



Mechanical Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**

Project Title: Patrons Oxford Offices

Project Type: New Construction

Construction Site:

Portland Technology Park
Rand Road
Portland, ME

Owner/Agent:

Designer/Contractor:

Section 2: General Information

Building Location (for weather data):

Portland, Maine

Climate Zone:

6a

Section 3: Mechanical Systems List

Quantity System Type & Description

- 3 HP-1 Multi-purpose 108 (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 13 kBtu/h,
Proposed Efficiency = 3.75 COP, Required Efficiency = 2.84 COP
Cooling Mode: Capacity = 14 kBtu/h,
Proposed Efficiency = 10.00 EER, Required Efficiency = 9.32 EER
Fan System: HP 1-1 thru 3 Cassettes | Multi-purpose 108 -- Compliance (Brake HP method) : **Passes**

Fans:
Cassettes HP1 Supply, Constant Volume, 320 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:
Particulate filtration credit: MERV 13 through 15, 0.0697 credit
- 2 HP-2 Conf 109 & Mud 110 (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 14 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.91 COP
Cooling Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 9.96 EER
Fan System: HP 2-1 & 2 Cassettes | Conf 109 & Mud 110 -- Compliance (Brake HP method) : **Passes**

Fans:
HP 21 & 2 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
- 3 HP-3 Fitness (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.91 COP
Cooling Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 9.96 EER
Fan System: HP 3-1 thru 3 Cassettes | Fitness -- Compliance (Brake HP method) : **Passes**

Fans:
HP3 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
- 3 HP-4 Stor & Mail 115 (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.89 COP
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 9.74 EER
Fan System: HP 4-1 thru 3 | Stor & Mail 115 -- Compliance (Brake HP method) : **Passes**

Fans:
HP4 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp

Pressure Drop Credits:

- 4 HP-5 Kitchen & Cafe (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 3.75 COP, Required Efficiency = 2.91 COP
Cooling Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 9.96 EER
Fan System: HP 5-1 & 2 | Kitchen & Caf -- Compliance (Brake HP method) : **Passes**

Fans:
HP 5 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:
- 3 HP-6 Meeting & Entry (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.91 COP
Cooling Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 9.96 EER
Fan System: HP 6-1 thru 3 | Meetg & Entry -- Compliance (Brake HP method) : **Passes**

Fans:
HP 6 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:
- 2 HP-7 Pres Offices (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 14 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.94 COP
Cooling Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 10.17 EER
Fan System: HP 7-1 & 2 | Pres Offices -- Compliance (Brake HP method) : **Passes**

Fans:
HP 7 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:
- 2 HP-8 Offices 206 & 7 (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.94 COP
Cooling Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 10.17 EER
Fan System: HP 8 1 & 2 | Offices 206 & 7 -- Compliance (Brake HP method) : **Passes**

Fans:
HP 8 Supply, Constant Volume, 290 CFM, 0.7 motor nameplate hp, 0.6 brake hp
Pressure Drop Credits:
- 4 HP-9 Lounge Meeting (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 9 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.94 COP
Cooling Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 10.17 EER
Fan System: HP 9 1 thru 4 | Louonge Meeting Atrium -- Compliance (Brake HP method) : **Passes**

Fans:
HP 9 Lounge Meeting Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:
- 4 HP-10 Work stations (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 3.75 COP, Required Efficiency = 2.91 COP
Cooling Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 10.00 EER, Required Efficiency = 9.96 EER
Fan System: HP 10 1 thru 4 | Work stations -- Compliance (Brake HP method) : **Passes**

Fans:
HP 10 1 & 2 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:
- 4 HP-11 Work stations Office 227 (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 8 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.99 COP
Cooling Mode: Capacity = 8 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 10.60 EER
Fan System: HP 11 1 thru 4 | Work Station Office 227 -- Compliance (Brake HP method) : **Passes**

Fans:
HP11 1 thru 4 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:

- 4 HP-12 Work Stations Office 221 (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 9 kBtu/h,
Proposed Efficiency = 3.95 COP, Required Efficiency = 2.97 COP
Cooling Mode: Capacity = 9 kBtu/h,
Proposed Efficiency = 14.00 EER, Required Efficiency = 10.38 EER
Fan System: HP 12 1 thru 4 | Work Station Office 221 -- Compliance (Brake HP method) : **Passes**

Fans:
HP 12 1 thru 4 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:

- 4 HP-13 Work Stations (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 3.75 COP, Required Efficiency = 2.91 COP
Cooling Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 10.00 EER, Required Efficiency = 9.96 EER
Fan System: HP 13 1 thru 4 | Work Stations -- Compliance (Brake HP method) : **Passes**

Fans:
HP 13 1 thru 4 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:

- 3 HP-14 Core Meeting (Single Zone) : Packaged Terminal Heat Pump
Heating Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 3.10 COP, Required Efficiency = 2.91 COP
Cooling Mode: Capacity = 11 kBtu/h,
Proposed Efficiency = 11.30 EER, Required Efficiency = 9.96 EER
Fan System: HP 14 1 thru 3 | Core Meetings -- Compliance (Brake HP method) : **Passes**

Fans:
HP 14 1 thru 3 Supply, Constant Volume, 290 CFM, 0.1 motor nameplate hp, 0.1 brake hp
Pressure Drop Credits:

Section 4: Requirements Checklist

Requirements Specific To: HP-1 Multi-purpose 108 :

1. Equipment minimum efficiency: Heat Pump: 2.84 COP 9.32 EER

Requirements Specific To: HP-2 Conf 109 & Mud 110 :

1. Equipment minimum efficiency: Heat Pump: 2.91 COP 9.96 EER

Requirements Specific To: HP-3 Fitness :

1. Equipment minimum efficiency: Heat Pump: 2.91 COP 9.96 EER

Requirements Specific To: HP-4 Stor & Mail 115 :

1. Equipment minimum efficiency: Heat Pump: 2.89 COP 9.74 EER

Requirements Specific To: HP-5 Kitchen & Cafe :

1. Equipment minimum efficiency: Heat Pump: 2.91 COP 9.96 EER

Requirements Specific To: HP-6 Meeting & Entry :

1. Equipment minimum efficiency: Heat Pump: 2.91 COP 9.96 EER

Requirements Specific To: HP-7 Pres Offices :

1. Equipment minimum efficiency: Heat Pump: 2.94 COP 10.17 EER

Requirements Specific To: HP-8 Offices 206 & 7 :

1. Equipment minimum efficiency: Heat Pump: 2.94 COP 10.17 EER

Requirements Specific To: HP-9 Lounge Meeting :

1. Equipment minimum efficiency: Heat Pump: 2.94 COP 10.17 EER

Requirements Specific To: HP-10 Work stations :

1. Equipment minimum efficiency: Heat Pump: 2.91 COP 9.96 EER

Requirements Specific To: HP-11 Work stations Office 227 :

1. Equipment minimum efficiency: Heat Pump: 2.99 COP 10.60 EER

Requirements Specific To: HP-12 Work Stations Office 221 :

1. Equipment minimum efficiency: Heat Pump: 2.97 COP 10.38 EER

Requirements Specific To: HP-13 Work Stations :

1. Equipment minimum efficiency: Heat Pump: 2.91 COP 9.96 EER

Requirements Specific To: HP-14 Core Meeting :

1. Equipment minimum efficiency: Heat Pump: 2.91 COP 9.96 EER

Generic Requirements: Must be met by all systems to which the requirement is applicable:

1. Plant equipment and system capacity no greater than needed to meet loads
Exception(s):
- Standby equipment automatically off when primary system is operating
 - Multiple units controlled to sequence operation as a function of load
2. Minimum one temperature control device per system
3. Minimum one humidity control device per installed humidification/dehumidification system
4. Load calculations per ASHRAE/ACCA Standard 183.
5. Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
Exception(s):
- Continuously operating zones
6. Outside-air source for ventilation; system capable of reducing OSA to required minimum
7. Hot water pipe insulation: 1.5 in. for pipes <=1.5 in. and 2 in. for pipes >1.5 in.
Chilled water/refrigerant/brine pipe insulation: 1.5 in. for pipes <=1.5 in. and 1.5 in. for pipes >1.5 in.
Steam pipe insulation: 1.5 in. for pipes <=1.5 in. and 3 in. for pipes >1.5 in.
Exception(s):
- Piping within HVAC equipment.
 - Fluid temperatures between 55 and 105°F.
 - Fluid not heated or cooled with renewable energy.
 - Piping within room fan-coil (with AHR1440 rating) and unit ventilators (with AHR1840 rating).
 - Runouts <4 ft in length.
8. Operation and maintenance manual provided to building owner
9. Demand control ventilation (DCV) present for high design occupancy areas (>40 person/1000 ft² in spaces >500 ft²) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
Exception(s):
- Systems with heat recovery.
 - Multiple-zone systems without DDC of individual zones communicating with a central control panel.
 - Systems with a design outdoor airflow less than 1200 cfm.
 - Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
10. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings
Exception(s):
- Gravity dampers acceptable in buildings <3 stories
11. Automatic controls for freeze protection systems present
12. Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specifically exempted
Exception(s):
- Hazardous exhaust systems, commercial kitchen and clothes dryer exhaust systems that the International Mechanical Code prohibits the use of energy recovery systems.
 - Systems serving spaces that are heated and not cooled to less than 60°F.
 - Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
 - Heating systems in climates with less than 3600 HDD.
 - Cooling systems in climates with a 1 percent cooling design wet-bulb temperature less than 64°F.
 - Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
 - Laboratory fume hood exhaust systems that have either a variable air volume system capable of reducing exhaust and makeup air volume to 50 percent or less of design values or, a separate make up air supply meeting the following makeup air requirements:
a) at least 75 percent of exhaust flow rate, b) heated to no more than 2°F below room setpoint temperature, c) cooled to no lower than 3°F above room setpoint temperature, d) no humidification added, e) no simultaneous heating and cooling.

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2009 IECC requirements in COMcheck Version 4.0.2.8 and to comply with the mandatory requirements in the Requirements Checklist.

Ian A MacDonald

Name - Title

Signature

3-14-16

Date

Section 6: Post Construction Compliance Statement

- HVAC record drawings of the actual installation, system capacities, calibration information, and performance data for each equipment provided to the owner.
- HVAC O&M documents for all mechanical equipment and system provided to the owner by the mechanical contractor.
- Written HVAC balancing and operations report provided to the owner.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name

Signature

Date