| GENERAL INFORMATION | | | | | |
|---|---|---|---|---|---|
| 01 | Project Name | 1 Story Example | | | |
| 02 | Calculation Description | 2100 ft2 CEC Prototype with tile roof | | | |
| 03 | Project Location | 1516 Ninth St | | | |
| 04 | City | Sacramento, CA | 05 | Standards Version | Compliance 2017 |
| 06 | Zip Code | 95814 | 07 | Software Version | CBECC-Res 2016.3.0 Beta (949) |
| 08 | Climate Zone | CZ12 | 09 | Front Orientation (deg/Cardinal) | 0 |
| 10 | Building Type | Single Family | 11 | Number of Dwelling Units | 1 |
| 12 | Project Scope | Newly Constructed | 13 | Number of Bedrooms | 3 |
| 14 | New Construction/Addition Cond. Floor Area ($ft^2$) | 2100 | 15 | Number of Stories | 1 |
| 16 | Existing Cond. Floor Area ($ft^2$) | | 17 | Natural Gas Available | Yes |
| 18 | Total Cond. Floor Area($ft^2$) | n/a | 19 | Glazing Percentage (%) | 20.0% |

| COMPLIANCE RESULTS | |
|---|---|
| 01 | **Building Complies with Computer Performance** |
| 02 | **This building incorporates features that require field testing and/or verification by a certified HERS rater under the supervision of a CEC-approved HERS provider.** |
| 03 | **This building incorporates one or more Special Features shown below** |

**ENERGY USE SUMMARY**

| 04 | 05 | 06 | 07 | 08 |
|---|---|---|---|---|
| Energy Use ($kTDV/ft^2$-yr) | Standard Design | Proposed Design | Compliance Margin | Percent Improvement |
| Space Heating | 20.98 | 23.39 | -2.41 | -11.5% |
| Space Cooling | 10.27 | 3.51 | 6.76 | 65.8% |
| IAQ Ventilation | 1.17 | 1.17 | 0.00 | 0.0% |
| Water Heating | 8.56 | 8.56 | 0.00 | 0.0% |
| Photovoltaic Offset | ---- | 0.00 | 0.00 | ---- |
| **Compliance Energy Total** | **40.98** | **36.63** | **4.35** | **10.6%** |

**REQUIRED SPECIAL FEATURES**

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- **Whole house fan**
- **Cool roof**
- **Insulation below roof deck**
- **Window overhangs and/or fins**

**HERS FEATURE SUMMARY**

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the building components tables below.

**Building-level Verifications:**
- **IAQ mechanical ventilation**

**Cooling System Verifications:**
- **Minimum Airflow**
- **Refrigerant Charge**
- **Fan Efficacy Watts/CFM**

**HVAC Distribution System Verifications:**
- **Duct Sealing**

**Domestic Hot Water System Verifications:**
- **-- None --**

**BUILDING - FEATURES INFORMATION**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
|---|---|---|---|---|---|---|
| **Project Name** | **Conditioned Floor Area (ft2)** | **Number of Dwelling Units** | **Number of Bedrooms** | **Number of Zones** | **Number of Ventilation Cooling Systems** | **Number of Water Heating Systems** |
| 1 Story Example | 2100 | 1 | 3 | 1 | 1 | 1 |

**ZONE INFORMATION**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
|---|---|---|---|---|---|---|
| **Zone Name** | **Zone Type** | **HVAC System Name** | **Zone Floor Area ($ft^2$)** | **Avg. Ceiling Height** | **Water Heating System 1** | **Water Heating System 2** |
| Conditioned | Conditioned | HVAC System 1 | 2100 | 9 | DHW System | n/a |

