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

FARRAR RESIDENCE — Project Title
7/6/2011 — Date
[redacted] — Project Address
Building Permit #
Gallant Energy Consulting — Documentation Author
(760) 743-5408 — Telephone
Plan Check/Date
EnergyPro — Compliance Method
CA Climate Zone 10 — Climate Zone
Field Check/Date

TDV (kBtu/sf-yr)	Standard Design	Proposed Design	Compliance Margin
Space Heating	17.61	7.49	10.12
Space Cooling	23.84	14.12	9.71
Fans	3.66	2.48	1.18
Domestic Hot Water	8.78	1.94	6.84
Pumps	0.00	0.18	-0.18
Totals	53.88	26.21	27.67
Percent better than Standard:			51.4%

BUILDING COMPLIES - HERS VERIFICATION REQUIRED

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

Building Front Orientation: (SW) 225 deg
Fuel Type: Natural Gas
Fenestration:
Area: 1,051 ft²
Ratio: 34.5%
Avg. U: 0.50
Avg. SHGC: 0.34

Total Conditioned Floor Area: 3,046 ft²
Existing Floor Area: n/a ft²
Raised Floor Area: 422 ft²
Slab on Grade Area: 1,980 ft²
Average Ceiling Height: 9.4 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
1)Fam,Kit,Din,Entry	1,681	16,306	0.55	Conditioned	Setback	8	n/a
2)BR WING	1,365	12,401	0.45	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	None	93	0.064	None	R-14.6	270	90	X		New	13-A5	1)Fam,Kit,Din,Entry
Wall	None	106	0.064	None	R-14.6	135	90	X		New	13-A5	1)Fam,Kit,Din,Entry
Door	None	18	0.500	None	R-0.0	135	90	X		New	28-A4	1)Fam,Kit,Din,Entry
Wall	None	36	0.064	None	R-14.6	0	90	X		New	13-A5	1)Fam,Kit,Din,Entry
Wall	None	126	0.064	None	R-14.6	225	90	X		New	13-A5	1)Fam,Kit,Din,Entry
Door	None	21	0.500	None	R-0.0	225	90	X		New	28-A4	1)Fam,Kit,Din,Entry
Wall	None	88	0.064	None	R-14.6	180	90	X		New	13-A5	1)Fam,Kit,Din,Entry
Wall	None	125	0.064	None	R-14.6	315	90	X		New	13-A5	1)Fam,Kit,Din,Entry
Wall	None	458	0.064	None	R-14.6	90	90	X		New	13-A5	1)Fam,Kit,Din,Entry
Roof	Wood	1,259	0.029	R-38	R-0.0	180	0	X		New	02-A11	1)Fam,Kit,Din,Entry
Wall	Wood	141	0.047	R-30	R-0.0	225	90	X		New	09-A11	1)ACCESSORY
Floor	Wood	422	0.048	R-19	R-0.0	0	180		X	New	21-A4	1)ACCESSORY
Wall	Wood	188	0.047	R-30	R-0.0	135	90	X		New	09-A11	1)ACCESSORY
Wall	None	60	0.064	None	R-14.6	0	90	X		New	13-A5	1)ACCESSORY
Wall	None	71	0.064	None	R-14.6	150	90	X		New	13-A5	1)ACCESSORY
Wall	None	223	0.064	None	R-14.6	315	90	X		New	13-A5	1)ACCESSORY
Wall	None	40	0.064	None	R-14.6	90	90	X		New	13-A5	1)ACCESSORY
Roof	Wood	422	0.029	R-38	R-0.0	180	0	X		New	02-A11	1)ACCESSORY
Wall	None	102	0.064	None	R-14.6	135	90	X		New	13-A5	2)1ST BR
Wall	None	18	0.064	None	R-14.6	90	90	X		New	13-A5	2)1ST BR
Wall	None	18	0.064	None	R-14.6	270	90	X		New	13-A5	2)1ST BR
Wall	None	174	0.064	None	R-14.6	225	90	X		New	13-A5	2)1ST BR
Wall	None	147	0.064	None	R-14.6	315	90	X		New	13-A5	2)1ST BR
Wall	None	264	0.064	None	R-14.6	45	90	X		New	13-A5	2)1ST BR
Roof	Wood	77	0.029	R-38	R-0.0	180	0	X		New	02-A11	2)1ST BR

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Project Title

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Compliance Method

CA Climate Zone 10
Climate Zone

Field Check/Date

TDV (kBtu/sf-yr)	Standard Design	Proposed Design	Compliance Margin
Space Heating	17.61	7.49	10.12
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Fenestration:

Area: 1,051 ft²

Ratio: 34.5%

Avg. U: 0.50

Avg. SHGC: 0.34

Total Conditioned Floor Area:	3,046 ft²
Existing Floor Area:	n/a ft²
Raised Floor Area:	422 ft²
Slab on Grade Area:	1,980 ft²
Average Ceiling Height:	9.4 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

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	None	36	0.064	None	R-14.6	180	90	X		New	13-A5	2)2ND BR
Wall	None	155	0.064	None	R-14.6	135	90	X		New	13-A5	2)2ND BR
Wall	None	164	0.064	None	R-14.6	225	90	X		New	13-A5	2)2ND BR
Wall	None	355	0.064	None	R-14.6	45	90	X		New	13-A5	2)2ND BR
Wall	None	195	0.064	None	R-14.6	315	90	X		New	13-A5	2)2ND BR
Roof	Wood	644	0.029	R-38	R-0.0	180	0	X		New	02-A11	2)2ND BR

