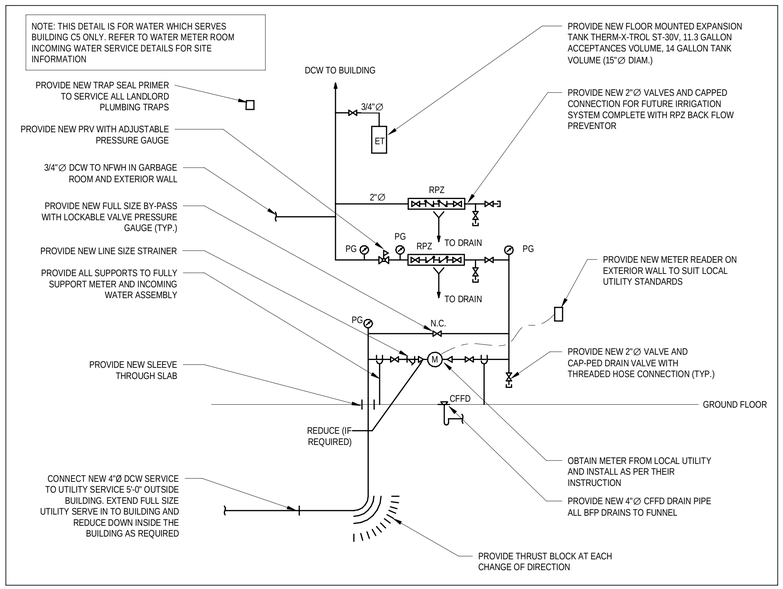


NOTES: (ALL COMPONENTS BY MECHANICAL TRADES)

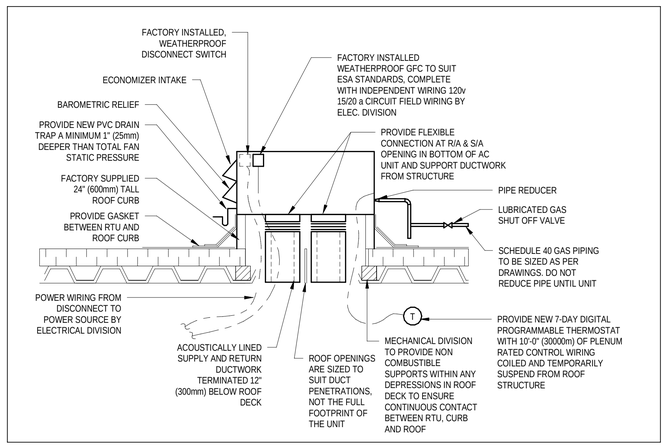
1. 500MM/500MM/50MM (20"/20"/2") ROOFMATE INSULATION PLACED ON FINISHED ROOF
2. 600MM/600MM/50MM (24"/24"/2") PATIO PAVER
3. MANUFACTURED, SINGLE PIECE VOLCANIZED RUBBER GAS SUPPORT (4"X6"X9" LONG) COMPLETE WITH STAINLESS STEEL STRUTS. SUPPORTS SHALL WEIGH NO LESS THAN 9LBS PER 9" WIDE SUPPORT
4. SCHEDULE 40 STEEL PIPE PAINTED YELLOW
5. GALVANIZED STEEL SUPPORT STRAPS WITH INTERIOR WEAR SURFACE TO ALLOW GAS PIPES TO MOVE

4 M001B SUPPORTS FOR GAS PIPING ON ROOF
NTS

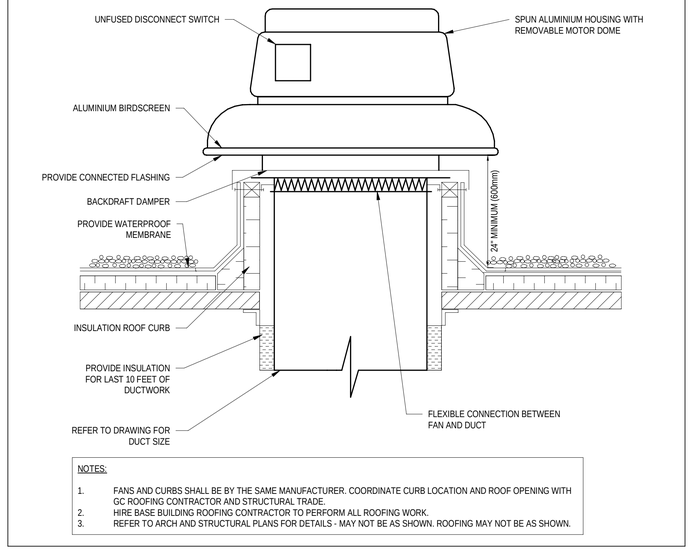
NOTE: THIS DETAIL IS FOR WATER WHICH SERVES BUILDING C5 ONLY. REFER TO WATER METER ROOM INCOMING WATER SERVICE DETAILS FOR SITE INFORMATION



5 M001B INCOMING WATER SERVICE - BUILDING C5
NTS



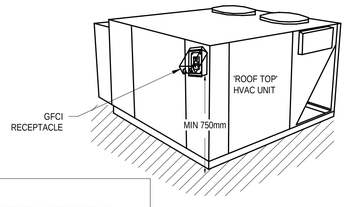
6 M001B ROOFTOP UNIT INSTALLATION
NTS



NOTES:

1. FANS AND CURBS SHALL BE BY THE SAME MANUFACTURER. COORDINATE CURB LOCATION AND ROOF OPENING WITH GC ROOFING CONTRACTOR AND STRUCTURAL TRADE.
2. HIRE BASE BUILDING ROOFING CONTRACTOR TO PERFORM ALL ROOFING WORK.
3. REFER TO ARCH AND STRUCTURAL PLANS FOR DETAILS - MAY NOT BE AS SHOWN. ROOFING MAY NOT BE AS SHOWN.

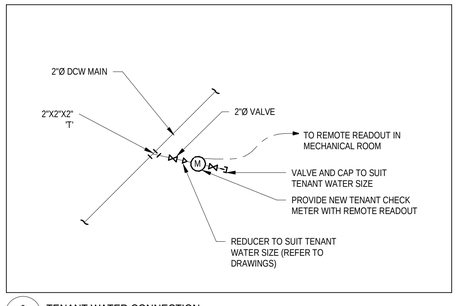
7 M001B ROOF MOUNTED DOWNBLAST EXHAUST FAN
NTS



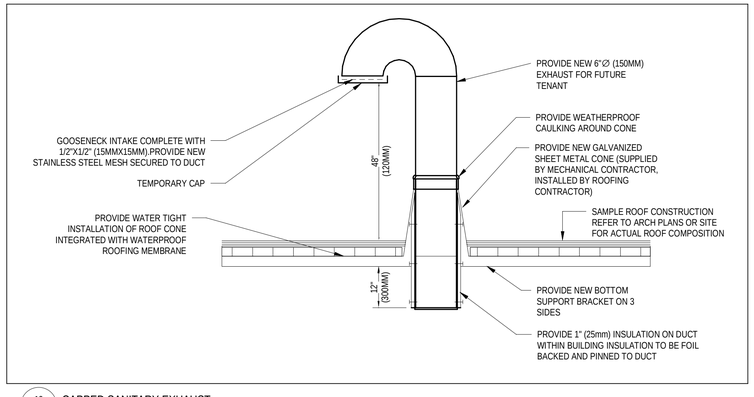
NOTES:

1. PROVIDE AT LEAST ONE (1) NEW GFCI RECEPTACLE PER PIECE OF EQUIPMENT WITH WEATHER PROOF COVER FACTORY SUPPLIED AND FIELD INSTALLED ON EXTERIOR UNIT.
2. RECEPTACLE SHALL BE INSTALLED MINIMUM 750mm ABOVE GRADE.
3. RECEPTACLE SHALL BE FIELD WITHIN BY ELECTRICAL DIVISION FROM INDEPENDENT POWER SOURCE WIRED.
4. COORDINATE INSTALLATION WITH ELECTRICAL DIVISION.
5. ROOF PENETRATIONS SHALL BE RAIN TIGHT AND CONDUITS PROPERLY SUPPORTED.

8 M001B ROOFTOP EQUIPMENT GFCI DETAIL
NTS



9 M001B TENANT WATER CONNECTION
NTS



10 M001B CAPPED SANITARY EXHAUST
NTS

HAMMERSCHLAG & JOFFE INC.
43 Lesmill Road, Toronto, Ontario
Canada M3B 2T8
T: (416) 444.9263
F: (416) 444.1463
E: dwg@hamjof.com

#	DATE	DESCRIPTION	BY
3	2023-07-14	ISSUED FOR TENDER AND PERMIT	DJ
2	2023-06-16	ISSUED FOR PERMIT	DJ
1	2023-04-12	ISSUED FOR COORDINATION	DJ

RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

DRAWING
MECHANICAL DETAILS

PROJECT NO. 22-000-176
PROJECT DATE Issue Date
DRAWN BY J.S.
CHECKED BY R.R.
SCALE NTS

LICENCED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M001B
REV. 3

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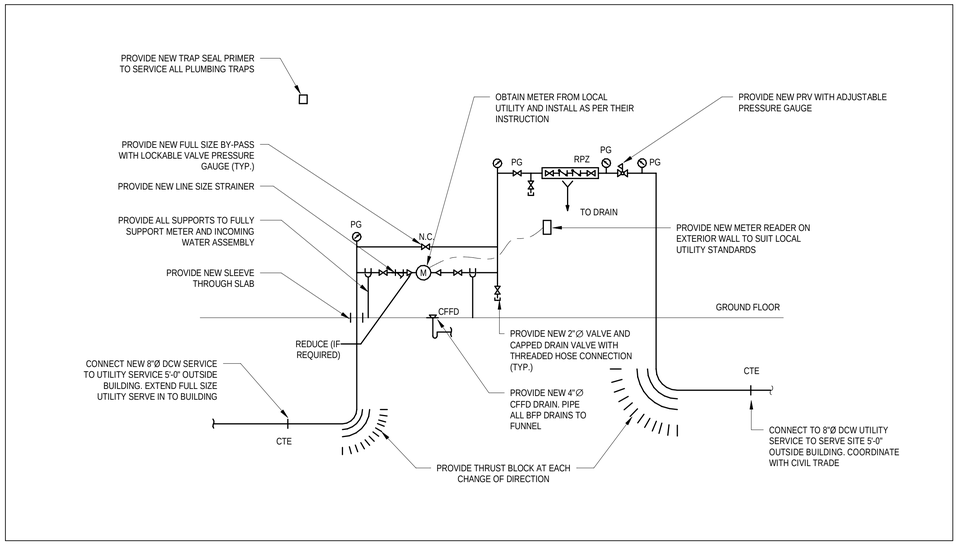


1 / M001C INCOMING WATER SERVICE - SITE WATER METER ROOM
NTS

HAMMERSCHLAG & JOFFE INC.
43 Lesmill Road, Toronto, Ontario
Canada M3B 2T8
T: (416) 444.9263
F: (416) 444.1463
E: dwg@hamjof.com

#	DATE	DESCRIPTION	BY
3	2023-07-14	ISSUED FOR TENDER AND PERMIT	DJ
2	2023-06-16	ISSUED FOR PERMIT	DJ
1	2023-04-12	ISSUED FOR COORDINATION	DJ

RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5

WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

DRAWING
MECHANICAL DETAILS

PROJECT NO.	22-000-176
PROJECT DATE	Issue Date
DRAWN BY	Author
CHECKED BY	Checker
SCALE	NTS

LICENSED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

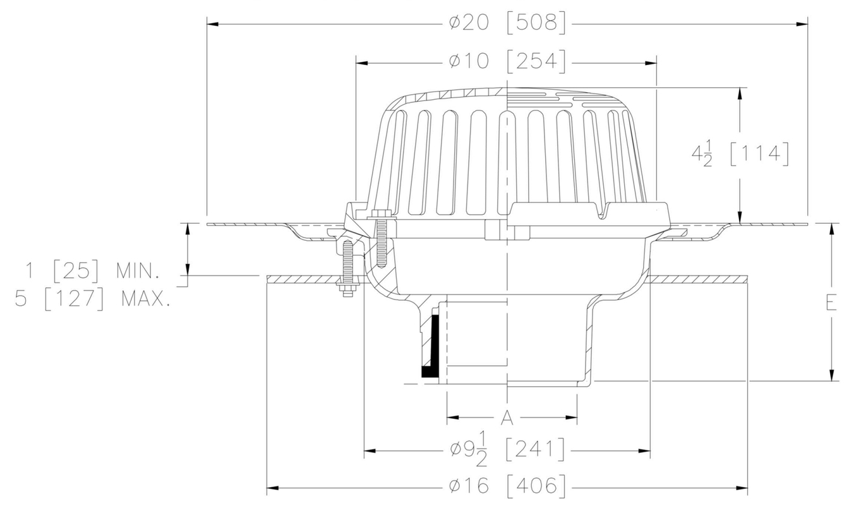
DRAWING NO. M001C
REV. 3

7/13/2023 2:02:13 PM

ZURN Z121-C-R
12 [305] DIAMETER ROOF DRAIN W/ UNDERDECK CLAMP AND ROOF SUMP RECEIVER

SPECIFICATION SHEET
TAG RD-1

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



A Pipe Size in [mm]	Approx Wt. lbs [kg]	Dome Open Area in² [cm²]
2,3,4,6 [51,76,102,152]	22 [10]	78 [503]

ENGINEERING SPECIFICATION: ZURN Z121-C-R
12" [305mm] Diameter roof drain. Dura-Coated cast iron body with combination membrane flashing clamp/gravel guard, roof sump receiver, underdeck clamp and low silhouette Poly-Dome.

OPTIONS (Check/specify appropriate options)

PIPE SIZE	(Specify size/type) OUTLET			E BODY HT. DIM.
2,3,4,6 [51,76,102,152]	____	IC	Inside Caulk	5-1/4 [133]
2,3,4,6 [51,76,102,152]	____	IP	Threaded	3-3/4 [95]
2,3,4,6 [51,76,102,152]	____	NH	No-Hub	5-1/4 [133]
2,3,4 [51,76,102]	____	NL	Neo-Loc	4-9/16 [116]

PREFIXES
- ____ Z D.C.C.I. Body with Poly-Dome (4-1/4 [108] Dome Height)*
- _✓_ ZA D.C.C.I. Body with Aluminum Dome (6-9/16 [167] Dome Height)
- ____ ZC D.C.C.I. Body with Cast Iron Dome

SUFFIXES
- ____ -AR Acid Resistant Epoxy Coated
- ____ -DB Deep Sump Body (IC Only)
- ____ -E Static Extension 1 [25] thru 4 [102] (Specify Ht.)
- ____ -FG Flush Grate
- ____ -G Galvanized Cast Iron
- _✓_ -SC Secondary Clamping Collar
- ____ -SS Stainless Mesh Screen Over Dome
- ____ -TC Neo-Loc Test Cap Gasket (2,3,4 [51,76,102] NL Bottom Outlet Only)
- ____ -VP Vandal Proof Secured Top
- ____ -XJ Vertical Expansion Joint
- ____ -84 Stainless Steel Perforated Gravel Guard
- ____ -85 Stainless Steel Perforated Extension
- ____ -89 2 [51] High External Water Dam
- ____ -90 90° Threaded Side Outlet Body

* Regularly furnished unless otherwise specified.

Zurn Industries, LLC | Specification Drainage Operation
1801 Pittsburgh Avenue, Erie, PA U.S.A. 16502 · Ph. 855-663-9876, Fax 814-454-7929
In Canada | Zurn Industries Limited
3544 Nashua Drive, Mississauga, Ontario L4V 1L2 · Ph. 905-405-8272, Fax 905-405-1292
www.zurn.com

Rev. C
Date: 10/2/2017
C.N. No. 138256
Prod. | Dwg. No. Z121-C-R

HD

zurn

Z211-U-P

Cast iron floor drain with a 165 mm (6 1/2") in diam. body with a 102 mm (4") in diam. threaded throat to receive adjustable 127 mm (5") in diam. adjustable round bell type strainer. Used as open drain with trap primer.

Page 13 of 19 Mon 28 Mar 2022 09:45:55 PM EDT

The specifications sheets are for suggestion purposes. Please assure yourself of its compatibility for your project. Prices are subject to change without prior notification.

FD
Robust floor drain with clamp collar (for concrete slab with membrane ideal for ceramic tiles)

zurn

ZN415-Y5-P

Cast iron floor drain for membrane with a 213 mm (8 3/8") in diam., reversible clamp collar with lateral openings on top body with a 102 mm (4") in diam. threaded throat to receive adjustable 127 mm (5") in diam. adjustable round strainer combined with 127 mm (5 x 5") square polished nickel bronze regular traffic grate. Trap primer connection.

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The specifications sheets are for suggestion purposes. Please assure yourself of its compatibility for your project. Prices are subject to change without prior notification.

CFFD

zurn

Z556-FO-Y-P

Cast iron floor drain with a 213 mm (8 3/8") in diam., 171 mm (6 3/4") in diam. grate and funnel with 203 mm (8") in diam. frame for heavy duty traffic, clamp collar with secondary drainage, adjustable frame and sediment bucket; all cast iron. Trap primer connection.

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The specifications sheets are for suggestion purposes. Please assure yourself of its compatibility for your project. Prices are subject to change without prior notification.

CO-1
Extra heavy duty traffic cleanout for finished floors

zurn

ZXN1612-SP

Cast iron floor cleanout with a 165 mm (6 1/2") in diam. body with a 102 mm (4") in diam. threaded throat to receive adjustable 130 mm (5 1/8") in diam. nickel bronze strainer combined with a slip proof extra heavy duty traffic cover. ABS threaded seal plug inside body.

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NFHB
Cardinal

Encased non-freeze wall hydrant

zurn

Z1320XL (10" - 12" - 14")

Encased non-freeze wall hydrant, removable operating key, brass body, copper casing, all bronze interior componants, ceramic disc rod assembly, integral backflow preventer, DN 3/4 in male IP or sweat fem. inlet, brass hinged box with nickel bronze box. Offered for wall thickness starting at 10 in (254 mm), 12 in (305 mm) to 14 in (356 mm).
* Additional options available. CL: Cylinder lock

Page 7 of 12 Fri 08 Apr 2022 11:07:29 AM EDT

The specifications sheets are for suggestion purposes. Please assure yourself of its compatibility for your project. Prices are subject to change without prior notification.

CO-2
Cardinal

zurn

ZN1448-4

Dura-Coated cast iron cleanout tee, 102 mm (4 in) for gas and watertight ABS tapered thread plug and round, scoriated secured nickel bronze floor access cover and frame.

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CO 4 INCH
Cardinal

zurn

Z1445 4"

Column cleanout with 102 mm (4") cast iron body with gaz and water proof ABS cap.

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CO- 6 INCH
Cardinal

zurn

Z1445 6"

Column cleanout with 152 mm (6") cast iron body with gaz and water proof ABS cap.

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The specifications sheets are for suggestion purposes. Please assure yourself of its compatibility for your project. Prices are subject to change without prior notification.

TP-1
Cardinal

zurn

Z1022-DU4

Trap primer valve where replenishment of water in floor drain traps is required; activates with a 2 to 3 PSIG pressure drop between 20–80 PSIG. All bronze body, integral vacuum breaker, 1/2" FIP inlet. 4-outlet distribution unit.

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The specifications sheets are for suggestion purposes. Please assure yourself of its compatibility for your project. Prices are subject to change without prior notification.

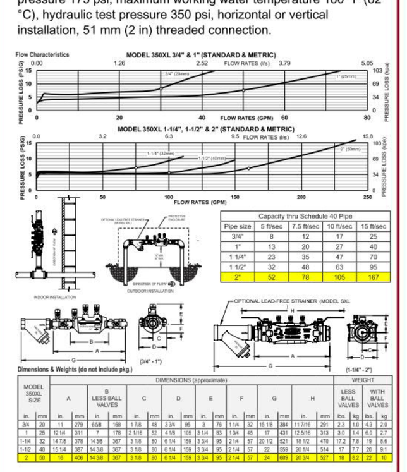
BFP
Cardinal

SXL 2

Cast bronze Y strainer, low lead, 300 psi at 82 °C (180 °F) WOG, body and cover cast iron (ASTM B 584), integral strainer screen accessible without removing device from line. 51 mm (2") diameter.

350XL 2

Moderate hazard backflow preventer (DCVA), low lead, to be installed on potable water lines to protect against both backsiphonage and backpressure of polluted water into the water supply, cast bronze body, reinforced nylon housing, stainless steel fasteners and springs, silicone and buna nitrile (FDA approved) elastomers, Delrin (NSF listed) internal componants, full port quarter turn ball valves, forged brass struts, Maximum working pressure 175 psi, maximum working water temperature 180 °F (82 °C), hydraulic test pressure 350 psi, horizontal or vertical installation, 51 mm (2 in) threaded connection.



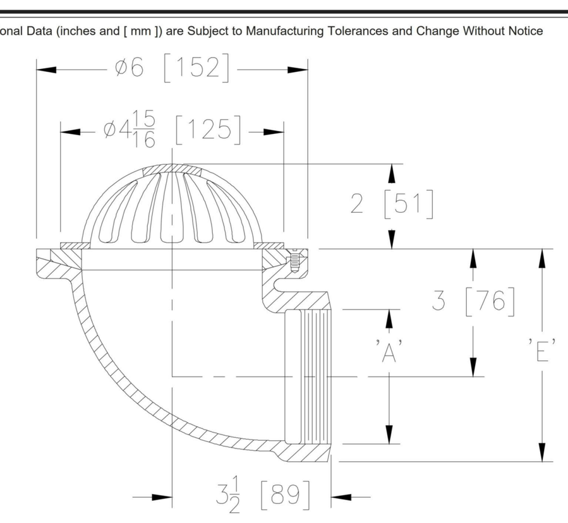
Page 3 of 3 Fri 25 Mar 2022 02:42:29 PM EDT

The specifications sheets are for suggestion purposes. Please assure yourself of its compatibility for your project. Prices are subject to change without prior notification.

ZURN Z185
RD-2
6 [152] DIAMETER CORNICE DRAIN W/ 90° OUTLET

SPECIFICATION SHEET
TAG _______

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



'A' Pipe Size In.[mm]	Approx. Wt. Lbs. [kg]	Dome Open Area Sq. In. [cm²]
3 [76]	8 [4]	11 [71]
4 [102]	10 [4]	

ENGINEERING SPECIFICATION: ZURN ZRB185
6" [152mm] Diameter cornice drain, Dura-Coated cast iron with 90° side outlet body, plain bronze dome and membrane flashing clamp.

OPTIONS (Check/specify appropriate options)

PIPE SIZE	(Specify size/type) OUTLET			'E' BODY HT. DIM.
3 [76]	___	IP	Threaded	5-1/8 [130]
4 [102]	___	IP	Threaded	5-5/8 [143]

PREFIXES
- ___ ZRB D.C.C.I. Body with Plain Bronze Dome*
- ___ ZN D.C.C.I. Body with Polished Nickel Bronze Dome

SUFFIXES
- ___ -FS Flat Strainer (ZN)
- ___ -G Galvanized Cast Iron
- ___ -HD 5-3/4 [146] High Dome
- ___ -VP Vandal Proof Secured Top
- ___ -45 45° Side Outlet Body

* Regularly furnished unless otherwise specified.

Zurn Industries, LLC | Specification Drainage Operation
1801 Pittsburgh Avenue, Erie, PA U.S.A. 16502 · Ph. 855-663-9876, Fax 814-454-7929
In Canada | Zurn Industries Limited
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www.zurn.com

Rev. F
Date: 09/26/2017
C.N. No. 137816
Prod. | Dwg. No. Z185

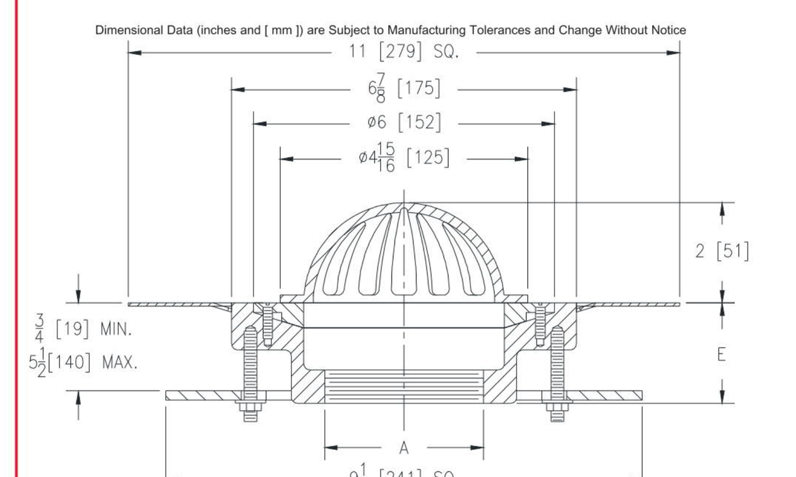
RD-2
Cardinal

ZURN

ZURN ZRB181-C-R

6" [152mm] Diameter by 2" [51mm] High cornice drain, Dura-Coated cast iron body, roof sump receiver, underdeck clamp, plain bronze dome and membrane flashing clamp.

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



ENGINEERING SPECIFICATION: ZURN ZRB181-C-R
6" [152mm] Diameter by 2" [51mm] High cornice drain, Dura-Coated cast iron body, roof sump receiver, underdeck clamp, plain bronze dome and membrane flashing clamp.

Page 3 of 3 Thu 11 May 2023 11:00:56 AM EDT

The specifications sheets are for suggestion purposes. Please assure yourself of its compatibility for your project. Prices are subject to change without prior notification.

HAMMERSCHLAG & JOFFE INC.
43 Lesmill Road, Toronto, Ontario
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T: (416) 444.9263
F: (416) 444.1463
E: dwg@hamjof.com

#	DATE	DESCRIPTION	BY
3	2023-07-14	ISSUED FOR TENDER AND PERMIT	DJ
2	2023-06-16	ISSUED FOR PERMIT	DJ
1	2023-04-12	ISSUED FOR COORDINATION	DJ

RIO CAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

DRAWING
PLUMBING FIXTURE SCHEDULES

PROJECT NO. 22-000-176
PROJECT DATE Issue Date
DRAWN BY SF
CHECKED BY DJ
SCALE 1 : 345

LICENSED PROFESSIONAL ENGINEER
D.S. JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M001D
REV. 3

7/13/2023 2:02:17 PM

MECHANICAL SPECIFICATION - GENERAL

1 GENERAL

1.1 COMPLY WITH ALL REQUIREMENTS OF DIVISION 1, OWNER, PROJECT MANAGER AND/OR CONSTRUCTION MANAGER.

1.2 PERFORM ALL MECHANICAL WORK DETAILED ON THESE DRAWINGS IN ACCORDANCE WITH THE MOST STRINGENT INDUSTRY STANDARDS TO PROVIDE A COMPLETE AND FULLY OPERATIONAL SYSTEM TO THE SATISFACTION OF THE OWNER AND/OR MECHANICAL CONSULTANT.

1.3 WORK SPECIFIED ON THESE DRAWINGS IS INTENDED TO SHOW OVERALL MECHANICAL SCOPE. DIVISION OF RESPONSIBILITY BETWEEN MECHANICAL CONTRACTOR AND THEIR SUB-TRADES IS THE RESPONSIBILITY OF THE PRIME MECHANICAL CONTRACTOR.

1.4 NO SYSTEM SHALL BE CONCEALED/BURIED/COVERED PRIOR TO INSPECTION BY MECHANICAL CONSULTANT AND LOCAL AUTHORITIES HAVING JURISDICTIONS. THIS CONTRACTOR SHALL CONTACT HAMMERSCHLAG & JOFFE INC. (416-444-9263) A MINIMUM OF 5 BUSINESS PRIOR TO REQUIRED INSPECTION DATE. WHEN SYSTEMS HAVE BEEN CONCEALED/BURIED/COVERED PRIOR TO THIS INSPECTION WITHOUT WRITTEN CONSENT BY THE MECHANICAL CONSULTANT, THE MECHANICAL CONTRACTOR SHALL UNCOVER/EXPOSE ALL SUCH SYSTEMS AT NO ADDITIONAL COST.

1.5 THE MOST RIGOROUS OF THIS SPECIFICATION AND BASE BUILDING STANDARDS SHALL FORM THE BASIS FOR THIS CONSTRUCTION. COMPLY WITH BUILDING OWNER'S OR LANDLORD'S REQUIREMENTS FOR MECHANICAL SYSTEM INSTALLATIONS AND EXISTING SYSTEM SHUTDOWN AND CONNECTION.

1.6 OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND FEES TO PERFORM THE WORK WITHIN THESE DOCUMENTS. ADHERE TO ALL CODES, STANDARDS AND BYLAWS. ARRANGE AND PAY FOR ALL REQUIRED INSPECTIONS FROM LOCAL AUTHORITY'S HAVING JURISDICTION. INCLUDE ALL COSTS ASSOCIATED TO THIS IN TENDER AMOUNT. ANY DEFICIENCIES NOTES BY AUTHORITY'S HAVING JURISDICTION SHALL BE IMMEDIATELY REPORTED TO THE MECHANICAL CONSULTANT INCLUDING REQUIRED CORRECTIVE MEASURES.

1.7 THIS CONTRACTOR SHALL VISIT THE SITE TO REVIEW EXISTING CONDITIONS PRIOR TO SUBMITTING TENDER PRICING. INCLUDE IN THE TENDER AMOUNT ALL REQUIRED LABOUR AND MATERIALS TO SUIT EXISTING CONDITIONS. NO EXTRAS WILL BE AWARDED TO SUIT EXISTING CONDITIONS.

1.8 CUTTING, PATCHING AND CORE DRILLING REQUIRED BY THIS TRADE SHALL BE PAID FOR BY THIS CONTRACTOR. ARRANGE AND PAY TO X-RAY AND SCAN EXISTING CONCRETE STRUCTURES IN ACCORDANCE WITH OWNER/LANDLORD STRUCTURAL ENGINEER'S REQUIREMENTS. PROVIDE DETAILS OF NEW OPENINGS THROUGH STRUCTURAL COMPONENTS FOR BASE BUILDING STRUCTURAL ENGINEER'S APPROVAL AT MECHANICAL CONTRACTORS COST.

1.9 PROVIDE ALL REQUIRED FIRE STOPPING FOR MECHANICAL SYSTEMS THROUGH RATED PARTITIONS (INCLUDING 0-HOUR RATED PARTITIONS.) FIRE STOP SHALL BE ULC LISTED FOR THE REQUIRED SEPARATION AND BE INSTALLED INC ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTION. ALL FIRE STOPPING SHALL BE REVIEWED BY MANUFACTURER'S REP. ACCEPTABLE MANUFACTURERS: 3M, HILTI.

1.10 ON COMPLETION OF THE FIRE STOPPING SCOPE OF WORK, SUBMIT A LETTER OF ASSURANCE BY THE MANUFACTURER OF THE FIRESTOP PRODUCTS, AND A SEPARATE LETTER FROM THE MECHANICAL CONTRACTOR, CERTIFYING THAT THE FIRE STOPPING OF ALL MECHANICAL SYSTEMS HAS BEEN INSTALLED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS AND THE ULC LISTINGS OF THE MANUFACTURER OF THE PRODUCT.

1.11 MEET CONSTRUCTION SPECIFICATION AS PREPARED BY ARCHITECT/GENERAL CONTRACTOR/OWNER INCLUDING ALL PHASING.

1.11.1 INCLUDE ALL PREMIUM LABOUR TO SUIT REQUIREMENTS AS LISTED WITHIN THESE DOCUMENTS, AND TO MEET PROJECT SCHEDULING. CONFIRM WITH OWNER/LANDLORD FOR SUITABLE AFTER-HOURS WORK SCHEDULE.

1.12 FLASHING AND COUNTER FLASHING FOR EXTERIOR PENETRATIONS OR WATER-PROOFED FLOORS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR'S SUB-CONTRACTOR AND INCLUDED IN MECHANICAL TENDER PRICE. USE PREFABRICATED ALUMINUM OR PVC FLASHINGS FOR ROOF, AND MEMBRANE OR COPPER FOR WALLS AND FLOORS. ENSURE ALL OPENINGS THROUGH VERTICAL AND HORIZONTAL BUILDING SURFACES ARE WEATHER PROOF AND WATER PROOF, USING AN APPROVED FLEXIBLE SEALANT.

1.13 PROVIDE SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT. SHOP DRAWINGS SHALL BE COMPLETE WITH CONTRACTORS REVIEWED STAMP. SUBMIT SHOP DRAWINGS IN PDF FORMAT. ALLOW ONE (1) WEEK FOR ENGINEERS REVIEW.

1.14 ALL EQUIPMENT SHALL FROM A MANUFACTURER LISTED WITHIN THESE DOCUMENTS AS BEING BASIS OF DESIGN OR APPROVED. WHERE A LIST OF APPROVED MANUFACTURERS IS NOT PROVIDED, PROVIDE EQUIPMENT FROM MANUFACTURER LISTED ON THE DOCUMENTS. REQUESTS FOR EQUIPMENT SUBSTITUTION SHALL BE PROVIDED IN WRITING INCLUDING PROPOSED COST SAVINGS FOR SAID EQUIPMENT. THE QUALITY AND PERFORMANCE CHARACTERISTICS OF SUBSTITUTED PRODUCT SHALL BE EQUIVALENT TO THE SPECIFIED PRODUCT. ALL SUBSTITUTE PRODUCTS SHALL BE APPROVED BY CONSULTANTS. ANY ADDITIONAL COSTS INCURRED BY ANY TRADE (ARCHITECTURAL, STRUCTURAL, ELECTRICAL) FOR SUBSTITUTED EQUIPMENT INSTALLATION MUST BE INCURRED BY THE MECHANICAL CONTRACTOR.

1.15 ALL CONTROLS WORK SHALL BE PERFORMED BY OWNER'S/LANDLORD'S APPROVED CONTRACTOR AND INCLUDED IN MECHANICAL TENDER PRICE. ENSURE CONTROLS CONTRACTOR INCLUDES ALL LABOUR AND MATERIAL REQUIRED TO COMPLETE THE CONTROLS SCOPE OF WORK DETAILED ON THESE DRAWINGS. PROVIDE ALL CONTROLS WIRING AND CONDUIT TO PERFORM SAID WORK. INCLUDE ALL HIGH VOLTAGE POWER WIRING AND TRANSFORMERS AS REQUIRED TO COMPLETE THIS WORK, WHICH IS NOT EXPRESSLY CALLED FOR ON ELECTRICAL DRAWINGS.

1.16 ACCESS DOORS SHALL BE PROVIDED IN ALL HARD SURFACES TO ALLOW FOR INSPECTION/MAINTENANCE OF MECHANICAL SYSTEMS. ACCESS DOOR FINISHES SHALL BE AS PER ARCHITECT'S/DESIGNER'S/ENGINEER'S REQUIREMENTS. PROVIDE ACCESS DOORS WITH SUITABLE RECESS TO ACCEPT WALL FINISHES (TILE, CARPET, ETC.) PROVIDE FIRE RATED ACCESS DOORS IN FIRE RATED PARTITIONS.

1.17 PROVIDE ONE YEAR LABOUR AND MATERIAL WARRANTY FOR THE COMPLETE MECHANICAL INSTALLATION FROM DATE OF SUBSTANTIAL COMPLETION.

1.18 SUBMIT OPERATING AND MAINTENANCE MANUALS IN PDF FORMAT FOR REVIEW. ONCE APPROVED SUBMIT FINAL PDF COPY AND THREE (3) HARD COPIES OF DOCUMENTS TO OWNER. INCLUDE ALL APPROVED SHOP DRAWINGS, WARRANTY LETTERS, AIR AND WATER BALANCING REPORTS, OPERATING INSTRUCTIONS, MAINTENANCE PROCEDURES, CONTRACTOR AND SUB-CONTRACTOR CONTACT INFORMATION, INSPECTION REPORTS FROM THIRD PARTY INSPECTION AGENCIES AND AUTHORITIES HAVING JURISDICTION AND ALL OTHER PERTINENT INFORMATION. FINAL HARD-COPY SHOP DRAWINGS SHALL BE SEPARATED WITH DIVIDERS IN A NEAT AND ORDERLY FASHION COMPLETE WITH TABLE OF CONTENTS. ALLOW A MINIMUM OF 5% OF CONTRACT VALUE TO BE HELD UNTIL SUCH TIME THAT OPERATING AND MAINTENANCE MANUALS ARE ACCEPTED AND RECEIVED BY OWNER IN HARD COPY.

1.19 AS-BUILT DRAWINGS SHALL BE COMPLETED USING AUTOCAD/REVIT. RECORD ACCURATELY INSTALLED WORK ON SITE AND TRANSFER INFORMATION TO AUTOCAD/REVIT. SUBMIT BOTH PDF AND AUTOCAD/REVIT COPIES OF AS-BUILTS. ALLOW A MINIMUM OF 5% OF CONTRACT VALUE TO BE HELD UNTIL SUCH TIME THAT AS-BUILT DRAWINGS ARE APPROVED.

1.20 CHANGE NOTICE QUOTATIONS SHALL BE SUBMITTED COMPLETE WITH DETAILED COST BREAKDOWN OF LABOUR AND MATERIALS. FAILURE TO PROVIDE DETAILED BREAKDOWNS WILL RESULT IN REJECTION. ALL MECHANICAL CHANGE NOTICES SHALL BE PRICED IN ACCORDANCE WITH "MECHANICAL CONTRACTORS ASSOCIATION" (MCA) LABOUR UNITS AND MARK UPS (NOT TO EXCEED 20%). ALL MATERIAL SHALL BE IDENTIFIED INCLUDING ALLPRISER LIST PRICE, AND A MINIMUM OF 25% DISCOUNT.

1.21 TEMPORARY FILTERS 25MM (1 IN.) SHALL BE PROVIDED AT ALL BASE BUILDING RETURN AIR OPENINGS WHICH REMAIN OPERATIONAL DURING CONSTRUCTION. FILTERS TO BE REPLACED WHEN 50% USABLE LIFT REMAINS OR WEEKLY (WHICHEVER COMES FIRST). REMOVE UPON CONSTRUCTION COMPLETION.

1.22 RETURN ALL BASE BUILDING MECHANICAL COMPONENTS TO LANDLORD/OWNER AS DIRECTED. COORDINATE REQUIREMENTS WITH OWNER/LANDLORD PRIOR TO COMMENCEMENT OF DEMOLITION. RELOCATE ALL COMPONENTS ANYWHERE WITHIN THE PROPERTY AS PER LANDLORD/OWNER'S DIRECTION.

1.23 THE MECHANICAL CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO KEEP ALL AREAS PERTAINING TO HIS WORK, INCLUDING CONSTRUCTION AREA, STORAGE AND STAGING CLEAN AND TIDY. ALL AREAS SHALL BE FREE OF SURPLUS DEBRIS AND RUBBISH.

1.24 DO NOT ALLOW MATERIAL/EQUIPMENT TO BE STORED IN EXCESS OF BUILDING STRUCTURE LIMITATION.

1.25 MECHANICAL CONTRACTOR SHALL PROTECT ALL EXISTING PROPERTY AND ADJACENT PROPERTIES FROM DAMAGE, INCLUDING WORK COMPLETED BY OTHER TRADES WITHIN THE PROJECT SCOPE OF WORK. MECHANICAL CONTRACTOR SHALL BE FULLY RESPONSIBLE TO PAY FOR CORRECTIVE MEASURES TO ALL DAMAGE CAUSED BY THEM, THEIR PERSONNEL OR THEIR SUB-TRADES.

MECHANICAL SPECIFICATION - GENERAL

1.26 DIVISION 15 CONTRACTORS ARE RESPONSIBLE TO ENSURE THAT THEIR EMPLOYEES AND SUB-TRADES OBSERVE ALL SAFETY REGULATIONS, SECURITY REGULATIONS AND FIRE SAFETY RULES, INCLUDING CONDUCT THEIR WORK WITHIN ACCORDANCE WITH LOCAL WORKPLACE HEALTH AND SAFETY REGULATIONS.

1.27 ALL MATERIALS SHALL BE NEW, (UNLESS SPECIFICALLY STATED AS BEING REUSED) AND FREE OF DEFECT. ALL MATERIALS AND EQUIPMENT SHALL BARE THE APPROVAL OF LOCAL AUTHORITIES (INCLUDING CSA, ULC ETC.) AND BE ACCEPTABLE FOR USE IN CANADA.

1.28 ALL EQUIPMENT SHALL MEET THE MINIMUM PERFORMANCE REQUIREMENTS SPECIFIED IN THESE DOCUMENTS INCLUDING SPATIAL PROPERTIES. SUPPLY EQUIPMENT FROM THE BASIS OF DESIGN, OR APPROVED ALTERNATE MANUFACTURERS AS LISTED ON THESE DOCUMENTS. BASE BID PRICE SHALL INCLUDE EQUIPMENT AS SPECIFIED ON THESE DRAWINGS WITH OPTIONAL EQUIPMENT SUBSTITUTIONS LISTED AS COST SAVINGS.

1.29 REQUESTS FOR ALTERNATE EQUIPMENT MANUFACTURERS SHALL BE PROVIDED IN WRITING AND INCLUDE ALL RELEVANT PERFORMANCE AND CONSTRUCTION INFORMATION. INCLUDE IN REQUEST COST SAVINGS TO OWNER OFFERED TO USE ALTERNATE EQUIPMENT. DO NOT PROCEED WITH AN ALTERNATE MANUFACTURER WITHOUT WRITTEN APPROVAL FROM CONSULTANT/OWNER.

1.30 ADHERE TO ALL BASE BUILDING STANDARDS FOR NEW EQUIPMENT. OBTAIN OWNER/LANDLORD APPROVAL FOR ALL NEW EQUIPMENT.

1.31 PROVIDE ALL REQUIRED SUPPORTS, HANGERS, RODS, FRAMES, MISCELLANEOUS METALS AND OTHER MATERIAL REQUIRED TO ADEQUATELY SUPPORT AND INSTALL NEW EQUIPMENT. ALL SUPPORTS SHALL BE DESIGNED AND STAMPED BY A STRUCTURAL ENGINEERING LICENSED IN THE PROVIDE OF THE PROJECT. SUBMIT ALL STAMPED SUPPORT SHOP DRAWINGS FOR REVIEW PRIOR TO ORDERING EQUIPMENT.

1.32 INSTALL SUPPORTS TO MEET REQUIREMENTS OF APPLICABLE CODES, AND TO SUITABLE SUPPORT THE EQUIPMENT WITHOUT UNDER STRESS/STRAIN TO THE EQUIPMENT AND ASSOCIATED SYSTEMS.

1.33 ALL EQUIPMENT SHALL BE SUPPORTING FROM BUILDING STRUCTURES. DO NOT SUPPORT EQUIPMENT FROM OTHER EQUIPMENT/PIPES/DUCTS OR THEIR SUPPORT SYSTEMS.

1.34 PROVIDE LAMACOID NAME PLATES ON ALL NEW AND EXISTING MECHANICAL EQUIPMENT SHOWING VOLTAGE, DESIGNATION, CRU# AND USE. NUMBERS AND LETTERS TO BE 3/8" (10MM) HIGH. NAME PLATES SHALL BE PERMANENT AND NOT FADE OVER TIME.

1.35 IDENTIFY ALL VALVES WITH TAGS. PROVIDE A FRAMED LIST OF VALVES, INDICATING THEIR LOCATION AND USE, SUPPLY TO OWNER/TENANT. PROVIDE NEW (OR UPDATED) VALVE TAG LOCATION MAP ON FRAMES 11X17 PRINTS. PROVIDE PDF COPIES TO OWNER.

1.36 THIS MECHANICAL CONTRACTOR SHALL BARE THE RESPONSIBILITY TO COORDINATE ALL NEW MECHANICAL EQUIPMENT AND SYSTEMS WITH OTHER CONTRACTORS INCLUDING, BUT NOT LIMITED TO, ARCHITECTURAL, STRUCTURAL, LEED, ELECTRICAL, AND CIVIL DISCIPLINES.

1.37 MECHANICAL CONTRACTOR SHALL BE FULLY RESPONSIBLE AND TAKE THE LEAD ROLE IN PROVIDING INTERFERENCE DRAWINGS FOR ALL TRADES. OBTAIN ALL INFORMATION FROM OTHER TRADES AND PREPARE ONE COMBINED SET OF INTERFERENCE DRAWINGS. SITE VERIFY ALL EXISTING INFORMATION INCLUDING ALL DIMENSIONS OF EXISTING STRUCTURE AND EQUIPMENT AND INCLUDE IN INTERFERENCE DRAWINGS.

1.38 MECHANICAL CONTRACTOR SHALL REVIEW AVAILABLE POWER ON SITE AND WITH ELECTRICAL CONTRACTOR/DRAWINGS PRIOR TO ORDERING ANY NEW MECHANICAL EQUIPMENT. ORDER AND SUPPLY EQUIPMENT TO SUIT AVAILABLE SITE POWER, AND IN COORDINATION WITH THE MECHANICAL DRAWINGS.

1.39 ALL MECHANICAL FINISHES AND LOCATIONS SHALL BE REVIEWED AND APPROVED BY ARCHITECTURAL DIVISION AND/OR OWNER INCLUDING, BUT NOT LIMITED TO, AIR TERMINALS, THERMOSTATS/CONTROLS, EXPOSED INSULATION/DUCTWORK. WHERE A DISCREPANCY EXISTS BETWEEN MECHANICAL AND ARCHITECTURAL DRAWINGS AS TO THE LEVEL OF FINISHED REQUIRED, THE MOST STRINGENT/COSTLY REQUIREMENTS SHALL BE CARRIED IN THE TENDER AMOUNT. OBTAIN CLARIFICATION FOR FINAL FINISH PRIOR TO ORDERING.

1.40 ALL MECHANICAL EQUIPMENT WEIGHTS, SUPPORTS, AND OPENING SHALL BE REVIEWED AND APPROVED BY A STRUCTURAL ENGINEER. WHEN APPLICABLE, HIRE BASE BUILDING STRUCTURAL ENGINEER TO PERFORM ALL SUCH REVIEWS. MECHANICAL CONTRACTOR SHALL PAY FOR ALL SUCH REVIEWS AND INCLUDE COST IN TENDER AMOUNTS.

2 SEISMIC RESTRAINTS

2.1 THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL SEISMIC RESTRAINTS REQUIRED FOR MECHANICAL SYSTEMS IN ACCORDANCE WITH LOCAL CODES.

2.2 THE MECHANICAL CONTRACTOR SHALL HIRE A SEISMIC ENGINEER LICENSED IN THE PROVINCE OF INSTALLATION TO REVIEW ALL MECHANICAL SYSTEMS AND DESIGN SEISMIC SUPPORTS. SUBMIT SEISMIC SUPPORT DESIGN AS A SHOP DRAWING. ALL SEISMIC SUPPORTS DESIGNS SHALL BE STAMPED THE ENGINEER.

2.3 THE SEISMIC ENGINEER SHALL REVIEW THE INSTALLATION OF ALL SEISMIC SUPPORTS THROUGHOUT THE PROJECT AND PROVIDE A STAMPED SEISMIC SUPPORT CONFORMANCE LETTER AT THE COMPLETION OF THE PROJECT. PROVIDE LETTER TO THE CONSULTANT AND INCLUDE WITHIN CLOSE OUT DOCUMENTS.

2.4 COORDINATE THE INSTALLATION OF SEISMIC SUPPORTS ON SITE WITH ALL OTHER TRADES AND EXISTING CONDITIONS.

3 EQUIPMENT START-UP AND BALANCING

3.1 PROVIDE START UP REPORTS FOR ALL NEW MECHANICAL EQUIPMENT. START UP REPORT SHALL BE PREPARED BY A FACTORY TRAINED REPRESENTATIVE AND SHOW THAT THE EQUIPMENT IS IN GOOD CONDITION.

3.2 PROVIDE ALL TEMPORARY POWER, GAS, AND OTHER UTILITIES AS REQUIRED TO PERFORM START UP OF EQUIPMENT.

3.3 PERFORM BALANCING OF MECHANICAL SYSTEMS ONCE ALL COMPONENTS ARE INSTALLED AND PRESSURE TESTED.

3.4 PERFORM BALANCING TO SUIT PROJECT SCHEDULE. IF REQUIRED PAY AND PROVIDE ALL TEMPORARY POWER AND UTILITIES IF EQUIPMENT IS REQUIRED TO BE BALANCED PRIOR TO SAID SERVICES BEING IN PLACE TO SUIT PROJECT SCHEDULE.

3.5 WHERE START UP OF EQUIPMENT OCCURS WHILE THE BUILDING IS STILL IN CONSTRUCTION, REPLACE ALL FILTERS AND STRAINERS AFTER START UP.

3.6 GENERALLY SPEAKING ALL CEILINGS, WALLS, DOORS, WINDOWS, PLENUMS, SHEET METAL, AND OTHER BUILDING COMPONENTS AFFECTING THE PERFORMANCE OF A UNIT SHALL BE FULLY COMPLETE PRIOR TO THE BALANCING.

3.7 ALL BALANCING SHALL BE COMPLETED BY A SINGLE FIRM INCLUDING BOTH AIR AND WATER SYSTEMS. THE FOLLOWING SYSTEMS SHALL BE BALANCED:

3.7.1 AIR SYSTEM BALANCING

3.7.1.1 AIR SYSTEMS SHALL BE TESTED ONCE THE DUCTWORK SYSTEMS ARE COMPLETE AND SEALED, FILTERS ARE CLEAN, FAN ROTATION HAS BEEN VERIFIED TO BE IN THE CORRECT DIRECTION, ALL CONTROL ELEMENTS INCLUDING THERMOSTATS, SMOKE DETECTORS, AND DUCT MOUNTED SENSORS ARE INSTALLED, COILS ARE CLEAN, DUCT ACCESS DOORS ARE CLOSED, ALL FIRE/SMOKE/CONTROL DAMPERS ARE INSTALLED AND FUNCTIONAL.

3.7.1.2 TEST ALL AIR SYSTEMS TO BE +/- 5% OF THE DESIGN VALUES.

3.7.1.3 PERFORM RE-BALANCING OF SYSTEMS AS MANY TIMES AS REQUIRED TO OBTAIN SUITABLE READINGS.

3.7.1.4 BALANCING DAMPERS WHICH EXHIBIT VIBRATION AND OR NOISE SHALL BE REPLACED AND THE SYSTEM SHALL BE RE-BALANCED.

3.7.1.5 ONCE AIR SYSTEMS ARE BALANCED, ALLOW SYSTEMS TO CONTINUE TO RUN FOR FIVE DAYS. AFTER RUNNING, REPLACE ALL FILTERS, INSPECT ALL MOVING COMPONENTS AND CONFIRM SYSTEM OPERATION. PRODUCE ALL ADDITIONAL NOISE/VIBRATION CONTROL ELEMENTS TO ELIMINATE EXCESS NOISE/VIBRATION. LUBRICATE ALL MOVING PART AND REPAIR ANY NOTICEABLE DEFECTS IN THE SYSTEM.

3.7.2 WATER SYSTEM BALANCING

3.7.2.1 WATER SYSTEMS SHALL BE TESTED ONCE ALL PIPE WORK IS COMPLETE, FILLED, PRESSURE TESTED, VENTED AND VOID OF AIR, PUMPS PROVEN TO OPERATE IN CORRECT DIRECTION, STRAINERS IN PLACE AND CLEANED, ALL VALVES AND CIRCUIT BALANCING VALVES ARE INSTALLED AND SYSTEMS ARE COMPLETE.

3.7.2.2 TEST ALL WATER SYSTEMS TO BE +/- 5% OF THE DESIGN VALUES

3.7.2.3 PERFORM RE-BALANCING OF SYSTEMS AS MANY TIMES AS REQUIRED TO OBTAIN SUITABLE READINGS.

3.8 SUBMIT PDF COPIES OF BALANCING REPORTS ONCE SYSTEMS MEET THRESHOLDS NOTED ABOVE. INCLUDE APPROVED BALANCING REPORTS IN CLOSEOUT DOCUMENTS.

3.9 TEST ALL CONTROL SYSTEMS INCLUDING FUNCTION OF THERMOSTATS AND READINGS OF CONTROLS POINTS.

4 COMPLETION OF CONTRACT

MECHANICAL SPECIFICATION - GENERAL

4.1 THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL LABOUR AND MATERIAL TO INSTALL ALL SYSTEMS SHOWN AND/OR IMPLIED ON THESE DRAWINGS IN GOOD WORKING ORDER. THESE SYSTEMS SHALL BE FULLY OPERATIONAL, TESTED, BALANCED, VERIFIED, CLEAN AND FREE OF DEBRIS AT COMPLETION OF CONTRACT.

4.2 PROGRESS BILLING

4.2.1 PROVIDE COMPLETE BREAKDOWN OF MATERIAL, LABOUR AND GENERAL COSTS WHEN SUBMITTING PROGRESS DRAW REQUESTS.

4.2.2 PROVIDE SEPARATE BILLING SECTION FOR EACH SYSTEM INSTALLED AS PART OF THE PROJECT. SEPARATE SECTIONS SHALL INCLUDE, HOWEVER NOT BE LIMITED TO THE FOLLOWING: HVAC, GAS, PLUMBING, DRAWINGS, FIRE PROTECTION, COMPRESSED AIR, PROJECT CLOSEOUT.

4.2.3 INCLUDE A LINE ITEM AS PART OF BILLING STRUCTURE FOR 'PROJECT CLOSEOUT' TO BE BILLED ONLY ONCE ALL PROJECT CLOSE OUT DOCUMENTS ARE PROVIDED AND ACCEPTED (INCLUDING AS BUILT DRAWINGS) AS PER THE FOLLOWING PRICING STRUCTURE:
UP TO $100,000 → $5,000
UP TO $500,000 → $7,500
UP TO $1,000,000 → $10,000
GREATER THAN $1,000,000 → 1%

4.3 AT THE COMPLETION OF THE PROJECT PROVIDE THE FOLLOWING INFORMATION TO THE CONSULTANT FOR REVIEW:

4.3.1 WARRANTY LETTERS

4.3.2 AS BUILT DRAWINGS IN AUTOCAD AND PDF FORMAT

4.3.3 CLOSE OUT DOCUMENTS INCLUDING A BINDER OF APPROVED SHOP DRAWINGS, TAB REPORTS, AND O&M MANUALS.

4.3.4 NFPA 13 SIGN OFF LETTER IF APPLICABLE

4.4 SCHEDULE WORK TO MEET PROJECT SCHEDULE. ARRANGE TO PROVIDE CLOSE OUT DOCUMENTS PRIOR TO SCHEDULE COMPLETION TO ENSURE NO DELAY IN PROJECT CLOSE.

4.5 ALL SYSTEMS SHALL BE COMPLETED AND FULLY FUNCTIONAL AT PROJECT COMPLETION. REPLACE ALL FILTERS AND STRAINERS AT PROJECT COMPLETION. ENSURE ALL TEMPORARY CONSTRUCTION AIDS, AND OR CONSTRUCTION DEBRIS IS REMOVED FROM SITE. WHERE WORKING IN EXISTING BUILDING, ALL EXISTING FINISHES TO REMAIN SHALL BE IN AS NEW CONDITION.

MECHANICAL SPECIFICATION - PLUMBING AND DRAINAGE

1 GENERAL

1.1 PROVIDE ALL PLUMBING AND DRAINAGE SYSTEMS COMPLETE WITH ALL EQUIPMENT, PIPING, CONNECTIONS, SUPPORTS, HANGERS AND ACCESSORIES TO PROVIDE A FULLY COMPLETE AND FUNCTIONAL SYSTEM. PROVIDE ALL SYSTEMS BETWEEN UTILITY CONNECTIONS (WATER AND DRAINAGE) AND EQUIPMENT AND/OR CAPPED PROVISIONS.

1.2 PROVIDE ALL PLUMBING FIXTURES INCLUDING ALL REQUIRED TRIM AND SUPPORTS. COORDINATE FIXTURE FINISHES AND ACCESSORIES WITH ARCHITECTURAL DIVISION.

1.3 ROUGH-IN AND PROVIDE FINAL CONNECTION TO ALL EQUIPMENT.

1.4 PROVIDE ALL REQUIRED FIRE EXTINGUISHERS IN ACCORDANCE WITH OBC, OFC AND NFPA STANDARDS.

1.5 PRESSURE TEST ALL PIPING SYSTEMS IN ACCORDANCE WITH LOCAL & PROVINCIAL CODES FOR LEAKS, BEFORE INSULATION IS ADDED. SUBMIT REPORT TO THE OWNER AND A COPY TO THE ENGINEER.

1.6 PROVIDE ALL TRENCHING AND BACKFILLING REQUIRED FOR DIVISION 15 WORK.

1.7 ALL PLUMBING FIXTURES SHALL BE VENTED IN ACCORDANCE WITH LOCAL PLUMBING CODES. CONNECT NEW VENTING TO EXISTING SYSTEMS OR PROVIDE NEW VENTING SYSTEMS WHERE EXISTING ARE NOT SUFFICIENT.

1.8 PRIME ALL TRAPS AS REQUIRED TO MEET CODE REQUIREMENTS AND REQUIREMENTS OF LOCAL AUTHORITIES. PROVIDE NEW TRAP SEAL PRIMERS AS NECESSARY.

1.9 ALL PLUMBING FIXTURES SHALL BE INSTALLED IN CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS.

1.10 FOR UNDERGROUND INSTALLATIONS, PROVIDE SUITABLE BEDDING, COVERAGE AND SLOPE TO EASE DRAINAGE.

1.11 PROVIDE TEMPORARY CAPS AND/OR SCREEN ON ALL SYSTEMS DURING CONSTRUCTION TO PREVENT DEBRIS FROM ENTERING. AT THE COMPLETION OF CONSTRUCTION, FLUSH ALL SYSTEMS TO REMOVE DEBRIS.

1.12 SEPARATE DISSIMILAR METALS BY MEANS OF GASKETS, DI-ELECTRIC UNIONS OR COUPLINGS THAT PREVENT ELECTROLYTIC ACTION. (E.G. BRASS BETWEEN COPPER AND STEEL).

1.13 COORDINATE THE INSTALLATION OF ALL PLUMBING AND DRAINAGE SYSTEMS WITH OTHER TRADES. INSTALL SYSTEMS AS HIGH AS POSSIBLE. SUPPORT ALL SYSTEMS FROM BUILDING STRUCTURE.

1.14 PROVIDE SUITABLE DRAIN DOWN LOCATIONS FOR ALL SYSTEMS. INSTALL SYSTEMS TO ALLOW THEM TO BE DRAINAGE TO BUILDING DRAINAGE.

1.15 PROVIDE ALL POINT OF USE CSA APPROVED BACKFLOW PREVENTERS AT EQUIPMENT AS REQUIRED BY CODE AND AS SHOWN ON THESE DRAWINGS. ALL BACKFLOW PREVENTER SHALL DRAIN TO SUITABLE HUB DRAIN AND BE INSTALLED TO ALLOW FOR INSPECTION.

1.16 PROVIDE SLEEVES FOR ALL PIPES PASSING THROUGH WALLS, FLOORS AND CEILINGS. SLEEVES SHALL BE SCHEDULE 40 BLACK STEEL AND PACKED TO ENSURE A WATER TIGHT INSTALLATION. PROVIDE 3M OR EQUAL FIRE SEAL.

1.17 ALL SYSTEMS SHALL BE SUPPORTED FROM BUILDING STRUCTURE (SUPPORTS FROM OTHER EQUIPMENT OR DAISY-CHAINED SUPPORTS WILL NOT BE ACCEPTED.) SUPPORTS AND HANGERS SHALL BE INSTALLED ON THE EXTERIOR OF INSULATION COMPLETE WITH SADDLES.

1.18 EXISTING SANITARY DRAIN LOCATIONS AND INVERT ELEVATIONS SHALL BE VERIFIED ON SITE PRIOR TO COMMENCEMENT OF WORK.

2 PIPING MATERIALS:

2.1 SANITARY AND STORM DRAINAGE AND VENT PIPE ABOVE GROUND:

2.1.1 2-1/2" AND SMALLER TO BE DWV COPPER WITH DWV DRAINAGE FITTINGS WITH 95/5 TIN/ANTIMONY SOLDER JOINTS..

2.1.2 3" AND LARGER TO BE CSA CLASS 4000 CAST IRON PIPE AND FITTINGS WITH MECHANICAL JOINTS.

2.1.3 FOR ABOVE GROUND SANITARY, STORM AND VENT PIPE, WHERE ACCEPTED BY CODE, AT THE CONTRACTOR'S OPTION, 25/50 FLAME AND SMOKE RATED RIGID IPS PVC PLENUM RATED PIPING (XFR PIPING). THE CONTRACTOR SHALL REVIEW THE INSTALLATION WITH THE PIPE MANUFACTURER TO ENSURE CODE COMPLIANCE OF THE INSTALLATION.

2.2 SANITARY AND STORM DRAINAGE AND VENT PIPE BELOW GROUND:

2.2.1 2-1/2" AND SMALLER TO BE PVC SEWER PIPE AND FITTINGS WITH SOLVENT WELDED FITTINGS.

2.2.2 3" AND LARGER TO BE IPEX RING-TITE SDR35 CSA CERTIFIED TO B182.2 PVC GASKETTED SEWER PIPE.

2.3 DOMESTIC HOT COLD AND RECIRCULATION PIPING TO BE TYPE L HARD COPPER WITH WROUGHT IRON COPPER FITTING WITH 95/5 TIN/ANTIMONY SOLDER JOINTS.

2.4 BURIED DOMESTIC COLD AND HOT WATER PIPING TO BE TYP. 'K' SOFT COOPER FREE OF ANY BURIED FITTING WITHIN PVC CONDUIT. PROVIDE TRANSITION/FITTING ABOVE GROUND COMPLETE WITH UNIONS.

2.5 PROVIDE NEW KITZ FIG 44 200 PSI SOLDERED GATE VALVES.

2.6 PUMPED SANITARY AND STORM PIPING TO BE :

2.6.1 2" AND SMALLER TO BE TYPE 'L' COPPER WITH 50/50 LEAD/TIN SOLDER JOINTS.

2.6.2 2.5" AND LARGER TO BE SCHEDULE 40 GALVANIZED STEEL WITH THREADED 150 LBS GALVANIZED MALLEABLE IRON FITTINGS.

2.6.3 ALL PUMPED SANITARY SYSTEMS SHALL BE SUITABLE OF HANDLING THE MAX SYSTEM PRESSURE WITH 25% FACTOR OF SAFETY

3 GAS PIPING

3.1 PROVIDE ALL LABOUR, MATERIALS, PRODUCTS AND ACCESSORIES TO SUPPLY AND INSTALL A FULLY OPERATIONAL NATURAL GAS DISTRIBUTION SYSTEM IN ACCORDANCE WITH THE LATEST VERSION OF CSA B149, TSSA REGULATIONS AND THE CANADIAN GAS ASSOCIATED'S REQUIREMENTS.

3.2 ALL SYSTEMS SHALL BE INSTALLED BY PERSONNEL LICENSED BY TSSA TO PERFORM SUCH WORK.

3.3 PROVIDE ALL SEISMIC CONTROL AND RESTRAINT DEVICES AS REQUIRED TO SUIT LOCAL CODES.

3.4 TAG ALL SYSTEMS WITH INSTALLATION TAG INCLUDING DATE OF INSTALLATION, COMPLIANCE CODE FOLLOWED, INSTALLING CONTRACTOR, INSTALLATION SUPERVISORS, AND DATE OF AHJ INSPECTION. TAGS SHALL NOT FADE OR BE DAMAGED OVER TIME AND BE FULLY LEGIBLE FOR THE LIFE OF THE GAS SYSTEM.

3.5 ARRANGE AND PAY FOR GAS SERVICE AND METER INSTALLATION TO BE PROVIDED BY LOCAL GAS UTILITY. SCHEDULE WORK WITH GAS UTILITY TO MEET ALL CONSTRUCTION SCHEDULES. PROVIDE ALL APPLICATION DOCUMENTS TO UTILITY AS REQUIRED.

MECHANICAL SPECIFICATION - PLUMBING AND DRAINAGE

3.6 ALL GAS PIPE SHALL BE SCHEDULE 40 MILD BLACK CARBON STEEL, ASTM A53 GRADE B COMPLETE WITH MALLEABLE CAST IRON SCREWED FITTING AND JOINTS FOR PIPES 50MM (2") AND SMALLER, OR BEVELED AND COMPLETE WITH BUTT WELDED FITTINGS AND JOINTS FOR PIPES 65MM (2-1/2") AND LARGER.

3.7 SCREWED BALL VALVES SHALL BE CSA CERTIFIED MINIMUM 3100 KPA (450 PSI) WOG RATED ¼ TURN FULL PORT NON-LUBRICATED BRASS BALL VALVES WITH TEFLON PTFE SEAT, CHROME PLATED SOLID BALL AND REMOVABLE LEVEL HANDLE AS MANUFACTURED BY NEO VALVES, KITZ, OR TOYO VALVE COMPANY.

3.8 PROVIDE ISOLATION VALVES AT ALL EQUIPMENT AND AS REQUIRED BY CSA B149 AND LOCAL CODES AND STANDARDS.

3.9 PROVIDE AND INSTALL ALL PRESSURE REGULATING STATIONS INCLUDING PRESSURE REDUCING AND PRESSURE RELIEF COMPONENTS AS SHOWN ON DRAWINGS AND AS REQUIRED TO REDUCE BUILDING GAS PRESSURE SYSTEMS TO SUIT EQUIPMENT REQUIREMENTS. PROVIDE GAS PRESSURE RELIEF STATIONS DOWNSTREAM OF ALL PRESSURE REDUCING STATIONS.

