

Air Leakage



Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Property
McCain-Walworth Home
Summer Street
Portland, ME 04102

Weather:Portland, ME
McCain-Walworth Home -APP
(03-07-13).blg

Organization
Wes Riley
207-689-1211
Wes Riley

Builder
Mark McCain

HERS
Projected Rating
March 7, 2013
Rating No:McCain - As Per
Plans
Rater ID:5614207

Date: 06/03/13

Whole House Infiltration

	Blower Door Test	
	Heating	Cooling
Natural ACH	0.23	0.17
ACH @ 50 Pascals	3.00	3.00
CFM @ 25 Pascals	633	633
CFM @ 50 Pascals	993	993
Eff. Leakage Area (sq.in)	54.5	54.5
Specific Leakage Area	0.00015	0.00015
ELA/100 sf shell (sq.in)	1.07	1.07

Duct Leakage

Leakage to Outside Units			
CFM @ 25 Pascals			
CFM25 / CFMfan			
CFM25 / CFA			
CFM per Std 152			
CFM per Std 152 / CFA			
CFM @ 50 Pascals			
Eff. Leakage Area (sq.in)			
Thermal Efficiency			
Total Duct Leakage Units			
Total Duct Leakage			

Ventilation

Mechanical	Exhaust Only
Sensible Recovery Eff. (%)	0.0
Total Recovery Eff. (%)	0.0
Rate (cfm)	55
Hours/Day	24.0
Fan Watts	20.0
Cooling Ventilation	Natural Ventilation

ASHRAE 62.2 - 2010 Ventilation Requirements

For this home to comply with ASHRAE Standard 62.2 - 2010 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, a minimum of 55 cfm of mechanical ventilation must be provided continuously, 24 hours per day. Alternatively, an intermittently operating mechanical ventilation system may be used if the ventilation rate is adjusted accordingly. For example, a 110 cfm mechanical ventilation system would need to operate 12 hours per day, as long as the system operates to provide required average ventilation once each hour.

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Component Consumption



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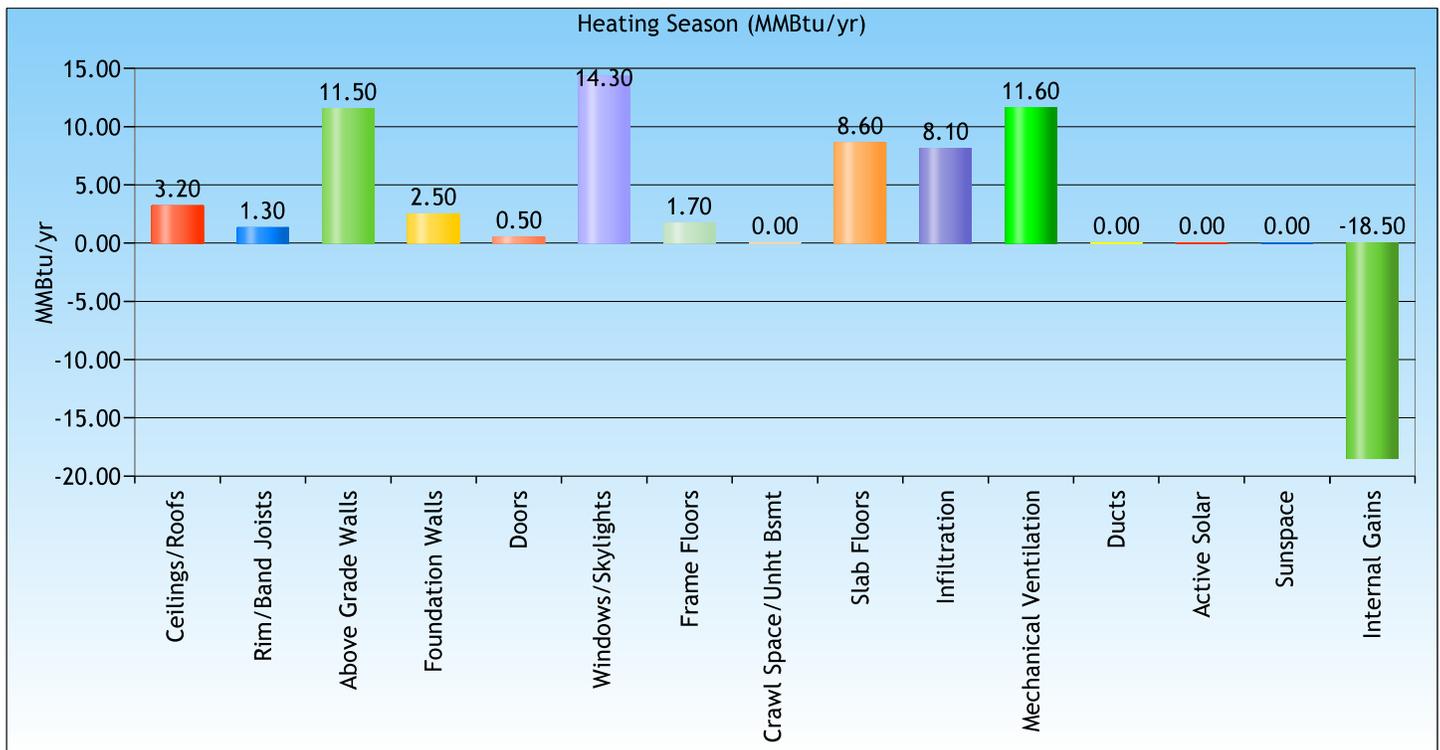
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Component	MMBtu/yr
Ceilings/Roofs	3.2
Rim/Band Joists	1.3
Above Grade Walls	11.5
Foundation Walls	2.5
Doors	0.5
Windows/Skylights	14.3
Frame Floors	1.7
Crawl Space/Unht Bsmt	0.0
Slab Floors	8.6
Infiltration	8.1
Mechanical Ventilation	11.6
Ducts	0.0
Active Solar	0.0
Sunspace	0.0
Internal Gains	-18.5
Total	44.8



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Energy Cost and Features



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Annual Energy Costs	\$/yr
Heating	679
Cooling	0
Water Heating	227
Lights & Appliances	1392
Photovoltaics	-0
Service Charges	0
Total	2299
Average Monthly(\$/Month)	192

Energy Features

Ceiling w/Attic	R60Truss R40CE+R20RF U=0.017
Sealed Attic	R50 hatch U=0.019
Vaulted Ceiling	None
Above Grade Wall	R30 SIPs U=0.030
Foundation Walls (Cond)	R20I R=20.0
Foundation Walls (Uncond)	None
Doors	R5 steel insul U=0.168
Windows	U-.31 / SHGC-.35 U=0.310
Frame Floors	H,R3,R39,BICe1,12,16 U=0.025
Slab Floors	R0,4,R20,99,1,NR U=0.044
Infiltration	Htg: 3.00 Clg: 3.00 ACH50
Infiltration Measure	Blower door test
Mechanical Ventilation	Exhaust Only: 55 cfm, 20.0 watts.
Interior Mass	None
Mechanical Equipment 1	Heating: Fuel-fired hydronic distribution, 81.0 kBtuh, 93.0 AFUE.
Mechanical Equipment 2	Water Heating: Integrated, Gas, 0.83 EF.
Programmable Thermostat	Heat=Yes; Cool=Yes
Ducts	NA
Duct Leakage to Outside	NA
Total Duct Leakage	NA
Lights/Appliances	Defaults
Active Solar	None
Photovoltaics	0.00
Sunspace	No

Note: Where feature level varies in home, the dominate value is shown.

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Lights and Appliances



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Electric Consumption	kWh/yr
Interior Lighting	2471.0
Exterior Lighting	226.0
Garage Lighting	100.0
Refrigerator	637.0
Freezer	0.0
Dishwasher	170.7
Oven/Range	448.0
Clothes Washer	68.7
Clothes Dryer	979.9
Mechanical Ventilation Fan	175.2
Ceiling Fan	0.0
Plug Loads	2913.2
Total	8189.7

Annual Energy Cost	\$/yr
Interior Lighting	420
Exterior Lighting	38
Garage Lighting	17
Refrigerator	108
Freezer	0
Dishwasher	29
Oven/Range	0
Clothes Washer	12
Clothes Dryer	0
Mechanical Ventilation Fan	30
Ceiling Fan	0
Plug Loads	495
Total	1392

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Performance Report



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Annual Load	MMBtu/yr
Heating	41.4
Cooling	0.0
Water Heating	14.1

Annual Consumption	MMBtu/yr
Heating	44.8
Cooling	0.0
Water Heating	15.2
Lights & Appliances	28.0
Photovoltaics	-0.0
Total	87.9

Annual Energy Cost	\$/yr
Heating	679
Cooling	0
Water Heating	227
Lights & Appliances	1392
Photovoltaics	-0
Service Charges	0
Total	2299

Design Loads	kBtu/hr
Space Heating	25.0
Space Cooling	0.0

Utility Rates	
Electricity	.17 KWH**
Gas	1.50NG**

Performance Report



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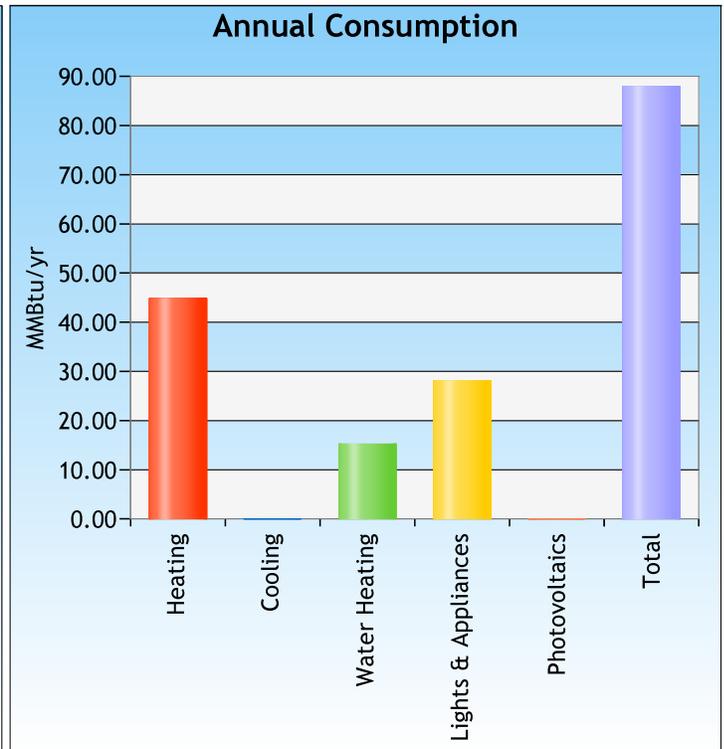
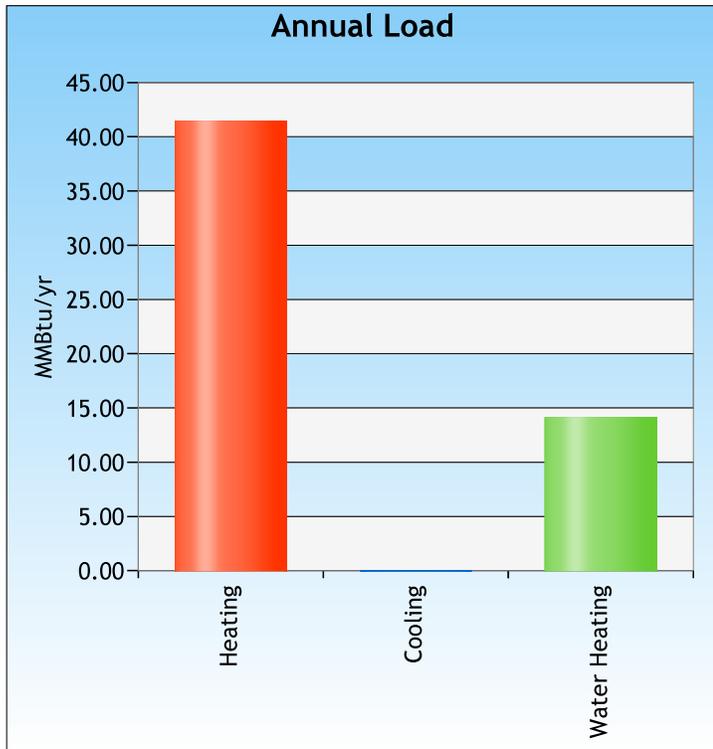
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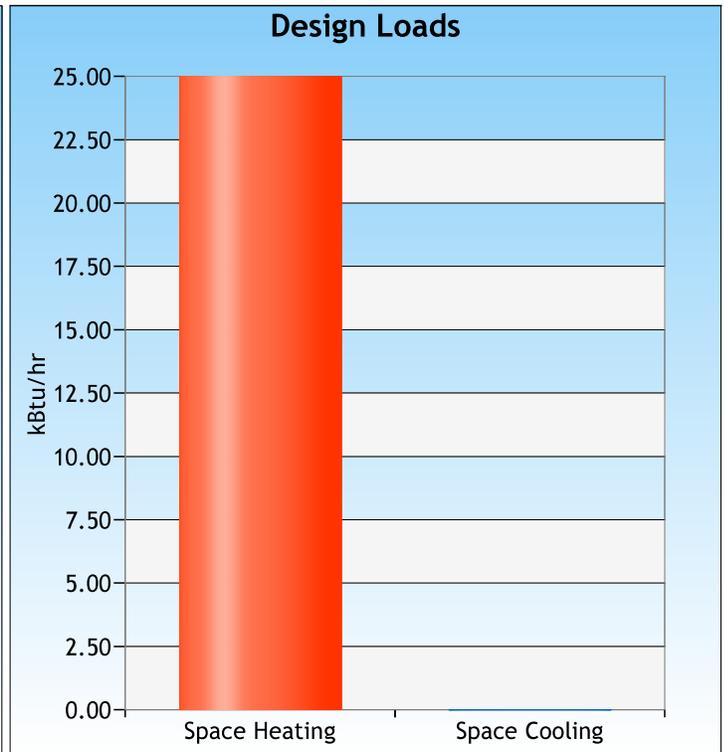
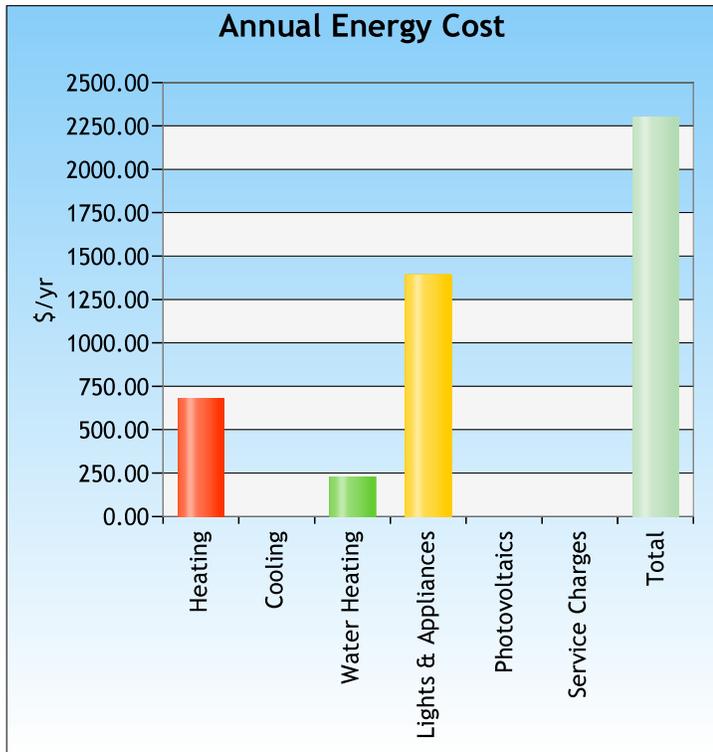
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Source Energy & Emissions



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Source Energy Consumption (MMBtu/year)

	All Electric Reference Home	As Designed	Difference	% Difference
Heating	136.6	49.5	-87.2	-63.8%
Cooling	7.8	3.7	-4.1	-52.1%
WaterHeating	22.9	16.7	-6.3	-27.3%
LightsAppliances	50.9	50.3	-0.6	-1.2%
Photovoltaics	0.0	0.0		
Total	218.3	120.2	-98.1	-44.9%

Total Emissions

Type of Emissions	All Electric Reference Home	As Designed	Difference	% Difference
Carbon Dioxide (CO2) - tons/year	11.2	5.9	-5.3	-47.2%
Sulfur Dioxide (SO2) - lbs/year	12.0	10.9	-1.2	-9.8%
Nitrogen Oxides (NOx) - lbs/year	31.6	18.1	-13.6	-42.8%

Emissions By End-Use

(All Electric Reference Home versus As Designed)

	CO2-tons/yr		SO2-lbs/yr		NOx-lbs/yr	
	Reference	Design	Reference	Design	Reference	Design
Heating	7.4	2.7	0.4	0.1	18.7	6.8
Cooling	0.3	0.2	1.6	0.7	1.3	0.6
WaterHeating	1.3	0.9	0.0	0.0	3.1	2.3
LightsAppliances	2.2	2.2	10.1	10.0	8.5	8.4
Photovoltaics	0.0	0.0	0.0	0.0	0.0	0.0

The energy and emission values are calculated by comparing the Rated Home to an all-electric version of the Reference Home as defined in the 'Mortgage Industry National Home Energy Rating Systems Standards' as promulgated by the Residential Energy Services Network (RESNET). Site-to-source multipliers and air emission data were taken from the US EPA eGRID2007 database.

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2005 EPACT Energy Efficient Home Tax Credit (13-001)



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	Normalized, Modified End-Use Loads (MMBtu/yr)		Envelope Loads (MMBtu/yr)	
	2006 IECC 50% Target	As Designed	2006 IECC 90% Target	As Designed
Heating	35.5	26.0	64.0	42.1
Cooling	4.9	6.2	8.9	7.8
Total	40.5	32.2	72.9	49.9

Building Features

Ceiling Flat	R-60	Exposed Floor	R-42
Sealed Attic	R-50	Slab	R-0.0 Edge, R-20.0 Under
Vaulted Ceiling	NA	Duct	NA
Above Grade Walls	R-30, R-32	Window	U-Value: 0.310, SHGC: 0.350
Foundation Walls	R-20.0	Cooling	N/A
Heating	Fuel-fired hydronic distribution, Natural gas, 93.0 AFUE.		

This home MEETS the requirements for the residential energy efficiency tax credits under Section 1332, Credit for Construction of New Energy Efficient Homes, of the Energy Policy Act of 2005 extended to December 31, 2013.

As demonstrated above, this dwelling unit has a projected level of annual heating and cooling energy consumption that is at least 50% below the annual level of heating cooling energy consumption of a 2006 IECC reference dwelling in the same climate zone, and the building envelope components improvements alone account for at least 10% of those savings. The projected heating and cooling energy savings above have been calculated in the manner prescribed in Appendix A of the RESNET Publication No. 13-001. Field inspections of the dwelling unit performed by the undersigned eligible certifier during and after the completion of construction have confirmed that all features of the home affecting such heating and cooling energy consumption comply with the design specifications provided to the undersigned certifier.

Under penalties of perjury, I declare that I have examined this certification, including accompanying documents, and to the best of my knowledge and belief, the facts presented in support of this certification are true, correct, and complete.

Name	Wes Riley	Signature	
Company	Wes Riley	Date	March 11, 2013
Address	PO Box 472, Brunswick, ME 04011		

Energy Code Inspection Checklist



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Builder
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Date: 06/03/13

Projected Rating: Based on Plans - Field Confirmation Required.

Building Information

Conditioned Area (sq ft) 2520
Conditioned Volume (cubic ft) 19860
Insulated Shell Area (sq ft) 5072

Ceilings

[] 1. Attic: R60Truss R40CE+R20RF (953 s.f.)
R-20.0 continuous insulation, R-40.0 cavity insulation.
Name: Flat Roof Insulation Grade: I II III Face / Inset

Comments/Location

[] 2. Sealed Attic: R50 hatch (7 s.f.)
R-50.0 continuous insulation, R-0.0 cavity insulation.
Name: Hatch Insulation Grade: I II III Face / Inset

Comments/Location

Above-Grade Walls

[] 1. Wall: R30 SIPS (2412 s.f.), Between conditioned space and ambient
R-30.0 continuous insulation, R-0.0 cavity insulation.
Name: Cond>Amb Insulation Grade: I II III Face / Inset

Comments/Location

[] 2. Wall: R33 dbl-std (160 s.f.), Between conditioned space and garage
R-7.0 continuous insulation, R-24.5 cavity insulation.
Name: Cond>Garage Insulation Grade: I II III Face / Inset

Comments/Location

Windows and Skylights

Window-to-Wall Area Ratio: 0.16

[] 1. Window: U-.24 / SHGC-.27 (62 s.f., Northeast), U-Value: 0.240, SHGC: 0.270
For windows without labeled U-factors, describe features:
Name: F NE Orientation: Northeast

Comments/Location

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Windows and Skylights

- [] 2. Window: U-.24 / SHGC- .27 (13 s.f., Northwest), U-Value: 0.240, SHGC: 0.270
For windows without labeled U-factors, describe features:
Name: F NW Orientation: Northwest

Comments/Location
- [] 3. Window: U-.24 / SHGC- .27 (57 s.f., Southwest), U-Value: 0.240, SHGC: 0.270
For windows without labeled U-factors, describe features:
Name: F SW Orientation: Southwest

Comments/Location
- [] 4. Window: U-.24 / SHGC- .27 (72 s.f., Southeast), U-Value: 0.240, SHGC: 0.270
For windows without labeled U-factors, describe features:
Name: F SE Orientation: Southeast

Comments/Location
- [] 5. Window: U-.31 / SHGC- .35 (40 s.f., Northeast), U-Value: 0.310, SHGC: 0.350
For windows without labeled U-factors, describe features:
Name: C NE Orientation: Northeast

Comments/Location
- [] 6. Window: U-.31 / SHGC- .35 (21 s.f., Northwest), U-Value: 0.310, SHGC: 0.350
For windows without labeled U-factors, describe features:
Name: C NW Orientation: Northwest

Comments/Location
- [] 7. Window: U-.31 / SHGC- .35 (13 s.f., Southwest), U-Value: 0.310, SHGC: 0.350
For windows without labeled U-factors, describe features:
Name: C SW Orientation: Southwest

Comments/Location
- [] 8. Window: U-.31 / SHGC- .35 (48 s.f., Southeast), U-Value: 0.310, SHGC: 0.350
For windows without labeled U-factors, describe features:
Name: C SE Orientation: Southeast

Comments/Location

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Windows and Skylights

[] 9. Window: U-.31 / SHGC- .35 (18 s.f., Northeast), U-Value: 0.310, SHGC: 0.350
For windows without labeled U-factors, describe features:
Name: A NE Orientation: Northeast

Comments/Location

[] 10. Window: U-.31 / SHGC- .35 (39 s.f., Southwest), U-Value: 0.310, SHGC: 0.350
For windows without labeled U-factors, describe features:
Name: A SW Orientation: Southwest

Comments/Location

[] 11. Window: U-.31 / SHGC- .35 (21 s.f., Northeast), U-Value: 0.310, SHGC: 0.350
For windows without labeled U-factors, describe features:
Name: D NE Orientation: Northeast

Comments/Location

[] 12. Window: U-.31 / SHGC- .35 (21 s.f., Northwest), U-Value: 0.310, SHGC: 0.350
For windows without labeled U-factors, describe features:
Name: D NW Orientation: Northwest

Comments/Location

Doors

[] 1. Door: R5 steel insul (21 s.f.), R-Value 5.0

Comments/Location

Frame Floors

[] 1. Floor: H,R3,R39,BlCe1,12,16 (360 s.f.), Between conditioned space and garage
R-3.0 continuous insulation, R-39.4 cavity insulation.
Name: Flr over garage Insulation Grade: I II III Face / Inset

Comments/Location

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Slab Floors

- [] 1. Name: Slab Insulation Grade: I II III Face / Inset
Comments/Location

Foundation Walls

- [] 1. Wall: R20I (60 s.f.), Between conditioned space and ambient/ground
R-20.0 interior continuous insulation, R-0.0 interior cavity insulation, R-0.0 exterior insulation.
Name: 2ft Insulation Grade: I II III Face / Inset
Comments/Location

- [] 2. Wall: R20I (80 s.f.), Between conditioned space and ambient/ground
R-20.0 interior continuous insulation, R-0.0 interior cavity insulation, R-0.0 exterior insulation.
Name: 4ft Insulation Grade: I II III Face / Inset
Comments/Location

- [] 3. Wall: R20I (224 s.f.), Between conditioned space and ambient/ground
R-20.0 interior continuous insulation, R-0.0 interior cavity insulation, R-0.0 exterior insulation.
Name: 8ft Insulation Grade: I II III Face / Inset
Comments/Location

Rim and Band Joists

- [] 1. Joist: 1st/2nd R/B (80 s.f.), Between conditioned space and ambient
R-30.0 continuous insulation, R-0.0 cavity insulation.
Name: 1st/2nd R/B Insulation Grade: I II III Face / Inset
Comments/Location

- [] 2. Joist: 2nd/3rd R/B (136 s.f.), Between conditioned space and ambient
R-30.0 continuous insulation, R-0.0 cavity insulation.
Name: 2nd/3rd R/B Insulation Grade: I II III Face / Inset
Comments/Location

Mechanical Equipment

- [] 1. Heating: Fuel-fired hydronic distribution, Natural gas, 93.0 AFUE.
Make and Model Number

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Mechanical Equipment

- 2. Water Heating: Integrated, Natural gas, 0.83 EF, 40.0 Gal.
Make and Model Number

Mechanical Ventilation System

- Mechanical ventilation system rated for, and capable of, providing continuous ventilation.
System shall include automatic timing controls.
System type: Exhaust Only, 55 cfm, 24.0 hrs/day, 20.0 watts.
System description(make)

Air Leakage Control

- Blower Door Test at Final _____
- House is air-sealed so as to achieve 3.00 ACH50 or less at final blower door test. (Max CFM50 is: 993)
- Visual inspection at rough for mandatory code air barrier and insulation features.

Infiltration Requirements for IECC

2009 IECC Infiltration limit for the design home is 7 ACH50.

2012 IECC Infiltration limit for the design home is 3 ACH50.

Duct Leakage and Insulation

N/A

Duct Leakage Code Requirements for IECC

N/A

Notes

2009 IECC Building UA Compliance



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Elements

Insulation Levels

	2009 IECC	As Designed
Shell UA Check		
Ceilings:	25.0	16.6
Above-Grade Walls:	133.6	69.9
Windows and Doors:	155.4	120.5
Slab Floor:	6.3	3.5
Floors Over Garage:	11.9	9.1
Basement Walls:	21.2	14.1
Overall UA (Design must be equal or lower):	353.3	233.7
Window U-Factor Check (Section 402.5)		
Window U-Factor (Design must be equal or lower):	0.400	0.276

This home **MEETS** the overall thermal performance requirements and verifications of the International Energy Conservation Code based on a climate zone of 6A. (Section 402, International Energy Conservation Code, 2009 edition.) In fact, this home surpasses the requirements by **33.8%**.

Building Elements	Type	U-Value	Area
Ceilings			
Roof	R60Truss R40CE+R20RF	0.017	953.0
Roof	R50 hatch	0.019	7.0
Above-Grade Walls			
Wall	R30 SIPS	0.030	1989.0
Wall	R33 dbl-std	0.031	139.0
Joist	1st/2nd R/B	0.030	80.0
Joist	2nd/3rd R/B	0.030	136.0
Windows and Doors			
Window	U-.24 / SHGC- .27	0.240	61.5
Window	U-.24 / SHGC- .27	0.240	12.8
Window	U-.24 / SHGC- .27	0.240	56.9
Window	U-.24 / SHGC- .27	0.240	71.5
Window	U-.31 / SHGC- .35	0.310	40.3
Window	U-.31 / SHGC- .35	0.310	20.6
Window	U-.31 / SHGC- .35	0.310	13.3
Window	U-.31 / SHGC- .35	0.310	47.6
Window	U-.31 / SHGC- .35	0.310	18.0

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2009 IECC Building UA Compliance



Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Property
McCain-Walworth Home
Summer Street
Portland, ME 04102

Organization
Wes Riley
207-689-1211
Wes Riley

HERS
Projected Rating
March 7, 2013
Rating No: McCain - As Per
Plans
Rater ID: 5614207

Date: 06/03/13

Weather: Portland, ME
McCain-Walworth Home -APP
(03-07-13).blg

Builder
Mark McCain

Building Elements	Type	U-Value	Area
Window	U-.31 / SHGC- .35	0.310	38.5
Window	U-.31 / SHGC- .35	0.310	21.0
Window	U-.31 / SHGC- .35	0.310	21.0
Door	R5 steel insul	0.168	21.0
Slab Floors			
On-Grade Perimeter	R0,4,R20,99,1,NR	n/a	0.044
80.0	Floors Over Garage		
	Floor	H,R3,R39,BIC	0.025
360.0	Basement Walls		
	Wall	R20I	0.045
60.0	Wall	R20I	0.042
80.0	Wall	R20I	0.036

REM/Rate - Residential Energy Analysis and Rating Software v14.2

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Home Energy Rating Certificate

Summer Street
Portland, ME 04102



5 Stars Plus
Projected Rating
HERS Index: 49

Projected Rating: Based on Plans - Field Confirmation Required.

General Information

Conditioned Area	2520 sq. ft.	House Type	Single-family detached
Conditioned Volume	19860 cubic ft.	Foundation	Slab
Bedrooms	3		

Mechanical Systems Features

Heating:	Fuel-fired hydronic distribution, Natural gas, 93.0 AFUE.
Water Heating:	Integrated, Natural gas, 0.83 EF, 40.0 Gal.
Duct Leakage to Outside	NA
Ventilation System	Exhaust Only: 55 cfm, 20.0 watts.
Programmable Thermostat	Heat=Yes; Cool=Yes

Building Shell Features

Ceiling Flat	R-60.0	Slab	R-0.0 Edge, R-20.0 Under
Sealed Attic	R-50.0	Exposed Floor	R-42.4
Vaulted Ceiling	N/A	Window Type	U-.31 / SHGC- .35
Above Grade Walls	R-30.0	Infiltration Rate	Htg: 3.00 Clg: 3.00 ACH50
Foundation Walls	R-20.0	Method	Blower door test

Lights and Appliance Features

Percent Interior Lighting	10.00	Range/Oven Fuel	Electric
Percent Garage Lighting	0.00	Clothes Dryer Fuel	Electric
Refrigerator (kWh/yr)	637.00	Clothes Dryer EF	3.01
Dishwasher Energy Factor	0.46	Ceiling Fan (cfm/Watt)	0.00

The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

REM/Rate - Residential Energy Analysis and Rating Software v14.2

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Registry ID
Rating Number
Certified Energy Rater
Rating Date
Rating Ordered For

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Estimated Date: 06/03/13

Use	MMBTU	Cost	Percent
Heating	44.8	\$679	30%
Cooling	0	\$0	0%
Hot Water	15.2	\$227	10%
Lights/Appliances	28.0	\$1392	61%
Photovoltaics	-0.0	\$-0	-0%
Service Charges		\$0	0%
Total	90.0	\$2299	100%

Criteria

This home meets or exceeds the minimum criteria for the following:

TITLE
Company
Address
City, State, Zip
Phone #
Fax #

2012 IECC Building UA Compliance



Property
McCain-Walworth Home
Summer Street
Portland, ME 04102

Organization
Wes Riley
207-689-1211
Wes Riley

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Builder
Mark McCain

Elements

Insulation Levels

	2012 IECC	As Designed
Shell UA Check		
Ceilings:	25.0	16.6
Above-Grade Walls:	112.5	69.9
Windows and Doors:	142.1	120.5
Slab Floor:	6.3	3.5
Floors Over Garage:	11.9	9.1
Basement Walls:	21.2	14.1
Overall UA (Design must be equal or lower):	318.9	233.7
Window U-Factor Check (Section 402.5)		
Window U-Factor (Design must be equal or lower):	0.400	0.276

This home **MEETS** the overall thermal performance requirements and verifications of the International Energy Conservation Code based on a climate zone of 6A. (Section 402, International Energy Conservation Code, 2012 edition.) In fact, this home surpasses the requirements by **26.7%**.

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