GENERAL REQUIREMENTS

IT IS UNDERSTOOD THAT THESE PLANS ARE INTENDED AS A GUIDE AND THAT THE CONTRACTOR SHALL TAKE ALL NECESSARY STEPS TO DO A COMPLETE JOB. ANY WORK NOT SPECIFICALLY MENTIONED, BUT IMPLICITLY UNDERSTOOD OR REQUIRED, SHALL BE CARRIED OUT AND PROVIDED AS AN INTEGRAL PART OF THE JOB. NO SUPPLEMENT WILL BE CONSIDERED UNLESS THERE IS A MAJOR CHANGE IN SCOPE OF WORK.

HVAC AND PLUMBING TRADE GENERAL WORK LISTED HERE NOT LIMITED TO THE FOLLOWING:

HVAC CONTRACTOR SHALL PROVIDE THE FOLLOWING:
PROVIDE MEANS SUPPLY & INSTALL UNLESS SPECIFICALLY NOTED OTHERWISE.

PROVIDE:

1. MECHANICAL HVAC COORDINATION AND INTERFERENCE DRAWING.
2. SUPPORTS FOR ROOFTOP DUCTWORK, EQUIPMENT AND RELATED REFRIGERATION PIPING.
3. ALL NECESSARY SLEEVES FOR DUCTWORK, EQUIPMENT AND RELATED REFRIGERATION PIPING. ALL NECESSARY CO-ORDINATION, SIZING AND LAYOUT FOR LARGE OPENINGS FOR DUCTWORK, EQUIPMENT AND RELATED REFRIGERATION PIPING REQUIRED TO PENETRATE THROUGH NEW REINFORCED CONCRETE WALLS AND SLABS.
4. MECHANICAL HVAC COMMISSIONING, AS-BUILT DRAWINGS AND OPERATION AND MAINTENANCE DRAWINGS AND MANUALS AS SPECIFIED BY COMMISSIONING CONSULTANT.
5. COMPLY WITH CODES AS SPECIFIED.
6. HANGERS AND SUPPORTS FOR DUCTWORK SYSTEMS.
7. BEYOND THE SPECIFIED CONTRACT FULL WARRANTY (CCA), THE EXTENDED WARRANTY(IES) ARE LIMITED TO THE TERMS OF THE MANUFACTURERS WARRANTY(IES).
8. FOR TRADE CLEAN UP SEE OTTAWA CONSTRUCTION ASSOCIATION (OCA) RECOMMENDED DAY TO DAY CLEAN UP STANDARD OF PRACTICE.
9. HOISTING FOR MECHANICAL HVAC MATERIALS AND EQUIPMENT.
10. SCAFFOLDING AND ACCESS EQUIPMENT AS REQUIRED FOR MECHANICAL HVAC WORK.
11. DESIGN, SUPPLY AND INSTALLATION OF VIBRATION ISOLATION AND SEISMIC RESTRAINT FOR MECHANICAL HVAC SYSTEMS.
12. MECHANICAL HVAC IDENTIFICATION.
13. TESTING, ADJUSTING AND AIR BALANCING (TAB) OF MECHANICAL HVAC SYSTEM.
14. ALL STEEL BASES AND STEEL SUPPORTS FOR MECHANICAL HVAC EQUIPMENT WHEN SPECIFIED OR DETAILED ONLY ON MECHANICAL HVAC DRAWINGS AND SPECIFICATIONS.
15. SUPPLY ACCESS DOOR(S) WHEN REQUIRED BY MECHANICAL HVAC.
16. FIRE-STOPPING FOR MECHANICAL HVAC SYSTEMS.
17. MECHANICAL HVAC PERMITS AND INSPECTION FEES.
18. MECHANICAL HVAC CONNECTIONS TO SPECIALTY EQUIPMENT WHICH IS SUPPLIED AND INSTALLED BY OTHERS.
19. SHEET METAL AND NON-METALLIC AIR HANDLING DUCTWORK, SHEET METAL PLENUMS AND CASINGS INCLUDING HANGERS AND SUPPORTS EXCEPT CONCRETE, MASONRY AND DRYWALL CONSTRUCTED SHAFTS, TUNNELS OR PLENUMS.
20. ALL AIR MOVING EQUIPMENT SPECIFIED IN MECHANICAL DRAWINGS AND SPECIFICATIONS.
21. ALL DAMPERS EXCEPT WHERE SUPPLIED BY OTHERS.
22. ACOUSTIC DUCTWORK LINING.
23. WEATHER LOUVERS COMPLETE WITH BIRD SCREEN AND BLANK-OFF PANELS, PENTHOUSES AND VENTS WHERE SPECIFIED IN MECHANICAL DRAWINGS AND SPECIFICATIONS.
24. GRAVITY RELIEF VENTS AND INTAKES AND ROOF HOODS WHEN SPECIFIED OR DETAILED ON MECHANICAL DRAWINGS AND SPECIFICATIONS.
25. TERMINAL BOXES AND AIR VALVES INCLUDING COILS.
26. ALL HVAC RELATED FILTERS.
27. REGISTERS, GRILLES, DIFFUSERS.
28. SUPPLY AND/OR INSTALLATION OF DOOR GRILLES WHERE SPECIFIED.
29. COUNTER FLASHING FOR HVAC EQUIPMENT.
30. UNIT HEATER GAS FIRED.
31. PACKAGED AND SELF-CONTAINED HEATING AND COOLING AIR CONDITIONING UNITS.
32. FANS DUCTED OR NON-DUCTED C/W GUARDS AND CONTROLLERS IF SPECIFIED HVAC.
33. MECHANICAL HVAC INSULATION.
34. ALL SUPPLIED EQUIPMENTS TO COMPLY WITH ASHRAE 90.1.

PLUMBING CONTRACTOR SHALL PROVIDE THE FOLLOWING:
PROVIDE MEANS SUPPLY & INSTALL UNLESS SPECIFICALLY NOTED OTHERWISE.

PROVIDE:

1. MECHANICAL PLUMBING COORDINATION AND INTERFERENCE DRAWING.
2. SUPPORTS FOR ROOF TOP PLUMBING.
3. ALL NECESSARY SLEEVES FOR PLUMBING.
4. MECHANICAL PLUMBING COMMISSIONING, AS BUILT DRAWINGS AND OPERATION AND MAINTENANCE DRAWINGS AS SPECIFIED.
5. COMPLY WITH CODES AS SPECIFIED.
6. HANGERS AND SUPPORTS FOR PLUMBING.
7. THE MECHANICAL PLUMBING CONTRACTOR SHALL INCLUDE CONTINGENCY FUNDS AND CASH ALLOWANCES SPECIFICALLY CALLED FOR IN THE MECHANICAL TENDER DOCUMENTS.
8. BEYOND THE SPECIFIED CONTRACT FULL WARRANTY (CCA), THE EXTENDED WARRANTY (IES) ARE LIMITED TO THE TERMS OF THE MANUFACTURERS' WARRANTY(IES).
9. FOR TRADE CLEAN UP SEE OTTAWA CONSTRUCTION ASSOCIATION (OCA) RECOMMENDED DAY TO DAY CLEAN UP STANDARD OF PRACTICE.PROTECTION OF OTHER TRADES' WORK FROM DAMAGE BY THIS TRADE.
10. HOISTING FOR MECHANICAL PLUMBING MATERIALS AND EQUIPMENT.
11. ARRANGE INSPECTION FOR PLUMBING WORK.
12. X-RAYS OF WELDED JOINTS WHEN REQUIRED BY CODE OR SPECIFIED.
13. EQUIPMENT AS REQUIRED FOR MECHANICAL PLUMBING WORK.
14. DESIGN, SUPPLY AND INSTALLATION OF VIBRATION ISOLATION AND SEISMIC RESTRAINT FOR MECHANICAL SYSTEMS.
15. IDENTIFICATION.
16. ALL STEEL BASES AND STEEL SUPPORTS FOR MECHANICAL PLUMBING EQUIPMENT WHEN SPECIFIED OR DETAILED ONLY ON MECHANICAL.
17. SUPPLY ACCESS DOOR(S) WHEN REQUIRED BY MECHANICAL PLUMBING.
18. FIRE-STOPPING FOR MECHANICAL PLUMBING SYSTEMS.
19. MECHANICAL PLUMBING PERMITS AND INSPECTION FEES WHEN AND WHERE REQUIRED.
20. MECHANICAL PLUMBING CONNECTIONS TO SPECIALTY EQUIPMENT WHICH IS SUPPLIED AND INSTALLED BY OTHERS.
21. CATCH BASIN AND COVERS, TRENCH GRATINGS WHEN SPECIFIED OR DETAILED ON MECHANICAL PLUMBING DRAWINGS WITHIN THE BUILDING WHERE APPLICABLE.
22. PREFAB SHOWER CABINETS OR SURROUNDS COMPLETE WITH MANUFACTURED BASES.
23. ALL PLUMBING SYSTEMS.
24. NATURAL GAS PIPING SYSTEMS TO COMPLETE THE SYSTEM BEYOND THE GAS METER.
25. ALL HOT WATER HEATERS.
26. MECHANICAL INSULATION FOR PLUMBING.
34. ALL SUPPLIED EQUIPMENTS TO COMPLY WITH ASHRAE 90.1.

PIPING INSULATION

1. APPLY THE INSULATION WHEN THE REQUIRED HYDROSTATIC TESTS HAVE BEEN COMPLETED.
2. INSULATION SHALL BE APPLIED TO CLEAN DRY PIPES AND DUCTS, ALL JOINTS BUTTED FIRMLY AND LAPPED WITH 4" WIDE STRIP OF APPROVED ADHESIVE BACKED VAPOUR PROOF TAPE.
3. COVER ALL PIPE FITTINGS USING FABRICATED SECTION FROM THE PIPE COVERING.
4. APPLY AN APPROVED VAPOUR BARRIER OVER ALL PIPES HAVING COLD SURFACES AND ENSURE A SUITABLE SEAL.
5. INSULATION JACKET OR ADHESIVES NOT TO HAVE A FLAME SPREAD RATING OVER 25, SMOKE DEVELOPED, AND FUEL CONTRIBUTED RATING NOT OVER 50, IN ACCORDANCE WITH ULC STANDARDS AND THE ONTARIO FIRE MARSHALL.
6. WORK SHALL BE PERFORMED BY LICENSED JOURNEY-MAN.
7. INSULATE ALL DOMESTIC COLD AND HOT AND RETURN PIPES WITH 1" (25MM) FIBREGLASS PIPE INSULATION. INSULATE RAIN WATER LEADER PIPES WITH 1" (25MM) PREFORMED FIBREGLASS INSULATION WITH VAPOUR BARRIER WITH 4" STRIPS INSULATION BOUNDING ADHESIVE AT 8" O.C.

DUCTWORK INSULATION

1. INSULATION ON SUPPLY DUCT FROM RTU, INSIDE THE VERTICAL SHAFT AND THE MAIN HORIZONTAL RUN, SHALL BE 1.5" THICK VAPOUR BARRIER TYPE. INSULATION IS SHOWN BY DASHED-LINE.
2. EXHAUST DUCT INSULATION SHALL BE 1.5" THICK. USE RIGID BLANKET INSULATION ON CONCEALED DUCTS. USE VENTURE-CLAD ON EXPOSED DUCTS.

NATURAL GAS DISTRIBUTION SYSTEM

1. MECHANICAL CONTRACTOR SHALL ARRANGE FOR AND PAY ALL COSTS INVOLVED REGARDING THE INSTALLATION OF THE NATURAL GAS SERVICE.
2. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE TO CGA-149.1 - LATEST EDITION OF THE INSTALLATION CODE FOR NATURAL GAS BURNING APPLIANCES AND EQUIPMENT AND THE ONTARIO REGULATION 862-LATEST EDITION OF ENERGY ACT.
3. ALL PIPING SHALL BE SCHEDULE 40 STEEL, WITH SCREWED JOINTS OR WELDED JOINTS AS PERMITTED BY THE APPLICABLE CODES. ALL PIPING TO BE PAINTED BY THIS MECHANICAL CONTRACTOR. MINIMUM TWO COATS OF ALKYD YELLOW PAINT.
4. VALVES: CODE APPROVED

FIRE PROTECTION

FIRE EXTINGUISHERS (FE).
1. TYPE FE: MULTI-PURPOSE DRY CHEMICAL EXTINGUISHER, STORED PRESSURE, RECHARGEABLE TYPE WITH HOSE AND SHUT-OFF NOZZLE, ULC LABELED FOR A, B, AND C CLASS PROTECTION. SIZE 4.5 kg (10 lbs). PROVIDE COMPLETE WITH WALL BRACKET AND MAINTENANCE TAGS.
2. RECESSED BOX C/W GLASS DOOR.
3. STANDARD OF ACCEPTANCE: WILSON & COUSINS OR CANADIAN FIRE HOSE CORPORATION.
4. PROVIDE SIGNS AND MARKERS.

GENERAL NOTES FOR PLUMBING:

1. CONTRACTOR TO PROVIDE FIRE STOP AT ALL PENETRATION IN FIRE RATED WALLS, CEILINGS AND FLOORS. PROVIDE FIRE STOP SHOP DRAWING TO GC AND THE CITY.
2. SEISMIC RESTRAINT REQUIRED FOR ALL MECHANICAL EQUIPMENT AND PIPING.
3. PROVIDE SANITARY, DCW, DHW, DHWR, AND VENT PIPES FOR ALL PLUMBING FIXTURES WHICH ARE SHOWN ON ARCHITECTURAL DRAWINGS.
5. PROVIDE PLUMBING FIXTURES SHOWN ON ARCHITECTURAL PLANS. REFER TO ARCHITECTURAL DRAWINGS FOR INSTALLATION HEIGHTS.
7. PROVIDE SHUT OFF VALVE ON DCW & DHW LINES FOR PLUMBING FIXTURES. PROVIDE TRAP SEAL PRIMER FOR FD, FFD, TD, & HD PER OBC 7.4.5.5.
8. ANY HUB DRAIN (HD) THAT ACCEPTS DISCHARGE FORM HVAC SYSTEM SHALL HAVE INDIRECT CONNECTION PER OBC 7.4.2.1.(1)(d)(vii).
9. SOME STRATEGIC CLEANOUTS ARE SHOWN ON THE PLANS. PROVIDE CLEANOUTS AS PER PART 7 OF OBC.
10. PLACEMENT OF PIPES ON HANGERS OR IN TRENCHES SHALL BE PER PART 7 OF OBC.
11. FOR THE UNDERGROUND PIPING, PROVIDE PRESSURE TEST REPORT TO GC AND THE CITY.

GENERAL NOTES FOR HVAC:

1. INSULATE 6' OF ALL EXHAUST DUCTS FROM EXTERIOR WALL. INSULATION IS SHOWN BY DASHED-LINE.
2. ALL HVAC DUCT PENETRATIONS SHALL HAVE SMOKE TIGHT SEAL. PROVIDE TO MATERIAL DATA SHEET FOR FIRE STOPS TO GC AND THE CITY.
3. INSULATE ENTIRE LENGTH OF FRESH AIR INTAKE DUCTS WITH 38MM VENTURE-CLAD.
4. COMBUSTIBLE COVERINGS AND LININGS, INCLUDING ASSOCIATED ADHESIVE AND INSULATION SHALL HAVE FLAME SPREAD RATING OF NOT MORE THAN 25 PPM AND SMOKE DEVELOPED CLASSIFICATION OF NOT MORE THAN 50 PPM.
5. THE HVAC CONTRACTOR IS RESPONSIBLE TO SUPPLY AND INSTALL PULLEYS AND BELTS IF REQUIRED TO SLOW DOWN OR SPEED UP FANS TO MEET DESIGN CAPACITY WHEN THE AIR BALANCING IS IN PROGRESS.
6. HVAC CONTRACTOR IS RESPONSIBLE FOR ALL LOW VOLTAGE CONTROL WIRING & CONDUITS.
7. PROVIDE FLEX CONNECTION BETWEEN MECHANICAL EQUIPMENTS AND DUCTS. PROVIDE RIGID SUPPORT FOR DUCT WITHIN 1' OF FLEX CONNECTION.
8. FANS TO BE SUPPORTED BY VIBRATION ISOLATORS.
9. SEISMIC RESTRAINT REQUIRED FOR ALL MECHANICAL EQUIPMENT.
10. THERMOSTATS SHALL BE EQUIPPED WITH MANUAL CHANGE OVER OR DUAL SET-POINT.

REVIEW OF SHOP DRAWINGS

SHOP DRAWINGS MUST BE REVIEWED AND STAMPED BY BOTH SUB-CONTRACTOR AND GENERAL CONTRACTOR. REFER TO MECHANICAL SPECIFICATIONS 1.6

REVIEW BY ENGINEER IS ONLY FOR THE VERIFICATION OF GENERAL QUALITY AND DESIGN, AND DOES NOT RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITY FOR ENSURING THAT ALL SPACES, CAPACITIES, SPECIFICATION, COORDINATION, INSTALLATION AND CONTRACTUAL REQUIREMENTS ARE MET.

ALL TRADES SHALL COORDINATE THEIR WORK WITH EACH OTHER AND SITE CONDITION TO AVOID INTERFERENCE AND REPETITION. CONSULT WITH PM.

GENERAL NOTES:

1. SLEEVES THROUGH THE SLAB SHALL TERMINATE AT LEAST 3" ABOVE SLAB.
2. COORDINATE EQUIPMENT AND PIPE INSTALLATION LOCATIONS ON SITE WITH PM/CLIENT.
3. PROVIDE WALL SLEEVE FOR ALL DUCTWORK AND PIPING PENETRATIONS. COORDINATE LOCATIONS WITH ALL TRADES AND PROJECT MANGER.
4. PROVIDE NECESSARY EXPANSION COMPENSATORS LOOPS, ANCHORS, GUIDES, SUPPORTS ECT... AND FIRE STOPS AS REQUIRED FOR ALL RISERS.
5. PLUMBING VENT(S) AND HVAC EXHAUST TERMINAL(S) ON ROOF SHALL BE AT LEAST 10' FROM THE FRESH AIR INTAKE OF THE ROOF TOP UNIT(S).
6. BENT, DENTED, OR SQUEEZED DUCT IS NOT ACCEPTABLE.
7. HANDLE AND STORE PIPES, DUCTWORKS, DEVICES, EQUIPMENT PER THE MANUFACTURES' INSTRUCTION.
8. CONTROLS FOR THE PUMP SYSTEMS SHALL BE BY OTHERS COMPLETE WITH CONTROL PANELS, CONDUITS AND WIRING.
9. SLEEVES THROUGH SLAB SHALL TERMINATE AT LEAST 3" ABOVE SLAB.

DRAWING NOTE:

IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND DETAILS (WHETHER SHOWN ON THE DRAWINGS OR NOT) AND TO ACCURATELY ESTIMATE MATERIAL AND LABOUR COST FOR THE PROJECT, SHORTAGE OF MATERIAL AND LABOUR DUE TO WRONG SCALE SHALL NOT INCUR EXTRA COST TO THE OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INVESTIGATE AND INQUIRE IN WRITING ABOUT AN AMBIGUITY, INCONSISTENCY, OR MISTAKE DURING THE TENDER PHASE OF THE PROJECT. THE CONTRACTOR ASSUMES FULL RESPONSIBILITY TO VERIFY THE CONDITIONS, DIMENSIONS, AND DETAILS OF THE BUILDING AND ASSUMES FULL LIABILITY FOR ANY PROBLEMS THAT MAY ARISE DUE TO POSSIBLE ERRORS ON THESE PLANS. ALL FEDERAL, PROVINCIAL, AND LOCAL CODES, REGULATIONS, ETC. SHALL BE CONSIDERED PART OF THE SPECIFICATIONS OF THIS PROJECT AND SHALL TAKE PRECEDENCE OVER ANYTHING SHOWN, DESCRIBED OR IMPLIED WHERE SAME ARE AT VARIANCE. USE OF THESE PLANS AND SPECIFICATION CONSTITUTES COMPLIANCE WITH ITS TERMS AND CONDITION.

