

2016 Code Software Review 2700 Sqft / 2-Story / 20% Glazing / 4 BDRMS.	2016 Building Features	2016 Building Features	2016 Building Features	2016 Building Features
<b>Run</b>	2016 Code	2016 HPA Opt. A w/ R-8	2016 HPW w/ 2x6 @ 24" o.c.	2016 HPW w/ 2x4 @ 16" o.c.
<b>File Number</b>	0	1	2	3
<b>Software</b>	CBECC-Res 2016.2.1 (868)	CBECC-Res 2016.2.1 (868)	CBECC-Res 2016.2.1 (868)	CBECC-Res 2016.2.1 (868)
<b>Code Compliance - Worst Case</b>				
Percentage Improvement	1.0%	1.3%	1.1%	-0.3%
Compliance Margin (KTDV)	0.32	0.42	0.37	-0.11
Proposed Design (KTDV)	33.27	33.17	33.22	33.70
Standard Design (KTDV)	33.59	33.59	33.59	33.59
Photovoltaic Offset	N/A	N/A	N/A	N/A
Proposed Design (EDR)	43.8	43.7	43.8	44.1
Required PV System Size (kWdc)	N/A	N/A	N/A	N/A
Battery System Size (kWdc)	N/A	N/A	N/A	N/A
2019 Compliance Margin EDR w/ Efficiency	N/A	N/A	N/A	N/A
2019 Compliance Margin EDR w/ PV	N/A	N/A	N/A	N/A
<b>Envelope: Opaque Surfaces</b>				
Wall Insulation - 2x4 Exterior Walls	N/A	N/A	N/A	R-15+R8 \$ 6,410
Wall Insulation - 2x6 Exterior Walls	R-19+R5	R-19+R5	R-19+R5 @ 24" o.c. \$ (384)	N/A \$ (7,073)
Wall Insulation - 2x4 Interior Garage Walls	N/A	N/A	N/A	R-15 \$ 482
Wall Insulation - 2x6 Interior Garage Walls	R-19	R-19	R-19 @ 24" o.c. \$ (39)	N/A \$ (534)
Wall Insulation - Kneewall @ Garage	R-19	R-19	R-19 @ 24" o.c. \$ (6)	R-19
Insulated Entry Door(s)	N/A	N/A	N/A	N/A
Wall Insulation - 2x4 Exterior Garage Walls	N/A	N/A	N/A	R-0+R8 \$ 895
Wall Insulation - 2x6 Exterior Garage Walls	R-0+R5	R-0+R5	R-0+R5 @ 24" o.c. \$ (69)	N/A \$ (1,042)
Attic Insulation - Flat Portions	R-38	R-38	R-38	R-38
Floor Insulation - Above Garage	R-19	R-19	R-19 @ 24" o.c. \$ (29)	R-19
Insulation Installation - QII	Required	Required	Required	Required
Insulation Installation [Verification] - QII	Required	Required	Required	Required
Air Infiltration [Testing] - Blower Door	5.0 ACH	5.0 ACH	5.0 ACH	5.0 ACH
Roofing Material	Tile	Tile	Tile	Tile
Roofing Properties (Reflectance / Emittance)	0.10 / 0.85	0.10 / 0.85	0.10 / 0.85	0.10 / 0.85
Radiant Barrier	N/A	Required \$ 230	N/A	N/A
Above Roof Deck Insulation	N/A	R-8 \$ 1,398	N/A	N/A
Below Roof Deck Insulation	R-13	N/A \$ (723)	R-13	R-13
Ventilated Attic (Yes / No)	Yes	Yes	Yes	Yes
HPA HERS Inspection	N/A	N/A	N/A	N/A
<b>Envelope: Glazing (U-Factor / SHGC)</b>				
Horizontal Slider	0.31 / 0.22	0.31 / 0.22	0.31 / 0.22	0.31 / 0.22
Single Hung	0.31 / 0.22	0.31 / 0.22	0.31 / 0.22	0.31 / 0.22
Fixed	0.31 / 0.22	0.31 / 0.22	0.31 / 0.22	0.31 / 0.22
Patio Door	0.31 / 0.22	0.31 / 0.22	0.31 / 0.22	0.31 / 0.22
<b>HVAC: Space Heating, Cooling Systems</b>				
Space Heating Type	Furnace	Furnace	Furnace	Furnace
Space Heating Efficiency (AFUE)	0.80	0.80	0.80	0.80
Space Cooling Type	ACSplit	ACSplit	ACSplit	ACSplit
Space Cooling Efficiency (SEER / EER)	14 / 11.7	14 / 11.7	14 / 11.7	14 / 11.7
EER [Verification]	N/A	N/A	N/A	N/A
Refrigerant Charge [Verification/Testing]	Required	Required	Required	Required
Fan Watt Draw [Testing]	0.58 W/cfm	0.58 W/cfm	0.58 W/cfm	0.58 W/cfm
Adequate Airflow [Testing]	350 cfm/ton	350 cfm/ton	350 cfm/ton	350 cfm/ton
Low Leakage Air Handler [Verification]	N/A	N/A	N/A	N/A
<b>HVAC: Duct System</b>				
Duct Insulation R-Value	R-8	R-8	R-8	R-8
Duct Location	Attic	Attic	Attic	Attic
Buried Ducts [Verification]	N/A	N/A	N/A	N/A
Low Leakage (Tight) Ducts [Testing]	Required @ 5%	Required @ 5%	Required @ 5%	Required @ 5%
<b>HVAC: Mechanical Ventilation</b>				
Minimum Whole-House Ventilation, Continuous	65 cfm	65 cfm	65 cfm	65 cfm
Ventilation System Type	Exhaust	Exhaust	Exhaust	Exhaust
Ventilation System Efficiency (cfm / W/cfm)	65 / 0.25	65 / 0.25	65 / 0.25	65 / 0.25
Whole House Fan	N/A	N/A	N/A	N/A
Whole House Fan (Verification)	N/A	N/A	N/A	N/A
<b>Water Heating</b>				
Water Heater Type	Tankless	Tankless	Tankless	Tankless
Water Heater Efficiency (EF)	0.82	0.82	0.82	0.82
Fuel Source	Natural Gas	Natural Gas	Natural Gas	Natural Gas
External Blanket	N/A	N/A	N/A	N/A
Drain Hot Water Recovery	N/A	N/A	N/A	N/A
Distribution Type	Standard	Standard	Standard	Standard
Solar Water Heater (Solar Fraction)	N/A	N/A	N/A	N/A
<b>Costs</b>				
		\$ 905	\$ (527)	\$ (862)
<b>Compliance Margin Difference</b>				
Percentage change in Compliance from Base		0.3%	0.1%	-1.3%
KTDV change in Compliance from Base		0.10	0.05	-0.43