## MECHANICAL SPECIFICATION

- .1 CONTRACTOR TO VISIT JOBSITE DURING BID OPPORTUNITY. DRAWINGS INDICATE APPROXIMATE LOCATION OF EXISTING MECHANICAL EQUIPMENT AND SERVICES. VERIFY EXACT LOCATIONS OF EXISTING MECHANICAL EQUIPMENT AND SERVICES AND ALLOW FOR NECESSARY RELOCATING OF NOTED SERVICES (OR RECONNECTION TO EXISTING SERVICES) TO SUIT NEW CONSTRUCTION.
- 2 ALL WORK SHALL CONFORM TO MANITOBA BUILDING CODE AND LOCAL AUTHORITIES. APPLY FOR, OBTAIN AND PAY FOR ALL NECESSARY PERMITS. .3 INSTALLATION OF WORK SHALL BE COORDINATED WITH THE
- GENERAL CONTRACTOR AND SHALL BE SCHEDULED SO AS NOT TO ENDANGER OR DISTURB THE CITY OR USERS OF THE BUILDING SHUTDOWN OF EXISTING BUILDING SYSTEMS SHALL BE COORDINATED WITH THE CITY'S REPRESENTATIVE 4 MECHANICAL SUBCONTRACTOR SHALL PERFORM COORDINATION OF MECHANICAL DIVISION INSTALLATION WITH ALL RELATED GENERAL CONTRACTORS AND SUBCONTRACTORS. VERIFY ALL DIMENSIONS AND LOCATIONS OF EXISTING EQUIPMENT AND SERVICES PRIOR TO PROCEEDING WITH WORK
- .5 ALL INTERIOR SPACE POWER HAMMERING. DRILLING AND OTHER NOISY WORK SHALL BE COORDINATED WITH THE CITY PRIOR TO ROUGH-IN.
- .6 BID OPPORTUNITY SHALL BE BASED ON THE USE OF SPECIFIED FOLIPMENT, LINESS ACCEPTANCE FOR THE USE OF FOLIAL MANUFACTURERS IS IN ACCORDANCE WITH B7 AND OBTAINED FROM THE CONTRACT ADMINISTRATOR PRIOR TO BID SUBMISSION. ALTERNATE MANUFACTURERS MAY BE QUOTED AS AN INCREASE OR DECREASE AMOUNT TO THE BID SUBMISSION, WITHOUT PRIOR ACCEPTANCE OF THE CONTRACT ADMINISTRATOR.
- .7 SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT TO CONTRACT ADMINISTRATOR FOR SHOP DRAWINGS SUBMITTED ELECTRONICALLY, INCLUDE CONTRACT ADMINISTRATOR PROJECT NAME AND NUMBER IN SUBJECT LINE OF E-MAIL TO CONTRACTADMIN@SMSENG.COM. ALLOW 10 BUSINESS DAYS FOR THE REVIEW AND PROCESSING OF SHOP DRAWINGS.
- .8 REQUEST FOR INTERPRETATION (RFI): 1 FOR REI'S SUBMITTED ELECTRONICALLY INCLUDE CONTRACT ADMINISTRATOR PROJECT NAME AND NUMBER IN THE SUBJECT LINE OF E-MAIL TO CONTRACTADMINI@SMSENG.COM.
- .2 CONTENT OF THE RFIL INCLUDE A DETAILED DESCRIPTION OF THE ITEM NEEDING INTERPRETATION AND PROPOSED SOLUTION .3 ALLOW 10 BUSINESS DYAS FOR THE REVIEW AND
- PROCESSING OF RIF'S. .9 UNLESS NOTED OTHERWISE PROVIDE ONE YEAR GUARANTEE (FROM PROJECT SUBSTANTIAL COMPLETION) FOR ALL **EQUIPMENT AND WORKMANSHIP**
- .10 ALL CONNECTIONS TO EXISTING BUILDING MECHANICAL SERVICES SHALL BE COORDINATED WITH THE CITY REPRESENTATIVE. .11 ALL NECESSARY CUTTING AND PATCHING SHALL BE
