

**CERTIFICATE OF COMPLIANCE****CF1R-PRF-01E****Project Name:** 2019 Prototype 7320ft2 Prop Elec**Calculation Date/Time:** 2020-03-10T20:11:36-07:00**(Page 1 of 14)****Calculation Description:** TDSv30 V19R12 V19 R12 UGLASS15 ELEC PVSTD**Input File Name:** instance.ribd22

| GENERAL INFORMATION |  |   |    |                                   |                       |
|---------------------|--|---|----|-----------------------------------|-----------------------|
| 01                  | Project Name                                 | 2019 Prototype 7320ft2 Prop Elec          |    |                                   |                       |
| 02                  | Run Title                                    | TDSv30 V19R12 V19 R12 UGLASS15 ELEC PVSTD |    |                                   |                       |
| 03                  | Project Location                             | 1516 Ninth St                             |    |                                   |                       |
| 04                  | City   | CTZ10S22A                                 | 05 | Standards Version                 | 2022                  |
| 06                  | Zip code                                     | 95814                                     | 07 | Software Version                  | CBECC-Res 2022.0.2 RV |
| 08                  | Climate Zone                                 | 10  | 09 | Front Orientation (deg/ Cardinal) | 0                     |
| 10                  | Building Type                                | Multifamily                               | 11 | Number of Dwelling Units          | 8                     |
| 12                  | Project Scope                                | NewConstruction                           | 13 | Number of Bedrooms                | 12                    |
| 14                  | Addition Cond. Floor Area (ft <sup>2</sup> ) | 0   | 15 | Number of Stories                 | 2                     |
| 16                  | Existing Cond. Floor Area (ft <sup>2</sup> ) | n/a                                       | 17 | Fenestration Average U-factor     | 0.3                   |
| 18                  | Total Cond. Floor Area (ft <sup>2</sup> )    | 7320                                      | 19 | Glazing Percentage (%)            | 11.21%                |
| 20                  | ADU Bedroom Count                            | n/a                                       | 21 | ADU Conditioned Floor Area        | n/a                   |
| 22                  | Is Natural Gas Available?                    | Yes                                       |    |                                   |                       |

| COMPLIANCE RESULTS |   |
|--------------------|---|
| 01                 | Building Does Not Comply  |
| 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   |

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| ENERGY DESIGN RATING   |                               |                          |                               |                          |
|--|-------------------------------|--------------------------|-------------------------------|--------------------------|
|  | Energy Design Ratings         |                          | Compliance Margins            |                          |
|  | Efficiency <sup>1</sup> (EDR) | Total <sup>2</sup> (EDR) | Efficiency <sup>1</sup> (EDR) | Total <sup>2</sup> (EDR) |
| Standard Design  | 53.8                          | 25.8                     |                               |                          |
| Proposed Design  | 58                            | 29.7                     | -4.2                          | -3.9                     |
| <b>RESULT: <sup>3</sup>: DOES NOT COMPLY</b>   |                               |                          |                               |                          |
| 1: Efficiency EDR includes improvements to the building envelope and more efficient equipment  |                               |                          |                               |                          |
| 2: Total EDR includes efficiency and demand response measures such as photovoltaic (PV) systems and batteries  |                               |                          |                               |                          |
| 3: Building complies when efficiency and total compliance margins are greater than or equal to zero  |                               |                          |                               |                          |
| <ul style="list-style-type: none"> <li>Standard Design PV Capacity: 15.10 kWdc</li> <li>PV System resized to 15.10 kWdc (a factor of 15.101) to achieve 'Standard Design PV' PV scaling</li> </ul> |                               |                          |                               |                          |

| ENERGY USE SUMMARY                    |                 |                 |                   |                     |
|---------------------------------------|-----------------|-----------------|-------------------|---------------------|
| Energy Use (kTDV/ft <sup>2</sup> -yr) | Standard Design | Proposed Design | Compliance Margin | Percent Improvement |
| Space Heating                         | 5.27            | 5.02            | 0.25              | 4.7                 |
| Space Cooling                         | 24.85           | 22.51           | 2.34              | 9.4                 |
| IAQ Ventilation                       | 7               | 7               | 0                 | 0                   |
| Water Heating                         | 7.75            | 20.85           | -13.1             | -169                |
| Self Utilization Credit               | n/a             | 0               | 0                 | n/a                 |
| <b>Compliance Energy Total</b>        | <b>44.87</b>    | <b>55.38</b>    | <b>-10.51</b>     | <b>-23.4</b>        |

