TITLE 24 REPORT

Title 24 Report for:

Addition and Remodel For: Craig and Robin Williams
20680 Mockingbird Road
Bodega Bay, C A 94923

Project Designer:

James McCalligan Architect
115 4th Street, Ste. A
Santa Rosa, Ca 95401
(707) 578-4525

Report Prepared By:

Roy D Fowler
8131 Ragle Place
Sebastopol, CA 95472
(707) 824-6928

Job Number:

0914

Date:

1/29/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2005 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC - www.energysoft.com.

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Certificate Of Compliance : Residential (Part 1 of 4) CF-1R

Addition and Remodel For: Craig and Robin Williams — Project Title
1/29/2010 — Date
20680 Mockingbird Road Bodega Bay — Project Address
Building Permit #
Roy D Fowler — Documentation Author
(707) 824-6928 — Telephone
Plan Check/Date
EnergyPro — Compliance Method
CA Climate Zone 01 — Climate Zone
Field Check/Date

TDV (kBtu/sf-yr)	Standard Design	Proposed Design	Compliance Margin
Space Heating	40.19	41.68	-1.49
Space Cooling	1.83	0.12	1.70
Fans	1.19	1.28	-0.09
Domestic Hot Water	14.09	11.27	2.82
Pumps	0.00	0.00	0.00
Totals	57.30	54.36	2.94
Percent better than Standard:			5.1%

BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

Building Type: [X] Single Family [ ] Addition [ ] Multi Family [X] Existing + Add/Alt

Building Front Orientation: (N) 0 deg
Fuel Type: Propane
Fenestration:
Area: 804 ft²
Ratio: 22.0%
Avg. U: 0.41
Avg. SHGC: 0.40

Total Conditioned Floor Area: 3,663 ft²
Existing Floor Area: 3,663 ft²
Raised Floor Area: 872 ft²
Slab on Grade Area: 1,427 ft²
Average Ceiling Height: 9.6 ft
Number of Dwelling Units: 1.00
Number of Stories: 2

BUILDING ZONE INFORMATION

Zone Name	Floor Area	Volume	# of Units	Zone Type	Thermostat Type	Vent Hgt.	Vent Area
Res Heating	3,663	35,203	1.00	Conditioned	Setback	8	n/a

OPAQUE SURFACES

Type	Frame	Area	U-Fac.	Insulation Cav.	Insulation Cont.	Act. Azm.	Tilt	Gains Y	Gains N	Condition Status	JA IV Reference	Location / Comments
Wall	Wood	450	0.102	R-13	R-0.0	0	90	X		New	09-A3	Lower Floor Zone
Wall	Wood	72	0.102	R-13	R-0.0	0	90	X		New	09-A3	Lower Floor Zone
Wall	Wood	62	0.102	R-13	R-0.0	270	90	X		New	09-A3	Lower Floor Zone
Wall	Wood	176	0.102	R-13	R-0.0	90	90	X		Altered	09-A3 (E=09-A2)	Lower Floor Zone
Wall	Wood	287	0.102	R-13	R-0.0	180	90	X		New	09-A3	Lower Floor Zone
Wall	Wood	225	0.102	R-13	R-0.0	270	90	X		Altered	09-A3 (E=09-A2)	Lower Floor Zone
Roof	Wood	482	0.033	R-30	R-0.0	0	0	X		New	02-A27	Upper Floor Zone
Roof	Wood	1,758	0.033	R-30	R-0.0	0	0	X		Altered	02-A27 (E=01-A4)	Upper Floor Zone
Floor	Wood	390	0.037	R-19	R-0.0	0	180		X	Altered	20-A4 (E=20-A1)	Upper Floor Zone
Floor	Wood	482	0.037	R-19	R-0.0	0	180		X	New	20-A4	Upper Floor Zone
Wall	Wood	506	0.102	R-13	R-0.0	270	90	X		Altered	09-A3 (E=09-A2)	Upper Floor Zone
Wall	Wood	79	0.069	R-21	R-0.0	90	90	X		Altered	09-A6 (E=09-A2)	Upper Floor Zone
Wall	Wood	230	0.102	R-13	R-0.0	0	90	X		Altered	09-A3 (E=09-A2)	Upper Floor Zone
Wall	Wood	87	0.102	R-13	R-0.0	0	90	X		New	09-A3	Upper Floor Zone
Wall	Wood	145	0.102	R-13	R-0.0	90	90	X		New	09-A3	Upper Floor Zone
Wall	Wood	232	0.102	R-13	R-0.0	90	90	X		Altered	09-A3 (E=09-A2)	Upper Floor Zone
Wall	Wood	121	0.102	R-13	R-0.0	180	90	X		Altered	09-A3 (E=09-A2)	Upper Floor Zone
Wall	Wood	143	0.102	R-13	R-0.0	180	90	X		New	09-A3	Upper Floor Zone
Wall	Wood	104	0.069	R-21	R-0.0	180	90	X		Altered	09-A6 (E=09-A2)	Upper Floor Zone
Wall	Wood	145	0.102	R-13	R-0.0	270	90	X		New	09-A3	Upper Floor Zone

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FENESTRATION SURFACES

#	Type			Area	U-Factor[1]		SHGC[2]		True Azm.	Tilt	Cond. Stat.	Glazing Type	Location/ Comments
1	Window	Right	(W)	5.0	0.410	NFRC	0.39	NFRC	270	90	New	Blomberg 880 FF Low E2 (RM)	Lower Floor Zone
2	Window	Right	(W)	5.0	0.410	NFRC	0.39	NFRC	270	90	New	Blomberg 880 FF Low E2 (RM)	Lower Floor Zone
3	Window	Left	(E)	4.0	0.410	NFRC	0.39	NFRC	90	90	New	Blomberg 880 FF Low E2 (RM)	Lower Floor Zone
4	Window	Rear	(S)	24.0	0.870	NFRC	0.77	NFRC	180	90	Removed	Double Clear Low-E (RM)	Lower Floor Zone
5	Window	Rear	(S)	24.0	0.870	NFRC	0.77	NFRC	180	90	Removed	Double Clear Low-E (RM)	Lower Floor Zone
6	Window	Rear	(S)	35.0	0.410	NFRC	0.39	NFRC	180	90	Altered	Blomberg 880 FF LOW E2 (RM)	Lower Floor Zone
7	Existing				0.870	NFRC	0.77	NFRC				Double Clear Low-E (RM)	pre-altered for above
8	Window	Rear	(S)	24.0	0.410	NFRC	0.39	NFRC	180	90	New	Blomberg 880 FF LOW E2 (RM)	Lower Floor Zone
9	Window	Rear	(S)	40.0	0.410	NFRC	0.39	NFRC	180	90	Altered	Blomberg 880 FF LOW E2 (RM)	Lower Floor Zone
10	Existing				0.870	NFRC	0.77	NFRC				Double Clear Low-E (RM)	pre-altered for above
11	Window	Rear	(S)	47.5	0.410	NFRC	0.39	NFRC	180	90	Altered	Blomberg 880 FF LOW E2 (RM)	Lower Floor Zone
12	Existing				0.870	NFRC	0.77	NFRC				Double Clear Low-E (RM)	pre-altered for above
13	Window	Rear	(S)	16.5	0.410	NFRC	0.39	NFRC	180	90	Altered	Blomberg 880 FF LOW E2 (RM)	Lower Floor Zone
14	Existing				0.870	NFRC	0.77	NFRC				Double Clear Low-E (RM)	pre-altered for above
15	Skylight	Front	(N)	16.0	0.650	NFRC	0.70	NFRC	0	0	Removed	Dbl Clear Velux Low-E (RM)	Upper Floor Zone
16	Skylight	Front	(N)	16.0	0.650	NFRC	0.70	NFRC	0	0	New	Dbl Clear Velux Low-E (RM)	Upper Floor Zone
17	Window	Right	(W)	18.0	0.410	NFRC	0.39	NFRC	270	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
18	Window	Left	(E)	11.3	0.410	NFRC	0.39	NFRC	90	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
19	Window	Left	(E)	11.3	0.410	NFRC	0.39	NFRC	90	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone

1. Indicate source either from NFRC or Table 116A. 2. Indicate source either from NFRC or Table 116B.

INTERIOR AND EXTERIOR SHADING

#	Exterior Shade Type	SHGC	Window Hgt.	Window Wd.	Overhang Len.	Overhang Hgt.	Overhang LExt.	Overhang RExt.	Left Fin Dist.	Left Fin Len.	Left Fin Hgt.	Right Fin Dist.	Right Fin Len.	Right Fin Hgt.
1	Bug Screen	0.76												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76	5.0	7.0	4.0	0.1	4.0	4.0						
8	Bug Screen	0.76												
9	Bug Screen	0.76	6.7	6.0	10.0	0.1	10.0	10.0	0.1	4.0	0	0.0	0.0	0
11	Bug Screen	0.76	5.0	9.5	10.0	0.1	10.0	10.0						
13	Bug Screen	0.76												
15	None	1.00												
16	None	1.00												
17	Bug Screen	0.76												
18	Bug Screen	0.76												
19	Bug Screen	0.76												

THERMAL MASS FOR HIGH MASS DESIGN

Type	Area (sf)	Thick. (in.)	Heat Cap.	Cond.	Inside R-Val.	JA IV Reference	Condition Status	Location/ Comments

PERIMETER LOSSES

Type	Length	R-Val.	Insulation Location	JA IV Reference	Condition Status	Location/ Comments
Slab Perimeter	172	None	No Insulation	26-A1 (E=26-A1)	Altered	Lower Floor Zone

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FENESTRATION SURFACES

#	Type			Area	U-Factor[1]	SHGC[2]	True Azm.	Tilt	Cond. Stat.	Glazing Type	Location/ Comments
20	Window	Left	(E)	48.0	0.410 NFRC	0.39 NFRC	90	90	Altered	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
21	Existing				0.870 NFRC	0.77 NFRC				Double Clear Low-E (RM)	pre-altered for above
22	Window	Left	(E)	45.0	0.410 NFRC	0.39 NFRC	90	90	Altered	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
23	Existing				0.870 NFRC	0.77 NFRC				Double Clear Low-E (RM)	pre-altered for above
24	Window	Front	(N)	48.0	0.320 NFRC	0.44 NFRC	0	90	Altered	Andersen HP (R)	Upper Floor Zone
25	Existing				0.380 NFRC	0.77 NFRC				Double Clear Low-E(RW)	pre-altered for above
26	Window	Front	(N)	32.0	0.410 NFRC	0.39 NFRC	0	90	Altered	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
27	Existing				0.870 NFRC	0.77 NFRC				Double Clear Low-E (RM)	pre-altered for above
28	Window	Front	(N)	20.0	0.410 NFRC	0.39 NFRC	0	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
29	Window	Front	(N)	20.0	0.410 NFRC	0.39 NFRC	0	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
30	Window	Front	(N)	20.0	0.410 NFRC	0.39 NFRC	0	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
31	Window	Left	(E)	16.0	0.410 NFRC	0.39 NFRC	90	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
32	Window	Left	(E)	4.0	0.410 NFRC	0.39 NFRC	90	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
33	Window	Left	(E)	9.0	0.870 NFRC	0.77 NFRC	90	90	Removed	Double Clear Low-E (RM)	Upper Floor Zone
34	Window	Left	(E)	6.0	0.870 NFRC	0.77 NFRC	90	90	Removed	Double Clear Low-E (RM)	Upper Floor Zone
35	Window	Left	(E)	32.0	0.410 NFRC	0.39 NFRC	90	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
36	Window	Rear	(S)	30.0	0.410 NFRC	0.39 NFRC	180	90	Altered	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
37	Existing				0.870 NFRC	0.77 NFRC				Double Clear Low-E (RM)	pre-altered for above
38	Window	Rear	(S)	45.0	0.410 NFRC	0.39 NFRC	180	90	Altered	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone

1. Indicate source either from NFRC or Table 116A. 2. Indicate source either from NFRC or Table 116B.

INTERIOR AND EXTERIOR SHADING

#	Exterior Shade Type	SHGC	Window Hgt.	Window Wd.	Overhang Len.	Overhang Hgt.	Overhang LExt.	Overhang RExt.	Left Fin Dist.	Left Fin Len.	Left Fin Hgt.	Right Fin Dist.	Right Fin Len.	Right Fin Hgt.
20	Bug Screen	0.76												
22	Bug Screen	0.76												
24	Bug Screen	0.76	8.0	6.0	4.0	0.1	4.0	4.0	0.1	4.0	0	0.1	4.0	0
26	Bug Screen	0.76												
28	Bug Screen	0.76												
29	Bug Screen	0.76												
30	Bug Screen	0.76												
31	Bug Screen	0.76												
32	Bug Screen	0.76	2.0	2.0	6.0	0.1	6.0	6.0						
33	Bug Screen	0.76												
34	Bug Screen	0.76												
35	Bug Screen	0.76												
36	Bug Screen	0.76												
38	Bug Screen	0.76												

