COM*check* Software Version 4.0.5.5

Envelope Compliance Certificate

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 05/31/17

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: 23 Ocean Mixed Use
Project Type: New Construction

Construction Site:
23 Ocean Avenue
Portland, ME 04013
Permit No. BP#2017-00012

Owner/Agent:
Adam Cope
Ocean Avenue Associates
PO Box 1398
Portland, ME 04103

Designer/Contractor:
Kevin Moquin
Kevin Moquin Architect
1 Union St. #203
Portland, ME 04101
207-615-6421
kevin@km-a.me

Building Location (for weather data): Portland, Maine
Climate Zone: 6a
Vertical Glazing / Wall Area Pct.: **12%**

Building Use: Activity Type(s)	Floor Area
1-Office : Nonresidential	1700
2-Multifamily : Residential	5240

Section 2: Envelope Assemblies and Requirements Checklist

Envelope PASSES: Design 6% better than code.

Envelope Assemblies:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor(a)
Orientation: NORTH					
Exterior Wall 1 copy 1: Wood-Framed, 16" o.c., [Bldg. Use 1 - Office]	476	20.4	9.6	0.037	0.051
Window 1 copy 1: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID Sierra Pacific H3, SHGC 0.39, [Bldg. Use 1 - Office] (b)	59	---	---	0.240	0.350
Exterior Wall 1 copy 2: Wood-Framed, 16" o.c., [Bldg. Use 2 - Multifamily]	1558	20.4	9.6	0.037	0.051
Window 1 copy 2: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID Sierra Pacific H3, SHGC 0.39, [Bldg. Use 2 - Multifamily] (b)	162	---	---	0.240	0.350
Basement Wall 1 copy 1: Solid Concrete:8" Thickness, Normal Density, Furring: Wood, Wall Ht 8.0, Depth B.G. 7.5, [Bldg. Use 2 - Multifamily]	363	0.0	7.5	0.101	0.108
Orientation: EAST					
Exterior Wall 1 copy 2: Wood-Framed, 16" o.c., [Bldg. Use 2 - Multifamily]	856	20.4	9.6	0.037	0.051
Window 1 copy 2: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID Sierra Pacific H3, SHGC 0.39, [Bldg. Use 2 - Multifamily] (b)	58	---	---	0.240	0.350
Exterior Wall 1 copy 3: Wood-Framed, 16" o.c., [Bldg. Use 1 - Office]	403	20.4	9.6	0.037	0.051
Basement Wall 1 copy 2: Solid Concrete:8" Thickness, Normal Density, Furring: Wood, Wall Ht 8.0, Depth B.G. 7.5, [Bldg. Use 2 - Multifamily]	308	0.0	7.5	0.101	0.108
Orientation: SOUTH					
Exterior Wall 1: Wood-Framed, 16" o.c., [Bldg. Use 1 - Office]	602	20.4	9.6	0.037	0.051
Window 1: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID Sierra Pacific H3, SHGC 0.39, [Bldg. Use 1 - Office] (b)	70	---	---	0.240	0.350

Exterior Wall 1 copy 1: Wood-Framed, 16" o.c., [Bldg. Use 2 - Multifamily]	1927	20.4	9.6	0.037	(
Window 1 copy 1: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID Sierra Pacific H3, SHGC 0.39, [Bldg. Use 2 - Multifamily] (b)	336	---	---	0.240	(
Basement Wall 1: Solid Concrete:8" Thickness, Normal Density, Furring: Wood, Wall Ht 8.0, Depth B.G. 7.5, [Bldg. Use 2 - Multifamily]	477	0.0	7.5	0.101	(
Orientation: WEST					
Exterior Wall 1 copy 1: Wood-Framed, 16" o.c., [Bldg. Use 1 - Office]	326	20.4	9.6	0.037	0.051
Window 1 copy 1: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID Sierra Pacific H3, SHGC 0.39, [Bldg. Use 1 - Office] (b)	36	---	---	0.240	0.350
Exterior Wall 1 copy 2: Wood-Framed, 16" o.c., [Bldg. Use 2 - Multifamily]	694	20.4	9.6	0.037	0.051
Window 1 copy 2: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID Sierra Pacific H3, SHGC 0.39, [Bldg. Use 2 - Multifamily] (b)	78	---	---	0.240	0.350
Basement Wall 1 copy 3: Solid Concrete:8" Thickness, Normal Density, Furring: Wood, Wall Ht 8.0, Depth B.G. 7.5, [Bldg. Use 2 - Multifamily]	272	0.0	7.5	0.101	0.108
Orientation: UNSPECIFIED ORIENTATION					
Roof 1: Attic Roof with Wood Joists, [Bldg. Use 2 - Multifamily]	2665	51.0	0.0	0.020	0.027

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(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

(b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.

Air Leakage, Component Certification, and Vapor Retarder Requirements:

- ☐ 1. All joints and penetrations are caulked, gasketed or covered with a moisture vapor-permeable wrapping material installed in accordance with the manufacturer's installation instructions.
- ☐ 2. Windows, doors, and skylights certified as meeting leakage requirements.
- ☐ 3. Component R-values & U-factors labeled as certified.
- ☐ 4. No roof insulation is installed on a suspended ceiling with removable ceiling panels.
- ☐ 5. 'Other' components have supporting documentation for proposed U-Factors.
- ☐ 6. Insulation installed according to manufacturer's instructions, in substantial contact with the surface being insulated, and in a manner that achieves the rated R-value without compressing the insulation.
- ☐ 7. Stair, elevator shaft vents, and other outdoor air intake and exhaust openings in the building envelope are equipped with motorized dampers.
- ☐ 8. Cargo doors and loading dock doors are weather sealed.
- ☐ 9. Recessed lighting fixtures installed in the building envelope are Type IC rated as meeting ASTM E283, are sealed with gasket or caulk.
- ☐ 10. Building entrance doors have a vestibule equipped with self-closing devices.

  Exceptions:

  - ☐ Building entrances with revolving doors.
  - ☐ Doors not intended to be used as a building entrance.
  - ☐ Doors that open directly from a space less than 3000 sq. ft. in area.
  - ☐ Doors used primarily to facilitate vehicular movement or materials handling and adjacent personnel doors.
  - ☐ Doors opening directly from a sleeping/dwelling unit.

Section 3: Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 2009 IECC requirements in COM*check* Version 4.0.5.5 and to comply with the mandatory requirements in the Requirements Checklist.

Kevin Moquin Architect		3-27-2017
Name - Title	Signature	Date

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Mechanical Compliance Certificat

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Section 1: Project Information

Energy Code: **2009 IECC**
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Project Type: New Construction

Construction Site:
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Owner/Agent:
Adam Cope
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PO Box 1398
Portland, ME 04103

Designer/Contractor:
Kevin Moquin
Kevin Moquin Architect
1 Union St. #203
Portland, ME 04101
207-615-6421
kevin@km-a.me

Section 2: General Information

Building Location (for weather data):	Portland, Maine
Climate Zone:	6a

Section 3: Mechanical Systems List

Quantity	System Type & Description
1	HVAC System AOU24RLXFZ (Multiple-Zone) : Split System Heat Pump Heating Mode: Capacity = 24000 kBtu/h, Proposed Efficiency = 3.74 COP, Required Efficiency = 3.20 COP Cooling Mode: Capacity = 22000 kBtu/h, , Air Economizer Proposed Efficiency = 11.55 EER, Required Efficiency: 9.50 EER + 9.2 IPLV Fan System: None
1	HVAC System ASU9RLF1 (Multiple-Zone) : Split System Heat Pump Heating Mode: Capacity = 36400 kBtu/h, Proposed Efficiency = 3.94 COP, Required Efficiency = 3.20 COP Cooling Mode: Capacity = 35200 kBtu/h, , Air Economizer Proposed Efficiency = 12.50 EER, Required Efficiency: 9.50 EER + 9.2 IPLV Fan System: None
4	HVAC System AOU15RLS3H (Single Zone) : Split System Heat Pump Heating Mode: Capacity = 18000 kBtu/h, Proposed Efficiency = 4.59 COP, Required Efficiency = 3.20 COP Cooling Mode: Capacity = 14500 kBtu/h, , Air Economizer Proposed Efficiency = 11.55 EER, Required Efficiency: 9.50 EER + 9.2 IPLV Fan System: None
12	HVAC System Elect Bsbd (Single Zone w/ Perimeter System) : Heating: 1 each - Other, Electric, Capacity = 3 kBtu/h No minimum efficiency requirement applies Fan System: None
5	Water Heater Heat Pump WH: Electric Storage Water Heater, Capacity: 50 gallons Proposed Efficiency: 3.50 EF, Required Efficiency: 0.86 EF

Section 4: Requirements Checklist

Requirements Specific To: HVAC System AOU24RLXFZ :

q 1. Equipment minimum efficiency: Heat Pump: 3.20 COP 9.50 EER + 9.2 IPLV
q 2. Minimum one temperature control device per zone

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q 3. Integrated economizer is required for this location and system.
q 4. Cooling system provides a means to relieve excess outdoor air during economizer operation.
q 5. Systems serving more than one zone must be VAV systems
q 6. Single-duct VAV terminals reduce primary air before reheating
q 7. Controls capable of resetting supply air temp (SAT) by 25% of SAT-room temp difference
Exception(s):
- q Systems that prevent reheating, recooling or mixing of heated and cooled supply air
- q Seventy five percent of the energy for reheating is from site-recovered or site solar energy sources.
- q Zones with peak supply air quantities of 300 cfm (142 L/s) or less.

q 8. VAV fans with static pressure sensors are placed in a position such that the controller setpoint is no greater than one-third the total design fan static pressure. If placement results in the sensor being located downstream of major duct splits, multiple sensors are installed in each major branch.
Exception(s):
- q Systems with DDC of individual zone boxes reporting to the central control panel and reset of static pressure setpoint based on the zone requiring the most pressure.

q 9. Systems with DDC of individual zone boxes reporting to the central control panel has static pressure setpoint reset based on the zone requiring the most pressure.

Requirements Specific To: HVAC System ASU9RLF1 :

q 1. Equipment minimum efficiency: Heat Pump: 3.20 COP 9.50 EER + 9.2 IPLV
q 2. Minimum one temperature control device per zone
q 3. Integrated economizer is required for this location and system.
q 4. Cooling system provides a means to relieve excess outdoor air during economizer operation.
q 5. Systems serving more than one zone must be VAV systems
q 6. Single-duct VAV terminals reduce primary air before reheating
q 7. Controls capable of resetting supply air temp (SAT) by 25% of SAT-room temp difference
Exception(s):
- q Systems that prevent reheating, recooling or mixing of heated and cooled supply air
- q Seventy five percent of the energy for reheating is from site-recovered or site solar energy sources.
- q Zones with peak supply air quantities of 300 cfm (142 L/s) or less.

q 8. VAV fans with static pressure sensors are placed in a position such that the controller setpoint is no greater than one-third the total design fan static pressure. If placement results in the sensor being located downstream of major duct splits, multiple sensors are installed in each major branch.
Exception(s):
- q Systems with DDC of individual zone boxes reporting to the central control panel and reset of static pressure setpoint based on the zone requiring the most pressure.

q 9. Systems with DDC of individual zone boxes reporting to the central control panel has static pressure setpoint reset based on the zone requiring the most pressure.

Requirements Specific To: HVAC System AOU15RLS3H :

q 1. Equipment minimum efficiency: Heat Pump: 3.20 COP 9.50 EER + 9.2 IPLV
q 2. Discharge dampers prohibited with fan motors > 25 hp
q 3. Integrated economizer is required for this location and system.
q 4. Cooling system provides a means to relieve excess outdoor air during economizer operation.

Requirements Specific To: HVAC System Elect Bsbd :

None

Requirements Specific To: Water Heater Heat Pump WH :

q 1. Water heating equipment meets minimum efficiency requirements: Electric Water Heater efficiency: 0.86 EF (267 SL, Btu/h (if > 12 kW))
q 2. First 8 ft of outlet piping is insulated
q 3. Hot water storage temperature controls that allow setpoint of 90°F for non-dwelling units and 110°F for dwelling units.
q 4. Heat traps provided on inlet and outlet of storage tanks

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

q 1. Plant equipment and system capacity no greater than needed to meet loads
Exception(s):
- q Standby equipment automatically off when primary system is operating
- q Multiple units controlled to sequence operation as a function of load

q 2. Minimum one temperature control device per system

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- ☐ 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. R-5 supply and return air duct insulation in unconditioned spaces
  R-8 supply and return air duct insulation outside the building
  R-8 insulation between ducts and the building exterior when ducts are part of a building assembly
  Exception(s):
  - ☐ Ducts located within equipment
  - ☐ Ducts with interior and exterior temperature difference not exceeding 15°F.
- ☐ 8. Mechanical fasteners and sealants used to connect ducts and air distribution equipment
- ☐ 9. Ducts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics
- ☐ 10. 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 AHRI440 rating) and unit ventilators (with AHRI840 rating).
  - ☐ Runouts <4 ft in length.
- ☐ 11. Operation and maintenance manual provided to building owner
- ☐ 12. Balancing devices provided in accordance with IMC 603.17
- ☐ 13. 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.
- ☐ 14. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings
  Exception(s):
  - ☐ Gravity dampers acceptable in buildings <3 stories
- ☐ 15. Automatic controls for freeze protection systems present
- ☐ 16. 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 COM*check* Version 4.0.5.5 and to comply with the mandatory requirements in the Requirements Checklist.

Kevin Moquin Architect _____ 3-27-2017

Name - Title Signature Date

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Section 6: Post Construction Compliance Statement

q HVAC record drawings of the actual installation, system capacities, calibration information, and performance data for eac provided to the owner.

q HVAC O&M documents for all mechanical equipment and system provided to the owner by the mechanical contractor.

q Written HVAC balancing and operations report provided to the owner.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name Signature Date