CERTIFICATE OF COMPLIANCE: Residential (Part 4 of 5) CF-1R

Project Name: *Hansel Residence* | Building Type: ☑ Single Family ☐ Multi Family ☐ Addition Alone ☐ Existing+ Addition/Alteration | Date: *4/28/2010*

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation Cavity	Exterior	Frame	Interior	Frame	Azm	Tilt	Status	Joint Appendix 4	Location/Comments

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor[1]	SHGC[2]	Azm	Status	Glazing Type	Location/Comments
33	Window	106.0	0.390 NFRC	0.26 NFRC	270	New	Low E Glass,39-26	living Area First Floor
34	Window	36.0	0.390 NFRC	0.26 NFRC	270	New	Low E Glass,39-26	living Area First Floor
35	Window	210.0	0.390 NFRC	0.26 NFRC	270	New	Low E Glass,39-26	living Area First Floor
36	Window	105.0	0.390 NFRC	0.26 NFRC	270	New	Low E Glass,39-26	living Area First Floor
37	Skylight	9.0	0.550 NFRC	0.29 NFRC	0	New	Velux vent	living Area First Floor
38	Window	38.0	0.390 NFRC	0.26 NFRC	45	New	Low E Glass,39-26	living Area First Floor
39	Window	20.0	0.390 NFRC	0.26 NFRC	45	New	Low E Glass,39-26	living Area First Floor
40	Window	51.0	0.390 NFRC	0.26 NFRC	45	New	Low E Glass,39-26	living Area First Floor
41	Window	20.0	0.390 NFRC	0.26 NFRC	45	New	Low E Glass,39-26	living Area First Floor
42	Window	7.5	0.390 NFRC	0.26 NFRC	45	New	Low E Glass,39-26	living Area First Floor
43	Window	36.0	0.390 NFRC	0.26 NFRC	90	New	Low E Glass,39-26	living Area First Floor
44	Window	9.0	0.390 NFRC	0.26 NFRC	90	New	Low E Glass,39-26	living Area First Floor
45	Window	9.0	0.390 NFRC	0.26 NFRC	90	New	Low E Glass,39-26	living Area First Floor
46	Window	15.0	0.390 NFRC	0.26 NFRC	90	New	Low E Glass,39-26	living Area First Floor
47	Window	38.0	0.390 NFRC	0.26 NFRC	225	New	Low E Glass,39-26	living Area First Floor
48	Window	68.0	0.390 NFRC	0.26 NFRC	225	New	Low E Glass,39-26	living Area First Floor

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value
(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	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
33	Bug Screen	0.76	7.0	7.1	10.0	2.0	0.0	0.0						
34	Bug Screen	0.76	6.0	6.0	24.0	2.0	0.0	0.0						
35	Bug Screen	0.76	10.5	20.0	10.0	2.0	0.0	0.0						
36	Bug Screen	0.76												
37	None	1.00												
38	Bug Screen	0.76												
39	Bug Screen	0.76												
40	Bug Screen	0.76												
41	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												

CERTIFICATE OF COMPLIANCE: Residential (Part 4 of 5) CF-1R

Project Name: *Hansel Residence* | Building Type: ☑ Single Family ☐ Multi Family ☐ Addition Alone ☐ Existing+ Addition/Alteration | Date: *4/28/2010*

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation Cavity	Exterior	Frame	Interior	Frame	Azm	Tilt	Status	Joint Appendix 4	Location/Comments

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor[1]	SHGC[2]	Azm	Status	Glazing Type	Location/Comments
49	Window	48.0	0.390 NFRC	0.26 NFRC	315	New	Low E Glass,39-26	living Area First Floor
50	Window	7.5	0.390 NFRC	0.26 NFRC	315	New	Low E Glass,39-26	living Area First Floor
51	Window	18.0	0.390 NFRC	0.26 NFRC	315	New	Low E Glass,39-26	living Area First Floor
52	Skylight	19.8	0.550 NFRC	0.29 NFRC	0	New	Velux vent	living Area First Floor
53	Skylight	27.0	0.550 NFRC	0.29 NFRC	0	New	Velux vent	living Area First Floor
54	Window	56.0	0.390 NFRC	0.26 NFRC	90	New	Low E Glass,39-26	2nd Floor
55	Window	30.0	0.390 NFRC	0.26 NFRC	90	New	Low E Glass,39-26	2nd Floor
56	Window	15.6	0.390 NFRC	0.26 NFRC	90	New	Low E Glass,39-26	2nd Floor
57	Window	50.0	0.390 NFRC	0.26 NFRC	0	New	Low E Glass,39-26	2nd Floor
58	Window	10.0	0.390 NFRC	0.26 NFRC	0	New	Low E Glass,39-26	2nd Floor
59	Window	7.5	0.390 NFRC	0.26 NFRC	0	New	Low E Glass,39-26	2nd Floor
60	Window	48.0	0.390 NFRC	0.26 NFRC	180	New	Low E Glass,39-26	2nd Floor
61	Window	36.0	0.390 NFRC	0.26 NFRC	180	New	Low E Glass,39-26	2nd Floor
62	Window	36.0	0.390 NFRC	0.26 NFRC	180	New	Low E Glass,39-26	2nd Floor
63	Window	18.0	0.390 NFRC	0.26 NFRC	270	New	Low E Glass,39-26	2nd Floor
64	Window	7.5	0.390 NFRC	0.26 NFRC	270	New	Low E Glass,39-26	2nd Floor

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value
(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	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
49	Bug Screen	0.76												
50	Bug Screen	0.76												
51	Bug Screen	0.76												
52	None	1.00												
53	None	1.00												
54	Bug Screen	0.76	7.0	8.0	9.0	2.0	0.0	0.0						
55	Bug Screen	0.76	5.0	3.0	9.0	2.0	0.0	0.0						
56	Bug Screen	0.76	2.6	6.0	9.0	2.0	0.0	0.0						
57	Bug Screen	0.76												
58	Bug Screen	0.76												
59	Bug Screen	0.76												
60	Bug Screen	0.76												
61	Bug Screen	0.76												
62	Bug Screen	0.76												
63	Bug Screen	0.76												
64	Bug Screen	0.76												

CERTIFICATE OF COMPLIANCE: Residential (Part 5 of 5) CF-1R

Project Name: *Hansel Residence* | Building Type: ☑ Single Family ☐ Multi Family ☐ Addition Alone ☐ Existing+ Addition/Alteration | Date: *4/28/2010*

BUILDING ZONE INFORMATION

System Name	Zone Name	Floor Area (ft²) New	Existing	Altered	Removed	Volume	Year Built
Residential HVAC Unit	*Living Area*	*6,740*				*80,880*	
	2nd Floor	*1,440*				*17,280*	
	Totals	*8,180*	*0*	*0*	*0*		

HVAC SYSTEMS

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
Residential HVAC Unit	*1*	*Boiler*	*see below*	*Split Air Conditioner*	*13.0 SEER*	*Setback*	*New*

HVAC DISTRIBUTION

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
Residential HVAC Unit	*Radiant Floor*	*Ducted*	*Attic, Ceiling Ins, vented*	*6.0*	☑	*New*
					☐	
					☐	
					☐	
					☐	

WATER HEATING SYSTEMS

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or FE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
Radiant floor	*1*	*Large Gas*	*No Pipe Insulation*	*199,000*	*60*	*0.93*	*0.00 %*	*0.0*	*New*
Radiant floor	*1*	*Large Gas*	*Hydronic Heating*	*199,000*	*60*	*0.92*	*0.00 %*	*0.0*	*New*

MULTI-FAMILY WATER HEATING DETAILS

Control	Qty.	HP	Fr. Plenum	Hot Water Piping Length (ft) Plenum	Outside	Buried	Add ½" Insulation
			☐				☐
			☐				☐
			☐				☐
			☐				☐
			☐				☐

HYDRONIC HEATING SYSTEM PIPING

System Name	Pipe Length	Pipe Diameter	Insul. Thick.
Radiant floor	*20*	*2.00*	*0.50*

MANDATORY MEASURES SUMMARY: Residential (Page 1 of 3) MF-1R

Project Name: *Hansel Residence* | Date: *4/28/2010*

NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

Building Envelope Measures:

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

Fireplaces, Decorative Gas Appliances and Gas Log Measures:

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

Space Conditioning, Water Heating and Plumbing System Measures:

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: 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 are insulated per Standards Table 150-B.

§150(j)2: Cooling system piping (suction, chilled water, or brine lines),and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.

MANDATORY MEASURES SUMMARY: Residential (Page 2 of 3) MF-1R

Project Name: *Hansel Residence* | Date: *4/28/2010*

§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum 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

§150(m)1: 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.

§150(m)2D: 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.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: 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.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

Pool and Spa Heating Systems and Equipment Measures:

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

Residential Lighting Measures:

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft² or 100 watts for dwelling units larger than 2,500 ft² may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.

MANDATORY MEASURES SUMMARY: Residential (Page 3 of 3) MF-1R

Project Name: *Hansel Residence* | Date: *4/28/2010*

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less then 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283: and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: 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. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

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HANSEL RESIDENCE
473 Cahill Lane, Santa Rosa, California 95401

NOT FOR CONSTRUCTION

Drawn By	WD
Checked By	WD
Project No.	09013

Date	Issue
03.01.10	PRELIM PRICING SET
04.22.10	PROGRESS SET
05.01.10	PERMIT SET

ENERGY CALCULATIONS

SCALE : N/A

T24.1