Address 300 ASSINIBOINE AVENUE Project No. 2004-049 Date 2004.08.24 Description MECHANICAL SPECIFICATIONS File Name 2004049V0.dwgM3

MECHANICAL SPECIFICATIONS

PART 1 – MECHANICAL GENERAL CONDITIONS

1. SCOPE

A. PROVIDE A FULLY FUNCTIONAL HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) SYSTEM FOR THE SPACES NOTED.

B. MODIFY THE BUILDING TO PERMIT THE HVAC SYSTEM INSTALLATION.

2. REFERENCE CODES AND STANDARDS

A. PERFORM ALL WORK IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS.
B. SMACNA HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE, 1985.
C. SMACNA HVAC DUCT LEAKAGE TEST MANUAL, 1985.
D. ANSI/NFPA 90B–1989, INSTALLATION OF WARM AIR HEATING AND AIR CONDITIONING SYSTEMS.

3. SHOP DRAWINGS

A. SUBMIT SHOP DRAWINGS FOR ALL COMPONENTS PROVIDED, INCLUDING AIR HANDLING UNITS, CONTROLS, BUILDING PRODUCTS, ELECTRICAL COMPONENTS, ANY COMPONENTS SIGNIFICANT TO PROJECT SUCCESS.
B. FOR EACH SUBMISSION, SUBMIT TWO SETS OF LETTER OR 11"X17" SHOP DRAWINGS. IF SHOP DRAWINGS ARE LARGER THAN 11"X17" SUBMIT ONE REPRODUCIBLE AND ONE PRINT.

4. DUCT WORK

A. SEAL CLASSIFICATION: USE SMACNA SEAL CLASS C. TRANSVERSE JOINT AND CONNECTIONS MADE AIR TIGHT WITH GASKETS SEALANT TAPE OR COMBINATION THEREOF. LONGITUDINAL SEAMS UNSEALED.
B. SEALANT: OIL RESISTANT, POLYMER TYPE FLAME RESISTANT DUCT SEALANT. TEMPERATURE RANGE OF MINUS 30C TO PLUS 93C
C. TAPE: POLYVINYL TREATED, OPEN WEAVE FIBERGLASS TAPE 2" WIDE.
D. DUCT LEAKAGE: IN ACCORDANCE WITH SMACNA HVAC DUCT LEAKAGE TEST MANUAL.
E. FITTINGS:
1. FABRICATION: TO SMACNA.
2. RADIUSES ELBOWS
1. RECTANGULAR: STANDARD RADIUS AND OR SHORT RADIUS WITH SINGLE TURNING VANES CENTRELINE RADIUS: 1.5 TIMES WIDTH OF DUCT.
2. ROUND: SMOOTH RADIUS 5 PIECE. CENTRELINE RADIUS: 1.5 TIMES DIAMETER.
3. MITERED ELBOWS, RECTANGULAR
.1. TO 16" WITH SINGLE DOUBLE THICKNESS TURNING VANES.
.2. OVER 16" WITH DOUBLE THICKNESS TURNING VANES.
4. BRANCHES:
.1. RECTANGULAR MAIN AND BRANCH: WITH RADIUS ON BRANCH 1.5 TIMES WIDTH OF DUCT 45° ENTRY ON BRANCH
.2. PROVIDE VOLUME CONTROL DAMPER IN BRANCH DUCT NEAR CONNECTION TO MAIN DUCT.
.3. MAIN DUCT BRANCHES: WITH SPLITTER DAMPER
5. TRANSITIONS:
.1. DIVERGING: 20° MAXIMUM INCLUDED ANGLE.
.2. CONVERGING 30° MAXIMUM INCLUDED ANGLE.
6. GALVANIZED DUCTWORK:
.1. LOCK FORMING QUALITY: TO ASTM A525M, Z90 ZINC COATING
.2. THICKNESS, FABRICATION AND REINFORCEMENT: TO ASHRAE AND SMACNA
.3. JOINTS: TO ASHRAE AND SMACNA AND OR PROPRIETARY MANUFACTURED DUCT JOINT. PROPRIETARY MANUFACTURED FLANGED DUCT JOINT SHALL BE CONSIDERED TO BE A CLASS "A" SEAL.
7. DUCT HANGERS AND SUPPORTS:
.1. STRAP HANGERS: OF SAME MATERIAL AS DUCT BUT NEXT SHEET METAL THICKNESS HEAVIER THAN DUCT. MAXIMUM SIZE DUCT SUPPORTED BY STRAP HANGER 18".
.2. HANGER CONFIGURATION: TO ASHRAE AND SMACNA STD.
8. EXECUTION:
.1. DO WORK IN ACCORDANCE WITH ANSI/NFPA 90A ANSI/NFPA 90B ASHRAE CSA B228.1 AND SMACNA.
.2. DO NOT BREAK CONTINUITY OF INSULATION VAPOUR BARRIER WITH HANGERS OR RODS. INSULATE STRAP HANGERS 100mm BEYOND INSULATED DUCT.
.3. SUPPORT RISERS IN ACCORDANCE WITH ASHRAE AND SMACNA.
.4. INSTALL BREAKAWAY JOINTS IN DUCTWORK ON EACH SIDE OF FIRE SEPARATION.
.5. INSTALL PROPRIETARY MANUFACTURED FLANGED DUCT JOINTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
.6. MANUFACTURE DUCT IN LENGTHS TO ACCOMMODATE INSTALLATION OF ACOUSTIC DUCT LINING.
.7. APPLY SEALANT TO OUTSIDE OF JOINT TO MANUFACTURER'S RECOMMENDATIONS.
.8. BED TAPE IN SEALANT AND RECOAT WITH MINIMUM OF 1 COAT OF SEALANT TO MANUFACTURERS RECOMMENDATIONS.

