

2010 - M01 - NOTES & ABBREVIATION | October 10, 2020 16:20:18 | ARCH (full sheet) D (38.00 x 24.00 inches)

1. GENERAL REQUIREMENTS:

1.1.	INTENT:	1.1.1.	PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL MECHANICAL SYSTEMS TO MEET REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORD WITH APPLICABLE CODES AND ORDINANCES.
1.1.2.		1.1.2.	CONTRACT DOCUMENTS OF THIS SPECIFICATION, NOTES AND MECHANICAL SERIES DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE UNLESS DETAILED OTHERWISE. THEY ESTABLISH SCOPE, MATERIAL, AND INSTALLATION QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS.
1.1.3.		1.1.3.	FOLLOW MANUFACTURERS RECOMMENDED INSTALLATION DETAILS AND PROCEDURES FOR EQUIPMENT, SUPPLEMENTED BY REQUIREMENTS OF CONTRACT DOCUMENTS.
1.1.4.		1.1.4.	INSTALL EQUIPMENT GENERALLY IN LOCATIONS AND ROUTES SHOWN, CLOSE TO BUILDING STRUCTURE WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE. REMOVE AND REPLACE IMPROPERLY INSTALLED EQUIPMENT TO SATISFACTION OF THE OWNER AT NO EXTRA COST.
1.1.5.		1.1.5.	CONNECT TO EQUIPMENT SPECIFIED IN OTHER SECTIONS AND TO EQUIPMENT SUPPLIED AND INSTALLED BY OTHER CONTRACTORS OR BY THE OWNER. UNCRATE EQUIPMENT , MOVE IN PLACE AND INSTALL COMPLETE; START-UP AND TEST.
1.2.	MATERIALS:	1.2.1.	MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT AND OF QUALITY SPECIFIED. USE SAME BRAND OR MANUFACTURER FOR EACH SPECIFIC APPLICATION.
1.2.2.		1.2.2.	STATICALLY AND DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR MINIMUM VIBRATION AND LOW OPERATING NOISE LEVEL.
1.3.	CUTTING AND PATCHING:	1.3.1.	PROVIDE HOLES AND SLEEVES. CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED HOLES AND SLEEVES.
1.3.2.		1.3.2.	DRILL FOR EXPANSION BOLTS, HANGER RODS, BRACKETS AND SUPPORTS.
1.3.3.		1.3.3.	OBTAIN WRITTEN APPROVAL FROM ENGINEER BEFORE CUTTING OR BURNING STRUCTURAL MEMBERS.
1.3.4.		1.3.4.	PATCH BUILDING WHERE DAMAGED FROM EQUIPMENT INSTALLATION, IMPROPERLY LOCATED HOLES ETC. USE MATCHING MATERIALS AS SPECIFIED IN THE RESPECTIVE SECTION.
1.4.	SHOP DRAWINGS:	1.4.1.	CLEARLY MARK SUBMITTAL MATERIAL USING ARROWS, UNDERLINING OR CIRCILING TO SHOW DIFFERENCES FROM SPECIFIED, EG. RATINGS, CAPACITIES AND OPTIONS BEING PROPOSED. CROSS OUT NON-APPLICABLE MATERIAL. SPECIFICALLY NOTE ON THE SUBMITTAL SPECIFIED FEATURES SUCH AS SPECIAL TANK LININGS, PUMPS SEALS MATERIALS ON PAINTING.
1.4.2.		1.4.2.	DO NOT ORDER EQUIPMENT OR MATERIAL UNTIL ENGINEER HAS REVIEWED, APPROVED AND RETURNED SHOP DRAWING.
1.5.	TEMPORARY HEAT:	1.5.1.	DO NOT USE THE PERMANENT SYSTEM FOR TEMPORARY HEATING PURPOSES WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.
1.5.2.		1.5.2.	OPERATE HEATING SYSTEMS UNDER CONDITIONS WHICH ENSURE NO TEMPORARY OR PERMANENT DAMAGE. OPERATE FANS AT PROPER RESISTANCE WITH FILTERS INSTALLED. CHANGE FILTERS AT REGULAR INTERVALS. OPERATE WITH PROPER SAFETY DEVICES AND CONTROLS INSTALLED AND FULLY OPERATIONAL.
1.5.3.		1.5.3.	WHEN PUMPS ARE USED FOR TEMPORARY HEATING, REPLACE MECHANICAL SEALS, REGARDLESS OF CONDITION, WITH NEW MECHANICAL SEALS.
1.6.	EQUIPMENT PROTECTION AND CLEAN UP:	1.6.1.	PROTECT EQUIPMENT AND MATERIALS IN STORAGE ON SITE DURING AND AFTER INSTALLATION UNTIL FINAL ACCEPTANCE. LEAVE FACTORY COVERS IN PLACE. TAKE SPECIAL PRECAUTIONS TO PREVENT ENTRY OF FOREIGN MATERIAL INTO WORKING PARTS OF PIPING AND DUCT SYSTEMS.
1.6.2.		1.6.2.	OPERATE, DRAIN AND FLUSH OUT BEARINGS AND REFILL WITH NEW CHANGE OF OIL, BEFORE FINAL ACCEPTANCE.
1.6.3.		1.6.3.	THOROUGHLY CLEAN PIPING, DUCTS AND EQUIPMENT OF DIRT, CUTTINGS AND OTHER FOREIGN SUBSTANCES. AFTER AND PRIOR TO START-UP.
1.6.4.		1.6.4.	ENSURE THAT EXISTING EQUIPMENT IS CAREFULLY DISMANTLED AND NOT DAMAGED OR LOST. DO NOT REUSE EXISTING MATERIALS AND EQUIPMENT UNLESS SPECIFICALLY INDICATED.
1.7.	SITE UTILITY SERVICES:	1.7.1.	MAINTAIN LIAISON WITH ENGINEER TO INTERRUPT, RE-ROUTE OR CONNECT TO WATER, SEWER, HEATING, OR GAS SYSTEMS, WITH MINIMUM INTERRUPTION OF SERVICES.
1.8.	ELECTRICAL MOTORS	1.8.1.	SUPPLY MECHANICAL EQUIPMENT COMPLETE WITH ELECTRICAL MOTORS.
1.8.2.		1.8.2.	PROVIDE MOTORS TO CEMA AND CSA STANDARDS FOR HARD, CONTINUOUS SERVICE, DESIGNED TO LIMIT TEMPERATURE RISE TO 40 DEGREES FOR OPEN HOUSING AND 50 DEGREES FOR DRIP PROOF HOUSING, AND OPERATE AT 1200 OR 1800 RMIN UNLESS OTHERWISE SPECIFIED.
1.8.3.		1.8.3.	MOTORS SHALL HAVE BALL OR ROLLER TYPE BEARINGS
1.8.4.		1.8.4.	REFER TO ELECTRICAL SPECIFICATION FOR VOLTAGE, PHASE AND CYCLE.
1.9.	WARRANTY	1.9.1.	CONTRACTOR SHALL WARRANT ALL WORK PERFORMED BY HIMSELF AND HIS SUB-CONTRACTORS FOR A PERIOD OF ONE YEAR FOLLOWING OWNER ACCEPTANCE OF WORK.