| REQUIRED PV SYSTEMS - SIMPLIFIED |           |             |                    |                   |      |               |            |                   |                 |                   |                         |
|----------------------------------|-----------|-------------|--------------------|-------------------|------|---------------|------------|-------------------|-----------------|-------------------|-------------------------|
| 01                               | 02        | 03          | 04                 | 05                | 06   | 07            | 08         | 09                | 10              | 11                | 12                      |
| DC System Size (kWdc)            | Exception | Module Type | Array Type         | Power Electronics | CFI  | Azimuth (deg) | Tilt Input | Array Angle (deg) | Tilt: (x in 12) | Inverter Eff. (%) | Annual Solar Access (%) |
| 15.1                             | NA        | Standard    | Fixed (roof mount) | none              | true | 150-270       | n/a        | n/a               | <=7:12          | 96                | 100                     |

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

- PV System: 15.1 kWdc
- Indoor air quality, balanced fan
- Cool roof
- Insulation below roof deck
- Non-standard duct location (any location other than attic)
- Multifamily: Recirculating demand control
- Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed

**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 tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

**Building-level Verifications:**

- Quality insulation installation (QII)
- Indoor air quality ventilation
- Kitchen range hood

**Cooling System Verifications:**

- Minimum Airflow
- Verified Refrigerant Charge
- Fan Efficacy Watts/CFM

**Heating System Verifications:**

- -- None --

**HVAC Distribution System Verifications:**

- Duct leakage testing
- Ducts located entirely in conditioned space confirmed by duct leakage testing

**Domestic Hot Water System Verifications:**

- -- None --

**BUILDING - FEATURES INFORMATION**

| 01                               | 02  | 03                       | 04                 | 05              | 06                                    | 07                              |
|----------------------------------|---|--------------------------|--------------------|-----------------|---------------------------------------|---------------------------------|
| Project Name                     | Conditioned Floor Area (ft <sup>2</sup> ) | Number of Dwelling Units | Number of Bedrooms | Number of Zones | Number of Ventilation Cooling Systems | Number of Water Heating Systems |
| 2019 Prototype 7320ft2 Prop Elec | 7320                                      | 8                        | 12                 | 2               | 0                                     | 8                               |

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| ZONE INFORMATION |             |                                    |                     |                          |
|------------------|-------------|------------------------------------|---------------------|--------------------------|
| 01               | 02          | 03                                 | 04                  | 05                       |
| Zone Name        | Zone Type   | Zone Floor Area (ft <sup>2</sup> ) | Avg. Ceiling Height | Number of Dwelling Units |
| Zone1            | Conditioned | 3660                               | 8                   | 4                        |
| Zone2            | Conditioned | 3660                               | 8                   | 4                        |

| DWELLING UNIT INFORMATION       |                    |       |
|---------------------------------|--------------------|-------|
| 01                              | 02                 | 03    |
| Dwelling Unit Name              | Dwelling Unit Type | Zone  |
| OneBedroomDownstairsZone1-(1/2) | OneBedroom         | Zone1 |
| OneBedroomDownstairsZone1-(2/2) | OneBedroom         | Zone1 |
| TwoBedroomDownstairsZone1-(1/2) | TwoBedroom         | Zone1 |
| TwoBedroomDownstairsZone1-(2/2) | TwoBedroom         | Zone1 |
| OneBedroomUpstairsZone1-(1/2)   | OneBedroom         | Zone2 |
| OneBedroomUpstairsZone1-(2/2)   | OneBedroom         | Zone2 |
| TwoBedroomUpstairsZone1-(1/2)   | TwoBedroom         | Zone2 |
| TwoBedroomUpstairsZone1-(2/2)   | TwoBedroom         | Zone2 |

| DWELLING UNIT TYPES |           |                    |                    |  |                 |                             |
|---------------------|-----------|--------------------|--------------------|--|-----------------|-----------------------------|
| 01                  | 02        | 03                 | 04                 | 05   | 06              | 07                          |
| Name                | CFA (ft2) | Number of Bedrooms | Number in Building | Space Conditioning Systems Assigned  | DHW System Name | IAQ Vent Fan Name           |
| OneBedroom          | 750       | 1                  | 4                  | OneBedroomUpstairsZone1 1/2  <br>CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3<br>OneBedroomUpstairsZone1 2/2  <br>CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3 | DHWHeatpump     | Specify Individual IAQ Fans |