OTHER PIPING SCHEDULE

SERVICE	MATERIAL	NOTES
DCW BELOW GROUND	COPPER TYPE 'K', PEX-A	PEX; PLACE PIPE CONNECTORS AND JOINTS ABOVE GROUND
DCW , DHW , DHWR ABOVE GROUND	COPPER TYPE 'L', PEX-A	
SANITARY, STORM & VENT ABOVE GROUND	CAST IRON, PVC, COPPER	ABS; CONCEALED IN WALLS
SANITARY, STORM & VENT IN AIR-STREAM PLENUM	CAST IRON, SYSTEM XFR	
SANITARY, STORM & VENT BELOW GROUND	PVC, ABS	

HVAC LEGEND

	THERMALLY INSULATED DUCT
	DUCT BOOT WITH DAMPER
	DUCT DAMPER
MD	MOTORIZED DAMPER
	TURNING VANES
	DIFFUSER - ROUND CONNECTION
	EGGCRATE RETURN AIR GRILLE
	EXHAUST FAN - WALL MOUNT
	EXHAUST FAN - CEILING MOUNT
T	THERMOSTAT
	OUTDOOR SPLIT UNIT - FLOOR MOUNT C/W PATIO STONE
A B C	DIFFUSER TAG A - TAG B - FLOW (CFM) C - SIZE
XX-xx	EQUIPMENT TAG
	SINGLE WALL BOX C/W LOUVER, BIRD SCREEN AND BACK DRAFT DAMPER, INSULATE THE BOX
	DOUBLE WALL BOX C/W LOUVER, BIRD SCREEN AND BACK DRAFT DAMPER, INSULATE THE BOX
	TRIPLE WALL BOX C/W LOUVER, BIRD SCREEN AND BACK DRAFT DAMPER, INSULATE THE BOX
SC	STRATIFICATION FAN SPEED CONTROLLER

PLUMBING LEGEND

DCW	DOMESTIC COLD WATER
MTW	MIXED TEMPERATURE WATER AT 110°F
DHR	DOMESTIC HOT WATER RETURN
NGA	NATURAL GAS
SAN	SANITARY WASTE BELOW GRADE/FLOOR
	SANITARY WASTE ABOVE GRADE/FLOOR
VEN	SANITARY VENT
FD	FLOOR DRAIN - ROUND
HD	FLOOR DRAIN - HUB
	PIPE DOWN
	PIPE UP
	PIPE CONNECTION DOWN
	PIPE CONNECTION UP
	PIPE CONNECTION ON TOP
	PIPE - BREAK - SINGLE LINE
	P-TRAP
	TRAP SEAL PRIMER
	GATE VALVE
	BALL VALVE
	CHECK VALVE
RP	REDUCED PRINCIPLE BACKFLOW PREVENTER
	THERMOSTATIC MIXING VALVE
	PRESSURE RELIEF VALVE
	DRAIN VALVE
BV	BALANCING VALVE
HB	HOSE BIBB
NFH	NON-FREEZE WALL HYDRANT
	TEMPERATURE GAUGE
	THERMOMETER
	CLEANOUT
V	SANITARY VENT
M	VENT THROUGH ROOF
XX-xx	EQUIPMENT TAG
FE	FIRE EXTINGUISHER
BWV	BACK WATER VALVE
	COMPRESSED AIR QUICK DISCONNECT @ 48" AFFL

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ARGUE CONSTRUCTION LTD.

ISSUE	DESCRIPTION	CHECKED	DATE
1	25% COORDINATION	FH	2024-04-08
2	66% COORDINATION	FH	2024-05-07
3	BUILDING PERMIT	FH	2024-05-31

KEY PLAN

DRAWINGS ARE TO BE READ AS A PACKAGE AND ARE NOT INTENDED TO BE SEPARATED AND VIEWED INDIVIDUALLY BY DISCIPLINE.

DESIGNED BY:	FH
DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
LEGEND, NOTES AND GENERAL REQUIREMENTS

SEAL:
LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100500303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:
SHEET NO: 1 OF 15
PROJECT NO: 23074

M1

PLUMBING FIXTURE SCHEDULE

TAG	SPECIFICATION	DCW SIZE (INCH)	DHW SIZE (INCH)	SAN SIZE (INCH)	REMARKS
WC-1 WC-2	TANK TYPE TOILET WITH THE FLUSH RIGHT, COMPLETE WITH TANK LINER, BARRIER FREE, FLOOR MOUNTED AMERICAN STANDARD 2386 012, WHITE VITREOUS CHINA, EVER CLEAN, 6.0 LPF/1.3 GPF TRIM: MOLDEX OR OLSONITE, WHITE ELONGATED SEAT OPEN FRONT COVER	0.5		3.0	PROVIDE ESCUTCHEONS PROVIDE SHUT-OFF VALVE BARRIER-FREE INSTALLATION
LV-1	LAVATORY, WALL HUNG, AMERICAN STANDARD MURRO MODEL 0954.004.EC, VITREOUS CHINA, 20.5"X21-1/4"X5" DEEP, CONCEALED SUPPORT ARMS, REAR OVERFLOW, DRILLED FOR SPECIFIED TRIM, EXPOSED PIPING COVER 0059.020EC, MANUAL FAUCET AMERICAN STANDARD MODEL 5500.170, WATER-CONSERVING 1.5 GPM/5.7L/MIN, LESS DRAIN AND POP-UP HOLE, OPEN GRID DRAIN	0.5	0.5	1.5	PROVIDE ESCUTCHEONS PROVIDE SHUT-OFF VALVES BARRIER-FREE INSTALLATION MIXED WATER TEMPERATURE AT 43 °C (110 °F)
LV-2	LAVATORY, COUNTER MOUNTED, BARRIER FREE, AMERICAN STANDARD MODEL 9494.001 WHITE VITREOUS CHINA, 4" (102MM) CENTRES, REAR OVERFLOW, SELF-RIMMING WITH SEALANT, OPEN GRID DRAIN, 21" X 17-1/2" X 7" DEEP (533MM X 445MM X 150MM DEEP) MANUAL FAUCET: AMERICAN STANDARD MODEL 5502.170 WATER-CONSERVING 1.5 GPM/5.7L/MIN, BLADE HANDLES	0.5	0.5	1.5	PROVIDE ESCUTCHEONS PROVIDE SHUT-OFF VALVES BARRIER-FREE INSTALLATION AS REQUIRED MIXED WATER TEMPERATURE AT 43 °C (110 °F)
UR	URINAL - ALLBROOK FLOWISE, TOP SPUD MANUFACTURER: AMERICAN STANDARD MODEL #: 6550.501.001 TRIM & WALL HANGER DIMENSION: 21-1/2" X 14-5/16" X 14" (546 X 363 X 356) 0.5 GPF FLUSH VALVE: LEFT HAND MANUAL FLUSH VALVE #6045.051	0.75		2.0	PROVIDE ESCUTCHEONS PROVIDE SHUT-OFF VALVE BARRIER-FREE INSTALLATION
KS	DOUBLE COMPARTMENT S.S. SINK - KINDRED 'STEEL QUEEN' #QDL-2031-8 S.S. SINK, 3 HOLE, 8" (203MM) CENTRES, 31-1/4" X 20-1/2" X 8" (790MM X 520MM X 203MM) DEEP, COUNTER MOUNTED, BACK LEDGE, GRADE 18-8 TYPE 302 STAINLESS STEEL, MIRROR FINISHED RIM, SATIN FINISHED BOWL, SELF_RIMMING, WITH CRUMB CUP STRAINERS AND SOUND DEADENING. AMERICAN STANDARD COLONY PRO SINGLE CONTROL FAUCET MODEL 7074.000 LESS SIDE SPARY, C.P. 8" (203MM) C.C., DECK MOUNTED, BRASS LEAD-FREE WATERWAYS BODY WITH METAL DECK PLATE, CERAMIC DISC VALVE CARTRIDGE, SWING SPOUT WITH 1.5 GPM (5.7 LPM) FLOW AERATOR OUTLET, SINGLE CONTROL METAL LEVER HANDLE AND 3/8" (10MM) SUPPLY TUBES. SUPPLIES WITH ANGLE STOPS, ADAPTORS AND ESCUTCHEONS. CAST BRASS 'P' TRAP, 1-1/2" (38MM) WITH CLEANOUT, UNIONS AND ESCUTCHEON.	0.5	0.5	1.5	PROVIDE ESCUTCHEONS PROVIDE SHUT-OFF VALVES
MV	MIXING VALVE OUTPUT FLOW RATE: 1.51 LPS EQUIPPED WITH LEAD-FREE BRASS BODY, ROTATABLE CHECK STOPS, PARAFFIN-BASED TECHNOLOGY TO SENSE AND ADJUST OUTLET TEMPERATURE, DIRT AND LIME RESISTANT POPPET AND SEAT DESIGN, SHUT-OFF ON SUPPLY PRESSURE FAILURE AND VANDAL RESISTANT TEMPERATURE ADJUSTMENTS. POWERS MODEL ETV200	0.5	0.5	1.5	SET MIXED WATER TEMPERATURE AT 43 °C (110 °F)
BFP	REDUCED PRESSURE VALVE ASSEMBLY BACKFLOW PREVETER WATTS SERIES LF009, INTEGRAL SHUTOFF VALVES, TOP ENTRY ACCESS POINTS FOR EACH CHECK ASSEMBLY, ALL WETTED RUBBER PARTS SHALL BE MANUFACTURED FROM SILICONE OR CHLORAMINE RESISTANT EPDM RUBBER	1.25			
HB	HOSE BIBB, ACORN 'NEPTUNE' #8121CR HOSE VALVE, C.P. HEAVY DUTY ROUGH CAST BRASS BODY WITH INTEGRAL CAST FLANGE, VANDAL-RESISTANT LOCK SHIELD BONNET WITH REMOVABLE HANDLE, 2" (51MM) NPT FEMALE INLET AND HOSE END VACUUM BREAKER.	0.75			
FD	FLOOR DRAIN, ZURN ZN-211-B-P, DURA-COATED CAST IRON FLOOR DRAIN WITH 5" ROUND NICKLE BRONZE ROUND STRAINER AND 0.5" TRAP PRIMER CONNECTION	TRAP PRIMER		3.0	
FFD	FUNNEL FLOOR DRAINS WITH COMBINATION FUNNEL - MECHANICAL ROOMS ZURN ZN-415-BE, BODY ASSEMBLY, TYPE "BE" STRAINER, OVAL FUNNEL. DURA-COATED CAST IRON 5" ROUND NICKEL BRONZE ROUND STRAINER, 0.5" TRAP PRIMER CONNECTION, P-TRAP	TRAP PRIMER		3.0	
RD	ROOF DRAINS _ STANDARD FLOW ZURN Z101-C-R ROOF DRAIN, 20" (508MM) DIAMETER, DURA-COATED CAST IRON BODY WITH COMBINATION MEMBRANE FLASHING CLAMP/GRAVEL GUARD, ROOF SUMP RECEIVER, UNDERDECK CLAMP AND LOW SILHOUETTE DOME. SOLID EXTENSION HEIGHT TO SUIT ROOF CONSTRUCTION.			6.0	
SD	SCUPPER DRAINS (GUTTER) (PARAPET) (PIT DRAIN) SMITH SERIES 1510SG SCUPPER DRAIN, ALL DUCO COATED CAST IRON BODY, WITH SECURED ANGLED CAST IRON GRATE, FLASHING CLAMP AND 90DEGREE OUTLET. FOR GUTTER INSTALLATION USE SMITH SERIES 1630SG GUTTER DRAIN, WITH 4-1/2" (114MM) DIAMETER SECURED BRONZE DOME.				OR EQUIVALENT EQUIVALENT GRATE ALSO ACCEPTABLE
TD	TRENCH DRAIN - CAST IN PLACE. TRENCH DETAILS AND DIMENSIONS BY OTHERS. HEAVY DUTY GRATE EQUAL TO "VULCRAFT GRATING", LOAD CLASS 'F', GRATE TO MATCH TRENCH DIMENSIONS.	TRAP PRIMER		4.0	REFER TO ARCHITECTURAL FOR DIMENSIONS
BWV	BACK WATER VALVE - PVC CONSTRUCTION WITH EPDM FLAPPER SEAL, THREADED TOP PLUG FOR CONVENIENT SERVICE, ACCESS EXTENSION KIT, 43 psi PRESSURE RATED, CONFORMS TO ANSI A112.14.1, EXTERNAL ARROW FLOW INDICATOR. AND ACCESS BOX AND COVER. EQUAL TO SPEARS.			4.0	SIZE TO FIT SANITARY PIPES

OIL INTERCEPTOR

TAG	DESCRIPTION	SPECIFICATION	INLET SIZE (INCH)	VENT SIZE (INCH)
OI	PROCEPTOR MODEL#: OMC 500 UPC OR EQUIVALENT	RECESSED OIL INTERCEPTOR, GRAVITY APPLICATIONS, FIBERGLASS REINFORCED PLASTIC, 1/4" WALL THICKNESS. PROVIDE EXTENSION COLLAR, TRAFFIC RATED COVER, C/W SMARTPRO WIRELESS RF MONITORING SYSTEM 96"X62"X55" HIGH, DRY WEIGHT: 500 LBS (227 KG), INSTALL PER THE MANUFACTURE'S INSTALLATION INSTRUCTIONS. DIMENSION:	4.0	2 X 3.0

HOT WATER TANK (HWT-#)

TAG	MANUFACTURER	MODEL #	LOCATION	STORAGE CAPACITY USGAL (L)	VOLTAGE / WATTAGE	DIMENSIONS H x DIA. (INCHES)	SHIPPING WEIGHT LB (KG)	PLUMBING CONNECTIONS	REMARKS
HWT-1	GIANT ELECTRIC	142STE-2F7M	BLDG A MECH. ROOM	36 (135)	208 / 3000	22 x 36-1/4	115 (52)	3/4" NPT	FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS
HWT-2	GIANT ELECTRIC	119SEO-3R5M	BLDG C MECH. ROOM	19 (72)	208 / 2250	26-1/2X18-1/4	65 (30)	3/4" NPT	FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS

NATURAL GAS FURNACE SCHEDULE (FUR-#)

TAG	MANUFACTURER/ MODEL/ TYPE	AIR FLOW (CFM)	COOLING TONS	GAS HEATING (MBH)			ESP (INCH WC)	THERMAL EFFICIENCY	POWER V-P-Hz (FLA)	BLOWER MOTOR NOMINAL HP	WEIGHT (LBS)	REMARKS
				INPUT	OUTPUT	STAGES						
FUR	TRANE/ S9X2B060U3PSAA UP FLOW OR EQUIVALENT	1265	3.0	60	58.2	2	0.5	95	120/1/60 (8.4.)	0.5	---	PROVIDE HIGH EFFICIENCY NATURAL GAS FURNACE C/W DC VARIABLE SPEED MOTOR, TWO STAGE HEATING, COOLING COIL, AND REMOTE CONDENSING UNIT (CU) C/W ALL CONTROL WIRING. CONDENSING UNIT SHALL BE COMPATIBLE WITH MODEL OF THE FURNACE, 208/1/60, 20A. LOW VOLTAGE 7 DAY PROGRAMMABLE THERMOSTAT. PROVIDE HEPA FILTERS. CONCENTRIC VENT TERMINAL.

OTHER EQUIPMENT SCHEDULE

TAG	SPECIFICATIONS	NOTES
COMP	AIR COMPRESSOR	SUPPLIED BY THE OWNER AND INSTALLED BY THIS CONTRACTOR. INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
CAST	COMPRESSED AIR STORAGE TANK	SUPPLIED BY THE OWNER AND INSTALLED BY THIS CONTRACTOR. INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

EXHAUST FAN SCHEDULE (EF-#)

TAG	LOCATION	MANUFACTURER/ MODEL#	AIRFLOW (CFM)	ESP (IN. W.C.)	H.P.	Volts/Ph/Hz (MAX WATTS)	FAN (RPM)	SONES	REMARKS
EF-1	ROOF	PENNBARRY DX10Q	500	0.25	1/12	115V/1/60	1550	6.1	DIRECT DRIVE CENTRIFUGAL EXHAUST FAN C/W CSA APPROVED MOTOR ISOLATION KIT, BACKDRAFT DAMPER. FAN SUPPLIED AND INSTALLED BY DIV.15. LINE VOLTAGE CONNECTION TO FAN BY DIV.16. PROVIDE ANCHORED TO STRUCTURE WITH SEISMIC RESTRAINT (IF APPLICABLE). ROOF CURB MOTOR AND DRIVES ISOLATED ON SEISMIC MOUNT TO BE CONTROLLED BY A DIGITAL TIMER INSTALLED IN ELECTRICAL ROOM.
EF-2	ROOF	PENNBARRY DX10R	750	0.25	1/12	115V/1/60	1550	6.1	DIRECT DRIVE CENTRIFUGAL EXHAUST FAN C/W CSA APPROVED MOTOR ISOLATION KIT, BACKDRAFT DAMPER. FAN SUPPLIED AND INSTALLED BY DIV.15. LINE VOLTAGE CONNECTION TO FAN BY DIV.16. PROVIDE ANCHORED TO STRUCTURE WITH SEISMIC RESTRAINT (IF APPLICABLE). ROOF CURB MOTOR AND DRIVES ISOLATED ON SEISMIC MOUNT TO BE CONTROLLED BY A COOLING THERMOSTAT INSTALLED IN ELECTRICAL ROOM.
EF-3 EF-4	MECH. ROOM BOARDROOM	REVERSOMATIC/ QCF-110ES	100	0.15	1/90	115/1/60	1050	1.0	LAY-IN T-BAR. RIGID DUCTWORK. CONTROLLED BY A DEDICATED SWITCH.
EF-5	AWP SERVICE SHOP BAY	PENNBARRY ----------	7820	0.25	3/4	208/3/60	1300	14.6	EXHAUST FAN TO BE INTERLOCKED WITH INTAKE AIR MOTORIZED DAMPER. CONTROLLED BY OPERATION OF CO/NO2 MONITORING SYSTEM. COMPLETE WITH WALL SLEEVE, DAMPER GUARD, SAFETY SERVICE SWITCH INSTALLED AT SAME HEIGHT AS THE FAN INSTALL AN OVERRIDE MANUAL SWITCH IN PARALLEL WITH CO/NO2 SYSTEM. INSTALL MANUAL BELOW THE FAN FAN AT 5' AFFL C/W SIGNAGE. BACKDRAFT DAMPER, BIRD SCREEN, EXHAUST AIR LOUVER. DIMS: XX" X XX" X XX", 30 LBS.
EF-6	WASH BAY	PENNBARRY P16SA	1160	0.25	1/2	115/1/60	1300	14.6	EXHAUST FAN TO BE INTERLOCKED WITH INTAKE AIR LOUVER AND DAMPER. CONTROLLED BY OPERATION OF AIR COMPRESSOR. COMPLETE WITH WALL SLEEVE, DAMPER GUARD, SAFETY SERVICE SWITCH INSTALLED AT SAME HEIGHT AS THE FAN, BACKDRAFT DAMPER, BIRD SCREEN, AND LOUVER. DIMS: 22-3/4"X22-3/4"X11-1/4", 30 LBS.
EF-7 EF-10	MEZZANINE A & B COMPRESSOR ROOMS	PENNBARRY P16SA	2000	0.25	1/2	115/1/60	1300	14.6	EXHAUST FAN TO BE INTERLOCKED WITH INTAKE AIR LOUVER AND DAMPER. CONTROLLED BY OPERATION OF AIR COMPRESSOR. COMPLETE WITH WALL SLEEVE, DAMPER GUARD, SAFETY SERVICE SWITCH INSTALLED AT SAME HEIGHT AS THE FAN, BACKDRAFT DAMPER, BIRD SCREEN, AND LOUVER. DIMS: 22-3/4"X22-3/4"X11-1/4", 30 LBS.
EF-8 EF-9	MEZZANINE A & B BOILER ROOMS	REVERSOMATIC/ QCF-110ES	100	0.15	1/90	115/1/60	1050	1.0	SURFACE MOUNTED. RIGID DUCTWORK. CONTROLLED BY A COOLING THERMOSTAT.
EF-11	HEAVY EQUIPMENT REPAIR BAY	PENNBARRY ----------	7820	0.25	3/4	208/3/60	1300	14.6	EXHAUST FAN TO BE INTERLOCKED WITH INTAKE AIR MOTORIZED DAMPER. CONTROLLED BY OPERATION OF CO/NO2 MONITORING SYSTEM. COMPLETE WITH WALL SLEEVE, DAMPER GUARD, SAFETY SERVICE SWITCH INSTALLED AT SAME HEIGHT AS THE FAN. INSTALL AN OVERRIDE MANUAL SWITCH IN PARALLEL WITH CO/NO2 SYSTEM. INSTALL MANUAL BELOW THE FAN FAN AT 5' AFFL C/W SIGNAGE. BACKDRAFT DAMPER, BIRD SCREEN, EXHAUST AIR LOUVER. DIMS: XX" X XX" X XX", 30 LBS.
EF-12		GREENHECK CENTRIFUGAL SQUARE INLINE DUCTED BSQ 140HP-20	1438	3.0	2	115 / 1 / 60	2520		HOSE REEL EXHAUST FAN C/W DUCT FLANGES, CSA MOTOR, AMCA RATING, CEILING HUNG, CONTROLLED VIA MOTOR STARTER MSEM COMBINATION TYPE-NEMA1- 16GA-2HP- 115/60/1 POWER-12 TO 250V DIRECT VOLTAGE INPUT- 690V RATED OPERATIONAL CONTACTOR VOLTAGE- ELECTRONIC OVERLOAD- OL MANUAL OR AUTO REST- DISCONNECT RATED CURRENT 22A-DAMPER POWER 120VAC, WIRED JUNCTION BOX, VCD-34-08-18X18 INLINE DAMPER, MS4104F1210 ACTUATOR-115VAC ACTUATED END SWITCH COATED WITH EPOXY, INSULATED HOUSING, ISOLATORS AND BRACKETS, SPRING HANGING. FAN ACTIVATED VIA M3 DAMPER ACTUATOR THROUGH END SWITCH. END SWITCH ACTIVATE INTEGRAL CONTACT OF MOTOR STARTER MS-1P, STARTER ACTIVATE THE CORRESPONDING DAMPER WITH ITS CONTROL CONTACT. ALL WIRED BY ELECTRICAL.
EF-13 EF-14	MEZZANINE A & B COMPRESSOR ROOMS	PENNBARRY P16SA	2000	0.25	1/2	115/1/60	1300	14.6	EXHAUST FAN TO BE INTERLOCKED WITH INTAKE AIR MOTORIZED DAMPER. CONTROLLED BY OPERATION OF CO/H2 MONITORING SYSTEM. COMPLETE WITH WALL SLEEVE, DAMPER GUARD, SAFETY SERVICE SWITCH INSTALLED AT SAME HEIGHT AS THE FAN. INSTALL AN OVERRIDE MANUAL SWITCH IN PARALLEL WITH CO/H2 SYSTEM. INSTALL MANUAL BELOW THE FAN FAN AT 5' AFFL C/W SIGNAGE. BACKDRAFT DAMPER, BIRD SCREEN, EXHAUST AIR LOUVER. DIMS: XX" X XX" X XX", 30 LBS.

