Energy Code: **2009 IECC**Project Title: Bayside Anchor
Project Type: New Construction

Construction Site: Owner/Agent: Designer/Contractor:

Building Location (for weather data): Portland, Maine

Climate Zone: 6

Vertical Glazing / Wall Area Pct.: 20%

Building Use: Activity Type(s)Floor Area1-Multifamily: Nonresidential356542-Office: Nonresidential9493-School/University: Nonresidential12124-Automotive Facility: Nonresidential1000

## **Section 2: Envelope Assemblies and Requirements Checklist**

Envelope TBD: All building area types must be assigned to at least one envelope assembly

#### **Envelope Assemblies:**

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor <sub>(a)</sub>
Roof: Insulation Entirely Above Deck,	9424		24.8	0.039	0.048
Ext. Wall: Wood-Framed, 16in. o.c.,	20336	27.3	3.8	0.043	0.051
Window: Vinyl Frame, Perf. Specs.: Product ID pending ID, SHGC 0.45, [Bldg. Use 1 - Multifamily] (b)	4044			0.129	0.350
Door: , Perf. Specs.: Product ID pending ID, SHGC 0.45, PF 6.67, [Bldg. Use 1 - Multifamily] (b)	72			0.290	0.800
Floor: Unheated Slab-On-Grade, Horizontal with vertical >= 4 ft.,	467		12.3		

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

#### 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.
ā	4.	No roof insulation is installed on a suspended ceiling with removable ceiling panels.
$\bar{\Box}$	5.	'Other' components have supporting documentation for proposed U-Factors.
ā	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.

Data filename:

Project Title: Bayside Anchor

Report date: 12/09/15

Page 1 of 9

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

	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.
ie	ect Notes:

## Project Notes:

A four story building with 45 units of housing, Head Start, Community Policing and PHA offices.

Report date: 12/09/15 Page 2 of 9

Energy Code: **2009 IECC**Project Title: Bayside Anchor
Project Type: New Construction

Construction Site: Owner/Agent: Designer/Contractor:

# **Section 2: Interior Lighting and Power Calculation**

A Area Category	B Floor Are (ft2)	C a Allowed Watts / ft2	D Allowed Watts (B x C)
Multifamily	35654	0.7	24958
Office	949	1	949
School/University	1212	1.2	1454
Automotive Facility	1000	0.9	900
		Total Allowed Watto	00001

Total Allowed Watts = 28261

# **Section 3: Interior Lighting Fixture Schedule**

A	В	С	D	E
Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	Lamps/	# of Fixtures	Fixture Watt.	(C X D)
Multifamily (35654 sq.ft.)	Tixture	TIXUICO	Watt.	
LED: L1: Other:	1	45	22	990
LED: L2: Other:	1	46	17	782
LED: L3: Other:	1	193	17	3281
LED: L4: LED Linear 33W:	1	15	48	720
LED: L5: LED Panel Unit 40W:	1	2	40	80
LED: L6: LED Panel Unit 33W:	1	33	30	990
LED: L8: LED Linear 33W:	1	12	55	660
LED: L10: LED Linear 33W:	1	1	25	25
LED: L13: Other:	1	6	60	360
LED: L19: Other:	1	1	11	11
LED: L20: LED Panel Unit 36W:	1	8	35	280
Office (949 sq.ft.)				
LED: L6: LED Panel Unit 33W:	1	13	30	390
LED: L20: LED Panel Unit 36W:	1	7	35	245
School/University (1212 sq.ft.)				
LED: L20: LED Panel Unit 36W:	1	12	35	420
LED: L6: LED Panel Unit 33W:	1	3	30	90
LED: L5: LED Panel Unit 40W:	1	3	40	120
Automotive Facility (1000 sq.ft.)				

Total Proposed Watts = 9444

# **Section 4: Requirements Checklist**

## Interior Lighting PASSES: Design 67% better than code.

## **Lighting Wattage:**

■ 1. Total proposed watts must be less than or equal to total allowed watts.

Project Title: Bayside Anchor Data filename:

Report date: 12/09/15 Page 3 of 9 **Allowed Watts Proposed Watts** Complies 28261 YES 9444

C	controls, Switching, and wiring:
<b>1</b> 2	2. Daylight zones under skylights more than 15 feet from the perimeter have lighting controls separate from daylight zones adjacent to vertical fenestration.
<b></b> 3	Daylight zones have individual lighting controls independent from that of the general area lighting.
	Exceptions:
	☐ Contiguous daylight zones spanning no more than two orientations are allowed to be controlled by a single controlling device.
	Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.
<b>4</b>	. Independent controls for each space (switch/occupancy sensor).
	Exceptions:
	Areas designated as security or emergency areas that must be continuously illuminated.
	☐ Lighting in stairways or corridors that are elements of the means of egress.
	Master switch at entry to hotel/motel guest room.
	<ol> <li>Individual dwelling units separately metered.</li> <li>Medical task lighting or art/history display lighting claimed to be exempt from compliance has a control device independent of the control of the nonexempt lighting.</li> </ol>
□ 8	Each space required to have a manual control also allows for reducing the connected lighting load by at least 50 percent by either controlling all luminaires, dual switching of alternate rows of luminaires, alternate luminaires, or alternate lamps, switching the middle lamp luminaires independently of other lamps, or switching each luminaire or each lamp.
	Exceptions:
	Only one luminaire in space.
	☐ An occupant-sensing device controls the area.
	☐ The area is a corridor, storeroom, restroom, public lobby or sleeping unit.
	☐ Areas that use less than 0.6 Watts/sq.ft.
<b>9</b>	Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.
	Exceptions:
<u> </u>	<ul> <li>Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.</li> <li>Photocell/astronomical time switch on exterior lights.</li> </ul>
	Exceptions:
<u> </u>	☐ Lighting intended for 24 hour use.  1. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).
	Exceptions:
	☐ Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.
Se	ction 5: Compliance Statement
and o	ppliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC irements in COMcheck-Web and to comply with the mandatory requirements in the Requirements Checklist.

Project Title: Bayside Anchor Data filename: Report date: 12/09/15 Page 4 of 9

Signature

Date

Name - Title

Energy Code: 2009 IECC Project Title: Bayside Anchor Project Type: New Construction

Exterior Lighting Zone: 2 (Residentially zoned area)

Construction Site: Owner/Agent: Designer/Contractor:

# Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Entry canopy	349 ft2	0.25	Yes	87	102
Main entry	48 ft of door width	20	Yes	960	45
Plaza area	1013 ft2	0.14	Yes	142	30
Walkway >= 10 feet wide	525 ft2	0.14	Yes	74	30
		Total Trac	lable Watts* =	1263	207
		Total All	owed Watts =	1263	
	Total Allow	ed Suppleme	ntal Watts** =	600	

<sup>\*</sup> Wattage tradeoffs are only allowed between tradable areas/surfaces.

# **Section 3: Exterior Lighting Fixture Schedule**

A Fixture ID: Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	(C X D)
Entry canopy (349 ft2): Tradable Wattage				
LED: L12: Other:	1	6	17	102
Main entry (48 ft of door width): Tradable Wattage				
LED: L12: Other:	1	1	17	17
LED: L16: Other:	1	2	14	28
Plaza area (1013 ft2): Tradable Wattage				
LED: L17: Other:	1	1	30	30
Walkway >= 10 feet wide (525 ft2): Tradable Wattage				
LED: L17: Other:	1	1	30	30

## **Section 4: Requirements Checklist**

#### **Lighting Wattage:**

1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.

Total Tradable Proposed Watts =

207

Compliance: Passes.

### Controls, Switching, and Wiring:

Project Title: Bayside Anchor Report date: 12/09/15 Data filename: Page 5 of 9

<sup>\*\*</sup> A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Nan	ame - Title Si	gnature	Date
and c	<i>Impliance Statement:</i> The proposed exterior lighting design repred other calculations submitted with this permit application. The proposed exterior lighting design repreduction and the comply with the mandatory lighting the complex with the complex with the mandatory lighting the complex with the complex with the mandatory lighting the complex with the complex wi	pposed lighting system has been designed	to meet the 2009 IECC
Sec	ection 5: Compliance Statement		
	Lighting that is controlled by motion sensor.		
	☐ Emergency lighting that is automatically off during normal	building operation.	
	Lighting that is specifically designated as required by a he	alth or life safety statue, ordinance, or regu	ulation.
	Lighting that has been claimed as exempt and is identified	as such in Section 3 table above.	
	Exceptions:		
<b>□</b> 6.	6. All exterior building grounds luminaires that operate at greate	r than 100W have minimum efficacy of 60	lumen/watt.
	Exterior Lighting Efficacy:		
<b>1</b> 5.	5. All time switches are capable of retaining programming and the	ne time setting during loss of power for a p	eriod of at least 10 hours.
_	4. Lighting designated for dusk-to-dawn operation is controlled $\ensuremath{t}$		
<b>3</b> .	3. Lighting not designated for dusk-to-dawn operation is controll switch.	ed by either a a photosensor (with time sw	itch), or an astronomical time
□ 2.	2. All exemption claims are associated with fixtures that have a	control device independent of the control o	of the nonexempt lighting.

Project Title: Bayside Anchor Data filename:

Energy Code: 2009 IECC Project Title: Bayside Anchor Project Type: New Construction

Construction Site: Owner/Agent: Designer/Contractor:

## **Section 2: General Information**

Building Location (for weather data): Portland, Maine

Climate Zone:

# **Section 3: Mechanical Systems List**

### **Quantity System Type & Description**

3 Head Start & PHA Heat Pumps (Single Zone): Split System Heat Pump Heating Mode: Capacity = 32 kBtu/h,

Proposed Efficiency = 9.50 HSPF, Required Efficiency = 7.70 HSPF

Cooling Mode: Capacity = 30 kBtu/h,

Proposed Efficiency = 16.50 SEER, Required Efficiency = 13.00 SEER

Lobby Heat Pumps (Single Zone): Split System Heat Pump

Heating Mode: Capacity = 34 kBtu/h,

Proposed Efficiency = 9.50 HSPF, Required Efficiency = 7.70 HSPF

Cooling Mode: Capacity = 30 kBtu/h,

Proposed Efficiency = 16.50 SEER, Required Efficiency = 13.00 SEER

32 Electric Baseboard (500W) (Single Zone w/ Perimeter System): Heating: 32 each - Radiant Heater, Electric, Capacity = 2 kBtu/h

No minimum efficiency requirement applies

Electric Baseboard (750W) (Single Zone w/ Perimeter System): 8 Heating: 8 each - Radiant Heater, Electric, Capacity = 2 kBtu/h

No minimum efficiency requirement applies

**Domestic Water Heaters:** 

Gas Storage Water Heater, Capacity: 119 gallons, Input Rating: 199 Btu/h Proposed Efficiency: 96.00 % Et, Required Efficiency: 80.00 % Et

# **Section 4: Requirements Checklist**

#### Requirements Specific To: Head Start & PHA Heat Pumps:

1. Equipment minimum efficiency: Heat Pump: 7.70 HSPF 13.00 SEER

### Requirements Specific To: Lobby Heat Pumps:

■ 1. Equipment minimum efficiency: Heat Pump: 7.70 HSPF 13.00 SEER

### Requirements Specific To: Electric Baseboard (500W):

## Requirements Specific To: Electric Baseboard (750W):

Requirements Specific To: Domestic Water Heaters:

Project Title: Bayside Anchor Report date: 12/09/15 Data filename: Page 7 of 9

		Vater heating equipment meets minimum efficiency requirements: Gas Storage Water Heater efficiency: 80.00 % Et (258 SL, kBtu/h)
		irst 8 ft of outlet piping is insulated
_		lot water storage temperature controls that allow setpoint of 90°F for non-dwelling units and 110°F for dwelling units.
ā	4. F	leat traps provided on inlet and outlet of storage tanks
	Ger	neric Requirements: Must be met by all systems to which the requirement is applicable:
		clant equipment and system capacity no greater than needed to meet loads
		Standby equipment automatically off when primary system is operating
		-
_		finimum one temperature control device per system
_		finimum one humidity control device per installed humidification/dehumidification system oad calculations per ASHRAE/ACCA Standard 183.
_		utomatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
	Ex	cception(s):
		-
_		Outside-air source for ventilation; system capable of reducing OSA to required minimum
Ц		I-5 supply and return air duct insulation in unconditioned spaces I-8 supply and return air duct insulation outside the building
	F	1-8 insulation between ducts and the building exterior when ducts are part of a building assembly
		cception(s):
	8 1	Ducts with interior and exterior temperature difference not exceeding 15°F. Iechanical fasteners and sealants used to connect ducts and air distribution equipment
_		bucts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics
_		lot 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.
		team pipe insulation: 1.5 in. for pipes <=1.5 in. and 3 in. for pipes >1.5 in.  ception(s):
		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.
_		peration and maintenance manual provided to building owner
		alancing devices provided in accordance with IMC 603.17
	8	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.  **Execution(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.
		flotorized, automatic shutoff dampers required on exhaust and outdoor air supply openings ception(s):
		Gravity dampers acceptable in buildings <3 stories
		utomatic controls for freeze protection systems present
		Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specifically exempted acception(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.
	Г	Newstems requiring dehumidification that employ energy recovery in series with the cooling coil.

Project Title: Bayside Anchor Data filename:

_	a) at least 75 percent of exhai	of design values or, a separate mak ust flow rate, b) heated to no more t temperature, d) no humidification a	han 2°F below room setpoint te	emperature, c) cooled to no lower		
Secti	on 5: Compliance	Statement				
and other	calculations submitted with this p	chanical design represented in this permit application. The proposed me mply with the mandatory requireme	echanical systems have been d	esigned to meet the 2009 IECC		
Name -	Title	Signature		Date		
Secti	on 6: Post Constr	uction Compliance	Statement			
_	/AC record drawings of the actual ovided to the owner.	installation, system capacities, cali	oration information, and perform	nance data for each equipment		
_						
The abov	e post construction requirements	have been completed.				
Principal	Mechanical Designer-Name	Signature		Date		

Laboratory fume hood exhaust systems that have either a variable air volume system capable of reducing exhaust and makeup air

Report date: 12/09/15 Page 9 of 9 Project Title: Bayside Anchor

Data filename: