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**WILLIAM WOOD
ARCHITECTS**
301 HARTZ AVENUE, SUITE 203
DANVILLE, CALIFORNIA 94526
(925) 820-8233

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GENERAL NOTES

2022 CALIFORNIA BUILDING CODE
2022 CALIFORNIA RESIDENTIAL CODE
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE
2022 CALIFORNIA MECHANICAL CODE
2022 CALIFORNIA ELECTRICAL CODE
2022 CALIFORNIA PLUMBING CODE
2022 CALIFORNIA FIRE CODE
2022 CALIFORNIA ENERGY CODE
TOWN OF DANVILLE MUNICIPAL CODE

1. All materials, workmanship and methods of construction shall conform to the requirements of the 2022 codes listed above. The Contractor is required to incorporate whatever changes or additional work these codes or regulations require without additional cost to the Owner.
2. Do not scale drawings. Written dimensions shall always take precedence over scale dimensions. Dimensions shown on floor plans are to face of stud unless otherwise noted or indicated.
3. Notify the Architect of any discrepancies in the Documents or between the Documents and the existing conditions before proceeding with any work.
4. The Contractor shall obtain all required inspections for his work and give the Owner timely notice of his intent to have inspections.
5. The Contractor and/or Subcontractor shall at all times keep the premises free of accumulations of waste materials or rubbish caused by his employees or work. At the completion of the work, he shall remove all his rubbish, all of his tools, scaffolding, and surplus materials from and about the building and shall leave his work "broom clean" or its equivalent.
6. Contractor to coordinate and verify all sizes of kitchen appliances, to be selected by the Owner, and the style of the design, materials, hardware and finish of the cabinets with the Owner and cabinet-maker prior to manufacturing.
7. The escape opening has a minimum net clear opening of 5.7 square feet; minimum net clear opening height of 24 inches; and minimum net clear opening width of 20 inches. Maximum sill height to be 44" where windows are provided as means of escape or rescue.
8. All ICC evaluation reports and manufacturer specifications for fireplaces and skylights to be provided by Contractor and approved by the TOWN OF DANVILLE prior to plan installation.
9. Contractor to verify size and clearances of selected water heater and furnace for adequacy of space shown on the drawings prior to construction. Notify Architect immediately of any conflicts with space requirements for this equipment.
11. All shower and tub/shower enclosures to be provided with smooth, hard, nonabsorbent finish backing (e.g., tile over W.R. Board to 70" above drain).
12. Handrails & Guardrails: Stairways to have handrails on open side of stairs, not less than 34" nor more than 38" above the nosing treads. They should be continuous the full length of the stairs and need not extend 12" beyond top and 12" plus tread width beyond bottom tread. Ends shall be returned or shall terminate in newel posts or safety terminals. Handgrip shall not be less than 1 ¼" or more than 2" in cross-sectional dimension w/ no sharp corners, height of 34 inches to 38 inches above nosing, extend continuously from top to bottom risers, and terminate at newel posts or return to walls; handgrip shall have a space not less than 1½" out from the wall. Open guardrail and stair railings shall have intermediate rails or an ornamental pattern such that a sphere 4" in diameter cannot pass through. All interior and exterior handrails and guardrails to conform to 2022 CRC. Guardrails shall be designed to withstand a 200-pound load applied in any direction at any point along the top rail per 2022 CRC.
13. Maximum 3.5-inch handrail projection into the required stair width. Stringers and other projections such as trim are limited to 1- ½ inches on each side.
14. Handrail(s) is required for stairways with four or more risers.
16. Batt insulation shall have maximum flame spread of 25 and smoke development of 450. .
17. The Contractor will read and conform to the Title 24 requirements for this project. A copy of Title 24 documents can be obtained from the Owner.
18. Glass & glazing to comply with 2022 CRC.
19. Discrepancies: In the event of conflict or discrepancy in contract documents, larger quantity and higher quality shall govern unless Architect approval is given in writing.

Site & Grading Notes

1. The site plan drawing is not a property survey. All information shown in regard to boundaries of property was taken from the County Assessor's maps. The Architect does not accept responsibility for the accuracy of the data presented and drawn. The Contractor is to hire and pay for a licensed surveyor to locate the property line adjacent to the addition prior to the start of construction.
2. Non-removable backflow prevention to be provided at meter and provide non-removable vacuum breaker on all hose bibbs.
3. All utilities to be field verified by contractor. William Wood Architects assume no responsibility for accuracy of utility locations, as shown on plans.
4. Restore all existing building and site improvements, including sidewalks, curb and gutters, walks, patios, fences, landscaping, sprinklers, plumbing, etc., which have been altered or damaged by reason of the contractor's operations to a new condition, to the complete satisfaction of the owner.
5. Work to comply with TOWN OF DANVILLE ordinance for setbacks and grading requirements as shown on the site plan.
6. All downspouts, site area drains and catch basins as shown on site plan shall be collected with PVC tight line rigid wall, independent of all other drainage systems.
7. All retaining walls shall have drainage with 4" perforated PVC rigid wall and collected with PVC Tight line rigid wall.
8. A positive gradient shall be provided away from the foundation in order to provide rapid removal of the surface water runoff away from the foundation to an adequate discharge point. The grade shall fall a minimum of 6" within the first 10' measured perpendicular to the face of the foundation wall per CRC R401.3.

General Construction Notes:

1. Gypsum drywall systems with fire-resistance ratings where indicated or required are to comply with governing regulations. Provide materials and installations identical with applicable assemblies that have been tested and listed by recognized authorities, including UL. Comply with FM approval Guide where applicable.

Foundation Notes:

See structural drawing for foundation notes.

Framing Notes:

See Structural Drawings for framing notes:

Plumbing Notes

1. Showerheads shall be flow control of 1.8 G.P.M. or less.
2. All lavatory faucets shall be flow control of 1.2 G.P.M. or less.
3. Kitchen faucet to be 1.8 gallons per minute, maximum.
4. Water closet to be 1.28 gallon per flush maximum. or dual flush per CPC 411.2.
5. All piping and equipment shall be supported as per section 313 in the CPC.
6. Seismic restraint requirements for all piping and equipment (including gas lines and fuel fired equipment) shall be installed per CBC 1613.1 and Chapter 13 of ASCE7-16.
6. All backflow prevention devices shall be installed per CPC 603.3.
7. All potable and non-potable (closed loop fire sprinkler system) water piping is to be clearly identified as per the requirements of CPC 601.2.
8. Hose bibs shall be protected with a nonremovable hose-bib0-type backflow preventer, a non removable hose-bib-type vacuum breaker or by an atmospheric vacuum breaker installed not less than 6 inches above the highest point of usage located on the discharge side of the last valve. CPC 603.5.7.

Electrical and Mechanical Notes:

1. Electrical receptacles in bathrooms, outdoors and within 6'-0" of sink to be on ground fault protection (G.F.I.);
2. Provide 1/2-switched outlet under counter at sink for disposal.
4. Switch and duplex outlet, or multiple switches shown adjacent to each other on plan are to be under one plate.
5. New 110v smoke detector(s), with battery backup, and interconnected, which are audible in all sleeping area will be provided at the following locations: (1) all new bedrooms; (2) in hallways and immediately adjacent to new bedrooms.
6. All appliances shall conform to the standards set forth by the California Energy Commission Title 24 requirements.
7. Gas fired cooking appliances and space-heating equipment shall have intermittent ignition devices.
8. All air ducts penetrating separation wall or ceiling between garage and living area shall be 26 GA. The ducts, plenums, A/C coil boxes must be insulated to R4 minimum and be of 26 ga. sheetmetal in the garage.
9. Contractor to verify space requirements for plenums and ducts prior to start of work.
10. Mechanical ventilation shall be capable of providing five air changes per hour in lieu of the natural ventilation in bathrooms, water closet compartments and laundry rooms and vented directly to the outside. All exhaust fans and fan systems to have damper controls.
11. Gaskets to be provided at exterior receptacles and switch plates.
12. Final locations of all mechanical and electrical equipment, panel boards, meters, fixtures, flues, vents, switches etc., shall be approved by Owner prior to installation.
13. Lights: All lights shall be high efficiency.
14. HVAC equipment, water heaters, showerheads and faucets to be certified by the CEC.
15. Provide a setback thermostat on all applicable heating systems.
16. Ducts penetrating the one-hour separation between garage and the house shall be not less than 26 gauge galvanized steel.
17. The HVAC equipment shown meets the assumed efficiency requirements of this compliance, however, it is recommended that the actual system to be installed be determined by an HVAC designer. The loads shown are only one of the criteria affecting the selection of HVAC equipment. Other relevant design factors such as airflow requirements, outdoor design temperatures, coil sizing, availability of equipment, oversizing safety margin, etc., must also be considered. It is the HVAC designer's responsibility to consider all factors when selecting the HVAC equipment.
18. Fused disconnect at A/C compressor unit or approved circuit breaker to be installed.
19. Clothes dryer, vented range hoods, and bathroom vent fans must be exhausted to outside per 2022 CMC.
20. Install new receptacle outlets as specified in NEC.
21. Provide a dedicated 20-amp branch circuit to supply the laundry receptacle outlet.
22. Contractor to provide additional electrical load as necessary to equip all new & existing elect. equipment.

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LICENSED ARCHITECT
WILLIAM A. WOOD
C 13874
Jan. 31, 2025
REN. DATE
STATE OF CALIFORNIA

DANVILLE ACCESSORY
DWELLING UNITS - STUDIO

DANVILLE CA 94526

WILLIAM WOOD
ARCHITECTS

301 HARTZ AVENUE, SUITE 203
DANVILLE, CALIFORNIA 94526
(925) 820-8233

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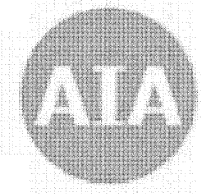
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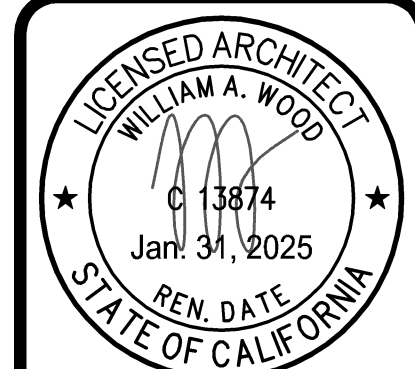
2022 CAL GREEN RESIDENTIAL MANDATORY MEASURES



California

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE
RESIDENTIAL MANDATORY MEASURES, SHEET 1 (January 2023)

REVISIONS	DATE



DANVILLE ACCESSORY
DWELLING UNITS - STUDIO

WILLIAM WOOD
ARCHITECTS
301 HARTZ AVENUE, SUITE 203
DANVILLE, CALIFORNIA 94526
(925) 820-8233

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CHAPTER 3

GREEN BUILDING

SECTION 301 GENERAL

301.1 SCOPE. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

301.1.1 Additions and alterations. [HCD] The mandatory provisions of Chapter 4 shall be applied to additions or alterations of existing residential buildings where the addition or alteration increases the building's conditioned area, volume, or size. The requirements shall apply only to and/or within the specific area of the addition or alteration.

The mandatory provision of Section 4.106.4.2 may apply to additions or alterations of existing parking facilities or the addition of new parking facilities serving existing multifamily buildings. See Section 4.106.4.3 for application.

Note: Repairs including, but not limited to, resurfacing, restriping and repairing or maintaining existing lighting fixtures are not considered alterations for the purpose of this section.

Note: On and after January 1, 2014, residential buildings undergoing permitted alterations, additions, or improvements shall replace noncompliant plumbing fixtures with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.

301.2 LOW-RISE AND HIGH-RISE RESIDENTIAL BUILDINGS. [HCD] The provisions of individual sections of CALGreen may apply to either low-rise residential buildings high-rise residential buildings, or both. Individual sections will be designated by banners to indicate where the section applies specifically to low-rise only (LR) or high-rise only (HR). When the section applies to both low-rise and high-rise buildings, no banner will be used.

SECTION 302 MIXED OCCUPANCY BUILDINGS

302.1 MIXED OCCUPANCY BUILDINGS. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

Exceptions:

1. [HCD] Accessory structures and accessory occupancies serving residential buildings shall comply with Chapter 4 and Appendix A4, as applicable.

2. [HCD] For purposes of CALGreen, live/work units, complying with Section 419 of the California Building Code, shall not be considered mixed occupancies. Live/Work units shall comply with Chapter 4 and Appendix A4, as applicable.

DIVISION 4.1 PLANNING AND DESIGN

ABBREVIATION DEFINITIONS:

HCD Department of Housing and Community Development

BSC California Building Standards Commission

DSA-SS Division of the State Architect, Structural Safety

OSHPD Office of Statewide Health Planning and Development

LR Low Rise

HR High Rise

AA Additions and Alterations

N New

CHAPTER 4

RESIDENTIAL MANDATORY MEASURES

SECTION 4.102 DEFINITIONS

4.102.1 DEFINITIONS

The following terms are defined in Chapter 2 (and are included here for reference)

FRENCH DRAIN. A trench, hole or other depressed area loosely filled with rock, gravel, fragments of brick or similar pervious material used to collect or channel drainage or runoff water.

WATTLES. Wattles are used to reduce sediment in runoff. Wattles are often constructed of natural plant materials such as hay, straw or similar material shaped in the form of tubes and placed on a downflow slope. Wattles are also used for perimeter and inlet controls.

4.106 SITE DEVELOPMENT

4.106.1 GENERAL. Preservation and use of available natural resources shall be accomplished through evaluation and careful planning to minimize negative effects on the site and adjacent areas. Preservation of slopes, management of storm water drainage and erosion controls shall comply with this section.

4.106.2 STORM WATER DRAINAGE AND RETENTION DURING CONSTRUCTION. Projects which disturb less than one acre of soil and are not part of a larger common plan of development which in total disturbs one acre or more, shall manage storm water drainage during construction. In order to manage storm water drainage during construction, one or more of the following measures shall be implemented to prevent flooding of adjacent property, prevent erosion and retain soil runoff on the site.

1. Retention basins of sufficient size shall be utilized to retain storm water on the site.

2. Where storm water is conveyed to a public drainage system, collection point, gutter or similar disposal method, water shall be filtered by use of a barrier system, wattle or other method approved by the enforcing agency.

3. Compliance with a lawfully enacted storm water management ordinance.

Note: Refer to the State Water Resources Control Board for projects which disturb one acre or more of soil, or are part of a larger common plan of development which in total disturbs one acre or more of soil.

(Website: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html)

4.106.3 GRADING AND PAVING. Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales

2. Water collection and disposal systems

3. French drains

4. Water retention gardens

5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

Exception: Additions and alterations not altering the drainage path.

4.106.4 Electric vehicle (EV) charging for new construction. New construction shall comply with Sections 4.106.4.1 or 4.106.4.2 to facilitate future installation and use of EV chargers. Electric vehicle supply equipment (EVSE) shall be installed in accordance with the California Electrical Code, Article 625.

Exceptions:

1. On a case-by-case basis, where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:

1.1 Where there is no local utility power supply or the local utility is unable to supply adequate power.

1.2 Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 4.106.4, may adversely impact the construction cost of the project.

2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities.

4.106.4.1 New one- and two-family dwellings and townhouses with attached private garages. For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere 208/240-volt minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

Exception: A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the proposed location of an EV charger at the time of original construction in accordance with the California Electrical Code.

4.106.4.1.1 Identification. The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".

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4.106.4.2 New multifamily dwellings, hotels and motels and new residential parking facilities.

When parking is provided, parking spaces for new multifamily dwellings, hotels and motels shall meet the requirements of Sections 4.106.4.2.1 and 4.106.4.2.2. Calculations for spaces shall be rounded up to the nearest whole number. A parking space served by electric vehicle supply equipment or designed as a future EV charging space shall count as at least one standard automobile parking space only for the purpose of complying with any applicable minimum parking space requirements established by a local jurisdiction. See Vehicle Code Section 22511.2 for further details.

4.106.4.2.1 Multifamily development projects with less than 20 dwelling units; and hotels and motels with less than 20 sleeping units or guest rooms.

The number of dwelling units, sleeping units or guest rooms shall be based on all buildings on a project site subject to this section.

1.EV Capable. Ten (10) percent of the total number of parking spaces on a building site, provided for all types of parking facilities, shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE. Electrical load calculations shall demonstrate that the electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at a minimum of 40 amperes.

The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.

Exceptions:

1. When EV chargers (Level 2 EVSE) are installed in a number equal to or greater than the required number of EV capable spaces

2. When EV chargers (Level 2 EVSE) are installed in a number less than the required number of EV capable spaces, the number of EV capable spaces required may be reduced by a number equal to the number of EV chargers installed.

Note:

a. Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.

b. There is no requirement for EV spaces to be constructed or available until receptacles for EV charging or EV chargers are installed for use.

2.EV Ready. Twenty-five (25) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles. For multifamily parking facilities, no more than one receptacle is required per dwelling unit when more than one parking space is provided for use by a single dwelling unit.

Exception: Areas of parking facilities served by parking lifts.

4.106.4.2.2 Multifamily development projects with 20 or more dwelling units, hotels and motels with 20 or more sleeping units or guest rooms.

The number of dwelling units, sleeping units or guest rooms shall be based on all buildings on a project site subject to this section.

1.EV Capable. Ten (10) percent of the total number of parking spaces on a building site, provided for all types of parking facilities, shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE. Electrical load calculations shall demonstrate that the electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at a minimum of 40 amperes.

The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.

Exception: When EV chargers (Level 2 EVSE) are installed in a number greater than five (5) percent of parking spaces required by Section 4.106.4.2.2, Item 3, the number of EV capable spaces required may be reduced by a number equal to the number of EV chargers installed over the five (5) percent required.

Note:

a. Construction documents shall show locations of future EV spaces.

b. There is no requirement for EV spaces to be constructed or available until receptacles for EV charging or EV chargers are installed for use.

2.EV Ready. Twenty-five (25) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles. For multifamily parking facilities, no more than one receptacle is required per dwelling unit when more than one parking space is provided for use by a single dwelling unit.

Exception: Areas of parking facilities served by parking lifts.

3.EV Chargers. Five (5) percent of the total number of parking spaces shall be equipped with Level 2 EVSE. Where common use parking is provided, at least one EV charger shall be located in the common use parking area and shall be available for use by all residents or guests.

When low power Level 2 EV charging receptacles or Level 2 EVSE are installed beyond the minimum required, an automatic load management system (ALMS) may be used to reduce the maximum required electrical capacity to space served by the ALMS. The electrical system and any on-site distribution transformer(s) shall have sufficient capacity to deliver at least 3.3 kW simultaneously to each EV charging station (EVCS) served by the ALMS. The branch circuit shall have a minimum capacity of 40 amperes, and installed EVSE shall have a capacity of not less than 30 amperes. ALMS shall not be used to reduce the minimum required electrical capacity to the required EV capable spaces.

4.106.4.2.2.1 Electric vehicle charging stations (EVCS).

Electric vehicle charging stations required by Section 4.106.4.2.2, Item 3, shall comply with Section 4.106.4.2.2.1. Electric vehicle charging stations serving public accommodations, public housing, motels and hotels shall not be required to comply with this section. See California Building Code, Chapter 11B, for applicable requirements.

4.106.4.2.2.1.1 Location.

EVCS shall comply with at least one of the following options:

1. The charging space shall be located adjacent to an accessible parking space meeting the requirements of the California Building Code, Chapter 11A, to allow use of the EV charger from the accessible parking space, Chapter 2, to the building.

2. The charging space shall be located on an accessible route, as defined in the California Building Code, Chapter 2, to the building.

Exception: Electric vehicle charging stations designed and constructed in compliance with the California Building Code, Chapter 11B, are not required to comply with Section 4.106.4.2.2.1.1 and Section 4.106.4.2.2.1.2, Item 3.

4.106.4.2.2.1.2 Electric vehicle charging stations (EVCS) dimensions.

The charging spaces shall be designed to comply with the following:

1. The minimum length of each EV space shall be 18 feet (5486 mm).

2. The minimum width of each EV space shall be 9 feet (2743 mm).

3. One in every 25 charging spaces, but not less than one, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet (3658 mm).

a. Surface slope for this EV space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent/slope) in any direction.

4.106.4.2.2.1.3 Accessible EV spaces.

In addition to the requirements in Sections 4.106.4.2.2.1.1 and 4.106.4.2.2.1.2, all EVSE, when installed, shall comply with the accessibility provisions for EV chargers in the California Building Code, Chapter 11B. EV ready spaces and EVCS in multifamily developments shall comply with California Building Code, Chapter 11A, Section 1109A.

4.106.4.2.3 EV space requirements.

1. Single EV space required. Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EV space. Construction documents shall identify the raceway termination point, receptacle or charger location, as applicable. The service panel and/or subpanel shall have a 40-ampere minimum dedicated branch circuit, including branch circuit overcurrent protective device installed, or space(s) reserved to permit installation of a branch circuit overcurrent protective device.

Exception: A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the location or the proposed location of the EV space, at the time of original construction in accordance with the California Electrical Code.

2. Multiple EV spaces required. Construction documents shall indicate the raceway termination point and the location of installed or future EV spaces, receptacles or EV chargers. Construction documents shall also provide information on ampere rating of installed or future receptacles or EVSE, raceway methods, wiring schematics and electrical load calculations. Plan design shall be based upon a 40-ampere minimum branch circuit. Required raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.

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Exception: A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the location or the proposed location of the EV space at the time of original construction in accordance with the California Electrical Code.

4.106.4.2.4 Identification.

The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.

4.106.4.2.5 Electric Vehicle Ready Space Signage.

Electric vehicle ready spaces shall be identified by signage or pavement markings, in compliance with Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

4.106.4.3 Electric vehicle charging for additions and alterations of parking facilities serving existing multifamily buildings.

When new parking facilities are added, or electrical systems or lighting of existing parking facilities are added or altered and the work requires a building permit, ten (10) percent of the total number of parking spaces added or altered shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE.

Note:

1. Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.

2. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.

DIVISION 4.2 ENERGY EFFICIENCY

4.201 GENERAL

4.201.1 SCOPE. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards.

DIVISION 4.3 WATER EFFICIENCY AND CONSERVATION

4.303 INDOOR WATER USE

4.303.1 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the sections 4.303.1.1, 4.303.1.2, 4.303.1.3, and 4.303.4.4.

Note: All noncompliant plumbing fixtures in any residential real property shall be replaced with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy, or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.

4.303.1.1 Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-type Toilets.

Note: The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

4.303.1.2 Urinals. The effective flush volume of wall mounted urinals shall not exceed 0.125 gallons per flush. The effective flush volume of all other urinals shall not exceed 0.5 gallons per flush.

4.303.1.3 Showerheads.

4.303.1.3.1 Single Showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

4.303.1.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 7.8 gallons per minute at 80 psi, or the shower shall be designed to only allow one shower outlet to be in operation at a time.

Note: A hand-held shower shall be considered a showerhead.

4.303.1.4 Faucets.

4.303.1.4.1 Residential Lavatory Faucets. The maximum flow rate of residential lavatory faucets shall not exceed 1.2 gallons per minute at 60 psi. The minimum flow rate of residential lavatory faucets shall not be less than 0.8 gallons per minute at 20 psi.

4.303.1.4.2 Lavatory Faucets in Common and Public Use Areas. The maximum flow rate of lavatory faucets installed in common and public use areas (outside of dwellings or sleeping units) in residential buildings shall not exceed 0.5 gallons per minute at 60 psi.

4.303.1.4.3 Metering Faucets. Metering faucets when installed in residential buildings shall not deliver more than 0.2 gallons per cycle.

4.303.1.4.4 Kitchen Faucets. The maximum flow rate of kitchen faucets shall not exceed 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

4.303.1.4.5 Pre-rinse spray valves.

When installed, shall meet the requirements in the California Code of Regulations, Title 20 (Appliance Efficiency Regulations), Sections 1605.1 (h)(4) Table H-2, Section 1605.3 (h)(4)(A), and Section 1607 (d)(7) and shall be equipped with an integral automatic shut-off.

FOR REFERENCE ONLY: The following table and code section have been reprinted from the California Code of Regulations, Title 20 (Appliance Efficiency Regulations), Section 1605.1 (h)(4) and Section 1605.3 (h)(4)(A).

TABLE H-2

STANDARDS FOR COMMERCIAL PRE-RINSE SPRAY VALVES MANUFACTURED ON OR AFTER JANUARY 28, 2019

PRODUCT CLASS	MAXIMUM FLOW RATE (gpm)
[spray force in ounce force (ozf)]	
Product Class 1 (< 5.0 ozf)	1.00
Product Class 2 (> 5.0 ozf and < 8.0 ozf)	1.20
Product Class 3 (> 8.0 ozf)	1.28

Title 20 Section 1605.3 (h)(4)(A): Commercial pre-rinse spray valves manufactured on or after January 1, 2005, shall have a minimum spray force of not less than 4.0 ounces-force (ozf) [113 grams-force(gf)]

4.303.2 Submitters for multifamily buildings and dwelling units in mixed-used residential/commercial buildings.

Submitters shall be installed to measure water usage of individual rental dwelling units in accordance with the California Plumbing Code.

4.303.3 Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings shall be installed in accordance with the California Plumbing Code, and shall meet the applicable standards referenced in Table 1701.1 of the California Plumbing Code.

NOTE:

THIS TABLE COMPILES THE DATA IN SECTION 4.303.1, AND IS INCLUDED AS A CONVENIENCE FOR THE USER.

FIXTURE TYPE	FLOW RATE
SHOWER HEADS (RESIDENTIAL)	1.8 GPM @ 80 PSI
LAVATORY FAUCETS (RESIDENTIAL)	MAX. 1.2 GPM @ 60 PSI MIN. 0.8 GPM @ 20 PSI
LAVATORY FAUCETS IN COMMON & PUBLIC USE AREAS	0.5 GPM @ 60 PSI
KITCHEN FAUCETS	1.8 GPM @ 60 PSI
METERING FAUCETS	0.2 GAL/CYCLE
WATER CLOSET	1.28 GAL/FLUSH
URINALS	0.125 GAL/FLUSH

Y

N/A

RESPON

PARTY

4.304 OUTDOOR WATER USE

4.304.1 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. Residential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.

NOTES:

1. The Model Water Efficient Landscape Ordinance (MWELO) is located in the California Code Regulations, Title 23, Chapter 2.7, Division 2. MWELO and supporting documents, including water budget calculator, are available at: <https://www.water.ca.gov/>

DIVISION 4.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

4.406 ENHANCED DURABILITY AND REDUCED MAINTENANCE

4.406.1 RODENT PROOFING. Annual spaces around pipes, electric cables, conduits or other openings in soffit/ceiling plates or exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or a similar method acceptable to the enforcing agency.

4.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

4.408.1 CONSTRUCTION WASTE MANAGEMENT. Recycle and/or salvage for reuse a minimum of 65 percent of the non-hazardous construction and demolition waste in accordance with either Section 4.408.2, 4.408.3 or 4.408.4, or meet a more stringent local construction and demolition waste management ordinance.

Exceptions:

1. Excavated soil and land-clearing debris.

2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist or are not located reasonably close to the jobsite.

3. The enforcing agency may make exceptions to the requirements of this section when isolated jobsites are located in areas beyond the haul boundaries of the diversion facility.

4.408.2 CONSTRUCTION WASTE MANAGEMENT PLAN. Submit a construction waste management plan in conformance with Items 1 through 5. The construction waste management plan shall be updated as necessary and shall be available during construction for examination by the enforcing agency.

1. Identify the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project or salvage for future use or sale.

2. Specify if construction and demolition waste materials will be sorted on-site (source separated) or bulk mixed (single stream).

3. Identify diversion facilities where the construction and demolition waste material collected will be taken.

4. Identify construction methods employed to reduce the amount of construction and demolition waste generated.

5. Specify that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

4.408.3 WASTE MANAGEMENT COMPANY. Utilize a waste management company, approved by the enforcing agency, which can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with Section 4.408.1.

Note: The owner or contractor may make the determination if the construction and demolition waste materials will be diverted by a waste management company.

4.408.4 WASTE STREAM REDUCTION ALTERNATIVE [LR]. Projects that generate a total combined weight of construction and demolition waste disposed of in landfills, which do not exceed 3.4 lbs. sq. ft. of the building area shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1.

4.408.4.1 WASTE STREAM REDUCTION ALTERNATIVE. Projects that generate a total combined weight of construction and demolition waste disposed of in landfills, which do not exceed 2 pounds per square foot of the building area, shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1.

4.408.5 DOCUMENTATION. Documentation shall be provided to the enforcing agency which demonstrates compliance with Section 4.408.2, Items 1 through 5, Section 4.408.3 or Section 4.408.4.

NOTES:

1. Sample forms found in "A Guide to the California Green Building Standards Code (Residential)" located at www.hcd.ca.gov/CALGreen.html may be used to assist in documenting compliance with this section.

2. Mixed construction and demolition debris (C & D) processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

4.410 BUILDING MAINTENANCE AND OPERATION

4.410.1 OPERATION AND MAINTENANCE MANUAL. At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency which includes all of the following shall be placed in the building:

1. Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure.

2. Operation and maintenance instructions for the following:

a. Equipment and appliances, including water-saving devices and systems, HVAC systems, photovoltaic systems, electric vehicle chargers, water-heating systems and other major appliances and equipment.

b. Roof and yard drainage, including gutters and downspouts.

c. Space conditioning systems, including condensers and air filters.

d. Landscape irrigation systems.

e. Water reuse systems.

3. Information from local utility, water and waste recovery providers on methods to further reduce resource consumption, including recycle programs and locations.

4. Public transportation and/or carpool options available in the area.

5. Educational material on the positive impacts of an interior relative humidity between 30-60 percent and what methods an occupant may use to maintain the relative humidity level in that range.

6. Information about water-conserving landscape and irrigation design and controllers which conserve water.

7. Instructions for maintaining gutters and downspouts and the importance of diverting water at least 5 feet away from the foundation.

8. Information on required routine maintenance measures, including, but not limited to, caulking, painting, grading around the building, etc.

9. Information about state solar energy and incentive programs available.

10. A copy of all special inspectors' verifications required by the enforcing agency or this code.

11. Information from the Department of Forestry and Fire Protection on maintenance of defensible space around residential structures.

12. Information and/or drawings identifying the location of grab bar reinforcements.

4.410.2 RECYCLING BY OCCUPANTS. Where 5 or more multifamily dwelling units are constructed on a building site, provide readily accessible area(s) that serves all buildings on the site and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals, or meet a lawfully enacted local recycling ordinance, if more restrictive.

Exception: Rural jurisdictions that meet and apply for the exemption in Public Resources Code Section 42649.82 (a)(2)(A) et seq. are not required to comply with the organic waste portion of this section.

DIVISION 4.5 ENVIRONMENTAL QUALITY

SECTION 4.501 GENERAL

4.501.1 SCOPE.

The provisions of this chapter shall outline means of reducing the quality of air contaminants that are odorous, irritating and/or harmful to the comfort and well being of a building's installers, occupants and neighbors.

SECTION 4.502 DEFINITIONS

5.102.1 DEFINITIONS

The following terms are defined in Chapter 2 (and are included here for reference)

AGRIFIBER PRODUCTS. Agrifiber products include wheatboard, strawboard, panel substrates and door cores, not including linum, fixtures and equipment (FF&E) not considered base building elements.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. Composite wood products does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, prefabricated wood joists or finger-jointed lumber, all as specified in California Code of regulations (CCR), title 17, Section 83120.1.

DIRECT-VENT APPLIANCE. A fuel-burning appliance with a sealed combustion system that draws all air for combustion from the outside atmosphere and discharges all flue gases to the outside atmosphere.

DISCLAIMER: THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.



DANVILLE CA 94526

301 HARTZ AVENUE, SUITE 203
DANVILLE, CALIFORNIA 94526
(925) 820-8233

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DRAWN KLL
CHECKED WW
DATE 03-30-23
SCALE AS SHOWN
JOB NO. 20.921R
SHEET

1 SHE



NOTE: THE LOADS SHOWN ARE ONLY ONE OF THE CRITERIA AFFORDING THE SELECTION OF HVAC EQUIPMENT. OTHER FACTORS SUCH AS AIRFLOW, OUTDOOR DESIGN TEMPERATURES, COIL SIZING, AVAILABILITY OF EQUIPMENT, OVERSIZING OR UNDERSIZING OF EQUIPMENT, AND THE HVAC DESIGNER'S RESPONSIBILITY TO CONSIDER ALL FACTORS WHEN SELECTING THE HVAC EQUIPMENT. THE HVAC DESIGNER SHALL BE RESPONSIBLE FOR THE PROPERLY INSTALLED SYSTEM TO MEET ALL ENERGY STAR REQUIREMENTS IF APPLICABLE. THE MINIMUM SIZE OF THE AIR CONDITIONING SYSTEM SHALL BE DETERMINED BY THE CALIFORNIA BUILDING CODE (CBC), SECTION 310.11. THE CBC REQUIRES THAT THE HEATING SYSTEM BE LOCATED AT LEAST 10 FEET FROM THE EXTERIOR WALLS AND AT A DISTANCE THREE FEET ABOVE THE FLOOR THROUGHOUT THE CONDITIONED SPACE OF THE BUILDING. DP ADVANCED CONTRACTORS, INC. DOES NOT ASSUME RESPONSIBILITY FOR PERFORMANCE OR INSTALLATION OF ANY EQUIPMENT LABELED OR ALLOWED TO ON ANY CALCULATION PRODUCED BY THE DP ADVANCED CONTRACTORS, INC. DESIGNER. THE DESIGNER IS WORKING ON THE PROJECT INVOLVING TITLE-24 UNDERSTAND AND ACCEPT ALL ASPECTS OF THE DP ADVANCED CONTRACTORS, INC. DESIGNER'S DESIGN. THE DESIGNER TO THEIR WORK. ALL SUB-CONTRACTORS ARE RESPONSIBLE TO CONTACT THE BUILDER AND DP ADVANCED CONTRACTORS, INC. DESIGNER IMMEDIATELY IF THERE IS ANY ERROR IN ANY CALCULATION THAT WOULD PREVENT THE SUB-CONTRACTOR FROM WARRANTING THE PROJECT TO THE OWNER WHICH INCLUDING THE ENERGY STAR PROCEDURES.

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Initial Issue Date:	March 31, 2023
Energy Analyst:	J. Bennett Ext. 20
Project Manager:	J. Peek Ext. 23
Job No.	W021420
Sheet No.	

PLAN SET ID: S-ME-M-F

[illegible]

Registration Number: 223-P010000746A-000-000-00000000-0000	Registration Date/Time: 2023-03-31 08:34:41	HERS Provider: CalCERTS Inc.
CA Building Energy Efficiency Standards - 2022 Residential Compliance	Report Version: 2022.0.000 Schema Version: rev 20220901	Report Generated: 2023-03-30 18:17:46

PROJECT NAME: Danville ADU_Mediterranean 1Bedroom										Calculation Date/Time: 2023-03-30T18:16:58-07:00										CFIR-PHF-01E (Page 11 of 14)									
WATER DESCRIPTION: Title 2 Analysis										Input File Name: Danville ADU_Mediterranean_1Bedroom.rbd22																			
WATER HEATING - NEEA HEAT PUMP																													
G1		G2		G3		G4		G5		G6		G7		G8															
Name	# of Units	Tank Vol. (gal)	NEEA Heat Pump Brand	NEEA Heat Pump Model	Tank Location	Duct Inlet Air Source	Duct Outlet Air Source																						
Heat Pump WH	1	40	Rheem	RheemPHOPH4072RH37151	Outside	Outside	Outside																						
WATER HEATING - HERS VERIFICATION																													
G1	G2	G3	G4	G5	G6	G7																							
Name	Pipe Insulation	Parallel Piping	Compact Distribution	Compact Distribution Type	Recirculation Control	Shower Drain Water Recovery																							
DHW System 1 - L21	Not Required	Not Required	Not Required	None	Not Required	Not Required																							
SPACE CONDITIONING SYSTEMS																													
G1	G2	G3	G4	G5	G6	G7	G8	G9																					
Name	System Type	Heating Unit Name	Holding Equipment Count	Cooling Unit Name	Cooling Equipment Count	Fan Name	Distribution Name	Required Thermostat Type																					
HVAC System 1	Heat pump heating cooling	PEAD-A2AA47	1	PEAD-A2AA47	1	HVAC Fan Systems 4	Distribution System 1	Setback																					
HVAC - HEAT PUMPS																													
G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13																	
Name	System Type	Number of Units	Efficiency Type / HSPF / COP	Cap 47	Cap 57	Efficiency Type / SEER / SEER2	FER / EER / CEEF	Zonally Controlled	Compressor Type	HERS Verification																			
PEAD-A2AA47	Central split HP	1	HSPF	10.8	26000	14800	EERSEER	15.6	11.3	Not Zonal	Single Speed	PEAD-A2AA47 herm-pump																	

Registration Number: 2023-P0100308746A-000-000-00000000-0000	Registration Date/Time: 2023-03-31 08:34:41	HERS Provider: CalCERTS Inc.
CA Building Energy Efficiency Standards - 2022 Residential Compliance	Report Version: 2022.0.000 Schema Version: rev 20220901	Report Generated: 2023-03-30 18:17:46

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD Project Name: Danville DAU Mediterranean Bedroom Calculation Description: Title 24 Analysis										Calculation Date/Time: 2023-03-30T18:16:58-07:00 Input File Name: Danville DAU_Mediterranean_Bedroom.ridd2		CS19-PHF-01E (Page 12 of 14)
REQUIRED PV SYSTEMS												
01	02	03	04	05	06	07	08	09	10	11	12	13
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CFI	Asimuth (deg)	Tilt Inpt	Array Angle (deg)	Tilt (a in 12)	Inverter Eff (%)	Annual Solar Access (%)	Annual Solar Access (%)
2	NA	Standard (14-17%)	Fixed	none	true	105-100	n/a	n/a	<~7:12	96	100	100

REQUIRED SPECIAL FEATURES												
The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis. * PV System 2 kWdc * Indoor air quality ventilation * IAG Ventilation System: Backflow minimum 67 SRE and 73 ASR * Indoor air ventilation system: supply outside air, make, fresh, and return only accessible per RACHA Reference Manual * IAG Ventilation System: leak indicator display * Insulation below roof deck * Window overhangs and/or fins * Northwest Energy Efficient Home (NEEA) (roof heat pump water heater, specific R-values, etc.) or equivalent, must be installed												

OTHER FEATURE SUMMARY												
The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry												
* Indoor air quality ventilation * Kitchen range hood * Minimum Airflow * Verified SCSR DSR2 * Verified Refrigerant Charge * Fan Efficiency WdM/CMAP * Verified HP * Verified Heat pump rating heating capacity * Duct leakage testing												

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD							Calculation Date/Time: 2023-03-03 18:58:07:00		C318-PHF-01a (Page 10 of 14)	
Project Name: Danville DAU Mediterranean 1Bedroom							Input File Name: Danville DAU_Mediterranean_1Bedroom.rbd22			
Calculation Description: Title 24 Analysis										
OPAQUE SURFACE CONSTRUCTIONS										
01	02	03	04	05	06	07	08			
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers			
Exterior 3rd Wall R-21	Exterior Walls	Wood Framed Wall	2x8 @ 16 in. O. C.	1.1	None / None	0.065	Inside Finish: Gypsum Board Cavity: Fiberglass R-21 / 2x6 Sheathing / Insulation / Stud Siding: Insulation / Siding Exterior Finish: Siding Exterior Air Space: 1/2 inch			
Attic Roof	Attic Roofs	Wood Framed Ceiling	2x4 Top Chord of Roof Truss @ 24 in. O. C.	R-13	None / None	0.092	Roofing: Asphalt / Shingles (Gas) 1/2 inch Gypsum present			
R-38 Attic Ceiling	Ceilings (below attic)	Wood Framed Ceiling	2x4 Bottom Chord of Truss @ 24 in. O. C.	R-38	None / None	0.025	Siding: Insulation / Siding Dry Ceiling: R-13.0 / 2x6 Stud Battled Roof: R-38 Over Ceiling: R-38 Insul. Cavity: R-3.1 / 2x4 Batt Chord Inside Finish: Gypsum Board			
BUILDING ENVELOPE - HERS VERIFICATION										
01	02	03	04	05	06	07	08	09		
Quality Insulation Installation (QII)	High R-value Spring Foam Insulation	Building Envelope Air Leakage	CFM50	CFM50	CFM50	CFM50	CFM50	CFM50		
Not Required	Not Required	N/A	n/a	n/a	n/a	n/a	n/a	n/a		
WATER HEATING SYSTEMS										
01	02	03	04	05	06	07	08	09		
Name	System Type	Distribution Type	Water Heater Name	Number of Units	Solar Heating System	Compact Distribution	HERS Verification	Water Heater (1)		
DHW System 1	Domestic Hot Water (DHW)	Standard	Heat Pump Unit	n/a	n/a	None	n/a	Heat Pump Unit		
Registration Number: 2023-P0100037-040-000-0000000-0000 CA Building Energy Efficiency Standards - 2022 Residential Compliance Registration Date/Time: 2023-03-03 18:34:41 Report Version: 2022.0.0.00 Software Version: 2023/06/01 HERS Provider: GaCERTS Inc. Report Generated: 2023-03-03 18:12:46										



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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD				CFSB-PHF-01E
Project Name: Danville ADU Mediterranean 1Bedroom		Calculation Date/Time: 2023-03-30T18:16:58 07:00		(Page 5 of 14)
Calculation Description: Title 24 Analysis		Input File Name: Danville ADU_Mediterranean_1bedroom.rbd22		
ENERGY USE INTENSITY				
	Standard Design (kBtu/h ² · yr)	Proposed Design (kBtu/h ² · yr)	Compliance Margin (kBtu/h ² · yr)	Margin Percentage
North Facing				
Gross EU ¹	27.43	21.1	6.33	23.08
Net EU ²	15.58	9.07	6.51	41.78
East Facing				
Gross EU ¹	27.43	21.21	6.22	22.68
Net EU ²	15.58	9.18	6.4	41.08
South Facing				
Gross EU ¹	27.43	20.97	6.56	23.93
Net EU ²	15.58	8.84	6.74	43.26
West Facing				
Gross EU ¹	27.43	21.3	6.13	22.35
Net EU ²	15.58	9.27	6.31	40.5
Notes 1. Gross EU is Energy Use Total (not including PV) / Total Building Area. 2. Net EU is Energy Use Total (including PV) / Total Building Area.				

Registration Number: 223-P010038749A-000-000-00000000-0000	Registration Date/Time: 2023-03-31 08:34:41	HIRS Provider: CalCERTS Inc.
CA Building Energy Efficiency Standards - 2022 Residential Compliance	Report Version: 2022.0.000 Schema Version: rev 20220901	Report Generated: 2023-03-30 18:17:46

Registration Number: 223-P010038746A-000-000-000000-0000	Registration Date/Time: 2023-03-31 08:34:41	HERS Provider: GaCERTS inc.
CA Building Energy Efficiency Standards - 2022 Residential Compliance	Report Version: 2022.0.000 Schema Version: rev 20220901	Report Generated: 2023-03-30 18:17:46

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD Project Name: Denville ADU Mediterranean 1bedroom Calculation Description: Title 24 Analysis					Calculation Date/Time: 2023-03-30T18:16:58-07:00 Input File Name: Denville_ADU_Mediterranean_1bedroom_rbd022	CFIR PRF-01E (Page 13 of 14)					
HVAC FAN SYSTEMS - HERS VERIFICATION											
01		02									
Name		Verified Fan Motor Draw		Required Fan Efficiency (Watts/CFM)							
HVAC Fan System 1-bary fan		Required		0.45							
INDOOR AIR QUALITY (IAQ) FANS											
01	02	03	04	05	06	07	08	09			
Dwelling Unit	Airflow (CFM)	Fan Efficiency (W/CFM)	IAQ Fan Type	Includes Heat/Energy Recovery?	IAQ Recovery Effectiveness - SEER	Includes Fault Indicator Display?	HERS Verification	Status			
System 1:Mech/Wh/Trf 1-1	49	0.816326	Balanced	Yes	73	No	Yes				

Registration Number: 2023-P010038746A-000-000-0000000-0000	Registration Date/Time: 2023-03-31 08:34:41	HERS Provider: CalCERTS inc.
CA Building Energy Efficiency Standards - 2022 Residential Compliance	Report Version: 2022.0.000 Schema Version: rev 2020901	Report Generated: 2023-03-30 18:17:46

Registration Number: 2023-P010038746A-000-000-0000000-0000	Registration Date/Time: 2023-03-31 08:34:41	HERS Provider: CalCERTS inc.
CA Building Energy Efficiency Standards - 2022 Residential Compliance	Report Version: 2022.0.000 Schema Version: rev 2020901	Report Generated: 2023-03-30 18:17:46



2022 Single-Family Residential Mandatory Requirements Summary

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

Building Envelope:

§ 110.6(a):	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 1011.5.2/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 J44.5 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(j):	Roofing Products Solar Reflectance and Thermal Emission. The thermal emission and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(j) and be labeled per § 10-113 when the installation of a cool roof is specified on the CFIR.
§ 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):	Roof Deck, Ceiling and Rafter Roof Insulation. Roof decks in newly constructed attics in climate zones 4 and 8-16 area-weighted average U-factor not exceeding U-0.184. Ceiling and rafter roofs minimum R-22 insulation in wood-frame ceiling; or area-weighted average U-factor must not exceed 0.043. Rafter roof alterations minimum R-19 or area-weighted average U-factor of 0.054 or less. All 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 the 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 minimum 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 crawlspace 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 0.45; or area-weighted average U-factor of all fenestration must not exceed 0.45. *

Fireplaces, Decorative Gas Appliances, and Gas Log:

§ 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 Conditioning, Water Heating, and Plumbing System:

§ 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-N. *
§ 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)3:	Insulation. Unfired service water heater storage tanks and solar water-heating backup tanks must have adequate insulation, or tank surface heat loss rating.
§ 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.

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2022 Single-Family Residential Mandatory Requirements Summary

§ 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)1I:	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 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)2A:	Accessible Controls. Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned on and off. *
§ 150.0(k)2B:	Multiple Controls. Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the dimmer or sensor is installed to comply with § 150.0(k).
§ 150.0(k)2C:	Mandatory Requirements. Lighting controls must comply with the applicable requirements of § 110.9.
§ 150.0(k)2D:	Energy Management Control Systems. An energy management control system (EMCS) may be used to comply with dimming, occupancy, and control requirements if it provides the functionality of the specified control per § 110.9 and the physical controls specified in § 150.0(k)2A.
§ 150.0(k)2E:	Automatic Shutoff Controls. In bathrooms, garages, laundry rooms, utility rooms and walk-in closets, at least one installed luminaire must be controlled by an occupancy or vacancy sensor providing automatic-off functionality. Lighting inside drawers and cabinets with opaque fronts or doors must have controls that turn the light off when the drawer or door is closed.
§ 150.0(k)2F:	Dimmers. Lighting in habitable spaces (e.g., living rooms, dining rooms, kitchens, and bedrooms) must have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down. Forward phase cut dimmers controlling LED light sources in these spaces must comply with NEMA SSL 7A.
§ 150.0(k)2K:	Independent controls. Integrated lighting of exhaust fans shall be controlled independently from the fans. Lighting under cabinets or shelves, lighting in display cabinets, and switched outlets must be controlled separately from ceiling-installed lighting.
§ 150.0(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 have a manual on/off switch and either a photocell and motion sensor or automatic time switch control) or an astronomical time clock. An energy management control system that provides the specified control functionality and meets all applicable requirements may be used to meet these requirements.
§ 150.0(k)4:	Internally illuminated address signs. Internally illuminated address signs must either comply with § 140.8 or consume no more than 5 watts of power.
§ 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 §§ 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.

Solar Readiness:

§ 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)-(e).
§ 110.10(b)1A:	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.
§ 110.10(b)2:	Azimuth. All sections of the solar zone located on steep-sloped roofs must have an azimuth between 90-300° of true north.
§ 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.
§ 110.10(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 horizontal distance of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane. *
§ 110.10(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.
§ 110.10(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.
§ 110.10(d):	Documentation. A copy of the construction documents or a comparable document indicating the information from § 110.10(b)-(c) must be provided to the occupant.
§ 110.10(e)1:	Main Electrical Service Panel. The main electrical service panel must have a minimum busbar rating of 200 amps.
§ 110.10(e)2:	Main Electrical Service Panel. The main electrical service panel must have a reserved space to allow for the installation of a double pole circuit breaker for a future solar electric installation. The reserved space must be permanently marked as "For Future Solar Electric."

Electric and Energy Storage Ready:

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2022 Single-Family Residential Mandatory Requirements Summary

§ 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.
§ 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(i)1:	Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation. All domestic hot water piping must be insulated as specified in § 609.11 of the California Plumbing Code. *
§ 150.0(j)2:	Insulation Protection. Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by § 120.3(b). Insulation exposed to weather must be water resistant and protected from UV light (no adhesive tapes). Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space must include, or be protected by, a Class I or Class II vapor retarder. 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 designate a space at least 2.5' x 2.5' x 7' suitable for the future installation of a heat pump water heater, and meet electrical and plumbing requirements, based on the distance between this designated space and the water heater location; and a condensate drain no more than 2' higher than the base of the water heater.
§ 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:

§ 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 CMC §§ 601.0-605.0 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 R-6.0 or higher; ducts located entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8) do not require insulation. Connections of metal ducts and inner core of flexible ducts must be mechanically fastened. Openings must be sealed with mastic, tape, or other duct-closure system that meets the applicable UL requirements, or aerosol sealant that meets UL 723. The combination of mastic and either mesh or tape must be used to seal openings greater than 1/2". If mastic or tape is used, Building cavities, air handler support platforms, 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 these spaces must not be compressed. *
§ 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 duct black 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, mastic, 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.
§ 150.0(m)9:	Protection of Insulation. Insulation must be protected from damage due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather must be suitable for outdoor service (e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover). Cellular foam insulation must be protected as above or painted with a water retardant and solar radiation-resistant coating.
§ 150.0(m)10:	Porous Inner Core Flex Duct. Porous inner cores of flex ducts must have a non-porous layer or air barrier between the inner core and outer vapor barrier.
§ 150.0(m)11:	Duct System Sealing and Leakage Test. When space conditioning systems use forced air duct systems to supply conditioned air to an occupiable space, the ducts must be sealed and duct leakage tested, as confirmed through field verification and diagnostic testing, in accordance with Reference Residential Appendix RA3.1.
§ 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 160.0-A. Clean-filter pressure drop and labeling must meet the requirements in § 150.0(m)12. Filters must be accessible for regular service. Filter racks or grilles must use gaskets, sealing, or other means to close gaps around the inserted filters to and prevents air from bypassing the filter. *

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2022 Single-Family Residential Mandatory Requirements Summary

§ 150.0(s):	Energy Storage System (ESS) Ready. All single-family residences must meet all of the following: Either ESS-ready interconnection equipment with backed up capacity of 80 amps or more and four or more ESS-supplied branch circuits; or a dedicated raceway from the main service to a subpanel that supplies the branch circuits in § 150.0(s); at least four branch circuits must be identified and have their service collocated at a single panelboard suitable to be supplied by the ESS, with one circuit supplying the refrigerator, one lighting circuit near the primary exit, and one circuit supplying a sleeping room receptacle outlet; main panelboard must have a minimum busbar rating of 225 amps; sufficient space must be reserved to allow future installation of a system isolation equipment/transfer switch within 3' of the main panelboard; with raceways installed between the panelboard and the switch location to allow the connection of backup power source.
§ 150.0(t):	Heat Pump Space Heater Ready. Systems using gas or propane furnaces to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the furnace with circuit conductors rated at least 30 amps with the blank cover identified as "240V ready;" and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."
§ 150.0(u):	Electric Cooktop Ready. Systems using gas or propane cooktop to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the cooktop with circuit conductors rated at least 50 amps with the blank cover identified as "240V ready;" and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."
§ 150.0(v):	Electric Clothes Dryer Ready. Clothes dryer locations with gas or propane plumbing to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the dryer location with circuit conductors rated at least 30 amps with the blank cover identified as "240V ready;" and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."

*Exceptions may apply.

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2022 Single-Family Residential Mandatory Requirements Summary

§ 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 gas furnace air handlers and ≤ 0.38 watts per CFM for oil or 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. *
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Ventilation and Indoor Air Quality:

§ 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)1B:	Central Fan Integrated (CFI) Ventilation Systems. Continuous operation of CFI air handlers is not allowed to provide the whole-dwelling unit ventilation airflow required per § 150.0(o)1C. A motorized damper(s) must be installed on the ventilation duct(s) that prevents all airflow through the space conditioning duct system when the damper(s) is closed and uncontrolled per § 150.0(o)1Biii(i). CFI ventilation systems must have controls that track outdoor air ventilation run time, and either open or close the motorized damper(s) for compliance with § 150.0(o)1C.
§ 150.0(o)1C:	Whole-Dwelling Unit Mechanical Ventilation for Single-Family Detached and townhouses. Single-family detached dwelling units, and attached dwelling units not sharing ceilings of floors with other dwelling units, occupiable spaces, public garages, or commercial spaces must have mechanical ventilation airflow specified in § 150.0(o)1C-iii.
§ 150.0(o)1G:	Local Mechanical Exhaust. Kitchens and bathrooms must have local mechanical exhaust; nonenclosed kitchens must have demand-controlled exhaust system meeting requirements of § 150.0(o)1Giii enclosed kitchens and bathrooms can use demand-controlled or continuous exhaust meeting § 150.0(o)1Giii-iv. Airflow must be measured by the installer per § 150.0(o)1Gv, and rated for sound per § 150.0(o)1Gvi. *
§ 150.0(o)1H&I:	Airflow Measurement and Sound Ratings of Whole-Dwelling Unit Ventilation Systems. The airflow required per § 150.0(o)1C must be measured by using a flow hood, flow grid, or other airflow measuring device at the fan's inlet or outlet terminals/grilles per Reference Residential Appendix RA3.7. Whole-Dwelling unit ventilation systems must be rated for sound per ASHRAE 62.2 §7.2 at no less than the minimum airflow rate required by § 150.0(o)1C.
§ 150.0(o)2:	Field Verification and Diagnostic Testing. Whole-Dwelling unit ventilation airflow, vented range hood airflow and sound rating, and HRV and ERV fan efficacy must be verified in accordance with Reference Residential Appendix RA3.7. Vented range hoods must be verified per Reference Residential Appendix RA3.7.4.3 to confirm if it is rated by HVI or AHAM to comply with the airflow rates and sound requirements per § 150.0(o)1G.

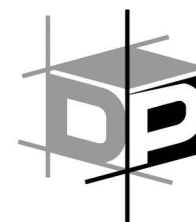
Pool and Spa Systems and Equipment:

§ 110.4(a):	Certification by Manufacturers. Any pool or spa heating system or equipment must be certified to have all of the following: compliance with the Appliance Efficiency Regulations and listing in MAEDbS; an on-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 3/8 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:

§ 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, except lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, and garage door openers; navigation lighting less than 5 watts; and lighting integral to drawers, cabinets, and linen closets with an efficacy of at least 45 lumens per watt.
§ 150.0(k)1B:	Screw based luminaires. Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8. *
§ 150.0(k)1C:	Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must not contain screw based sockets, must be airtight, and must be sealed with a gasket or caulk. California Electrical Code § 410.116 must also be met.
§ 150.0(k)1D:	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)1E:	Blank Electrical Boxes. The number of electrical boxes that are more than five feet above the finished floor and do not contain a luminaire or other device shall be no more than the number of bedrooms. These boxes must be served by a dimmer, vacancy sensor control, low voltage wiring, or fan speed control.
§ 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).

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ADVANCED ENGINEERING STRUCTURAL ENGINEERING SOLUTIONS

TITLE 24 SUMMARY OF FEATURES

PROJECT: TOWN OF DANVILLE ADU DATE: 3-31-2023
JOB NO: W021420 ANALYST: J. BENNETT

ENVELOPE INSULATION

EXTERIOR WALLS:

R-21 1N 2x6

FOUNDATION:

SLAB: NOT INSULATED

ROOF OVER LIVING SPACE:

R-38 BETWEEN CEILING JOISTS

R-13 BETWEEN RAFTERS

WINDOW PERFORMANCE

MAXIMUM WINDOW PERFORMANCE VALUES (U-FACTOR / SHGC)

WINDOWS: 30, 23

FRENCH DOORS: 32, 16

DOMESTIC HOT WATER

RHEEM 40-GALLON HEAT PUMP WATER HEATER OR EQUIV.

SOLAR (STUDIO)

(NOT REQUIRED; CALCULATED SIZE IS <1.8 KW)

SOLAR (1 BEDROOM)

2.0 KW MINIMUM

ACCEPTABLE ORIENTATION:

(DEGREES EAST OF TRUE NORTH)

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

N

300°

130°

BROAN

BROAN ERV100
Part no. ERV100S
Low speed: 50 CFM (0.2 in. w.g.), selectable 65 CFM
High speed: 100 CFM (0.4 in. w.g.), selectable 85 CFM



CONSTRUCTION

- 22 ga. galvanized steel housing and door
- One-piece molded insulation shell, expanded polystyrene (UL 94 HF-1 certified)
- Galvanized steel 5" diameter ports*
- Steel door hinges and latches
- Cold side ports with plastic ring; allow vapor barrier sealing
- No drain required
- Included installation brackets

*All unit ports were created to be connected to ducts having a minimum of 5" diameter, but if need be, they can be connected to bigger sized ducts by using an appropriate transition (e.g. 5" diameter to 6" diameter transition).

MOTORS

- Two high reliability, external rotor PSC motors, totally enclosed and thermally protected
- Backward blowers, can support high static pressure environment

FILTERS

- Two washable 20 gpi reticulated polyester urethane foam filters, UL 900 class 2 certified
- Optional MERV 8 filter kit, part no. V21030 (additional 0.1 in. w.g. static pressure to be considered) (sold separately)

ERV CORE

- Crossflow aluminum-polymerized paper core, UL723 certified
- Hydroscopic polymer exchange water by direct vapor transfer using molecular transport without the need of condensation
- Constructed of alternate layers of corrugated aluminum material and polymeric bactericide impregnated media; will not promote growth of mold or bacteria
- Unique rectangular flute design to provide very low pressure drop values

ENERGY RECOVERY VENTILATOR

Controls

- Integrated push-button control for Low or High speed operation.
- For a complete list of optional main and auxiliary controls available, refer to the **Wall Control Compatibility Chart** on last pages of wall controls specification sheet, available at www.broan.com.
- For more details about controls, refer to the **Main and auxiliary wall controls** user guide, also available at www.broan.com.
- Removable terminal block included for quicker low voltage control connections
- LED indicator shows operating modes and error codes.
- Unit must be permanently energized, no control should be installed on power supply of unit.

Air Flow

- Pressure taps and balancing chart to allow easier balancing of the unit
- Integrated balancing/backdraft dampers in cold supply and cold exhaust ports

Defrost Cycles

- Choice of regular or extended defrost cycles, according to climatic conditions
- To set extended defrost cycles, refer to unit installation manual

Regular Defrost Cycles			
Outdoor Temperature*		Defrost in Minutes / Air Exchange in Minutes	
°C	°F	Low Speed	High Speed
Warmer than -10	Warmer than 14	No defrost	No defrost
from -10 to -15	from 14 to 5	6/40	9/40
from -15 to -27	from 5 to -17	6/20	9/20
-27 and less	-17 and less	8/12	11/12

* Outdoor temperature is read by a thermostat located inside the unit, next to fresh air from outdoor port.

Warranty

The Broan ERV100 is protected by a 5-year warranty on parts only, with the original proof of purchase.

Requirements and standards

• HVI certified

- Complies with the UL 1812 requirements regulating the installation of Energy Recovery Ventilators
- Complies with the CSA C22.2 no. 113 Standard applicable to ventilators
- Complies with CSA C444 requirements regulating the installation of Energy Recovery Ventilators



Professional Prestige® ProTerra™ Hybrid Electric with LeakGuard™ is the most efficient water heater available

Efficiency

- Up to 4.0 UEF reduces operating cost
- ENERGY STAR® rated

Performance

- Delivers hot water faster than most standard electric water heaters
- Ambient operating range: 37°-145° F is widest in class, offering more days of HP operation annually, designed to meet Northern Climate Spec (Tier 4)

Easy Installation

- Easy access side connections
- Quick access to electrical junction box
- Easy replaces a standard electric water heater
- Dry-fire protection
- Easy access, top mounted washable air filter
- 2" Non-CFC foam insulation
- Enhanced flow brass drain valve
- Temperature and pressure relief valve installed
- Design certified to NSF/ANSI 372 (Lead Content)

Integration

- LED Screen with built-in water sensor alert with audible alarm!
- Integrated EcoNet® WiFi-connected technology and free mobile app gives users control over water heater, allowing for customizable temperature, vacation settings, energy savings and system monitoring at home or away. Visit Rheem.com/hybridolutions

LEAKGUARD™ WATER SHUT-OFF VALVE

- Integrated leak detection and prevention system with factory installed auto water shut-off valve limits leaks to no more than 20 ounces of water* -1
- LeakSense™ Built-in Leak Detection System detects any leak large or small, internal or external* -2

Units meet or exceed ANSI requirements and have been tested according to D.O.E. procedures. Units meet or exceed the energy efficiency requirements of NAECA, ASHRAE standard 90, ICC Code and all state energy efficiency performance criteria.

*Available with select models. 100% broadband external connection required. *Source: Rheem Leak-Sensing Data; testing under a vacuum (not using 50 gallon tank, no expansion tank, average tank pressure of 40 psi, assuming no additional faucets are opened. Minor leaks from the heater only, no tested across scenarios including a minimum of 5.5x10.6 volume tank size, using most common installation scenarios.

See specifications chart on page 2.

PEAD-A24AA7 & PUZ-A24NHA7-(BS) MID STATIC HORIZONTAL-DUCTED INDOOR UNIT 24,000 BTU/H HEAT PUMP UNIVERSAL OUTDOOR

Job Name: _____ Date: _____
System Reference: _____



INDOOR UNIT FEATURES

- Unobtrusive ceiling-concealed design for short-run ductwork
- Wide ranging external static pressure (0.14-0.60 in. WG)
- Built-in condensate lift mechanism (up to 27-9'10")
- Auto fan speed mode
- Optional FB Series filter boxes for easy access and service
- Ideal for residential homes, retail shopping centers, larger classrooms, office complexes, conference rooms, ballrooms, fitness centers, and more
- Multiple control options available:
 - Kurmo cloud® smart device app for remote access
 - Third-party interface options
 - Wired or wireless controllers

OUTDOOR UNIT FEATURES

- Variable speed INVERTER-driven compressor
- Power receiver pre-charged with refrigerant volume for piping length up to 70 ft
- Low ambient cooling down to 0°F providing 100% capacity
- 24-hour continuous operation (cooling mode)
- High pressure protection
- Fast restart
- Superior energy and operational efficiency



Certificate of Product Ratings

AHRI Certified Reference Number : 201754461 Date : 03-30-2020 Model Status : Active

AHRI Type : HRCU-A-CB (Mini-Split System): Heat Pump with Outdoor Unit-Air-Source, Ducted)

Series Name : P-Series

Outdoor Unit Brand Name : Mitsubishi Electric

Outdoor Unit Model Number : PUZ-A24NHA7***

Indoor Type : Mini-Splits (Ducted)

Indoor Model Number(s) : PEAD-A24AA*

Rated as follows in accordance with the latest edition of AHRI 210/240 - 2017 with Addendum 1, Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment and subject to rating accuracy by AHRI-sponsored, independent, third party testing:

Cooling Capacity (A2) - Single or High Stage (95F), btuh : 24000

SEER : 19.60

EER (A2) - Single or High Stage (95F) : 11.70

Heating Capacity (H12) - Single or High Stage (47F) : 26000

HSPF (Region IV) : 10.80

Rated as follows in accordance with the latest edition of AHRI 210/240 - 2020, Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment and subject to rating accuracy by AHRI-sponsored, independent, third party testing:

Cooling Capacity (A1a) - Single or High Stage (95F), btuh : 24000

SEER2 : 19.20

EER2 (A1a) - Single or High Stage (95F) : 12.00

Heating Capacity (H1a) - Single or High Stage (47F), btuh : 26000

HSPF2 (Region IV) : 9.10

Sold In : USA, Canada

*"Active" Model Status are those that an AHRI Certification Program Participant is currently producing AND selling or offering for sale; OR new models that are being marketed but are not yet being produced "Production Stopped" Model Status are those that an AHRI Certification Program Participant is no longer producing BUT is still selling or offering for sale.

Ratings that are accompanied by WAS indicate an involuntary re-rate. The new published rating is shown along with the previous (i.e. WAS) rating.

The Department of Energy has published updated energy efficiency metrics for central air conditioners and heat pumps. This publication reflects both the 1987 metric (SEER) and the 2023 metric (SEER2). Efficiency requirements are published at 10 C.F.R. 430.32(g). Please refer to www.AHRInet.org for more information about updated energy efficiency metrics.

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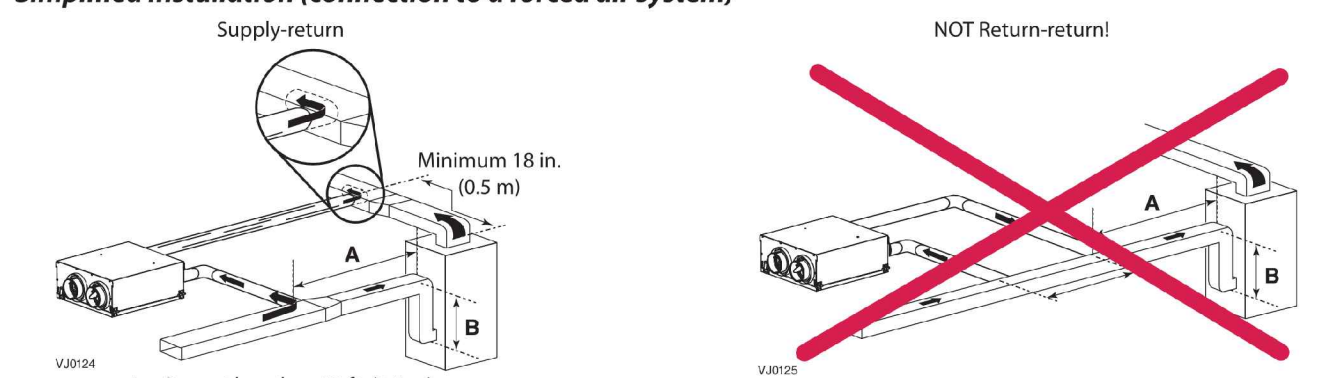
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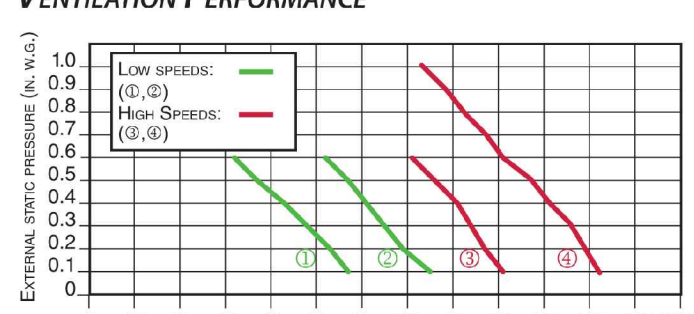
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CERTIFICATE NO.: 13324701402997907

Simplified Installation (connection to a forced air system)



VENTILATION PERFORMANCE



NOTE: Low speed ① and high speed ② are factory set, low speed ③ and high speed ④ are selectable.

ENERGY PERFORMANCE

Supply Temperature	Net Air Flow	Power	Sensible	Annual	Average	Limit
°C	°F	L/s	CFM	Watts	Recovery Efficiency	Recovery Efficiency
0	32	23	48	82	40	67
0	32	30	64	109	50	65
0	32	40	85	144	64	61
0	14	23	49	83	40	65
-25	-13	24	50	85	36	51
					53	79
					53	79
					45	48

NOTE: All specifications are subject to change without notice.

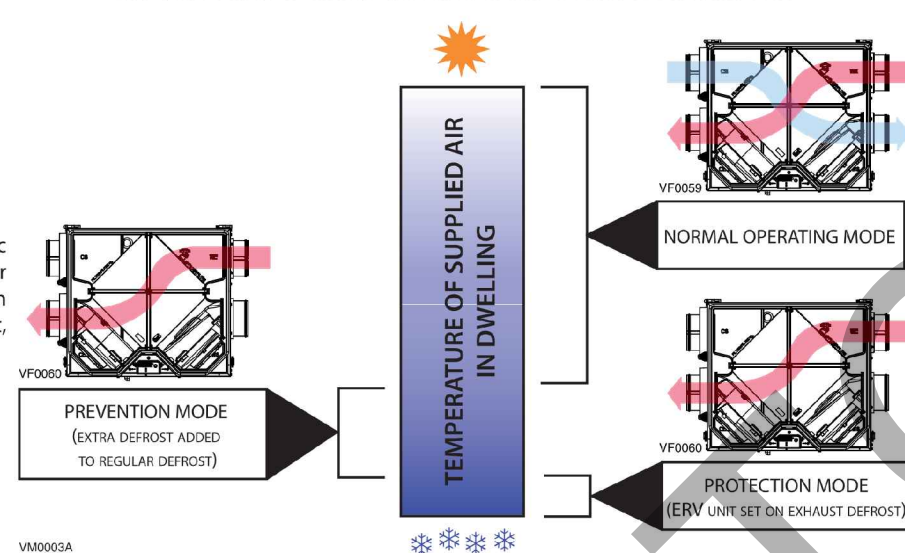
Acoustic Noise Power Chart (dBA)

Airflow	Fresh air to building port	Exhaust air from building port
100 CFM at 0.4 in. w.g.	67.8 dBA	58.3 dBA
55 CFM at 0.1 in. w.g.	58.0 dBA	49.4 dBA

The data shown on left chart come from measurement performed according to ISO 5136 Standard. These data represent the sound power directly measured at the fresh air distribution port and exhaust air from building port. To get the actual noise level in the room, consider noise attenuation resulting from total ductwork installation.

Coldshield™ Protection

ERV UNIT MODES BASED ON AIR DISTRIBUTION TEMPERATURE

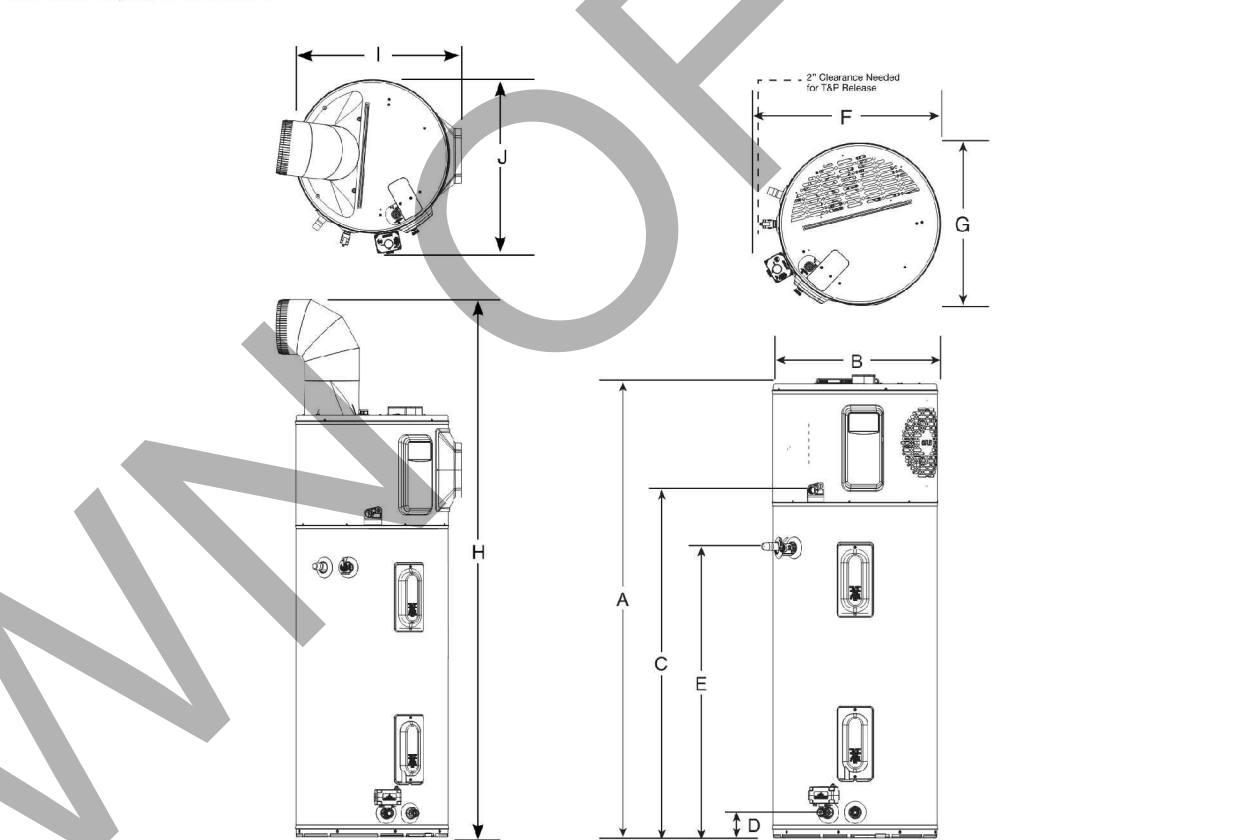


- ERV unit is equipped with an electronic supplemental protection to stop air distribution in dwelling if air distribution temperature drops below freezing point, due to abnormal conditions.

Professional Prestige® ProTerra Hybrid Specifications

DESCRIPTION		ENERGY INFO		FEATURES		WEIGHTS	
NOMINAL CAPACITY	RATED CAPACITY	MODEL NUMBER	ELECTRIC HEATING SIZE	ENERGY FACTOR	DEFROST CYCLE	DEFROST CYCLE	DEFROST CYCLE
ProTerra with LeakGuard							
40	36	PROPH40 T2 RH-075-SO	700944	30	3.75	\$104	4,200
50	45	PROPH50 T2 RH-075-SO	700943	30	3.75	\$104	4,200
65	59	PROPH65 T2 RH-075-SO	700944	30	3.86	\$155	4,200
80	72	PROPH80 T2 RH-075-SO	700945	30	4.00	\$146	4,200
ProTerra 30 Amp without LeakGuard							
40	36	PROPH40 T2 RH-075-SO	700947	30	3.75	\$104	4,200
50	45	PROPH50 T2 RH-075-SO	700947	30	3.75	\$104	4,200
65	59	PROPH65 T2 RH-075-SO	700948	30	3.86	\$155	4,200
80	72	PROPH80 T2 RH-075-SO	700949	30	4.00	\$146	4,200
ProTerra 15 Amp without LeakGuard							
40	36	PROPH40 T2 RH-075-SO	700949	15	3.46	\$78	4,200
50	45	PROPH50 T2 RH-075-SO	700948	15	3.75	\$104	4,200
65	59	PROPH65 T2 RH-075-SO	700950	15	3.66	\$110	4,200
80	72	PROPH80 T2 RH-075-SO	700948	15	3.70	\$105	4,200

Estimated energy cost based on a national average electricity cost of \$0.12/kWh, Uniform Energy Factor and rated gallons capacity based on Department of Energy (DOE) requirements. All units have integrated Wi-Fi control option.

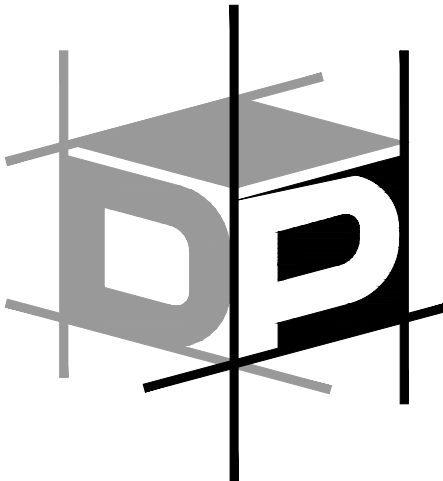


DESCRIPTION	MODEL NUMBER	A	B	C	D	E	F	G	H	I	J
40	PROPH40	60-616	20-114	47	3-5/8	39-5/8	25-3/8	20-1/2	18-7/8	23-3/8	23-1/4
50	PROPH50	61-3/4	22-114	47	3-5/8	39-5/8	25-3/8	22-1/2	18-5/8	24-3/8	25-9/16
65	PROPH65	64-3/16	24-114	49	3-7/8	42-3/8	27-1/2	24-5/8	21-1/8	25-1/2	27-3/8
80	PROPH80	74-3/16	24-114	50	3-7/8	42-3/8	27-1/2	24-5/8	21-1/8	25-1/2	27-3/8

2

Specifications are subject to change without notice.

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ADVANCED ENGINEERING

3381 Walnut Blvd. Ste. 220
Brentwood, CA 94513
Office: 925.516.3502
Fax: 925.262.4662

NOTE: THE LOADS SHOWN ARE ONLY ONE OF THE CRITERIA AFFECTING THE SELECTION OF HVAC EQUIPMENT. OTHER RELEVANT DESIGN FACTORS SUCH AS AIRFLOW, OUTDOOR DESIGN TEMPERATURES, COIL SIZING, AVAILABILITY OF EQUIPMENT, OVERSIZING, WASTAGE, ETC. MUST ALSO BE CONSIDERED. IT IS THE HVAC DESIGNER'S RESPONSIBILITY TO CONSIDER ALL FACTORS WHEN SELECTING THE HVAC EQUIPMENT. MECHANICAL CONTRACTOR MUST WARRANT THE INSTALLED SYSTEM TO MEET ALL ENERGY STAR REQUIREMENTS IF APPLICABLE. THE MINIMUM SIZE OF THE RESIDENTIAL HEATING SYSTEMS IS REGULATED BY THE CALIFORNIA BUILDING CODE (CBC), SECTION 310.11. THE CBC REQUIRES THAT THE HEATING SYSTEM BE CAPABLE OF MAINTAINING A TEMPERATURE OF 70°F AT A DISTANCE THREE FEET ABOVE THE FLOOR THROUGHOUT THE CONDITIONED SPACE OF THE BUILDING. DP ADVANCED ENGINEERING, INC. DOES NOT WARRANT OR ASSUME RESPONSIBILITY FOR PERFORMANCE OR INSTALLATION OF ANY EQUIPMENT LABELED OR ALLOWED TO ON ANY CALCULATION PRODUCED BY DP ADVANCED ENGINEERING, INC. BUILDERS AND ALL SUB-CONTRACTORS WORKING ON THE PROJECT INVOLVING TITLE-24 UNDERSTAND AND ACCEPT ALL ASPECTS OF THE TITLE-24 SUBMITTED TO BUILDING DEPARTMENT PERTAINING TO THEIR WORK. ALL SUB-CONTRACTORS ARE RESPONSIBLE TO CONTACT THE BUILDER AND DP ADVANCED ENGINEERING, INC. BEFORE BEGINNING WORK IF THERE IS ANY ERROR IN ANY CALCULATION THAT WOULD PREVENT THE SUB-CONTRACTOR FROM WARRANTING THE PERFORMANCE OF HIS PRODUCT WHICH INCLUDED ANY ENERGY STAR PROCEDURES.

TOWN OF DANVILLE ACCESSORY DWELLING UNIT

- 1
- 2
- 3
- 4
- 5
- 6

PLEASE NOTE THE REVISION NUMBER AND DATE ARE FOR ENERGY SHEETS ONLY.

Sheet Description:

ENERGY CALCULATIONS

SUBMITTAL SHEETS FOR EQUIPMENT

Initial Issue Date: March 31, 2023

Energy Analyst: J. Bennett Ext. 26

Project Manager: J. Peek Ext. 23

Job No. W021420

Sheet No.

ECS

GENERAL NOTES

1. ALL MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE 2022 EDITION OF THE CALIFORNIA BUILDING CODE (CBC); THE MOST RECENT VERSIONS OF THE CMC, CPC AND CEC; ALL APPLICABLE LOCAL CODES AND ORDINANCES; AND LOCALLY ACCEPTED STANDARDS OF PRACTICE.
2. THESE DRAWINGS AND SPECIFICATIONS HAVE BEEN PREPARED EXCLUSIVELY FOR USE ON THIS PROJECT ONLY. THE DRAWINGS AND SPECIFICATIONS, OR PORTIONS THEREOF, SHALL NOT BE USED ON OTHER PROJECTS OR ADDITIONS TO THIS PROJECT EXCEPT BY AGREEMENT IN WRITING AND WITH APPROPRIATE COMPENSATION OF THE ENGINEER.
3. WRITTEN INFORMATION AND DIMENSIONS SHALL TAKE PRECEDENCE OVER GRAPHIC INFORMATION.
4. STRUCTURAL DRAWINGS SHOW ONLY THE BASIC STRUCTURAL SYSTEMS. REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL AND CIVIL DRAWINGS FOR ITEMS WHICH REQUIRE SPECIAL PROVISIONS DURING CONSTRUCTION.
5. SEE DRAWINGS OTHER THAN STRUCTURAL FOR: TYPES OF FINISH MATERIALS AND THEIR LOCATIONS, FOR DEPRESSIONS IN FLOOR SLABS, FOR OPENINGS IN WALLS AND FLOORS REQUIRED BY ARCHITECTURAL AND MECHANICAL FEATURES, FOR STAIRS, CURBS, ETC.
6. ALL DETAIL REFERENCES SHALL BE CONSIDERED "TYPICAL". THE INTENT OF TYPICAL DETAILS SHALL BE APPLIED TO SIMILAR CONDITIONS ELSEWHERE IN THE PROJECT. WHEN DETAILS LABELED "SIMILAR" ARE GIVEN ON DRAWINGS, THE CONTRACTOR SHALL APPLY THE GENERAL INTENT OF THE DETAIL TO THE REFERENCED CONDITION.
7. **THE CONTRACTOR SHALL REVIEW ALL DRAWINGS IMMEDIATELY UPON RECEIPT AND SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES.**
8. STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR THIS WORK HAVE BEEN PREPARED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS OF PRACTICE TO MEET THE MINIMUM REQUIREMENTS OF THE APPLICABLE EDITION OF THE CBC. ANY OMISSIONS OR DISCREPANCIES ON THE PLANS OR ANY DEVIATIONS FROM THE PLANS THAT ARE NECESSITATED BY FIELD CONDITIONS OR ANY CONDITION DIFFERENT FROM THOSE INDICATED ON THE PLANS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONTINUING CONSTRUCTION. ALL WORK SHALL BE COORDINATED SO COOPERATION BETWEEN THE TRADES IS ACCOMPLISHED.
9. CONNECTIONS AND IMPLIED CONSTRUCTION ASSEMBLIES THAT ARE NOT SPECIFICALLY DESCRIBED OR DETAILED SHALL BE CONSTRUCTED USING STANDARD CONSTRUCTION PRACTICES IN COMPLIANCE WITH THE GOVERNING CODES AND LOCAL ORDINANCES.
10. THE STRUCTURAL SYSTEMS HAVE BEEN DESIGNED TO CARRY THE SUPERIMPOSED LIVE LOADS AS PRESCRIBED BY THE CALIFORNIA BUILDING CODE AND IN ACCORDANCE WITH STANDARD ENGINEERING PRACTICES, WITH NO SPECIAL PROVISIONS TO CARRY CONCENTRATED LOADS FROM STORAGE AND HANDLING OF CONSTRUCTION MATERIALS OR FROM OPERATION OF CONSTRUCTION EQUIPMENT.
11. DRAWINGS AND SPECIFICATIONS REPRESENT FINISHED STRUCTURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO SHORING AND TEMPORARY BRACING. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURE TO INSURE SAFETY OF ALL PERSONS AND STRUCTURES AT THE SITE AND ADJACENT TO THE SITE. OBSERVATION VISITS TO THE SITE BY THE ARCHITECT, ENGINEER OR CONSTRUCTION MANAGER SHALL NOT RELIEVE THE CONTRACTOR OF SUCH RESPONSIBILITY.
12. THE CONTRACTOR IS RESPONSIBLE FOR AND SHALL MAINTAIN THE INTEGRITY OF ALL SCAFFOLDING, BRACING, AND SHORING SYSTEMS AS REQUIRED FOR INSTALLATION, STABILITY AND SAFETY OF NEW WORK AND EXISTING STRUCTURES, PIPING, AND FOUNDATION SYSTEMS. CONTRACTOR SHALL ALSO PROVIDE FOR THE SAFETY OF PEDESTRIANS AND JOB SITE PERSONNEL. AT ALL TIMES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITION OF THE JOB SITE, INCLUDING SAFETY OF PERSONS AND PROPERTY. THE CONTRACTOR SHALL PROTECT NEW AND EXISTING CONSTRUCTION FROM INCMENET WEATHER AND PHYSICAL DAMAGE.
13. CONTRACTOR SHALL COORDINATE WITH THE CITY TO ENSURE ALL INSPECTIONS (INCLUDING SPECIAL INSPECTIONS) ARE COMPLETED PER THE LOCAL BUILDING DEPARTMENT REQUIREMENTS. APPROVALS BY BUILDING INSPECTORS SHALL NOT CONSTITUTE AUTHORITY TO DEVIATE FROM THE PLANS AND SPECIFICATIONS.
14. IF PROVIDED, OBSERVATION OF THE CONSTRUCTION BY THE ENGINEER IS INTENDED TO IMPROVE THE PROBABILITY THAT THE WORK IS COMPLETED IN GENERAL CONFORMANCE WITH THE ENGINEERING INTENT OF THE DESIGN. OBSERVATION OF THE CONSTRUCTION BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR COMPLETING THE CONSTRUCTION IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS, GENERALLY ACCEPTED STANDARDS OF PRACTICE, AND CITY/COUNTY REQUIRED INSPECTIONS.
15. ALL FRAMING HARDWARE SHALL BE MANUFACTURED BY SIMPSON STRONGTIE, OR EQUAL. ALTERNATE FRAMING HARDWARE MANUFACTURERS SHALL NOT BE PROVIDED UNLESS SPECIFICALLY AUTHORIZED BY THE ENGINEER AND THE BUILDING OWNER. IF ALTERNATE HARDWARE SYSTEMS ARE AUTHORIZED, THE CONTRACTOR SHALL FORWARD COMPLETE SHOP DRAWINGS FOR REVIEW AND APPROVAL.

FOUNDATION NOTES

1. FOOTING DEPTH DIMENSION ARE INTO UNDISTURBED SOIL OR ENGINEERED FILL APPROVED BY THE GEOTECHNICAL ENGINEER, IF APPLICABLE. FINAL FOOTING DEPTH SHALL BE MEASURED FROM LOWEST ADJACENT GRADE OR BOTTOM OF UNAPPROVED FILL.
2. REMOVE LOOSE SOIL AND STANDING WATER FROM FOUNDATION EXCAVATIONS PRIOR TO PLACING CONCRETE. THE GEOTECHNICAL ENGINEER (IF APPLICABLE) SHALL INSPECT AND APPROVE ALL EXCAVATIONS, SOIL COMPACTION WORK PRIOR TO PLACEMENT OF ANY REBAR OR CONCRETE, SHORING INSTALLATIONS, BACKFILL MATERIALS AND BACK FILLING PROCEDURES.
3. MINIMUM CLEARANCE OF 8" SHALL BE PROVIDED BETWEEN EARTH AND WOOD IN ALL LOCATIONS PER CBC 2304.12
4. **DRAINAGE AND SURFACE RUNOFF:**
PERIMETER GRADES SHOULD BE POSITIVELY SLOPED AT ALL TIMES TO PROVIDE FOR RAPID REMOVAL OF SURFACE WATER RUNOFF AWAY FROM THE FOUNDATION SYSTEMS AND TO PREVENT PONDING OF WATER UNDER FOUNDATIONS OR SEEPAGE TOWARD THE FOUNDATION SYSTEMS AT ANY TIME DURING OR AFTER CONSTRUCTION. PONDED WATER MAY CAUSE UNDESIRABLE SOIL SWELL OR LOSS OF STRENGTH.
A. AS A MINIMUM REQUIREMENT, FINISHED GRADES SHOULD HAVE SLOPES OF AT LEAST 5 PERCENT WITHIN 10 FEET FROM THE EXTERIOR WALLS AND AT RIGHT ANGLES TO ALLOW SURFACE WATER TO DRAIN POSITIVELY AWAY FROM THE STRUCTURE. FOR PAVED AREAS, THE SLOPE GRADIENT CAN BE REDUCED TO 2 PERCENT.
- B. ALL SURFACE WATER SHOULD BE COLLECTED AND DISCHARGED INTO APPROVED DRAINAGE FACILITIES. APPROVED DRAINAGE FACILITIES SHALL BE PACIFIED BY THE THE CIVIL ENGINEER, IF APPLICABLE.
- C. ALL ROOF STORMWATER SHOULD BE COLLECTED AND DIRECTED TO DOWNSPOUTS. STORMWATER FROM ROOF DOWNSPOUTS SHOULD NOT BE ALLOWED TO DISCHARGE DIRECTLY ONTO THE GROUND SURFACE IN CLOSE PROXIMITY TO THE FOUNDATION SYSTEM. RATHER, STORMWATER FROM ROOF DOWNSPOUTS SHOULD BE DIRECTED BY AN IMPERMEABLE SURFACE INTO THE STREET OR TO AN APPROVED DRAINAGE FACILITY. IF THIS IS NOT ACCEPTABLE, WE RECOMMEND DOWNSPOUTS DISCHARGE AT LEAST 5 FEET AWAY FROM FOUNDATIONS.
5. **OVER-OPTIMUM SOIL MOISTURE CONDITIONS:**
THE CONTRACTOR SHOULD ANTICIPATE ENCOUNTERING EXCESSIVELY OVER-OPTIMUM (WET) SOIL MOISTURE CONDITIONS DURING WINTER OR SPRING GRADING, OR DURING OR FOLLOWING PERIODS OF RAIN. IN ADDITION, WET SOIL CONDITIONS MAY BE ENCOUNTERED NEAR THE BOTTOM OF EXCAVATIONS. WET SOIL CAN MAKE PROPER COMPACTION DIFFICULT OR IMPOSSIBLE. WET SOIL CONDITIONS SHALL BE MITIGATED BY APPROVED MEANS.
6. **OVER-OPTIMUM SOIL MOISTURE CONDITIONS:**
WHERE MOISTURE VAPOR TRANSMISSION IS A CONCERN, CONSULT A WATERPROOFING EXPERT. MOISTURE TRANSITION IS OUTSIDE THE SCOPE OF THESE PLANS.
A. A TIGHT, WATER VAPOR RETARDING MEMBRANE SHOULD BE INSTALLED BELOW ALL SLAB FOUNDATIONS SYSTEMS TO REDUCE MOISTURE CONDENSATION UNDER FLOOR COVERINGS. THE VAPOR RETARDER SHOULD MEET ASTM E 1745 CLASS A REQUIREMENTS FOR WATER VAPOR PERMEANCE, TENSILE STRENGTH, AND PUNCTURE RESISTANCE. VAPOR TRANSMISSION THROUGH THE SLAB FOUNDATIONS CAN ALSO BE REDUCED BY USING HIGH STRENGTH CONCRETE WITH A LOW WATER-CEMENT RATIO.
7. DEEPEN PERIMETER FOOTINGS AS REQUIRED WHERE FOOTING, OR EDGE OF SLAB, IS WITHIN 3'-0" OF EDGE OF BIO-SWALE, BIO-RETENTION FACILITIES, TRENCHES, ETC. DEEPEN FOOTING SUCH THAT A 1:1 PLANE IS MAINTAINED BETWEEN BOTTOM OF FOOTING AND BOTTOM OF ADJACENT EXCAVATION. SEE DTL. 207 FOR MORE INFORMATION.
8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND PROTECT EXISTING UTILITIES TO REMAIN DURING AND/OR AFTER CONSTRUCTION.
9. CONTRACTOR TO REMOVE ABANDONED FOOTINGS, UTILITIES, ETC. WHICH INTERFERE WITH NEW CONSTRUCTION, UNLESS OTHERWISE INDICATED. NOTIFY THE OWNER'S REPRESENTATIVE IF ANY BURIED STRUCTURES NOT INDICATED, SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, ETC., ARE FOUND.
10. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, UNDERPINNING AND PROTECTION OF EXISTING CONSTRUCTION.
11. PLACE BACKFILL BEHIND RETAINING WALLS AFTER CONCRETE OR MASONRY HAS ATTAINED FULL DESIGN STRENGTH. BRACE BUILDING AND PIT WALLS BELOW GRADE FROM LATERAL LOADS UNTIL ATTACHED FLOORS AND SLABS ON GRADE ARE COMPLETE AND HAVE ATTAINED FULL DESIGN STRENGTH.

SYMBOLS LEGEND

- NOT ALL SYMBOLS USED IN THE DRAWING ARE LISTED BELOW. REFER TO AMERICAN WELDING SOCIETY PUBLICATIONS FOR WELDING SYMBOLS.
- (LENGTH)
SW-# INDICATES SHEARWALL NUMBER AND MINIMUM DESIGN LENGTH. SHEARWALLS SHALL BE AS NOTED IN THE SHEARWALL SCHEDULE
- SD INDICATES HOLDOWN TYPE AS MANUFACTURED BY THE "SIMPSON STRONGTIE COMPANY." HOLDOWNS SHALL BE AS NOTED IN THE HOLDOWN SCHEDULE, PER
- INDICATES INTERIOR BEARING WALL BELOW

SHEARWALL NOTES

1. WHERE A STRUCTURAL SHEARWALL IS INDICATED ON PLANS THE ASSEMBLY SHALL RUN HORIZONTALLY AND CONTINUOUSLY TO THE NEAREST WALL OPENING OR END OF THE WALL; THE ASSEMBLY SHALL RUN VERTICALLY CONTINUOUSLY FROM THE BOTTOM OF THE NEAREST SOLE OR BOTTOM PLATE UP TO THE TOP OF THE NEAREST DOUBLE TOP PLATE (OR BEAM). ALL PLYWOOD PANEL EDGES SHALL BE BLOCKED AND EDGE NAILED.
2. WHERE HOLDOWN POSTS OR STUDS ARE INDICATED AT THE END OF A SHEARWALL, THE SHEAR PLYWOOD SHALL BE EDGE NAILED AND THE POST SHALL RUN CONTINUOUSLY FROM THE SOLE PLATE TO THE DOUBLE TOP PLATE. HOLDOWNS SHALL BE ATTACHED TO POSTS AT THE ENDS OF SHEARWALLS AND SHALL EXTEND TO EITHER FRAMING BELOW OR TO FOUNDATION AS SHOWN ON PLANS.
3. SEE SHEARWALL SCHEDULE ON PLANS FOR REQUIRED SHEARWALL NAILING, ANCHOR BOLTS, SILL NAILS, AND OTHER SHEAR TRANSFER HARDWARE.
4. SHEARWALL PLYWOOD SHALL NOT BE CUT FOR PIPE, DUCTS, SLEEVES, ETC., U.N.O. OR DETAILED.
5. UNLESS OTHERWISE DETAILED, ALL INTERIOR SHEARWALLS SHALL BE CONTINUOUS TO THE ROOF OR FLOOR PLYWOOD IN ACCORDANCE WITH THE TYPICAL SHEAR TRANSFER DETAILS
6. PLYWOOD SHEETS LOCATED AT SHEARWALL EDGES SHALL BE AT LEAST 12" WIDE. PLYWOOD EDGES SHALL BE EDGE NAILED TO ALL SHEARWALL FRAMING MEMBERS. SEE SHEARWALL SCHEDULE FOR FIELD NAILING REQUIREMENTS.
7. SEE SHEARWALL SCHEDULE FOR SHEARWALLS THAT REQUIRE 3x MUDDSILLS AND 3x FRAMING AT ADJOINING PLYWOOD PANEL EDGES. SILL PLATES, TOP PLATES AND MEMBERS IN THE FIELD OF INDIVIDUAL PLYWOOD PANELS DO NOT TYPICALLY BACK ADJOINING PANEL EDGES AND THUS MAY BE 2x.

OBSERVATION OF CONSTRUCTION

1. IN ADDITION TO OBSERVATIONS BY THE SOILS ENGINEER(IF APPLICABLE), AND CITY INSPECTOR, OBSERVATION OF THE CONSTRUCTION BY THE PROJECT ENGINEER IS RECOMMENDED FOR THIS PROJECT. THE CONTRACTOR SHALL PHASE THE PROJECT AND COORDINATE WITH THE ENGINEER TO ENSURE THAT THE PRIMARY STRUCTURAL ELEMENTS OF THE CONSTRUCTION ARE OBSERVED PRIOR TO COVERING WITH FINISHES OR OTHER MATERIALS. AS A MINIMUM, OBSERVATION BY THE ENGINEER IS RECOMMENDED AS FOLLOWS:
- A. REINF. STEEL AND HARDWARE EMBEDDED IN THE FNDTION SHALL BE OBSERVED PRIOR TO CONCRETE PLACEMENT
B. SHEARWALLS AND FRAMING ELEMENTS SHALL BE OBSERVED PRIOR TO INSTALLATION OF FINISHES.
2. OBSERVATION OF THE CONSTRUCTION BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY TO COMPLETE THE CONSTRUCTION IN CONFORMANCE WITH THE PROJECT DOCUMENTS AND GENERALLY ACCEPTED STANDARDS OF PRACTICE. THE PURPOSE OF OUR VISITS WILL BE TO BECOME GENERALLY FAMILIAR WITH THE PROGRESS AND QUALITY OF THE CONTRACTOR'S WORK AND DETERMINE IF THE WORK IS PROGRESSING IN GENERAL CONFORMANCE WITH OUR DESIGN INTENT. DURING OUR VISITS, ADVANCED ENGINEERING WILL NOT BE MAKING DETAILED INSPECTIONS, OR VERIFYING DIMENSIONS. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING APPLICABLE CODES AND THE APPROVED CONSTRUCTION DOCUMENTS.

SPECIAL INSPECTIONS PER 2022 CBC 1701

1. IN ADDITION TO OBSERVATIONS BY THE CITY INSPECTOR AND THE PROJECT ENGINEER, SPECIAL INSPECTIONS BY AN ICC CERTIFIED SPECIAL INSPECTOR IS REQUIRED AS FOLLOWS:
- A. EPOXY ANCHORS INSTALLED IN CONCRETE SHALL HAVE SPECIAL INSPECTION OF HOLE DEPTH & DIAMETER, MATERIALS, CLEANING PROCEDURES, AND INSTALLATION PER ICC-REPORT ICC-ES/ESR-2508 SECTION 4.4.3.
B. TITEN HD ANCHORS INSTALLED IN CONCRETE SHALL HAVE SPECIAL INSPECTION OF DRILLING AND INSTALLATION PER ICC-REPORT ICC-ES/ESR-2713 SECTION 4.4.
C. PERIODIC SPECIAL INSPECTION IS REQUIRED FOR NAILING, BOLTING, ANCHORING, AND OTHER FASTENING OF COMPONENTS WITHIN THE SEISMIC-FORCE-RESISTING SYSTEM, INCLUDING WOOD SHEAR WALLS, WOOD DIAPHRAGMS, DRAG STRUTS, BRACES, SHEAR PANELS AND HOLDOWNS PER SECTION 1705.12.2 OF THE CURRENT EDITION OF THE C.B.C.
D. CONTINUOUS INSPECTIONS OF CAST-IN-PLACE DEEP FOUNDATION (PIERS) OR DRILLING OPERATIONS. COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT SHALL BE PROVIDED PER SECTION 1705.8 OF THE CURRENT EDITION OF THE C.B.C.
E. CONTINUOUS INSPECTIONS OF CAST-IN-PLACE DEEP FOUNDATION (PIERS) TO VERIFY: PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM ELEMENT DIAMETERS, LENGTHS, AND EMBEDMENTS PER SECTION 1705.8 OF THE CURRENT EDITION OF THE C.B.C.
2. THE CONTRACTOR SHALL COORDINATE WITH THE CITY TO ENSURE SPECIAL INSPECTION IS PROVIDED PER CITY REQUIREMENTS. THE SPECIAL INSPECTOR SHALL BE EMPLOYED BY THE OWNER AND MUST DEMONSTRATE HIS QUALIFICATIONS TO THE ARCHITECT/ENGINEER OF RECORD AND THE BUILDING OFFICIAL.

FASTENING SCHEDULE (C.B.C. TABLE 2304.10.2)

ITEM	DESCRIPTION OF CONNECTION	FASTENING (NOTE 1, 4, 8)		
		COMMON / BOX	SMOOTH SHANK	STAPLES
1	JOIST TO SILL OR GIRDER, TOE-NAIL	(3) 8d	(3) 3" x 0.131"	(3) 3"-14 GA.
2	BRIDGING TO JOIST, TOE-NAIL EA. END	(2) 8d	(2) 3" x 0.131"	(2) 3"-14 GA.
3	1" x 6" SUBFLOOR OR LESS, TO EACH JOIST, FACE NAIL	(2) 8d	N.A.	N.A.
4	WIDER THAN 1" x 6" SUBFLOOR TO EACH JOIST, FACE NAIL	(3) 8d	N.A.	N.A.
5	2" SUBFLOOR TO JOIST OR GIRDER, BLIND AND FACE NAIL	(2) 16d	N.A.	N.A.
6	SOLE PLATE TO JOIST OR BLOCKING, TYPICAL FACE NAIL	16d AT 16"	3" x 0.131" AT 8" O.C.	3"-14 GA. AT 12" O.C.
	SOLE PLATE TO JOIST OR BLOCKING, AT BRACED WALL PANELS	(3) 16d AT 16"	(4) 3" x 0.131" AT 16" O.C.	(4) 3"-14 GA. PER 16" O.C.
7	TOP PLATE TO STUD, END NAIL	(2) 16d	(3) 3" x 0.131"	(3) 3"-14 GA.
8	STUD TO SOLE PLATE, END NAIL	(2) 16d	(3) 3" x 0.131"	(3) 3"-14 GA.
	STUD TO SOLE PLATE, TOE-NAIL	(4) 8d	(4) 3" x 0.131"	(3) 3"-14 GA.
9	DOUBLE STUDS, FACE NAIL	16d AT 24"	3" x 0.131" AT 8" O.C.	3"-14 GA. AT 8" O.C.
10	DOUBLED TOP PLATES, TYP. FACE NAIL	16d AT 16"	3" x 0.131" AT 12" O.C.	3"-14 GA. AT 12" O.C.
	DOUBLED TOP PLATES, LAP SPLICE	(8) 16d	(12) 3" x 0.131"	(12) 3"-14 GA.
11	BLOCKING BETWEEN JOISTS OR RAFTERS, TO TOP PLATE, TOE-NAIL	(3) 8d	(3) 3" x 0.131"	(3) 3"-14 GA.
12	RIM JOIST TO TOP PLATE, TOE-NAIL	8d AT 6"	3" x 0.131" AT 6" O.C.	3"-14 GA. AT 6" O.C.
13	TOP PLATES, LAPS AND INTERSECTIONS, FACE NAIL	(2) 16d	(3) 3" x 0.131"	(3) 3"-14 GA.
14	CONTINUOUS HEADER, TWO PIECES	16d AT 16" ALONG EDGE	N.A.	N.A.
15	CEILING JOIST TO PLATE, TOE-NAIL	(3) 8d	(5) 3" x 0.131"	(5) 3"-14 GA.
16	CONTINUOUS HEADER TO STUD, TOE-NAIL	(4) 8d	N.A.	N.A.
17	CEILING JOISTS: LAPS OVER PARTITIONS, FACE NAIL (SEE C.B.C. TABLE 2308.7.3.1)	(3) 16d MIN.	(4) 3" x 0.131"	(4) 3"-14 GA.
18	CEILING JOISTS TO PARALLEL RAFTERS, FACE NAIL (SEE C.B.C. TABLE 2308.7.3.1)	(3) 16d MIN.	(4) 3" x 0.131"	(4) 3"-14 GA.
19	RAFTER TO PLATE, TOE-NAIL (SEE C.B.C. TABLE 2308.7.9)	(3) 8d	(3) 3" x 0.131"	(3) 3"-14 GA.
20	1" DIAGONAL BRACE TO EACH STUD AND PLATE, FACE NAIL	(2) 8d	(2) 3" x 0.131"	(3) 3"-14 GA.
21	1" x 8" SHEATHING OR LESS TO EACH BEARING, FACE NAIL	(3) 8d	N.A.	N.A.
22	WIDER THAN 1" x 8" SHEATHING TO EACH BEARING, FACE NAIL	(3) 8d	N.A.	N.A.
23	BUILT-UP CORNER STUDS	16d AT 24"	3" x 0.131" AT 16" O.C.	3"-14 GA. AT 16" O.C.
24	BUILT-UP GIRDER AND BEAMS, FACE NAIL TOP AND BTM STAGG. ON OPP. SIDE	20d AT 32"	3" x 0.131" AT 24" O.C.	3"-14 GA. AT 24" O.C.
	BUILT-UP GIRDER AND BEAMS, FACE NAIL AT ENDS AND AT EACH SPLICE	(2) 20d	(3) 3" x 0.131"	(3) 3"-14 GA.
25	2" PLANK TO EACH BEARING	16d	N.A.	N.A.
26	COLLAR TIE TO RAFTER, FACE NAIL	(3) 10d	(4) 3" x 0.131"	(4) 3"-14 GA.
27	JACK RAFTER TO HIP, TOE-NAIL	(3) 10d	(4) 3" x 0.131"	(4) 3"-14 GA.
28	JACK RAFTER TO HIP, FACE NAIL	(2) 16d	(3) 3" x 0.131"	(3) 3"-14 GA.
29	ROOF RAFTER TO 2x RIDGE BEAM, TOE-NAIL OR FACE-NAIL	(2) 16d	(3) 3" x 0.131"	(3) 3"-14 GA.
30	JOIST TO BAND JOIST, FACE NAIL	(3) 16d	(4) 3" x 0.131"	(4) 3"-14 GA.
31	LEDGER STRIP, FACE NAIL	(3) 16d	(4) 3" x 0.131"	(4) 3"-14 GA.
	WOOD STRUCTURAL PANELS AND PARTICLE BOARD (NOTE 2): SUBFLOOR, ROOF + WALL SHEATHING TO FRAMING:			
	1/2" AND LESS	6d (NOTE 3, 7)	2.375" x 0.113" (NOTE 9)	1.75" x 16 GA. (NOTE 10)
	19/32" TO 3/4"	8d (NOTE 4)	2.375" x 0.113" (NOTE 11)	2" x 16 GA. (NOTE 11)
	7/8" TO 1"	8d (NOTE 3)	N.A.	N.A.
	1-1/8" TO 1-1/4"	10d OR 8d (NOTE 4)	N.A.	N.A.
	SINGLE FLOOR (COMBINATION SUBFLOOR- UNDERLAYMENT TO FRAMING):			
	3/4" AND LESS	6d (NOTE 5)	N.A.	N.A.
	7/8" TO 1"	8d (NOTE 5)	N.A.	N.A.
	1-1/8" TO 1-1/4"	10d (NOTE 4)	N.A.	N.A.
32	PANEL SIDING TO FRAMING (NOTE 2):			
	1/2" AND LESS	6d (NOTE 6)	N.A.	N.A.
	5/8"	8d (NOTE 6)	N.A.	N.A.

NOTES:

- FOR S1: 1 inch = 25.4 mm
1. COMMON OR BOX NAILS ARE PERMITTED TO BE USED EXCEPT WHERE OTHERWISE STATED.
2. NAILS SPACED AT 6" O.C. AT EDGES, 12" O.C. AT INTERMEDIATE SUPPORTS EXCEPT 6" O.C. AT ALL SUPPORTS WHERE SPANS ARE 4'-0" OR MORE. NAILING OF WOOD STRUCTURAL PANEL AND PARTICLEBOARD DIAPHRAGMS AND SHEAR WALLS, REFER TO C.B.C. SECTION 2305. WALL SHEATHING NAILS ARE PERMITTED TO BE COMMON, BOX OR CASING. COMMON OR DEFORMED SHANK (6d - 2" x 0.113"; 8d - 2.5" x 0.131"; 10d - 3" x 0.148")
3. COMMON (6d - 2" x 0.113"; 8d - 2.5" x 0.131"; 10d - 3" x 0.148"; 16d - 3.5" x 0.162")
4. DEFORMED SHANK (6d - 2" x 0.113"; 8d - 2.5" x 0.131"; 10d - 3" x 0.148")
5. CORROSION-RESISTANT SIDING (6d - 1.875" x 0.106"; 8d - 2.375" x 0.128") OR CASING (6d - 2" x 0.099"; 8d - 2.5" x 0.113") NAILS.
7. FOR ROOF SHEATHING APPLICATIONS, 8d NAILS (2.5" x 0.113") ARE THE MINIMUM REQUIRED FOR WOOD STRUCTURAL PANELS.
8. STAPLES SHALL HAVE A MINIMUM CROWN WIDTH OF 7/16".
9. FOR ROOF SHEATHING APPLICATIONS, FASTENERS SPACED 4" O.C. AT EDGES AND 8" O.C. AT INTERMEDIATE SUPPORTS.
10. FASTENERS SPACED 4" O.C. AT EDGES AND 8" O.C. AT INTERMEDIATE SUPPORTS FOR SUBFLOOR AND WALL SHEATHING AND 3" O.C. AT EDGES AND 6" O.C. AT INTERMEDIATE SUPPORTS FOR ROOF SHEATHING.
11. FASTENERS SPACED 4" O.C. AT EDGES AND 8" O.C. AT INTERMEDIATE SUPPORTS.

NAIL SCHEDULE

FASTENER PER PLAN	SHANK DIA.	HEAD DIA.	MIN. LENGTH
8d	0.131"	0.281"	2-1/2"
10d	0.148"	0.312"	3"
16d	0.148"	0.344"	3-1/4"
16d COMMON	0.162"	0.344"	3-1/2"
20d	0.192"	0.406"	4"

NOTES:

1. ALL NAILS IN MANUF. HARDWARE SHALL BE PER MANUFACTURERS SPECIFICATIONS AS NOTED TO ACHIEVE MAX HARDWARE VALUE. FASTENERS, INCLUDING NUTS AND WASHERS, IN CONTACT WITH SODIUM BORATE SBX/DOT PRESERVATIVE-TREATED WOOD IN AN INT., DRY ENVIRONMENT SHALL BE PERMITTED.
2. FASTENERS IN CONTACT WITH PRESERVATIVE-TREATED TREATED WOOD USING ALKALINE COPPER QUAT (ACQ-C, ACQ-D, ACQ-Q CARBONATE), COPPER AZOLE (CA-B & CA-C, MCA-C) OR EXPOSED TO WEATHER SHALL BE HOT DIPPED GALV. OR STAINLESS STEEL.

REFERENCE TO STRUCTURAL CALCULATIONS FOR THE BENEFIT OF THE BUILDING OFFICIAL

INDICATES REVISION NUMBER AND PLAN REVISIONS INSIDE CLOUD

REFERENCE TO STRUCTURAL CALCULATIONS FOR THE BENEFIT OF THE BUILDING OFFICIAL

INDICATES HANGER.

ABBREVIATION LEGEND

	AT	EXT.	EXTERIOR	OPNG	OPENING
A.B.	ANCHOR BOLT	FDN	FOUNDATION	O.S.B.	ORIENTED STRAND BOARD
ABV	ABOVE	F.F.	FINISH FLOOR	O.W.S.J.	OPEN WEB STEEL JOIST
ACI	AMERICAN CONCRETE	FIN.	FINISH	O.W.J.G.	OPEN WEB JOIST GIRDER
	INSTITUTE	F.J.	FLOOR JOIST	P.A.	POST ABOVE
ADD'L	ADDITIONAL	FLG	FLANGE	P.A.F.	POWDER-ACTUATED
A.F.F.	ABOVE FINISHED FLOOR	FLR	FLOOR		FASTER
AGGREG.	AGGREGATE	F.O.B.	FACE OF BLOCK	P.C.F.	POUNDS PER CUBIC FOOT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	F.N.	FACE NAIL	PEN.	PENETRATION
ATTC	AMERICAN INSTITUTE OF TIMBER CONSTRUCTION	F.O.C.	FACE OF CONCRETE	PERF.	PERFORATED
	ALTERNATE	F.O.M.	FACE OF MASONRY	PERP.	PERPENDICULAR
ALT.	ALTERNATE	F.O.S.	FACE OF STUD	PL	PLATE
ARCH.	ARCHITECT(URAL)	F.P.	FIREPLACE - OR - FULL PENETRATION	PLY.	PLYWOOD
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS	FRMD	FRAMED	PLYWD	PLYWOOD
	TESTING & MATERIALS	FRMG	FRAMING	PR	PAIR
B/	BOTTOM OF	F.S.	FAR SIDE	P.S.F.	POUNDS PER SQUARE FOOT
B.C.	BOTTOM CHORD	FT	FOOT	P.S.I.	POUNDS PER SQUARE INCH
BLDG	BUILDING	FTG	FOOTING	PST	POST
BLK	BLOCK	G & N	GLUE AND NAIL	PT	POINT
BLKG	BLOCKING	GA	GAGE	PT	PRESSURE TREATED - OR -
BLW	BELOW	GALV.	GALVANIZED		POST-TENSION
BR	BRACE	G.B.	GRADE BEAM	R	RADIUS
B.N.	BOUNDARY NAILING	GEN.	GENERAL	REC'D	RECOMMEND(ATION)
B.O.	BY OTHERS - OR - BOTTOM OF	GLB	GLUED-LAMINATED BEAM	REF.	REFERENCE
B.O.C.	BOTTOM OF CONCRETE	GR.	GRADE	REINF.	REINFORCED - OR -
B.O.F.	BOTTOM OF FOOTING	G.T.	GIRDER TRUSS		REINFORCING - OR -
B.O.S.	BOTTOM OF STEEL	G.W.B.	GYPUSM WALL BOARD	REQD	REQUIRED
BRG	BEARING	HD	HOLDOWN	RET.	RETAINING
B.S.	BOTH SIDES	H.D.G.	HOT-DIP GALVANIZED	RETAIN.	RETAINING
BTM	BOTTOM	HDR	HEADER	R.J.	ROUGH JOIST
BTWN	BETWEEN	HGR	HANGER	R.O.	ROUGH OPENING
CALCS	CALCULATIONS	H.N.H.	HEAVY HEX NUT	R.P.	"REAL" POST
CANT.	CANTILEVER	H.N.	HEX NUT	R.R.	ROOF RAFTER
C.B.	CEILING BEAM	HORIZ.	HORIZONTAL	R/S	RESAWN (ROUGH-SAWN)
C.B.C.	CALIFORNIA BUILDING CODE	H.S.B.	HIGH STRENGTH BOLT	R.T.	ROUGH TRUSS
	CENTER TO CENTER	HSS	STRUCTURAL TUBE	R.W.	RETAINING WALL
C.C.	CENTER TO CENTER	HT	HEIGHT	RWD	REDWOOD
C.C.J.	CRACK CONTROL JOINT	I.D.	INSIDE DIAMETER	S.A.D.	SEE ARCHITECTURAL
C.F.	CUBIC FOOT	INFO.	INFORMATION		DRAWINGS
C.J.	CONTROL JOINT - OR - CEILING JOIST	INT.	INTERIOR	S.B.	SOLID BLOCK
Ç	CENTERLINE	INV.	INVERT(ED)	S.B.T.	SET-BACK TRUSS
CLG	CEILING	JNT	JOINT	SCHED.	SCHEDULE
CLR	CLEAR	JST	JOIST	SEP.	SEPARATION
C.M.U.	CONCRETE MASONRY UNIT	J.T.	JACK TRUSS	S.G.T.	SH-GRIDER TRUSS
COL.	COLUMN	K.	KIPS	S.H.	SHEET
COLL.	COLLECTOR	K.D.	KILN-DRIED	SIM	SIMILAR
CONC.	CONCRETE	K.F.	KIPS PER LINEAL FOOT	S.M.S.	SHEET METAL SCREW
COND.	CONDITION	K.P.	KING POST	S.J.	SOFFIT JOIST
CONV.	CONNECTION	POUNDS	POUNDS	S.E.	SPECIFICATION
CONSTR.	CONSTRUCTION	L.B.	LAG BOLT	SQ.	SQUARE
CONT.	CONTINUOUS	L.F.	LINEAL FOOT	S.S.	SELECT STRUCTURAL
CONTR.	CONTRACTOR	LONGIT.	LONGITUDINAL	S4S	STAGGERED 4 SIDES
C.P.	COMPLETE PENETRATION	LG	LONG	STAGG.	STAGGER - OR - STAGGERED
	WELD	L.L.	LIVE LOAD	STD	STANDARD
C.S.	COUNTERSUNK	LSL	LAMINATED STRAND LUMBER	STIFF.	STIFFENER
C.T.	COLLECTOR TRUSS	STL	STEEL	STRUCT.	STRUCTURAL
CTR	CENTER	TWT	LIGHTWEIGHT	SW	SHEARWALL
CTRD	CENTERED	LVL	LAMINATED VENEER LUMBER	SYMM.	SYMMETRICAL
C.Y.	CUBIC YARD	MATL	MATERIAL	T + B	TOP AND BOTTOM
DBL	DOUBLE	MAX.	MAXIMUM	T + G	TONGUE AND GROOVE
DET.	DETAIL	M.B.	MACHINE BOLT	T.C.	TOP CHORD
D.F.	DOUGLAS FIR	MECH.	MECHANICAL	T.C.	TOP CHORD
DIA.	DIAMETER	MEMB.	MEMBRANE	THK	THICK
DIA.	DIAMETER	MID.	MIDDLE	THKND	THICKENED
DIM.	DIMENSION	MIN.	MINIMUM	T.N.	TOP OF BLOCK
DJM.	DEAD LOAD	M.L.W.	MALLEABLE IRN WASHER	T.O.B.	TOP OF BLOCK
D.J.	DECK JOIST	M.O.	MASONRY OPENING	T.O.C.	TOP OF CONCRETE
D.T.	DRAG TRUSS	MOIST.	MOISTURE	T.O.P.	TOP OF PLATE
DP	DEEP	MFR	MANUFACTURER	T.O.S.	TOP OF STEEL - OR - TOP OF SHEATHING
DTL	DETAIL	MFRD	MANUFACTURED		
DWG	EXISTING	MTL	METAL	T.O.W.	TOP OF WALL
DWL	EXISTING	(N)	NEW	T/	TOP OF
E.	EACH	NOT APPLICABLE	NOT APPLICABLE	T.P.	TOP PLATE
E.A.	EXPANSION BOLT	N.B.	NON-BEARING	TRANSV.	TRANSVERSE
E.F.	EACH FACE	N.D.T.	NON-DESTRUCTIVE TESTING	TPP.	TYPICAL
E.F.J.	EXPANSION JOINT	N.I.C.	NOT IN CONTRACT	U.N.O.	UNLESS NOTED OTHERWISE
E.L.	ELEVATION	NLG	NAILING	VERT.	VERTICAL
ELEV.	ELEVATOR	NO.	NUMBER	V.I.F.	VERIFY IN FIELD
EMB.	EMBEMENT	N.S.	NEAR SIDE	W/	WITH
EMB.	EMBEMENT	N.S.G.	NON-SHRINK GROUT	W	WOOD
EMB.	EMBEMENT	N.T.S.	NOT TO SCALE	W.P.	WORK POINT - OR - WATERPROOFING
E.N.	EDGE NAIL	O/	OVER		
E.O.	ENGINEER OF RECORD	O.C.	ON CENTER	WT	WEIGHT
E.Q.	EQUIPMENT	O.D.	OUTSIDE DIAMETER	W.F.	WELDED WIRE FABRIC
E.Q.U.P.	EQUIPMENT	O.F.O.S.	OUTSIDE FACE OF STUD	W.W.M.	WELDED WIRE MESH
E.S.	EACH SIDE	O.H.	OVERHANG - OR - OPPOSITE HAND	#	NUMBER (PREFIX)
E.W.	EACH WAY			#	POUNDS (SUFFIX)

GENERAL FRAMING NOTES

1. NO STRUCTURAL MEMBER SHALL BE CUT OR NOTCHED UNLESS SPECIFICALLY SHOWN, NOTED, OR APPROVED BY THE ENGINEER. NOTCH DETAILS, IF PROVIDED, ARE FOR GENERAL GUIDANCE ONLY. THE ENGINEER SHALL BE CONTACTED TO APPROVE LOCATIONS OF PROPOSED NOTCHES. STUDS IN EXTERIOR WALLS AND BEARING PARTITIONS MAY BE CUT OR NOTCHED TO A DEPTH NOT EXCEEDING 25% OF STUD WIDTH. CUTTING OR NOTCHING OF STUDS IN NON-BEARING PARTITIONS SHALL NOT EXCEED 40% OF THE WIDTH. SEE DETAIL 404 FOR MORE INFORMATION.
2. **TYPICAL FRAMING AND STRUCTURAL MATERIALS:**
ALL FRAMING LUMBER SHALL BE DOUGLAS FIR, AND SHALL BE STAMPED WITH A GRADE MARK WITH THE FOLLOWING GRADES. FRAMING LUMBER SHALL CONFORM TO GRADING RULES OF WVPA AND COMPLIES WITH DOC PS 20.
MAXIMUM MOISTURE CONTENT SHALL NOT EXCEED 19% AT THE TIME OF CONSTRUCTION.
- | FRAMING MATERIAL | GRADE | FRAMING MATERIAL | GRADE |
|------------------------------------|------------------------|--|----------------------|
| TYPICAL WALL STUDS | PER NOTE 6 BELOW | RAFTERS (2x DIMENSIONAL) | D.F. #2, MIN. U.N.O. |
| SOLE PLATES (2x MIN.) ¹ | STUD GRADE, MINIMUM | BUILT UP HEADERS (2-2x) | D.F. #2, MIN. U.N.O. |
| MUDSILLS (2x MIN.) ² | P.T. D.F. STD & BETTER | 4x POSTS/BEAMS/RAFTERS | D.F. #2, MIN. U.N.O. |
| TOP PLATES (2x MIN.) ³ | D.F. #2, MIN. U.N.O. | 6x POSTS/BEAMS/RAFTERS | D.F. #1, MIN. U.N.O. |
| RIM JOIST (2x DIMENSIONAL) | D.F. #2, MIN. U.N.O. | STRUCTURAL PLYWOOD | APA RATED SHGT |
| FLR JOISTS (2x DIMENSIONAL) | D.F. #2, MIN. U.N.O. | LUMBER EXPOSED TO WEATHER ⁴ | P.T. D.F. #2 U.N.O. |
1. SOLE PLATES, AS NOTED ABOVE, ARE ALL INTERIOR SILL PLATES NOT IN CONTACT WITH CONCRETE. MATERIAL SHALL BE UC1 INTERIOR/DRY CATEGORY AS DEFINED BY AWPA STANDARD U1.
2. MUDSILLS, AS NOTED ABOVE, ARE ALL INTERIOR SILL PLATES IN DIRECT CONTACT WITH CONCRETE. MATERIAL SHALL BE UC2 INTERIOR/DAMP CATEGORY AS DEFINED BY AWPA STANDARD U1.
3. LUMBER EXPOSED TO WEATHER, AS NOTED ABOVE, IS ALL EXTERIOR LUMBER ABOVE GROUND AND EXPOSED TO WEATHER. MATERIAL SHALL BE UC3B ABOVE GROUND EXPOSED CATEGORY AS DEFINED BY AWPA STANDARD U1.
3. **PRESERVATIVE TREATED OR NATURALLY DURABLE MATERIALS:**
LUMBER SHALL BE TREATED WITH TYPICAL WATERBORNE PRESERVATIVES: ALKALINE COPPER QUAT (ACQ-C, ACQ-D, ACQ-D CARBONATE), COPPER AZOLE (CA-B & CA-C, MCA-C) AND SODIUM BORATES (SBX/DOT). THESE TREATMENTS ARE OFTEN REFERRED TO BY "TRADE NAMES SUCH AS: WOLMANIZED NATURAL SELECT™ (COPPER AZOLE), PRESERVE AND NATUREWOOD® (ACQ), MICROPRO™, SMART SENSE™ (MCQ), AND ADVANCE GUARD® (BORATE).
- A. ALL INTERIOR/DAMP CONSTRUCTION, UC2 CATEGORY, SHALL BE TREATED WITH SODIUM BORATE SBX/DOT.
1. PLAIN CARBON STEEL FASTENERS, INCLUDING NUTS AND WASHERS, IN CONTACT WITH SODIUM BORATE SBX/DOT PRESERVATIVE-TREATED WOOD IN AN INTERIOR, DRY ENVIRONMENT SHALL BE PERMITTED.
- B. ALL EXTERIOR ABOVE GROUND CONSTRUCTION (INCL. DECK FRAMING), UC3B CATEGORY, SHALL BE TREATED WITH ALKALINE COPPER QUAT (ACQ-C, ACQ-D, ACQ-D CARBONATE), OR COPPER AZOLE (CA-B & CA-C, MCA-C)
1. ALL FASTENERS AND CONNECTORS IN CONTACT WITH PRESERVATIVE-TREATED TREATED WOOD USING ALKALINE COPPER QUAT (ACQ-C, ACQ-D, ACQ-D CARBONATE), OR COPPER AZOLE (CA-B & CA-C, MCA-C) SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL IN ACCORDANCE WITH GOVERNING CBC SEC. 2304.10 AND SHALL BE IN ACCORDANCE WITH ASTM A 153.
- C. WOOD JOISTS OR WOOD STRUCTURAL FLOORS THAT ARE CLOSER THAN 18 INCHES OR WOOD GIRDERS THAT ARE CLOSER THAN 12 INCHES TO EXPOSED GROUND IN CRAWL SPACES OR UNEXCAVATED AREAS LOCATED WITHIN THE PERIMETER OF THE BUILDING FOUNDATION SHALL BE PRESERVATIVE-TREATED WOOD IN ACCORDANCE CBC.
4. **GLUE-LAMINATED STRUCTURAL MATERIALS:**
STANDARD SPECIFICATIONS FOR GLUE-LAMINATED STRUCTURAL MEMBERS, ANSI/AITC A 190.1 AND ASTM D3737. GLUE-LAMINATED BEAMS SHALL BE INSPECTED AND A CERTIFICATE PROVIDED TO THE FILED INSPECTOR AT THE TIME OF FRAMING INSPECTION. FABRICATION SHALL BE PERFORMED IN ACCORDANCE WITH CBC 1705.5. ALL GLUE-LAMINATED BEAMS THAT ARE CONTINUOUS OVER SUPPORTS OR CANTILEVERED SHALL HAVE TENSION LAMINATIONS ON TOP OF BEAMS.
MAXIMUM MOISTURE CONTENT SHALL NOT EXCEED 16% AT THE TIME OF CONSTRUCTION.
- A. GLULAM MEMBERS IN DRY SERVICE USE SHALL BE DOUGLAS-FIR 24F-V4 (SINGLE SPAN) OR COMBINATION 24F-V8 (MULTI-SPAN & CANTILEVER) U.N.O. BEAMS SHALL BE ARCHITECTURAL GRADE WHEN EXPOSED TO VIEW, S.A.D.
1. GLULAM MEMBERS, SEE PLAN SPECIFICATIONS FOR CAMBER WHERE OCCURS.
- | MATERIAL GRADE | E (x10 ³ psi) | Fb (psi) | Fv (psi) | Fc (psi) | RADIUS, U.N.O. |
|----------------|--------------------------|----------|----------|----------|----------------|
| DF/DF 24F-V4 | 1.8 | 2400 | 265 | 650 | 3500' RADIUS |
| DF/DF 24F-V8 | 1.8 | 2400 | 265 | 650 | NO CAMBER |
- B. GLULAM MEMBERS IN WET SERVICE USE SHALL BE ALASKAN CEDAR 20F-V12 (SINGLE SPAN) OR COMBINATION 20F-V13 (MULTI-SPAN & CANTILEVER) U.N.O.
1. GLULAM MEMBERS, SEE PLAN SPECIFICATIONS FOR CAMBER WHERE OCCURS.
- | MATERIAL GRADE | E (x10 ³ psi) | Fb (psi) | Fv (psi) | Fc (psi) | RADIUS, U.N.O. |
|----------------|--------------------------|----------|----------|----------|----------------|
| AC/AC 20F-V12 | 1.5 | 2000 | 265 | 560 | 3500' RADIUS |
| AC/AC 20F-V13 | 1.5 | 2000 | 265 | 560 | NO CAMBER |
- C. DESIGN, FABRICATION AND CONSTRUCTION OF STRUCTURAL GLULAM MEMBERS SHALL CONFORM TO THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION STANDARD, MANUAL No. 301 AND THE COMMERCIAL STANDARD FOR STRUCTURAL GLUED LAMINATED TIMBER, CS 253.
- D. STRUCTURAL PLYWOOD SHALL BE GRADED PER APA PSI-83AND SHALL BE INTERIOR TYPE SHEATHING C-D GRADE WITH EXTERIOR GLUE. EQUIVALENT O.S.B. WOOD STRUCTURAL PANEL MAY BE USED AS AN ALTERNATE TO PLYWOOD. HOWEVER, IN ACCORDANCE WITH THE TILE COUNCIL OF AMERICA RECOMMENDATIONS, O.S.B. SHALL NOT BE USED BELOW TILE MORTAR. ALL HORIZONTAL PLYWOOD SHALL BE LAID WITH FACE GRAIN PERPENDICULAR TO FRAMING MEMBERS, WITH STAGGERED JOINTS.
5. **STRUCTURAL COMPOSITE LUMBER (SCL) MATERIALS:**
ALL STRUCTURAL COMPOSITE LUMBER (SCL) SHALL BE MANUFACTURED PER ASTM D5055 AND ASTM D5456. STRUCTURAL COMPOSITE LUMBER SHALL BE MANUFACTURED BY BOISE CASCADE, OR EQUAL. ALTERNATE MANUFACTURERS ARE PERMITTED AND CONSIDERED AN EQUIVALENT SUBSTITUTION IF THE SUBSTITUTED MATERIAL MEETS, OR EXCEEDS, ALL THE DESIGN PROPERTIES LISTED BELOW.
- | SPECIFICATION | MATERIAL | WIDTH (in.) ^{1,2} | E (x10 ³ psi) | Fb (psi) | Fv (psi) | Fc ₁ (psi) | Fc _{II} (psi) |
|---------------|------------------|----------------------------|--------------------------|----------|----------|-----------------------|------------------------|
| RIM JOIST | VERSA-STRAND LVL | 1-5/16 | 1.4 | 1800 | 225 | 525 | 2500 |
| LVL COLUMN | VERSA-LAM LVL | 3.5, 5.25, 7 | 1.7 | 2650 | 285 | 750 | 3000 |
| LVL STUD | VERSA-STUD LVL | 1.5 | 1.7 | 2617 | 285 | 450 | 3000 |
| LVL BEAM | VERSA-LAM 2.0E | 1.75 | 2.0 | 2800 | 285 | 750 | 3000 |
| LVL BEAM | VERSA-LAM 2.0E | 3.5, 5.25, 7 | 2.0 | 3100 | 285 | 750 | 3000 |
1. BEAM DEPTH IS ASSUMED TO MATCH FLOOR FRAMING DEPTH U.N.O.
2. MFR BEAM MEMBERS MAY BE BUILT UP TO ACHIEVE SPECIFIED WIDTHS PER DETAIL 609 U.N.O. ON PLANS.
6. ALL STUD WALLS SHOWN ON STRUCTURAL DRAWINGS SHALL BE FRAMED AS FOLLOWS (U.O.N.):
- EXTERIOR WALL STUD HEIGHT TABLE (L/360 DEFL.)
- | MAX. PLATE HT | STUD TYPE | SPACING |
|---------------|---------------------|----------|
| 21'-5" | (2) 2x6 DOUG-FIR #1 | 12" O.C. |
| 19'-5" | (2)-2x6 DOUG-FIR #1 | 16" O.C. |
| 15'-1" | 2x6 DOUG-FIR #2 | 16" O.C. |
| 12'-1" | (2)-2x4 DOUG-FIR #1 | 16" O.C. |
| | 2x6 STUD GRADE | 16" O.C. |
| | 2x4 DOUG-FIR #1 | 16" O.C. |
| 10'-1" | 2x6 STUD GRADE | 16" O.C. |
| 9'-1" | 2x4 DOUG-FIR #2 | 16" O.C. |
| | 2x6 STUD GRADE | 16" O.C. |
| 8'-1" | 2x4 STUD GRADE | 16" O.C. |
| | 2x6 STUD GRADE | 16" O.C. |
- INTERIOR WALL STUD HEIGHT TABLE (L/240 DEFL.)
- | MAX. PLATE HT | STUD TYPE | SPACING |
|---------------|----------------|----------|
| 21'-5" | 2x6 STUD GRADE | 12" O.C. |
| 19'-5" | 2x6 STUD GRADE | 16" O.C. |
| 15'-1" | 2x6 STUD GRADE | 16" O.C. |
| 12'-1" | 2x4 STUD GRADE | 16" O.C. |
| | 2x6 STUD GRADE | 16" O.C. |
- NOTE:
A. STUD HEIGHTS EXCEEDING 10'-1" SHALL BE BRACED MID-HEIGHT USING FULL DEPTH 2x BLOCKING.
7. TOP PLATES SHALL BE DOUBLED ON ALL STUD WALLS. LAP 4'-0" MINIMUM AT TOP PLATE SPLICES, WITH (12) 16d NAILS EACH SIDE OF SPLICE, U.N.O. SPLICES IN UPPER AND LOWER PLATES SHALL BE STAGGERED 4'-0" MINIMUM.
8. POSTS IN WALLS MAY BE MADE WITH MULTIPLE STUDS OF EQUIVALENT WIDTH AND DEPTH, U.O.N. SECURE MULTIPLE STUDS WITH 16d NAILS AT 8" O.C. STAGGERED.
9. PROVIDE KING STUDS AT THE ENDS OF ALL HEADERS OR OTHER BEAMS INSTALLED IN WALLS, SEE DETAIL 401 FOR MORE INFORMATION.
10. ALL MEMBERS IN BEARING SHALL BE ACCURATELY CUT AND ALIGNED SO THAT FULL BEARING IS PROVIDED WITHOUT THE USE OF SHIMS.
11. BLOCK ALL STUD WALLS AS REQUIRED FOR SHEATHING AND FINISHES. BALLOON FRAME ALL WALLS WITH SLOPING CEILING OR WITH RAISED CEILINGS.
12. INSTALL HORIZONTAL MEMBERS WITH CROWN UP. WHERE KNOTS EXIST NEAR THE TOP OR BOTTOM OF HORIZONTAL MEMBERS, INSTALL MEMBER WITH KNOTS UP. CANTILEVERED DECK JOISTS SHALL BE CAREFULLY NOTCHED AND TRIMMED (IF NECESSARY) TO PROVIDE SLOPE WITHOUT OVER-CUTTING.
13. PROVIDE FULL DEPTH BLOCKING OR CONTINUOUS RIM JOIST AT ALL FLOOR AND ROOF FRAMING SUPPORTS. FRAMING MEMBERS SHALL HAVE A MINIMUM OF 2" BEARING AT SUPPORTS. LAPPING JOISTS SHALL HAVE 6" MINIMUM OVERLAP CENTERED OVER INTERIOR SUPPORTS.
14. ALL BOLTED WOOD CONNECTIONS SHALL HAVE A WASHER UNLESS A STEEL PLATE IS SPECIFIED. HOLES SHALL BE PROPERLY ALIGNED. OVERSIZED HOLES ARE NOT ALLOWED. NUTS SHALL BE SNUG TIGHTENED. BOLT HOLES SHALL BE NOMINAL DIAMETER OF BOLT PLUS 1/16".
15. NAILED WOOD CONNECTIONS SHALL USE COMMON WIRE NAILS, U.N.O. MIN. NAILING REQUIREMENTS FOR STANDARD CONNECTIONS SHALL BE IN ACCORDANCE WITH THE GOVERNING C.B.C. FASTENING SCHEDULE (TABLE 2304.10.1).
16. ALL MANUFACTURED CONNECTION HARDWARE SHALL BE AS DESIGNATED ON DRAWINGS AND INSTALLED (WITH ALL NAIL HOLES FILLED) IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPLICABLE ICC APPROVALS.
17. INSTALL LAG SCREWS IN DRILLED LEAD HOLES WITH A DIA. EQUAL TO 3/4" OF THE SHANK DIAMETER. LAG SCREWS SHALL NOT BE HAMMERED IN. PROVIDE WASHERS UNDER HEADS BEARING ON WOOD. HOLES SHALL BE PROPERLY ALIGNED.

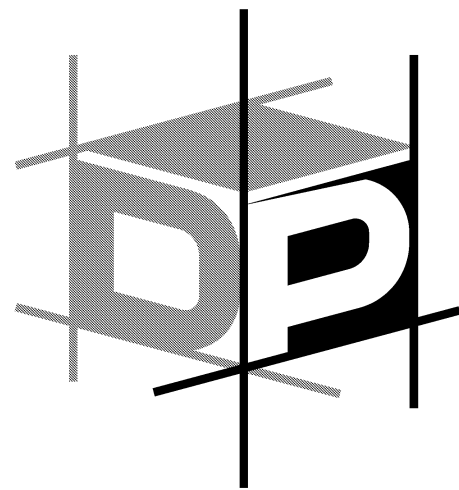
CONCRETE NOTES

- CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2022 BUILDING CODE (C.B.C.) AND THE LATEST EDITION OF THE AC1318-14, UNLESS NOTED OTHERWISE.
1. CONCRETE REQUIREMENTS: BASED ON NORMAL WEIGHT CONCRETE (UNIT WEIGHT OF 145 TO 150 pcf).
- | | MINIMUM COMPRESSIVE STRENGTH (psi) (AT 28 DAYS) | SLUMP (+/- 1/2") | AGGREG. SIZE | SPEC. INSP. REQD | MAXIMUM WATER TO CEMENT RATIO (NOTE 1F) | CEMENT TYPE ASTM C150 |
|--------------------------|---|------------------|--------------|------------------|---|-----------------------|
| GRADE BEAMS & STEM WALLS | 3000 | 4" | 3/4" | NO ** | .55 | II OR V |
| CONCRETE PIERS | 3000 | 4" | 3/4" | NO ** | .55 | II OR V |
| FOOTINGS ON GRADE | 3000 | 4" | 1" | NO ** | .55 | II OR V |
| FLOOR SLABS ON GRADE | 3000 | 4" | 1" | NO ** | .45 | II OR V |
- ** **SPECIAL INSPECTION IS NOT REQUIRED, DESIGN COMPRESSIVE STRENGTH IS 2500 psi, HIGHER STRENGTHS HAVE BEEN SPECIFIED FOR QUALITY CONTROL.**
- A. COARSE AGGREGATE SHALL BE HARD, DURABLE CRUSHED STONE OR GRAVEL GRADED PER ASTM C33. MAXIMUM SIZE OF AGGREGATE SHALL BE AS NOTED IN SCHEDULE ABOVE AND DEFINED BELOW. SAND SHALL BE CLEAN, HARD, DURABLE, WASHED FREE FROM SILT, LOAM OR CLAY.
1. GRADE BEAMS, STEM WALLS, RETAINING WALLS AND OTHER CONCRETE FRAMEWORK LESS THAN 10" WIDE SHALL USE 3/4" AGGREGATE CONFORMING TO ASTM C33 WITH 100% PASSING 1" SIEVE AND 90% (MINIMUM) PASSING 3/4" SIEVE. TO ENSURE PROPER CONCRETE COVER AND CONSOLIDATION.
2. FOOTING AND SLABS ON GRADE, INCLUDING POST-TENSION AND MAT SLABS, SHALL USE 1" AGGREGATE CONFORMING TO ASTM C33 WITH 95% (MINIMUM) PASSING 1" SIEVE.
- B. MIXING WATER SHALL BE CLEAN AND FREE FROM INJURIOUS AMOUNTS OF OIL, ACIDS, ALKALIES, ORGANIC MATERIALS OR OTHER DELETERIOUS SUBSTANCES.
- C. CONCRETE EXPOSED TO SULFATE SHALL USE TYPE V CEMENT WITH POZZOLAN.
- D. FLY ASH OR POZZOLANS, IF USED, SHALL CONFORM WITH ASTM C618, COAL FLY ASH AND RAW OR CALCINED NATURAL POZZOLAN FOR USE AS A MINERAL ADMIXTURE IN CONCRETE. USAGE SHALL NOT EXCEED 25 PERCENT, BY WEIGHT OF THE TOTAL CEMENTITIOUS MATERIALS. WHEN POZZOLANS ARE USED TO MITIGATE THE EFFECT OF SULFATE CONTAINING SOILS THEY SHALL BE OF A TYPE THAT HAS DEMONSTRATED SUCH ABILITY BY TEST OR SERVICE RECORD.
- E. ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL NOT BE USED.
- F. CEMENT SHALL CONFORM WITH ASTM C150 & C 595, PORTLAND CEMENT AND BLENDED HYDRAULIC CEMENTS
- G. TRANSIT MIX SHALL BE PER ASTM C-94.
- H. MIX DESIGN SHALL MEET THE RECOMMENDED SPECIFICATION UNLESS AN ALTERNATE MIX IS SUBMITTED AND REVIEWED BY THE ENGINEER.
2. SPECIAL INSPECTION OF CONCRETE WORK IS REQD WHERE NOTED ABOVE. WHEN REQD, SPECIAL INSPECTION SHALL INCLUDE THE INSPECTION OF THE PLACEMENT OF REINFORCEMENT, AND THE INSPECTION OF THE CONCRETE PLACEMENT OPERATIONS AS WELL AS CONCRETE CYLINDER TESTS, PER C.B.C. SECTION 1705.3. THE FOLLOWING THREE CRITERIA ESTABLISH THE REQD MINIMUM SAMPLING FREQUENCY FOR EACH CLASS OF CONCRETE:
- A. ONE EACH DAY A GIVEN CLASS IS PLACED, NOR LESS THAN
- B. ONCE FOR EACH 150 yd OF EACH CLASS PLACED EACH DAY, NOR LESS THAN
- C. ONCE FOR EACH 5000 ft OF SLAB OR WALL SURFACE AREA PLACED EACH DAY.
3. SPLICES OF CONTINUOUS REINFORCEMENT SHALL HAVE A MINIMUM LAP PER DETAILS 202 AND 203 UNLESS NOTED OTHERWISE. ALL REINFORCING STEEL SHALL BE SECURELY WIRED AND PROPERLY SUPPORTED ABOVE GROUND, AND AWAY FROM FORMS. REINFORCING BAR FABRICATION, LAPS AND PLACEMENT SHALL CONFORM TO THE MANUAL OF STANDARD PRACTICE OF THE CONCRETE REINFORCING STEEL INSTITUTE.
4. REINFORCING SHALL BE NEW STOCK, DEFORMED BARS, NO. 3 AND SMALLER: GRADE 40 CONFORMING TO ASTM A-615 AS FOLLOWS (U.N.O.) : NO. 4 AND LARGER: GRADE 60
- A. ALL BARS TO BE WELDED SHALL MEET THE REQUIREMENTS OF ASTM A706, GRADE 60.
- B. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185, FLAT SHEETS ONLY. LAP FABRIC 6" MINIMUM.
- C. REINFORCEMENT PLACEMENT SHALL CONFORM TO DETAIL 201 AND 203
- D. ANCHOR BOLTS SHALL BE ASTM A307, U.N.O. AND SHALL CONFORM TO DETAIL 201 AND 203
5. REINFORCEMENT COVER: ALL DIMENSIONS SHOWING THE LOCATIONS OF REINFORCEMENT STEEL NOT NOTED AS "CLEAR", ARE TO THE CENTER OF THE STEEL. MINIMUM CLEAR COVERAGE OF REINFORCEMENT SHALL BE AS FOLLOWS:
- A. CONCRETE CAST AGAINST EARTH, EXCEPT SLABS ON GRADE: 3" SLABS ON GRADE: 1-1/2" U.N.O.
- B. CONCRETE CAST IN FORMS, BUT EXPOSED TO EARTH OR WEATHER: No. 5 REINFORCING AND SMALLER: 1-1/2" No. 6 REINFORCING AND LARGER: 2"
- C. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND: SLABS, WALLS AND JOISTS: 3/4" BEAMS AND COLUMNS: 1-1/2"
6. UNFORMED CONCRETE SURFACE CURING:
- A. CURE FOR ONE TO SEVEN DAYS BY MAINTAINING TEMPERATURE ABOVE 50 DEGREES FAHRENHEIT, AND IN A MOIST CONDITION.
- B. APPLY MEMBRANE-FORMING CURING COMPOUND TO DAMP CONCRETE IMMEDIATELY AFTER COMPLETION OF THE MOIST-CURING PERIOD.
7. THE CONTRACTOR SHALL INFORM THE ENGINEER AT LEAST TWO DAYS PRIOR TO POURING ANY STRUCTURAL CONCRETE SO THAT OBSERVATION OF THE WORK MAY BE PERFORMED AS REQUIRED BY THE ENGINEER'S CONTRACT OR THE CODE.
8. FOOTING/GRADE BEAM CONSTRUCTION JOINTS SHALL CONFORM TO DETAIL 204 AND 205A
9. CRACK CONTROL JOINTS SHALL BE PLACED IN CONCRETE SLABS ON GRADE AT A SPACING OF 12'-0" MAX. O.C. EACH WAY (U.N.O. ON PLAN) PER DETAIL 202 AND 205B
- LOCATION OF SLAB ON GRADE CONSTRUCTION JOINTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. SLAB ON GRADE CONSTRUCTION JOINTS SHALL CONFORM TO DETAIL 206 AND 207
10. ALL PIPES AND DUCTS THROUGH CONCRETE SHALL BE SLEEVED. VERIFY OPENINGS WITH PLUMBER AND ELECTRICIAN. SEE DETAIL 206 AND 207
11. IF SPECIFIED, WELDED WIRE FABRIC SHALL BE 6x6-W1.4xW1.4. WIRE FABRIC SHALL BE ELECTRICALLY WELDED STEEL PER ASTM A185. LAP 6" MINIMUM AT ALL EDGES AND TIE AT THREE PLACES TO REINFORCING DOWELS (WHERE OCCUR) EXCEPT LOCATIONS WHERE SLAB IS INDEPENDENT OF FOUNDATION. CONTRACTOR SHALL PROVIDE SUPPORT CHAIRS TO ENSURE FABRIC IS LOCATED IN THE CENTER OF THE SLAB.
12. WELDING OF REINFORCING BARS SHALL CONFORM TO AWS D1.4 USING ASTM A706 REINFORCING BAR SPECIFICATIONS.

STRUCTURAL STEEL NOTES

1. THE FOLLOWING SECTION APPLIES TO ALL STRUCTURAL STEEL 1/8" THICK OR LARGER.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE CBC CHAPTER 22, AISC 15th EDITION, AND THE 2015 A.W.S. D1.1.
3. STEEL MATERIALS SHALL CONFORM TO THE FOLLOWING:
- A. PLATES AND SHAPES, U.N.O. ASTM A992 (fy = 50 ksi), OR ASTM A572, GRADE 50
- B. STRUCTURAL TUBE COLUMNS AND BEAMS: ASTM A500, GRADE B.
- C. PIPE COLUMNS: ASTM A53, TYPE E OR S, GRADE B
- D. ROD ASTM A36 (fy = 36 ksi)
4. FASTENERS SHALL CONFORM TO THE FOLLOWING:
- A. ANCHOR BOLTS: ASTM A307, U.N.O.
- B. STEEL TO WOOD CONNECTIONS: ASTM A307, U.N.O. USE CUT WASHERS (IF CONCEALED) AND MALLEABLE IRON WASHERS (IF EXPOSED)
5. WELDING ELECTRODES SHALL CONFORM TO 2015 A.W.S. D1.1 AND SHALL BE LOW HYDROGEN MATCHING FILLER METAL.
6. SURFACES OF STEEL TO BE FIELD WELDED SHALL BE FREE AND CLEAR OF ALL PAINT, DIRT, GREASE, OR OTHER DELETERIOUS COATINGS.
7. STEEL FRAMING, EXCEPT THOSE PORTIONS TO BE EMBEDDED IN CONCRETE, CONCEALED IN FRAMING, FIELD WELDED, OR HIGH STRENGTH BOLTED SHALL BE SHOP-PAINTED PER THE SPECIFICATIONS.
8. FIELD PAINT ALL EXPOSED STEEL SURFACES AFTER INSTALLATION, PER THE SPECIFICATIONS.
9. ALL WELDERS SHALL BE QUALIFIED BY A.W.S. PROCEDURES FOR THE REQUIRED WELDING.
10. SUBMIT CERTIFICATION OF COMPLIANCE FOR ALL STEEL MATERIALS.

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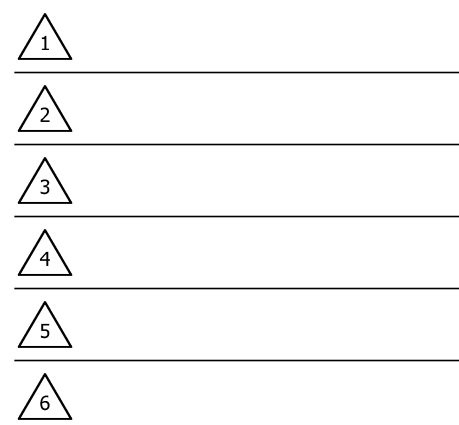


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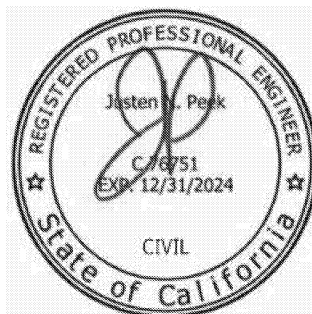
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Engineering Seal:



Sheet Description:

GENERAL STRUCTURAL
SPECIFICATIONS AND NOTES

No Scale

Initial Issue Date: March 24, 2023

Drawn By: E. Bennett

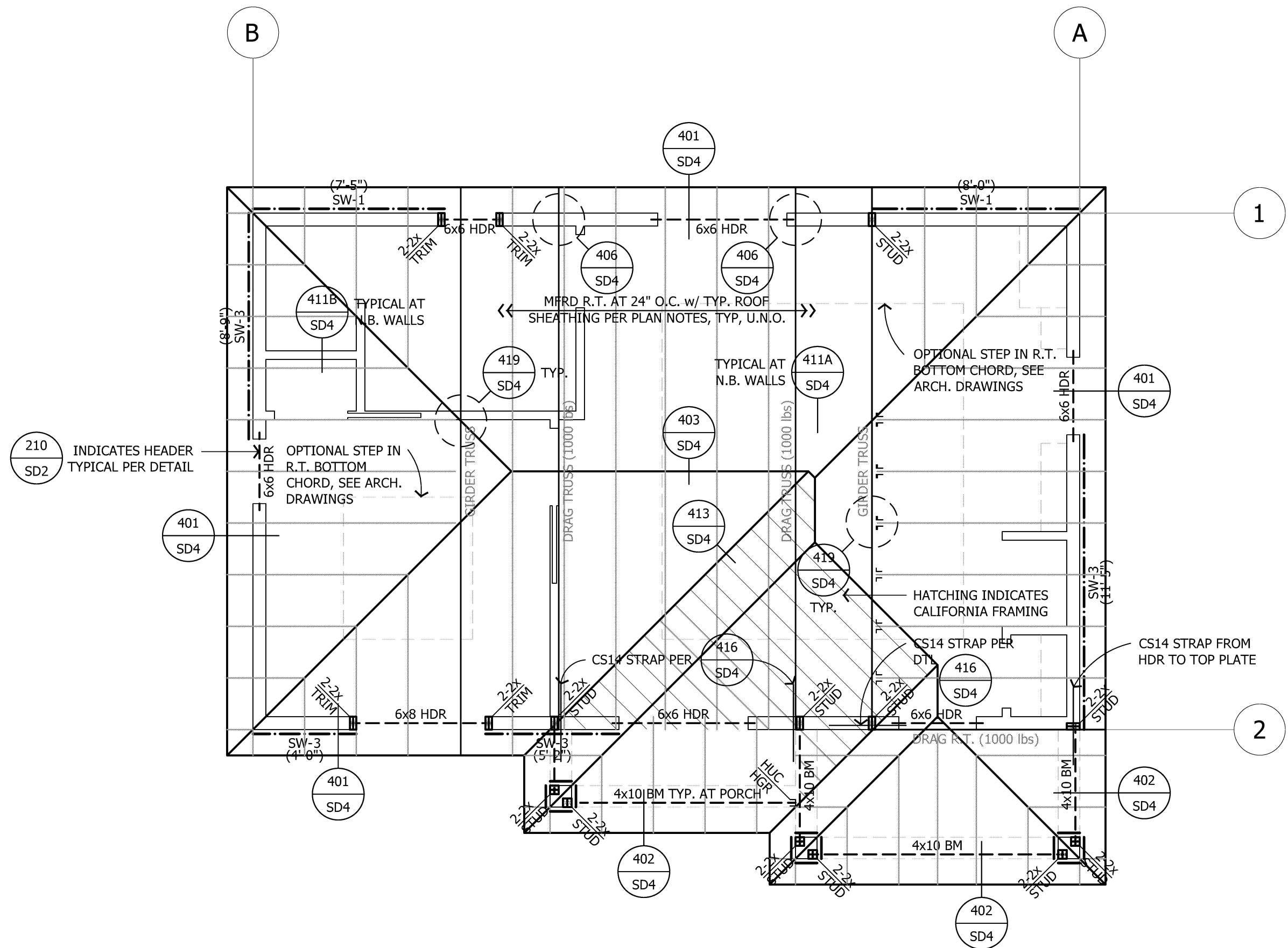
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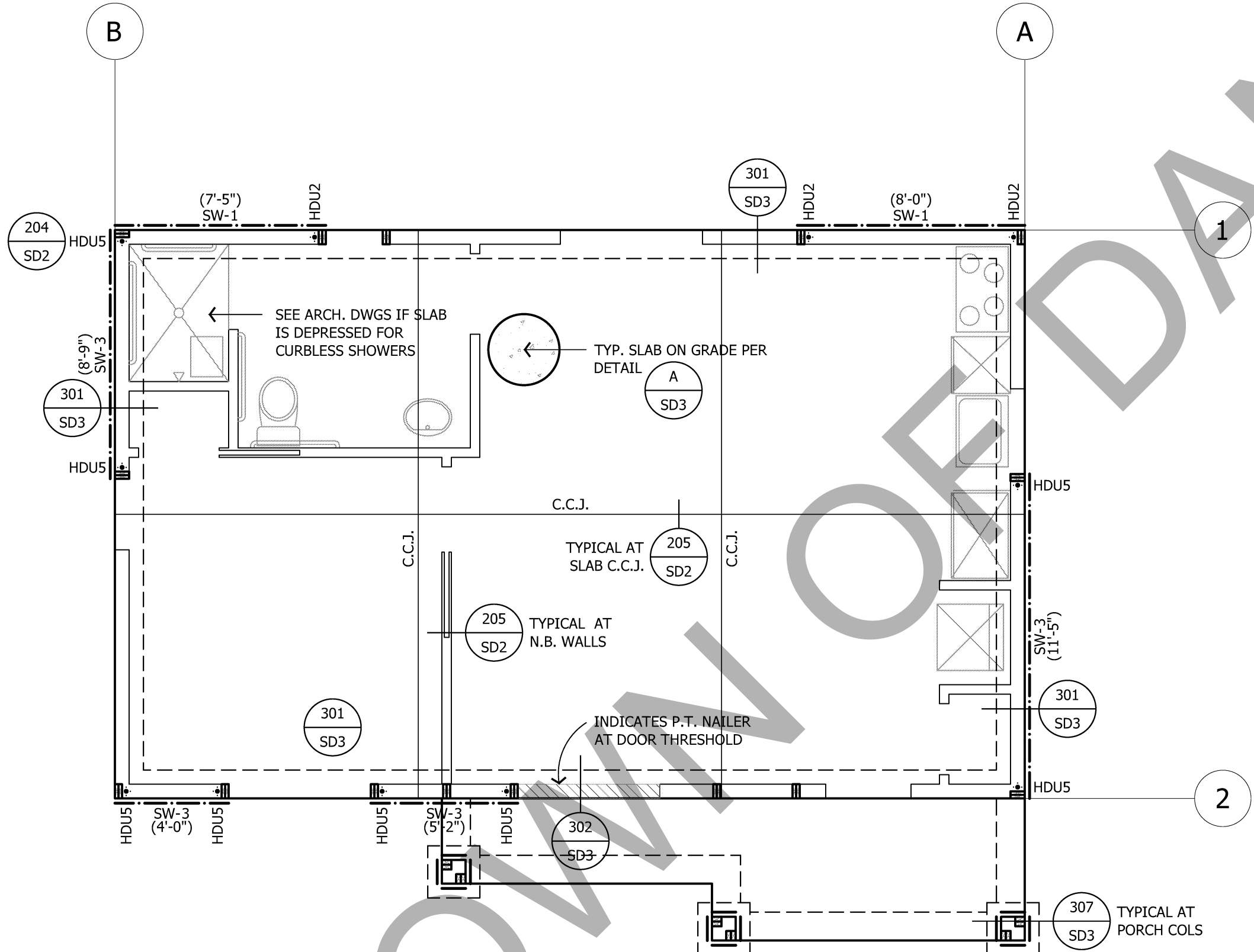
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SN2



A ROOF FRAMING PLAN - MEDITERRANEAN



B FOUNDATION PLAN - MEDITERRANEAN - CONCRETE SLAB

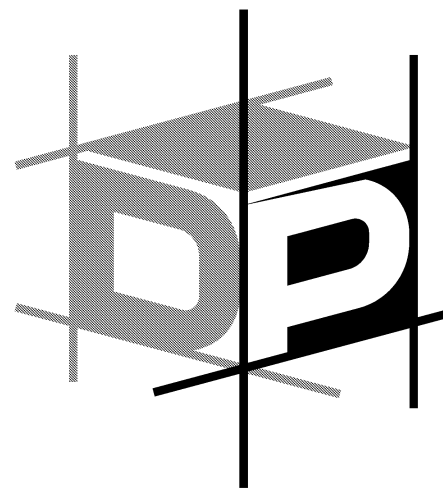
FOUNDATION NOTES

- SEE ARCHITECTURAL DRAWINGS FOR STUD SIZES AND OTHER REQUIREMENTS.
- SEE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS, ELEVATIONS, ETC. THE PROJECT ARCHITECT IS RESPONSIBLE FOR SPECIFYING DIMENSIONS TO ALL PROJECT ELEMENTS. THE DIMENSIONS SHOWN ON THE FOUNDATION PLANS SHALL NOT BE USED FOR CONSTRUCTION. THE FOUNDATION SHALL BE CONSTRUCTED USING THE DIMENSIONS SHOWN ON THE ARCHITECTURAL PLANS.
- DETAIL KEYS AND OTHER INFORMATION ARE TYPICAL.
- THE FOUNDATION SHALL CONSIST OF A UNIFORM THICKNESS REINFORCED CONCRETE STRUCTURAL SLAB PER DETAIL (A SD3).
- CONCRETE TIE BEAMS SHALL BE 12" x 18" AND SHALL BE REINFORCED WITH (2) #4 HORIZ. REINFORCING, TOP AND BOTTOM. THE BEAM REINFORCEMENT SHALL CONTINUE THROUGH FOUNDATION ELEMENTS OR SHALL BE PROPERLY TIED TO FOUNDATION REINFORCING.
- LANDSCAPE SLABS SHALL BE INDEPENDENT OF THE FOUNDATION. THE CONTRACTOR SHALL INSTALL ASPHALT-IMPREGNATED EXPANSIVE JOINT MATERIAL BETWEEN SLABS AND THE FOUNDATION.
- HOLDOWNS NOTED OCCUR AT THE LEVEL OF FRAMING SHOWN FOR CONNECTION OF WALLS ABOVE TO FOOTING.
 - ALL HOLDOWN MEMBERS IN CONTACT WITH P.T. MATERIAL SHALL BE HOT-DIP GALVANIZED. USE HOT-DIPPED GALVANIZED ANCHOR BOLTS WITH 3" x 3" x 1/4" PLATE WASHERS. PLAIN CARBON STEEL FASTENERS IN SBX/DOT AND ZINC BORATE PRESERVATIVE-TREATED WOOD SHALL BE PERMITTED.
 - ALL HOLDOWNS SHALL BE INSTALLED WITH ANCHORS PER DETAIL (112 SD1).
 - CONTRACTOR SHALL REVIEW HOLDOWN ANCHOR REQUIREMENTS FOR EMBEDMENT CONDITIONS THAT REQUIRE DEEPENED STEM WALL. REFER TO FOR REQUIREMENTS.
 - PROVIDE POSTS AT ALL HOLDOWNS AS SHOWN IN DETAIL WHERE DOUBLE 2x POSTS ARE USED. SISTER WITH 16d FACE NAILS AT SILL NAILING PER SHEARWALL SCHEDULE. WHERE 3x MEMBERS AT PANEL EDGES ARE REQUIRED, USE 4x MINIMUM POST FOR HOLDOWN PER FRAMER SHALL CONFIRM LAYOUT BEFORE CONCRETE IS POURED. NOTIFY ENGINEER OF CONFLICTS PRIOR TO PROCEEDING.
- CONTRACTOR SHALL REVIEW HOLDOWN ANCHOR REQUIREMENTS FOR EMBEDMENT CONDITIONS THAT REQUIRE DEEPENED FTG. REFER TO FOR REQUIREMENTS.
- REFER TO THE PROJECT SOILS REPORT IF APPLICABLE, FOR ADDITIONAL FOUNDATION AND SITE CONSTRUCTION REQUIREMENTS. ALL FOUNDATION ELEMENTS SHALL COMPLY WITH ALL CONDITIONS CONTAINED WITHIN APPROPRIATE SOILS REPORT AND REQUIREMENTS OF 2016 CBC CHAPTER 18. THE RESPONSIBLE SOILS ENGINEER IF APPLICABLE, SHALL OBSERVE ALL SLAB AND FOUNDATION SUBGRADES PRIOR TO PLACING CONCRETE. SEE SOILS REPORT FOR SPECIFIC INSPECTION REQUIREMENTS.
- ALL FOUNDATION PLATES AND MUDSILLS SHALL BE PRESSURE-TREATED DOUGLAS FIR MARKED OR BRANDED BY AN APPROVED AGENCY. SEE SHEARWALL SCHEDULE FOR SHEARWALL LOCATIONS THAT REQUIRE 3x MINIMUM MUDSILLS. FOUNDATION PLATES AND MUDSILLS SHALL BE BOLTED TO THE FOUNDATION WITH NOT LESS THAN 5/8" DIA. HOT-DIPPED GALVANIZED ANCHOR BOLTS WITH 3" x 3" x 1/4" PLATE WASHERS. PLAIN CARBON STEEL FASTENERS IN SBX/DOT AND ZINC BORATE PRESERVATIVE-TREATED WOOD SHALL BE PERMITTED. EMBED ANCHOR BOLTS 7" INTO CONCRETE FOUNDATION, WALL OR 12" INTO GROUTED MASONRY, AND SPACE NOT MORE THAN 4'-0" APART, UNLESS NOTED OTHERWISE ON THE SHEARWALL SCHEDULE. THERE SHALL BE A MINIMUM OF TWO BOLTS PER BOARD WITH ONE BOLT LOCATED 12" MAXIMUM AND 4-3/8" MINIMUM OF EACH END. FOR ADDITIONAL INFORMATION SEE DETAIL (201 SD2).
- SEE GENERAL NOTES FOR ADDITIONAL REQUIREMENTS. ALL DETAIL CALLOUTS SHALL BE CONSIDERED TYPICAL. CONTRACTOR SHALL REVIEW THE DETAIL SHEETS FOR DETAILS NOT SPECIFICALLY REFERENCED.
- SHEARWALLS: LENGTHS OF SHEARWALLS ARE SHOWN ABOVE OR BELOW SHEARWALL NUMBER (SEE PLAN). THE NUMBERS INDICATE THE MINIMUM DESIGN LENGTH OF THE SHEARWALL. SEE DETAIL (103 SD1).

ROOF FRAMING NOTES

- WALLS SHOWN AS SOLID ARE BELOW FRAMING. SEE ARCHITECTURAL DRAWINGS FOR STUD SIZES AND OTHER REQUIREMENTS.
- SEE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS, ELEVATIONS, ETC. THE PROJECT ARCHITECT IS RESPONSIBLE FOR SPECIFYING DIMENSIONS TO ALL PROJECT ELEMENTS.
- DETAIL KEYS AND OTHER INFORMATION ARE TYPICAL.
- ROOF FRAMING TERMS:
 - DROPPED:** BEAM IS SET BELOW ROOF FRAMING WITH TOP OF BEAM SET AT BOTTOM OF ROOF FRAMING.
 - DOWNSSET:** BEAM IS DEEPER THAN THE ROOF FRAMING AND SET WITH TOP OF BEAM EQUAL TO TOP OF ROOF FRAMING. BOTTOM OF BEAM EXTENDS BELOW ROOF FRAMING.
 - UPSET:** BEAM IS DEEPER THAN THE ROOF FRAMING AND SET WITH BOTTOM OF BEAM EQUAL TO BOTTOM OF ROOF FRAMING. TOP OF BEAM EXTENDS ABOVE ROOF FRAMING.
 - "HDR":** BOTTOM OF HEADER IS SET AT ROUGH OPENING (R.O.). SEE ARCH. FOR HEIGHT. IF HEADER BREAKS TOP PLATES INSTALL CS14 x 36" STRAP FROM FACE OF PLATE TO FACE OF HEADER, TYPICAL AT EACH END OF HEADER.
- ROOF FRAMING:
 - ROOF SHALL BE FRAMED WITH PRE-MANUFACTURED ROOF TRUSSES AT 24" O.C. INSTALLED PER APPROVED ROOF TRUSS SHOP DRAWINGS. ROOF TRUSS MANUFACTURER SHALL DESIGN THE ROOF TRUSSES AS SPECIFIED IN THE GENERAL NOTES (SHEET SN-2, U.N.O.). SEE ROOF TRUSS DETAILS DETAILS ON SHEET SD4 FOR TYPICAL DETAILING.
 - ROOF TRUSSES WITH FLAT BOTTOM CHORDS SHALL BE SECURED TO END BEARING POINTS WITH "H" CLIP TO TOP PLATE. ROOF TRUSSES WITH SLOPED BOTTOM CHORDS SHALL BE SECURED TO BEARING POINTS WITH SIMPSON "TC" CLIPS OR EQUIVALENT CONNECTORS THAT ALLOW HORIZONTAL MOVEMENT IN ACCORDANCE WITH THE ROOF TRUSS DESIGNER'S REQUIREMENTS.
 - PROVIDE 2x BLOCKING BELOW ALL HIPs, VALLEYS, AND RIDGES. CONTRACTOR SHALL INSTALL STRONGBACKS, CROSS BRIDGING, AND/OR BRACING AS SPECIFIED BY THE ROOF TRUSS SHOP DRAWINGS.
- MANUFACTURED BEAM FRAMING:
 - ALL MANUFACTURED WOOD BEAMS SHALL BE MANUFACTURED BY "TRUSS JOIST" WEYERHAUSER. REFER TO "GENERAL FRAMING NOTES" ON SHEET SN1 FOR MATERIAL SPECIFICATIONS.
- ROOF SHEATHING:
 - PLYWOOD SHEETS LOCATED AT ROOF EDGES OR CHANGES IN FRAMING SHALL BE AT LEAST 24 INCHES WIDE OR SHALL BE EDGE BLOCKED AND NAILED. EDGE NAIL PLYWOOD TO ALL GABLE AND SHEAR TRUSSES (TRUSSES WITH DRAG LOADS).
 - EDGE NAIL ROOF PLYWOOD TO ALL DRAG MEMBERS (RAFTERS OR BEAMS w/ HORIZ. STRAPS).
- SUPPORT OF BEAMS, HIPs, GIRDERS, ETC.:
 - INSTALL POSTS (POST SIZE TO MATCH BEAM AND WALL SIZE), MINIMUM BELOW ALL ROOF BEAMS AND GIRDERS. CONTRACTOR SHALL VERIFY FRAMING LAYOUT TO ENSURE CONTINUOUS AND SOLID BLOCKING UNDER ALL CONCENTRATED LOADS.
- CRICKETS AND/OR CALIFORNIA (BUILT-UP FRAMING):
 - CRICKETS AND/OR CALIFORNIA FRAMING SHALL BE CONSTRUCTED WITH 2x6 MEMBERS AT 24" O.C. SUPPORTED TO THE ROOF BELOW AT 48 INCHES ON CENTER. ROOF PLY SHALL CONTINUE BELOW CRICKETS AND/OR CALIFORNIA FRAMING.
- HEADERS:
 - WINDOW AND DOOR HEADERS SHALL CONFORM TO THE HEADER SCHEDULE, U.N.O. ON THE PLAN (210 SD2).
- TOP PLATE SPLICES:
 - TOP PLATE SPLICES OF ALL WALLS SHALL CONFORM TO DETAIL (209 SD2). INSTALL CS14 x 3'-0" LONG STRAPS AT TOP PLATE SLOPE CHANGES AND OTHER DISCONTINUOUS TOP PLATE CONDITIONS.
- TOP CONNECTORS SHALL BE INSTALLED AT EXTERIOR WALL TOP PLATES AT 4'-0" O.C. MINIMUM WHERE SHEAR IS NOT NOTED ON PLANS.
 - SEE GENERAL NOTES FOR ADDITIONAL REQUIREMENTS. ALL DETAIL CALLOUTS SHALL BE CONSIDERED TYPICAL. THE CONTRACTOR SHALL REVIEW THE DETAIL SHEETS FOR DETAILS NOT SPECIFICALLY REFERENCED.
- SHEARWALLS AT OPENING TRIMMERS:
 - WHERE SHEARWALL LENGTH SPECIFIED ON PLANS REQUIRES EDGE NAILING TO WINDOW AND/OR DOOR TRIMMERS, REFER TO DETAIL (108 SD1).
- SHEARWALLS:
 - LENGTHS OF SHEARWALLS ARE SHOWN ABOVE OR BELOW SHEARWALL NUMBER (SEE PLAN). THE NUMBERS INDICATE THE MIN. DESIGN LENGTH OF THE SHEARWALL. SEE DETAIL (103 SD1).
- HOLDOWN STRAPS:
 - WHERE HOLDOWN STRAPS ARE SPECIFIED ON PLANS, INSTALL PER DETAIL (112 SD1, 113 SD1).

A. ALL NAIL HOLES SHALL BE FILLED ON HOLDOWN STRAPS



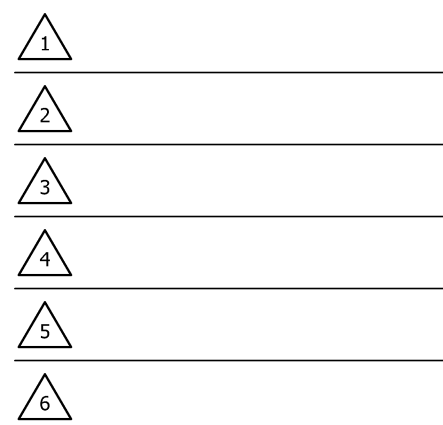
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Brentwood, CA 94513
Office: 925.516.3502
Fax: 925.262.4662

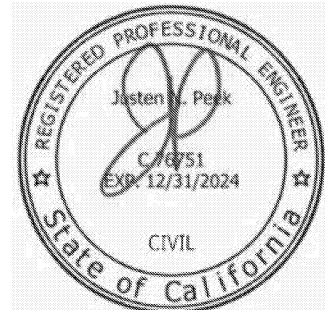
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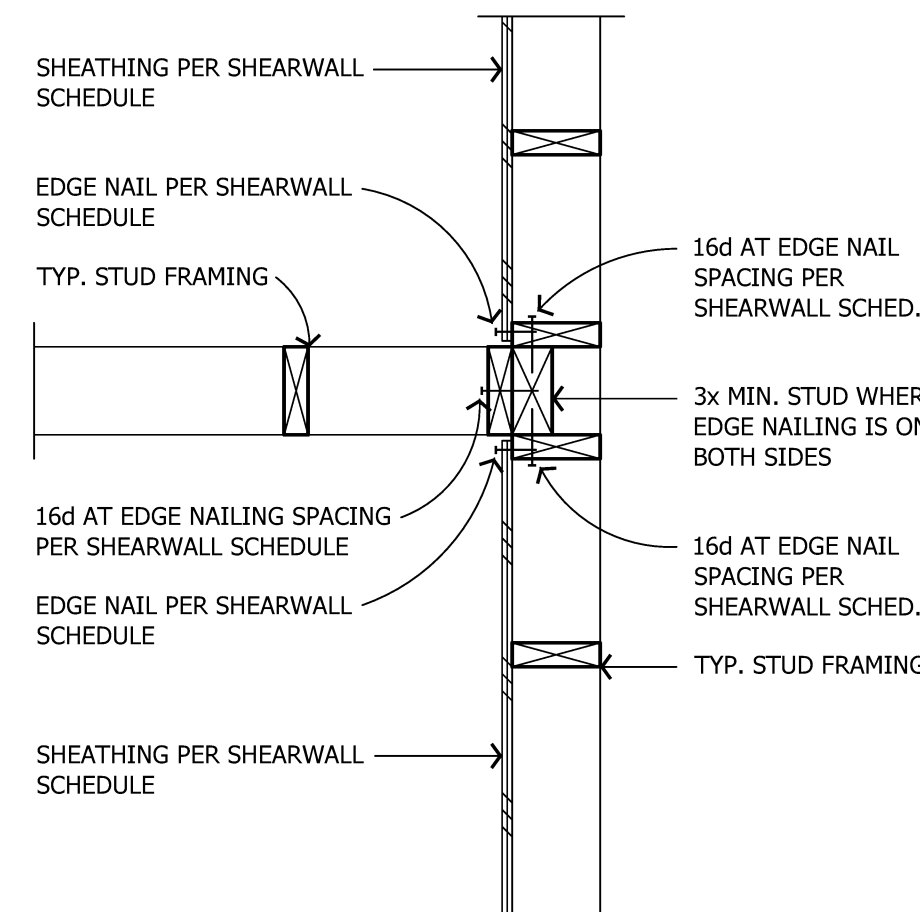
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Engineering Seal:



Sheet Description:
**STUDIO
MIRRORED PLAN
STRUCTURAL ROOF FRAMING
PLAN AND FOUNDATION PLAN**

Scale: 1/4" = 1'-0"
Initial Issue Date: March 24, 2023
Drawn By: E. Bennett
Project Designer: J. Peek
Project Manager: J. Peek Ext. 23
Job No. W021420

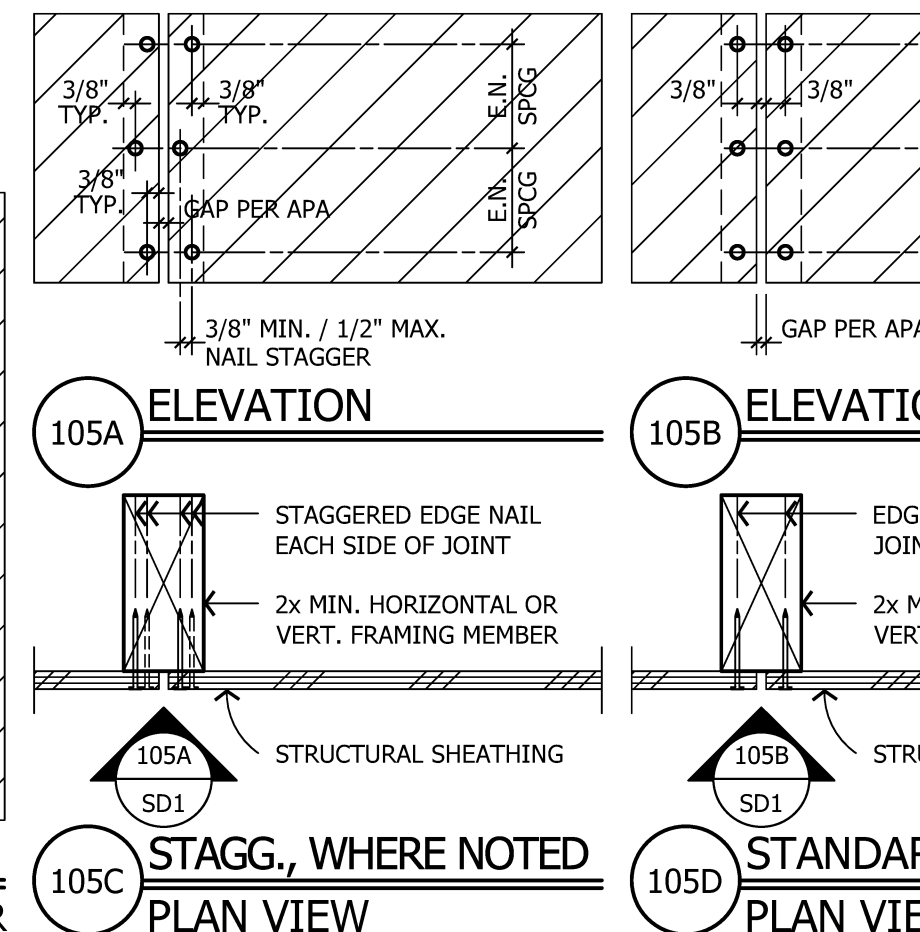
Sheet No.
S1



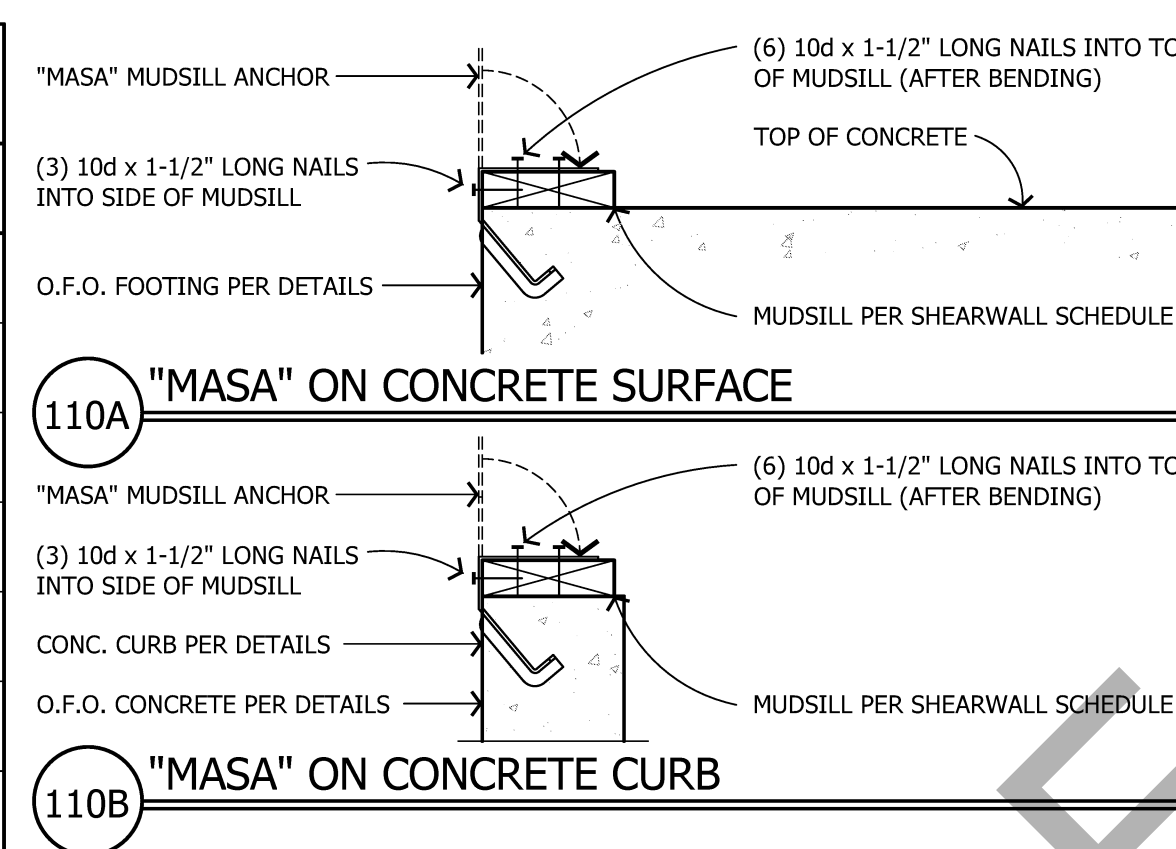
1/2" SHEATHING (ONE FACE)	SHEARWALL LENGTH: SHEARWALL DESIGNATION:	X'-X" SW-1	X'-X" SW-2	X'-X" SW-3	X'-X" SW-4	X'-X" SW-5
	PLYWOOD OR O.S.B. SHEATHING THICKNESS:	15/32"	15/32"	15/32"	15/32"	15/32" STR.
	10d EDGE NAIL (0.148 DIA):	10d @ 6" O.C.	10d @ 4" O.C.	10d @ 3" O.C.	10d @ 2" O.C.	10d @ 2" O.C.
	10d FIELD NAIL (0.148 DIA.):	10d @ 12" O.C.	10d @ 12" O.C.	10d @ 12" O.C.	10d @ 12" O.C.	10d @ 12" O.C.
	FRAMING MEMBER AT ADJOINING PANEL EDGES:	SINGLE 2x	SINGLE 3x, 4x OR 2-2x w/ 10d @ 4" O.C.	SINGLE 3x, 4x OR 2-2x w/ 10d @ 3" O.C.	SINGLE 3x OR 4x	SINGLE 3x OR 4x
	3x SILL REQ. (NOTE 6):	NO	NO	NO	YES	YES
	SILL CONNECTION: 16d NAIL (0.148 DIA.) SDS SCREW (SDS25600):	16d @ 4" O.C. SDS @ 21" O.C.	16d @ 3" O.C. SDS @ 34" O.C.	16d @ 2" O.C. SDS @ 9" O.C.	-- SDS @ 7" O.C.	-- SDS @ 6" O.C.
	5/8" DIA. MUDDSILL A.B.: WITH 2x SILL	@ 48" O.C. MAX	@ 38" O.C. MAX	@ 29" O.C. MAX	@ 28" O.C. MAX	@ 26" O.C. MAX
	TOP CONNECTION - "RBC" TOP CONNECTION - "LTP4" TOP CONNECTION - "A35"	@ 16" O.C. MAX @ 23" O.C. MAX @ 24" O.C. MAX	@ 10" O.C. MAX @ 15" O.C. MAX @ 18" O.C. MAX	@ 8" O.C. MAX @ 12" O.C. MAX @ 13" O.C. MAX	@ 6" O.C. MAX @ 8" O.C. MAX @ 10" O.C. MAX	@ 6" O.C. MAX @ 8" O.C. MAX @ 8" O.C. MAX
	ALLOWABLE SHEAR	310	460	600	770	870

1. ALL NAILS SHALL HAVE MINIMUM SHANK DIAMETER AS SPECIFIED IN SCHED.
- A. GALVANIZED NAILS SHALL BE HOT DIPPED OR TUMBLED.
- B. ALL FASTENERS THAT ARE INSTALLED INTO OR IN CONTACT WITH PRESSURE TREATED LUMBER ARE TO BE HOT DIPPED GALVANIZED
- PLYWOOD AND OSB SHALL BE TYPE CDX GRADE OR BETTER (EXCEPT WHERE STRUCTURAL 1 GRADE IS NOTED).
- A. STR. 1 = STRUCTURAL 1 GRADE PLYWOOD / O.S.B.
3. WHEN FASTENERS ARE SPACED LESS THEN 4" ON CENTER, NAILING AT PANEL EDGES SHOULD BE STAGGERED PER DETAIL 104A
4. ALL DOUBLE SIDED WALLS REQUIRE 3x ILL. MIN. SD1
5. PREDRILL SILL CONNECTIONS WHERE NEEDED TO AVOID VOID SPLITTING. USE DRILL BIT (1/2" OR SCREW) DIAMETER.
6. 3x ILL. PLATES MAY BE OMITTED WHEN ALTERNATE SHEATHING JOINT AT RIM OR BLOCKING IS PROVIDED PER DETAIL 107
7. INSTALL DBL 2x POST MIN. AT END OF SHEARWALLS. IF 3x FRAMING MEMBERS ARE REQUIRED USE 4x POST MINIMUM SD1
8. ALL ANCHOR BOLTS MUST BE INSTALLED WITH 3"x3"x0.229" GALVANIZED PLATE WASHERS PER THE CURRENT CBC
9. THERE ARE SHEAR NAIL MATERIAL IS REQUIRED ON BOTH FACES OF A SHEARWALL, AND NAIL SPACING IS LESS THAN 6" O.C. ALL THE FOLLOWING REQ. SHALL BE MET:
 - A. USE 3x ILLS AND 3x TOP PLATES.
 - B. THE VERTICAL SHEAR PANEL JOINTS ON OPPOSITE FACES SHALL BE OFFSET TO FALL ON DIFFERENT FRAMING MEMBERS, UNLESS SUCH FRAMING MEMBERS ARE 4x OR THICKER.
 - C. INSTALL 4x RIM OR BLOCKING MINIMUM BELOW ALL DOUBLE SIDED SHEARWALLS.
10. FOR ALTERNATE MUDSILL ANCHORAGE, SEE DETAIL 109 SD1

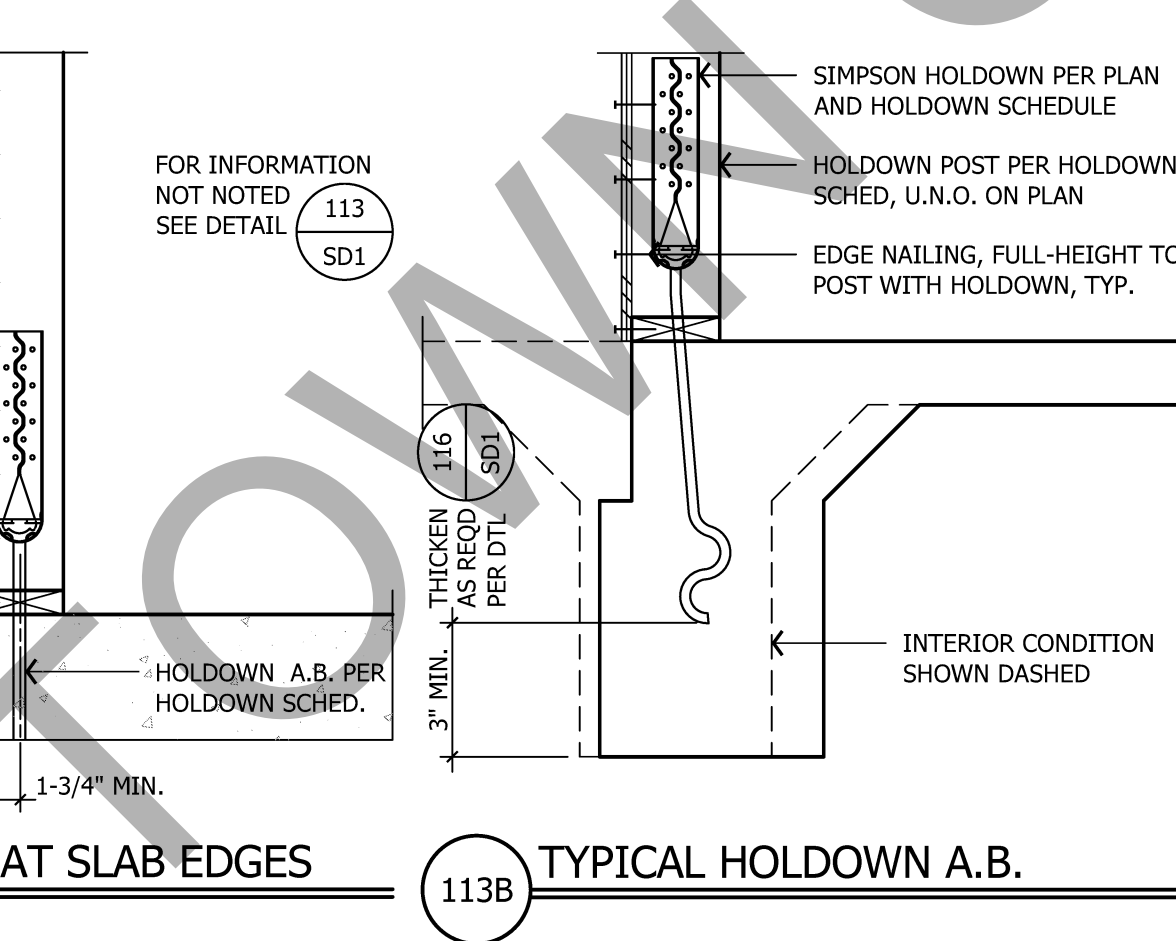
(103) SHEARWALL SCHEDULE



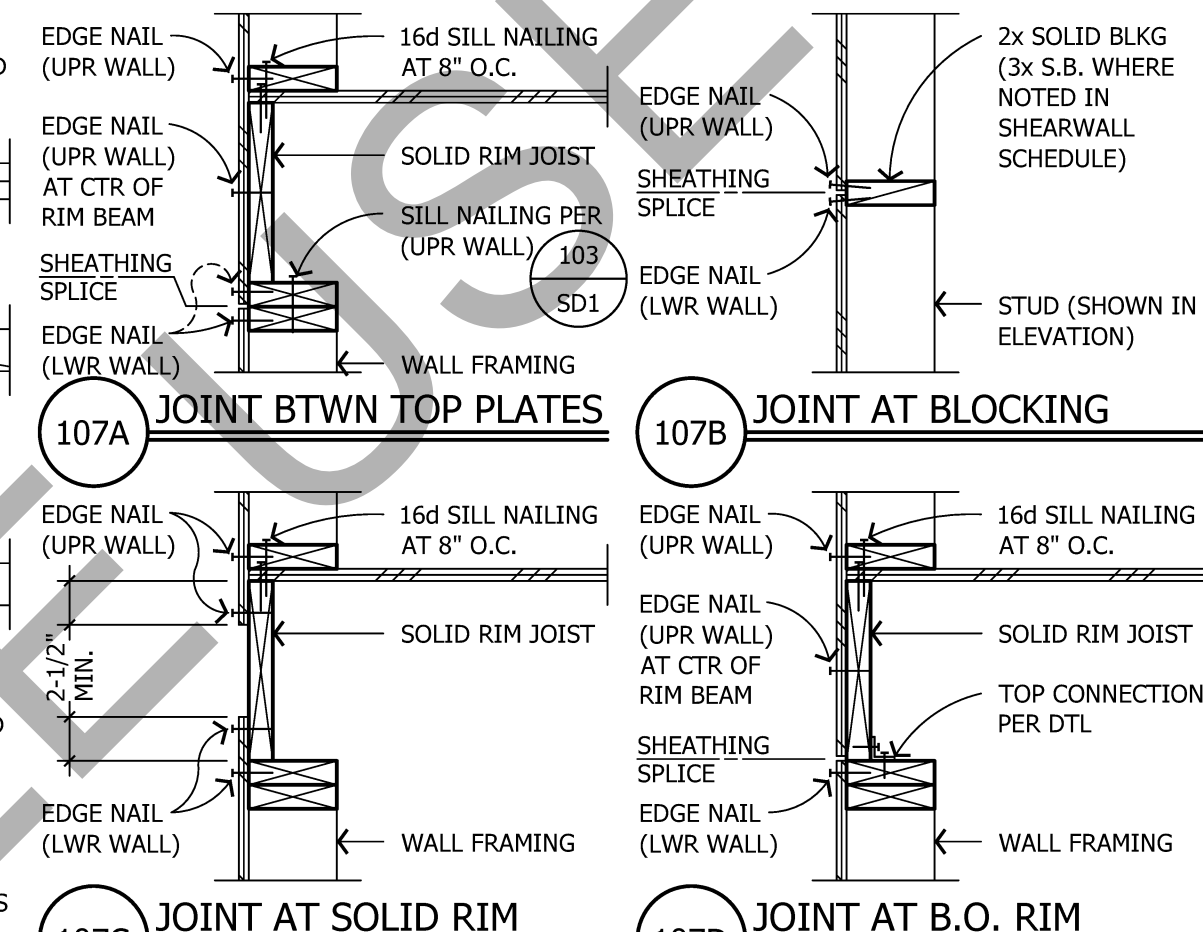
NT 106 SMALL OPENING IN SHEARWALL



111 "TITEN HD" ANCHORAGE & NOTES



116 DEEPENED FOUNDATION (FOR A.B.)



SCREWED / BOLTED HOLDOWN SCHEDULE

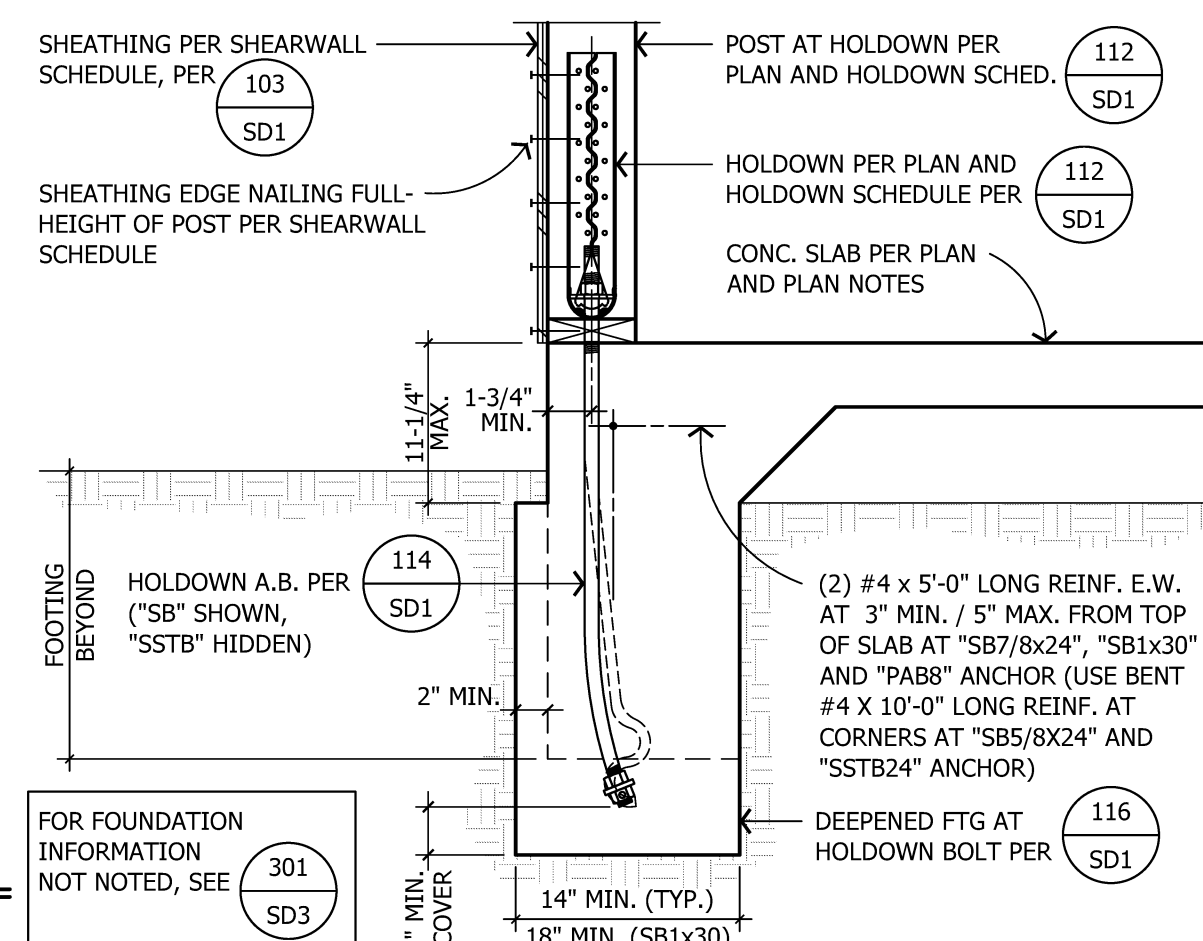
SCREWED / BOLTED HOLDDOWN SCHEDULE				
ANCHOR	POST CONNECTORS	HOLDDOWN ANCHOR	MIN. POST	ALLOW. LOAD
"HDU2"	(6) SDS25212 SCREWS	SSTB24 OR SB5/8x24	(2) 2x	2940 lbs
"HDU4"	(10) SDS25212 SCREWS	SSTB24 OR SB5/8x24	(2) 2x	3815 lbs
"HDU5"	(14) SDS25212 SCREWS	SSTB24 OR SB5/8x24	(2) 2x	5645 lbs
"HDU8"	(20) SDS25212 SCREWS	SSTB28 OR SB7/8x24	4x6 / 6x6	7855 lbs
"HDU11"	(30) SDS25212 SCREWS	SB1x30 ^(A)	4x8 / 6x6	11175 lbs
"HDU14"	(36) SDS25212 SCREWS	PAB8 (OR EQUIV.)	4x8 / 6x6	14390 lbs
"HD19"	(5) 1" DIA. A307 BOLTS	PAB10 (OR EQUIV.)	4x8 / 6x6	19070 lbs

1.FILL ALL NAIL HOLES PER MANUFACTURER'S REQUIREMENTS

1. FILL ALL NAIL HOLES PER MANUFACTURER'S REQUIREMENTS.
2. STRAPS SHALL BE INSTALLED OVER PLYWOOD SHEATHING.
3. STRAPS MUST BE INSTALLED FLAT TO THE FACE OF THE POST. NO BENDS, NICKS OR SLACK OF ANY KIND ARE ALLOWED. STRAPS INSTALLED WITH ANY BENDS, NICKS OR SLACK SHALL BE CONSIDERED AS INADEQUATE AND MUST BE RE-INSTALLED.
4. STRAPS MUST BE INSTALLED VERTICALLY WHEN USED AS A HOLDOWN. STRAPS INSTALLED ON A SLOPE OR AT AN ANGLE SHALL BE CONSIDERED AS INADEQUATE AND MUST BE RE-INSTALLED.
5. LOADS MUST BE A 60% LOAD FACTOR BASED ON THE FASTENERS FOR WIND OR SEISMIC.
6. STRAPS MUST SPAN EVERY OTHER ROUND HOLE IF THE WIND TENDS TO SPLIT. INCREASE STRAP LENGTH AS REQUIRED TO ACHIEVE MINIMUM NUMBER OF FASTENERS LISTED IN TABLE ABOVE.
7. PRE-DRILL HOLES TO PREVENT WOOD SPLITTING AS REQUIRED.

NOTE: A. WHERE NOTED, SB1x30 REQUIRES FOOTING WIDTH TO BE 18" WIDE

112 SLAB HOLDOWN SCHEDULES



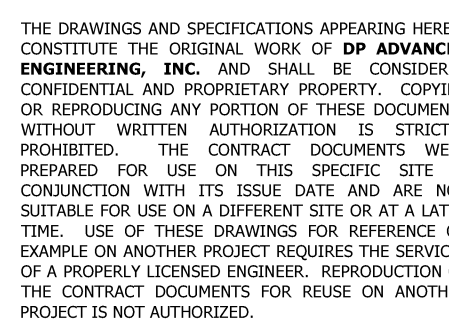
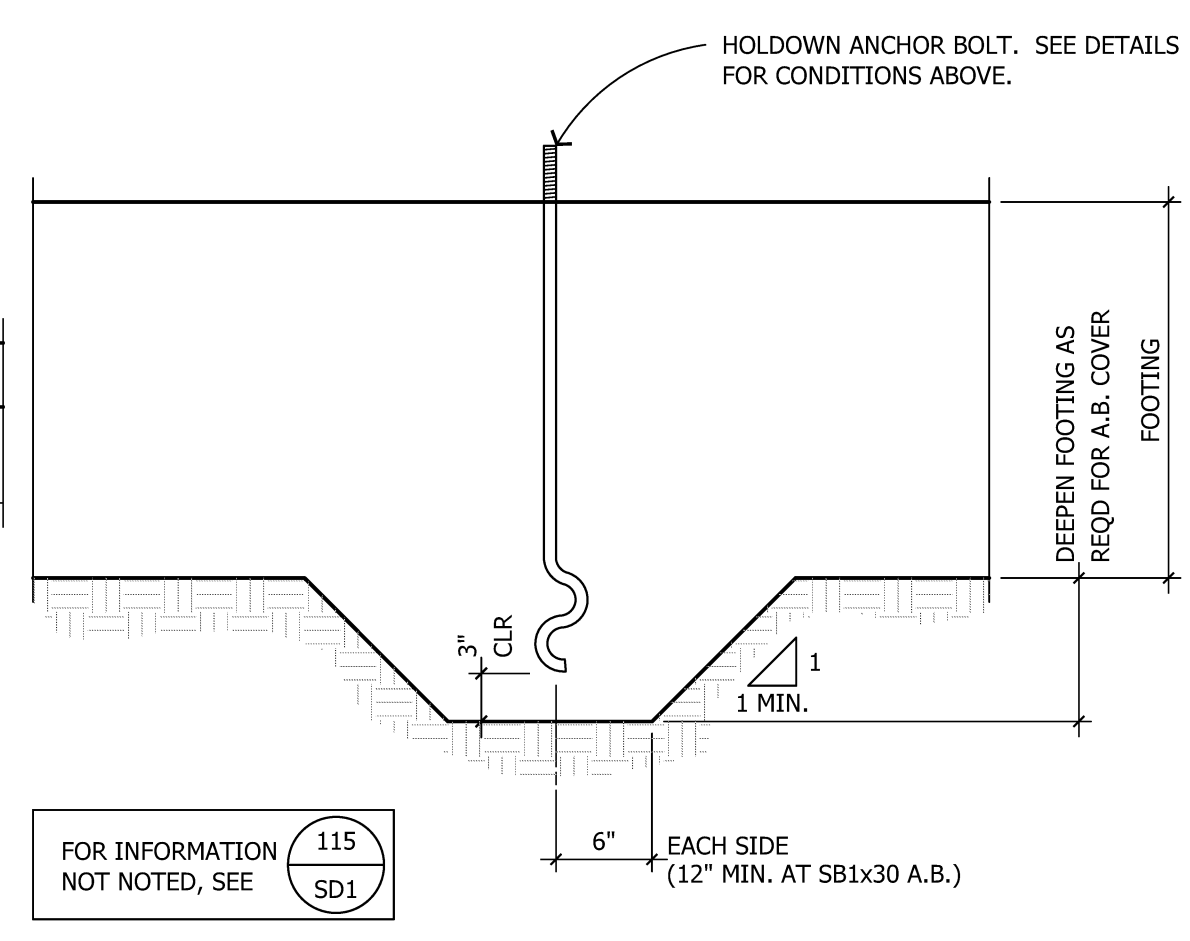
1. RE-TIGHTEN ALL BOLTS PRIOR TO SHEARWALL CLOSE-IN.

1. RE-TIGHTEN ALL BOLTS PRIOR TO SHEARWALL CLOSE-IN.

2. DETACHMENT HOLD-DOWN POSTS SHALL BE INSTALLED TO MEET PER SILL NAILING REQUIREMENTS FOR SHEARWALL TYPE. SEE DETAIL 103 SD1 FOR MORE INFORMATION.

3. CONTRACTOR'S OPTION TO SUBSTITUTE "STDH" TYPE HOLD-DOWNS:

ANCHOR	"STDH" OPTION	POST CONNECTORS	MIN. POST	ALLOW. LOAD
"HDU2"	"STDH10"	(20) 16d SINKERS	(2) 2x	2940 lbs
"HDU4"	"STDH14"	(24) 16d SINKERS	(2) 2x	3815 lbs

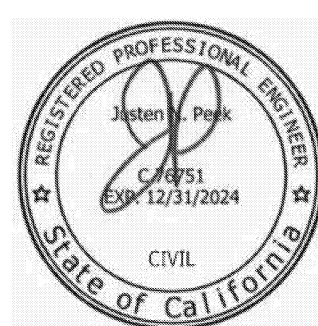


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1	PLAN CHECK RESPONSES	04-19-
2		
3		
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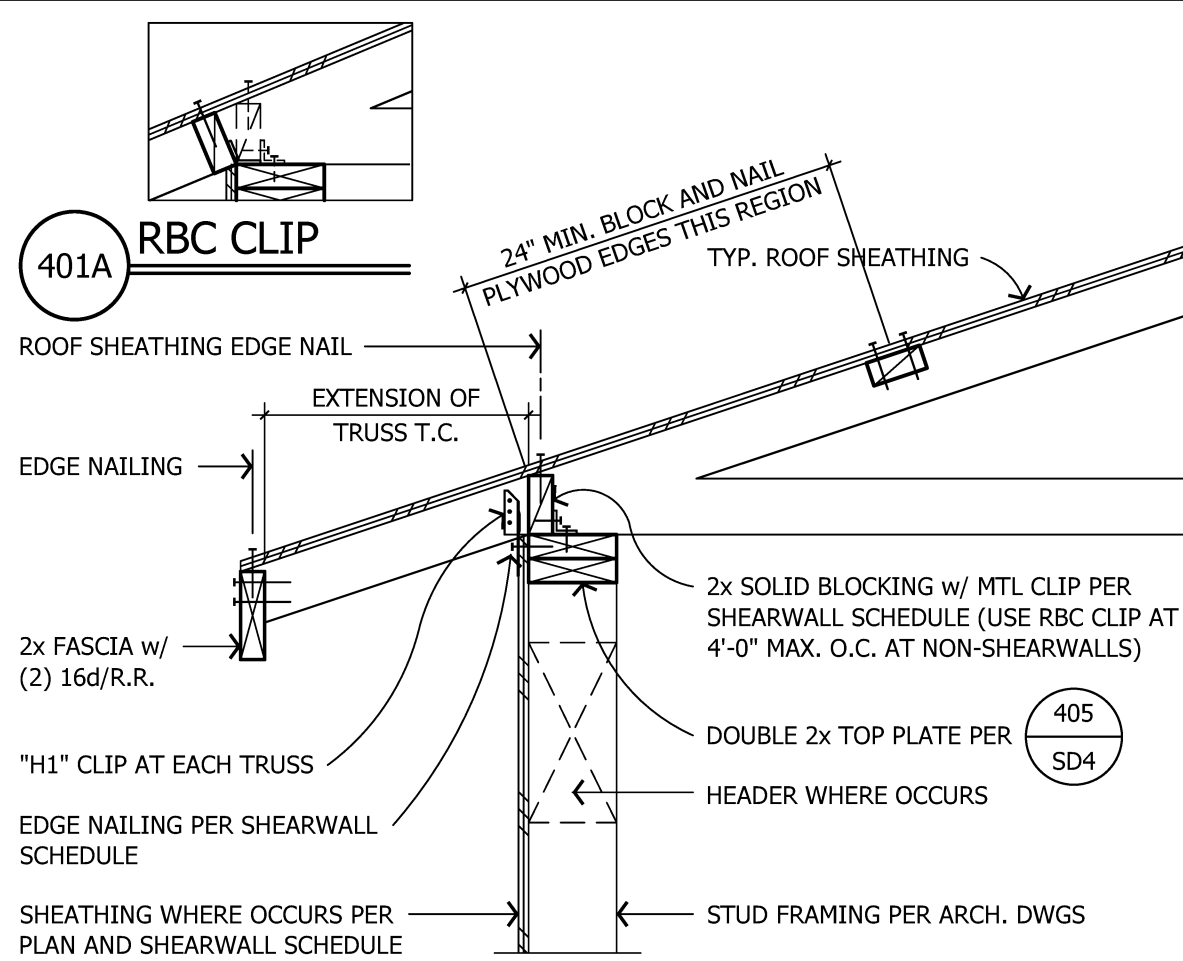
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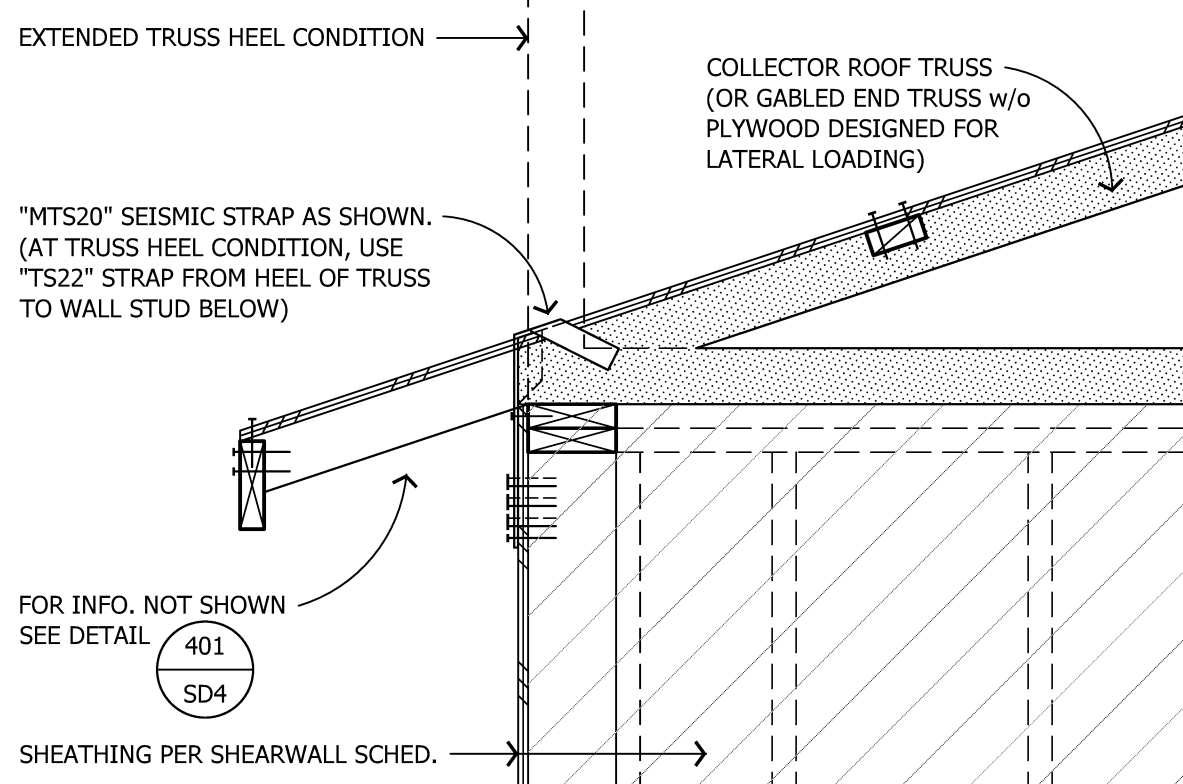


No Scale	
Initial Issue Date:	March 24, 202
Drawn By:	E. Benne
Project Designer:	J. Peek
Project Manager:	J. Peek Ext. 2
Job No.	G01012
Sheet No.	

SD1

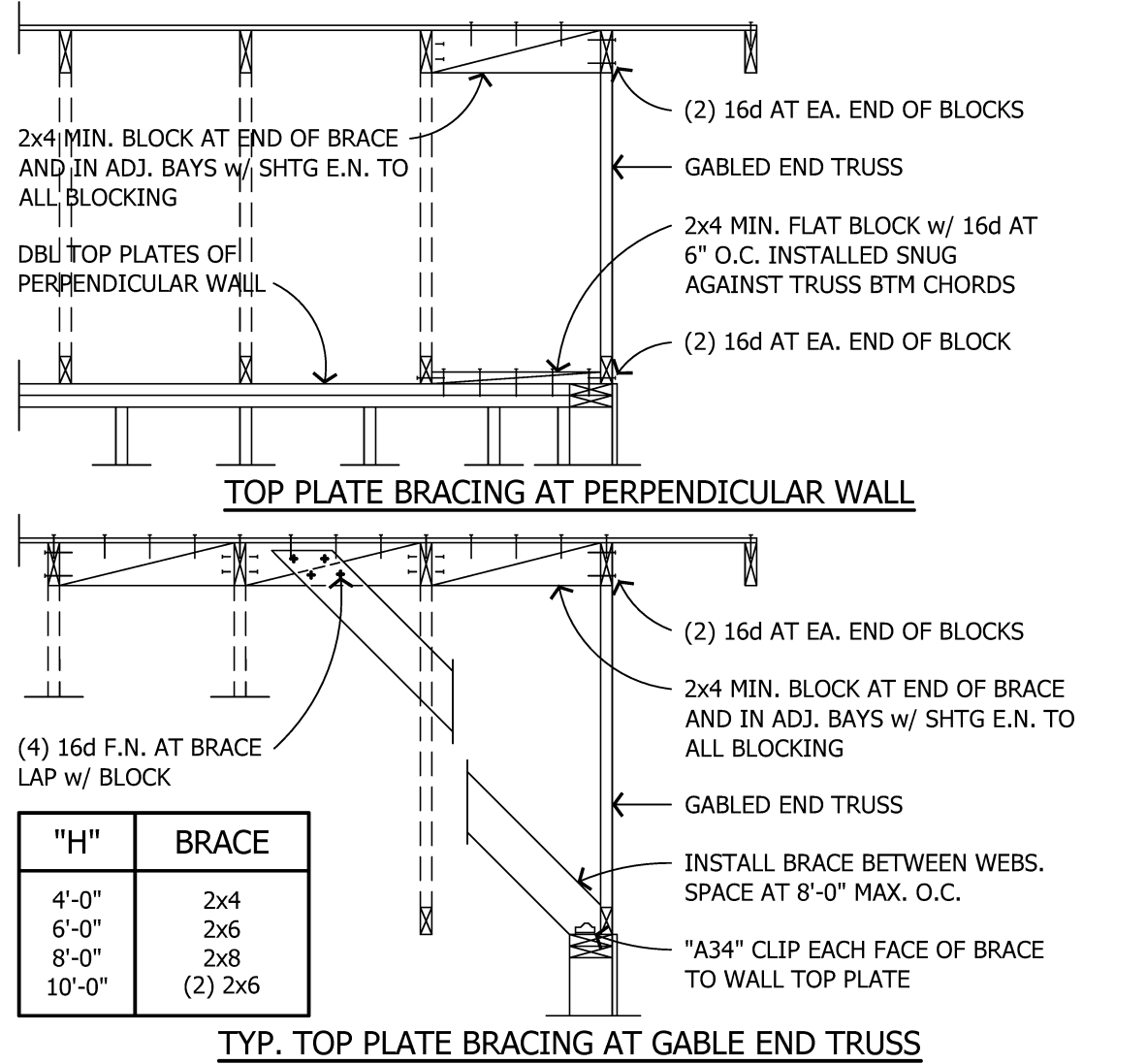


401 TRUSS PERPEND. TO EXTERIOR WALL

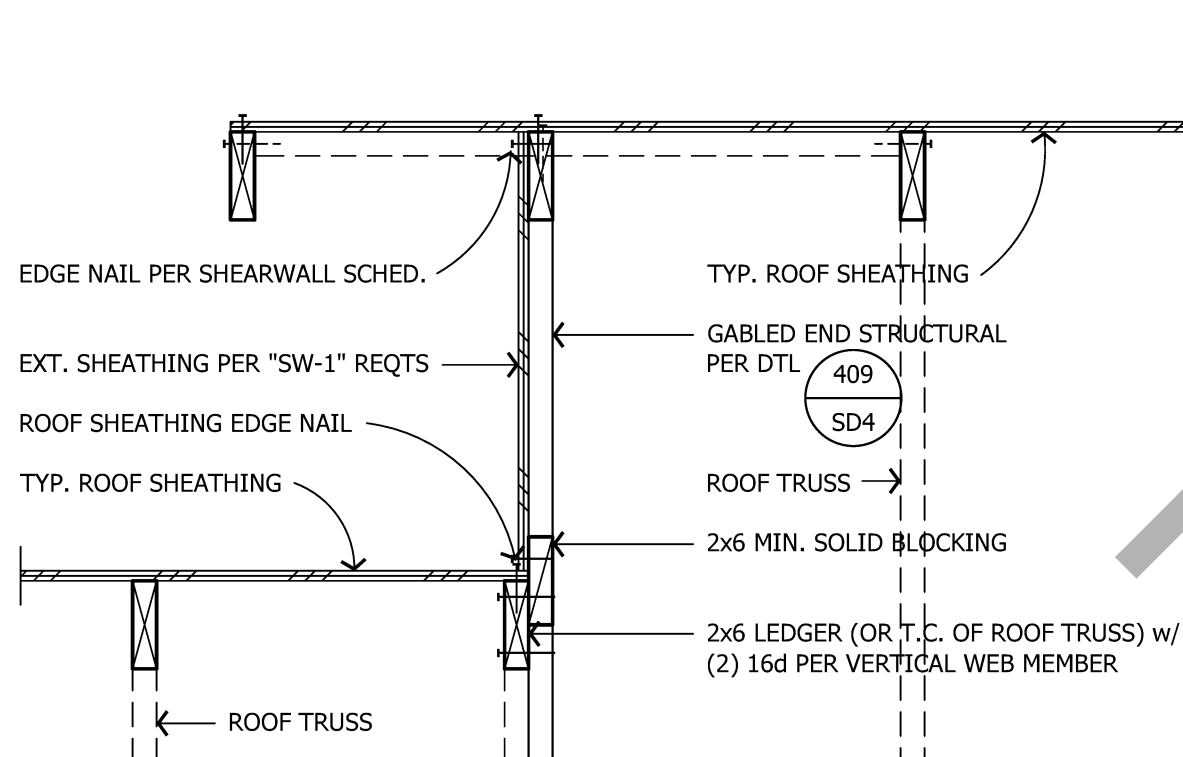


TYPICAL AT ENDS OF COLLECTOR AND GABLED END TRUSSES WHERE SHEARWALL SHEATHING DOES NOT EXTEND UP TO TOP CHORD.

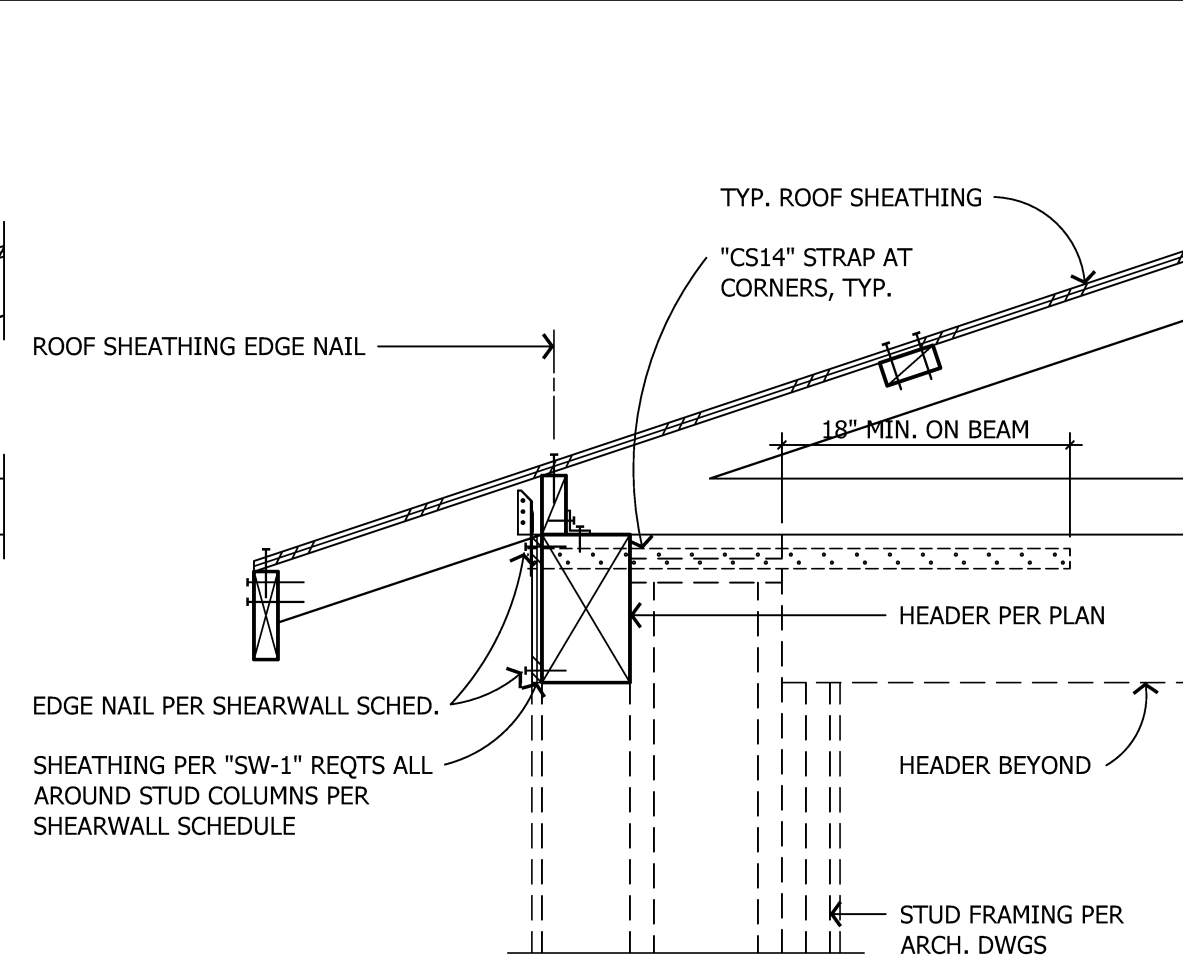
406 COLLECTOR TRUSS UPLIFT ANCHORAGE



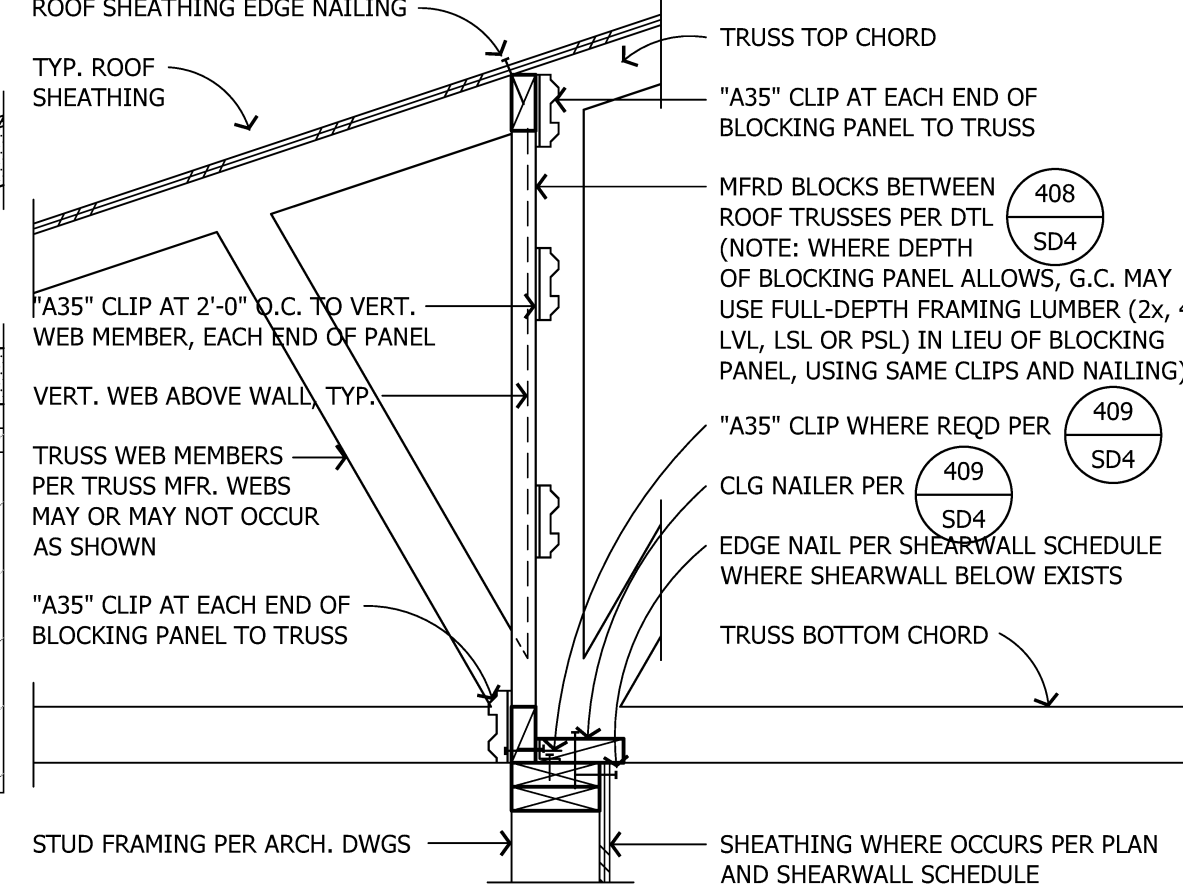
410 GABLE END TRUSS BRACING



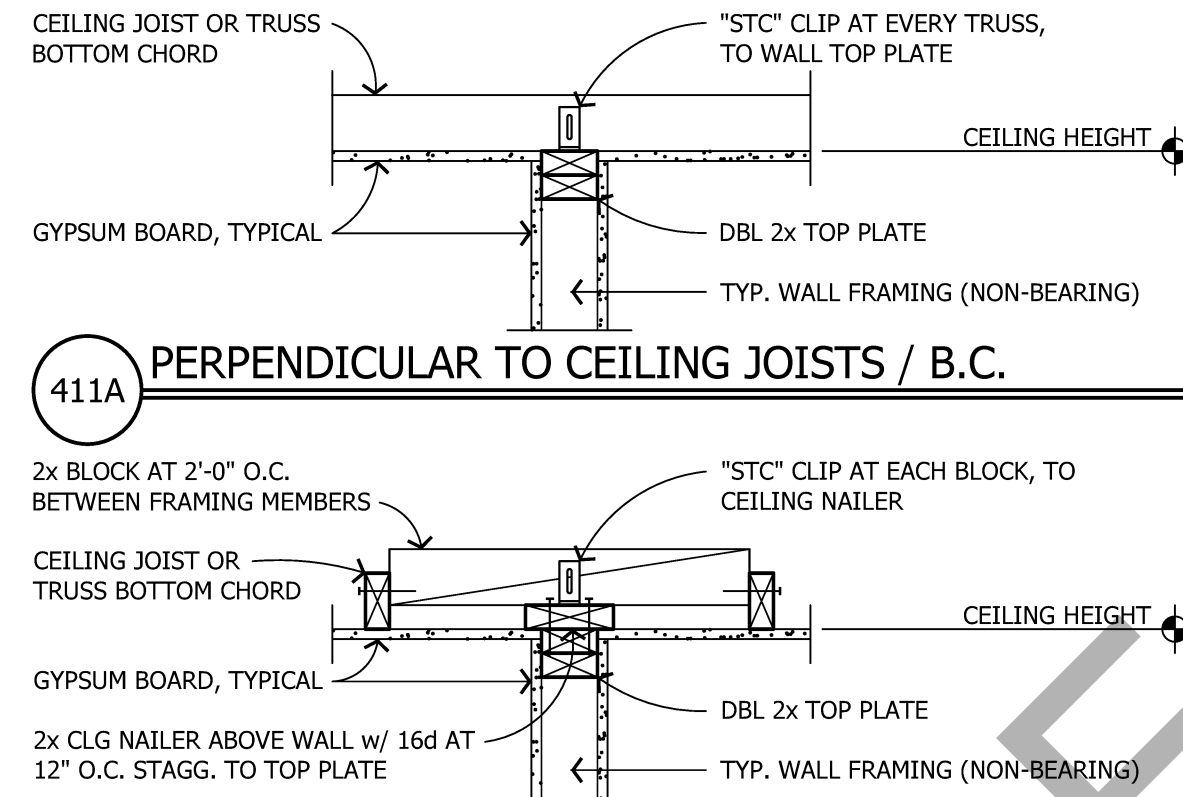
415 ROOF STEP



402 TRUSS PERPEND. TO PORCH BEAM

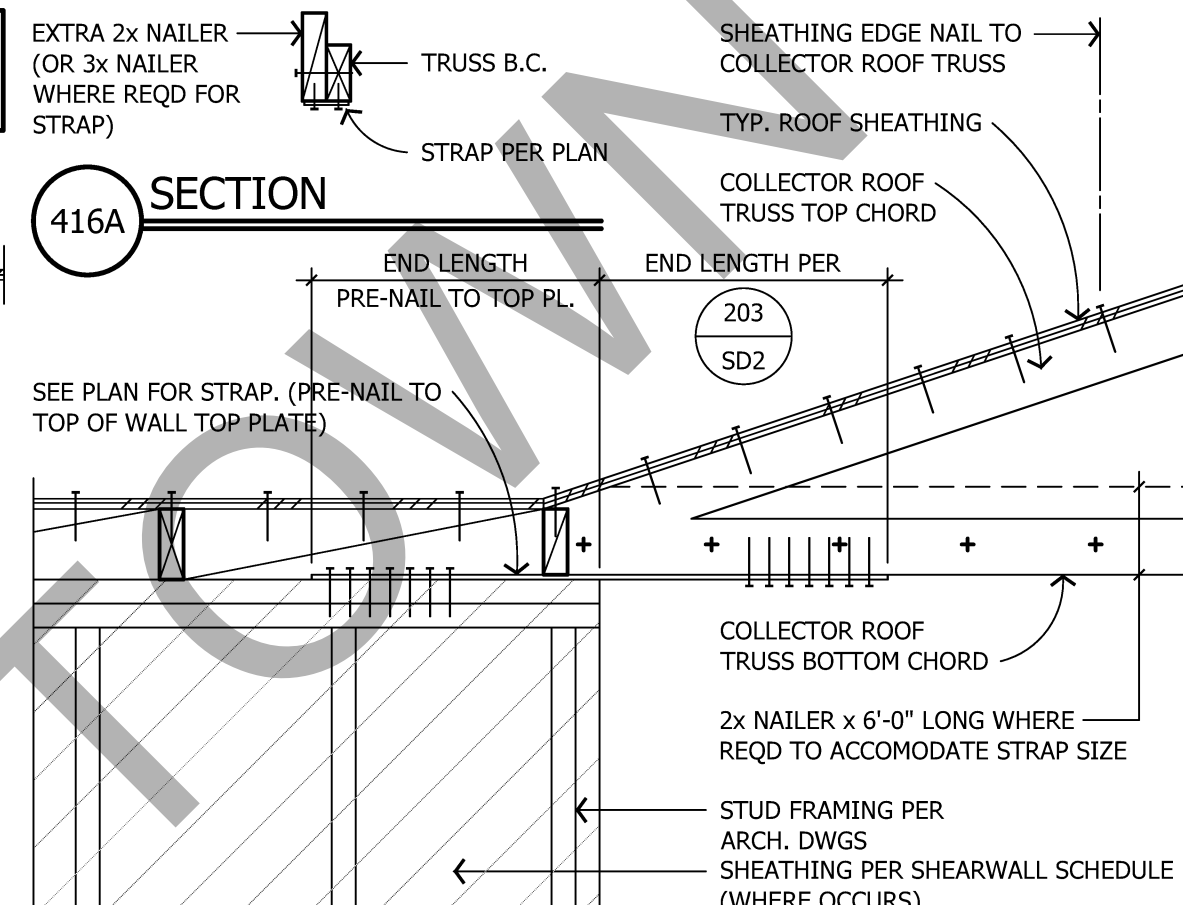


407 TRUSS TO INTERIOR SHEAR WALL

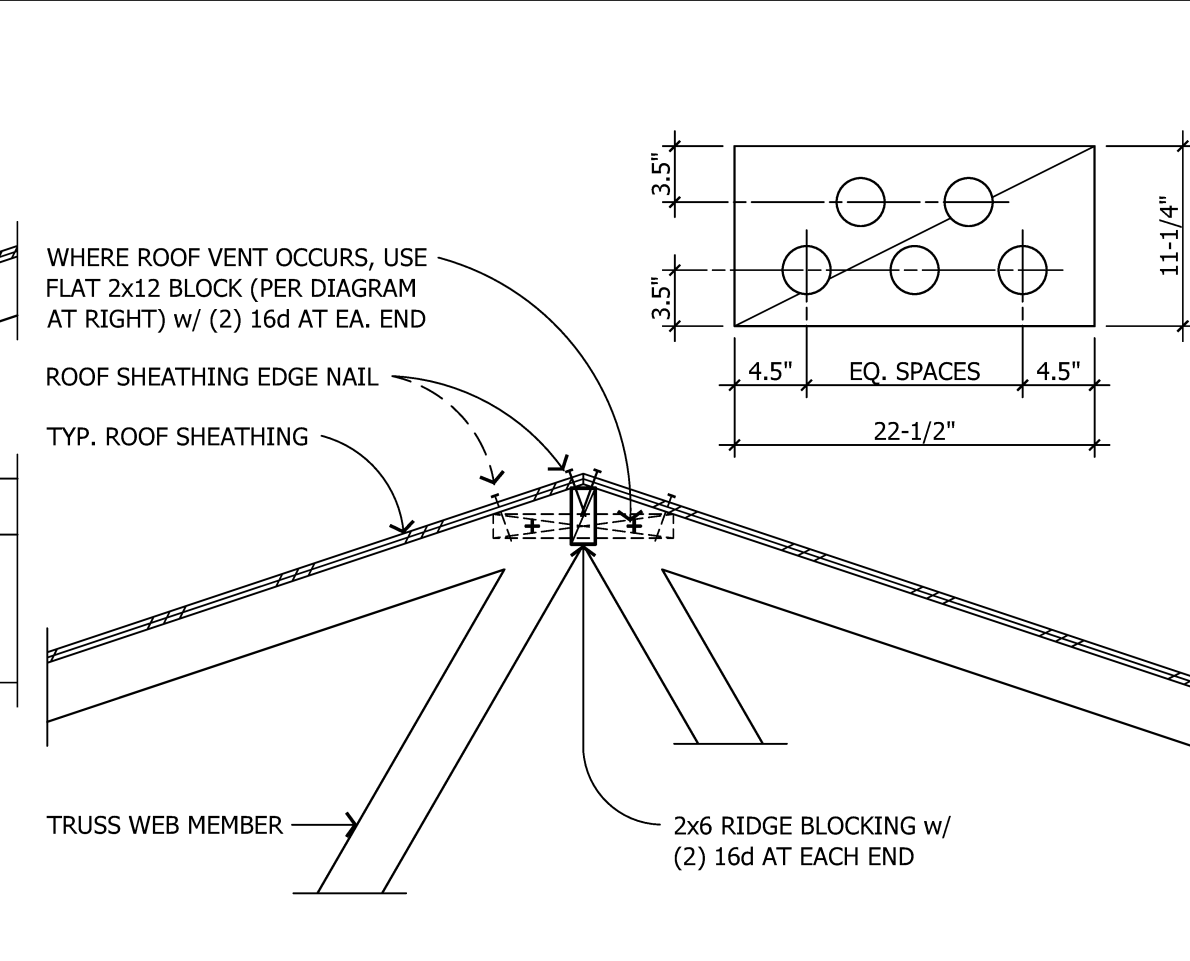


411B PARALLEL TO CEILING JOISTS / B.C.

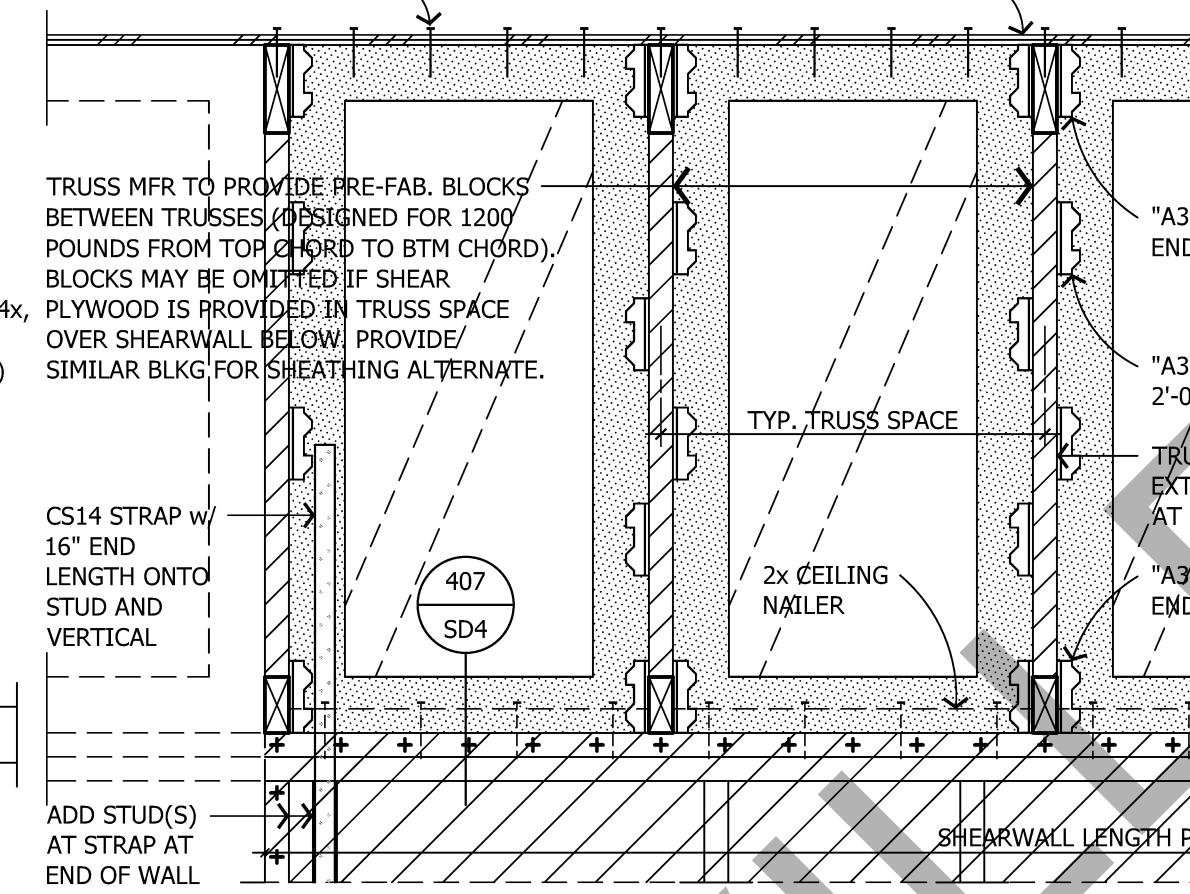
411 INTERIOR NON-BEARING WALL TO TRUSS



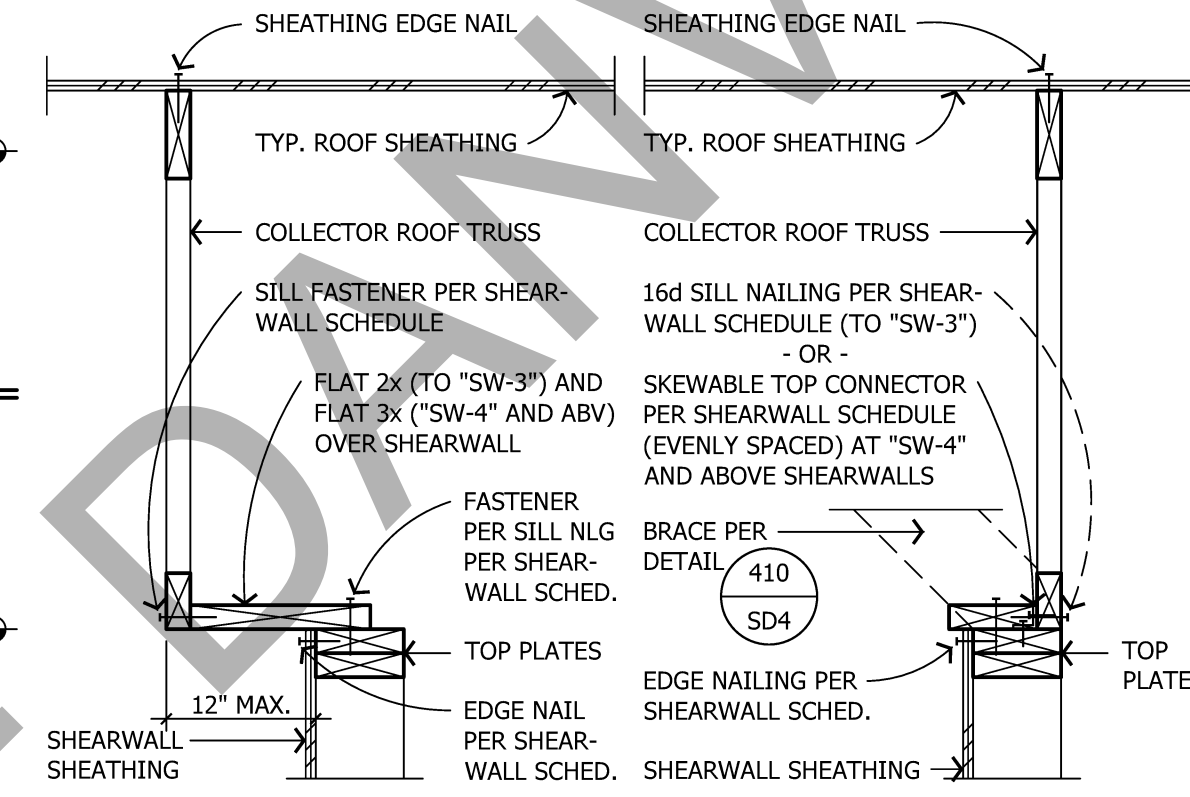
416 HORIZONTAL STRAP TO WALL TOP PLATE



403 RIDGE BLOCKING AT ROOF TRUSSES

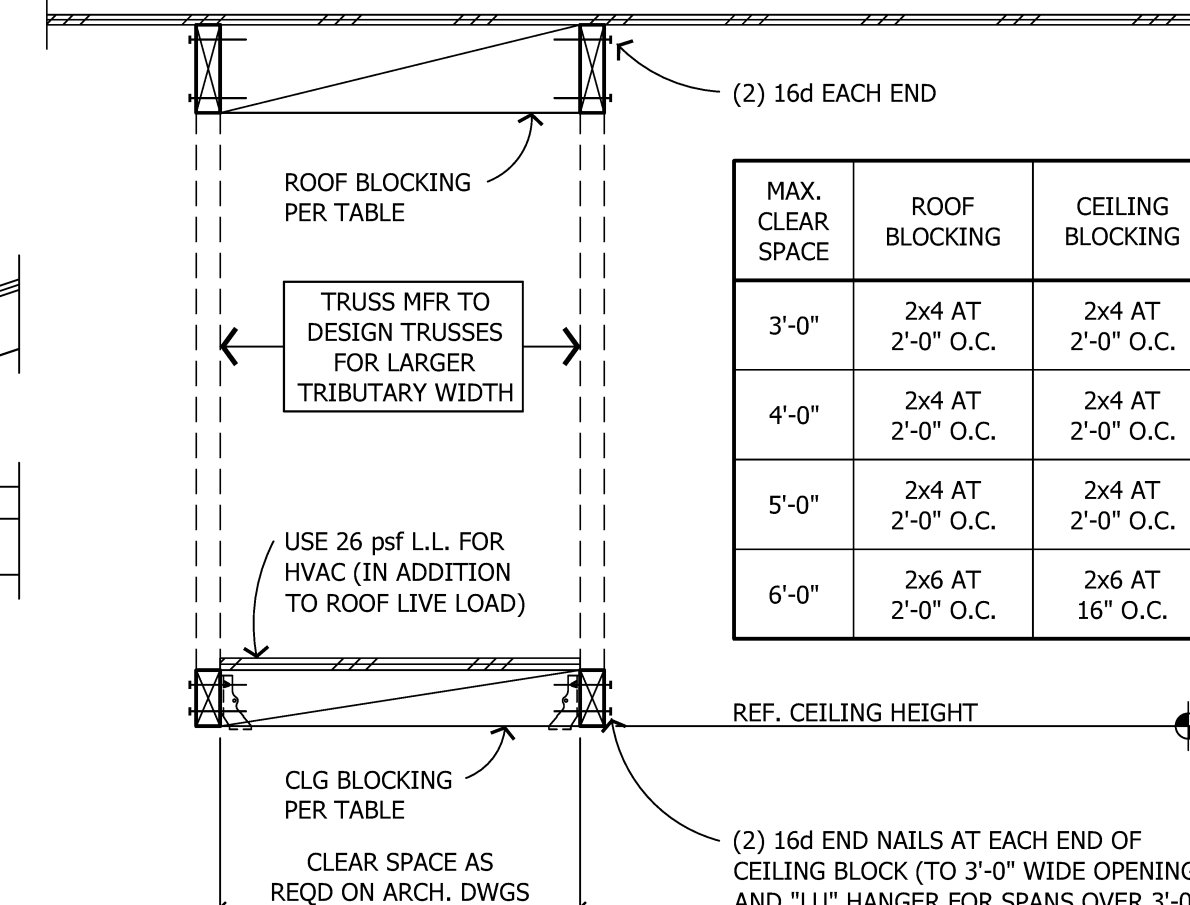


408 FABRICATED TRUSS BLOCKING PANEL ELEVATION ABOVE SHEARWALL

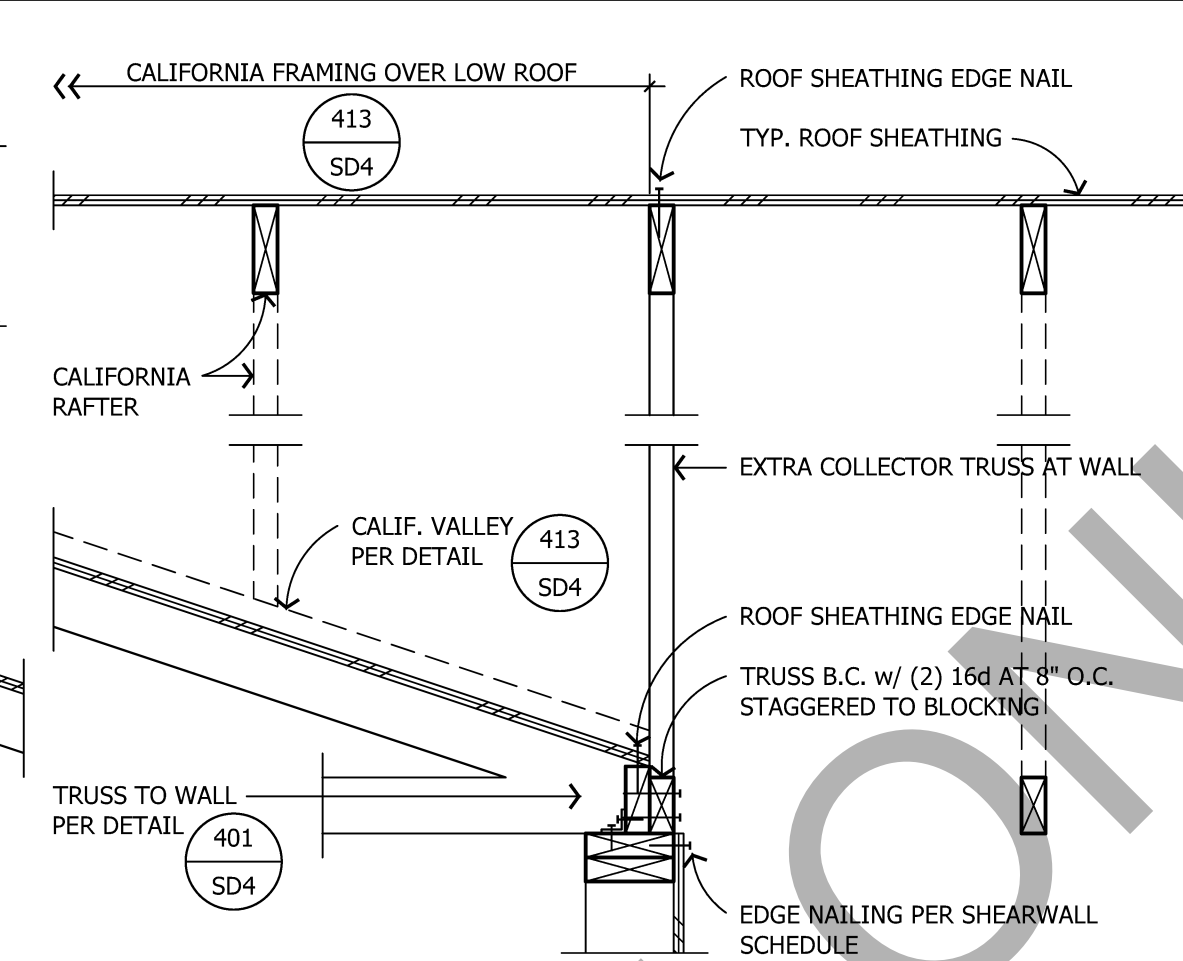


412A OFFSET SHEARWALL

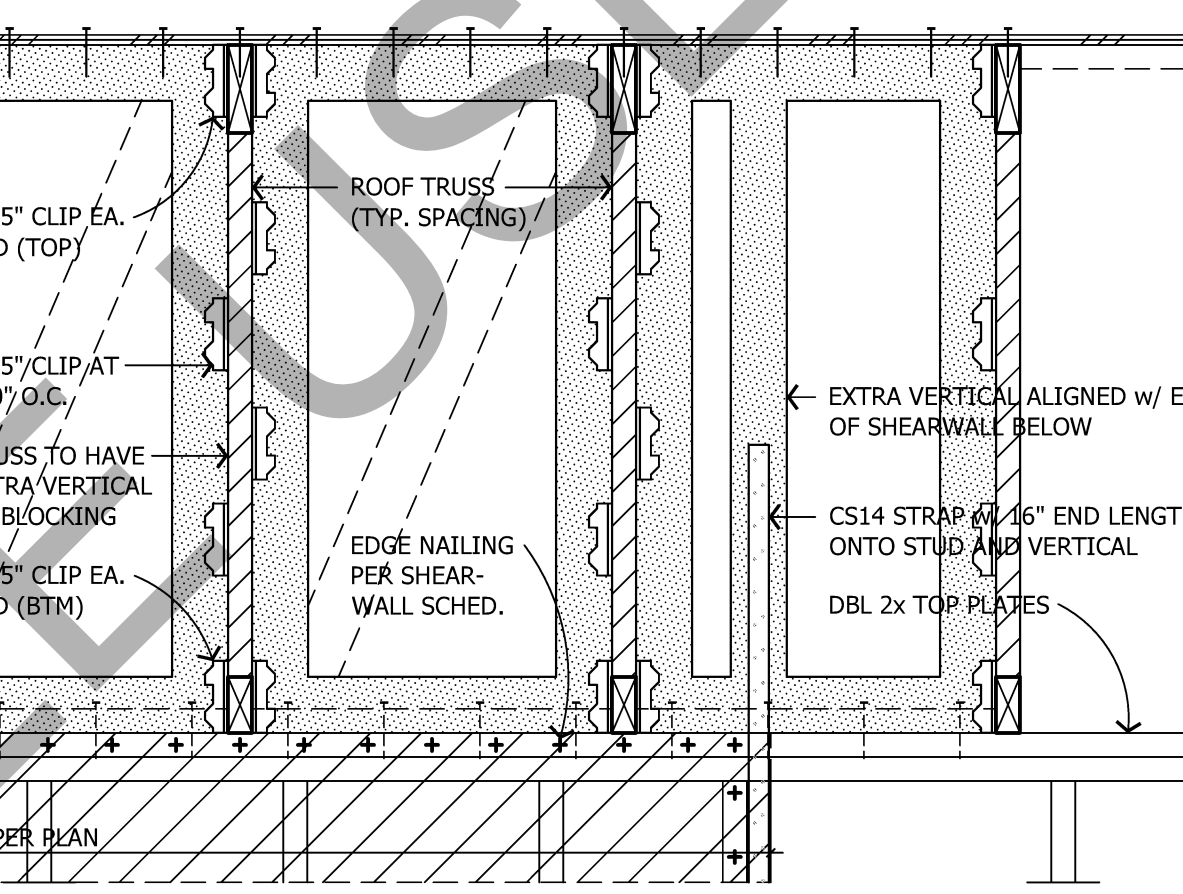
412 PARALLEL TRUSS TO INTERIOR SHEARWALL



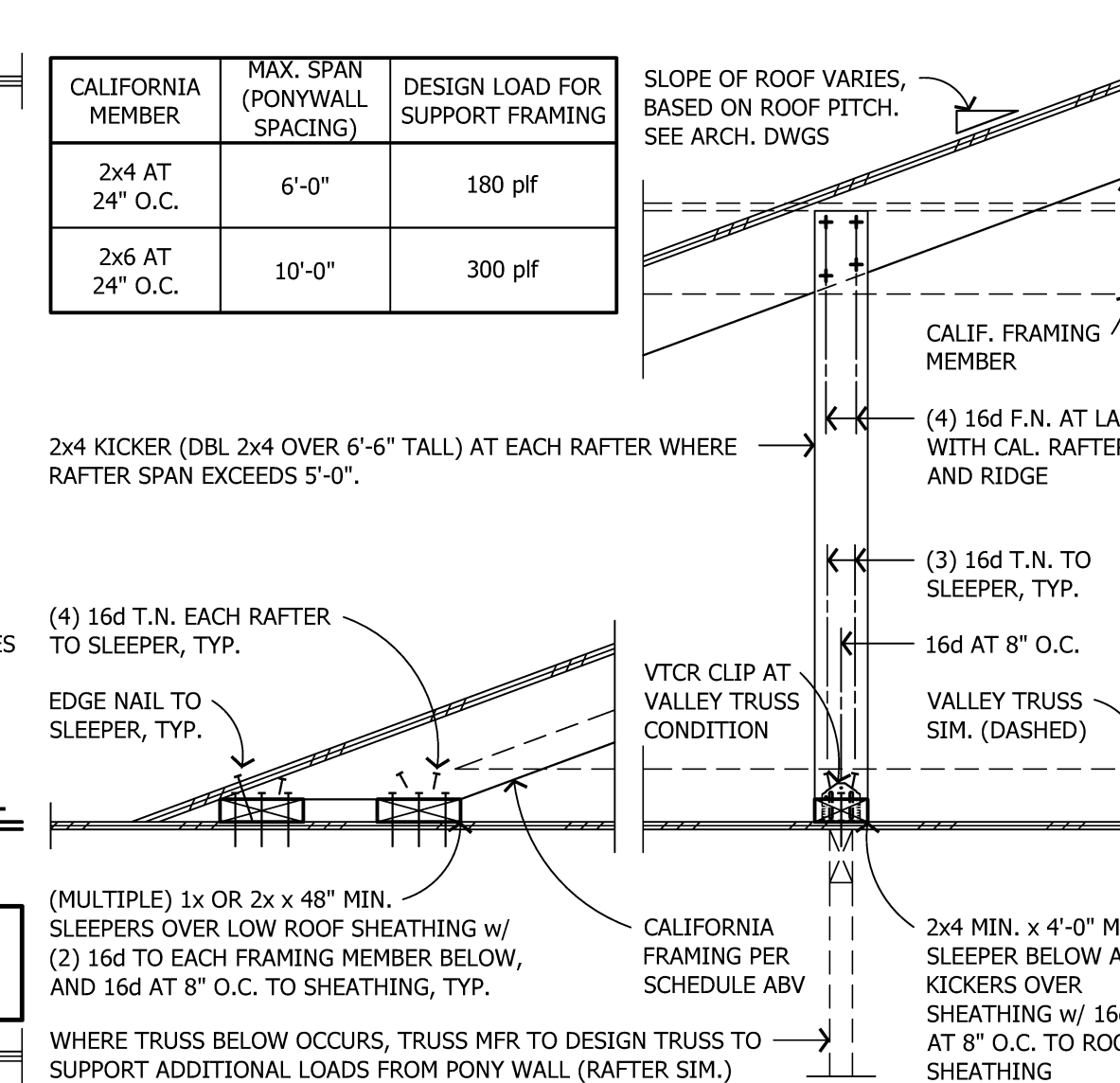
417 ROOF TRUSSES AT HVAC / ATTIC ACCESS



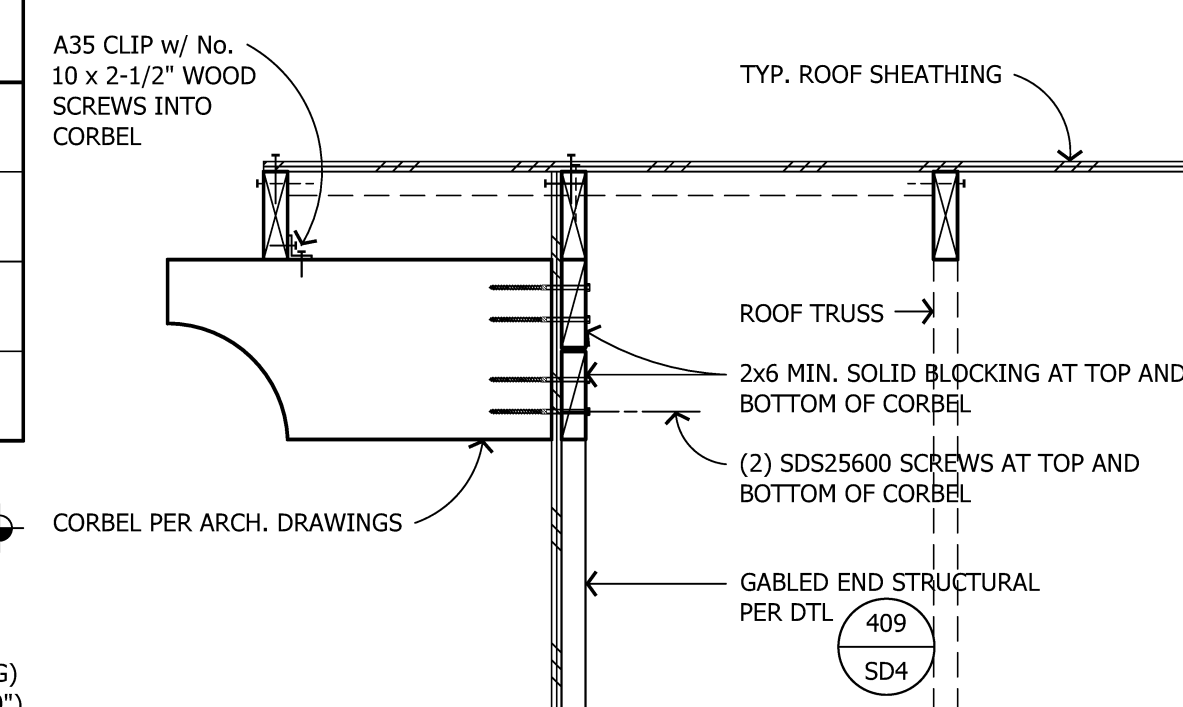
404 TRUSS TO INTERIOR BEARING WALL



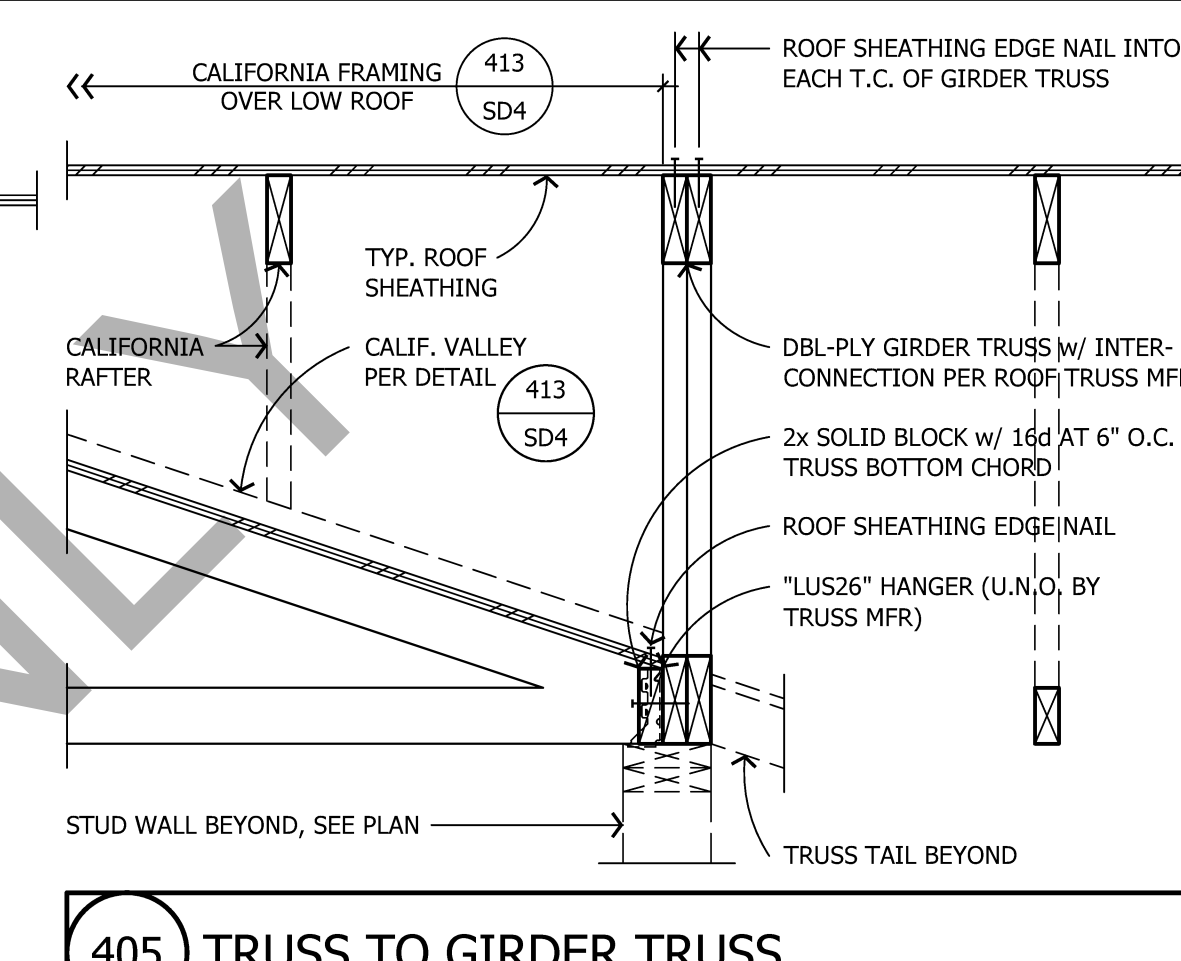
408 FABRICATED TRUSS BLOCKING PANEL ELEVATION ABOVE SHEARWALL



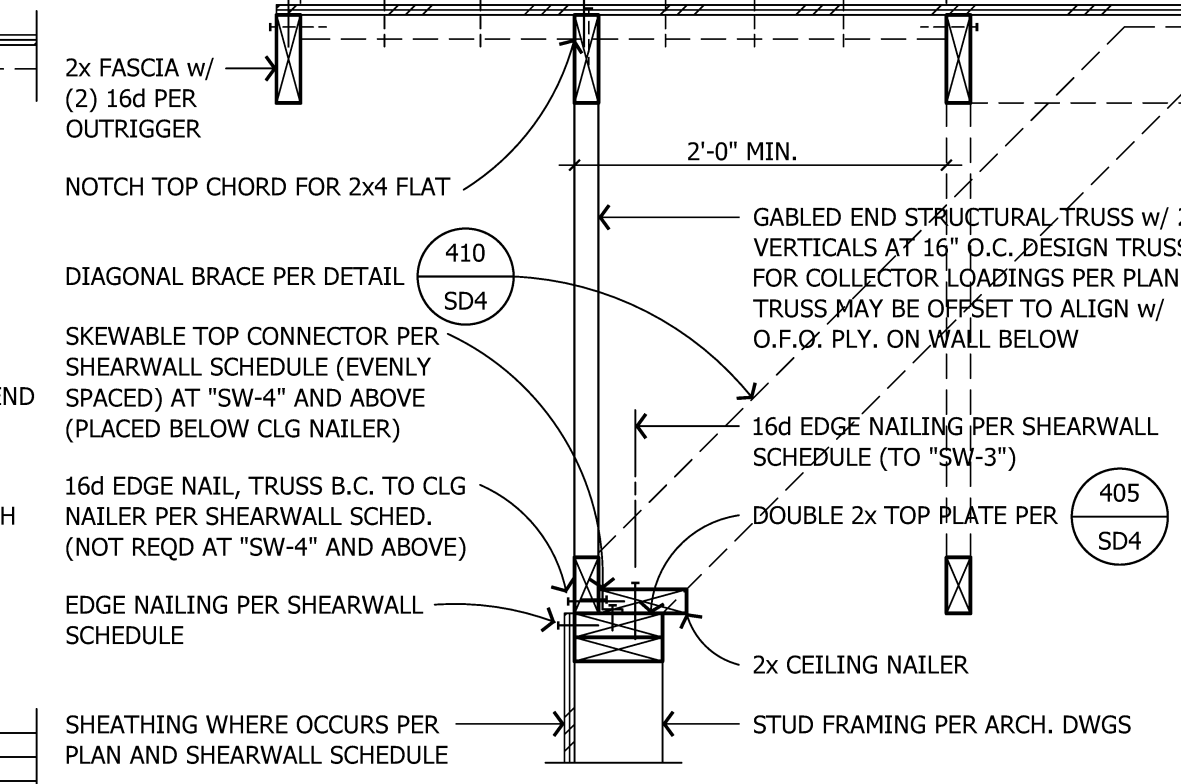
413 CALIFORNIA FRAMING DETAIL



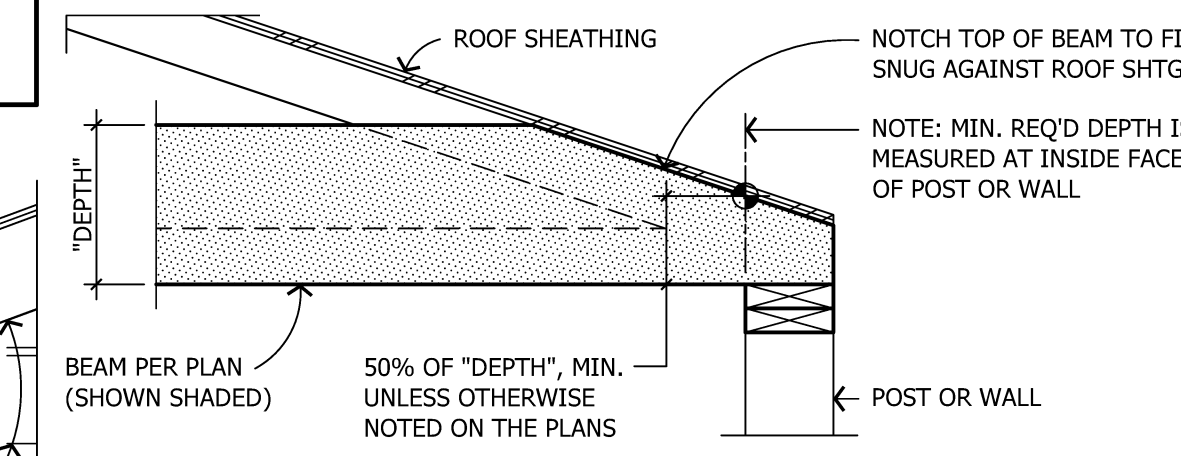
418 CORBEL BEAM AT GABLED END TRUSS



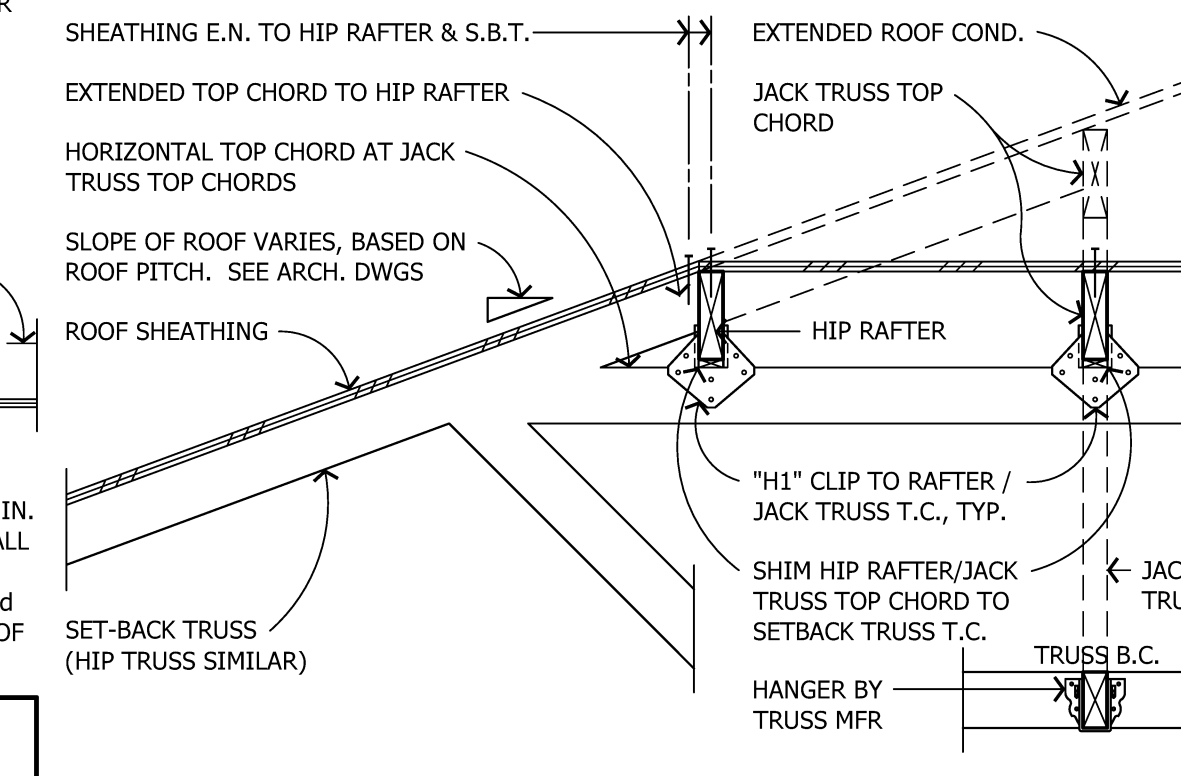
405 TRUSS TO GIRDER TRUSS



409 GABLED END TRUSS



414 SHAPED TOP OF BEAM AT EAVE



419 CONNECTION AT SET-BACK TRUSS

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3381 Walnut Blvd. Ste. 220
Brentwood, CA 94513
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Engineering Seal:

REGISTERED PROFESSIONAL ENGINEER
J. Peek
CIVIL
EXP. 12/31/2024
State of California

Sheet Description:
ROOF FRAMING DETAILS

Scale: 1" = 1'-0"

Initial Issue Date: March 24, 2023

Drawn By: E. Bennett

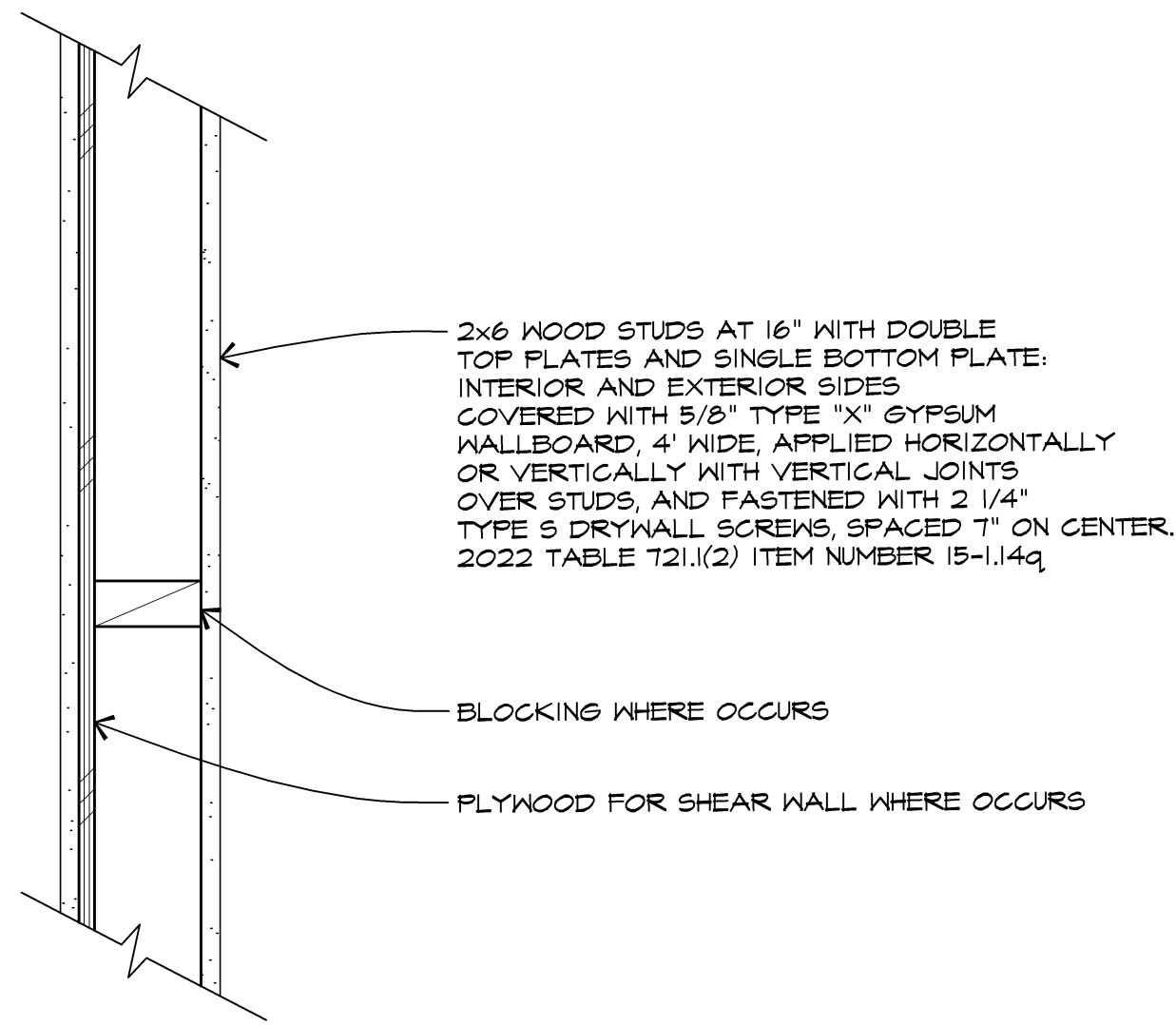
Project Designer: J. Peek

Project Manager: J. Peek Ext. 23

Job No. W021420

Sheet No.

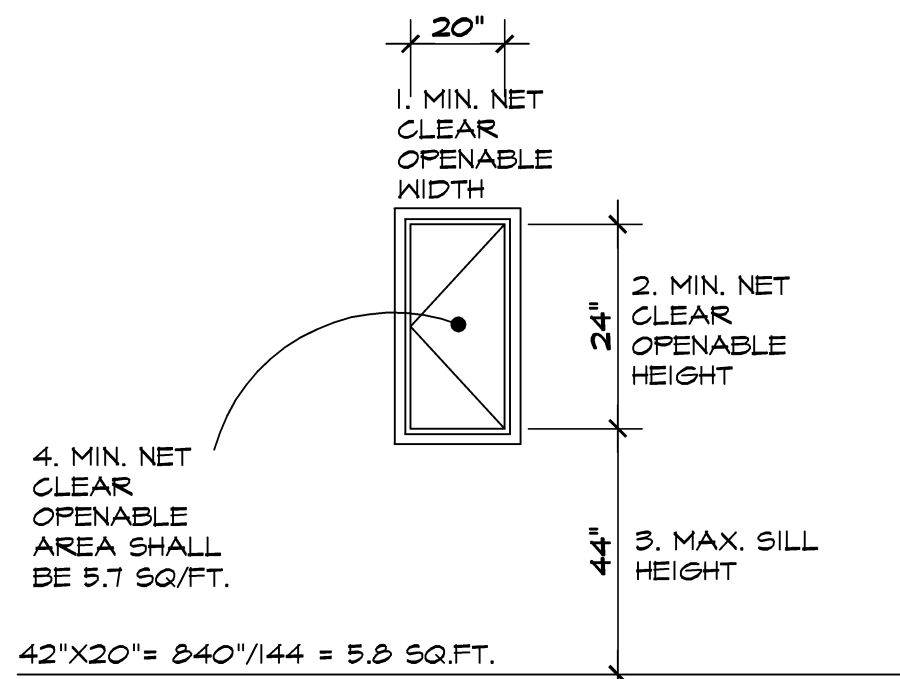
SD4



1 1 HOUR FIRE RATED WALL DETAIL
A1

- NOTES:
- 1) ALL NEW EXTERIOR WALLS TO BE 2x6 FRAMED STUD WALLS.
 - 2) WINDOWS MARKED W/ (T) SHALL BE TEMPERED SAFETY GLASS.
 - 3) ALL WINDOW HEAD HTS. SHALL BE 8'-0" TYP., U.N.O.
 - 4) ALL WINDOWS MARKED "EGRESS" SHALL MEET MIN. EMERGENCY EGRESS WINDOW STANDARDS OF MIN. NET CLEAR OPENING OF 5.7 SQ. FT. & MIN. NET CLEAR HEIGHT OF 24" & MIN. NET CLEAR WIDTH OF 34" CONTRACTOR SHALL VERIFY W/ WINDOW MANUFACTURER.
 - 5) THERE MUST BE AT LEAST 15" INCHES BETWEEN THE CENTER OF PLUMBING FIXTURES SUCH AS WATER CLOSETS OR SINKS AND THE NEAREST WALL OR OBJECT.
 - 6) CONTRACTOR SHALL VERIFY LOCATION & NUMBER OF A/C UNITS W/ OWNER. PROVIDE 4" CONC. SLAB W/ #10 W.K.M. ALL NECESSARY PLUMBING & ELECTRICAL.
 - 7) MINIMUM OF 36-INCH DEEP LANDING IS REQUIRED IN DIRECTION OF TRAVEL. MAXIMUM RISE OF STEP IS 7.75-INCH.
 - 8) BATHTUB AND SHOWER FLOORS AND WALLS ABOVE BATHTUBS WITH INSTALLED SHOWER HEADS AND IN SHOWER COMPARTMENTS SHALL BE FINISHED WITH NONABSORBENT SURFACE. SUCH WALL SURFACES SHALL EXTEND TO A HEIGHT OF NOT LESS THAN 6 FEET ABOVE THE FLOOR, CRC R307.2.
 - 9) GYPSUM BOARD SHALL NOT BE USED WHERE THERE WILL BE DIRECT EXPOSURE TO WATER, OR IN AREAS SUBJECT TO CONTINUOUS HIGH HUMIDITY, CRC T02.3.1.

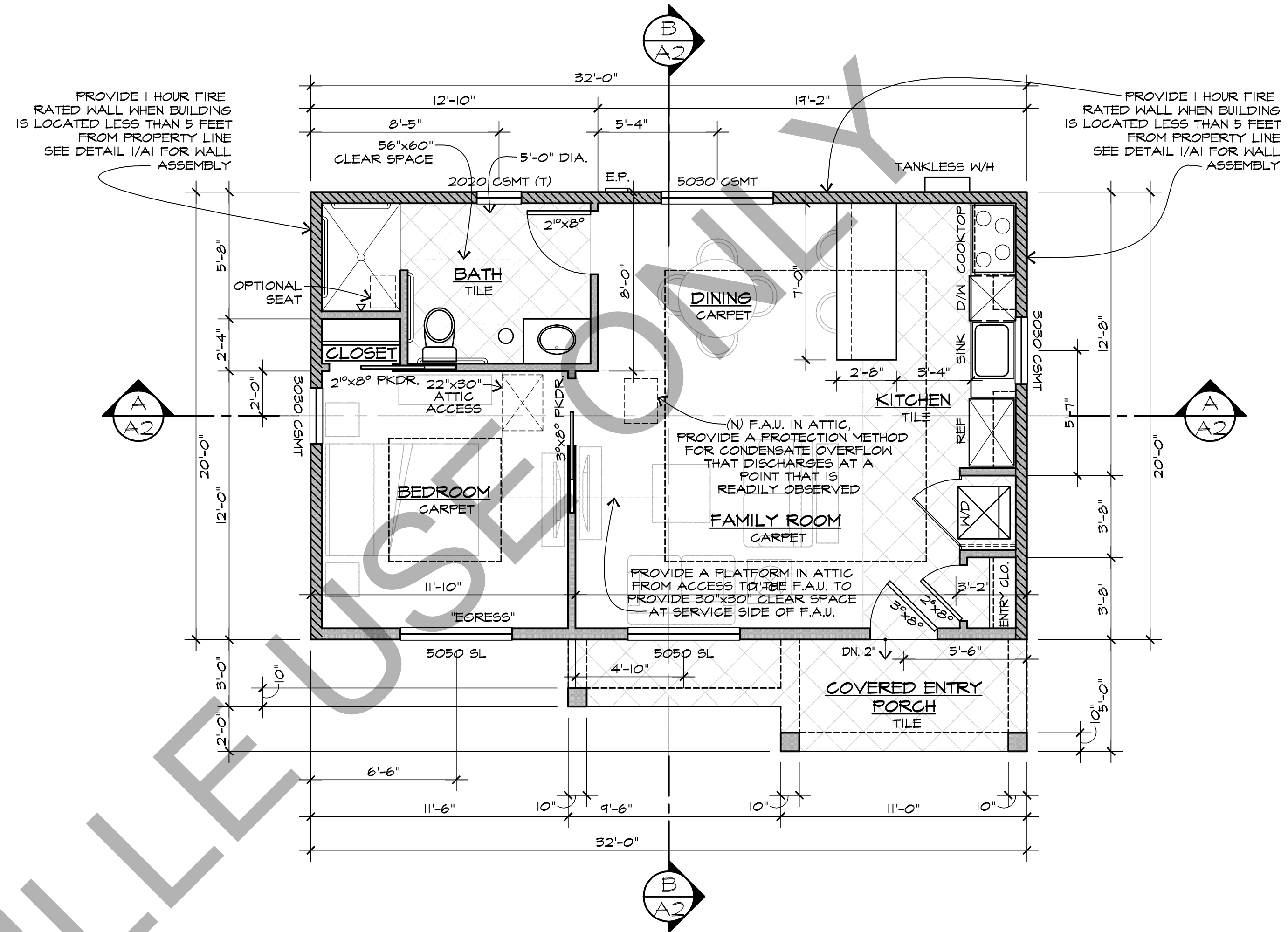
* EGRESS WINDOW DETAIL
EGRESS WINDOWS SHALL COMPLY W/ ALL 4 CONDITIONS ILLUSTRATED BELOW.



ESCAPE OR RESCUE WINDOWS SHALL HAVE A MINIMUM NET CLEAR OPENABLE AREA OF 5.7 SQ.FT. (0.53 M²). (EXCEPTION: THE MINIMUM NET CLEAR OPENING FOR EMERGENCY ESCAPE AND RESCUE GRADE-FLOOR OPENINGS SHALL BE 5 SQUARE FEET (0.46M²). THE MINIMUM NET CLEAR OPENABLE HEIGHT DIMENSION SHALL BE 24 INCHES (610 MM). THE MINIMUM NET CLEAR OPENABLE WIDTH DIMENSION SHALL BE 20 INCHES (508 MM). THE NET CLEAR OPENINGS DIMENSIONS SHALL BE THE RESULT OF NORMAL OPERATION OF THE OPENING.

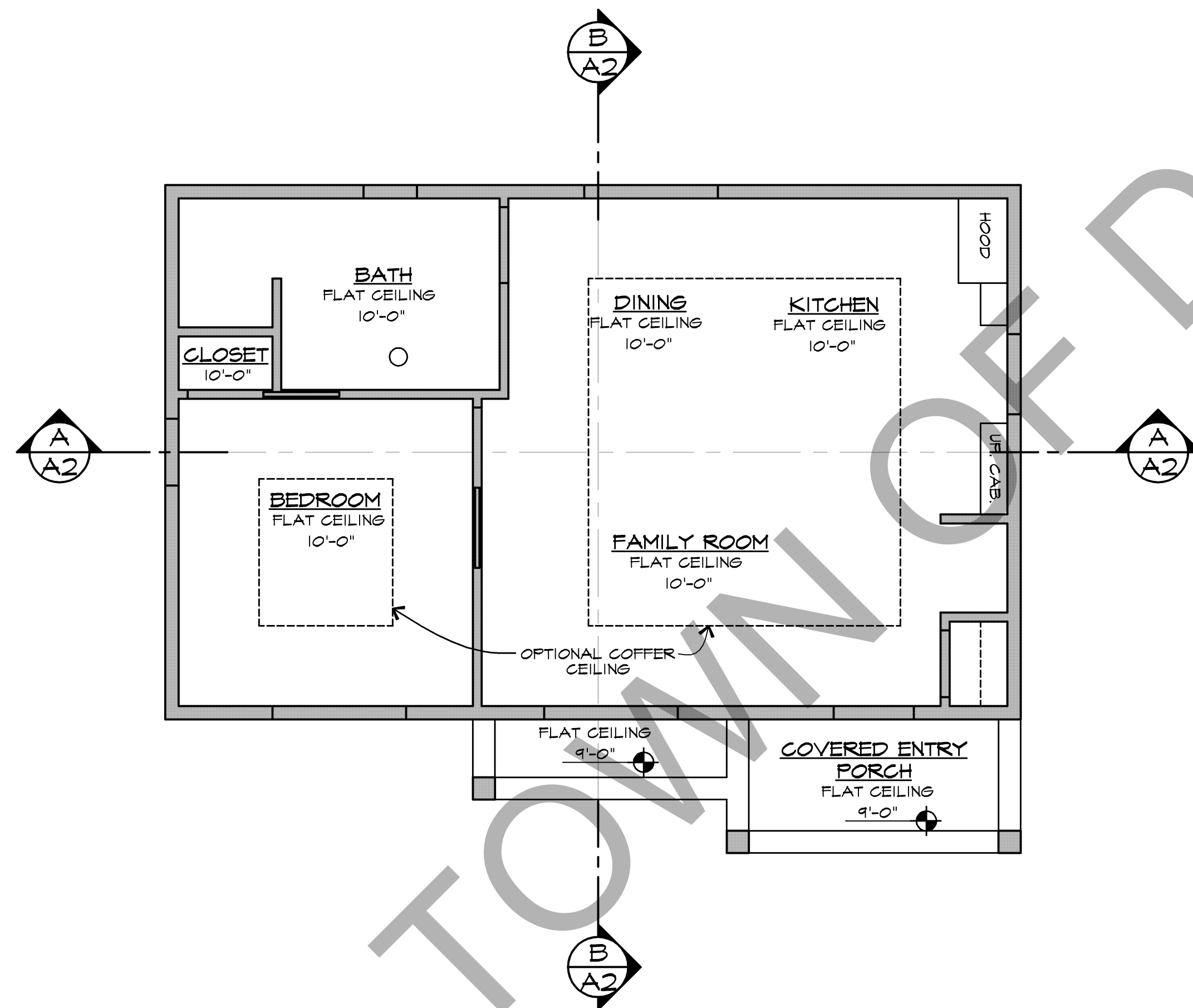
WHEN WINDOWS ARE PROVIDED AS A MEANS OF ESCAPE OR RESCUE, THEY SHALL HAVE A FINISHED SILL HEIGHT NOT MORE THAN 44 INCHES (1118 MM) ABOVE THE FLOOR, CRC SECTION R310.1, R310.1.1, R310.1.2, R310.1.3, AND R310.1.4.

CONTRACTOR NOTE: CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL EGRESS REQUIREMENTS.



FLOOR PLAN (STUDIO) (MEDITERRANEAN STYLE)

SCALE: 1/4" = 1'-0"

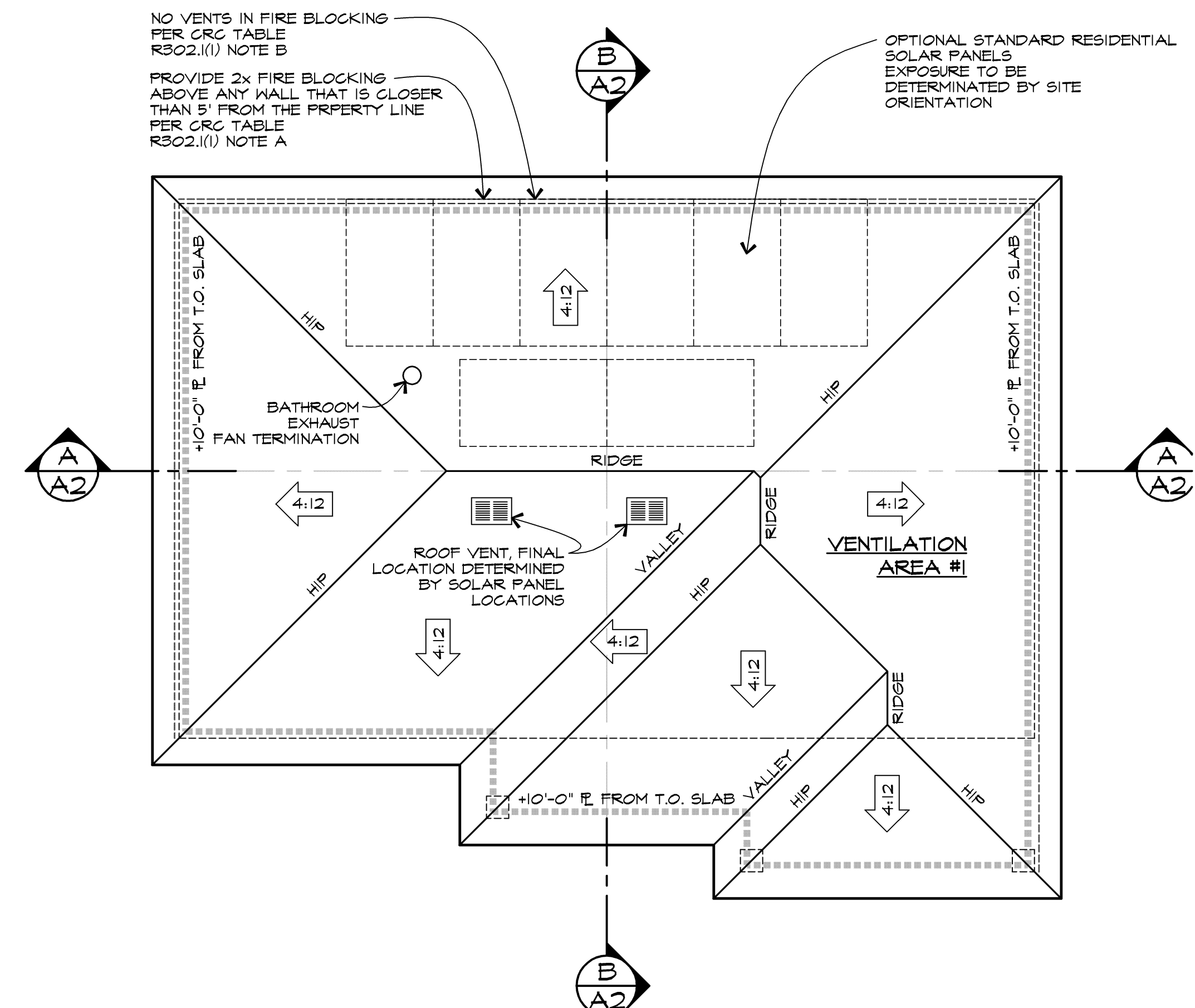


REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

VENTILATION CALCULATIONS

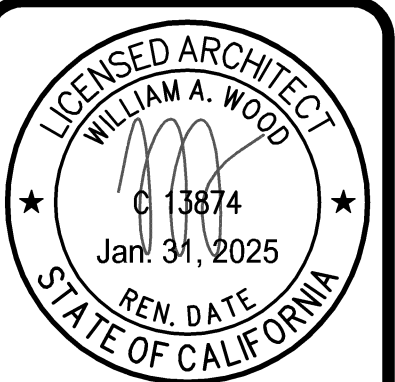
- AREA |
- * ATTIC AREA: 724 SQ. FT.
 - * REQUIRED AREA: 347.5 SQ. IN. (CONVERTED TO INCHES @ 1/300)
 - * UPPER AREA: 173.75 SQ. IN. (50% REQUIRED IN UPPER 1/3)
 - * PROVIDE 173.75 SQ. IN. IN UPPER 1/3 OFF ROOF WITH CHAGINS "FLAT" VENT (98.75 SQ. IN. FREE AREA) * 2 VENTS REQUIRED
 - * LOWER AREA: 173.75 SQ. IN. (50% REQUIRED IN LOWER 1/3)
 - * TO BE PROVIDED BY 25 VENTED FRIEZE BLOCKS MIN. (7 SQ. IN. FREE VENTING PER BLOCK VIA 3-2" DIA. HOLES)



ROOF PLAN

SCALE: 1/4" = 1'-0"

REVISIONS	DATE



DANVILLE ACCESSORY
DWELLING UNITS - STUDIO

DANVILLE CA 94526

WILLIAM WOOD
ARCHITECTS

301 HARTZ AVENUE, SUITE 203
DANVILLE, CALIFORNIA 94526
(925) 820-8233

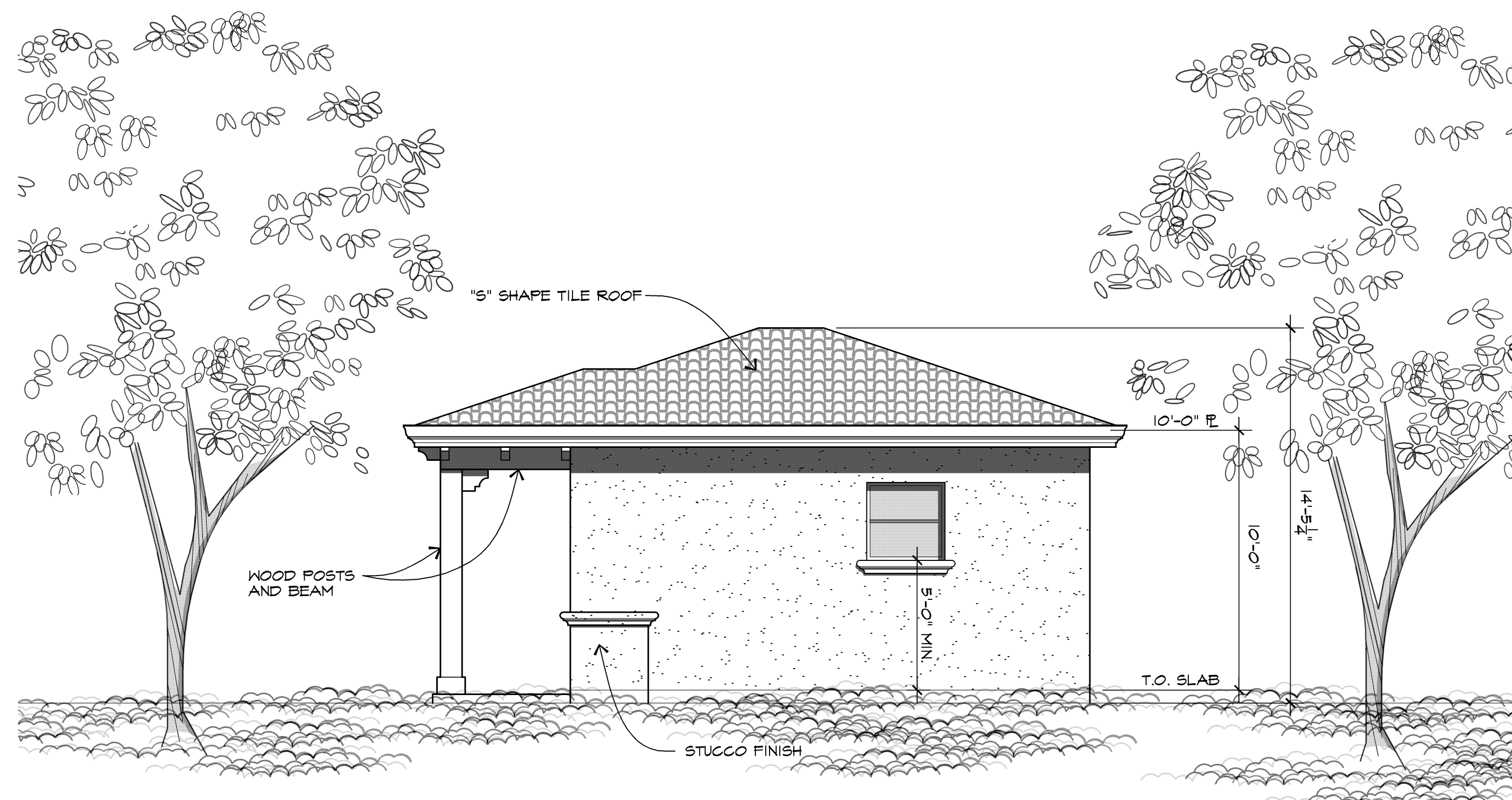
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JOB NO. 20.921R
SHEET A2
OF SHEETS

Apr 26, 2023 - 4:50pm A2 Studio Mediterranean style.dwg

PLAN SET ID: S-ME-M-F



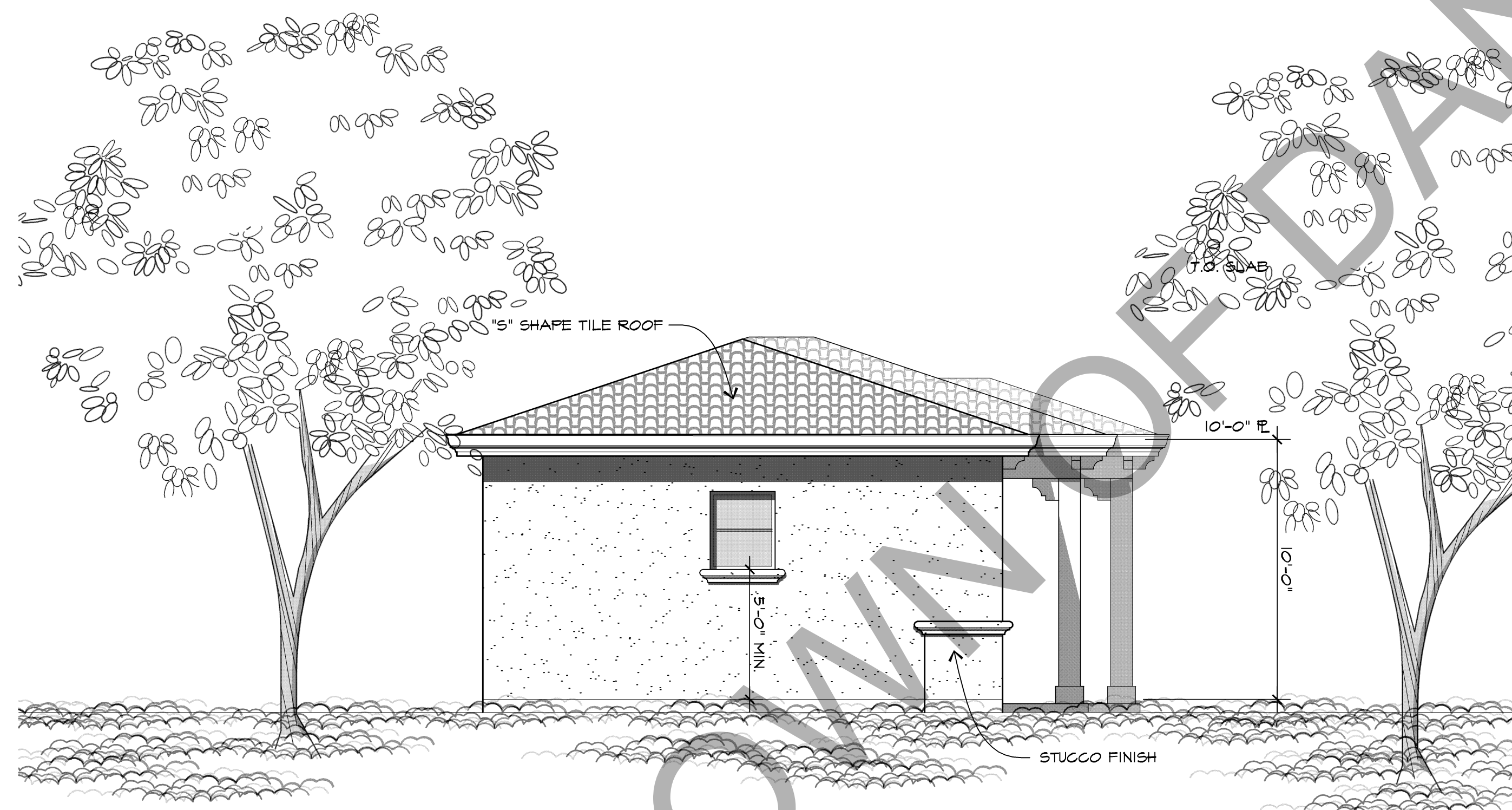
RIGHT ELEVATION (MEDITERRANEAN STYLE)

SCALE: 1/4" = 1'-0"



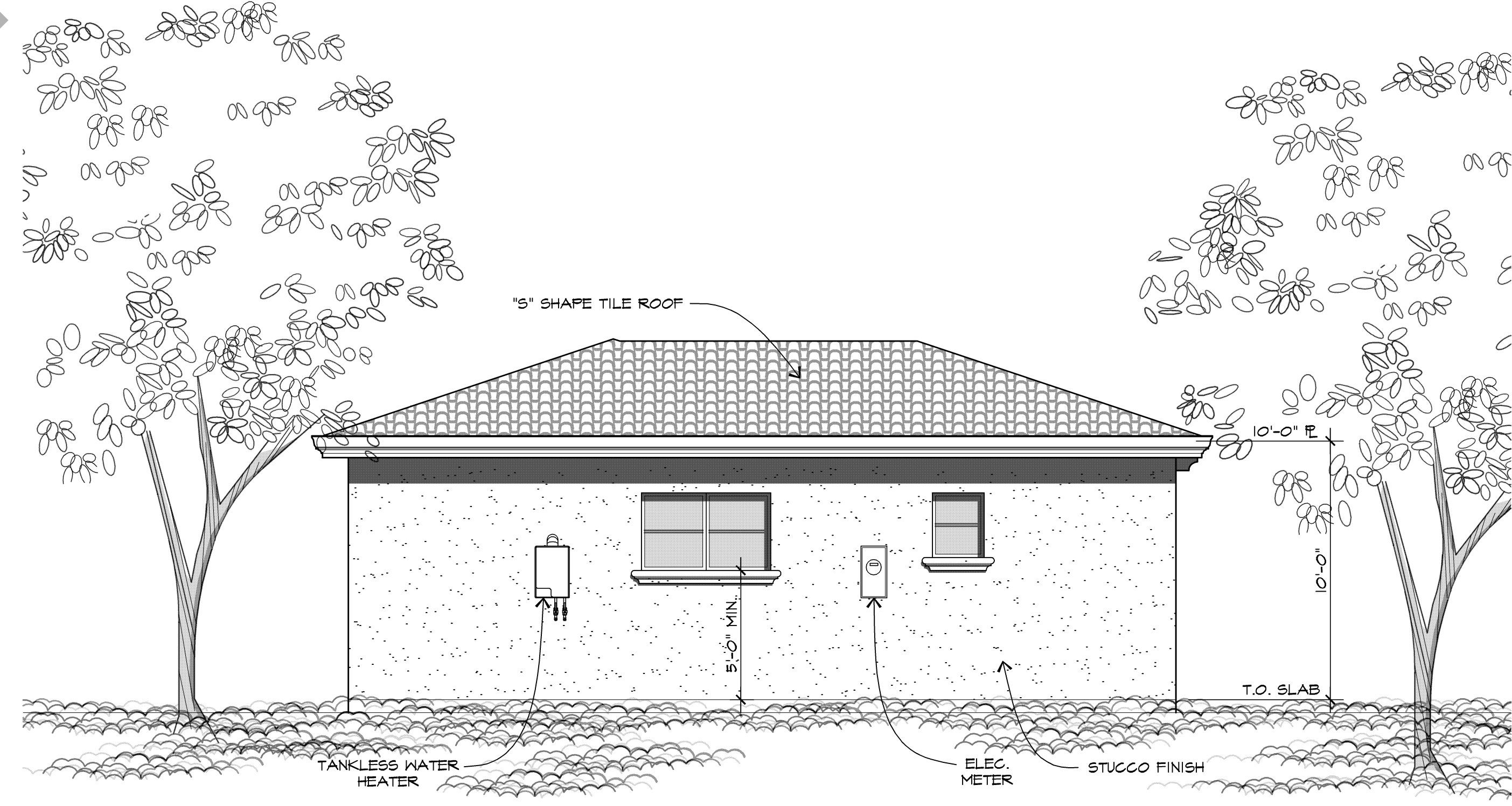
FRONT ELEVATION (MEDITERRANEAN STYLE)

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION (MEDITERRANEAN STYLE)

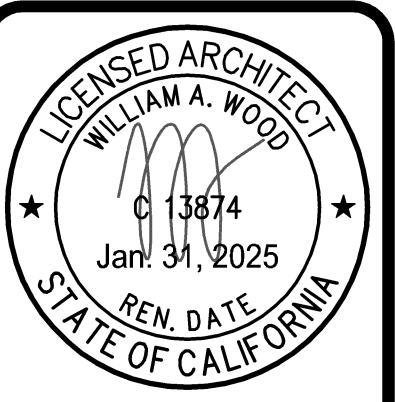
SCALE: 1/4" = 1'-0"



REAR ELEVATION (MEDITERRANEAN STYLE)

SCALE: 1/4" = 1'-0"

REVISIONS	DATE



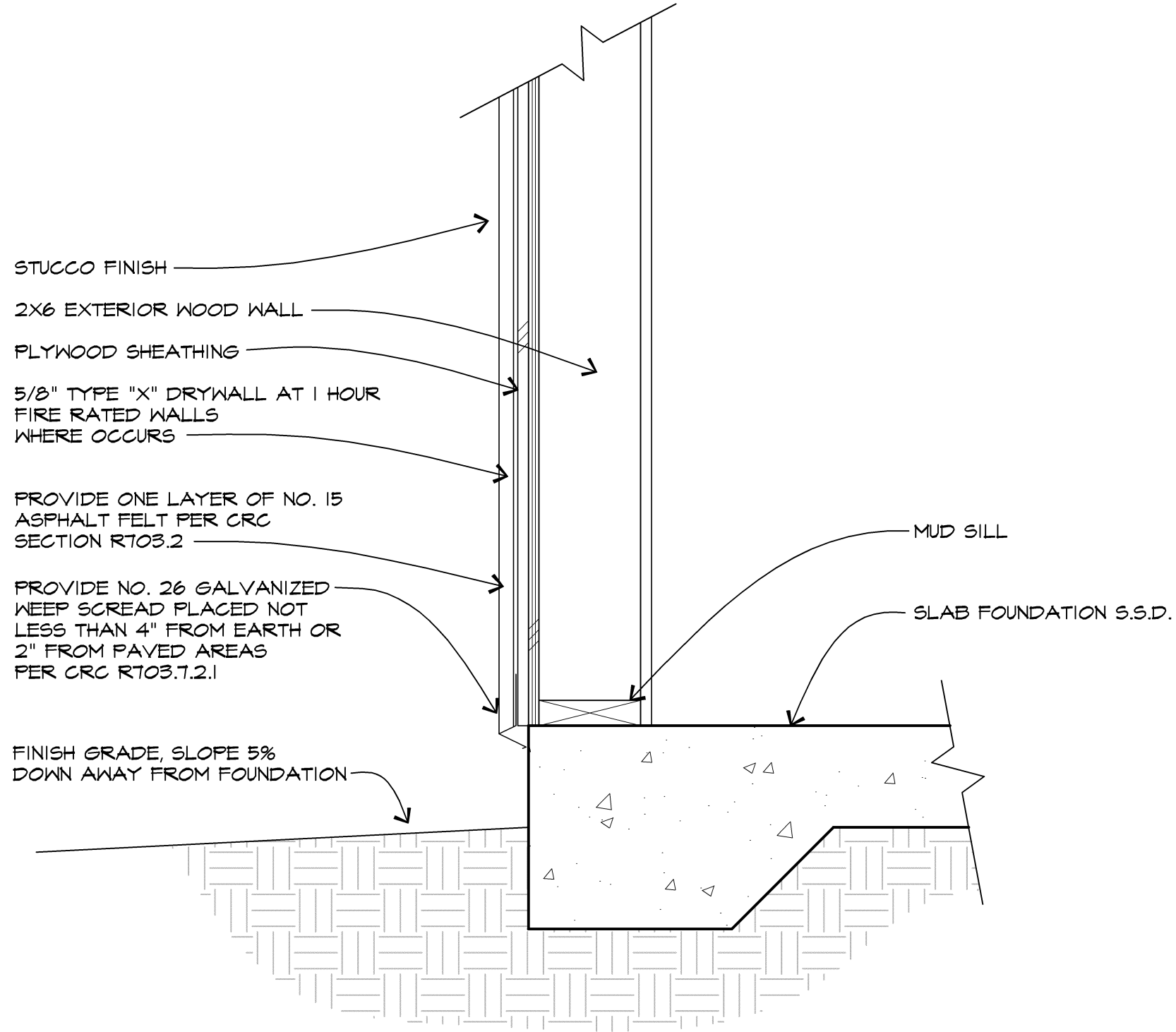
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ARCHITECTS
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OF SHEETS

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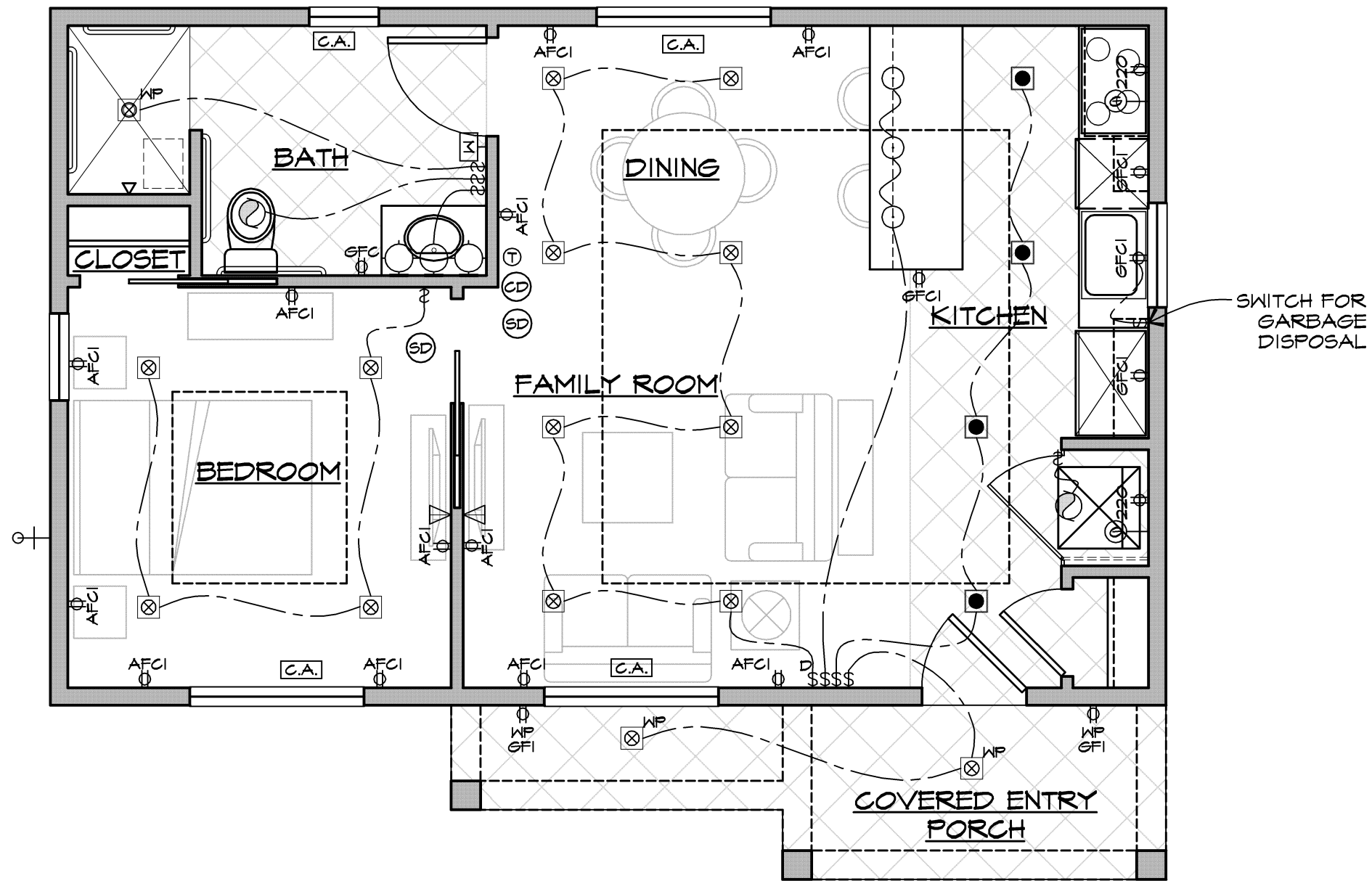


TYPICAL WALL DETAIL

SCALE: 1 1/2" = 1'-0"

- ELECTRICAL/MECHANICAL KEY**
- SWITCHED RECEPTACLE OUTLET @ 12" U.N.O.
 - AFCI DUPLEX RECEPTACLE OUTLET @ 12" U.N.O. W/ ARC-FAULT CIRCUIT INTERRUPTER
 - GFCI DUPLEX RECEPTACLE OUTLET W/ GROUND FAULT CIRCUIT INTERRUPTER
 - WEATHER PROOF DUPLEX RECEPTACLE OUTLET (GFCI PROTECTED PER NEC210-8(a)3)
 - 220V DUPLEX RECEPTACLE OUTLET - 220 VOLT
 - \$ SINGLE POLE SWITCH @ 48" U.N.O.
 - 3W THREE-WAY SWITCH
 - SWD SWITCH W/ DIMMER
 - SL SWITCH W/ MOTION LIGHT
 - MOTION SENSOR
 - CEILING MOUNTED LIGHT FIXTURE
 - WALL MOUNTED LIGHT FIXTURE
 - WALL MOUNTED LIGHT FIXTURE - SHALL BE SUITABLE FOR DAMP LOCATIONS
 - HANGING LIGHT
 - RECESSED LED CEILING LIGHT FIXTURE
 - RECESSED LED LOW VOLTAGE CEILING LIGHT
 - RECESSED LIGHT FIXTURE - SHALL BE LABELED SUITABLE FOR DAMP LOCATIONS
 - EXHAUST FAN
 - SMOKE DETECTOR - (110V W/ BATTERY BACK-UP) HARD WIRED & INTERCONNECTED
 - CARBON MONOXIDE DETECTOR - (110V W/ BATTERY BACK-UP) HARD WIRED & INTERCONNECTED
 - TELEVISION OUTLET
 - HOSE BIBB (1/2" CW) W/ NON-REMOVABLE ANTI-SIPHON DEVICE (FOR OUTSIDE BIBB)
 - GAS OUTLET
 - THERMOSTAT
 - CEILING SUPPLY AIR REGISTER
 - FLOOR AIR SUPPLY REGISTER
 - COLD AIR RETURN @ CEILING

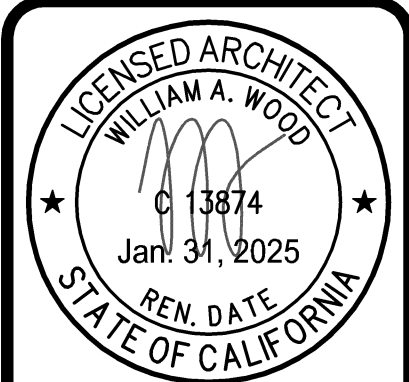
- ELECTRICAL NOTES**
- THERMOSTAT LOCATION TO BE DETERMINED BY HVAC DESIGNER.
 - CEILING AIR REGISTERS TO BE DETERMINED BY HVAC DESIGNER.
 - KITCHEN & BATHROOM LIGHTING SHALL MEET EFFICIENCY REQUIREMENT OF 2022 TITLE 24.
 - CONTRACTOR TO PROVIDE A COLD WATER CONNECTION @ THE REFRIGERATOR.
 - CONTRACTOR TO PROVIDE THE OPTION OF GAS OR 220V @ THE COOK TOP (VERIFY W/ OWNER).
 - WATER CLOSETS TO BE MAX 1.28 GALLONS PER FLUSH PER CAL GREEN SECTION 4.303.1.1.
 - INSTALLATION INSTRUCTIONS FOR ALL EQUIP. SHALL BE PROVIDED TO THE FIELD INSPECTOR @ THE TIME OF INSPECTION.
 - PROVIDE TWO SMALL APPLIANCE BRANCH CIRCUITS FOR THE KITCHEN AND ARE LIMITED TO SUPPLYING WALL AND COUNTER SPACE OUTLETS FOR THE KITCHEN, PANTRY, BREAKFAST ROOM, DINING ROOM, OR SIMILAR AREAS. NOTE: THESE CIRCUITS CANNOT SERVE OUTSIDE PLUGS, RANGE HOOD, DISPOSALS, DISHWASHERS OR MICROWAVES-ONLY THE REQUIRED COUNTERTOP/WALL OUTLETS INCLUDING THE REFRIGERATOR.
 - PROVIDE A DEDICATED 20-AMP BRANCH CIRCUIT TO SUPPLY THE LAUNDRY RECEPTACLE OUTLET.
 - PROVIDE AN ARC-FAULT CIRCUIT INTERRUPTER TO PROTECT ALL RECEPTACLES IN THE BEDROOMS.
 - PROVIDE RECEPTACLE OUTLETS IN FOLLOWING LOCATIONS:
 - A. AT EACH KITCHEN AND DINING AREA COUNTER SPACE WIDER THAN 12" LOCATED SO THAT NO POINT ALONG THE COUNTER WALL IS OVER 24" FROM A RECEPTACLE.
 - B. AN EXTERIOR RECEPTACLES AT THE FRONT AND REAR OF THE HOME. THEY MUST BE WITHIN 6 FEET, 6 INCHES OF GRADE AND WATERPROOF.
 - C. ONE RECEPTACLE FOR THE LAUNDRY, (I.E. WASHER).
 - D. IN ANY HALLWAY 10 FT OR MORE IN LENGTH.
 - KITCHEN COUNTERTOP RECEPTACLES SHALL BE LOCATED ABOVE THE COUNTERTOP NOT MORE THAN 18", AND MAY NOT BE INSTALLED FACE-UP IN THE COUNTER.
 - ALL LIGHT FIXTURE IN TUB OR SHOWER ENCLOSURES SHALL BE LABEL "SUITABLE FOR DAMP LOCATIONS" AND IF CEILING HEIGHT IS > 8 FT. BE PROTECTED BY GFCI.
 - AN APPROVED CARBON MONOXIDE ALARM SHALL BE INSTALLED IN DWELLING UNITS AND IN SLEEPING UNITS WITHIN WHICH FUEL-BURNING APPLIANCES ARE INSTALLED. CARBON MONOXIDE ALARMS REQUIRED BY SECTIONS R315.1 AND R315.2 SHALL BE INSTALLED IN THE FOLLOWING LOCATIONS: OUTSIDE OF EACH SEPARATE DWELLING UNIT SLEEPING ARE IN THE IMMEDIATE VICINITY OF THE BEDROOM(S); ON EVERY LEVEL OF A DWELLING UNIT INCLUDING BASEMENTS. CARBON MONOXIDE ALARMS COMBINED WITH SMOKE ALARMS SHALL COMPLY WITH SECTION R315, ALL APPLICABLE STANDARDS, AND REQUIREMENTS FOR LISTING AND APPROVAL BY THE OFFICE OF THE STATE FIRE MARSHALL, FOR SMOKE ALARMS.
 - EXHAUST FANS TO BE 50 CFM INTERMITTENT OR 20 CFM CONTINUOUS. IN WATER CLOSETS, 50 CFM CONTINUOUS.
 - ALL RECEPTACLES IN THE BATHROOMS, UTILITY ROOMS, KITCHEN COUNTERS, KITCHEN ISLAND, GARAGE (INCLUDING CEILING MOUNTED) AND ALL EXTERIOR LOCATIONS ARE TO BE GFCI PROTECTED CEC 210.8(a).
 - CONDUIT IN CONCRETE SLAB IS TO BE RATED FOR WET LOCATIONS. CEC 430.
 - PROVIDE DEDICATED CIRCUITS FOR FOR BATHROOM CIRCUITS SERVING ONLY THE RECEPTACLES PER CEC20.11(a)3.
 - PROVIDE TAMPER RESISTANT RECEPTACLES IN ALL NEW CIRCUITS PER CEC SECTION 406.12, & 406.4(D)(5).
 - OUTDOOR LIGHTS TO BE "HIGH EFFICACY" OR "LOW EFFICACY" AND ON PHOTO/MOTION SENSOR PER CA ENERGY SECTION 150.0(K)4A.
 - HOSE BIBBS SHALL HAVE NON-REMOVABLE BACKFLOW PREVENTER OR BIBB-TYPE VACUUM BREAKER.
 - WATER CLOSETS TO BE 1.28 GALLONS PER FLUSH MAXIMUM OR DUAL FLUSH PER CFC 411.2.
 - KITCHEN FAUCET TO BE 1.8 GALLONS PER MINUTE, MAXIMUM PER CFC 4.303.1.4.4.
 - LAVATORY FAUCET TO BE 1.2 GALLONS PER MINUTE, MAXIMUM, PER CFC 407.2.2.
 - SHOWER HEADS TO BE 1.8 GALLONS PER MINUTE AT 80 PSI, MAXIMUM, PER CFC 403.3.



ELECTRICAL/ MECHANICAL PLAN

SCALE: 1/4" = 1'-0"

REVISIONS	DATE



DANVILLE ACCESSORY
DWELLING UNITS - STUDIO

DANVILLE CA 94526

WILLIAM WOOD
ARCHITECTS

301 HARTZ AVENUE, SUITE 203
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Apr 26, 2025 - 4:12pm A4 Studio Mediterranean style.dwg

BUILDING ENERGY ANALYSIS REPORT

PROJECT:

Town of Danville ADU
Danville, CA 94526

Project Designer:

William Wood Architects
301 Hartz Ave #203
Danville, CA 94526
(925) 820-8233

Report Prepared by:

Jason Bennett
DP Advanced Engineering Inc.
3381 Walnut Blvd. Suite 220
Brentwood, CA 94513
(925) 516-3502

Job Number:

W021420

Date:

March 31, 2023

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

CF1R-PRF-01E

Project Name: Danville ADU Mediterranean Studio

Calculation Date/Time: 2023-03-30T18:09:40-07:00

(Page 1 of 13)

Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

GENERAL INFORMATION					
01	Project Name	Danville ADU Mediterranean Studio			
02	Run Title	Title 24 Analysis			
03	Project Location	Varies			
04	City	Danville, CA	05	Standards Version	2022
06	Zip code	94526	07	Software Version	CBECC-Res 2022.2.1
08	Climate Zone	12	09	Front Orientation (deg/ Cardinal)	All orientations
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	Newly Constructed	13	Number of Bedrooms	1
14	Addition Cond. Floor Area (ft ²)	0	15	Number of Stories	1
16	Existing Cond. Floor Area (ft ²)	n/a	17	Fenestration Average U-factor	0.31
18	Total Cond. Floor Area (ft ²)	640	19	Glazing Percentage (%)	17.30%
20	ADU Bedroom Count	n/a			

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

Registration Number:

223-P010038752B-000-000-00000000-0000

Registration Date/Time:

2023-03-31 08:35:29

HERS Provider:

CalCERTS inc.

CA Building Energy Efficiency Standards - 2022 Residential Compliance

Report Version: 2022.0.000

Schema Version: rev 20220901

Report Generated: 2023-03-30 18:11:02

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
CF1R-PRF-01E
Project Name: Danville ADU Mediterranean Studio

Calculation Date/Time: 2023-03-30T18:09:40-07:00

(Page 2 of 13)
Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

ENERGY DESIGN RATINGS						
	Energy Design Ratings			Compliance Margins		
	Source Energy (EDR1)	Efficiency ¹ EDR (EDR2efficiency)	Total ² EDR (EDR2total)	Source Energy (EDR1)	Efficiency ¹ EDR (EDR2efficiency)	Total ² EDR (EDR2total)
Standard Design	41.1	44.5	58.9			
Proposed Design						
North Facing	33.8	40.5	56.6	7.3	4	2.3
East Facing	34	41.5	57.2	7.1	3	1.7
South Facing	33.5	39.7	56	7.6	4.8	2.9
West Facing	34.1	43.3	58.2	7	1.2	0.7
RESULT ³ : PASS						
¹ Efficiency EDR includes improvements like a better building envelope and more efficient equipment ² Total EDR includes efficiency and demand response measures such as photovoltaic (PV) system and batteries ³ Building complies when source energy, efficiency and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded						
- Standard Design PV Capacity: 0.00 kWdc - Proposed PV Capacity Scaling: North (0.00 kWdc) East (0.00 kWdc) South (0.00 kWdc) West (0.00 kWdc)						

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CF1R-PRF-01E
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Calculation Date/Time: 2023-03-30T18:09:40-07:00

(Page 3 of 13)
Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

ENERGY USE SUMMARY						
Energy Use	Standard Design Source Energy (EDR1) (kBtu/ft ² -yr)	Standard Design TDV Energy (EDR2) (kTDV/ft ² -yr)	Proposed Design Source Energy (EDR1) (kBtu/ft ² -yr)	Proposed Design TDV Energy (EDR2) (kTDV/ft ² -yr)	Compliance Margin (EDR1)	Compliance Margin (EDR2)
Space Heating	7.13	31.36	3.2	24.6	3.93	6.76
Space Cooling	1.06	31.57	0.99	33.14	0.07	-1.57
IAQ Ventilation	0.87	9.28	1.38	14.79	-0.51	-5.51
Water Heating	3.59	37.82	2.64	27.67	0.95	10.15
Self Utilization/Flexibility Credit				0		0
North Facing Efficiency Compliance Total	12.65	110.03	8.21	100.2	4.44	9.83
Space Heating	7.13	31.36	3.18	24.18	3.95	7.18
Space Cooling	1.06	31.57	1.15	36.04	-0.09	-4.47
IAQ Ventilation	0.87	9.28	1.38	14.79	-0.51	-5.51
Water Heating	3.59	37.82	2.64	27.67	0.95	10.15
Self Utilization/Flexibility Credit				0		0
East Facing Efficiency Compliance Total	12.65	110.03	8.35	102.68	4.3	7.35

Registration Number:

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Registration Date/Time:

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
CF1R-PRF-01E
Project Name: Danville ADU Mediterranean Studio

Calculation Date/Time: 2023-03-30T18:09:40-07:00

(Page 4 of 13)
Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

ENERGY USE SUMMARY						
Energy Use	Standard Design Source Energy (EDR1) (kBtu/ft ² -yr)	Standard Design TDV Energy (EDR2) (kTDV/ft ² -yr)	Proposed Design Source Energy (EDR1) (kBtu/ft ² -yr)	Proposed Design TDV Energy (EDR2) (kTDV/ft ² -yr)	Compliance Margin (EDR1)	Compliance Margin (EDR2)
Space Heating	7.13	31.36	3.04	23	4.09	8.36
Space Cooling	1.06	31.57	0.99	32.6	0.07	-1.03
IAQ Ventilation	0.87	9.28	1.38	14.79	-0.51	-5.51
Water Heating	3.59	37.82	2.64	27.67	0.95	10.15
Self Utilization/Flexibility Credit				0		0
South Facing Efficiency Compliance Total	12.65	110.03	8.05	98.06	4.6	11.97
Space Heating	7.13	31.36	3.12	23.97	4.01	7.39
Space Cooling	1.06	31.57	1.28	40.58	-0.22	-9.01
IAQ Ventilation	0.87	9.28	1.38	14.79	-0.51	-5.51
Water Heating	3.59	37.82	2.64	27.67	0.95	10.15
Self Utilization/Flexibility Credit				0		0
West Facing Efficiency Compliance Total	12.65	110.03	8.42	107.01	4.23	3.02

Registration Number:

223-P010038752B-000-000-0000000-0000

Registration Date/Time:

2023-03-31 08:35:29

HERS Provider:

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(Page 5 of 13)
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ENERGY USE INTENSITY				
	Standard Design (kBtu/ft ² - yr)	Proposed Design (kBtu/ft ² - yr)	Compliance Margin (kBtu/ft ² - yr)	Margin Percentage
North Facing				
Gross EUI¹	32.25	26.5	5.75	17.83
Net EUI²	32.25	26.5	5.75	17.83
East Facing				
Gross EUI¹	32.25	26.75	5.5	17.05
Net EUI²	32.25	26.75	5.5	17.05
South Facing				
Gross EUI¹	32.25	26.3	5.95	18.45
Net EUI²	32.25	26.3	5.95	18.45
West Facing				
Gross EUI¹	32.25	26.86	5.39	16.71
Net EUI²	32.25	26.86	5.39	16.71
Notes 1. Gross EUI is Energy Use Total (not including PV) / Total Building Area. 2. Net EUI is Energy Use Total (including PV) / Total Building Area.				

Registration Number:

223-P010038752B-000-000-0000000-0000

Registration Date/Time:

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CF1R-PRF-01E

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(Page 6 of 13)

Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

REQUIRED PV SYSTEMS											
01	02	03	04	05	06	07	08	09	10	11	12
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CFI	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt: (x in 12)	Inverter Eff. (%)	Annual Solar Access (%)
0		Standard (14-17%)	Fixed	none	true	n/a	n/a	n/a	n/a	n/a	

REQUIRED SPECIAL FEATURES											
The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.											
- PV exception 2: No PV required when minimum PV size (Section 150.1(c)14) < 1.8 kWdc (0 kW) - Indoor air quality, balanced fan - IAQ Ventilation System Heat Recovery: minimum 67 SRE and 73 ASRE - IAQ Ventilation System: supply outside air inlet, filter, and H/ERV cores accessible per RACM Reference Manual - IAQ Ventilation System: fault indicator display - Insulation below roof deck - Window overhangs and/or fins - Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed											

HERS FEATURE SUMMARY											
The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry											
- Indoor air quality ventilation - Kitchen range hood - Minimum Airflow - Verified SEER/SEER2 - Verified Refrigerant Charge - Fan Efficacy Watts/CFM - Verified HSPF - Verified heat pump rated heating capacity - Duct leakage testing											

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CF1R-PRF-01E
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(Page 7 of 13)
Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

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
Danville ADU Mediterranean Studio	640	1	1	1	0	1

ZONE INFORMATION						
01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft ²)	Avg. Ceiling Height	Water Heating System 1	Status
Accessory Unit	Conditioned	HVAC System 1	640	10	DHW System 1	New

OPAQUE SURFACES							
01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft ²)	Window and Door Area (ft ²)	Tilt (deg)
Front Wall	Accessory Unit	Exterior 2x6 Wall R-21	0	Front	320	74	90
Left Wall	Accessory Unit	Exterior 2x6 Wall R-21	90	Left	200	9	90
Back Wall	Accessory Unit	Exterior 2x6 Wall R-21	180	Back	320	19	90
Right Wall	Accessory Unit	Exterior 2x6 Wall R-21	270	Right	200	9	90
Ceiling Below Attic	Accessory Unit	R-38 Attic Ceiling	n/a	n/a	640	n/a	n/a

ATTIC							
01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic	Attic Roof	Ventilated	4	0.1	0.85	No	No

Registration Number:

223-P010038752B-000-000-00000000-0000

Registration Date/Time:

2023-03-31 08:35:29

HERS Provider:

CalCERTS inc.

CA Building Energy Efficiency Standards - 2022 Residential Compliance

Report Version: 2022.0.000

Schema Version: rev 20220901

Report Generated: 2023-03-30 18:11:02

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
Project Name: Danville ADU Mediterranean Studio

Calculation Description: Title 24 Analysis

Calculation Date/Time: 2023-03-30T18:09:40-07:00

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

CF1R-PRF-01E
(Page 8 of 13)

FENESTRATION / GLAZING													
01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft ²)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
Front Door	Window	Front Wall	Front	0	3	8	1	24	0.34	NFRC	0.2	NFRC	Bug Screen
FamilyRm 5050	Window	Front Wall	Front	0	5	5	1	25	0.3	NFRC	0.23	NFRC	Bug Screen
Bedroom 5050	Window	Front Wall	Front	0	5	5	1	25	0.3	NFRC	0.23	NFRC	Bug Screen
Kitchen 3030	Window	Left Wall	Left	90	3	3	1	9	0.3	NFRC	0.23	NFRC	Bug Screen
Bathroom 2020	Window	Back Wall	Back	180	2	2	1	4	0.3	NFRC	0.23	NFRC	Bug Screen
DiningRm 5030	Window	Back Wall	Back	180	5	3	1	15	0.3	NFRC	0.23	NFRC	Bug Screen
Bedroom 3030	Window	Right Wall	Right	270	3	3	1	9	0.3	NFRC	0.23	NFRC	Bug Screen

OVERHANGS AND FINIS													
01	02	03	04	05	06	07	08	09	10	11	12	13	14
Window	Overhang					Left Fin				Right Fin			
	Depth	Dist Up	Left Extent	Right Extent	Flap Ht.	Depth	Top Up	Dist L	Bot Up	Depth	Top Up	Dist R	Bot Up
Front Door	5	0	2	2	0	0	0	0	0	0	0	0	0
FamilyRm 5050	4	0	2	2	0	0	0	0	0	0	0	0	0
Bedroom 5050	1	0	2	2	0	0	0	0	0	0	0	0	0
Kitchen 3030	1	0	2	2	0	0	0	0	0	0	0	0	0
Bathroom 2020	1	0	2	2	0	0	0	0	0	0	0	0	0
DiningRm 5030	1	0	2	2	0	0	0	0	0	0	0	0	0

Registration Number:

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Registration Date/Time:

2023-03-31 08:35:29

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CF1R-PRF-01E
Project Name: Danville ADU Mediterranean Studio

Calculation Date/Time: 2023-03-30T18:09:40-07:00

(Page 9 of 13)
Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

OVERHANGS AND FINIS													
01	02	03	04	05	06	07	08	09	10	11	12	13	14
Window	Overhang					Left Fin				Right Fin			
	Depth	Dist Up	Left Extent	Right Extent	Flap Ht.	Depth	Top Up	Dist L	Bot Up	Depth	Top Up	Dist R	Bot Up
Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0

SLAB FLOORS							
01	02	03	04	05	06	07	08
Name	Zone	Area (ft ²)	Perimeter (ft)	Edge Insul. R-value and Depth	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab On Grade	Accessory Unit	640	104	none	0	80%	No

OPAQUE SURFACE CONSTRUCTIONS							
01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
Exterior 2x6 Wall R-21	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O. C.	R-21	None / None	0.065	Inside Finish: Gypsum Board Cavity / Frame: R-21 / 2x6 Sheathing / Insulation: Wood Siding/sheathing/decking Exterior Finish: 3 Coat Stucco
Attic Roof	Attic Roofs	Wood Framed Ceiling	2x4 Top Chord of Roof Truss @ 24 in. O. C.	R-13	None / None	0.072	Roofing: 10 PSF (RoofTileAirGap) Tile Gap: present Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: R-13.0 / 2x4 Top Chrd Around Roof Joists: R-0.0 insul.
R-38 Attic Ceiling	Ceilings (below attic)	Wood Framed Ceiling	2x4 Bottom Chord of Truss @ 24 in. O. C.	R-38	None / None	0.025	Over Ceiling Joists: R-28.9 insul. Cavity / Frame: R-9.1 / 2x4 Btm Chrd Inside Finish: Gypsum Board

Registration Number:

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CF1R-PRF-01E
Project Name: Danville ADU Mediterranean Studio

Calculation Date/Time: 2023-03-30T18:09:40-07:00

(Page 10 of 13)
Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

BUILDING ENVELOPE - HERS VERIFICATION				
01	02	03	04	05
Quality Insulation Installation (QII)	High R-value Spray Foam Insulation	Building Envelope Air Leakage	CFM50	CFM50
Not Required	Not Required	N/A	n/a	n/a

WATER HEATING SYSTEMS								
01	02	03	04	05	06	07	08	09
Name	System Type	Distribution Type	Water Heater Name	Number of Units	Solar Heating System	Compact Distribution	HERS Verification	Water Heater Name (#)
DHW System 1	Domestic Hot Water (DHW)	Standard	Heat Pump WH	1	n/a	None	n/a	Heat Pump WH (1)

WATER HEATERS - NEEA HEAT PUMP							
01	02	03	04	05	06	07	08
Name	# of Units	Tank Vol. (gal)	NEEA Heat Pump Brand	NEEA Heat Pump Model	Tank Location	Duct Inlet Air Source	Duct Outlet Air Source
Heat Pump WH	1	40	Rheem	RheemPROPH40T2R H37515	Outside	Outside	Outside

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

Registration Number:

223-P010038752B-000-000-00000000-0000

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CA Building Energy Efficiency Standards - 2022 Residential Compliance

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CF1R-PRF-01E
Project Name: Danville ADU Mediterranean Studio

Calculation Date/Time: 2023-03-30T18:09:40-07:00

(Page 11 of 13)
Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

SPACE CONDITIONING SYSTEMS								
01	02	03	04	05	06	07	08	09
Name	System Type	Heating Unit Name	Heating Equipment Count	Cooling Unit Name	Cooling Equipment Count	Fan Name	Distribution Name	Required Thermostat Type
HVAC System 1	Heat pump heating cooling	PEAD-A24AA7	1	PEAD-A24AA7	1	HVAC Fan System 1	Distribution System 1	Setback

HVAC - HEAT PUMPS												
01	02	03	04	05	06	07	08	09	10	11	12	13
Name	System Type	Number of Units	Heating				Cooling			Zonally Controlled	Compressor Type	HERS Verification
			Efficiency Type	HSPF / HSPF2 / COP	Cap 47	Cap 17	Efficiency Type	SEER / SEER2	EER / EER / CEER			
PEAD-A24AA7	Central split HP	1	HSPF	10.8	26000	14800	EERSEER	19.6	11.7	Not Zonal	Single Speed	PEAD-A24AA7-hers-htpump

HVAC HEAT PUMPS - HERS VERIFICATION								
01	02	03	04	05	06	07	08	09
Name	Verified Airflow	Airflow Target	Verified EER/EER2	Verified SEER/SEER2	Verified Refrigerant Charge	Verified HSPF/HSPF2	Verified Heating Cap 47	Verified Heating Cap 17
PEAD-A24AA7-hers-htpump	Required	350	Not Required	Required	Yes	Yes	Yes	Yes

HVAC - DISTRIBUTION SYSTEMS											
01	02	03	04	05	06	07	08	09	10	11	12
Name	Type	Design Type	Duct Ins. R-value		Duct Location		Surface Area		Bypass Duct	Duct Leakage	HERS Verification
			Supply	Return	Supply	Return	Supply	Return			
Distribution System 1	Unconditioned attic	Non-Verified	R-6	R-6	Attic	Attic	n/a	n/a	No Bypass Duct	Sealed and Tested	Distribution System 1-hers-dist

Registration Number:

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CA Building Energy Efficiency Standards - 2022 Residential Compliance

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
CF1R-PRF-01E
Project Name: Danville ADU Mediterranean Studio

Calculation Date/Time: 2023-03-30T18:09:40-07:00

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Calculation Description: Title 24 Analysis

Input File Name: Danville ADU_Mediterranean_Studio.ribd22

HVAC DISTRIBUTION - HERS VERIFICATION								
01	02	03	04	05	06	07	08	09
Name	Duct Leakage Verification	Duct Leakage Target (%)	Verified Duct Location	Verified Duct Design	Buried Ducts	Deeply Buried Ducts	Low-leakage Air Handler	Low Leakage Ducts Entirely in Conditioned Space
Distribution System 1-hers-dist	Yes	5.0	Not Required	Not Required	Not Required	Credit not taken	Not Required	No

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

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

INDOOR AIR QUALITY (IAQ) FANS								
01	02	03	04	05	06	07	08	09
Dwelling Unit	Airflow (CFM)	Fan Efficacy (W/CFM)	IAQ Fan Type	Includes Heat/Energy Recovery?	IAQ Recovery Effectiveness - SRE	Includes Fault Indicator Display?	HERS Verification	Status
SFam IAQVentRpt 1-1	49	0.816326	Balanced	Yes	73	No	Yes	

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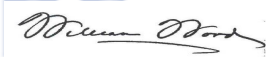
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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

CF1R-PRF-01E

Project Name: Danville ADU Mediterranean Studio**Calculation Date/Time:** 2023-03-30T18:09:40-07:00**(Page 13 of 13)****Calculation Description:** Title 24 Analysis**Input File Name:** Danville ADU_Mediterranean_Studio.ribd22

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT			
1. I certify that this Certificate of Compliance documentation is accurate and complete.			
Documentation Author Name: Jason E Bennett		Documentation Author Signature: 	
Company: DP Advanced Engineering		Signature Date: 2023-03-30 19:18:04	
Address: 3381 Walnut Blvd. Ste. 220		CEA/ HERS Certification Identification (If applicable): R19-21-30042	
City/State/Zip: Brentwood, CA 94513		Phone: 925-516-3502	
RESPONSIBLE PERSON'S DECLARATION STATEMENT			
I certify the following under penalty of perjury, under the laws of the State of California: 1. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance. 2. I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 3. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.			
Responsible Designer Name: William Wood		Responsible Designer Signature: 	
Company: William Wood Architects		Date Signed: 2023-03-31 08:35:29	
Address: 301 Hartz Ave #203		License: C13874	
City/State/Zip: Danville, CA 94526		Phone: 925-820-8233	

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.



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2023-03-31 08:35:29

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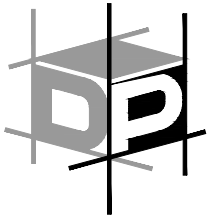
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CA Building Energy Efficiency Standards - 2022 Residential Compliance

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ADVANCED ENGINEERING

STRUCTURAL ENGINEERING SOLUTIONS

TITLE 24 SUMMARY OF FEATURES

PROJECT: TOWN OF DANVILLE ADU

DATE: 3-31-2023

JOB NO: W021420

ANALYST: J. BENNETT

ENVELOPE INSULATION

EXTERIOR WALLS:

R-21 IN 2x6

FOUNDATION:

SLAB, NOT INSULATED

ROOF OVER LIVING SPACE:

R-38 BETWEEN CEILING JOISTS

R-13 BETWEEN RAFTERS

WINDOW PERFORMANCE

MAXIMUM WINDOW PERFORMANCE VALUES (U-FACTOR / SHGC)

WINDOWS: .30/.23

FRENCH DOORS: .32/.16

DOMESTIC HOT WATER

RHEEM 40-GALLON HEAT PUMP WATER HEATER OR EQUIV.

SOLAR (STUDIO)

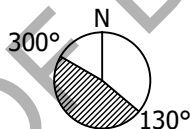
(NOT REQUIRED; CALCULATED SIZE IS <1.8 KW)

SOLAR (1 BEDROOM)

2.0 KW MINIMUM

ACCEPTABLE ORIENTATION:

(DEGREES EAST OF TRUE NORTH)



HERS VERIFICATIONS

- INDOOR AIR QUALITY VENTILATION
- KITCHEN RANGE HOOD
- MINIMUM AIRFLOW [350 CFM/TON]
- VERIFIED SEER [19.6]
- VERIFIED REFRIGERANT CHARGE
- FAN EFFICACY WATTS/CFM [0.45]
- VERIFIED HSPF [10.8]
- VERIFIED HEAT PUMP RATED HEATING CAPACITY
- DUCT LEAKAGE TESTING [5%]

SPACE HEATING & COOLING

HEAT PUMP (10.2 HSPF, 19.6 SEER, 11.7 EER)

MITSUBISHI PEAD-A24AA7 + PUZ-A24NHA7

AHRI # 201754661

DUCTS

SUPPLY AIR DUCTS IN ATTIC

DUCTS IN UNCONDITIONED SPACE TO HAVE R-6 INSULATION

INDOOR AIR QUALITY

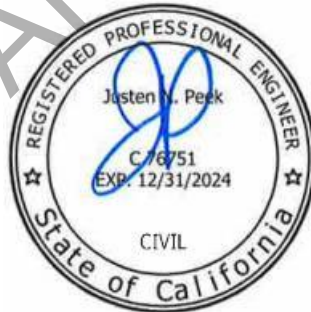
BROAN ERV100S ENERGY RECOVERY VENTILATOR OR EQUIV.

Structural Calculations

PROJECT: Town of Danville Studio ADU
ADDRESS: Danville, California

JOB No.: W021420
DELTA: Permit Submittal
DATE: March 24, 2023

CLIENT: Town of Danville



GOVERNING CODE: California Building Code, 2022 Edition
CONSTRUCTION: One-Story Wood Framed Building

STRUCTURE:
Vertical Load System - Wood Framed Roof
Lateral Load System - Wood Framed Shear Walls



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

STRUCTURAL CALCULATIONS ARE BASED ON THE FOLLOWING CRITERIA, UNLESS NOTED OTHERWISE

STRUCTURAL MATERIALS:

Structural Steel:

W Shapes	ASTM A992, Fy = 50 ksi
Shapes (M, S, HP, C, MC, L)	ASTM A572, Grade 50
Pipe	ASTM A53, Grade B
Tube (HSS)	ASTM A500, Grade B
Plates and Bars	ASTM A572, Grade 50
Welding	Current AWS D1.1
Bolts - Unfinished	ASTM A307
Bolts - High Strength (HSB)	ASTM A325 SC/N/X
Threaded Rods	ASTM A449
Light Gage Steel Studs and Joists	ASTM A653, Grade 50
Welding (Light Gage)	Current AWS D1.3

Concrete:

Slab on Grade	2500 psi @ 28 Days
Foundation	2500 psi @ 28 Days
Tilt-Up Wall Panels	4000 psi @ 28 Days
Structural Concrete	3000 psi @ 28 Days
Reinforcing Steel (#3 Rebar)	ASTM A615, Grade 40
Reinforcing Steel (#4 & larger)	ASTM A615, Grade 60
Welding (Reinf.)	Current AWS D1.4

Wood:

2" to 4" Thick x 2" and Wider	DF No. 2 or better
Joists and Planks	DF No. 2 or better
Beams and Stringers	DF No. 1 or better
Posts and Timbers	DF No. 1 or better
Glu-lam Beams (simple span)	2400F-V4 DF/DF
Glu-lam Beams (cantilevers)	2400F-V8 DF/DF
Sheathing	Exposure 1, Grade C-D, C-C



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

STRUCTURAL CALCULATIONS ARE BASED ON THE FOLLOWING CRITERIA, UNLESS NOTED OTHERWISE

LOADING SCHEDULE:

Roof Dead Load:

Max. Roof Pitch /12:

5

Roofing:	Concrete Tile	10.8 psf
Sheathing:	1/2" Plywood	1.8 psf
Insulation:	R38 Insulation Ceiling & R19 Insulation Roof Deck	1.0 psf
Framing:	Trusses @ 24" o.c.	2.5 psf
Ceiling:	5/8" Gyp. Installed on Bottom of Roof Framing	2.8 psf
Sprinklers:	Automatic Fire Sprinklers	1.0 psf
Misc:	HVAC + Miscellaneous	2.1 psf
		22.0 psf

Photovoltaic Dead Load:

Non-concurrent with Live Load

3.0 psf

Roof Live Load:

Sloped Roof (Reducible)

20.0 psf

Exterior Wall Load:

Wall Type: 2x6 @ 16 in, 5/8" Gyp, Insulated, 7/8" Stucco

17.0 psf

Interior Wall Load:

Wall Type: 2x4 @ 16 in, (2) 5/8" Gyp, Insulated

7.0 psf



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

SEISMIC LOADS: ASCE 7-16 SECTION 12.8 (EQUIV. LATERAL FORCE):

SITE INFORMATION:

S_s 2.500 ASCE 7-16 Sect. 11.4.2
 S_1 1.200 ASCE 7-16 Sect. 11.4.2
 Site Class..... D Per Geotech Report
 Risk Category II ASCE 7-16 Table 1.5-1
 Importance Factor 1.0 ASCE 7-16 Table 1.5-2

Site coefficients and adjusted maximum considered eq. spectral response accel. parameters

F_a 1.200 ASCE 7-16 Sect. 11.4.4
 F_v 1.700 ASCE 7-16 Sect. 11.4.4

Table 11.4-1 Short-Period Site Coefficient F_a

Site Class	$S_s \leq 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s = 1.25$	$S_s \geq 1.50$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	0.9	0.9	0.9	0.9	0.9	0.9
C	1.3	1.3	1.2	1.2	1.2	1.2
D	1.6	1.4	1.2	1.1	1.0	1.0
E	2.4	1.7	1.3	1.2	1.2	1.2
F	Site-Specific Response Analysis Required					

Table 11.4-2 Short-Period Site Coefficient F_v

Site Class	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 = 0.50$	$S_1 \geq 0.60$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	0.8	0.8	0.8	0.8	0.8	0.8
C	1.5	1.5	1.5	1.5	1.5	1.4
D	2.4	2.2	2	1.9	1.8	1.7
E	4.2	3.3	2.8	2.4	2.2	2
F	Site-Specific Response Analysis Required					

$S_{MS} = F_a S_s$ 3.000 (EQ. 11.4-1)

$S_{M1} = F_v S_1$ 2.040 (EQ. 11.4-2)

$S_{DS} = (2/3) S_{MS}$ 2.000 g (EQ. 11.4-3)

$S_{D1} = (2/3) S_{M1}$ 1.360 g (EQ. 11.4-4)

Seismic Design Category Based on Short-Period Response Accelerations:

VALUE OF S_{DS}	1 OR 11	111	1V	S1 IS GREATER THAN 0.75 USE CATEGORY E PER CBC 1613.2.5
$S_{DS} < 0.167g$	A	A	A	
$0.167g \leq S_{DS} < 0.33g$	B	B	C	
$0.33g \leq S_{DS} < 0.50g$	C	C	D	
$0.50g \leq S_{DS}$	D	D	D	

Seismic Design Category Based on 1-Second Response Accelerations:

VALUE OF S_{D1}	1 OR 11	111	1V	S1 IS GREATER THAN 0.75 USE CATEGORY E PER CBC 1613.2.5
$S_{D1} < 0.067g$	A	A	A	
$0.067g \leq S_{D1} < 0.133g$	B	B	C	
$0.133g \leq S_{D1} < 0.20g$	C	C	D	
$0.20g \leq S_{D1}$	D	D	D	



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

SEISMIC LOADS: ASCE 7-16 SECTION 12.8 (CONT.):

BUILDING INFORMATION:

Building Height, h_n 14.7 ft
 Mean Roof Height, H_m 12.3 ft
 Eave Height, h 10.0 ft

Building Depth:

Bldg Depth (Roof Level)..... 25.0 ft

Building Width:

Bldg Width (Roof Level)..... 32.0 ft

EQUIVALENT LATERAL FORCE PROCEDURE:

Seismic Base Shear:

R (ASCE 7-16 Table 12.2-1)..... 6.5
 C_t 0.020
 X 0.75
 $T_a = C_t(h_n)^X$ 0.15 sec

Seismic Response Coefficient:

$C_S = S_{DS}/(R/I)$ 0.308 (EQ. 12.8-2)
 $C_S = S_{D1}/T(R/I)$ 1.396 (EQ. 12.8-3)
 $C_S = 0.044S_{DS}I$ 0.088 (EQ. 12.8-5)
 $C_S = 0.5S_1/(R/I)$ 0.092 (EQ. 12.8-6)

Seismic Base Shear:

$V = C_S W$ **0.308 W** (EQ. 12.8-1)

BUILDING WEIGHTS:

SEISMIC BASE SHEAR:

Roof Loads:	AREA (sq ft)	WEIGHT (psf)	TOTAL (lb)
Roof Area	842	22.0	18545
Roof Top Deck	0	15.0	0
Photovoltaic Area	842	3.0	2526

Building DL = 33802 lb
 Seismic Coef. = 0.308
 $k = 1.00$
Base Shear = 10401 lb

Roof Loads:	LENGTH (ft)	WEIGHT (psf)	TOTAL (lb)
Linear Feet of Ext. Wall	114	17.0	8305
Linear Feet of Int. Wall	125	7.0	4426

*Note: Approximate Fenestration Percentage: 15 %
TOTAL ROOF LOAD (lb): 33802

CALCULATE SEISMIC SHEAR LOADS:

VERTICAL DISTRIBUTION OF SEISMIC FORCES					
Level	w_x (lb)	Top Plate Height (ft)	h_x (ft)	F_x (lb)	Unit Shear (psf)
ROOF	33802	10.1	12.3	10401	12.4
			$\sum w_i * h_i^k =$	416945	

REDUNDANCY FACTOR (ASCE 7-16 SECTION 12.3.4):

Seismic Design Cat: **USE CATEGORY E**
 Roof East/ West: **1.0**

*Note: Refer to calculations on following sheets
 Roof North/South: **1.3**

SUMMARY OF SEISMIC DESIGN LOADS:

Level	Direction	SEISMIC FORCE (lb)	UNIT SHEAR (psf)	Redundancy Factor	ASD DESIGN FORCE (lb)	ASD DESIGN LOAD (psf)
Roof	North/South	10401	12.4	1.3	9464	11.2
Roof	East/West	10401	12.4	1.0	7280	8.6



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

WIND ANALYSIS (ENCLOSED, PARTIALLY ENCLOSED AND OPEN BUILDINGS OF ALL HEIGHTS)

MAIN WIND-FORCE RESISTING SYSTEM:

Design Wind Speed..... 95 mph
 Wind Exposure..... C
 Site Elevation..... Unknown Feet
 Topographic factor, ASCE 7-10 Section 26.8.2 -
 K_{zt} (Assumed Flat Area)..... 1.00

BUILDING INFORMATION:

Building Height, h_n 14.7 ft
 Mean Roof Height, H_m 12.3 ft
 Eave Height, h 10.0 ft

Building Depth "B":

Bldg Depth (Roof Level)..... 25.0 ft
 Bldg Depth (Floor Level)..... 0.0 ft

Building Width "L":

Bldg Width (Roof Level)..... 32.0 ft
 Bldg Width (Floor Level)..... 0.0 ft

DETERMINE WIND LOAD PARAMETERS:

DIRECTIONALITY FACTOR (K_d): 0.85 ** See ASCE 7-16 Section 26.6 and Table 26.6-1
 TOPOGRAPHIC FACTOR (K_{zt}): 1.00 ** See ASCE 7-16 Section 26.8 and Figure 26.8-1
 GUST FACTOR (G): 0.85 ** See ASCE 7-16 Section 26.11.1
 ENCLOSURE CLASSIFICATION Enclosed ** See ASCE 7-16 Section 26.12
 INTERNAL PRESSURE (CG_{PI}) 0.18 ** See ASCE 7-16 Section 26.12 and Table 26.13-1
 GROUND ELEVATION FACTOR (K_e) 1.00 ** See ASCE 7-16 Table 26.9-1, Note 2

Table 26.10-1 Velocity Pressure Coefficients, K_z

Height Above Ground (ft)	Exposure Category		
	B	C	D
15.0	0.57	0.85	1.03
20.0	0.62	0.90	1.08
25.0	0.66	0.94	1.12
30.0	0.70	0.98	1.16
35.0	0.73	1.01	1.19
40.0	0.76	1.04	1.22
45.0	0.79	1.07	1.25
50.0	0.81	1.09	1.27
55.0	0.83	1.11	1.29
60.0	0.85	1.13	1.31

VELOCITY COEFFICIENT (K_z): 0.85
 ** See ASCE 7-16 Table 26.10.1

DETERMINE VELOCITY PRESSURE:

$q_z = 0.00256 K_z K_{zt} K_d K_e V^2$: 16.69 psf



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

WIND ANALYSIS (ENCLOSED, PARTIALLY ENCLOSED AND OPEN BUILDINGS OF ALL HEIGHTS)

DETERMINE WALL PRESSURE:

Wall Pressure Coefficients, ASCE-7 (Figure 27..3-1)

Surface	L/B	Cp	Use With
Windward Wall	All Values	0.8	q _z
Leeward Wall	0-1	-0.5	q _h
	2	-0.3	
	>4	-0.2	
Side Wall	All Values	-0.7	q _h

Determine Cp Values

Level	Direction	L/B Values	Windward C _p Value	Leeward C _p Value
Roof	East/West	1.28	0.80	-0.444

Level	Direction	L/B Values	Windward C _p Value	Leeward C _p Value
Roof	North/South	0.78	0.80	-0.500

Windward Pressures:

Plan North/South

CASE 1: 14.36
CASE 2: 8.35

Plan East/West

CASE 1: 14.36
CASE 2: 8.35

Leeward Pressures:

Plan North/South

CASE 1: 4.09
CASE 2: 10.10

Plan East/West

CASE 1: 3.30
CASE 2: 9.30

SUMMARY OF WIND FORCE DESIGN LOADS

Level	Direction	WIND DESIGN FORCE (lb)	UNIT SHEAR (plf)		ASD DESIGN FORCE (lb)	ASD DESIGN LOAD (plf)
Roof	North/South	4305	135		2583	81
Roof	East/West	3218	129		1931	77



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

SHEARWALL DESIGN: ROOF LEVEL

Shearwall Framing: 3/8" CDX ply with 8d Nailing

SHEAR LINE ID:	1	2
-----------------------	----------	----------

DETERMINATION OF LATERAL DESIGN LOADS:

Grid Line Trib. Area (sq ft):	375	467
Seismic Shear Load (psf):	8.6	8.6
Seismic Shear Force (lb):	3242	4038

Grid Line Trib. Width (ft):	10	15
Wind Design Load (plf):	77	77
Wind Design Force (lb):	772	1159

SHEARWALL LENGTHS:

Wall Length 1 (ft):	8.0	5.2
Wall Length 2 (ft):	7.4	4.0
Wall Length 3 (ft):	0.0	0.0
Wall Length 4 (ft):	0.0	0.0
Wall Length 5 (ft):	0.0	0.0

SHEARWALL RIGIDITY DESIGN:

Wall 1 Rigidity K_i (kip/in):	5.12	4.42
Wall 2 Rigidity K_i (kip/in):	4.58	2.99
Wall 3 Rigidity K_i (kip/in):		
Wall 4 Rigidity K_i (kip/in):		
Wall 5 Rigidity K_i (kip/in):		

NAILING DESIGN BASED ON SDPWS SECTION 4.3.4 CAPACITY ADJ:

Wall 1 Design Shear (plf):	214	466
Sec. 4.3.4.2 Capacity Reduction	1.00	1.00
Wall 2 Design Shear (plf):	206	436
Sec. 4.3.4.2 Capacity Reduction	1.00	0.93
Wall 3 Design Shear (plf):		
Sec. 4.3.4.2 Capacity Reduction		
Wall 4 Design Shear (plf):		
Sec. 4.3.4.2 Capacity Reduction		
Wall 5 Design Shear (plf):		
Sec. 4.3.4.2 Capacity Reduction		

Shear Capacity (plf):	260	490
-----------------------	-----	-----

Shear Designation #: **Type 1** **Type 3**

REDUNDANCY FACTOR ANALYSIS (ASCE 7-16 SECTION 12.3.4):

Wall 1 Capacity (%):	0.24	0.30
Wall 2 Capacity (%):	0.23	0.23
Wall 3 Capacity (%):		
Wall 4 Capacity (%):		
Wall 5 Capacity (%):		

Redundancy Factor: **Use 1.0** **Use 1.0**



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

SHEARWALL DESIGN (CONT.): ROOF LEVEL

SHEAR LINE ID:	1	2
-----------------------	----------	----------

SHEARWALL OVERTURNING DESIGN:

Wall Height (ft):	10.1	10.1
Wall Weight (psf):	17.0	17.0
Roof Trib. Width (ft):	2	2
Roof Weight (psf):	22.0	22.0

SEISMIC UPLIFT FORCE (lb): Load Combo (ASCE 7-16): (0.6-0.14*SDS)D+0.7E

Wall Dead Load (plf):	69	69
Wall 1 Uplift (lb):	1881	4521
Wall 2 Uplift (lb):	1826	3971
Wall 3 Uplift (lb):		
Wall 4 Uplift (lb):		
Wall 5 Uplift (lb):		

WIND UPLIFT FORCE (lb): Load Combo (ASCE 7-16): 0.6D+0.6W

Wall Dead Load (plf):	129	129
Wall 1 Uplift (lb):	-3	1014
Wall 2 Uplift (lb):	16	920
Wall 3 Uplift (lb):		
Wall 4 Uplift (lb):		
Wall 5 Uplift (lb):		

HOLDOWN TYPE:

Wall 1 Holdown Type:	HDU2	HDU5
Wall 2 Holdown Type:	HDU2	HDU5
Wall 3 Holdown Type:		
Wall 4 Holdown Type:		
Wall 5 Holdown Type:		

STORY DRIFT CHECK ($C_d=4$): Due to approximate nature of rigidity calculation methods, +/- 10% variation OK.

Wall 1 Defl. Check (in):	1.5	2.8
Wall 2 Defl. Check (in):	1.5	2.8
Wall 3 Defl. Check (in):		
Wall 4 Defl. Check (in):		
Wall 5 Defl. Check (in):		
Wall 1 Drift Check (in):	OK	OK
Wall 2 Drift Check (in):	OK	OK
Wall 3 Drift Check (in):		
Wall 4 Drift Check (in):		
Wall 5 Drift Check (in):		

AREA VERIFICATION CHECK:

Seismic Trib Area Sum: 842 sq ft

Trib Width Sum: 25 ft



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

SHEARWALL DESIGN: ROOF LEVEL

Shearwall Framing: 3/8" CDX ply with 8d Nailing

SHEAR LINE ID:	A	B
-----------------------	----------	----------

DETERMINATION OF LATERAL DESIGN LOADS:

Grid Line Trib. Area (sq ft):	451	391
Seismic Shear Load (psf):	11.2	11.2
Seismic Shear Force (lb):	5069	4395

Grid Line Trib. Width (ft):	16	16
Wind Design Load (plf):	81	81
Wind Design Force (lb):	1291	1291

SHEARWALL LENGTHS:

Wall Length 1 (ft):	11.5	9.5
Wall Length 2 (ft):	0.0	0.0
Wall Length 3 (ft):	0.0	0.0
Wall Length 4 (ft):	0.0	0.0
Wall Length 5 (ft):	0.0	0.0

SHEARWALL RIGIDITY DESIGN:

Wall 1 Rigidity K_i (kip/in):	13.50	10.63
Wall 2 Rigidity K_i (kip/in):		
Wall 3 Rigidity K_i (kip/in):		
Wall 4 Rigidity K_i (kip/in):		
Wall 5 Rigidity K_i (kip/in):		

NAILING DESIGN BASED ON SDPWS SECTION 4.3.4 CAPACITY ADJ:

Wall 1 Design Shear (plf):	441	463
Sec. 4.3.4.2 Capacity Reduction	1.00	1.00

Wall 2 Design Shear (plf):

Sec. 4.3.4.2 Capacity Reduction

Wall 3 Design Shear (plf):

Sec. 4.3.4.2 Capacity Reduction

Wall 4 Design Shear (plf):

Sec. 4.3.4.2 Capacity Reduction

Wall 5 Design Shear (plf):

Sec. 4.3.4.2 Capacity Reduction

Shear Capacity (plf):	490	490
-----------------------	-----	-----

Shear Designation #: **Type 3** **Type 3**

REDUNDANCY FACTOR ANALYSIS (ASCE 7-16 SECTION 12.3.4):

Wall 1 Capacity (%):	0.45
Wall 2 Capacity (%):	
Wall 3 Capacity (%):	
Wall 4 Capacity (%):	
Wall 5 Capacity (%):	

Redundancy Factor: **Use 1.0** **Use 1.3**



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

SHEARWALL DESIGN (CONT.): ROOF LEVEL

SHEAR LINE ID:	A	B
-----------------------	----------	----------

SHEARWALL OVERTURNING DESIGN:

Wall Height (ft):	10.1	10.1
Wall Weight (psf):	17.0	17.0
Roof Trib. Width (ft):	0	0
Roof Weight (psf):	22.0	22.0

SEISMIC UPLIFT FORCE (lb): Load Combo (ASCE 7-16): (0.6-0.14*SDS)D+0.7E

Wall Dead Load (plf):	55	55
Wall 1 Uplift (lb):	4130	4404
Wall 2 Uplift (lb):		
Wall 3 Uplift (lb):		
Wall 4 Uplift (lb):		
Wall 5 Uplift (lb):		

WIND UPLIFT FORCE (lb): Load Combo (ASCE 7-16): 0.6D+0.6W

Wall Dead Load (plf):	103	103
Wall 1 Uplift (lb):	541	882
Wall 2 Uplift (lb):		
Wall 3 Uplift (lb):		
Wall 4 Uplift (lb):		
Wall 5 Uplift (lb):		

HOLDOWN TYPE:

Wall 1 Holdown Type:	HDU5	HDU5
Wall 2 Holdown Type:		
Wall 3 Holdown Type:		
Wall 4 Holdown Type:		
Wall 5 Holdown Type:		

STORY DRIFT CHECK ($C_d=4$): Due to approximate nature of rigidity calculation methods, +/- 10% variation OK.

Wall 1 Defl. Check (in):	2.0	2.2
Wall 2 Defl. Check (in):		
Wall 3 Defl. Check (in):		
Wall 4 Defl. Check (in):		
Wall 5 Defl. Check (in):		
Wall 1 Drift Check (in):	OK	OK
Wall 1 Drift Check (in):		
Wall 1 Drift Check (in):		
Wall 1 Drift Check (in):		
Wall 5 Drift Check (in):		

AREA VERIFICATION CHECK:

Seismic Trib Area Sum: 842 sq ft

Trib Width Sum: 32 ft



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

ROOF DIAPHRAGM DESIGN:

DIMENSIONS:

L = 32 ft

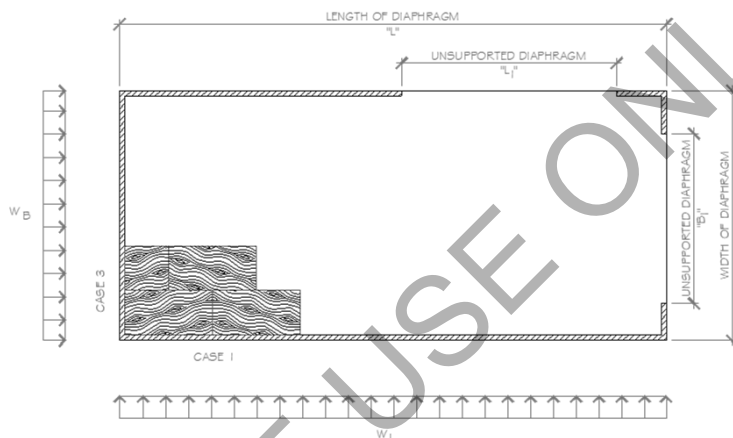
B = 25 ft

B₁ = 0 ft

L₁ = 0 ft

FRAMING MATERIALS:

Plywood Panel Grade **CD, CC**
 Minimum Nominal Framing Size: **2 x**
 Nominal Plywood Thickness: **15/32**
 Common Nail Size: **8 d**
 Wall framing size: **2x4**
 Specific Gravity of Framing Members: **0.5**



LATERAL FORCE ALONG L SIDE:

$w_L = 281 \text{ plf}$

LATERAL FORCE ALONG B SIDE:

$w_B = 277 \text{ plf}$

ANALYSIS -

The diaphragm is considered flexible if its maximum lateral deformation is more than 2x the average shearwall deflection of the associated story.

Diaphragm Ratio: $L/B = 1.28 < 3$ Diaphragm OK

Shear_{MAX} along Side L: $w_B * B / 2 * L = 108 \text{ plf}$

Shear_{MAX} along Side B: $w_L * L / 2 * B = 180 \text{ plf}$

Chord Forces:

Side L: $T_L = C_L = w_L * L^2 / 8 * B = 1439 \text{ lb}$

** Min. Blkg Req'd @ 96 in o.c.

Side B: $T_B = C_B = w_B * B^2 / 8 * L = 676 \text{ lb}$

** Min. Blkg Req'd @ 96 in o.c.

Drag Forces:

Side L: $F_L = V_L * L_1 = 0 \text{ lb}$

** Min. Strap Req'd - NONE

Side B: $F_B = V_B * B_1 = 0 \text{ lb}$

** Min. Strap Req'd - NONE

DIAPHRAGM DEFLECTION -

* per APA: Supplement For Shearwall and Diaphragms

$$D = \frac{5vL^3}{8EAb} + \frac{vL}{4Gt} + 0.188Le_n + \frac{S(D_cX)}{2b}$$

Chord Properties:

Area (in²): 5.25

G_vt_v of ply (lb/in): 83500

E (psi): 1600000

e_n (in) = (V_n/616)^{3.018}: 0.045

ν (plf): 180

S (D_cX) (in): 2.50

D = 0.37 in

D_{ALLOW} = 0.025 * Story Height = 3.7 in

Deflection OK



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 45009

0

ROOF DIAPHRAGM DESIGN:

NAILING PATTERN -

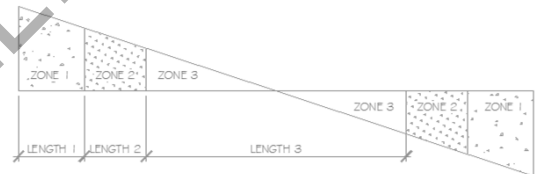
Panel Grade	Common Nail	Min. Pen. (in)	Min. Thick. (in)	Member Width (in)	Blocked Nail Spacing				Unblocked	
					Boundary / Other Edges					
					6 / 6	4 / 6	2.5 / 4	2 / 3	Case 1	Others
CD, CC	8 d	1 1/2	15/32	2	270	360	530	600	240	180

DIAPHRAGM NAILING DESIGN -

Along Length 'L'

Zone 1: 32 FT WIDE x 25 FT DEEP

UNBLOCKED 15/32 SHEATHING WITH 8 d COMMON NAILS
6.0 IN O.C. BOUNDARY/ 12 IN O.C. EDGES/ 12 IN O.C. FIELD

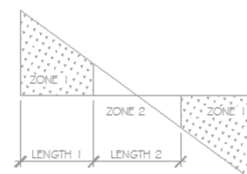
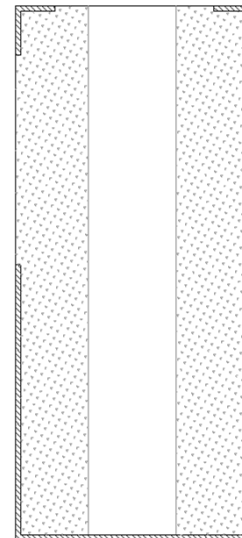


DIAPHRAGM NAILING DESIGN -

Along Length 'B'

Zone 1: 25 FT WIDE x 32 FT DEEP

UNBLOCKED 15/32 SHEATHING WITH 8 d COMMON NAILS
6.0 IN O.C. BOUNDARY/ 12 IN O.C. EDGES/ 12 IN O.C. FIELD



Wood Beam

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DP ADVANCED ENGINEERING INC.

DESCRIPTION: Typical Header

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : ASCE 7-16

Wood Species : Douglas Fir-Larch

Wood Grade : No.1

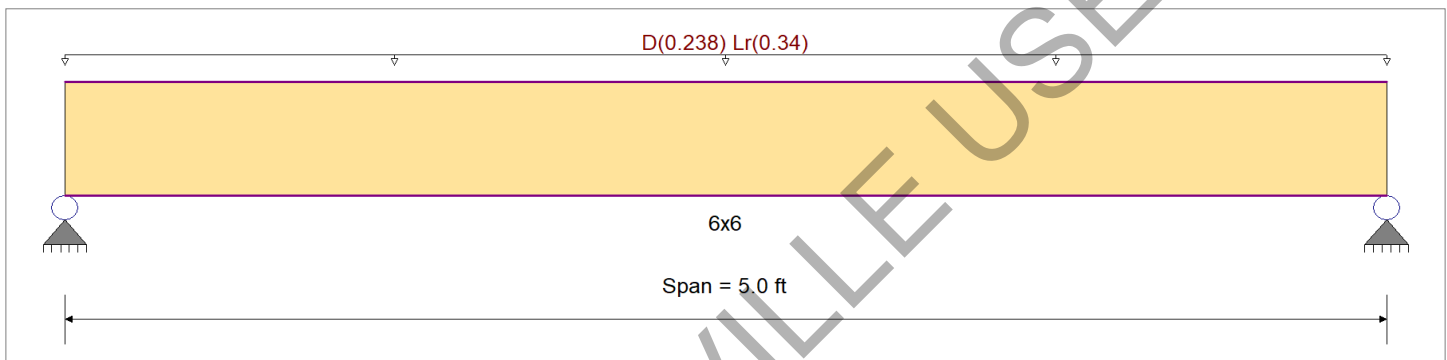
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

F_b + 1,350.0 psiF_b - 1,350.0 psiF_c - Prll 925.0 psiF_c - Perp 625.0 psiF_v 170.0 psiF_t 675.0 psi

E : Modulus of Elasticity

E_{bend-xx} 1,600.0 ksiE_{minbend-xx} 580.0 ksi

Density 31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads

Uniform Load : D = 0.0140, Lr = 0.020 ksf, Tributary Width = 17.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.468	1	Maximum Shear Stress Ratio	=	0.279	1
Section used for this span	=	6x6		Section used for this span	=	6x6	
	=	790.53 psi			=	59.24 psi	
	=	1,687.50 psi			=	212.50 psi	
Load Combination	=	+D+Lr		Load Combination	=	+D+Lr	
Location of maximum on span	=	2.500 ft		Location of maximum on span	=	0.000 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.039 in	Ratio = 1522				
Max Upward Transient Deflection		0.000 in	Ratio = 0				
Max Downward Total Deflection		0.068 in	Ratio = 885				
Max Upward Total Deflection		0.000 in	Ratio = 0				

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values		
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	f _b	F _b	V	f _v
D Only													0.00	0.00	0.00	0.00
Length = 5.0 ft	1	0.272	0.162	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.76	330.73	1215.00	0.50	24.78	153.00
+D+Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1	0.468	0.279	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.83	790.53	1687.50	1.19	59.24	212.50
+D+0.750Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1	0.400	0.238	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.56	675.58	1687.50	1.02	50.63	212.50
+0.60D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1	0.092	0.055	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.46	198.44	2160.00	0.30	14.87	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.0678	2.518		0.0000	0.000

Wood Beam

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DESCRIPTION: Typical Header

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.461	1.461
Overall MINimum	0.850	0.850
D Only	0.611	0.611
+D+Lr	1.461	1.461
+D+0.750Lr	1.249	1.249
+0.60D	0.367	0.367
Lr Only	0.850	0.850

Wood Beam

File: W021420 - Town of Danville ADU_Enercalc (Studio).ec6

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DP ADVANCED ENGINEERING INC.

DESCRIPTION: B1

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : ASCE 7-16

Wood Species : Douglas Fir-Larch

Wood Grade : No.1

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 1,350.0 psi

Fb - 1,350.0 psi

Fc - Prll 925.0 psi

Fc - Perp 625.0 psi

Fv 170.0 psi

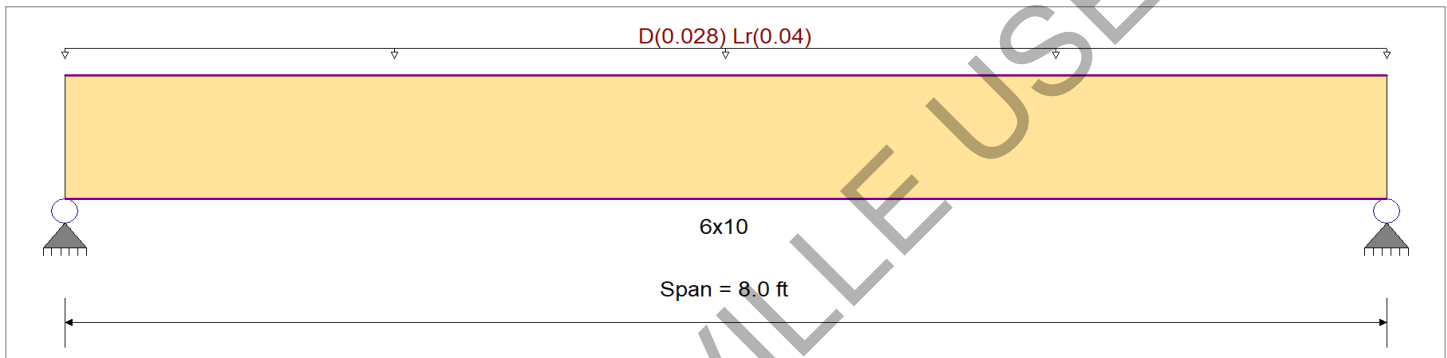
Ft 675.0 psi

E : Modulus of Elasticity

Ebend-xx 1,600.0 ksi

Eminbend-xx 580.0 ksi

Density 31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads

Uniform Load : D = 0.0140, Lr = 0.020 ksf, Tributary Width = 2.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.055	1	Maximum Shear Stress Ratio	=	0.034	1
Section used for this span	=	6x10		Section used for this span	=	6x10	
	=	92.05 psi			=	7.31 psi	
	=	1,687.50 psi			=	212.50 psi	
Load Combination	=	+D+Lr		Load Combination	=	+D+Lr	
Location of maximum on span	=	4.000 ft		Location of maximum on span	=	7.212 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.006 in	Ratio = 16278				
Max Upward Transient Deflection		0.000 in	Ratio = 0				
Max Downward Total Deflection		0.012 in	Ratio = 8208				
Max Upward Total Deflection		0.000 in	Ratio = 0				

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values		
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	f _b	F'b	V	f _v
D Only														0.00	0.00	0.00
Length = 8.0 ft	1	0.038	0.024	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.31	45.63	1215.00	0.13	3.63	153.00
+D+Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.055	0.034	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.63	92.05	1687.50	0.25	7.31	212.50
+D+0.750Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.048	0.030	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.55	80.45	1687.50	0.22	6.39	212.50
+0.60D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.013	0.008	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.19	27.38	2160.00	0.08	2.18	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.0117	4.029		0.0000	0.000

Wood Beam

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DESCRIPTION: B1

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.317	0.317
Overall MINimum	0.160	0.160
D Only	0.157	0.157
+D+Lr	0.317	0.317
+D+0.750Lr	0.277	0.277
+0.60D	0.094	0.094
Lr Only	0.160	0.160

Wood Beam

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DESCRIPTION: B2

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

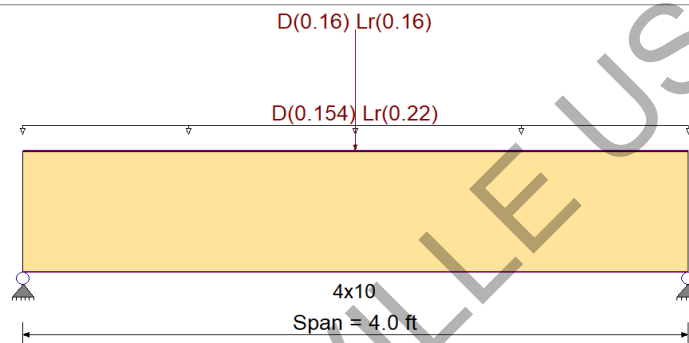
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 1,350.0 psi
Fb - 1,350.0 psi
Fc - Prll 925.0 psi
Fc - Perp 625.0 psi
Fv 170.0 psi
Ft 675.0 psi

E : Modulus of Elasticity
Ebend- xx 1,600.0 ksi
Eminbend - xx 580.0 ksi

Density 31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads

Uniform Load : D = 0.0140, Lr = 0.020 ksf, Tributary Width = 11.0 ft

Point Load : D = 0.160, Lr = 0.160 k @ 2.0 ft, (PL FROM B1)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.128	1	Maximum Shear Stress Ratio	=	0.138	1
Section used for this span		4x10		Section used for this span		4x10	
	=	260.15 psi			=	29.32 psi	
	=	2,025.00 psi			=	212.50 psi	
Load Combination		+D+Lr		Load Combination		+D+Lr	
Location of maximum on span	=	2.000 ft		Location of maximum on span	=	3.241 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.004 in	Ratio = 10775 >= 360				
Max Upward Transient Deflection		0.000 in	Ratio = 0 < 360				
Max Downward Total Deflection		0.008 in	Ratio = 6012 >= 240				
Max Upward Total Deflection		0.000 in	Ratio = 0 < 240				

Maximum Forces & Stresses for Load Combinations

Load Combination Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
		M	V	Cd	C _{F/V}	C _i	C _r	C _m	C _t	C _L		M	fb	F'b	V	fv	F'v
D Only Length = 4.0 ft	1	0.079	0.085	0.90	1.200	1.00	1.00	1.00	1.00	1.00		0.48	115.89	0.00	0.00	0.00	0.00
+D+Lr Length = 4.0 ft	1	0.128	0.138	1.25	1.200	1.00	1.00	1.00	1.00	1.00		1.08	260.15	2025.00	0.63	29.32	212.50
+D+0.750Lr Length = 4.0 ft	1	0.111	0.119	1.25	1.200	1.00	1.00	1.00	1.00	1.00		0.93	224.08	2025.00	0.54	25.23	212.50
+0.60D Length = 4.0 ft	1	0.027	0.029	1.60	1.200	1.00	1.00	1.00	1.00	1.00		0.29	69.54	2592.00	0.17	7.78	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.0080	2.015		0.0000	0.000

Wood Beam

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DESCRIPTION: B2

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.922	0.922
Overall MINimum	0.520	0.520
D Only	0.402	0.402
+D+Lr	0.922	0.922
+D+0.750Lr	0.792	0.792
+0.60D	0.241	0.241
Lr Only	0.520	0.520

Wood Beam

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DESCRIPTION: B3

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set : ASCE 7-16

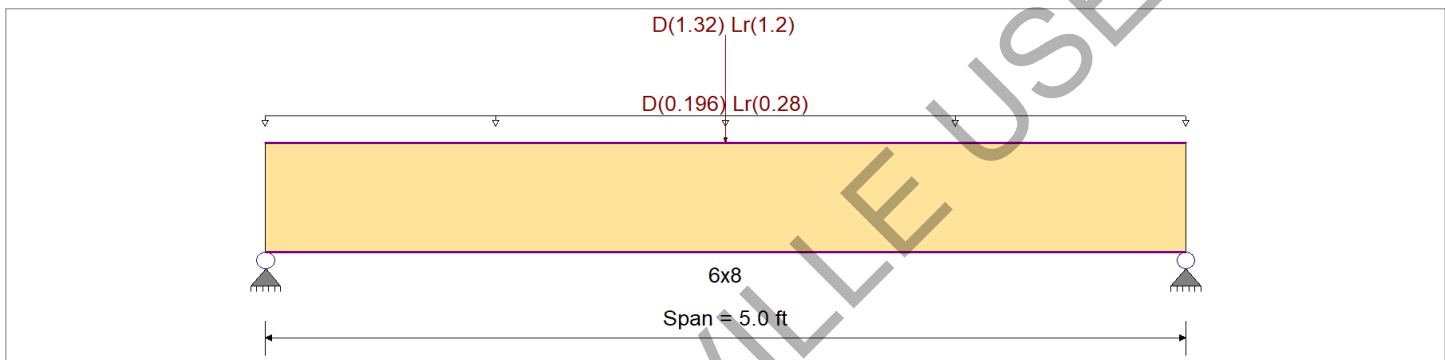
Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

Wood Species : Douglas Fir-Larch
Wood Grade : No.1

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 1,350.0 psi
Fb - 1,350.0 psi
Fc - Prll 925.0 psi
Fc - Perp 625.0 psi
Fv 170.0 psi
Ft 675.0 psi
E : Modulus of Elasticity
Ebend- xx 1,600.0 ksi
Eminbend - xx 580.0 ksi
Density 31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads

Uniform Load : D = 0.0140, Lr = 0.020 ksf, Tributary Width = 14.0 ft

Point Load : D = 1.320, Lr = 1.20 k @ 2.50 ft, (PL From G.T.)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.643	1	Maximum Shear Stress Ratio	=	0.372	1
Section used for this span		6x8		Section used for this span		6x8	
	=	1,085.77	psi		=	78.96	psi
	=	1,687.50	psi		=	212.50	psi
Load Combination		+D+Lr		Load Combination		+D+Lr	
Location of maximum on span	=	2.500	ft	Location of maximum on span	=	0.000	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.030	in	Ratio =		1976	>=360
Max Upward Transient Deflection		0.000	in	Ratio =		0	<360
Max Downward Total Deflection		0.059	in	Ratio =		1016	>=240
Max Upward Total Deflection		0.000	in	Ratio =		0	<240

Maximum Forces & Stresses for Load Combinations

Load Combination Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L		M	f _b	F ['] _b	V	f _v	F ['] _v
D Only Length = 5.0 ft	1	0.439	0.248	0.90	1.000	1.00	1.00	1.00	1.00	1.00		2.29	533.05	1215.00	0.00	0.00	0.00
+D+Lr Length = 5.0 ft	1	0.643	0.372	1.25	1.000	1.00	1.00	1.00	1.00	1.00		4.67	1,085.77	1687.50	2.17	78.96	212.50
+D+0.750Lr Length = 5.0 ft	1	0.562	0.323	1.25	1.000	1.00	1.00	1.00	1.00	1.00		4.07	947.59	1687.50	1.89	68.72	212.50
+0.60D Length = 5.0 ft	1	0.148	0.084	1.60	1.000	1.00	1.00	1.00	1.00	1.00		1.37	319.83	2160.00	0.63	22.80	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.0590	2.518		0.0000	0.000

Wood Beam

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DESCRIPTION: B3

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	2.472	2.472
Overall MINimum	1.300	1.300
D Only	1.172	1.172
+D+Lr	2.472	2.472
+D+0.750Lr	2.147	2.147
+0.60D	0.703	0.703
Lr Only	1.300	1.300

Wood Column

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DP ADVANCED ENGINEERING INC.

DESCRIPTION: 6x6 POST

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used : ASCE 7-16

General Information

Analysis Method : Allowable Stress Design				Wood Section Name 6x6	
End Fixities Top & Bottom Pinned				Wood Grading/Manuf. Graded Lumber	
Overall Column Height		9 ft		Wood Member Type Sawn	
(Used for non-slender calculations)					
Wood Species Douglas Fir-Larch		Allow Stress Modification Factors			
Wood Grade No.2					
Fb +	750.0 psi	Fv	170.0 psi	Exact Width	5.50 in
Fb -	750.0 psi	Ft	475.0 psi	Exact Depth	5.50 in
Fc - Prll	700.0 psi	Density	31.210 pcf	Area	30.250 in^2
Fc - Perp	625.0 psi			Ix	76.255 in^4
				Iy	76.255 in^4
E : Modulus of Elasticity . . .				Incising Factors :	
				for Bending 0.80	
x-x Bending		y-y Bending		for Elastic Modulus 0.95	
Basic 1,300.0		1,300.0		Cfu : Flat Use Factor 1.0	
Minimum 470.0		470.0		Kf : Built-up columns 1.0	
				Use Cr : Repetitive ? No	
Brace condition for deflection (buckling) along columns :					
				X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 9 ft, K = 1.0	
				Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 9 ft, K = 1.0	

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 59.006 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 9.0 ft, D = 0.660, Lr = 0.820 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS	Max. Axial+Bending Stress Ratio =	0.09102 : 1	Maximum SERVICE Lateral Load Reactions . .			
	Load Combination	+D+Lr	Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
	Governing NDS Formula	Comp Only, f_c/F_c'	Top along X-X	0.0 k	Bottom along X-X	0.0 k
	Location of max.above base	0.0 ft	Maximum SERVICE Load Lateral Deflections . .			
	At maximum location values are . . .		Along Y-Y	0.0 in	at	0.0 ft above base
	Applied Axial	1.539 k	for load combination :	n/a		
	Applied Mx	0.0 k-ft	Along X-X	0.0 in	at	0.0 ft above base
	Applied My	0.0 k-ft	for load combination :	n/a		
	Fc : Allowable	558.95 psi	Other Factors used to calculate allowable stresses . .			
				<u>Bending</u>	<u>Compression</u>	<u>Tension</u>
PASS	Maximum Shear Stress Ratio =	0.0 : 1				
	Load Combination	+0.60D				
	Location of max.above base	9.0 ft				
	Applied Design Shear	0.0 psi				
	Allowable Shear	217.60 psi				

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.866	0.05444	PASS	0.0 ft	0.0	PASS	9.0 ft
+D+Lr	1.250	0.799	0.09102	PASS	0.0 ft	0.0	PASS	9.0 ft
+D+0.750Lr	1.250	0.799	0.07890	PASS	0.0 ft	0.0	PASS	9.0 ft
+0.60D	1.600	0.728	0.02186	PASS	0.0 ft	0.0	PASS	9.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		k	My - End Moments		k-ft	Mx - End Moments		k-ft
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top		@ Base	@ Top	
D Only												0.719
+D+Lr												1.539
+D+0.750Lr												1.334

Wood Column

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DESCRIPTION: 6x6 POST

Maximum Reactions

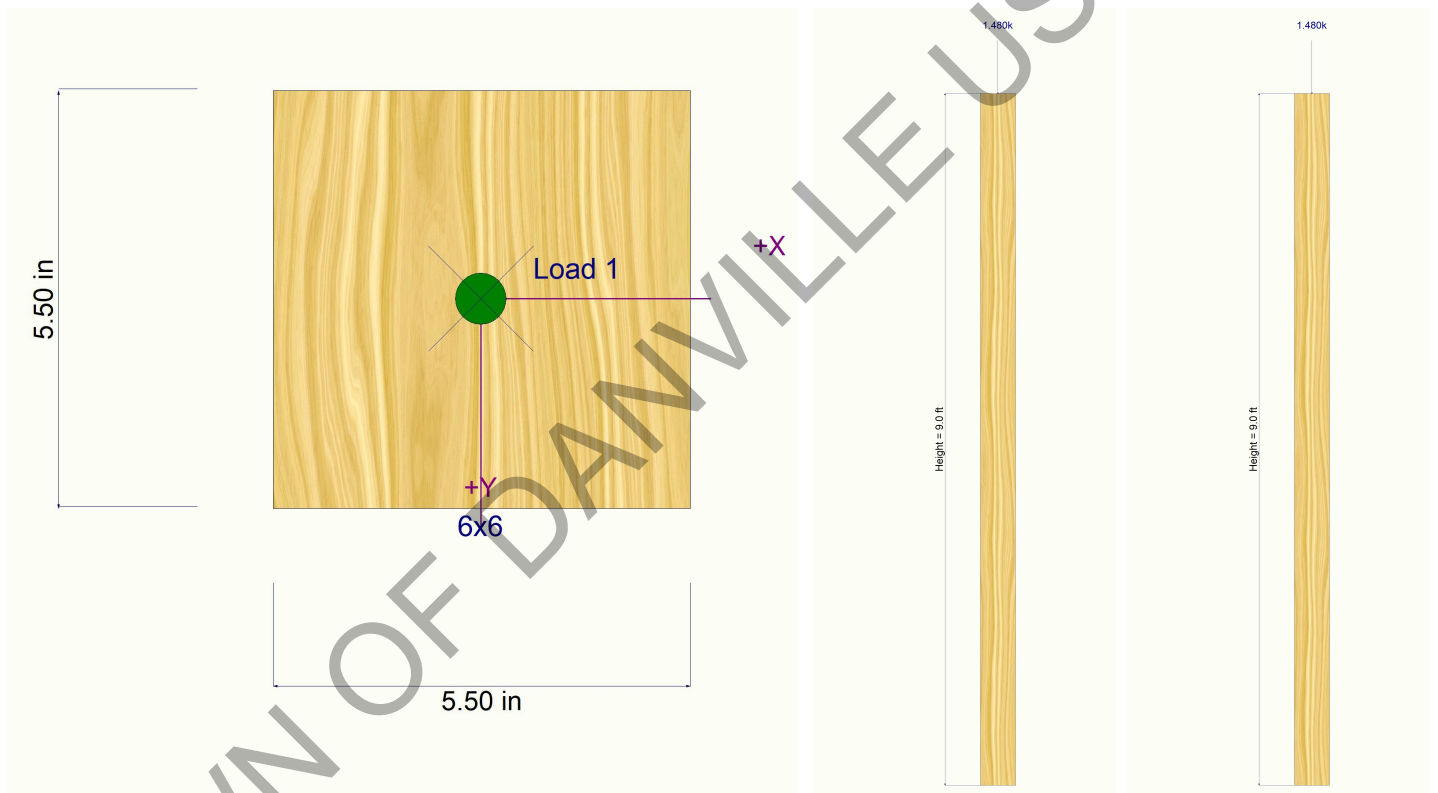
Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top		@ Base	@ Top
+0.60D						0.431					
Lr Only						0.820					

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.0000	in	0.000	ft
+D+Lr	0.0000	in	0.000	ft	0.0000	in	0.000	ft
+D+0.750Lr	0.0000	in	0.000	ft	0.0000	in	0.000	ft
+0.60D	0.0000	in	0.000	ft	0.0000	in	0.000	ft
Lr Only	0.0000	in	0.000	ft	0.0000	in	0.000	ft

Sketches





PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

SPREAD FOOTING FOUNDATION ANALYSIS:

Allowable Stress:

fy (ksi): 60
f'c (psi): 2500

Footing Reinf:

(2) #4 in Top
(2) #4 in Bottom

As used: 0.4

<i>Grid Line:</i>	<i>1</i>	<i>2</i>	<i>A</i>	<i>B</i>
<u>Footing Design Criteria:</u>				
Allow. Bearing Pres. (psf):	1500	1500	1500	1500
Footing Width (in):	12	12	12	12
Footing Depth (in):	18	18	18	18
Unsupported Length (ft):	5.0	5.0	5.0	5.0
<u>Uniform Loads:</u>				
Roof Trib (ft)	11.0	13.0	17.0	17.0
Roof DL (psf)	22.0	22.0	22.0	22.0
Roof LL (psf)	20.0	20.0	20.0	20.0
Floor Trib (ft)	0.0	0.0	0.0	0.0
Floor DL (psf)	15.0	15.0	15.0	15.0
Floor LL (psf)	40.0	40.0	40.0	40.0
Lower Floor Trib (ft)	0.0	0.0	0.0	0.0
Lower Floor DL (psf)	15.0	15.0	15.0	15.0
Lower Floor LL (psf)	40.0	40.0	40.0	40.0
Deck Trib (ft)	0.0	0.0	0.0	0.0
Deck DL (psf)	15.0	15.0	15.0	15.0
Deck LL (psf)	60.0	60.0	60.0	60.0
Wall Trib (ft)	10.0	10.0	10.0	10.0
Wall DL (psf)	17.0	17.0	17.0	17.0
TOTAL DL (plf):	412	456	544	544
TOTAL Lr (plf):	220	260	340	340
TOTAL LL (plf):	0	0	0	0
<u>Point Load:</u>				
Max. Point DL (lbs)	1320	1320	0	0
Max. Point Lr (lbs)	1200	1200	0	0
Max. Point LL (lbs)	0	0	0	0
Max. HD Load (lbs)	1881	3521	4130	4404
<u>Soil Analysis:</u>				
q (psf):	1247	1331	723	771
q/ q _{ALLOW} :	0.83	0.89	0.48	0.51
M_{max} (ft-lb):	7026 ft-lb	7391 ft-lb	5417 ft-lb	5674 ft-lb
V_{max} (lb):	3869 lbs	4161 lbs	2993 lbs	2993 lbs
Allowable M_{max} (ft-lb):	25253 ft-lb	25253 ft-lb	25253 ft-lb	25253 ft-lb
Allowable V_{max} (lb):	7395 lbs	7395 lbs	7395 lbs	7395 lbs
Footing A(s) req'd:	0.40	0.40	0.40	0.40
	O.K.	O.K.	O.K.	O.K.



PROJECT: Town of Danville Studio ADU

CLIENT: Town of Danville

JOB NO.: W021420

CALCS BY: J. Peek

DATE: 3/24/2023

PIER AND GRADE BEAM FOUNDATION ANALYSIS:

Allowable Stress:

fy (ksi): 60
f'c (psi): 2500

Grade Beam Reinf:

(3) #5 in Top
(3) #5 in Bottom

As used: 0.93

Grid Line:	1	2	A	B
------------	---	---	---	---

Pier Design Criteria:

Allow. Skin Friction (psf):	250	250	250	250
Pier Diameter (in):	16	16	16	16
Neglect Pier Depth (ft):	2	2	2	2

Grade Beam Design Criteria:

Grade Beam Width (in):	12	12	12	12
Grade Beam Depth (in):	18	18	18	18
Grade Beam Span (ft):	8.0	8.0	8.0	8.0

Uniform Loads:

Roof Trib (ft)	11.0	13.0	17.0	17.0
Roof DL (psf)	22.0	22.0	22.0	22.0
Roof LL (psf)	20.0	20.0	20.0	20.0
Floor Trib (ft)	0.0	0.0	0.0	0.0
Floor DL (psf)	15.0	15.0	15.0	15.0
Floor LL (psf)	40.0	40.0	40.0	40.0
Lower Floor Trib (ft)	0.0	0.0	0.0	0.0
Lower Floor DL (psf)	15.0	15.0	15.0	15.0
Lower Floor LL (psf)	40.0	40.0	40.0	40.0
Deck Trib (ft)	0.0	0.0	0.0	0.0
Deck DL (psf)	15.0	15.0	15.0	15.0
Deck LL (psf)	60.0	60.0	60.0	60.0
Wall Trib (ft)	10.0	10.0	10.0	10.0
Wall DL (psf)	17.0	17.0	17.0	17.0
TOTAL DL (plf):	637	681	769	769
TOTAL Lr (plf):	220	260	340	340
TOTAL LL (plf):	0	0	0	0

Point Load:

Max. Point DL (lbs)	1320	1320	0	0
Max. Point Lr (lbs)	1200	1200	0	0
Max. Point LL (lbs)	0	0	0	0
Max. HD Load (lbs)	1881	3521	4130	4404

Grade Beam Analysis:

M_{max} (ft-lb):	15942 ft-lb	16877 ft-lb	11764 ft-lb	12176 ft-lb
V_{max} (lb):	6219 lbs	6686 lbs	5869 lbs	5869 lbs
Allowable M_{max} (ft-lb):	56104 ft-lb	56104 ft-lb	56104 ft-lb	56104 ft-lb
Allowable V_{max} (lb):	7395 lbs	7395 lbs	7395 lbs	7395 lbs
Grade Beam A(s) req'd:	0.93	0.93	0.93	0.93
	O.K.	O.K.	O.K.	O.K.

Pier Analysis:

Design Pier Load (lbs):	9378	10051	8875	8875
Req'd Pier Depth (ft)	10.96	11.60	10.48	10.48
Use Pier Depth (ft):	11	12	11	11