Certificate Of Compliance : Residential (Part 2 of 4) CF-1R

FARRAR RESIDENCE — **Project Title**

7/6/2011 — **Date**

FENESTRATION SURFACES

#	Type			Area	U-Factor[1]	SHGC[2]	True Azm.	Tilt	Cond. Stat.	Glazing Type	Location/ Comments
1	Window	Front	(W)	20.0	0.370 NFRC	0.34 NFRC	270	90	New	Lowe2picture	1)Fam,Kit,Din,Entry
2	Window	Front	(W)	24.0	0.530 NFRC	0.23 NFRC	270	90	New	Lowe2awning	1)Fam,Kit,Din,Entry
3	Window	Front	(W)	84.0	0.680 NFRC	0.41 NFRC	270	90	New	La Cantina Door	1)Fam,Kit,Din,Entry
4	Window	Front	(W)	19.0	0.370 NFRC	0.34 NFRC	270	90	New	Lowe2picture	1)Fam,Kit,Din,Entry
5	Window	Right	(SE)	12.0	0.370 NFRC	0.34 NFRC	135	90	New	Lowe2picture	1)Fam,Kit,Din,Entry
6	Window	Left	(N)	8.0	0.430 NFRC	0.30 NFRC	0	90	New	Lowe2tiltturn	1)Fam,Kit,Din,Entry
7	Window	Front	(SW)	11.5	0.370 NFRC	0.34 NFRC	225	90	New	Lowe2picture	1)Fam,Kit,Din,Entry
8	Window	Front	(SW)	42.0	0.680 NFRC	0.41 NFRC	225	90	New	La Cantina Door	1)Fam,Kit,Din,Entry
9	Window	Front	(SW)	16.0	0.370 NFRC	0.34 NFRC	225	90	New	Lowe2picture	1)Fam,Kit,Din,Entry
10	Window	Front	(SW)	8.0	0.430 NFRC	0.30 NFRC	225	90	New	Lowe2tiltturn	1)Fam,Kit,Din,Entry
11	Window	Left	(NW)	35.0	0.680 NFRC	0.41 NFRC	315	90	New	La Cantina Door	1)Fam,Kit,Din,Entry
12	Window	Rear	(E)	17.5	0.450 NFRC	0.28 NFRC	90	90	New	Lowe2BEDE Dr	1)Fam,Kit,Din,Entry
13	Window	Rear	(E)	10.0	0.530 NFRC	0.23 NFRC	90	90	New	Lowe2awning	1)Fam,Kit,Din,Entry
14	Window	Rear	(E)	16.0	0.430 NFRC	0.30 NFRC	90	90	New	Lowe2tiltturn	1)Fam,Kit,Din,Entry
15	Window	Rear	(E)	10.0	0.370 NFRC	0.34 NFRC	90	90	New	Lowe2picture	1)Fam,Kit,Din,Entry
16	Window	Rear	(E)	17.5	0.450 NFRC	0.28 NFRC	90	90	New	Lowe2BEDE Dr	1)Fam,Kit,Din,Entry
17	Window	Rear	(E)	10.0	0.530 NFRC	0.23 NFRC	90	90	New	Lowe2awning	1)Fam,Kit,Din,Entry
18	Window	Rear	(E)	21.0	0.430 NFRC	0.30 NFRC	90	90	New	Lowe2tiltturn	1)Fam,Kit,Din,Entry
19	Window	Front	(SW)	11.5	0.430 NFRC	0.30 NFRC	225	90	New	Lowe2tiltturn	1)ACCESSORY

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	4.0	5.0	13.0	1.0	10.0	10.0						
2	Bug Screen	0.76	2.0	18.0	3.0	1.0	2.0	2.0						
3	Bug Screen	0.76	7.0	12.0	15.0	1.0	8.0	8.0						
4	Bug Screen	0.76	6.3	3.0	15.0	1.0	8.0	8.0						
5	Bug Screen	0.76	4.0	3.0	3.0	1.0	2.0	2.0						
6	Bug Screen	0.76	4.0	2.0	15.0	1.0	8.0	8.0						
7	Bug Screen	0.76	5.8	2.0	3.0	1.0	2.0	2.0						
8	Bug Screen	0.76	7.0	6.0	3.0	1.0	2.0	2.0						
9	Bug Screen	0.76	4.0	4.0	3.0	1.0	2.0	2.0						
10	Bug Screen	0.76	4.0	2.0	3.0	1.0	2.0	2.0						
11	Bug Screen	0.76	7.0	5.0	3.0	1.0	2.0	2.0						
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76												
16	Bug Screen	0.76												
17	Bug Screen	0.76												
18	Bug Screen	0.76												
19	Bug Screen	0.76	5.8	2.0	3.0	1.0	2.0	2.0						

THERMAL MASS FOR HIGH MASS DESIGN

Type	Area (sf)	Thick. (in.)	Heat Cap.	Cond.	Inside R-Val.	JA IV Reference	Condition Status	Location/ Comments
Concrete, Lightweight	93	12.00	17	0.36	0	13-A5	New	1)Fam,Kit,Din,Entry / Exterior Mass
Concrete, Lightweight	106	12.00	17	0.36	0	13-A5	New	1)Fam,Kit,Din,Entry / Exterior Mass
Concrete, Lightweight	36	12.00	17	0.36	0	13-A5	New	1)Fam,Kit,Din,Entry / Exterior Mass
Concrete, Lightweight	126	12.00	17	0.36	0	13-A5	New	1)Fam,Kit,Din,Entry / Exterior Mass
Concrete, Heavyweight	1,259	3.50	28	0.98	2	27-B17	New	1)Fam,Kit,Din,Entry / Slab on Grade

PERIMETER LOSSES

Type	Length	R-Val.	Insulation Location	JA IV Reference	Condition Status	Location/ Comments
Slab Perimeter	168	R-5	24 in. vertical	27-B17	New	1)Fam,Kit,Din,Entry
Slab Perimeter	126	R-5	24 in. vertical	27-B17	New	2)1ST BR

Certificate Of Compliance : Residential (Part 2 of 4) CF-1R

FARRAR RESIDENCE — 7/6/2011

Project Title — **Date**

FENESTRATION SURFACES

#	Type			Area	U-Factor[1]		SHGC[2]		True Azm.	Tilt	Cond. Stat.	Glazing Type	Location/ Comments
20	Window	Front	(SW)	23.0	0.370	NFRC	0.34	NFRC	225	90	New	Lowe2picture	1)ACCESSORY
21	Window	Front	(SW)	17.5	0.450	NFRC	0.28	NFRC	225	90	New	Lowe2BEDE Dr	1)ACCESSORY
22	Window	Front	(SW)	27.0	0.430	NFRC	0.30	NFRC	225	90	New	Lowe2tiltturn	1)ACCESSORY
23	Window	Right	(SE)	10.0	0.530	NFRC	0.23	NFRC	135	90	New	Lowe2awning	1)ACCESSORY
24	Window	Left	(N)	17.5	0.450	NFRC	0.28	NFRC	0	90	New	Lowe2BEDE Dr	1)ACCESSORY
25	Window	Right	(SE)	10.0	0.530	NFRC	0.23	NFRC	150	90	New	Lowe2awning	1)ACCESSORY
26	Window	Right	(SE)	7.0	0.370	NFRC	0.34	NFRC	150	90	New	Lowe2picture	1)ACCESSORY
27	Window	Left	(NW)	7.0	0.370	NFRC	0.34	NFRC	315	90	New	Lowe2picture	1)ACCESSORY
28	Window	Left	(NW)	12.0	0.430	NFRC	0.30	NFRC	315	90	New	Lowe2tiltturn	1)ACCESSORY
29	Window	Right	(SE)	20.0	0.430	NFRC	0.30	NFRC	135	90	New	Lowe2tiltturn	2)1ST BR
30	Window	Right	(SE)	30.0	0.370	NFRC	0.34	NFRC	135	90	New	Lowe2picture	2)1ST BR
31	Window	Rear	(E)	31.5	0.370	NFRC	0.34	NFRC	90	90	New	Lowe2picture	2)1ST BR
32	Window	Front	(W)	31.5	0.370	NFRC	0.34	NFRC	270	90	New	Lowe2picture	2)1ST BR
33	Window	Front	(SW)	25.0	0.430	NFRC	0.30	NFRC	225	90	New	Lowe2tiltturn	2)1ST BR
34	Window	Front	(SW)	8.0	0.530	NFRC	0.23	NFRC	225	90	New	Lowe2awning	2)1ST BR
35	Window	Front	(SW)	14.4	1.280	116-A	0.80	116-B	225	90	New	Single Metal Clear	2)1ST BR
36	Window	Front	(SW)	24.0	0.430	NFRC	0.30	NFRC	225	90	New	Lowe2tiltturn	2)1ST BR
37	Window	Front	(SW)	35.0	0.450	NFRC	0.28	NFRC	225	90	New	Lowe2BEDE Dr	2)1ST BR
38	Window	Left	(NW)	17.3	0.430	NFRC	0.30	NFRC	315	90	New	Lowe2tiltturn	2)1ST BR

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	5.8	4.0	3.0	1.0	2.0	2.0						
21	Bug Screen	0.76	7.0	2.5	3.0	1.0	2.0	2.0						
22	Bug Screen	0.76	4.5	6.0	2.0	1.0	4.0	4.0						
23	Bug Screen	0.76	1.7	6.0	3.0	1.0	2.0	2.0						
24	Bug Screen	0.76	7.0	2.5	3.0	1.0	2.0	2.0						
25	Bug Screen	0.76	1.7	6.0	3.0	1.0	2.0	2.0						
26	Bug Screen	0.76	4.5	1.5	3.0	1.0	2.0	2.0						
27	Bug Screen	0.76	4.5	1.5	3.0	1.0	2.0	2.0						
28	Bug Screen	0.76	4.0	3.0	3.0	1.0	2.0	2.0						
29	Bug Screen	0.76												
30	Bug Screen	0.76												
31	Bug Screen	0.76												
32	Bug Screen	0.76	6.3	5.0	3.0	1.0	2.0	2.0						
33	Bug Screen	0.76	5.0	5.0	15.0	1.0	8.0	8.0						
34	Bug Screen	0.76	1.5	5.0	15.0	1.0	8.0	8.0						
35	Bug Screen	0.76	4.0	3.6	3.0	1.0	2.0	2.0						
36	Bug Screen	0.76	4.0	6.0	3.0	1.0	2.0	2.0						
37	Bug Screen	0.76	7.0	5.0	3.0	1.0	2.0	2.0						
38	Bug Screen	0.76	5.8	3.0	5.0	1.0	6.0	6.0						

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Type	Area (sf)	Thick. (in.)	Heat Cap.	Cond.	Inside R-Val.	JA IV Reference	Condition Status	Location/ Comments
Concrete, Lightweight	88	12.00	17	0.36	0	13-A5	New	1)Fam,Kit,Din,Entry / Exterior Mass
Concrete, Lightweight	125	12.00	17	0.36	0	13-A5	New	1)Fam,Kit,Din,Entry / Exterior Mass
Concrete, Lightweight	458	12.00	17	0.36	0	13-A5	New	1)Fam,Kit,Din,Entry / Exterior Mass
Concrete, Lightweight	60	12.00	17	0.36	0	13-A5	New	1)ACCESSORY / Exterior Mass
Concrete, Lightweight	71	12.00	17	0.36	0	13-A5	New	1)ACCESSORY / Exterior Mass

PERIMETER LOSSES

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

Certificate Of Compliance : Residential (Part 2 of 4) CF-1R

FARRAR RESIDENCE — 7/6/2011

Project Title — **Date**

FENESTRATION SURFACES

#	Type			Area	U-Factor[1]		SHGC[2]		True Azm.	Tilt	Cond. Stat.	Glazing Type	Location/ Comments
39	Window	Left	(NW)	17.5	0.450	NFRC	0.28	NFRC	315	90	New	Lowe2BEDE Dr	2)1ST BR
40	Window	Left	(NW)	12.0	0.430	NFRC	0.30	NFRC	315	90	New	Lowe2tiltturn	2)1ST BR
41	Window	Left	(NW)	14.4	1.280	116-A	0.80	116-B	315	90	New	Single Metal Clear	2)1ST BR
42	Window	Rear	(NE)	11.5	0.430	NFRC	0.30	NFRC	45	90	New	Lowe2tiltturn	2)1ST BR
43	Window	Rear	(NE)	4.0	0.530	NFRC	0.23	NFRC	45	90	New	Lowe2awning	2)1ST BR
44	Window	Right	(S)	4.0	0.530	NFRC	0.23	NFRC	180	90	New	Lowe2awning	2)2ND BR
45	Window	Right	(SE)	10.0	0.430	NFRC	0.30	NFRC	135	90	New	Lowe2tiltturn	2)2ND BR
46	Window	Right	(SE)	15.0	0.370	NFRC	0.34	NFRC	135	90	New	Lowe2picture	2)2ND BR
47	Window	Front	(SW)	3.0	0.530	NFRC	0.23	NFRC	225	90	New	Lowe2awning	2)2ND BR
48	Window	Front	(SW)	15.0	1.280	116-A	0.80	116-B	225	90	New	Single Metal Clear	2)2ND BR
49	Window	Front	(SW)	30.0	0.430	NFRC	0.30	NFRC	225	90	New	Lowe2tiltturn	2)2ND BR
50	Window	Front	(SW)	17.5	0.450	NFRC	0.28	NFRC	225	90	New	Lowe2BEDE Dr	2)2ND BR
51	Window	Front	(SW)	18.0	0.370	NFRC	0.34	NFRC	225	90	New	Lowe2picture	2)2ND BR
52	Window	Front	(SW)	8.0	0.430	NFRC	0.30	NFRC	225	90	New	Lowe2tiltturn	2)2ND BR
53	Window	Rear	(NE)	10.0	0.370	NFRC	0.34	NFRC	45	90	New	Lowe2picture	2)2ND BR
54	Window	Rear	(NE)	5.0	0.370	NFRC	0.34	NFRC	45	90	New	Lowe2picture	2)2ND BR
55	Window	Rear	(NE)	20.0	0.430	NFRC	0.30	NFRC	45	90	New	Lowe2tiltturn	2)2ND BR
56	Window	Rear	(NE)	30.0	0.370	NFRC	0.34	NFRC	45	90	New	Lowe2picture	2)2ND BR
57	Window	Left	(NW)	30.0	0.430	NFRC	0.30	NFRC	315	90	New	Lowe2tiltturn	2)2ND BR

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.
39	Bug Screen	0.76	7.0	2.5	5.0	1.0	6.0	6.0						
40	Bug Screen	0.76	4.0	3.0	5.0	1.0	6.0	6.0						
41	Bug Screen	0.76	4.0	3.6	5.0	1.0	6.0	6.0						
42	Bug Screen	0.76												
43	Bug Screen	0.76												
44	Bug Screen	0.76	1.5	2.5	5.0	1.0	6.0	6.0						
45	Bug Screen	0.76	4.0	2.5	3.0	1.0	2.0	2.0						
46	Bug Screen	0.76	6.0	2.5	3.0	1.0	2.0	2.0						
47	Bug Screen	0.76	1.5	2.0	3.0	1.0	2.0	2.0						
48	Bug Screen	0.76	5.0	3.0	3.0	1.0	2.0	2.0						
49	Bug Screen	0.76	5.0	6.0	3.0	1.0	2.0	2.0						
50	Bug Screen	0.76	7.0	2.5	3.0	1.0	2.0	2.0						
51	Bug Screen	0.76	4.5	4.0	3.0	1.0	2.0	2.0						
52	Bug Screen	0.76	4.0	2.0	3.0	1.0	2.0	2.0						
53	Bug Screen	0.76	1.7	6.0	3.0	1.0	2.0	2.0						
54	Bug Screen	0.76	1.7	3.0	3.0	1.0	2.0	2.0						
55	Bug Screen	0.76	4.0	5.0	3.0	1.0	2.0	2.0						
56	Bug Screen	0.76	6.0	5.0	3.0	1.0	2.0	2.0						
57	Bug Screen	0.76	5.0	6.0	3.0	1.0	2.0	2.0						

THERMAL MASS FOR HIGH MASS DESIGN

Type	Area (sf)	Thick. (in.)	Heat Cap.	Cond.	Inside R-Val.	JA IV Reference	Condition Status	Location/ Comments
Concrete, Lightweight	223	12.00	17	0.36	0	13-A5	New	1)ACCESSORY / Exterior Mass
Concrete, Lightweight	40	12.00	17	0.36	0	13-A5	New	1)ACCESSORY / Exterior Mass
Concrete, Lightweight	102	12.00	17	0.36	0	13-A5	New	2)1ST BR / Exterior Mass
Concrete, Lightweight	18	12.00	17	0.36	0	13-A5	New	2)1ST BR / Exterior Mass
Concrete, Lightweight	18	12.00	17	0.36	0	13-A5	New	2)1ST BR / Exterior Mass

PERIMETER LOSSES

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

Certificate Of Compliance : Residential (Part 2 of 4) CF-1R

FARRAR RESIDENCE — 7/6/2011

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FENESTRATION SURFACES

#	Type	Area	U-Factor[1]	SHGC[2]	True Azm.	Tilt	Cond. Stat.	Glazing Type	Location/ Comments
58	Window Left (NW)	15.0	0.370 NFRC	0.34 NFRC	315	90	New	Lowe2picture	2)2ND BR

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.
58	Bug Screen	0.76	5.0	3.0	3.0	1.0	2.0	2.0						

THERMAL MASS FOR HIGH MASS DESIGN

Type	Area (sf)	Thick. (in.)	Heat Cap.	Cond.	Inside R-Val.	JA IV Reference	Condition Status	Location/ Comments
Concrete, Lightweight	174	12.00	17	0.36	0	13-A5	New	2)1ST BR / Exterior Mass
Concrete, Heavyweight	721	3.50	28	0.98	2	27-B17	New	2)1ST BR / Slab on Grade
Concrete, Lightweight	147	12.00	17	0.36	0	13-A5	New	2)1ST BR / Exterior Mass
Concrete, Lightweight	264	12.00	17	0.36	0	13-A5	New	2)1ST BR / Exterior Mass
Concrete, Lightweight	36	12.00	17	0.36	0	13-A5	New	2)2ND BR / Exterior Mass

PERIMETER LOSSES

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

Certificate Of Compliance : Residential (Part 2 of 4) CF-1R

FARRAR RESIDENCE — 7/6/2011

Project Title — **Date**

FENESTRATION SURFACES

#	Type	Area	U-Factor[1]	SHGC[2]	True Azm.	Tilt	Cond. Stat.	Glazing Type	Location/ Comments

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.

THERMAL MASS FOR HIGH MASS DESIGN

Type	Area (sf)	Thick. (in.)	Heat Cap.	Cond.	Inside R-Val.	JA IV Reference	Condition Status	Location/ Comments
Concrete, Lightweight	155	12.00	17	0.36	0	13-A5	New	2)2ND BR / Exterior Mass
Concrete, Lightweight	164	12.00	17	0.36	0	13-A5	New	2)2ND BR / Exterior Mass
Concrete, Lightweight	355	12.00	17	0.36	0	13-A5	New	2)2ND BR / Exterior Mass
Concrete, Lightweight	195	12.00	17	0.36	0	13-A5	New	2)2ND BR / Exterior Mass

PERIMETER LOSSES

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

Certificate Of Compliance : Residential (Part 3 of 4) CF-1R

FARRAR RESIDENCE — 7/6/2011
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HVAC SYSTEMS

Location	Heating Type	Minimum Eff	Cooling Type	Minimum Eff	Condition Status	Thermostat Type
1)Fam,Kit,Din,Entry	Split Heat Pump	13.92 HSPF	Split Heat Pump	19.7 SEER	New	Setback
2)BR WING	Split Heat Pump	13.92 HSPF	Split Heat Pump	19.7 SEER	New	Setback

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Condition Status	Ducts Tested?
1)Fam,Kit,Din,Entry	Ducted	Ducted	Attic	6.0	New	No
2)BR WING	Ducted	Ducted	Attic	6.0	New	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.
A.O.Smith FCG75 FHR=127	Large Gas	Recirc/Time+Temp	1	75,100	75	New	0.80	2.50%	12.0

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

THE CONTRACTORS ARE RESPONSIBLE FOR THE FINAL SIZING OF HEATING, COOLING AND DHW EQUIPMENT.