5. DUCT ACCESSORIES

A. GENERAL MANUFACTURE IN ACCORDANCE WITH CSA B228.1
B. FLEXIBLE CONNECTIONS:
1. FRAME: GALVANIZED SHEET METAL FRAME mm THICK WITH FABRIC CLENCHED BY MEANS OF DOUBLE LOCKED SEAMS.
2. MATERIAL: FIRE RESISTANT, SELF–EXTINGUISHING, NEOPRENE COATED FABRIC, TEMPERATURE RATED AT MINUS 40°F TO PLUS 190°F DENSITY OF 0.08 LB/FT^3

C. EXECUTION:

1. INSTALL FLEXIBLE CONNECTIONS IN FOLLOWING LOCATIONS
.1. INLETS AND OUTLETS TO SUPPLY AIR UNITS AND FANS.
.2. INLETS AND OUTLETS TO EXHAUST AND RETURN AIR FANS.
.3. AS INDICATED.
.4. LENGTH OF CONNECTION: 4"
.5. MINIMUM DISTANCE BETWEEN METAL PARTS WHEN SYSTEM IN OPERATION: 3"
.6. INSTALL IN ACCORDANCE WITH RECOMMENDATIONS OF SMACNA.
.7. WHEN FAN IS RUNNING: DUCTING ON EACH SIDE OF FLEXIBLE CONNECTION TO BE IN ALIGNMENT AND ENSURE SLACK MATERIAL IN FLEXIBLE CONNECTION.
2. INSTRUMENT TEST PORTS: INSTALL IN ACCORDANCE WITH RECOMMENDATIONS OF SMACNA AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3. TURNING VANES: INSTALL IN ACCORDANCE WITH RECOMMENDATIONS OF SMACNA AND AS INDICATED.

6. AIR HANDLING UNIT

A. GENERAL
1. FACTORY ASSEMBLED COMPONENTS TO FORM UNITS SUPPLYING AIR AT DESIGNED CONDITIONS, AS INDICATED.
2. CERTIFY RATINGS: TO ARI 430, UNIT SHALL BEAR ARI SEAL.
B. CASING
1. GALVANIZED OR PHOSPHATE TREATED STEEL HEAVY GAUGE REINFORCED AND BRACED FOR RIGIDITY, INSPECTION DOORS. ACCESS DOORS SHALL PROVIDE ACCESS FOR MAINTENANCE OF INTERNAL PARTS. CGSB 1–GP–181M. FINISH ENTIRE UNITS, INSIDE AND OUT, WITH RUST RESISTANT ENAMEL.
2. LINE ENTIRE CASING WITH FIRE–RESISTANT, ODORLESS GLASS–FIBER INSULATION. COVER THE INSULATION TO PREVENT DEGRADATION CAUSED BY WATER OR HIGH HUMIDITY.
C. DRAIN PANS
1. MATERIAL: NON RUSTING, ROUNDED CORNERS
2. INSULATION: EXTERNAL FOAM TYPE, MINIMUM 1/2" THICK
3. DRAIN CONNECTION: IN BOTTOM AT LOW POINT
4. INSTALLATION: SLOPE WITHOUT SAG MINIMUM 1% TO ENSURE STANDING WATER AT ANY TIME OR AT ANY POINT
5. DIMENSIONS: MINIMUM 3" FROM UPSTREAM FACE OF COIL TO 6" BEYOND DOWNSTREAM FACE OF COIL ELIMINATOR AND TO INCLUDE ALL RETURN BENDS AND HEADERS
D. FANS
1. CABINET HUNG FREE STANDING AMCA–RATED FOR SOUND AND PERFORMANCE CENTRIFUGAL FANS WITH FORWARD CURVED WHEELS. SELECTED TO OPERATE IN STABLE PART OF PERFORMANCE CURVE AT ALL TIMES AND HEAVY SERVICE SELF ALIGNING SPLIT PILLOW BLOCK BEARINGS. PROVIDE INTERNALLY MOUNTED MOTOR AS INDICATED COMPLETE WITH ADJUSTABLE V–BELT AND GUARD. MOTOR: SIZE AS NOTED, 1800 R/MIN.
E. FILTER BOX:
1. MATERIAL TO MATCH CASING. FOR FLAT FILTER ARRANGEMENT. PROVIDE ACCESS TO FILTER THROUGH HINGED DOOR WITH SUITABLE HARDWARE. PROVIDE BLANK–OFF PLATES AND GASKETS TO PREVENT AIR BYPASS.
F. MIXING BOX
1. MATERIAL TO MATCH CASING. AND PRODUCE UNIFORMLY MIXED AIR TEMPERATURE WITHIN PLUS OR MINUS 10°F OF DESIGN. ACROSS FACE OF OUTLET.
G. DAMPERS
1. OPPOSED BLADE TYPE WITH EDGE SEALS. ELECTRIC DAMPER OPERATORS TO BE FAIL SAFE DESIGN. SIZED TO OPERATE DAMPERS WITH FULL AIR FLOW THROUGH ONE SECTION ONLY.
H. GAS HEATING SECTION
1. MATERIALS: ALUMINIZED STEEL
2. FORCED COMBUSTION BLOWER TO SUPPLY PREMIXED FUEL TO A SINGLE BURNER IGNITED BY A PILOTLESS HOT SURFACE IGNITION SYSTEM.
3. PROVIDE FOR STAGED HEATING AS NOTED ON DRAWINGS
4. CAPACITY AS NOTED ON DRAWINGS.
I. DIRECT EXPANSION REFRIGERANT COILS, EVAPORATOR AND CONDENSER:
1. CAPACITY AS INDICATED
2. RATINGS: ARI CERTIFIED
3. CONSTRUCTION:
1. CASINGS: 1.5mm THICK GALVANIZED SHEET STEEL. SUPPORTS OF GALVANIZED STEEL CHANNEL CHANNEL DOUBLE ANGLE FRAMES. BLANK–OFF PLATES. INSULATED SANDWICH CONSTRUCTION
2. SERPENTINE TYPE, STRAIGHT TUBE TYPE ARRANGED TO PREVENT TRAPPING OF OIL. LIQUID DISTRIBUTORS TO ENSURE EVEN DISTRIBUTION OF LIQUID REFRIGERANT TO ALL CIRCUITS. SILVER SOLDER OR BRAZE JOINTS IN REFRIGERANT TUBING. EVALUATE AND CHARGE COIL WITH NITROGEN AND SEAL BEFORE SENDING TO SITE.
3. TUBES: COPPER
4. FINS: ALUMINUM PLATE SPIRAL WOUND
5. HEADERS: COPPER
J. COMPRESSORS
1. DIRECT DRIVE HERMETIC RECIPROCATING TYPE COMPRESSORS WITH A CENTRIFUGAL OIL PUMP PROVIDING POSITIVE LUBRICATIONS TO MOVING PARTS.
2. SUCTION COOLED MOTOR
3. CRANKCASE HEATER, INTERNAL TEMPERATURE AND CURRENT–SENSITIVE MOTOR OVERLOADS.
4. INTERNAL SPRING ISOLATION
5. LOW PRESSURE SWITCHES
6. USE R–22 REFRIGERANT
7. OPERATING RANGE BETWEEN 115°F AND 0°F
K. INSTALLATION
1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS
2. INSTALL FAN SHEAVES REQUIRED FOR FINAL AIR BALANCE
3. INSTALL FLEXIBLE CONNECTIONS AT FAN INLET AND FAN OUTLETS
4. INSTALL VIBRATION ISOLATORS
5. INSTALL DEEP SEAL P–TRAPS AND TRAP SEAL PRIMER ON DRIP LINES. DEPTH OF WATER SEAL SEAL TO BE 1.5 TIMES STATIC PRESSURE AT THIS POINT.

