

**MECHANICAL SPECIFICATIONS:**

**1.0 GENERAL**

**1.1 SCOPE OF WORK:**

- SUPPLY AND INSTALL HEAT RECOVERY VENTILATOR HRV-1, MOTORIZED DAMPERS, REHEAT COIL HC-1 AND THERMOSTAT.
- SUPPLY AND INSTALL ALL NEW DOMESTIC WATER SERVICE LINE AS INDICATED.
- SUPPLY AND INSTALL ALL NEW DRAINAGE AND VENT PIPING.
- SUPPLY AND INSTALL EXHAUST FAN EF-1 AND AIR INTAKE AND ALL ASSOCIATED DUCTWORK AND CONTROLS.
- PROVIDE CONTROLS.
- PROVIDE AIR BALANCING.

**HEATING SYSTEM OPTION 1 - INFLOOR RADIANT HEAT (INCLUDE IN BASE PRICE):**

- SUPPLY, INSTALL, AND COMMISSION BOILER, PUMPS AND ASSOCIATED CONTROL VALVES AND PIPING.
- DESIGN, SUPPLY, AND INSTALL NEW INFLOOR PIPING. PROVIDE INFLOOR PIPING LAYOUT PLANS FOR REVIEW AND APPROVAL.
- PROVIDE CONTROLS.
- PROVIDE HYDRONIC BALANCING.

**HEATING SYSTEM OPTION 2 - ELECTRIC UNIT HEATERS (SEPARATE PRICE):**

- SUPPLY AND INSTALL NEW ELECTRIC UNIT HEATERS AND ELECTRIC BASEBOARD HEATERS AS INDICATED.
- PROVIDE CONTROLS.

**FUTURE WORK (BY OTHERS):**

- INSTALLATION OF PLUMBING FIXTURES.
- DRAINAGE AND DOMESTIC WATER SERVICE TO BUILDING.
- INSTALLATION OF WASHROOM EXHAUST FAN.

**1.2 SITE COORDINATION:**

ACCESS TO THE SITE SHALL BE CO-ORDINATED WITH CONTRACT ADMINISTRATOR.

**1.3 DESCRIPTION OF WORK:**

THE CONTRACTOR SHALL INCLUDE THE FURNISHING OF ALL LABOR, 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 THIS DRAWINGS AND TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.

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

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

CONTRACTOR TO CO-ORDINATE ACCESS TO THE SITE WITH THE CONTRACT ADMINISTRATOR AND FOLLOW HIS INSTRUCTIONS.

**1.4 SUBMITTALS:**

- SUBMIT SHOP DRAWINGS FOR APPROVAL FOR EQUIPMENT SPECIFIED.
- SUBMIT THREE (3) SETS OF O & M MANUALS.
- PROVIDE O & M TRAINING TO PERSONNEL DESIGNATED BY 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, AND 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.

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

**INSPECTION AND TESTING:**

THE WORK SHALL BE AT ALL TIMES AVAILABLE FOR INSPECTION BY THE CONTRACT ADMINISTRATOR. 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 CONTRACT ADMINISTRATOR. NOTICE OF THE DATE OF WHEN TESTS SHALL BE PERFORMED MUST BE RECEIVED BY THE CONTRACT ADMINISTRATOR.

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

OPERATE SYSTEM FOR A SUFFICIENT PERIOD OF TIME TO ENSURE COMPLETE ACCEPTANCE; DEFECTS SHALL BE REMEDIATED AT CONTRACTOR'S EXPENSE.

**2.0 HVAC**

**2.1 PRODUCTS**

**DUCTWORK:**

CONFORM TO SMACNA STANDARDS FOR SUPPLY AND INSTALLATION OF DUCTWORK. PERFORM WORK IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARDS.

FOR ALL NEW INDOOR DUCTWORK WHERE INDICATED, PROVIDE 1 1/2" THICK FLEXIBLE DUCT WRAP EXTERNAL DUCT INSULATION C/W ASJ.

FOR OUTDOOR DUCTWORK PROVIDE 2" THICK RIGID EXTERNAL DUCT INSULATION WITH ASJ. SEAL ASJ SEAMS AIRTIGHT. COVER INSULATION WITH 18 GAUGE ALUMINUM JACKET. SEAL ALL JOINTS WATER TIGHT.

DUCTWORK SHALL BE RATED FOR 2" W.C.

SEAL ALL DUCTWORK JOINTS USING "DURO-DYNE" DUCT SEALER. SEAL ALL JOINTS IN DUCT INSULATION VAPOR BARRIER USING TAPE AND DUCT SEALER.

**BALANCE DAMPERS:**

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

**GRILLES:**

GRILLES AS PER GRILLE SCHEDULE

**HEAT RECOVERY VENTILATOR (HRV-1):**

HEAT RECOVERY VENTILATOR RATED FOR 500 CFM @ 0.2" ESP, 90% EFFECTIVE ALUMINUM HEAT EXCHANGER, WASHABLE FILTERS, 120V/1 PH 6.3 AMP CENTRIFUGAL TYPE DIRECT DRIVE PSC MOTOR, DUAL PASS DAMPER DEFROST SYSTEM, 20 GAUGE PRE-PAINTED AND INSULATED STEEL CASING, AND 13MM (1/2") DRAIN CONNECTION.

ACCEPTABLE PRODUCT: "LENNOX" MODEL HRV2-500DDP

**2.1 PRODUCTS con't:**

**HEATING COIL (HC-1):**

6 KW ELECTRIC C/W SCR CONTROL, 208/3/60, REMOTE DUCT MOUNTED THERMOSTAT, AIR PROVING SWITCH, AUTOMATIC RESETS. SUITABLE FOR 350x200 DUCT. CSA APPROVED.

ACCEPTABLE PRODUCT: "THERMOLEC" MODEL: 6 KW, 208/3/60, 350x200, C/W DUCT MOUNTED SCR THERMOSTAT.

**MOTORIZED DAMPERS:**

INSULATED MOTORIZED DAMPER, ALUMINUM CONSTRUCTION, C/W 120V BELIMO ACTUATOR.

ACCEPTABLE PRODUCT: "TAMCO" SERIES 9000 C/W BELIMO ACTUATOR.

**EXHAUST FAN (EF-1):**

DIRECT DRIVE SIDEWALL EXHAUST FAN, RATED FOR 1415 L/s @ 62.5 Pa, 1750 FRPM, 1/2 H.P., 120/1/60 TEFC MOTOR, GALVANIZED STEEL FAN PANEL, DIE FORMED, GALVANIZED STEEL DRIVE FRAME ASSEMBLY, FABRICATED STEEL PROPELLER, BALL BEARING MOTORS, AND CORROSION RESISTANT, FASTENERS. UNITS SHALL BE C/W WALL HOUSING WITH REAR GUARD, MOTORIZED DAMPER, AND 1-POINT WIRING. CSA LABELLED MOTOR. ULC LISTED.

ACCEPTABLE PRODUCT: "GREENHECK" MODEL: SE2-16-430-A5 C/W LONG WALL HOUSING FLUSH EXTERIOR WITH REAR GUARD, INTERNAL MOUNT 120 VAC MOTORIZED DAMPER, AND 1-POINT WIRING.

**HEATING SYSTEM OPTION 1- INFLOOR RADIANT HEAT:**

**BOILER (B-1):**

ELECTRIC HOT WATER BOILER, 45 KW INPUT, 208/3/60, 50% PROPYLENE GLYCOL/50% WATER, 1100 KPA (160 PSI) MAXIMUM WORKING PRESSURE, CONSTRUCTED AS PER SECTION IV OF ASME CODE, HEAVY DUTY MEDIUM WATT DENSITY ELEMENTS WITH INCOLOY SHEATHING, LOW WATER CUTOFF, 120 V CONTROL CIRCUIT POWERED BY FUSED TRANSFORMER, TWO HIGH TEMPERATURE LIMIT CONTROLS, 18 GAUGE STEEL JACKET WITH POWDER COAT FINISH, 75MM (3") FIBERGLASS INSULATION, COMBINATION TEMPERATURE/PRESSURE GAUGE, DRAIN VALVE, ASME PRESSURE RELIEF VALVE. ASME RATED AND ULC LISTED.

ACCEPTABLE PRODUCT: "A.O. SMITH" MODEL: NW-37

**PUMPS (PU-1, PU-2, PU-3, AND PU-4):**

THE PUMPS SHALL BE OF A HORIZONTAL, PERMANENTLY LUBRICATED TYPE, SUITABLE FOR 107 DEG. C. (225 DEG. F.) OPERATION AT 1200 KPA (175 PSIG) WORKING PRESSURE, SINGLE STAGE, VERTICAL SPLIT CASE DESIGN, IN CAST IRON BRONZE FITTED CONSTRUCTION. THE PUMP INTERNALS SHALL BE CAPABLE OF BEING SERVICES WITHOUT DISTURBING PIPING CONNECTIONS. THE PUMPS SHALL HAVE A SOLID SAE1144 STEEL SHAFT SUPPORTED BY TWO (2) SEALED BALL BEARINGS. A NON-FERROUS SHAFT SLEEVE SHALL BE EMPLOYED TO COMPLETELY COVER THE WETTED AREA UNDER THE SEAL. PUMP SHALL BE EQUIPPED WITH AN INTERNALLY FLUSHED MECHANICAL SEAL ASSEMBLY. SEAL ASSEMBLY SHALL HAVE A BRASS HOUSING, BUNA BELLWOS AND SEAT GASKET, STAINLESS STEEL SPRING, AND BE OF A CARBON CERAMIC DESIGN WITH THE CARBON FACE ROTATING AGAINST A STATIONARY CERAMIC FACE. BEARING ASSEMBLY SHAFT SHALL CONNECT TO EITHER A CAST BRONZE IMPELLER. IMPELLER SHALL BE HYDRAULICALLY AND DYNAMICALLY BALANCED, KEYED TO THE SHAFT AND SECURED BY A LOCKING CAPSCREW OR NUT. PUMP VOLUTE SHALL BE OF CAST IRON DESIGN FOR HEATING SYSTEMS. THE CONNECTION STYLE ON CAST IRON SHALL BE FLANGED. VOLUTE SHALL INCLUDE GAUGE PORTS AT NOZZLES, AND VENT AND DRAIN PORTS. MOTORS SHALL MEET SCHEDULED HORSEPOWER, SPEED, VOLTAGE, AND ENCLOSURE DESIGN. MOTORS THROUGH 1 HP SHALL BE RESILIENT MOUNTED, MOTORS OVER 1.5 HP SHALL BE RIDGID MOUNTED. MOTORS SHALL HAVE PERMANENTLY LUBRICATED BALL BEARINGS AND MUST BE COMPLETELY MAINTENANCE FREE. MOTORS SHALL HAVE NON-OVERLOADING AT ANY POINT ON THE PUMP CURVE AND SHALL MEET NEMA SPECIFICATIONS.

PUMP SCHEDULE					
TAG	CAPACITY	HEAD (kPa)	HP	VOLTAGE	MAKE/MODEL
PU-1	1.26 L/s	50	1/3	120/1/60	BELL & GOSSETT/SERIES 60, 1x1x5 1/4
PU-2	1.26 L/s	50	1/3	120/1/60	BELL & GOSSETT/SERIES 60, 1x1x5 1/4
PU-3	1.26 L/s	60	1/2	120/1/60	BELL & GOSSETT/SERIES 60, 1 1/4x1 1/4x5 1/4
PU-4	1.26 L/s	60	1/2	120/1/60	BELL & GOSSETT/SERIES 60, 1 1/4x1 1/4x5 1/4

**GLYCOL FILL PACKAGE (GP-1):**

GLYCOL FILL PACKAGE (HYDRONIC SYSTEM FEEDER) C/W 65 L STORAGE/MIXING TANK WITH MOLDED-IN LEVEL GAUGE, 125MM FILL/ACCESS OPENING AND COVER, PUMP SUCTION HOSE WITH INLET STRAINER AND CHECK VALVE, PRESSURE PUMP WITH FUSE PROTECTION, LOW FLUID LEVEL PUMP CUT-OUT FLOAT SWITCH, MANUAL DIVERTER VALVE FOR PURGING AIR AND AGITATING CONTENTS OF STORAGE TANK, PRESSURE SWITCH WITH SNUBBER AND TOW SETS OF SPST CONTACTS, EACH INDIVIDUALLY ADJUSTABLE FROM 55 KPA TO 125 KPA CUT OUT PRESSURE, AND LIQUID FILLED PRESSURE GAUGE. THE UNIT SHALL BE C/W POWER SUPPLY ADAPTER, 115/1/60 TO 24 VDC 50 W AC, SUPPLIED LOOSE FOR FIELD INSTALLATION. THE UNIT SHALL BE COMPATIBLE WITH 50% PROPYLENE GLYCOL SOLUTION. PUMP SHALL BE CAPABLE OF RUNNING DRY WITHOUT DAMAGE. THE SECOND SET OF CONTACTS IN THE PRESSURE SWITCH SHALL BE WIRED TO A TERMINAL STRIP FOR USE AS LOW PRESSURE ALARM CONTACTS FOR REMOTE ALARM. UNIT SHALL COME C/W OPTIONAL LOW LEVEL ALARM PANEL C/W REMOTE MONITORING DRY CONTACTS.

ACCEPTABLE PRODUCT: "AXIOM" MODEL MF300 C/W RIA10-1-SAA.

**EXPANSION TANK (EXP-1):**

ASME RATED FULL REPLACEABLE BLADDER EXPANSION TANK WITH PRE-CHARGE AIR CONNECTION AND 19 MM (3/4") SYSTEM CONNECTION AS STATED BELOW:

VOLUME (L)	30
FLUID	50% PROPYLENE GLYCOL/50% WATER
HEIGHT (MM)	482
DIAMETER (MM)	300

ACCEPTABLE PRODUCT: "HG SPEC" MODEL: OT-15.

**2.1 PRODUCTS con't:**

**FLOW BALANCE VALVES (CIRCUIT SETTERS):**

50 MM - 75 MM SIZE: THREADED BRONZE BODY CONSTRUCTION, BRASS BALL, TFE SEAT RINGS C/W MEMORY STOP, AND DIFFERENTIAL PRESSURE READOUT PORTS.

ACCEPTABLE PRODUCT: "BELL & GOSSETT" CIRCUIT SETTER PLUS MODEL CB.

**AIR VENTS:**

AUTOMATIC AIR VENT SUITABLE FOR HOT WATER HEATING SYSTEM WITH SEMI STEEL BODY AND STAINLESS STEEL FLOAT. SIZE = 12 MM.

ACCEPTABLE PRODUCT: "HG SPEC" MODEL MV-15.

**AIR PURGER:**

38 MM AIR PURGER SUITABLE FOR WATER HEATING SYSTEMS WITH 6 MM AUTOMATIC AIR VENT AND BALL VALVE ON FILL CONNECTION.

ACCEPTABLE PRODUCT: "HG SPEC" MODEL P-150 C/W R8814 AUTOMATIC AIR VENT.

**HEAT TRANSFER FLUID:**

FLUID SHALL BE 50% PROPYLENE GLYCOL AND 50% WATER, PROVIDE A HIGH-GRADE INHIBITED PROPYLENE GLYCOL TO ASTM -D1384 STANDARDS. PROVIDE EITHER DISTILLED OR DEIONIZED WATER WITH LESS THAN 25 PPM EACH OF CHLORIDE AND SULPHATE, AND LESS THAN 50 PPM EACH OF HARD WATER IONS (CALCIUM AND MAGNESIUM AS CALCIUM CARBONATE) WITH TOTAL HARDNESS NOT TO EXCEED 100 PPM.

**CHEMICAL POT FEEDER:**

7.6 L BY-PASS FEEDER, 2068 KPA (300 PSIG) WORKING PRESSURE, CONSTRUCTION: 11 GAUGE STEEL TANK SHELL AND HEADS, CAST IRON WITH BUNA N SEAL TANK CAP.

ACCEPTABLE PRODUCT: "DREW INDUSTRIAL - ASHLAND" MODEL: 35862.

ACCESSORIES: PROVIDE INITIAL CHEMICAL TREATMENT, TEST KIT, AND SITE INSPECTIONS AS SUPPLIED BY DREW INDUSTRIAL.

**FILTER:**

FILTER HOUSING AND CARTRIDGE, CAST IRON HEAD, CARBON STEEL SHELL, 19 MM (3/4") INLET AND OUTLET, CARBON STEEL CAPSCREW DRAIN.

ACCEPTABLE PRODUCT: "DREW INDUSTRIAL - ASHLAND" MODEL 35884.

**FLOW INDICATOR:**

20 MM FLOW INDICATOR, 304 STAINLESS STEEL BODY AND INTERNALS, FUSED GLASS WINDOW, METRIC AND U.S. SCALES (15-30 LPM AND 4-8 GPM), STAINLESS STEEL RETURN SPRING, 1082 KPA MAXIMUM PRESSURE.

ACCEPTABLE PRODUCT: "DREW INDUSTRIAL - ASHLAND" MODEL 35016.

**PIPE:**

STEEL PIPE: TO ASTM A53, GRADE B, AS FOLLOWS:

TO NPS 6, SCHEDULE 40.

**PIPE JOINTS:**

NPS 2 AND UNDER: SCREWED FITTINGS WITH TEFLON TAPE OR PULVERIZED LEAD PASTE.

NPS 2 1/2 AND OVER: WELDING FITTINGS AND FLANGES TO CSAW47.1 AND CSA W47.1S1.

FLANGES: PLAIN OR RAISED FACE, SLIP-ON OR WELD NECK.

FLANGE GASKETS: TO ANSI/AWWA C111/A21.11.

BOLTS AND NUTS: TO ANSI B18.2.1 AND ANSI/ASME B18.2.2.

PIPE THREAD: TAPER.

**FITTINGS:**

SCREWED FITTINGS: MALLEABLE IRON, TO ANSI/ASME B16.3, CLASS 150.

PIPE FLANGES AND FLANGED FITTINGS:

CAST IRON: TO ANSI/ASME B16.1, CLASS 125.

STEEL: TO ANSI/ASME B16.5.

UNIONS: MALLEABLE IRON, TO ASTM A47M AND ANSI/ASME B16.3.

BUTT - WELDING FITTINGS: STEEL, TO ANSI/ASME B16.9.

**GATE VALVES:**

NPS 2 AND UNDER, SCREWED:

RISING STEM: TO MSS SP-80, CLASS 125, 860 KPA, BRONZE BODY, SOLID WEDGE DISC.

ACCEPTABLE MATERIAL: TOYO FIG 206A, CRANE, GRINNELL.

**BALL VALVES:**

NPS 2 AND UNDER:

TO ASTM B82, 4 MPA WOG, BRONZE BODY, SCREWED ENDS, TFE SEAL, HARD CHROME SOLID BALL, TEFLON SEATS AND LEVER HANDLE.

ACCEPTABLE PRODUCT: TOYO FIGURE 5044A, CRANE, GRINNELL OR APPROVED EQUAL.

**THERMOMETERS:**

VARIABLE ANGLE TYPE, LIQUID FILLED, 0-120° C. DUAL RANGE, 175mm SCALE LENGTH, TO CGSP 14-GP-2a

ACCEPTABLE MATERIAL: "WEISS" MODEL: 7VD, "MARSHALLTOWN", "TRERICE".

KGS FILE NO.: P:\PROJECTS\2006\06-0107-17\MECH\DWGS\06-0107-17M007.dwg PLOT SIZE: 1:1



B.M. ELEV.				
0	ISSUED FOR TENDER	NOV.16/06	PSS	
NO.	REVISIONS	DATE	BY	

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DATE NOV. 2006	DATE



**THE CITY OF WINNIPEG**  
 PLANNING PROPERTY AND DEVELOPMENT  
 Winnipeg \* SERVICES DEPARTMENT

**RIVER PATROL BOAT STORAGE BUILDING**

SPECIFICATIONS  
 SHEET 1 OF 2

SHEET 7 OF 8
CAD FILE DRAWING NUMBER 06-107-17M007.dwg
PROJECT NUMBER 2005-081

CONSULTANT DRAWING NO. 06-0107-17M7