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	CTZ14S22A	05	Standards Version	2022
06	Zip code	95814	07	Software Version	CBECC-Res 2022.0.2 RV
08	Climate Zone	14	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^2)	0	15	Number of Stories	2
16	Existing Cond. Floor Area (ft^2)	n/a	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft^2)	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**

ENERGY DESIGN RATING

	Energy Design Ratings		Compliance Margins	
	Efficiency[1] (EDR)	**Total[2] (EDR)**	**Efficiency[1] (EDR)**	**Total[2] (EDR)**
Standard Design	50.7	25.6		
Proposed Design	54.6	29.1	-3.9	-3.5

RESULT: [3:] DOES NOT COMPLY

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

- Standard Design PV Capacity: 14.40 kWdc
- PV System resized to 14.40 kWdc (a factor of 14.402) to achieve 'Standard Design PV' PV scaling

ENERGY USE SUMMARY

Energy Use (kTDV/ft^2-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	16.95	16.6	0.35	2.1
Space Cooling	26.02	23.46	2.56	9.8
IAQ Ventilation	6.95	6.95	0	0
Water Heating	7.36	21.29	-13.93	-189.3
Self Utilization Credit	n/a	0	0	n/a
Compliance Energy Total	**57.28**	**68.3**	**-11.02**	**-19.2**

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 (%)**
14.4	NA	Standard	Fixed (roof mount)	none	true	150-270	n/a	n/a	<=7:12	96	100

REQUIRED SPECIAL FEATURES

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

- PV System: 14.4 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 buildng 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^2)**	**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

ZONE INFORMATION

01	02	03	04	05
Zone Name	**Zone Type**	**Zone Floor Area (ft^2)**	**Avg. Ceiling Height**	**Number of Dweilling 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 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3 OneBedroomUpstairsZone1 2/2 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3	DHWHeatpump	Specify Individual IAQ Fans

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 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3 TwoBedroomUpstairsZone1 2/2 | 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^2)**	**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

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^2)	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^2)	U-factor
Zone1DoorFront	Zone1WallFront	80	0.2
Zone2DoorFront	Zone2WallFront	80	0.2

SLAB FLOORS

01	02	03	04	05	06	07
Name	Zone	Area (ft2)	Perimeter (ft)	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Zone1Slab	Zone1	3660	304	None	80%	No

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 Cavity / Frame: R-21 / 2x6 Sheathing / Insulation: R-4 Sheathing 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) Tile Gap: present Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: R-13.0 / 2x4 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. Cavity / Frame: R-9.1 / 2x4 Btm Chrd 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 Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x12 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

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

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**
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:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3	Heating and cooling system other	HeatingComponent	CoolingComponent	HVACFan-Furnace	AirDistributionSystem	Setback	New	NA	1	1

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 2/2 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3	Heating and cooling system other	HeatingComponent	CoolingComponent	HVACFan-Furnace	AirDistributionSystem	Setback	New	NA	1	1
TwoBedroomDownstairsZone1 1/2 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3	Heating and cooling system other	HeatingComponent	CoolingComponent	HVACFan-Furnace	AirDistributionSystem	Setback	New	NA	1	1
TwoBedroomDownstairsZone1 2/2 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3	Heating and cooling system other	HeatingComponent	CoolingComponent	HVACFan-Furnace	AirDistributionSystem	Setback	New	NA	1	1
OneBedroomUpstairsZone1 1/2 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3	Heating and cooling system other	HeatingComponent	CoolingComponent	HVACFan-Furnace	AirDistributionSystem	Setback	New	NA	1	1
OneBedroomUpstairsZone1 2/2 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3	Heating and cooling system other	HeatingComponent	CoolingComponent	HVACFan-Furnace	AirDistributionSystem	Setback	New	NA	1	1
TwoBedroomUpstairsZone1 1/2 | CoolingComponent:HeatingComponent:AirDistributionSystem:HVACFan-Furnace:1:3	Heating and cooling system other	HeatingComponent	CoolingComponent	HVACFan-Furnace	AirDistributionSystem	Setback	New	NA	1	1

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**	**Mulit-speed 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

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

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 - SREIAQ Recovery Effectiveness - SRE**
OneBedroomDownstairsZone1 1/2 fan 1/1 cnt 1/1	38	0.6	Balanced		n/a
OneBedroomDownstairsZone1 2/2 fan 1/1 cnt 1/1	38	0.6	Balanced		n/a
TwoBedroomDownstairsZone1 1/2 fan 1/1 cnt 1/1	55	0.6	Balanced		n/a
TwoBedroomDownstairsZone1 2/2 fan 1/1 cnt 1/1	55	0.6	Balanced		n/a
OneBedroomUpstairsZone1 1/2 fan 1/1 cnt 1/1	38	0.6	Balanced		n/a
OneBedroomUpstairsZone1 2/2 fan 1/1 cnt 1/1	38	0.6	Balanced		n/a
TwoBedroomUpstairsZone1 1/2 fan 1/1 cnt 1/1	55	0.6	Balanced		n/a
TwoBedroomUpstairsZone1 2/2 fan 1/1 cnt 1/1	55	0.6	Balanced		n/a

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: 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. 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. 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: