

MECHANICAL SPECIFICATION

MECHANICAL SUBCONTRACTOR SHALL SUBMIT PRICE FOR THE COST OF SUPPLY AND INSTALLATION OF EQUIPMENT AND MATERIAL NECESSARY TO PROVIDE A COMPLETE AND OPERATING MECHANICAL PACKAGE. MECHANICAL PACKAGE TO CONSIST OF EQUIPMENT AND MATERIALS AS DESCRIBED IN THIS OUTLINE SPECIFICATION. REFER TO MECHANICAL PLANS FOR ACTUAL REQUIREMENTS OF EQUIPMENT.

MECHANICAL SCOPE OF WORK

- INCLUDE IN MECHANICAL SECTION, PROVISION OF LABOUR, NEW MATERIALS, TOOLS, TRANSPORTATION, SERVICES AND FACILITIES FOR A COMPLETE MECHANICAL INSTALLATION. THE INSTALLATION SHALL BE LEFT COMPLETE IN ALL RESPECTS AND READY FOR OPERATION. FINAL INSTALLATION SHALL BE INSTALLED TO COMPLETE SATISFACTION OF THE RESPONSIBLE PROFESSIONAL ENGINEER.
- THE MECHANICAL SCOPE OF WORK INCLUDES, BUT IS NOT NECESSARILY LIMITED TO THE FOLLOWING PROVISION:
 - GENERAL:
 - FAMILIARIZE CREW WITH SITE IN ORDER TO DETERMINE APPROPRIATE LOCATIONS, SITE CONDITIONS, ETC. THAT MAY AFFECT WORK.
 - WORK MAY NEED TO BE PERFORMED AT NON-STANDARD HOURS. DETERMINE SCHEDULE WITH OWNER.
 - O&M MANUALS AND OWNER TRAINING.
 - RECORD DRAWINGS.
 - PROVISION OF FIRE STOPPING AT ALL PIPE, DUCT AND CONDUIT WIRING PENETRATIONS INSTALLED BY THIS TRADE (ONLY).
 - PLUMBING:
 - PROVISIONS OF ALL GAS PIPING AND VENTING FOR SUPPLIED EQUIPMENT.
 - HVAC
 - PROVISION OF ALL AIR HANDLING EQUIPMENT, FANS, DUCTWORK, CONTROL/BALANCE FITTINGS, INSULATION, GRILLES/REGISTERS/DIFFUSERS/LOUVERS, FIRE DAMPERS, LABOR AND MISCELLANEOUS MATERIALS AS REQUIRED TO COMPLETE THE PROJECT.
 - PROVISION OF TAB REPORTS INCLUDING FIRE DAMPER TESTING, CERTIFICATION, AIR FLOWS, AND PUMP PERFORMANCE.
 - CONTROLS
 - PROVISION OF COMPLETE ELECTRONIC CONTROLS AS DESCRIBED.
 - COORDINATION OF ALL CONTROL INTERFACE AND POWER REQUIREMENTS WITH ELECTRICAL SUBCONTRACTOR.

GENERAL CONDITIONS

- PROVIDE ALL LABOUR, MATERIALS, AND EQUIPMENT NECESSARY TO COMPLETE THE WORK SHOWN ON DRAWINGS AND AS SPECIFIED HEREIN.
- ALL NECESSARY PERMITS SHALL BE OBTAINED AND ALL FEES SHALL BE PAID TO CARRY OUT THE SPECIFIED WORK.
- REFER TO CITY OF WINNIPEG SUPPORTING DOCUMENTS FOR GUARANTEE AND WARRANTY REQUIREMENTS.
- ALL WORK SHALL COMPLY IN EVERY RESPECT WITH ALL NATIONAL, PROVINCIAL AND LOCAL CODES AND BY-LAWS, WHICH SHALL BE CONSIDERED PART OF THIS SPECIFICATION. IN THE CASE OF CONFLICTING REQUIREMENTS, BE GOVERNED BY THE MOST STRINGENT REGULATIONS.
- ALL CUTTING, PATCHING, FLASHING FOR WORK AS REQUIRED HEREIN SHALL BE BY THE CONTRACTOR.
- THE MECHANICAL SUBCONTRACTOR SHALL INSTALL PLUMBING, HEATING, VENTILATION, AND AIR CONDITIONING SYSTEMS IN COMPLETE ACCORDANCE WITH THE RECOMMENDATIONS OF THE NATIONAL/PROVINCIAL BUILDING CODE, ASHRAE, SMACNA LATEST EDITION DUCT STANDARDS, AND LOCAL PLUMBING CODES, N.F.P.A. REQUIREMENTS.
- COORDINATE WORK WITH WORK OF OTHER TRADES TO AVOID CONFLICT.
- ALTER THE LOCATION OF DUCTS OR PIPES AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR WITHOUT CHARGE TO THE OWNER, PROVIDED THE CHANGE IS MADE BEFORE INSTALLATION AND DOES NOT NECESSITATE ADDITIONAL MATERIALS.
- QUOTATIONS SHALL BE BASED ON THE USE OF SPECIFIED MANUFACTURERS OR APPROVED EQUAL IN ACCORDANCE WITH B7. THE USE OF AN EQUAL OR ALTERNATE MANUFACTURER IN ACCORDANCE WITH B7 SHALL IN NO WAY RELIEVE THE MECHANICAL CONTRACTOR FROM THE RESPONSIBILITY OF PROVIDING ALL WORK THAT MAY BE REQUIRED BY REASON OF DIFFERENT SPACE, WEIGHT, ELECTRICAL, OR OTHER REQUIREMENT FROM THAT OF THE SPECIFIED MANUFACTURER. ALTERNATES SHALL BE APPROVED IN ACCORDANCE WITH B7. NO SUBMITTALS RECEIVED AFTER BID OPPORTUNITY CLOSING WILL BE ACCEPTED.
- THE MECHANICAL SUBCONTRACTOR SHALL PROVIDE SIX (6) SETS OF SHOP DRAWINGS FOR ALL EQUIPMENT FOR REVIEW AND APPROVAL BY THE CONTRACT ADMINISTRATOR. CONTRACTOR SHALL STAMP SHOP DRAWINGS REVIEWED BY CONTRACTOR PRIOR TO SUBMISSION. FAILURE TO COMPLY WILL RESULT IN SHOP DRAWINGS BEING RETURNED "UNREVIEWED" BY THE CONTRACT ADMINISTRATOR.
- FURNISH TO THE CONTRACT ADMINISTRATOR THREE (3) HARD-COVERED LOOSE-LEAF BINDERS CONTAINING THEREIN ONE (1) COMPLETE SET OF MANUFACTURERS' OPERATING AND MAINTENANCE INSTRUCTIONS SHOWING ALL MAJOR EQUIPMENT AND APPARATUS REQUIRING MAINTENANCE. INSTRUCTIONS SHALL BE COMPLETE FOR INSTALLATION, OPERATION AND MAINTENANCE, AND SHALL INCLUDE PERTINENT INFORMATION SUCH AS DETAILED DRAWINGS AND OPERATION CURVES. SPARE PARTS, SUPPLIER LISTS AND ADDRESSES SHALL BE SUPPLIED. INSTRUCTION SHALL BE REQUIRED WITH THE OWNERS' REPRESENTATIVE TO ENSURE A THOROUGH UNDERSTANDING OF THE EQUIPMENT AND ITS OPERATION.
- ALL WIRING, SUPPLY AND INSTALLATION OF DISCONNECT SWITCHES FOR EQUIPMENT SPECIFIED HEREIN SHALL BE PERFORMED BY THE ELECTRICAL SUBCONTRACTOR, UNLESS OTHERWISE NOTED.
- MECHANICAL SUBCONTRACTOR SHALL EXAMINE THE SITE AND CONDITIONS AFFECTING WORK, METHODS OF CONNECTION AND LOCATION OF ALL SERVICES INVOLVED UNDER THIS CONTRACT. FAILURE TO MAKE THIS VISIT IN NO WAY ALLEVIATES THE MECHANICAL SUBCONTRACTOR FROM RESPONSIBILITY FOR COMPLETING THE MECHANICAL WORK OF THIS CONTRACT IN A WORKMANLIKE MANNER. NO ALLOWANCE WILL BE MADE AFTER CONTRACT AWARD FOR ANY EXPENSE INCURRED THROUGH A FAILURE TO MAKE THIS EXAMINATION AND INVESTIGATION.
- SCHEDULING OF ALL WORK SHALL BE ARRANGED WITH THE CITY, AND THE CITY SHALL BE NOTIFIED, AND HIS APPROVAL OBTAINED PRIOR TO SHUTTING OFF EXISTING SERVICES FOR PURPOSES OF CONNECTING NEW WORK. WORK WITHIN THE BUILDING MAY HAVE TO BE PERFORMED DURING NON-REGULAR WORKING HOURS AND MUST CONFORM TO WORK RULES OF THE BUILDING AS DIRECTED BY THE CITY.
- RECORD DRAWINGS:
 - OBTAIN SETS OF WHITE PRINTS (ONE FOR EACH SYSTEM IE. PLUMBING, HVAC) AND KEEP AT JOB SITE AT ALL TIMES.
 - RECORD ALL ADDITIONS OR DEVIATIONS FROM THE CONTRACT DOCUMENTS INCLUDING ALL CHANGES INCURRED BY ADDENDA, CHANGE ORDERS, FIELD CHANGES, JOB CONDITIONS, ETC.
 - MECHANICAL SUBCONTRACTORS SHALL BE RESPONSIBLE FOR THE PRODUCTION OF RECORD DRAWINGS WHICH SHALL PROVIDE A COMPLETE AND ACCURATE RECORD OF THE ACTUAL MECHANICAL INSTALLATION. ALL PRINCIPLE BELOW GRADE OR INACCESSIBLE PIPING OR DUCT SYSTEMS, ETC. SHALL BE DIMENSIONED AT EACH

CHANGE IN DIRECTION, INCLUDE ALL ROUTING OF SERVICES NOT INDICATED ON ORIGINAL DRAWINGS.

- PROJECT RECORD DRAWINGS SHALL BE TRANSFERRED BY MECHANICAL SUBCONTRACTOR TO REPRODUCIBLE BOND DRAWINGS AND LABELED RECORD.
- SUBMIT REPRODUCIBLE BOND DRAWINGS TO THE CONTRACT ADMINISTRATOR FOR REVIEW UPON COMPLETION IF CORRECTIVE MEASURES ARE REQUIRED AFTER THE SECOND CONTRACT ADMINISTRATOR REVIEW (DUE TO MISSING INFORMATION AND/OR IMPROPER DRAFTING STANDARDS). THE MECHANICAL SUBCONTRACTOR SHALL BE RESPONSIBLE FOR CONTRACT ADMINISTRATOR'S TIME COSTS FOR CORRECTIVE MEASURES, COURIER AND PRINTING COSTS.
- CONTRACTOR SHALL EMPLOY CONTRACT ADMINISTRATOR'S OFFICE (OR CAD DRAFTING SERVICE) TO PRODUCE ELECTRONIC COPY RECORD DRAWINGS. MECHANICAL SUBCONTRACTOR SHALL BEAR ALL COSTS OF PRODUCTION.
- COPY OF FINAL RECORD DRAWING SHALL BE SUBMITTED TO CONTRACT ADMINISTRATOR.
- ALL COSTS OF RECORD DRAWINGS PRODUCTION SHALL BE BORNE BY MECHANICAL SUBCONTRACTOR.
- VERIFY SIZES, INVERTS AND LOCATIONS OF ALL SERVICES PRIOR TO COMMENCEMENT OF WORK. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO SANITARY SEWER, STORM SEWER, DOMESTIC WATER MAINS, ETC.
- HOISTING OF ALL MECHANICAL EQUIPMENT SHALL BE BY THE MECHANICAL SUBCONTRACTOR.
- ASSUME FULL RESPONSIBILITY FOR LAYING OUT ALL WORK AND ENSURING THAT NO DAMAGE IS CAUSED TO THE CITY'S EQUIPMENT AND PREMISES DUE TO IMPROPER LOCATION AND EXECUTION OF WORK IN THIS CONTRACT. PROTECT AND MAINTAIN ALL WORK UNTIL WORK HAS BEEN COMPLETED AND ACCEPTED BY THE CITY. STORE ALL MATERIALS AS REQUIRED, AND CLEAN UP REFUSE CAUSED BY ALL WORK.
- IDENTIFY ALL NEW PIPING WITHIN BUILDING INSTALLED IN THIS CONTRACT SHOWING SERVICE, PIPE SIZE, AND FLOW DIRECTION. USE CAPITAL LETTERS USING EITHER FIRE RESISTANT HIGH GLOSS INTERIOR ENAMEL PAINT OR WATERPROOF, HEAT RESISTANT PLASTIC MARKER TACS (SIMILAR TO: W.H. BRADY IDENTIFICATION TAPES, BANDS, MARKERS.) IDENTIFY AT MAXIMUM OF EVERY 50 FT. AND AT LEAST ONCE IN EACH ROOM. LOCATE AND SIZE LETTERING SUCH THAT IT CAN BE SEEN FROM FLOOR.
- IN THE CASE OF DISCREPANCY BETWEEN ARCHITECTURAL AND MECHANICAL DRAWINGS TO NUMBER, TYPE, OR LOCATION OF HVAC EQUIPMENT AND SYSTEMS COMPONENTS, OBTAIN WRITTEN RULING.
- ALL TIME/DATE SENSITIVE ELECTRONIC EQUIPMENT AND SOFTWARE PROVIDED ON THIS PROJECT SHALL BE 4 DIGIT YEAR INPUT COMPATIBLE AND SHALL BE BASED ON THE USE OF FULL, UNABBREVIATED, UNAMBIGUOUS DISCRETE TIME AND DATE CODES.
- MECHANICAL SUBCONTRACTOR SHALL COORDINATE PROVISION OF POWER TO BUILDING CONTROL TRANSFORMERS WITH DIVISION 16 AND CARRY ALL INCREMENTAL COSTS.
- COORDINATE THE ELECTRICAL REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH DIVISION 16. DIVISION 16 SHALL PROVIDE THE FOLLOWING:
 - ALL POWER WIRING TO EQUIPMENT.
- PROVIDE FIRE STOPPING AT ALL PIPING, CONDUIT (CONTROLS) AND DUCTWORK PENETRATIONS OF ALL REQUIRED FIRE SEPARATIONS WITH APPROVED MATERIAL SYSTEMS. ACCEPTABLE MATERIALS: 3M, DOW, CORNING, APS.
- MECHANICAL CONTRACT DOCUMENTS ARE DIAGRAMMATIC AND APPROXIMATE TO SCALE; REFER TO ARCHITECTURAL AND/OR STRUCTURAL DRAWINGS, AND SITE VERIFY ALL CRITICAL DIMENSIONS. THE DRAWINGS AND SPECIFICATIONS ESTABLISH SCOPE FOR MATERIAL AND INSTALLATION QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS. ANY DISCREPANCIES MUST BE BROUGHT TO THE CONTRACT ADMINISTRATOR'S ATTENTION IN WRITING PRIOR TO THE CLOSE OF THE BID OPPORTUNITY.
- SHOULD ANY DISCREPANCY APPEAR BETWEEN THE DRAWINGS AND SPECIFICATIONS, WHICH LEAVE THE CONTRACTOR IN DOUBT AS TO THE TRUE INTENT AND MEANING OF THE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL OBTAIN A WRITTEN RULING FROM THE CONTRACT ADMINISTRATOR PRIOR TO BID OPPORTUNITY SUBMISSION.
- FIELD VERIFY ALL BUILDING AND SITE DIMENSIONS AND REVIEW MECHANICAL DRAWINGS AND SPECIFICATIONS PRIOR TO ANY FABRICATION OR INSTALLATION OF EQUIPMENT OR MATERIALS. DO NOT ATTEMPT ANY FABRICATION OR INSTALLATION UNTIL SUCH CLARIFICATION IS PROVIDED. NO CONTRACT REVISIONS WILL BE CONSIDERED FOR FAILURE TO VERIFY THESE DIMENSIONS ON SITE.
- DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER, WHAT IS CALLED FOR BY ONE SHALL BE BINDING AS IF CALLED FOR BY BOTH.
- MECHANICAL WORK SHALL BE COMPLETED IN CONFORMANCE WITH, AND SUBJECT TO, ALL CAUTIONARY NOTES AVAILABLE TO THE READER INCLUDING THOSE AVAILABLE ON THE WEBSITES OF THE MANUFACTURERS, THE RESPONSIBLE PROFESSIONAL ENGINEERS' OFFICE, AND THE CONTRACT ADMINISTRATOR'S OFFICE.

INSULATION

ALL INSULATING MATERIALS, METHODS, SIZES AND TYPES OF INSULATION FOR ALL PIPING AND DUCT WORK SHALL BE INSTALLED TO THE REQUIREMENTS OF THE ASHRAE STANDARDS 90.1-2010 "ENERGY STANDARD FOR BUILDING EXCEPT LOW-RISE RESIDENTIAL BUILDING", AND THERMAL INSULATION ASSOCIATION OF CANADA (TIAC) STANDARDS.

- PROVIDE 1 1/2" (38 MM) THICK KNAUF ATMOSPHERE DUCTWRAP, 1.0 PCF DENSITY R4.5 (RSI 0.80) 25% COMPRESSED FLEXIBLE DUCT INSULATION C/W RFRFK FACING ON EXHAUST DUCTWORK & ALL SUPPLY DUCTWORK FROM ALL AIR HANDLING EQUIPMENT. EXHAUST DUCTWORK SHALL BE INSULATED FOR A MINIMUM DISTANCE OF 10'-0" (3 M) FROM PENETRATION OF BUILDING THERMAL ENVELOPE. REFER TO DRAWINGS FOR ADDITIONAL INSULATION REQUIREMENTS. ALL SUPPLY AIR DUCTWORK CONVEYING AIR-CONDITIONED AIR SHALL BE INSULATED.
- PROVIDE 2" (50 MM) THICK KNAUF ATMOSPHERE DUCTWRAP, 1.5 PCF DENSITY, R6.4 (RSI 1.13) 25% COMPRESSED THERMAL FACED INSULATION ON ALL DUCTWORK CONVEYING OUTSIDE AIR COMPLETE WITH RFRFK FACING. DUCTWORK SHALL BE INSULATED OVER ENTIRE RUN FROM PENETRATION OF BUILDING THERMAL ENVELOPE TO UNIT CONNECTION.
- ACoustically INSULATE DUCTWORK WITH 1" (25 MM) FLEXIBLE DUCT INSULATION WITH FLAME-ATTENUATED FIBRES BONDED WITH THERMOSETTING RESIN; BLACK PLASTIC-COATED MAT FINISH. PROVIDE WHERE NOTED ON DRAWINGS OR AS SHOWN AS HATCHED DUCTWORK OR ALLOW FOR UP TO 10 FT. (3 M) FROM SUPPLY AND RETURN AIR OPENINGS OF ROOF MOUNTED EQUIPMENT. ACCEPTABLE PRODUCT: KNAUF AIR DUCT BOARD.
- DO NOT EXTERNALLY INSULATE ANY DUCTWORK WHICH IS SPECIFIED OR SHOWN TO BE INTERNALLY INSULATED UNLESS NOTED OTHERWISE.
- ALL INSULATION IN EXPOSED LOCATIONS, AND ALL DUCTWORK IN FAN ROOMS, SERVICE ROOMS, ETC., SHALL BE COVERED WITH CANVAS WRAP. INSULATION EXPOSED TO THE MOISTURE SHALL BE COMPLETE WITH ENGINEER-APPROVED COVER.

PLUMBING

- MECHANICAL SUBCONTRACTOR SHALL VERIFY ON SITE ALL CONNECTION POINTS TO EXISTING BUILDING SERVICES. COORDINATE ALL NEW PIPING RUNS WITH CONTRACT ADMINISTRATOR.

2. VALVES

- SHALL BE BY ONE MANUFACTURER. STANDARD OF ACCEPTANCE: JENKINS BROS. LTD.
 - SHALL BE UL CLASSIFIED IN ACCORDANCE WITH ANSI/NSF-61 FOR POTABLE WATER SERVICE, AND SHALL BE CERTIFIED TO THE LOW LEAD REQUIREMENTS OF NSF-372.
- MECHANICAL SUBCONTRACTOR SHALL ALLOW FOR IN BID OPPORTUNITY QUOTATION ANY ADDITIONAL LABOUR, MATERIALS, ETC. DEEMED NECESSARY DUE TO EXACT SITE CONDITIONS WHICH HAVE NOT BEEN REFLECTED IN MECHANICAL DRAWING OR IN MECHANICAL SPECIFICATION. NOTIFY CONTRACT ADMINISTRATOR OF ALL DISCREPANCIES PRIOR TO BID OPPORTUNITY CLOSURE.
 - ON COMPLETION, ALL PIPING SYSTEMS SHALL BE CLEANED & FLUSHED OUT TO REMOVE ANY FOREIGN MATERIAL IN THE PIPING.
 - GAS PIPING SHALL BE BLACK STEEL PIPE, EQUAL TO ASTM A-53 SCH. 40 WITH 150 LBS. STANDARD BLACK MALLEABLE IRON SCREWED FITTINGS. ALL WORK SHALL COMPLY WITH C.G.A. B149.1-15 "NATURAL GAS AND PROPANE INSTALLATION CODE", COMPLETE WITH MANITOBA OFFICE OF THE FIRE COMMISSIONER GAS NOTICES, AND SHALL BE PERFORMED BY FULLY QUALIFIED GAS FITTERS AND/OR WELDERS LICENSED TO PRACTICE IN THE PROVINCE OF MANITOBA.
 - VALVES IN GAS PIPING SHALL BE GRINNELL FIG. C.G.A. OR EQUAL IN ACCORDANCE WITH B7.
 - RUN GAS PIPING TO SERVE OWNER'S EQUIPMENT. TAKE-OUT PERMITS AND CONNECT EQUIPMENT READY FOR USE. PROVIDE GAS REGULATORS TO SERVE NEW GAS FIRED EQUIPMENT. GAS REGULATORS SHALL BE C.G.A. APPROVED AS MANUFACTURED BY FISHER, OR EQUAL IN ACCORDANCE WITH B7. PROVIDE GAS COCK DIRT LEG AND FLEXIBLE CONNECTIONS AT EACH PIECE OF EQUIPMENT.
 - MECHANICAL SUBCONTRACTOR SHALL COORDINATE SERVICE INSTALLATIONS AND/OR MODIFICATIONS WITH LOCAL UTILITY PRIOR TO COMMENCEMENT OF WORK. PAY ALL COSTS AND/OR FEES.
 - ROOF MOUNTED PIPING SHALL BE SUPPORTED WITH C-PORT UV RESISTANT RUBBER MOUNTS OF SUITABLE WIDTHS TO ACCOMMODATE INSTALLATION REQUIREMENTS, AS MANUFACTURED BY CLEARLINE TECHNOLOGIES OR APPROVED EQUAL IN ACCORDANCE WITH B7. INSTALLATIONS TO CAN/CSA-B149.1 (LATEST EDITION).
 - MECHANICAL SUBCONTRACTOR SHALL PROVIDE PRE-ASSEMBLED AND PRE-TESTED OVER-PRESSURE RELIEF REGULATORS AND VENT ASSEMBLIES ON ALL PROPANE AND NATURAL GAS PIPING SYSTEMS GREATER THAN 7" W.C., INSTALLED AT EACH APPLIANCE AND/OR EQUIPMENT. INSTALLATION AND REQUIREMENTS TO MEET THE CAN/CSA-B149.1-05 AND TSSA/MB. OFFICE OF THE FIRE COMMISSIONER REQUIREMENTS.

- PROVIDE DIELECTRIC COUPLINGS WHEREVER PIPES OF DISSIMILAR METALS ARE JOINED.

- USE THE FOLLOWING ROD DIAMETER AND SPACING SCHEDULE TO ESTABLISH MINIMUM HANGING STANDARDS FOR HORIZONTAL PIPING:

PIPE SIZE	ROD DIA	STEEL	COPPER
UP TO 3/4"	3/8"	6'	6'
1" TO 1 1/4"	3/8"	8'	6'
1 1/2" & 2"	3/8"	10'	8'

- PIPE HANGERS WHERE REQUIRED SHALL BE GRINNELL FIG.65 FOR STEEL PIPE AND FIG.117 EXPANSION CASE SET IN HOLES DRILLED IN CONCRETE OR ATTACHED TO FIG.225 OR 227 CLAMP ATTACHED TO FLOOR JOIST AND ROOF JOIST. FOR INSULATED PIPING, PROVIDE PROTECTION FIG.167 SADDLES SIZE HANGER TO ACCOMMODATE INSULATION WHERE APPLIED.

HEATING, VENTILATION & AIR CONDITIONING

- PROVIDE SUPPLY, RETURN AND EXHAUST AIR DUCT SYSTEMS FROM AIR HANDLING EQUIPMENT AND FANS AS SHOWN.
- ALL DUCTWORK INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH ASHRAE, SMACNA LATEST EDITION DUCT STANDARDS.
- THIS CONTRACTOR SHALL SUPPLY AND INSTALL ALL DUCTWORK INCLUDING APPURTENANCES, HANGERS, DAMPERS, ETC.

4. DUCT CONSTRUCTION:

- RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED FROM GALVANIZED SHEET METAL OF THE FOLLOWING U.S. STANDARD GAUGES:

DUCTS UP TO 12" ON LONGEST DIMENSION 24 GA.
DUCTS 13" TO 28" ON LONGEST DIMENSION 26 GA.

- ROUND AND OVAL DUCTWORK SHALL BE SPIRAL CONDUIT CONSTRUCTION OF ZINC COATED STEEL OF THE FOLLOWING U.S. GAUGES:

CONDUIT SIZE	GAUGE OF METAL
8" AND SMALLER <td>26</td>	26
9" TO 22" <td>24</td>	24

ALL SEAMS AND JOINTS IN ROUND OR OVAL DUCT FITTINGS SHALL BE CONTIGUOUSLY WELDED. RE-COAT ZINC COATING DAMAGED BY WELDING PROCEDURE.

- BALANCING DAMPERS SHALL BE CONSTRUCTED FROM GALVANIZED STEEL 2 GAUGES HEAVIER THAN THE DUCTWORK IN WHICH THEY ARE INSTALLED C/W LOCKING QUADRANT AND INDICATING DEVICE.
- TURNING VANES SHALL BE CONSTRUCTED TO THE FOLLOWING REQUIREMENTS:
 - USE DUCT ELBOWS WHICH HAVE A THROAT RADIUS OF 1-1/2 TIMES THE DUCT DIAMETER.
 - WHERE SPACE IS LIMITED, USE DUCT ELBOWS FABRICATED WITH SPACE THROATS AND BACKS AND FITTED WITH ROVANE TURNING VANES.
- THE FOLLOWING DUCT JOINING METHODS SHALL BE USED:
 - PITTSBURGH LOCK OR DOUBLE SLIDE LOCK HAMMERED FLAT FOR LONGITUDINAL JOINTS ON STRAIGHT DUCTWORK.
 - PITTSBURGH LOCK FOR CORNER LOCK OF FITTING.
 - FLAT DRIVE CLEAT JOINT ON ALL SIDE JOINTS 18" (450MM) AND UNDER IN LENGTH.
 - FLAT SLIP CLEAT JOINT ON ALL TRANSVERSE JOINTS 18" (450MM) AND UNDER IN LENGTH.
 - ANGLE "S" OR STANDING DRIVE CLEATS ON ALL SIDE JOINTS 19"(475MM) TO 30"(750MM) ON HEIGHT.
 - STANDING "S" OR STANDING DRIVE CLEATS ON ALL TRANSVERSE JOINTS 19"(475MM) TO 30"(750MM) IN LENGTH.
 - ANGLE "S" OR STANDING DRIVE CLEATS ON ALL TRANSVERSE AND SIDE JOINTS 31"(725MM) TO 72"(1800MM).
 - STANDING "S" OR STANDING DRIVE CLEATS REINFORCED WITH 1 1/2"(38MM) X 4.5MM MILD STEEL BAR ON ALL TRANSVERSE AND SIDE JOINTS 73"(1825MM) AND OVER.
- PROVIDE FIRE DAMPERS WHICH CONFORM TO NFPA REGULATIONS, BEAR ULC LABEL, AND HAVE APPROVAL OF AUTHORITY HAVING JURISDICTION. DAMPERS TO BE TYPE 'B' AND 'C' (UNLESS OTHERWISE NOTED)AND INSTALLED IN DUCTWORK AT FIRE SEPARATIONS WHETHER SHOWN OR NOT. VERIFY LOCATIONS ON ARCHITECTURAL DRAWINGS.
- ALL NEW DUCTWORK SHALL BE SEALED USING DUCT BOND II HIGH PRESSURE, NON-TOXIC, DUCT SEALER THROUGHOUT ALL SEAMS AND JOINTS.

- SUPPORT HORIZONTAL DUCTS ON MAXIMUM 8'-0" (2.4 M)CENTERS BY PERFORATED GALV. STEEL RIVETTED STRAP FOR DUCTWORK 36" (915 MM) (EITHER DIMENSION) OR LESS, AND MINIMUM 1" X 1" X 1/8" (25 X 25 X 2 MM) GALV. IRON UNDER DUCTS OVER 36" (915 MM) (EITHER DIMENSION) WITH 3/8" (6 MM) DIAM. THREADED RODS SUSPENDING ANGLES FROM STRUCTURE.

- PROVIDE ACCESS DOORS WHERE REQUIRED FOR SERVING OF EQUIPMENT AND FIRE DAMPERS.

- PROVIDE 4" (100 MM) FLEXIBLE DUCT CONNECTIONS ON BOTH INLET AND OUTLET DISCHARGE SIDES OF EACH FAN.

- PROVIDE ONE SPARE SET OF FILTERS FOR EACH AIR HANDLING UNIT.

- DUCT MOUNTED MOTORIZED DAMPERS SHALL BE PROVIDED WITH THE FOLLOWING REQUIREMENTS:

- ALL MOTORIZED DAMPERS SHALL BE INSULATED LOW LEAKAGE TYPE TO TAMCO 9000 OR EQUAL IN ACCORDANCE WITH B7.
- MOTORIZED DAMPERS SHALL BE LOCATED AS NEAR AS POSSIBLE TO THE PLANE OF THE BUILDING ENVELOPE FOR ALL AIR INTAKE AND OUTLET TYPES.
- MOTORIZED DAMPERS SHALL CLOSE AUTOMATICALLY WHEN HVAC SYSTEM IS NOT IN OPERATION.
- MOTORIZED DAMPERS SHALL BE PROVIDED ON ALL AIR INTAKES AND AIR OUTLET DUCTS EXCEEDING 12"Ø OR 12"x12" IN SIZE.

- PROVIDE VIBRATION ISOLATORS FOR ALL MECHANICAL EQUIPMENT, INCLUDING PUMPS, UTILITY FANS, AND VENT SETS, AIR HANDLERS, ROOF-TOPS UNITS, CONDENSING UNITS, COMPRESSED, ETC. AS APPLICABLE. SUBMIT SHOP DRAWINGS PRIOR TO INSTALLATION.

- BACK-DRAFT DAMPERS SHALL BE PROVIDED WITH THE FOLLOWING MINIMUM REQUIREMENTS:

- 16 GA. GALVANIZED STEEL OR ALUMINUM CHANNEL FRAME; 16 GA. GALVANIZED BLADES C/W STIFFENERS, FULL BLADE-LENGTH SHAFT; BRASS, BALL OR NYLON BUSHING; FELT OR NEOPRENE ANTI-CHATTER BLADE STRIPS; ADJUSTABLE COUNTER-BALANCE.

- CHIMNEYS AND BREECHING SHALL BE LABORATORY TESTED AND LISTED BY THE UNDERWRITERS LABORATORIES INC. FOR USE WITH BUILDING HEATING EQUIPMENT BURNING NATURAL GAS OR PROPANE GAS, AS DESCRIBED IN NFPA 211, SECTION 60. THE DOUBLE WALL STACK SHALL HAVE AN OUTER JACKET OF GALVANIZED STEEL CONFORMING TO ASTM A525. THERE SHALL BE AN AIR SPACE BETWEEN THE WALLS. THE INNER GAS CONVEYING PIPE SHALL BE AN ALUMINUM ALLOY - JOINTS TO BE SECURED WITH SHEET METAL SCREWS. MODIFY EXISTING CHIMNEYS/VENTING AS REQUIRED TO CONFORM WITH REQUIREMENTS OF THE CODE. EXTRA COMPENSATION SHALL NOT BE PROVIDED FOR FAILURE TO ACCOMMODATE REQUIRED INSTALLATION BASED ON EXISTING CONDITIONS.

- PROVIDE CHIMNEYS AND/OR BREECHING FOR:
 - GAS-FIRED MAKE-UP AIR UNITS.

- PROVIDE BASE TEE WITH CLEANOUT, ROOF FLASHING AND VENT CAP FOR ALL EQUIPMENT AS REQUIRED.

- ALL AIR SYSTEMS SHALL BE BALANCED AND TESTED BY A CERTIFIED A.A.B.C. INDEPENDENT BALANCING AGENCY TO PROVIDE QUANTITIES AS SHOWN. PROVIDE THREE(3) SETS OF BALANCE REPORTS FOR REVIEW BY THE CONTRACT ADMINISTRATOR. ALL BALANCING REPORTS SHALL INCLUDE FIRE DAMPER TESTING AND CERTIFICATION.

CONTROLS

THE POINTS BELOW DESCRIBE THE CONTROL SEQUENCE OF THE H.V.A.C. EQUIPMENT SPECIFIED IN THE SCHEDULES. ALL CONTROLS TO BE SUPPLIED BY DIV. 15 AND WIRED BY DIV.15. CONTROLS SUBCONTRACTOR SHALL BE A SUBCONTRACTOR OF THE MECHANICAL SUBCONTRACTOR. PROVIDE LOCKABLE COVERS FOR ALL THERMOSTATS, NEW OR EXISTING. ALL CONTROL WIRING SHALL BE PLENUM RATED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE TO MEET THE DEVELOPED SMOKE/FLAME SPREAD RATINGS OF 25/50.

1. EXHAUST VENTILATION CONTROL:

- INDOOR MAKE UP AIR UNIT AND EXHAUST FAN TO BE TIMECLOCK CONTROLLED PER THE FOLLOWING:

1.1.1. UNOCCUPIED HOURS OPERATION:

- MOTORIZED DAMPER ON MIXING BOX FOR OUTSIDE AIR TO MAKE UP AIR UNIT SHALL CLOSE AND RETURN DAMPER ON MIXING BOX SHALL OPEN.
- FAN OF MAKE UP AIR UNIT SHALL CYCLE ON CALL FOR HEAT.
- UNIT TO UTILIZE DISCHARGE TEMPERATURE CONTROL C/W REMOTE ROOM RESET.

1.1.2. OCCUPIED HOURS OPERATION:

- MOTORIZED DAMPER ON MIXING BOX FOR OUTSIDE AIR TO MAKE UP AIR UNIT SHALL OPEN AND RETURN DAMPER ON MIXING BOX SHALL CLOSE.
- EXHAUST FAN SHALL ENERGIZE
- FAN OF MAKE UP AIR UNIT SHALL REMAIN ON.
- UNIT TO UTILIZE DISCHARGE TEMPERATURE CONTROL C/W REMOTE ROOM RESET.
- WHEN TIMECLOCK INITIATES UNOCCUPIED SCHEDULE, EXHAUST FAN SHALL DE-ENERGIZE.

MECHANICAL EQUIPMENT SCHEDULES:

EQUIPMENT THAT IS SUPPLIED WITH A FACTORY-INSTALLED DISCONNECT MEANS FOR THE CONNECTION OF THE SUPPLY SIDE FEEDER CONDUCTORS MUST BE CERTIFIED SO THAT THESE CONDUCTORS CAN BE OF EITHER ALUMINUM OR COPPER.

MECHANICAL AND ELECTRICAL SUBCONTRACTORS ARE RESPONSIBLE FOR THE MUTUAL COORDINATION OF ALL ELECTRICAL REQUIREMENTS OF MECHANICAL EQUIPMENT. COORDINATION IS TO INCLUDE THE COMMUNICATION OF ALL FINAL ELECTRICAL NAMEPLATE INFORMATION FROM THE MECHANICAL SUBCONTRACTOR TO THE ELECTRICAL SUBCONTRACTOR. THE COMMUNICATION OF THE DETAILED CONTROL INFORMATION AS WELL AS ANY ANCILLARY INFORMATION REQUIRED FOR THE FINAL SYSTEMS TO OPERATE AS INTENDED BY THE RESPONSIBLE PROFESSIONAL ENGINEER. THE COORDINATION IS TO OCCUR PRIOR TO THE ORDERING OF EQUIPMENT BY EITHER TRADE. NO EXTRA COMPENSATION WILL BE ALLOWED DUE TO FAILURE TO CARRY OUT THIS COORDINATION. REPORT AT ONCE TO THE CONTRACT ADMINISTRATOR ANY DEFECT, DISCREPANCY, OMISSION OR INTERFERENCE AFFECTING THE SATISFACTORY COMPLETION OF WORK.



ISSUED FOR CONSTRUCTION

17.08.04 MECHANICAL ADDENDUM #1
17.07.24 ISSUED FOR CONSTRUCTION
No. DATE REVISION /ISSUANCE



MECHANICAL

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Project

ST. VITAL ARENA
CHANGE ROOM UPGRADES
580 ST. ANNE'S ROAD, WINNIPEG, MB

Sheet Title

MECHANICAL
SPECIFICATIONS 1 OF 2

Project No.

1723

Sheet

Date

JULY 2017

M2.0