



2022 Single-Family Residential Mandatory Requirements Summary

NOTE: Single-family residential buildings subject to the Energy Codes must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information.
(04/2022)

Building Envelope:

# 110.0(a)(1)	Air Leakage. Manufactured, fenestration, exterior doors, and AHA/MDMA/CSA 1011.2/2444-2011 *.
# 110.0(a)(5)	Labeling. Fenestration products and exterior doors have a label meeting the requirements of 110.111(a).
# 110.0(a)(6)	Field Testing exterior doors and fenestration products must use Factors and solar heat gain coefficient (SHGC) values from Table 110.11.2, 110.11.6 or J4.1.5 for exterior doors. They must be caulked and/or weather-stripped.
# 110.7	Air Leakage. All joints, penetrations, and other openings in the building envelope that are potential sources of air leakage must be caulked, gasketed, or weather striped.
# 110.0(a)	Insulation Certification by Manufacturers. Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHSGS).
# 110.0(a)	Insulation Requirements for Heated Slab Floors. Heated slab floors must be insulated per the requirements of § 110.0(a).
# 110.0(a)	Roofing Products Solar Reflectance and Thermal Emittance. The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.0(a) and be labeled per 110.113 when the installation of a cool roof is specified on the CFR.
# 110.0(a)	Radiant Barrier. When required, radiant barriers must have an emittance of 0.05 or less and be certified to the Department of Consumer Affairs.
# 150.0(a)(1)	Roof Deck, Ceiling and Rafter Roof Insulation. Roof decks in newly constructed attics in climate zones 4 and 3-16 area-weighted average U-factor not exceeding U-0.184. Ceiling and rafters roof minimum R-22 insulation in wood-frame ceiling, or area-weighted average U-factor must not exceed U-0.194. Ceiling and rafters roof minimum R-19 area-weighted average U-factor of 0.054 or less. All access doors must have permanently attached insulation using adhesive or mechanical fasteners. The attic access must be gasketed to prevent air leakage. Insulation must be installed in direct contact with a roof or ceiling which is sealed to limit infiltration and exfiltration, as specified in § 110.7, including but not limited to placing insulation either above or below the roof deck or on top of a drywall ceiling.
# 150.0(a)(2)	Loose-fill Insulation. Loose fill insulation must meet the manufacturer's required density for the labeled R-value.
# 150.0(a)(3)	Wall Insulation. Minimum R-13 insulation in 2nd inch wood framing wall or U-factor of 0.12 or less, or R-20 in 2nd inch wood framing or have a U-factor of 0.071 or less. Non-cavity non-bracket assemblies must have an overall assembly U-factor not exceeding 0.102. Masonry walls must meet Tables 150.1.4 or B *.
# 150.0(a)(4)	Raised-Floor Insulation. Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor *.
# 150.0(a)(5)	Slab Edge Insulation. Slab edge insulation must meet all of the following: have a water absorption ratio, for the insulation material alone without physical damage, no greater than 0.3 percent; have a water vapor permeance no greater than 2.0 perm inch; be protected from flashing and UV light deterioration; and, when installed as part of a heated slab floor, must meet the requirements of § 110.0(a).
# 150.0(a)(1)	Vapor Retarder. In climate zones 1 through 16, the earth floor of unvented crawl space must be covered with a Class I or Class II vapor retarder. This requirement also applies to conditioned ventilation crawl space for buildings complying with the exception to § 150.0(a).
# 150.0(a)(2)	Vapor Retarder. In climate zones 14 and 15, a Class I or Class II vapor retarder must be installed on the conditioned space side of the insulation in exterior walls, vented attics, and unvented attics with air-permeable insulation.
# 150.0(a)(3)	Fenestration Products. Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.45; or air-leakage U-factor of all fenestration must not exceed 0.45.
Fireplaces, Decorative Gas Appliances, and Gas Appliances	
# 110.0(e)	Pilot Light. Continuously burning pilot lights are not allowed for indoor and outdoor fireplaces.
# 150.0(e)(1)	Closable Doors. Masonry or factory-built fireplaces must have a closable metal or glass door covering the entire opening of the firebox.
# 150.0(e)(2)	Combustion Intake. Masonry or factory-built fireplaces must have a combustion outside air intake, which is at least six square inches in area and is equipped with a readily accessible, operable, and tight-fitting damper or combustion-air control device.
# 150.0(e)(3)	Flue Damper. Masonry or factory-built fireplaces must have a flue damper with a readily accessible control *.
Space Conditioning: Water Heating, and Plumbing System	
# 110.0.5 110.3	Certification. Heating, ventilation, and air conditioning (HVAC) equipment, water heaters, showereheads, faucets, and all other plumbing and heating equipment must be certified by the California Energy Commission.
# 110.0.5 110.3	HVAC Efficiency. Equipment must meet the applicable efficiency requirements in Table 110.2.14.2 through Table 110.2.14.2 *.
# 110.0.5 110.3	Controls for Heat Pumps with Supplementary Electric Resistance Heaters. Heat pumps with supplementary electric resistance heaters must have controls that prevent supplementary heater operation when the heating load can be met by the heat pump alone, and in which the cut-on temperature for compression heating is higher than the cut-off temperature for supplementary heating.
# 110.0.5 110.3	Thermostats. All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a setback thermostat *.
# 110.0.5 110.3	Insulation. Unlined service water heater storage tanks and solar water-heating backup tanks must have adequate insulation, or tank insulation, as required.
# 110.0.5 110.3	Isolation Valves. Instantaneous water heaters with an input rating greater than 6.8 kBtu per hour (2 kW) must have isolation valves with hose bibbs or other fittings on both cold and hot water lines to allow for flushing the water heater when the valves are closed.