3.10 ALL PRESSURE REGULATING STATION SHALL BE VENTED TO ATMOSPHERE IN ACCORDANCE WITH LOCAL CSA B149 AND LOCAL CODES AND BY LAWS. WHERE VENTING REGULATORS TO ATMOSPHERE IS NOT POSSIBLE, AND WHERE APPROVED BY CONSULTANT PROVIDE VENTLESS REGULATORS. ALL RELIEF VENTS SHALL BE PIPED INDIVIDUALLY TO ATMOSPHERE AND SIZED FOR A MAXIMUM PRESSURE DROP OF 10% OF THE PRESSURE REDUCING VALVE SETPOINT WITH A 25% SAFETY FACTOR.

3.11 VENTED PRESSURE REGULATORS SHALL BE SPRING-LOADED SELF OPERATED, TIGHT CLOSING, SELECTED FOR THE FACILITY GAS PRESSURE AND PIPING PRESSURE LOSS, AND CONNECTED EQUIPMENT LOAD AT FULL FIRING RATE PLUS 20% SPARE CAPACITY COMPLETE WITH 1035 KPA (150 PSI) RATED CAST IRON BODY WITH CORROSIVE RESISTANT EPOXY ENAMEL, ALUMINUM DIAPHRAGM WITH SPRING CASE WITH NITRILE DIAPHRAGM, DISC, AND BODY O-RING, THROTTLING TYPE HIGH FLOW RATE TIGHT SHUT-OFF RELIEF VALVE SELECTED TO PROTECT EQUIPMENT DOWNSTREAM OF REGULATOR.

3.12 NON VENTED REGULATORS SHALL BE LEVER ACTION, DEAD END LOCKUP TYPE COMPLETE WITH A VENT LIMITER, SELF ALIGNING VALVE, DIS-CAST ALUMINUM HOUSING, AND SYNTHETIC RUBBER COMPOUND DIAPHRAGM. THESE VALVES SHALL ONLY BE USED WHERE THE BUILDING PERFORMANCE IS IN CONFORMANCE WITH THEIR LISTINGS INCLUDING VENTILATION AIR REQUIREMENTS.

3.13 CLEARLY IDENTIFY ALL SYSTEM PRESSURES UPSTREAM AND DOWNSTREAM OF PRESSURE REGULATORS WITH STENCILED MARKING ON DRAWINGS, AND LAMACOID PRESSURE TAGS.

3.14 ACCEPTABLE PRESSURE REGULATOR MANUFACTURERS ARE MAXITROL, JORDAN VALVE, FISHER CONTROLS, AND LESLIE CONTROLS.

3.15 PROVIDE 6 MM (1/4") DIAMETER TEST PORTS UPSTREAM AND DOWNSTREAM OF EACH REGULATOR ASSEMBLY.

3.16 ALL REGULATOR STATIONS SHALL BE ACCESSIBLE WITHOUT THE USE OF LADDERS OR LIFTS.

3.17 SLOPE GAS PIPING IN THE DIRECTION OF FLOW TO LOW POINTS. PROVIDE FULL PIPE DIAMETER 150 MM (6") LONG DRIP POCKETS AT THE BOTTOM OF ALL VERTICAL RISERS, AT ALL PIPING LOW POINTS, AND WHEREVER SHOWN ON DRAWINGS OR AS REQUIRED BY CODE.

3.18 PAINT ALL NATURAL GAS PIPING INSIDE AND OUTSIDE OF BUILDING WITH TWO COATS OF YELLOW ENAMEL APPLIED OVER PRIMER. PIPE SHALL PAINTED IN ITS ENTIRETY INCLUDING BELOW SUPPORTS. PROVIDE SMS LTD. (OR STENCIL PAINTED) LABELS SHOWING GAS PRESSURE, DIRECTION OF FLOW AND 'NAT. GAS'.

3.19 PROVIDE GAS CONNECTIONS TO ALL EQUIPMENT INCLUDING KITCHEN EQUIPMENT IN ACCORDANCE WITH DRAWINGS, PLANS, SCHEDULES, AND MANUFACTURERS RECOMMENDATIONS.

3.20 PROVIDE CSA APPROVED FLEXIBLE GAS CONNECTION TO ALL EQUIPMENT EQUAL TO BRASS CRAFT PROCOAT LARGE DIAMETER GAS CONNECTIONS OR DORMONT BLUE HOSE. HIGH TENSILE STRENGTH STEEL CORRUGATED HOSE WITH BAKED ANTI-CORROSION COATING. SUPPLY FITTING AND CONNECTIONS TO SUIT APPLICATIONS.

3.21 GAS SUPPORTS ON ROOF SHALL BE COMPRISED OF SINGLE PIECE VULCANIZED RUBBER COMPLETE WITH GALVANIZED STEEL U CHANNEL SUPPORTS AND STRUTS. SUPPORTS SHALL WEIGHT NO LESS THAN 1 LBS PER 1" IN LENGTH. INSTALL SUPPORTS ON 600MM X 600MM (24" X 24") PATIO PAVER ON TOP OF 500MM X 500MM (20" X 20") 25 MM (1") THICK RIGID ROOF DECK INSULATION. PROVIDE WEATHER PROOF COATING ON EXTERIOR EDGE OF ROOF INSULATION TO PREVENT DETERIORATION OVER TIME.

4 TESTING

4.1 CARRY OUT NOT LESS THAN THE FOLLOWING TESTS:

4.2 BALL TEST ALL SANITARY DRAINS.

4.3 PERFORM WATER PRESSURE TESTS ON ALL DRAINAGE AND VENT SYSTEMS WHEN ROUGH-IN OF THE SYSTEM COMPLETED. SYSTEM SHALL BE FILLED WITH WATER FOR 2 HOURS WITHOUT NOTICEABLE LEAKS.

4.4 PRESSURE TEST ALL PUMPED SANITARY SYSTEM AT 150% OF SYSTEM PRESSURE FOR A MINIMUM OF 6HRS WITHOUT PRESSURE LOSS

4.5 PROVIDE ALL TESTING AND BALANCING OF EXISTING AND NEW HVAC SYSTEMS AND PROVIDE BALANCING REPORTS AND START UP REPORTS OF EQUIPMENT TO CONSULTANT.

4.6 PROVIDE ALL ADDITIONAL TESTING AS REQUIRED BY LOCAL AUTHORITIES IN THEIR PRESENCE.

4.7 PERFORM TESTS PRIOR TO CONCEALING SYSTEMS.

4.8 REMOVE ALL COMPONENTS WHICH WILL NOT WITHSTAND TEST PRESSURE, AND REPLACE AFTER TESTS.

4.9 FAILURE OF TEST WILL REQUIRE SYSTEMS TO BE REINSTALLED UNTIL SUCH TIME AS THE TEST IS PASSED. REPEAT TESTS AS MANY TIMES AS REQUIRED UNTIL SYSTEM PASSES. DO NOT CAULK OR COVER LEAKS. REMOVE AND REPLACED SYSTEMS AS NECESSARY.

5 INSTALLATION

5.1 CLEANING AND DISINFECT ALL DOMESTIC WATER SYSTEMS TO ACCEPTABLE LOCAL AUTHORITY STANDARDS. PROVIDE ALL TESTING OF DOMESTIC WATER SYSTEMS IN ACCORDANCE WITH AWWA STANDARD C651.86. PROVIDE TEST RECORDS TO OWNER. ARRANGE AND PAY FOR ALL WATER QUALITY TESTS BY INDEPENDENT TESTING LABORATORY.

5.2 FLUSH ALL DRAINAGE SYSTEMS AFTER SYSTEM HAS BEEN INSTALLED. REMOVE ALL DEBRIS AND PROVIDE CAMERA SCOPE OF LINES TO VERIFY CONDITIONS.

5.3 PROVIDE FINAL CONNECTION TO ALL KITCHEN EQUIPMENT INCLUDING ALL ISOLATION VALVES, HOSES, AND FLEXIBLE PIPES. ADHERE TO MANUFACTURER'S RECOMMENDED INSTALLATION REQUIREMENTS FOR SPECIFIC INSTALLATION REQUIREMENTS.

5.4 PROVIDE ALL BACKFLOW PREVENTERS FOR KITCHEN EQUIPMENT IN ACCORDANCE WITH CSA STANDARDS.

5.5 PROVIDE ALL TRAP SEAL PRIMERS TO SUIT NEW DRAINS IN ACCORDANCE WITH LOCAL PLUMBING CODE.

MECHANICAL SPECIFICATION - SPLIT DX SYSTEMS

1 SUBMITTALS

1.1 SUBMITTALS SHALL INCLUDE THE FOLLOWING: PERFORMANCE AND CAPACITY DETAILS OF ALL UNITS AT SPECIFIED INDOOR AND OUTDOOR CONDITIONS, PIPING SCHEMATICS OUTPUTTED FROM MANUFACTURER SPECIFIC SOFTWARE INCLUDING PIPE SIZES AND ESTIMATED PIPING LENGTHS, REFRIGERANT CHARGE PER SYSTEM INCLUDING CSA B52 ANALYSIS, WIRING DIAGRAMS, AND 10 YEAR PARTS ONLY WARRANTY INFORMATION.

1.2 SUBMITTAL SHALL INCLUDE A COPY OF THE INSTALLING CONTRACTOR'S CERTIFICATION OF VRF MANUFACTURER APPROVED TRAINING.

1.3 PRODUCTS

2 GENERAL

2.1 ALL UNITS SHALL BE LISTED AND RATED BY ANSI/AHRI STANDARD 1230-2010 AND MEET ALL MINIMUM IEER PERFORMANCE REQUIREMENTS AS SCHEDULED.

2.2 THE UNITS SHALL BE CSA APPROVED, ANSI/UL STD 1995 LISTED AND LISTED BY ELECTRICAL TESTING LABS (ETL) AND BEAR THE CETL LABEL.

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

2.4 THE SYSTEM WILL BE PRODUCED IN AN ISO 9001 AND ISO 14001 FACILITY, WHICH ARE STANDARDS SET BY THE INTERNATIONAL STANDARD ORGANIZATION (ISO). THE SYSTEM SHALL BE FACTORY TESTED FOR SAFETY AND FUNCTION.

2.5 THE SYSTEM AND THE DESIGN SHALL BE IN COMPLIANCE WITH CSA B52 MECHANICAL REFRIGERANT CODE.

2.6 ALL CONDENSATE SHALL BE PIPED TO NEAREST SUITABLE BUILDING DRAIN, BE INSULATED, AND BE SLOPED AT 2%.

2.7 ACCEPTABLE MANUFACTURER : DAIKIN, MITSUBISHI, LENNOX, LG.

3 SYSTEM DESCRIPTION

MECHANICAL SPECIFICATION - SPLIT DX SYSTEMS

3.1 VRF SYSTEM SHALL AUTOMATICALLY VARY THE TARGET EVAPORATING AND CONDENSING TEMPERATURES BASED ON BUILDING LOAD AND WEATHER CONDITIONS TO INCREASE PART LOAD EFFICIENCY (VARIABLE REFRIGERANT TEMPERATURE). THE CONDENSING UNIT SHALL ALSO FEATURE CUSTOMIZABLE OPERATING MODES WHICH ALLOWS FOR THE MANUAL SETTING OF TARGET EVAPORATING AND CONDENSING TEMPERATURES.

3.2 SYSTEM SHALL BE A TWO PIPE HEAT PUMP SWITCHOVER VRF SYSTEM. ALL INDOOR UNITS ON SINGLE REFRIGERANT CIRCUITS SHALL OPERATE IN THE SAME MODE (HEATING OR COOLING). THE SPECIFIED SYSTEM IS NOT A SIMULTANEOUS HEATING AND COOLING HEAT RECOVERY SYSTEM. REFER TO THE CONTROLS SECTION OF THIS SPECIFICATION FOR ANY CENTRAL CONTROLLER AND/OR MODE SWITCHOVER SEQUENCE THAT MAY BE REQUIRED.

4 START-UP AND WARRANTY

4.1 INSTALLING CONTRACTOR MUST BE CERTIFIED BY VRF MANUFACTURER. THE BIDDERS SHALL BE REQUIRED TO SUBMIT TRAINING CERTIFICATION PROOF WITH BID DOCUMENTS AND SUBMITTAL DOCUMENTS.

4.2 THE MANUFACTURER SHALL PROVIDE A FACTORY TRAINED SERVICE TECHNICIAN TO START-UP EACH UNIT. MANUFACTURER SHALL PROVIDE INSTRUCTION TO THE OWNERS' PERSONNEL ON PROPER UNIT OPERATION AND MAINTENANCE.

4.3 THE WARRANTY PERIOD ON ALL PARTS AND COMPRESSORS SHALL COMMENCE ON THE DATE OF INITIAL START-UP AND SHALL CONTINUE FOR A PERIOD OF TEN (10) YEARS NOT TO EXCEED ONE HUNDRED AND TWENTY SIX (126) MONTHS FROM DATE OF SHIPMENT. PROPER MAINTENANCE OF THE EQUIPMENT SHALL BE CONDUCTED BY CERTIFIED TECHNICIANS AS PER THE MANUFACTURER OR MANUFACTURER'S REPRESENTATIVE REQUIREMENTS. MAINTENANCE LOGS SHALL BE SUPPLIED BY THE OWNER UPON REQUEST.

4.4 ALL MANUFACTURER WARRANTY SHALL BE FOR PARTS ONLY. ALL DIAGNOSIS AND LABOUR WARRANTY SHALL BE CARRIED OUT BY INSTALLING CONTRACTOR AS PER THE WARRANTY REQUIREMENTS OF THIS PROJECT.

4.5 STANDARD T STYLE JOINTS ARE NOT ACCEPTABLE FOR A VARIABLE REFRIGERANT VOLUME SYSTEM. MANUFACTURER SPECIFIC Y JOINTS SHALL BE SUPPLIED BY THE VRF MANUFACTURER.

5 WALL MOUNTED UNIT

5.1 INDOOR UNIT SHALL BE A WALL MOUNTED FAN COIL UNIT FOR INSTALLATION ONTO A WALL WITHIN A CONDITIONED SPACE. A MILDEW-PROOF, POLYSTYRENE CONDENSATE DRAIN PAN AND RESIN NET MOLD RESISTANT FILTER SHALL BE INCLUDED AS STANDARD EQUIPMENT.

5.2 THE INDOOR UNIT'S SOUND PRESSURE SHALL RANGE FROM 31 DB(A) TO 41 DB(A) AT LOW SPEED MEASURED AT 3.3 FEET BELOW AND 3.3 FEET AWAY FROM THE UNIT.

5.3 THE UNIT SHALL HAVE AN AUTO-SWING LOUVER WHICH ENSURES EFFICIENT AIR DISTRIBUTION, WHICH CLOSES AUTOMATICALLY WHEN THE UNIT STOPS. THE REMOTE CONTROLLER SHALL BE ABLE TO SET FIVE (5) STEPS OF DISCHARGE ANGLE. THE FRONT GRILLE SHALL BE EASILY REMOVED FOR WASHING.

5.4 THE CABINET SHALL BE AFFIXED TO A FACTORY SUPPLIED WALL MOUNTING TEMPLATE AND LOCATED IN THE CONDITIONED SPACE.

5.5 THE CABINET SHALL BE CONSTRUCTED WITH SOUND ABSORBING FOAMED POLYSTYRENE AND POLYETHYLENE INSULATION.

5.6 THE FAN TYPE SHALL BE DIRECT-DRIVE CROSS-FLOW WITH STATICALLY AND DYNAMICALLY BALANCED IMPELLER WITH HIGH AND LOW FAN SPEEDS AVAILABLE.

5.7 UNITS SHALL BE PROVIDED WITH A LOOSE FIELD INSTALLED CONDENSATE PUMP.

5.8 4 WAY CEILING SUSPENDED EXPOSED CASSETTE UNIT.

5.9 INDOOR UNIT SHALL BE A CEILING SUSPENDED CASSETTE FAN COIL UNIT FOR EXPOSED INSTALLATION BELOW A CEILING. THERE SHALL BE NO VISIBLE SHEET METAL WHEN THE UNIT IS INSTALLED FULLY EXPOSED OR RECESSED UP TO 3 INCHES IN THE CEILING SPACE. IT SHALL BE A FOUR-WAY AIR DISTRIBUTION TYPE, FRESH WHITE IMPACT RESISTANT WASHABLE DECORATION PANEL. THE SUPPLY AIR IS DISTRIBUTED VIA MOTORIZED LOUVERS WHICH CAN BE HORIZONTALLY AND VERTICALLY ADJUSTED FROM 0° TO 60°.

MECHANICAL SPECIFICATION - EXHAUST FANS

1 GENERAL

1.1 SUBMIT SHOP DRAWINGS FOR ALL FANS LISTED ON THESE DRAWINGS INCLUDING ALL DIMENSIONS, FAN CURVES, ELECTRICAL PERFORMANCE, AND OPTIONS.

1.2 BASIS OF DESIGN SHALL BE AS SPECIFIED ON DRAWINGS AND FAN SCHEDULE. ACCEPTABLE MANUFACTURERS: LOREN COOK, CARNES, GREENHECK, PENNBARRY, AND TWIN CITY.

1.3 PROVIDE ENGRAVED ALUMINUM NAME PLATE ON EACH FAN SHOWING DESIGN CFM, STATIC PRESSURE AND FAN RPM.

1.4 PROVIDE ALL STARTERS AND CONTROLS FOR EXHAUST FANS. ALL FANS TO BE COMPLETE WITH BACKDRAFT DAMPERS, UNLESS MOTORIZED DAMPER IS SPECIFIED ON THE DRAWINGS. PROVIDE FAN MOUNTED FACTORY WIRED NEMA 3 DISCONNECTS. ALL FANS SHALL BE SUPPLIED WITH ELECTRONICALLY COMMUTATED MOTORS RATED FOR CONTINUOUS DUTY.

1.5 PROVIDE PROOF CURBS FOR ALL ROOF MOUNTED FANS. COORDINATE SCHEDULE OF INSTALLATION WITH GENERAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL INSTALL CURB TO SUIT ROOFING CONTRACTOR'S SCHEDULE. CURB SHALL BE 18 GAUGE GALVANIZED STEEL WITH CONTINUOUSLY WELDED CORNERS, AND COMPLETE WITH 1-1/2" 3 LBS DENSITY INSULATION. PROVIDE WOOD NAILER ON TOP OF ROOF CURB. CURBS SHALL BE MINIMUM OF 24" TALL.

2 ROOF MOUNTED DOWNBLAST

2.1 FAN SHALL BE SPIN ALUMINUM ROOF MOUNTED DIRECT OR BELT DRIVEN CENTRIFUGAL EXHAUST FAN AS SCHEDULED.

2.2 WHEEL SHALL BE CENTRIFUGAL BACKWARD INCLINED. AN AERODYNAMIC INLET CONE SHALL BE PROVIDED FOR MAXIMUM PERFORMANCE AND EFFICIENCY.

2.3 STRUCTURAL COMPONENTS SHALL BE CONSTRUCTED OF MINIMUM 16 GAUGE MARINE ALLOY ALUMINUM, BOLTED TO A RIGID ALUMINUM SUPPORT STRUCTURE. THE ALUMINUM BASE SHALL HAVE CONTINUOUSLY WELDED CURB CAP CORNERS FOR MAXIMUM LEAK PROTECTION.

2.4 AN INTEGRAL CONDUIT CHASE SHALL BE PROVIDED THROUGH THE CURB CAP AND INTO THE MOTOR COMPARTMENT TO FACILITATE WIRING CONNECTIONS. THE MOTOR SHALL BE ENCLOSED IN A WEATHER-TIGHT COMPARTMENT, SEPARATED FROM THE EXHAUST AIRSTREAM. MOTOR SHALL BE NEMA DESIGN B WITH CLASS B INSULATION. MOTOR MOUNTING PLATE SHALL BE MANUFACTURER FROM 10 GAUGE STEEL.

2.5 ALL FANS MUST BE PROVIDED WITH LIFTING LUGS, AS WELL AS STAINLESS STEEL LATCHES ON THE TOP CAP OF THE FAN TO FACILITATE INSTALLATION AND SERVICE.

2.6 PROVIDE HINGED FAN BASE TO ALLOW FOR EASY ACCESS TO INLET OF THE FAN FOR ANY FAN OVER 500 CFM.

3 INSTALLATION

3.1 INSTALL FANS AS SHOWN. COORDINATE ROOF OPENING WITH GENERAL CONTRACTOR AND STRUCTURAL CONTRACTOR.

3.2 PROVIDE ALL VIBRATION ISOLATION MEASURES TO PREVENT VIBRATION FROM BEING TRANSFERRED TO THE STRUCTURE, AND TO PREVENT NOISE.

3.3 PROVIDE FLEXIBLE DUCT CONNECTIONS FROM DUCTWORK TO FAN.

3.4 PROTECT MOTORS AND FANS SURGING CONSTRUCTION AND ROTATE FANS, BY HAND, EVERY 2 WEEKS BETWEEN DELIVERY AND SUBSTANTIAL PERFORMANCE.

3.5 PROVIDE ALL CONTROLS AS SHOWN ON DRAWINGS TO PROVIDE FULLY FUNCTIONAL FAN SYSTEMS.

3.6 PROVIDE AIR BALANCING REPORT FOR EACH FAN INSTALLED ON SITE WITHIN +/- 3% DEVIATION FROM SCHEDULED PERFORMANCE.

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#	DATE	DESCRIPTION	BY
3	2023-07-14	ISSUED FOR TENDER AND PERMIT	DJ
2	2023-06-16	ISSUED FOR PERMIT	DJ
1	2023-04-12	ISSUED FOR COORDINATION	DJ

RIO CAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

DRAWING
MECHANICAL SPECIFICATIONS

PROJECT NO. 22-000-176
PROJECT DATE Issue Date
DRAWN BY D.C.
CHECKED BY R.R.
SCALE

LICENSED PROFESSIONAL ENGINEER
D.S. JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M002A
REV. 3

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MECHANICAL SPECIFICATION - HVAC

1 GENERAL

1.1 COMPLY WITH ALL REQUIREMENTS OF DIVISION 1, OWNER, PROJECT MANAGER AND/OR CONSTRUCTION MANAGER.

1.2 COORDINATE THE WORK OF THIS TRADE WITH ALL OTHER TRADES. INCLUDE FOR ALL MATERIAL AND LABOUR TO INSTALL THESE SYSTEMS TO SUIT THE EXISTING AND NEW SYSTEMS OF OTHER TRADES.

2 DUCTWORK

2.1 UNLESS OTHERWISE SPECIFIED, CONSTRUCT AND INSTALL ALL DUCTWORK IN ACCORDANCE WITH ANSI/SMACNA HVAC DUCT CONSTRUCTION STANDARDS USING A MINIMUM PRESSURE CLASSIFICATION OF POSITIVE OR NEGATIVE 500 PA (2" W.C) AND A MINIMUM VELOCITY OF 10 M/S (2000 FPM) SUCH THAT THE DUCTWORK DOES NOT DRUM.

2.2 FOR DUCTWORK SUBJECTED TO MORE THAN 500 PA (2" W.C.) POSITIVE/NEGATIVE PRESSURE, CONSTRUCT DUCTWORK TO MEET ANSI/SMACNA DUCT STANDARD TO SUIT APPLICABLE PRESSURE CLASSIFICATION PLUS 10% FACTOR OF SAFETY.

2.3 STANDARD DUCTWORK SHALL BE CONSTRUCTED FROM GALVANIZED STEEL SHEETS, HOT DIPPED IN ACCORDANCE WITH ASTM A653. GALVANIZING FOR BARE UNCOVERED DUCTS TO BE FINISH PAINTED TO BE G60. ALL OTHER GALVANIZING TO BE G90.

2.4 PROVIDE ALUMINUM DUCTWORK AS SHOWN ON DRAWINGS AND FOR ALL SYSTEMS IN HIGH HUMIDITY AREAS OR FOR ALL SYSTEMS SERVING SYSTEMS WITH HIGH WATER CONTENT OR HUMIDITY.

2.4.1 ALUMINUM DUCTWORK SHALL BE CONSTRUCTED FROM ALLOY 3003 TEMPER H14 ALUMINUM, ASTM B209, AND BE FABRICATED TO BE WATER TIGHT WITH METAL GAUGES AND FABRICATION IN ACCORDANCE WITH ANSI/SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

2.4.2 SLOPE DUCTWORK TO ENSURE THAT ALL MOISTURE DRAINS TO SYSTEM LOW POINTS. PROVIDE VALVED AND CAPPED DRAIN CONNECTIONS AT SYSTEM LOW POINTS.

2.5 FABRICATE AND INSTALL DUCTWORK TO ENSURE INTERIOR SURFACE IS SMOOTH AND FREE OF OBSTRUCTIONS, AND THAT DUCTWORK DOES NOT VIBRATE OR CREATE NOISE ONCE SYSTEMS ARE IN OPERATION.

2.6 DUCTWORK HANGERS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS AS A MINIMUM. INCLUDE ALL ADDITIONAL SUPPORTS AS REQUIRED TO SUIT SYSTEMS SPECIFICS AND ENSURE A FULLY OPERATIONAL AND VIBRATION FREE DUCTWORK SYSTEM.

2.7 FLEXIBLE DUCTWORK SHALL BE SPIRALLY WOUND, SEMI-RIGID, SELF SUPPORTING CORRUGATED ALUMINUM DUCT WITH CONTINUOUS TRIPLE LOCK SEAMS, ULC-S110 LISTED AND LABELED AS A CLASS 1 AIR DUCT, CONSTRUCTED OF DEAD SOFT ALUMINUM STRIP FACTORY COVERED WITH 40 MM (1-1/2"), 12 KG/M^3 (0.75 LB/FT^3) DENSITY FIBERGLASS INSULATION WITH VINYL JACKET MEETING FLAME AND SMOKE DEVELOPMENT REQUIREMENTS OF CAN/ULC S-102. BASIS OF DESIGN SHALL BE NOVAFLEX GROUND T/L-A TRIPLE LOCK ACOUSTIC DUCT.

2.8 FLEXIBLE DUCTS SERVING DIFFUSERS/GRILLES SHALL HAVE A MAX LENGTH OF 2400 MM (8'-0"). FLEXIBLE DUCTS SERVING TERMINAL CONTROL UNITS (VAV/FAN POWERED VAV) SHALL HAVE A MAXIMUM LENGTH 12000 MM (4'-0") AND A MINIMUM OF 3 DUCT DIAMETERS OF STRAIGHT LENGTH.

2.9 ALL FLEXIBLE DUCTWORK SHALL BE INSTALLED WITHOUT EXCESS LENGTH AND SUPPORTED IN ACCORDANCE WITH ANSI/SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

2.10 FIRE DAMPERS SHALL BE INSTALLED IN ALL DUCTWORK PASSING FIRE RATED PARTITIONS. DAMPERS SHALL BE CURTAIN BLADE TYPE, DYNAMIC, GALVANIZED STEEL FUSIBLE LINK DAMPERS, ULC CLASSIFIED TO STANDARD CAN/ULC-S112 AND IN ACCORDANCE WITH NFPA 90A.

2.11 DAMPERS SHALL BE OUT OF STREAM TYPE UNLESS SIZE OR LOCATIONS DICTATES THE USE OF IN STREAM DAMPERS.

2.12 FIRE DAMPERS SHALL BE SELECTED IN ACCORDANCE WITH THE RATING OF THE PARTITION AND LOCAL CODES (OBC). MINIMUM DAMPER RATING SHALL 1.5 HOURS WITH 74C (165F) FUSIBLE LINK (UNLESS APPLICATION REQUIRED HIGHER TEMPERATURE RATING.

2.11 PROVIDE ACCESS DOORS IN DUCTS AND HARD SURFACES AS REQUIRED TO ACCESS AND MAINTAIN FIRE DAMPERS.

2.12 PROVIDE CURTAIN OR PARALLEL BLADE TYPE DAMPERS TO MAINTAIN FIRE RATING INTEGRITY OF MEMBRANE BEING PIERCED. MINIMUM RATING TO BE 1-1/2 HOURS WITH {100OC} [212OF] FUSIBLE LINK. PROVIDE MULTIPLE DAMPERS WHERE SIZES EXCEED CODE LIMITATION.

2.13 FIRE DAMPERS SHALL BE MANUFACTURED BY NAILOR INDUSTRIES INC, GREENHECK FAN CORP, NCA MANUFACTURING OR RUSKIN CO. SELECT DAMPERS TO SUIT ORIENTATION, SIZE, REQUIRED RATING, AND ALL OTHER FACTORS REQUIRED.

2.14 PROVIDE FLEXIBLE DUCT CONNECTIONS BETWEEN ALL AIR HANDLING EQUIPMENT AND SYSTEM DUCTWORK. FLEXIBLE DUCT CONNECTIONS SHALL BE 0.68 mm (0.027") THICK WOVEN FIBERGLASS WITH POLYCHLOROPRENE COATING MEETING NFPA 90A/90B, NFPA-701 AND CAN/ULC S109-03. DURODYNE NEOPRENE FLEXIBLE CONNECTOR (OR APPROVED EQUAL.)

2.15 PROVIDE ALL MANUAL BALANCING DAMPERS AS SHOWN ON DRAWINGS AND AS REQUIRED TO PROVIDE FULLY BALANCED HVAC SYSTEMS. PROVIDE BALANCING DAMPERS IN EXISTING DUCTWORK AS REQUIRED TO BALANCED SYSTEM TO PERFORMANCE LEVELS SHOWN ON THE DRAWINGS. BALANCING CONTRACTOR SHALL BE A MEMBER IN GOOD STANDING OF AABC OR NEBC. SUBMIT BALANCING REPORT IN PDF FORMAT TO THE CONSULTANT FOR REVIEW. BALANCING REPORT SHALL INCLUDE LEGIBLE DRAWINGS INDICATED TERMINAL LOCATION. ALL BALANCING SHALL BE COMPLETED WITHIN +/- 3% OF VALUES LISTED WITHIN DOCUMENTS. REPLACE/ADJUST FAN SHEAVES, BELTS AND PULLEYS AS REQUIRED TO OBTAIN DESIGN AIR QUANTITIES. INDICATE DESIGN AND ACTUAL PERFORMANCE OF EACH EQUIPMENT AND TERMINAL. PROVIDE TEN (10) ADDITIONAL HOURS OF BALANCING WORK AFTER INITIAL APPROVED BALANCING TO SUIT TENANT COMFORT BALANCING. THIS WORK SHALL BE PERFORMED AFTER THE TENANT HAS MOVED IN, AS MAY BE REQUIRED FOR COMFORT BALANCING. WHERE REQUIRED HIRE BASE BUILDING TESTING/BALANCING CONTRACTOR AND INCLUDE COST WITHIN MECHANICAL TENDER.

2.16 BALANCING DAMPERS SHALL BE BY NAILOR INDUSTRIES, TAMCO, GREENHECK, NCA OR GREENHECK.

2.17 ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. WHERE ACOUSTIC INSULATION IS ADDED, INCREASE DUCT FABRICATION DIMENSIONS AS REQUIRED TO SUIT.

3 RTUS

3.1 PROVIDE ROOF TOP UNITS COMPLETE WITH CURBS AND ALL ACCESSORIES AS OUTLINED IN THESE DOCUMENTS IN ACCORDANCE WITH THE RTU SCHEDULE AND DRAWING NOTES. WHERE DISCREPANCIES EXIST BETWEEN THIS SPECIFICATION AND NOTES WITHIN THE DRAWINGS, THE MORE STRINGENT SYSTEM SHALL BE INSTALLED.

3.2 ACCEPTABLE ROOF TOP UNIT MANUFACTURERS: LENNOX, CARRIER, YORK

3.3 SUBMIT SHOP DRAWINGS FOR RTUS INCLUDING ALL ACCESSORIES AND PERFORMANCE VALUES.

3.4 ALL RTUS SHALL BE IN CONFORMANCE WITH THE LATEST VERSIONS OF ARI 210/240, ARI 340/360, CSA B52, ASHRAE 90.1, CSA B149 AND BE CSA OR ETL CERTIFIED.

3.5 MECHANICAL CONTRACTORS SHALL VERIFY WITH ELECTRICAL DRAWINGS, AND SITE CONDITIONS THE AVAILABLE VOLTAGE FOR NEW MECHANICAL EQUIPMENT AND ORDER RTU TO SUIT.

3.6 CABINET SHALL BE CONSTRUCTION OF A MINIMUM OF #18 GUAGE GALVANIZED STEEL FINISHED WITH TWO COATS OF BAKED EXTERIOR ENAMEL PAINT AND BE COMPLETE WITH 50MM (2") FIBERGLASS INSULATION INSULATED BASE, WALLS AND ROOF. INSULATION SHALL MEET FLAME AND SMOKE REGULATION AND SHALL BE SUITABLE FOR PROXIMITY TO GAS HEAT EXCHANGER AND HIGH HUMIDITY APPLICATIONS.

3.7 PROVIDE WATER AND AIR SEALED HINGED ACCESS PANELS TO BE INSULATED TO THE SAME STANDARDS AS THE RTU CASING.

3.8 PROVIDE AIR DISCHARGE PATH (VERTICAL OR HORIZONTAL) AS INDICATED ON DRAWINGS. WHERE HORIZONTAL DISCHARGE IS REQUIRED, PROVIDE UNIT COMPLETE WITH HORIZONTAL DISCHARGE OR PROVIDE DOWN TO VERTICAL DISCHARGE DIRECTION CURB ADPATOR.

3.9 COMPRESSORS SHALL BE HERMETICALLY SEALED SCROLL TYPE COMPLETE WITH VIBRATION ISOLATIONS WITH DIRECT DRIVE CONDENSER FANS AND COPPER TUBE/ALUMINUM FIN FACTORY LEAK AND PRESSURE TESTED CONDENSER COILS.

3.10 CONDENSER FAN SHALL BE PERMANENTLY LUBRICATED, TOTALLY ENCLOSURE, RESLIENTLY MOUNTED AND OVERLOAD PROTECTED AND COME COMPLETE WITH PVC COATED FAN GUARD.

3.11 REFRIGERATION SYSTEM SHALL BE R410-A AND BE CAPABLE OF OPERATING DOWN TO -17C (0F) AND BE COMPLETE WITH ALL SUCTION AND LIQUID PIPING, SERVICE GAUGE PORTS, FREEZE-STATS, EXPANSION VALVES, LIQUID LINE FILTER DRYER AND AUTOMATIC RESET HIGH AND LOW PRESSURE COMPRESSOR CIRCUIT CONTROLS.

MECHANICAL SPECIFICATION - HVAC

3.12 PROVIDE ALL CONTROLS AS LISTED WITHIN THESE DOCUMENTS AND AS REQUIRED TO PROVIDE A FULLY OPERATIONAL SYSTEM. PROVIDE A 7-DAY DIGITAL PROGRAMMABLE THERMOSTAT WITH EACH RTU AND ALL OTHER CONTROLS AS REQUIRED.

3.13 PROVIDE 50MM (2") THICK ROLL DISPOSSIBLE MERV 8 RATED, METAL FRAMED FILTERS. AT THE END OF CONSTRUCTION REPLACE FILTERS USED FOR INITIAL START UP, TESTING AND BALANCING, AND PROVIDE A SECONDARY SET OF FILTERS PER RTU TO OWNER.

3.14 PROVIDE CSA 149 APPROVED MULTIPLE PASS DIRECT SPARK IGNITIATION REMOVABLE GAS HEAT EXCHANGER AND BURNER ASSEMBLY SUITABLE FOR NATURAL GAS SUPPLY PRESSURE OF 7" W.C. WITH STAINLESS STEEL PRIMARY AND SECONDARY HEATING SURFACES COMPLETE WITH 100% SAFETY SHUTDOWN FLAME SENSOR CONTROLS, FLAME ROLLOUT SWITCH, LIMIT CONTROLS, REDUNDANT DIAL GAS VALVES WITH STAGING CONTROL AND COMBUSTION AIR PROVIDING SWITCH.

3.15 PROVIDE FACTORY INSTALLED INTERNALLY SLOPPED NON-CORROSIVE CONDENSATE DRAIN PAN COMPLETE WITH FACTORY SUPPLIED, FIELD INSTALLED, PVC TRAP. TRAP SHALL BE A MINIMUM OF 25 MM (1") DEEPER THAN MAXIMUM STATIC PRESSURE OF FAN.

3.16 RTU SHALL BE COMPLETE WITH FACTORY INSTALLED HEATING CONTROLS AS REQUIRED TO PROVIDE A FAIL-SAFE HEATING SYSTEMS INCLUDING ALL SAFETIES AND CONTROLS NECESSARY. UNIT SHALL SHUT DOWN IN EVENT WHERE ITS OPERATION IS CONSIDERED UNSAFE AND RECORD ALL ERRORS.

3.17 SUPPLY AIR BLOWER SHALL BE BELT DRIVEN FORWARD CURVED DOUBLE INLET CENTRIFUGAL TYPE FAN, STATICALLY AND DYNAMICALLY BALANCED WITHIN REMOVABLE BLOWER ASSEMBLY. ALL COMPONENTS SHALL BE STEEL WITH CORROSION RESISTANCE FINISHED FACTORY APPLIED. BLOWER ASSEMBLY SHALL BE MOUNTED ON VIBRATION ISOLATION SPRING ISOLATORS.

3.18 ALL CONTROLS SHALL BE FACTORY INSTALLED AND CALIBRATED INCLUDING INTEGRAL CONTROL PANEL, CONTROL SENSORS AND WIRING. WHERE SPECIFIC NON STANDARD CONTROLS ARE REQUIRED AS PER THESE DOCUMENTS THEY SHALL BE FACTORY INSTALLED AND TESTED. UNIT SHALL BE COMPLETE WITH ALL TRANSFORMERS TO CREATE CONTROLS VOLTAGES REQUIRED.

3.19 PROVIDE NEW 600MM (24") HIGH PREFABRICATED AND INSULATED ROOF CURB CONFORMING TO THE REQUIREMENTS OF THE NATIONAL ROOFING CONTRACTORS ASSOCIATION. ROOF CURB SHALL BE PROVIDED BY THE RTU MANUFACTURER.

3.20 WHERE REQUIRED, PROVIDE NEW CUSTOM FABRICATED ROOF CURB ADAPTER COMPLYING TO THE NATIONAL ROOFING CONTRACTORS ASSOCIATION. ALL EXISTING CURB DIMENSIONS SHALL BE FIELD FABRICATED. CUSTOM ROOF CURB ADAPTER SHALL BE FULLY INSULATED AND STAMPED BY A STRUCTURAL ENGINEER LICENSED IN THE PROVINCE OF INSTALLATION.

3.21 WHERE REQUIRED PROVIDE FACTORY SECURED SEISMIC RESTRAINT CONNECTION HARDWARE.

3.22 UNLESS OTHERWISE STATES, ROOF CURBS SHALL BE PURCHASED BY MECHANICAL CONTRACTOR AND INSTALLED BY ROOFING CONTRACTOR. ORDER AND HAND OVER ROOF CURBS IN A TIMELY MANNER TO SUIT THE CONSTRUCTION SCHEDULE.

3.23 PROVIDE ALL RTU OPTIONS AS LISTED ON THE DRAWINGS AND AS NOTED BELOW:
-DUAL ENTHALPY ECONOMIZER COMPLETE WITH HOOD AND ALL REQUIRED CONTROLS.
-BAROMETRIC RELIEF DAMPERS COMPLETE WITH HOOD.
-FACTORY INSTALLED, FIELD WIRED, 120V 20A/15A GFCI COMPLETE WIT WEATHERPROOF COVER COMPLYING WITH LATEST ESA STANDARDS. GFCI SHALL BE WIRED FROM INDEPENDENT POWER SOURCE TO REMAIN OPERATIONAL WITH RTU POWER SHUT DOWN.

3.24 INSTALL ALL ROOF TOP UNITS LEVEL WITH THE FLOOR LEVEL BELOW. INCLUDE FOR ALL BEVELLED CURBS AS REQUIRED TO ACHIEVE THIS REQUIREMENT. INSTALL UNITS TO ENSURE SERVICE CLEARANCES AND CLEARANCES FROM EDGE OF ROOF ARE MAINTAINED.

3.25 INSTALL ALL COMPONENTS SHIPPED LOOSE WITH RTU ON SITE. PAY FOR FACTORY TRAINED TECHNICIAN TO PERFORM RTU START UP AND CONFIRM CORRECT INSTALLATION OF INSTALLATION.

3.26 AFTER SUCCESSFUL START UP OF RTU, PERFORM ALL COMMISSIONING AND TESTING AND BALANCING OF THE RTU. SUBMIT ALL START UP, AND TESTING AND BALANCING REPORTS FOR RTU TO CONSULTANT FOR REVIEW. PROVIDE ALL DEMONSTRATION AND TRAINING OF CORRECT OPERATION AND MAINTENANCE OF THE UNIT TO THE OWNER AND PROVIDE PROOF DEMONSTRATION AS PART OF CLOSE OUT DOCUMENTS.

3.27 PROVIDE UNIT WITH LIMITED 5 YEAR WARRANTY ON COMPRESSOR, 3 YEAR WARRANTY ON UNIT CONTROLS, 5 YEAR WARRANTY ON GAS HEAT EXCHANGER, AND 1 YEAR WARRANTY ON ALL OTHER COMPONENTS.

3.28 STORE AND HANDLE ALL UNITS AS PER THE MANFUACTURER'S WRITTEN RECOMMENDATIONS. DO NOT MOVE, HANDLE, OPERATE OR OTHERWISE ACT IN ANY WAY TO WAIVE UNIT WARRANTIES.

MECHANICAL SPECIFICATION - CONTROLS

1.1 PROVIDE ALL CONTROLS AS SHOWN ON THESE DRAWINGS.

1.2 ALL CONTROLS WORK SHALL BE PROVIDED BY BASE BUILDING CONTROLS CONTRACTOR AND INCLUDED IN MECHANICAL SCOPE OF WORK AND TENDER.

1.3 ALL CONTROLS WIRING SHALL BE PLENUM RATED.

1.4 MECHANICAL CONTRACTOR SHALL PROVIDE ALL 120V AND LOW VOLTAGE WIRING AS REQUIRED TO COMPLETE CONTROLS SCOPE OF WORK. PROVIDE ALL TRANSFORMERS AS REQUIRED TO PROVIDE LOW VOLTAGE CONTROL WIRING. WHERE CONTROLS WORK REQUIRED 120V WIRING, HIRE ELECTRICAL CONTRACTOR TO PERFORM ALL SAID WORK.

1.5 PROVIDE ALL NEW THERMOSTATS TO SUIT BASE BUILDING STANDARDS WHERE APPLICABLE.

1.6 WHERE THERMOSTATS HAVE OCCUPANT INTERACTION, THEY SHALL BE INSTALLED 4'-0" ABOVE FINISHED FLOOR, WITH LOCKING PLEXI-GLASS COVER.

MECHANICAL SPECIFICATION - INSULATION

1 INSULATION

1.1 PROVIDE ALL LABOUR AND MATERIAL REQUIRED TO INSULATE ALL MECHANICAL SYSTEMS AS SPECIFIED WITHIN THIS SECTION AND AS NOTED ON DRAWINGS.

1.2 UNLESS OTHERWISE SPECIFIED, INSULATION THERMAL PERFORMANCE IS TO MEET OR EXCEED THE MORE STRINGENT REQUIREMENTS OF THE LATEST EDITIONS OF THE NATIONAL ENERGY CODE OF CANADA FOR BUILDINGS AND ASHRAE 90.1.

1.3 ALL SYSTEM SUBJECT TO CONDENSATION (INCLUDING COLD AND DUAL TEMPERATURE) SHALL BE INSULATED COMPLETE WITH VAPOUR BARRIER. VAPOUR BARRIER SHALL BE INSTALLED OVER ALL SYSTEM COMPONENTS INCLUDING VALVES. VAPOUR BARRIER SHALL BE COMPLETE AND CONTINUOUS IN ITS ENTIRETY. ANY DAMAGE TO VAPOUR BARRIER SHALL REQUIRE FULL REMOVAL AND REPLACEMENT. DO NOT PATCH NEW VAPOUR BARRIERS INSTALLED AS PART OF THIS CONTRACT.

1.4 INSULATION SHALL ONLY BE APPLIED ONCE SYSTEMS HAVE BEEN TESTED AND REVIEWED BY ENGINEER AND AUTHORITY HAVING JURISDICTION.

1.5 INSTALL INSULATION ON PIPES AND DUCTS WHICH ARE CLEAN AND DRY, AND WITH ENVIRONMENTAL CONDITIONS AS REQUIRED BY THE INSULATION MANUFACTURER.

1.6 STORE ALL INSULATION MATERIAL ON SITE IN A DRY STORAGE AREA AND ENVIRONMENTAL CONDITIONS AS REQUIRED BY THE INSULATION MANUFACTURER.

1.7 ALL INSULATION OF MECHANICAL SYSTEMS SHALL BE INSTALLED BY A SINGLE INSULATION CONTRACTOR.

1.8 ALL INSULATION SHALL HAVE FLAME AND SMOKE SPREAD RATINGS OF 25/50 AND AS REQUIRED BY THE LOCAL BUILDING CODE AND REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND AS PER CAN/ULC-S114 AND CAN/ULC-S101.

1.9 ACCEPTABLE INSULATION MANUFACTURERS ARE JOHNS MANVILLE, OWENS CORNING, MANSON INSULATION, AND KNAUF OR AS LISTED BELOW.

1.10 ALL PIPE/DUCT LABELS SHALL BE APPLIED TO OUTSIDE OF INSULATION USING STENCILS OR WITH PIPE WRAP LABELS INSTALLED IN SUCH A WAY AS TO BE VISIBLE FROM THE FLOOR.

1.11 ALL INSULATION BUTT JOINTS SHALL BE FIRMLY CONNECTED JOINED AND INSTALLED IN SUCH A WAY AS TO NOT SEPARATE OVER TIME.

2 PIPING INSULATION

2.1 FOR SYSTEMS UP TO 250 F (121 C) PROVIDE BELFORM INSULATION LTD KOOLPHEN K-BLOCK INSULATED PIPE SUPPORT INSERTS, A MINIMUM OF 6" (150MM) LONG, PRE-MOLDED, RIGID, SECTIONAL PHENOLIC FOAM INSULATION (MATCHING THICKNESS OF ADJACENT INSULATION) WITH REINFORCED FOIL AND KRAFT PAPER VAPOUR JACKET AND A 180 DEGREE CAPTIVE GALVANIZED STEEL SADDLE.

2.2 FOR ABOVE GROUND PIPE PROVIDE PREFORMED MINERAL FIBRE RIGID, SECTIONAL, SLEEVE TYPE INSULATION TO ASTM STANDARD C 547, STANDARD SPECIFICATION FOR MINERAL FIBRE PIPE INSULATION, WITH A FACTORY APPLIED VAPOUR BARRIER JACKET EQUAL TO JOHN MANVILLE INC MICRO-LOK AP-T PLUS, KNAUF FIBER GLASS PIPE INSULATION WITH ASJ-SSL JACKET, MANSON INSULATION INC ALLEY K APT OR OWNES CORNING FIBERGLASS PIPE INSULATION.

2.3 FOR ALL VALVES AND ACCESSORIES IN PIPING SYSTEMS PROVIDE BLANKET MINERAL FIBRE TYPE ROLL INSULATION TO ASTM C553, STANDARD SPECIFICATION FOR MINERAL FIBRE BLANKET THERMAL INSULATION FOR COMMERCIAL AND INDUSTRIAL APPLICATIONS, 24 KG/M^3 (1-1/2 LB./FT/^3) DENSITY WITH A FACTORY APPLIED VAPOUR BARRIER FACING.

2.4 PROVIDE THE FOLLOWING INSULATION THICKNESSES:

2.4.1 DOMESTIC COLD WATER PIPING UP TO AND INCLUDING 4" (100MM) - 1" (25MM) WITH VAPOUR BARRIER

2.4.2 DOMESTIC COLD WATER PIPING LARGER THAN 4" (100 MM) - 1-1/2" WITH VAPOUR BARRIER

2.4.3 STORM PIPING - 1" (25MM) WITH VAPOUR BARRIER

2.4.4 CONDENSATE PIPING - 1" (25MM) WITH VAPOUR BARRIER

2.4.5 MECHANICAL SYSTEMS COMPLETE WITH HEAT TRACING OF ALL SIZES - 2" (50MM)

2.5 WRAP ALL EXPOSED INSULATION WITH WHITE SHEET PVC AND FITTING COVERS JACKET. INSTALL JACKET WITH OVERLAPPING LONGITUDINAL AND CIRCUMFERENTIAL JOINTS AND PROVIDE WATER TIGHT INSULATION. PROVIDE SLIP-TYPE JACKET EXPANSION JOINTS WHERE REQUIRED.

2.6 INSULATION SHALL BE APPLIED DIRECTLY TO THE PIPE AND NOT AROUND HANGERS AND SUPPORTS.

2.7 INSTALL ALL INSULATION IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.

2.8 PROVIDE PREFORMED INSULATION ON ALL BARRIER FREE LAVATORIES INCLUDING P-TRAP, ANGLE STOPS AND PIPING INSULATION.

2.9 ALL INSULATION SHALL BE CONTINUOUS AND BE EXTENDED THROUGH WALL AND FLOOR OPENINGS. SUPPLY SOUND PROOF AND FIRE PROOF PENETRATIONS TO SUIT.

2.10 INSULATION APPLIED IN TWO LAYERS SHALL HAVE JOINTS STAGGERED.

2.11 INSULATE OVER FLANGES AND MECHANICAL COUPLINGS WITH INSULATION TO MATCH PIPE INSULATION THICKNESS AND OUTSIDE DIAMETER OF FLANGE/COUPLING. FILL THE VOID BETWEEN THE FLANGE/COUPLING INSULATION AND THE PIPE INSULATION WITH THE SAME MATERIAL. ENSURE A CONTINUOUS VAPOUR SEAL ACROSS FULL INSTALLATION.

2.12 DO NOT INSULATE TERMINAL UNIT CONTROL VALVES SO LONG AS THEY ARE SITUATION ABOVE CONDENSATE PAN.

2.13 WHERE INSULATING INLINE COMPONENTS WITH FLEXIBLE INSULATION, DO NOT COMPRESS PRODUCT MORE THAN 50% OF ORIGINAL FACTORY THICKNESS. APPLY LAYERS AS REQUIRED TO ACHIEVE MINIMUM THICKNESS VALUES.

3 SHEET METAL INSULATION

3.1 FOR EXPOSED RECTANGULAR DUCTS PROVIDE PREFORMED BOARD TYPE INSULATION TO ASTM C612, STANDARD SPECIFICATION FOR MINERAL FIBER BOCK AND BOARD THERMAL INSULATION WITH A FACTORY APPLIED REINFORCED ALUMINUM FOIL AND KRAFT PAPER FACING EQUAL TO KNAUF FIBER GLASS INSULATION BOARD WITH FSK FACING, MANSON INSULATION INC AK BOARD FSK, JOHNS MANVILLE INC TYPE 814 SPIN-GLAS OR OWENS CORNING 703, 704.

3.2 FOR EXPOSED ROUND OR OVAL DUCTS PROVIDE ROLL FORM INSULATION TO ASTM C1393 STANDARD SPECIFICATION FOR PERPENDICULARLY ORIENTED FIBER ROLL AND SHEET THERMAL INSULATION FOR PIPES AND TANKS WITH A FACTORY APPLIED VAPOUR BARRIER FACING CONSISTING OF CUT STRIPS OF RIGID MINERAL BOARD INSULATION GLUED TO AN ALUMINUM FOIL AND KRAFT PAPER FACING ACCEPTABLE TO MULTI-GLASS INSULATION LTD MULTI-FLEX MKF, GLASS-CELL FABRICATORS LTD. R-FLEX, OWNS CORNING PIPE AND TANK INSULATION, JOHNS MANVILLE INC PIPE AND TANK INSULATION.

3.3 FOR CONCEALED RECTANGULAR OR OVAL DUCTS PROVIDE BLANKET TYPE ROLL FORM INSULATION TO ASTM STANDARD C553 STANDARD SPECIFICATION FOR MINERAL FIBRE BLANKET THERMAL INSULATION 24 KG/M^3 (1-1/2 LB./FT^3) DENSITY WITH A FACTORY APPLIED VAPOUR BARRIER FACING EQUAL TO KNAUF FIBER GLASS BLANKET INSULATION AND MULTI-PURPOSE FSK FACING, MANSON INSULATION INC ALLEY WRAP FSK, JOHNS MANVILLE INC DUCT WRAP TYPE 150 MICROLITE OR ISOFAB FACED FLEXIBLE FSK INSULATION.

3.4 FOR DUCTS AND PIPES INSTALLED OUTSIDE OF THE BUILDING PROVIDE SHEET OR ROLL FORM CFC FREE CLOSED CELL SELF-ADHERING ELASTOMERIC EPDM RUBBER INSULATION IN ACCORDANCE WITH REQUIREMENTS ASTM C534, STANDARD SPECIFICATION FOR PERFORMED FLEXIBLE ELASTOMERIC CELLULAR THERMAL INSULATION IN SHEET AND TUBULAR FORM WITH ALL REQUIRED INSTALLATION ACCESSORIES EQUAL TO ARMACELL AP/ARMAFLEX SA AND WRAPPED IN ALUMINUM SHEETING WITH ALUMINUM BANDING WITH ALL JOINTS SEALED WITH WEATHERPROOF SEALANT.

3.5 PROVIDE THE FOLLOWING INSULATION THICKNESS:

3.5.1 OUTDOOR AIR INTAKE DUCTS, CASINGS, PLENUMS UP TO MIXING BOXES OR COILS - 1-1/2" (40MM)

3.5.2 PRE-TREATED OUTDOOR AIR DUCTS, CASINGS, PLENUMS - 1-1/2 (40MM)

3.5.3 SUPPLY AIR DUCTS - 1" (25MM)

3.5.4 FINAL 10 FEET OF EXHAUST DUCTS WORK BEFORE BUILDING EXTERIOR - 1" (25MM)

3.5.5 EXPOSED DUCTWORK IN AREAS WHICH IT IS NOT SERVING - 1" (25MM)

3.5.6 DUCTWORK OUTSIDE OF BUILDING - 2" (50MM) WITH ALUMINUM JACKETING.

3.5.7 BLANK-OFF PANELS ON EXTERIOR LOUVERS - 3" (50MM)

3.13 DUCTWORK EXPOSED WITHIN THE SPACE IT SERVES DOES NOT REQUIRE EXTERNAL INSULATION.

3.14 DUCTWORK LINED WITH ACOUSTIC INSULATION CAN SUBTRACT THE THICKNESS OF ACOUSTIC INSULATION FROM THE REQUIRED EXTERNAL INSULATION TO DETERMINE FINAL EXTERNAL INSULATION.

3.15 INSULATION SHALL BE APPLIED DIRECTLY TO THE DUCT AND NOT AROUND HANGERS AND SUPPORTS. PROVIDE RIGID BOARD INSULATION BELOW HANGERS WITH ALUMINUM SADDLE WEAR PLATE BETWEEN INSULATION AND SUPPORTS.

MECHANICAL SPECIFICATION - INSULATION

3.16 INSTALL ALL INSULATION IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.

3.17 ALL INSULATION SHALL BE CONTINUOUS AND BE EXTENDED THROUGH WALL AND FLOOR OPENINGS. SUPPLY SOUND PROOF AND FIRE PROOF PENETRATIONS TO SUIT.

3.18 INSULATION APPLIED IN TWO LAYERS SHALL HAVE JOINTS STAGGERED.

3.19 INSULATE OVER FLANGES WITH INSULATION TO MATCH PIPE INSULATION THICKNESS AND OUTSIDE DIAMETER OF FLANGE/COUPLING. FILL THE VOID BETWEEN THE FLANGE/COUPLING INSULATION AND THE PIPE INSULATION WITH THE SAME MATERIAL. ENSURE A CONTINUOUS VAPOUR SEAL ACROSS FULL INSTALLATION.

3.20 INSULATION EXPOSED TO THE OUTDOORS SHALL BE WRAPPED IN ALUMINUM JACKET AND SEALED AT ALL ENDS.

3.21 PROVIDE FIRE-RATED DUCT WRAP WHERE SHOWN ON DRAWINGS AND WHERE REQUIRED TO MEET COSTS:

3.21.1 FOR FIRE RATED DUCTS PROVIDE FLEXIBLE NON-COMBUSTIBLE BLANKET TYPE MINERAL FIBRE DUCT WRAP COMPLETELY ENCAPSULATED IN REINFORCED FOIL 1-1/2" (40MM) THICK, SUITABLE FOR INSTALLATION WITH ZERO CLEARANCE TO COMBUSTIBLES, AND ULC TESTED AND LISTED (ULC DESIGNS FRD-3 & 5 FOR VENTILATION DUCTS, ULC DESIGN FRD-4 FOR KITCHEN EXHAUST DUCTS TO FACILITATE A 1 OR 2 HOUR FIRE RESISTANCE RATING EQUAL TO 3M FIRE PROTECTION PRODUCTS FIRE MASTER.

3.21.2 INSTALL FIRE RATED DUCT WRAP IN STRICT ACCORDANCE WITH MANUFACTURER'S AND ULC LISTING REQUIREMENTS FOR KITCHEN EXHAUST OR VENTILATION DUCTWORK AS NECESSARY. DO NOT COVER FIRE WRAP LABELS REGARDLESS OF FINISH. IDENTIFY DUCT SERVICE AND FLOW DIRECTION WITH STENCILED MARKINGS.

3.21.3 ARRANGE AND PAY FOR THE DUCT WRAP SUPPLIER TO EXAMINE THE COMPLETED DUCT WRAP SYSTEM ON SITE AND SUBMIT A LETTER FROM THE SUPPLIER TO CERTIFY THAT THE DUCT WRAP SYSTEM HAS BEEN PROPERLY INSTALLED.

3.21.4 FOR FIRE RATED DUCTS PROVIDE FLEXIBLE NON-COMBUSTIBLE BLANKET TYPE MINERAL FIBRE DUCT WRAP COMPLETELY ENCAPSULATED IN REINFORCED FOIL 1-1/2" (40MM) THICK, SUITABLE FOR INSTALLATION WITH ZERO CLEARANCE TO COMBUSTIBLES, AND ULC TESTED AND LISTED (ULC DESIGNS FRD-3 & 5 FOR VENTILATION DUCTS, ULC DESIGN FRD-4 FOR KITCHEN EXHAUST DUCTS TO FACILITATE A 1 OR 2 HOUR FIRE RESISTANCE RATING EQUAL TO 3M FIRE PROTECTION PRODUCTS FIRE MASTER.

3.21.5 INSTALL FIRE RATED DUCT WRAP IN STRICT ACCORDANCE WITH MANUFACTURER'S AND ULC LISTING REQUIREMENTS FOR KITCHEN EXHAUST OR VENTILATION DUCTWORK AS NECESSARY. DO NOT COVER FIRE WRAP LABELS REGARDLESS OF FINISH. IDENTIFY DUCT SERVICE AND FLOW DIRECTION WITH STENCILED MARKINGS.

3.21.6 ARRANGE AND PAY FOR THE DUCT WRAP SUPPLIER TO EXAMINE THE COMPLETED DUCT WRAP SYSTEM ON SITE AND SUBMIT A LETTER FROM THE SUPPLIER TO CERTIFY THAT THE DUCT WRAP SYSTEM HAS BEEN PROPERLY INSTALLED.

3.22 PROVIDE ACOUSTIC DUCT LINING WHERE NOTED ON DRAWINGS AND AS A MINIMUM THE FIRST 10 FEET ON BOTH SUPPLY AND RETURN DUCTS DOWNSTREAM OF FANS/TERMINAL UNITS PLUS AT LEAST TWO CHANGES OF DIRECTION.

3.23 ACOUSTIC DUCT LINING SHALL BE A MINIMUM OF 1" (25MM) THICK ACOUSTIC LINING MATERIAL MEETING NFPA 90A REQUIREMENTS AND FLAME AND SMOKE SPREAD DEVELOPMENT FIRE HAZARD RATINGS OF CAN/ULC-S102, FLEXIBLE FOR ROUND DUCT, BOARD TYPE FOR RECTANGULAR DUCTS, CONSISTING OF A BONDED FIBERGLASS MAT COATED ON THE INSIDE (AIRSIDE) FACE WITH A BLACK FIRE-RESISTANCE RATING. MATERIAL SHALL HAVE NOISE REDUCTION COEFFICIENT OF 70 OR HIGHER.

3.24 INSTALL LINING IN ACCORDANCE WITH ANSI/SMACNA HVAC DUCT CONSTRUCTION STANDARDS PLUS FOR ALL INSTALLATION REGARDLESS OF VELOCITY AT THE LEADING AND TRAILING EDGES OF DUCT LINER SECTION PROVIDE GALVANIZED STEEL NOSING CHANNEL AS PER ANSI/SMACNA STANDARDS.

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#	DATE	DESCRIPTION	BY
3	2023-07-14	ISSUED FOR TENDER AND PERMIT	DJ
2	2023-06-16	ISSUED FOR PERMIT	DJ
1	2023-04-12	ISSUED FOR COORDINATION	DJ

RIO CAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

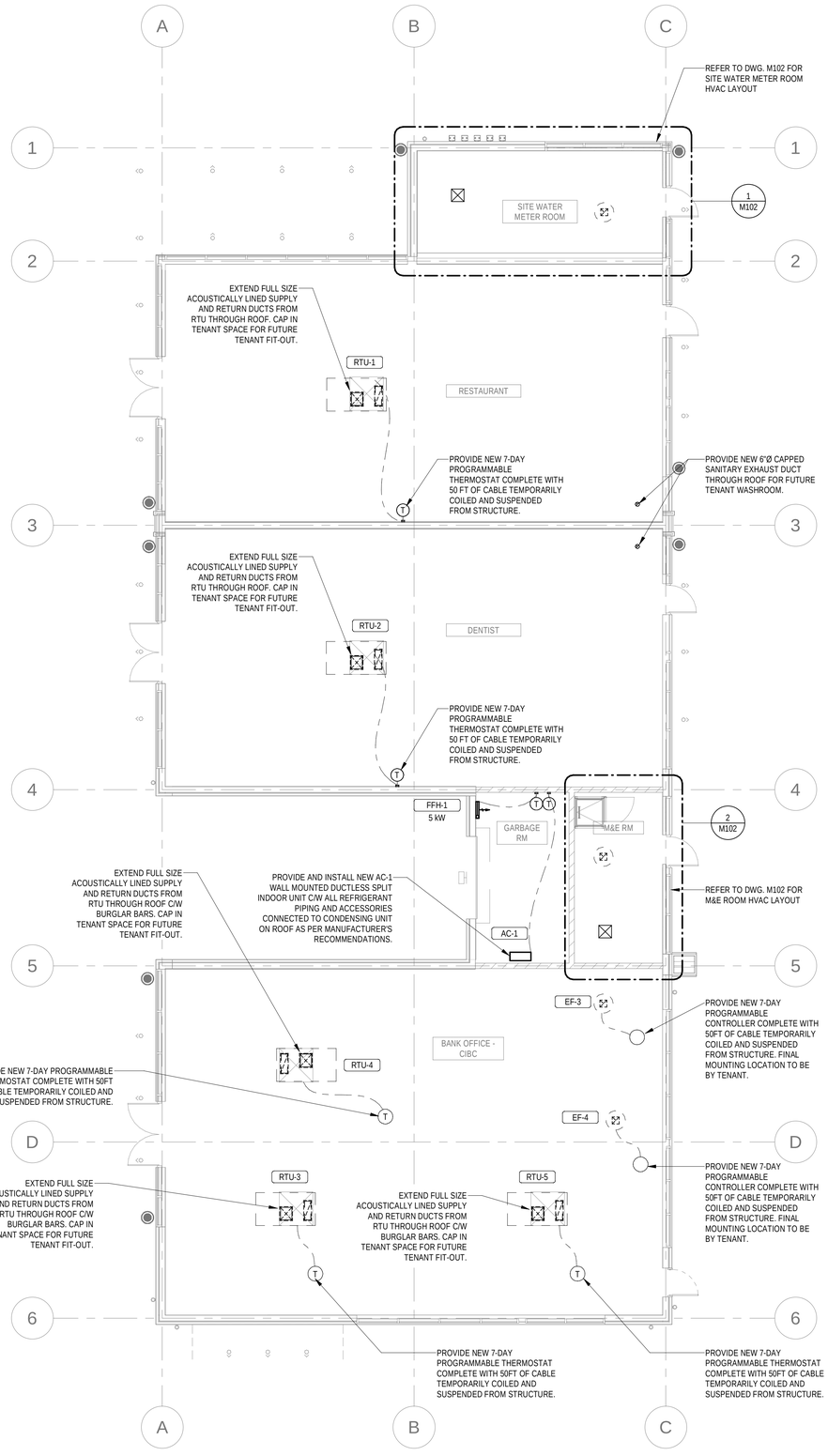
DRAWING
MECHANICAL SPECIFICATIONS

PROJECT NO. 22-000-176
PROJECT DATE Issue Date
DRAWN BY D.C.
CHECKED BY R.R.
SCALE

LICENSED PROFESSIONAL ENGINEER
D.S. JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M002B
REV. 3

7/13/2023 2:02:19 PM



1 M101 LEVEL 1 HVAC PLAN
1/8" = 1'-0"

HVAC SHEET NOTES

1. INSTALL HVAC SYSTEMS AS HIGH AS POSSIBLE. COORDINATE INSTALLATION WITH STRUCTURE, ARCHITECTURE, ELECTRICAL AND OTHER MECHANICAL SERVICES PRIOR TO BEGINNING INSTALLATION. INSTALL ALL DUCTWORK IN STRAIGHT RUNS PARALLEL OR PERPENDICULAR TO BUILDING LINES UNLESS NOTED OTHERWISE.
2. UNDER NO CIRCUMSTANCES INSTALL ANY OVERHEAD DUCT OR MECHANICAL EQUIPMENT LOWER THAN 2100MM (6' 10") AFF.
3. LOCATE SENSORS AND THERMOSTATS SUCH THAT THEY ARE ACCESSIBLE, PROTECTED, AND IN AN AREA OF UNOBSTRUCTED AIR CIRCULATION. PROVIDE EACH DEVICE WITH A WIRE IMPACT GUARD ASSEMBLY.
4. PROVIDE THE NECESSARY LOW VOLTAGE WIRING, POWER SUPPLIES TO CONTROLS AND TRANSFORMERS TO SUPPLY POWER TO REMOTE SENSORS AS REQUIRED BY MANUFACTURER.
5. PROVIDE BALANCING DAMPERS COMPLETE WITH MANUAL LOCKING QUADRANT ON ALL RUN-OUTS TO SUPPLY AND EXHAUST GRILLES AND DIFFUSERS AND WHERE INDICATED ON THE PLANS.
6. PROVIDE MIN 2" (50MM) INSULATION FOR ALL SUPPLY DUCTWORK, AND, FOR FIRST 10 FEET OF ALL DUCTWORK CONNECTED TO EXTERIOR OF BUILDING.
7. PROVIDE ACOUSTIC LINING ON SUPPLY AND RETURN AIR DUCTS 3M (10') DOWNSTREAM OF ROOFTOP UNITS, AIR HANDLERS AND FANS, ON DUCTED TRANSFERS BETWEEN ROOMS, ON ALL EXHAUST DUCTS WITHIN 3M (10') OF FANS AND OUTDOOR LOUVERS, AND WHERE INDICATED ON THE PLANS. DUCT SIZES SHOWN ARE NET INSIDE CLEAR DIMENSION AND EXCLUDE INSULATION THICKNESS.
8. INSTALL DAMPERS AND ACCESSORIES TO BE READILY ACCESSIBLE; PROVIDE ACCESS PANELS TO SUIT FINISH OF WALL OR CEILING WHERE REQUIRED. ACCESS DOORS IN FIRE RATED ASSEMBLIES SHALL BE ULC LISTED TO MATCH ASSEMBLY RATING.
9. COVER AND PROTECT DUCT OPENINGS, AIR TERMINALS AND EQUIPMENT UNTIL COMMISSIONING. FAILURE TO DO SO WILL RESULT IN THE MECHANICAL CONTRACTOR BEARING THE FULL COST OF CLEANING THE INTERIOR OF THE DUCTWORK SYSTEM(S) PRIOR TO OCCUPANCY.
10. PROVIDE DYNAMIC, TYPE 'B' FIRE DAMPERS AT ALL DUCT PENETRATIONS THROUGH HORIZONTAL AND VERTICAL FIRE SEPARATIONS AS INDICATED ON THE ARCHITECTURAL DRAWINGS, AND WHERE INDICATED ON THE PLANS.
11. MAKE PENETRATIONS THROUGH FLOORS WATERTIGHT IN WASHROOMS, JANITOR'S CLOSETS, MECHANICAL ROOMS, AND THROUGH CEILINGS OF ELECTRICAL ROOMS.
12. COORDINATE WITH THE GENERAL CONTRACTOR TO VERIFY THAT ALL REQUIRED MECHANICAL OPENINGS SHOWN ON THE DRAWINGS AND/OR REQUIRED BY THE SPECIFICATIONS ARE PROVIDED IN PRECAST BUILDING ELEMENTS AT THE SHOP DRAWING STAGE. REVIEW PRECAST SHOP DRAWING TO VERIFY.

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RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

DRAWING
LEVEL 1 HVAC PLAN

PROJECT NO. 22-000-176
PROJECT DATE Issue Date
DRAWN BY D.C.
CHECKED BY R.R.
SCALE 1/8" = 1'-0"

LICENSED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M101
REV. 3

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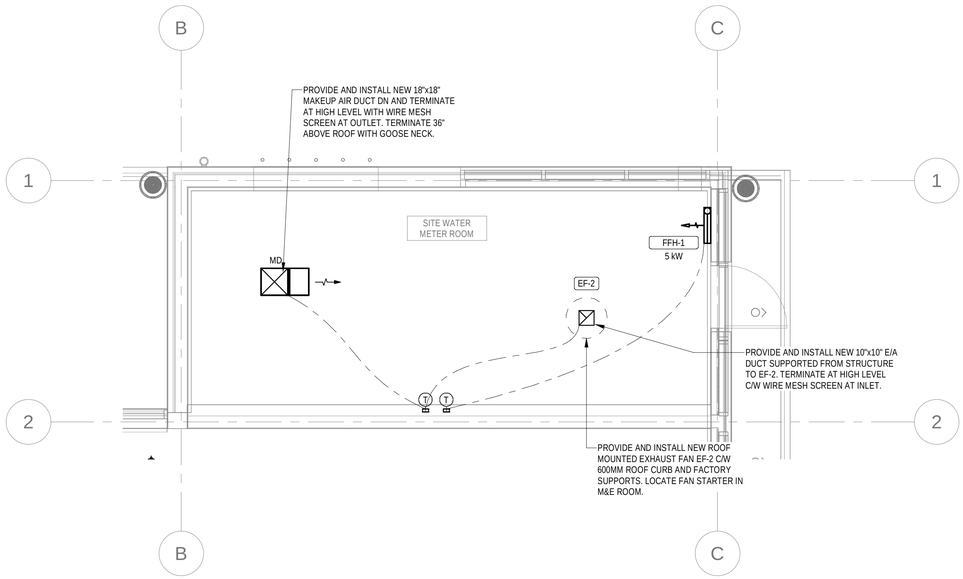
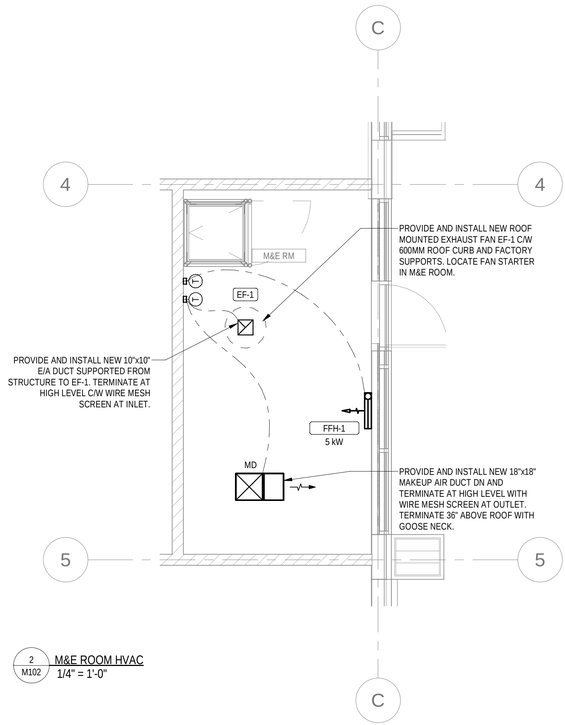


1 M102 SITE WATER METER ROOM HVAC
1/4" = 1'-0"



2 M102 M&E ROOM HVAC
1/4" = 1'-0"

HVAC SHEET NOTES

1. INSTALL HVAC SYSTEMS AS HIGH AS POSSIBLE. COORDINATE INSTALLATION WITH STRUCTURE, ARCHITECTURE, ELECTRICAL AND OTHER MECHANICAL SERVICES PRIOR TO BEGINNING INSTALLATION. INSTALL ALL DUCTWORK IN STRAIGHT RUNS PARALLEL OR PERPENDICULAR TO BUILDING LINES UNLESS NOTED OTHERWISE.
2. UNDER NO CIRCUMSTANCES INSTALL ANY OVERHEAD DUCT OR MECHANICAL EQUIPMENT LOWER THAN 2100MM (6' 10") AFF.
3. LOCATE SENSORS AND THERMOSTATS SUCH THAT THEY ARE ACCESSIBLE, PROTECTED, AND IN AN AREA OF UNOBSTRUCTED AIR CIRCULATION. PROVIDE EACH DEVICE WITH A WIRE IMPACT GUARD ASSEMBLY.
4. PROVIDE THE NECESSARY LOW VOLTAGE WIRING, POWER SUPPLIES TO CONTROLS AND TRANSFORMERS TO SUPPLY POWER TO REMOTE SENSORS AS REQUIRED BY MANUFACTURER.
5. PROVIDE BALANCING DAMPERS COMPLETE WITH MANUAL LOCKING QUADRANT ON ALL RUN-OUTS TO SUPPLY AND EXHAUST GRILLES AND DIFFUSERS AND WHERE INDICATED ON THE PLANS.
6. PROVIDE MIN 2" (50MM) INSULATION FOR ALL SUPPLY DUCTWORK, AND, FOR FIRST 10 FEET OF ALL DUCTWORK CONNECTED TO EXTERIOR OF BUILDING.
7. PROVIDE ACOUSTIC LINING ON SUPPLY AND RETURN AIR DUCTS 3M (10') DOWNSTREAM OF ROOFTOP UNITS, AIR HANDLERS AND FANS, ON DUCTED TRANSFERS BETWEEN ROOMS, ON ALL EXHAUST DUCTS WITHIN 3M (10') OF FANS AND OUTDOOR LOUVERS, AND WHERE INDICATED ON THE PLANS. DUCT SIZES SHOWN ARE NET INSIDE CLEAR DIMENSION AND EXCLUDE INSULATION THICKNESS.
8. INSTALL DAMPERS AND ACCESSORIES TO BE READILY ACCESSIBLE; PROVIDE ACCESS PANELS TO SUIT FINISH OF WALL OR CEILING WHERE REQUIRED. ACCESS DOORS IN FIRE RATED ASSEMBLIES SHALL BE ULC LISTED TO MATCH ASSEMBLY RATING.
9. COVER AND PROTECT DUCT OPENINGS, AIR TERMINALS AND EQUIPMENT UNTIL COMMISSIONING. FAILURE TO DO SO WILL RESULT IN THE MECHANICAL CONTRACTOR BEARING THE FULL COST OF CLEANING THE INTERIOR OF THE DUCTWORK SYSTEM(S) PRIOR TO OCCUPANCY.
10. PROVIDE DYNAMIC, TYPE 'B' FIRE DAMPERS AT ALL DUCT PENETRATIONS THROUGH HORIZONTAL AND VERTICAL FIRE SEPARATIONS AS INDICATED ON THE ARCHITECTURAL DRAWINGS, AND WHERE INDICATED ON THE PLANS.
11. MAKE PENETRATIONS THROUGH FLOORS WATERTIGHT IN WASHROOMS, JANITOR'S CLOSETS, MECHANICAL ROOMS, AND THROUGH CEILINGS OF ELECTRICAL ROOMS.
12. COORDINATE WITH THE GENERAL CONTRACTOR TO VERIFY THAT ALL REQUIRED MECHANICAL OPENINGS SHOWN ON THE DRAWINGS AND/OR REQUIRED BY THE SPECIFICATIONS ARE PROVIDED IN PRECAST BUILDING ELEMENTS AT THE SHOP DRAWING STAGE. REVIEW PRECAST SHOP DRAWING TO VERIFY.

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#	DATE	DESCRIPTION	BY
3	2023-07-14	ISSUED FOR TENDER AND PERMIT	DJ
2	2023-06-16	ISSUED FOR PERMIT	DJ
1	2023-04-12	ISSUED FOR COORDINATION	DJ

RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

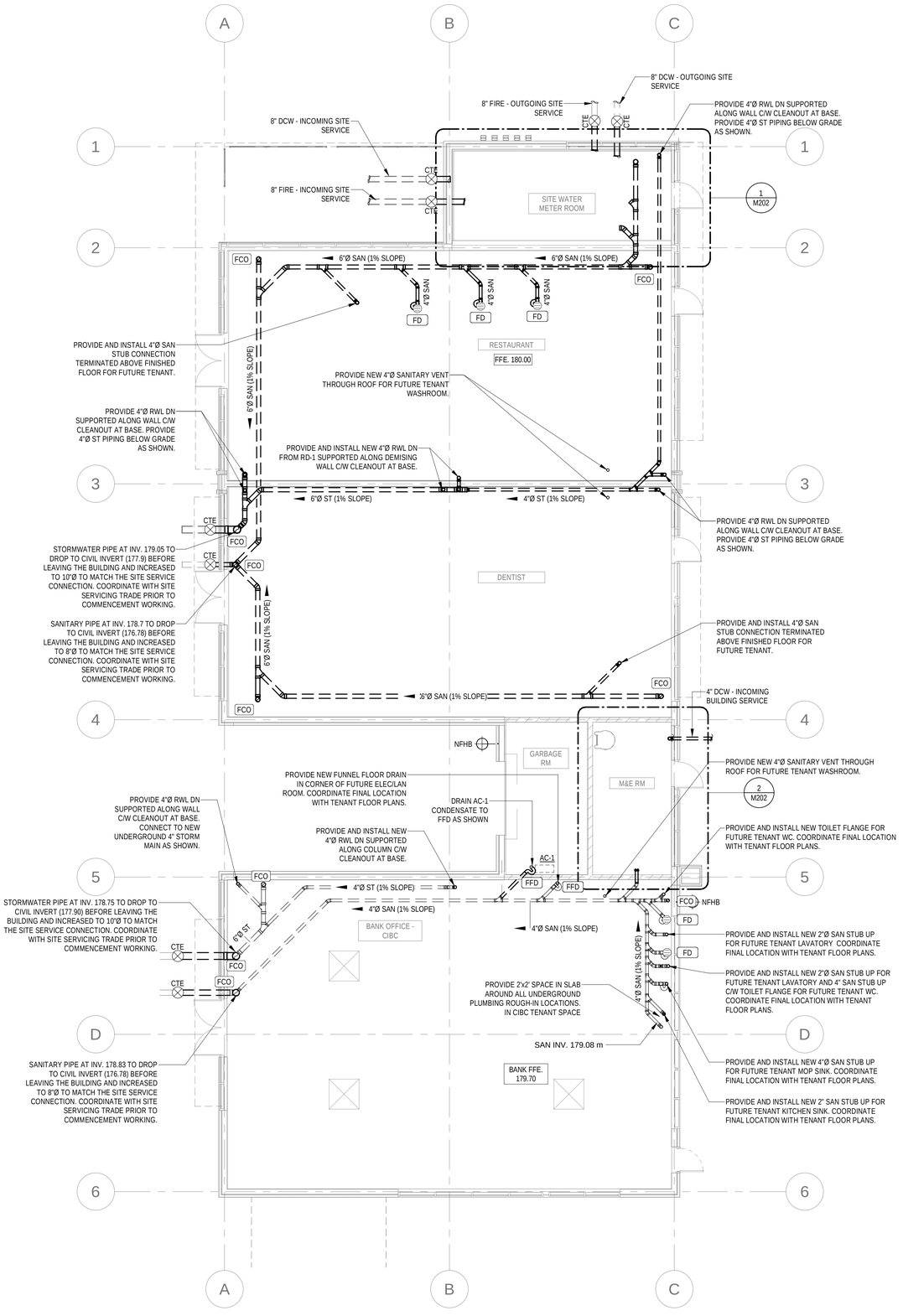
DRAWING
SITE WATER METER ROOM & UTILITY ROOM ENLARGED VIEW - HVAC

PROJECT NO.	22-000-176
PROJECT DATE	Issue Date
DRAWN BY	Author
CHECKED BY	Checker
SCALE	1/4" = 1'-0"

LICENCED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M102
REV. 3

7/13/2023 2:02:21 PM



1 M200 UNDERFLOOR PLUMBING PLAN
1/8" = 1'-0"

PLUMBING SHEET NOTES

1. PROVIDE ALL VENTING OF SYSTEMS TO MEET OBC PART 7 REQUIREMENTS, WHETHER SHOWN OR NOT.
2. ALL TRAP MUST BE PRIMED IN ACCORDANCE WITH OBC PART 7.
3. INSTALL PLUMBING SYSTEMS AS HIGH AS POSSIBLE. COORDINATE INSTALLATION WITH STRUCTURE, ARCHITECTURE, ELECTRICAL AND OTHER MECHANICAL SERVICES PRIOR TO BEGINNING INSTALLATION. INSTALL ALL PIPING ANIN STRAIGHT RUNS PARALLEL OR PERPENDICULAR TO BUILDING LINES UNLESS NOTED OTHERWISE.
4. UNDER NO CIRCUMSTANCES INSTALL ANY OVERHEAD PIPE, HANGER OR MECHANICAL EQUIPMENT LOWER THAN 2100MM (6' 10") AFF.
5. PROVIDE ALL REQUIRED CLEANOUTS IN DRAINAGE SYSTEMS IN ACCORDANCE WITH OBC PART 7, INCLUDING EVERY 6M (20') FOR SINK DRAIN LINES, EVERY 15M (50') FOR PIPE 100ø AND SMALLER, AND EVERY 30M (100') FOR LARGER PIPE HORIZONTALLY, AND AT EVERY CHANGE IN DIRECTION OF 135 DEGREES, WHETHER SHOWN OR NOT. CLEANOUTS INSTALLED WITHIN VERTICAL LEADERS SHALL BE COORDINATED WITH THE ARCHITECTURAL DRAWINGS TO ENSURE THE CLEANOUT IS ON THE CORRECT SIDE OF ANY ENCLOSURES. PROVIDE ACCESS PANELS TO ACCESS ALL CLEANOUTS BEHIND ARCHITECTURAL ENCLOSURES.
6. CLEANOUTS INSTALLED WITHIN VERTICAL LEADERS SHALL BE COORDINATED WITH THE ARCHITECTURAL DRAWINGS TO ENSURE THE CLEANOUT IS ON THE CORRECT SIDE OF ANY ENCLOSURES. PROVIDE ACCESS PANELS TO ACCESS ALL CLEANOUTS BEHIND ARCHITECTURAL ENCLOSURES. CLEANOUTS IN VERTICAL STACKS SERVING CIBC TENANT SPACE TO BE 16" AFF.
7. REFER TO ARCHITECTURAL DRAWINGS FOR THE EXACT LOCATION OF ALL PLUMBING FIXTURES. COORDINATE FIXTURE ROUGH-IN DIMENSIONS WITH ARCHITECTURAL DRAWINGS AND PLUMBING FIXTURE SHOP DRAWINGS.
8. UNLESS NOTED OTHERWISE, SLOPE DRAINAGE PIPES 75MM (3") AND SMALLER AT MIN. 2%; HORIZONTAL OFFSETS LESS THAN 6M (20') CONNECTING ROOF DRAINS TO RAIN LEADERS AT MIN. 2%; AND ALL OTHER DRAINAGE PIPES AT MIN. 1%.
9. ALL SANITARY BRANCHES TO BE MINIMUM 100MM (4") UNLESS NOTED OTHERWISE.
10. PROVIDE ISOLATION VALVES WHERE REQUIRED FOR SERVICING, UPSTREAM AND DOWNSTREAM AT ALL EQUIPMENT, AT CONNECTIONS TO RISERS AND WHERE INDICATED ON THE PLANS.
11. MAKE PENETRATIONS THROUGH FLOORS WATERTIGHT IN WASHROOMS, JANITOR'S CLOSETS, MECHANICAL ROOMS, AND THROUGH CEILINGS OF ELECTRICAL ROOMS.
12. INSTALL VALVES AND ACCESSORIES TO BE READILY ACCESSIBLE; PROVIDE ACCESS PANELS TO SUIT FINISH OF WALL OR CEILING WHERE REQUIRED. ACCESS DOORS IN FIRE RATED ASSEMBLIES SHALL BE ULC LISTED TO MATCH ASSEMBLY RATING.
13. ALL PIPING THAT PENETRATES AN ARCHITECTURAL FIRE SEPARATION IS TO BE FULLY FIRE STOPPED WITH UL-LISTED FIRE STOP ASSEMBLIES COMPLYING FULLY WITH SPECIFICATION AND AHJ REQUIREMENTS.
14. COORDINATE WITH THE GENERAL CONTRACTOR TO VERIFY THAT ALL REQUIRED MECHANICAL OPENINGS SHOWN ON THE DRAWINGS AND/OR REQUIRED BY THE SPECIFICATIONS ARE PROVIDED IN PRECAST BUILDING ELEMENTS AT THE SHOP DRAWING STAGE. REVIEW PRECAST SHOP DRAWING TO VERIFY.