THERMAL MASS FOR HIGH MASS DESIGN

Type	Area (sf)	Thick. (in.)	Heat Cap.	Cond.	Inside R-Val.	JA IV Reference	Condition Status	Location/ Comments

PERIMETER LOSSES

Type	Length	R-Val.	Insulation Location	JA IV Reference	Condition Status	Location/ Comments

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FENESTRATION SURFACES

#	Type			Area	U-Factor[1]	SHGC[2]	True Azm.	Tilt	Cond. Stat.	Glazing Type	Location/ Comments
39	Existing				0.870 NFRC	0.77 NFRC				Double Clear Low-E (RM)	pre-altered for above
40	Window	Rear	(S)	22.0	0.410 NFRC	0.39 NFRC	180	90	Altered	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
41	Existing				0.870 NFRC	0.77 NFRC				Double Clear Low-E (RM)	pre-altered for above
42	Window	Rear	(S)	4.0	0.410 NFRC	0.39 NFRC	180	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
43	Window	Rear	(S)	70.0	0.870 NFRC	0.77 NFRC	180	90	Removed	Double Clear Low-E (RM)	Upper Floor Zone
44	Window	Rear	(S)	11.3	0.410 NFRC	0.39 NFRC	180	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
45	Window	Rear	(S)	11.3	0.410 NFRC	0.39 NFRC	180	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
46	Window	Rear	(S)	11.3	0.410 NFRC	0.39 NFRC	180	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
47	Window	Rear	(S)	45.0	0.410 NFRC	0.39 NFRC	180	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
48	Window	Rear	(S)	45.0	0.410 NFRC	0.39 NFRC	180	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
49	Window	Rear	(S)	45.0	0.410 NFRC	0.39 NFRC	180	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone
50	Window	Right	(W)	16.0	0.410 NFRC	0.39 NFRC	270	90	New	Blomberg 880 FF LOW E2 (RM)	Upper Floor Zone

1. Indicate source either from NFRC or Table 116A. 2. Indicate source either from NFRC or Table 116B.

INTERIOR AND EXTERIOR SHADING

#	Exterior Shade Type	SHGC	Window Hgt.	Window Wd.	Overhang Len.	Overhang Hgt.	Overhang LExt.	Overhang RExt.	Left Fin Dist.	Left Fin Len.	Left Fin Hgt.	Right Fin Dist.	Right Fin Len.	Right Fin Hgt.
40	Bug Screen	0.76												
42	Bug Screen	0.76												
43	Bug Screen	0.76												
44	Bug Screen	0.76												
45	Bug Screen	0.76												
46	Bug Screen	0.76												
47	Bug Screen	0.76												
48	Bug Screen	0.76												
49	Bug Screen	0.76												
50	Bug Screen	0.76												

THERMAL MASS FOR HIGH MASS DESIGN

Type	Area (sf)	Thick. (in.)	Heat Cap.	Cond.	Inside R-Val.	JA IV Reference	Condition Status	Location/ Comments

PERIMETER LOSSES

Type	Length	R-Val.	Insulation Location	JA IV Reference	Condition Status	Location/ Comments

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HVAC SYSTEMS

Location	Heating Type	Minimum Eff	Cooling Type	Minimum Eff	Condition Status	Thermostat Type
Res Heating	Central Furnace	92% AFUE	Split Air Conditioner	13.0 SEER	Altered	Setback
pre-altered for above	Central Furnace	75% AFUE	Split Air Conditioner	8.9 SEER		Setback

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Condition Status	Ducts Tested?
Res Heating	Ducted	Ducted	Crawlspace	4.2	Altered	No

Hydronic Piping System Name	Pipe Length	Pipe Diameter	Insul. Thick.

WATER HEATING SYSTEMS

System Name	Water Heater Type	Distribution	# in Syst.	Rated Input (Btu/hr)	Tank Cap. (gal)	Condition Status	Energy Factor or RE	Standby Loss (%)	Tank Insul. R-Value Ext.
Aquastar 2700ES (LP GAS)	Instant Gas	All Pipes Ins	1	199,000	0	Altered	0.82	500	n/a
Standard Gas 50 gal or Less	Small Gas	pre-altered for Above	1	40,000	50		0.53	n/a	n/a

Multi-Family Central Water Heating Details

Control	Hot Water Pump #	Hot Water Pump HP	Hot Water Pump Type	Hot Water Piping Length (ft) In Plenum	Hot Water Piping Length (ft) Outside	Hot Water Piping Length (ft) Buried	Add 1/2" Insulation

REMARKS

COMPLIANCE STATEMENT

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 and 6 of the California Code of Regulations, and the administrative regulations to implement them.This certificate has been signed by the individual with overall design responsibility. The undersigned recognizes that compliance using duct design, duct sealing, verification of refrigerant charge and TXVs, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Name:
Title/Firm: James McCalligan Architect
Address: 115 4th Street, Ste. A
Santa Rosa, Ca 95401
Telephone: (707) 578-4525 Lic. #:

(signature) (date)

Documentation Author

Name:
Title/Firm: Roy D Fowler
Address: 8131 Ragle Place
Sebastopol, CA 95472
Telephone: (707) 824-6928

(signature) (date)

Enforcement Agency

Name:
Title/Firm:
Address:
Telephone:

(signature) (date)

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Special Features and Modeling Assumptions

The local enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The local enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

	Plan	Field
The HVAC System "Res Heating" has the Ducts in the Crawlspace. Supply registers may be no more than 2 feet above the floor.		

HERS Required Verification

Items in this section require field testing and/or verification by a certified home energy rater under the supervision of a HERS provider using approved testing and/or verification methods.

	Plan	Field

Mandatory Measures Summary: Residential (Page 1 of 2) MF-1R

NOTE: Lowrise residential buildings subject to the Standards must contain these measures regardless of the compliance approach used. More stringent compliance requirements from the Certificate of Compliance supercede the items marked with an asterisk (*) below. When this checklist is incorporated into the permit documents, the features noted shall be considered by all parties as minimum component performance specifications for the mandatory measures whether they are shown elsewhere in the documents or on this checklist only.

