

90.1 (2007) Standard

Section 1: Project Information

Project Type: Addition

Project Title: Bean 2 roof addition

Construction Site:

22 Bramhall St
Portland, ME 04102

Construction Site:

Maine Medical Center
22 Bramhall St
Portland, ME 04102

Designer/Contractor: Suffolk Construction

Section 2: General Information

Building Location (for weather data): Portland, Maine

Climate Zone:

Section 3: Mechanical Systems List

Quantity System Type & Description

1 HVAC System 1 (Multiple-Zone) :

Heating: 1 each - Hydronic or Steam Coil, Steam, Capacity = 913 kBtu/h

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No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 1229 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: FAN SYSTEM 1 | OR -- Compliance (Brake HP method): Passes

Fans:

FAN 1 Supply, Multi-Zone VAV, 30000 CFM, 60 motor nameplate hp, 44 brake hp

FAN 2 Return, Multi-Zone VAV, 25000 CFM, 20 motor nameplate hp, 13 brake hp

FAN 3 Exhaust, Constant Volume, 3250 CFM, 2 motor nameplate hp, 1 brake hp

Pressure Drop Credits:

Fully ducted return and/or exhaust air systems, 3.4193 credit

Particulate filtration credit: MERV 9 through 12, 3.6311 credit

Particulate filtration credit: MERV 16 and greater and electronically enhanced filters, 7.9884 credit

Sound attenuation section, 1.9971 credit

Return and/or exhaust airflow control devices, 6.6570 credit

1 HVAC System 2 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Steam, Capacity = 603 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 819 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: FAN SYSTEM 2 | PACU -- Compliance (Brake HP method) : Passes

Fans:

FAN 6 Supply, Multi-Zone VAV, 20000 CFM, 40 motor nameplate hp, 29 brake hp

FAN 11 Return, Multi-Zone VAV, 17000 CFM, 10 motor nameplate hp, 9 brake hp

FAN 12 Exhaust, Constant Volume, 840 CFM, 1 motor nameplate hp, 0 brake hp

FAN 13 Exhaust, Constant Volume, 370 CFM, 0 motor nameplate hp, 0 brake hp

Pressure Drop Credits:

Fully ducted return and/or exhaust air systems, 2.2041 credit

Return and/or exhaust airflow control devices, 2.0576 credit

Particulate filtration credit: MERV 9 through 12, 2,4207 credit

Particulate filtration credit: MERV 16 and greater and electronically enhanced filters, 5.3256 credit

Sound attenuation section, 1.3569 credit

1 HVAC System 3 (Single Zone w/ Perimeter System) :

Heating: 1 each - Radiant Heater, Hot Water, Capacity = 310 kBtu/h

No minimum efficiency requirement applies

Fan System: None

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Report date: 07/01/13

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Section 5: Compliance Statement

and o	liance Statement: The proposed med ther calculations submitted with this pr ard requirements in COMcheck Version	ermit application. The	proposed mechanical sy	stems have been o	designed to meet the 90.1 (2007)
Da	vid Roberts-Sr. Me	rch Engineer	Wal M	alleriens in the Ri	7/1/13
Maili	e - Title ction 6: Post Constru	r	Signature	nent	Date 1
	HVAC record drawings of the actual system acceptance.	installation and perfo	rmance data for each equ	uipment provided to	the owner within 90 days after
0	HVAC O&M documents for all mecha Written HVAC balancing report provide	, .	system provided to the o	wner within 90 day	s after system acceptance.
The a	bove post construction requirements h	nave been completed			
Princi	pal Mechanical Designer-Name	Signature			Date

Inspection Checklist

Requirements: 100.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

1 High Impact (Tier 1)

2 Medium Impact (Tier 2)

3 Low Impact (Tier 3)

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90.1 (2007) Standard	Plan Review	Complies?	Comments/Assumptions
4.2.2, 6.4.2 [PR2] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
4.2.2, 7.4.1 [PR3] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the service water heating systems and equipment and document where exceptions to the standard are claimed. Hot water system sized per manufacturer's sizing guide.	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.4 [PR5] ¹	Detailed instructions for HVAC systems commissioning included on the plans or specifications for projects >=50,000 ft2.	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Exception: Requirement does not apply.

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1 High Impact (Tier 1)	2 Medium Impact (Tier 2)	3 Low Impact (Tier 3)
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90.1 (2007) Standard	Footing / Foundation Inspection	Complies?	Comments/Assumptions
6.4.3.8 [FO9] ³	Freeze protection and snow/ice melting system sensors for future connection to controls.	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.

