

PROJECT DIRECTORY **PROJECT DATA** PROFESSIONAL ENGINEER MOHAMMAD U SADIQ **KULDIP BAINS** 3718 MAY SCHOOL ROAD 1000 BOURN DRIVE LIVERMORE CA 94551 MAUJAAN FARMS WOODLAND, CA 95776 APN: 085-5200-40 3718 MAY SCHOOL ROAD CELL PHONE (530) 315-4907 EXISTING USE: VACANT PROPOSED USE: SINGLE FAMILY DWELLING) LIVERMORE CA 94551 E-MAIL mohammad.sadig@sbcglobal.net CONTRUCTION TYPE: V-B OCCUPANCY: R-3 GEOTECHNICAL ENGINEER SPRINKLER SYSTEM: YES Tri Nugyen Engineering 881 Moss Dr. NEW SINGLE FAMILY DWELLING WITH DETACHED BARN San Jose, CA 95116 AND DETACHED ADU (510) 277-2945 nttri1215@gmail.com PROPOSED TOTAL SQUARE FOOTAGES: STRUCTURAL ENGINEER HC STRUCTURAL ENGINEERING INC. 4,695 SF JAMIE GREEN/HUMZA S CHOWDDHRY MAIN RESIDENCE FIRST FLOOR 2,187 SF MAIN RESIDENCE SECOND FLOOR 117 BERNAL RD STE 70-648 DETACHED ADU 1,198 SF SAN JOSE, CA 95119 8.080 SF TOTAL (LIV.) 650 567 4826/650 557 4333 GARAGE jamie@hcseonline.com 1,892 SF **ENERGY CONSULTANT** 87,120 SF OT SIZE THE ENERGY CONSULTANT CO. ROBERT MAO PE, CEA OAKLAND, CA 94611 OT COVERAGE 510 387 2756 OT COVERAGE PERCENTAGE **APPLICABLE CODES: TESTING AND INSPECTION LABORATORY** SIGMA ENGINEERING LABORATORIES CALIFORNIA BUILDING CODE (CBC) BELKACEM SAOUD, PE CALIFORNIA RESIDENTIAL CODE (CRC) 1180 4TH STREET CALIFORNIA MECHANICAL CODE (CMC) SAN FRANCISCO, CA 94518 CALIFORNIA PLUMBING CODE (CPC) CALIFORNIA ELECTRICAL CODE (CEC) 415 702 8374 2019 EDITION CALIFORNIA ENERGY STANDARDS **2019 EDITION** BELKACEM@SIGMAENGINEERING.COM CALIFORNAI FIRE CODE & TITLE 24 2019 EDITION CALIFORNIA GREEN BUILDING CODE 2019 EDITION **KULDIP BAINS** INCLUDING ALL AMMENDMENTS ADOPTED IN ORDINANCE 1856-2010 700 TERMINAL CIRCLE ALL OTHER APPLICABLE CITY CODES AND REGULATIONS LIVERMORE. CA 94551 510 499 4052 **DEFERRED SUBMITTALS** KUL@5RIVERSAVIATION.COM 1. FIRE SPRINKLER SYSTEM PLAN SUBMITTAL SPECIAL INSPECTIONS AND TESTING 2. PREFABRICATED ROOF TRUSS AND THEIR CONNECTIONS 3. PV SOLAR SYSTEMS (MINIMUM REQUIRED) 4. 94KWDC MAIN DWELLING AND 2.47 KWDC ADU . Anchor bolt placement, dowels and hold downs and foundation to be inspected and approved by Structural and Geo Tech Engineer of Record. 2. Any drill and bond operations performed during construction to be inspected and approved by Structural Engineer of Record. 3. Roof and floor framing truss design, calculations and layout to be inspected and approved by Structural Engineer of Record. The Structural Engineer of Record must provide a review letter (or conformance review stamp), noting no exceptions, regarding roof truss

lateral-force resisting (drag) forces (where/if applicable).

by the Alameda County Building Department.

notes; see Sheet S0.1, Note 5.

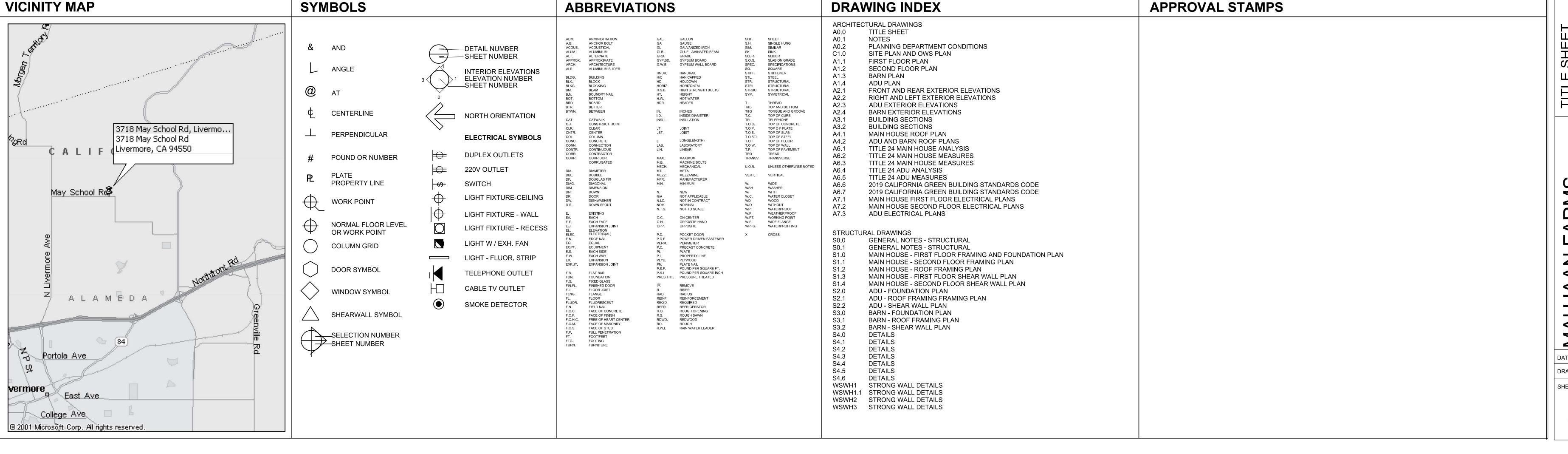
Engineer of Record should provide a letter to the Building Inspector prior to inspection with the approval letter indicating work has been performed per proposed design and plans approved

6. Contractor/Owner will employ an approved testing and inspection laboratory, such as Sigma Engineering Laboratories, to perform tasks as noted in tests, inspections, and observations

MAUJAANFARMS

3718 MAY SCHOOL ROAD LIVERMORE CALIFORNIA 94551





GENERAL REVISIONS 12/21/2021 2 01/27/2022

3 | 02/02/2022

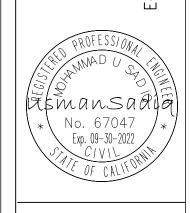
4 03/02/2022

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6 05/26/2022 TITLE CHANGE TO **DRAWING A7.3**

7 06/05/2022 8 | 06/24/2022

9 | 08/18/2022



12/29/22 DRAWN BY MB

GENERAL NOTES

- All work shall conform to the contract documents which includes the drawings, all addendums and/or modifications issued by the engineer or owner.
- 2. The General Contractor shall review all documents and verify all dimension and field conditions and shall confirm that work is buildable as shown. Any conflicts or omissions, etc., shall be immediately reported to the Engineer for clarification prior to the performance of any work in question.
- 3. Coordination of work: the Contractor is responsible for coordinating all trades and all work including, but not limited to: architectural, structural, plumbing, mechanical and electrical. In case of conflict between the drawings and field conditions, the Engineer shall be notified for clarification.
- 4. Permits: the Contractor shall apply for, and obtain all necessary construction permits required by all applicable regulatory agencies governing this work. The G.C. shall arrange for inspections necessary to obtain a certificate of occupancy.
- 5. Do not scale drawings. Written dimensions govern partition locations, dimensions and types. Door and window locations shall be as shown on construction plan. In case of conflict, notify Engineer for written clarification prior to proceeding with construction.
- 6. The Contract Documents are complimentary. What is shown or referred to, at a given location, shall be provided as though shown on all (U.O.N.).
- 7. All dimensions are to face of stud, face of concrete, to centerlines of columns and other grid points & to centerlines of doors and other scheduled openings unless otherwise noted. All dimensions are to be exact within "full width of walls. Contractor shall not adjust any dimensions marked "CLEAR" or "CLR."
- 8. The G.C. is responsible for all concrete floors to be level and free from scaling. G.C. to report any variations in floor level greater than $\frac{3}{4}$ " in 1'-0" (non-cumulative) to Engineer.
- Offset studs where required to align finish materials.
- 10. "Typical" or "TYP" shall mean that the condition is representative for similar conditions throughout, unless otherwise noted. Details are usually keyed and noted "TYP" only once, when they first occur.
- 11. Coordinate access panel, clean out, and the like locations (for concealed items) with appropriate Contractor.
- 12. All manufactured articles, materials and equipment shall be applied, installed, connected, erected, cleaned and conditioned per Mfr.'s instructions. In case of differences between the manufacturer's instructions and contract documents, the G.C. shall notify the engineer before proceeding.
- 13. Record drawings: during the course of construction, actual location of items and/ or deviations from the drawings shall be indicated in the record drawings kept at the construction site and submit to owner upon completion of work.
- 14. Roof trusses will be deferred submittal item. Note that structural engineer of record must review & approve stamp/sign truss calculations & layout before truss' review.
- 15. Engineer of Record shall inspect all anchor bolts, dowels and hold downs prior to foundation inspection by the Building Officials.
- 16. Services of Engineer of Record, Soil Engineer will be available during the various phase of construction. Additional professional services may be required at the discretion of the Engineer of Record.
- 17. Installation of earthquake-actuated gas shut-off valve (certified by the State Architect as conforming to California Referenced Standard 12-12-1) is part of new gas meter installation. The shut-off must be located after the gas provider company's shut-off valve, pressure regulator, meter and the service tee. No attachments or connections of any kind are allowed on the utility facilities before the point where the service tee connects to the gas houseline piping.

FIRE AND SAFETY NOTES

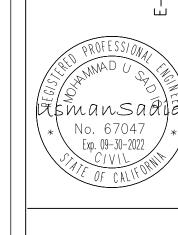
- An automatic fire sprinkler system shall be installed in accordance with 2019 NFPA 13D-Residential. A separate fire permit is required for the fire sprinkler system installation. A state licensed C-16 fire sprinkler contractor shall be responsible for the fire sprinkler system installation.
- 2. Building address is to be plainly legible and visible from the public street. These numbers shall contrast with their background.
- Single station smoke alarms shall be provided within an individual sleeping unit. Approved smoke detectors shall be installed per the CBC Section 907.2.10. Detectors shall be interconnected to sound simultaneously.
- 4. A spark arrestor is required for all chimneys.
- 5. Fire safety during construction: provide an emergency telephone on the job site prior to any construction.
- 6. Hazardous material requirement: the applicant must immediately notify the Alameda County Fire Department, hazardous materials unit of any underground pipes, tanks or structures; any suspected or actual contaminated solid; or other environmental anomalies encountered during site development activities. Any confirmed environmental liabilities will need to be remedied prior to proceeding with Site Development.
- 7. Building construction shall comply with the requirements contained in the California Building Code chapter 7a, as applicable.
- 8. Deck/canopy/trellis construction shall meet the requirements of Alameda County Fire Department.
- 9. Enclose all roof eaves with minimum required attic vents covered with metal mesh in accordance with chapter 7a of California building code. The dimensions of mesh openings shall be minimum 1/16 inch and shall not exceed 1/8 inch.

FIRE-HAZARD NOTES:

- 1. The construction of this project is located within a Wildland Urban Interface (WUI) fire hazard area (moderate high fire-hazard in State Responsibility Area). The construction materials will comply with all applicable requirements of R337.
- 2. Space between the roof covering and roof decking shall be constructed to prevent the intrusion of flames and embers, be fire stopped with approved materials or have one layer of minimum 72 pounds mineral-surfaced non-perforated cap sheet installed over the combustible decking per CRC R337.5.2.
- 3. The exterior wall covering or wall assembly (for all 3 structures, including barn that is closer than 50 ft to main dwelling) shall comply with one of the following requirements, per CRC R337.7.3:
- a. Noncombustible material
- b. Ignition-resistant material
- c. Sawn lumber or glue-laminated wood with the smallest minimum nominal dimension of 4 inches sawn or glue-laminated planks splined, tongue-and-grove, or set close together and well spiked.
- d. Log wall construction assembly
- e. Wall assemblies that meet the performance criteria in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance shown in Section R337.7.3.l.
- f. Wall assemblies that meet the performance criteria in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in SFM Standard 12-7A-I.
- 4. Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and under floor ventilation openings shall be fully covered with metal wire mesh, vents, other materials or other devices that meet the following requirements per CRC 337.6.2:
 - a. The dimensions of the openings shall be a minimum of 1/16th inch and shall not exceed 1/8th
 - b. The materials used shall be noncombustible and corrosion resistant.
- All roofing materials to be class A fire-rated, per CRC R337.5.1 & R902.
- 6. Exterior wall coverings shall extend from the top of the foundation to the roof, and terminate at 2 inch nominal solid wood blocking between rafters at all roof overhangs, or in the case, of enclosed eaves, terminate at the enclosure per CRC R337.7.3.1.
- . The exposed underside of enclosed roof eaves having either a boxed-in roof eave soffit with a horizontal underside, or sloping rafter tails with an exterior covering applied to the underside of the rafter tails, shall be protected by one of the following per CRC R337.7.5 [per CBC 7A section 707A.5]:
- a. Noncombustible material
- b. Ignition-resistant material
- c. One layer of 5/8" Type 'X' gypsum sheathing applied behind an exterior covering on the underside of the rafter tails or soffit.
- d. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the rafter tails or soffit including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistant Design Manual.
- e. Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3.
- 7A. The exposed underside of exterior porch ceilings shall be protected by one of the following per CRC R337.7.6 [or CBC Chapter 7A section 707A.6]:
 - a. Noncombustible material
- b. Ignition-resistant material
- c. One layer of 5/8" Type 'X' gypsum sheathing applied behind the exterior covering on the underside of the ceiling
- d. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the ceiling assembly including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistant Design Manual
- e. Porch ceiling assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3
- 8. Exterior windows and exterior glazed door assemblies shall comply with one of the following requirements, per CRC R337.8.2.1:
 - Be constructed of multi-pane glazing with a minimum of one tempered pane meeting the requirements of Section 2406 Safety Glazing.
- 9. In WUI high fire zones, the walking surfaces of decks, porches, balconies, and stairs shall be constructed with one of the following materials, per CRC R337.9:
- a. Ignition resistant material that complies with the performance requirements of both SFM Standard 12-7A-4, and SFM Standard 12-7A-5.
- b. Exterior fire-retardant treated wood.
- c. Noncombustible material.
- d. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also either noncombustible or ignition-resistant material.

- 10. Exterior garage door perimeter gaps shall be limited to 1/8" by one of the, methods listed below, per CRC R337.8.4/CBC 708A.4:
- a. Provide weather-stripping product meeting specific ASTM standards in accordance with CBC 708A.4(1).
- b. Door overlaps onto jambs and headers.
- c. Garage door jambs and headers covered with metal flashing.
- 11. Roof gutters shall be provided with means to prevent accumulation of leaves & debris, per
- 12. Contractor shall be familiar with QII Booklet found at the link below:
- https://www.calcerts.com/forms/public/CalCERTS OII Handbook 2019.pdf
- 13. Contractor shall review and comply with the latest CA Energy Commission forms CF3R-ENV-21-H&CF3R-ENV-22-H.
- 14. Prior to building permit final approval, the property shall be in compliance with vegetation management requirements prescribed in CA FC sec. 4906, including CA Public Resources Code 4291 or CA Government Code Sec. 51182, per CRC R337.l.5.
- 15. Exterior doors shall comply with one of the following, per CRC 337.8.3:
- a. The exterior surface or cladding shall be of noncombustible or ignition-resistant material, or b. or Shall be constructed of solid core wood that comply with the following requirements:
 - i. Stiles and rails shall not be less than 1 3/8 inches thick
 - ii. Raised panels shall not be less than 1 1/4 inches thick, except for the exterior perimeter of the raised panel that may taper to a tongue not less than 3/8 inch thick.
- c. Shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA
- d. Shall be tested to meet the performance requirements of SFM Standard 12-8A-I.

GENERAL REVISIONS



ARMS

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A0.1



Sandra Rivera

ALAMEDA COUNTY COMMUNITY DEVELOPMENT AGENCY

PLANNING DEPARTMENT

June 3, 2022

SITE DEVELOPMENT REVIEW (PLN2021-00090)

Interim Agency Director

1000 Bourn Drive Albert Lopez **Planning Director**

Dear Applicant,

Mohammad Sadiq

Woodland, CA 95776

224 West Winton Ave Hayward, California

Accompanying this letter are documents approving SITE DEVELOPMENT REVIEW (PLN2021-00090), application to allow construction of a 6,882 square foot residence with detached 1,198 square foot Accessory Dwelling Unit (ADU), 640 square foot garage, and 1,892 square foot barn for property in the "A" (Agricultural) District and designated "LPA" (Large Parcel Agriculture) under the East County Area Plan, on a 87,120 square foot parcel located at 3718 May School Road, 2000 feet east from Bel www.acgov.org/cda Roma Road, unincorporated Livermore area of Alameda County, designated County Assessor's Parcel Number 902 -0004-008-00.

> Action on this approval may be appealed within 10 days after the date of this letter by submitting a letter to the Clerk, Board of Supervisors, Administration Building, 1221 Oak Street, Oakland, CA 94612. The letter should include reference to the application number, aspects of the action being appealed, and reasons for the appeal. The project applicant will be charged actual County costs for consideration of appeals. An appeal fee of \$250.00 must be submitted by anyone else appealing an action.

> For questions regarding this approval, please call Damien Curry at the Planning Department, (510) 670-5400 or Damien.Curry@acgov.org.

cc: Kuldip Bains, 700 Terminal Circle, Livermore, CA 94551 Alameda County Building Inspection Department Public Works Agency, Development Services Section Alameda County Fire Department

CONDITIONS OF APPROVAL, PLN2021-00090, SITE DEVELOPMENT REVIEW

THIS SITE SHALL BE DEVELOPED AND MAINTAINED IN CONFORMANCE WITH THE DESIGN, STATEMENTS, AND CONDITIONS INDICATED HEREON. NO STRUCTURES OR OTHER USES THAN THOSE INDICATED ARE PERMITTED.

ANY DESIGN MODIFICATIONS REQUESTED BY ANY PARTY, EITHER PRIOR TO THE ISSUANCE OF A BUILDING PERMIT OR DURING CONSTRUCTION, SHALL BE SUBJECT TO APPROVAL BY THE PLANNING DIRECTOR

Approval subject to plans marked "Exhibit B", dated April 1, 2022, on file with the Alameda County Planning Department and the following conditions:

- 1. This permit authorizes the construction of a 6,882 square foot residence with detached 640 square foot garage, 1,198 square foot Accessory Dwelling Unit (ADU) and 1,892 square foot barn, and the occupancy of a recreation vehicle during construction, consistent with plans labelled Exhibit "B" and dated April 1, 2022, in the "A" (Agricultural), District, located at 3718 May School Road, north side, 2,000 feet east of Bel Roma Road, unincorporated Livermore area of Alameda County, designated Assessor's Parcel Number: 902 -0004-008-00.
- 2. Occupancy of recreation vehicle shall be allowed only for the duration of current building permits for the original construction of the primary dwelling. The recreation vehicle shall be self-contained and not require domestic sewer service on the subject parcel.
- 3. The project shall meet the requirements of the following agencies:
 - a. Alameda County Public Works Agency, Building Inspection Department
 - b. Alameda County Public Works Agency, Land Development Division c. Alameda County Public Works Agency, Grading Division
 - d. Alameda County Fire Department
 - e. Alameda County Department of Environmental Health

Architectural Design

- 4. Elevations shall be in substantial conformance with those shown on Exhibit "B", PLN2021-00090 and dated April 1, 2022.
- 5. Any and all lighting shall be designed, installed, and operated so as not to radiate or emit glare towards the neighboring residences. Lighting shall be oriented internally toward the site. The illumination intensity of lighting shall be sufficient only for the intended purpose and neither excessive nor unnecessary.

Prior to Issuance of a Building Permit

6. Prior to issuance of Building Permits for every building or other structure having plumbing for wastewater drainage on a parcel, Permittee or successor shall (1) secure a permit from the government agency appropriate to the parcel location for connection to a public sewer, or (2) where there is not a public sewer available, secure approval from the Alameda County Environmental Health Agency for an on-site wastewater treatment system.

- 7. Prior to issuance of Building Permits for every building or other structure having plumbing fixtures on a parcel, Permittee or successor shall demonstrate that there is a potable water supply source and system sufficient to support the water usage demands of the parcel by securing a permit for (1) connection to a permitted small water system or public water system; or (2) an individual well.
- 8. Building Permit application shall not be approved by the Planning Department until a WELO-compliant Project landscape plan is approved by the Planning Director.

Prior to Occupancy

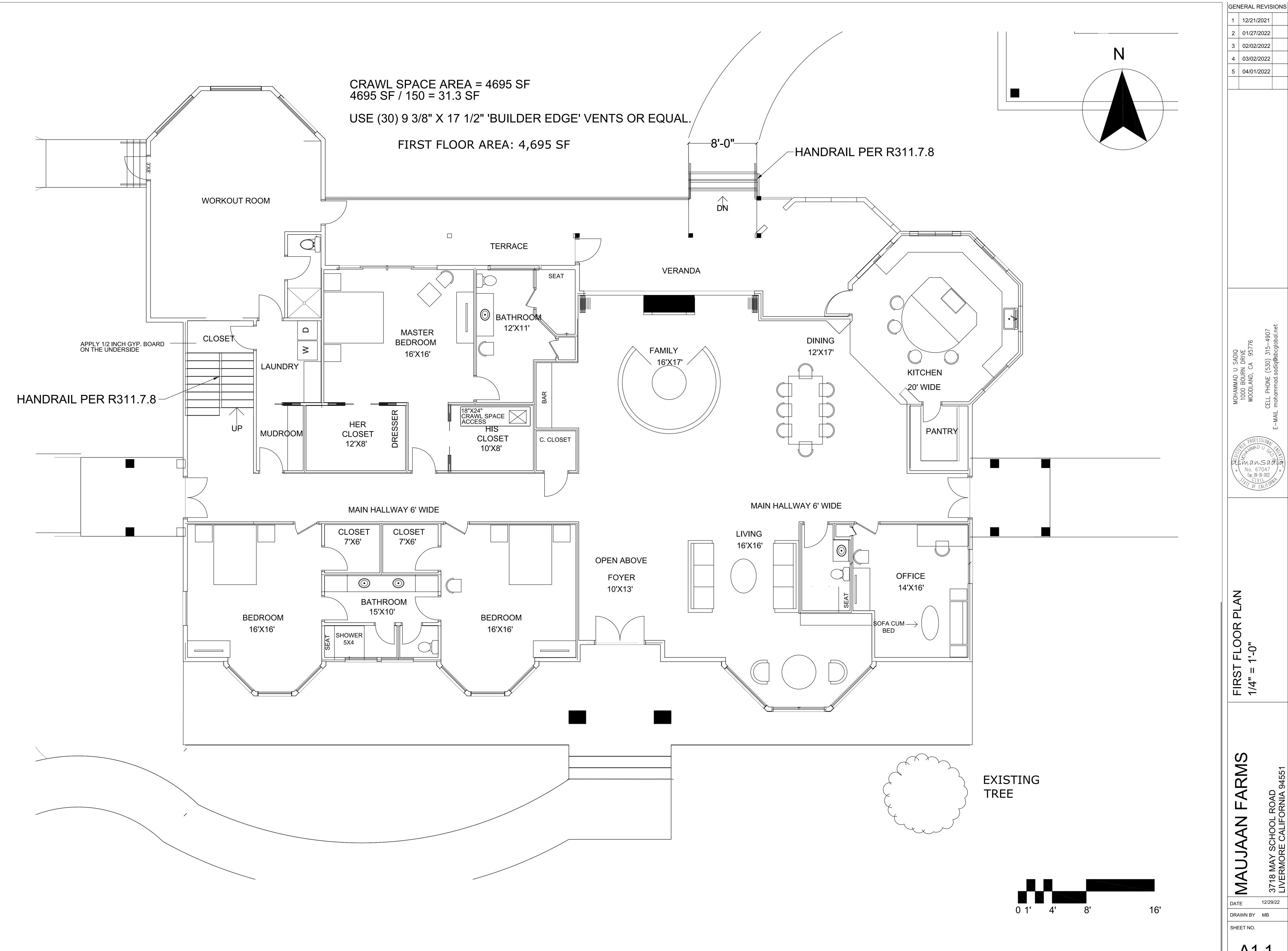
9. Landscaping shall be installed according to the WELO-compliant Final Landscape Plan submitted the Planning Director for approval.

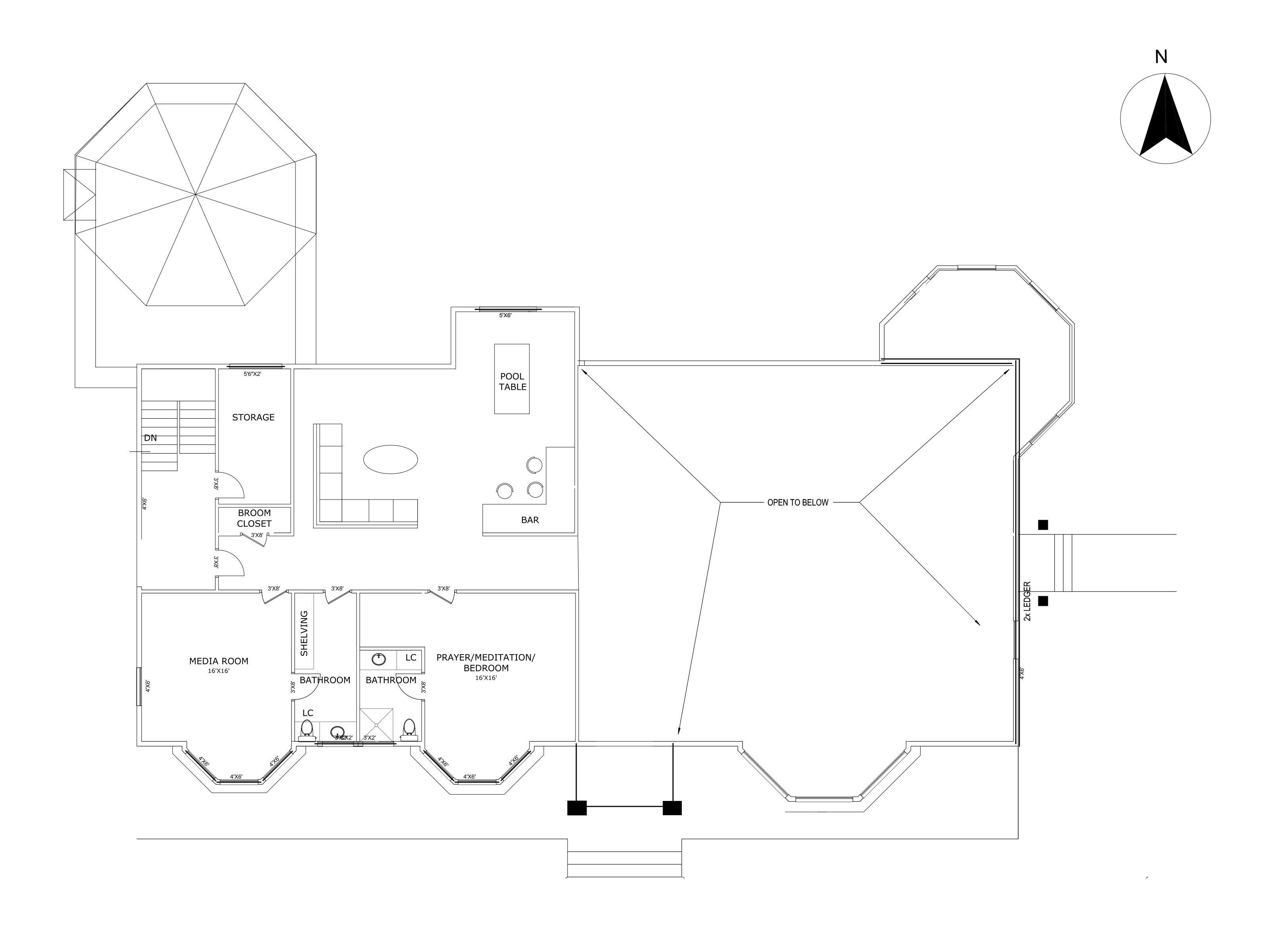
General Requirements

- 10. Construction Building Permit shall be issued for the residence within 3 years of approval or the Site Development Review approval shall be null and void.
- 11. Owner or successor shall defend, indemnify, and hold harmless Alameda County and connected agents, officers, and employees from any claim, action, or proceeding to attack, set aside, void, or annul PLN2021-00090, Site Development Review, for related building improvements, or any subsequent Site Development Review. Such indemnification shall include, but not be limited to, an award of costs and attorney's fees incurred by Alameda County for such defense. The County shall promptly notify owner or successor of any such challenge.
- 12. Permittee, and their successors, shall comply with all Federal, State, and Local Laws, Regulations and Alameda County Ordinances.

GENERAL REVISIONS







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GENERAL REVISIONS 1 12/21/2021

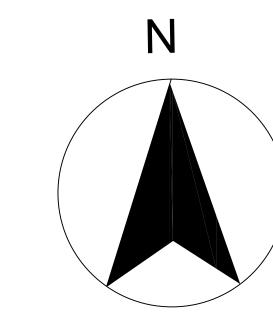
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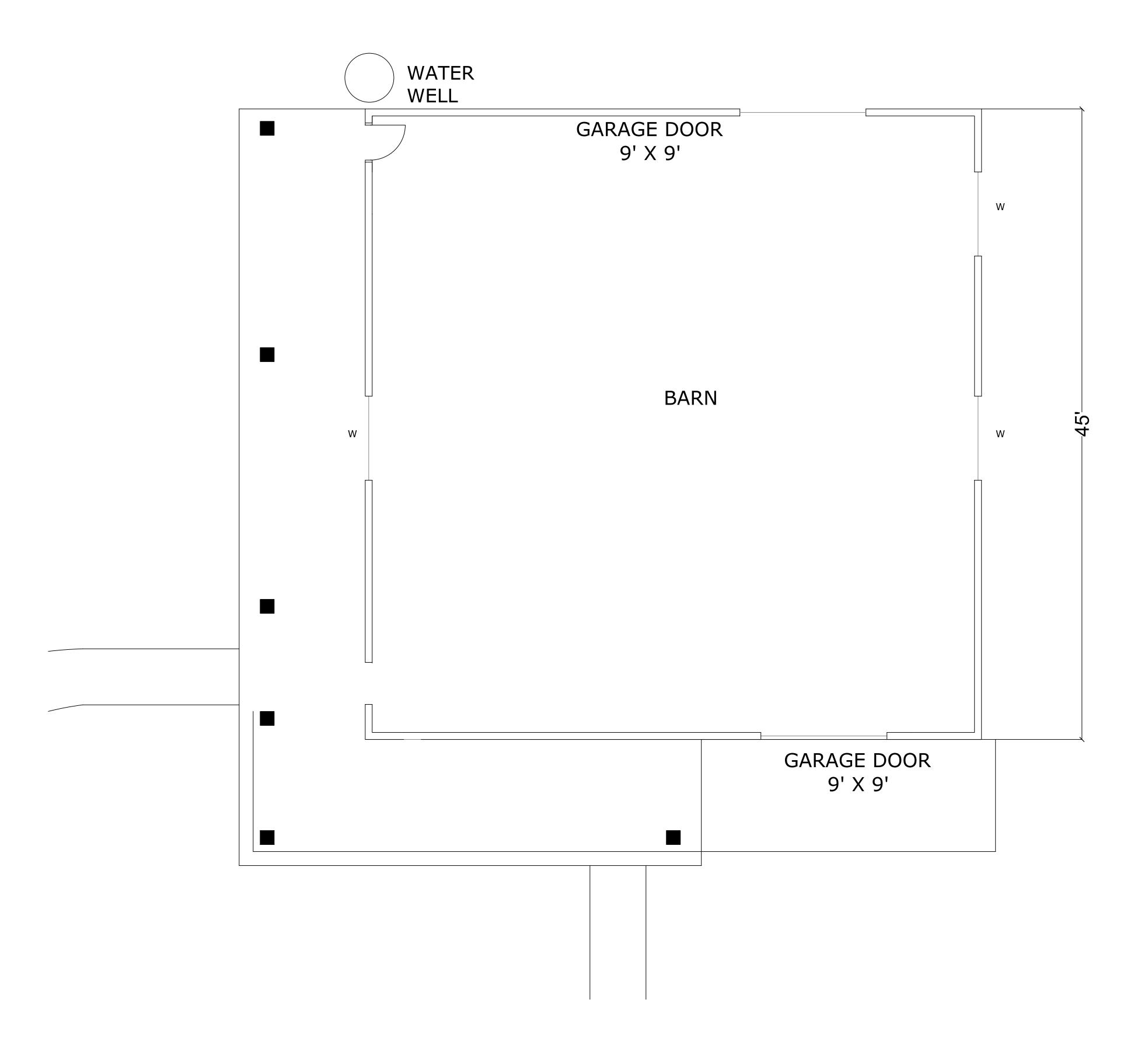
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2 01/27/2022 3 02/02/2022 4 03/02/2022 5 04/01/2022 NOTE: BARN IS A SINGLE STORY STRUCTURE AND IS INTENDED TO STORE FARMING EQUIPMENT AND SUPPLIES. EQUIPMENT SUCH AS POWER LAWN MOWERS, SMALL HAND HELD TOOLS AND VARIOUS ATTACHMENTS.





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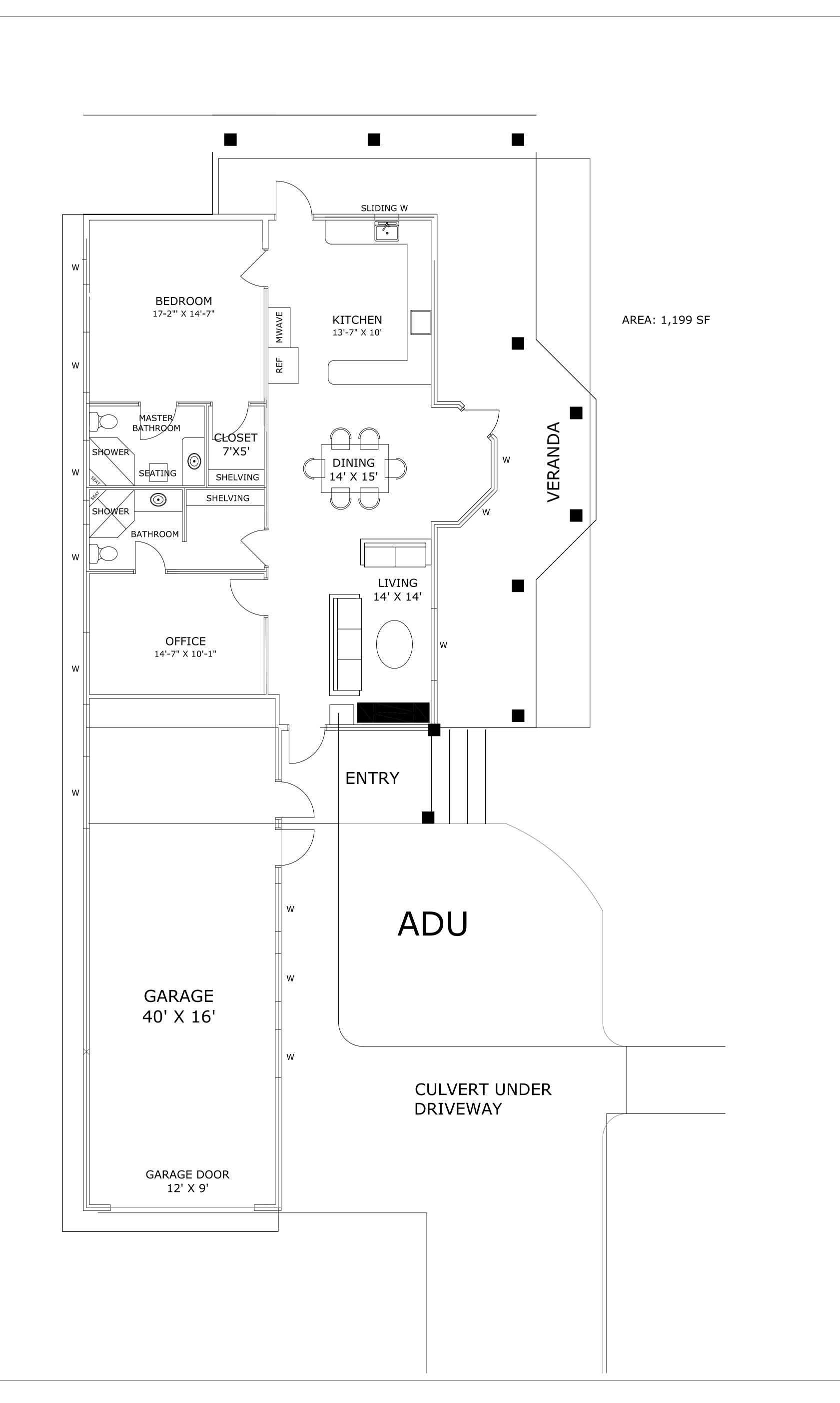
BARN 1/4" = 1'-0"

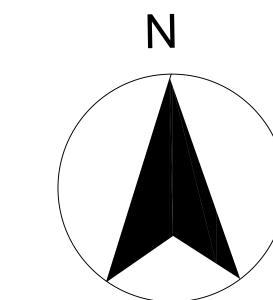
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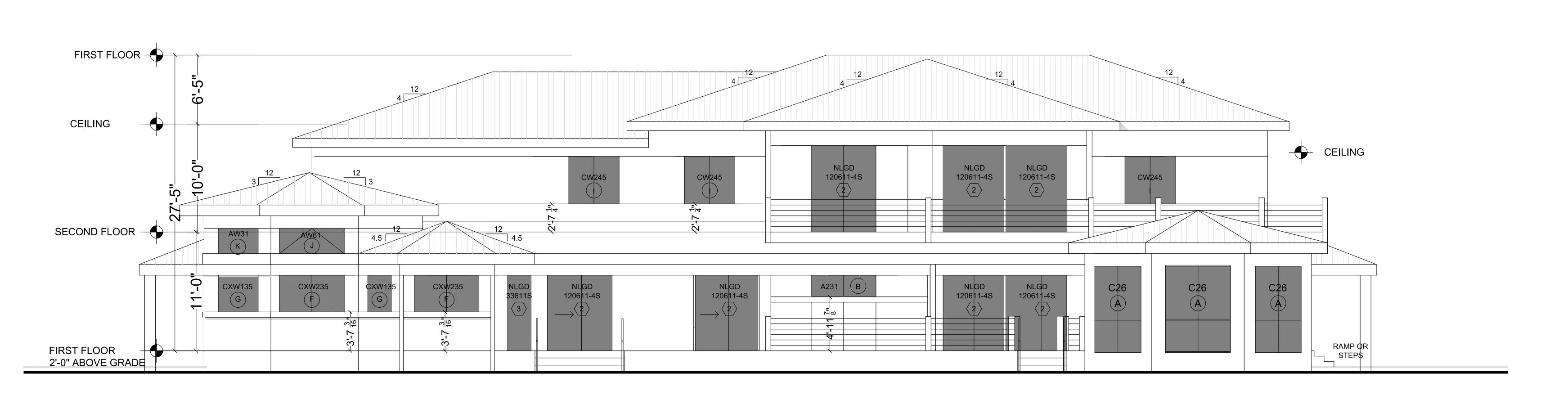
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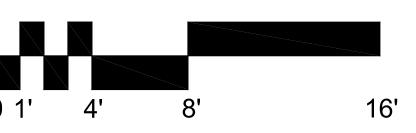
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REAR ELEVATION



> MUHAMMAD U SADIQ 1000 BOURN DRIVE WOODLAND, CA 95776 CELL PHONE (530) 315—4907

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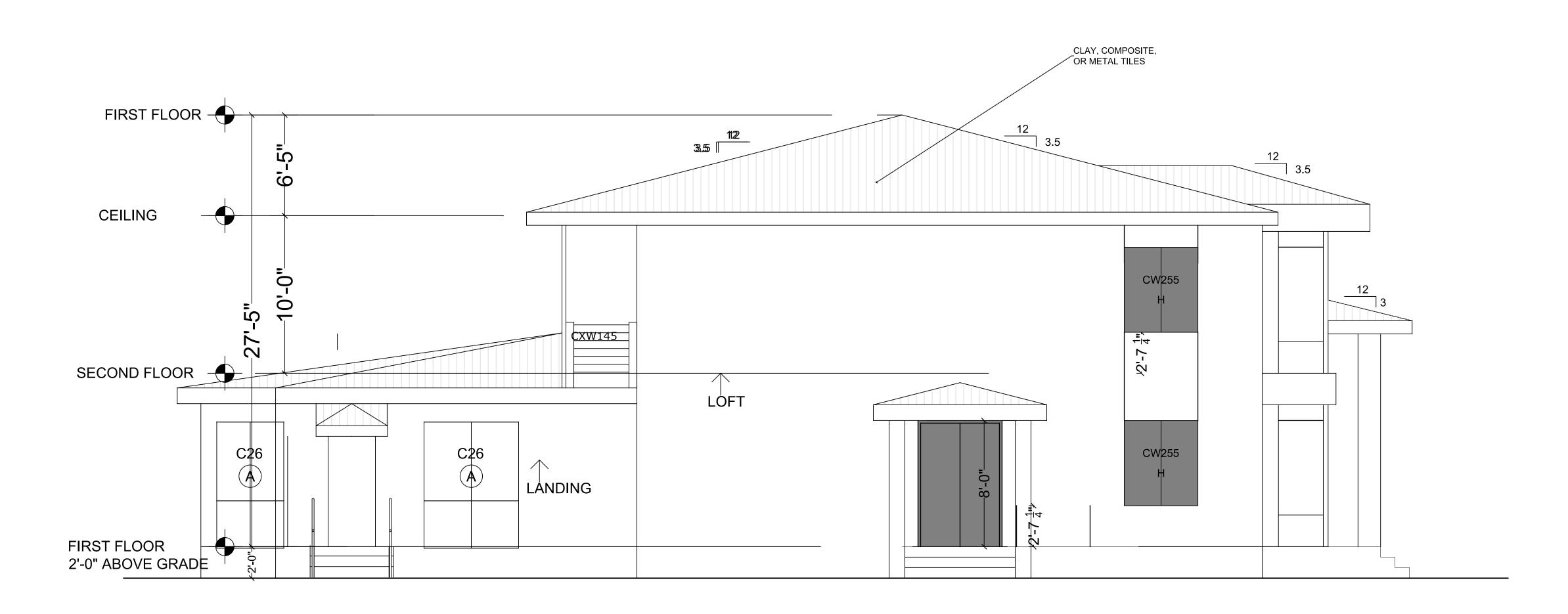
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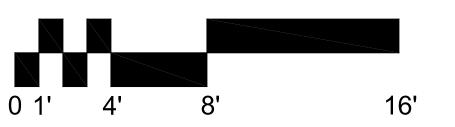
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RIGHT ELEVATION



LEFT ELEVATION



> 1000 BOURN DRIVE WOODLAND, CA 95776 CELL PHONE (530) 315-4907

PROFESSIONAL

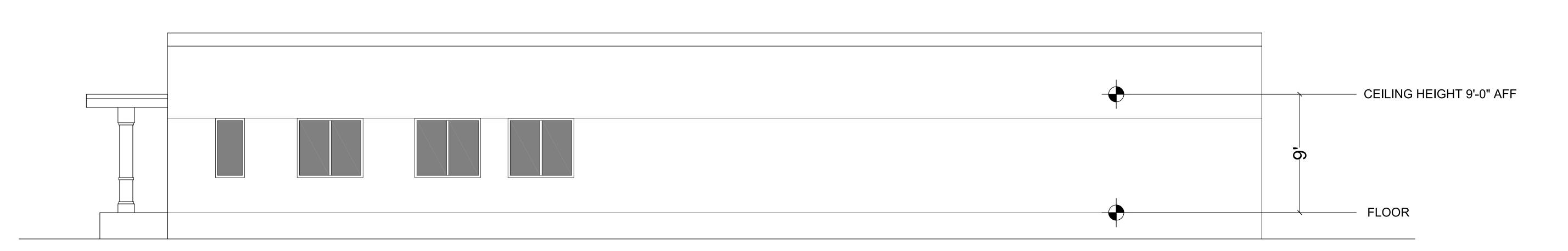
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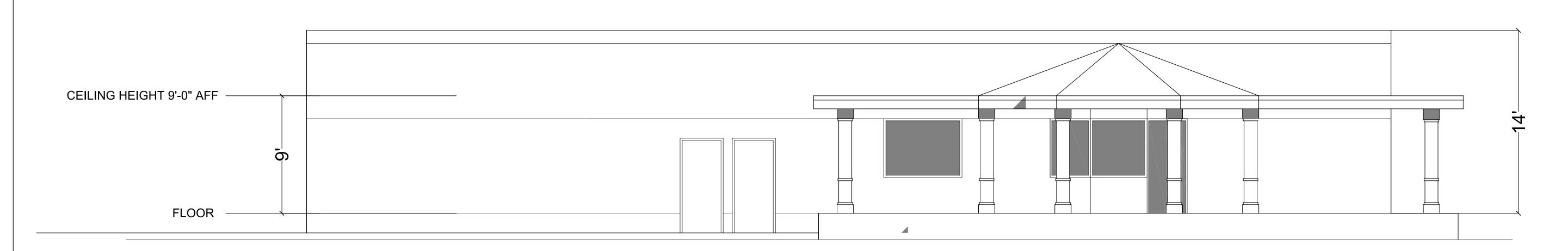
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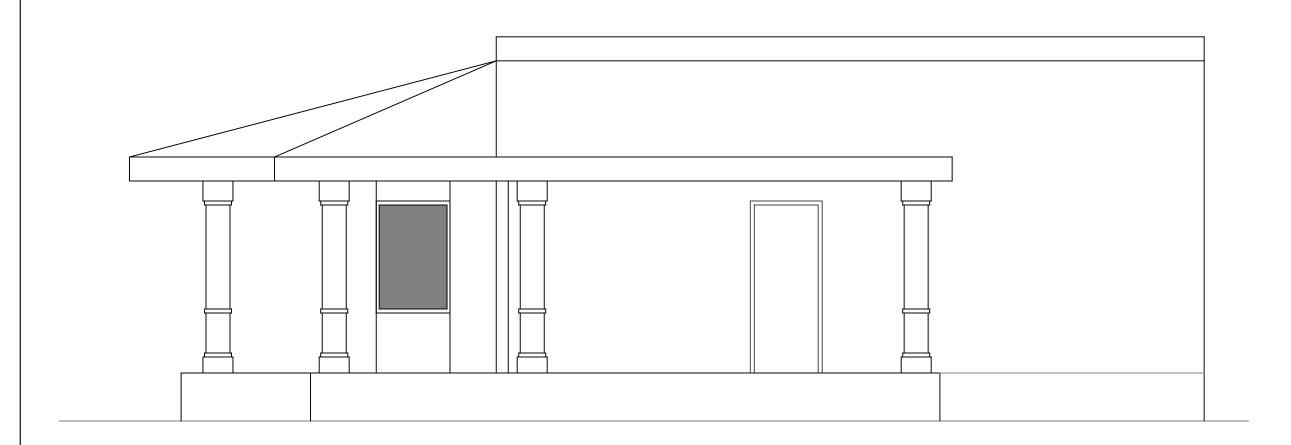
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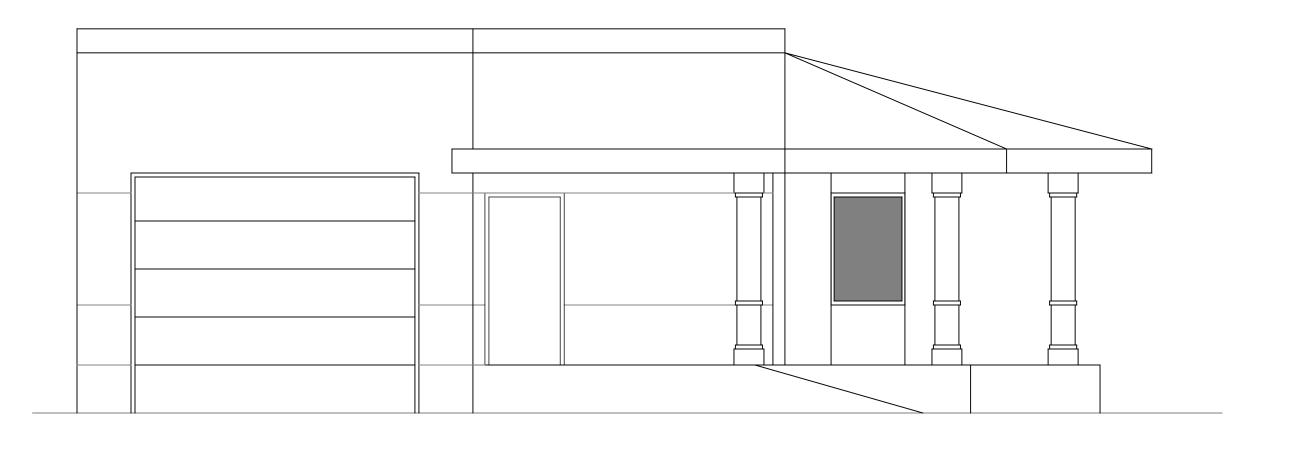
LEFT ELEVATION



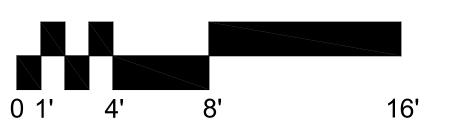
RIGHT ELEVATION



REAR ELEVATION



FRONT ELEVATION



GENERAL REVISIONS

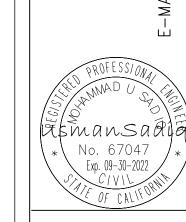
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MOHAMMAD U SADIQ 1000 BOURN DRIVE WOODLAND, CA 95776 CELL PHONE (530) 315-4907



ESSORY DWELLING UNIT

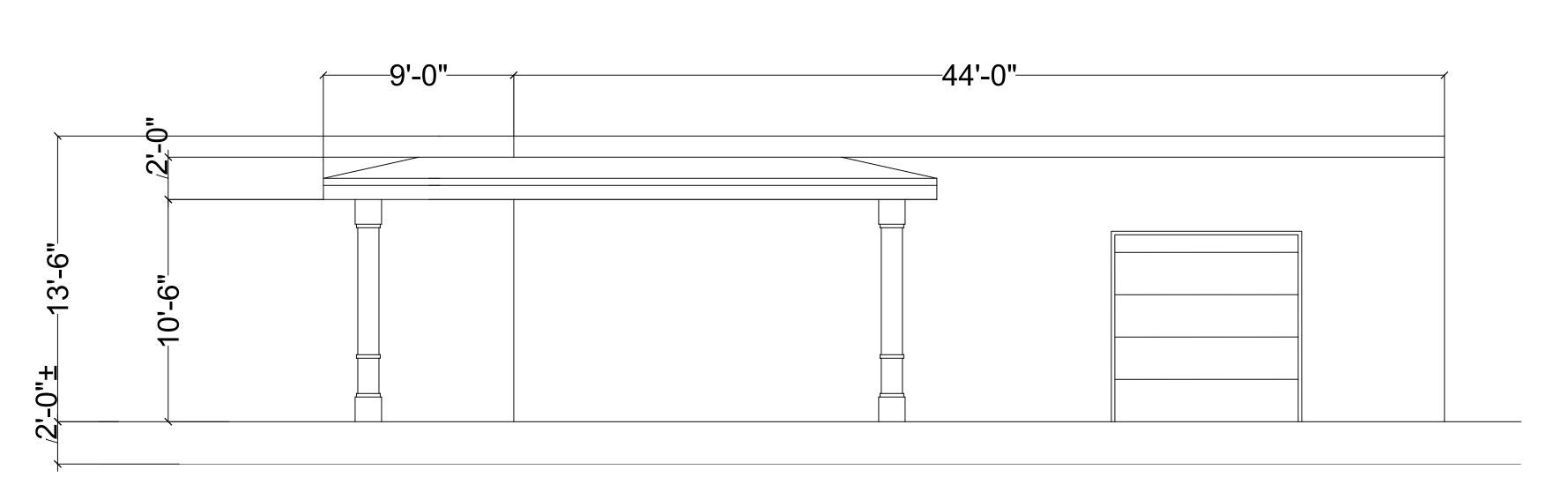
ELEVATIONS 1/4" = 1'-0"

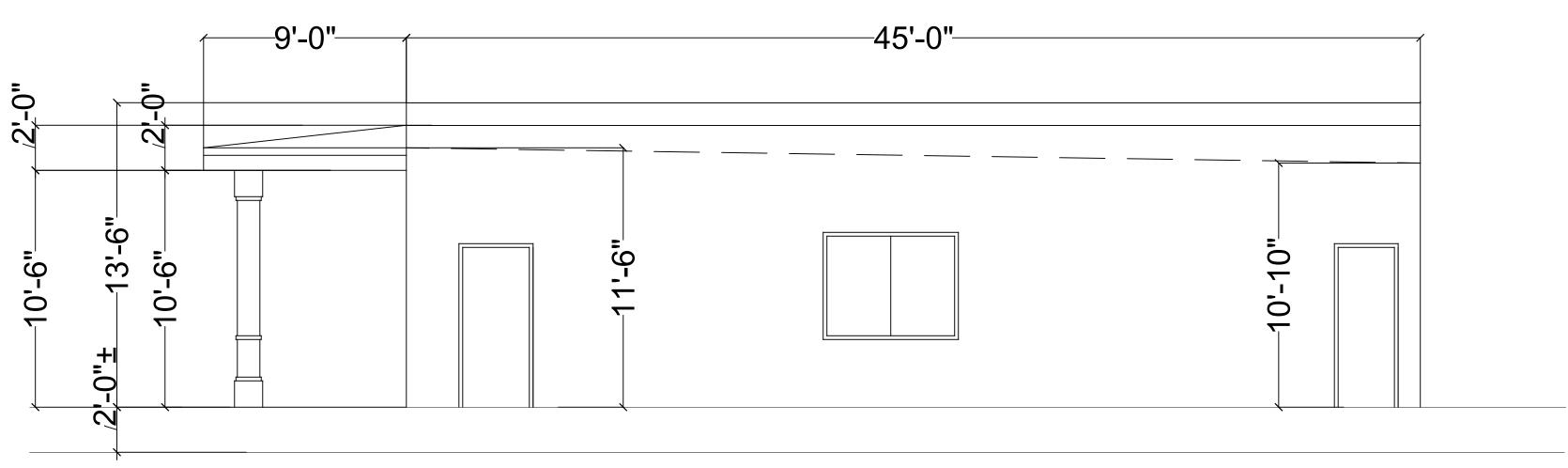
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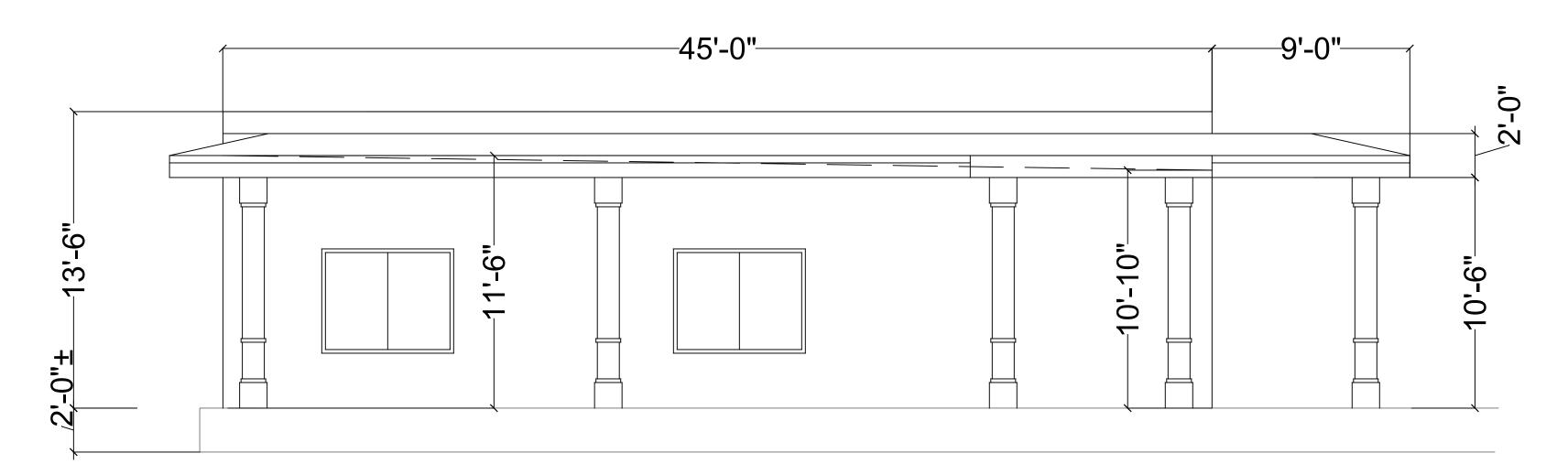
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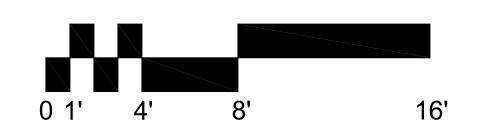
FRONT ELEVATION

LEFT ELEVATION



REAR ELEVATION

RIGHT ELEVATION



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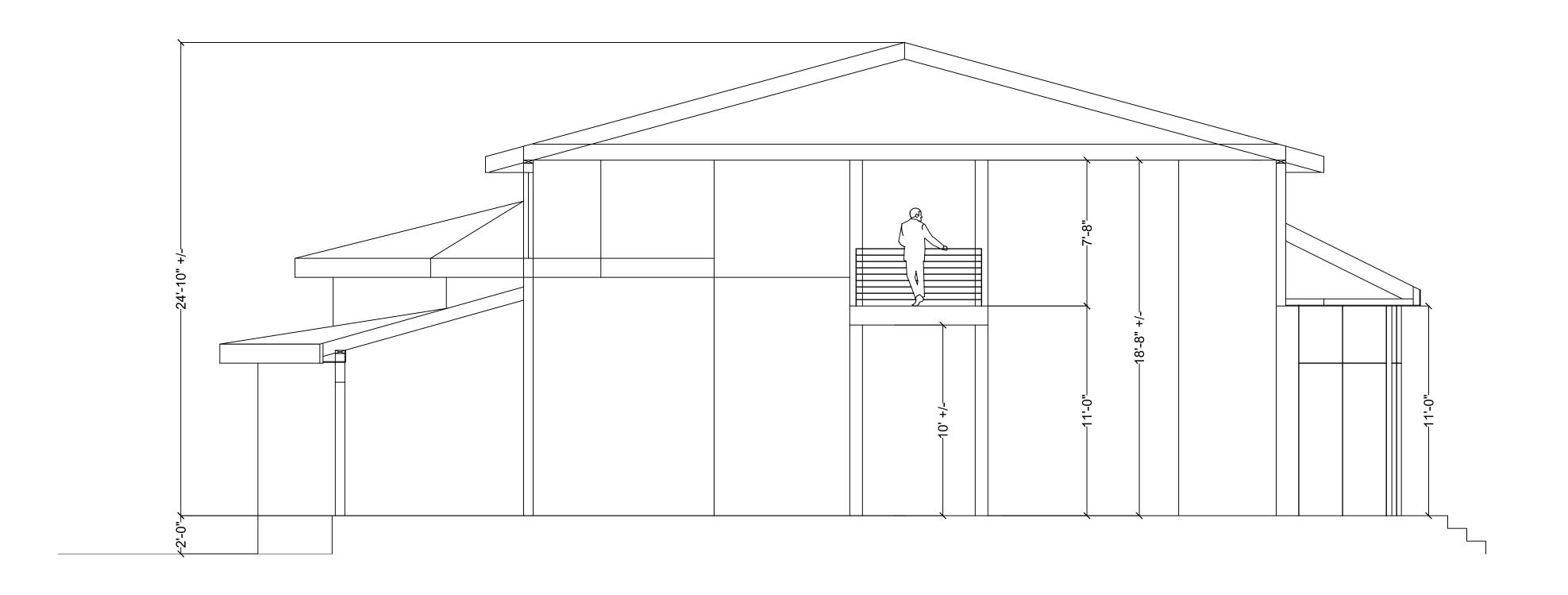
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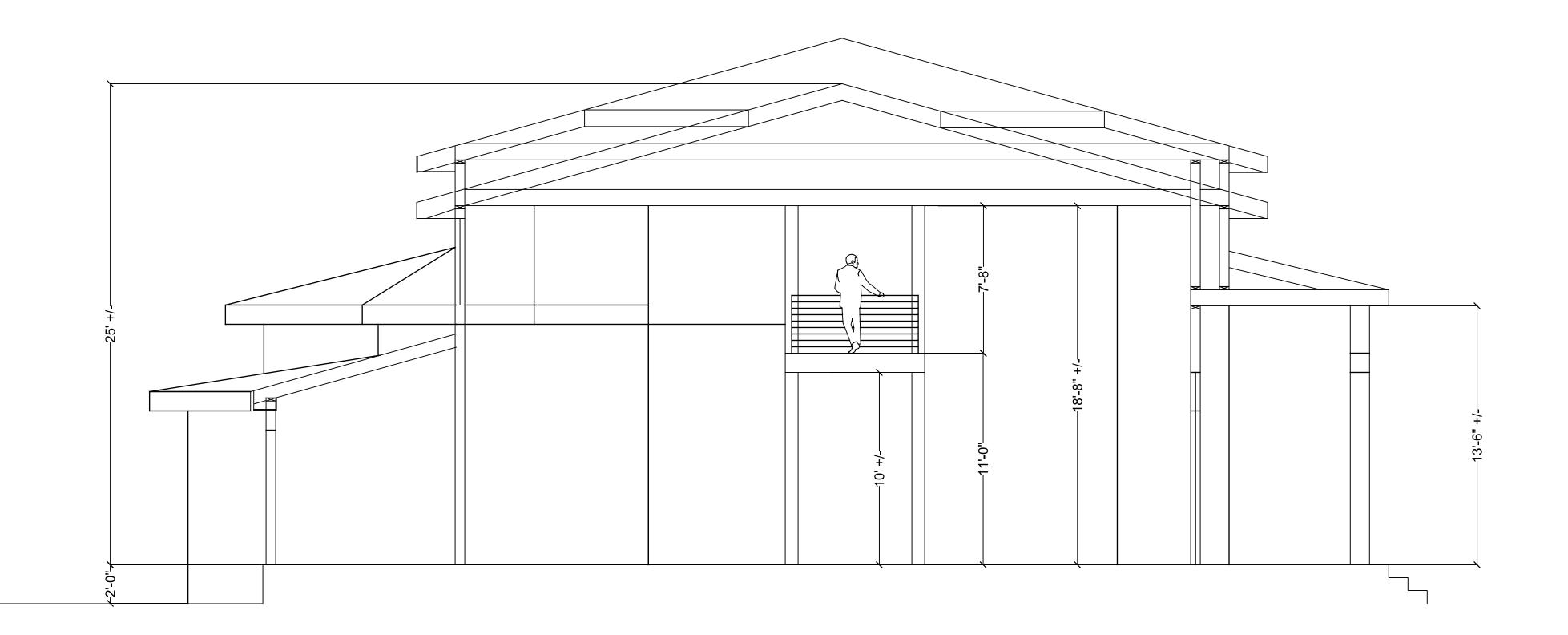
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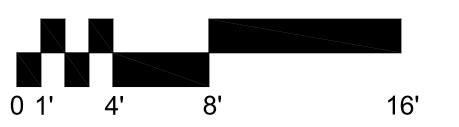
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SECTION - S1



SECTION - S2

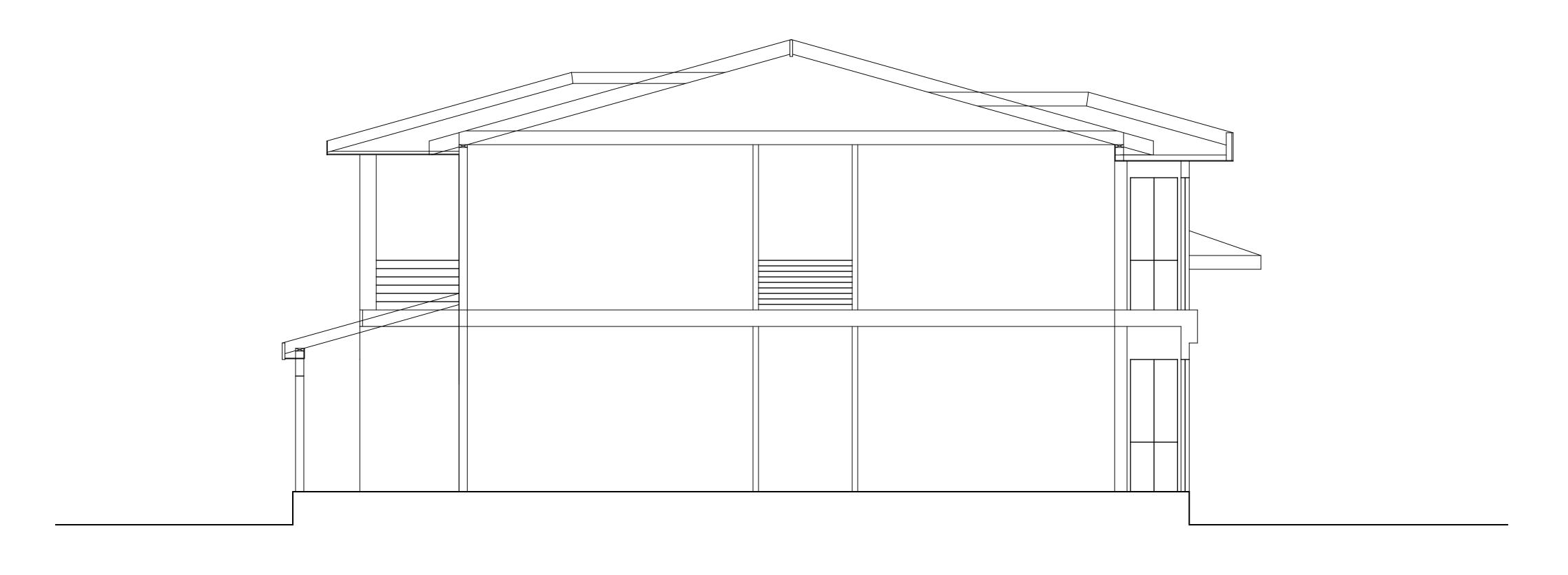




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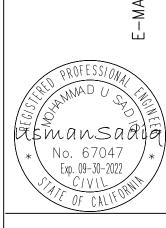
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A3.1



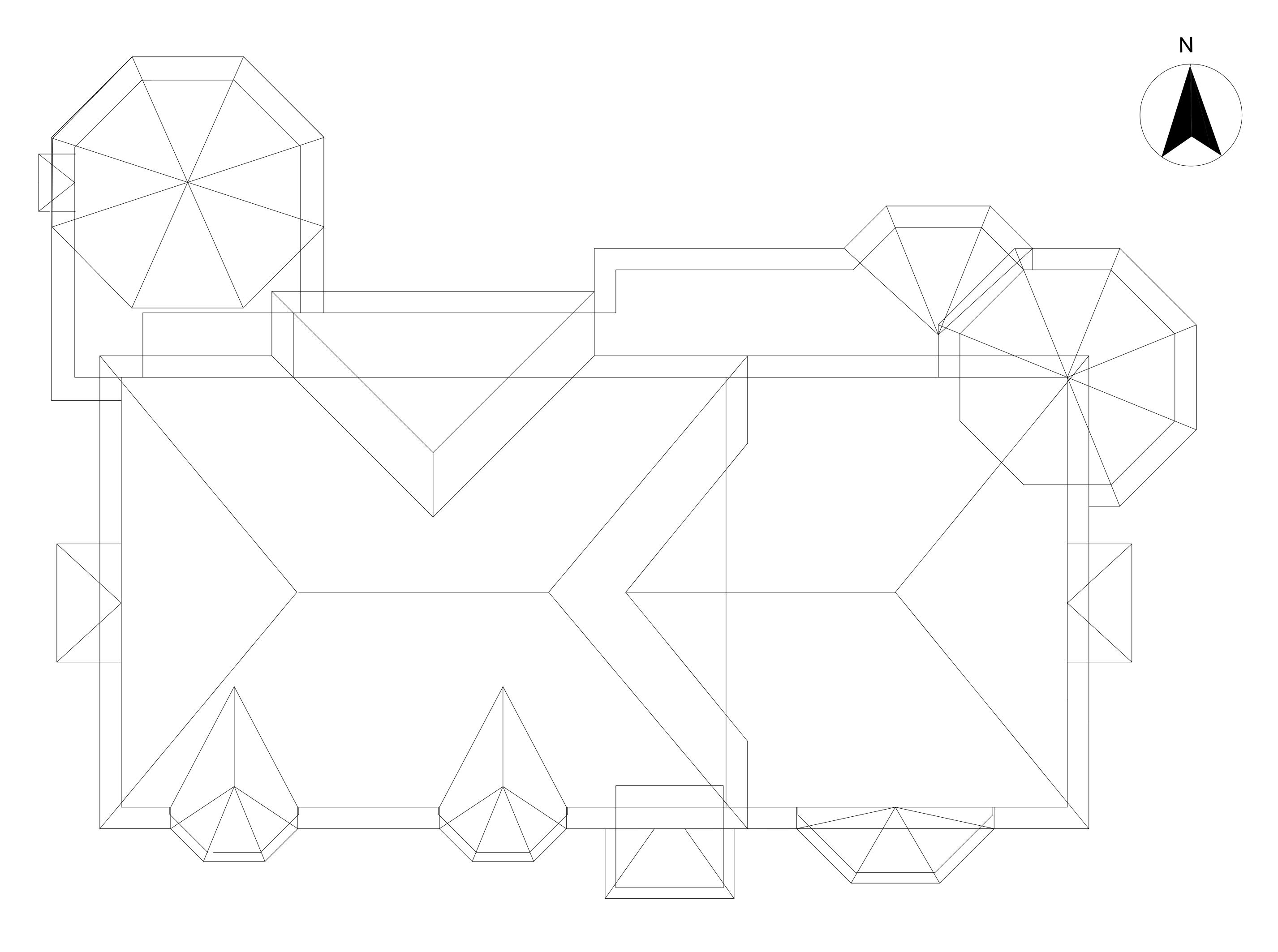
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2 01/27/2022 3 02/02/2022 4 03/02/2022



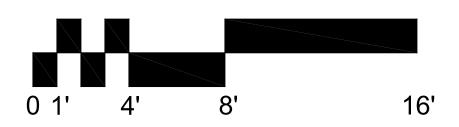
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A3.2



SHEET NOTES:

- 1. ROOF UNDERLAYMENT SHALL BE 30# ROOFING FELT FOR ROOF SLOPES OF 4:12, PER CRC R905.2.2.
- 2. ROOF UNDERPAYMENT SHALL BE TWO LAYERS OF 15# ROOFING FELT FOR ROOF SLOPES LES THAN 4:12 PER CRC R905.2.2.
- 3. ROOFING SHALL BE LIGHT WEIGHT CONCRETE CLASS A ROOF ASSEMBLE AS MANUFACTURED BY EAGLE ROOFING OR EQUIVALENT. ROOFING MATERIAL SHALL BE APPROVED BY STRUCTURAL ENGINEER.