DESCRIPTION — Check or initial applicable boxes or check NA if not applicable and included with the permit application documentation.	N/A	DESIGNER	ENFORCEMENT
Building Envelope Measures			
*§ 150(a): Minimum R-19 in wood ceiling insulation or equivalent U-factor in metal frame ceiling.	☐	☒	☐
§ 150(b): Loose fill insulation manufacturer's labeled R-Value:_____.	☐	☒	☐
*§ 150(c): Minimum R-13 wall insulation in wood framed walls or equivalent U-factor in metal frame walls (does not apply to exterior mass walls).	☐	☒	☐
*§ 150(d): Minimum R-13 raised floor insulation in framed floors or equivalent U-factor.	☐	☒	☐
§ 150(e): Installation of Fireplaces, Decorative Gas Appliances and Gas Logs.			
1. Masonry and factory-built fireplaces have:			
a. closable metal or glass door covering the entire opening of the firebox	☐	☒	☐
b. outside air intake with damper and control, flue damper and control	☐	☒	☐
2. No continuous burning gas pilot lights allowed.	☐	☒	☐
§ 150(f): Air retarding wrap installed to comply with §151 meets requirements specified in the ACM Residential Manual.	☐	☐	☐
§ 150(g): Vapor barriers mandatory in Climate Zones 14 and 16 only.	☐	☐	☐
§ 150(l): Slab edge insulation - water absorption rate for the insulation alone without facings no greater than 0.3%, water vapor permeance rate no greater than 2.0 perm/inch.	☐	☒	☐
§ 118: Insulation specified or installed meets insulation installation quality standards. Indicate type and include CF-6R Form: _____	☐	☒	☐
§ 116-17: Fenestration Products, Exterior Doors, and Infiltration/Exfiltration Controls.			
1. Doors and windows between conditioned and unconditioned spaces designed to limit air leakage.	☐	☒	☐
2. Fenestration products (except field fabricated) have label with certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration certification.	☐	☒	☐
3. Exterior doors and windows weatherstripped; all joints and penetrations caulked and sealed.	☐	☒	☐
Space Conditioning, Water Heating and Plumbing System Measures			
§ 110-13: HVAC equipment, water heaters, showerheads and faucets certified by the Energy Commission.	☐	☒	☐
§ 150(h): Heating and/or cooling loads calculated in accordance with ASHRAE, SMACNA or ACCA.	☐	☒	☐
§ 150(i): Setback thermostat on all applicable heating and/or cooling systems.	☐	☒	☐
§ 150(j): Water system pipe and tank insulation and cooling systems line insulation.			
1. Storage gas water heaters rated with an Energy Factor less than 0.58 must be externally wrapped with insulation having an installed thermal resistance of R-12 or greater.	☐	☒	☐
2. Back-up tanks for solar systems, unfired storage tanks, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation and indicated on the exterior of the tank showing the R-value.	☐	☒	☐
3. The following piping is insulated according to Table 150-A/B or Equation 150-A Insulation Thickness:			
1. First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes shall be insulated to Table 150B.	☐	☒	☐
2. Cooling system piping (suction, chilled water, or brine lines), piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.	☐	☒	☐
4. Steam hydronic heating systems or hot water systems > 15 psi, meet requirements of Table 123-A.	☐	☐	☐
5. Insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.	☐	☒	☐
6. Insulation for chilled water piping and refrigerant suction piping includes a vapor retardant or is enclosed entirely in conditioned space.	☐	☐	☐
7. Solar water-heating systems/collectors are certified by the Solar Rating and Certification Corporation.	☐	☐	☐

NOTE: Lowrise residential buildings subject to the Standards must contain these measures regardless of the compliance approach used. More stringent compliance requirements from the Certificate of Compliance supercede the items marked with an asterisk (*) below. When this checklist is incorporated into the permit documents, the features noted shall be considered by all parties as minimum component performance specifications for the mandatory measures whether they are shown elsewhere in the documents or on this checklist only.

DESCRIPTION	Instructions: Check or initial applicable boxes when completed or check N/A if not applicable.	N/A	DESIGNER	ENFORCE-MENT
Space Conditioning, Water Heating and Plumbing System Measures: (continued)				
§ 150(m):	Ducts and Fans			
	1. All ducts and plenums installed, sealed and insulated to meet the requirements of the CMC Sections 601, 602, 603, 604, 605, and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minumum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used.	☐	☒	☐
	2. Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.	☐	☒	☐
	3. Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.	☐	☒	☐
	4. Exhaust fan systems have back draft or automatic dampers.	☐	☒	☐
	5. Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operating dampers.	☐	☒	☐
	6. Protection of Insulation. Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.	☐	☒	☐
	7. Flexible ducts cannot have porous inner cores.	☐	☒	☐
§ 114:	Pool and Spa Heating Systems and Equipment			
	1. A thermal efficiency that complies with the Appliance Efficiency Regulations, on-off switch mounted outside of the heater, weatherproof operating instructions, no electric resistance heating and no pilot light.	☐	☐	☐
	2. System is installed with:			
	a. At least 36" of pipe between filter and heater for future solar heating.	☐	☐	☐
	b. Cover for outdoor pools or outdoor spas.	☐	☐	☐
	3. Pool system has directional inlets and a circulation pump time switch.	☐	☐	☐
§ 115:	Gas fired fan-type central furnaces, pool heaters, spa heaters or household cooking appliances have no continuously burning pilot light. (Exception: Non-electrical cooking appliances with pilot < 150 Btu/hr)	☐	☒	☐
§ 118 (i):	Cool Roof material meets specified criteria	☐	☐	☐
Lighting Measures				
§ 150(k)1:	HIGH EFFICACY LUMINAIRES OTHER THAN OUTDOOR HID: contain only high efficacy lamps as outlined in Table 150-C, and do not contain a medium screw base socket (E24/E26). Ballasts for lamps 13 Watts or greater are electric and have an output frequency no less than 20 kHz.	☐	☒	☐
§ 150(k)1:	HIGH EFFICACY LUMINAIRES - OUTDOOR HID: contain only high efficacy lamps as outlined in Table 150-C, luminaire has factory installed HID ballast.	☐	☒	☐
§ 150(k)2:	Permanently installed luminaires in kitchens shall be high efficacy luminaires. Up to 50% of the Wattage, as determined in Section 130(c), of permanently installed luminaires in kitchens may be in luminaires that are not high efficacy luminaires, provided that these luminaires are controlled by switches separate from those controlling the high efficacy luminaires.	☐	☒	☐
§ 150(k)3:	Permanently installed luminaires in bathrooms, garages, laundry rooms, utility rooms shall be high efficacy luminaires. OR are controlled by an occupant sensor(s) certfied to comply with Section 119(d).	☐	☒	☐
§ 150(k)4:	Permanently installed luminaires located other than in kitchens, bathrooms, garages, laundry rooms, and utility rooms shall be high efficacy luminaires (except closets less than 70 ft) OR are controlled by a dimmer switch OR are controlled by an occupant sensor that complies with Section 119(d) that does not turn on automatically or have an always on option.	☐	☒	☐
§ 150(k)5:	Luminaires that are recessed into insulated ceilings are approved for zero clearance insulation cover (IC) and are certified to ASTM E283 and labeled as air tight (AT) to less than 2.0 CFM at 75 Pascals.	☐	☒	☐
§ 150(k)6:	Luminaires providing outdoor lighting and permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy luminaires (not including lighting around swimming pools/water features or other Article 680 locations) OR are controlled by occupant sensors with integral photo control certified to comply with Section 119(d).	☐	☒	☐
§ 150(k)7:	Lighting for parking lots for 8 or more vehicles shall have lighting that complies with Sections 130, 132, and 147. Lighting for parking garages for 8 or more vehicles shall have lighting that complies with Section 130, 131, and 146.	☐	☐	☐
§ 150(k)8:	Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires OR are controlled by occupant sensor(s) certified to comply with Section 119(d).	☐	☐	☐

HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

PROJECT NAME	DATE
Addition and Remodel For: Craig and Robin Williams	1/29/2010
SYSTEM NAME	**FLOOR AREA**
Res Heating	3,663

ENGINEERING CHECKS

Number of Systems	2
Heating System	
Output per System	74,000
Total Output (Btuh)	148,000
Output (Btuh/sqft)	40.4
Cooling System	
Output per System	23,200
Total Output (Btuh)	46,400
Total Output (Tons)	3.9
Total Output (Btuh/sqft)	12.7
Total Output (sqft/Ton)	947.3
Air System	
CFM per System	895
Airflow (cfm)	1,790
Airflow (cfm/sqft)	0.49
Airflow (cfm/Ton)	462.9
Outside Air (%)	0.0
Outside Air (cfm/sqft)	0.00

Note: values above given at ARI conditions

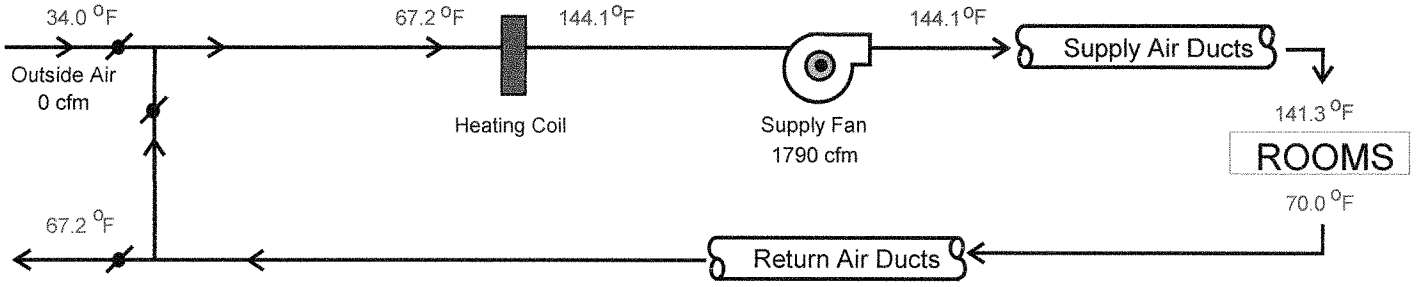
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	Sensible	Latent	CFM	Sensible
Total Room Loads	1,812	35,368	1,600	562	43,135
Return Vented Lighting		0			
Return Air Ducts		2,320			5,326
Return Fan		0			0
Ventilation	0	0	0	0	0
Supply Fan		0			0
Supply Air Ducts		2,320			5,326
TOTAL SYSTEM LOAD		40,009	1,600		53,787

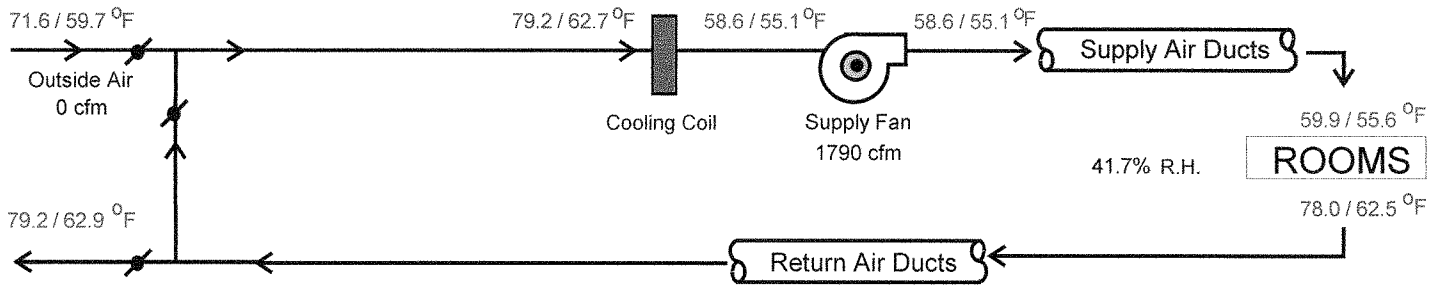
HVAC EQUIPMENT SELECTION

Trane TUC080C942B*	39,585	9,138		148,000
Total Adjusted System Output (Adjusted for Peak Design Conditions)	39,585	9,138		148,000
TIME OF SYSTEM PEAK		Aug 2 pm		Jan 12 am

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



ROOM LOAD SUMMARY

PROJECT NAME Addition and Remodel For: Craig and Robin Williams

DATE 1/29/2010

SYSTEM NAME Res Heating

FLOOR AREA 3,663

ROOM LOAD SUMMARY

			ROOM COOLING PEAK			COIL COOLING PEAK			COIL HTG. PEAK	
ZONE NAME	ROOM NAME	Mult.	CFM	SENSIBLE	LATENT	CFM	SENSIBLE	LATENT	CFM	SENSIBLE
Lower Floor Zone	Lower Floor	1	395	7,711	800	395	7,711	800	214	16,439
Upper Floor Zone	Upper Floor	1	1,417	27,656	800	1,417	27,656	800	348	26,695

	CFM	SENSIBLE	LATENT	CFM	SENSIBLE
PAGE TOTAL	1,812	35,368	1,600	562	43,135
TOTAL	1,812	35,368	1,600	562	43,135

ROOM HEATING PEAK LOADS

Project Title	Date
Addition and Remodel For: Craig and Robin Williams	1/29/2010

Room Information		Design Conditions	
Room Name	Lower Floor	**Time of Peak**	Jan 12 am
Floor Area	1,427	**Outdoor Dry Bulb Temperature**	34 °F
Indoor Dry Bulb Temperature	70 °F		

Conduction	Area		U-Value		ΔT °F		Btu/hr
Slab-On-Grade	perimeter = 172.0	x	0.7300	x	36	=	4,520
R-13 Wall (W.13.2x4.16)	450.0	x	0.1020	x	36	=	1,652
R-13 Wall (W.13.2x4.16)	72.0	x	0.1020	x	36	=	264
R-13 Wall (W.13.2x4.16)	62.0	x	0.1020	x	36	=	228
Blomberg 880 FF Low E2 (RM)	5.0	x	0.4100	x	36	=	74
Blomberg 880 FF Low E2 (RM)	5.0	x	0.4100	x	36	=	74
R-13 Wall (W.13.2x4.16)	176.0	x	0.1020	x	36	=	646
Blomberg 880 FF Low E2 (RM)	4.0	x	0.4100	x	36	=	59
R-13 Wall (W.13.2x4.16)	287.0	x	0.1020	x	36	=	1,054
Blomberg 880 FF LOW E2 (RM)	35.0	x	0.4100	x	36	=	517
Blomberg 880 FF LOW E2 (RM)	24.0	x	0.4100	x	36	=	354
Blomberg 880 FF LOW E2 (RM)	40.0	x	0.4100	x	36	=	590
Blomberg 880 FF LOW E2 (RM)	47.5	x	0.4100	x	36	=	701
Blomberg 880 FF LOW E2 (RM)	16.5	x	0.4100	x	36	=	244
R-13 Wall (W.13.2x4.16)	225.0	x	0.1020	x	36	=	826

Items shown with an asterisk (*) denote conduction through an interior surface to another room.

Page Total: 11,803

Infiltration:	Schedule Fraction		Air Sensible		Area		Ceiling Height		ACH			ΔT		
	1.00	x	1.076	x	1,427	x	9.00	x	0.559	/ 60	x	36	=	4,636

TOTAL HOURLY HEAT LOSS FOR ROOM 16,439

ROOM HEATING PEAK LOADS

Project Title	Date
Addition and Remodel For: Craig and Robin Williams	1/29/2010

Room Information		Design Conditions	
Room Name	Upper Floor	Time of Peak	Jan 12 am
Floor Area	2,236	Outdoor Dry Bulb Temperature	34 °F
Indoor Dry Bulb Temperature	70 °F		

Conduction	Area		U-Value		ΔT °F		Btu/hr
R-30 Roof (R.30.2x12.24)	482.0	x	0.0330	x	36	=	573
R-30 Roof (R.30.2x12.24)	1,758.0	x	0.0330	x	36	=	2,089
Dbl Clear Velux Low-E (RM)	16.0	x	0.6500	x	36	=	374
R-19 Floor (F.19.2x10.16)	390.0	x	0.0370	x	36	=	519
R-19 Floor (F.19.2x10.16)	482.0	x	0.0370	x	36	=	642
R-13 Wall (W.13.2x4.16)	506.0	x	0.1020	x	36	=	1,858
Blomberg 880 FF LOW E2 (RM)	18.0	x	0.4100	x	36	=	266
R-21 Wall (W.21.2x6.16)	79.4	x	0.0690	x	36	=	197
Blomberg 880 FF LOW E2 (RM)	11.3	x	0.4100	x	36	=	167
Blomberg 880 FF LOW E2 (RM)	11.3	x	0.4100	x	36	=	167
Blomberg 880 FF LOW E2 (RM)	48.0	x	0.4100	x	36	=	708
Blomberg 880 FF LOW E2 (RM)	45.0	x	0.4100	x	36	=	664
R-13 Wall (W.13.2x4.16)	230.0	x	0.1020	x	36	=	845
Andersen HP (R)	48.0	x	0.3200	x	36	=	553
Blomberg 880 FF LOW E2 (RM)	32.0	x	0.4100	x	36	=	472
R-13 Wall (W.13.2x4.16)	87.0	x	0.1020	x	36	=	319
Blomberg 880 FF LOW E2 (RM)	20.0	x	0.4100	x	36	=	295
Blomberg 880 FF LOW E2 (RM)	20.0	x	0.4100	x	36	=	295
Blomberg 880 FF LOW E2 (RM)	20.0	x	0.4100	x	36	=	295
R-13 Wall (W.13.2x4.16)	145.0	x	0.1020	x	36	=	532
Blomberg 880 FF LOW E2 (RM)	16.0	x	0.4100	x	36	=	236
R-13 Wall (W.13.2x4.16)	232.0	x	0.1020	x	36	=	852
Blomberg 880 FF LOW E2 (RM)	4.0	x	0.4100	x	36	=	59
Blomberg 880 FF LOW E2 (RM)	32.0	x	0.4100	x	36	=	472
R-13 Wall (W.13.2x4.16)	121.0	x	0.1020	x	36	=	444
Blomberg 880 FF LOW E2 (RM)	30.0	x	0.4100	x	36	=	443
Blomberg 880 FF LOW E2 (RM)	45.0	x	0.4100	x	36	=	664
Blomberg 880 FF LOW E2 (RM)	22.0	x	0.4100	x	36	=	325
R-13 Wall (W.13.2x4.16)	143.0	x	0.1020	x	36	=	525
Blomberg 880 FF LOW E2 (RM)	4.0	x	0.4100	x	36	=	59
R-21 Wall (W.21.2x6.16)	104.1	x	0.0690	x	36	=	259
Blomberg 880 FF LOW E2 (RM)	11.3	x	0.4100	x	36	=	167
Blomberg 880 FF LOW E2 (RM)	11.3	x	0.4100	x	36	=	167
Blomberg 880 FF LOW E2 (RM)	11.3	x	0.4100	x	36	=	167
Blomberg 880 FF LOW E2 (RM)	45.0	x	0.4100	x	36	=	664
Blomberg 880 FF LOW E2 (RM)	45.0	x	0.4100	x	36	=	664
Blomberg 880 FF LOW E2 (RM)	45.0	x	0.4100	x	36	=	664
R-13 Wall (W.13.2x4.16)	145.0	x	0.1020	x	36	=	532
Blomberg 880 FF LOW E2 (RM)	16.0	x	0.4100	x	36	=	236