2. PLUMBING:

2.1.	GENERAL REQUIREMENTS:	2.1.1.	PROVIDE MATERIALS, EQUIPMENT AND LABOR TO INSTALL PLUMBING AS REQUIRED BY PROVINCIAL AND LOCAL CODES AND AS SPECIFIED HEREIN.
2.1.2.		2.1.2.	PROVIDE WATER AND DRAINAGE CONNECTIONS TO EQUIPMENT FURNISHED IN OTHER SECTIONS OF THIS SPECIFICATION.
2.1.3.		2.1.3.	PROVIDE AN APPROVED WATER METER AND BYPASS INSTALLATION CONFORMING TO BC BUILDING CODE AND/OR CSA STANDARDS.
2.2.	PIPING:	2.2.1.	INSTALL PIPING SYSTEMS IN ACCORDANCE WITH THE FOLLOWING:
2.2.1.1.		2.2.1.1.	NATURAL GAS AND PROPANE DISTRIBUTION SYSTEMS: TO CANIGCA B149.1.
2.2.1.2.		2.2.1.2.	PLUMBING AND DRAINAGE SYSTEM: BRITISH COLUMBIA PLUMBING CODE 2012 REGULATION 119/2007 - PLUMBING CODE REGULATION.
2.2.1.3.		2.2.1.3.	HEATING AND COOLING SYSTEM: TO COMPLY WITH RECOMMENDATIONS OF ASHRAE GUIDE.
2.2.2.		2.2.2.	INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT EXCEEDING MAXIMUM ALLOWABLE STRESS FOR PIPE AND EQUIPMENT FLANGES
2.2.3.		2.2.3.	PROVIDE CLEARANCE FOR PROPER INSTALLATION OF INSULATION AND FOR ACCESS TO VALVES, AIR VENTS, DRAINS AND UNIONS.
2.2.4.		2.2.4.	PROVIDE ALL OFFSETS NECESSARY TO INSTALL PIPING SYSTEMS WITHIN THE PHYSICAL LIMITATIONS OF THE BUILDING.
2.3.	ROUTES AND GRADES:	2.3.1.	ROUTE PIPING IN AN ORDERLY MANNER AND MAINTAIN PROPER GRADES.
2.3.2.		2.3.2.	ROUTE ABOVE GRADE PIPING PARALLEL TO WALLS.
2.3.3.		2.3.3.	INSTALL CONCEALED PIPES AS CLOSE TO BUILDING STRUCTURE TO KEEP FURRING TO A MINIMUM. SLOPE HYDRONIC AND DOMESTIC WATER SYSTEM PIPING AT 0.2% AND DRAIN AT LOW POINTS.
2.3.4.		2.3.4.	MAKE REDUCTIONS IN WATER, STEAM AND CONDENSATE PIPING WITH ECCENTRIC REDUCING FITTINGS TO PROVIDE COMPLETE DRAINAGE AND VENTING.
2.4.	CLEAN-OUTS:	2.4.1.	PROVIDE CAULKED OR THREADED TYPE EXTENDED TO FINISHED FLOOR OR WALL SURFACE. PROVIDE BOLTED COVERPLATE CLEAN-OUTS ON VERTICAL RAINWATER LEADERS ONLY. ENSURE AMPL E CLEARANCE AT CLEAN-OUT FOR RODDING OF DRAINAGE SYSTEM.
2.4.2.		2.4.2.	FLOOR CLEAN-OUT ACCESS COVERS IN UNFINISHED AREAS SHALL BE ROUND WITH NICKEL BRONZE SCORIATED FRAMES AND PLATES. PROVIDE ROUND ACCESS COVERS IN FINISHED AREAS WITH DEPRESSED CENTER SECTION TO ACCOMMODATE FLOOR FINISH. WALL CLEAN-OUTS TO HAVE CHROME PLATED CAPS.
2.5.	FLOOR DRAINS:	2.5.1.	FLOOR DRAINS SHALL HAVE LACQURED CAST IRON BODY WITH DOUBLE DRAINAGE FLANGE, WEEP HOLES COMBINED

2.5.2.	TWO PIECE BODY REVERSIBLE CLAMPING DEVICE AND ADJUSTABLE NICKEL/BRONZE STRAINER. SHOWER AND WASHROOM FLOOR DRAINS SHALL HAVE A REMOVABLE PERFORATED SEDIMENT BUCKET
2.6.	SUMP:
2.6.1.	REINFORCED CONCRETE SUMPS SHALL HAVE NECESSARY DRAINAGE FITTINGS, 10MM CHECKERED STEEL PLATE COVERS WITH GASKET SEAL FRAMES ANCHOR BOLTS.
2.7.	VALVES:
2.7.1.	PROVIDE AND INSTALL ISOLATION VALVES TO SERVE EACH PLUMBING FIXTURE, GAS FIRED APPLIANCE.
2.7.2.	BALL - ISOLATING SERVICES 50MM OR SMALLER: BODY AND TRIM: BRONZE STEM: BRASS CONNECTION: SCREWED ENDS. SEATS: BUNA UP TO 90°C VITON UP TO 150°C BALL: BRASS CHROME PLATED
2.7.3.	PLUG COCKS - 50MM AND SMALLER: BODY: CAST IRON PLUGS AND WASHERS: BRASS CONNECTION: SCREWED ENDS
2.7.4.	HOSE BIBBS - STANDARD TYPE HOSE BIBBS BODY: BRONZE OR RED BRASS DISC: REPLACEABLE HEXAGONAL SPOUT: WITH HOSE THREAD FINISH: CHROME PLATED ON EXPOSED SURFACES
2.8.	PLUMBING FIXTURES AND TRIM:
2.8.1.	PLUMBING FIXTURES SHALL MEET OR EXCEED CAN/CSA-B45 SERIES - 94, CSA STANDARDS ON PLUMBING FIXTURES AND REQUIREMENTS OF THE PROVINCIAL PLUMBING CODE.
2.8.2.	PROVIDE AND INSTALL NEW PLUMBING FIXTURES AND TRIM AS OUTLINES IN THE PLUMBING FIXTURE SCHEDULE.
2.8.3.	MAKE ALL REQUIRED CONNECTIONS TO PLUMBING FIXTURES AS REQUIRED. INSTALLATIONS SHALL COMPLY WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS AND IN ACCORDANCE WITH THE PLUMBING CODE AND LOCAL AUTHORITIES.
2.8.4.	INSTALL EACH FIXTURE WITH ITS OWN TRAP, EASILY REMOVABLE FOR SERVICING AND CLEANING. AT COMPLETION THOROUGHLY CLEAN PLUMBING FIXTURE AND EQUIPMENT.
2.8.5.	PROVIDE CHROME PLATED RIGID OR FLEXIBLE SUPPLIES TO FIXTURES WITH SCREWDRIVER STOPS, REDUCERS AND ESCUTCHEONS.
2.8.6.	INSTALL WALL MOUNTED LAVATORIES, URINALS AND WATER CLOSETS WITH APPROVED WALL CARRIERS, MODEL TO SUIT INSTALLATION.
2.9.	PLUMBING FIXTURE ROUGH-IN:
2.9.1.	IT IS THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO CONFIRM EXACT LOCATIONS ON SITE OF ALL FIXTURES REQUIRING WATER, WASTE AND GAS CONNECTIONS PRIOR TO INSTALLATION. PIPE, DRAIN AND VENTS TO BE INDIVIDUAL FIXTURES SHALL BE ACCORDING TO PLUMBING ROUGH-IN SCHEDULE.
2.9.2.	CONFIRM ALL PIPE SIZES, CONNECTIONS AND LOCATIONS WITH DRAWINGS PRIOR TO INSTALLATION.
2.9.3.	PIPING IS TO BE RUN CONCEALED, ONLY IN THE CASE OF APPROVAL FROM ENGINEER OR INDICATED.
2.10.	INSTALLATION:
2.10.1.	BURY OUTSIDE WATER AND DRAINAGE PIPE MINIMUM 2400mm.
2.10.2.	INSTALL CAST IRON CONNECTIONS FROM WEEPING TILE TO SANITARY DRAINAGE SYSTEM INCLUDING BACK WATER VALVE, DEEP SEAL P-TRAP AND CLEAN-OUT. PROVIDE ACCESS FOR SERVICING OF BACKWATER VALVE.
2.10.3.	LUBRICATE CLEAN-OUT PLUGS WITH MIXTURE OF GRAPHITE AND LINSEED OIL. PRIOR TO BUILDING TURNOVER REMOVE CLEAN-OUT PLUGS, RE-LUBRICATE AND REINSTALL USING ONLY ENOUGH FORCE TO ENSURE PERMANENT LEAKPROOF JOINT.
2.10.4.	INSTALL VACUUM BREAKERS ON PLUMBING LINES WHERE CONTAMINATION OF DOMESTIC WATER MAY OCCUR. GENERALLY NECESSARY ON BOILER MAKE-UP LINES, HOSE BIBS AND FLUSH VALVES.
2.10.5.	INSTALL GAS PIPING IN OPEN OR VENTILATED SPACES. PITCH LINES AND PROVIDE DRIP LEGS FOR CONDENSATION COLLECTION POINTS. WHERE GAS PIPING IS RUN IN A CONCEALED SPACE, PROVIDE VENTILATION GRILLES AS REQUIRED.
2.10.6.	WHERE FLOOR DRAINS ARE LOCATED OVER OCCUPIED AREAS, PROVIDE WATERPROOF INSTALLATION.
2.10.7.	INSTALL TRAP PRIMER WHERE REQUIRED BY CODES AND/OR WHERE INDICATED ON DRAWINGS.
2.10.8.	DRAINAGE LINES SHALL GRADE 2MM PER 100mm UNLESS OTHERWISE INDICATED ON DRAWINGS.
2.10.9.	PRESSURE REDUCING VALVES SHALL BE INSTALLED TO LIMIT MAXIMUM STATIC PRESSURE AT PLUMBING FIXTURES TO 500KPA.
2.11.	SERVICES:
2.11.1.	PROVIDE NEW SANITARY SEWER SERVICES. BEFORE COMMENCING WORK CHECK INVERT ELEVATIONS REQUIRED FOR SEWER CONNECTIONS, CONFIRM INVERTS AND ENSURE THAT THESE CAN BE PROPERLY CONNECTED WITH SUFFICIENT SLOPE FOR DRAINAGE AND ADEQUATE COVER TO AVOID FREEZING.
2.11.2.	PROVIDE NEW WATER SERVICE COMPLETE WITH WATER METER AND BY-PASS VALVES. PROVIDE NECESSARY THRUST BLOCKS UNDERGROUND WATER PIPING AS REQUIRED AND DETAILED. PROVIDE SLEEVE IN WALL FOR SERVICE MAIN AND ADEQUATELY SUPPORT AT WALL WITH REINFORCED CONCRETE BRIDGE. CAULK ENLARGED SLEEVE AND MAKE WATERTIGHT WITH PLIABLE MATERIAL. SECURELY ANCHOR SERVICE MAIN INSIDE CONCRETE WALL. PROVIDE 1.2mm GALVANIZED SHEET METAL SLEEVE AROUND SERVICE MAIN TO 150mm ABOVE FLOOR AND 1800mm ABOVE FLOOR AND 1800mm MINIMUM BELOW GRADE. SIZE FOR MINIMUM OF 50mm OF LOOSE FILL INSULATION.
2.11.3.	PROVIDE NEW GAS SERVICE COMPLETE WITH GAS METERS AND REGULATORS. GAS SERVICE DISTRIBUTION PIPING SHALL HAVE INITIAL MINIMUM PRESSURE AS SPECIFIED IN MECHANICAL GAS DRAWING. PROVIDE REGULATORS ON EACH LINE SERVICING GRAVITY TYPE APPLIANCE, SIZED IN ACCORDANCE WITH EQUIPMENT. THESE REGULATORS ARE IN ADDITION TO NORMAL CONTROLS.

3. HEATING, VENTILATION AND AIR-CONDITIONING

3.1.	GENERAL REQUIREMENTS:	3.1.1.	DUCT AND PIPING ELEVATIONS SHOWN ARE APPROXIMATE. VERIFY ELEVATIONS PRIOR TO INSTALLATION IN THE FIELD. EXCEPT WHERE DIMENSIONS ARE SPECIFICALLY INDICATED. MECHANICAL DRAWINGS ARE GENERALLY DIAGRAMMATIC AND SHALL NOT BE SCALED. SIZE AND LOCATIONS OF EQUIPMENT IS SHOWN TO SCALE WHERE POSSIBLE.
3.1.2.		3.1.2.	DRAWINGS INDICATE THE REQUIRED SIZE AND ROUTES OF SYSTEM ELEMENTS. IT IS NOT INTENDED TO INDICATE ALL OFFSETS, RISERS OR FITTINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL SYSTEM ELEMENTS IN A MANNER TO CONFORM TO BUILDING STRUCTURE AND AVOID OBSTRUCTIONS.
3.1.3.		3.1.3.	REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF LOUVERS AND ROOF OPENINGS.
3.2.	MATERIALS:	3.2.1.	DUCTS: GALVANIZED STEEL LOCK FORMING QUALITY, HAVING GALVANIZED COATING TO ASTM A653M-96, G90 DESIGNATION FOR BOTH SIDES.
3.2.2.		3.2.2.	FLEXIBLE DUCTS: CORRUGATED ALUMINUM OR FABRIC SUPPORTED BY HELICALLY WOUND STEEL WIRE OR FLAT STEEL STRIPS.
3.3.	FABRICATION:	3.3.1.	COMPLETE METAL DUCTS WITH THEMSELVES WITH NO SINGLE PARTITION BETWEEN DUCTS. WHERE WIDTH OF DUCT EXCEEDS 450MM CROSS BREAK FOR RIGIDITY. OPEN CORNERS ARE NOT ACCEPTABLE.
3.3.2.		3.3.2.	LAP METAL DUCTS IN DIRECTION OF AIR FLOW. HAMMER DOWN EDGES AND SLIPS TO LEAVE SMOOTH DUCT INTERIOR.
3.3.3.		3.3.3.	CONSTRUCT TEES, BENDS, AND ELBOWS WITH RADIUS OF NOT LESS THAN 1.5 TIMES THE WIDTH OF DUCT ON CENTRE LINE.
3.3.4.		3.3.4.	INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15 DEGREES DIVERGENCE WHEREVER POSSIBLE.
3.3.5.		3.3.5.	MAXIMUM DIVERGENCE:
3.3.5.1.		3.3.5.1.	UPSTREAM OF EQUIPMENT: 30 DEGREES
3.3.5.2.		3.3.5.2.	DOWNSTREAM OF EQUIPMENT: 45 DEGREES
3.3.6.		3.3.6.	RIGIDLY CONSTRUCT METAL DUCTS WITH JOINTS MECHANICALLY TIGHT, SUBSTANTIALLY AIRTIGHT, BRACED AND STIFFENED SO AS NOT TO BREATHE, RATTLE, VIBRATE OR SAG. CAULK JOINTS DUCT JOINTS AND CONNECTIONS WITH SEALANT AS DUCTS ARE BEING ASSEMBLED.

3.4. INSTALLATION:

3.4.1.	LOCATE DUCTS WITH SUFFICIENT SPACE AROUND EQUIPMENT TO ALLOW NORMAL OPERATING AND MAINTENANCE ACTIVITIES.
3.4.2.	CLEAN DUCT SYSTEMS AND FORCE AIR AT HIGH VELOCITY THROUGH DUCT TO REMOVE ACCUMULATED DUST. TO OBTAIN SUFFICIENT AIR, CLEAN HALF THE SYSTEM AT A TIME. PROTECT EQUIPMENT WHICH MAY BE HARMED BY EXCESSIVE DIRT WITH FILTERS, OR BYPASS DURING CLEANING.
3.4.3.	CLEAN DUCT SYSTEMS WITH HIGH POWER VACUUM MACHINES. PROTECT EQUIPMENT WHICH MAY BE HARMED WITH EXCESSIVE DIRT WITH FILTERS, OR BYPASS DURING CLEANING. PROVIDE ADEQUATE ACCESS INTO DUCTWORK FOR CLEANING PURPOSES
3.4.4.	CONNECT TERMINAL UNITS TO MEDIUM OR HIGH PRESSURE DUCTS WITH 300 mm MAXIMUM LENGTH OF FLEXIBLE DUCT. DO NOT USE FLEXIBLE DUCT TO CHANGE DIRECTION.
3.4.5.	CONNECT DIFFUSERS OR TROFFER BOOTS TO LOW PRESSURE DUCTS WITH 1.5M MAXIMUM LENGTH OF FLEXIBLE DUCT. HOLD IN PLACE WITH CAULKING COMPOUND AND STRAP OR CLAMP.
3.4.6.	INSTALL VOLUME DAMPERS IN ALL BRANCH DUCTWORK AS REQUIRED FOR BALANCING. SINGLE BLADE WITH LOCKING QUADRANT.
3.4.7.	PROVIDE AND INSTALL ULC APPROVED FIRE DAMPER INSTALLATIONS IN ALL DUCTWORK AND DUCT OPENINGS PASSING THROUGH REQUIRED FIRE SEPARATIONS AND WALLS.
3.4.8.	ALL AIR-HANDLING DUCTS, PLENUMS AND RUN-OUTS FORMING PART OF A HEATING, VENTILATION, OR AIR-CONDITIONING SYSTEM SHALL BE THERMALLY INSULATED IN ACCORDANCE WITH ASHRAE 90.1-2016.
3.5.	DUCT SEALING
3.5.1.	ALL DUCTS SHALL BE CONSTRUCTED, INSTALLED AND SEALED AS DESCRIBED IN THE LATEST EDITION OF ANSI/SMACNA 006, "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," AND IN ACCORDANCE WITH THE ASHRAE 90.1-2016.
3.6.	PROTECTION OF DUCT INSULATION
3.6.1.	INSULATION ON COLD-AIR SUPPLY DUCT SHALL BE PROVIDED WITH VAPOUR BARRIER PROTECTION TO PREVENT CONDENSATION, WHERE THE SURFACE TEMPERATURE OF THE DUCT IS BELOW THE DEW POINT OF THE AIR SURROUNDING THE DUCT.

4. PIPE AND DUCTWORK INSULATION:

4.1.	PIPE AND DUCT INSULATION, RECOVERY MATERIALS, TAPES VAPOR BARRIER FACING AND ADHESIVES SHALL HAVE A MAXIMUM FLAME SPREAD RATING OF 25 AND A MAXIMUM SMOKE DEVELOPMENT RATING OF 100 EXCEPT IN PLENUM SPACING AND AIR HANDLING SYSTEMS WHERE MAXIMUM SMOKE DEVELOPMENT RATING SHALL BE 50.
4.2.	INSULATION SHALL BE APPLIED AS PER THE MANUFACTURER RECOMMENDATIONS IN A WORKMANLIKE MANNER TO PRESENT A NEAT AND CLEAN APPEARANCE AT COMPLETION OF THE WORK TO THE SATISFACTION OF THE ENGINEER AND AS PER ALL AUTHORITY REQUIREMENTS. INSULATION ASSEMBLIES SHALL COMPLY WITH LOCAL AND NATIONAL BUILDING REGULATIONS.
4.3.	INSULATE ALL SUPPLY AIR DUCTWORK WHERE CONCEALED WITH EXTERNAL DUCT INSULATION 25MM THICKNESS.
4.4.	INSULATE ALL RETURN AIR PLENUMS, SUPPLY AIR PLENUMS, FRESH AND RELIEF AIR DUCTWORK WITH INTERNAL ACOUSTIC DUCT INSULATION 25 mm THICKNESS.
4.5.	INSULATE ALL EXHAUST AIR DUCTWORK LOCATED WITHIN 3 METERS OF EXTERIOR OUTLET.
4.6.	INSULATE ALL DOMESTIC COLD WATER PIPING WITH 13 mm THICK ANTI-SWEAT INSULATION.
4.7.	INSULATE ALL DOMESTIC HOT WATER PIPING AND 25 mm THICK FIBERGLASS PIPING INSULATION.
4.8.	INSULATE PLUMBING VENT PIPING WITH 25 mm THICK FIBERGLASS PIPE INSULATION WITHIN 3 METERS OF ROOF OUTLET.