1 12/21/2021

2 01/27/2022 3 02/02/2022

 3
 02/02/2022

 4
 03/02/2022

 5
 04/01/2022

5 04/01/2022

MOHAMMAD U SADIQ 1000 BOURN DRIVE WOODLAND, CA 95776 CELL PHONE (530) 315-4907

JSE ROOF PLAN

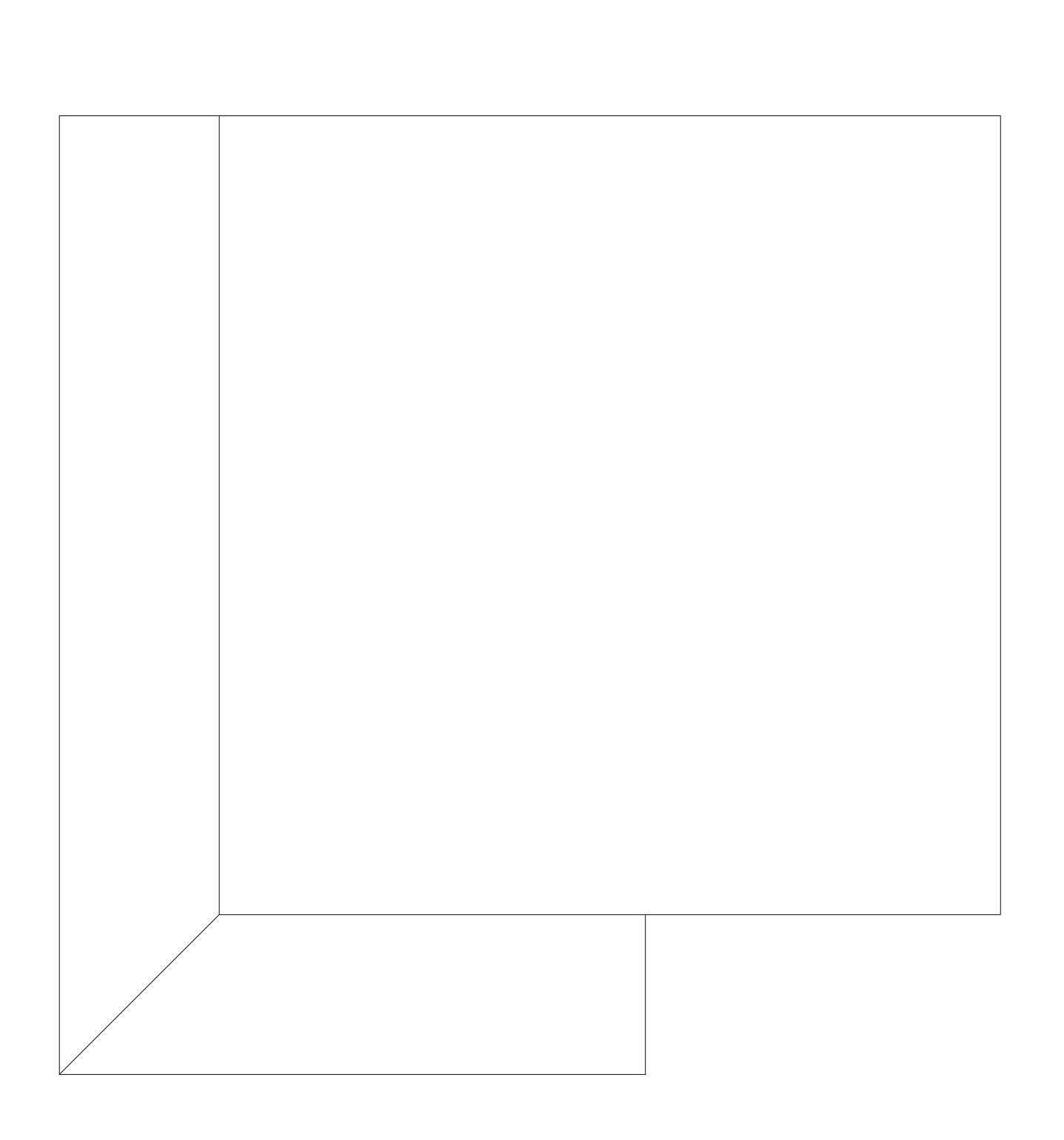
MAIN HOUSE R 1/4" = 1'-0"

AUJAAN FARMS

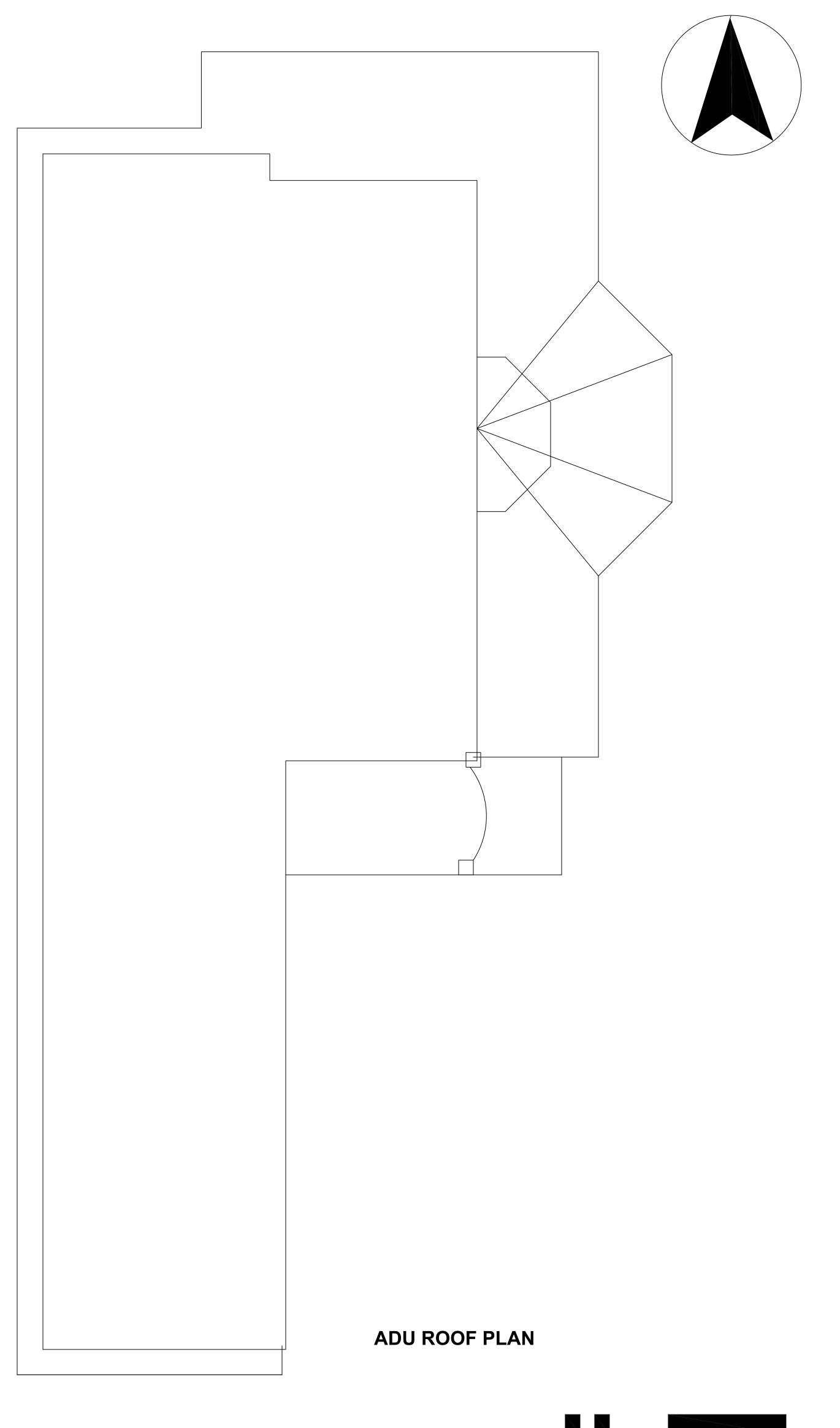
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SHEET NO.

A4.1



BARN ROOF PLAN



3 02/02/2022

1' 4' 8' 16'

DRAWN BY MB
SHEET NO.

A4.2

PROJECT:

New Main House 3718 May School Road Livermore, CA 94551

Project Designer:

Mohammad Sadiq, PE 1000 Burn Drive Woodland, CA 95776

Report Prepared by: Robert Mao, PE, CEA The Energy Consulting Company 6367 Swainland Road Oakland, CA 94611 510 387-2756

Job Number:

220327

Date:

3/24/2022

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2019 Building Energy Efficiency Standards. This program developed by EnergySoft Software – www.energysoft.com.

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Form MF-1R Mandatory Measures Summary	4
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		AL MEAS	OUKES !	SU
Project New I	_{Name} <i>Main Hou</i> s	e		
Project	Address			
	_	ol Road Li	vermore	
	ILATION			
Cons	struction	Type		
Wall	Wood Fra	med		
Door	Opaque E	Door		
Floor	Wood Fra	med w/Crawl S	pace	
Roof	Wood Fra	med Attic		
FENI	ESTRATI	ON	Total Area:	
	ntation	•	U-Fac	SH
Front (S		206.0	0.280	<u> </u>
Front (S		136.0	0.280	
Left (W)		152.0	0.280	
Left (NV		80.0	0.280	
Rear (N		366.0	0.280	
Rear (N		90.0	0.280	
Right (E		108.0	0.280	
Right (S		136.0	0.280	
,,,,,	-			
HVA	C SYSTE	MS		
HVA Qty.			Min. E	ff
1000		<u> </u>	Min. E	
Qty.	Heating	<u> </u>		
Qty. 2	Heating Split Heat F	J Pump		
Qty.	Heating Split Heat F	J Pump BUTION	9.00 HSF	
Qty. 2 HVA	Heating Split Heat F	BUTION He	9.00 HSF	
Qty.	Heating Split Heat F	J Pump BUTION	9.00 HSF	
Qty. 2 HVA Loca	Heating Split Heat F	BUTION He	9.00 HSF	
Qty. 2 HVA Loca	Heating Split Heat F C DISTRI tion	BUTION He	9.00 HSF	
HVA Loca HVAC	Heating Split Heat F C DISTRI tion	BUTION He	9.00 HSF ating	PF
HVA Loca HVAC WAT Qty.	Heating Split Heat F C DISTRI tion ER HEAT	BUTION He Ducted	9.00 HSF ating	PF
Qty. 2 HVA Loca HVAC	Heating Split Heat F C DISTRI tion	BUTION He Ducted	9.00 HSF ating	PF
HVAC Loca HVAC WAT Qty.	Heating Split Heat F C DISTRI tion ER HEAT	BUTION He Ducted	9.00 HSF ating	PF
HVAC Loca HVAC WAT Qty.	Heating Split Heat F C DISTRI tion ER HEAT	BUTION He Ducted	9.00 HSF ating	PF
HVALOCA HVAC WAT Qty. 2	Heating Split Heat F C DISTRI tion ER HEAT	BUTION He Ducted	9.00 HSF ating	allo

RESIDE	ENTIAL MEAS	SURES SL	JMMARY					RMS-1
Project Name			Building Ty			y Addition Alor		Date
New Main Project Addre			California E		ılti Family	☐ Existing+ Add		3/24/2022 # of Units
	ss School Road Li	ivermore		mate Zo		6,882	rea Addition	# or Units
INSULA				Area		- /		
	ction Type		Cavity	(ft^2)		oecial Featur	es	Status
4.5 5.6	lood Framed		R 15	2,936		ner P		New
Door O	paque Door		- no insulation	40)			New
Floor V	lood Framed w/Crawl S	pace	R 19	4,695	5			New
Roof V	ood Framed Attic		R 38	3,738	5			New
FENEST	RATION	Total Area:	1,274 Glazi	na Porcert	200: 11	8.5% New/Altered	Average II Fasta	0.28
Orientati	^	Total Area: U-Fac Sh		ng Percenta rhang	Sidefi		Average U-Factor: Shades	Status
Front (S)	206.0	0.280	0.23 none		none	N/A	Ondues	New
Front (SW)	136.0	0.280	0.23 none		none	N/A		New
Left (W)	152.0	0.280	0.23 none		none	N/A		New
Left (NW)	80.0	0.280	0.23 none		none	N/A		New
Rear (N)	366.0	0.280	0.23 none		none	N/A		New
Rear (NE)	90.0	0.280	0.23 none		none	N/A		New
Right (E)	108.0	0.280	0.23 none	,	none	N/A		New
Right (SE)	136.0	0.280	0.23 none		none	N/A		New
HVAC S' Qty. He	YSTEMS eating	Min. Eff	Cooling	נ	Min.	. Eff T	hermostat	Status
	it Heat Pump	9.00 HSPF	Split Heat		15.0 \$		back	New
	·							
HVAC DI	STRIBUTION	atina	Cooling	, D	nt I o o o	tion	Duct R-Value	Status
	100	ating	Cooling	_	ct Loca	шоп		9704
HVAC	Ducte	a .	Ducted	Attic			8.0	New
MATER	UEATING							
	HEATING	0-11-	M.	C f f	District	vutio-		Ctatus
Qty. Ty	pe	Gallo	ons iviir	ı. Eff	Distrik	oution		Status



2019 Low-Rise Residential Mandatory Measures Summary

NOTE: Low-rise residential buildings subject to the Energy Standards must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information. *Exceptions may apply.

	De Measures:					
§ 110.6(a)1:	Air Leakage. Manufactured fenestration, exterior doors, and exterior pet doors must limit air leakage to 0.3 CFM per square foot or less when tested per NFRC-400, ASTM E283 or AAMA/WDMA/CSA 101/I.S.2/A440-2011.*					
§ 110.6(a)5:	Labeling. Fenestration products and exterior doors must have a label meeting the requirements of § 10-111(a).					
§ 110.6(b):	Field fabricated exterior doors and fenestration products must use U-factors and solar heat gain coefficient (SHGC) values from Tables 110.6-A, 110.6-B, or JA4.5 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 stripped.					
§ 110.8(a):	Insulation Certification by Manufacturers. Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).					
§ 110.8(g):	Insulation Requirements for Heated Slab Floors. Heated slab floors must be insulated per the requirements of § 110.8(g).					
§ 110.8(i):	Roofing Products Solar Reflectance and Thermal Emittance. The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(i) and be labeled per §10-113 when the installation of a cool roof is specified on the CF1R.					
§ 110.8(j):	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):	Ceiling and Rafter Roof Insulation. Minimum R-22 insulation in wood-frame ceiling, or the weighted average U-factor must not exceed 0.043. Minimum R-19 or weighted average U-factor of 0.054 or less in a rafter roof alteration. Attic 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 continuous 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(b):	Loose-fill Insulation. Loose fill insulation must meet the manufacturer's required density for the labeled R-value.					
§ 150.0(c):	Wall Insulation. Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less, or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. Opaque non-framed assemblies must have an overall assembly U-factor not exceeding 0.102. Masonry walls must meet Tables 150.1-A or B.*					
§ 150.0(d):	Raised-floor Insulation. Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor."					
§ 150.0(f):	Slab Edge Insulation. Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone with					
§ 150.0(g)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. 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. 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 controlled ventilation crawl space for buildings complying with the exception to § 150.0(d).					
§ 150.0(g)2:	Vapor Retarder. In climate zones 14 and 16, a Class I or Class II vapor retarder must be installed on the conditioned space side of all insulation in all exterior walls, vented attics, and unvented attics with air-permeable insulation.					
§ 150.0(q):	Fenestration Products. Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.58; or the weighted average U-factor of all fenestration must not exceed 0.58.*					
Fireplaces, Deco	rative Gas Appliances, and Gas Log Measures:					
§ 110.5(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 Condition	ing, Water Heating, and Plumbing System Measures:					
§ 110.0-§ 110.3:	Certification. Heating, ventilation and air conditioning (HVAC) equipment, water heaters, showerheads, faucets, and all other regulated appliances must be certified by the manufacturer to the California Energy Commission.*					
§ 110.2(a):	HVAC Efficiency. Equipment must meet the applicable efficiency requirements in Table 110.2-A through Table 110.2-K.*					
§ 110.2(b):	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-on temperature for supplementary heating, and the cut-off temperature for					
	compression heating is higher than the cut-off temperature for supplementary heating.* Thermostats. All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a					
§ 110.2(c):	setback thermostat.* Water Heating Recirculation Loops Serving Multiple Dwelling Units. Water heating recirculation loops serving multiple dwelling units must					
§ 110.3(c)4:	meet the air release valve, backflow prevention, pump priming, pump isolation valve, and recirculation loop connection requirements of § 110.3(c) 4.					
§ 110.3(c)6:	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.					
§ 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.*					
§ 150.0(h)1:	Building Cooling and Heating Loads. Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; the SMACNA Residential Comfort System Installation Standards					

2019 Low-Rise Residential Mandatory Measures Summary

ENERGY COMMISSION	
§ 150.0(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 dryer
§ 150.0(h)3B:	Liquid Line Drier . Air conditioners and heat pump systems must be equipped with liquid line filter driers if required, as specified by the manufacturer's instructions.
§ 150.001:	Storage Tank Insulation. Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems, must have a minimum of R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.
§ 150.0(j)2A:	Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation. All domestic hot water piping must be insulated as specified in Section 609.11 of the California Plumbing Code. In addition, the following piping conditions must have a minimum insulation wall thickness of one inch or a minimum insulation R-value of 7.7: the first five feet of cold water pipes from the storage tank; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter less than 3/4 inch that is: associated with a domestic hot water recirculation system, from the heating source to storage tank or between tanks, buried below grade, and from the heating source to kitchen fixtures.*
§ 150.0 (jj3:	Insulation Protection. Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by Section 120.3(b). Insulation exposed to weather must be water retardant 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. Pipe insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.
§ 150.0(n)1:	Gas or Propane Water Heating Systems. Systems using gas or propane water heaters to serve individual dwelling units must include all of the following: A dedicated 125 volt, 20 amp electrical receptacle connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit, within three feet of the water heater without obstruction. Both ends of the unused conductor must be labeled with the word "spare" and be electrically isolated. Have a reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled with the words "Future 240V Use"; a Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; a condensate drain that is no more than two inches higher than the base of the water heater, and allows natural draining without pump assistance; and a gas supply line with a capacity of at least 200,000 Btu per hour.
§ 150.0(n)2:	Recirculating Loops. Recirculating loops serving multiple dwelling units must meet the requirements of § 110.3(c)5.
§ 150.0(n)3:	Solar Water-heating Systems. Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.
Ducts and Fans	Measures:
§ 110.8(d)3:	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.
§ 150.0(m)1:	CMC Compliance. All air-distribution system ducts and plenums must meet the requirements of the CMC §§ 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. 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 requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than ¼ inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed 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 cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.*
§ 150.0(m)2:	Factory-Fabricated Duct Systems. Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw hands.

g 100.0(1)jo.	agency that is approved by the Executive Director.
Ducts and Fan	s Measures:
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§ 150.0(m)1:	CMC Compliance. All air-distribution system ducts and plenums must meet the requirements of the CMC §§ 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. 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 requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed 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 cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.*
§ 150.0(m)2:	Factory-Fabricated Duct Systems. Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.
§ 150.0(m)3:	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.
§ 150.0(m)7:	Backdraft Damper. Fan systems that exchange air between the conditioned space and outdoors must have backdraft or automatic dampers.
§ 150.0(m)8:	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.
	Protection of Insulation. Insulation must be protected from damage, sunlight, moisture, equipment maintenance, and wind. Insulation exposed

§ 150.0(m)12:	Air Filtration. Space conditioning systems with ducts exceeding 10 feet and the supply side of ventilation systems must have MERV 13 or equivalent filters. Filters for space conditioning systems must have a two inch depth or can be one inch if sized per Equation 150.0-A. Pressure drops and labeling must meet the requirements in §150.0(m)12. Filters must be accessible for regular service.*
§ 150.0(m)13:	Space Conditioning System Airflow Rate and Fan Efficacy. Space conditioning systems that use ducts to supply cooling must have a hole for the placement of a static pressure probe, or a permanently installed static pressure probe in the supply plenum. Airflow must be ≥ 350 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.45 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 efficacy ≤ 0.62 watts per CFM. Field verification testing is required in accordance with Reference Residential Appendix RA3.3.*

§ 150.0(m)9: to weather must be suitable for outdoor service. For example, protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular

Porous Inner Core Flex Duct. Porous inner core flex ducts must have a non-porous layer between the inner core and outer vapor barrier.

§ 150.0(m)11: occupiable space, the ducts must be sealed and duct leakage tested, as confirmed through field verification and diagnostic testing, in accordance with § 150.0(m)11 and Reference Residential Appendix RA3.

foam insulation must be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation.

Duct System Sealing and Leakage Test. When space conditioning systems use forced air duct systems to supply conditioned air to an

	2019 Low-Rise Residential Mandatory Measures Summary
irements fo	or Ventilation and Indoor Air Quality:
O(o)1:	Requirements for Ventilation and Indoor Air Quality. All dwelling units must meet the requirements of ASHRAE Standar and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in § 150.0(o)1.

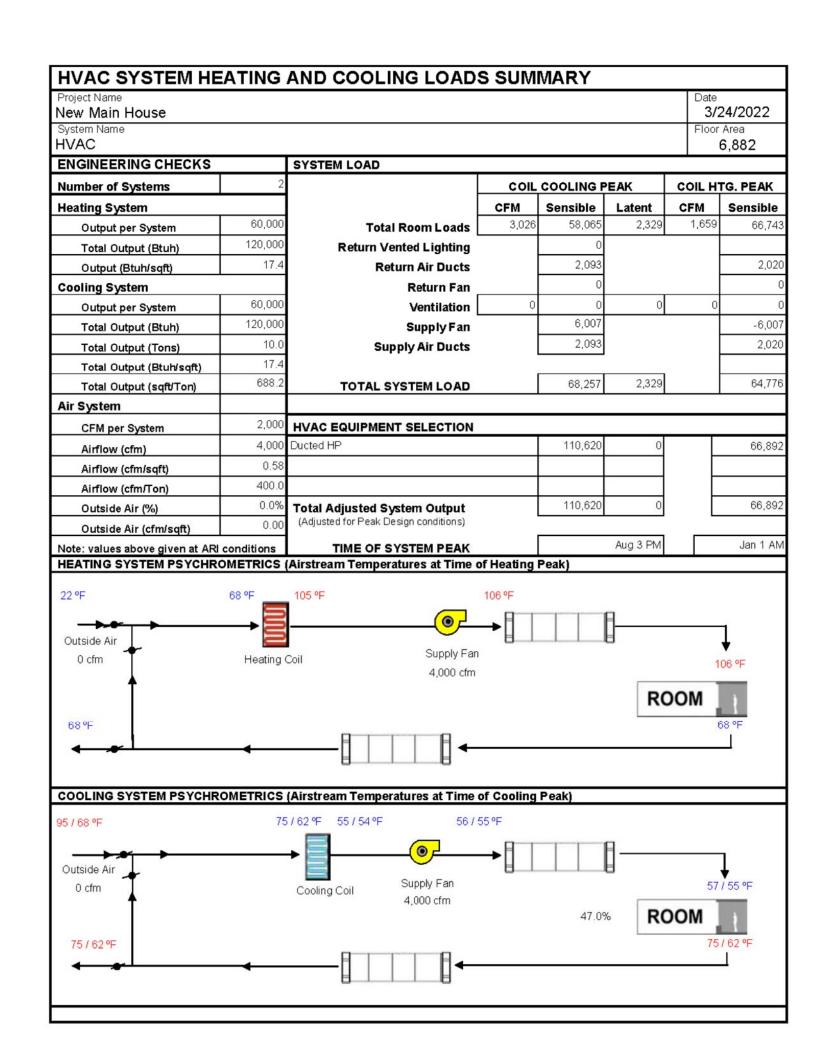
§ 150.0(o)1:	Requirements for Ventilation and Indoor Air Quality. All dwelling units must meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in § 150.0(o)1.
§ 150.0(o)1C:	Single Family Detached Dwelling Units. 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 provided at rates determined by ASHRAE 62.2 Sections 4.1.1 and 4.1.2 and as specified in § 150.0(o)1C.
§ 150.0(o)1E:	Multifamily Attached Dwelling Units. Multifamily attached dwelling units must have mechanical ventilation airflow provided at rates in accordance with Equation 150.0-B and must be either a balanced system or continuous supply or continuous exhaust system. If a balanced system is not used, all units in the building must use the same system type and the dwelling-unit envelope leakage must be ≤ 0.3 CFM at 50 Pa (0.2 inch water) per square foot of dwelling unit envelope surface area and verified in accordance with Reference Residential Appendix RA3.8.
§ 150.0(o)1F:	Multifamily Building Central Ventilation Systems. Central ventilation systems that serve multiple dwelling units must be balanced to provide ventilation airflow for each dwelling unit served at a rate equal to or greater than the rate specified by Equation 150.0-B. All unit airflows must be within 20 percent of the unit with the lowest airflow rate as it relates to the individual unit's minimum required airflow rate needed for compliance
§ 150.0(o)1G:	Kitchen Range Hoods. Kitchen range hoods must be rated for sound in accordance with Section 7.2 of ASHRAE 62.2.
§ 150.0(o)2:	Field Verification and Diagnostic Testing. Dwelling unit ventilation airflow must be verified in accordance with Reference Residential Appendix RA3.7. A kitchen range hood must be verified in accordance with Reference Residential Appendix RA3.7.4.3 to confirm it is rated by HVI to comply with the airflow rates and sound requirements as specified in Section 5 and 7.2 of ASHRAE 62.2.
Pool and Spa S	ystems and Equipment Measures:
§ 110.4(a):	Certification by Manufacturers. Any pool or spa heating system or equipment must be certified to have all of the following: a thermal efficiency that complies with the Appliance Efficiency Regulations; an or-off switch mounted outside of the heater that allows shutting off the heater without adjusting the thermostat setting; a permanent weatherproof plate or card with operating instructions; and must not use electric resistance heating."
§ 110.4(b)1:	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 dedicated suction and return lines, or built-in or built-up connections to allow for future solar heating.
§ 110.4(b)2:	Covers. Outdoor pools or spas that have a heat pump or gas heater must have a cover.
§ 110.4(b)3:	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 all pumps to be set or programmed to run only during off-peak electric 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 Measu	res:
§ 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) 1A:	Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A.
§ 150.0(k)1B:	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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control.
§ 150.0(k)1C:	Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k)1C.
§ 150.0(k)1D:	Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz.
§ 150.0(k)1E:	Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens.
§ 150.0(k)1F:	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(k).*
§ 150.0(k)1G:	Screw based luminaires. Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8.*
§ 150.0(k)1H:	Light Sources in Enclosed or Recessed Luminaires. Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.
§ 150.0(k)11:	Light Sources in Drawers, Cabinets, and Linen Closets. Light sources internal to 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 not more than 150 lumens, and are equipped with controls that automatically turn the lighting off when the drawer, cabinet or linen closet is closed.
§ 150.0(k)2A:	Interior Switches and Controls. All forward phase cut dimmers used with LED light sources must comply with NEMA SSL 7A
§ 150.0(k)2B:	Interior Switches and Controls. Exhaust fans must be controlled separately from lighting systems.*
§ 150.0(k)2C:	Interior Switches and Controls. Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned ON and OFF.*
§ 150.0(k)2D:	Interior Switches and Controls. Controls and equipment must be installed in accordance with manufacturer's instructions.
3 100.011920.	
§ 150.0(k)2E:	Interior Switches and Controls. Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the control is installed to comply with § 150.0(k).

2019 Low-Rise Residential Mandatory Measures Summary

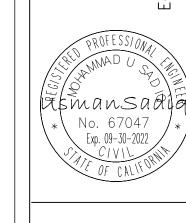
50 3.20 Standard

New

50.0(k)2G:	Interior Switches and Controls. An energy management control system (EMCS) may be used to comply with control requirements if it: provides functionality of the specified control according to § 110.9, meets the Installation Certificate requirements of § 130.4; meets the EMCS requirements of § 130.0(e); and meets all other requirements in § 150.0(k)2.
50.0(k)2H:	Interior Switches and Controls. A multiscene programmable controller may be used to comply with dimmer requirements in § 150.0(k) if it provides the functionality of a dimmer according to § 110.9, and complies with all other applicable requirements in § 150.0(k)2.
50.0(k)2l:	Interior Switches and Controls. In bathrooms, garages, laundry rooms, and utility rooms, at least one luminaire in each of these spaces must be controlled by an occupant sensor or a vacancy sensor providing automatic-off functionality. If an occupant sensor is installed, it must be initially configured to manual-on operation using the manual control required under Section 150.0(k)2C.
50.0(k)2J:	Interior Switches and Controls. Luminaires that are or contain light sources that meet Reference Joint Appendix JA8 requirements for dimming, and that are not controlled by occupancy or vacancy sensors, must have dimming controls.*
50.0(k)2K:	Interior Switches and Controls. Under cabinet lighting must be controlled separately from ceiling-installed lighting systems.
50.0(k)3A:	Residential Outdoor Lighting. For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or to other buildings on the same lot, must meet the requirement in item § 150.0(k)3Ai (ON and OFF switch) and the requirements in either § 150.0(k)3Aii (photocell and either a motion sensor or automatic time switch control) or § 150.0(k)3Aii (astronomical time clock), or an EMCS.
50.0(k):3B:	Residential Outdoor Lighting. For low-rise residential buildings with four or more dwelling units, outdoor lighting for private patios, entrances, balconies, and porches; and residential parking lots and carports with less than eight vehicles per site must comply with either § 150.0(k)3A or with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.
50.0(k)3C:	Residential Outdoor Lighting. For low-rise residential buildings with four or more dwelling units, any outdoor lighting for residential parking lots or carports with a total of eight or more vehicles per site and any outdoor lighting not regulated by § 150.0(k)3B or § 150.0(k)3D must comply with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.
50.0(k)4:	Internally illuminated address signs. Internally illuminated address signs must comply with § 140.8; or must consume no more than 5 watts of power as determined according to § 130.0(c).
50.0(k)5:	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 Sections 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.
50.0(k)6A:	Interior Common Areas of Low-rise Multifamily Residential Buildings. In a low-rise multifamily residential building where the total interior common area in a single building equals 20 percent or less of the floor area, permanently installed lighting for the interior common areas in that building must be comply with Table 150.0-A and be controlled by an occupant sensor.
50.0(k)6B:	Interior Common Areas of Low-rise Multifamily Residential Buildings. In a low-rise multifamily residential building where the total interior common area in a single building equals more than 20 percent of the floor area, permanently installed lighting for the interior common areas in that building must: i. Comply with the applicable requirements in Sections 110.9, 130.0, 130.1, 140.6 and 141.0; and ii. Lighting installed in corridors and stairwells must be controlled by occupant sensors that reduce the lighting power in each space by at least 50 percent. The occupant sensors must be capable of turning the light fully on and off from all designed paths of ingress and egress.
ar Ready Bui	
10.10(a)1:	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 § 110.10(b) through § 110.10(e).
10.10(a)2:	Low-rise Multifamily Buildings. Low-rise multi-family buildings that do not have a photovoltaic system installed must comply with the requirements of § 110.10(b) through § 110.10(d).
10.10(b)1:	Minimum Solar Zone Area. The solar zone must have a minimum total area as described below. The solar zone must comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other parts of 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 single family residences, 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. For low-rise multi-family buildings the solar zone must be located on the roof or overhang of the building, or on the roof or overhang of another structure located within 250 feet of the building, or on covered parking installed with the building project, and have a total area no less than 15 percent of the total roof area of the building excluding any skylight area. The solar zone requirement is applicable to the entire building, including mixed occupancy.*
10.10(b)2:	Azimuth. All sections of the solar zone located on steep-sloped roofs must be oriented between 90 degrees and 300 degrees of true north.
10.10(b)3A:	Shading. The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.*
10.10(b)3B:	Shading. Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, 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."
10.10(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.
10.10(c):	Interconnection Pathways. The construction documents must indicate: a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection 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.
	Documentation. A copy of the construction documents or a comparable document indicating the information from § 110.10(b) through
10.10(d):	§ 110.10(c) must be provided to the occupant.
10.10(d): 10.10(e)1:	



GENERAL REVISIONS



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GENER	AL INFORMATION							
01	Project Name	New Main House	w Main House					
0 2	Run Title	Title 24 Analysis	e 24 Analysis					
03	Project Location	3718 May School Road						
04	City	City Livermore 05 Standards Version 2		2019				
06	Zip code	Zip code 94551 07		Software Version	EnergyPro 8.3			
08	Climate Zone	Climate Zone 12		Front Orientation (deg/ Cardinal)	180			
10	Building Type	Single family	11	Number of Dwelling Units	1			
12	Project Scope	NewConstruction	13	Number of Bedrooms	5			
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	0.28			
18	Total Cond. Floor Area (ft ²)	6882	19	Glazing Percentage (%)	18.51%			
20	ADU Bedroom Count	n/a	21	ADU Conditioned Floor Area	n/a			
22	Is Natural Gas Available?	Yes	K	I S Inc				
		COICE!	1 //	1 9, 1110.				
COMPL	IANCE RESULTS	HERS P	R	OVIDER				
	01 Building Complies with Computer Performance							

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

Attic RoofSFR

CF1R-PRF-01E

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CERTIFICATE OF COMPLIANCE

Project Name: New Main House

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NE INFORMATION									
01	02	03	04			05	06	07	
Zone Name	Zone Type	HVAC System Name	Zone Floor A	rea (ft ²)	Avg.	Ceiling Height	Water Heating System 1	Water Heating System	
SFR Conditioned		HVAC1	6882	6882		9	DHW Sys 1	N/A	
PAQUE SURFACES									
01	02	03	04	05		06	07	08	
Name	Zone	Construction	Azimuth	Orientati	on	Gross Area (ft ²	Window and Door Area (ft2)	Tilt (deg)	
Front	SFR	R-15 + R-5 Wall	180	Front		810	246	90	
Front+45	SFR	R-15 + R-5 Wall	225	n/a		250	136	90	
Left	SFR	R-15 + R-5 Wall	270	Left		790	152	90	
Left+45	SFR	R-15 + R-5 Wall	315	n/a		120	80	90	
Rear	SFR	R-15 + R-5 Wall	0	Back	,	960	366	90	
Rear+45	SFR	R-15 + R-5 Wall	45	n/a),	120	90	90	
Right	SFR	R-15 + R-5 Wall	D C 90 D	Right	1/1	890	108	90	
Right+45	SFR	R-15 + R-5 Wall	135	n/a		310	136	90	
Roof	SFR	R-38 Roof Attic	n/a	n/a		3735	n/a	n/a	
Raised Floor	SFR	R-19 Floor Crawlspace	n/a	n/a		4695	n/a	n/a	
тіс									
01	02	03	04	05		06	07	08	
Name	Construction	Туре	Roof Rise (x in 12)	Roof Reflect	tance	Roof Emittance	e Radiant Barrier	Cool Roof	

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2022-03-24 07:53:37

Report Version: 2019.2.000
Schema Version: rev 20200901

CERTIFICATE OF COMPLIANCE

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		,212						and 27 20 may	201700110111011		
WATER HEATERS											
01	02	03	04	05	06	07	08	09	10	11	12
Name	Heating Element Type	Tank Type	# of 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
DHW Heater 1	Heat Pump	n/a	2	50	NEEA Rated	<= 12 kW	n/a	n/a	n/a	١	Outside

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
DHW Sys 1 - 1/2	Not Required	Not Required	Not Required	None	Not Required	Not Required	Not Required

(5)					1	-						
SPACE CONDITIONING S	SYSTEM	15		10		- D I	C	In c	1			
01			02	03	04	05	06	07	08	09	10	11
Name		Sys	tem Type	Heating Unit Name	Cooling Unit Name	Fan Name	Distribution Name	Required Thermostar Type	C. C	Verified Existing Condition	Heating Equipment Count	Cooling Equipment Count
HVAC1		Heat pump	o heating cooling	Heat Pump System 1	Heat Pump System 1	HVAC Fan 1	Air Distribution System 1	Setback	New	NA	2	2
01		02	03	04	05	06	07	08	09	14	0	11
HVAC HEAT DUBADE											-	

01	02	03	04	05	06	07	08	09	10	11
HVAC - HEAT PUMPS										
Name	System Type	Number of Units		Heating		Coo	ling	Zonally	Compressor	HERS Verification
Name	System Type	Number of onits	HSPF/COP	Cap 47	Cap 17	SEER	EER/CEER	Controlled	Туре	HERS VEHICACION
Heat Pump System 1	Central split HP	2	9	60000	55000	15	11.7	Not Zonal	Single Speed	Heat Pump System 1-hers-htpump

CERTIFICATE OF COMPLIANCE

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ENERGY DESIGN RATING				
	Energy Des	ign Ratings	Compliano	e Margins
	Efficiency ¹ (EDR)	Total² (EDR)	Efficiency ¹ (EDR)	Total² (EDR)
Standard Design	40.7	27		
Proposed Design	40.4	26.8	0.3	0.2
	RESULT: 3:	COMPLIES		
1. Efficiency EDR includes improvements to the building envelope	and mayo officions on Jamous			

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: 4.94 kWdc

PV System resized to 4.94 kWdc (a factor of 4.939) to achieve 'Standard Design PV' PV scaling

	ENERGY (JSE SUMMARY		
Energy Use (kTDV/ft ² -yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	26.58	K O 19.05	7.53	28.3
Space Cooling	19.27	27.22	-7.95	-41.3
IAQ Ventilation	5.93	4.87	1.06	17.9
Water Heating	4.93	5.05	-0.12	-2.4
Self Utilization/Flexibility Credit	n/a	0	0	n/a
Compliance Energy Total	56.71	56.19	0.52	0.9

REQUIRED PV SYS	TEMS - 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 Acces (%)
4.94	NA	Standard	Fixed	none	true	150-270	n/a	n/a	<=7:12	96	98

CERTIFICATE OF COMPLIANCE

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FENESTRATION / GLAZING

01	- 02	03	04	05	06	07	08	-09	10	11	12	13	14
Name	Туре	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft ²)	U-factor	U-factor Source	SHGC	SHGC Sourc e	Exterio Shadin
Window	Window	Front	Front	180			1	206	0.28	NFRC	0.23	NFRC	Bug Scre
Window 2	Window	Front+45		225			1	136	0.28	NFRC	0.23	NFRC	Bug Scre
Window 3	Window	Left	Left	270			1	152	0.28	NFRC	0.23	NFRC	Bug Scre
Window 4	Window	Left+45		315			1	80	0.28	NFRC	0.23	NFRC	Bug Scre
Window 5	Window	Rear	Back	0			1	366	0.28	NFRC	0.23	NFRC	Bug Scre
Window 6	Window	Rear+45		45		, ,	1	90	0.28	NFRC	0.23	NFRC	Bug Scre
Window 7	Window	Right	Right	90			1	108	0.28	NFRC	0.23	NFRC	Bug Scre
Window 8	Window	Right+45		135			1	136	0.28	NFRC	0.23	NFRC	Bug Scre

OPAQUE DOORS	4 (3 (F	DICINC	
01	02	03	04
Name	Side of Building	Area (ft²)	U-factor
Door	Front	40	0.5

PAQUE SURFACE CONSTR	RUCTIONS						
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
R-15 + R-5 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None/R-5	0.06	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Sheathing / Insulation: R-5 Sheathing Exterior Finish: 3 Coat Stucco

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CalCERTS

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Schema Version: rev 20200901

CERTIFICATE OF COMPLIANCE

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REQ	EQUIRED SPECIAL FEATURES						
The	following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.						
·	Indoor air quality, balanced fan						
-	IAQ Ventilation System: as low as 0.575 W/CFM						
١.	IAQ Ventilation System Heat Recovery: minimum 66 SRE and 66 ASRE						
-	IAQ Ventilation System: supply outside air inlet, filter, and H/ERV cores accessible per RACM Reference Manual						
	IAQ Ventilation System: fault indicator display						
١٠	Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed						

HERS FEATURE SUMMARY	
	ust be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional stered 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 SEER Fan Efficacy Watts/CFM Heating System Verifications: Verified HSPF Verified heat pump rated heating capacity HVAC Distribution System Verifications:	CalCERTS, Inc.

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
New Main House	6882	1	5	1	0	1

Duct leakage testing

Domestic Hot Water System Verifications:

Registration Number:

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CERTIFICATE OF COMPLIANCE

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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
Attic RoofSFR	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-O	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
R-19 Floor Crawlspace	Floors Over Crawlspace	Wood Framed Floor	2x10 @ 16 in. O. C.	R-19	None / None	0.046	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: R-19 / 2x10
R-38 Roof Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-38	None / None	0.025	Over Ceiling Joists: R-28.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board

		0 6 100	
BUILDING ENVELOPE - HERS VERIFICATION	A COICE	KID, INC.	
01	H 02 E R S P	R O V 103D F R	04
Quality Insulation Installation (QII)	High R-value Spray Foam Insulation	Building Envelope Air Leakage	CFM50
Required	Not Required	Not Required	n/a

WATER HEATING SYSTEM	s		-			-!	
01	02	03	04	l l	05	06	07
Name	System Type	Distribution Type	Water Heater	r Name (#)	Solar Heating System	Compact Distribution	HERS Verification
DHW Sys 1	Domestic Hot Water (DHW)	Standard Distribution System	DHW Heat	ter 1 (2)	n/a	None	n/a

GENERAL REVISIONS

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Calculation Description: Title 24 Analysis

Verified Airflow

03

Airflow Target

04

Verified EER

HVAC HEAT PUMPS - HERS VERIFICATION

01

Name

Heat Pump System

CF1R-PRF-01E Calculation Date/Time: 2022-03-22T18:11:19-07:00 (Page 8 of 10)

Input File	: Name: sadiq 3718 ı	may school rd main.	ribd19x	30 10/49
05	06	07	08	09
erified SEER	Verified Refrigerant	Verified HSPF	Verified Heating	Verified Heating

	1-hers-htpump											
Ī	HVAC - DISTRIBUTIO	ON SYSTEMS										
	01	02	03	04	05	06	07	08	09	10	11	12
				Duct Ins	. R-value	Duct L	ocation	Surfa	ce Area			
	Name	Туре	Design Type	Supply	Return	Supply	Return	Supply	Return	Bypass	Duct Leakage	HERS
		.,,,,		J.,		Supply	rictairi	J.,		Duct	- met Leamage	Verification

HVAC DISTRIBUTION	- HERS VERIFICATION		HERS	PRO	VIDI	E D		
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
Air Distribution System 1-hers-dist	Yes	5.0	Not Required	Not Required	Not Required	Credit not taken	Not Required	No

Ī	HVAC - FAN SYSTEMS			
	01	02	03	04
	Name	Туре	Fan Power (Watts/CFM)	Name
	HVAC Fan 1	HVAC Fan	0.45	HVAC Fan 1-hers-fan
-				

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CERTIFICATE OF COMPLIANCE CF1R-PRF-01E Calculation Date/Time: 2022-03-22T18:11:19-07:00 Project Name: New Main House (Page 9 of 10) Calculation Description: Title 24 Analysis Input File Name: sadiq 3718 may school rd main.ribd19x

HVAC FAN SYSTEMS - HERS VERIFICATION		
01	02	03
Name	Verified Fan Watt Draw	Required Fan Efficacy (Watts/CFM)
HVAC Fan 1-hers-fan	Required	0.45

IAQ (INDOOR AIR QUALITY) FANS IAQ Recovery IAQ Recovery IAQ CFM IAQ Watts/CFM IAQ Fan Type **HERS Verification** Dwelling Unit Effectiveness - SRE Effectiveness - ASRE SFam IAQVentRpt 1-1 240 0.575 Balanced

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CERTIFICATE OF COMPLIANCE Project Name: New Main House

Calculation Description: Title 24 Analysis

Calculation Date/Time: 2022-03-22T18:11:19-07:00 Input File Name: sadiq 3718 may school rd main.ribd19x

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT 1. I certify that this Certificate of Compliance documentation is accurate and complete. Documentation Author Name: Robert Mao, PE, CEA TECC 2022-03-24 07:53:37 CEA/ HERS Certification Identification (If applicable): 6367 Swainland Road c70157 Oakland, CA 94611 510-387-2756 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.

 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.
 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. sponsible Designer Name: Robert Mao, PE, CEA Date Signed: 2022-03-24 07:53:37 TECC 6367 Swainland Road c70157 City/State/Zip: Oakland, CA 94611 510-387-2756

Digitally signed by CalCERTS. This digital signature is provided in order to secure the content of this registered document, and in no way implies Registration Provider responsibility for the accuracy of the information.

222-P010056123A-000-000-0000000-0000 CA Building Energy Efficiency Standards - 2019 Residential Compliance

Registration Date/Time: 2022-03-24 07:53:37 Report Version: 2019.2.000 Schema Version: rev 20200901

HERS Provider: CalCERTS inc. Report Generated: 2022-03-22 18:11:50

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CF1R-PRF-01E

(Page 10 of 10)

GENERAL REVISIONS



DRAWN BY MB

SHEET NO. A6.3

PROJECT:

New ADU 3718 May School Road Livermore, CA 94551

Project Designer:

Mohammad Sadiq, PE 1000 Burn Drive Woodland, CA 95776

Report Prepared by: Robert Mao, PE, CEA The Energy Consulting Company 6367 Swainland Road Oakland, CA 94611 510 387-2756

Job Number:

220327

Date:

3/24/2022

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2019 Building Energy Efficiency Standards. This program developed by EnergySoft Software – www.energysoft.com.

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Project Na				Build	ding Typ
New AD				Coli	fornia E
Project Add	aress By School Roa	ad Li	ivermore		fornia E A <i>Clii</i>
INSUL	•				
Constr		е		Cav	ity
Wall	Wood Framed			R 15	
Door	Opaque Door			- no ins	sulation
Floor	Wood Framed w/	Crawl S	pace	R 19	
Roof	Wood Framed At	tic		R 38	
FENES	TRATION		Total Area:	261	Glazir
Orienta	ation Area	(ft^2)		HGC	Ove
Left (W)	1	08.0	0.280	0.23	none
Rear (N)		26.0	0.280	0.23	none
Rear (NE)		15.0	0.280	0.23	none
Right (E)		97.0	0.280	0.23	none
Right (SE)		15.0	0.280	0.23	none
	SYSTEMS				
Qty. I	Heating		Min. Eff		
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2019 Low-Rise Residential Mandatory Measures Summary

NOTE: Low-rise residential buildings subject to the Energy Standards must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information. *Exceptions may apply.

Building Envelop	
§ 110.6(a)1:	Air Leakage. Manufactured fenestration, exterior doors, and exterior pet doors must limit air leakage to 0.3 CFM per square foot or less when tested per NFRC-400, ASTM E283 or AAMA/WDMA/CSA 101/I.S.2/A440-2011.*
§ 110.6(a)5:	Labeling. Fenestration products and exterior doors must have a label meeting the requirements of § 10-111(a).
§ 110.6(b):	Field fabricated exterior doors and fenestration products must use U-factors and solar heat gain coefficient (SHGC) values from Tables 110.6-A, 110.6-B, or JA4.5 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 stripped.
§ 110.8(a):	Insulation Certification by Manufacturers. Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).
§ 110.8(g):	Insulation Requirements for Heated Slab Floors. Heated slab floors must be insulated per the requirements of § 110.8(g).
§ 110.8(i):	Roofing Products Solar Reflectance and Thermal Emittance. The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(i) and be labeled per §10-113 when the installation of a cool roof is specified on the CF1R.
§ 110.8(j):	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):	Ceiling and Rafter Roof Insulation. Minimum R-22 insulation in wood-frame ceiling, or the weighted average U-factor must not exceed 0.043. Minimum R-19 or weighted average U-factor of 0.054 or less in a rafter roof alteration. Attic 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 continuous 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(b):	Loose-fill Insulation. Loose fill insulation must meet the manufacturer's required density for the labeled R-value.
§ 150.0(c):	Wall Insulation. Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less, or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. Opaque non-framed assemblies must have an overall assembly U-factor not exceeding 0.102. Masonry walls must meet Tables 150.1-A or B.*
§ 150.0(d):	Raised-floor Insulation. Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor.*
§ 150.0(f):	Slab Edge Insulation. Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone without facings, no greater than 0.3 percent; have a water vapor permeance no greater than 2.0 perm per inch; be protected from physical damage and UV light deterioration; and, when installed as part of a heated slab floor, meet the requirements of § 110.8(g).
§ 150.0(g)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 controlled ventilation crawl space for buildings complying with the exception to § 150.0(d). Vapor Retarder. In climate zones 14 and 16, a Class I or Class II vapor retarder must be installed on the conditioned space side of all
§ 150.0(g)2:	insulation in all exterior walls, vented attics, and unvented attics with air-permeable insulation. Fenestration Products. Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a
§ 150.0(q):	maximum U-factor of 0.58; or the weighted average U-factor of all fenestration must not exceed 0.58.*
Fireplaces, Deco	rative Gas Appliances, and Gas Log Measures:
§ 110.5(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."
	ing, Water Heating, and Plumbing System Measures:
§ 110.0-§ 110.3:	Certification. Heating, ventilation and air conditioning (HVAC) equipment, water heaters, showerheads, faucets, and all other regulated appliances must be certified by the manufacturer to the California Energy Commission.*
§ 110.2(a):	HVAC Efficiency. Equipment must meet the applicable efficiency requirements in Table 110.2-A through Table 110.2-K.*
§ 110.2(b):	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-on temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.*
§ 110.2(c):	Thermostats. All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a setback thermostat.*
§ 110.3(c)4:	Water Heating Recirculation Loops Serving Multiple Dwelling Units. Water heating recirculation loops serving multiple dwelling units must meet the air release valve, backflow prevention, pump priming, pump isolation valve, and recirculation loop connection requirements of § 110.3(c) 4.
§ 110.3(c)6:	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.
§ 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.*
§ 150.0(h)1:	Building Cooling and Heating Loads. Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; the SMACNA Residential Comfort System Installation Standards Manual; or the ACCA Manual J using design conditions specified in § 150.0(h)2.

2019 Low-Rise Residential Mandatory Measures Summary

I ENEMET COMMISSION I	,					
§ 150.0(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 dryer					
§ 150.0(h)3B:	That larget are a metral entreme.					
§ 150.0(j)1:	Storage Tank Insulation. Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems, must have a minimum of R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.					
§ 150.0(j)2A:	Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation. All domestic hot water piping be insulated as specified in Section 609.11 of the California Plumbing Code. In addition, the following piping conditions must have a minimum insulation wall thickness of one inch or a minimum insulation R-value of 7.7: the first five feet of cold water pipes from the storage tank water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping w					
§ 150.0 ()3:	Insulation Protection. Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by Section 120.3(b). Insulation exposed to weather must be water retardant 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. Pipe insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.					
§ 150.0(n)1:	Gas or Propane Water Heating Systems. Systems using gas or propane water heaters to serve individual dwelling units must include all of the following: A dedicated 125 volt, 20 amp electrical receptade connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit, within three feet of the water heater without obstruction. Both ends of the unused conductor must be labeled with the word "spare" and be electrically isolated. Have a reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled with the words "Future 240V Use"; a Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; a condensate drain that is no more than two inches higher than the base of the water heater, and allows natural draining without pump assistance; and a gas supply line with a capacity of at least 200,000 Btu per hour:					
§ 150.0(n)2:	Recirculating Loops. Recirculating loops serving multiple dwelling units must meet the requirements of § 110.3(c)5.					
§ 150.0(n)3:	Solar Water-heating Systems. Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.					
Ducts and Fans	Measures:					
§ 110.8(d)3:	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.					
§ 150.0(m)1:	CMC Compliance. All air-distribution system ducts and plenums must meet the requirements of the CMC §§ 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. 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 requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed 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 cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.*					
0.450.07.30	Factory-Fabricated Duct Systems. Factory-fabricated duct systems must comply with applicable requirements for duct construction,					

Porous Inner Core Flex Duct. Porous inner core flex ducts must have a non-porous layer between the inner core and outer vapor barrier.

§ 150.0(m)11: occupiable space, the ducts must be sealed and duct leakage tested, as confirmed through field verification and diagnostic testing, in

drops and labeling must meet the requirements in §150.0(m)12. Filters must be accessible for regular service.*

Duct System Sealing and Leakage Test. When space conditioning systems use forced air duct systems to supply conditioned air to an

Air Filtration. Space conditioning systems with ducts exceeding 10 feet and the supply side of ventilation systems must have MERV 13 or equivalent filters. Filters for space conditioning systems must have a two inch depth or can be one inch if sized per Equation 150.0-A. Pressure

Space Conditioning System Airflow Rate and Fan Efficacy. Space conditioning systems that use ducts to supply cooling must have a hole for the placement of a static pressure probe, or a permanently installed static pressure probe in the supply plenum. Airflow must be ≥ 350 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 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 efficacy ≤ 0.62 watts per CFM. Field verification testing is required in accordance with Reference Residential Appendix RA3.3.*

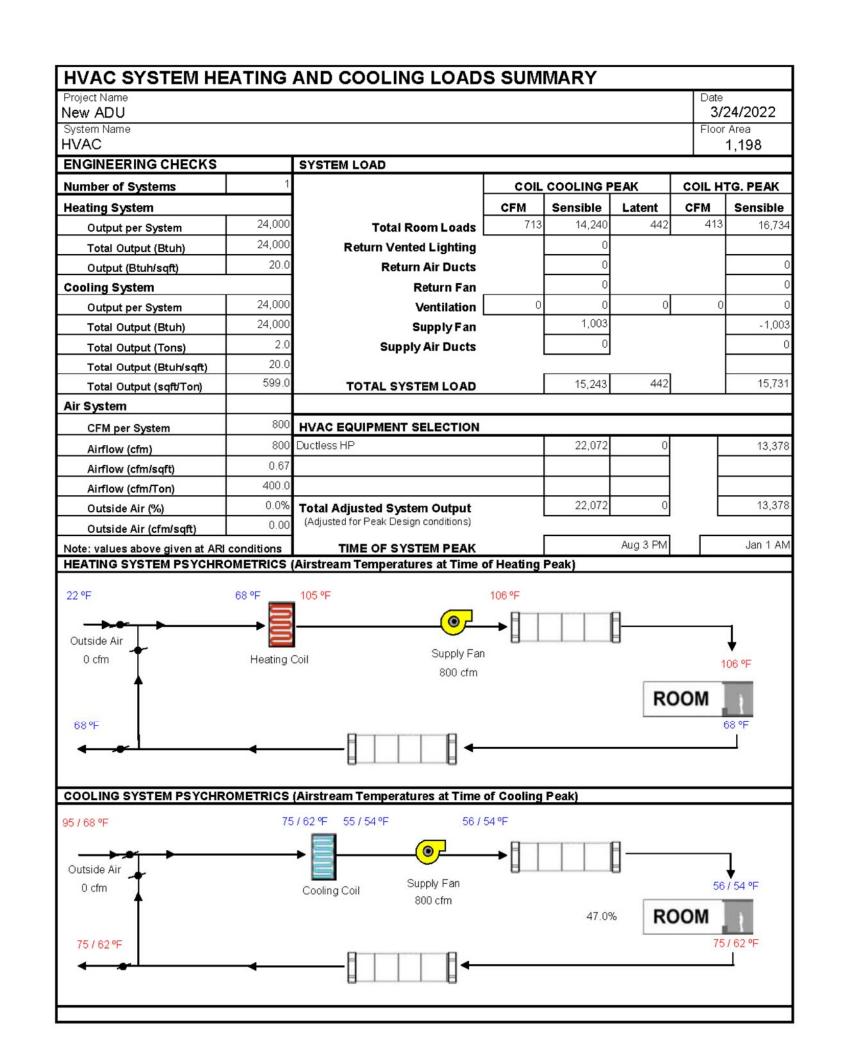
accordance with § 150.0(m)11 and Reference Residential Appendix RA3.

§ 150.0(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 dryer				
§ 150.0(h)3B:	Liquid Line Drier. Air conditioners and heat pump systems must be equipped with liquid line filter driers if required, as specified by the manufacturer's instructions.				
§ 150.0 (j)1:	Storage Tank Insulation. Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems, must have a minimum of R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.				
§ 150.0(j)2A:	Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation. All domestic hot water piping must be insulated as specified in Section 609.11 of the California Plumbing Code. In addition, the following piping conditions must have a minimum insulation wall thickness of one inch or a minimum insulation R-value of 7.7: the first five feet of cold water pipes from the storage tank; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter less than 3/4 inch that is: associated with a domestic hot water recirculation system, from the heating source to storage tank or between tanks, buried below grade, and from the heating source to kitchen fixtures.*				
§ 150.0 (j)3:	Insulation Protection. Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by Section 120.3(b). Insulation exposed to weather must be water retardant 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 II vapor retarder. Pipe insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.				
§ 150.0(n)1:	Gas or Propane Water Heating Systems. Systems using gas or propane water heaters to serve individual dwelling units must include all of the following: A dedicated 125 volt, 20 amp electrical receptacle connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit, within three feet of the water heater without obstruction. Both ends of the unused conductor must be labeled with the word "spare" and be electrically isolated. Have a reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled with the words "Future 240V Use"; a Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; a condensate drain that is no more than two inches higher than the base of the water heater, and allows natural draining without pump assistance; and a gas supply line with a capacity of at least 200,000 Btu per hour.				
§ 150.0(n)2:	Recirculating Loops. Recirculating loops serving multiple dwelling units must meet the requirements of § 110.3(c)5.				
§ 150.0(n)3:	Solar Water-heating Systems. Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.				
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§ 150.0(m)1:	CMC Compliance. All air-distribution system ducts and plenums must meet the requirements of the CMC §§ 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. 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 requirements of UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than ¼ inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed 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 cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.* Factory-Fabricated Duct Systems. Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands. Field-Fabricated Duct Systems. Field-fabricated duct systems must comply with applicable requirements for: pressure-sensitive tapes,				
§ 150.0(m)1: § 150.0(m)2: § 150.0(m)3:	CMC Compliance. All air-distribution system ducts and plenums must meet the requirements of the CMC §§ 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. 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 requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than ½ inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed sheet metal, duct board or flexible duct must not be used to convey conditioned air. Building cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.* Factory-Fabricated Duct Systems. Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands. 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.				
§ 150.0(m)1: § 150.0(m)2: § 150.0(m)3: § 150.0(m)7:	CMC Compliance. All air-distribution system ducts and plenums must meet the requirements of the CMC §§ 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. 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 requirements of UL 181, UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than ½ inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed 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 cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.* Factory-Fabricated Duct Systems. Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems must comply with applicable requirements for pressure-sensitive tapes, mastics, sealants, and other requirements specified for duct construction. Backdraft Damper. Fan systems that exchange air between the conditioned space must have either automatic or readily accessible,				

2019 Low-Rise Residential Mandatory Measures Summary

1000 Avr. 2011 1600 Dec - 4000 Dec - 2010 Avr. 2	or Ventilation and Indoor Air Quality: Requirements for Ventilation and Indoor Air Quality. All dwelling units must meet the requirements of ASHRAE Standard 62.2, Ventilation			
§ 150.0(o)1:	and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in § 150.0(o)1.			
Single Family Detached Dwelling Units. Single family detached dwelling units, and attached dwelling units not sharing ceilings or other dwelling units, occupiable spaces, public garages, or commercial spaces must have mechanical ventilation airflow provided at determined by ASHRAE 62.2 Sections 4.1.1 and 4.1.2 and as specified in § 150.0(a)1C.				
§ 150.0(o)1E:	Multifamily Attached Dwelling Units. Multifamily attached dwelling units must have mechanical ventilation airflow provided at rates in accordance with Equation 150.0-B and must be either a balanced system or continuous supply or continuous exhaust system. If a balance system is not used, all units in the building must use the same system type and the dwelling-unit envelope leakage must be ≤ 0.3 CFM at (0.2 inch water) per square foot of dwelling unit envelope surface area and verified in accordance with Reference Residential Appendix F			
§ 150.0(o)1F:	Multifamily Building Central Ventilation Systems. Central ventilation systems that serve multiple dwelling units must be balanced to proventilation airflow for each dwelling unit served at a rate equal to or greater than the rate specified by Equation 150.0-B. All unit airflows multiple within 20 percent of the unit with the lowest airflow rate as it relates to the individual unit's minimum required airflow rate needed for compliance.			
§ 150.0(o)1G: Kitchen Range Hoods. Kitchen range hoods must be rated for sound in accordance with Section 7.2 of ASHRAE 62.2.				
§ 150.0(o)2:	Field Verification and Diagnostic Testing. Dwelling unit ventilation airflow must be verified in accordance with Reference Residential Appendix RA3.7. A kitchen range hood must be verified in accordance with Reference Residential Appendix RA3.7.4.3 to confirm it is rated by HVI to comply with the airflow rates and sound requirements as specified in Section 5 and 7.2 of ASHRAE 62.2.			
Pool and Spa S	ystems and Equipment Measures:			
§ 110.4(a):	Certification by Manufacturers. Any pool or spa heating system or equipment must be certified to have all of the following: a thermal efficiency that complies with the Appliance Efficiency Regulations; an or-off switch mounted outside of the heater that allows shutting off the heater without adjusting the thermostat setting; a permanent weatherproof plate or card with operating instructions; and must not use electric resistance heating.*			
§ 110.4(b)1:	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 dedicated suction and return lines, or built-in or built-up connections to allow for future solar heating.			
§ 110.4(b)2:	Covers. Outdoor pools or spas that have a heat pump or gas heater must have a cover.			
§ 110.4(b)3:	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 all pumps to be set or programmed to run only during off-peak electric 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			
2 . a.a. (b).	rate, piping, filters, and valves."			
	rate, piping, filters, and valves.* res:			
Lighting Measur	res:			
Lighting Measu	res: Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements			
Lighting Measur	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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			
§ 110.9: § 150.0(k)1A:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or			
§ 110.9: § 150.0(k)1A: § 150.0(k)1B:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz.			
§ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens.			
§ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C: § 150.0(k)1D:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be			
§ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C: § 150.0(k)1D: § 150.0(k)1E:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens. Lighting Integral to Exhaust Fans. Lighting integral to exhaust fans (except when installed by the manufacturer in kitchen exhaust hoods)			
§ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C: § 150.0(k)1C: § 150.0(k)1D: § 150.0(k)1E:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens. 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(k).*			
§ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C: § 150.0(k)1C: § 150.0(k)1D: § 150.0(k)1E: § 150.0(k)1F: § 150.0(k)1G:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing, maintenance; and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens. 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(k).* Screw based luminaires. Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8.* Light Sources in Enclosed or Recessed Luminaires. Lamps and other separable light sources that are not compliant with the JA8 elevated			
§ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C: § 150.0(k)1D: § 150.0(k)1E: § 150.0(k)1F: § 150.0(k)1F: § 150.0(k)1F:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling, air leakage; sealing, maintenance; and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens. 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(k).* Screw based luminaires. Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8.* Light Sources in Enclosed or Recessed Luminaires. Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires. Light Sources in Drawers, Cabinets, and Linen Closets. Light sources internal to 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			
§ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C: § 150.0(k)1D: § 150.0(k)1E: § 150.0(k)1F: § 150.0(k)1F: § 150.0(k)1F:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling, air leakage, sealing, maintenance; and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens. 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(k).* Screw based luminaires. Screw based Luminaires must contain lamps that comply with Reference Joint Appendix JA8.* Light Sources in Enclosed or Recessed Luminaires must not be installed in enclosed or recessed luminaires. Light Sources in Drawers, Cabinets, and Linen Closets. Light sources internal to 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			
\$ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C: § 150.0(k)1C: § 150.0(k)1E: § 150.0(k)1F: § 150.0(k)1F: § 150.0(k)1F: § 150.0(k)1H:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9." Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling, air leakage; sealing, maintenance; and socket and light source as described in § 150.0(k) 1 C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens. 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(k).* Screw based luminaires. Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8.* Light Sources in Enclosed or Recessed Luminaires. Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires. Light Sources in Drawers, Cabinets, and Linen Closets. Light sources internal to 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			
\$ 110.9: § 150.0(k)1A: § 150.0(k)1B: § 150.0(k)1C: § 150.0(k)1C: § 150.0(k)1E: § 150.0(k)1F: § 150.0(k)1F: § 150.0(k)1F: § 150.0(k)1B:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling, air leakage; sealing, maintenance, and socket and light source as described in § 150.0(k)1C. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens. 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(k).* Screw based luminaires. Screw based luminaires must contain lamps that comply with Reference Joint Appendix JAB.* Light Sources in Enclosed or Recessed Luminaires must contain lamps that comply with Reference Joint Appendix JAB.* Light Sources in Drawers, Cabinets, and Linen Closets. Light sources internal to 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,			
\$ 110.9: § 150.0(k) 1A: § 150.0(k) 1B: § 150.0(k) 1C: § 150.0(k) 1D: § 150.0(k) 1E: § 150.0(k) 1F: § 150.0(k) 1F: § 150.0(k) 1H: § 150.0(k) 1H: § 150.0(k) 2A: § 150.0(k) 2B: § 150.0(k) 2C:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.* Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A. 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 must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control. Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for, insulation contact (IC) labeling, air leakage, sealing, maintenance, and socket and light source as described in § 150.0(k) 1.0. Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz. Night Lights, Step Lights, and Path Lights. Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens. 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(k).* Screw based luminaires. Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8.* Light Sources in Enclosed or Recessed Luminaires must contain lamps that comply with Reference Joint Appendix JA8.* Light Sources in Drawers, Cabinets, and Linen Closets. Light sources internal to 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 drawe			

	Interior Switches and Controls. An energy management control system (EMCS) may be used to comply with control requirements if it:				
§ 150.0(k)2G:	provides functionality of the specified control according to § 110.9, meets the Installation Certificate requirements of § 130.4; meets the EMCS requirements of § 130.0(e); and meets all other requirements in § 150.0(k)2.				
§ 150.0(k)2H:	Interior Switches and Controls. A multiscene programmable controller may be used to comply with dimmer requirements in § 150.0(k) if it provides the functionality of a dimmer according to § 110.9, and complies with all other applicable requirements in § 150.0(k)2.				
§ 150.0(k)21:	Interior Switches and Controls. In bathrooms, garages, laundry rooms, and utility rooms, at least one luminaire in each of these spaces must be controlled by an occupant sensor or a vacancy sensor providing automatic-off functionality. If an occupant sensor is installed, it must be initially configured to manual-on operation using the manual control required under Section 150.0(k)2C.				
§ 150.0(k)2J:	Interior Switches and Controls. Luminaires that are or contain light sources that meet Reference Joint Appendix JA8 requirements for dimming, and that are not controlled by occupancy or vacancy sensors, must have dimming controls.*				
§ 150.0(k)2K:	Interior Switches and Controls. Under cabinet lighting must be controlled separately from ceiling-installed lighting systems.				
§ 150.0(k)3A:	Residential Outdoor Lighting. For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or				
§ 150.0(k)3B:	Residential Outdoor Lighting. For low-rise residential buildings with four or more dwelling units, outdoor lighting for private patios, end balconies, and porches; and residential parking lots and carports with less than eight vehicles per site must comply with either § 150.0(with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.				
§ 150.0(k)3C:	Residential Outdoor Lighting. For low-rise residential buildings with four or more dwelling units, any outdoor lighting for residential parking lots or carports with a total of eight or more vehicles per site and any outdoor lighting not regulated by § 150.0(k)3B or § 150.0(k)3D must comply with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.				
§ 150.0(k)4:	Internally illuminated address signs. Internally illuminated address signs must comply with § 140.8; or must consume no more than 5 watts o power as determined according to § 130.0(c).				
§ 150.0(k)5:	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 Sections 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.				
§ 150.0(k)6A:	Interior Common Areas of Low-rise Multifamily Residential Buildings. In a low-rise multifamily residential building where the total interior common area in a single building equals 20 percent or less of the floor area, permanently installed lighting for the interior common areas in that building must be comply with Table 150.0-A and be controlled by an occupant sensor.				
§ 150.0(k)6B:	Interior Common Areas of Low-rise Multifamily Residential Buildings. In a low-rise multifamily residential building where the total interior common area in a single building equals more than 20 percent of the floor area, permanently installed lighting for the interior common areas in that building must: i. Comply with the applicable requirements in Sections 110.9, 130.0, 130.1, 140.6 and 141.0; and ii. Lighting installed in corridors and stairwells must be controlled by occupant sensors that reduce the lighting power in each space by at least 50 percent. The occupant sensors must be capable of turning the light fully on and off from all designed paths of ingress and egress.				
Solar Ready Bui					
§ 110.10(a)1:	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 § 110.10(b) through § 110.10(e).				
§ 110.10(a)2:	Low-rise Multifamily Buildings. Low-rise multi-family buildings that do not have a photovoltaic system installed must comply with the requirements of § 110.10(b) through § 110.10(d).				
§ 110.10(b)1:	Minimum Solar Zone Area. The solar zone must have a minimum total area as described below. The solar zone must comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other parts of 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 single family residences, 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. For low-rise multi-family buildings the solar zone must be located on the roof or overhang of the building, or on the roof or overhang of another structure located within 250 feet of the building, or on covered parking installed with the building project, and have a total area no less than 15 percent of the total roof area of the building excluding any skylight area. The solar zone requirement is applicable to the entire building, including mixed occupancy.*				
§ 110.10(b)2:	Azimuth. All sections of the solar zone located on steep-sloped roofs must be oriented between 90 degrees and 300 degrees of true north.				
§ 110.10(b)2: § 110.10(b)3A:	Shading. The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment."				
	Shading. The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.* Shading. Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, 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.*				
§ 110.10(b)3A:	Shading. The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.* Shading. Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, 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.* 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.				
§ 110.10(b)3A: § 110.10(b)3B:	Shading. The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.* Shading. Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, 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.* 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. Interconnection Pathways. The construction documents must indicate: a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection 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.				
§ 110.10(b)3A: § 110.10(b)3B: § 110.10(b)4:	Shading. The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.* Shading. Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, 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.* 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. Interconnection Pathways. The construction documents must indicate: a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection with the electrical service; and for single family				
§ 110.10(b)3A: § 110.10(b)3B: § 110.10(b)4: § 110.10(c):	Shading. The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.* Shading. Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, 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.* 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. Interconnection Pathways. The construction documents must indicate: a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection 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. Documentation. A copy of the construction documents or a comparable document indicating the information from § 110.10(b) through				



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A6.4

Building Type ☐ Single Family ☐ Addition Alone ☐ Date ☐ Multi Family ☐ Existing+ Addition/Alteration 3/24/2022 California Energy Climate Zone Total Cond. Floor Area Addition # of Units

Status

New

R-Value Status

Status

CA Climate Zone 12 1,198 n/a

Cavity (ft^2) Special Features

Total Area: 261 Glazing Percentage: 21.8% New/Altered Average U-Factor: 0.28 U-Fac SHGC Overhang Sidefins Exterior Shades Status

none

R 15 1,209

- no insulation 20

9.00 HSPF Split Heat Pump 14.0 SEER

Gallons Min. Eff Distribution

2019 Low-Rise Residential Mandatory Measures Summary

Manual; or the ACCA Manual J using design conditions specified in § 150.0(h)2.

GENERAL REVISIONS

GENERAL REVISIONS

CERTIFICATE OF COMPLIANCE CF1R-PRF-01E CERTIFICATE OF COMPLIANCE CF1R-PRF-01E CERTIFICATE OF COMPLIANCE CF1R-PRF-01E Project Name: New ADU Calculation Date/Time: 2022-03-24T07:49:52-07:00 (Page 1 of 9) Project Name: New ADU Calculation Date/Time: 2022-03-24T07:49:52-07:00 (Page 2 of 9) Project Name: New ADU Calculation Date/Time: 2022-03-24T07:49:52-07:00 (Page 3 of 9) Calculation Description: Title 24 Analysis Calculation Description: Title 24 Analysis Input File Name: sadiq 3718 may school rd adu.ribd19x Calculation Description: Title 24 Analysis Input File Name: sadiq 3718 may school rd adu.ribd19x Input File Name: sadiq 3718 may school rd adu.ribd19x GENERAL INFORMATION ENERGY DESIGN RATING REQUIRED SPECIAL FEATURES Project Name New ADU The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis. **Compliance Margins Energy Design Ratings** Indoor air quality, balanced fan Run Title Title 24 Analysis Efficiency¹ (EDR) Total² (EDR) Total² (EDR) Efficiency¹ (EDR) IAQ Ventilation System: as low as 0.575 W/CFM Project Location | 3718 May School Road IAQ Ventilation System Heat Recovery: minimum 66 SRE and 66 ASRE Standard Design 27.6 IAQ Ventilation System: supply outside air inlet, filter, and H/ERV cores accessible per RACM Reference Manual City Livermore Standards Version 2019 IAQ Ventilation System: fault indicator display 07 Zip code | 94551 Software Version EnergyPro 8.3 Proposed Design 49.4 0.7 Variable capacity heat pump compliance option (verification details from VCHP Staff report, Appendix B, and RA3) Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed Climate Zone | 12 Front Orientation (deg/ Cardinal) 18 RESULT: 3: COMPLIES Number of Dwelling Units Building Type | Single family HERS FEATURE SUMMARY : Efficiency EDR includes improvements to the building envelope and more efficient equipment Project Scope NewConstruction Number of Bedrooms 2: Total EDR includes efficiency and demand response measures such as photovoltaic (PV) systems and batteries 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 Number of Stories Addition Cond. Floor Area (ft²) 3: Building complies when efficiency and total compliance margins are greater than or equal to zero detail is provided in the building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry Fenestration Average U-factor | 0 Existing Cond. Floor Area (ft²) n/a Standard Design PV Capacity: 2.47 kWdc Building-level Verifications: PV System resized to 2.47 kWdc (a factor of 2.471) to achieve 'Standard Design PV' PV scaling Quality insulation installation (QII) Glazing Percentage (%) 21.79% Total Cond. Floor Area (ft²) 1198 Indoor air quality ventilation Kitchen range hood 21 ADU Conditioned Floor Area n/a ADU Bedroom Count n/a ENERGY USE SUMMARY ling System Verifications: Is Natural Gas Available? Yes Verified Refrigerant Charge Standard Design Proposed Design Percent Improvement Energy Use (kTDV/ft²-yr) Airflow in habitable rooms (SC3.1.4.1.7) COMPLIANCE RESULTS HERS PROVIDER Heating System Verifications: 31.3 10.75 34.3 Space Heating Verified HSPF Building Complies with Computer Performance 36.27 -20.9 Verified heat pump rated heating capacity Space Cooling 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. Wall-mounted thermostat in zones greater than 150 ft2 (SC3.4.5) 8.59 -8.5 IAQ Ventilation Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8) This building incorporates one or more Special Features shown below Water Heating 18.04 -0.1 HVAC Distribution System Verifications: Self Utilization/Flexibility Credit n/a omestic Hot Water System Verifications: 2.6 Compliance Energy Total -- None --REQUIRED PV SYSTEMS - SIMPLIFIED **BUILDING - FEATURES INFORMATION** Number of Ventilation Number of Water Number of Dwelling Project Name Number of Bedrooms Number of Zones DC System Size Module Type Array Type Cooling Systems Heating Systems (deg) (deg) 12) (%) New ADU 1198 Standard Registration Date/Time: HERS Provider: 222-P010056125A-000-000-000000-0000 CalCERTS inc. 222-P010056125A-000-000-0000000-0000 CalCERTS inc. 222-P010056125A-000-000-0000000-0000 CalCERTS inc. CA Building Energy Efficiency Standards - 2019 Residential Compliance CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Generated: 2022-03-24 07:50:18 CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Generated: 2022-03-24 07:50:18 Report Generated: 2022-03-24 07:50:18 Report Version: 2019.2.000 Report Version: 2019.2.000 Report Version: 2019.2.000 Schema Version: rev 20200901 Schema Version: rev 20200901 Schema Version: rev 20200901 CERTIFICATE OF COMPLIANCE CF1R-PRF-01E CERTIFICATE OF COMPLIANCE CF1R-PRF-01E CERTIFICATE OF COMPLIANCE CF1R-PRF-01E Calculation Date/Time: 2022-03-24T07:49:52-07:00 Project Name: New ADU (Page 4 of 9) Project Name: New ADU Calculation Date/Time: 2022-03-24T07:49:52-07:00 (Page 5 of 9) Project Name: New ADU Calculation Date/Time: 2022-03-24T07:49:52-07:00 (Page 6 of 9) Calculation Description: Title 24 Analysis Input File Name: sadiq 3718 may school rd adu.ribd19x Calculation Description: Title 24 Analysis Input File Name: sadiq 3718 may school rd adu.ribd19x Calculation Description: Title 24 Analysis Input File Name: sadiq 3718 may school rd adu.ribd19x FENESTRATION / GLAZING **OPAQUE SURFACE CONSTRUCTIONS** ZONE INFORMATION 06 08 Interior / Exterior Total Cavity Surface U-factor Assembly Layers Name Orientation Azimuth Construction Name Surface Type Construction Type Continuous U-factor Zone Name Zone Type HVAC System Name Zone Floor Area (ft²) Avg. Ceiling Height Water Heating System 1 | Water Heating System 2 R-value R-value ADU Conditioned 1198 Window 3 Over Ceiling Joists: R-28.9 insul. Wood Framed R-38 2x4 @ 24 in. O. C. 0.28 NFRC 0.23 NFRC Bug Screen R-38 Roof Attic None / None 0.025 Cavity / Frame: R-9.1 / 2x4 Window 4 Right Window Ceiling OPAQUE SURFACES Inside Finish: Gypsum Board 0.28 NFRC 0.23 NFRC Bug Screen Right+45 135 Window 5 Window 01 02 03 04 06 BUILDING ENVELOPE - HERS VERIFICATION Window and Door OPAQUE DOORS Construction Orientation Gross Area (ft²) Tilt (deg) 62 04 04 R-15 Wall Front Front ADU 180 280 90 CFM50 Quality Insulation Installation (QII) High R-value Spray Foam Insulation Building Envelope Air Leakage Side of Building U-factor Name Area (ft²) Left ADU R-15 Wall 270 Left 460 108 90 Not Required Not Required n/a Door Front 0.5 Rear R-15 Wall Back 280 90 ADU 26 R-15 Wall Rear+45 ADU n/a 40 90 OPAQUE SURFACE CONSTRUCTIONS WATER HEATING SYSTEMS 04 R-15 Wall 90 Right Right ADU 390 97 90 04 -02 R-15 Wall n/a Distribution Type **HERS Verification** Name System Type Water Heater Name (#) Solar Heating System Compact Distribution Total Cavity R-38 Roof Attic 1198 n/a n/a Construction Name Surface Type Construction Type Assembly Layers ADU n/a n/a Framing Continuous R-value Domestic Hot Water Standard Distribution DHW Sys 1 n/a R-19 Floor Crawlspace Raised Floor 1198 ADU n/a n/a n/a n/a Inside Finish: Gypsum Board R-15 Wall Wood Framed Wall 2x4 @ 16 in. O. C. R-15 None / None Cavity / Frame: R-15 / 2x4 Exterior Walls WATER HEATERS Exterior Finish: 3 Coat Stucco 02 03 04 05 06 07 08 Construction Type Roof Rise (x in 12) Roof Reflectance Roof Emittance Radiant Barrier Cool Roof Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood None / None 0.644 Attic RoofADU Attic Roofs 2x4 @ 24 in. O. C. R-O Attic ADU Attic RoofADU Ventilated 0.1 0.85 No Energy Ceiling Siding/sheathing/decking Input Rating Insulation # of Vol. Factor or or Recovery or Flow Rate Brand or Model Cavity / Frame: no insul. / 2x4 or Pilot R-value Ambient Condition (gal) Efficiency FENESTRATION / GLAZING Floor Surface: Carpeted 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | **NEEA Rated** Floor Deck: Wood DHW Heater 1 Heat Pump R-19 Floor Crawlspace 2x10 @ 16 in. O. C. R-19 None / None Wood Framed Floor Crawlspace Siding/sheathing/decking Surface Orientation U-factor Cavity / Frame: R-19 / 2x10 Source Window 1 108 0.28 NFRC 1 26 0.28 Window 2 Registration Number: Registration Date/Time: Registration Date/Time: Registration Date/Time: 222-P010056125A-000-000-0000000-0000 2022-03-24 07:56:05 CalCERTS inc. 222-P010056125A-000-000-0000000-0000 2022-03-24 07:56:05 CalCERTS inc. 222-P010056125A-000-000-0000000-0000 2022-03-24 07:56:05 CalCERTS inc. CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Generated: 2022-03-24 07:50:18 Report Generated: 2022-03-24 07:50:18 CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Generated: 2022-03-24 07:50:18 Report Version: 2019.2.000 CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Version: 2019.2.000 Report Version: 2019.2.000 Schema Version: rev 20200901 Schema Version: rev 20200901 CF1R-PRF-01E CF1R-PRF-01E CERTIFICATE OF COMPLIANCE CF1R-PRF-01E CERTIFICATE OF COMPLIANCE CERTIFICATE OF COMPLIANCE Project Name: New ADU Calculation Date/Time: 2022-03-24T07:49:52-07:00 (Page 7 of 9) Project Name: New ADU Calculation Date/Time: 2022-03-24T07:49:52-07:00 (Page 8 of 9) Project Name: New ADU Calculation Date/Time: 2022-03-24T07:49:52-07:00 (Page 9 of 9) Input File Name: sadiq 3718 may school rd adu.ribd19x Calculation Description: Title 24 Analysis Input File Name: sadiq 3718 may school rd adu.ribd19x Calculation Description: Title 24 Analysis Input File Name: sadiq 3718 may school rd adu.ribd19x Calculation Description: Title 24 Analysis DOCUMENTATION AUTHOR'S DECLARATION STATEMENT WATER HEATING - HERS VERIFICATION VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION - HERS VERIFICATION I certify that this Certificate of Compliance documentation is accurate and complete cumentation Author Signature: ocumentation Author Name Shower Drain Wate ompact Distribution Central DHW Low Leakage Air Filter Sizing 1 deno Pipe Insulation Parallel Piping mpact Distribution ecirculation Contro Airflow to **Ductless Units** Robert Mao, PE, CEA Distribution Ducts in Airflow per Heat Recovery Low-Static Habitable in Conditioned & Pressure non-continuous Running Thermostat Conditioned RA3.3 and Continuously VCHP System Rooms Drop Rating DHW Sys 1 - 1/1 Not Required Not Required Not Required None Not Required Not Required Not Required SC3.3.3.4.1 TECC 2022-03-24 07:56:05 Not required Required Required Not required Not required Not required Not required EA/ HERS Certification Identification (If applicable): SPACE CONDITIONING SYSTEMS 6367 Swainland Road c70157 IAQ (INDOOR AIR QUALITY) FANS Heating 510-387-2756 Required Oakland, CA 94611 Distribution Heating Unit | Cooling Unit | Name Fan Name Thermostat Status Existing Equipment Equipmen Name Name RESPONSIBLE PERSON'S DECLARATION STATEME<mark>NT</mark> Type Count Count Condition IAQ Recovery IAQ Recovery **HERS Verification** Dwelling Unit IAQ CFM IAQ Watts/CFM IAQ Fan Type Effectiveness - SRE Effectiveness - ASRE certify the following under penalty of perjury, under the laws of the State of California: Heat Pump Heat Pump 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. Setback HVAC1 Heat pump heating cooling System 1 System 1 SFam IAQVentRpt 1-1 80 0.575 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. 05 06 08 07 onsible Designer Name: Robert Mao, PE, CEA HVAC - HEAT PUMPS Heating Cooling HERS Date Signed: 2022-03-24 07:56:05 Compressor **HERS Verification** HSPF/COP Cap 47 Cap 17 SEER EER/CEER Controlled Type Heat Pump System Single c70157 6367 Swainland Road 21000 Heat Pump System 1 VCHP-ductless 24000 11.5 Not Zonal 1-hers-htpump Oakland, CA 94611 510-387-2756 HVAC HEAT PUMPS - HERS VERIFICATION

Verified Heating

Cap 47

Report Generated: 2022-03-24 07:50:18

Verified Refrigerant

Verified HSPF

Verified Airflow

Not Required

222-P010056125A-000-000-0000000-0000

CA Building Energy Efficiency Standards - 2019 Residential Compliance

Heat Pump System

1-hers-htpump

Airflow Target

Verified EER

Not Required

Verified SEER

Not Required

Report Version: 2019.2.000

Schema Version: rev 20200901

Verified Heating

Cap 17

CalCERTS inc.

222-P010056125A-000-000-0000000-0000

Report Version: 2019.2.000

Schema Version: rev 20200901

CA Building Energy Efficiency Standards - 2019 Residential Compliance

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CA Building Energy Efficiency Standards - 2019 Residential Compliance

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Report Generated: 2022-03-24 07:50:18

Registration Date/Time:
2022-03-24 07:56:05

Report Version: 2019.2.000

Schema Version: rev 20200901

HERS Provider:

CalCERTS inc.

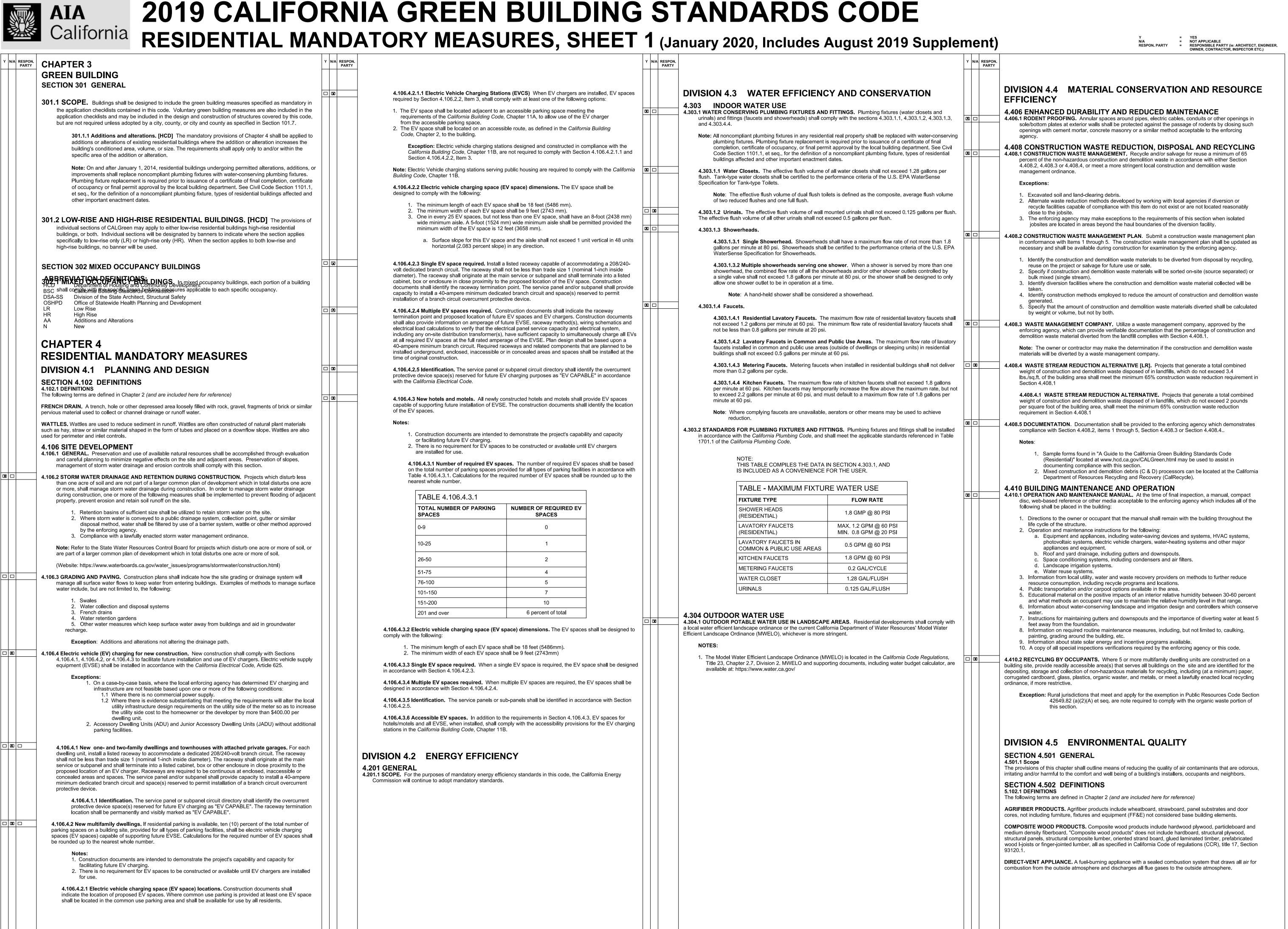
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Easy to Verify at CalCERTS.com

46.5

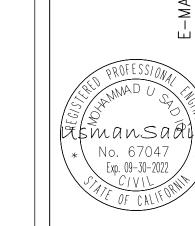
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2019 CALIFORNIA GREEN BUILDING STANDARDS CODE



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GENERAL REVISIONS

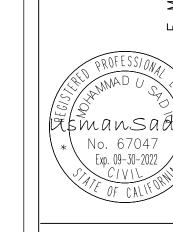


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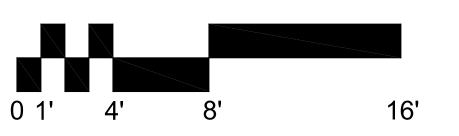
25000	RESIDENTIAL MANDA	ATORY MEASURES, SHEET	「1 (January 2020, Includes August 2019 Suppleme	Y = YES N/A = NOT APPLICABLE RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)
Y N/A RESPOI	Y N/A RESPON. PARTY	<u> </u>	Y N/A RESPON. PARTY	/A RESPON. PARTY
	MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a	TABLE 4.504.2 - SEALANT VOC LIMIT	TABLE 4.504.5 - FORMALDEHYDE LIMITS	CHAPTER 7 INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS
	compound to the "Base Reactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundredths of a gram (g O³/g ROC). Note: MIR values for individual compounds and hydrocarbon solvents are specified in CCR, Title 17, Sections 94700	(Less Water and Less Exempt Compounds in Grams per Liter) SEALANTS VOC LIMIT	MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION PRODUCT CURRENT LIMIT	702 QUALIFICATIONS
	and 94701.	ARCHITECTURAL 250	HARDWOOD PLYWOOD VENEER CORE 0.05	702.1 INSTALLER TRAINING. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or
	MOISTURE CONTENT. The weight of the water in wood expressed in percentage of the weight of the oven-dry wood.	MARINE DECK 760	HARDWOOD PLYWOOD COMPOSITE CORE 0.05	certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems.
	PRODUCT-WEIGHTED MIR (PWMIR). The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).	NONMEMBRANE ROOF 300 ROADWAY 250	PARTICLE BOARD 0.09 MEDIUM DENSITY FIBERBOARD 0.11	Examples of acceptable HVAC training and certification programs include but are not limited to the following:
	Note: PWMIR is calculated according to equations found in CCR, Title 17, Section 94521 (a).	SINGLE-PLY ROOF MEMBRANE 450	THIN MEDIUM DENSITY FIBERBOARD2 0.13	State certified apprenticeship programs. Public utility training programs.
	REACTIVE ORGANIC COMPOUND (ROC). Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.	OTHER 420	1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIF. AIR RESOURCES BOARD, AIR TOXICS CONTROL	3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.4. Programs sponsored by manufacturing organizations.
	VOC. A volatile organic compound (VOC) broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a).	SEALANT PRIMERS ARCHITECTURAL	MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIF. CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH	702.2 SPECIAL INSPECTION [HCD]. When required by the enforcing agency, the owner or the
	4.503 FIREPLACES	NON-POROUS 250	93120.12. 2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM	responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to
X	4.503.1 GENERAL. Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as	POROUS 775	THICKNESS OF 5/16" (8 MM).	the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:
	applicable, and shall have a permanent label indicating they are certified to meet the emission limits. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.	MODIFIED BITUMINOUS 500 MARINE DECK 760		1. Certification by a national or regional green building program or standard publisher.
X O 🗆	4.504 POLLUTANT CONTROL 4.504.1 COVERING OF DUCT OPENINGS & PROTECTION OF MECHANICAL EQUIPMENT DURING	OTHER 750		Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
	CONSTRUCTION. At the time of rough installation, during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of water, dust or debris which may enter the system.		DIVISION 4.5 ENVIRONMENTAL QUALITY (continued) 4.504.3 CARPET SYSTEMS. All carpet installed in the building interior shall meet the testing and product requirements of at least one of the following:	3. Successful completion of a third party apprentice training program in the appropriate trade. 4. Other programs acceptable to the enforcing agency. Notes:
x 0	4.504.2 FINISH MATERIAL POLLUTANT CONTROL. Finish materials shall comply with this section.	TARLE 4 FOA 2 VOC CONTENT LIMITS FOR	 Carpet and Rug Institute's Green Label Plus Program. California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile 	Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
X □	4.504.2.1 Adhesives, Sealants and Caulks. Adhesives, sealant and caulks used on the project shall meet the requirements of the following standards unless more stringent local or regional air pollution or air quality	TABLE 4.504.3 - VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS2,3	Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" Version 1.1, February 2010 (also known as Specification 01350).	2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).
	management district rules apply:	GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS	3. NSF/ANSI 140 at the Gold level. 4. Scientific Certifications Systems Indoor Advantage™ Gold.	[BSC] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall
	Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where	COATING CATEGORY VOC LIMIT	4.504.3.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute's Green Label program.	employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the
	applicable or SCAQMD Rule 1168 VOC limits, as shown in Table 4.504.1 or 4.504.2, as applicable. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and	FLAT COATINGS 50	4.504.3.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 4.504.1.	particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification
	compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and tricloroethylene), except for aerosol products, as specified in Subsection 2 below.	NON-FLAT COATINGS 100 NONFLAT-HIGH GLOSS COATINGS 150	4.504.4 RESILIENT FLOORING SYSTEMS. Where resilient flooring is installed , at least 80% of floor area receiving	shall be closely related to the primary job function, as determined by the local agency.
	Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than 1 pound and do not consist of more	SPECIALTY COATINGS 150	resilient flooring shall comply with one or more of the following: 1. Products compliant with the California Department of Public Health, "Standard Method for the Testing and	Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
	than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of <i>California Code of Regulations</i> , Title 17,	ALUMINUM ROOF COATINGS 400	Evaluation of Volatile Organic Chemical Émissions from Indoor Sources Using Environmental Chambers," Version 1.1, February 2010 (also known as Specification 01350), certified as a CHPS Low-Emitting Material in	ZO2 VEDIFICATIONS
X 🗆	commencing with section 94507. 4.504.2.2 Paints and Coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of	BASEMENT SPECIALTY COATINGS 400	the Collaborative for High Performance Schools (CHPS) High Performance Products Database. 2. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children & Schools program).	703 VERIFICATIONS 703.1 DOCUMENTATION. Documentation used to show compliance with this code shall include but is not
	the ARB Architectural Suggested Control Measure, as shown in Table 4.504.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories	BITUMINOUS ROOF COATINGS 50	 Certification under the Resilient Floor Covering Institute (RFCI) FloorScore program. Meet the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers", Version 1.1, 	limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific
	listed in Table 4.504.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in subsections 4.21, 4.36, and 4.37 of the 2007 California Air Resources	BITUMINOUS ROOF PRIMERS 350 BOND BREAKERS 350	February 2010 (also known as Specification 01350).	documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.
	Board, Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 4.504.3 shall apply.	CONCRETE CURING COMPOUNDS 350	4.504.5 COMPOSITE WOOD PRODUCTS. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for	and appropriate destant of identation approaches
IX	4.504.2.3 Aerosol Paints and Coatings. Aerosol paints and coatings shall meet the Product-weighted MIR Limits for ROC in Section 94522(a)(2) and other requirements, including prohibitions on use of certain toxic	CONCRETE/MASONRY SEALERS 100	formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 4.504.5	
	compounds and ozone depleting substances, in Sections 94522(e)(1) and (f)(1) of California Code of Regulations, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air	DRIVEWAY SEALERS 50 DRY FOG COATINGS 150	4.504.5.1 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:	
	Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8, Rule 49.	FAUX FINISHING COATINGS 350	1. Product certifications and specifications.	
X □	4.504.2.4 Verification. Verification of compliance with this section shall be provided at the request of the	FIRE RESISTIVE COATINGS 350	2. Chain of custody certifications. 3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see	
	enforcing agency. Documentation may include, but is not limited to, the following: 1. Manufacturer's product specification.	FLOOR COATINGS 100	CCR, Title 17, Section 93120, et seq.). 4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered	
	2. Field verification of on-site product containers.	FORM-RELEASE COMPOUNDS 250 GRAPHIC ARTS COATINGS (SIGN PAINTS) 500	Wood Association, the Australian AS/NZS 2269, European 636 3S standards, and Canadian CSA 0121, CSA 0151, CSA 0153 and CSA 0325 standards. 5. Other methods acceptable to the enforcing agency.	
		HIGH TEMPERATURE COATINGS 420	4.505 INTERIOR MOISTURE CONTROL	
	TABLE 4.504.1 - ADHESIVE VOC LIMIT _{1,2}	INDUSTRIAL MAINTENANCE COATINGS 250	4.505.1 General. Buildings shall meet or exceed the provisions of the California Building Standards Code.	
	(Less Water and Less Exempt Compounds in Grams per Liter) ARCHITECTURAL APPLICATIONS VOC LIMIT	LOW SOLIDS COATINGS 120 MAGNESITE CEMENT COATINGS 450	4.505.2 CONCRETE SLAB FOUNDATIONS. Concrete slab foundations required to have a vapor retarder by California Building Code, Chapter 19, or concrete slab-on-ground floors required to have a vapor retarder by the	
	INDOOR CARPET ADHESIVES 50	MASTIC TEXTURE COATINGS 100	California Residential Code, Chapter 5, shall also comply with this section. 4.505.2.1 Capillary break. A capillary break shall be installed in compliance with at least one of the	
	CARPET PAD ADHESIVES 50	METALLIC PIGMENTED COATINGS 500	4.505.2.1 Capillary break. A capillary break shall be installed in compliance with at least one of the following:	
	OUTDOOR CARPET ADHESIVES 150 WOOD FLOORING ADHESIVES 100	MULTICOLOR COATINGS 250 PRETREATMENT WASH PRIMERS 420	1. A 4-inch (101.6 mm) thick base of 1/2 inch (12.7mm) or larger clean aggregate shall be provided with a vapor barrier in direct contact with concrete and a concrete mix design, which will address bleeding,	
	WOOD FLOORING ADHESIVES 100 RUBBER FLOOR ADHESIVES 60	PRIMERS, SEALERS, & UNDERCOATERS 100	shrinkage, and curling, shall be used. For additional information, see American Concrete Institute, ACI 302.2R-06.	
	SUBFLOOR ADHESIVES 50	REACTIVE PENETRATING SEALERS 350	Other equivalent methods approved by the enforcing agency. A slab design specified by a licensed design professional.	
	CERAMIC TILE ADHESIVES 65	RECYCLED COATINGS 250 ROOF COATINGS 50	4.505.3 MOISTURE CONTENT OF BUILDING MATERIALS. Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19 percent	
	VCT & ASPHALT TILE ADHESIVES 50 DRYWALL & PANEL ADHESIVES 50	ROOF COATINGS 50 RUST PREVENTATIVE COATINGS 250	moisture content. Moisture content shall be verified in compliance with the following:	
	COVE BASE ADHESIVES 50	SHELLACS	Moisture content shall be determined with either a probe-type or contact-type moisture meter. Equivalent moisture verification methods may be approved by the enforcing agency and shall satisfy requirements	
	MULTIPURPOSE CONSTRUCTION ADHESIVE 70	CLEAR 730	found in Section 101.8 of this code. 2. Moisture readings shall be taken at a point 2 feet (610 mm) to 4 feet (1219 mm) from the grade stamped end of each piece verified.	
	STRUCTURAL GLAZING ADHESIVES 100 SINGLE-PLY ROOF MEMBRANE ADHESIVES 250	OPAQUE 550	3. At least three random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing.	
	OTHER ADHESIVES NOT LISTED 50	SPECIALTY PRIMERS, SEALERS & 100 UNDERCOATERS	Insulation products which are visibly wet or have a high moisture content shall be replaced or allowed to dry prior to	
	SPECIALTY APPLICATIONS	STAINS 250	enclosure in wall or floor cavities. Wet-applied insulation products shall follow the manufacturers' drying recommendations prior to enclosure.	
	PVC WELDING 510 CPVC WELDING 490	STONE CONSOLIDANTS 450 SWIMMING POOL COATINGS 340	4.506 INDOOR AIR QUALITY AND EXHAUST 4.506.1 Bathroom exhaust fans. Each bathroom shall be mechanically ventilated and shall comply with the	
	CPVC WELDING 490 ABS WELDING 325	TRAFFIC MARKING COATINGS 100	4.506.1 Bathroom exhaust fans. Each bathroom shall be mechanically ventilated and shall comply with the following:	
	PLASTIC CEMENT WELDING 250	TUB & TILE REFINISH COATINGS 420	 Fans shall be ENERGY STAR compliant and be ducted to terminate outside the building. Unless functioning as a component of a whole house ventilation system, fans must be controlled by a 	
	ADHESIVE PRIMER FOR PLASTIC 550	WATERPROOFING MEMBRANES 250 WOOD COATINGS 275	humidity control.	
	CONTACT ADHESIVE 80 SPECIAL PURPOSE CONTACT ADHESIVE 250	WOOD COATINGS 275 WOOD PRESERVATIVES 350	a. Humidity controls shall be capable of adjustment between a relative humidity range less than or equal to 50% to a maximum of 80%. A humidity control may utilize manual or automatic means of adjustment	
	STRUCTURAL WOOD MEMBER ADHESIVE 140	ZINC-RICH PRIMERS 340	adjustment. b. A humidity control may be a separate component to the exhaust fan and is not required to be integral (i.e., built-in)	
	TOP & TRIM ADHESIVE 250	1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS	Notes:	
	SUBSTRATE SPECIFIC APPLICATIONS	2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.	1. For the purposes of this section, a bathroom is a room which contains a bathtub, shower or	
	METAL TO METAL 30	3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY	tub/shower combination. 2. Lighting integral to bathroom exhaust fans shall comply with the California Energy Code.	
	PLASTIC FOAMS 50 POROUS MATERIAL (EXCEPT WOOD) 50	THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS	4.507 ENVIRONMENTAL COMFORT 4.507.2 HEATING AND AIR-CONDITIONING SYSTEM DESIGN. Heating and air conditioning systems shall be	
	WOOD 30	AVAILABLE FROM THE AIR RESOURCES BOARD.	sized, designed and have their equipment selected using the following methods:	
	FIBERGLASS 80		The heat loss and heat gain is established according to ANSI/ACCA 2 Manual J - 2011 (Residential Load Calculation), ASHRAE handbooks or other equivalent design software or methods.	
			2. Duct systems are sized according to ANSI/ACCA 1 Manual D - 2014 (Residential Duct Systems), ASHRAE handbooks or other equivalent design software or methods. 3. Select heating and expline equipment according to ANSI/ACCA 3 Manual S - 2014 (Residential	
	1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.		3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S - 2014 (Residential Equipment Selection), or other equivalent design software or methods.	
	2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE		Exception: Use of alternate design temperatures necessary to ensure the system functions are acceptable.	
	THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.			

DISCLAIMER: THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE FULL CODE.



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CONTRACTOR SHALL INSTALL A LABEL OR SIGN AT CONTROLLER OF SWITCH TO INFORM OCCUPANTS
THAT FRESH AIR VENTILATOR IS AN INDOOR AIR QUALITY FAN THAT SHOULD OPERATE WHEN BUILDING
IS OCCUPIED.

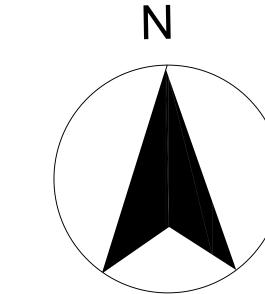


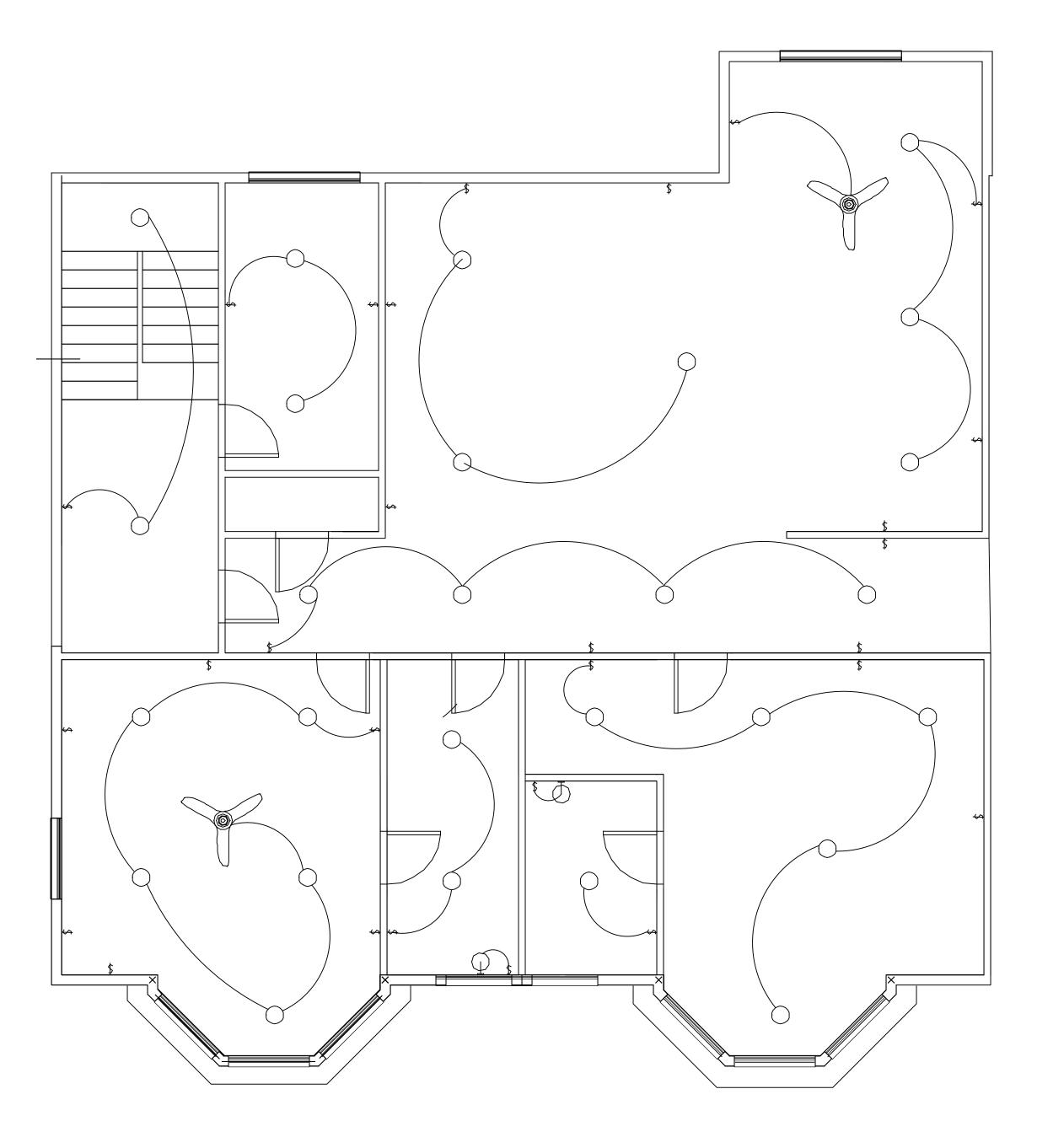
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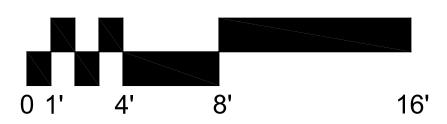
A7.1

ELECTRICAL PLANS ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL PROVIDE ALL ELECTRICAL SYSTEMS TO MEET THE REQUIREMENTS OF THE OWNER AND SHALL COMPLY WITH ALL CODES INCLUDING PROJECT TITLE 24 REQUIREMENTS. FOLLOWING ARE SOME GENERAL NOTES FOR CONFORMANCE.

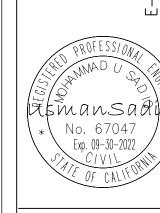
- 1. No electrical panels in closets or bathrooms. Maintain a clearance of 36" inches in front of panels, 30" wide or width of equipment and 6'-6" high for headroom. (CEC 110.26)
- 2. Provide a minimum 3 lug intersystem bonding bus bar at the main electrical service. (CEC 250.94)
- 3. All automatic garage door openers that are installed in a residence shall have a battery backup function that is designed to operate when activated because of an electrical outage. (SB-969)
- 4. A concrete-encased electrode (ufer) consisting of 20' of rebar or #4 copper wire placed in the bottom of a footing is required for all new construction. (CEC 250.52(A) (3)) Bond all metal gas and water pipes to ground. All ground clamps shall be accessible and of an approved type. (CEC 250.104)
- 5. All 15/20 ampere receptacles installed per CEC 210.52 shall be listed tamper-resistant receptacles. (CEC 406.12)
- 6. All branch circuits supplying 15/20 ampere outlets in family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, kitchens, laundry room or similar rooms/areas shall be protected by a listed combination type arc-fault circuit interrupter. (CEC 210.12)
- 7. Provide a minimum of one 20A circuit to be used for the laundry receptacle. (CEC 210.11(C)(2)) Provide a minimum of one 20A circuit for bathroom receptacle outlets. (CEC 210.11(C)(3)
- 8. Provide at least 1 outlet in basements, garages, laundry rooms, decks, balconies, porches and within 3' of the outside of each bathroom basin. (CEC 210.52 (D), (F) & (G))
- 9. Furnaces installed in attics and crawl spaces shall have an access platform (catwalk in attics), light switch and receptacle in the space. Provide a service receptacle for the furnace. (CEC 210.63)
- 10. All dwellings must have one exterior outlet at the front and the back of the dwelling. (CEC 210.52(E)) 11. Garage receptacles shall not serve outlets outside the garage. Exception: Garage circuit may serve readily accessible outdoor receptacle outlets. ((CEC 210.
- 11 (C)(4)) A minimum of 1 receptacle shall be provided for each car space. (210.52(G) (1))
- 12. At least one wall switched lighting outlet or fixture shall be installed in every habitable room, bathroom, hallways, stairways, attached garages and detached garages with electrical power, equipment spaces (attics, basements, etc.). (CEC 210.70)
- 13. Kitchens, dining rooms, pantries, breakfast nooks, and similar areas must have a minimum of two 20A circuits. Kitchen, pantry, breakfast nooks, dining rooms, work surfaces and similar areas counter outlets must be installed in every counter space 12" inches or wider, not greater than 4' o.c., within 24" inches of the end of any counter space and not higher than 20" above counter. (CEC 210.52 (C)) Island counter spaces shall have at least 1 receptacle outlet unless a range top or sink is installed than 2 receptacles may be required. 1 receptacle is required for peninsular counter spaces. Receptacles shall be located behind kitchen sinks if the counter area depth behind the sink is more than 12" for straight counters and 18" for corner installations. (CEC Figure 210.52(C)(1))
- 14. The main service disconnect shall have a rating of not less than 100 amps. C.E.C. Article 230.79(C).
- 15. Receptacles shall be installed at 12' o.c. maximum in walls starting at 6' maximum from the wall end. Walls longer than two feet shall have a receptacle. Hallway walls longer than 10 ft. shall have a receptacle in hallways. (CEC 210.52(A))
- 16. Receptacles shall not be installed within or directly over a bathtub or shower stall. (CEC 406.9(C) Light pendants, ceiling fans, lighting tracks, etc. shall not be located within 3ft horizontally and 8ft vertically above a shower and/or bathtub threshold. (CEC 410.10(D))
- 17. All lighting/fan fixtures located in wet or damp locations shall be rated for the application. (CEC 410.10)
- 18. GFCI outlets are required: for all kitchen receptacles that are designed to serve countertop surfaces, dishwashers, bathrooms, in under-floor spaces or below grade level, in unfinished basements, crawl space lighting outlets, in exterior outlets, within 6' of a laundry/utility/wet bar sinks, laundry areas, and in all garage outlets including outlets dedicated to a single device or garage door opener. (CEC 210.8)
- 19. Carbon-monoxide alarms shall be installed in dwelling units with fuel-burning appliances or with attached garages (CRC R315): ② Outside of each separate sleeping area in the immediate vicinity of bedrooms ② On every level of a dwelling unit including basements
- 20. Smoke alarms shall be installed (CRC (R314): ② In each room used for sleeping purposes. ② Outside of each separate sleeping area in the immediate vicinity of bedrooms. ③ In each story, including basements. ② At the top of stairways between habitable floors where an intervening door or obstruction prevents smoke from reaching the smoke detector. ③ Shall not be installed within 20ft horizontally of cooking appliances and no closer than 3ft to mechanical registers, ceiling fans and bathroom doors with a bathtub or shower unless this would prevent placement of a smoke detector (314.3(4)). ④ All smoke and carbon-monoxide alarms shall be hardwired with a battery backup (smoke alarms shall have a 10-year sealed battery). (CRC R314.4 & R315.1.2) ④ Smoke detectors within 10 feet to 20 feet of the stove shall be ionization type with alarm silencing switch. CRC R314.3.3.
- 21. All 15/20 ampere receptacles in wet locations shall have in-use (bubble) covers installed. All receptacles in wet locations shall also be listed weather-resistant type. (CEC 406.9(B)(1))





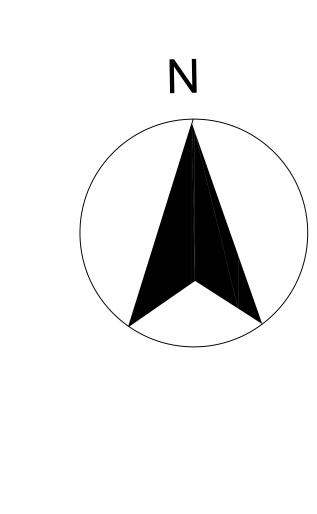


MOHAMMAD U SADIQ 1000 BOURN DRIVE WOODLAND, CA 95776 CELL PHONE (530) 315-4907



MAIN ELEC⁻ 1/4" =

A7.2



1 05/26/2022

2 06/05/2022

ELECTRICAL PANEL

ILLUMINATED ADDRESS SIGN

SHEET NOTES:

- 1. CONTRACTOR SHALL INSTALL A LABEL OR SIGN AT CONTROLLER OF SWITCH TO INFORM OCCUPANTS THAT FRESH AIR VENTILATOR IS AN INDOOR AIR QUALITY FAN THAT SHOULD OPERATE WHEN BUILDING IS OCCUPIED.
- 2. ELECTRICAL PANEL FOR ADU SHALL BE 100 AMP RATED.
- 3. ALL GARAGE DOOR OPENERS MUST HAVE BATTERY BACKUP, PER CA SB-969 AND R309.4.

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SHEET NO.

A7.3