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| DWELLING UNIT TYPES |           |                    |                    |  |                 |                             |
|---------------------|-----------|--------------------|--------------------|--|-----------------|-----------------------------|
| 01                  | 02        | 03                 | 04                 | 05   | 06              | 07                          |
| Name                | CFA (ft2) | Number of Bedrooms | Number in Building | Space Conditioning Systems Assigned  | DHW System Name | IAQ Vent Fan Name           |
| TwoBedroom          | 1080      | 2                  | 4                  | TwoBedroomUpstairsZone1 1/2  <br>CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3<br>TwoBedroomUpstairsZone1 2/2  <br>CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3 | DHWHeatpump     | Specify Individual IAQ Fans |

| OPAQUE SURFACES           |       |                          |         |             |                               |                            |            |
|---------------------------|-------|--------------------------|---------|-------------|-------------------------------|----------------------------|------------|
| 01                        | 02    | 03                       | 04      | 05          | 06                            | 07                         | 08         |
| Name                      | Zone  | Construction             | Azimuth | Orientation | Gross Area (ft <sup>2</sup> ) | Window and Door Area (ft2) | Tilt (deg) |
| Zone1WallFront            | Zone1 | Exterior Wall Cons       | 0       | Front       | 1037                          | 244.7                      | 90         |
| Zone1WallLeft             | Zone1 | Exterior Wall Cons       | 90      | Left        | 255                           | 40.5                       | 90         |
| Zone1WallBack             | Zone1 | Exterior Wall Cons       | 180     | Back        | 1037                          | 164.7                      | 90         |
| Zone1WallRight            | Zone1 | Exterior Wall Cons       | 270     | Right       | 255                           | 40.5                       | 90         |
| Zone2WallFront            | Zone2 | Exterior Wall Cons       | 0       | Front       | 1037                          | 244.7                      | 90         |
| Zone2WallLeft             | Zone2 | Exterior Wall Cons       | 90      | Left        | 255                           | 40.5                       | 90         |
| Zone2WallBack             | Zone2 | Exterior Wall Cons       | 180     | Back        | 1037                          | 164.7                      | 90         |
| Zone2WallRight            | Zone2 | Exterior Wall Cons       | 270     | Right       | 255                           | 40.5                       | 90         |
| Zone2ToAtticCeiling       | Zone2 | Ceiling Below Attic Cons | n/a     | n/a         | 3660                          | n/a                        | n/a        |
| Zone2ToZone1InteriorFloor | Zone2 | Interior Floor           | n/a     | n/a         | 3660                          | n/a                        | n/a        |

| ATTIC |                 |            |                     |                  |                |                 |           |
|-------|-----------------|------------|---------------------|------------------|----------------|-----------------|-----------|
| 01    | 02              | 03         | 04                  | 05               | 06             | 07              | 08        |
| Name  | Construction    | Type       | Roof Rise (x in 12) | Roof Reflectance | Roof Emittance | Radiant Barrier | Cool Roof |
| Attic | Attic Roof Cons | Ventilated | 5                   | 0.2              | 0.85           | No              | Yes       |

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| FENESTRATION / GLAZING |        |                |             |         |            |             |       |                         |          |                 |      |             |                  |
|------------------------|--------|----------------|-------------|---------|------------|-------------|-------|-------------------------|----------|-----------------|------|-------------|------------------|
| 01                     | 02     | 03             | 04          | 05      | 06         | 07          | 08    | 09                      | 10       | 11              | 12   | 13          | 14               |
| Name                   | Type   | Surface        | Orientation | Azimuth | Width (ft) | Height (ft) | Mult. | Area (ft <sup>2</sup> ) | U-factor | U-factor Source | SHGC | SHGC Source | Exterior Shading |
| Zone1WinFront          | Window | Zone1WallFront | Front       | 0       | 3          | 5           | 10    | 164.7                   | 0.3      | NFRC            | 0.23 | NFRC        | Bug Screen       |
| Zone1WinLeft           | Window | Zone1WallLeft  | Left        | 90      | 3          | 5           | 2     | 40.5                    | 0.3      | NFRC            | 0.23 | NFRC        | Bug Screen       |
| Zone1WinBack           | Window | Zone1WallBack  | Back        | 180     | 3          | 5           | 10    | 164.7                   | 0.3      | NFRC            | 0.23 | NFRC        | Bug Screen       |
| Zone1WinRight          | Window | Zone1WallRight | Right       | 270     | 3          | 5           | 2     | 40.5                    | 0.3      | NFRC            | 0.23 | NFRC        | Bug Screen       |
| Zone2WinFront          | Window | Zone2WallFront | Front       | 0       | 3          | 5           | 10    | 164.7                   | 0.3      | NFRC            | 0.23 | NFRC        | Bug Screen       |
| Zone2WinLeft           | Window | Zone2WallLeft  | Left        | 90      | 3          | 5           | 2     | 40.5                    | 0.3      | NFRC            | 0.23 | NFRC        | Bug Screen       |
| Zone2WinBack           | Window | Zone2WallBack  | Back        | 180     | 3          | 5           | 10    | 164.7                   | 0.3      | NFRC            | 0.23 | NFRC        | Bug Screen       |
| Zone2WinRight          | Window | Zone2WallRight | Right       | 270     | 3          | 5           | 2     | 40.5                    | 0.3      | NFRC            | 0.23 | NFRC        | Bug Screen       |

| OPAQUE DOORS   |                  |                         |          |
|----------------|------------------|-------------------------|----------|
| 01             | 02               | 03                      | 04       |
| Name           | Side of Building | Area (ft <sup>2</sup> ) | U-factor |
| Zone1DoorFront | Zone1WallFront   | 80                      | 0.2      |
| Zone2DoorFront | Zone2WallFront   | 80                      | 0.2      |

| SLAB FLOORS |       |                         |                |                               |                   |        |
|-------------|-------|-------------------------|----------------|-------------------------------|-------------------|--------|
| 01          | 02    | 03                      | 04             | 05                            | 06                | 07     |
| Name        | Zone  | Area (ft <sup>2</sup> ) | Perimeter (ft) | Edge Insul. R-value and Depth | Carpeted Fraction | Heated |
| Zone1Slab   | Zone1 | 3660                    | 304            | None                          | 80%               | No     |

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| OPAQUE SURFACE CONSTRUCTIONS |                        |                     |  |                      |  |          |  |
|------------------------------|------------------------|---------------------|--|----------------------|--|----------|--|
| 01                           | 02                     | 03                  | 04                                       | 05                   | 06                                     | 07       | 08   |
| Construction Name            | Surface Type           | Construction Type   | Framing                                  | Total Cavity R-value | Interior / Exterior Continuous R-value | U-factor | Assembly Layers  |
| Exterior Wall Cons           | Exterior Walls         | Wood Framed Wall    | 2x6 @ 16 in. O. C.                       | R-21                 | None / R-4                             | 0.051    | Inside Finish: Gypsum Board<br>Cavity / Frame: R-21 / 2x6<br>Sheathing / Insulation: R-4 Sheathing<br>Exterior Finish: Synthetic Stucco                            |
| Attic Roof Cons              | Attic Roofs            | Wood Framed Ceiling | 2x4 @ 24 in. O. C.                       | R-19                 | None / None                            | 0.055    | Roofing: 10 PSF (RoofTile)<br>Tile Gap: present<br>Roof Deck: Wood<br>Siding/sheathing/decking<br>Cavity / Frame: R-13.0 / 2x4<br>Around Roof Joists: R-6.0 insul. |
| Ceiling Below Attic Cons     | Ceilings (below attic) | Wood Framed Ceiling | 2x4 Bottom Chord of Truss @ 24 in. O. C. | R-38                 | None / None                            | 0.025    | Over Ceiling Joists: R-28.9 insul.<br>Cavity / Frame: R-9.1 / 2x4 Btm Chrd<br>Inside Finish: Gypsum Board  |
| Interior Floor               | Interior Floors        | Wood Framed Floor   | 2x12 @ 16 in. O. C.                      | R-0                  | None / None                            | 0.196    | Floor Surface: Carpeted<br>Floor Deck: Wood<br>Siding/sheathing/decking<br>Cavity / Frame: no insul. / 2x12<br>Ceiling Below Finish: Gypsum Board                  |