HAMMERSCHLAG & JOFFE INC.
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RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

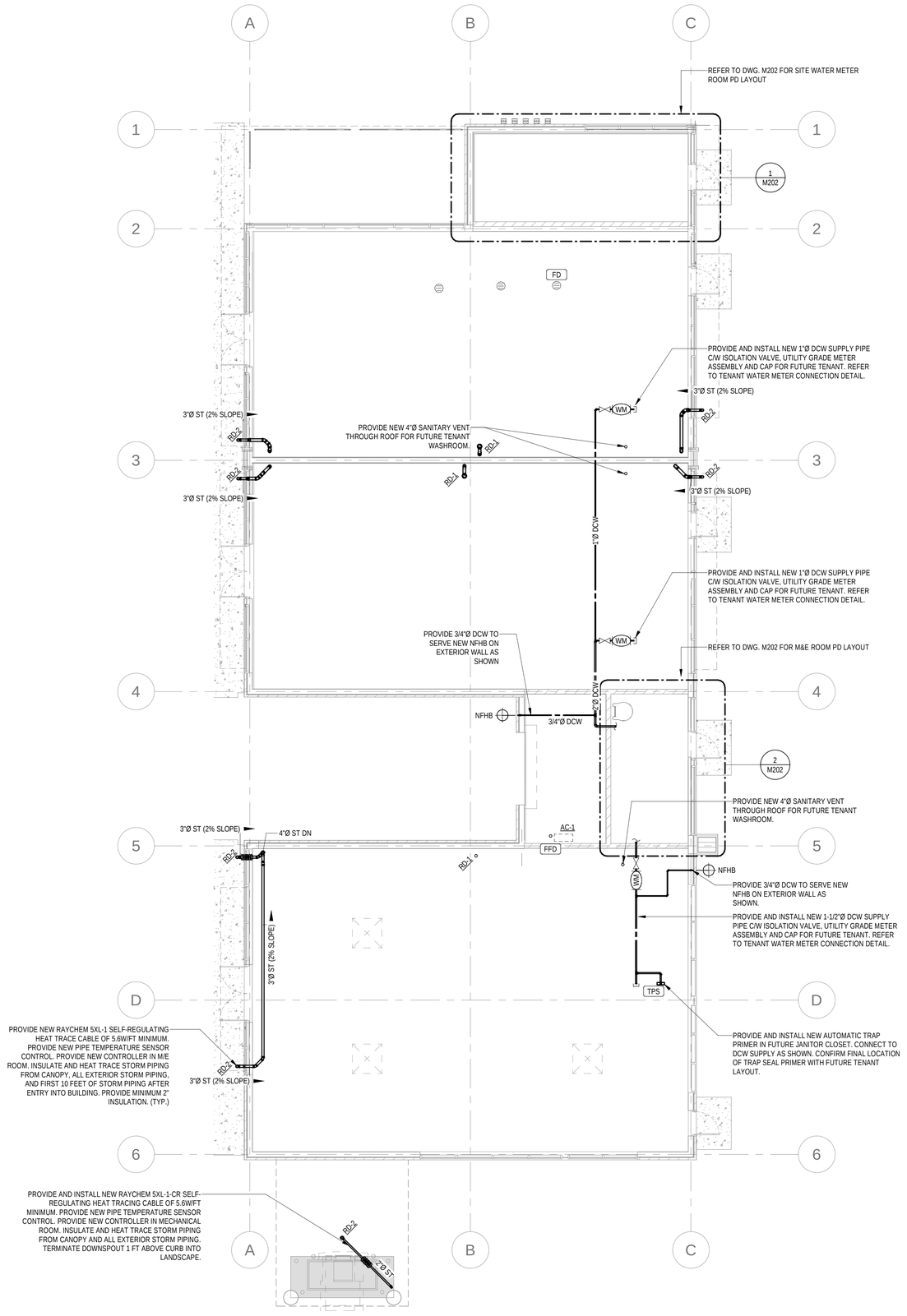
DRAWING
UNDERFLOOR PLUMBING PLAN

PROJECT NO. 22-000-176
PROJECT DATE Issue Date
DRAWN BY D.C.
CHECKED BY R.R.
SCALE 1/8" = 1'-0"

LICENCED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M200
REV. 3

7/13/2023 2:02:23 PM



1 M201 LEVEL 1 PLUMBING PLAN
1/8" = 1'-0"

PLUMBING SHEET NOTES

1. PROVIDE ALL VENTING OF SYSTEMS TO MEET OBC PART 7 REQUIREMENTS, WHETHER SHOWN OR NOT.
2. ALL TRAP MUST BE PRIMED IN ACCORDANCE WITH OBC PART 7.
3. INSTALL PLUMBING SYSTEMS AS HIGH AS POSSIBLE. COORDINATE INSTALLATION WITH STRUCTURE, ARCHITECTURE, ELECTRICAL AND OTHER MECHANICAL SERVICES PRIOR TO BEGINNING INSTALLATION. INSTALL ALL PIPING ANIN STRAIGHT RUNS PARALLEL OR PERPENDICULAR TO BUILDING LINES UNLESS NOTED OTHERWISE.
4. UNDER NO CIRCUMSTANCES INSTALL ANY OVERHEAD PIPE, HANGER OR MECHANICAL EQUIPMENT LOWER THAN 2100MM (6' 10") AFF.
5. PROVIDE ALL REQUIRED CLEANOUTS IN DRAINAGE SYSTEMS IN ACCORDANCE WITH OBC PART 7, INCLUDING EVERY 6M (20') FOR SINK DRAIN LINES, EVERY 15M (50') FOR PIPE 100ø AND SMALLER, AND EVERY 30M (100') FOR LARGER PIPE HORIZONTALLY, AND AT EVERY CHANGE IN DIRECTION OF 135 DEGREES, WHETHER SHOWN OR NOT. CLEANOUTS INSTALLED WITHIN VERTICAL LEADERS SHALL BE COORDINATED WITH THE ARCHITECTURAL DRAWINGS TO ENSURE THE CLEANOUT IS ON THE CORRECT SIDE OF ANY ENCLOSURES. PROVIDE ACCESS PANELS TO ACCESS ALL CLEANOUTS BEHIND ARCHITECTURAL ENCLOSURES.
6. CLEANOUTS INSTALLED WITHIN VERTICAL LEADERS SHALL BE COORDINATED WITH THE ARCHITECTURAL DRAWINGS TO ENSURE THE CLEANOUT IS ON THE CORRECT SIDE OF ANY ENCLOSURES. PROVIDE ACCESS PANELS TO ACCESS ALL CLEANOUTS BEHIND ARCHITECTURAL ENCLOSURES. CLEANOUTS IN VERTICAL STACKS SERVING CIBC TENANT SPACE TO BE 16" AFF.
7. REFER TO ARCHITECTURAL DRAWINGS FOR THE EXACT LOCATION OF ALL PLUMBING FIXTURES. COORDINATE FIXTURE ROUGH-IN DIMENSIONS WITH ARCHITECTURAL DRAWINGS AND PLUMBING FIXTURE SHOP DRAWINGS.
8. UNLESS NOTED OTHERWISE, SLOPE DRAINAGE PIPES 75MM (3") AND SMALLER AT MIN. 2%; HORIZONTAL OFFSETS LESS THAN 6M (20') CONNECTING ROOF DRAINS TO RAIN LEADERS AT MIN. 2%; AND ALL OTHER DRAINAGE PIPES AT MIN. 1%.
9. ALL SANITARY BRANCHES TO BE MINIMUM 100MM (4") UNLESS NOTED OTHERWISE.
10. PROVIDE ISOLATION VALVES WHERE REQUIRED FOR SERVICING, UPSTREAM AND DOWNSTREAM AT ALL EQUIPMENT, AT CONNECTIONS TO RISERS AND WHERE INDICATED ON THE PLANS.
11. MAKE PENETRATIONS THROUGH FLOORS WATERTIGHT IN WASHROOMS, JANITOR'S CLOSETS, MECHANICAL ROOMS, AND THROUGH CEILINGS OF ELECTRICAL ROOMS.
12. INSTALL VALVES AND ACCESSORIES TO BE READILY ACCESSIBLE; PROVIDE ACCESS PANELS TO SUIT FINISH OF WALL OR CEILING WHERE REQUIRED. ACCESS DOORS IN FIRE RATED ASSEMBLIES SHALL BE ULC LISTED TO MATCH ASSEMBLY RATING.
13. ALL PIPING THAT PENETRATES AN ARCHITECTURAL FIRE SEPARATION IS TO BE FULLY FIRE STOPPED WITH UL-LISTED FIRE STOP ASSEMBLIES COMPLYING FULLY WITH SPECIFICATION AND AHJ REQUIREMENTS.
14. COORDINATE WITH THE GENERAL CONTRACTOR TO VERIFY THAT ALL REQUIRED MECHANICAL OPENINGS SHOWN ON THE DRAWINGS AND/OR REQUIRED BY THE SPECIFICATIONS ARE PROVIDED IN PRECAST BUILDING ELEMENTS AT THE SHOP DRAWING STAGE. REVIEW PRECAST SHOP DRAWING TO VERIFY.

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RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

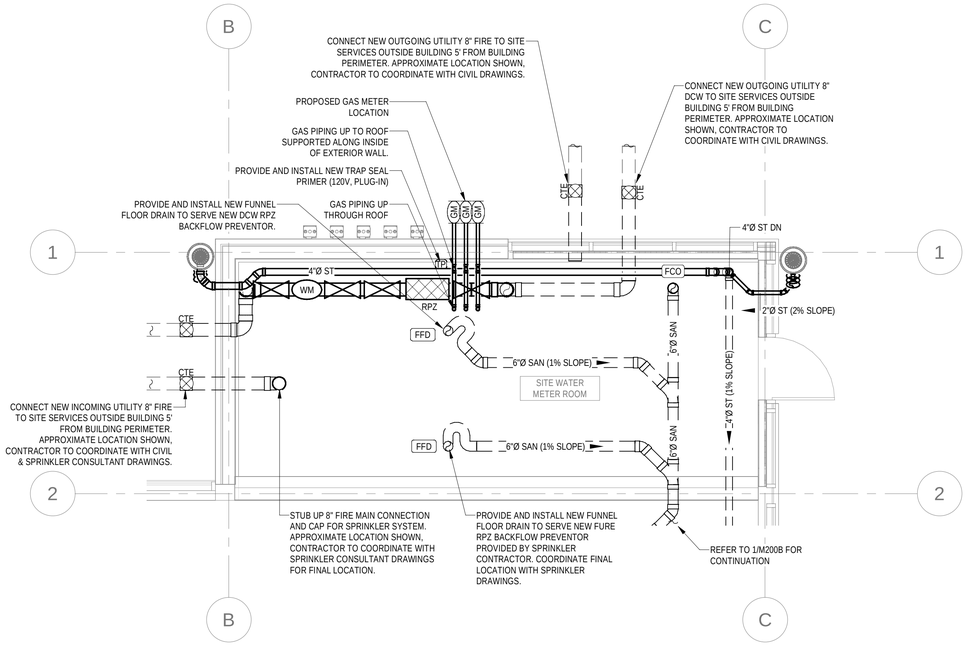
DRAWING
LEVEL 1 PLUMBING PLAN

PROJECT NO.	22-000-176
PROJECT DATE	Issue Date
DRAWN BY	D.C.
CHECKED BY	R.R.
SCALE	1/8" = 1'-0"

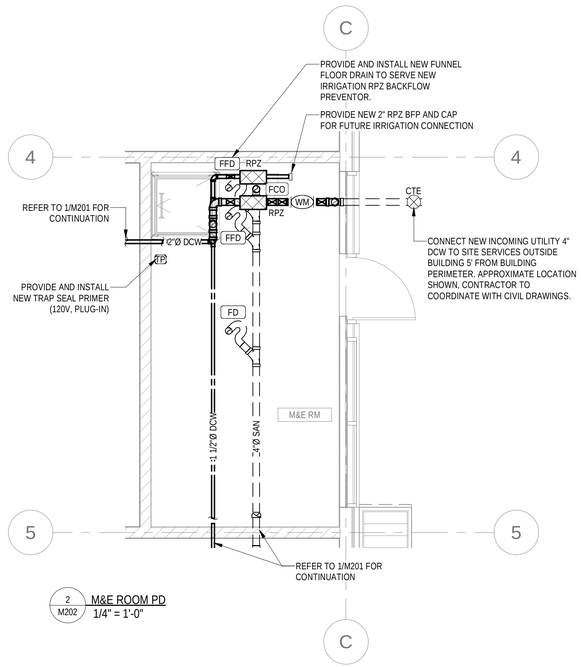
LICENSED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M201
REV. 3

7/13/2023 2:02:25 PM



1 M202 SITE WATER METER ROOM PD
1/4" = 1'-0"



2 M202 M&E ROOM PD
1/4" = 1'-0"

PLUMBING SHEET NOTES

1. PROVIDE ALL VENTING OF SYSTEMS TO MEET OBC PART 7 REQUIREMENTS, WHETHER SHOWN OR NOT.
2. ALL TRAP MUST BE PRIMED IN ACCORDANCE WITH OBC PART 7.
3. INSTALL PLUMBING SYSTEMS AS HIGH AS POSSIBLE. COORDINATE INSTALLATION WITH STRUCTURE, ARCHITECTURE, ELECTRICAL AND OTHER MECHANICAL SERVICES PRIOR TO BEGINNING INSTALLATION. INSTALL ALL PIPING ANIN STRAIGHT RUNS PARALLEL OR PERPENDICULAR TO BUILDING LINES UNLESS NOTED OTHERWISE.
4. UNDER NO CIRCUMSTANCES INSTALL ANY OVERHEAD PIPE, HANGER OR MECHANICAL EQUIPMENT LOWER THAN 2100MM (6' 10") AFF.
5. PROVIDE ALL REQUIRED CLEANOUTS IN DRAINAGE SYSTEMS IN ACCORDANCE WITH OBC PART 7, INCLUDING EVERY 6M (20') FOR SINK DRAIN LINES, EVERY 15M (50') FOR PIPE 100ø AND SMALLER, AND EVERY 30M (100') FOR LARGER PIPE HORIZONTALLY, AND AT EVERY CHANGE IN DIRECTION OF 135 DEGREES, WHETHER SHOWN OR NOT. CLEANOUTS INSTALLED WITHIN VERTICAL LEADERS SHALL BE COORDINATED WITH THE ARCHITECTURAL DRAWINGS TO ENSURE THE CLEANOUT IS ON THE CORRECT SIDE OF ANY ENCLOSURES. PROVIDE ACCESS PANELS TO ACCESS ALL CLEANOUTS BEHIND ARCHITECTURAL ENCLOSURES.
6. CLEANOUTS INSTALLED WITHIN VERTICAL LEADERS SHALL BE COORDINATED WITH THE ARCHITECTURAL DRAWINGS TO ENSURE THE CLEANOUT IS ON THE CORRECT SIDE OF ANY ENCLOSURES. PROVIDE ACCESS PANELS TO ACCESS ALL CLEANOUTS BEHIND ARCHITECTURAL ENCLOSURES.
7. UNLESS NOTED OTHERWISE, SLOPE DRAINAGE PIPES 75MM (3") AND SMALLER AT MIN. 2%; HORIZONTAL OFFSETS LESS THAN 6M (20') CONNECTING ROOF DRAINS TO RAIN LEADERS AT MIN. 2%; AND ALL OTHER DRAINAGE PIPES AT MIN. 1%.
8. ALL SANITARY BRANCHES TO BE MINIMUM 100MM (4") UNLESS NOTED OTHERWISE.
9. PROVIDE ISOLATION VALVES WHERE REQUIRED FOR SERVICING, UPSTREAM AND DOWNSTREAM AT ALL EQUIPMENT, AT CONNECTIONS TO RISERS AND WHERE INDICATED ON THE PLANS.
10. MAKE PENETRATIONS THROUGH FLOORS WATERTIGHT IN WASHROOMS, JANITOR'S CLOSETS, MECHANICAL ROOMS, AND THROUGH CEILINGS OF ELECTRICAL ROOMS.
11. INSTALL VALVES AND ACCESSORIES TO BE READILY ACCESSIBLE; PROVIDE ACCESS PANELS TO SUIT FINISH OF WALL OR CEILING WHERE REQUIRED. ACCESS DOORS IN FIRE RATED ASSEMBLIES SHALL BE ULC LISTED TO MATCH ASSEMBLY RATING.
12. ALL PIPING THAT PENETRATES AN ARCHITECTURAL FIRE SEPARATION IS TO BE FULLY FIRE STOPPED WITH UL-LISTED FIRE STOP ASSEMBLIES COMPLYING FULLY WITH SPECIFICATION AND AHJ REQUIREMENTS.
13. COORDINATE WITH THE GENERAL CONTRACTOR TO VERIFY THAT ALL REQUIRED MECHANICAL OPENINGS SHOWN ON THE DRAWINGS AND/OR REQUIRED BY THE SPECIFICATIONS ARE PROVIDED IN PRECAST BUILDING ELEMENTS AT THE SHOP DRAWING STAGE. REVIEW PRECAST SHOP DRAWING TO VERIFY.

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RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

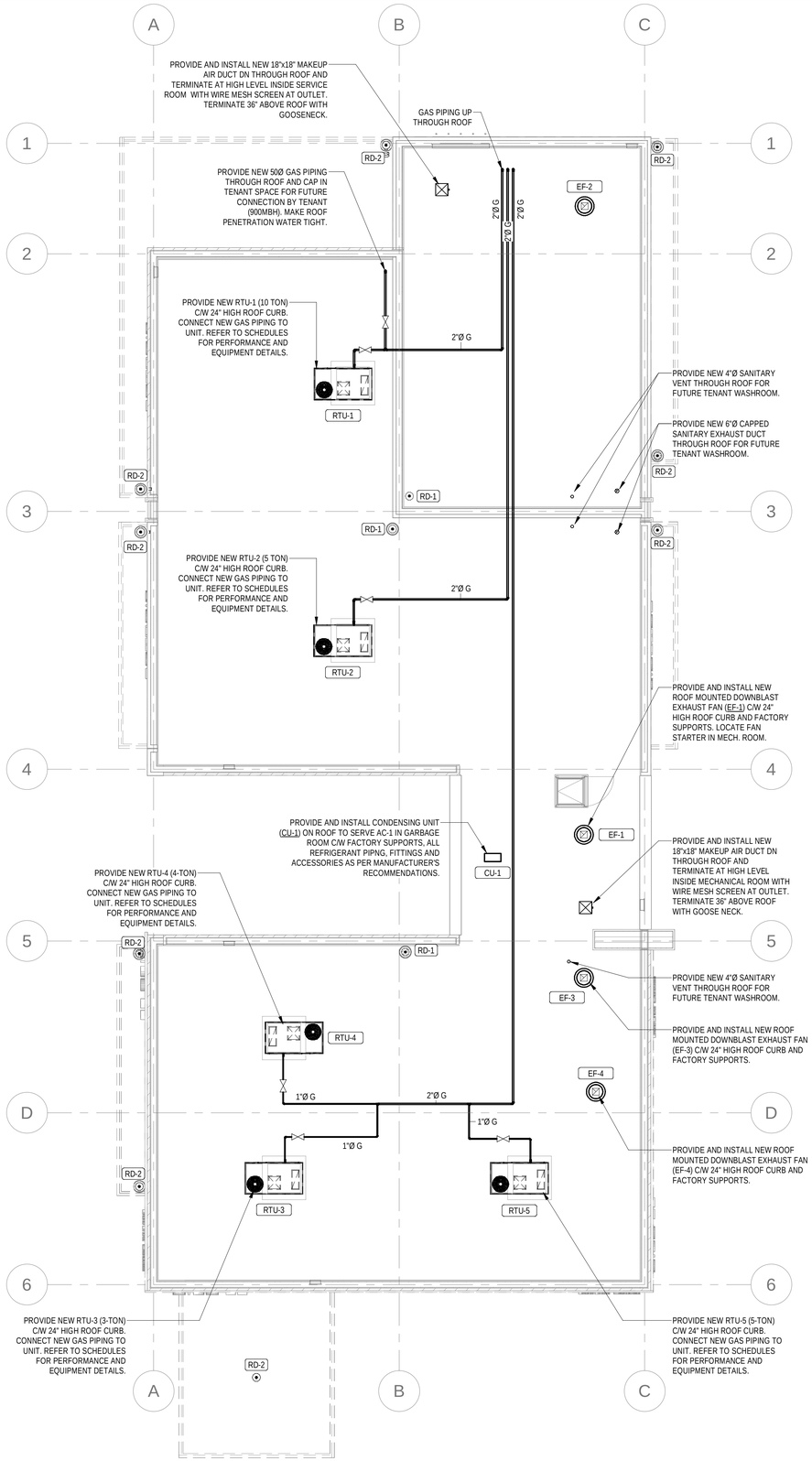
DRAWING
SITE WATER METER ROOM & UTILITY ROOM ENLARGED VIEW - PD

PROJECT NO.	22-000-176
PROJECT DATE	Issue Date
DRAWN BY	Author
CHECKED BY	Checker
SCALE	As indicated

LICENSED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M202
REV. 3

7/13/2023 2:02:26 PM



1 / M203 ROOF PLUMBING PLAN
1/8" = 1'-0"

ROOF SHEET NOTES

1. PROVIDE GAS SYSTEM ISOLATION VALVES WHERE REQUIRED FOR SERVICING, AT EACH PIECE OF EQUIPMENT, AND WHERE INDICATED ON THE PLANS.
2. LOCATE EACH GAS PRV MIN 10' (3M) FROM ANY AIR INTAKE, INCLUDING THE INTAKE ON THE RTU THE PRV SERVES.
3. LOCATE EVERY PLUMBING VENT THROUGH ROOF MIN 10' (3M) FROM OCCUPIED ROOF AREAS, OPENINGS AND FRESH AIR INTAKES.
4. INSTALL ALL VALVES AND ACCESSORIES TO BE READILY ACCESSIBLE.
5. ALL PIPING THAT PENETRATES AN ARCHITECTURAL FIRE SEPARATION IS TO BE FULLY FIRE STOPPED WITH UL-LISTED FIRE STOP ASSEMBLIES COMPLYING FULLY WITH SPECIFICATION AND AHJ REQUIREMENTS.

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RIOCAN

PROJECT
WINDFIELDS FARMS - BLOCK C2, PROPOSED BUILDING C5
WINCHESTER ROAD & SIMCOE STREET, OSHAWA, ONTARIO

DRAWING
ROOF PLAN

PROJECT NO.	22-000-176
PROJECT DATE	Issue Date
DRAWN BY	D.C.
CHECKED BY	R.R.
SCALE	1/8" = 1'-0"

LICENCED PROFESSIONAL ENGINEER
D.S.JOFFE
100125836
2023-07-14
PROVINCE OF ONTARIO

DRAWING NO. M203
REV. 3

7/13/2023 2:02:28 PM