Items shown with an asterisk (*) denote conduction through an interior surface to another room.

Page Total: 19,431

Infiltration: 1.00 (Schedule Fraction) x 1.076 (Air Sensible) x 2,236 (Area) x 10.00 (Ceiling Height) x 0.503 (ACH) / 60 x 36 (ΔT) = 7,264

TOTAL HOURLY HEAT LOSS FOR ROOM	26,695

RESIDENTIAL ROOM COOLING LOAD SUMMARY

Project Title	Date
Addition and Remodel For: Craig and Robin Williams	1/29/2010

Room Information		Design Conditions	
Room Name:	Lower Floor	Outdoor Dry Bulb Temperature:	72°F
Floor Area:	1,427 sf	Outdoor Web Bulb Temperature:	60°F
Indoor Dry Bulb Temperature:	78 °F	Outdoor Daily Range:	15°F

Opaque Surfaces	Orientation	Area		U-Factor		CLTD [1]		Btu/hr
R-13 Wall (W.13.2x4.16)	(N)	522.0	x	0.1020	x	8.0	=	426
R-13 Wall (W.13.2x4.16)	(W)	62.0	x	0.1020	x	18.0	=	114
R-13 Wall (W.13.2x4.16)	(E)	176.0	x	0.1020	x	18.0	=	323
R-13 Wall (W.13.2x4.16)	(S)	287.0	x	0.1020	x	11.0	=	322
R-13 Wall (W.13.2x4.16)	(W)	225.0	x	0.1020	x	18.0	=	413
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
						Page Total		1,598

Items shown with an asterisk (*) denote conduction through an interior surface to another room.

1. Cooling Load Temperature Difference (CLTD)

Fenestration	Orientation	Shaded Area		Shaded GLF		Unshaded Area		Unshaded GLF		Btu/hr
Window	(W)	0.0	x	16.7	+	5.0	x	39.9	=	199
Window	(W)	0.0	x	16.7	+	5.0	x	39.9	=	199
Window	(E)	0.0	x	16.7	+	4.0	x	39.9	=	159
Window	(S)	35.0	x	16.7	+	0.0	x	24.4	=	585
Window	(S)	0.0	x	16.7	+	24.0	x	24.4	=	586
Window	(S)	40.0	x	16.7	+	0.0	x	24.4	=	668
Window	(S)	47.5	x	16.7	+	0.0	x	24.4	=	793
Window	(S)	0.0	x	16.7	+	16.5	x	24.4	=	403
			x		+		x		=	
			x		+		x		=	
			x		+		x		=	
								Page Total		3,593

Internal Gain

						Btu/hr
Occupants	4	Occupants x	230	Btuh/occ.	=	920
Equipment	1	Dwelling Units x	1,600	Btuh	=	1,600

Infiltration: 1.076 (Air Sensible) x 0.00 (CFM) x 100.69 (ELA) x -6 (△T) = 0

TOTAL HOURLY SENSIBLE HEAT GAIN FOR ROOM 7,711

Latent Gain

						Btu/hr
Occupants	4	Occupants x	200	Btuh/occ.	=	800

Infiltration: 4,822 (Air Latent) x 0.00 (CFM) x 100.69 (ELA) x 0.00000 (△W) = 0

TOTAL HOURLY LATENT HEAT GAIN FOR ROOM 800

RESIDENTIAL ROOM COOLING LOAD SUMMARY

Project Title	Date
Addition and Remodel For: Craig and Robin Williams	1/29/2010

Room Information		Design Conditions	
Room Name:	Upper Floor	Outdoor Dry Bulb Temperature:	72°F
Floor Area:	2,236 sf	Outdoor Web Bulb Temperature:	60°F
Indoor Dry Bulb Temperature:	78 °F	Outdoor Daily Range:	15°F

Opaque Surfaces	Orientation	Area		U-Factor		CLTD [1]		Btu/hr
R-30 Roof (R.30.2x12.24)	(N)	2,240.0	x	0.0330	x	42.0	=	3,105
R-19 Floor (F.19.2x10.16)		390.0	x	0.0370	x	9.0	=	130
R-19 Floor (F.19.2x10.16)		482.0	x	0.0370	x	9.0	=	161
R-13 Wall (W.13.2x4.16)	(W)	506.0	x	0.1020	x	18.0	=	929
R-21 Wall (W.21.2x6.16)	(E)	79.4	x	0.0690	x	18.0	=	99
R-13 Wall (W.13.2x4.16)	(N)	317.0	x	0.1020	x	8.0	=	259
R-13 Wall (W.13.2x4.16)	(E)	145.0	x	0.1020	x	18.0	=	266
R-13 Wall (W.13.2x4.16)	(E)	232.0	x	0.1020	x	18.0	=	426
R-13 Wall (W.13.2x4.16)	(S)	121.0	x	0.1020	x	11.0	=	136
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
						Page Total		5,509

Items shown with an asterisk (*) denote conduction through an interior surface to another room.