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

| WATER HEATING SYSTEMS |    |    |    |    |    |    |    |    |
|-----------------------|----|----|----|----|----|----|----|----|
| 01                    | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 |

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| Name        | System Type              | Number of Systems in Building | Multi-Family Distribution Type             | Dwelling Unit Distribution Type | Water Heater Name (#)  | Solar Heating System | Compact Distribution | HERS Verification |
|-------------|--------------------------|-------------------------------|--|---------------------------------|------------------------|----------------------|----------------------|-------------------|
| DHWHeatpump | Domestic Hot Water (DHW) | 1                             | Multi-family: Recirculating demand control | Standard Distribution System    | DHWHeatpump-heater (1) | n/a                  | None                 | n/a               |

| WATER HEATERS |                      |           |         |                 |                             |                       |                                   |                               |                             |                               |                                    |
|---------------|----------------------|-----------|---------|-----------------|-----------------------------|-----------------------|-----------------------------------|-------------------------------|-----------------------------|-------------------------------|------------------------------------|
| 01            | 02                   | 03        | 04      | 05              | 06                          | 07                    | 08                                | 09                            | 10                          | 11                            | 12                                 |
| Name          | Heating Element Type | Tank Type | # Units | Tank Vol. (gal) | Energy Factor or Efficiency | Input Rating or Pilot | Tank Insulation R-value (Int/Ext) | Standby Loss or Recovery Eff. | 1st Hr. Rating or Flow Rate | NEEA Heat Pump Brand or Model | Tank Location or Ambient Condition |
| Heatpump      | Heat Pump            | n/a       | 16      | 83              | NEEA                        | n/a                   | n/a                               | n/a                           | n/a                         | Sanden\SandenGUS_SAN83SSAQA   | Outside                            |

| WATER HEATERS - CHPWH |                      |                       |                        |                            |                           |                           |
|-----------------------|----------------------|-----------------------|------------------------|----------------------------|---------------------------|---------------------------|
| 01                    | 02                   | 03                    | 04                     | 05                         | 06                        | 07                        |
| Name                  | HPWH Compressor Type | Number of Compressors | Loop Tank Volume (gal) | Loop Tank Heater Type      | Primary Tank Volume (gal) | Recirc Pump Power (Watts) |
| DHWHeatpump           | Sanden               | 2                     | 80                     | Commercial Elec Resistance | 67.5                      | 10                        |

| WATER HEATING - HERS VERIFICATION           |                 |                 |                      |                           |                       |                          |                                  |
|---|-----------------|-----------------|----------------------|---------------------------|-----------------------|--------------------------|----------------------------------|
| 01  | 02              | 03              | 04                   | 05                        | 06                    | 07                       | 08                               |
| Name  | Pipe Insulation | Parallel Piping | Compact Distribution | Compact Distribution Type | Recirculation Control | Central DHW Distribution | Shower Drain Water Heat Recovery |
| OneBedroomDownstairsZone1 1/2   DHWHeatpump | Not Required    | Not Required    | Not Required         | None                      | Not Required          | Not Required             | Not Required                     |
| OneBedroomDownstairsZone1 2/2   DHWHeatpump | Not Required    | Not Required    | Not Required         | None                      | Not Required          | Not Required             | Not Required                     |

