

20140520.dwg
FILE NAME:
DATE: 2014.04.24
SHEET TITLE: PARTIAL FOURTH FLOOR PLAN
PROJECT No: 2014-052
ADDRESS: 251 DONALD STREET

MECHANICAL SPECIFICATIONS

- 1.0 GENERAL**
1.1 SCOPE OF WORK:
- SUPPLY AND INSTALL NEW ROOF TOP UNIT (RTU-1) AND ALL ASSOCIATED DUCTWORK, DAMPERS AND GRILLES.
 - SUPPLY AND INSTALL NEW DUCT HEATER (DH-1). REPLACE EXISTING VMA CONTROLLER IN ROOM 4:34 FOR NEW VMA CONTROLLER WITH ANALOGUE OUTPUT TO DH-1 FOR HEATING TEMPERATURE CONTROL.
 - PROVIDE AND INSTALL ALL NECESSARY CONTROL WIRING, CONTROLLERS, ACCESSORIES, HARDWARE, SOFTWARE, AND PROGRAMMING TO ALLOW NEW RTU-1 AND DH-1 TO FULLY COMMUNICATE WITH NEW TEMPERATURE SENSOR AND VMA CONTROLLER, CO₂ SENSOR, AND JOHNSON CONTROLS BAS AS SPECIFIED IN SECTION 2.6.
 - COMMISSION ALL HVAC EQUIPMENT AND CONTROLS.
 - PROVIDE TESTING AND BALANCING OF COMPLETE NEW RTU-1 AND DH-1 SYSTEM.

1.2 SITE COORDINATION:
ACCESS TO THE SITE SHALL BE COORDINATED WITH THE CITY.

1.3 DESCRIPTION OF WORK:
THE CONTRACTOR SHALL INCLUDE THE FURNISHING OF ALL LABOUR, NEW MATERIALS, EQUIPMENT AND INSTALLATION OF EQUIPMENT AND SERVICES NECESSARY FOR AND INCIDENTAL TO THE COMPLETE INSTALLATION OF THE WORK AS SHOWN AND DESCRIBED ON THESE DRAWINGS AND TO THE SATISFACTION OF THE CITY.

CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR REQUIRED WORK AND PAY ALL FEES.

WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LOCAL CODES, STANDARDS AND REGULATIONS.

CONTRACTOR TO COORDINATE ACCESS TO THE SITE WITH THE CITY AND FOLLOW HIS INSTRUCTIONS.

- 1.4 SUBMITTALS:**
- SUBMIT SHOP DRAWINGS FOR APPROVAL BY THE CONTRACT ADMINISTRATOR FOR EQUIPMENT SPECIFIED.
 - SUBMIT THREE (3) SETS OF O & M MANUALS.
 - PROVIDE O & M TRAINING TO THE CITY.
 - PROVIDE AS-BUILT MARK-UPS OF MECHANICAL DRAWINGS TO THE CONTRACT ADMINISTRATOR.

1.5 WORKMANSHIP:
WORKMANSHIP SHALL BE OF BEST QUALITY, EXECUTED BY WORKERS EXPERIENCED AND SKILLED IN RESPECTIVE DUTIES FOR WHICH THEY ARE EMPLOYED.

1.6 EXECUTION:
INSTALLATION OF EQUIPMENT:
TO NATIONAL BUILDING CODE, ALL LOCAL CODES, STANDARDS AND REGULATIONS.

INSTALL ALL EQUIPMENT SPECIFIED OR INDICATED ON DRAWINGS IN A MANNER THAT WILL ENSURE ITS SATISFACTORY OPERATION UPON COMPLETION AND ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

THE SAFE DELIVERY TO THE SITE OF ALL MATERIALS SHALL BE ENTIRELY THE CONTRACTOR'S RESPONSIBILITY. MATERIALS AND EQUIPMENT SHALL BE HANDLED AT ALL TIMES WITH CARE TO AVOID DAMAGE.

FOLLOW APPROVED MANUFACTURER'S RECOMMENDATIONS FOR SAFETY, EASY ACCESS FOR INSPECTION, MAINTENANCE AND REPAIRS.

PERMIT EQUIPMENT MAINTENANCE AND DISASSEMBLY WITH MINIMUM DISTURBANCE TO ADJACENT EQUIPMENT AND WITHOUT INTERFERENCE WITH BUILDING STRUCTURE OR OTHER EQUIPMENT.

BEFORE COMMENCING THE INSTALLATION, THE CONTRACTOR SHALL CONFIRM RECEIPT OF AN APPROVED COPY OF THE MANUFACTURER'S DRAWINGS AND INSTALLATION MANUAL FOR THE INSTALLATION THEREOF.

DISCREPANCIES OR IRREGULARITIES IN THE WORK OR DEFECTS OR DAMAGES TO THE EQUIPMENT, ATTRIBUTABLE TO FAULTY OR INCORRECT INSTALLATION, SHALL BE RECTIFIED BY THE CONTRACTOR AT HIS OWN EXPENSE.

MAINTAIN ADEQUATE ACCESS TO PROJECT SITE. COORDINATE WORK TO MINIMIZE INTERFERENCE OR DISRUPTION TO THE CITY'S OPERATIONS.

MAINTAIN THE WORK IN TIDY CONDITION, FREE FROM ACCUMULATION OF WASTE PRODUCTS AND DEBRIS.

PROTECT EQUIPMENT AND DUCTWORK FROM ACCUMULATION OF DUST, ETC. SEAL ALL DUCT OPENINGS DURING DUST PRODUCING ACTIVITIES.

INSPECTION AND TESTING:
THE WORK SHALL BE AT ALL TIMES AVAILABLE FOR INSPECTION BY A CITY REPRESENTATIVE. ALL WORK SHALL BE IN ACCORDANCE WITH AND SHALL BE INSPECTED TO MEET THE REQUIREMENTS OF THIS SPECIFICATION.

ALL STARTUP AND TESTING SHALL BE PERFORMED IN THE PRESENCE OF THE CITY. NOTICE OF THE DATE OF WHEN TESTS SHALL BE PERFORMED MUST BE RECEIVED BY THE CITY.

WORK SHALL NOT BE INSULATED OR CONCEALED PRIOR TO BEING TESTED OR APPROVED.

OPERATE SYSTEM FOR A MINIMUM OF 3 DAYS TO ENSURE COMPLETE ACCEPTANCE; DEFECTS SHALL BE REMEDIATED AT CONTRACTOR'S EXPENSE.

- USE OF NEW HVAC SYSTEMS DURING CONSTRUCTION:**
- NEW HVAC SYSTEMS SHALL NOT BE USED DURING CONSTRUCTION UNLESS APPROVED OTHERWISE BY THE CITY. (OBTAIN WRITTEN APPROVAL FROM THE CITY).
 - IF THE CITY APPROVES USE OF HVAC SYSTEMS, THE CONTRACTOR SHALL:
 - ENSURE THAT HVAC SYSTEM IS OPERATED AS PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
 - CONTINUOUSLY MONITOR SYSTEM.
 - PERFORM REGULAR PREVENTATIVE AND OTHER MANUFACTURER'S RECOMMENDED MAINTENANCE ROUTINES AT CONTRACTOR'S OWN EXPENSE.
 - NOT RELAX WARRANTIES AND GUARANTEES.
 - REFURBISH ENTIRE SYSTEM BEFORE STATIC COMPLETION, CLEAN ALL DUCTWORK AND ALL AIR HANDLING EQUIPMENT INTERNALLY AND EXTERNALLY, RESTORE TO "AS NEW" CONDITION, REPLACE FILTERS IN AIR HANDLING SYSTEM.

2.0 HVAC PRODUCTS:
2.1 DUCTWORK:
CONFORM TO SMACNA STANDARDS FOR SUPPLY AND INSTALLATION OF DUCTWORK. PERFORM WORK IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARDS. DUCTWORK SHALL BE RATED FOR 2" W.C. (500 PA).

SEAL ALL DUCTWORK JOINTS USING "DURO-DYNE" DUCT SEALER.

2.2 DUCT INSULATION:
ACOUSTIC INSULATION:
ACOUSTIC DUCT INSULATION TO BE 1" THICK FIBROUS GLASS BLANKET DUCT LINER MOUNTED WITH WELD PINS.

2.3 GRILLES:
IN ACCORDANCE WITH SCHEDULE ON DRAWING M1. FIELD PAINT TO MATCH EXISTING CEILING SUPPLY DIFFUSERS IN PREVIOUS LOCAL HISTORY ROOM 3:79.

2.4 BALANCE DAMPERS:
BALANCING DAMPERS TO BE CONSTRUCTED TO SMACNA STANDARDS C/W LOCKING LEVER.

2.5 ROOF TOP UNIT (RTU-1):
PERFORMANCE: 2,400 CFM AT 0.5" E.S.P., 6 TONS OF COOLING, ENTHALPY-BASED ECONOMIZER, 575V/3PH. FANS SHALL BE LICENSED TO BEAR THE AMCA CERTIFIED RATINGS SEAL FOR BOTH SOUND AND AIR, AND FAN EFFICIENCY GRADE.

OUTDOOR, ROOFTOP MOUNTED, ELECTRICALLY CONTROLLED, COOLING UNIT UTILIZING A FULLY HERMETIC SCROLL COMPRESSOR FOR COOLING, FACTORY ASSEMBLED. SINGLE-PIECE COOLING ROOFTOP UNIT, CONTAINED WITHIN THE UNIT ENCLOSURE SHALL BE ALL FACTORY WIRING, PIPING, CONTROLS, AND SPECIAL FEATURES REQUIRED PRIOR TO FIELD START-UP. UNIT SHALL USE R-410A REFRIGERANT.

UNIT CABINET SHALL BE CONSTRUCTED OF GALVANIZED STEEL AND COATED WITH A PRE-PAINTED BAKED ENAMEL FINISH ON ALL EXTERNALLY EXPOSED SURFACES. INTERIOR SURFACES SHALL BE INSULATED WITH A MINIMUM 1/2-IN. THICK, 1 LB DENSITY, FLEXIBLE FIBERGLASS INSULATION, NEOPRENE COATED ON THE AIR SIDE. CABINET ACCESS PANELS SHALL BE HINGED FOR EASY REMOVAL.

CONDENSATE PAN SHALL BE SLOPED AND MADE OF A NON-CORROSIVE MATERIAL AND SHALL USE A 3/4" NPT DRAIN CONNECTION, POSSIBLE EITHER THROUGH THE BOTTOM OR SIDE OF THE DRAIN PAN. CONNECTION SHALL BE MADE PER MANUFACTURER'S RECOMMENDATIONS.

UNIT SHALL HAVE ONE FACTORY INSTALLED, TOOL-LESS, REMOVABLE, FILTER ACCESS PANEL. FILTERS SHALL BE HELD IN PLACE BY A PIVOTING FILTER TRAY, FACILITATING EASY REMOVAL AND INSTALLATION AND SHALL CONSIST OF FACTORY INSTALLED, LOW VELOCITY, THROW-AWAY 2-IN. THICK FIBERGLASS FILTERS. FILTERS SHALL BE STANDARD, COMMERCIALY AVAILABLE SIZES.

STANDARD EVAPORATOR AND CONDENSER COILS SHALL HAVE ALUMINUM LANCED PLATE FINS MECHANICALLY BONDED TO SEAMLESS INTERNALLY GROOVED COPPER TUBES WITH ALL JOINTS BRAZED. EVAPORATOR COILS SHALL BE LEAK TESTED TO 150 PSIG AND PRESSURE TESTED TO 450 PSIG. CONDENSER COILS SHALL BE LEAK TESTED TO 150 PSIG AND PRESSURE TESTED TO 650 PSIG.

REFRIGERANT CIRCUIT SHALL INCLUDE THE FOLLOWING CONTROL, SAFETY, AND MAINTENANCE FEATURES: FIXED ORIFICE METERING SYSTEM, REFRIGERANT FILTER DRIER, SERVICE GAUGE CONNECTIONS ON SUCTION AND DISCHARGE LINES AND PRESSURE GAUGE ACCESS THROUGH A SPECIALLY DESIGNED ACCESS PORT IN THE TOP PANEL OF THE UNIT.

COMPRESSORS SHALL BE FULLY HERMETIC, SCROLL TYPE, MOTORS SHALL BE COOLED BY REFRIGERANT GAS PASSING THROUGH MOTOR WINDINGS, SHALL BE INTERNALLY PROTECTED FROM HIGH DISCHARGE TEMPERATURE CONDITIONS, SHALL BE PROTECTED FROM AN OVER-TEMPERATURE AND OVER-AMPERAGE CONDITIONS BY AN INTERNAL, MOTOR OVERLOAD DEVICE, FACTORY MOUNTED ON RUBBER GROMMETS, MOTORS SHALL HAVE INTERNAL LINE BREAK THERMAL, CURRENT OVERLOAD AND HIGH PRESSURE DIFFERENTIAL PROTECTION AND CRANKCASE HEATERS SHALL NOT BE REQUIRED FOR NORMAL OPERATING RANGE, UNLESS REQUIRED BY COMPRESSOR MANUFACTURER DUE TO REFRIGERANT CHARGE LIMITS.

EVAPORATOR FAN SHALL BE BELT DRIVE SHALL INCLUDE AN ADJUSTABLE PITCH MOTOR PULLEY, SHALL USE SEALED, PERMANENTLY LUBRICATED BALL-BEARING TYPE, FAN SHALL BE DOUBLE-INLET TYPE WITH FORWARD-CURVED BLADES AND BE CONSTRUCTED FROM STEEL WITH A CORROSION RESISTANT FINISH AND DYNAMICALLY BALANCED.

CONDENSER FAN MOTORS SHALL BE A TOTALLY ENCLOSED MOTOR, USE PERMANENTLY LUBRICATED BEARINGS, HAVE INHERENT THERMAL OVERLOAD PROTECTION WITH AN AUTOMATIC RESET FEATURE AND SHALL USE A SHAFT-DOWN DESIGN CONDENSER FAN SHALL BE DIRECT-DRIVEN PROPELLER TYPE FAN WITH GALVALUM BLADES RIVETED TO CORROSION RESISTANT STEEL SPIDERS AND SHALL BE DYNAMICALLY BALANCED.

PROVIDE INTEGRATED FACTORY INSTALLED ENTHALPY-BASED ECONOMIZER C/W BAROMETRIC RELIEF. UNIT SHALL INCLUDE ALL HARDWARE AND CONTROLS NECESSARY TO PROVIDE FREE COOLING WITH OUTDOOR AIR WHEN TEMPERATURE AND HUMIDITY ARE BELOW SETPOINTS. PROVIDE OUTDOOR AIR ENTHALPY SENSOR AND RETURN AIR ENTHALPY SENSOR TO PROVIDE DIFFERENTIAL ENTHALPY CONTROL TO ALLOW UNIT TO DETERMINE IF OUTSIDE AIR IS SUITABLE FOR FREE COOLING. ECONOMIZER SHALL MAINTAIN MINIMUM AIRFLOW INTO THE BUILDING DURING OCCUPIED PERIOD AND PROVIDE DESIGN VENTILATION RATE FOR FULL OCCUPANCY. A REMOTE POTENTIOMETER MAY BE USED TO OVERRIDE THE DAMPER SETPOINT. ECONOMIZER SHALL BE CAPABLE OF INTRODUCING UP TO 100% OUTDOOR AIR.

PROVIDE JOHNSON N2 OPEN CONTROL PROTOCOL TO FULLY COMMUNICATE WITH EXISTING JOHNSON CONTROLS METASYS BAS. OPEN CONTROL PROTOCOL SHALL ACCEPT THE FOLLOWING INPUTS: SPACE TEMPERATURE, SETPOINT ADJUSTMENT, OUTDOOR AIR TEMPERATURE, INDOOR AIR QUALITY, RELATIVE HUMIDITY, COMPRESSOR LOCK-OUT, FIRE SHUTDOWN, ENTHALPY SWITCH, AND FAN STATUS/FILTER STATUS/HUMIDITY/REMOTE OCCUPANCY.

OPEN PROTOCOL SHALL PROVIDE THE FOLLOWING OUTPUTS: ECONOMIZER, FAN, COOLING STAGE 1, COOLING STAGE 2, EXHAUST/REVERSING VALVE.

ALL UNIT POWER WIRING SHALL ENTER UNIT CABINET AT A SINGLE, FACTORY PREPARED, KNOCKOUT LOCATION.

PROVIDE UNIT-MOUNTED NON-FUSED DISCONNECT SWITCH AND 120V, 15AMP, GFCI, POWERED CONVENIENCE OUTLET C/W "WET IN USE" COVER. CONVENIENCE OUTLET SHALL BE POWERED FROM RTU-1 AND LOCATED ADJACENT AND EXTERIOR TO THE UNIT.

PROVIDE 30" HIGH, VIBRATION ISOLATED ROOF CURB FOR RTU-1 C/W ADJUSTABLE SPRING PACKS, INSULATED PANELS/COVERS, WEATHER SEALS BETWEEN UPPER AND LOWER SECTIONS, AND GASKET SEALS FOR TOP PERIMETER. DUCT OPENING DIMENSIONS AND ORIENTATION IN ROOF CURB TO MATCH WITH RTU-1 DUCT OPENINGS. CHOOSE VIBRATION ISOLATION TYPE IN ROOF CURB TO ELIMINATE VIBRATION AND NOISE TRANSFER OF RTU-1, WHILE OPERATING, INTO LOCAL HISTORY ROOM 4:34.

ACCEPTABLE PRODUCT: "CARRIER" MODEL 50TC C/W "CDI" ISOLATION CURB OR APPROVED EQUAL IN ACCORDANCE WITH B7

2.6 DUCT HEATER, DH-1
30KW, 575V/3PH/60HZ, ELECTRIC DUCT HEATER C/W OPEN COIL ELEMENTS, AUTOMATIC AND MANUAL THERMAL CUTOFF, MAGNETIC CONTACTOR, SCR CONTROLLER, INLET AND OUTLET SCREENS, CONTROL FUSE, AIRFLOW SENSORS, TRANSFORMER, ANALOGUE INPUT CAPABILITY FOR ROOM TEMPERATURE CONTROL. DUCT HEATER DIMENSION TO MATCH DESTINATION DUCT SIZE.

ACCEPTABLE PRODUCT: "EH PRICE" MODEL DF C111H C/W NEPTRONIC CONTROLLER OR APPROVED EQUAL IN ACCORDANCE WITH B7

2.0 HVAC PRODUCTS CONT'D:

2.6 CONTROL SYSTEM:
PROVIDE ALL NECESSARY CONTROL WIRING, CONTROLLERS, ACCESSORIES, HARDWARE, SOFTWARE, AND PROGRAMMING NECESSARY FOR NEW RTU-1 AND DH-1 TO FULLY COMMUNICATE WITH EXISTING JOHNSON CONTROLS BAS FOR 251 DONALD. CONTROL RTU-1 AND DH-1 USING EXISTING JOHNSON CONTROLS METASYS BAS USING EXISTING SETPOINTS AND OCCUPANCY SCHEDULES. TEMPERATURE SETPOINT FOR RTU-1 AND DH-1 SHALL BE DEFINED IN BAS AND SENSED BY EXISTING TEMPERATURE SENSOR. REPLACE EXISTING JOHNSON CONTROLS VMA1410 CONTROLLER IN ROOM 4:34 WITH NEW VMA1420 CONTROLLER TO MAINTAIN EXISTING CONTROL CONNECTIONS AND TO ADD CAPABILITY OF PROVIDING ANALOGUE OUTPUT FOR HEATING TO NEW DH-1.

INDOOR AIR QUALITY (CO₂ CONCENTRATION) SHALL BE MEASURED BY EXISTING CO₂ SENSOR LOCATED IN ROOM 4:34. PROVIDE DEMAND CONTROLLED VENTILATION VIA RTU-1 TO PROVIDE OUTDOOR AIR SUPPLY RATE USING SIMILAR CONTROL LOGIC AS EXISTING AHU-7 FOR 4TH FLOOR. TIE-IN TO EXISTING FIRE ALARM SYSTEM TO SHUT DOWN RTU-1 AND DH-1 DURING FIRE EVENTS.

ADD RTU-1 AND DH-1 INTO EXISTING JOHNSON CONTROLS METASYS BAS GUI USER VIEW FOR CITY OF WINNIPEG UNDER HEADING FOR 251 DONALD SHOWING THE FOLLOWING CONTROL AND STATUS POINTS: RTU STATUS, HEATING/COOLING STAGES, ECONOMIZER STATUS, TEMPERATURE SETPOINT, OUTDOOR AND INDOOR TEMPERATURE AND RELATIVE HUMIDITY.

2.7 AIR BALANCING:
GENERAL:
FOLLOW START-UP PROCEDURES AS RECOMMENDED BY THE CITY, UNLESS OTHERWISE SPECIFIED. CONTRACTOR TO PROVIDE ABILITY FOR THE CITY TO ADJUST OCCUPANCY SCHEDULE, SINCE HOURS OF WORK VARY FROM DAY-TO-DAY. INSTALL SHEAVES IF REQUIRED TO ACHIEVE FINAL AIR BALANCE.

BALANCE FOLLOWING SYSTEM: RTU-1 AND ASSOCIATED DUCTWORK, BALANCE DAMPERS AND GRILLES. BALANCE RTU-1 TO PROVIDE ASHRAE 62.1-2013 MINIMUM OUTDOOR AIR RATE (REFER TO DWG M1) AT MINIMUM OUTDOOR AIR DAMPER SETTING.

QUALIFICATIONS: PERSONNEL PERFORMING AIR BALANCING TO BE CURRENT MEMBER IN GOOD STANDING OF AABC.

QUALITY ASSURANCE: PERFORM AIR BALANCE UNDER DIRECTION OF SUPERVISOR QUALIFIED BY AABC.

REFERENCE STANDARDS: DO TAB OF COMPLETE MECHANICAL SYSTEMS OVER ENTIRE OPERATING RANGE IN ACCORDANCE WITH MOST STRINGENT CONDITIONS OF SELECT STANDARD:
-AABC (ASSOCIATED AIR BALANCE COUNCIL)
-SMACNA (SHEET METAL & AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION)

ACCURACY: DO TAB TO WITHIN +/-5% OF DESIGN VALUES.

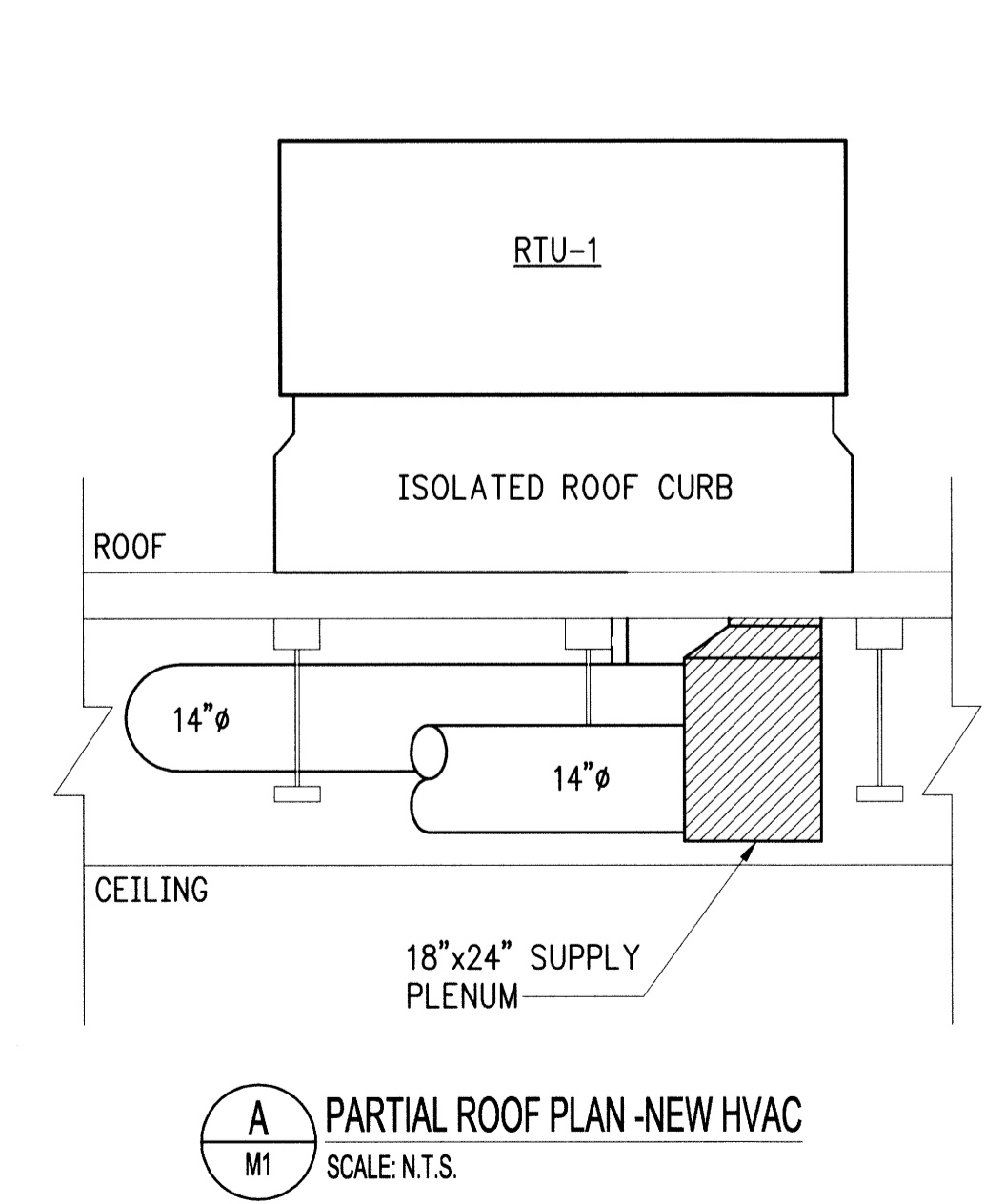
INSTRUMENT CALIBRATION: TO BE IN ACCORDANCE WITH TAB REF. STANDARD, BUT WITHIN 3 MONTHS OF COMMENCEMENT.

REPORT: FORMAT TO BE IN ACCORDANCE WITH TAB SCHEMATICS SHOWN AND RESULTS OF TAB.

SUBMIT ONE COPY OF DRAFT TAB REPORT FOR VERIFICATION AND APPROVAL OF THE CITY. SUBMIT THREE FINAL COPIES WITH REVIEW COMMENTS INCORPORATED.

AIR MOVING SYSTEMS:
GENERAL:
MEASUREMENTS AS REQUIRED BY REFERENCED STANDARDS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING MEASUREMENTS:

- STATIC PRESSURE
- AIRFLOW
- BHP
- AMPERAGE



FOR TENDER ONLY
NOT TO BE USED FOR CONSTRUCTION

APEGM
Certificate of Authorization
KGS Group
No. 245

0	ISSUED FOR TENDER	DJ	2014
No.	REVISION/DESCRIPTION	BY	DATE

SEAL CONSULTANT:

KGS GROUP
CONSULTING ENGINEERS

DRAWN	TJC	CHECKED	DESIGNED	APPROVED
DATE	2014.06.17	USER APPROVAL		

THE CITY OF WINNIPEG
PLANNING, PROPERTY AND
DEVELOPMENT DEPARTMENT
MUNICIPAL ACCOMMODATIONS DIVISION
3-65 GARRY STREET, R3C 4K4

PROJECT
MILLENNIUM LIBRARY

RELOCATION OF HISTORY ROOM
251 DONALD STREET
SHEET TITLE

MECHANICAL SPECIFICATIONS

SCALE	PROJECT No:	SHEET No:
AS SHOWN	2014-052	M2