EXHAUST HOSE REELS (EHR-#) SCHEDULE

TAG	MANUF./ MODEL	DRUM WIDTH (INCH)	HOSE/OUTLET DIAMETER (INCH)	HOSE TEMPERATURE RATING (°F)	FLEXIBLE HOSE LENGTH (FEET)	REMARKS
EHR	AQC/ MAXIREEL (HR-4567040) STANDARD SPRING RETURN	4.5	6	700	18	MANUAL WITH PULL ROPE HOSE REELS FUME EXTRACTION SYSTEM C/W HOSE GUIDE, POWDER COATED, GALVANIZED STEEL DRUM. COMPLETE WITH; FLEXIBLE HOSE (HO-700) TO BE DARK GRAY, E-GLASS WITH V4A WIRE FABRIC, CROSS TWILL WEAVE, HELIX GALVANIZED STEEL, TEMPERATURE RESISTANCE +22°F TO +700°F. OUTLET DAMPER 6"Ø TO BE FLAP OPEN WHEN HOSE GO UP, FLAP CLOSED WHEN HOSE GO DOWN, 16GA STEEL HOUSING, PAINTED BLACK ALUMINUM FLAP. INCLUDED ACCESSORIES SPRING LOADED DAMPER NOZZLE (NZG-06-SD), ALUMINUM 6" CANE ADAPTOR (NZA-DC-06) FITTED WITH NZG66 MALE/FEMALE ADAPTOR, (NZ-POLE-SG-H0) TELESCOPE ALUMINUM POLE (8' TO 16') WITH GRAB HOOK, WITH 2" EYEBOLT FOR GRAB HOOK AND POLE INSERT. FOUR HOSE REELS APPLICATION WITH SINGLE EXHAUST FAN (EF-2).

* ROOF TOP UNIT SCHEDULE (RTU-#)

TAG	NOM. TON	"LENNOX" MODEL No.	COOLING			HEATING (MBH)			EVAPORATOR			POWER	MCA	MOCP	WEIGHT (LBS)	REMARKS
			IEER	STAGES	ECON.	MED.	HIGH	STAGES	C.F.M.	E.S.P.	H.P.					
RTU-1	7.5	LGH092H4BM	13	2	YES	180	240	2	3,000	0.6	2	575/3/60	17	20	1,573	COMPLETE WITH MICROPROCESSOR CONTROLS SUITABLE TO CONTROL HEATING AND COOLING, TOUCH SCREEN SEVEN DAY PROGRAMMABLE THERMOSTAT AND BAROMETRIC RELIEF DAMPER WITH HOOD KIT, SET ECONOMIZER AT 15% F/A.
RTU-2	7.5	LGH092H4BM	13	2	YES	180	240	2	3,000	0.6	2	575/3/60	17	20	1,573	COMPLETE WITH MICROPROCESSOR CONTROLS SUITABLE TO CONTROL HEATING AND COOLING, TOUCH SCREEN SEVEN DAY PROGRAMMABLE THERMOSTAT AND BAROMETRIC RELIEF DAMPER WITH HOOD KIT, SET ECONOMIZER AT 15% F/A.

* SUPPLY AND INSTALL:
- SINGLE PACKAGE COMBINATION AIR TO DX COOLING AND INDIRECT GAS HEATING SYSTEM COMPLETE WITH AUTOMATIC CONTROLS
- UNIT SHALL BE C.S.A. AND C.G.A. APPROVED, ASHRAE 90.1-2013 COMPLY
- UNITS SHALL BE SHIPPED COMPLETELY FACTORY ASSEMBLED, PRE-CHARGED, PIPED AND WIRED INTERNALLY FOR FIELD CONNECTIONS
- HIGH PERFORMANCE ECONOMIZER C/W MIXING DAMPERS AND MIXED AIR CONTROLLER
- AUTOMATIC MINIMUM FRESH AIR DAMPER AND ENTHALPY CONTROLS
- GRAVITY RELIEF DAMPER
- 5 YEAR COMPRESSOR WARRANTY
- DRAIN PAN OVER FLOW SWITCH
- PLUMBER TO PROVIDE 'P' TRAP ON CONDENSATE DRAIN
- FACTORY INSTALLED DISCONNECT SWITCH
- PVC BAGNET
- HINGED ACCESS DOOR
- ROOF CURB(S): SLOPED ROOF, 18" HIGH CURB, FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTION, CONTRACTOR TO ENSURE ROOF CURB(S) IS SQUARE AND LEVEL PRIOR TO INSTALLATION OF UNIT
- FILTER(S): THREE SETS OF 2" PLEATED PANEL "FARR" OR EQUIVALENT PER EQUIPMENT, LABEL FILTERS PER EACH EQUIPMENT, USE ONE FILTER DURING CONSTRUCTION, REPLACE AND INSTALL SECOND FILTER AFTER CONSTRUCTION (DURING AIR BALANCING), THIRD FILTER TO BE HANDED OVER TO OWNER

CO AND NO2 MONITOR – GASOLINE AND DIESEL EXHAUST MONITORING SYSTEM

DUAL CHANNEL GAS MONITORING SYSTEM WITH INTEGRAL CARBON MONOXIDE AND NITROGEN DIOXIDE ELECTROCHEMICAL SENSORS, AND CARBON MONOXIDE AND HYDROGEN ELECTROCHEMICAL SENSORS. POWER REQUIREMENT; 120 V, 60 Hz, DEDICATED 15A BREAKER.
UNITS SHALL INCLUDES:

MONITORING PANEL
- MONITOR ENCLOSED IN 16 GAUGE STEEL, ANSI/ASA 61 GREY
- DUAL ALARM TRIP POINTS: CARBON MONOXIDE AT 25 AND 100 PPM
- NITROGEN DIOXIDE AT ONE AND THREE PPM
- COMMON LOW AND HIGH DPDT, 10A ALARM RELAYS, FOR CONTROL OF VENTILATION EQUIPMENT AND/OR AUXILIARY ALARM
- LEDS FOR POWER ON, LOW, HIGH AND FAIL
- TEST SEQUENCE ACTIVATED BY PUSH BUTTON
- ALARMS EQUIPPED WITH USER SELECTABLE TIME DELAYS, WHEREBY, WHEN CHOSEN, LOW AND HIGH ALARM CONDITIONS MUST PREVAIL FOR FIVE AND TEN MINUTES, RESPECTIVELY, BEFORE ACTIVATION OCCURS.
- ALARMS EQUIPPED WITH DEAD BAND, WHICH REQUIRES GAS LEVELS TO DECLINE SLIGHTLY BELOW THE ORIGINAL TRIP POINT BEFORE ALARMS WILL AUTOMATICALLY RESET.
- CSA CERTIFIED
- TWO YEAR WARRANTY

CARBON MONOXIDE SENSOR
- RANGE OF 0-100 PPM CO, ELECTRO-CHEMICAL TYPE SENSOR, THREE YEAR WARRANTY (MINIMUM)

NITROGEN DIOXIDE SENSOR
- 4-20 MA LINEAR SIGNAL OUTPUT CORRESPONDING TO 0-10 PPM NO2, ELECTRO-CHEMICAL TYPE SENSOR, ONE YEAR WARRANTY (MINIMUM)

HYDROGEN SENSOR
- TGS000 ELECTRO-CHEMICAL DUAL GAS SENSOR, ONE YEAR WARRANTY (MINIMUM)

AIR DISTRIBUTION SCHEDULE

TAG	SPECIFICATIONS	NOTES
A	SQUARE SUPPLY DIFFUSER, 24" x 24" & 12" X 12" 3 CONE, ROUND NECK, LAY IN T-BAR INSTALLATION EH PRICE MODEL SCD	FINISH AND COLOUR BY OTHERS
B	EGGCRATE RETURN GRILLE, 1/2 X 1/2 GRID CORE LAY IN T-BAR INSTALLATION EH PRICE MODEL 80 SERIES	FINISH AND COLOUR BY OTHERS
C	LOUVERED FACE RETURN GRILLE SINGLE DEFLECTION EH PRICE MODEL 530FD	FINISH AND COLOUR BY OTHERS
D	WASHROOM EXHAUST GRILLE, 1/2 X 1/2 GRID CORE SUITABLE FOR LAY IN T-BAR INSTALLATION EH PRICE MODEL 80D-TB	FINISH AND COLOUR BY OTHERS
E	1" X 1" STEEL FRAMED WIRE MESH SIZE AS INDICATED	INSTALLED ON FRESH AIR SUPPLY DUCTS & RTU RETURN DUCTS
F	LOUVERED FACE RETURN GRILLE SINGLE DEFLECTION EH PRICE MODEL 530FD	FINISH AND COLOUR BY OTHERS
WBX	EXHAUST WALL BOX - SINGLE & TRIPLE, EQUAL TO REVERSOMATIC MODEL TWBW-8, OR EQUIVALENT	FINISH AND COLOUR BY OTHERS

ELECTRIC UNIT HEATER SCHEDULE

TAG	SPECIFICATIONS	NOTES
EH-1	FAN-FORCED HEATER, RECESSED, WALL MOUNT C/W FRAME RFP80W DIMPLEX RFI SERIES, MODEL RFI830D31W HEATING CAPACITY 2250W (7680 BTUH) FRAME COVER DIMENSION 425MM X 546MM (16-3/4" X 21-1/2") BUILT-IN, DOUBLE-POLE THERMOSTAT ELECTRICAL: 208V/1/60	SUPPLIED AND INSTALLED BY DIV. 16.
EH-2	ELECTRIC BASEBOARD HEATER STELPRO MODEL: SCA24208 750 WATTS, 120V/1/60 36" IN LENGTH COMPLETE WITH BUILT IN THERMOSTAT	SUPPLIED AND INSTALLED BY DIV. 16.

STRATIFICATION FAN SCHEDULE

TAG	SPECIFICATIONS	NOTES
SF-1 TO SF-6	BIG ASS FANS E12, 12' DIAMETER, 85 RPM, SOUND LEVEL 35 dBA VARIABLE SPEED WALL CONTROLLER POWER SUPPLY: 115/1/60, 10A SHIPPING WEIGHT: 79 LBS (36 KG)	INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND AWAY FROM THE PATH OF CRANE. COLOR BY OTHERS
SF-7 TO SF-9	FORWARD AND REVERSE STRATIFICATION FAN CANARM MODEL # CP60D11N, AIR MOVEMENT: 8944 CFM C/W 16" DOWNROD WALL CONTROLLER MODEL # PREM-DC0014-W POWER SUPPLY: DC MOTOR, 120/1/60, 259 CFM/W (35 W) SHIPPING WEIGHT: 19 LBS (9 KG)	INSTALL AT THE SAME HEIGHT AS LIGHT FIXTURES COLOR BY OTHERS

INFRARED HEATER

REF.	SPECIFICATIONS	NOTES
IRH	SCHWANK, SUPER TUBE HEATER, MODULATING, LARGE COVERAGE AREA MODEL: SST 250-60 INPUT BTU/HR: 250,000 SYSTEM LENGTH: 70' WEIGHT: 324 LBS. GAS PRESSURE (MIN/MAX): 5" W.C. NG / 14" W.C. NG, GAS INLET 1/2" THERMOSTAT, 24V, MODULATING DIGITAL ELECTRICAL: 120V/60HZ/15A, EC MOTOR C/W COMPLETE COMPONENT, 5' FRESH AIR INTAKE AND FLUE VENT TERMINALS, SUSPENDED HORIZONTALLY.	INSTALL AT 45 ° AT HIGH LEVEL MAINTAINING THE REQUIRED CLEARANCES FROM OH DOOR AND LIGHT FIXTURES. FOLLOW THE MANUFACTURER INSTALLATION INSTRUCTION.

GAS UNIT HEATER (GUH-#)

TAG	SPECIFICATIONS	NOTES
GUH 1-8	POWER VENTED, LOW STATIC, NATURAL GAS, UNIT HEATER REZNOR MODEL UDAP HEATING CAPACITY 75,000 BTUH COMPLETE WITH COMBUSTION AIR/VENT KIT INCLUDING CONCENTRIC ADAPTER THERMOSTAT ELECTRICAL: 115/1/60 FLA: 3.3 A	INSTALL AT 16' AFFL

HEAT RECOVERY VENTILATOR (HRV)

TAG	MAKE / MODEL	AIRFLOW (CFM)	ESP (WG)	ELECTRICAL (V/P/Hz)	REMARKS
HRV	VANEE V230H75R SUSPENDED, TOP/SIDE PORTS	229	0.3"	120/1/60 3.6A	BUILT-IN RELAY FOR INTERFACING TO FURNACE, PMSM ECM MOTOR, 6" PORTS, MOUNTING BRACKETS, WASHABLE FILTERS, ENERGY STAR QUALIFIED, DEFROST BYPASS DAMPER. CONNECT DRAIN PIPE TO HD. CONTROLLED BY A TIMER SWITCH IN M&E ROOM. CONTROLLER MODEL ADVANCE TOUCHSCREEN. RECIRCULATE AIR WHEN FURNACE IS OFF. HIGH LEVEL DURING WORKING HOURS AND LOW LEVEL DURING OFF HOURS. SIZE: 25" x 21" x 19-1/2" (H) WEIGHT: 47 LBS (21.4 Kg)

LOUVER SCHEDULE IAL & EAL

TAG	MANUFACTURER / MODEL	REMARKS
IAL EAL	VENTEX 2450/2455	4" DEEP HIGH PERFORMANCE ALUMINUM LOUVER COMPLETE WITH BIRD SCREEN, BACK DRAFT DAMPER. COLOR & FINISH BY OTHERS.

MOTORIZED DAMPER SCHEDULE

TAG	SPECIFICATIONS	NOTES
MD	MOTOR-OPERATED DAMPER 24VA/5.5W EQUIPPED WITH EXTRUDED ALUMINUM FRAME, BLADES WITH SEALS, DRIVE ASSEMBLY, LINKAGE ASSEMBLY, 24VAC MOTORIZED ACTUATOR AND 24VAC TRANSFORMER (8.4 VA). DAMPER: E.H. PRICE MODEL 80D-2X MOTOR: BELIMO SERIES AF OR EQUIVALENT	TO BE INTERLOCKED WITH THE CORRESPONDING EXHAUST FAN

FIRE DAMPER

ALL FIRE DAMPERS SHALL BE DYNAMIC TYPE
MATCH WITH THE RATING OF WALLS

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ISSUE	DESCRIPTION	CHECKED	DATE
1	25% COORDINATION	FH	2024-04-08
2	66% COORDINATION	FH	2024-05-07
3	BUILDING PERMIT	FH	2024-05-31

KEY PLAN

DRAWINGS ARE TO BE READ AS A PACKAGE AND ARE NOT INTENDED TO BE SEPARATED AND VIEWED INDIVIDUALLY BY DISCIPLINE.

DESIGNED BY:	FH
DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

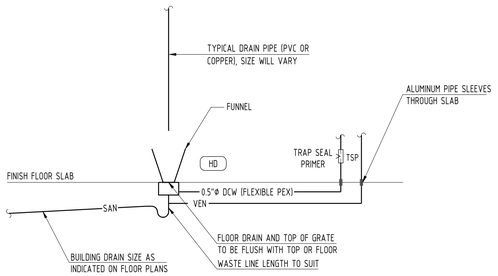
PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
MECHANICAL
EQUIPMENT SCHEDULES

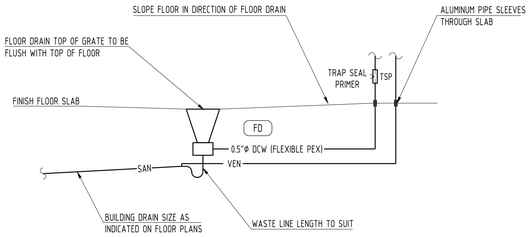
SEAL:
LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100900303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:	
SHEET NO:	2 OF 15
PROJECT NO:	23074

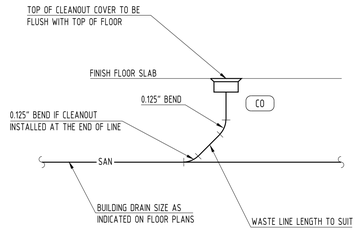
M2



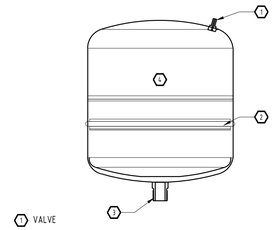
1 / M3 DETAIL - HUB DRAIN
NTS



2 / M3 DETAIL - FLOOR DRAIN
NTS

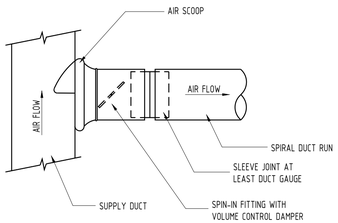


3 / M3 DETAIL - FLOOR CLEANOUT
NTS



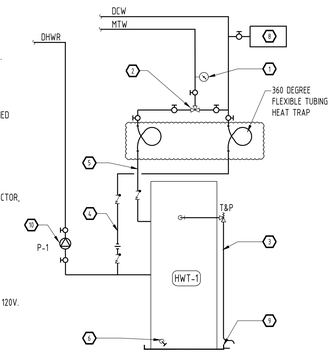
1 VALVE
2 11" CLIP AND RING
3 3/4" STEEL NPT ADAPTER
4 MODEL NO. WATTS PLT-12

4 / M3 DETAIL - EXPANSION TANK
NTS

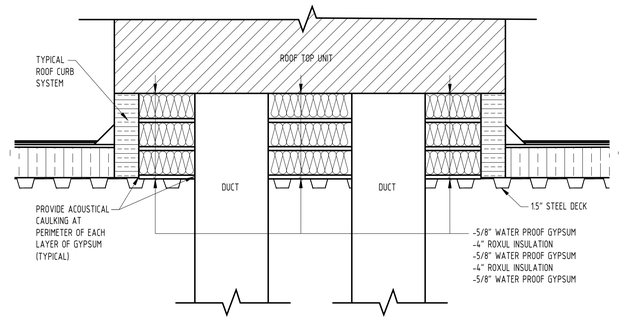


5 / M3 DETAIL - SPIRAL DUCT CONNECTION
NTS

1. 43 °C (109°F) TEMPERED WATER TEMPERATURE GAUGE EQUAL TO WATTS TB-1 (1.5"), INSTALL BELOW CEILING.
2. LEONARD THERMOSTATIC MIXING VALVE EQUAL TO 210-LF-F, INSTALL BELOW CEILING ON HWT-1 ONLY.
3. 1"Φ T&P RELIEF LINE, TERMINATE AT 4" ABOVE FINISHED FLOOR.
4. COLD WATER LINE, CONFIRM EXACT INLET LOCATION.
5. HOT WATER LINE, CONFIRM EXACT OUTLET LOCATION.
6. DRAIN VALVE COMPLETE WITH THREADED HOSE CONNECTOR, PIPE TO HD.
7. REFER TO FLOOR PLANS FOR ALL PIPE SIZES.
8. EXPANSION TANK STRAPPED TO WALL.
9. 2" HIGH DRAIN PAN WITH 0.75" DRAIN LINE TO HD.
10. CIRCULATION PUMP, SMART TYPE, 3 GPM @ 12' HEAD, 120V.