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: HUBBELL & HUBBELL
Address: 1970 SIXTH AVENUE
SAN DIEGO, CA 92101
Telephone: 619.231-0446 Lic. #:

(signature) (date)

Documentation Author

Name: Mark Gallant, CEPE
Title/Firm: Gallant Energy Consulting
Address: 508 W Mission Avenue, Suite 201
Escondido, CA 92025
Telephone: (760) 743-5408

M Gallant 7/6/11
(signature) (date)

Enforcement Agency

Name:
Title/Firm:
Address:
Telephone:

(signature) (date)

Run Initiation Time: 07/06/11 16:01:30 **Run Code: 1309993290**

FARRAR RESIDENCE — 7/6/2011

Project Title — **Date**

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 Roof "R-38 Roof Cathedral" includes a Radiant Barrier.		
The DHW System "A.O.Smith FCG75 FHR=127" is a Large Gas water heater with Pilot Loss = 0 btuh.		
The DHW System "A.O.Smith FCG75 FHR=127" includes a Solar System with a 85.0% Solar Fraction (see CF-SR).		
HIGH MASS Design - Thermal Mass: 93 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)Fam,Kit,Din,Entry		
HIGH MASS Design - Thermal Mass: 106 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)Fam,Kit,Din,Entry		
HIGH MASS Design - Thermal Mass: 36 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)Fam,Kit,Din,Entry		
HIGH MASS Design - Thermal Mass: 126 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)Fam,Kit,Din,Entry		
HIGH MASS Design - Thermal Mass: 1259 sqft Covered Slab Floor, 3.50" thick at 1)Fam,Kit,Din,Entry		
HIGH MASS Design - Thermal Mass: 88 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)Fam,Kit,Din,Entry		
HIGH MASS Design - Thermal Mass: 125 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)Fam,Kit,Din,Entry		
HIGH MASS Design - Thermal Mass: 458 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)Fam,Kit,Din,Entry		
HIGH MASS Design - Thermal Mass: 60 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)ACCESSORY		
HIGH MASS Design - Thermal Mass: 71 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)ACCESSORY		

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
This building has credit for Insulation Quality Installation. A certified HERS rater must visually verify the installation of all Insulation.		
This building has credit for Insulation Quality Installation. A certified HERS rater must visually verify the installation of all Insulation.		

FARRAR RESIDENCE — 7/6/2011

Project Title — **Date**

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
HIGH MASS Design - Thermal Mass: 223 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)ACCESSORY		
HIGH MASS Design - Thermal Mass: 40 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 1)ACCESSORY		
HIGH MASS Design - Thermal Mass: 102 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)1ST BR		
HIGH MASS Design - Thermal Mass: 18 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)1ST BR		
HIGH MASS Design - Thermal Mass: 18 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)1ST BR		
HIGH MASS Design - Thermal Mass: 174 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)1ST BR		
HIGH MASS Design - Thermal Mass: 721 sqft Covered Slab Floor, 3.50" thick at 2)1ST BR		
HIGH MASS Design - Thermal Mass: 147 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)1ST BR		
HIGH MASS Design - Thermal Mass: 264 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)1ST BR		
HIGH MASS Design - Thermal Mass: 36 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)2ND BR		
HIGH MASS Design - Thermal Mass: 155 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)2ND BR		
HIGH MASS Design - Thermal Mass: 164 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)2ND BR		
HIGH MASS Design - Thermal Mass: 355 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)2ND BR		

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

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

FARRAR RESIDENCE — 7/6/2011

Project Title — **Date**

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
HIGH MASS Design - Thermal Mass: 195 sqft Concrete, Lightweight Exterior Mass, 12.00" thick at 2)2ND BR		

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^2) 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).		☐	☐	☐

Residential Kitchen Lighting Worksheet WS-5R

FARRAR RESIDENCE — 7/6/2011

Project Title — **Date**

At least 50% of the total rated wattage of permanently installed luminaires in kitchens must be in luminaires that are high efficacy luminaires as defined in Table 150-C. Luminaires that are not high efficacy must be switched separately.

Kitchen Lighting Schedule. **Provide the following information for all luminaires to be installed in kitchens.**

Luminaire Type	High Efficacy?	Watts		Quantity		High Efficacy Watts		Other Watts
fluor can	Yes [X] No [ ]	28.0	x	6	=	168	or	
pendant	Yes [ ] No [X]	40.0	x	4	=		or	160
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
	Yes [ ] No [ ]		x		=		or	
				Total	**A:**	168	**B:**	160

COMPLIES IF A ≥ B **YES** [X] **NO** [ ]

HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

PROJECT NAME	DATE
FARRAR RESIDENCE	7/6/2011
SYSTEM NAME	**FLOOR AREA**
1)Fam,Kit,Din,Entry	1,681

ENGINEERING CHECKS

Number of Systems	1
Heating System	
Output per System	42,000
Total Output (Btuh)	42,000
Output (Btuh/sqft)	25.0
Cooling System	
Output per System	42,000
Total Output (Btuh)	42,000
Total Output (Tons)	3.5
Total Output (Btuh/sqft)	25.0
Total Output (sqft/Ton)	480.3
Air System	
CFM per System	1,400
Airflow (cfm)	1,400
Airflow (cfm/sqft)	0.83
Airflow (cfm/Ton)	400.0
Outside Air (%)	0.0
Outside Air (cfm/sqft)	0.00

Note: values above given at ARI conditions

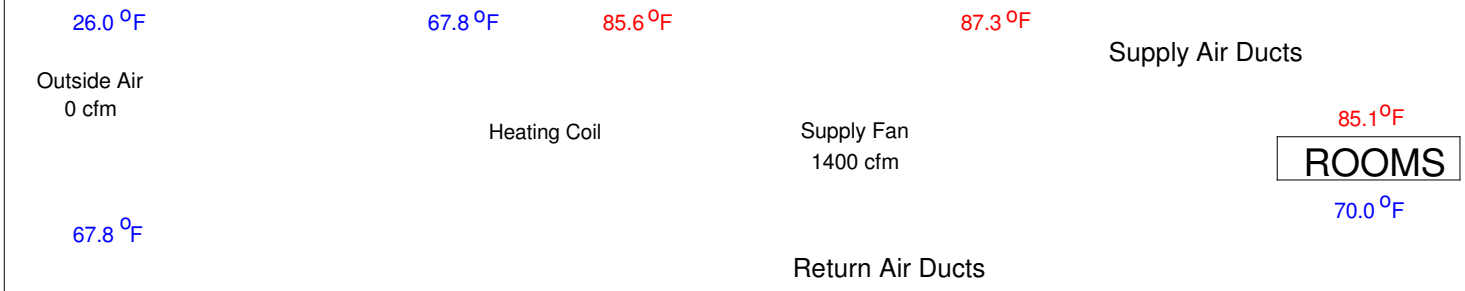
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	Sensible	Latent	CFM	Sensible
Total Room Loads	1,068	19,059	2,141	2,184	34,685
Return Vented Lighting		0			
Return Air Ducts		1,992			3,238
Return Fan		0			0
Ventilation	0	0	0	0	0
Supply Fan		2,480			-2,480
Supply Air Ducts		1,992			3,238
TOTAL SYSTEM LOAD		25,523	2,141		38,682

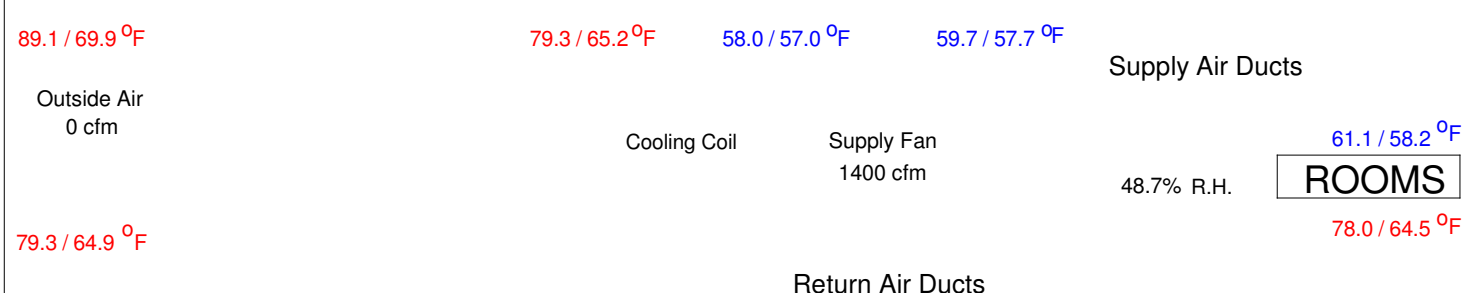
HVAC EQUIPMENT SELECTION

Geothermal HP 3.5t	31,437	10,567		26,232
Total Adjusted System Output (Adjusted for Peak Design Conditions)	31,437	10,567		26,232
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)



HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

PROJECT NAME	DATE
FARRAR RESIDENCE	7/6/2011
SYSTEM NAME	**FLOOR AREA**
2)BR WING	1,365

ENGINEERING CHECKS

Number of Systems	1
Heating System	
Output per System	36,000
Total Output (Btuh)	36,000
Output (Btuh/sqft)	26.4
Cooling System	
Output per System	36,000
Total Output (Btuh)	36,000
Total Output (Tons)	3.0
Total Output (Btuh/sqft)	26.4
Total Output (sqft/Ton)	455.0
Air System	
CFM per System	1,200
Airflow (cfm)	1,200
Airflow (cfm/sqft)	0.88
Airflow (cfm/Ton)	400.0
Outside Air (%)	0.0
Outside Air (cfm/sqft)	0.00

Note: values above given at ARI conditions

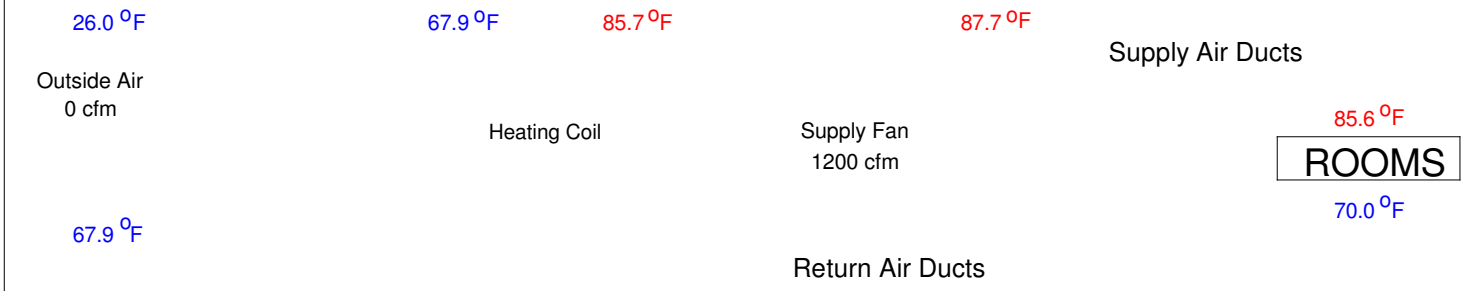
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	Sensible	Latent	CFM	Sensible
Total Room Loads	1,133	19,245	2,039	1,703	28,007
Return Vented Lighting		0			
Return Air Ducts		2,011			2,615
Return Fan		0			0
Ventilation	0	0	0	0	0
Supply Fan		2,480			-2,480
Supply Air Ducts		2,011			2,615
TOTAL SYSTEM LOAD		25,747	2,039		30,757

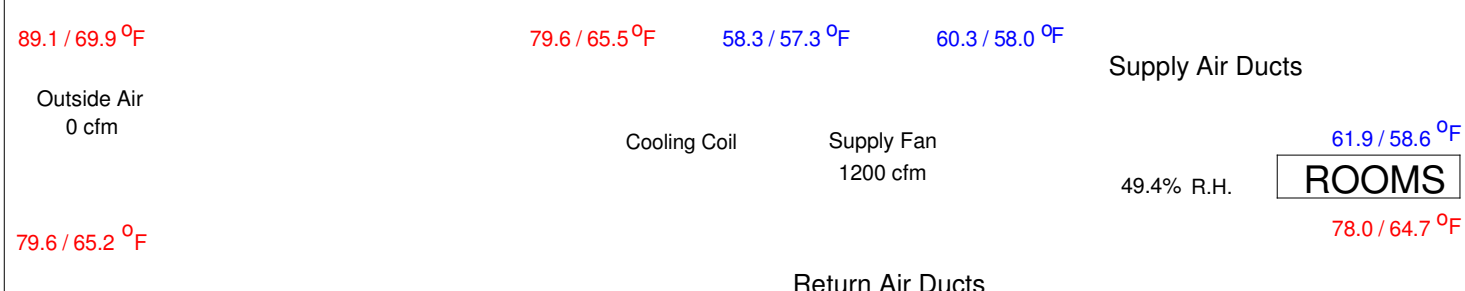
HVAC EQUIPMENT SELECTION

Geothermal HP 3t	26,886	9,280		22,485
Total Adjusted System Output (Adjusted for Peak Design Conditions)	26,886	9,280		22,485
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)



ENERGY USE AND COST SUMMARY — ECON-1

PROJECT NAME	DATE
FARRAR RESIDENCE	7/6/2011

Rate: Fuel Type:

	STANDARD			PROPOSED			MARGIN		
	Energy Use (kWh)	Peak Demand (kW)	Cost ($)	Energy Use (kWh)	Peak Demand (kW)	Cost ($)	Energy Use (kWh)	Peak Demand (kW)	Cost ($)
Jan	1,138	7		492	4		646	3	
Feb	698	14		288	6		409	8	
Mar	792	8		317	4		475	4	
Apr	468	5		175	3		293	2	
May	46	5		9	2		37	3	
Jun	275	7		115	6		160	1	
Jul	869	8		484	7		385	1	
Aug	834	9		514	8		320	1	
Sep	641	10		382	9		258	1	
Oct	267	7		117	7		150	1	
Nov	654	16		229	4		425	12	
Dec	1,009	14		424	6		585	7	
Year	**7,691**	**16**	**$**	**3,548**	**9**	**$**	**4,143**	**7**	**$**

Rate: Fuel Type:

	STANDARD			PROPOSED			MARGIN		
	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost ($)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost ($)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost ($)
Jan	23	6		5	1		17	5	
Feb	21	6		5	1		16	5	
Mar	23	6		5	1		18	5	
Apr	22	6		5	1		17	5	
May	22	6		5	1		17	5	
Jun	21	6		4	1		16	5	
Jul	21	6		4	1		16	4	
Aug	20	5		4	1		16	4	
Sep	20	5		4	1		15	4	
Oct	21	6		5	1		16	4	
Nov	21	6		5	1		16	4	
Dec	22	6		5	1		17	5	
Year	**255**	**6**	**$**	**57**	**1**	**$**	**199**	**5**	**$**

Annual Totals	Energy	Demand	Cost	Cost/sqft	Virtual Rate
Electricity	3,548 kWh	9 kW	$ 0	$ 0.00/sqft	$ 0.00/kWh
Natural Gas	57 therms	1 kBtu/hr	$ 0	$ 0.00/sqft	$ 0.00/therm
		Total	$ 0	$ 0.00/sqft	

The values shown here are based upon the results of an EnergyPro Compliance energy analysis that uses Title 24 profiles as specified in the Residential ACM manual.