- PERFORMED BY COMPETENT SUBCONTRACTORS EMPLOYED BY MECHANICAL CONTRACTOR TO SATISFACTION OF THE CITY REPRESENTATIVE. .12 ALL DUCTWORK AND PIPING TO BE INSTALLED STRAIGHT, PARALLEL TO THE BUILDING WALLS.
- 13 WHERE PIPES OR DUCTS GO THROUGH AN EXTERIOR ROOF OR WALL, THEY SHOULD BE BOXED-IN, FLASHED AND WATERPROOFED. ALLOW FOR EXPANSION AND CONTRACTION 14 PIPE HANGERS SHALL BE ANVIL FIG. 65 FOR STEEL PIPE AND
- FIG. CT65 FOR COPPER PIPE, ALL WITH FIG. 140 THREADED ROD ATTACHED TO FIG. 117 EXPANSION CASE SET IN HOLES DRILLED IN CONCRETE. OR ATTACHED TO FIG. 225 OR 227 CLAMP ATTACHED TO JOISTS OR BEAMS. 15 TREATED WOOD SLEEPERS (4" X 4") AND FLASHING FOR
- EQUIPMENT INSTALLED ON ROOF TO BE PROVIDED BY THE GENERAL CONTRACTOR.
- 16 PRIOR TO DRILLING HOLES AND/OR OPENINGS IN EXISTING STRUCTURE. CONTRACTOR SHALL RETAIN SERVICES OF NATIONAL TESTING LABORATORIES LIMITED TO LOCATE AND MARK ALL STRUCTURAL REINFORCING STEEL LOCATED IN AREA WHERE CUTTING OR DRILLING IS PROPOSED. AT NO IME QUALL DEINEODOING STEEL BE OUT WITHOUT DDIOD WRITTEN APPROVAL FROM STRUCTURAL CONTRACT ADMINISTRATOR QUALIFIED AND LICENSED TO PRACTICE IN PROVINCE OF MANITOBA. NO HOLES OR OPENINGS WILL BE PERMITTED WITHIN AREA OF STRUCTURAL DROP PANELS LOCATED AT COLUMNS.
- 17 FURNISH TO THE CITY THREE (3) COMPLETE SETS OF MANUFACTURER'S OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL EQUIPMENT REQUIRING MAINTENANCE REVIEW INSTRUCTIONS WITH THE CITY REPRESENTATIVE TO ENSURE A THOROUGH UNDERSTANDING OF THE EQUIPMENT AND ITS OPERATION.
- 18 PROVIDE A MARK-UP OF THE CONTRACT DRAWINGS FOR RECORD "RECORD DRAWINGS". REVISED AS REQUIRED TO SHOW ANY CHANGES FROM THAT ORIGINALLY SHOWN. RECORD DRAWINGS TO BE KEPT ON SITE AND UPDATED WEEKLY. CONTRACT ADMINISTRATOR WILL REVIEW PROGRESS DURING SITE OBSERVATIONS.
- .19 AT COMPLETION OF PROJECT PROVIDE RECORD DRAWINGS IN AUTOCAD 2013 FORMAT, COMPLETE WITH DISK PAID FOR BY MECHANICAL CONTRACTOR.
- .20 ALL EXTRANEOUS MATERIAL IN SPACE UNRELATED TO NEW AND REVISED WORK SHOWN, INCLUDING PIPING, CONTROL TUBING, DUCTWORK, ETC. SHALL BE REMOVED. .21 PROVIDE FIRESTOPPING FOR ALL OPENINGS IN FIRE SEPARATIONS FOR PASSAGE OF PIPES, DUCTS, ETC. TO
- MANUFACTURER'S PRINTED RECOMMENDATIONS. .22 ALL WIRING FOR EQUIPMENT SPECIFIED HEREIN SHALL BE BY THE ELECTRICAL SUB-CONTRACTOR, UNLESS OTHERWISE

MAINTAIN INTEGRITY OF FIRE SEPARATIONS AS PER

- .23 MECHANICAL CONTRACTOR SHALL REVIEW ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTION WITH ELECTRICAL SUBCONTRACTOR AND DIVISION 26 DRAWINGS PRIOR TO ORDERING EQUIPMENT. ENSURE PROPER ELECTRICAL CHARACTERISTICS ARE DETERMINED FOR ALL AFFECTED AND RELATED WORK.
- .24 WHERE MECHANICAL SERVICES ARE CONCEALED WITHIN WALLS, FLOORS OR CEILINGS AND CANNOT BE VISUALLY IDENTIFIED. PROVIDE ELECTRONIC SCANNING DEVICES OR OTHER APPROVED MEANS TO LOCATE AND IDENTIFY CONCEALED SERVICES PRIOR TO WORK START, MAKE GOOD ANY DAMAGE TO EXISTING MECHANICAL SERVICES AT NO COST TO THE CONTRACT.
- 2.0 INSULATION .1 VAPOUR BARRIER FLEXIBLE DUCT EXTERNALLY INSULATED WITH FIBREGLAS REFRK REINFORCED FOIL-FACED VAPOUR SEAL DUCT INSULATION PF335, 340 G. (3/4 LB./CU. FT.)
  - .1 50MM (2") THICKNESS .1 ALL ROUND EXHAUST DUCTS FROM/TO EXHAUST FAN NOT SHOWN ACOUSTICALLY LINED FROM ROOF FOR
  - A LENGTH OF 1.8M (6'-0") OR FROM ROOF DISCHARGE BACK TO DAMPER. WHICHEVER IS GREATER. .2 ALL ROUND ROOF DUCTING TO CENTRIFUGAL EXHAUST FANS LOCATED ON ROOFS.
  - .3 ROUND DUCT: ADHERE TO DUCT SURFACE APPLIED IN STRIPS 150MM (6") WIDE, 300MM (12") O.C. BUTT ALL EDGES OF INSULATION, STAPLE AND SEAL ALL JOINTS WITH TAPE ADHERED OVER THE JOINT. SEAL ALL BREAKS WITH VAPOR BARRIER TYPE.
  - .4 EXPOSED DUCT: RECOVER DUCTS EXPOSED TO VIEW WITH 170 G. (6 OZ.) CANVAS SECURED WITH BAKOR 120-18 WHITE FIRE RETARDANT LAGGING ADHESIVE FINISH WITH BRUSH COAT OF SAME ADHESIVE. .5 OUTDOOR DUCT: ON ROOF AND OTHER DUCTWORK
  - LOCATED OUTSIDE OF BUILDING, PROVIDE 26 GA. G. SHEET METAL COVER TO PROTECT INSULATION. SEAL ALL JOINTS AND MAKE WEATHERTIGHT.
- .2 VAPOUR BARRIER RIGID DUCT EXTERNALLY INSULATED WITH FIBREGLAS REERK REINFORCED FOIL-FACED VAPOUR SEAL DUCT INSULATION TYPE FF 340 G. (4.5 LB./CU.FT.) DENSITY. .1 50MM (2") THICKNESS

- .1 ALL ROUND EXHAUST DUCTS FROM/TO EXHAUST FAN NOT SHOWN ACOUSTICALLY LINED FROM ROOF FOR A LENGTH OF 1 8M (6'-0") OR FROM ROOF DISCHARGE BACK TO DAMPER, WHICHEVER IS GREATER.
- .2 ALL ROUND ROOF DUCTING TO CENTRIFUGAL EXHAUST FANS LOCATED ON ROOFS. .3 INSULATION APPLIED WITH EDGES TIGHTLY BUTTED AND SECURED BY IMPALING ON PINS WELDED TO DUCT. PINS TO BE STAGGERED, MINIMUM 300MM (12") O.C. IN EVERY DIRECTION, THIS APPLIES TO ALL
- SIDES. SECURE INSULATION TO PINS WITH METAL FASTENERS. PINS SHALL BE LONG ENOUGH TO BEND AFTER FASTENERS HAVE BEEN APPLIED. INSTALL TWO FASTENERS TO ALL INSULATION ON ROOF. DAB ADHESIVE OVER PINS AND FASTENERS.
- .4 SEAL ALL JOINTS, EDGES AND BREAKS IN VAPOR SEAL JACKET WITH VAPOR BARRIER FOIL OF THE SAME QUALITY AS THAT OF DUCT MEMBRANE 100MM (4") WIDE WITH BF 85-15 LAGGING ADHESIVE .5 EXPOSED DUCT: RECOVER DUCTS EXPOSED TO VIEW
- WITH 170 G. (6 OZ.) CANVAS SECURED WITH BAKOR 120-18 WHITE FIRE RETARDANT LAGGING ADHESIVE. FINISH WITH BRUSH COAT OF SAME ADHESIVE. .6 OUTDOOR DUCT: ON ROOF AND OTHER DUCTWORK LOCATED OUTSIDE OF BUILDING PROVIDE 26 GA G L SHEET METAL COVER TO PROTECT INSULATION. SEAL ALL JOINTS AND MAKE WEATHERTIGHT.

## 3.0 VENTILATION

- .1 DUCTWORK .1 DUCTWORK SHALL BE CONSTRUCTED AS RECOMMENDED IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE (LATEST REVISION) AND SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL (LATEST REVISION).
- .1 REFER TO FAN SCHEDULE FOR EXTERNAL STATIC PRESSURE (ESP) PRODUCED BY FANS AND AIR HANDLING UNITS.
- 2 DUCTWORK SHALL BE CONSTRUCTED TO THE PRESSURE CLASS ADEQUATE FOR THE ESP PRODUCED BY FANS.
- .3 DUCT SEAL CLASSIFICATION TAILPIPE .1 SMACNA CLASSIFICATION AS FOLLOWS

.2 DUCT PRESSURE CLASS

- .1 SEAL CLASS A .1 SEALING REQUIRED: ALL TRANSVERSE JOINTS LONGITUDINAL SEAMS AND APPLICABLE DUCT WALL PENETRATIONS. .2 STATIC PRESSURE CONSTRUCTION CLASS: 4" WC AND UP (1000PA).
- .2 SEAL CLASS B .1 SEALING REQUIRED: ALL TRANSVERSE JOINTS LONGITUDINAL SEAMS. .2 STATIC PRESSURE CONSTRUCTION CLASS: 3"
- WC AND UP (750PA). .2 SEAL CLASS C .1 SEALING REQUIRED: TRANSVERSE JOINTS. .2 STATIC PRESSURE CONSTRUCTION CLASS: 2"
- WC AND UP (500PA). .2 SEALANT .1 HIGH TEMPERATURE INDOOR DUCT SEALANT
- .1 TYPE: RTV SILICONE .2 SERVICE TEMPERATURE: -85F TO 500F. .3 STANDARD OF ACCEPTANCE: BRAMEC
- HI-TEMP SILICONE SEALANT. .1 TAPE: POLYVINYL TREATED, OPEN WEAVE FIBERGLASS TAPE, 50 MM WIDE.
- .2 STANDARD OF ACCEPTANCE: DURO DYNE .4 DUCT TO BE GALVANIZED STEEL OF LOCK-FORMING GRADE TO ASTM A653 AND A924 STANDARDS, UNLESS
- OTHERWISE NOTED WHERE DUCT WIDTH EXCEEDS 18" IN LARGEST
- DIMENSION. STIFFEN BY BREAKING SHEETS DIAGONALLY .6 SIZE ROUND DUCTS, INSTALLED IN PLACE OF RECTANGULAR DUCTS, FROM ASHRAE'S TABLE OF
- FOUIVALENT RECTANGULAR AND ROUND DUCTS .7 THICKNESS, FABRICATION AND REINFORCEMENT: TO SMACNA HAVC DUCT CONSTRUCTION STANDARDS .1 INDOOR DUCTWORK: TO SMACNA UNLESS NOTED
- .2 OUTDOOR DUCT TO BE TWO GAUGES HEAVIER THAN DIRECTED ABOVE. .8 JOINTS
- .1 TO SMACNA HVAC DUCT CONSTRUCTION STANDARD. .9 PRIOR TO FABRICATION OF DUCTWORK, CHECK ALL SPACES AND HEIGHTS FOR CONFLICTING WITH OTHER CONTRACTORS
- .10 DUCT FITTINGS: TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS
- .1 FABRICATION: TO SMACNA. .2 RADIUSED ELBOWS:
- .1 RECTANGULAR: 1.5 TIMES WIDTH OF DUCT. .2 ROUND: 1.5 TIMES DIAMETER.
- .3 MITRED ELBOWS, RECTANGULAR: .1 SINGLE THICKNESS TURNING VANES. REFER TO MECHANICAL DETAILS. PROVIDE ADDITIONAL SUPPORT FOR SEGMENTS LARGER THAN 600 MM
- .2 STANDARD OF ACCEPTANCE: DUCT MATE. .4 BRANCHES:
- .1 RECTANGULAR MAIN AND BRANCH: WITH 45 DEGREES ENTRY ON BRANCH 2 ROUND MAIN AND BRANCH: ENTER MAIN DUCT AT 45 DEGREES WITH CONICAL CONNECTION.
- .3 PROVIDE VOLUME CONTROL DAMPER IN BRANCH DUCT NEAR CONNECTION TO MAIN DUCT. .4 MAIN DUCT BRANCHES: WITH SPLITTER DAMPER.
- .5 DUCT SIDEWALL GRILLES: .1 PROVIDE AIR VOLUME EXTRACTOR AT DUCT BRANCHES WITH HEX KEY OPERATOR ACCESSIBLE THROUGH THE FACE OF THE
- .2 STANDARD OF ACCEPTANCE: PRICE AE1 W/ TYPE 3 OPERATOR .5 TRANSITIONS: TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS
- .6 OFFSETS: TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS .7 EASEMENTS: SPLIT DUCT IN TWO WITH ORIGINAL
- DUCT CROSS SECTIONAL AREA BEING MAINTAINED PER SMACNA STANDARDS. .8 ROUND SPIRAL DUCT SHALL BE USED IN EXPOSED
- FINISHED AREAS. .9 SPIRAL DUCT BRANCH FITTINGS SHALL BE MACHINE-FABRICATED, NOT FILED-CONSTRUCTED. .11 DUCT LEAKAGE
- .1 SMACNA HVAC AIR DUCT LEAKAGE TEST AS **FOLLOWS** .1 SEAL CLASS A
  - .1 SEALING APPLICABLE: JOINTS, SEAMS AND ALL APPLICABLE DUCT WALL PENETRATIONS .2 DUCT CLASS: 4" WC AND UP (1000PA); 6" WC AND UP (1500PA): 10" WC AND UP (2500PA).

.3 LEAKAGE CLASS: RECTANGULAR METAL 4;

- ROUND METAL 2. .2 SEAL CLASS B .1 SEALING APPLICABLE: TRANSVERSE JOINTS
- AND SEAMS 2 DUCT CLASS: 3" WC AND UP (750PA). .3 LEAKAGE CLASS: RECTANGULAR METAL 8; **ROUND METAL 4.**

- .2 SEAL CLASS C .1 SEALING APPLICABLE: TRANSVERSE JOINTS
- .2 DUCT CLASS: 1/2" WC AND UP (125PA); 1" WC AND UP (250PA); 2" WC AND UP (500PA). .3 LEAKAGE CLASS: RECTANGULAR METAL 16;
- ROUND METAL 8. .2 DUCT AND EQUIPMENT SUPPORTS. HANGERS AND INSERTS: .1 SUPPORT HORIZONTAL DUCTS ON MAXIMUM 8'-0" CENTRES BY NON-PERFORATED GALVANIZED STEEL RIVETED STRAP FOR DUCTWORK 36" (ANY DIMENSION) OR LESS. AND MINIMUM 1" X 1" X 1/8" GALVANIZED ANGLE IRON PASSING UNDER DUCTS 37" OR OVER (ANY DIMENSION) WITH 3/8" DIAMETER THREADED RODS SUSPENDING ANGLE IRON FROM STRUCTURE.
- .2 FOR INSERTS IN EXISTING CONCRETE STRUCTURE, USE HILTI H.K.D. STEEL ANCHORS. .3 SUPPORT VERTICAL DUCTS WITH ANGLE IRON COLLARS
- SIZED TO PROVIDE PROPER BEARING. .3 EQUIPMENT

.1 EXHAUST FANS:

.1 EF-1

.1 HOUSING: CLASS 0, I AND II FEATURE PERMA-LOCK CONSTRUCTION ON SIZES 4-49 AND CONTINUOUSLY WELDED ON SIZES 54-73 AND ALL CALSS III FANS - UNIT SUPPORT ANGLES WITH PRE-PUNCHED MOUNTING HOLES -ADJUSTABLE MOTOR PLATE - CORROSION RESISTANT FASTENERS - INLET COLLARS -PUNCHED OUTLET FLANGE STANDARD (EXCEPT FOR DOWNBLAST -DB) ON CLASS 0, I AND II SIZES 33-73 AND ALL CLASS III FANS - ALL STEEL PART ARE PROCESSED THROUGH A MULTI-STAGE

CLEANING AND PRE-TREATMENT AND THEN

FINISHED WITH A HIGH PERFORMANCE POWDER

- .2 BEARINGS. SHAFT, AND WHEEL: AIR HANDLING QUALITY, SELF-ALIGNING, BALL BEARING IN PILLOW BLOCK HOUSING - POLISHED, SOLID STEEL SHAFTS - CENTRIFUGAL WHEEL. .2 TAILPIPE EXHAUST HOSE
- METRES OF CORD, C/W CENTRIFUGAL BRAKE AND REVERSED SPRING .2 NEDERMAN SILVER COLOR HOSE FOR EXTREME TEMP 1200F (650C). VERY HIGH TEMPERATURE RESISTANCE FLAME RETARDANT SILICONE FREE HIGH RESISTANCE TO VACUUM, VIBRATION AND ABRATION, FLEXIBLE AND COMPRESSIBLE, SMALL BEND RADIUS, CLAMPING WITH HIGH TENSILE

.1 NEDERMAN BALANCER: OPEN REEL TYPE WITH 8

- STRENGTH BETWEEN HOSE MATERIAL AND EXTERNAL HELIX. .3 MATERIAL: HIGH TEMPERATURE FABRIC, COATED WITH HEAT, STABILISERS, REINFORCED WITH WOVEN
- STAINLESS STEEL WIRE. .4 HELIX MATERIAL: GALVANIZED STEEL. 5 TEMPERATURE: MAX. TEMP INTERMITTENT: 1382F (750C)
- MAX. TEMP CONTINUOUS: 1202F (650C) MIN. OPERATING TEMP: -4F (-20C) .6 HOSE SIZE: 8"Ø; HOSE LENGTH: 14 FEET (4.3 M)
- .3 ULTRA TIGHT MOTORIZED DAMPER .1 DAMPERS SHALL CONSIST OF A 14 GA (2MM) GALVANIZED STEEL CHANNEL FRAME WITH 8" (203MM) MINIMUM DEPTH AND 2" (51MM) FLANGES DOUBLE SKIN AIRFOIL TYPE BLADES FABRICATED FROM TWO LAYERS OF 20 GA (1MM) GALVANIZED STEEL WITH INSULATION SANDWICHED BETWEEN BLADE SKINS; 1/2" (12.7MM) DIA. PLATED STEEL AXLES TURNING IN STAINLESS STEEL SLEEVE BEARINGS:
- AND EXTERNAL (OUT OF THE AIRSTREAM) BLADE-TO-BLADE LINKAGE. .2 DAMPER SHALL BE SUITABLE FOR PRESSURES TO 8.5" WG (2.1 KPA) VELOCITIES TO 4.000 FMP (20.3 M/S) AND TEMPERATURES TO 250F (121C)
- 3 DAMPER SHALL BE FOUIPPED WITH BLADE AND JAMB SFALS FOR LOW LEAKAGE PERFORMANCE. BLADE SEALS SHALL BE FPDM 250F (121C) MAXIMUM TEMPERATURE OR SILICONE RUBBER FOR 400F (204C) MAXIMUM TEMPERATURE. JAMB SEALS SHALL BE FLEXIBLE STAINLESS STEEL. TESTING AND RATINGS SHALL BE PER AMCA STANADARD 500-D.

.4 STANDARD OF ACCEPTANCE: GREENHECK HCD-135.

COPIES FOR REVIEW UPON COMPLETION. PROVIDE DAMPER

- 4.0 TESTING AND BALANCING .1 AIR SYSTEMS SHALL BE BALANCED AND TESTED BY AN INDEPENDENT AIR BALANCE AGENCY (AABC) TO PROVIDE AIR QUANTITIES AS SHOWN. PROVIDE AIR BALANCE REPORT FOR REVIEW BY THE CONTRACT ADMINISTRATOR. SUBMIT TWO
- STICKER UPON FINAL BALANCING COMPLETION. .2 INCORPORATE COMMENTS OR CHANGES REQUESTED BY CONTRACT ADMINISTRATOR AND PROVIDE SUFFICIENT NUMBER OF COPIES OF FINAL REPORT TO MECHANICAL SUBCONTRACTOR FOR INCLUSION IN OPERATING & MAINTENANCE MANUALS.
- 5.0 CONTROLS .1 PROVIDE ONE .PDF SOFT COPY AND THREE HARD COVER COPIES OF INFORMATION PERTAINING TO TEMPERATURE CONTROL SYSTEM FOR THE CITY PERMANENT RECORD. INCLUDE SCHEMATIC DRAWINGS AND CONTROL SEQUENCE WRITE-UPS OF ALL CONTROL SYSTEMS TO MECHANICAL
- CONTRACTOR FOR INCLUSION IN OPERATIONS AND MAINTENANCE MANUAL. .2 PROVIDE ALL LABOUR, MATERIAL, PLANT, TOOLS, EQUIPMENT, AND SERVICES NECESSARY AND REASONABLY INCIDENTAL TO COMPLETION OF TEMPERATURE CONTROLS SYSTEMS AS
- NOTED HEREIN AND/OR SHOWN ON DRAWINGS 3 PROVIDE ALL NECESSARY DAMPERS, DAMPER OPERATORS, CONTROLLERS, INDICATION, RELAYS, CUMULATORS, POSITIONERS, SWITCHES, CLOCKS, TRANSFORMERS, ETC., TO
- MAKE COMPLETE AND OPERABLE SYSTEM. .4 MECHANICAL SUBCONTRACTOR TO DISTRIBUTE AND MOUNT ALL PIPE CONNECTED EQUIPMENT. .5 ELECTRICAL SUBCONTRACTOR TO SUPPLY AND INSTALL ALL
- CONDUIT, WIRE AND CONNECTIONS FROM DISTRIBUTION PANELS TO LINE SIDE OF MAGNETIC STARTERS AND THERMAL OVERLOAD SWITCHES, AND FROM LOAD SIDE OF STARTERS AND SWITCHES TO MOTORS. .6 CONTROL CONTRACTOR SHALL SUPPLY AND INSTALL ALL CONDUIT, WIRE, ELECTRIC RELAYS, CONNECTIONS AND OTHER DEVICES REQUIRED FOR CONTROL CIRCUIT WIRING FOR SYSTEMS AS SPECIFIED HEREIN WHETHER LINE OR LOW VOLTAGE, ELECTRICAL WIRING SHALL BE INSTALLED IN
- AND DIVISION 26 ELECTRICAL REQUIREMENTS AND SPECIFICATIONS INCLUDED WITHIN THIS PROJECT. .7 THE CITY OF WINNIPEG HAS AN EXISTING CENTRAL MONITORING SYSTEM IN PLACE. WHERE DDC POINTS ARE IDENTIFIED AS CENTRALLY MONITORED POINTS. THE CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL REQUIRED HARDWARE AND SOFTWARE TO INTERFACE TO THE THE CITY'S JOHNSON CONTROLS METASYS EA SERVERS AND WORKSTATIONS. THESE ARE LOCATED AT THE CENTRAL CONTROL OFFICES, 510 MAIN STREET, WINNIPEG, MANITOBA

CONFORMANCE WITH CSA, ULC, MANITOBA BUILDING CODE

(IE CITY HALL). .8 CONTROL CONTRACTOR TO SUPPLY ALL DRAWINGS / GRAPHICS/SEQUENCE OF OPERATIONS IN BOTH A HARD AND SOFT COPY. DRAWINGS AND GRAPHICS TO BE ABLE TO BE READ AND MODIFIED BY CITY OF WINNIPEG STAFF USER INTERFACE GRAPHICS TO BE COMPLETED USING GRAPHIC GENERATION TOOL SOFTWARE. GRAPHICS MUST USE CITY OF WINNIPEG GRAPHIC TEMPLATES. CONTRACTOR TO SUPPLY AS-BUILT DRAWINGS IN AN EDITABLE FORMAT, ABLE TO BE EASILY EDITED BY CITY OF WINNIPEG STAFF. CONTRACTOR SHALL USE METRIC UNITS; IMPERIAL UNITS WILL NOT BE

ACCEPTED. .9 THE USE OF EITHER N2OPEN OR BACNET TO BE DETERMINED BASED ON TYPE OF BUILDING WHERE THE WORK IS BEING PERFORMED. THE NEW WORK IS TO BE TIED INTO THE EXISTING CONTROLS. THE CONTRACTOR SHOULD CONTACT CITY OF WINNIPEG TECHNICAL STAFF TO DETERMINE THE

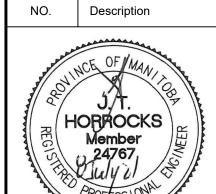
BEST PROTOCOL TO USE BASED ON EXISTING EQUIPMENT.

- .10 NO LON PROTOCOLS ARE TO BE ACCEPTED. .11 THE BUILDING MANAGEMENT SYSTEM (BMS) SHALL BE A COMPLETE SYSTEM DESIGNED FOR USE WITH THE ENTERPRISE IT SYSTEMS. THIS FUNCTIONALITY SHALL EXTEND INTO THE EQUIPMENT ROOMS. DEVICES RESIDING ON THE ALITOMATION NETWORK LOCATED IN FOLLIPMENT ROOMS AND SIMILAR SHALL BE FULLY IT COMPATIBLE DEVICES THAT MOUNT AND COMMUNICATE DIRECTLY ON THE IT INFRASTRUCTURE IN THE FACILITY. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE THE CITY'S IT STAFF TO ENSURE THAT THE FMS WILL PERFORM IN THE THE
- CITY'S ENVIRONMENT WITHOUT DISRUPTION TO ANY OF THE OTHER ACTIVITIES TAKING PLACE ON THAT LAN .12 ALL POINTS OF USER INTERFACE SHALL BE ON STANDARD PCS THAT DO NOT REQUIRE THE PURCHASE OF ANY SPECIAL SOFTWARE FROM THE BMS MANUFACTURER FOR USE AS A BUILDING OPERATIONS TERMINAL. THE PRIMARY POINT OF INTERFACE ON THESE PCS WILL BE A STANDARD WEB
- .13 WHERE NECESSARY AND AS DICTATED ELSEWHERE IN THESE SPECIFICATIONS, SERVERS SHALL BE USED FOR THE PURPOSE OF PROVIDING A LOCATION FOR EXTENSIVE ARCHIVING OF SYSTEM CONFIGURATION DATA, AND HISTORICAL DATA SUCH AS TREND DATA AND OPERATOR TRANSACTIONS ALL DATA STORED WILL BE THROUGH THE USE OF A STANDARD DATA BASE PLATFORM: MICROSOFT DATA ENGINE (MSDE) OR MICROSOFT SQL SERVER AS
- DICTATED ELSEWHERE IN THIS SPECIFICATION. .14 THE WORK OF THE SINGLE BMS CONTRACTOR SHALL BE AS DEFINED INDIVIDUALLY AND COLLECTIVELY IN ALL SECTIONS OF THIS DIVISION SPECIFICATIONS TOGETHER WITH THE ASSOCIATED POINT SHEETS AND DRAWINGS AND THE ASSOCIATED INTERFACING WORK AS REFERENCED IN THE
- RELATED DOCUMENTS. .15 THE BMS WORK SHALL CONSIST OF THE PROVISION OF ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, SOFTWARE, SOFTWARE LICENSES. SOFTWARE CONFIGURATIONS AND DATABASE ENTRIES INTERFACES WIRING TUBING INSTALLATION, LABELING, ENGINEERING, CALIBRATION DOCUMENTATION, SAMPLES, SUBMITTALS, TESTING, COMMISSIONING, TRAINING SERVICES, PERMITS AND LICENSES, TRANSPORTATION, SHIPPING, HANDLING, ADMINISTRATION, SUPERVISION, MANAGEMENT, INSURANCE, TEMPORARY PROTECTION, CLEANING, CUTTING AND PATCHING, WARRANTIES, SERVICES, AND ITEMS, EVEN THOUGH THESE MAY NOT BE SPECIFICALLY MENTIONED IN THESE DIVISION DOCUMENTS WHICH ARE REQUIRED FOR THE COMPLETE, FULLY FUNCTIONAL AND COMMISSIONED BMS.
- .16 PROVIDE A COMPLETE, NEAT AND WORKMANLIKE INSTALLATION. USE ONLY MANUFACTURER EMPLOYEES WHO ARE SKILLED, EXPERIENCED, TRAINED, AND FAMILIAR WITH THE SPECIFIC EQUIPMENT, SOFTWARE, STANDARDS AND CONFIGURATIONS TO BE PROVIDED FOR THIS PROJECT. .17 MANAGE AND COORDINATE THE BMS WORK IN A TIMELY MANNER IN CONSIDERATION OF THE PROJECT SCHEDULES.
- COORDINATE WITH THE ASSOCIATED WORK OF OTHER CONTRACTORS SO AS TO NOT IMPEDE OR DELAY THE WORK OF ASSOCIATED CONTRACTORS. .18 THE BMS AS PROVIDED SHALL INCORPORATE, AT MINIMUM,
- THE FOLLOWING INTEGRATED FEATURES, FUNCTIONS AND SERVICES: .1 OPERATOR INFORMATION, ALARM MANAGEMENT AND
- CONTROL FUNCTIONS.
- .2 ENTERPRISE-LEVEL INFORMATION AND CONTROL
- .3 INFORMATION MANAGEMENT INCLUDING MONITORING, TRANSMISSION, ARCHIVING, RETRIEVAL, AND REPORTING
- .4 DIAGNOSTIC MONITORING AND REPORTING OF BMS
- .5 OFFSITE MONITORING AND MANAGEMENT ACCESS. .6 ENERGY MANAGEMENT
- .19 SEQUENCES OF OPERATION .1 TAILPIECE EXHAUST FANS EXHAUST FAN SHALL OPERATE BY BMS SCHEDULE. .2 ON START, EXHAUST DAMPER TO OPEN. WITH DAMPER PROVEN OPEN VIA END SWITCH, FAN SHALL START AND RUN CONTINUOUSLY. ON STOP, EXHAUST
- DAMPER TO CLOSE. IF DAMPER FAILS TO CLOSE AS SENSED BY END SWITCH, ALARM TO BE ON. .3 AT A MINIMUM THE FOLLOWING POINTS SHALL BE MONITORED/ALARMED FOR EACH FAN:
- .1 BINARY OUTPUTS .1 E/A DAMPER .2 BINARY INPUTS

.1 FAN STATUS

Fan Schedule FAN CAP. E.S.P. SPD. OUT. BRK. MTR. | (CFM) | (in.W.G.) | (rpm) | VEL. | (HP) | (HP. **FAN TYPE REMARKS** SERVICE LOCATION MODEL **6300 4.00** 1725 2211 **5.61 7.50** Tailpipe Welded scroll Roof Greenheck USF-22 Exhaust universal single AF CW UB Hoist 10-18 width fan

> 'H<sub>AS</sub> 09/07/21 ISSUED FOR CONSTRUCTION BY DD/MM/YY









roject Title TRANSIT HOIST 10-18 **VEHICLE EXHAUST** 

WINNIPEG

**MANITOBA** MECHANICAL SPECIFICATION

3 OF 5

Checked By Approved By LP/WPD XZ/CRM **MANITOBA** AS NOTED Drawing Number Sheet Order

AND SCHEDULE

ENGINEERS
GEOSCIENTIST **Certificate of Authorizatio** SMS Engineering Ltd No. 166