7 / M3 DETAIL - HOT WATER TANK PIPING CONNECTION
NTS



8 / M3 DETAIL - TYPICAL RTU(S) ACOUSTICAL SECTION
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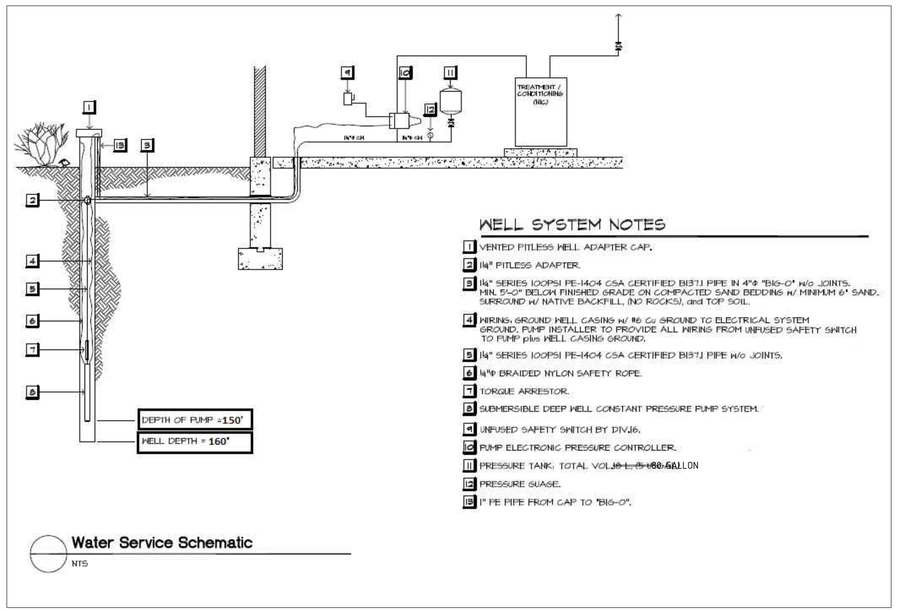

WELL SYSTEM NOTES

1. VENTED PITLESS WELL ADAPTER CAP.
2. 1¼" PITLESS ADAPTER.
3. 1¼" SERIES 100PSI PE-1404 CSA CERTIFIED (ASTM) PIPE IN 4"Φ "BIG-O" W/O JOINTS. MIN. 5'-0" BELOW FINISHED GRADE ON COMPACTED SAND BEDDING W/ MINIMUM 6" SAND. SURROUND W/ NATIVE BACKFILL, (NO ROCKS), and TOP SOIL.
4. WIRING, GROUND WELL CASING W/ #6 Cu GROUND TO ELECTRICAL SYSTEM GROUND. PUMP INSTALLER TO PROVIDE ALL WIRING FROM UNFUSED SAFETY SWITCH TO PUMP plus WELL CASING GROUND.
5. 1¼" SERIES 100PSI PE-1404 CSA CERTIFIED (ASTM) PIPE W/O JOINTS.
6. ¼"Φ BRAIDED NYLON SAFETY ROPE.
7. TORQUE ARRESTOR.
8. SUBMERSIBLE DEEP WELL CONSTANT PRESSURE PUMP SYSTEM.
9. UNFUSED SAFETY SWITCH BY DIVI6.
10. PUMP ELECTRONIC PRESSURE CONTROLLER.
11. PRESSURE TANK: TOTAL VOLUME 6 L/1.6 GALLON
12. PRESSURE GUAGE.
13. 1" PE PIPE FROM CAP TO "BIG-O".

Water Service Schematic
NTS

PROVIDE:

1. WELL PUMP: DEEP WELL SUBMERSIBLE PUMP, CONSTANT PRESSURE, 10 GPM AT 80 PSI, 208V, 1 PH, 1 HP
2. PRESSURE TANK: WELL-X-TROLL 80 GALLON SEALED DIAPHRAGM TYPE
3. PRESSURE SWITCH: 40-60 SETTING

9 / M3 DETAIL - WELL SYSTEM AND PRESURE TANK
NTS

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ISSUE	DESCRIPTION	CHECKED	DATE
1	25% COORDINATION	FH	2024-04-08
2	66% COORDINATION	FH	2024-05-07
3	BUILDING PERMIT	FH	2024-05-31

KEY PLAN

DRAWINGS ARE TO BE READ AS A PACKAGE AND ARE NOT INTENDED TO BE SEPARATED AND VIEWED INDIVIDUALLY BY DISCIPLINE.

DESIGNED BY:	FH
DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

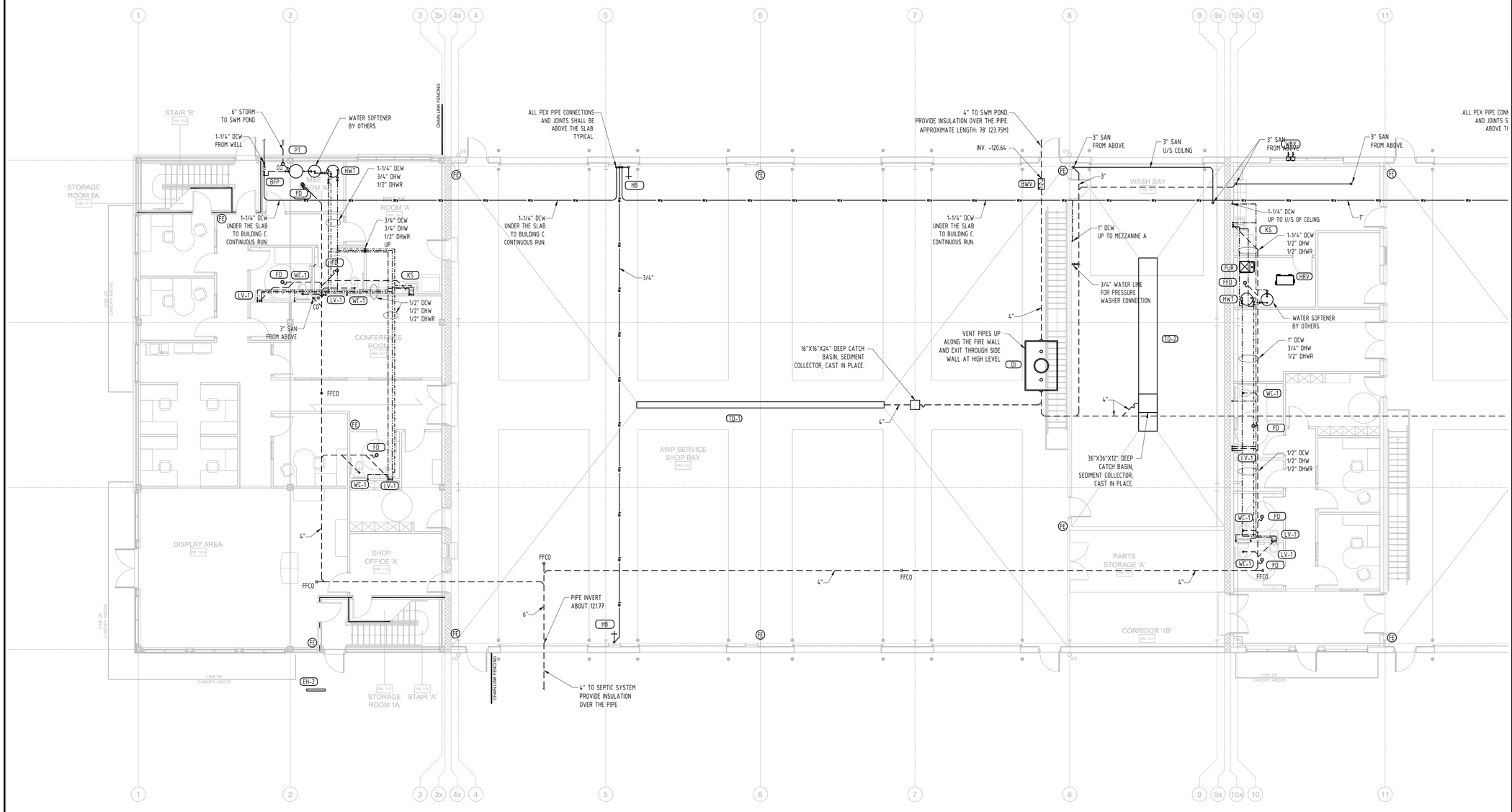
PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
MECHANICAL
DETAILS AND SCHEMATICS

SEAL:
LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100900303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:
SHEET NO: 3 OF 15
PROJECT NO: 23074

M3



SAN PIPE U/G
SAN PIPE
DCW PIPE U/G
DCW PIPE
DHW (MTW) PIPE
DHWR PIPE

NOTES:

1. THERE CANNOT BE ANY PENETRATIONS THROUGH THE FIRE WALLS. ALL SERVICES MUST PASS UNDER THE SLAB TO THE ADJACENT AREA.
2. THE UNDERGROUND DCW PIPE SHALL BE PEX-A WITHOUT JOINTS. ALL CONNECTORS AND JOINTS SHALL BE INSTALLED ABOVE SLAB.
3. MOBILE EYE WASH STATIONS TO BE SUPPLIED AND INSTALLED BY THE OWNER AND/OR GM. LOCATIONS TO BE DECIDED ON SITE BY THE OWNER/GM IT IS RECOMMENDED TO INSTALL ONE STATION IN EQUIPMENT STORAGE.

PROCESS PIPING LEGEND AND NOTES:

CA — COMPRESSED AIR LINE, SCHEDULE 40 BLACK STEEL PIPING AND FITTING

OIL — OIL LINE, SEAMLESS STEEL TUBING, TIM-035, 0.035" WALL THICKNESS

HYD — HYDRAULIC LINE, SEAMLESS STEEL TUBING, TIM-083, 0.083" WALL THICKNESS

SHOP EQUIPMENT NOTES:

1. REFER TO SUNBELT INTERIOR/EXTERIOR SPECIFICATION FOR DETAILS.
2. CONNECTION(S) TO OIL TANKS, HOSE REEL(S), EVAC SYSTEM, PRESSURE WASHER C/W SPRAY GUN ARE BY OTHERS.
3. FITTINGS AND CONNECTORS FOR OIL AND HYDRAULIC LINES ARE BY OTHERS.

0m 2m 4m 8m

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ISSUE	DESCRIPTION	CHECKED	DATE
1	25% COORDINATION	FH	2024-04-08
2	66% COORDINATION	FH	2024-05-07
3	BUILDING PERMIT	FH	2024-05-31

KEY PLAN

TRUE NORTH

DRAWINGS ARE TO BE READ AS A PACKAGE AND ARE NOT INTENDED TO BE SEPARATED AND VIEWED INDIVIDUALLY BY DISCIPLINE.

DESIGNED BY:	FH
DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

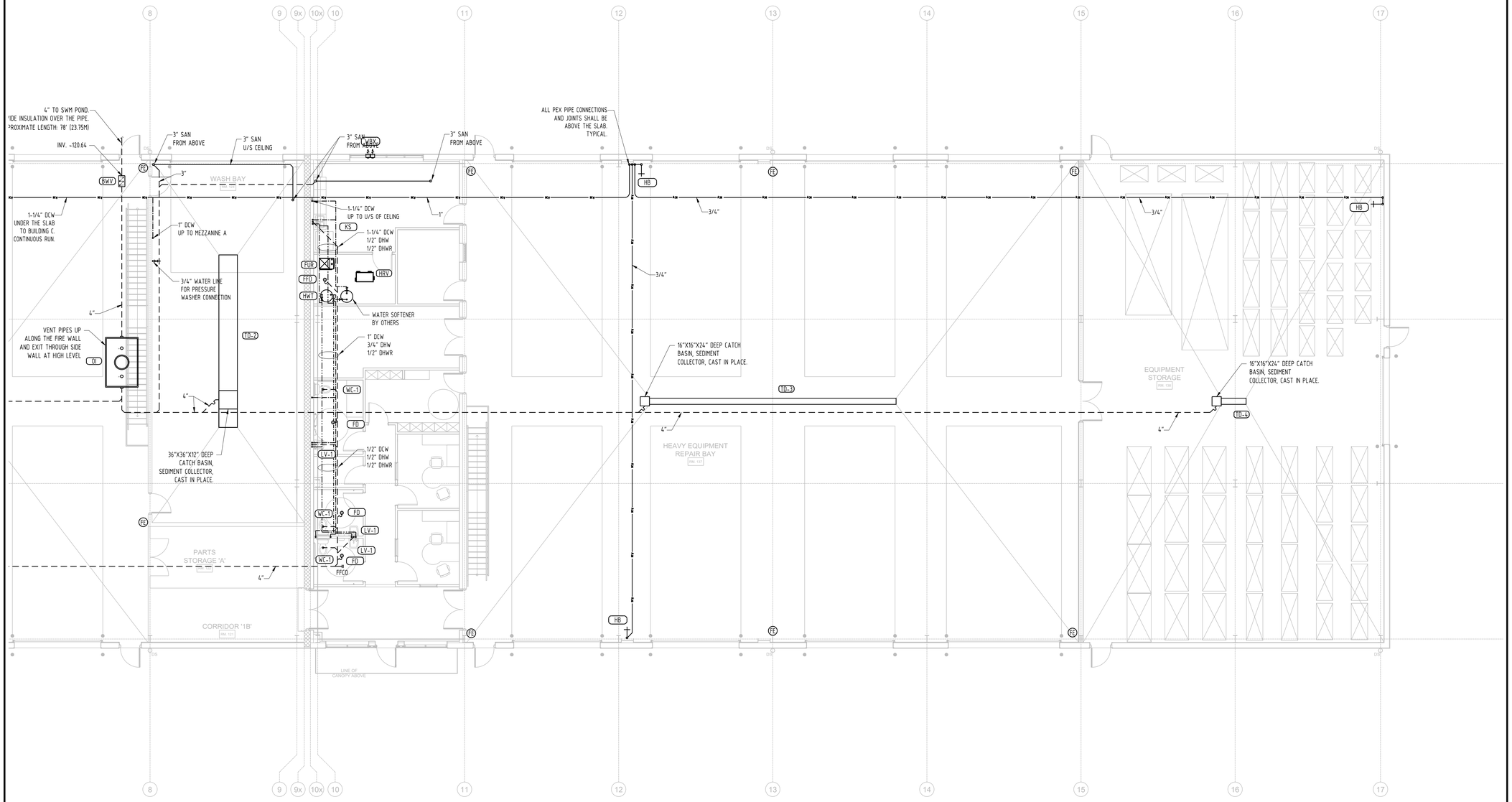
PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
GROUND FLOOR - FRONT
PLUMBING LAYOUT

SEAL:
LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100500303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:	1 : 100
SHEET NO:	4 OF 15
PROJECT NO:	23074

M4



SAN PIPE U/G
SAN PIPE
DCW PIPE U/G
DCW PIPE
DHW (MTW) PIPE
DHWR PIPE

NOTES:

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SHOP EQUIPMENT NOTES:

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ARGUE CONSTRUCTION LTD.

ISSUE	DESCRIPTION	CHECKED	DATE
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3	BUILDING PERMIT	FH	2024-05-31

KEY PLAN

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DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

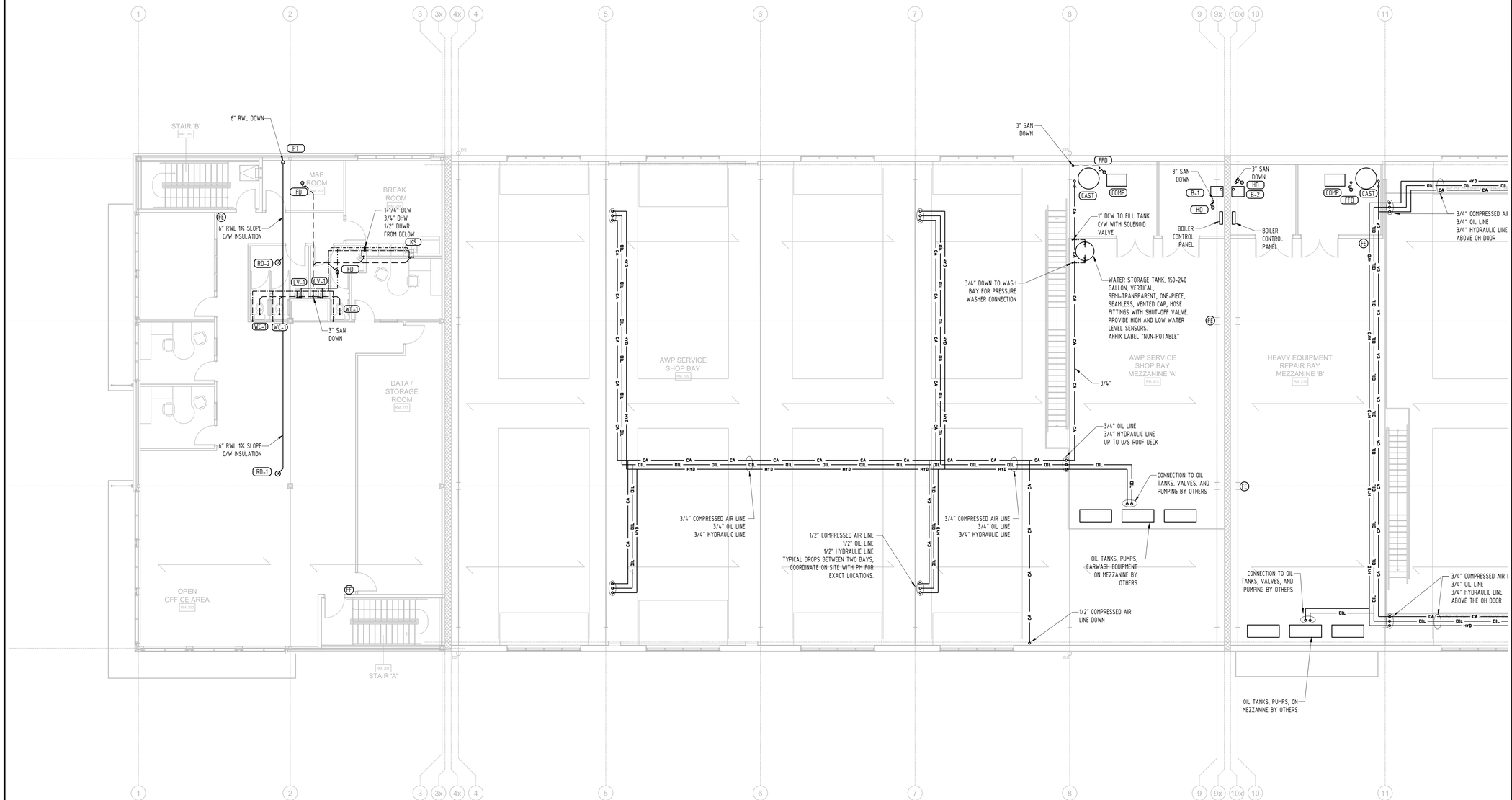
PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
GROUND FLOOR - REAR
PLUMBING LAYOUT

SEAL:
LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100500303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:	1 : 100
SHEET NO:	5 OF 15
PROJECT NO:	23074

M5



SAN PIPE U/G
SAN PIPE
DCW PIPE U/G
DCW PIPE
DHW (MTW) PIPE
DHWR PIPE

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SHOP EQUIPMENT NOTES:

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0m 2m 4m 8m

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2	66% COORDINATION	FH	2024-05-07
3	BUILDING PERMIT	FH	2024-05-31

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DESIGNED BY:	FH
DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

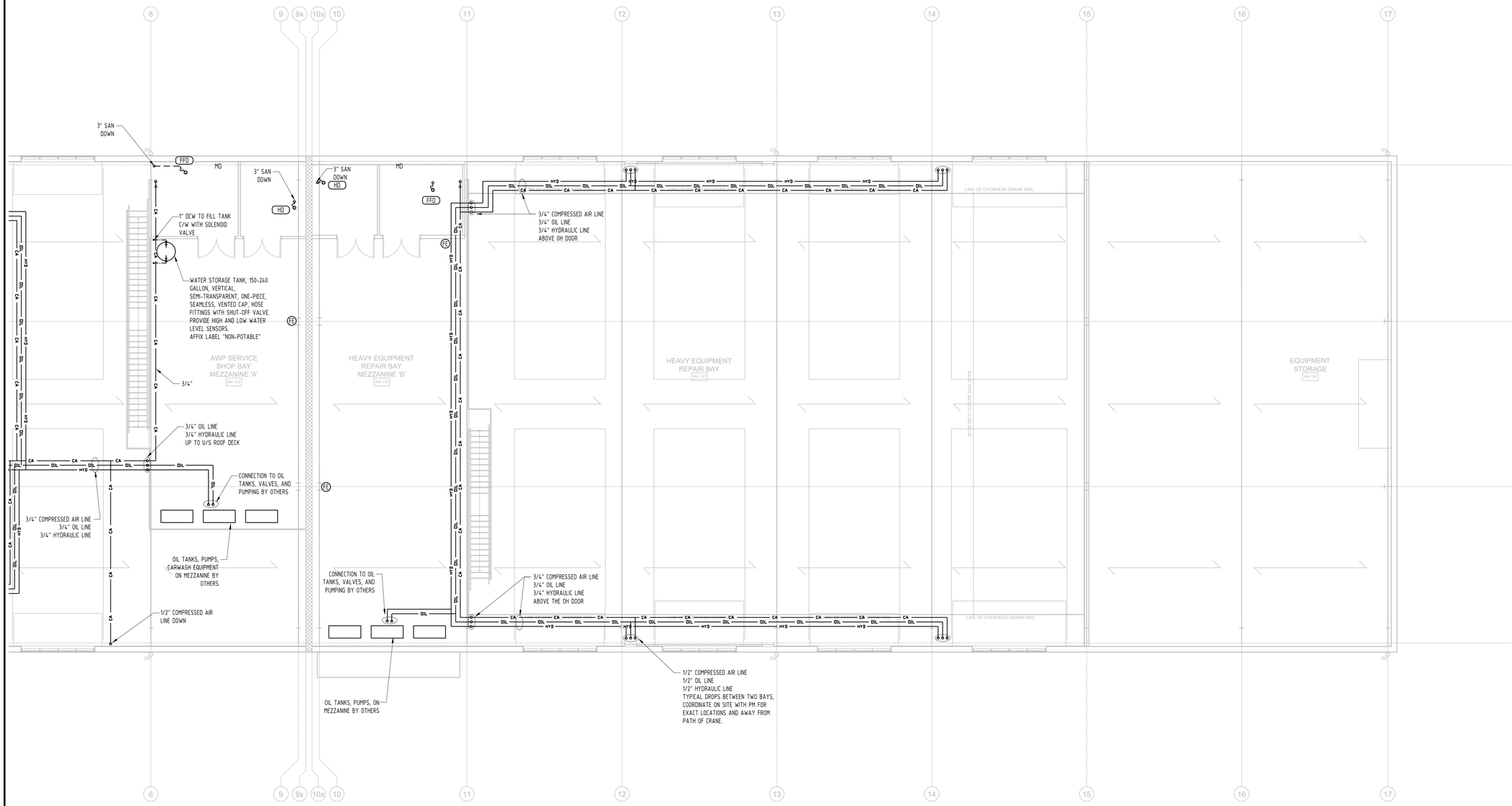
PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
SECOND FLOOR AND MEZZANINIE - FRONT PLUMBING LAYOUT

SEAL:
LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100500303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:	1 : 100
SHEET NO:	6 OF 15
PROJECT NO:	23074

M6



SAN PIPE U/G
SAN PIPE
DCW PIPE U/G
DCW PIPE
DHW (MTW) PIPE
DHWR PIPE

NOTES:
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2	66% COORDINATION	FH	2024-05-07
3	BUILDING PERMIT	FH	2024-05-31

KEY PLAN

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CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

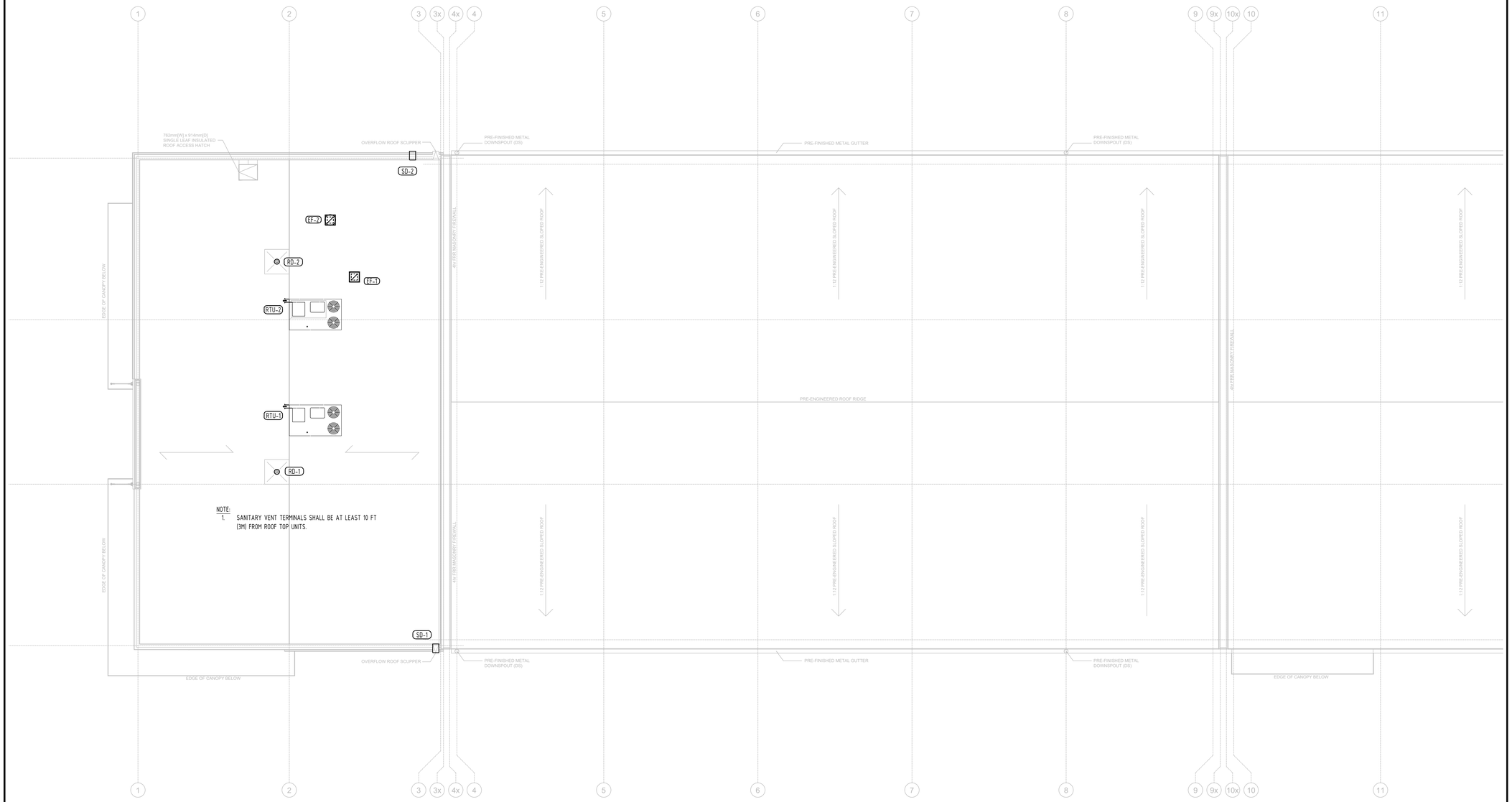
PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
MEZZANINE FLOOR - REAR
PLUMBING LAYOUT

SEAL:

SCALE:	1 : 100
SHEET NO:	7 OF 15
PROJECT NO:	23074

M7



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ARGUE CONSTRUCTION LTD.

ISSUE	DESCRIPTION	CHECKED	DATE
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CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

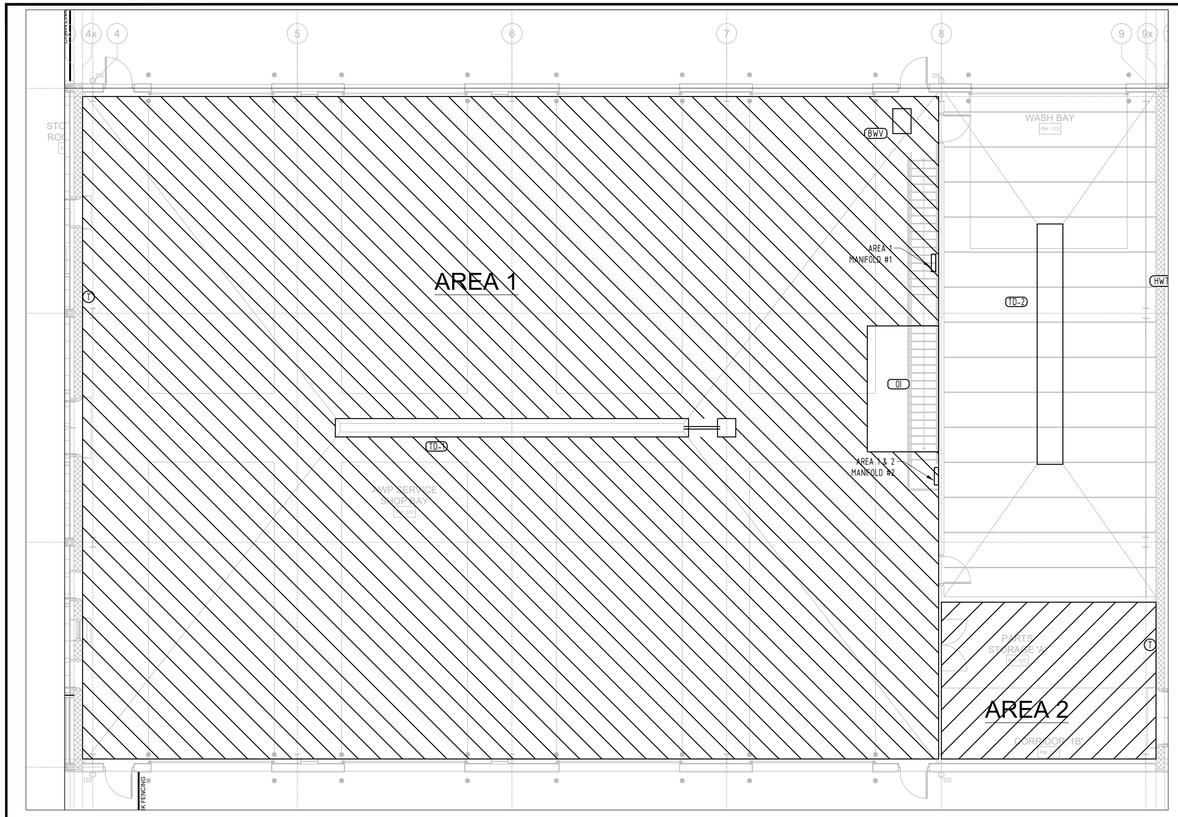
DRAWING TITLE:

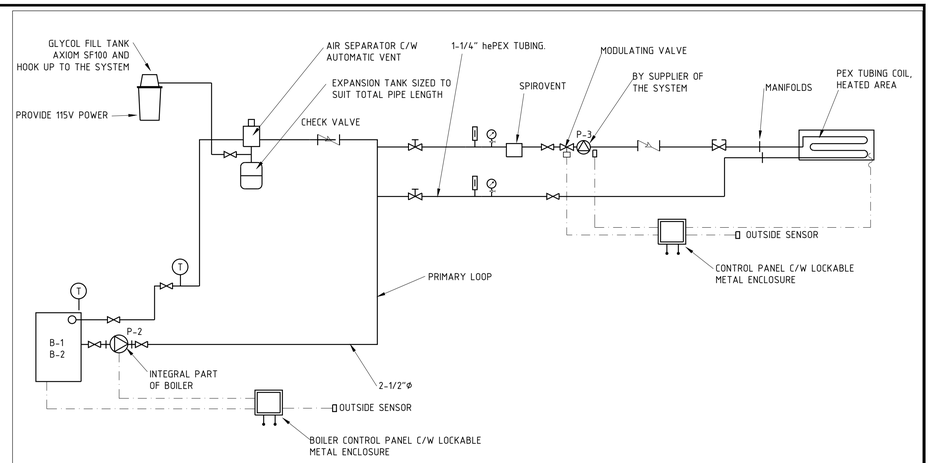
ROOF PLAN - FRONT
PLUMBING LAYOUT

SEAL:

SCALE:	1 : 100
SHEET NO:	8 OF 15
PROJECT NO:	23074

M8

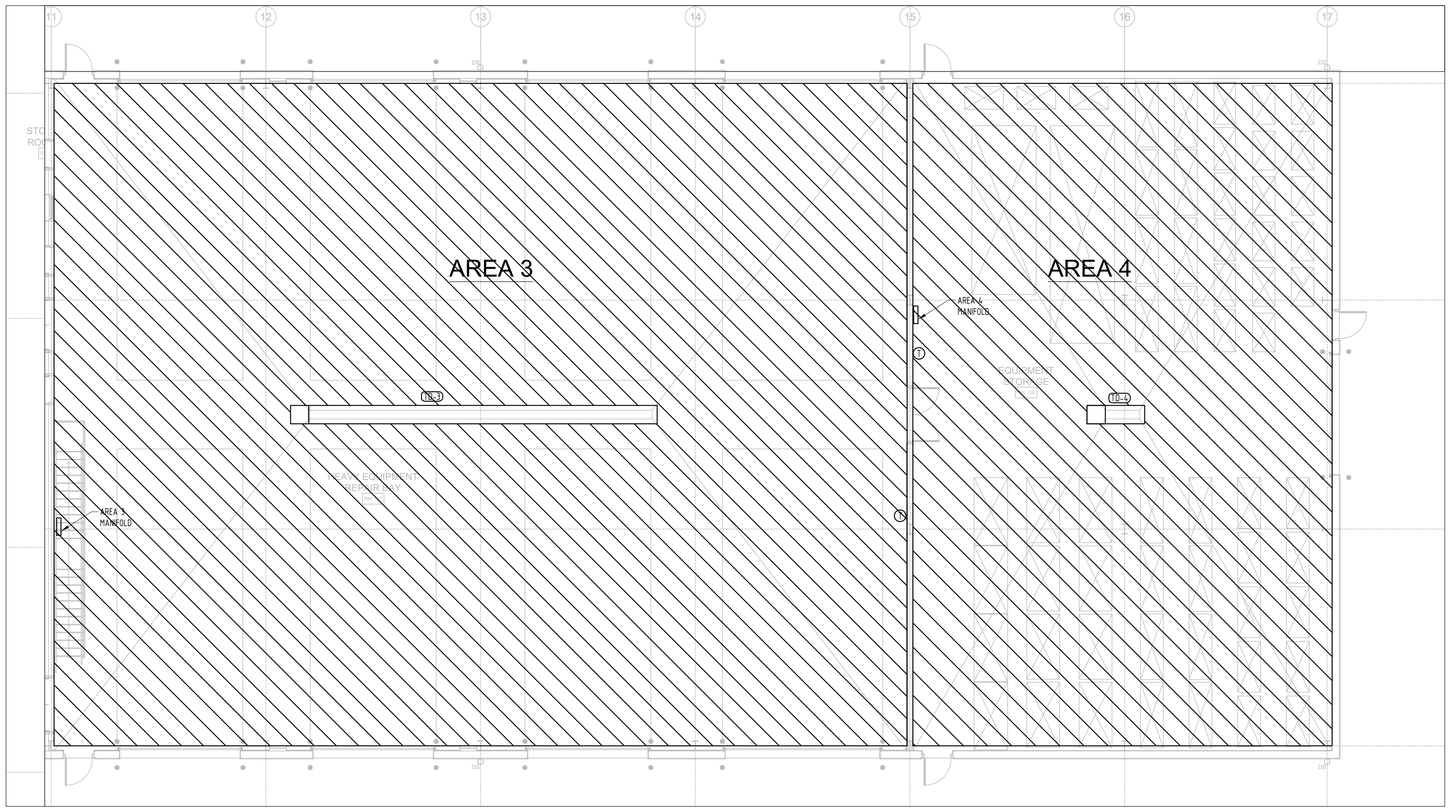




IN-FLOOR RADIANT HEATING SCHEMATIC
SCALE: N.T.S.

BOILER (B-#)

TAG	MANUFACTURER/ MODEL#	AFUE	LOCATION	GAS INPUT (BTUH)	GAS CONNECTION	POWER (V / W)	DIMENSIONS W/D/H (INCHES)	WEIGHT LB (Kg)	WATER CONNECTIONS	REMARKS
B-1 B-2	IBC SL-26-260 G3 MODULATING CONDENSING TYPE --- OR EQUIVALENT	95 %	SHOP AREA	B-1: 299,000 B-2: 299,000	3/4" NPT MALE	120/1/60 123 W DEDICATED RECEPTACLE, LESS PUMPS	25.1/22.3/32.8	162 (74)	SUPPLY & RETURN 1-1/2" NPT MALE	PROVIDE CONCENTRIC CPVC VENTING KIT, WALL HUNG BRACKET, CONDENSATE NETURALIZER KIT. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS. BUILT-IN FEATURE: HEATING SUPPLY TEMPERATURE SENSOR 2 SPEED BOILER CIRCULATING PUMP (GRUNDFOS) PUMP SEIZE PROTECTION 50 PSI PRESSURE RELIEF VALVE FROST PROTECTION HEAT EXCHANGER THERMO FUSE TWO STAGE FLUE TEMPERATURE SENSOR AUTOMATIC SELF-DIAGNOSTICS

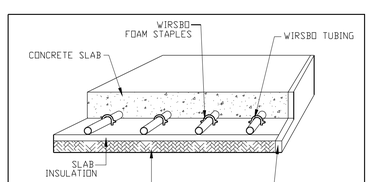


DESIGN NOTES/GUIDELINES:

1. PROVIDE IN-FLOOR HEATING AS SHOWN BY HATCH.
2. PROPOSED LOCATIONS OF MANIFOLD ARE SHOWN FOR EACH AREA.
3. PROVIDE A PROTECTIVE REMOVABLE COVER (BOX) OVER THE MANIFOLDS.
4. PROVIDE IN-LINE CIRCULATION PUMP(S) AND CONTROL(S).
5. PROVIDE PROTECTIVE SLEEVES ON PIPES PENETRATING THE SLAB. SLEEVES AND CONDUITS SHALL TERMINATE AT LEAST 3" AFFL TO MEET THE CODES.
6. THERE SHALL NOT BE ANY PENETRATIONS THROUGH THE FIREWALL. ALL PIPES AND CONTROL WIRES SHALL RUN UNDER THE SLAB FROM ONE AREA TO THE OTHER. PROVIDE APPROPRIATE CONDUITS AND SLEEVES.
7. LOCATION OF BOILERS AND CONTROL PANELS:
   BOILER 1, AREA 1 AND 2: MEZZANINE A
   BOILER 2, AREA 3 AND 4: MEZZANINE B
8. TOTAL AREA FOR IN-FLOOR HEATING:
   AREA 1: 7,483 FT^2 (695 M^2) @ 20 BTUH/FT^2
   AREA 2: 457 FT^2 (42 M^2) @ 24 BTUH/FT^2
   AREA 3: 7,665 FT^2 (712 M^2) @ 20 BTUH/FT^2
   AREA 4: 3,768 FT^2 (350 M^2) @ 24 BTUH/FT^2
9. PROVIDE COMPLETE DESIGN LAYOUT AND CALCULATION.
10. PROVIDE REQUIRED CLEARANCES FOR THE HOISTS, TRENCHES, AND OTHER EQUIPMENT ANCHORED TO SLAB.
11. EXPOSED PIPING SHALL BE INSULATED.
12. THERMOSTAT(S) SHALL BE INTERLOCKED WITH GAS UNIT HEATER'S (GHU) THERMOSTAT(S) IN EACH AREA.
13. PROVIDE A COPY OF THE DESIGN AND LAYOUT TO THE CITY INSPECTOR.