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|---|-----------------|-----------------|----------------------|---------------------------|-----------------------|--------------------------|----------------------------------|
| 01  | 02              | 03              | 04                   | 05                        | 06                    | 07                       | 08                               |
| Name  | Pipe Insulation | Parallel Piping | Compact Distribution | Compact Distribution Type | Recirculation Control | Central DHW Distribution | Shower Drain Water Heat Recovery |
| TwoBedroomDownstairsZone1 1/2   DHWHeatpump | Not Required    | Not Required    | Not Required         | None                      | Not Required          | Not Required             | Not Required                     |
| TwoBedroomDownstairsZone1 2/2   DHWHeatpump | Not Required    | Not Required    | Not Required         | None                      | Not Required          | Not Required             | Not Required                     |
| OneBedroomUpstairsZone1 1/2   DHWHeatpump   | Not Required    | Not Required    | Not Required         | None                      | Not Required          | Not Required             | Not Required                     |
| OneBedroomUpstairsZone1 2/2   DHWHeatpump   | Not Required    | Not Required    | Not Required         | None                      | Not Required          | Not Required             | Not Required                     |
| TwoBedroomUpstairsZone1 1/2   DHWHeatpump   | Not Required    | Not Required    | Not Required         | None                      | Not Required          | Not Required             | Not Required                     |
| TwoBedroomUpstairsZone1 2/2   DHWHeatpump   | Not Required    | Not Required    | Not Required         | None                      | Not Required          | Not Required             | Not Required                     |

| SPACE CONDITIONING SYSTEMS   |                                  |                   |                   |                 |                       |                          |        |                             |                         |                         |
|--|----------------------------------|-------------------|-------------------|-----------------|-----------------------|--------------------------|--------|-----------------------------|-------------------------|-------------------------|
| 01   | 02                               | 03                | 04                | 05              | 06                    | 07                       | 08     | 09                          | 10                      | 11                      |
| Name   | System Type                      | Heating Unit Name | Cooling Unit Name | Fan Name        | Distribution Name     | Required Thermostat Type | Status | Verified Existing Condition | Heating Equipment Count | Cooling Equipment Count |
| OneBedroomDownstairsZone1 1/2   CoolingComponent:Heating Component:AirDistributionSystem:HVACFan-Furnace:1:3 | Heating and cooling system other | HeatingComponent  | CoolingComponent  | HVACFan-Furnace | AirDistributionSystem | Setback                  | New    | NA                          | 1                       | 1                       |

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|--|-------------------------------------|-------------------|-------------------|-----------------|-----------------------|--------------------------|--------|-----------------------------|-------------------------|-------------------------|
| 01   | 02                                  | 03                | 04                | 05              | 06                    | 07                       | 08     | 09                          | 10                      | 11                      |
| Name   | System Type                         | Heating Unit Name | Cooling Unit Name | Fan Name        | Distribution Name     | Required Thermostat Type | Status | Verified Existing Condition | Heating Equipment Count | Cooling Equipment Count |
| OneBedroomDownstairsZone1 2/2  <br>CoolingComponent:Heating<br>Component:AirDistributionSystem:HVACFan-Furnace:1:3 | Heating and cooling system<br>other | HeatingComponent  | CoolingComponent  | HVACFan-Furnace | AirDistributionSystem | Setback                  | New    | NA                          | 1                       | 1                       |
| TwoBedroomDownstairsZone1 1/2  <br>CoolingComponent:Heating<br>Component:AirDistributionSystem:HVACFan-Furnace:1:3 | Heating and cooling system<br>other | HeatingComponent  | CoolingComponent  | HVACFan-Furnace | AirDistributionSystem | Setback                  | New    | NA                          | 1                       | 1                       |
| TwoBedroomDownstairsZone1 2/2  <br>CoolingComponent:Heating<br>Component:AirDistributionSystem:HVACFan-Furnace:1:3 | Heating and cooling system<br>other | HeatingComponent  | CoolingComponent  | HVACFan-Furnace | AirDistributionSystem | Setback                  | New    | NA                          | 1                       | 1                       |
| OneBedroomUpstairsZone1 1/2  <br>CoolingComponent:Heating<br>Component:AirDistributionSystem:HVACFan-Furnace:1:3   | Heating and cooling system<br>other | HeatingComponent  | CoolingComponent  | HVACFan-Furnace | AirDistributionSystem | Setback                  | New    | NA                          | 1                       | 1                       |
| OneBedroomUpstairsZone1 2/2  <br>CoolingComponent:Heating<br>Component:AirDistributionSystem:HVACFan-Furnace:1:3   | Heating and cooling system<br>other | HeatingComponent  | CoolingComponent  | HVACFan-Furnace | AirDistributionSystem | Setback                  | New    | NA                          | 1                       | 1                       |
| TwoBedroomUpstairsZone1 1/2  <br>CoolingComponent:Heating<br>Component:AirDistributionSystem:HVACFan-Furnace:1:3   | Heating and cooling system<br>other | HeatingComponent  | CoolingComponent  | HVACFan-Furnace | AirDistributionSystem | Setback                  | New    | NA                          | 1                       | 1                       |