1 High Impact (Tier 1)		3 Low Impact (Tier 3)
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90.1 (2007) Standard	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.4.1.4, 6.4.1.5 [ME1] ²	HVAC equipment efficiency verified. Non-NAECA HVAC equipment labeled as meeting 90.1.	Efficiency:	Efficiency:	Complies Does Not Comply Not Observable Not Applicable	See the Mechanical Systems list for values.
6.4.3.4.1 [ME3] ³	Stair and elevator shaft vents have motorized dampers that automatically close.	Transfer of the American Ameri		☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.4.2, 6.4.3.4.3, 6.4.3.4.4 [ME4] ³	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed.			Complies Comples Does Not Comply Not Observable Not Applicable	Requirement will be met.
6.4.3.4.5 [ME5] ³	Ventilation fans >0.75 hp have automatic controls to shut off fan when not required.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Exception: HVAC systems intended to operate continuously
6.4.3.9 [ME6] ¹	Demand control ventilation provided for spaces >500 ft2 and >40 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.1.1 [ME7] ³	Insulation exposed to weather protected from damage. Insulation outside of the conditioned space and associated with cooling systems is vapor retardant.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.1.2 [ME8] ²	HVAC ducts and plenums insulated.	R	R	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.1.3 [ME9] ²	HVAC piping insulation thickness.	in,	in.	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.2.1 [ME10] ²	Ducts and plenums sealed based on static pressure and location.			Complies Does Not Comply Not Observable Not Applicable	Requirement will be met.
6.4.4.2.2 [ME11] ³	Ductwork operating >3 in. water column requires air leakage testing.			Complies Does Not Comply Not Observable Not Applicable	Exception: Requirement does not apply. See the Mechanical Systems list for
6.5.1, 6.5.1.1.1, 6.5.1.1.2, 6.5.1.1.3, 6.5.1.3 [ME12] ¹	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.			Complies Does Not Comply Not Observable Not Applicable	values for HVAC System 3. See the Mechanical Systems list for values for HVAC System 1.
6.5.1, 6.5.1.1.1, 6.5.1.1.2, 6.5.1.1.3, 6.5.1.3 [ME12] ¹	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.			□Complies □Does Not Comply □Not Observable □Not Applicable	See the Mechanical Systems list for values for HVAC System 2.

90.1 (2007) Standard	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.5.1.4 [ME16] ¹	Economizer operation will not increase heating energy use during normal operation.			Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
6.5.1.4 ME16] ¹	Economizer operation will not increase heating energy use during normal operation.			Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 2.
8.5.2.3 ME19] ³	Dehumidification controls provided to prevent reheating, recooling, mixing of hot and cold airstreams or concurrent heating and cooling of the same airstream.			Complies Does Not Comply Not Observable Not Applicable	Requirement will be met.
5.5.3.1.2 ME21] ²	HVAC fan motors not larger than the first available motor size greater than the bhp.	bhp:	bhp:	Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
3.5.3.1.2 ME21] ²	HVAC fan motors not larger than the first available motor size greater than the bhp.	bhp:	bhp:	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 2.
5.5.3.2.1 [ME22] ²	VAV fan motors >=10 hp to be driven by variable speed drive, have a vaneaxial fan with variable pitch blades, or have controls to limit fan motor demand.	☐ VSD☐ Vane axial fan☐ Other	☐ VSD☐ Vane axial fan☐ Other	Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
3.5.3.2.1 ME22] ²	VAV fan motors >=10 hp to be driven by variable speed drive, have a vaneaxial fan with variable pitch blades, or have controls to limit fan motor demand.	☐ VSD ☐ Vane axial fan ☐ Other	☐ VSD ☐ Vane axial fan ☐ Other	Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 2.
3.5.3.2.2 ME23] ²	VAV fans have static pressure sensors positioned so setpoint <=1/3 total design pressure.			□Complies □Does Not Comply □Not Observable □Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
3.5.3.2.2 ME23] ²	VAV fans have static pressure sensors positioned so setpoint <=1/3 total design pressure.			Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list fo values for HVAC System 2.
5.5.3.2.3 ME24] ²	Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure.	aana ka da		Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
3,5.3.2.3 ME24] ²	Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure.			Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 2.
3.5.4.1 ME25] ³	HVAC pumping systems >10 hp designed for variable fluid flow.			Complies Does Not Comply Not Observable Not Applicable	Requirement will be met.
5.5.4.2 ME26] ³	Reduce flow in pumping systems >10 hp. to multiple chillers or boilers when others are shut down.	2 (2011) 100 (2010) 100 (2010) 100 (2010) 100 (2011) 110 (2010) 10		Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
6.5.4.2 ME26] ³	Reduce flow in pumping systems >10 hp. to multiple chillers or boilers when others are shut down.			Complies Does Not Comply Not Observable Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 2.

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90.1 (2007) Standard	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.5.4.3 [ME27] ³	Temperature reset by representative building loads in pumping systems >10 hp for chiller and boiler systems >300,000 Btu/h.			Complies Does Not Comply Not Observable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
6.5.4.3 [ME27] ³	Temperature reset by representative building loads in pumping systems >10 hp for chiller and boiler systems >300,000 Btu/h.			☐Not Applicable ☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 2.
6.5.4.3 [ME27] ³	Temperature reset by representative building loads in pumping systems >10 hp for chiller and boiler systems >300,000 Btu/h.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Exception: Reset controls canot be implemented without causing improper operation. See the Mechanical Systems list for values for HVAC System 3.
6.5.6.1 [ME30] ¹	Exhaust air energy recovery on systems >=5,000 cfm and 70% of design supply air.	a a commencia por en a caractería comencia incluida en a la concasión en acestrología.	operation in the second of the	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Exception: Requirement does
6.5.6.2, 6.5.6.2.1, 6.5.6.2.2 [ME31] ³	Condenser heat recovery system that can heat water to 85 °F or provide 60% of peak heat rejection is installed for preheating of service hot water in 24/7 facility, water cooled systems reject >6 MMBtu, SHW load >=1 MMBtu.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
6.5.6.2, 6.5.6.2.1, 6.5.6.2.2 [ME31] ³	Condenser heat recovery system that can heat water to 85 °F or provide 60% of peak heat rejection is installed for preheating of service hot water in 24/7 facility, water cooled systems reject >6 MMBtu, SHW load >=1 MMBtu.			□Complies □Does Not Comply □Not Observable □Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 2.
6.5.7.1 [ME32] ²	Kitchen hoods >5,000 cfm have make up air >=50% of exhaust air volume.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Exception: Requirement does not apply.
6.5.7.2 [ME33] ¹	Fume hoods exhaust systems >=15,000 cfm have VAV hood exhaust and supply systems, direct make-up air or heat recovery.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Exception: Requirement does not apply.
6.5.8.1 [ME34] ³	Unenclosed spaces that are heated use only radiant heat.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Exception: Requirement does not apply.
6.5.2.2.1 [ME50] ¹	Three-pipe hydronic systems using a common return for hot and chilled water are not used.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 1.
6.5.2.2.1 [ME50] ¹	Three-pipe hydronic systems using a common return for hot and chilled water are not used.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 2.
6.5.2.2.1 [ME50] ¹	Three-pipe hydronic systems using a common return for hot and chilled water are not used.			☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met. See the Mechanical Systems list for values for HVAC System 3.

1 High Impact (Tier 1)	2 Medium Impact (Tier 2)	3 Low Impact (Tier 3)

	90.1 (2007) Standard	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
	_	Electric motors meet requirements where applicable.	☐Complies ☐Does Not Comply	Requirement will be met.
-			☐Not Observable	
-			☐Not Applicable	

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90.1 (2007) Standard	Final Inspection	Complies?	Comments/Assumptions
6.4.3.1.1 [FI2] ²	Heating and cooling to each zone is controlled by a thermostat control.	□Complies □Does Not Comply □Not Observable □Not Applicable	Requirement will be met.
6.4.3.1.2, 6.4.3.2, 6.4.3.3, 6.4.3.3.1, 6.4.3.3.2 [FI3] ²	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.3.3 [FI4] ²	Systems with air capacity >10,000 cfm include optimum start controls.	☐Complies ☐Does Not Comply ☐Not Observable	Exception: Systems designed for continuous operation. See the Mechanical Systems list for values for HVAC System 1.
6.4.3.3.3 [FI4] ²	Systems with air capacity >10,000 cfm include optimum start controls.	☐Not Applicable ☐Complies ☐Does Not Comply ☐Not Observable	Exception: Systems designed for continuous operation. See the Mechanical Systems list for values for HVAC System 2.
6.4.3.7 [F16] ³	When humidification and dehumidification are provided to a zone, simultaneous operation is prohibited.	□Not Applicable □Complies □Does Not Comply □Not Observable	Requirement will be met.
6.7.2.1 [FI7] ³	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	□Not Applicable □Complies □Does Not Comply □Not Observable □Not Applicable	Requirement will be met.
6.7.2.2 [FI8] ³	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.		Requirement will be met.
6.7.2.3 [FI9] ¹	An air and/or hydronic system balancing report is provided for HVAC systems serving zones >5,000 ft2 of conditioned area.	Complies Does Not Comply Not Observable Not Applicable	Requirement will be met.
6.7.2.4 [FI10] ¹	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	□Complies □Does Not Comply □Not Observable □Not Applicable	Requirement will be met.
6.4.3.2 [FI20] ¹	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.3.1 [FI21] ¹	HVAC systems equipped with at least one automatic shutdown control.	☐Complies ☐Does Not Comply ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.3.2 [FI22] ¹	Setback controls allow automatic restart and temporary operation as required for maintenance.	Complies Does Not Comply Not Observable Not Applicable	Exception: null.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2)	3 Low Impact (Tier 3)
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