5. HANGERS AND SUPPORTS:

5.1.	PROVIDE HANGERS AND SUPPORTS TO SECURE EQUIPMENT IN PLACE. PREVENT VIBRATION, MAINTAIN GRADE, PROVIDE FOR EXPANSION AND CONTRACTION AND TO ACCOMMODATE INSULATION; PROVIDE INSULATION PROTECTION SADDLES.
5.2.	INSTALL SUPPORTS OF STRENGTH AND RIGIDITY TO SUIT LOADING WITHOUT UNDULY STRESSING BUILDING. LOCATE ADJACENT TO EQUIPMENT TO PREVENT UNDUE STRESSES IN PIPING AND EQUIPMENT.
5.3.	SELECT HANGERS AND SUPPORTS FOR THE SERVICE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED MAXIMUM LOADING. HANGERS SHALL HAVE A SAFETY FACTOR OF 5 TO 1.
5.4.	FASTEN HANGERS AND SUPPORTS TO BUILDING AND STEEL OR INSERTS IN CONCRETE CONSTRUCTION.
5.5.	PROVIDE AND SET SLEEVES REQUIRED FOR EQUIPMENT, INCLUDING OPENINGS REQUIRED FOR PLACING EQUIPMENT.
5.6.	DIELECTRICALLY ISOLATE DISSIMILAR METALS

6. CONTROL SYSTEMS:

6.1.	QUALITY ASSURANCE:	6.1.1.	PROVIDE COMPLETE SYSTEM OF AUTOMATIC CONTROLS FOR MECHANICAL SYSTEMS SUPPLIED AND INSTALLED BY FIRMS SPECIALIZING IN THIS TYPE OF WORK.
6.2.	SUBMITTALS:	6.2.1.	PROVIDE SHOP DRAWINGS INCLUDING COMPLETE OPERATING DATA, SYSTEM DRAWINGS, WIRING DIAGRAMS, AND WRITTEN DETAILED OPERATIONAL DESCRIPTION OF SEQUENCES, AND DESCRIPTION AND ENGINEERING DATA ON EACH CONTROL SYSTEM COMPONENT.
6.2.2.		6.2.2.	PROVIDE CONTROL DIAGRAMS FOR EACH SYSTEM, FRAMED UNDER GLASS FOR WALL MOUNTING.
6.3.	GENERAL REQUIREMENTS:	6.3.1.	PROVIDE CONTROL SYSTEMS CONSISTING OF THERMOSTATS, CONTROL VALVES, DAMPERS OPERATORS, INDICATING DEVICES, INTERFACE EQUIPMENT AND OTHER APPARATUS REQUIRED TO OPERATE MECHANICAL SYSTEM AND TO PERFORM FUNCTIONS SPECIFIED.
6.3.2.		6.3.2.	PROVIDE THE NECESSARY COMPONENTS TO CONNECT FACTORY SUPPLIED CONTROLS WITH CERTAIN EQUIPMENT WHERE SUCH CONTROLS ARE SPECIFIED.
6.4.	THERMOSTATS:	6.4.1.	PROVIDE ROOM THERMOSTATS WITH CELSIUS SCALE, SINGLE TEMPERATURE, GRADUAL-ACTING ADJUSTABLE SENSITIVITY. APPROVED COVERS WITH CONCEALED SET POINT ADJUSTMENTS, SET POINT INDICATION AND WITH THERMOMETER.
6.4.2.		6.4.2.	THERMOSTATS SHALL BE ACCURATE WITHIN 1°C.
6.5.	CONTROL VALVES:	6.5.1.	PROVIDE VALVES IN ACCORDANCE WITH GENERAL VALVE SPECIFICATION. PROVIDE POSITION INDICATORS ON VALVES AND PILOT POSITION ON SEQUENCED VALVES.
6.6.	DAMPERS:	6.6.1.	AUTOMATIC DAMPERS SHALL BE 1.6mm GALVANIZED STEEL OR EXTRUDE ALUMINUM MULTIPLE BLADE MOUNTED IN 3.0 mm STEEL OR EXTRUDED ALUMINUM FLANGED FRAME. INDIVIDUAL BLADES SHALL NOT EXCEED 1500 mm IN WIDTH OR 1200 mm IN LENGTH WITH INTERLOCKING EDGES AND COMPRESSIBLE SEALS. PROVIDE OIL IMPREGNATED BRONZE OR NYLON BEARINGS WITH ADDITIONAL THRUST BEARINGS FOR VERTICAL BLADES. PRIME COAT STEEL DAMPERS.
6.6.2.		6.6.2.	MIXING DAMPERS OF PARALLEL BLADE CONSTRUCTION ARRANGED TO MIX AIR STREAM. PROVIDE POSITIVE POSITIONING ON MIXED AIR DAMPERS WHERE DAMPERS ARE NOT MECHANICALLY LINKED. PROVIDE SEPARATE MINIMUM OUTSIDE AIR DAMPER SECTION ADJACENT TO RETURN AIR DAMPERS WITH SEPARATE DAMPER MOTOR.
6.6.3.		6.6.3.	MOTORIZED DAMPERS SHALL HAVE A MAXIMUM LEAKAGE ALLOWANCE OF 15 L/s PER m² AT A PRESSURE DIFFERENTIAL OR 250 Pa.

7. TESTING, ADJUSTING AND BALANCING:

7.1.	PROVIDE NOTIFICATION TO THE ENGINEER AT LEAST ONE WEEK PRIOR TO TESTING, SO THAT THE ENGINEER MAY ATTEND AND WITNESS THE TESTING AND BALANCING OF THE SYSTEMS AT THE ENGINEER'S DISCRETION.
7.2.	EMPLOY AN INDEPENDENT TESTING AND BALANCING COMPANY SPECIALIZING IN THE TESTING, ADJUSTING AND BALANCING OF SYSTEMS SPECIFIED HEREIN, WITH A MINIMUM OF FIVE (5) YEARS OF DOCUMENTED EXPERIENCE.
7.3.	BALANCE SYSTEM TO WITHIN 5% OF SPECIFIED PERFORMANCE ACCORDING TO ASHRAE STD 111 (LATEST EDITION).
7.4.	PROVIDE TEST REPORTS ON FORMS PREPARED FOLLOWING ASHRAE STD 111 (LATEST EDITION).

8. HAND OVER BUILDING SYSTEMS TO OWNER:

8.1.	PROVIDE OWNER AND ENGINEER WITH:	8.1.1.	FINAL INSPECTION CERTIFICATES
8.1.2.		8.1.2.	ALL MANUFACTURER'S WARRANTEE'S
8.1.3.		8.1.3.	COMPLETE SET OF AS-BUILT DRAWINGS
8.1.4.		8.1.4.	OPERATION AND MAINTENANCE MANUALS
8.1.5.		8.1.5.	VENTILATION AIR BALANCING REPORT
7.1.6.		7.1.6.	COMPLETE SPLINE CONSULTING LTD FINAL FIELD REVIEW CHECKLIST

ABBREVIATIONS

ABV	ABOVE	MFR.	MANUFACTURER
AFF	ABOVE FINISHED FLOOR	(N)	NEW
BCO	BUILDING CLEANOUT	NFHB	NON-FREEZE HOSE BIBB
BLDG	BUILDING	NIC	NOT IN CONTRACT
BLW	BELOW	N.T.S	NOT TO SCALE
BG	BATHROOM GROUP		
BO	BOTTOM OF	O/	OVER
BT	BATHTUB	OA	OUTSIDE AIR
BV	BALANCING VALVE	O.C.	ON CENTRE
		OPG	OPENING
CA	COMBUSTION AIR	OPP	OPPOSITE
CL	CENTRE LINE	O.D.	OUTER DIAMETER
CFM	CUBIC FEET PER MINUTE	O.F.	OVERFLOW DRAIN
CLS	CEILING		
COL	COLUMN	PL	PLATE
CO	CLEANOUT	PL	PROPERTY LINE
COTG	CLEANOUT TO GRADE	PT.	POINT
CW	CLOTHES WASHER	PVC	POLY VINYL CHLORIDE
(D)	DEMOLISH	PNL	ELECTRICAL PANEL
DCVA	DOUBLE CHECK VALVE ASSEMBLY		
DI	DIAMETER	R	RISER
DM	DIMENSION	RA	RETURN AIR
DCW	DOMESTIC COLD WATER	RD	ROOF DRAIN
DF	DRINKING FOUNTAIN	REF	REFERENCE
DHW	DOMESTIC HOT WATER	REINF	REINFORCED/ING
DHR	DOMESTIC RE-CIRCULATED WATER	REQ	REQUIRED
DS	DOWNSPOUT	RM	ROOM
DW	DISHWASHER	R.O.	ROUGH OPENING
DWG	DRAWING	R.O.W.	RIGHT OF WAY
		RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
(E)	EXISTING	SA	SUPPLY AIR
EL	ELEVATION	SD	SMOKE DETECTOR
ENCL	ENCLOSURE	SECT.	SECTION
ENG	ENGINEER	SF	SQUARE FEET
EQ	EQUAL	SHT	SHEET
EA	EXHAUST AIR	SM	SIMILAR
EXT	EXTERIOR	SK	SPECIALIZED SINK
		SQ	SQUARE
FD	FLOOR DRAIN	SS	STAINLESS STEEL
FDN	FOUNDATION	STL	STEEL
FFD	FUNNEL FLOOR DRAIN	STRUCT.	STRUCTURAL
FL	FLOOR	SWH	SERVICE WATER HEATER
FS	FLOOR SINK		
FTG	FOOTING	TEL	TELEPHONE
		T.O.	TOP OF
GA	GAUGE	TYP.	TYPICAL
GALV	GALVANIZED		
GWB	GYPNUM WALL BOARD	U.N.O	UNLESS NOTED OTHERWISE
		UPO	UNPROTECTED OPENING
HB	HOSE BIBB	UR	URINAL
HW	HARDWARE		
HWT	HOT WATER TANK		
HORIZ	HORIZONTAL	V	VENT STACK
HT	HEIGHT	VERT	VERTICAL
		VFY	VERIFY
I.D.	INSIDE DIAMETER	VIF	VERIFY IN FIELD
INV.	INVERT	VTR	VENT TO ROOF
INSUL.	INSULATION		
INT.	INTERIOR	W/	WITH
		WB	WET BULB
JBOX	JUNCTION BOX	WC	WATER CLOSET / TOILET
		WD	WOOD
KS	KITCHEN SINK	WDW	WINDOW
KO	KNOCK OUT	WHA	WATER HAMMER ARRESTOR
		W.P	WORK POINT
LAV	LAVATORY		
LT	LAUNDRY TRAY		
MAX.	MAXIMUM		
MIN	MINIMUM		



SPLINE
Consulting Ltd

SS2 Site7 Comp98
Fort St. John, BC, V1J 4M7

T: +1.778.256.1412
E: info@SCLeng.com

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13772 223 Rd Goodlow, Peace River Regional District BC V0C 1S0				
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APPLICATION TO EXISTING BUILDINGS

AS PER BC BUILDING CODE 2018: 1.1.1.2(1) [.. THE LEVEL OF LIFE SAFETY AND BUILDING PERFORMANCE SHALL NOT BE DECREASED BELOW A LEVEL THAT ALREADY EXISTS.]

THE EXISTING BUILDING WAS BUILT TO A PREVIOUS BUILDING CODE THAT MAY NO LONGER BE COMPLIANT WITH THE CURRENT BUILDING CODE. A RETROACTIVE UPGRADE TO THE EXISTING BUILDING OUTSIDE OF THE SCOPE OF WORK IS NOT INCLUDED IN THE DESIGN.

UNLESS FORMALLY WRITTEN REQUIRED BY THE AUTHORITY HAVING JURISDICTION OR BY LAWS.

SYMBOLS

PLUMBING	
VENT STACK	
ROOF DRAIN	
FLOOR DRAIN	
FUNNEL FLOOR DRAIN	
P-TRAP	
CLEAN-OUT	
CLEAN-OUT TO GRADE	
WATER HAMMER ARRESTOR	
PUMP	
PIPE CAP	
PIPE UNION	
ISOLATION VALVE	
CHECK VALVE	
SAFETY RELIEF VALVE	
CONTROL VALVE - MANUAL, ACTUATED	
PRESSURE REDUCING VALVE	
TEMPERATURE & PRESSURE SAFETY VALVE	
RPBP	
DCVA	
PIPE CONTINUATION	

GENERAL

BASEBOARD TYPE	
LENGTH	
FLOW (GPM)	
HEATING OUTPUT (BTU/H)	

QUANTITY	
GRILL/DIFFUSER TYPE	
SIZE OR NECK SIZE (IN.)	
AIR VOLUME (CFM)	

EQUIPMENT TYPE	
KEYNOTE DESIGNATOR	

WATER RISER DESIGNATOR

SAN OR GAS DESIGNATOR	
-----------------------	--

REVISION DESIGNATOR	
---------------------	--

GENERAL NOTE DESIGNATOR

PIPING CLASSIFICATION

DIAMETER

CLASSIFICATION

PIPING MATERIAL

LOAD

CAPACITY (IF AVAILABLE)

SLOPE AND DIRECTION

MECHANICAL

DUCTWORK	RECTANGULAR		ROUND	
	UP	DN	UP	DN
SUPPLY				
RETURN				
EXHAUST				
FLUE				
MAKE UP AIR				
OTHER				
OUTDOOR AIR				
RELIEF				

TERMINALS

SQUARE DIFUSER	
ROUND DIFFUSER	
LINEAR DIFFUSER	
GRILLE	
SIDEWALL GRILL/LOUVER	
REGISTER	

DEVICES

SENSORS - CO, CO NOx	
SENSORS - PRES., TEMP., HUMID.	
THERMOSTAT - WALL	

SWITCH - TEMP, HUMID.	
SWITCH - PRES., VARI. FLOW	

FLOAT, SWITCH

FLOAT LOW SIDE, SWITCH

FLOAT HIGH SIDE, SWITCH

BALANCING, DAMPER	
RECT. FIRE, DAMPER	
ROUND FIRE, DAMPER	

LINETYPES:

PLUMBING	ABOVE	BELOW
	SANITARY	STORM
SANITARY		
STORM		
VENT		
DOMESTIC COLD WATER		
DOMESTIC HOT WATER		
D.RECIRC. BELOW		
FOUNDATION DRAINAGE		
NATURAL GAS		
CONDENSATE DRAIN		
SUMP PIPING		
OTHER		

COMPRESSED AIR

POWER

ELECTRICAL

DRAWING HATCH CODING

	OUT OF SCOPE
	RESERVED
	RESERVED
	RESERVED
	RESERVED
	RESERVED
	RESERVED

FIRE RESISTANCE CODING

(REFER TO ARCHITECTURAL DRAWINGS)

	45 min
	1 h
	1.5 h
	2 h
	3 h
	4 h

DO NOT BUILD TO THESE
FIRE-RESISTANCE RATINGS
TO BE USED AS A GUIDE ONLY

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BW	BW	NTS	October 2020

PROJECT:
CLEARVIEW ARENA SOCIETY
ARENA HVAC

PROJECT ADDRESS:
13772 223 RD, GOODLOW, BC V0C 1S0

CLIENT PROJECT NO.:

DRAWING TITLE:
MECHANICAL & PLUMBING
GENERAL
DESIGN PARAMETERS & LEGEND

SOL PROJECT NO.:

20010

M0.2

20010 - M1.1 - GROUND FLOOR (October 10, 2020 15:20:26) [ARCH 14] based D: (36.00 x 24.00) (inches)

DRAWING NOTES	
1	RETURN AIR DUCTWORK - INTERNAL THERMAL INSULATION, EPOXY PAINTED EXTERIOR. PROVIDE SNOWICE COVERAGE NEAR BUILDING. ENSURE DUCTWORK IS ABOVE OVERHEAD DOOR OPENING. DUCT SIZE: 20x45.
2	SUPPLY AIR DUCTWORK - EXTERNALLY THERMAL INSULATION WITH VAPOUR WRAP. DUCT SIZE: 20x55, TRANSITION TO Ø36" BEFORE BUILDING EXTERIOR WALL.
3	INTERIOR SUPPLY TO BE INSTALLED AT HEIGHT > 15' A.F.F. DUCT SIZE (Ø36")
4	RETURN AIR TERMINAL MOUNTED ON EXTERIOR WALL. FACE VELOCITY: <500 FPM, AIRFLOW: 5000 CFM.
5	HUMIDISTAT SENSOR MOUNTED 8' A.F.F. INSTALL STEEL PROTECTIVE COVERING FROM VANDALISM, PLACE SIGN STATING <u>DO NOT COVER</u>
6	SHADED AREAS ARE OUT OF SCOPE
7	SPECTATOR STANDS: EXISTING RADIANT TUBE HEATERS.
8	RINK EXHAUST FANS AND MANUAL INTAKE LOUVERS TO BE REMOVED
9	SUPPLY AIR DISCHARGED HORIZONTALLY AT MINIMUM 15' A.F.F
10	EXISTING GAS METER
11	DEHUMIDIFIER EQUIPMENT GAS LINE SHALL BE TIED IN FROM HIGH PRESSURE GAS LINE BEFORE REGULATOR IN THE BOILER ROOM. ROUTE HIGH PRESSURE GAS TO UNIT OUTSIDE. ADD NEW GAS REGULATOR TO SATISFY EQUIPMENT GAS MANIFOLD OPERATING PRESSURE.
12	EXISTING COMMERCIAL KITCHEN. KITCHEN EXHAUST FAN OPERATES WITHOUT MAKE-UP AIR UNIT. ADVERSE NEGATIVE PRESSURE WITHIN BUILDING WAS OBSERVED. IT IS RECOMMENDED THAT THE COMMERCIAL KITCHEN BE DESIGNED BY A PROFESSIONAL ENGINEER TO ENSURE COMPLIANCE WITH NFPA 96.
13	DEHUMIDIFIER: AIR20, D-50, INDIRECT-FIRED SUPPLY AIR, DIRECT-FIRED REACTIVATION AIR, 600/347V 3PH
14	STRUCTURAL PLATFORM: 24" HIGH. STRUCTURAL PLATFORM AND FOUNDATION SHALL BE DESIGNED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE PROVINCE OF BRITISH COLUMBIA.

DIFFUSER, GRILLE, REGISTER SCHEDULE							
TAG	AIR TYPE	CATEGORY	SIZE, in	PREFERRED EQUIPMENT	MOUNTING	ELEVATION	NOTES
S-1	SUPPLY	SPIRAL DUCT GRILLE	10 x 32	EH PRICE 32in. x 10in. / SDG GV	MOUNT DIRECTLY ON DUCT FOR HORIZONTAL DISCHARGE	>15'-0" A.F.F	1, 2, 3
S-2	SUPPLY	ROUND SUPPLY GRILLE 3" SPACING	20"	EH PRICE 20 / RSG-3 / B12	MOUNT DIRECTLY AT THE END OF DUCT	>15'-0" A.F.F	1, 3, 4
R-1	RETURN	ALUMINUM LOUVERED RETURN	48 x 20	EH PRICE 610Z / F	WALL SURFACE MOUNTED	<10'-0" A.F.F	1
NOTES: 1. ALL DUCTWORK OUTSIDE OF THE CONDITIONED AREA IT SERVES SHALL BE INSULATED, AS PER ASHRAE 90.1-2010. 2. SPIRAL DUCT GRILLES SHALL BE INSTALLED WITH A STEEL OPPOSED BLADE DAMPER TO SET DESIRED VOLUMETRIC AIRFLOW 3. 0" DEFLECTION - HORIZONTAL DISCHARGE OVER ICE 4. ROUND CONTROL VOLUME DAMPER REQUIRED							

ARENA DESCRIPTION & OPERATION PROFILE

No. of Skaters: 43
Seating Capacity: 60

Ice Surface Area: 16,325 sq ft

Design Rink Conditions:
Space Temp: 60°F (DB)
Relative Humidity: 44% RH
Dew Point: 38.1°F
Humidity Ratio: 33.8 gr/lb

Outdoor Design Condition:
Dry Bulb: 59.0 °F
Wet Bulb: 52.4 °F
Humidity Ratio: 53.4 gr/lb

Occupancy & Ventilation Load

Occupancy:
Skaters: 3,500 gri/pers | 21.5 lbs/hr
Spectators: 630 gri/pers | 5.4 lbs/hr

RINK PRESSURIZATION

POSITIVE PRESSURIZATION: 0.15"

MODULATE RETURN AIR ACCORDINGLY TO MAINTAIN PRESSURIZATION

Ventilation - Ashrae 62.1-2013
Spectators: 8.0 CFM/pers
Combined outdoor air for ventilation [T6.2.2.1]

Playing Area:
0.18 CFM/sqft
20 CFM/pers
(playing/ice area) [T6.2.2.1]

Minimum Outdoor Air
Spectator Occupancy: 480 CFM
Load: 8.9 lbs/hr

Playing Area: 3,779 CFM
Load: 69.7 lbs/hr

Load Summary:
Minimum Ventilation Airflow Rate: 4,259 CFM
Ventilation Latent Load: 79 lbs/hr

Internal Latent Load: 73 lbs/hr

Total Latent Load: 152 lbs/hr

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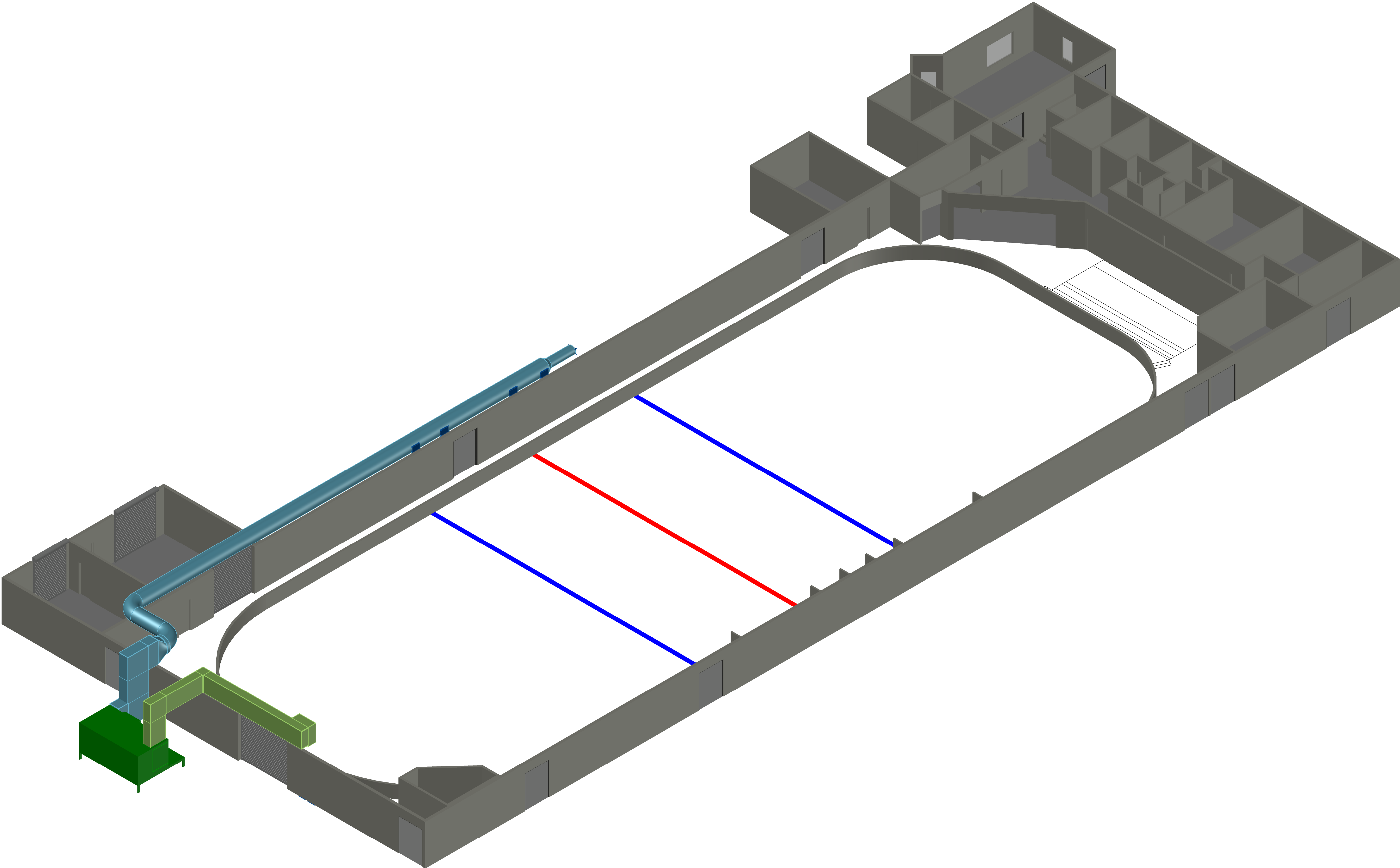
DRAWING TITLE:
MECHANICAL
PLAN
GROUND FLOOR

SOL PROJECT NO.:

20010

SOL DRAWING NO.:

M1.1



ISOMETRIC VIEW - FACING NORTH EAST
SCALE: N.T.S

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HVAC ISOMETRIC SUPPLEMENTRY VIEWS			
SQL PROJECT NO.:		SQL DRAWING NO.:	
20010		M2.1	