**Registration Number:**
**Registration Date/Time:**
**HERS Provider:**

**CERTIFICATE OF COMPLIANCE**
**CF1R-PRF-01E**
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**Input File Name:** instance.ribd22

| SPACE CONDITIONING SYSTEMS   |                                  |                   |                   |                 |                       |                          |        |                             |                         |                         |
|--|----------------------------------|-------------------|-------------------|-----------------|-----------------------|--------------------------|--------|-----------------------------|-------------------------|-------------------------|
| 01   | 02                               | 03                | 04                | 05              | 06                    | 07                       | 08     | 09                          | 10                      | 11                      |
| Name   | System Type                      | Heating Unit Name | Cooling Unit Name | Fan Name        | Distribution Name     | Required Thermostat Type | Status | Verified Existing Condition | Heating Equipment Count | Cooling Equipment Count |
| TwoBedroomUpstairsZone1 2/2   CoolingComponent:Heating Component:AirDistributionSystem:HVACFan-Furnace:1:3 | Heating and cooling system other | HeatingComponent  | CoolingComponent  | HVACFan-Furnace | AirDistributionSystem | Setback                  | New    | NA                          | 1                       | 1                       |

| HVAC - HEATING UNIT TYPES |                     |                 |                    |
|---------------------------|---------------------|-----------------|--------------------|
| 01                        | 02                  | 03              | 04                 |
| Name                      | System Type         | Number of Units | Heating Efficiency |
| HeatingComponent          | Central gas furnace | 8               | AFUE-80            |

| HVAC - COOLING UNIT TYPES |                  |                 |                |                 |                    |                       |                            |
|---------------------------|------------------|-----------------|----------------|-----------------|--------------------|-----------------------|----------------------------|
| 01                        | 02               | 03              | 04             | 05              | 06                 | 07                    | 08                         |
| Name                      | System Type      | Number of Units | Efficiency EER | Efficiency SEER | Zonally Controlled | Multispeed Compressor | HERS Verification          |
| CoolingComponent          | Central split AC | 8               | 11.7           | 14              | Not Zonal          | Single Speed          | CoolingComponent-hers-cool |

| HVAC COOLING - HERS VERIFICATION |                  |                |              |               |                             |
|----------------------------------|------------------|----------------|--------------|---------------|-----------------------------|
| 01                               | 02               | 03             | 04           | 05            | 06                          |
| Name                             | Verified Airflow | Airflow Target | Verified EER | Verified SEER | Verified Refrigerant Charge |
| CoolingComponent-hers-cool       | Required         | 350            | Not Required | Not Required  | Required                    |

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| HVAC - DISTRIBUTION SYSTEMS |                            |              |                   |        |                  |                  |              |        |                |                   |                                 |
|-----------------------------|----------------------------|--------------|-------------------|--------|------------------|------------------|--------------|--------|----------------|-------------------|---------------------------------|
| 01                          | 02                         | 03           | 04                | 05     | 06               | 07               | 08           | 09     | 10             | 11                | 12                              |
|                             |                            |              | Duct Ins. R-value |        | Duct Location    |                  | Surface Area |        |                |                   |                                 |
| Name                        | Type                       | Design Type  | Supply            | Return | Supply           | Return           | Supply       | Return | Bypass Duct    | Duct Leakage      | HERS Verification               |
| AirDistributionSystem       | Conditioned space-entirely | Non-Verified | R-4.2             | R-4.2  | Conditioned Zone | Conditioned Zone | n/a          | n/a    | No Bypass Duct | Sealed and Tested | AirDistributionSystem-hers-dist |