**OPAQUE SURFACES**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|
| Name | Zone | Construction | Azimuth | Orientation | Gross Area ($ft^2$) | Window & Door Area ($ft^2$) | Tilt (deg) |
| Front | Conditioned | R19 R5 Stucco Wall | 0 | Front | 270 | 120 | 90 |
| Left | Conditioned | R19 R5 Stucco Wall | 90 | Left | 324 | 56.04 | 90 |
| Back | Conditioned | R19 R5 Stucco Wall | 180 | Back | 450 | 207.32 | 90 |
| Right | Conditioned | R19 R5 Stucco Wall | 270 | Right | 414 | 56.04 | 90 |
| GarToHouse Front | Conditioned>>Garage | Gar House R15 | n/a | n/a | 180 | 20 | n/a |
| GarToHouse Left | Conditioned>>Garage | Gar House R15 | n/a | n/a | 90 | 0 | n/a |
| Ceiling (below attic) 1 | Conditioned | R38 Ceiling below attic | n/a | n/a | 2100 | n/a | n/a |
| Gwall Front | Garage | Garage Ext Wall 2 | 0 | Front | 180 | 108 | 90 |
| Gwall Left | Garage | Garage Ext Wall 2 | 90 | Left | 198 | 0 | 90 |
| Gwall Right | Garage | Garage Ext Wall 2 | 270 | Right | 108 | 0 | 90 |
| Gar Ceiling | Garage | R0 ClgBlwAttic Cons | n/a | n/a | 440 | n/a | n/a |

**ATTIC**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|
| Name | Construction | Type | Roof Rise | Roof Reflectance | Roof Emittance | Radiant Barrier | Cool Roof |
| Gar Attic | Tile Roof | Ventilated | 5 | 0.2 | 0.85 | No | No |
| Attic | Tile High Performance | Ventilated | 5 | 0.2 | 0.85 | No | Yes |

**FENESTRATION / GLAZING**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Name | Type | Surface (Orientation-Azimuth) | Width (ft) | Height (ft) | Multiplier | Area ($ft^2$) | U-factor | SHGC | Exterior Shading |
| F1 | Window | Front (Front-0) | 10.0 | 5.0 | 1 | 50.0 | 0.32 | 0.25 | Insect Screen (default) |
| F2 | Window | Front (Front-0) | 10.0 | 5.0 | 1 | 50.0 | 0.32 | 0.25 | Insect Screen (default) |
| L1 | Window | Left (Left-90) | 6.0 | 4.7 | 2 | 56.0 | 0.32 | 0.25 | Insect Screen (default) |
| B1 SGD | Window | Back (Back-180) | 8.0 | 7.7 | 1 | 61.4 | 0.32 | 0.25 | Insect Screen (default) |
| B2 | Window | Back (Back-180) | 6.0 | 4.7 | 3 | 84.6 | 0.32 | 0.25 | Insect Screen (default) |
| B3 SGD | Window | Back (Back-180) | 8.0 | 7.7 | 1 | 61.4 | 0.32 | 0.25 | Insect Screen (default) |
| R1 | Window | Right (Right-270) | 6.0 | 4.7 | 2 | 56.0 | 0.32 | 0.25 | Insect Screen (default) |

**OPAQUE DOORS**

| 01 | 02 | 03 | 04 |
|---|---|---|---|
| **Name** | **Side of Building** | **Area ($ft^2$)** | **U-factor** |
| Front Dr | Front | 20.0 | 0.50 |
| GarToHouse Dr | GarToHouse Front | 20.0 | 0.50 |
| GDoor | Gwall Front | 108.0 | 1.00 |

**OVERHANGS AND FINS**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Overhang | | | | | Left Fin | | | | Right Fin | | | |
| **Window** | **Depth** | **Dist Up** | **Left Extent** | **Right Extent** | **Flap Ht.** | **Depth** | **Top Up** | **Dist L** | **Bot Up** | **Depth** | **Top Up** | **Dist R** | **Bot Up** |
| F1 | 1 | 1.33 | 3 | 28 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F2 | 1 | 1.33 | 28 | 3 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L1 | 1 | 1.33 | 6 | 8 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| B1 SGD | 6 | 1.33 | 4 | 40 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| B2 | 6 | 1.33 | 23 | 23 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| B3 SGD | 6 | 1.33 | 40 | 4 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R1 | 1 | 1.33 | 8 | 8 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**OPAQUE SURFACE CONSTRUCTIONS**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
|---|---|---|---|---|---|---|
| **Construction Name** | **Surface Type** | **Construction Type** | **Framing** | **Total Cavity R-value** | **Winter Design U-factor** | **Assembly Layers** |
| Garage Ext Wall 2 | Exterior Walls | 0 | 2x6 @ 16 in. O.C. | none | 0.347 | • *Inside Finish: Gypsum Board*<br>• *Cavity / Frame: no insul. / 2x6*<br>• *Exterior Finish: 3 Coat Stucco* |
| R0 ClgBlwAttic Cons | Ceilings (below attic) | 0 | 2x4 Bottom Chord of Truss @ 24 in. O.C. | none | 0.481 | • *Inside Finish: Gypsum Board*<br>• *Cavity / Frame: no insul. / 2x4 Btm Chrd* |
| Gar House R15 | Interior Walls | 0 | 2x4 @ 16 in. O.C. | R 15 | 0.086 | • *Inside Finish: Gypsum Board*<br>• *Cavity / Frame: R-15 / 2x4*<br>• *Other Side Finish: Gypsum Board* |
| Tile High Performance | Attic Roofs | 0 | 2x4 @ 24 in. O.C. | R 13 | 0.072 | • *Around Roof Joists: R-0.0 insul.*<br>• *Cavity / Frame: R-13.0 / 2x4*<br>• *Roof Deck: Wood Siding/sheathing/decking*<br>• *Tile Gap: present*<br>• *Roofing: 10 PSF (RoofTile)* |
| Tile Roof | Attic Roofs | 0 | 2x4 @ 24 in. O.C. | none | 0.400 | • *Cavity / Frame: no insul. / 2x4*<br>• *Roof Deck: Wood Siding/sheathing/decking*<br>• *Tile Gap: present*<br>• *Roofing: 10 PSF (RoofTile)* |
| R38 Ceiling below attic | Ceilings (below attic) | 0 | 2x4 Bottom Chord of Truss @ 24 in. O.C. | R 38 | 0.025 | • *Inside Finish: Gypsum Board*<br>• *Cavity / Frame: R-9.1 / 2x4 Btm Chrd*<br>• *Over Ceiling Joists: R-28.9 insul.* |
| R19 R5 Stucco Wall | Exterior Walls | 0 | 2x6 @ 16 in. O.C. | R 19 in 5-1/2 in. cavity (R-18) | 0.051 | • *Inside Finish: Gypsum Board*<br>• *Cavity / Frame: R-19 in 5-1/2 in. (R-18) / 2x6*<br>• *Sheathing / Insulation: R5 Sheathing*<br>• *Exterior Finish: Synthetic Stucco* |

**SLAB FLOORS**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
|---|---|---|---|---|---|---|
| **Name** | **Zone** | **Area ($ft^2$)** | **Perimeter (ft)** | **Edge Insul. R-value & Depth** | **Carpeted Fraction** | **Heated** |
| Slab On Grade | Conditioned | 2100 | 162 | None | 0.8 | No |
| Gslab | Garage | 440 | 44 | None | 0 | No |

**BUILDING ENVELOPE - HERS VERIFICATION**

| 01 | 02 | 03 | 04 |
|---|---|---|---|
| **Quality Insulation Installation (QII)** | **Quality Installation of Spray Foam Insulation** | **Building Envelope Air Leakage** | **CFM50** |
| Not Required | Not Required | Not Required | n/a |

**WATER HEATING SYSTEMS**

| 01 | 02 | 03 | 04 | 05 | 06 |
|---|---|---|---|---|---|
| **Name** | **System Type** | **Distribution Type** | **Water Heater** | **Number of Heaters** | **Solar Fraction (%)** |
| DHW System | DHW | Standard | Small Instantaneous (1) | 1 | n/a |

**WATER HEATERS**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Name** | **Heater Element Type** | **Tank Type** | **Number of Units** | **Tank Volume (gal)** | **Uniform Energy Factor / Energy Factor / Efficiency** | **Input Rating / Pilot / Thermal Efficiency** | **Tank Insulation R-value (Int/Ext)** | **Standby Loss / Recovery Eff** | **First Hour Rating / Flow Rate** | **NEEA Heat Pump Brand / Model** | **Tank Location or Ambient Condition** |
| Small Instantaneous | Gas | Small Instantaneous | 1 | 0 | 0.82 EF | 125,000 Btu/hr | 0 | n/a | n/a | n/a | |

**SPACE CONDITIONING SYSTEMS**

| 01 | 02 | 03 | 04 | 05 | 06 |
|---|---|---|---|---|---|
| **SC Sys Name** | **System Type** | **Heating Unit Name** | **Cooling Unit Name** | **Fan Name** | **Distribution Name** |
| HVAC System 1 | Other Heating and Cooling System | Furn 80 | Split 14 11.7 | HVAC Fan 1 | Attic Default |

**HVAC - HEATING UNIT TYPES**

| 01 | 02 | 03 | 04 |
|---|---|---|---|
| **Name** | **System Type** | **Number of Units** | **Efficiency** |
| Furn 80 | CntrlFurnace | 1 | 80 AFUE |

**HVAC - COOLING UNIT TYPES**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|
| | | | **Efficiency** | | | | |
| **Name** | **System Type** | **Number of Units** | **EER** | **SEER** | **Zonally Controlled** | **Compressor Type** | **HERS Verification** |
| Split 14 11.7 | SplitAirCond | 1 | 11.7 | 14 | Not Zonal | Single Speed | Split 14 11.7-hers-cool |

**HVAC COOLING - HERS VERIFICATION**

| 01 | 02 | 03 | 04 | 05 | 06 |
|---|---|---|---|---|---|
| **Name** | **Verified Airflow** | **Airflow Target** | **Verified EER** | **Verified SEER** | **Verified Refrigerant Charge** |
| Split 14 11.7-hers-cool | Required | 350 | Not Required | Not Required | Required |

**HVAC - DISTRIBUTION SYSTEMS**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
|---|---|---|---|---|---|---|
| **Name** | **Type** | **Duct Leakage** | **Insulation R-value** | **Duct Location** | **Bypass Duct** | **HERS Verification** |
| Attic Default | DuctsAttic | Sealed and tested | 8 | Attic | None | Attic Default-hers-dist |

**HVAC DISTRIBUTION - HERS VERIFICATION**

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|
| **Name** | **Duct Leakage Verification** | **Duct Leakage Target (%)** | **Verified Duct Location** | **Verified Duct Design** | **Buried Ducts** | **Deeply Buried Ducts** | **Low-leakage Air Handler** |
| Attic Default-hers-dist | Required | 5.0 | Not Required | Not Required | Not Required | Not Required | n/a |

**HVAC - FAN SYSTEMS**

| 01 | 02 | 03 | 04 |
|---|---|---|---|
| **Name** | **Type** | **Fan Power (Watts/CFM)** | **HERS Verification** |
| HVAC Fan 1 | Single Speed PSC Furnace Fan | 0.58 | HVAC Fan 1-hers-fan |

**HVAC FAN SYSTEMS - HERS VERIFICATION**

| 01 | 02 | 03 |
|---|---|---|
| **Name** | **Verified Fan Watt Draw** | **Required Fan Efficiency (Watts/CFM)** |
| HVAC Fan 1-hers-fan | Required | 0.58 |

**IAQ (Indoor Air Quality) FANS**

| 01 | 02 | 03 | 04 | 05 | 06 |
|---|---|---|---|---|---|
| **Dwelling Unit** | **IAQ CFM** | **IAQ Watts/CFM** | **IAQ Fan Type** | **IAQ Recovery Effectiveness(%)** | **HERS Verification** |
| SFam IAQVentRpt | 51 | 0.25 | Default | 0 | Required |

**COOLING VENTILATION**

| 01 | 02 | 03 | 04 | 05 | 06 |
|---|---|---|---|---|---|
| **Name** | **Airflow Rate (CFM/ft2)** | **Cooling Vent CFM** | **Cooling Vent Watts/CFM** | **Total Watts** | **Number of Fans** |
| Whole House Fan | 1.5 | 3150 | 0.1 | 315 | 1 |

| **DOCUMENTATION AUTHOR'S DECLARATION STATEMENT** | |
|---|---|
| 1. I certify that this Certificate of Compliance documentation is accurate and complete. | |
| Documentation Author Name: | Documentation Author Signature: |
| Company: | Signature Date: |
| Address: | CEA/HERS Certification Identification (If applicable): |
| City/State/Zip: | Phone: |

| **RESPONSIBLE PERSON'S DECLARATION STATEMENT** | |
|---|---|
| I certify the following under penalty of perjury, under the laws of the State of California:<br>1. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.<br>2. I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.<br>3. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. | |
| Responsible Designer Name: | Responsible Designer Signature: |
| Company: | Date Signed: |
| Address: | License: |
| City/State/Zip: | Phone: |