PROPOSED MATERIAL, MANUFACTURER, MODEL#

SYSTEM DESIGN:	UPONOR
HEATING TUBING LAYOUT:	UPONOR 5/8" HELIOPEX
MANIFOLDS:	UPONOR 1.25" SS, 12 LOOP
MANIFOLD FITTINGS:	UPONOR
SENSOR SOCKET:	TEKMAR
TEMPERATURE SENSORS:	TEKMAR 6 ZONES
CONTROLLER:	TEKMAR 6 ZONES
BOILER:	NAVIEN OR IBC
CONDENSATE NEUTRALIZER:	AXIOM
LOW LOSS HEADER SINUS:	120/80
AIR ELIMINATORS:	SPIROTHERM
EXPANSION TANK:	AMTROL
GLYCOL MAKE-UP:	AXIOM
BOILER RECIRC PUMP, P-2:	GRUNDFOS
SYSTEM PUMP, P-3:	WILO STRATOS GIGA



SLAB ON OR BELOW GRADE WITH UNDERSLAB AND EDGE INSULATION
N.T.S.

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ARGUE CONSTRUCTION LTD.

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1	25% COORDINATION	FH	2024-04-08
2	66% COORDINATION	FH	2024-05-07
3	BUILDING PERMIT	FH	2024-05-31

KEY PLAN

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DESIGNED BY:	FH
DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

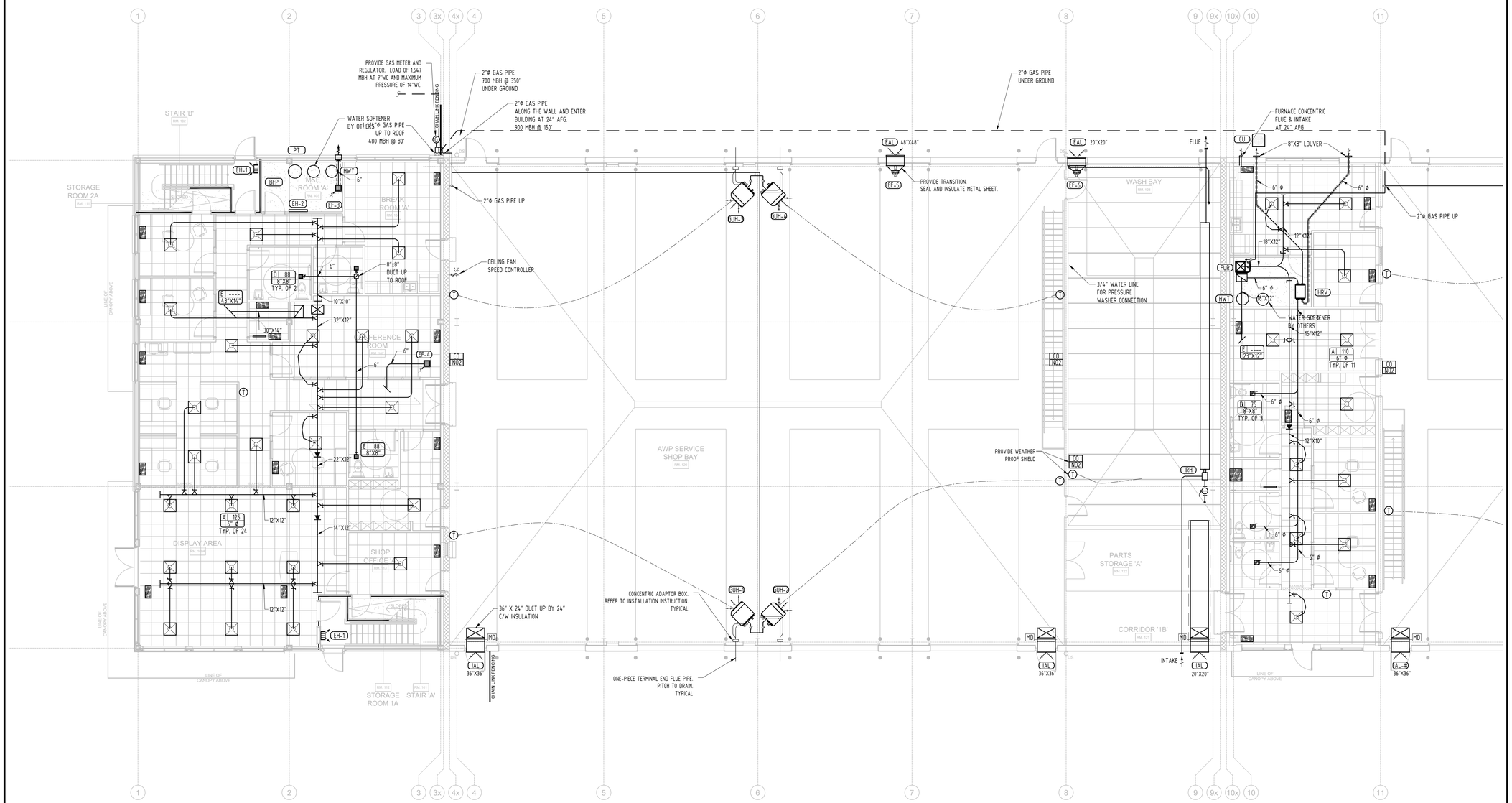
PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
IN-FLOOR HEATING LAYOUTS

SEAL:
LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100500303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:	AS NOTED
SHEET NO:	9 OF 15
PROJECT NO:	23074

M9



NOTES:

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ARGUE CONSTRUCTION LTD.

ISSUE	DESCRIPTION	CHECKED	DATE
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CLIENT:	ARGUE CONSTRUCTION LTD.

PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

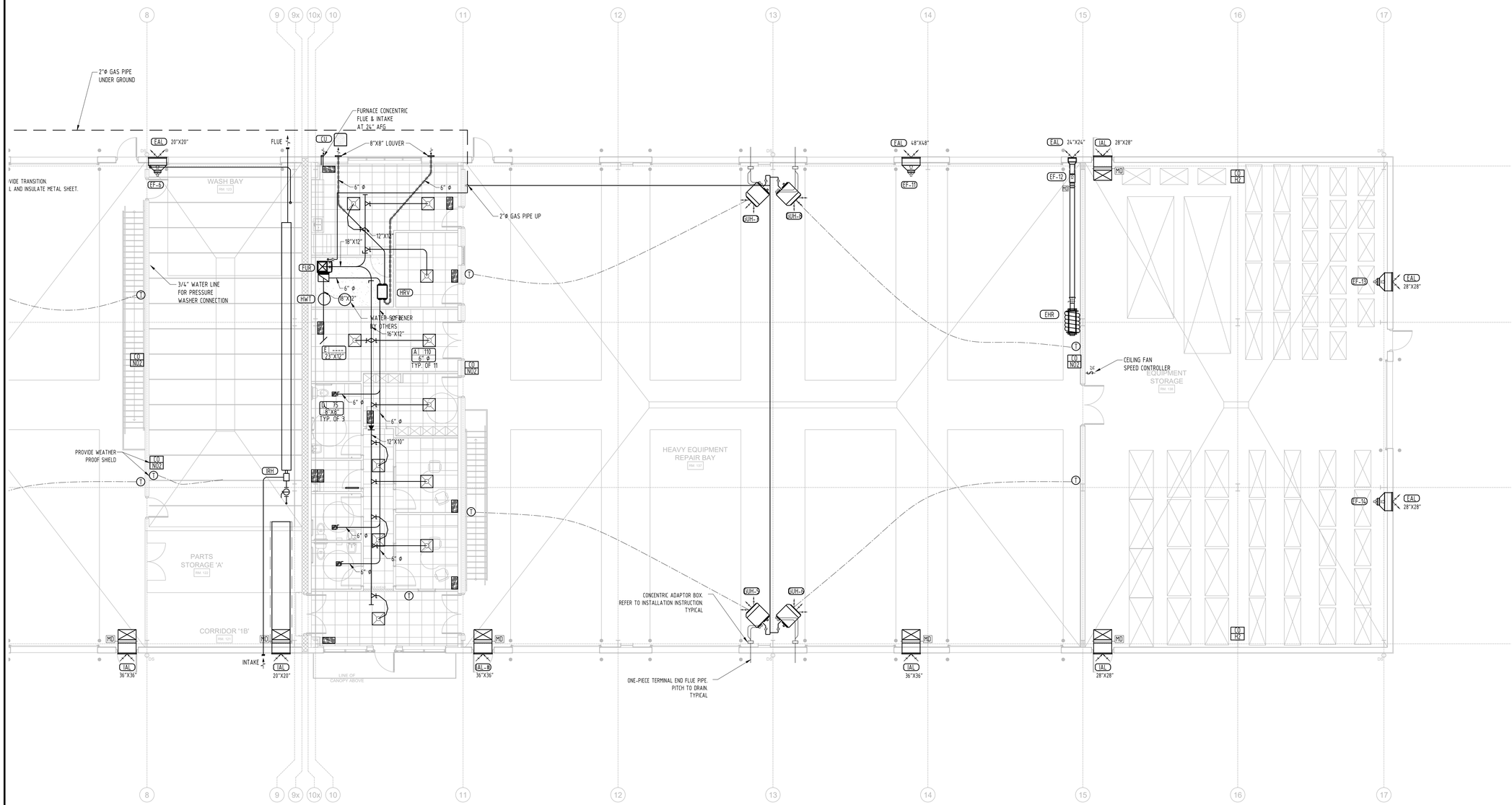
DRAWING TITLE:
GROUND FLOOR - FRONT
HVAC LAYOUT

SEAL:

LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100500303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:	1 : 100
SHEET NO:	10 OF 15
PROJECT NO:	23074

M10



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DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

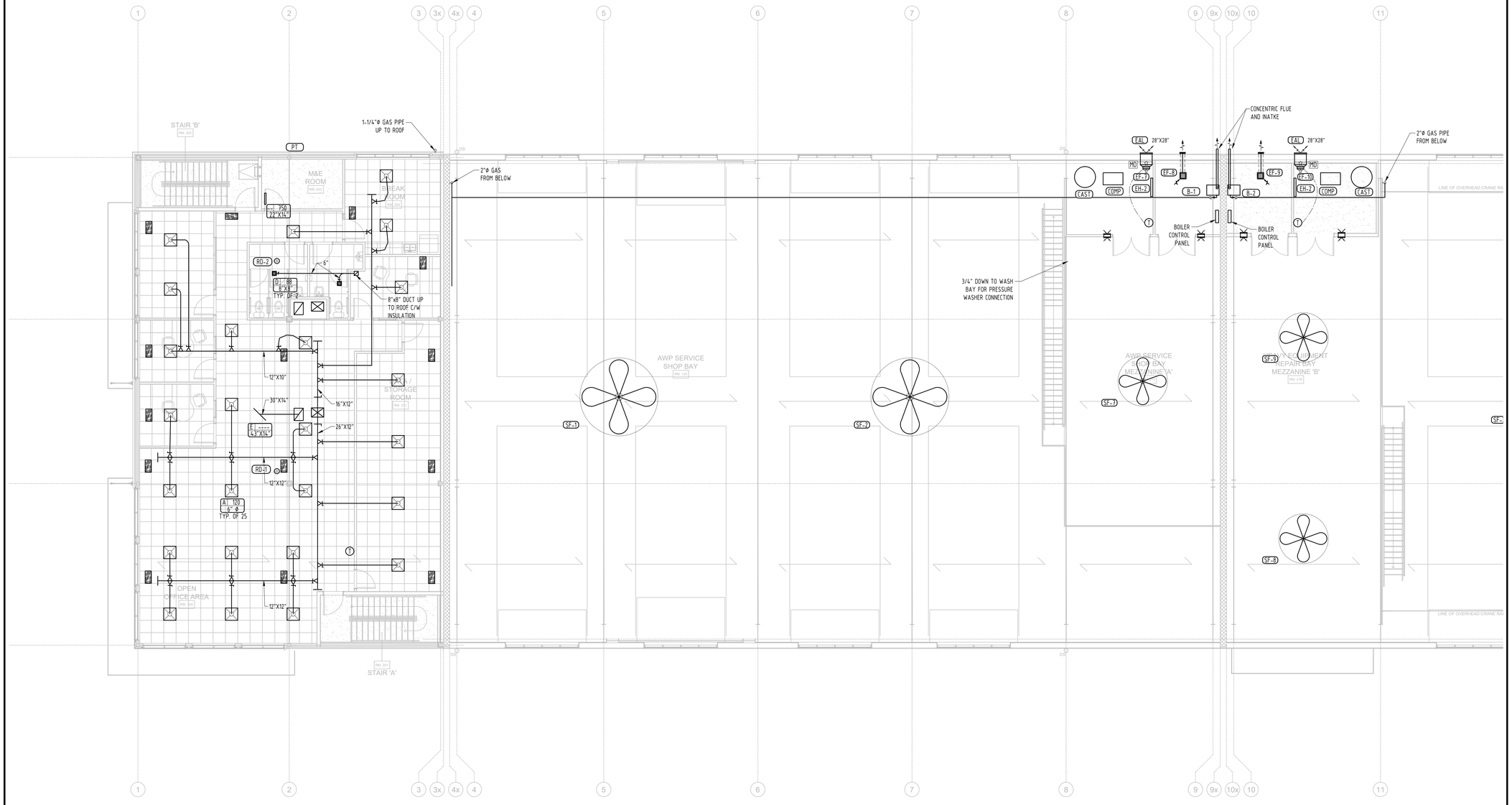
PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:
GROUND FLOOR - REAR
HVAC LAYOUT

SEAL:

SCALE:	1 : 100
SHEET NO:	11 OF 15
PROJECT NO:	23074

M11



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DRAWN BY:	FH
CHECKED BY:	FH
CLIENT:	ARGUE CONSTRUCTION LTD.

PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

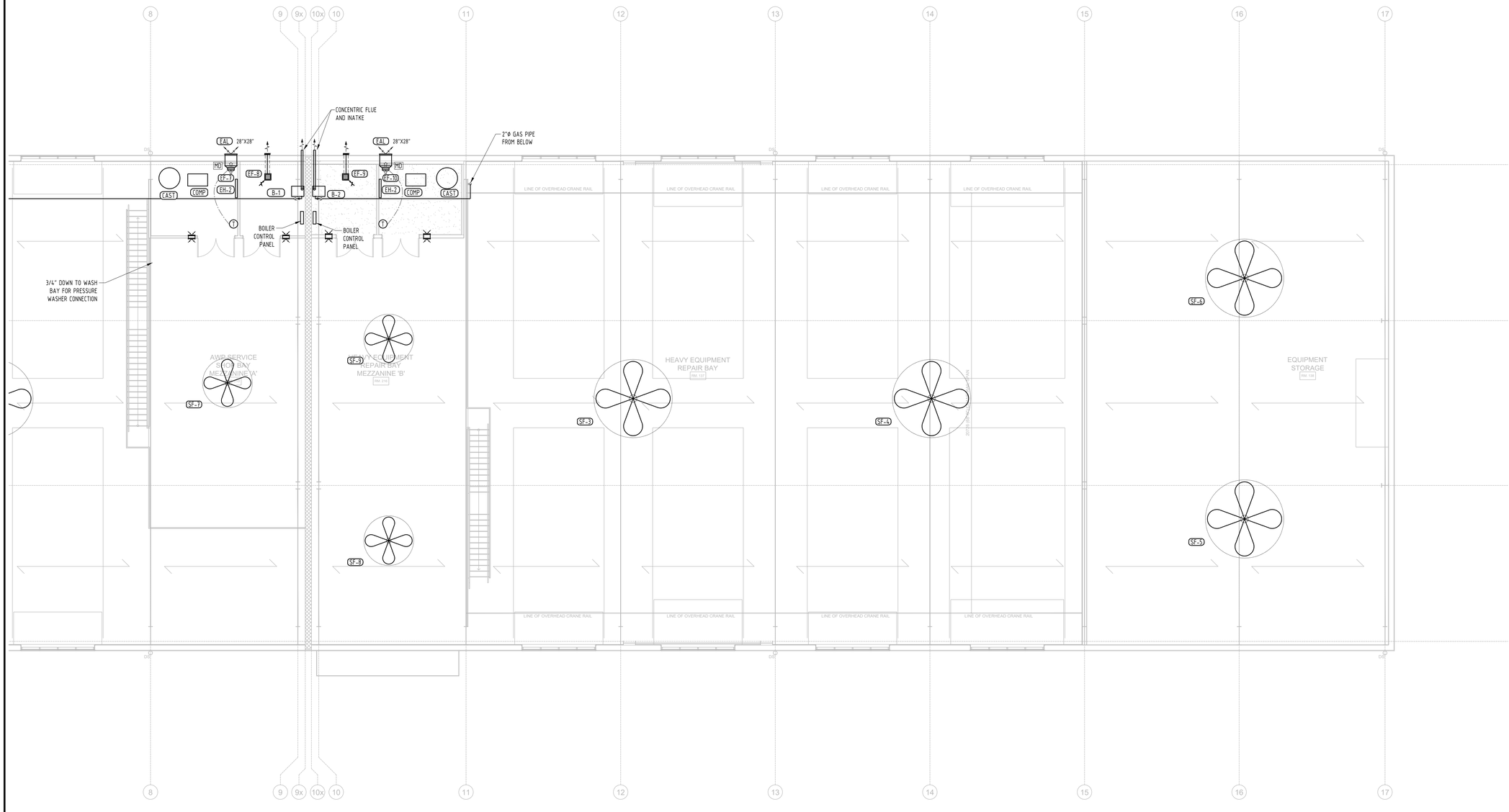
DRAWING TITLE:
SECOND FLOOR AND MEZZANINE A - FRONT HVAC LAYOUT

SEAL:

LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100500303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:	1 : 100
SHEET NO:	12 OF 15
PROJECT NO:	23074

M12



NOTES:

1. THERE CANNOT BE ANY PENETRATIONS THROUGH THE FIRE WALLS. ALL SERVICES MUST PASS UNDER THE SLAB TO THE ADJACENT AREA.

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ARGUE CONSTRUCTION LTD.

ISSUE	DESCRIPTION	CHECKED	DATE
1	25% COORDINATION	FH	2024-04-08
2	66% COORDINATION	FH	2024-05-07
3	BUILDING PERMIT	FH	2024-05-31

KEY PLAN

DRAWINGS ARE TO BE READ AS A PACKAGE AND ARE NOT INTENDED TO BE SEPARATED AND VIEWED INDIVIDUALLY BY DISCIPLINE.

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CLIENT:	ARGUE CONSTRUCTION LTD.