1. Cooling Load Temperature Difference (CLTD)

Fenestration	Orientation	Shaded Area		Shaded GLF		Unshaded Area		Unshaded GLF		Btu/hr
Skylight	(Sky)	0.0	x	32.1	+	16.0	x	130.4	=	2,087
Window	(W)	0.0	x	16.7	+	18.0	x	39.9	=	717
Window	(E)	0.0	x	16.7	+	11.3	x	39.9	=	450
Window	(E)	0.0	x	16.7	+	11.3	x	39.9	=	450
Window	(E)	0.0	x	16.7	+	48.0	x	39.9	=	1,913
Window	(E)	0.0	x	16.7	+	45.0	x	39.9	=	1,794
Window	(N)	0.0	x	20.1	+	48.0	x	20.1	=	963
Window	(N)	0.0	x	16.7	+	32.0	x	16.7	=	535
Window	(N)	0.0	x	16.7	+	20.0	x	16.7	=	334
Window	(N)	0.0	x	16.7	+	20.0	x	16.7	=	334
			x		+		x		=	
								Page Total		9,578

Internal Gain

						Btu/hr
Occupants	4	Occupants x	230	Btuh/occ.	=	920
Equipment	1	Dwelling Units x	1,600	Btuh	=	1,600

Infiltration: 1.076 (Air Sensible) x 0.00 (CFM) x 157.77 (ELA) x -6 (△T) = 0

TOTAL HOURLY SENSIBLE HEAT GAIN FOR ROOM	27,656

Latent Gain

						Btu/hr
Occupants	4	Occupants x	200	Btuh/occ.	=	800

Infiltration: 4,822 (Air Latent) x 0.00 (CFM) x 157.77 (ELA) x 0.00000 (△W) = 0

TOTAL HOURLY LATENT HEAT GAIN FOR ROOM	800

RESIDENTIAL ROOM COOLING LOAD SUMMARY

Project Title	Date
Addition and Remodel For: Craig and Robin Williams	1/29/2010

Room Information		Design Conditions	
Room Name:	Upper Floor	Outdoor Dry Bulb Temperature:	72°F
Floor Area:	2,236 sf	Outdoor Web Bulb Temperature:	60°F
Indoor Dry Bulb Temperature:	78 °F	Outdoor Daily Range:	15°F

Opaque Surfaces	Orientation	Area		U-Factor		CLTD [1]		Btu/hr
R-13 Wall (W.13.2x4.16)	(S)	143.0	x	0.1020	x	11.0	=	160
R-21 Wall (W.21.2x6.16)	(S)	104.1	x	0.0690	x	11.0	=	79
R-13 Wall (W.13.2x4.16)	(W)	145.0	x	0.1020	x	18.0	=	266
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
						Page Total		506

Items shown with an asterisk (*) denote conduction through an interior surface to another room.

1. Cooling Load Temperature Difference (CLTD)

Fenestration	Orientation	Shaded Area		Shaded GLF		Unshaded Area		Unshaded GLF		Btu/hr
Window	(N)	0.0	x	16.7	+	20.0	x	16.7	=	334
Window	(E)	0.0	x	16.7	+	16.0	x	39.9	=	638
Window	(E)	4.0	x	16.7	+	0.0	x	39.9	=	67
Window	(E)	0.0	x	16.7	+	32.0	x	39.9	=	1,275
Window	(S)	0.0	x	16.7	+	30.0	x	24.4	=	733
Window	(S)	0.0	x	16.7	+	45.0	x	24.4	=	1,099
Window	(S)	0.0	x	16.7	+	22.0	x	24.4	=	537
Window	(S)	0.0	x	16.7	+	4.0	x	24.4	=	98
Window	(S)	0.0	x	16.7	+	11.3	x	24.4	=	276
Window	(S)	0.0	x	16.7	+	11.3	x	24.4	=	276
			x		+		x		=	
								Page Total		5,333

Internal Gain

						Btu/hr
Occupants	4	Occupants x	230	Btuh/occ.	=	920
Equipment	1	Dwelling Units x	1,600	Btuh	=	1,600

Infiltration:	Air Sensible		CFM		ELA		△T	=	Btu/hr
	1.076	x	0.00	x	157.77	x	-6	=	0

TOTAL HOURLY SENSIBLE HEAT GAIN FOR ROOM	27,656

Latent Gain

						Btu/hr
Occupants	4	Occupants x	200	Btuh/occ.	=	800

Infiltration:	Air Latent		CFM		ELA		△W	=	Btu/hr
	4,822	x	0.00	x	157.77	x	0.00000	=	0

TOTAL HOURLY LATENT HEAT GAIN FOR ROOM	800

RESIDENTIAL ROOM COOLING LOAD SUMMARY

Project Title	Date
Addition and Remodel For: Craig and Robin Williams	1/29/2010

Room Information		Design Conditions	
Room Name:	Upper Floor	Outdoor Dry Bulb Temperature:	72 °F
Floor Area:	2,236 sf	Outdoor Web Bulb Temperature:	60 °F
Indoor Dry Bulb Temperature:	78 °F	Outdoor Daily Range:	15 °F

Opaque Surfaces	Orientation	Area		U-Factor		CLTD [1]		Btu/hr
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
			x		x		=	
						Page Total		0

Items shown with an asterisk (*) denote conduction through an interior surface to another room.

1. Cooling Load Temperature Difference (CLTD)

Fenestration	Orientation	Shaded Area		Shaded GLF		Unshaded Area		Unshaded GLF		Btu/hr
Window	(S)	0.0	x	16.7	+	11.3	x	24.4	=	276
Window	(S)	0.0	x	16.7	+	45.0	x	24.4	=	1,099
Window	(S)	0.0	x	16.7	+	45.0	x	24.4	=	1,099
Window	(S)	0.0	x	16.7	+	45.0	x	24.4	=	1,099
Window	(W)	0.0	x	16.7	+	16.0	x	39.9	=	638
			x		+		x		=	
			x		+		x		=	
			x		+		x		=	
			x		+		x		=	
			x		+		x		=	
			x		+		x		=	
								Page Total		4,211

Internal Gain

						Btu/hr
Occupants	4	Occupants x	230	Btuh/occ.	=	920
Equipment	1	Dwelling Units x	1,600	Btuh	=	1,600

	Air Sensible		CFM		ELA		ΔT		
Infiltration:	1.076	x	0.00	x	157.77	x	-6	=	0

TOTAL HOURLY SENSIBLE HEAT GAIN FOR ROOM	27,656

Latent Gain

						Btu/hr
Occupants	4	Occupants x	200	Btuh/occ.	=	800

	Air Latent		CFM		ELA		ΔW		
Infiltration:	4,822	x	0.00	x	157.77	x	0.00000	=	0

TOTAL HOURLY LATENT HEAT GAIN FOR ROOM	800