8. TESTING, ADJUSTING AND BALANCING (TAB)

A. SCOPE
1. TAB MEANS TO TEST AND BALANCE. TO PERFORM IN ACCORDANCE WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS AND TO DO ALL OTHER WORK AS SPECIFIED IN THIS SECTION.
2. TEST TO VERIFY PROPER AND SAFE OPERATION, DETERMINE ACTUAL POINT OF PERFORMANCE, EVALUATE QUALITATIVE AND QUANTITATIVE PERFORMANCE OF EQUIPMENT, SYSTEMS AND CONTROLS AT DESIGN, AVERAGE AND LOW LOADS USING ACTUAL OR SIMULATED LOADS.
3. ADJUST AND REGULATE EQUIPMENT AND SYSTEMS SO AS TO MEET SPECIFIC PERFORMANCE REQUIREMENTS AND TO ACHIEVE SPECIFIC INTERACTION WITH ALL OTHER RELATED SYSTEMS UNDER ALL NORMAL AND EMERGENCY LOADS AND OPERATING CONDITIONS.
4. BALANCE SYSTEMS AND EQUIPMENT AND REGULATE FLOW RATES TO MATCH LOAD REQUIREMENTS OVER FULL OPERATING RANGE.
B. EQUIPMENT STARTUP
1. FOLLOW STARTUP PROCEDURES AS RECOMMENDED BY EQUIPMENT MANUFACTURER UNLESS SPECIFIC OTHERWISE.
C. START OF TAB
1. START TAB ONLY WHEN CONSTRUCTION IS ESSENTIALLY COMPLETE
2. STARTUP VERIFCATION FOR PROPER, NORMAL AND SAFE OPERATION OF ALL MECHANICAL AND ASSOCIATED ELECTRICAL CONTROL SYSTEMS AFFECTING TAB INCLUDING BUT NOT LIMITED TO
1. PROPER THERMAL OVERLOAD PROTECTION IN PLACE FOR ELECTRICAL EQUIPMENT
2. AIR SYSTEMS
1. FILTERS IN PLACE, CLEAN
2. DUCT SYSTEM CLEAN
3. DUCTS, AIR SHAFTS, CEILING PLENUMS ARE AIRTIGHT TO WITHIN SPECIFIC TOLERANCES.
4. CORRECT FAN ROTATION
5. FIRE, SMOKE, VOLUME CONTROL DAMPERS INSTALLED AND OPEN
6. COIL FINS COMBED, CLEAN
7. ACCESS DOORS, INSTALLED, CLOSED
8. ALL OUTLETS INSTALLED, VOLUME CONTROL DAMPERS OPEN
3. DO TAB TO PLUS 5%, MINUS 5% OF DESIGN VALUES
4. ACCURACY TOLERANCES: MEASURED VALUES TO BE ACCURATE TO WITHIN PLUS OR MINUS 2% OF ACTUAL VALUES.
D. INSTRUMENTS:
CALIBRATE IN ACCORDANCE WITH REQUIREMENTS OF MOST STRINGENT OF REFERENCED STANDARDS FOR HVAC SYSTEM
E. TAB REPORT:
1. FORMAT TO BE IN ACCORDANCE WITH REFERENCED STANDARD
2. TAB REPORT TO SHOW ALL RESULTS IN IMPERIAL UNITS AND TO INCLUDE:
1. PROJECT RECORD DRAWINGS
2. SYSTEM SCHEMATICS
3. SUBMIT 6 COPIES OF TAB REPORT TO CONTRACT ADMINISTRATOR FOR VERIFICATION AND APPROVAL APPROVAL, IN ENGLISH, COMPLETE WITH INDEX TABS.
F. VERIFICATION:
1. ALL REPORTED RESULTS SUBJECT TO VERIFICATION BY CONTRACT ADMINISTRATOR.
2. PROVIDE MANPOWER AND INSTRUMENTATION TO VERIFY UP TO 30% OF ALL REPORTED RESULTS.
3. NUMBER AND LOCATION OF VERIFIED RESULTS TO BE AT DISCRETION OF CONTRACT ADMINISTRATOR.
4. BEAR COSTS TO REPEAT TAB AS REQUIRED TO SATISFACTION OF CONTRACT ADMINISTRATOR.
G. SETTINGS:
1. AFTER TAB IS COMPLETED TO SATISFACTION OF CONTRACT ADMINISTRATOR, REPLACE DRIVE GUARDS, CLOSE ALL ACCESS DOORS, LOCK ALL DEVICES IN SET POSITIONS, ENSURE SENSORS ARE AT REQUIRED SETTINGS.
2. PERMANENTLY MARK ALL SETTINGS TO ALLOW RESTORATION AT ANY TIME DURING LIFE OF FACILITY. MARKINGS NOT TO BE ERADICATED OR COVERED IN ANY WAY.
H. AIR SYSTEMS:
1. STANDARD: TAB TO BE TO MOST STRINGENT OF THIS SECTION OR TAB STANDARDS OF AABC NEBB SMACNA ASHRAE.
2. DO TAB OF ALL SYSTEMS, EQUIPMENT, COMPONENTS, CONTROLS SPECIFIED IN THE MECHANICAL DRAWINGS.
3. QUALIFICATIONS: PERSONNEL PERFORMING TAB TO BE CURRENT MEMBER IN GOOD STANDING OF AABC OR NEBB QUALIFIED TO STANDARDS OF AABC OR NEBB.
4. QUALITY ASSURANCE: PERFORM TAB UNDER DIRECTION OF SUPERVISOR QUALIFIED BY TO STANDARDS OF AABC OR NEBB.
5. MEASUREMENTS: TO INCLUDE, BUT NOT LIMITED TO, FOLLOWING AS APPROPRIATE FOR SYSTEMS, EQUIPMENT, COMPONENTS, CONTROLS: AIR VELOCITY, STATIC PRESSURE, FLOW RATE, PRESSURE DROP (OR LOSS), TEMPERATURES (DRY BULB, WET BULB, DEWPOINT), DUCT CROSS SECTIONAL AREA, RPM, ELECTRICAL POWER, VOLTAGE, NOISE, VIBRATION.
6. LOCATIONS OF EQUIPMENT MEASUREMENTS: TO INCLUDE, BUT NOT BE LIMITED TO, FOLLOWING AS APPROPRIATE:
1. INLET AND OUTLET OF EACH DAMPER, FILTER, COIL, HUMIDIFIER, FAN, OTHER EQUIPMENT CAUSING CHANGES IN CONDITIONS.
2. AT EACH CONTROLLER, CONTROLLED DEVICE
3. LOCATIONS OF SYSTEMS MEASUREMENTS TO INCLUDE, BUT NOT LIMITED TO, FOLLOWING AS APPROPRIATE:
EACH MAIN DUCT, MAIN BRANCH, SUB–BRANCH, RUN–OUT (OR GRILLE, REGISTER OR DIFFUSER)
I WARRANTY:
1. PROVIDE STARTUP ASSISTANCE AND WARRANTY FOR THE AHU, INCLUDING THE CONDENSING UNIT. WARRANTY IS TO BE INITIALLED FROM THE DATE OF "TOTAL PERFORMANCE".

NOTES :

NO.	REVISION/DESCRIPTION	BY	DATE

SEALS

ORIGINAL STAMPED BY: DOUG PALEY, P.ENG.
DATE: 20040825

DRAWN BY DTA	CHECKED BY	APPROVED
DATE 2004.08.24	USER APPROVAL	

Winnipeg
CITY OF WINNIPEG
PLANNING, PROPERTY & DEVELOPMENT DEPARTMENT
CIVIC ACCOMMODATIONS DIVISION
300 – 65 GARRY ST. R3C 4K4

PROJECT

COMMUNITY COMMITEE OFFICE
HEATING SYSTEM UPGRADE

300 ASSINIBOINE AVENUE

SHEET TITLE

MECHANICAL SPECIFICATIONS

SCALE	PROJECT NO.	SHEET NO.
AS SHOWN	2004-049	M3

DRAWING SHEET SIZE: A1 (594mm x 841mm) PLOT 1:1