PROJECT:

SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

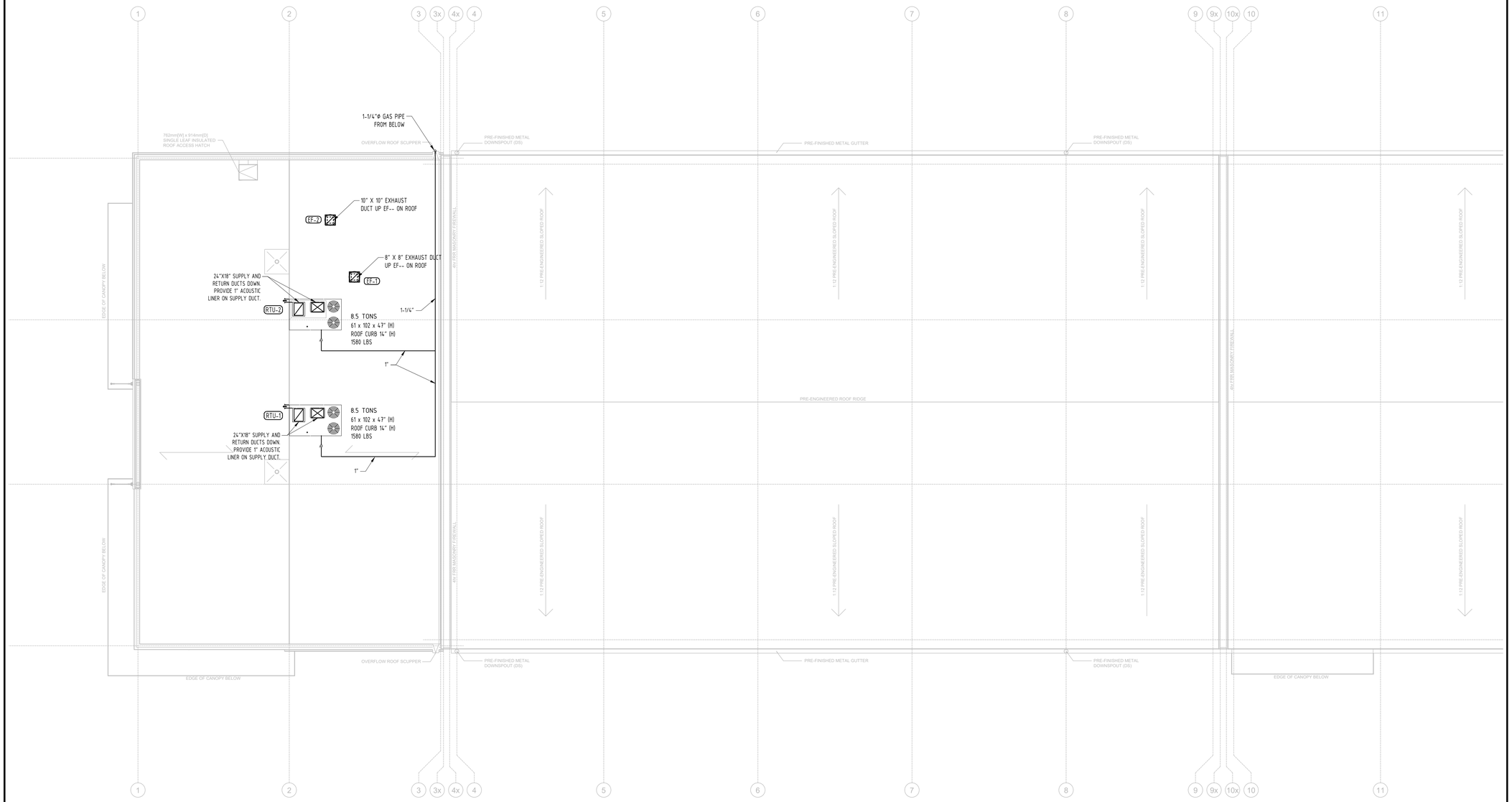
DRAWING TITLE:

MEZZANINE A & B - REAR
HVAC LAYOUT

SEAL:

SCALE:	1 : 100
SHEET NO:	13 OF 15
PROJECT NO:	23074

M13



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CLIENT:	ARGUE CONSTRUCTION LTD.

PROJECT:
SUNBELT RENTALS INC.
EQUIPMENT MAINTENANCE FACILTY
PHASE 1 BUILDING
151 - 159 Wescar Lane, Carp ON

DRAWING TITLE:

ROOF PLAN - FRONT
HVAC LAYOUT

SEAL:

LICENSED PROFESSIONAL ENGINEER
F. HATAM ARDESTANI
100500303
May 31, 2024
PROVINCE OF ONTARIO

SCALE:	1 : 100
SHEET NO:	14 OF 15
PROJECT NO:	23074

M14

SPECIFICATIONS

1.0 GENERAL

THIS SPECIFICATION IS ARRANGED BY SYSTEM TYPE AND COVERS BASIC MATERIALS ONLY.

1.1 REGULATIONS

ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH ALL APPLICABLE CODES, BY-LAWS, REGULATIONS AND THE REQUIREMENTS OF ANY AUTHORITY HAVING JURISDICTION.

MECHANICAL INSTALLATION TO MEET OR EXCEED THE LATEST EDITION OF THE FOLLOWING STANDARDS:

ONTARIO BUILDING CODE

ONTARIO PLUMBING CODE

ONTARIO FIRE CODE

ASHRAE

NFPA

CANADA OCCUPATIONAL HEALTH AND SAFETY REGULATIONS

IN THE EVENT CONFLICT BETWEEN DOCUMENT, THE DECISION OF THE CONSULTANT SHALL BE FINAL.

1.2 QUALIFICATIONS

MECHANICAL WORK IS TO BE CARRIED OUT BY QUALIFIED, LICENSED CONTRACTORS HAVING TRADE CERTIFICATES OF COMPETENCIES. SUBMIT CERTIFICATES AS PART OF PROJECT SUBMITTALS UPON REQUEST.

1.3 EXAMINATION OF PROJECT DOCUMENTS AND EXISTING SITE CONDITIONS

PRIOR TO SUBMITTING ANY TENDER, CONTRACTORS SHALL CAREFULLY EXAMINE THE DRAWINGS AND SPECIFICATIONS TO UNDERSTAND EXACTLY THE PROJECT SCOPE OF WORK AND THEY SHALL VISIT AND EXAMINE THE WORK SITE AND FULLY INFORM THEMSELVES OF ALL THE EXISTING CONDITIONS, LIMITATIONS AND DIFFICULTIES WHICH MAY ARISE. THE CONTRACTORS SHALL INCLUDE IN THEIR TENDERS THE COST OF ALL LABOUR, MATERIALS, EQUIPMENT AND SPECIALIZED SERVICES REQUIRED TO FULLY COMPLETE THE WORK. NO EXTRAS WILL BE ACCEPTED FOR WORK WHICH COULD HAVE BEEN DETERMINED THROUGH A CAREFULLY EXAMINATION OF THE EXISTING SITE CONDITIONS BY AN EXPERIENCED PERSON.

1.4 CERTIFICATES AND FEES

OBTAIN AND PAY FOR NECESSARY PERMITS, LICENSES, INSPECTIONS AND FEES REQUIRED. SUBMIT INSPECTION REPORTS AND CERTIFICATES OF ACCEPTANCE FROM THE AUTHORITIES HAVING JURISDICTION.

1.5 CO-OPERATION AND CO-ORDINATION WITH OTHER CONTRACTORS

CO-OPERATE WITH OTHER CONTRACTORS IN CARRYING OUT THEIR RESPECTIVE WORKS AND CARRY OUT INSTRUCTIONS FROM THE GENERAL CONTRACTOR. CO-ORDINATE WORK WITH THAT OF OTHER CONTRACTORS. IF ANY PART OF WORK UNDER THIS CONTRACT DEPENDS FOR ITS PROPER EXECUTION OR RESULT WORK OF ANOTHER CONTRACTOR, REPORT PROMPTLY TO CONSULTANT, IN WRITING, ANY DEFECTS WHICH MAY INTERFERE WITH PROPER EXECUTION OF WORK. MECHANICAL CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR LAYING OUT WORK AND FOR DAMAGE TO THE OWNER OR OTHER TRADES CAUSED BY IMPROPER LAYOUT.

1.6 SHOP DRAWINGS

CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMISSION TO THE ENGINEER. SHOP DRAWINGS NOT STAMPED, SIGNED, DATED AND IDENTIFIED AS TO SPECIFIC PROJECT WILL BE RETURNED WITHOUT BEING EXAMINED AND CONSIDERED REJECTED. SHOP DRAWINGS SHALL INCLUDE PRODUCT DESCRIPTION, MODEL, DIMENSIONS, COMPONENT SIZES, ROUGH-IN REQUIREMENTS, SERVICE SIZES, FINISHES, CONNECTIONS TO OTHER EQUIPMENT, PERFORMANCE DATA, POWER REQUIREMENTS AND ALL SPECIFIC TO THE SUBJECT MATERIALS AND/OR EQUIPMENT.

1.7 REVIEW BY CONSULTANT

CONSULTANT MAY ORDER ANY PART OF THE WORK TO BE REVIEWED, IF SUBMITTED PERFORMANCE DOCUMENTS (TEST AND INSPECTION REPORTS) ARE NOT ACCEPTABLE AND IF THE WORK IS SUSPECTED TO BE NOT IN ACCORDANCE WITH CONTRACT DOCUMENTS. IF, UPON REVIEW SUCH WORK IS FOUND NOT IN ACCORDANCE WITH CONTRACT DOCUMENTS OR DOES NOT SATISFY PERFORMANCE STANDARDS, CORRECT SUCH WORK AND PAY COST OF ADDITIONAL REVIEW AND CORRECTION.

1.8 WARRANTY

PROVIDE WARRANTY FOR ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP PERTAINING TO THIS PROJECT. WARRANTY DURATION SHALL NOT BE LESS THAN TWELVE (12) MONTHS FOLLOWING SUBSTANTIAL COMPLETION.

1.9 CLOSEOUT SUBMITTALS

PROVIDE TWO (2) BINDER COPIES PLUS ONE (1) SOFT COPY OF THE OPERATION AND MAINTENANCE DATA MANUAL THAT SHALL INCLUDE PRODUCT DATA, MANUFACTURER'S CERTIFICATES AND INSTRUCTIONS FOR INSTALLATION, MAINTENANCE AND OPERATION, TECHNICAL DESCRIPTIONS AND PARTS LIST, WIRING AND SCHEMATIC DIAGRAMS, TEST AND VERIFICATION REPORTS, SERVICE DEPOT LOCATIONS AND TELEPHONE NUMBERS, INSPECTION REPORTS AND CERTIFICATES OF ACCEPTANCE FROM AUTHORITIES HAVING JURISDICTION, PANEL SCHEDULES, AND WARRANTY LETTERS.

1.10 RECORD AS-BUILT DRAWINGS

KEEP ON SITE, AN EXTRA SET OF DRAWINGS AND SPECIFICATIONS RECORDING ALL CHANGES AND DEVIATIONS DAILY. UPON COMPLETION OF THE PROJECT, PROVIDE AN ACCURATELY UPDATED SET OF AS-BUILT DRAWINGS TO THE ENGINEER.

1.11 DELIVERY, HANDLING AND STORAGE

CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY TO RECEIVE, STORE AND HANDLE EQUIPMENT, FIXTURES AND MATERIALS COVERED UNDER THIS CONTRACT, PROTECT EQUIPMENT AND MATERIALS IN STORAGE ON SITE, DURING AND AFTER INSTALLATION UNTIL FINAL ACCEPTANCE. PROVIDE POLYETHYLENE COVERS AND CRATES TO ADEQUATELY PROTECT EQUIPMENT AND MATERIALS OR LEAVE FACTORY COVERS IN PLACE. TAKE SPECIAL PRECAUTIONS TO PREVENT ENTRY OF ANY FOREIGN MATERIAL INTO EQUIPMENT, PIPING AND DUCT SYSTEMS.

1.12 MATERIAL AND EQUIPMENT

IMMEDIATELY UPON SIGNING CONTRACT, REVIEW PRODUCT DELIVERY REQUIREMENTS AND ANTICIPATE FORESEEABLE SUPPLY DELAYS FOR ITEMS. IF DELAYS IN SUPPLY OR PRODUCTS ARE FORESEEABLE, NOTIFY CONSULTANT OF SUCH; IN ORDER THAT SUBSTITUTIONS OR OTHER REMEDIAL ACTION MAY BE AUTHORIZED IN AMPLE TIME TO PREVENT DELAY IN PERFORMANCE OF WORK. IN EVENT OF FAILURE TO NOTIFY CONSULTANT AT COMMENCEMENT OF WORK AND SHOULD IT SUBSEQUENTLY APPEAR THAT WORK MAY BE DELAYED FOR SUCH REASON, CONSULTANT RESERVES RIGHT TO SUBSTITUTE MORE READILY AVAILABLE PRODUCTS OF SIMILAR CHARACTER, AT NO INCREASE IN CONTRACT PRICE OR CONTRACT TIME.

MATERIAL AND EQUIPMENT SHALL BE NEW AND QUALIFY SPECIFIED, CSA APPROVED AND/OR ULC CERTIFIED. MAINTAIN UNIFORMITY OR MANUFACTURE FOR ANY PARTICULAR OR LIKE ITEM THROUGHOUT BUILDING EXCEPT WHERE SPECIFIED OTHERWISE. DEFECTIVE PRODUCTS, WHENEVER IDENTIFIED, WILL BE REJECTED REGARDLESS OF PREVIOUS INSPECTIONS. INSPECTION DOES NOT RELIEVE RESPONSIBILITY, BUT IS PRECAUTION AGAINST OVERSIGHT OR ERROR. REMOVE AND REPLACE DEFECTIVE PRODUCTS AT OWN EXPENSE AND BE RESPONSIBLE FOR DELAYS AND EXPENSES CAUSED BY REJECTION.

1.13 IDENTIFICATION

IDENTIFY WITH LAMACOID NAMEPLATES MECHANICAL EQUIPMENT SHOWN ON THE DRAWINGS AND/OR MENTIONED IN THE SPECIFICATION. IDENTIFY DUCTWORK AND PIPING THROUGHOUT WITH LABELS AND DIRECTION OF FLOW ARROWS. APPLY LABELS AT 9'/6" (14 MM) INTERVALS, BEFORE AND AFTER DUCTS AND PIPES PASS THROUGH WALLS AND AT ACCESS DOOR OPENINGS OR CLOSER. LABELS SHALL BE BLACK, 3/4" (19 MM) MINIMUM LETTERS ON WHITE BACKGROUNDS.

1.14 CUTTING, PATCHING AND FIRESTOPPING

MECHANICAL CONTRACTOR IS RESPONSIBLE FOR CUT OUT OR DRILL HOLES IN EXISTING CONSTRUCTION (THROUGH WALL, CEILING, OR FLOOR) NEEDED TO ACCOMMODATE DUCTWORK AND/OR PIPING. THE CONTRACTOR SHALL PROVIDE SCANNING PRIOR TO PERFORMING ANY NEW OPENINGS THROUGH A STRUCTURAL ELEMENT AND ENSURE THAT NO REINFORCING BAR IS CUT OUT WITHOUT APPROVAL OF A LICENSED STRUCTURAL ENGINEER AND THE BUILDING OWNER. ALL VOIDS AT FIRE RATED PENETRATIONS SHALL BE COMPLETELY SEALED WITH ULC APPROVED AND CERTIFIED FIRESTOPPING MATERIAL IN STRICT ACCORDANCE WITH THE MATERIAL MANUFACTURER'S INSTRUCTIONS. ARRANGE FOR HOLES THROUGH EXTERIOR WALLS AND ROOF TO BE FLASHED AND MADE WEATHERPROOF. MECHANICAL CONTRACTOR SHALL BEAR ALL COSTS OF CUTTING, PATCHING, INSULATION AND FIRESTOPPING RESULTING FROM THE MECHANICAL WORK.

1.15 LOCATION OF EQUIPMENT AND DISTRIBUTION SYSTEMS

LOCATION OF EQUIPMENT AND DISTRIBUTION SYSTEMS INDICATED OR SPECIFIED IS TO BE CONSIDERED AS APPROXIMATE. LOCATE EQUIPMENT AND DISTRIBUTION SYSTEMS TO PROVIDE MINIMUM INTERFERENCE AND MAXIMUM USABLE SPACE AND IN ACCORDANCE WITH PERTINENT CODES AND MANUFACTURER'S RECOMMENDATIONS FOR SAFETY, ACCESS AND MAINTENANCE. INFORM THE CONSULTANT OF IMPEDING INSTALLATION AND OBTAIN APPROVAL FOR ACTUAL LOCATION. ENSURE MANUFACTURER'S NAMEPLATES, CSA AND/OR ULC LABELS, AND IDENTIFICATION NAMEPLATES ARE VISIBLE AND LEGIBLE AFTER EQUIPMENT AND MATERIALS ARE INSTALLED.

1.16 LOCATION OF CONTROLS AND TERMINATIONS AND MOUNTING HEIGHTS

LOCATION OF CONTROLS AND TERMINATIONS SHOWN ON MECHANICAL DRAWINGS IS TO BE CONSIDERED AS APPROXIMATE. REFER TO INTERIOR DESIGNER DRAWINGS FOR EXACT LOCATION. IF MOUNTING HEIGHTS OR LOCATIONS OF CONTROLS AND TERMINATIONS ARE NOT INDICATED OF CONFLICTING, CONFIRM WITH CONSULTANT BEFORE PROCEEDING WITH INSTALLATION. CHANGE LOCATION OF CONTROLS AND TERMINATIONS AT NO EXTRA COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED 3000 MM, AND INFORMATION IS GIVEN BEFORE INSTALLATION.

1.17 CLEANING

CLEAN AND TOUCH UP SURFACES OF SHOP-PAINTED EQUIPMENT SCRATCHED OR MARRED DURING SHIPMENT OR INSTALLATION, TO MATCH ORIGINAL PAINT. CLEAN AND PRIME EXPOSED NON-GALVANIZED HANGERS, RACKS AND FASTENINGS TO PREVENT RUSTING. REMOVE STAINS, SPOTS, MARKS AND DIRT FROM MECHANICAL EQUIPMENT. REMOVE WASTE PRODUCTS AND DEBRIS OTHER THAN THAT CAUSED BY OWNER OR OTHER CONTRACTORS AT REGULARLY SCHEDULED TIMES. PRIOR TO FINAL REVIEW, REMOVE SURPLUS PRODUCTS, TOOLS, CONSTRUCTION MACHINERY AND EQUIPMENT, AND LEAVE WORK CLEAN AND SUITABLE FOR OCCUPANCY.

2.0 HANGERS AND SUPPORTS

2.1 INSERTS AND ANCHORS

THIS SECTION APPLIES WHERE PIPING IS SUPPORTED FROM CEILING SLABS, CONCRETE WALLS, COLUMNS, AND OTHER BUILDING MASONRY (EXCEPT FLOORS).

PLASTIC, LEAD OR FIBER SCREW ANCHORS, LAG SCREWS AND EXPANSION SHIELDS ARE NOT ACCEPTABLE FOR THIS APPLICATION.

2.2 HANGER RODS

SHALL BE HOT ROLLED STEEL WITH CUT COARSE THREADS.

ROD SIZES SHALL BE MINIMUM 3/8" (10MM)

HANGERS AND SUPPORTS FOR TUBING SHALL BE SPECIFIED FOR TUBING IN ORDER TO BE OF THE PROPER DIAMETER.

HANGERS AND SUPPORTS THAT ARE IN DIRECT CONTACT WITH COPPER SHALL BE COPPER-PLATED OR PLASTIC-COATED TO PREVENT ANY ELECTROLYTIC REACTION.

2.3 INSTALLATION

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL SUPPORTS, ANCHORS, AND HANGERS REQUIRED FOR THE SUSPENSION AND PLACEMENT OF THE PIPING REQUIRED FOR THIS INSTALLATION. PIPE HANGERS AND SUPPORTS SHALL BE INSTALLED TO ALLOW FOR EXPANSION AND CONTRACTION, AND PLACED CLOSE TO FITTINGS, VALVES, AND HEAVY EQUIPMENT. THEY SHALL BE INSTALLED SO THAT PIPING WILL BE FREE FROM VIBRATION, SAGGING OR MOVEMENT OTHER THAN CAUSED BY HEAT EXPANSION OR CONTRACTION. PIPING SHALL BE PITCHED AS SPECIFIED IN INDIVIDUAL SERVICE SPECIFICATIONS.

PIPING SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURES AND NOT FROM THE SUPPORTING SYSTEMS OR EQUIPMENT OF OTHER TRADES.

PIPE MAY BE SUPPORTED BY TRAPEZE HANGERS AND/OR IN TIERS, BUT THERE SHALL BE SUFFICIENT ROOM FOR INSTALLATION OF FITTINGS, INSULATION, ETC., AND FOR FUTURE REARRANGEMENT WORK OR MAINTENANCE.

THERE SHALL BE NO CUTTING, DRILLING OR WELDING ON THE BUILDING STEEL EXCEPT AS SHOWN ON THE CONTRACT DRAWINGS OR AS INSTRUCTED BY THE OWNER'S REPRESENTATIVE. MAXIMUM SPANS BETWEEN HANGERS FOR STRAIGHT HORIZONTAL RUNS OF STEEL AND COPPER PIPE SHALL BE 6 FEET.

ADDITIONAL HANGERS SHALL BE PROVIDED WHERE CONCENTRATED WEIGHTS SUCH AS VALVES OR HEAVY FITTINGS OCCUR, AND WHERE CHANGES IN DIRECTION OF THE PIPING SYSTEM OCCUR BETWEEN HANGERS.

HANGER RODS SHALL BE CONNECTED TO BEAM CLAMPS, CONCRETE INSERTS OR EXPANSION ANCHORS. "C" CLAMPS SHALL NOT BE ALLOWED. OFFSET SUSPENSION BY HANGERS IS NOT PERMITTED.

3.0 VIBRATION CONTROLS

3.1 ISOLATION PRODUCTS

OUTDOOR SPRINGS AND HOUSINGS TO BE CORROSION RESISTANT.

UNITS CONTAINING WATER THAT CAN BE DRAINED ARE TO USE A VERTICAL LIMITING SPRING AS F-2.

PADS

N1 - NEOPRENE WAFFLE OR RIBBED: 9 MM MINIMUM THICKNESS. DEFECTION AS SHOWN ON ISOLATION SCHEDULE. EQUAL TO KINETICS NPD PAD.

N2 - NEOPRENE-STEEL-NEOPRENE WAFFLE OR RIBBED: 21 MM MINIMUM THICKNESS. DEFECTION AS SHOWN ON ISOLATION SCHEDULE. EQUAL TO KINETICS NGD NEOPRENE-STEEL-NEOPRENE PAD.

HANGERS

SPRING HOUSINGS AND SPRINGS SHALL BE FINISHED WITH EPOXY-BASED POWDER COATING. HOUSING SHALL BE DESIGNED FOR A 500% OVERLOAD WITHOUT FAILURE AND TO ALLOW THE ROD TO MOVE BY 30 DEGREES WITHOUT METAL TO METAL CONTACT.

H1 - SPRING ELEMENT WITH A MINIMUM LATERAL STIFFNESS OF 1 TIMES THE VERTICAL STIFFNESS. DEFLECTION AS SHOWN ON ISOLATION SCHEDULE. EQUAL TO KINETICS SH.

H2 - SPRING ELEMENT WITH A MINIMUM LATERAL STIFFNESS OF 1 TIMES THE VERTICAL STIFFNESS. AN ELASTOMER ELEMENT SHALL BE USED ON THE ROD CONNECTING THE SPRING TO THE STRUCTURE FOR ADDED VIBRATION ISOLATION. DEFLECTION AS SHOWN ON ISOLATION SCHEDULE. EQUAL TO KINETICS SRH.

H3 - ELASTOMER ELEMENT. DEFLECTION AS SHOWN ON ISOLATION SCHEDULE. EQUAL TO KINETICS RH.

3.2 STRUCTURAL RAILS/BASES

PREFABRICATED STEEL BASE: INTEGRALLY WELDED ON SIZES UP TO 2400 MM ON SMALLEST DIMENSION, SPLIT FOR FIELD WELDING ON SIZES OVER 2400 MM ON SMALLEST DIMENSION AND REINFORCED FOR ALIGNMENT OF DRIVE AND DRIVEN EQUIPMENT, WITHOUT SUPPLEMENTARY HOLD DOWN DEVICES, COMPLETE WITH ISOLATION ELEMENTS ARRANGED TO MINIMIZE HEIGHT, PRE-DRILLED HOLES TO RECEIVE EQUIPMENT ANCHOR BOLTS, AND COMPLETE WITH ADJUSTABLE BUILT-IN MOTOR SLIDE RAIL WHERE INDICATED. REQUIREMENT AS SHOWN ON ISOLATION SCHEDULE. EQUAL TO KINETICS SFB.

3.3 CONCRETE INERTIA BASES

FULL DEPTH PERIMETER STRUCTURAL OR FORMED CHANNELS, FRAMES: WELDED IN PLACE REINFORCING RODS RUNNING IN BOTH DIRECTIONS, SPRING MOUNTED, CARRIED BY GUSSETED HEIGHT-SAVING BRACKETS WELDED TO FRAME, AND CLEAR HOUSEKEEPING PADS BY 1" (25 MM) MINIMUM. REQUIREMENT AS SHOWN ON ISOLATION SCHEDULE. EQUAL TO KINETICS CIB.

CONCRETE: TO SECTION 03300 BY GENERAL CONTRACTOR - CAST-IN-PLACE CONCRETE.

3.4 ISOLATION INSTALLATION

INSTALL VIBRATION ISOLATION EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND ADJUST MOUNTINGS TO LEVEL EQUIPMENT.

ENSURE PIPE, DUCT AND ELECTRICAL CONNECTIONS TO ISOLATED EQUIPMENT DO NOT REDUCE SYSTEM FLEXIBILITY. ENSURE THAT PIPE, CONDUIT AND DUCT PASSING THROUGH WALLS AND FLOORS DO NOT TRANSMIT VIBRATIONS.

BLOCK AND SHIM LEVEL BASES SO THAT DUCTWORK AND PIPING CONNECTIONS CAN BE MADE TO A RIGID SYSTEM AT THE OPERATING LEVEL. BEFORE ISOLATOR ADJUSTMENT IS MADE. ENSURE THAT THERE IS NO PHYSICAL CONTACT BETWEEN ISOLATED EQUIPMENT AND BUILDING STRUCTURE.

4.0 HOUSE-KEEPING PADS

4.1 PAD DIMENSIONS

PROVIDE 100 MM HIGH CONCRETE HOUSEKEEPING PADS FOR BASE-MOUNTED EQUIPMENT; SIZE PADS 50 MM LARGER THAN EQUIPMENT; CHAMFER PAD EDGES.

5.0 EQUIPMENT

5.1 HYDRONIC HEATING SYSTEM CONTROLS

PROVIDE HEAT PUMP SYSTEM LOOP CONTROL PANEL BY HEAT PUMP MANUFACTURER WITH THE FOLLOWING ACCESSORIES AND PROGRAMMED FEATURES. INSTALLATION OF FIELD CONTROLS AND WIRING BY CONTROL CONTRACTOR.

PANEL MOUNTED OPERATOR INTERFACE,

RETURN WATER TEMPERATURE SENSOR,

SUPPLY WATER TEMPERATURE SENSOR,

OUTSIDE AIR TEMPERATURE SENSOR,

FLUID FLOW MONITORING PRESSURE DIFFERENTIAL SWITCH,

NON-VOLATILE FLASH MEMORY BACKUP IN THE EVENT OF POWER LOSS.

LOOP CONTROL PANEL TO DISPLAY OUTSIDE AIR, RETURN WATER TEMPERATURE, SUPPLY WATER TEMPERATURE, RAMP VALUE, AND ALARM STATUS. THE RAMP VALUE, ASSOCIATED WITH SET POINT CONTROL, WILL BE ADJUSTABLE THROUGH THE ON BOARD LCD DEVICE.

6.0 DUCTWORK SYSTEMS

GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY.

SEALANT: NON-HARDENING, WATER RESISTANT, FIRE RESISTIVE LIQUID USED ALONE OR WITH TAPE.

SHEET METAL SCREWS SHALL NOT BE PERMITTED.

ALL TRANSVERSE AND LONGITUDINAL SEAMS AND CONNECTION JOINTS SHALL BE SEALED TO ACHIEVE THE LEAKAGE REQUIREMENTS, SMACNA SEAL CLASS "B".

6.1 RECTANGULAR DUCTWORK

ALL RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SMACNA STANDARD FOR THE PRESSURE CLASSIFICATION TO WHICH THE DUCT WILL BE OPERATED.

MANUFACTURED DUCT JOINING SYSTEMS SUCH AS DUCTMATE OR TRANSVERSE DUCT CONNECTORS (TDC) MAY BE USED, PROVIDED THEY MEET THE REQUIREMENTS OF SMACNA FOR THE PRESSURE CLASS AND INDEPENDENT TESTING LABORATORY DATA IS FURNISHED TO THE OWNER.

6.2 ROUND DUCTWORK

ROUND DUCTWORK SHALL BE SPIRAL LOCK SEAM, CONSTRUCTED IN ACCORDANCE WITH THE SMACNA STANDARD.

DUCTS TO BE UNDER NEGATIVE PRESSURE SHALL BE MADE TO THE 2" (50 MM) MAXIMUM W.C. STATIC NEGATIVE GAUGE REQUIREMENT (MINIMUM).

ASSEMBLY SHALL BE MADE WITH SELF-SEALING POP RIVETS. RIVETS SHALL BE SPACED APPROXIMATELY 200 MM APART WITH A MINIMUM OF 3 RIVETS PER CONNECTION.

DUCT-TO-DUCT JOINTS SHALL BE MADE WITH ROLLED BEAD REINFORCED SLEEVE COUPLINGS.

DUCT-TO-FITTING JOINTS SHALL BE BY SLIP-FIT OF ROLLED BEAD REINFORCED COLLAR ENDS ON FITTINGS INTO THE DUCT.

FOR DUCT, FITTINGS AND INSTALLATION METHODS NOT OTHERWISE SPECIFIED, UNITED SHEET METAL PRODUCTS AND METHODS SHALL BE THE STANDARD OF QUALITY TO DETERMINE EQUIVALENCY.

6.3 VOLUME CONTROL DAMPERS

FABRICATE IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE.

FABRICATE SPLITTER DAMPERS, SAME GAUGE AS DUCT TO 24" (600 MM) SIZE AND TWO GAUGES HEAVIER FOR LARGER SIZES, WITH DOUBLE THICKNESS SHEET METAL TO STREAMLINE SHAPE, SECURE WITH CONTINUOUS HINGE OR ROD. OPERATE WITH MINIMUM 6 MM DIAMETER ROD.

FABRICATE SINGLE BLADE DAMPERS FOR DUCTS SIZES TO 9-1/2 X 30 INCH (238 X 750 MM).

FABRICATE MULTI-BLADE DAMPER OF OPPOSED BLADE PATTERN WITH MAXIMUM BLADE SIZES 12 X 73 INCH (300 X 1800 MM). ASSEMBLE CENTRE AND EDGE CRIMPED BLADES IN PRIME COATED OR GALVANIZED CHANNEL FRAME WITH SUITABLE HARDWARE.

EXCEPT IN ROUND DUCTWORK 12" (300 MM) AND SMALLER, PROVIDE END BEARINGS, OIL-IMPREGNATED NYLON OR SINTERED BRONZE.

PROVIDE LOCKING, INDICATING QUADRANT REGULATORS ON SINGLE AND MULTI-BLADE DAMPERS. WHERE ROD LENGTHS EXCEED 30" (750 MM) PROVIDE REGULATOR AT BOTH ENDS.

6.4 FIRE DAMPERS

FABRICATE TO NFPA 90A, AND UL 555, CAN/ULC-S112 AND CAN/ULC-S112.2 AS INDICATED.

DAMPERS SHALL BE THE DYNAMIC TYPE WITH INTERLOCKING CURTAIN BLADE, WITH A UL LISTED 74°C <<165°F>> FUSIBLE LINK, UNLESS NOTED OTHERWISE.

FIRE DAMPERS SHALL CARRY THE UL FIRE DAMPER LABEL PER UL STANDARD 555, AND THE INSTALLATION SHALL COMPLY WITH NFPA 90A.

DAMPERS FOR VERTICAL OR HORIZONTAL INSTALLATIONS SHALL BE PROVIDED WITH CLOSURE SPRINGS AND LATCHES.

THE DAMPER DESIGN SHALL BE SUCH THAT THE DAMPER CURTAIN (BLADE PACKAGE) IS OUT OF THE AIR STREAM.

DUCT TO FIRE DAMPER SLEEVE CONNECTION SHALL BE THE BREAK AWAY TYPE ON BOTH SIDES OF THE PENETRATION. SLEEVES AND MOUNTING ANGLES SHALL BE A MINIMUM 16 GAUGE.

AN ACCESS DOOR OF ADEQUATE SIZE SHALL BE PROVIDED TO PERMIT REPLACEMENT OF THE FUSIBLE LINK.

7.0 SPRINKLER AND LIFE SAFETY

7.1 PIPE AND PIPE FITTINGS

STEEL PIPE: ASTM A53 OR A120, SCHEDULE 40 BLACK, WITH MALLEABLE IRON OR FORGED STEEL WELDING TYPE FITTINGS, SCREWED OR WELDED.

7.2 PIPING SPECIALTIES

AUTOMATIC SPRINKLER VALVE: FLOW DETECTOR WITH ALARM CIRCUITS, PRESSURE SWITCH, PRESSURE RETARD CHAMBER.

ALARM GONG: ELECTRIC TYPE.

7.3 SPRINKLER HEADS

SUSPENDED CEILING TYPE: STANDARD PENDANT TYPE WITH CHROME PLATED FINISH, WITH MATCHING ESCUTCHEON.

EXPOSED AREA TYPE: STANDARD UPRIGHT TYPE WITH CHROME PLATED FINISH.

SIDEWALL TYPE: CHROME PLATED FINISH WITH MATCHING ESCUTCHEON.

7.4 PORTABLE HAND FIRE EXTINGUISHERS

MULTI-PURPOSE DRY CHEMICAL: PRESSURIZED 4.5 KG (10 LB) CAPACITY SUITABLE FOR CLASS A, B, AND C FIRES WITH MOUNTING BRACKETS.

7.5 INSTALLATION

INSTALL PIPING IN ACCORDANCE WITH NFPA 13 FOR SPRINKLER SYSTEMS.

MECHANICAL GROOVED JOINTS MAY BE USED INSTEAD OF THREADED OR WELDED JOINTS. QUICK FIT, OR PRESS FIT JOINTS ARE NOT ACCEPTABLE.

PROVIDE GATE VALVES OR APPROVED BUTTERFLY VALVES, LOW POINTS OF PIPING AND APPARATUS.

PROVIDE DRAIN VALVES AT MAIN SHUT-OFF VALVES, LOW POINTS OF PIPING AND APPARATUS.

CENTRE SPRINKLER HEADS IN TWO DIRECTIONS IN CEILING TILE AND PROVIDE PIPING OFFSETS AS REQUIRED.

APPLY STRIPPABLE TAPE OR PAPER COVER TO ENSURE CONCEALED SPRINKLER HEAD COVER PLATES DO NOT RECEIVE FIELD PAINT FINISH.

PIPE DRAIN FROM PUMP BASE, STUFFING BOX, AND CASING TO FLOOR DRAIN. PROVIDE AIR VENT VALVE ON PUMP CASE. USE LONG RADIUS ELBOWS ON SUCTION SIDE OF PUMP.

7.6 SYSTEM TESTS

HYDROSTATICALLY TEST ENTIRE SYSTEM. TEST SHALL BE WITNESSED BY CONSULTANT OR PROJECT MANAGER.

8.0 PLUMBING SYSTEMS

MATERIALS

SANITARY SEWER PIPING AND VENT

CAST IRON PIPE AND FITTINGS; HUB-AND SPIGOT, NEOPRENE GASKETS, OR LEAD AND OAKUM JOINTS; OR HUBLESS WITH NEOPRENE GASKETS AND STAINLESS STEEL CLAMP-AND-SHIELD ASSEMBLIES.

FIRE RATED PVC PIPE: SCHEDULE 40 SYSTEM 15 XFR, SOLVENT WELD JOINTS TO CAN/ULC S102.2 AND CSA B181.2 STANDARDS.

STORM WATER PIPING

CAST IRON PIPE AND FITTINGS; HUB-AND-SPIGOT, NEOPRENE GASKETS, OR LEAD AND OAKUM JOINTS; OR HUBLESS WITH NEOPRENE GASKETS AND STAINLESS STEEL CLAMP-AND-SHIELD ASSEMBLIES.

FIRE RATED PVC PIPE: SCHEDULE 40 SYSTEM 15 XFR, SOLVENT WELD JOINTS TO CAN/ULC S102.2 AND CSA B181.2 STANDARDS.

NATURAL GAS PIPING

SCHEDULE 40 BLACK SEAMLESS STEEL, SCREWED (NPS 1/2 TO 2) AND/OR PLAIN END (NPS 2-1/2 AND OVER).

STEEL PIPE FITTINGS, SCREWED (CLASS 150 MALLEABLE IRON, BANDED), FLANGED (STEEL) AND/OR WELDED (BUTT-WELDING).

JOINTING MATERIALS, PULVERIZED LEAD PASTE FOR SCREWED FITTINGS, NONMETALLIC FLAT FOR FLANGE GASKETS AND/OR FUSION WELD FOR WELDED FITTINGS.

NSTALL ALL NATURAL GAS SYSTEM PIPING AND CONNECT EQUIPMENT IN ACCORDANCE WITH THE DEPARTMENT OF LABOUR "ONTARIO UTILIZATION REGULATION", INCLUDING LATEST AMENDMENTS, AND IN ACCORDANCE WITH THE LATEST REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.

SLOPE PIPING DOWN IN DIRECTION OF FLOW TO LOW POINTS.

USE ECCENTRIC REDUCERS AT PIPE SIZE CHANGE TO PROVIDE POSITIVE DRAINAGE.

PROVIDE C.G.A. APPROVED BALL TYPE SHUT-OFF VALVES TO ISOLATE ALL EQUIPMENT AND WHEREVER ELSE SHOWN.

FLANGES, UNIONS, AND COUPLINGS

PIPE SIZE 2" (50 MM) AND UNDER: MALLEABLE IRON UNIONS FOR FERROUS PIPING; SOLDERED BRONZE UNIONS FOR COPPER PIPE.

PIPE SIZE OVER 2" (50 MM): FORGED STEEL SLIP-ON FLANGES FOR FERROUS PIPING; BRONZE FLANGES FOR COPPER PIPING.

GROOVED AND SHOULDERED PIPE END COUPLINGS: MALLEABLE IRON HOUSING, COMPOSITION SEALING GASKET, STEEL BOLTS, NUTS, AND WASHERS.

DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.

GATE VALVES

VALVES UP TO 2" (50 MM): BRONZE BODY, NON-RISING STEM, HANDWHEEL, INSIDE SCREW, SINGLE WEDGE OR DISC, SOLDER OR THREADED ENDS.

VALVES OVER 2" (50 MM): IRON BODY, BRONZE TRIM, RISING STEM, HANDWHEEL, OS&Y, SINGLE WEDGE, FLANGED OR GROOVED ENDS.

GLOBE VALVES

VALVES UP TO 2" (50 MM): BRONZE BODY, RISING STEM AND HANDWHEEL, INSIDE SCREW, RENEWABLE COMPOSITION DISC, SOLDER OR SCREWED ENDS, WITH BACK SEATING CAPACITY.

VALVES OVER 2" (50 MM): IRON BODY, BRONZE TRIM, RISING STEM, HANDWHEEL, OS&Y, PLUG-TYPE DISC, FLANGED ENDS.

BALL VALVES

VALVES UP TO 2" (50 MM): [BRONZE] [STAINLESS STEEL] BODY, STAINLESS STEEL BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE [AND BALANCING STOPS], [SOLDER OR] THREADED ENDS [WITH UNION].

VALVES OVER 2" (50 MM): CAST STEEL BODY, CHROME PLATED STEEL BALL, TEFLON SEAT STUFFING BOX SEALS, LEVER HANDLE.

GAS COCKS

COCKS UP TO 2" (50 MM): BRONZE BODY, BRONZE TAPERED PLUG, NON-LUBRICATED, TEFLON PACKING, THREADED ENDS.

COCKS OVER 2" (50 MM): CAST IRON STEEL BODY AND PLUG, NON-LUBRICATED, TEFLON PACKING, FLANGED ENDS.

BUTTERFLY VALVES

VALVES: IRON BODY, BRONZE DISC, RESILIENT REPLACEABLE SEAT FOR SERVICE TO 180 DEGREES F (82 DEGREES C), WATER OR LUG ENDS, 10 POSITION LEVER HANDLE OR INFINITE LEVER HANDLE WITH MEMORY STOP.

SWING CHECK VALVES

VALVES UP TO 2" (50 MM): BRONZE SWING DISC, SOLDER OR SCREWED ENDS.

VALVES OVER 2" (50 MM): IRON BODY, BRONZE TRIM, SWING DISC, RENEWABLE DISC AND SEAT, FLANGED ENDS.

SPRING LOADED CHECK VALVES

VALVES: IRON BODY, BRONZE TRIM, SPRING LOADED, RENEWABLE COMPOSITION DISC, SCREWED, WAFER OR FLANGED ENDS.

WATER PRESSURE REDUCING VALVES

VALVES UP TO 2" (50 MM): BRONZE BODY, STAINLESS STEEL AND THERMOPLASTIC INTERNAL PARTS, FABRIC REINFORCED DIAPHRAGM, STR