| HVAC DISTRIBUTION - HERS VERIFICATION |                           |   |                        |                      |              |                     |                         |   |
|---------------------------------------|---------------------------|---|------------------------|----------------------|--------------|---------------------|-------------------------|---|
| 01                                    | 02                        | 03  | 04                     | 05                   | 06           | 07                  | 08                      | 09  |
| Name                                  | Duct Leakage Verification | Duct Leakage Target (%)                             | Verified Duct Location | Verified Duct Design | Buried Ducts | Deeply Buried Ducts | Low-leakage Air Handler | Low Leakage Ducts Entirely in Conditioned Space |
| AirDistributionSystem-hers-dist       | Yes                       | total leakage <= 12.0 or leakage to outdoors <= 6.0 | Required               | Not Required         | Not Required | Credit not taken    | Not Required            | No  |

| HVAC - FAN SYSTEMS |          |                       |                          |
|--------------------|----------|-----------------------|--------------------------|
| 01                 | 02       | 03                    | 04                       |
| Name               | Type     | Fan Power (Watts/CFM) | Name                     |
| HVACFan-Furnace    | HVAC Fan | 0.45                  | HVACFan-Furnace-hers-fan |

| HVAC FAN SYSTEMS - HERS VERIFICATION |                        |                                   |
|--------------------------------------|------------------------|-----------------------------------|
| 01                                   | 02                     | 03                                |
| Name                                 | Verified Fan Watt Draw | Required Fan Efficacy (Watts/CFM) |
| HVACFan-Furnace-hers-fan             | Required               | 0.45                              |

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| IAQ (INDOOR AIR QUALITY) FANS                    |         |               |              |                                |  |
|--|---------|---------------|--------------|--------------------------------|--|
| 01   | 02      | 03            | 04           | 05                             | 06   |
| Dwelling Unit                                    | IAQ CFM | IAQ Watts/CFM | IAQ Fan Type | IAQ Recovery Effectiveness (%) | IAQ Recovery Effectiveness - SRE<br>IAQ Recovery Effectiveness - SRE |
| OneBedroomDownstairsZone1<br>1/2 fan 1/1 cnt 1/1 | 38      | 0.6           | Balanced     |                                | n/a  |
| OneBedroomDownstairsZone1<br>2/2 fan 1/1 cnt 1/1 | 38      | 0.6           | Balanced     |                                | n/a  |
| TwoBedroomDownstairsZone1<br>1/2 fan 1/1 cnt 1/1 | 55      | 0.6           | Balanced     |                                | n/a  |
| TwoBedroomDownstairsZone1<br>2/2 fan 1/1 cnt 1/1 | 55      | 0.6           | Balanced     |                                | n/a  |
| OneBedroomUpstairsZone1<br>1/2 fan 1/1 cnt 1/1   | 38      | 0.6           | Balanced     |                                | n/a  |
| OneBedroomUpstairsZone1<br>2/2 fan 1/1 cnt 1/1   | 38      | 0.6           | Balanced     |                                | n/a  |
| TwoBedroomUpstairsZone1<br>1/2 fan 1/1 cnt 1/1   | 55      | 0.6           | Balanced     |                                | n/a  |
| TwoBedroomUpstairsZone1<br>2/2 fan 1/1 cnt 1/1   | 55      | 0.6           | Balanced     |                                | n/a  |

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CA Building Energy Efficiency Standards - 2019 Residential Compliance

Report Version: 2019.1.108  
Schema Version: rev 20200101

Report Generated: 2020-03-10 20:12:53

**CERTIFICATE OF COMPLIANCE****CF1R-PRF-01E****Project Name:** 2019 Prototype 7320ft2 Prop Elec**Calculation Date/Time:** 2020-03-10T20:11:36-07:00**(Page 14 of 14)****Calculation Description:** TDSv30 V19R12 V19 R12 UGLASS15 ELEC PVSTD**Input File Name:** instance.ribd22

| 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><ol style="list-style-type: none"><li>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.</li><li>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.</li><li>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.</li></ol> |   |
| Responsible Designer Name:   | Responsible Designer Signature:                         |
| Company:   | Date Signed:  |
| Address:   | License:  |
| City/State/Zip:  | Phone:  |

Registration Number:

Registration Date/Time:

HERS Provider: