

Prepared For: Town of Wiscasset; Public Works Department

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Submittal: 51 Bath Road, Wiscasset, ME 04578; 4 Primary Zone renewal and retrofit (HC-1, Heating and Ventilating unit; AC-1).

Job Name:

HVAC Renewal and retrofits.

Payment Terms: Per FE00014, Town Office Contract terms.

Proposal/Scope Expiration Date: Thirty (30) days.

Evaluation for Repair vs. Replacement; Energy Conservation Measures (ECMs).

Standards: IMC 2015, IECC 2015, ASHRAE 100 for existing buildings, and reference to ASHRAE 90.1 for replacement; CFR 40, Section 608 for Refrigerant Maintenance and Management.

Weather/Climate Design: Summer 83 DB / 68WB or 78 DB / 68W; Winter -2 DB 99.6%; 1% WS 23 mph.

Wiscasset Municipal Airport, ASOS; ASHRAE Weather Station Reference Brunswick NAS. Setpoint Temperature: 70°F.

Scope of Work/Bid Document:

Town Office Zone

1. This scope of work serves to document the equipment and control upgrade needed in order to improve the HVAC in the Town Office building. The results include evaluation for safety, health and performance of the Town Office Building and support offices, and selectboard meeting rooms and the proposed upgrades meet or exceed 2015 Buildings standards, NFPA, energy efficiency code and include feasible and acceptable meeting efficiency best practices and standards for new installation in existing buildings. The current unit must meet the current requirement for NFPA air at 1 CFM/ft². Minimum velocities are met for NFPA smoke control. The additional CFM is for air changes and maintaining duct temperatures below 120°F.
2. Install Air Source Heat Pump to replace the existing air handler with heating and cooling, DX coil capable of 7.5 tons SH, and 63 MBH heating, increasing the air volume to exceed NFPA and meet cooling capacity with an energy efficiency ratio (EER) that meets and exceeds IMC2015 and IECC2015.
 - a. Air handler to be installed in existing location.
 - b. See Siting for Condenser.
3. Equipment to be per ASHRAE 15 & 34 for mechanical refrigeration safety.
4. Replacement equipment Air Handler for CFM to meet Section 403 IMC 2015

minimum ventilation rates for multiple zone installations; including 2015 building codes and 2021 UPC.

- a. Minimum CFM 4000CFM, DX Cooling Coil to be added for split heating and split cooling ensuring Winter heating reliability.
5. Controls
 - a. Upgrade to include RH, and CO2 in the meeting room 143, selectboard meeting room at a minimum.
 - b. Building Management System (BMS) for building
 - i. BMS control data:
 1. Temperature (+/- 2°F within 40 to 80°F).
 2. RH feedback (+/- 5% within 20 to 80%) to updated control ventilation in demand scenario.
 3. CO2 (in-situ NDIR (gasometer typically 1 to 3-5%) 0-5000ppm +/- 50 to 150ppm, rapid sampling diffusion (5 to 15min), and dual wavelength filter, in duct and in meeting room (qty2). Include light indicator for existing exhaust control for CO2 at the manual switch if required other than FA and RA exhaust control.
 4. N/R; IR/PIR beam counter for occupancy count reference for demand zone control and manual override; in place of PIR/IR beam schedule balance for usage with manual override.
 - ii. Web-based building management tool or dedicated computer station.
6. Demand control ventilation (DCV); include CAV to Variable air Volume (VAV) with added cooling coil, and setback, economized unless 65% improved efficiency (Table 6.5. 1-2) (return air or pre-coil).
 - a. 3 sub-zones. 1) Meeting Room, 2) Right Corridor of Offices 3) Left Corridor of Admin and offices.
 - b. 1 Thermostat per each sub-zone.
 - c. Control to be Time-based control schedules for Zones capable and IR/PIR beam schedule. (actual people count for VAV).
7. Verify reliability of installed fire dampers.
8. Heat pump air source VRF achieves a credit as does EER ratings; though longer run into furnace house and following glycol piping.
9. Siting; South end of the Town Office building in the Equipment area South of the furnace room.
 - a. Refrigerant piping maximum is 514 between Indoor unit and Outdoor unit and will require 245 feet to 250 feet of refrigerant piping.
10. Ducting velocities to remain below 1500 fpm; existing ducting diameters are sufficient to maintain velocities below maximums at 4000 CFM. SP1"WC.
11. Distribution
 - a. Reuse existing ducting in Town Office air handler zones.

First and Second Floor Mechanical: Public Safety and EMT

1. Demand Control ventilation (DCV) and Variable Air Volume

Control (VAV) to optimize balance between First and Second Floors.

- a. 2 Sub-zones; 1) First Floor Public Safety 2) Second Floor EMT.
2. Temperature controls (+/- 2 F within 40 to 80 F).
3. RH Feedback (+/- 5% within 20 to 80%) to updated control. ventilation in demand scenario.
4. Verify fire dampers reliability.
5. Reuse existing ducting; ducting velocities to remain below 1500 CFM
6. New Split System 10 TR of refrigeration,
 - a. electric heating to replace glycol convectors.
7. Total CFM controls to have total to one floor capability to meet

NFPA Ground Floor: EMT and Rescue Service Garage Zone – ASHRAE 170.

1. New 2 TR refrigeration Split System; 1885 CFM; 8 ACH.
2. Possible reuse of air handler from town office side.
3. Filtration
 - a. HEPA and Carbon; comply with ANSI/UL 900.
4. Pressure
 - a. Pressure below adjacent independent zones, 1”WC.
5. Controls
 - a. Temperature (+/- 2 F within 40 to 80 F).
 - b. RH (+/- 5% within 20 to 80%) to updated control.
 - c. Engine Exhauster ON/OFF; Air handler ON/OFF. ; light Indication for admin office and manual controls.
 - d. 0% Return Air when engine exhauster is in operation.
6. Distribution
 - a. One Supply header. 2 Diffusers
 - b. One Return Header. 1 Return diffuser

Ground Floor: Firehouse and EMT

1. New 6 TR Air Handler; 3000 to 5200 CFM.
2. To be retrofit to Firehouse meeting zone.
3. Split system
4. Controls
 - a. Temperature (+/- 2 F within 40 to 80 F).
 - b. RH (+/- 5% within 20 to 80%) to updated control.
 - c. CO2; 0-5000 ppm; Light indication.
 - d.
5. Distribution
 - a. One supply header and 8 flex hose connections to offices.
 - b. One return header.

Fire Protection and smoke control Velocities:

1. Minimum 189 ft/min per IBC 2012 for smoke control exhaust. IBC 2012 Section 909.7.1
2. Maximum 1500 ft/min per sound quality standard.

All filtration to comply with ANSI/UL 900 section 4.2.2.2 of NFPA 90

Standards:

1. Installation per IMC 2015, and IBC 2015.
2. Applicable standards for
 - a. Ducting per AMCA and SMACNA.
 - b. Air Handlers – ANSI & AHRI.
 - c. Refrigerants – AHRI.
 - d. Piping and Assembly – ASME.
 - e. Refrigeration Safety & Efficiency– ASHRAE 15 & 34, 62.1, and 100
 - f. HVAC and smoke control comply with NFPA 90A unless other applicable design standards are more stringent.
 - g. Filtration to meet UL900 per NFPA 90A section 4.2.2.2.
 - h. Electric Duct heaters per NFPA 70.

Additional requests:

1. Please provide equipment installed cost bid.
2. Equipment delivery lead times.
3. Potential support schedule.