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§ 110.5:	Pilot Lights. Continuously burning pilot lights are prohibited for natural gas; fan-type central furnaces; household cooking appliances (except appliances without an electrical supply voltage connection with pilot lights that consume less than 150 Btu per hour); and pool and spa heaters.
§ 110.5(h):	Building Cooling and Heating Loads. Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Fundamentals Volume, and the ASHRAE Handbook, Equipment Volume, and the SMACNA Residential Control System Installation Standards Manual, or the ACCA Manual J using design conditions specified in § 110.5(h)(2).
§ 110.5(h)(3A):	Clearances. Air conditioner and heat pump outdoor condensing units must have a clearance of at least five feet from the outlet of any liquid line.
§ 110.5(h)(3B):	Line-Link Driers. Air conditioners and heat pump systems must be equipped with line-link filter driers if required, as specified by the manufacturer's instructions.
§ 110.5(h)(4):	Water Piping, Solar Water-Heating System Piping, and Space Conditioning System Line Insulation. All domestic hot water piping must be insulated as specified in § 603.11 of the California Plumbing Code. *
§ 110.5(h)(5):	Insulation Protection. Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment, and wind as specified in Table 110.5(h)(5). Insulation exposed to weather must be water resistant and protected from UV light (no adhesive tapes). Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space must include, or be protected by, a Class I or Class II vapor retarder. Piping insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.
§ 110.5(h)(6):	Hot Water or Propane Water Heating Systems. Systems using gas or propane water heaters to serve individual dwelling units must designate a space at least 2'5" x 2'5" x 2' suitable for the future installation of a heat pump water heater, and meet electrical and plumbing requirements, based on the distance between this designated space and the water heater location, and a condensate drain no more than 2" higher than the base of the water heater.
§ 110.5(h)(7):	Solar Water-Heating Systems. Solar water-heating systems and components must be certified and rated by the Solar Rating and Certification Corporation (SRCC) or the International Association of Plumbing and Mechanical Officials (Rational and Testing (IAPMO R&T)), or by a listing agency that is approved by the executive director.
§ 110.5(h)(8):	Ducts and Fans:
§ 110.5(h)(9):	Ducts. Insulation installed on an existing space-conditioning duct must comply with § 604.0 of the California Mechanical Code (CMC). If a contractor installs the insulation, the contractor must certify to the customer, in writing, that the insulation meets this requirement.
§ 110.5(h)(10):	CMC Compliance. All air-distribution system ducts and plenums must meet CMC §§ 601.0-605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply air return-air ducts and plenums must be insulated to R-4 or higher, ducts located in unconditioned spaces must be confirmed to meet the requirements of Table 110.5(h)(10). R-4.1.3.8) do not require insulation. Connections of metal ducts and inner core of flexible ducts must be mechanically fastened. Openings must be sealed with mastic, tape, or other duct-closure system that meets the applicable UL requirements, or aerosol sealed as meets UL 723. The combination of mastic and either mesh or tape must be used to seal openings greater than 1/4". If mastic or tape is used, Building cavities, air handler support structures, and plenums separated or constructed with materials other than sheet metal, duct board, or flexible duct must not be used to convey conditioned air. Building cavities and support platforms may contain ducts; ducts installed in these spaces must not be compressed.
§ 110.5(h)(11):	Factory-Fabricated Duct Systems. Factory-fabricated duct systems must comply with applicable requirements for duct construction, components, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive or other tapes unless tape is specifically approved for use with the duct system and its components.
§ 110.5(h)(12):	Field-Fabricated Duct Systems. Field-fabricated duct systems must comply with applicable requirements for: pressure-sensitive tapes, mastics, sealants, and other requirements specified for duct construction.
§ 110.5(h)(13):	Backdraft Damper. Fan systems that exchange air between the conditioned space and outdoors must have backdraft or automatic dampers.
§ 110.5(h)(14):	Gravity Ventilation Dampers. Gravity ventilating systems serving conditioned space must have either automatic or readily accessible, manually operated dampers in all openings to the outside, except combustion inlet and outlet air openings and elevator shaft vents.
§ 110.5(h)(15):	Protection of Insulation. Insulation must be protected from damage due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather must be suitable for outdoor service (e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover). Collar from insulation must be protected as above or painted with a water resistant and solar radiation-resistant coating.
§ 110.5(h)(16):	Porous Inner Core Flex Duct. Porous inner cores of flex ducts must have a non-porous layer or air barrier between the inner core and outer vapor barrier.
§ 110.5(h)(17):	Duct System Sealing and Leakage Test. When space conditioning systems use forced air duct systems to supply conditioned air to an occupied space, the ducts must be sealed and tested, using a pressure testing set, as confirmed through field verification and diagnostic testing in accordance with Reference Residential Appendix RAS.1.
§ 110.5(h)(18):	Air Filtration. Space conditioning systems with ducts exceeding 10 inch and the supply side of system supply must have MERV 13 or equivalent filters. Filters for space conditioning systems must have a two inch depth or can be one inch in sized per Equation 150.0-A. Clean-filter pressure drop and labeling must meet the requirements in § 150.0(m)(2). Filters must be accessible for regular service. Filter racks or grilles must use gaskets, sealants, or other means to close gaps around the inserted filters to prevent air from bypassing the filter. *

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	Space Conditioning System Airflow Rate and Fan Efficiency. Space conditioning systems that use ducts to supply cooling must have the air for the placement of a static pressure probe, or a permanently installed static pressure probe in the supply plenum. Airflow must be ≥ 0.50 CFM per ton of cooling capacity, and an air-handling unit fan efficiency is ≥ 0.45 watts per CFM for gas furnace air handlers and ≥ 0.58 watts per CFM for all others. Small duct high velocity systems must provide an airflow ≥ 250 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficiency ≥ 0.62 watts per CFM. Field verification testing is required in accordance with Reference Residential Appendix RA3.3.
§ 150.0(v)(1):	
Ventilation and Indoor Air Quality:	
§ 150.0(o):	Requirements for Ventilation and Indoor Air Quality. All dwelling units must meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in § 150.0(v).
§ 150.0(i)(B):	Central Fan Integrated (CFI) Ventilation Systems. Continuous operation of CFI air handlers is not allowed to provide the whole-dwelling unit ventilation system required per § 150.0(i)(C). A motorized damper must be installed on the ventilation duct(s) that prevents all airflow through the space conditioning duct system when the damper(s) is closed and controlled by § 150.0(i)(B)(i)(iv). CFI ventilation systems must have controls that track outdoor air ventilation run time, and either open or close the motorized damper(s) for compliance with § 150.0(i)(C).
§ 150.0(i)(C):	Whole-Dwelling Unit Mechanical Ventilation for Single-Family Detached and townhouses. Single-family detached dwelling units, and attached dwelling units not sharing ceilings or floors with other dwelling units, occupiable spaces, public garages, or commercial spaces must have mechanical ventilation airflow specified ≥ 1 n50.0(i)(C)(ii).
§ 150.0(i)(G):	Local Mechanical Exhaust. Kitchens and bathrooms must have local mechanical exhaust; nonenclosed kitchens must have demand-controlled exhaust system meeting requirements of § 150.0(i)(G). Enclosed kitchens and bathrooms can use demand-controlled or continuous exhaust meeting § 150.0(i)(G). Airflow must be measured by the installer per § 150.0(i)(G)(iv), and rated for sound per § 150.0(i)(G)(iv).
§ 150.0(i)(H)(A):	Airflow Measurement and Sound Ratings of Whole-Dwelling Unit Ventilation Systems. The airflow required per § 150.0(i)(C) must be measured by using a flow hood, flow grid, or other airflow measuring device at the fan's inlet or outlet terminals/girds per Reference Residential Appendix RA3.7. Whole-dwelling unit ventilation systems must be rated for sound per ASHRAE 92.2 § 7.2 at no less than the minimum airflow rate required by § 150.0(i)(C).
§ 150.0(i):	Field Verification and Diagnostic Testing. Whole-Dwelling Unit ventilation unit, vented range hood airflow and sound rating, and HRV and ERV fan efficiency must be verified in accordance with Reference Residential Appendix RA3.7. Vented range hood airflow and sound ratings must be verified per Reference Residential Appendix RA3.7.3 to confirm if it is rated by HVI or AHAM to comply with the airflow rates and sound requirements per § 150.0(i)(G).
Pool and Spa Systems and Equipment:	
§ 110.4(a):	Certification by Manufacturers. Any pool or spa heating system or equipment must be certified to have all of the following: compliance with the Appliance Efficiency Regulations and listed in NAEBS; an on-off switch mounted outside of the heater that allows shutting off the heater without affecting the thermostat setting; a permanent weatherproof plate or cap with operating instructions; and must not use electric resistance heating.
§ 110.4(b):	Piping. Any pool or spa heating system or equipment must be installed with at least 36 inches of pipe between the filter and the heater, or between the heater and return lines, and must be installed with at least 36 inches of pipe between the heater and the gas solenoid heater.
§ 110.4(c):	Covers. Outdoor pools or spas that have a heat pump or gas heater must have a cover.
§ 110.4(d):	Directional Inlets and Time Switches for Pools. Pools must have directional inlets that adequately mix the pool water, and a time switch that will allow pumps to be set or programmed to run only during off-peak electrical demand periods.
§ 110.5:	Pilot Light. Natural gas pool and spa heaters must not have a continuously burning pilot light.
§ 150.0(p):	Pool Systems and Equipment Installation. Residential pool systems or equipment must meet the specified requirements for pump sizing, flow rate, piping, filters, and valves.
Lighting:	
§ 110.9:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.
§ 150.0(k)(A):	Luminaires/Efficiency. All installed luminaires must meet the requirements in Table 50.0-4, excepting integral to bathroom fans, kitchen range hoods, bath vanity mirrors, and garage door openers; negotiation lighting less than 5 watts; and lighting integral to drawers, cabinets, and linen closets with an efficacy of at least 45 lumens per watt.
§ 150.0(k)(B):	Covered luminaires. Luminaires must contain lamps that comply with Reference Joint Appendix JA8.
§ 150.0(k)(C):	Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must not contain covered sockets; must be airtight, and must be sealed with a gasket or caulk. California Electrical Code § 410.116 must also be met.
§ 150.0(k)(D):	Light Sources in Enclosed or Recessed Luminaires. Lamps and other separable light sources that are not compliant with the JA8 identified temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.
§ 150.0(k)(E):	Blank Electrical Boxes. The number of electrical boxes that are more than five feet above the finished floor and do not contain a luminaire or other device shall be no more than the number of bedrooms. These boxes must be serviced by a dimmer, vacancy sensor circuit, low voltage wiring, or fan speed control.
§ 150.0(k)(F):	Lighting Integral to Exhaust Fans. Lighting integral to exhaust fans (except when installed by the manufacturer in kitchen exhaust hoods) must meet the applicable requirements of § 150.0(i).

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\$ § 100.01(G)	Scrow based luminaires. Scrow based luminaires must contain lamps that comply with Reference Joint Appendix A8.
\$ § 100.01(H)	Light Sources in Enclosed or Reccessed Luminaires. Lamps and other separable light sources that are not compliant with the JAB elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.
\$ § 100.01(I)	Light Sources in Drawers, Cabinets, and Linen Closets. Light sources installed in drawers, cabinetry or linen closets are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided that they are rated to consume no more than 5 watts of power, emit no more than 150 lumens, and are equipped with controls that automatically turn the lighting off when the drawer, cabinet or linen closet is closed.
\$ § 100.02(A)	Interior Switches and Controls. All forward phase cut dimmers used with LED light sources must comply with NEMA SSL 7A.
\$ § 100.02(B)	Interior Switches and Controls. Exhaust fans must be controlled separately from lighting systems.
\$ § 100.02(C)	Accessories/Controls. Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned on and off.
\$ § 100.02(D)	Multiple Controls. Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the dimmer or sensor is installed to comply with § 150.0(C).
\$ § 100.02(E)	Mandatory Requirements. Lighting controls must comply with the applicable requirements of § 110.0.
\$ § 100.02(F)	Energy Management Control Systems. An energy management control system (EMCS) may be used to comply with dimming, occupancy, and control requirements if it provides the functionality of the specified control per § 110.0 and the physical controls specified in § 150.02(A).
\$ § 100.02(G)	Automatic Shutout Controls. In bathrooms, garages, laundry rooms, utility rooms and walk-in closets, at least one installed luminaire must be controlled by an occupancy or vacancy sensor providing automatic off-functionality. Lighting inside drawers and cabinets with opaque fronts or doors must have controls that turn the light off when the drawer or door is closed.
\$ § 100.02(H)	Dimmers. Lighting in habitable spaces (e.g. living rooms, dining rooms, kitchens, and bedrooms) must have readily accessible wall-mounted dimming controls. Dimmers must be manually adjusted up and down. Forward phase cut dimmers controlling LED light sources in these spaces must comply with NEMA SSL 7A.
\$ § 100.02(I)	Independent controls. Integrated lighting of exhaust fans shall be controlled independently from the lights. Lighting under cabinets or shelves, lighting in display cabinets, and switched outlets must be controlled separately from ceiling-installed lighting.
\$ § 100.02(J)	Residential Outdoor Lighting. Exterior lighting for residential buildings, outdoor lighting personnel shall be required to install in other buildings the same set, must have a manual on/off switch and either a photohot and motion sensor or automatic time switch or an astronomical time clock. An energy management control system that provides the specified control functionality and meets all applicable requirements may be used to meet these requirements.
\$ § 100.02(K)	Internally illuminated address signs. Internally illuminated address signs must either comply with § 140.0.8 or consume no more than 5 watts of power.
\$ § 100.04(A)	Residential Garages for Eight or More Vehicles. Lighting for residential parking garages for eight or more vehicles must comply with the applicable requirements for nonresidential garages in §§ 110.0, 130.0, 130.1, 130.4, 140.0, and 141.0.
\$ § 100.05	Solar Readiness:
\$ § 110.01(A)	Single-Family Residences. Single-family residences located in subdivisions with 10 or more single-family residences and where the application for a tentative subdivision map for the residences has been deemed complete and approved by the enforcement agency, which do not have a photovoltaic system installed, must comply with the requirements of § 110.01(b)-(e).
\$ § 110.01(B)	Minimum Solar Zone Area. The minimum solar zone area must have a total area of at least 100 square feet. The solar zone must comply with access, pathway, shade, ventilation, and spacing requirements as specified in Table 2A. Part 9 of other parts of the Title 24 or in any requirements adopted by a local jurisdiction. The solar zone total area must be comprised of areas that have no dimension less than 5 feet and are no less than 80 square feet each for buildings with roof areas less than or equal to 10,000 square feet or no less than 160 square feet each for buildings with roof areas greater than 10,000 square feet. For buildings with roof areas less than 10,000 square feet, the solar zone must be located on the roof or overhang of the building and have a total area no less than 250 square feet.
\$ § 110.01(b)(1)	Azimuth. All sections of the solar zone located on steep-sloped roofs must have an azimuth between 90-300° of true north.
\$ § 110.01(b)(2)	Shading. The solar zone must not contain any obstructions, including but not limited to vents, chimneys, architectural features, and roof-mounted equipment.
\$ § 110.01(b)(3B)	Shading. Any obstruction located on the roof or any part of the building that projects above a solar zone must be located at least twice the horizontal distance of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane.
\$ § 110.01(b)(4)	Structural Design Loads on Construction Documents. For areas of the roof designated as a solar zone, the structural design loads for roof dead load and roof live load must be clearly indicated on the construction documents.
\$ § 110.01(C)	Interconnection Pathways. The construction documents must indicate: a location reserved for inverters and metering equipment and a pathway reserved for routing piping from the solar zone to the point of connection with the electrical service; and for single-family residences and central water-heating systems, a pathway reserved for routing plumbing from the solar zone to the water-heating system.
\$ § 110.01(D)	Documentation. A copy of the construction documents or a comparable document indicating the information from § 110.01(b)-(c) must be provided to the applicant.
\$ § 110.01(E)	Main Electrical Service Panel. The main electrical service panel must have a minimum busbar rating of 200 amps.
\$ § 110.01(F)	Main Electrical Service Panel. The main electrical service panel must have a reserved space to allow for the installation of a double circuit breaker for a future solar electric installation. The reserved space must be permanently marked as "For Future Solar Electric."

Electric and Energy Storage Ready:

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§ 500.0(a)	Energy Storage System (ESS) Ready. All single-family residences must meet all of the following: Either ESS-ready interconnection equipment with backed up capacity of 60 amps or more or an ESS supplied branch circuit, or a dedicated raceway from the main service to a subpanel that supplies the branch circuit. (Note: at least four branch circuits must be identified and have a panel allocated at a minimum of 100 square feet of space, with the panel located in the main living area, and the branch circuit near the primary entry, and one circuit supplying a sleeping room receptacle outlet; main panelboard must have a minimum branch circuit of 225 amps; sufficient space must be reserved to allow future installation of a system solution; equipment/transfer switch within 3' of the main panelboard; the service location with the branch location at the service location.)
§ 500.0(1)	Heat Pump Space Heater Ready. Systems using gas or propane furnaces to serve individual dwelling units must include: A dedicated unobstructed 240v branch circuit wiring installed within 3' of the furnace with circuit conductors rated at least 30 amps with the blank cover identified as "240V ready," and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240v use."
§ 500.0(2)	Electric Cooktop Ready. Systems using gas or propane cooktop to serve individual dwelling units must include: A dedicated unobstructed 240v branch circuit wiring installed within 3' of the cooktop with circuit conductors rated at least 50 amps with the blank cover identified as "240V ready," and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240v use."
§ 500.0(3)	Electric Clothes Dryer Ready. Clothes dryer locations with gas or propane plumbing to serve individual dwelling units must include: A dedicated unobstructed 240v branch circuit wiring installed within 3' of the dryer location with circuit conductors rated at least 30 amps with the blank cover identified as "240V ready," and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240v use."

*Exceptions may apply

HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name

Zafiris Residence

System Name

HVAC System

Date

10/10/2024

Floor Area

5,441

ENGINEERING CHECKS

Number of Systems

2

Heating System

Output per System

80,000

Total Output (Btuh)

160,000

Output (Btuh/sqft)

29.4

Cooling System

Output per System

36,000

Total Output (Btuh)

72,000

Total Output (Tons)

6.0

Total Output (Btuh/sqft)

13.2

Total Output (sqft/Ton)

906.8

SYSTEM LOAD

COIL COOLING PEAK

CFM

Sensible

Latent

2,849

55,248

2,403

COIL HTG. PEAK

CFM

Sensible

2,134

80,455

Total Room Loads

Return Ventilated Lighting

Return Air Ducts

Return Fan

Ventilation

Supply Fan

Supply Air Ducts

TOTAL SYSTEM LOAD

80,203

2,403

126,384

Air System

CFM per System

0

Airflow (cfm)

0

Airflow (cfm/sqft)

0.00

Airflow (cfm/Ton)

0.0

Outside Air (%)

0.0%

Outside Air (cfm/sqft)

0.00

HVAC EQUIPMENT SELECTION

Furnace - A/C

69,497

0

160,000

Total Adjusted System Output

(Adjusted for Peak Design conditions)

69,497

0

160,000

Note: values above given at ARI conditions

TIME OF SYSTEM PEAK

Aug 3 PM

Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)

29°F

66°F

106°F

103°F

68°F

Outside Air

0 cfm

Heating Coil

ROOM

COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)

86 / 66°F

77 / 62°F

55 / 54°F

57 / 54°F

75 / 81°F

Outside Air

0 cfm

Cooling Coil

46.1%

ROOM

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