



# 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

- 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.
- 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.
- Notify the Architect of any discrepancies in the Documents or between the Documents and the existing conditions before proceeding with any work.
- The Contractor shall obtain all required inspections for his work and give the Owner timely notice of his intent to have inspections.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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).
- 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 1/4" 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 1 1/2" 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.
- Maximum 3.5-inch handrail projection into the required stair width. Stringers and other projections such as trim are limited to 1- 1/2 inches on each side.
- Handrail(s) is required for stairways with four or more risers.
- Batt insulation shall have maximum flame spread of 25 and smoke development of 450. .
- 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.
- Glass & glazing to comply with 2022 CRC.
- 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

- 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.
- Non-removable backflow prevention to be provided at meter and provide non-removable vacuum breaker on all hose bibbs.
- All utilities to be field verified by contractor. William Wood Architects assume no responsibility for accuracy of utility locations, as shown on plans.
- 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.
- Work to comply with TOWN OF DANVILLE ordinance for setbacks and grading requirements as shown on the site plan.
- 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.
- All retaining walls shall have drainage with 4" perforated PVC rigid wall and collected with PVC Tight line rigid wall.
- 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:

- 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

- Showerheads shall be flow control of 1.8 G.P.M. or less.
- All lavatory faucets shall be flow control of 1.2 G.P.M. or less.
- Kitchen faucet to be 1.8 gallons per minute, maximum.
- Water closet to be 1.28 gallon per flush maximum. or dual flush per CPC 411.2.
- All piping and equipment shall be supported as per section 313 in the CPC.
- 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.
- All backflow prevention devices shall be installed per CPC 603.3.
- 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.
- Hose bibbs 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:

- Electrical receptacles in bathrooms, outdoors and within 6'-0" of sink to be on ground fault protection (G.F.I.);
- Provide 1/2-switched outlet under counter at sink for disposal.
- Switch and duplex outlet, or multiple switches shown adjacent to each other on plan are to be under one plate.
- 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.
- All appliances shall conform to the standards set forth by the California Energy Commission Title 24 requirements.
- Gas fired cooking appliances and space-heating equipment shall have intermittent ignition devices.
- 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.
- Contractor to verify space requirements for plenums and ducts prior to start of work.
- 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.
- Gaskets to be provided at exterior receptacles and switch plates.
- Final locations of all mechanical and electrical equipment, panel boards, meters, fixtures, flues, vents, switches etc., shall be approved by Owner prior to installation.
- Lights: All lights shall be high efficiency.
- HVAC equipment, water heaters, showerheads and faucets to be certified by the CEC.
- Provide a setback thermostat on all applicable heating systems.
- Ducts penetrating the one-hour separation between garage and the house shall be not less than 26 gauge galvanized steel.
- 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.
- Fused disconnect at A/C compressor unit or approved circuit breaker to be installed.
- Clothes dryer, vented range hoods, and bathroom vent fans must be exhausted to outside per 2022 CMC.
- Install new receptacle outlets as specified in NEC.
- Provide a dedicated 20-amp branch circuit to supply the laundry receptacle outlet.
- Contractor to provide additional electrical load as necessary to equip all new & existing elect. equipment.

REVISIONS	DATE



**DANVILLE ACCESSORY DWELLING UNITS - STUDIO**  
 DANVILLE CA 94526

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

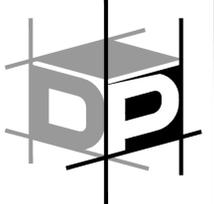
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DRAWN	HW
CHECKED	WW
DATE	03-30-23
SCALE	AS SHOWN
JOB NO.	20.921R
SHEET	GN1
OF SHEETS	

Apr 26, 2023 - 3:24pm ENI Gen Notes.dwg







# TOWN OF DANVILLE ACCESSORY DWELLING UNIT

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 ALTITUDE, OUTDOOR DESIGN TEMPERATURES, COIL SIZING, AVAILABILITY OF EQUIPMENT, OVERSIZING, HANGING, ETC. MUST ALSO BE CONSIDERED. IT IS THE HVAC DESIGNER'S RESPONSIBILITY TO VERIFY 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. OP-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 OP-ADVANCED ENGINEERING, INC. BUILDER 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 OP-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

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- 2
- 3
- 4
- 5
- 6

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

## ENERGY CALCULATIONS CONTEMPORARY STUDIO PERFORMANCE CERTIFICATE RESIDENTIAL CF-1R

Initial Issue Date: March 31, 2023  
Energy Analyst: J. Bennett Ext. 26  
Project Manager: J. Peek Ext. 23  
Job No. W021420  
Sheet No.



### CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Danville ADU Contemporary Studio  
Calculation Date/Time: 2023-03-30T18:32:03-07:00  
Input File Name: Danville ADU Contemporary Studio.rbd22

#### ENERGY USE SUMMARY

Energy Use	Standard Design Source Energy (EDEL) (kBtu/Nt-yr)	Standard Design TDV Energy (EDR2) (kWh/Nt-yr)	Proposed Design Source Energy (EDEL) (kBtu/Nt-yr)	Proposed Design TDV Energy (EDR2) (kWh/Nt-yr)	Compliance Margin (EDRL)	Compliance Margin (EDR2)
Space Heating	7.13	31.36	3.22	23.56	4.01	7.8
Space Cooling	1.06	31.57	0.99	32.77	0.07	-1.2
IAQ Ventilation	0.87	2.28	1.38	14.79	-0.51	-5.51
Water Heating	3.59	37.82	2.64	27.67	0.95	10.15
Self Utilization/Health/Credit	0	0	0	0	0	0
North Facing Efficiency Compliance Total	12.65	110.03	8.23	100.78	4.38	9.25
Space Heating	7.13	31.36	3.22	24.69	3.89	6.73
Space Cooling	1.06	31.57	1.14	30.21	-0.08	-4.64
IAQ Ventilation	0.87	2.28	1.38	14.79	-0.51	-5.51
Water Heating	3.59	37.82	2.64	27.67	0.95	10.15
Self Utilization/Health/Credit	0	0	0	0	0	0
West Facing Efficiency Compliance Total	12.65	110.03	8.47	107.22	4.18	2.81

Registration Number: 203-P01038750A-000-0000000-0000  
Registration Date/Time: 2023-03-31 08:33:37  
HERS Provider: CaCERTS, Inc.  
CA Building Energy Efficiency Standards - 2022 Residential Compliance  
Report Version: 2022.0.000  
Report Generated: 2023-03-30 18:32:45  
Schema Version: rev 20220901

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#### ENERGY USE INTENSITY

Standard Design (kBtu/Nt-yr)	Proposed Design (kBtu/Nt-yr)	Compliance Margin (kBtu/Nt-yr)	Margin Percentage
32.25	26.59	5.66	17.55
32.25	26.59	5.66	17.55
32.25	26.84	5.41	16.78
32.25	26.84	5.41	16.78
32.25	26.43	5.84	18.11
32.25	26.43	5.84	18.11
32.25	26.94	5.31	16.47
32.25	26.94	5.31	16.47

#### OVERHANDS AND FINIS

Window	Depth	Dist Up	Left Extent	Right Extent	Flag Ht.	Depth	Top Up	Dist L	Dist R										
Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Window	Depth	Dist Up	Left Extent	Right Extent	Flag Ht.	Depth	Top Up	Dist L	Dist R										
Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Space Heating	7.13	31.36	3.26	24.98	3.87	6.38
Space Cooling	1.06	31.57	0.99	33.34	0.07	-1.77
IAQ Ventilation	0.87	2.28	1.38	14.79	-0.51	-5.51
Water Heating	3.59	37.82	2.64	27.67	0.95	10.15
Self Utilization/Health/Credit	0	0	0	0	0	0
North Facing Efficiency Compliance Total	12.65	110.03	8.23	100.78	4.38	9.25
Space Heating	7.13	31.36	3.24	24.69	3.89	6.73
Space Cooling	1.06	31.57	1.14	30.21	-0.08	-4.64
IAQ Ventilation	0.87	2.28	1.38	14.79	-0.51	-5.51
Water Heating	3.59	37.82	2.64	27.67	0.95	10.15
Self Utilization/Health/Credit	0	0	0	0	0	0
East Facing Efficiency Compliance Total	12.65	110.03	8.4	103.3	4.25	6.73

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Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Window	Depth	Dist Up	Left Extent	Right Extent	Flag Ht.	Depth	Top Up	Dist L	Dist R										
Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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#### ENERGY DESIGN RATINGS

Source Energy (EDEL)	Efficiency EDR (EDR2/Efficiency)	Total EDR (EDR2Total)	Source Energy (EDEL)	Efficiency EDR (EDR2/Efficiency)	Total EDR (EDR2Total)
41	44.1	58.6			

#### COMPLIANCE MARGINS

Source Energy (EDEL)	Efficiency EDR (EDR2/Efficiency)	Total EDR (EDR2Total)	Source Energy (EDEL)	Efficiency EDR (EDR2/Efficiency)	Total EDR (EDR2Total)
33.8	40.4	56.4	7.2	3.7	2.2
34	41.4	57	7	2.7	1.6
33.5	39.6	55.9	7.5	4.5	2.7
34.1	43	57.9	6.9	1.1	0.7

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#### OVERHANDS AND FINIS

Window	Depth	Dist Up	Left Extent	Right Extent	Flag Ht.	Depth	Top Up	Dist L	Dist R										
Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Registration Number: 203-P01038750A-000-0000000-0000  
Registration Date/Time: 2023-03-31 08:33:37  
HERS Provider: CaCERTS, Inc.  
CA Building Energy Efficiency Standards - 2022 Residential Compliance  
Report Version: 2022.0.000  
Report Generated: 2023-03-30 18:32:45  
Schema Version: rev 20220901

### CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Danville ADU Contemporary Studio  
Calculation Date/Time: 2023-03-30T18:32:03-07:00  
Input File Name: Danville ADU Contemporary Studio.rbd22

#### OVERHANDS AND FINIS

Window	Depth	Dist Up	Left Extent	Right Extent	Flag Ht.	Depth	Top Up	Dist L	Dist R										
Bedroom 3030	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

#### OVERHANDS AND FINIS

Window	Depth	Dist Up	Left Extent	Right Extent	Flag Ht.	Depth	Top Up	Dist L	Dist R										
Bedroom 3030	1	0	2	2	0														



### 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:

Table with 2 columns: Code Section and Requirement. Includes items like Air Leakage, Field-fabricated exterior doors, Insulation Certification, Roofing Products, Radiant Barrier, Roof Deck, Ceiling and Rafter Roof Insulation, U-factor, Wall Insulation, Raised-floor Insulation, Slab Edge Insulation, Vapor Retarder, Fenestration Products, etc.

#### Fireplaces, Decorative Gas Appliances, and Gas Log:

Table with 2 columns: Code Section and Requirement. Includes items like Pilot Light, Closable Doors, Combustion Intake, Flue Damper, etc.

#### Space Conditioning, Water Heating, and Plumbing System:

Table with 2 columns: Code Section and Requirement. Includes items like Certification, HVAC Efficiency, Controls for Heat Pumps, Thermostats, Insulation, Isolation Valves, etc.

5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

Table with 2 columns: Code Section and Requirement. Includes items like Pilot Lights, Building Cooling and Heating Loads, Clearances, Liquid Line Drier, Water Piping, Solar Water-heating System Piping, Insulation Protection, Gas or Propane Water Heating Systems, Solar Water-heating Systems, etc.

#### Ducts and Fans:

Table with 2 columns: Code Section and Requirement. Includes items like Ducts, CMC Compliance, Field-Fabricated Duct Systems, Backdraft Damper, Gravity Ventilation Dampers, Protection of Insulation, Porous Inner Core Flex Duct, Duct System Sealing and Leakage Test, Air Filtration, etc.

5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

Table with 2 columns: Code Section and Requirement. Includes items like Space Conditioning System Airflow Rate and Fan Efficacy, Ventilation and Indoor Air Quality, Airflow Measurement and Sound Ratings, etc.

#### Pool and Spa Systems and Equipment:

Table with 2 columns: Code Section and Requirement. Includes items like Certification by Manufacturers, Piping, Directional Inlets and Time Switches for Pools, Pool Systems and Equipment Installation, etc.

#### Lighting:

Table with 2 columns: Code Section and Requirement. Includes items like Lighting Controls and Components, Luminaire Efficacy, Recessed Downlight Luminaires, Light Sources in Enclosed or Recessed Luminaires, Blank Electrical Boxes, etc.

5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

Table with 2 columns: Code Section and Requirement. Includes items like Screw based luminaires, Light Sources in Enclosed or Recessed Luminaires, Light Sources in Drawers, Cabinets, and Linen Closets, Interior Switches and Controls, Accessible Controls, Multiple Controls, Mandatory Requirements, Energy Management Control Systems, Automatic Shutoff Controls, Dimmers, Independent controls, Residential Outdoor Lighting, Internally illuminated address signs, Residential Garages for Eight or More Vehicles, etc.

#### Solar Readiness:

Table with 2 columns: Code Section and Requirement. Includes items like Single-family Residences, Minimum Solar Zone Area, Azimuth, Shading, Structural Design Loads on Construction Documents, Interconnection Pathways, Documentation, Main Electrical Service Panel, etc.

5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

Table with 2 columns: Code Section and Requirement. Includes items like Energy Storage System (ESS) Ready, Heat Pump Space Heater Ready, Electric Cooktop Ready, Electric Clothes Dryer Ready, etc.

\*Exceptions may apply.

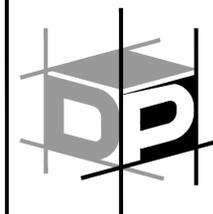
5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

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, HERS VERIFICATIONS, WINDOW PERFORMANCE, DOMESTIC HOT WATER, SOLAR (STUDIO), SOLAR (1 BEDROOM), INDOOR AIR QUALITY.

3381 Walnut Blvd. Ste.220 Brentwood, CA 94513 PH: 925.516.3502 FX: 925.262.4662 W: WWW.ADVANCEDENGINEERINGINC.COM



## 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 PIPING, 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. BUILDER 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/OR 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. INDOOR AIR QUALITY VENTILATION
2. KITCHEN RANGE HOOD
3. MINIMUM AIRFLOW (350 CFM/TON)
4. VERIFIED SEER (19.6)
5. VERIFIED REFRIGERANT CHARGE
6. FAN EFFICACY WATTS/CFM [0.45]
7. VERIFIED HSPF [10.8]
8. VERIFIED HEAT PUMP RATED HEATING CAPACITY
9. DUCT LEAKAGE TESTING [%]

SPACE HEATING & COOLING
HEAT PUMP (10.2 HSPF, 19.6 SEER, 11.7 EER)
MITSUBISHI PEAD-A24AA7 + PUZ-A24NH7
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.

PLEASE NOTE THE REVISION NUMBER AND DATE ARE FOR ENERGY SHEETS ONLY.
Sheet Description:
ENERGY CALCULATIONS

2022 SINGLE FAMILY RESIDENTIAL MANDATORY MEASURES SUMMARY AND SUMMARY SHEET

Initial Issue Date: March 31, 2023
Energy Analyst: J. Bennett Ext. 26
Project Manager: J. Peek Ext. 23
Job No. W021420

Sheet No.
ECM

# 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 blowing, can support high static pressure environment

- FILTERS**
- Two washable 20 µm 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](http://www.broan.com).
  - For more details about controls, refer to the **Main and auxiliary wall controls** user guide, also available at [www.broan.com](http://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

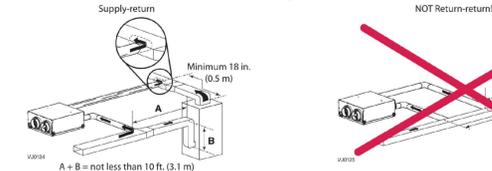
Outdoor Temperature*		Defrost in Minutes / Air Exchange in Minutes	
Outdoor Temperature*	Defrost in Minutes	Low Speed	High Speed
Warmer than 10°	Warmer than 14°	No defrost	No defrost
from 10 to -15°	from 14 to 5°	6/40	9/40
from -15 to -22°	from 5 to -17°	6/20	9/20
-27 and less	-17 and less	8/12	11/12

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

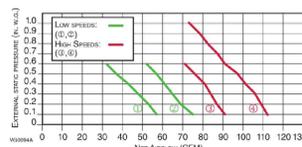
- Warranty**
- The Broan ERV100 is protected by a 5-year warranty on parts only, with the original proof of purchase.

- 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

### Simplified Installation (connection to a forced air system)



### VENTILATION PERFORMANCE



### ENERGY PERFORMANCE

Supply Temperature	Net Air Flow	Power	Source	Source	Ambient	Load		
°C	°F	W	CFM	Watts	Source	Recovery		
0	32	23	48	82	40	67	75	0.55
0	32	30	64	109	50	65	70	0.51
0	32	40	85	144	64	61	66	0.51
-10	14	23	49	83	40	65	71	0.53
-25	-13	24	50	85	36	51	73	0.39

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

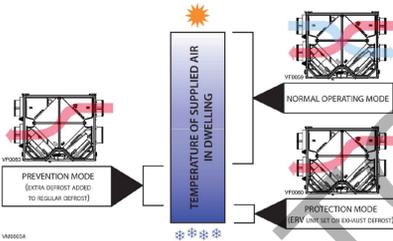
### Acoustic Noise Power Chart (dBA)

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.

The new degree of comfort™

## 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 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
- Easily replaces a standard electric water heater

**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.

**Operation Modes**

- Energy Saver
- Heat Pump
- High Demand
- Electric
- Vacation/Away: 2-28 days (or placed on hold indefinitely)

**Plus...**

- Premium grade anode rod with resistor extends the life of the tank
- 3/4" NPT water inlet and outlet; 3/4" condensate drain connections
- Inclody stainless steel resistor elements
- 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)

**Warranty**

- 10-Year limited tank and parts warranty
- See Residential Warranty Certificate for complete information

Available in 15 & 30 Amps

**Professional Prestige ProTerra Hybrid**  
40, 50, 65 and 80-Gallon Capacities  
208-240 Volt / 1 PH Electric

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

† LeakSense™ Built-in Leak Detection System detects any leak large or small, internal or external.\*

PEAD-A24AA7 & PUZ-A24NH7(BS)  
MID STATIC HORIZONTAL-DUCTED INDOOR UNIT  
24,000 BTU/H HEAT PUMP UNIVERSAL OUTDOOR

Job Name: \_\_\_\_\_ Date: \_\_\_\_\_

System Reference: \_\_\_\_\_

Indoor Unit: PEAD-A24AA7

Outdoor Unit Standard Model: PUZ-A24NH7

Seacoast Model: PUZ-A24NH7-BS

**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'ft)
- 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:
  - Keuro class® 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

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### Professional Prestige® ProTerra Hybrid Specifications

WARRANTY CAPACITY	RATED CAPACITY	MODEL NUMBER	ENERGY INFO		COMPRESSION		SOUND LEVEL		DEF. RECOVERY		TOTAL DEF. WATTAGE	MAX. AMP.	UNIT WEIGHT	NET WEIGHT	
			SEASONAL ENERGY RATIO	ENERGY EFFICIENCY INDEX	CONDENSATE PUMP	DEF. PUMP	DEF. PUMP	DEF. PUMP							
<b>ProTerra with LeakGuard</b>															
40	50	PROPH40 T2 RH075-S0	700946	30	3.75	\$104	4,200	40	60	27	4,500	5,000	21	157	174
50	45	PROPH50 T2 RH075-S0	700943	30	3.75	\$104	4,200	40	67	27	4,500	5,000	21	178	218
65	60	PROPH65 T2 RH075-S0	700944	30	3.86	\$156	4,200	40	75	27	4,500	5,000	21	225	282
80	72	PROPH80 T2 RH075-S0	700945	30	4.00	\$148	4,200	40	87	27	4,500	5,000	21	244	281
<b>ProTerra 30 Amp without LeakGuard</b>															
40	50	PROPH40 T2 RH075-S0	700947	30	3.75	\$104	4,200	40	60	27	4,500	5,000	21	157	174
50	45	PROPH50 T2 RH075-S0	700947	30	3.75	\$104	4,200	40	67	27	4,500	5,000	21	178	218
65	60	PROPH65 T2 RH075-S0	700948	30	3.86	\$156	4,200	40	75	27	4,500	5,000	21	225	282
80	72	PROPH80 T2 RH075-S0	700949	30	4.00	\$148	4,200	40	87	27	4,500	5,000	21	244	281
<b>ProTerra 15 Amp without LeakGuard</b>															
40	50	PROPH40 T2 RH075-S0	700947	15	3.46	\$118	4,200	40	60	16	2,250	2,750	12	157	174
50	45	PROPH50 T2 RH075-S0	700948	15	3.75	\$104	4,200	40	32	16	2,250	2,550	12	178	218
65	60	PROPH65 T2 RH075-S0	700949	15	3.66	\$110	4,200	40	54	16	2,250	2,350	12	225	282
80	72	PROPH80 T2 RH075-S0	700948	15	3.70	\$106	4,200	40	67	16	2,250	2,750	12	244	281

Estimated energy cost based on a residential average electricity cost of \$0.17/kWh. Uniform Energy Factor (UEF) values given are based on Department of Energy (DOE) requirements. All units have optional WiFi control option.

WARRANTY CAPACITY	MODEL NUMBER	DIMENSIONS SHOWN IN INCHES											
		A	B	C	D	E	F	G	H	I	J	K	L
40	PROPH40	60-616	20-14	47	3-5/8	39-5/8	25-3/8	20-1/2	18-1/8	23-3/8	23-1/4		
50	PROPH50	61-3/4	22-14	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	24-14	49	3-7/8	42-3/8	27-1/2	24-5/8	21-1/8	26-1/2	27-3/8		
80	PROPH80	74-3/16	24-14	50	3-7/8	42-3/8	27-1/2	24-5/8	21-1/2	27-1/2	27-3/8		

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## Certificate of Product Ratings

AHRI Certified Reference Number: 201754461 Date: 03-30-2023 Model Status: Active

AHRI Type: HFC/DA-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-A24NH7\*\*\*

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 : 19.20

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 - 2023, 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 (H14a) - Single or High Stage (47F), btuh : 26000

HSPF2 (Region IV) : 9.10

Sold in: USA, Canada

www.ahridirectory.org

\*Active Model Status are those that an AHRI Certification Program Participant is currently producing and offering for sale; OR new models that are being marketed but are not yet being produced. \*Model Status are those that an AHRI Certification Program Participant is no longer producing and offering for sale.

Address that are accompanied by NAEI include an involuntary re-rate. The new published rating is shown along with the previous (i.e. NAEI) 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(c). Please refer to [www.NAEMet.org](http://www.NAEMet.org) for more information about updated energy efficiency metrics.

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©2023 Air-Conditioning, Heating, and Refrigeration Institute

**CERTIFICATE NO.:** 1332471442997907

## ADVANCED ENGINEERING

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

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TOWN OF DANVILLE ACCESSORY DWELLING UNIT

DANVILLE, CALIFORNIA

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

Sheet Designation: 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

PLAN SET ID: S-CO-M-P

**GENERAL NOTES**

- 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.
- 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.
- WRITTEN INFORMATION AND DIMENSIONS SHALL TAKE PRECEDENCE OVER GRAPHIC INFORMATION.
- 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.
- 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.
- 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.
- 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.**
- 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.
- 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.
- 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.
- 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.
- 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 PROTECTION OF THE JOB SITE, INCLUDING SAFETY OF PERSONS AND PROPERTY. THE CONTRACTOR SHALL PROTECT NEW AND EXISTING CONSTRUCTION FROM INCLIMENT WEATHER AND PHYSICAL DAMAGE.
- 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.
- 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.
- 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**

- 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.
- 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.
- MINIMUM CLEARANCE OF 8" SHALL BE PROVIDED BETWEEN EARTH AND WOOD IN ALL LOCATIONS PER CBC 2304.12
- 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. PONDING WATER MAY CAUSE UNDESIRABLE SOIL SWELL OR LOSS OF STRENGTH.
  - 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.
  - 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.
  - 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.
- 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.
- 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 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.
- 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. FOR MORE INFORMATION.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND PROTECT EXISTING UTILITIES TO REMAIN DURING AND/OR AFTER CONSTRUCTION.
- 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.
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, UNDERPINNING AND PROTECTION OF EXISTING CONSTRUCTION.
- 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.
  - 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
  - INDICATES POST BELOW
  - INDICATES POST ABOVE
  - INDICATES WALL BELOW (NON-BEARING AT INTERIOR CONDITION)
  - INDICATES WALL ABOVE
  - INDICATES BALLOON FRAMED WALL. REFER TO NOTE 6, UNDER GENERAL FRAMING NOTES FOR STUD SIZE AND SPACING REQUIREMENTS, U.N.O.

**SHEARWALL NOTES**

- 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.
- 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.
- SEE SHEARWALL SCHEDULE ON PLANS FOR REQUIRED SHEARWALL NAILING, ANCHOR BOLTS, SILL NAILS, AND OTHER SHEAR TRANSFER HARDWARE.
- SHEARWALL PLYWOOD SHALL NOT BE CUT FOR PIPE, DUCTS, SLEEVES, ETC., U.N.O. OR DETAILED.
- UNLESS OTHERWISE DETAILED, ALL INTERIOR SHEARWALLS SHALL BE CONTINUOUS TO THE ROOF OR FLOOR PLYWOOD IN ACCORDANCE WITH THE TYPICAL SHEAR TRANSFER DETAILS
- 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.
- 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 THIS MAY BE 2x.

**OBSERVATION OF CONSTRUCTION**

- 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:
  - REINF. STEEL AND HARDWARE EMBEDDED IN THE FNDTION SHALL BE OBSERVED PRIOR TO CONCRETE PLACEMENT
  - SHEARWALLS AND FRAMING ELEMENTS SHALL BE OBSERVED PRIOR TO INSTALLATION OF FINISHES.
- 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 NOT 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**

- IN ADDITION TO OBSERVATIONS BY THE CITY INSPECTOR AND THE PROJECT ENGINEER, SPECIAL INSPECTIONS BY AN ICC CERTIFIED SPECIAL INSPECTOR IS REQUIRED AS FOLLOWS:
  - 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.
  - TITEN HD ANCHORS INSTALLED IN CONCRETE SHALL HAVE SPECIAL INSPECTION OF DRILLING AND INSTALLATION PER ICC-REPORT ICC-ES/ESR-2713 SECTION 4.4.
  - 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.
  - 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.
  - CONTINUOUS INSPECTIONS OF CAST-IN-PLACE DEEP FOUNDATION (PIERS) TO VERIFY: PLACEMENT LOCATIONS AND RUMBLENESS, CONFIRM ELEMENT DIAMETERS, LENGTHS, AND EMBEDMENTS PER SECTION 1705.8 OF THE CURRENT EDITION OF THE C.B.C.
- 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 JOIST 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.
	DOUBLE 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 6" 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 GIRDERS 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 GIRDERS 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	JOIST TO BAND JOIST, FACE NAIL	(3) 16d	(4) 3" x 0.131"	(4) 3"-14 GA.
30	LEDGER STRIP, FACE NAIL	(3) 16d	(4) 3" x 0.131"	(4) 3"-14 GA.
31	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.
	8d (NOTE 5)	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

- COMMON OR BOX NAILS ARE PERMITTED TO BE USED EXCEPT WHERE OTHERWISE STATED.
- 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")
- COMMON (6d - 2" x 0.113"; 8d - 2.5" x 0.131"; 10d - 3" x 0.148"; 16d - 3.5" x 0.162")
- DEFORMED SHANK (6d - 2" x 0.113"; 8d - 2.5" x 0.131"; 10d - 3" x 0.148")
- 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.
- FOR ROOF SHEATHING APPLICATIONS, 8d NAILS (2.5" x 0.113") ARE THE MINIMUM REQUIRED FOR WOOD STRUCTURAL PANELS.
- STAPLES SHALL HAVE A MINIMUM CROWN WIDTH OF 7/16".
- FOR ROOF SHEATHING APPLICATIONS, FASTENERS SPACED 4" O.C. AT EDGES AND 8" O.C. AT INTERMEDIATE SUPPORTS.
- 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.
- 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:**

- 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.
- FASTENERS IN CONTACT WITH PRESERVATIVE-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

**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
ADDL	ADDITIONAL	INSTTUTE	FLOOR JOIST	P.A.	POST ABOVE
A.F.F.	ABOVE FINISHED FLOOR	FLG	FLANGE	P.A.F.	POWDER-ACTUATED FASTENER
AGGREG.	AGGREGATE	FLR	FLOOR	P.C.F.	POUNDS PER CUBIC FOOT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	F.O.B.	FACE OF BLOCK	PEN.	PENETRATION
ATC	AMERICAN INSTITUTE OF TIMBER CONSTRUCTION	F.O.C.	FACE OF CONCRETE	PERF.	PERFORATED
ALT.	ALTERNATE	F.O.M.	FACE OF MASONRY	PERP.	PERPENDICULAR
ARCH.	ARCHITECT(URAL)	F.O.S.	FACE OF STUD	PL.	PLATE
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS	F.P.	FACE OF STUD	PLY.	PLYWOOD
B/	BOTTOM OF	FRMD	FRAMED	PLYWD	PLYWOOD
B.C.	BOTTOM CHORD	FRMG	FRAMING	PR	PAIR
BLDG	BUILDING	F.S.	FRAMING	P.S.F.	POUNDS PER SQUARE FOOT
BLK	BLOCK	FT	FOOT	P.S.L.	PARALLEL-STRAND LUMBER
BLKG	BLOCKING	FTG	FOOTING	PST	POST
BLW	BELOW	G & N	GLUE AND NAIL	POINT	POINT
B.N.	BOUNDARY NAILING	GA.	GAGE	P.T.	PRESSURE TREATED - OR - RADIUS
B.O.	BY OTHERS - OR - BOTTOM OF	GALV.	GALVANIZED	R	RECOMMENDATION
B.O.C.	BOTTOM OF CONCRETE	GEN.	GENERAL	REFC'D	REFERENCE
B.O.F.	BOTTOM OF FOOTING	GLB	GLUED-LAMINATED BEAM	REINF.	REINFORCED - OR - REINFORCING - OR - REINFORCEMENT
B.R.G.	BEARING	GR.	GRADE	REQD	REQUIRED
B.S.	BOTH SIDES	G.T.	GRADE TRUSS	RET.	RETAINING
BTM	BOTTOM	G.W.B.	GYPSON WALL BOARD	REJAIN.	RETRAINING
B.TWN	BETWEEN	H.D.G.	HOT-DIP GALVANIZED	R.O.	ROUGH OPENING
CALLCS	CALCULATIONS	HGR	HANGER	R.P.	REAL POST
CANT.	CANTILEVER	H.N.	HEAVY HEX NUT	R.S.	ROUGH SAWN
C.B.	CEILING BEAM	H.N.	HEX NUT	R/S	RESAWN (ROUGH-SAWN)
C.B.C.	CALIFORNIA BUILDING CODE	H.O.B.	HIGH STRENGTH BOLT	R.T.	ROOF TRUSS
C.C.	CENTER TO CENTER	HSS	STRUCTURAL TUBE	R.W.	RETAINING WALL
C.C.J.	CRACK CONTROL JOINT	HT	HEIGHT	RWD	REDWOOD
C.F.	CUBIC FOOT	I.D.	INSIDE DIAMETER	S.A.D.	SEE ARCHITECTURAL DRAWINGS
C.J.	CONTROL JOINT - OR - CEILING JOIST	INT.	INTERIOR	S.B.	SOLID BLOCK TRUSS
Ç	CENTERLINE	INV.	INVERT(ED)	S.C.H.T.	SCHEDULE
CLG	CEILING	JNT	JOINT	SEP.	SEPARATION
CLR	CLEAR	JST	JOIST	S.G.T.	SUB-GIRDER TRUSS
C.M.U.	CONCRETE MASONRY UNIT	J.T.	JACK TRUSS	SHT	SHEET
COL.	COLUMN	K.D.	KILN-DRIED	SIM.	SIMILAR
COLL.	COLLECTOR	K.F.	KIPS PER LINEAL FOOT	S.M.S.	SHEET METAL SCREW
CONC.	CONCRETE	K.P.	KING POST	S.J.	SOFFIT JOIST
COND.	CONDITION	lbs	POUNDS	SPEC.	SPECIFICATION
CONN.	CONNECTION	LAG	LAG BOLT	SQ.	SQUARE
CONSTR.	CONSTRUCTION	L.F.	LINEAL FOOT	S.S.	SELECT STRUCTURAL
CONT.	CONTINUOUS	LONGIT.	LONGITUDINAL	S4S	SURFACED 4 SIDES
CONTR.	CONTRACTOR	LG	LONG	STAGG.	STAGGER - OR - STAGGERED
C.P.	COMPLETE PENETRATION	L.L.	LIVE LOAD	STD	STANDARD

**GENERAL FRAMING NOTES**

- 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.
- 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.) <sup>1</sup>	STUD GRADE, MINIMUM	BUILT UP HEADERS (2-2x)	D.F. #2, MIN. U.N.O.
MUDSILLS (2x MIN.) <sup>2</sup>	P.T. D.F. STD & BETTER	4x POSTS/BEAMS/RAFTERS	D.F. #2, MIN. U.N.O.
TOP PLATES (2x MIN.) <sup>3</sup>	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 <sup>4</sup>	P.T. D.F. #2 U.N.O.

- 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.
- 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.
- 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.

- 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).

- ALL INTERIOR/DAMP CONSTRUCTION, UC2 CATEGORY, SHALL BE TREATED WITH SODIUM BORATE SBX/DOT.
  - 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.
- 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)
  - 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.
  - 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.

- 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.**

- 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.
  - GLULAM MEMBERS, SEE PLAN SPECIFICATIONS FOR CAMBER WHERE OCCURS.

MATERIAL GRADE	E (x10 <sup>3</sup> 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

- GLULAM MEMBERS IN WET SERVICE USE SHALL BE ALASKAN CEDAR 20F-V12 (SINGLE SPAN) OR COMBINATION 20F-V13 (MULTI-SPAN & CANTILEVER) U.N.O.
  - GLULAM MEMBERS, SEE PLAN SPECIFICATIONS FOR CAMBER WHERE OCCURS.

MATERIAL GRADE	E (x10 <sup>3</sup> 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

- 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.

- 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.

- 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.) <sup>2</sup>	E (x10 <sup>3</sup> psi)	Fb (psi)	Fv (psi)	Fc (psi)	F <sub>CL</sub> (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

- BEAM DEPTH IS ASSUMED TO MATCH FLOOR FRAMING DEPTH U.N.O.
- MFR BEAM MEMBERS MAY BE BUILT UP TO ACHIEVE SPECIFIED WIDTHS PER DETAIL 609 U.N.O. ON PLANS.

- 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.

- 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.
- 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. 401

- PROVIDE KING STUDS AT THE ENDS OF ALL HEADERS OR OTHER BEAMS INSTALLED IN WALLS, SEE DETAIL SD4 ADJACENT, STACKING WINDOWS SHALL BE SEPARATED BY KING STUDS THAT ARE CONTINUOUS FROM SILL TO TOP PLATE, CRIPPLE STUDS UNDER HEADERS SHALL BE CONTINUOUS TO SILL PLATE. END NAIL KING STUDS TO HEADERS.

- ALL MEMBERS IN BEARING SHALL BE ACCURATELY CUT AND ALIGNED SO THAT FULL BEARING IS PROVIDED WITHOUT THE USE OF SHIMS.

- BLOCK ALL STUD WALLS AS REQUIRED FOR SHEATHING AND FINISHES. BALLOON FRAME ALL WALLS WITH SLOPING CEILING OR WITH RAISED CEILINGS.

- 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.

- 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.

- 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".

- 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).

- 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.

- 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.

- CONCRETE REQUIREMENTS: BASED ON NORMAL WEIGHT CONCRETE (UNIT WEIGHT OF 145 TO 150 pcf).

	MINIMUM COMPRESSIVE STRENGTH (psi) (+/- 1/2") (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.

- 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.
  - 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.

- 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.

- MIXING WATER SHALL BE CLEAN AND FREE FROM INJURIOUS AMOUNTS OF OIL, ACIDS, ALKALIES, ORGANIC MATERIALS OR OTHER DELTERIOUS SUBSTANCES.
- CONCRETE EXPOSED TO SULFATE SHALL USE TYPE V CEMENT WITH POZZOLAN.
- 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.
- ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL NOT BE USED.
- CEMENT SHALL CONFORM WITH ASTM C150 & C 595, PORTLAND CEMENT AND BLENDED HYDRAULIC CEMENTS
- TRANSIT MIX SHALL BE PER ASTM C-94.
- MIX DESIGN SHALL MEET THE RECOMMENDED SPECIFICATION UNLESS AN ALTERNATE MIX IS SUBMITTED AND REVIEWED BY THE ENGINEER.

- 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:

- ONE EVERY DAY A GIVEN CLASS IS PLACED, NOR LESS THAN
- ONCE FOR EACH 150 yd OF EACH CLASS PLACED EACH DAY, NOR LESS THAN
- ONCE FOR EACH 5000 ft OF SLAB OR WALL SURFACE AREA PLACED EACH DAY.

- 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.

- REINFORCING SHALL BE NEW STOCK, DEFORMED BARS, CONFORMING TO ASTM A-615 AS FOLLOWS (U.N.O.):
  - ALL BARS TO BE WELDED SHALL MEET THE REQUIREMENTS OF ASTM A706, GRADE 60.
  - WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185, FLAT SHEETS ONLY. LAP FABRIC 6" MINIMUM.
  - REINFORCEMENT PLACEMENT SHALL CONFORM TO DETAIL A
  - ANCHOR BOLTS SHALL BE ASTM A307, U.N.O. AND SHALL CONFORM TO DETAIL SD3

- 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:
  - CONCRETE CAST AGAINST EARTH, EXCEPT SLABS ON GRADE: 3" SLABS ON GRADE: 1-1/2" U.N.O.
  - CONCRETE CAST IN FORMS, BUT EXPOSED TO EARTH OR WEATHER: No. 5 REINFORCING AND SMALLER: 1-1/2" No. 6 REINFORCING AND LARGER: 2"
  - CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND: SLABS, WALLS AND JOISTS: 3/4" BEAMS AND COLUMNS: 1-1/2"

- UNFORMED CONCRETE SURFACE CURING:
  - CURE FOR ONE TO SEVEN DAYS BY MAINTAINING TEMPERATURE ABOVE 50 DEGREES FAHRENHEIT, AND IN A MOIST CONDITION.
  - APPLY MEMBRANE-FORMING CURING COMPOUND TO DAMP CONCRETE IMMEDIATELY AFTER COMPLETION OF THE MOIST-CURING PERIOD.

- 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.

- FOOTING/GRADE BEAM CONSTRUCTION JOINTS SHALL CONFORM TO DETAIL 204 SD2

- 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 205A LOCATION OF SLAB ON GRADE CONSTRUCTION JOINTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. SLAB ON GRADE CONSTRUCTION JOINTS SHALL CONFORM TO 205B SD2

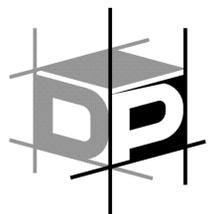
- ALL PIPES AND DUCTS THROUGH CONCRETE SHALL BE SLEEVED. VERIFY OPENINGS WITH PLUMBER AND ELECTRICIAN. SEE DETAIL 206 SD2
- IF SPECIFIED, WELDED WIRE FABRIC SHALL BE 6x6-W1.4xW1.4. WIRE FABRIC SHALL BE ELECTRICALLY WELDED STEEL PER ASTM A185. LAP 6" MINIMUM AT ALL EDGES AND TIE AT THREE PLACES TO REINFORCING DOWELS (WHERE OCCURS) EXCEPT LOCATIONS WHERE SLAB IS INDEPENDENT OF FOUNDATION. CONTRACTOR SHALL PROVIDE SUPPORT CHAIRS TO ENSURE FABRIC IS LOCATED IN THE CENTER OF THE SLAB.

- WELDING OF REINFORCING BARS SHALL CONFORM TO AWS D1.4 USING ASTM A706 REINFORCING BAR SPECIFICATIONS.

**STRUCTURAL STEEL NOTES**

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

DO NOT SCALE THESE DRAWINGS  
PLAN SET ID: S-CO-M-P



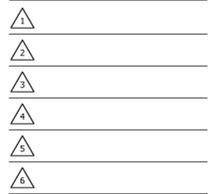
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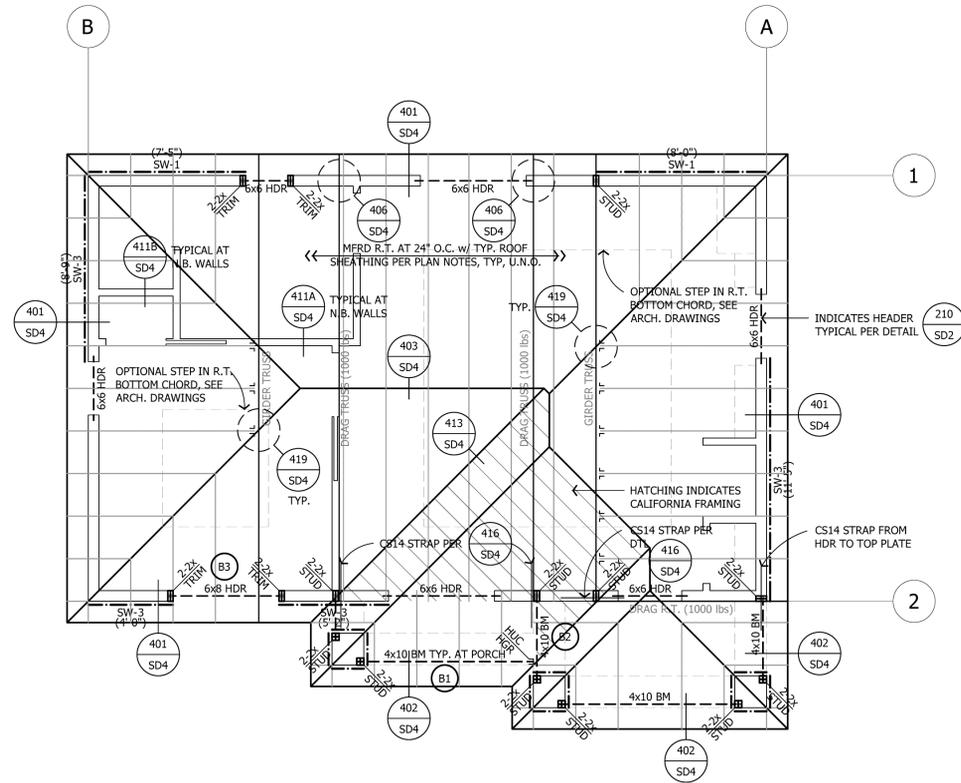
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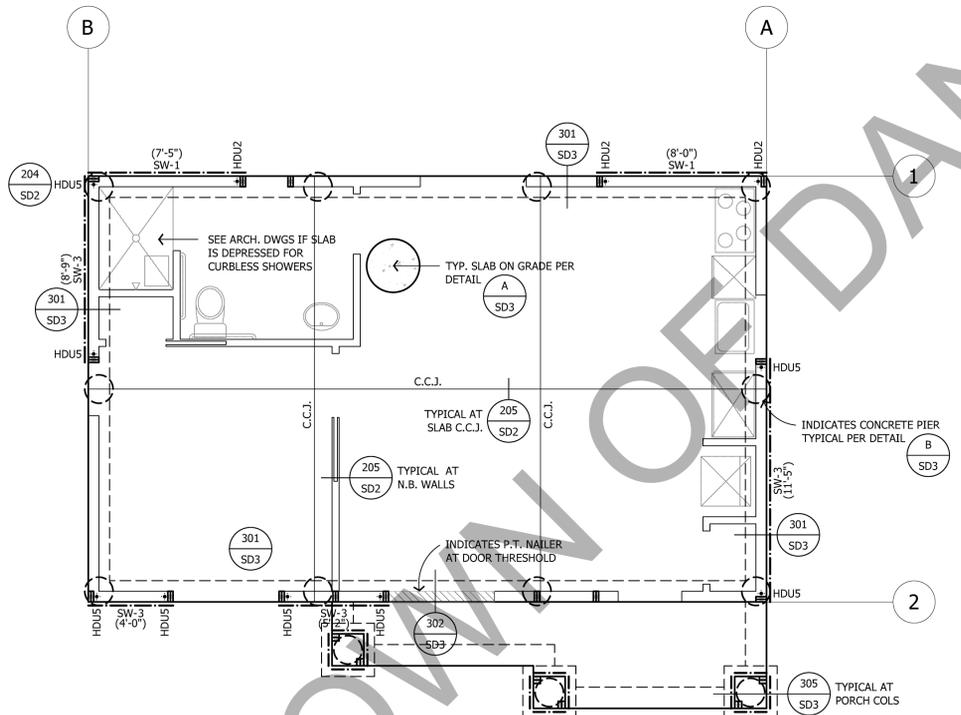
Sheet Description:  
**GENERAL STRUCTURAL SPECIFICATIONS AND NOTES**

No Scale  
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.  
**SN2**



**A** ROOF FRAMING PLAN - CONTEMPORARY



**B** FOUNDATION PLAN - CONTEMPORARY - CONCRETE SLAB ON PIERS

**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) SUPPORTED BY DRILLED CONCRETE PIERS PER (B) SD3.
  - STEP FOUNDATION AS (A) SD3 REQUIRED FOR FLOOR ELEVATION CHANGES AND COMPLIANCE WITH DETAILS. THE CONTRACTOR SHALL GRADE THE SITE TO PROVIDE PROPER SURFACE DRAINAGE AWAY FROM THE FOUNDATION AT ALL LOCATIONS. ROOF GUTTER DOWNSPOUTS SHALL NOT DISCHARGE NEAR THE FOUNDATION.
- 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.
- HOLD-DOWNS: HOLD-DOWNS NOTED OCCUR AT THE LEVEL OF FRAMING SHOWN FOR CONNECTION OF WALLS ABOVE TO FOOTING.
  - ALL HOLD-DOWN 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 HOLD-DOWNS SHALL BE INSTALLED WITH ANCHORS PER DETAIL (112) SD1.
  - CONTRACTOR SHALL REVIEW HOLD-DOWN ANCHOR REQUIREMENTS FOR EMBEDMENT CONDITIONS THAT REQUIRE DEEPENED FTG. REFER TO (112) SD1 FOR REQUIREMENTS.
  - PROVIDE POSTS AT ALL HOLD-DOWNS AS SHOWN IN DETAIL (112) SD1 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 HOLD-DOWN PER FRAMER SHALL CONFIRM LAYOUT BEFORE CONCRETE IS POURED. NOTIFY ENGINEER OF CONFLICTS PRIOR TO PROCEEDING.
- CONTRACTOR SHALL REVIEW HOLD-DOWN ANCHOR REQUIREMENTS FOR EMBEDMENT CONDITIONS THAT REQUIRE DEEPENED FTG. REFER TO (112) SD1 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: ALL BEAMS SHALL BE CONSIDERED FLUSH, (TOP OF BEAM EQUAL TO TOP OF ROOF FRAMING AND BOTTOM OF ROOF FRAMING) UNLESS NOTED OTHERWISE ON PLANS AS ONE OF THE FOLLOWING:
  - DROPPED:** BEAM IS SET BELOW ROOF FRAMING WITH TOP OF BEAM SET AT BOTTOM OF ROOF FRAMING.
  - DOWNSET:** 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.
  - "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: TYPICAL ROOF SHEATHING SHALL BE 15/32" THICK (24/0 OR 32/16) CDX GRADE PLYWOOD (OR EQUIVALENT-RATED ORIENTED STRAND BOARD (O.S.B.) WITH GAP PER MANUFACTURER. ROOF SHEATHING SHALL BE NAILED WITH 8d AT 6" O.C. (EDGES) AND 8d AT 12" O.C. (FIELD), UNLESS NOTED OTHERWISE ON THE PLAN. ORIENT SHEATHING WITH FACE GRAIN PERPENDICULAR TO FRAMING MEMBERS, AND STAGGER END JOINTS.
  - PLYWOOD SHEETS LOCATED AT ROOF EDGES OR CHANGES IN FRAMING SHALL BE AT LEAST 24 INCHES WIDE OR SHALL BE EDGE LOCKED 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 (210) SD2 TO THE HEADER SCHEDULE, U.N.O. ON THE PLAN.
- 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 (103) SD1.
- HOLD-DOWN STRAPS: WHERE HOLD-DOWN STRAPS ARE SPECIFIED ON PLANS, INSTALL PER DETAIL (112) SD1 (113) SD1.
  - ALL NAIL HOLES SHALL BE FILLED ON HOLD-DOWN STRAPS



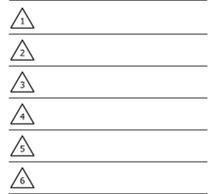
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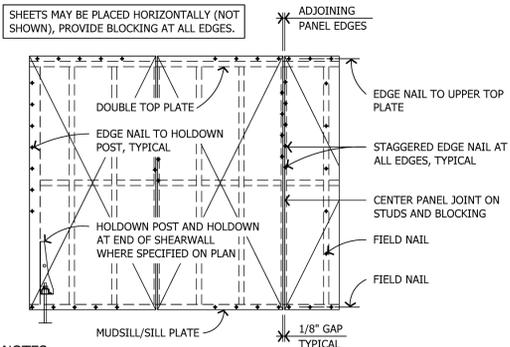


Sheet Description: **STUDIO MIRRORED PLAN**  
STRUCTURAL ROOF FRAMING PLAN AND FOUNDATION PLAN

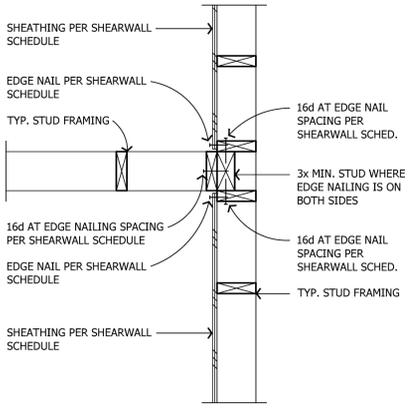
Scale: 1/4" = 1'-0"  
Initial Issue Date: March 24, 2023  
Drawn By: E. Bennett  
Project Designer: J. Peek  
Project Manager: J. Peek Ext. 23  
Job No. W021420

Sheet No.

**S1**



**NOTES:**  
 1. SEE SHEARWALL SCHEDULE FOR REQUIRED SHEATHING, NAILING, AND SILL CONNECTIONS.  
 2. FOR LOCATION OF TIEDOWNS AND TD POSTS, SEE TYPICAL DETAILS ON SHEET SD2.

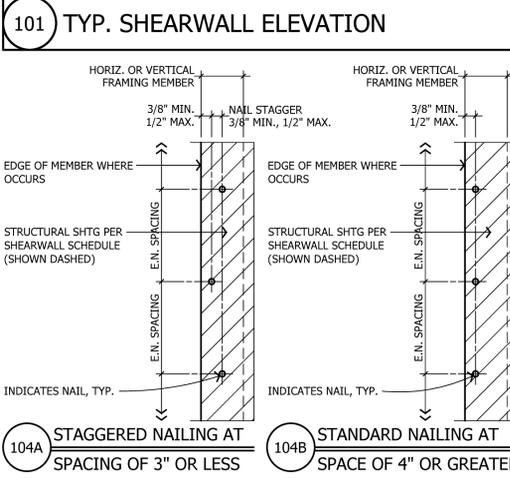


**101 TYP. SHEARWALL ELEVATION**

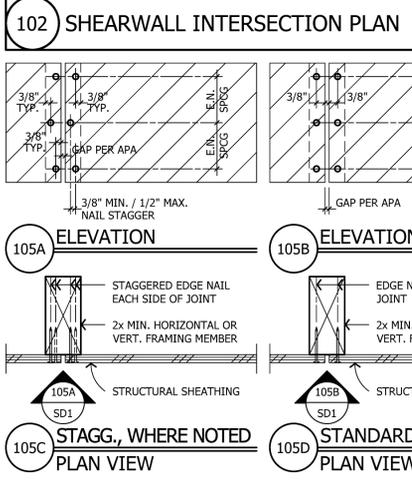
SHEARWALL LENGTH: SHEARWALL DESIGNATION:	X'-X" SW-1	X'-X" SW-2	X'-X" SW-3	X'-X" SW-4	X'-X" SW-5
	PLYWOOD OR O.S.B. SHEATHING THICKNESS:	15/32"	15/32"	15/32"	15/32"
10d EDGE NAIL (0.148 DIA):	10d @ 6" O.C.	10d @ 4" O.C.	10d @ 3" O.C.	10d @ 2" O.C.	10d @ 2" O.C.
10d FIELD NAIL (0.148 DIA.):	10d @ 21" O.C.	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 @ 14" O.C.	16d @ 2" O.C. SDS @ 9" O.C.	--	SDS @ 6" O.C.
5/8" DIA. MUDSILL 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"	@ 16" O.C. MAX	@ 10" O.C. MAX	@ 8" O.C. MAX	@ 6" O.C. MAX	@ 6" O.C. MAX
TOP CONNECTION - "LTP4"	@ 23" O.C. MAX	@ 15" O.C. MAX	@ 12" O.C. MAX	@ 8" O.C. MAX	@ 8" O.C. MAX
TOP CONNECTION - "A35"	@ 24" O.C. MAX	@ 18" O.C. MAX	@ 13" O.C. MAX	@ 10" O.C. MAX	@ 8" O.C. MAX
ALLOWABLE SHEAR	310	460	600	770	870

SHEARWALL LENGTH: SHEARWALL DESIGNATION:	X'-X" SW-6	X'-X" SW-7	X'-X" SW-8
	PLYWOOD OR O.S.B. SHEATHING THICKNESS:	15/32" STR. 1 EACH FACE	15/32" STR. 1 EACH FACE
10d EDGE NAIL (0.148 DIA):	10d @ 4" O.C.	10d @ 3" O.C.	10d @ 2" O.C.
10d FIELD NAIL (0.148 DIA.):	10d @ 12" O.C.	10d @ 12" O.C.	10d @ 12" O.C.
FRAMING MEMBER AT ADJOINING PANEL EDGES:	SINGLE 3x OR 4x	SINGLE 3x OR 4x	SINGLE 3x OR 4x
3x SILL REQ. (NOTE 6):	YES	YES	YES
SILL CONNECTION: LAG SCREW (1/2" DIA. x 7.5"): SDS SCREW (SDS25600):	LAG @ 7" O.C. SDS @ 5" O.C.	LAG @ 5" O.C. SDS @ 4" O.C.	LAG @ 4" O.C. SDS @ 3" O.C.
5/8" DIA. MUDSILL A.B.: WITH 3x SILL	@ 18" O.C. MAX	@ 16" O.C. MAX	@ 12" O.C. MAX
TOP CONNECTION - "RBC"	@ 5" O.C. MAX	@ 5" O.C. MAX	--
TOP CONNECTION - "LTP4"	@ 7" O.C. MAX	@ 6" O.C. MAX	--
TOP CONNECTION - "A35"	@ 8" O.C. MAX	@ 6" O.C. MAX	@ 4.5" O.C. MAX
ALLOWABLE SHEAR	1020	1330	1740

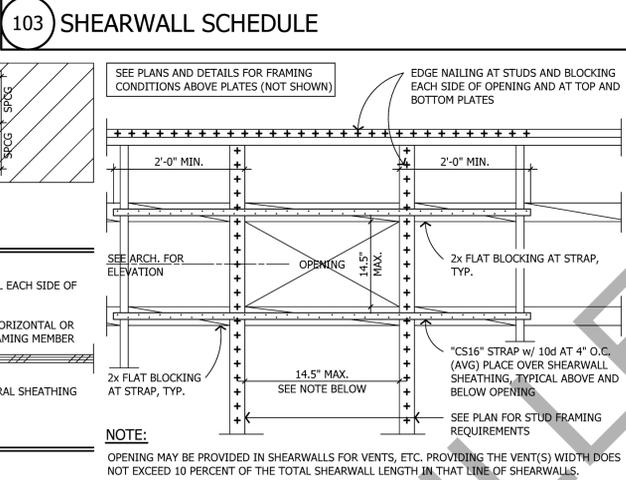
- ALL NAILS SHALL HAVE MINIMUM SHANK DIAMETER AS SPECIFIED IN SCHED.
- ALL FASTENERS THAT ARE INSTALLED INTO OR IN CONTACT WITH PRESSURE TREATED LUMBER ARE TO BE HOT DIPPED GALVANIZED PLYWOOD AND OSB SHALL BE TYPE CDX GRADE OR BETTER (EXCEPT WHERE STRUCTURAL 1 GRADE IS NOTED).
- STR. 1 = STRUCTURAL 1 GRADE PLYWOOD / O.S.B. WHEN FASTENERS ARE SPACED LESS THAN 4" ON CENTER, NAILING AT PANEL EDGES SHOULD BE STAGGERED PER DETAIL
- ALL DOUBLE SIDED WALLS REQUIRE 3x SILL. MIN.
- PREDRILL SILL CONNECTIONS WHERE NEEDED TO AVOID WOOD SPLITTING. USE DRILL BIT SIZE = 0.75 x NAIL (OR SCREW) DIAMETER.
- 3x SILL PLATES MAY BE OMITTED WHEN ALTERNATE SHEATHING JOINT AT RIM OR BLOCKING IS PROVIDED PER DETAIL
- INSTALL OBL 2x POST MIN. AT END OF SHEARWALLS. IF 3x FRAMING MEMBERS ARE REQUIRED USE 4x POST MINIMUM.
- ALL ANCHOR BOLTS MUST BE INSTALLED WITH 3"x3"x0.229" GALVANIZED PLATE WASHERS PER THE CURRENT CBC.
- WHERE SHEAR MATERIAL IS APPLIED ON BOTH FACES OF A SHEARWALL, AND NAIL SPACING IS LESS THAN 6" O.C. ALL THE FOLLOWING REQ. SHALL BE MET:
  - USE 3x SILLS AND 3x TOP PLATES.
  - 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.
  - INSTALL 4x RIM / BLOCKING MINIMUM BELOW ALL DOUBLE SIDED SHEARWALLS.
- FOR ALTERNATE MUDSILL ANCHORAGE, SEE DETAIL



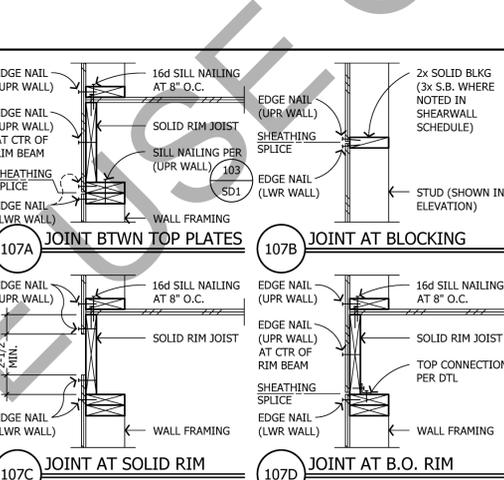
**102 SHEARWALL INTERSECTION PLAN**



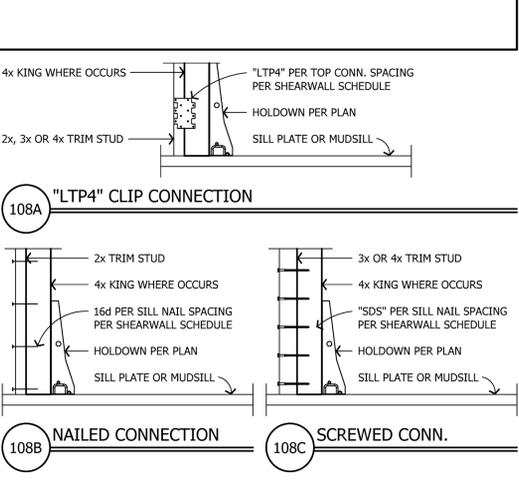
**103 SHEARWALL SCHEDULE**



**104 TYP. SHEARWALL EDGE NAIL PATTERN**



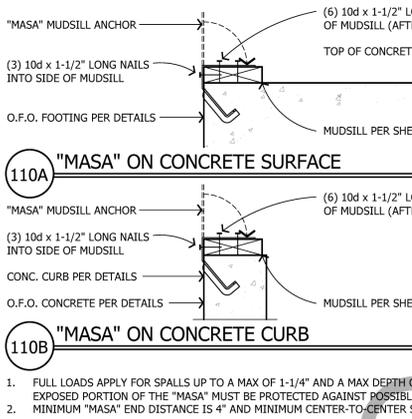
**105 SHEARWALL SHEATHING AT JOINT**



**106 SMALL OPENING IN SHEARWALL**

SHEARWALL DESIGNATION	ALTERNATIVE MUDSILL ANCHORAGE	
	"MASA" (NOTE 1.)	"TITEN HD" (NOTE 2.)
X'-X" SW-1	32" O.C.	48" O.C.
X'-X" SW-2	22" O.C.	36" O.C.
X'-X" SW-3	16" O.C.	28" O.C.
X'-X" SW-4	10" O.C. 3x SILL REQUIRED	24" O.C.
X'-X" SW-5	9" O.C. 3x SILL REQUIRED	24" O.C.
X'-X" SW-6	8" O.C. 3x SILL REQUIRED	24" O.C. 3/4" DIA. TITEN HD
X'-X" SW-7 & SW-8	NOT ALLOWED	16" O.C. 3/4" DIA. TITEN HD

**107 SHEATHING JOINT AT RIM OR BLKG**



**108 TRIM STUD TO HOLDOWN POST**

NOMINAL ANCHOR DIA.	DRILL BIT DIA.	MAX. INSTALL TORQUE	MAX. IMPACT WRENCH TORQUE RATING	EMBEDMENT DEPTH	CRITICAL EDGE DISTANCE
5/8"	5/8"	100	340	6.5"	6 3/8"
3/4"	3/4"	150	385	7.5"	7 5/16"

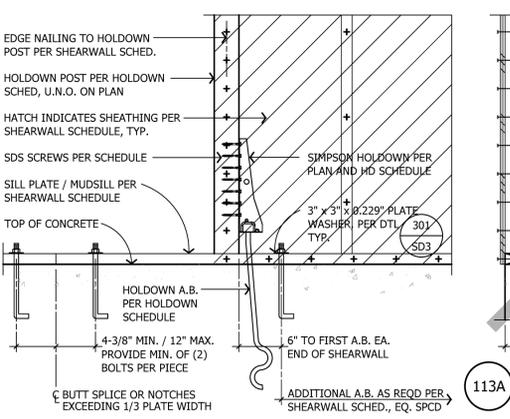
**109 ALTERNATIVE MUDSILL ANCHORAGE**

STRAP	END LENGTH	FASTENERS EA. END	MIN. POST SIZE	ALLOWABLE LOAD
"CS14"	15"	(13) 10d (0.148 DIA. x 2-1/2")	(2) 2x	2490 lbs
(2) "CS14"	15"	(13) 10d (0.148 DIA. x 2-1/2") EACH STRAP	4x4 / (2) 2x6	4980 lbs
"CMST14"	30"	(33) 10d (0.148 DIA. x 2-1/2")	4x6 / 6x6	6490 lbs
"CMST12"	39"	(43) 10d (0.148 DIA. x 2-1/2")	4x8 / 6x6	9215 lbs

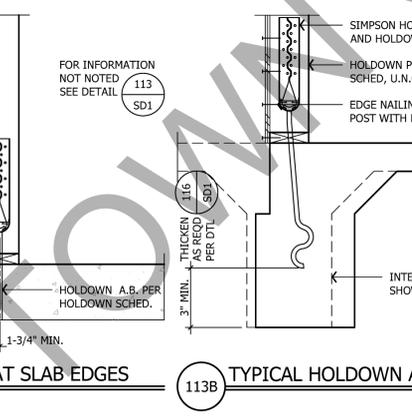
**110 MASA ANCHORAGES**

ANCHOR	"STHD" OPTION	POST CONNECTORS	MIN. POST	ALLOW. LOAD
"HDU2"	"STHD10"	(20) 16d SINKERS	(2) 2x	2940 lbs
"HDU4"	"STHD14"	(24) 16d SINKERS	(2) 2x	3815 lbs

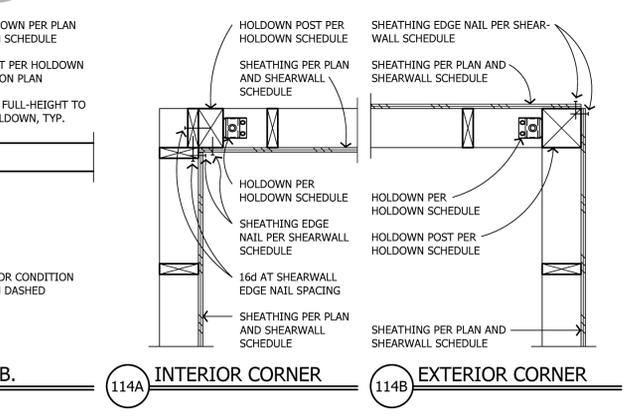
**111 "TITEN HD" ANCHORAGE & NOTES**



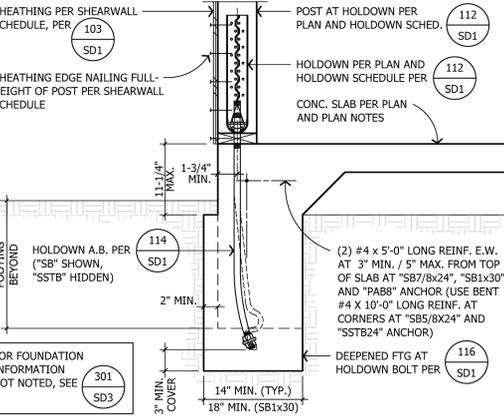
**112 SLAB HOLDOWN SCHEDULES**



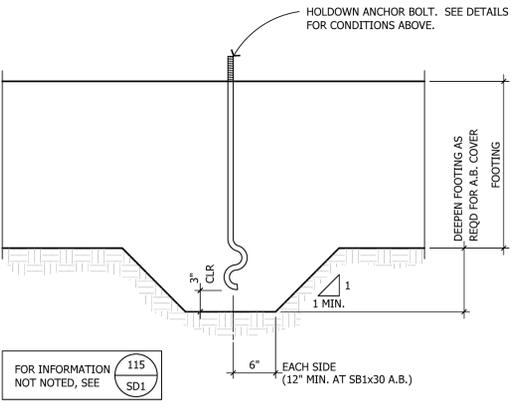
**113 TYPICAL HOLDDOWN AND HOLDOWN ANCHOR BOLT INSTALLATION**



**114 HOLDDOWN AT SHEARWALL CORNER (PLAN)**



**115 HOLDDOWN A.B. TO EXTERIOR FOOTING**



**116 DEEPENED FOUNDATION (FOR A.B.)**

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Sheet Description:  
 SHEARWALL SCHEDULE AND HOLDOWN SCHEDULE AND TYPICAL DETAILS

No Scale

Initial Issue Date: March 24, 2023

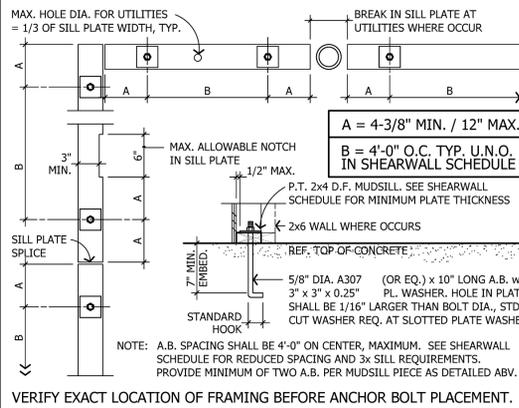
Drawn By: E. Bennett

Project Designer: J. Peek

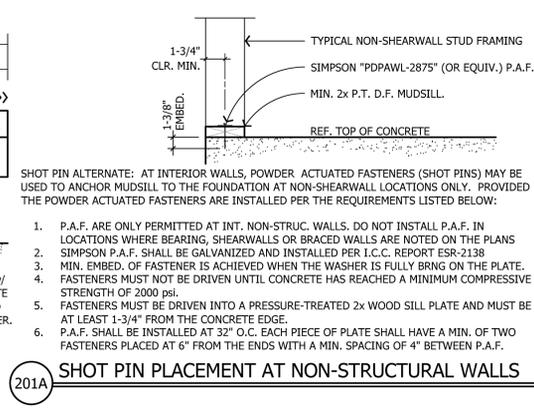
Project Manager: J. Peek Ext. 23

Job No. W021420

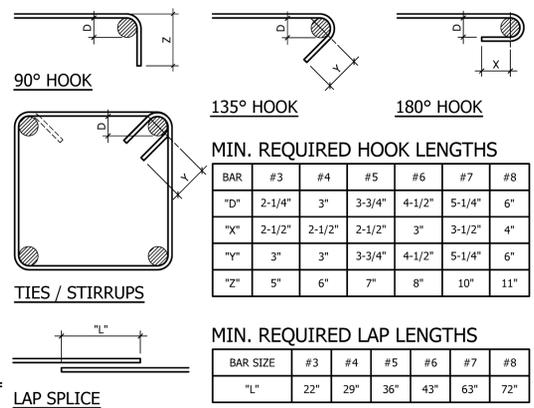
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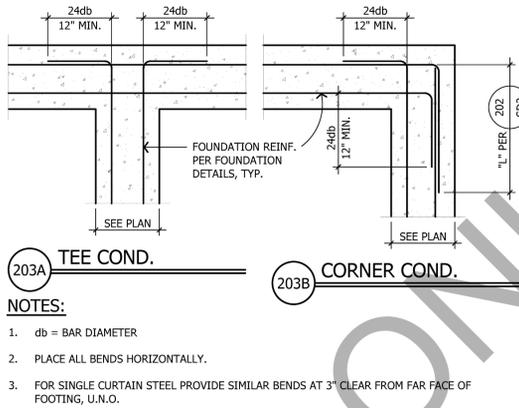
**201 TYPICAL ANCHOR BOLT AND SHOT PIN PLACEMENT**



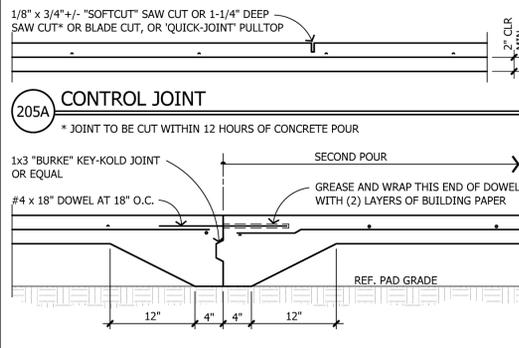
**202 TYP. REINFORCING HOOKS AND LAPS**



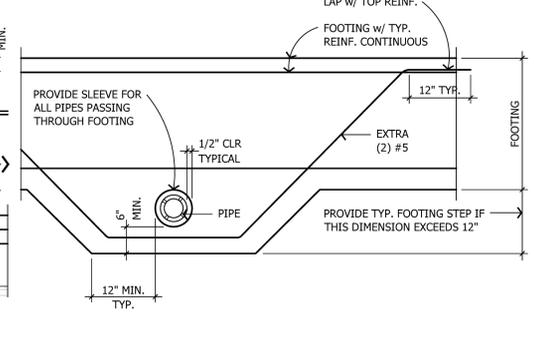
**203 STD REINF. HOOKS - DOUBLE ROW**



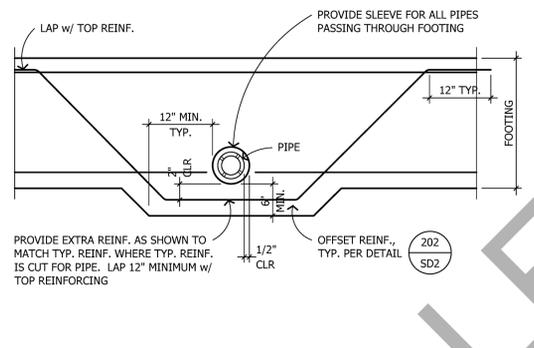
**204 FOOTING CONSTRUCTION JOINT**



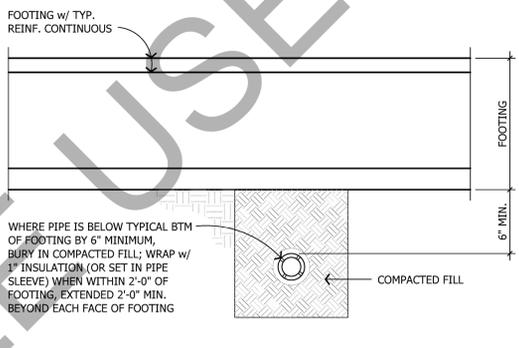
**205A CONTROL JOINT**



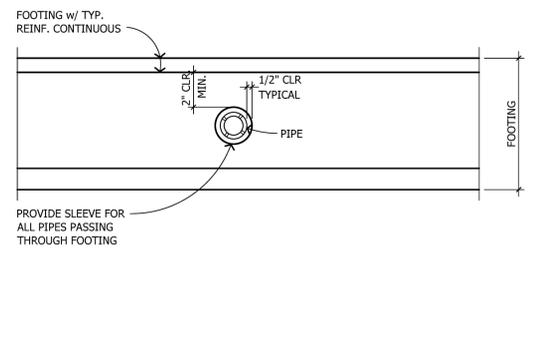
**205B CONSTRUCTION JOINT**



**206A PIPE BELOW FOOTING**



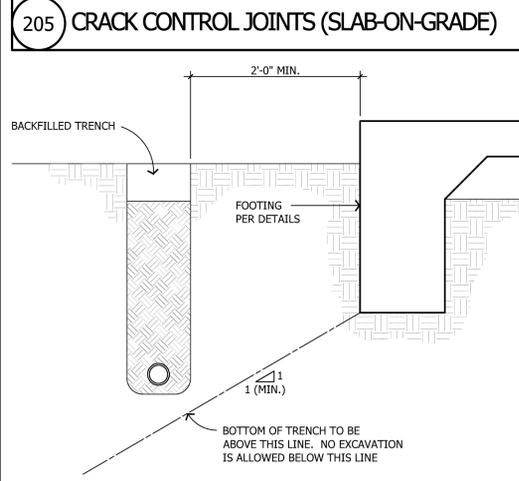
**206B PIPE THROUGH FOOTING**



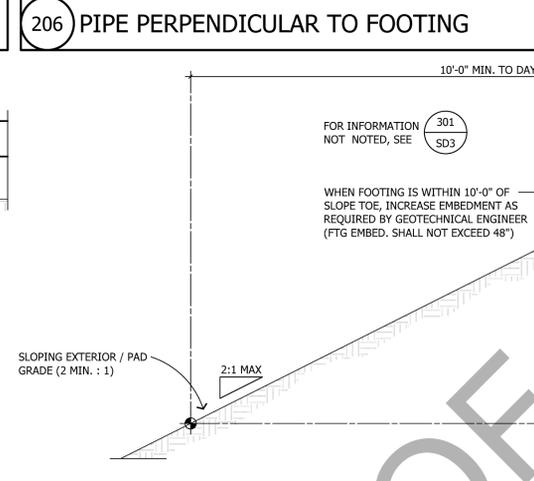
**206C PIPE BELOW FOOTING**



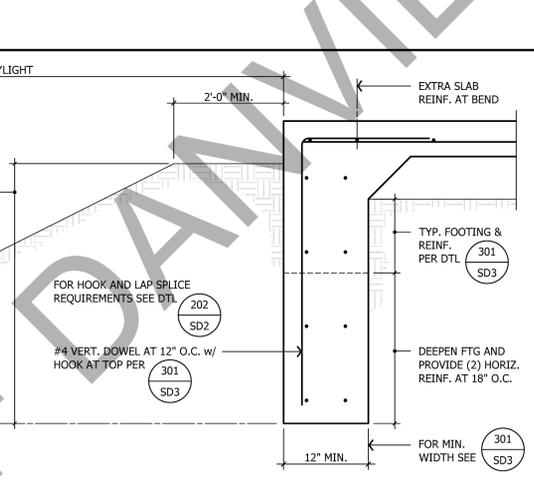
**206D PIPE BETWEEN BARS**



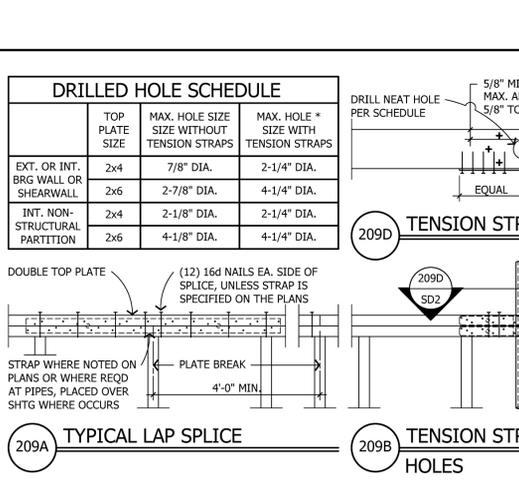
**207 PIPE / TRENCH PARALLEL TO FOOTING**



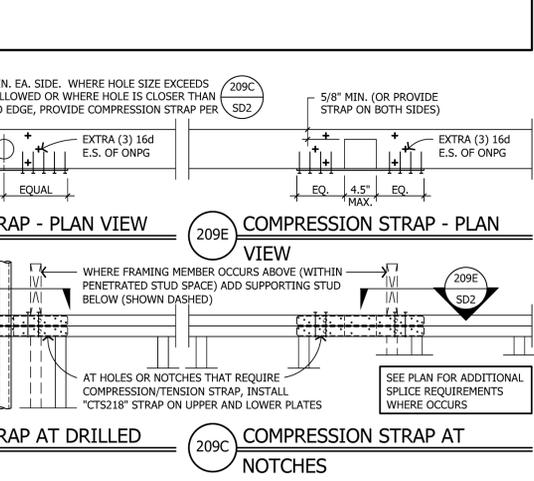
**208 INCREASED FOOTING DEPTH BY SLOPE**



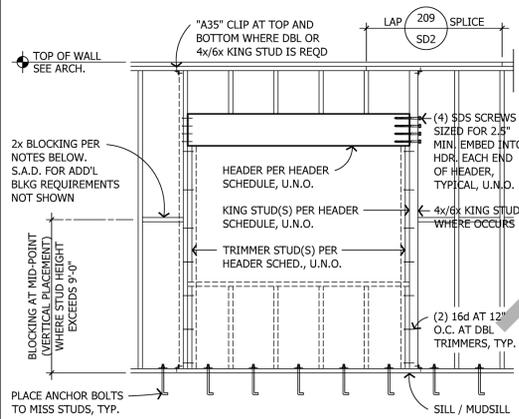
**209A TYPICAL LAP SPlice**



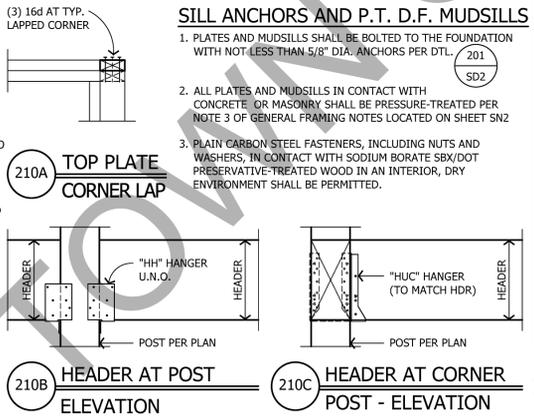
**209B TENSION STRAP AT DRILLED HOLES**



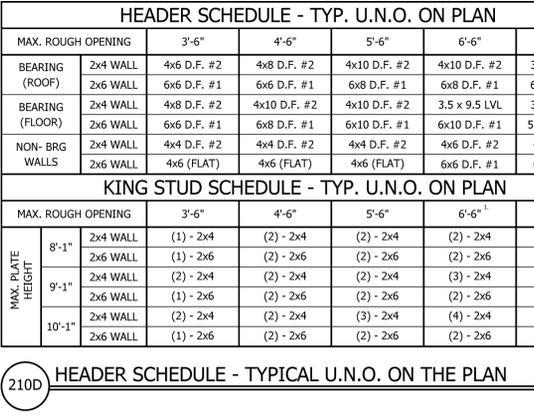
**209C COMPRESSION STRAP AT NOTCHES**



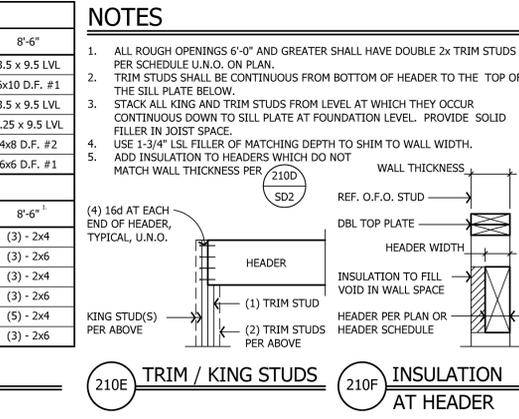
**210A TOP PLATE CORNER LAP**



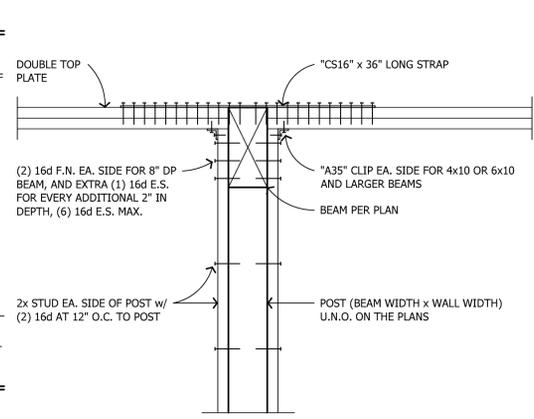
**210B HEADER AT POST ELEVATION**



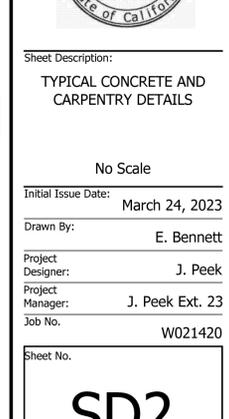
**210C HEADER AT CORNER POST - ELEVATION**



**210D HEADER SCHEDULE - TYPICAL U.N.O. ON THE PLAN**



**210E TRIM / KING STUDS**



**210F INSULATION AT HEADER**



**210 TYPICAL FRAMED WALL OPENING AND HEADER SCHEDULE**



**211 TYPICAL BEAM SUPPORT IN WALL**



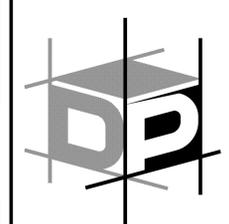
**210E TRIM / KING STUDS**



**210F INSULATION AT HEADER**



**211 TYPICAL BEAM SUPPORT IN WALL**



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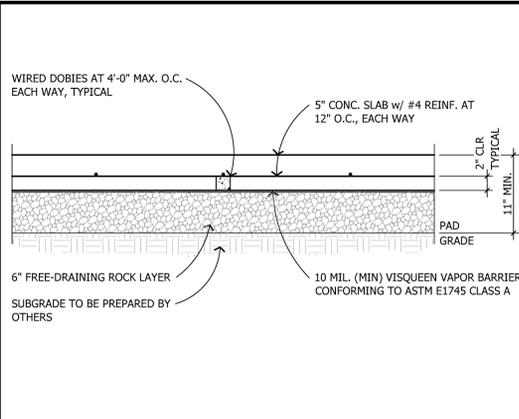
Drawn By: E. Bennett

Project Designer: J. Peek

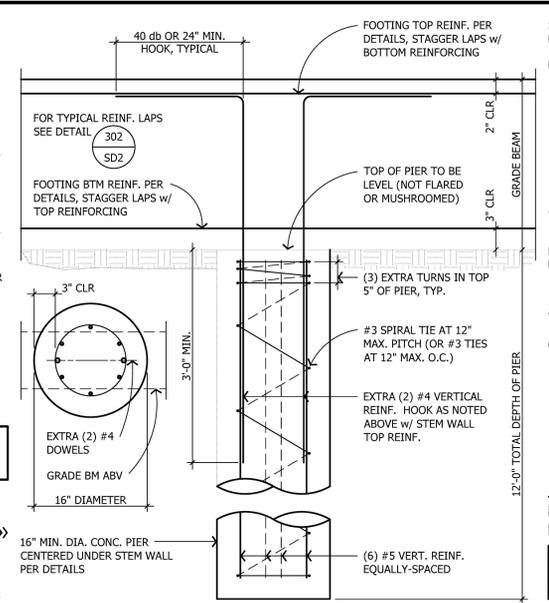
Project Manager: J. Peek Ext. 23

Job No. W021420

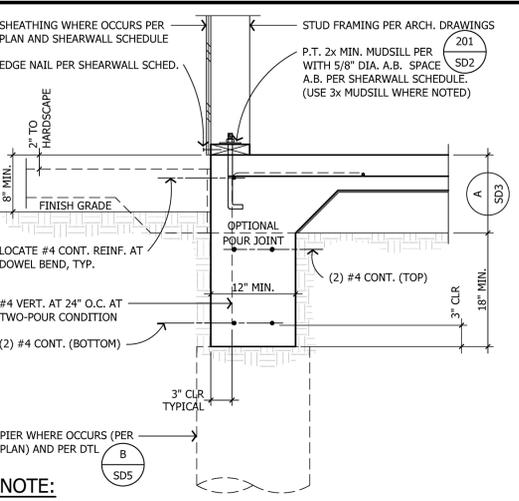
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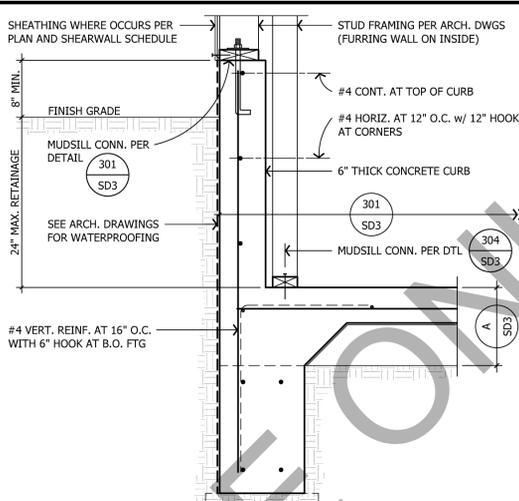
**301 TYPICAL SLAB-ON-GRADE SECTION**



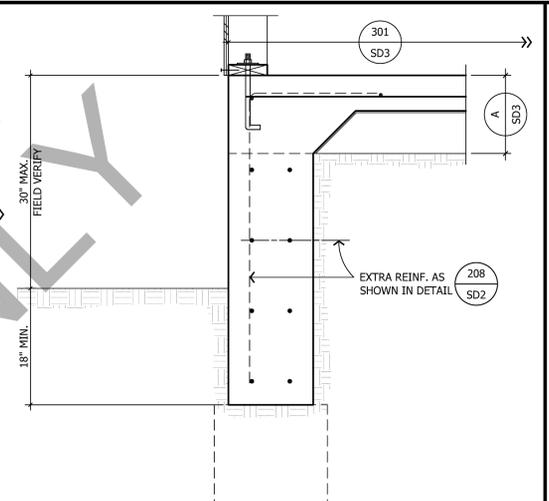
**302 TYPICAL FOOTING & PIER ELEVATION**



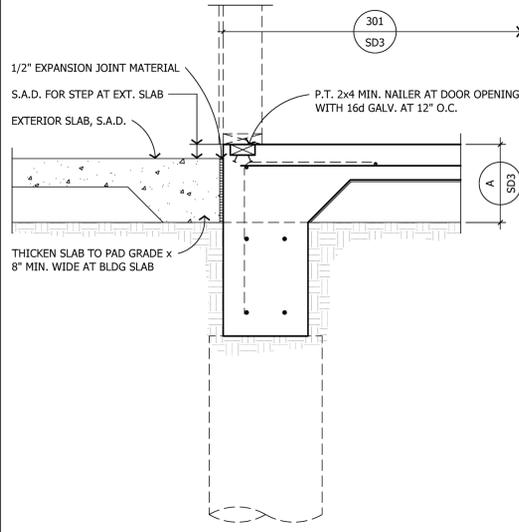
**303 TYPICAL INTERIOR FOOTING**



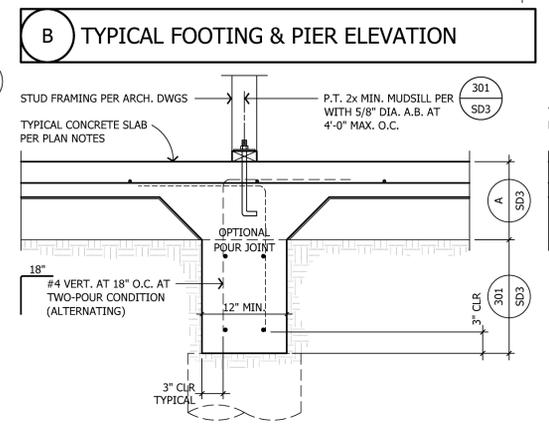
**304 NON BRG / NON-SHEARWALL TO SLAB**



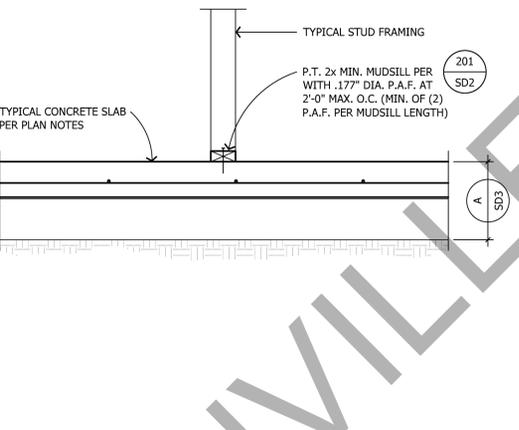
**305 PORCH STUD COLUMN AND FOOTING**



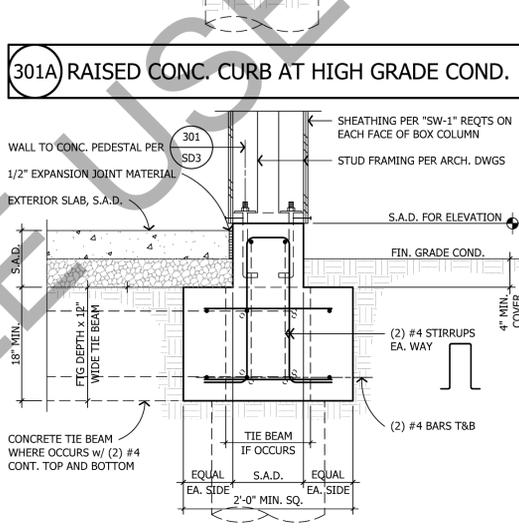
**306 EMBEDDED NAILER AT DOORWAY**



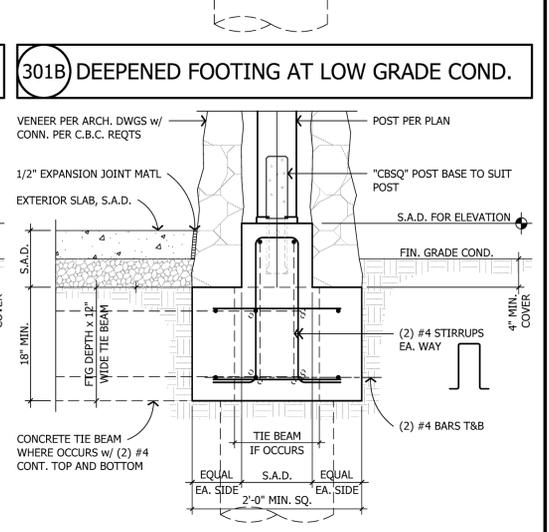
**307 TYPICAL INTERIOR FOOTING**



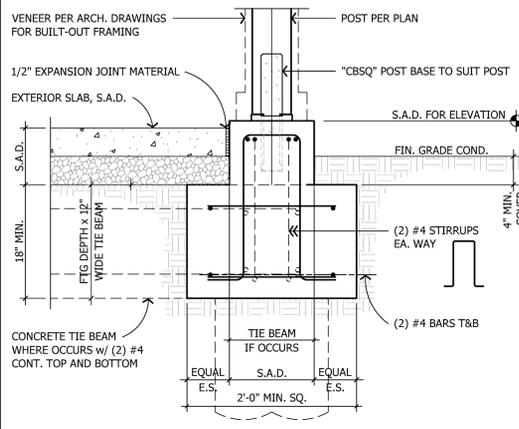
**308 TYPICAL STUD FRAMING**



**309A RAISED CONC. CURB AT HIGH GRADE COND.**



**309B DEEPEDED FOOTING AT LOW GRADE COND.**



**310 PORCH STUD COLUMN AND FOOTING**



**311 TYPICAL CONCRETE SLAB**



**312 PORCH STUD COLUMN AND FOOTING**



**313 PORCH STUD COLUMN AND FOOTING**



**314 PORCH STUD COLUMN AND FOOTING**

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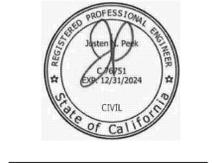
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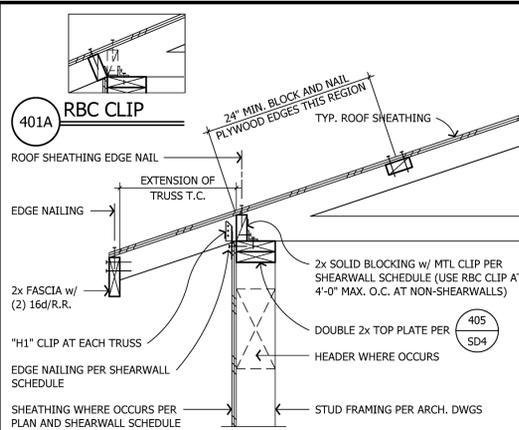
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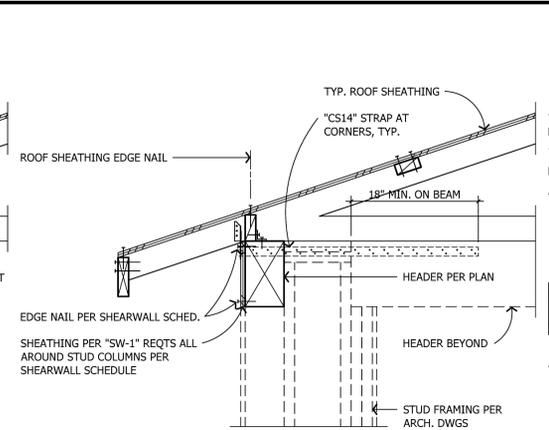
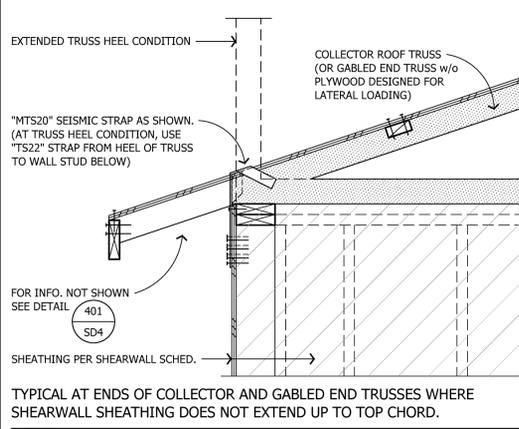
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 SLAB ON GRADE w/ PIERS

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 Initial Issue Date: March 24, 2023  
 Drawn By: E. Bennett  
 Project Designer: J. Peek  
 Project Manager: J. Peek Ext. 23  
 Job No. W021420

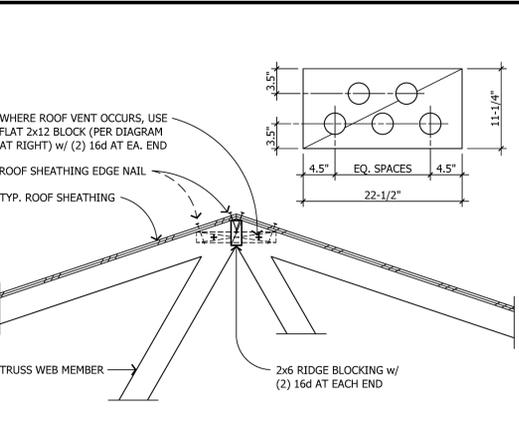
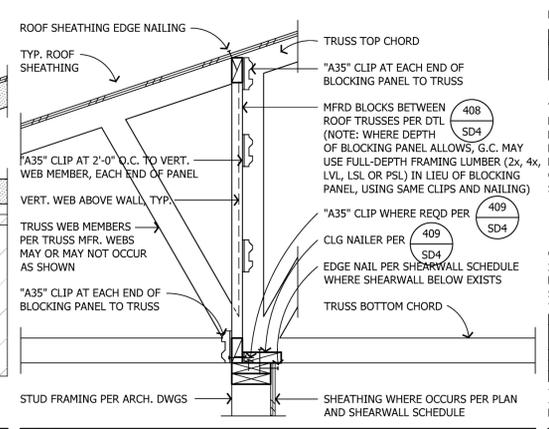
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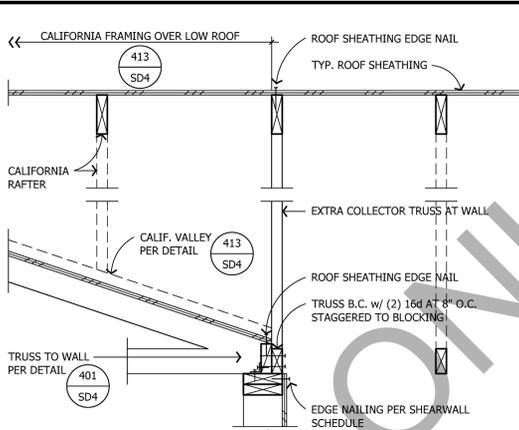
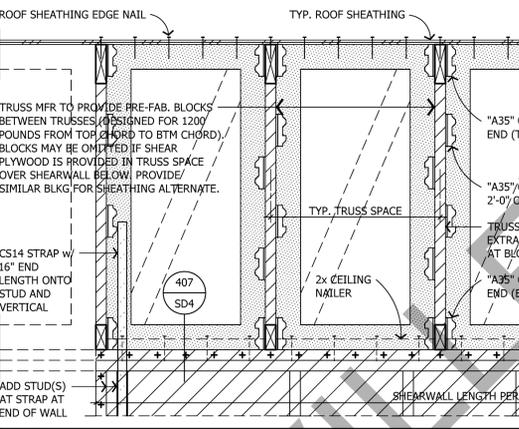
**401 TRUSS PERPEND. TO EXTERIOR WALL**



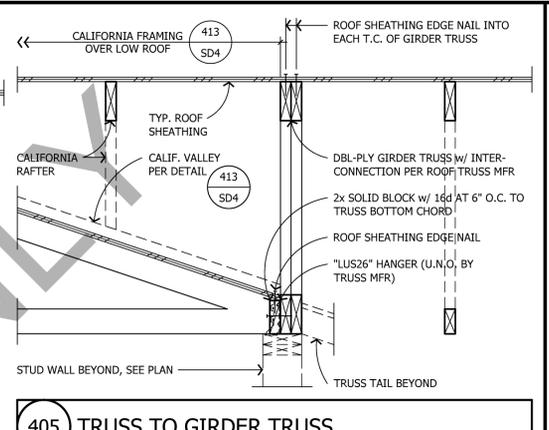
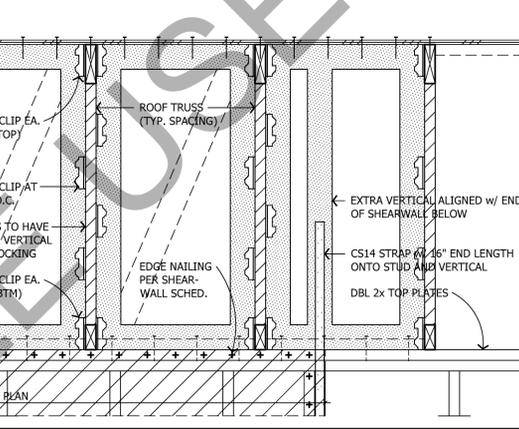
**402 TRUSS PERPEND. TO PORCH BEAM**



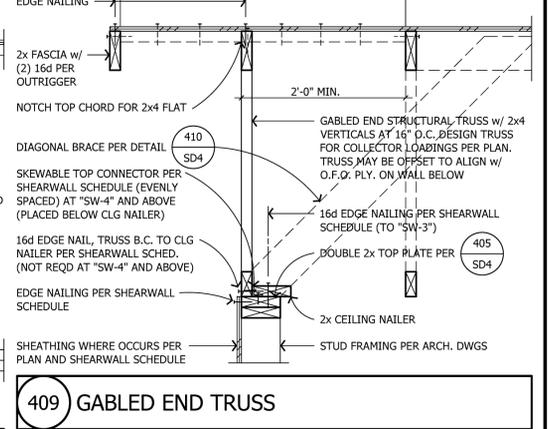
**403 RIDGE BLOCKING AT ROOF TRUSSES**



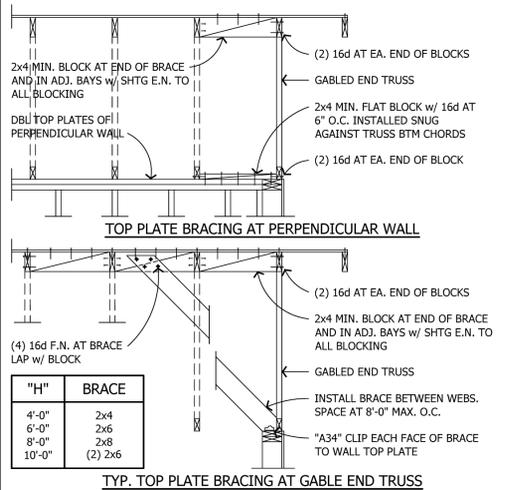
**404 TRUSS TO INTERIOR BEARING WALL**



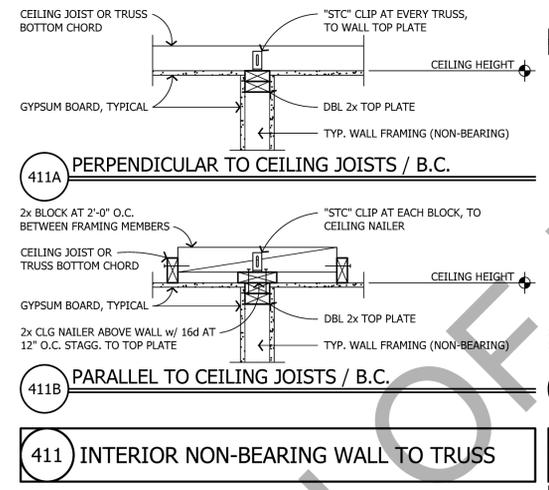
**405 TRUSS TO GIRDER TRUSS**



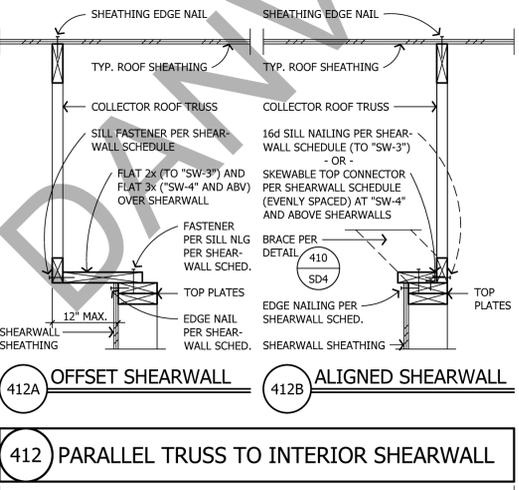
**406 COLLECTOR TRUSS UPLIFT ANCHORAGE**



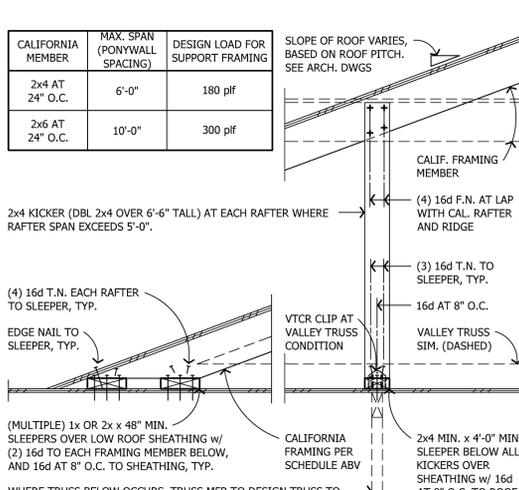
**407 TRUSS TO INTERIOR SHEAR WALL**



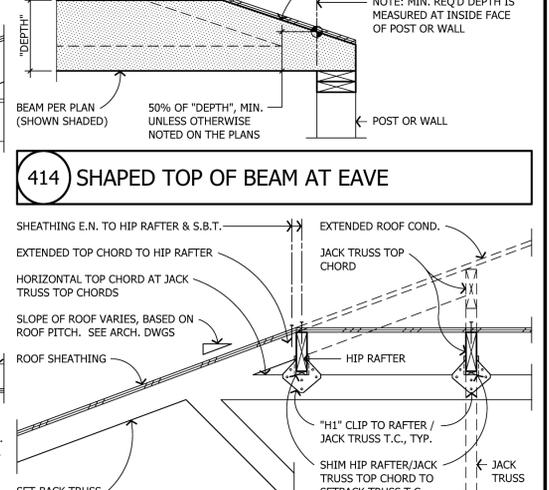
**408 FABRICATED TRUSS BLOCKING PANEL ELEVATION ABOVE SHEARWALL**



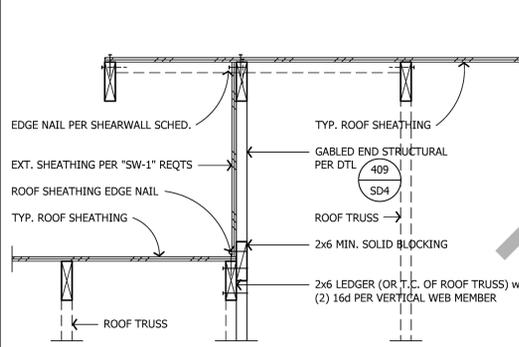
**409 GABLED END TRUSS**



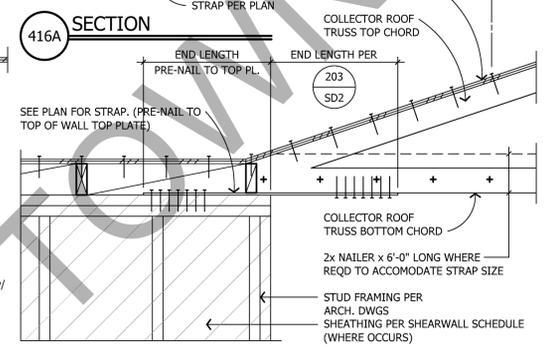
**410 GABLE END TRUSS BRACING**



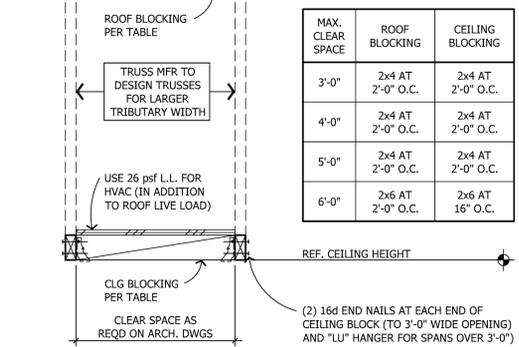
**410 GABLE END TRUSS BRACING**



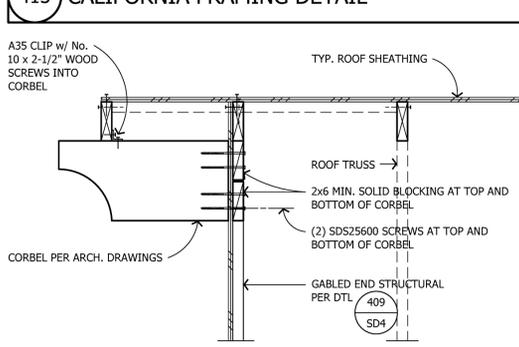
**411 INTERIOR NON-BEARING WALL TO TRUSS**



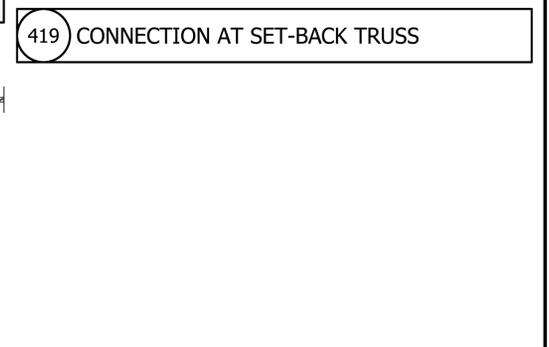
**412 PARALLEL TRUSS TO INTERIOR SHEARWALL**



**413 CALIFORNIA FRAMING DETAIL**



**414 SHAPED TOP OF BEAM AT EAVE**



**415 ROOF STEP**



**416 HORIZONTAL STRAP TO WALL TOP PLATE**



**417 ROOF TRUSSES AT HVAC / ATTIC ACCESS**



**418 CORBEL BEAM AT GABLED END TRUSS**



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**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**

REVISIONS	DATE



**DANVILLE ACCESSORY DWELLING UNITS - STUDIO**  
DANVILLE CA 94526

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

DRAWN	JJ
CHECKED	WW
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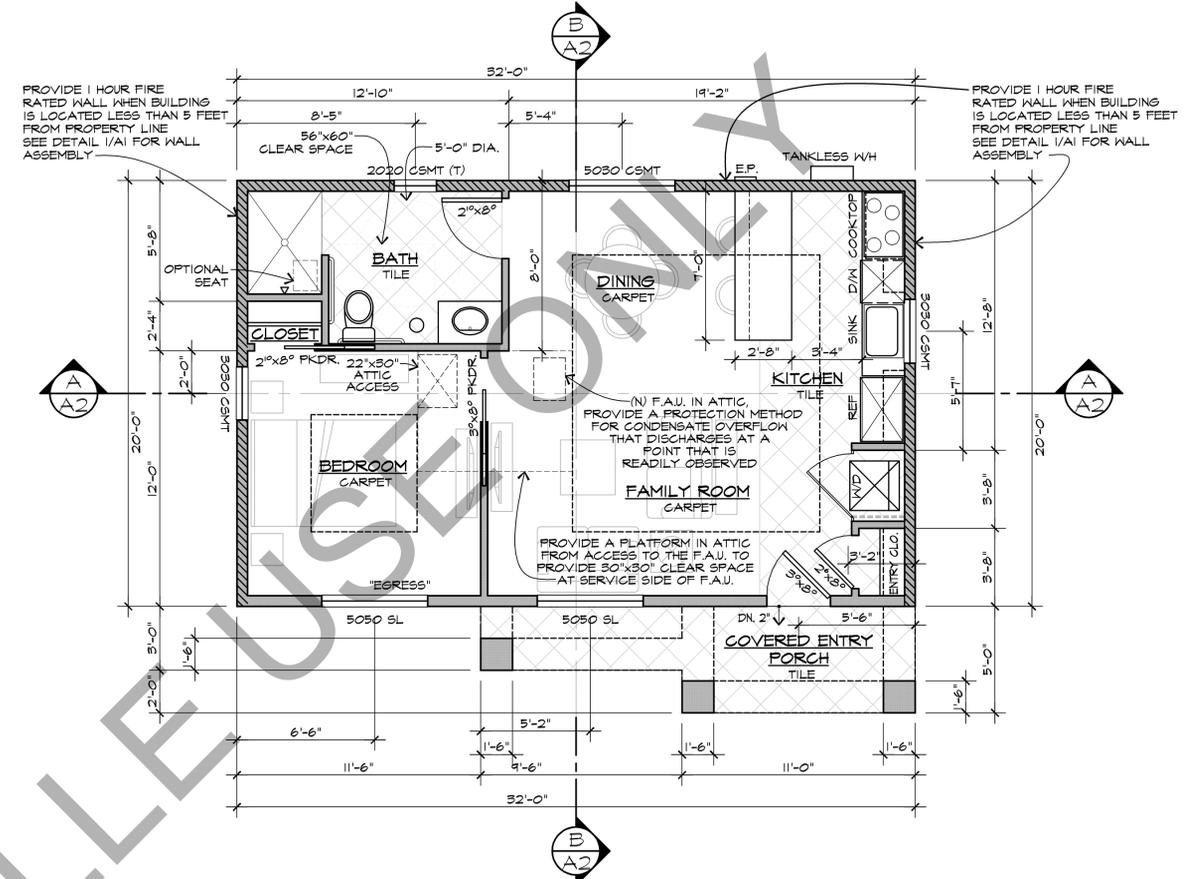
**NOTES:**

- 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 MANUFACTURE.
- 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/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 M)<sup>2</sup>. (EXCEPTION: THE MINIMUM NET CLEAR OPENING FOR EMERGENCY ESCAPE AND RESCUE GRADE-FLOOR OPENINGS SHALL BE 5 SQUARE FEET (0.46M)<sup>2</sup>. 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.

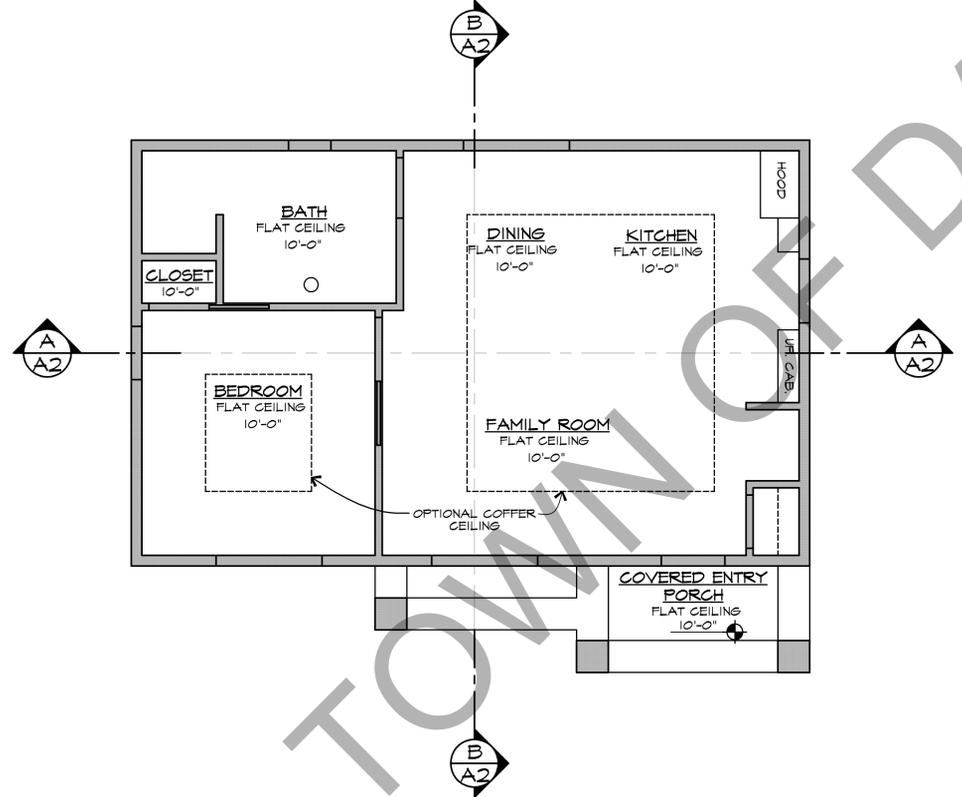
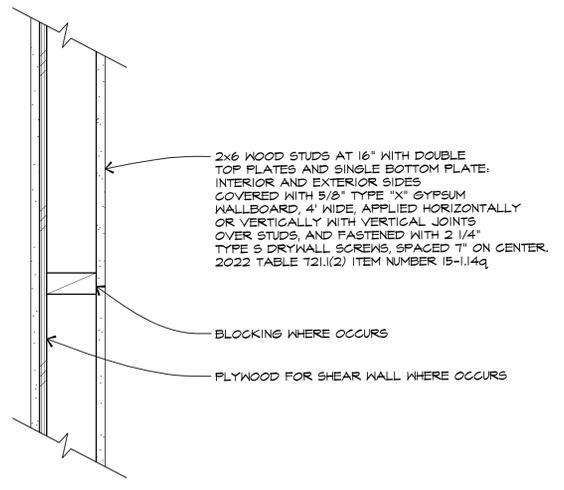
**CONTRACTOR NOTE:** CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL EGRESS REQUIREMENTS.



**FLOOR PLAN (STUDIO) (CONTEMPORARY STYLE)**

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

**1 1 HOUR FIRE RATED WALL DETAIL**  
A1

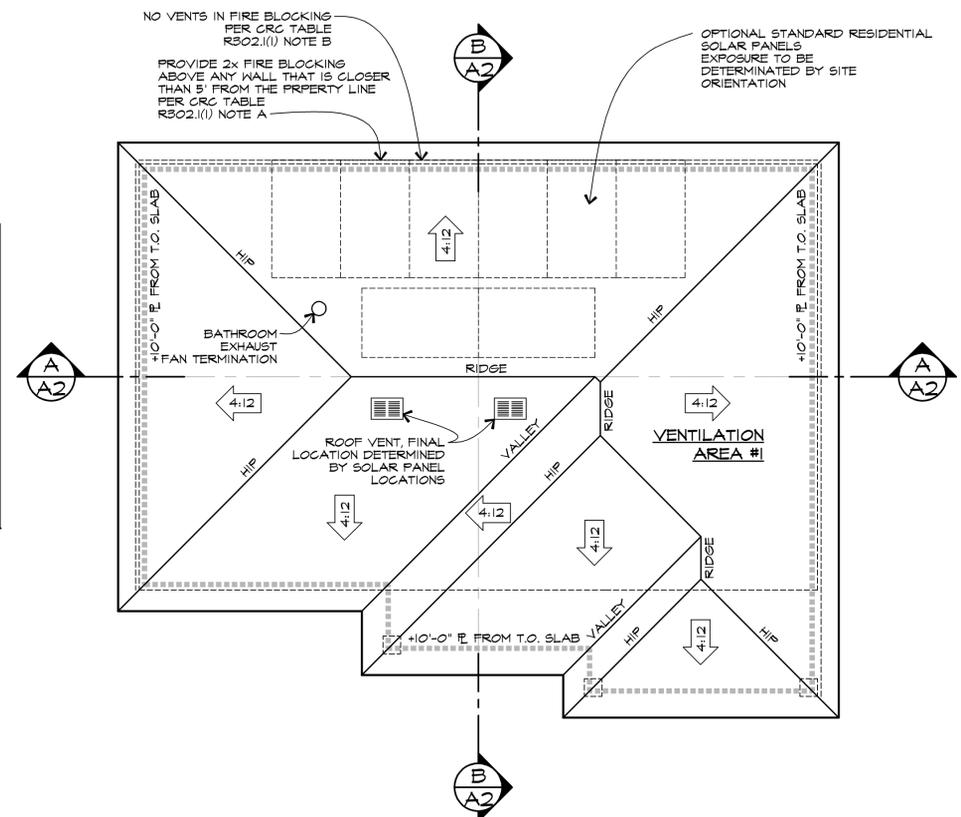


**REFLECTED CEILING PLAN**

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

**VENTILATION CALCULATIONS**

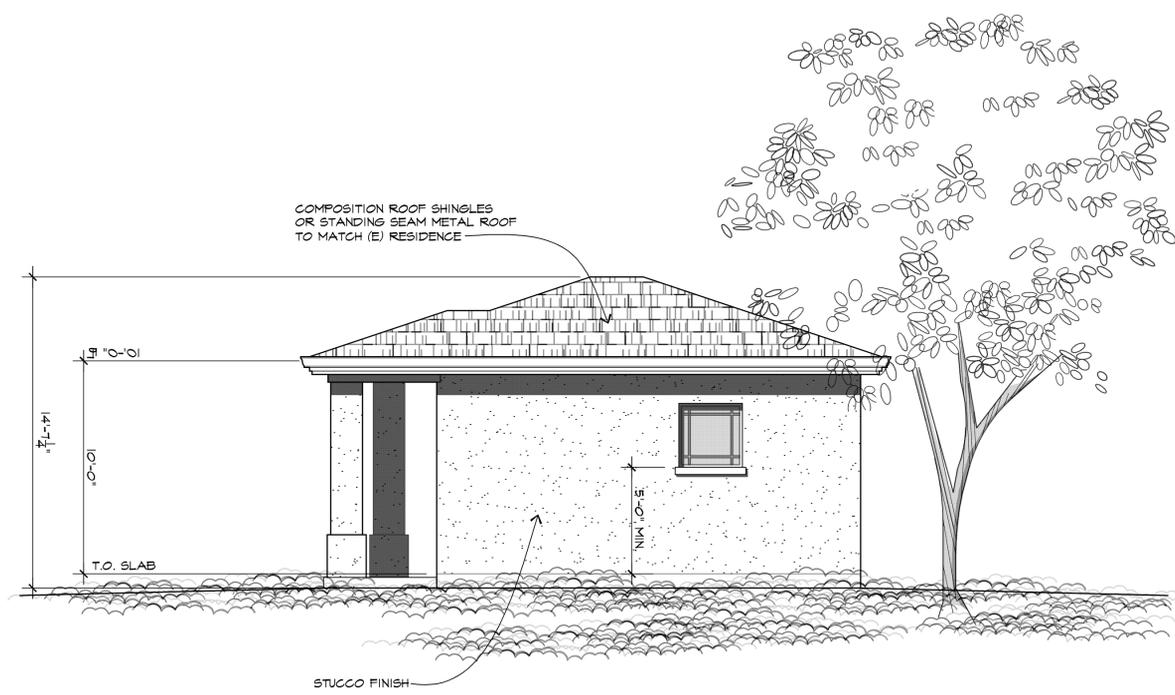
AREA 1	
* ATTIC AREA:	724 SQ. FT.
* REQUIRED AREA:	547.5 SQ. IN. (CONVERTED TO INCHES @ 1/300)
* UPPER AREA:	173.75 SQ. IN. (50% REQUIRED IN UPPER 1/3)
* PROVIDE 173.75 SQ. IN. IN UPPER 1/3 OFF ROOF WITH CHASING "FLAT" VENT (98.75 SQ. IN. FREE AREA) * 2 VENTS REQUIRED	
* LOWER AREA:	173.75 SQ. IN. (50% 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**

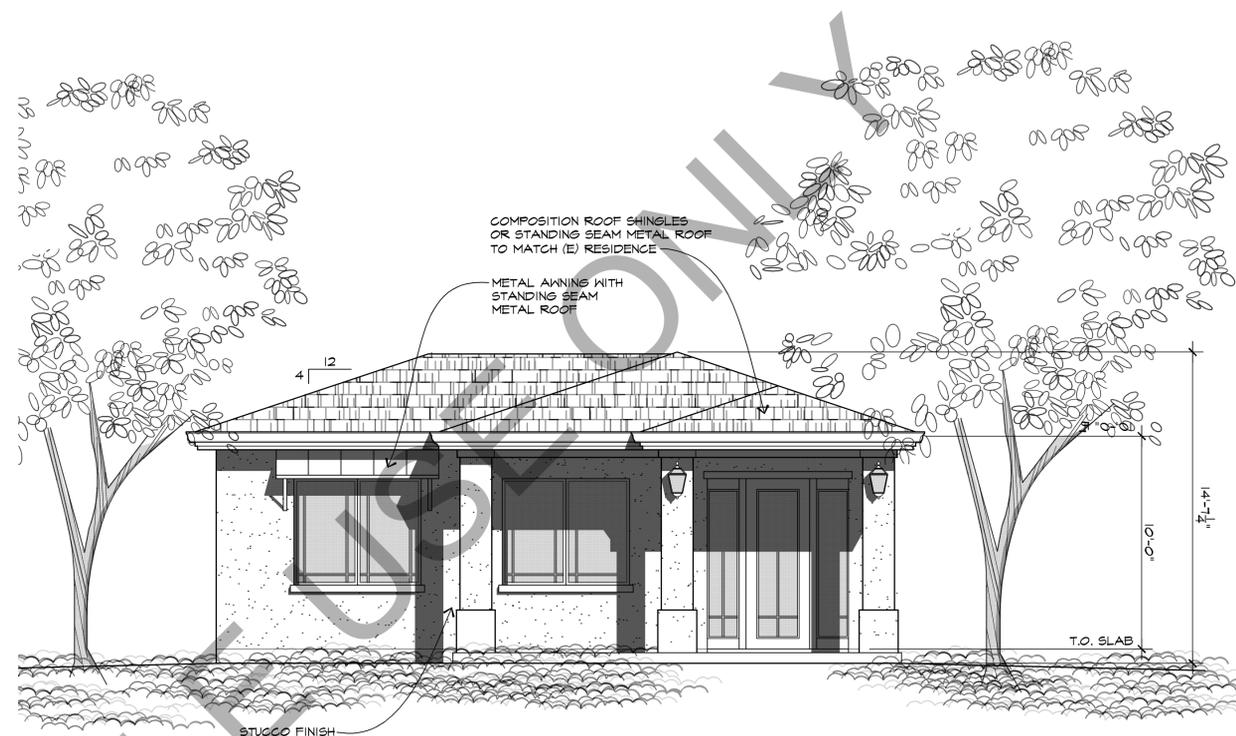
SCALE: 1/4" = 1'-0"

Apr. 26, 2023 - 3:44pm A2 Studio Contemporary style.dwg



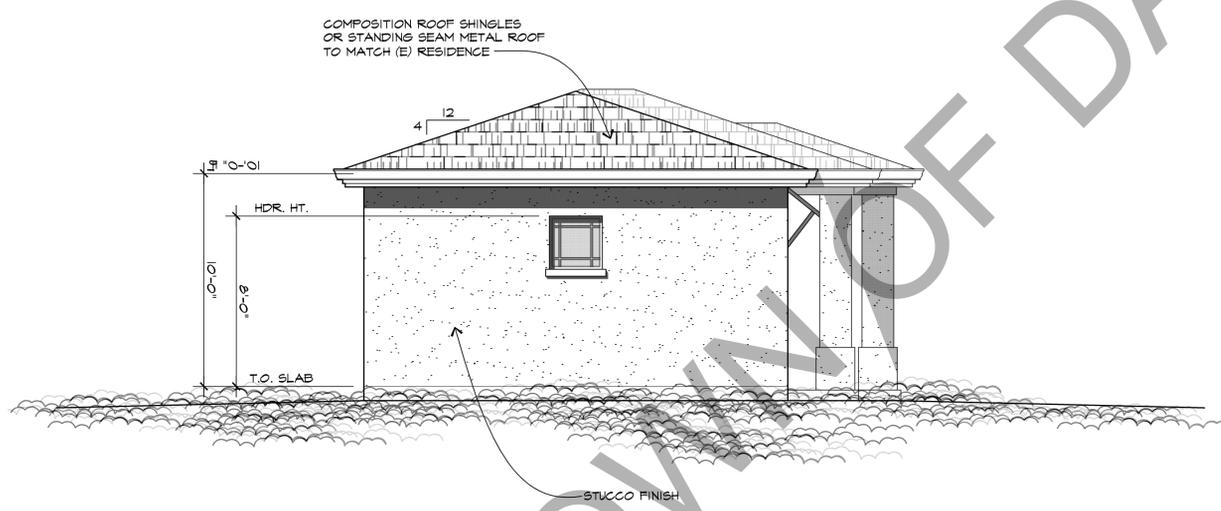
**RIGHT ELEVATION (CONTEMPORARY STYLE)**

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



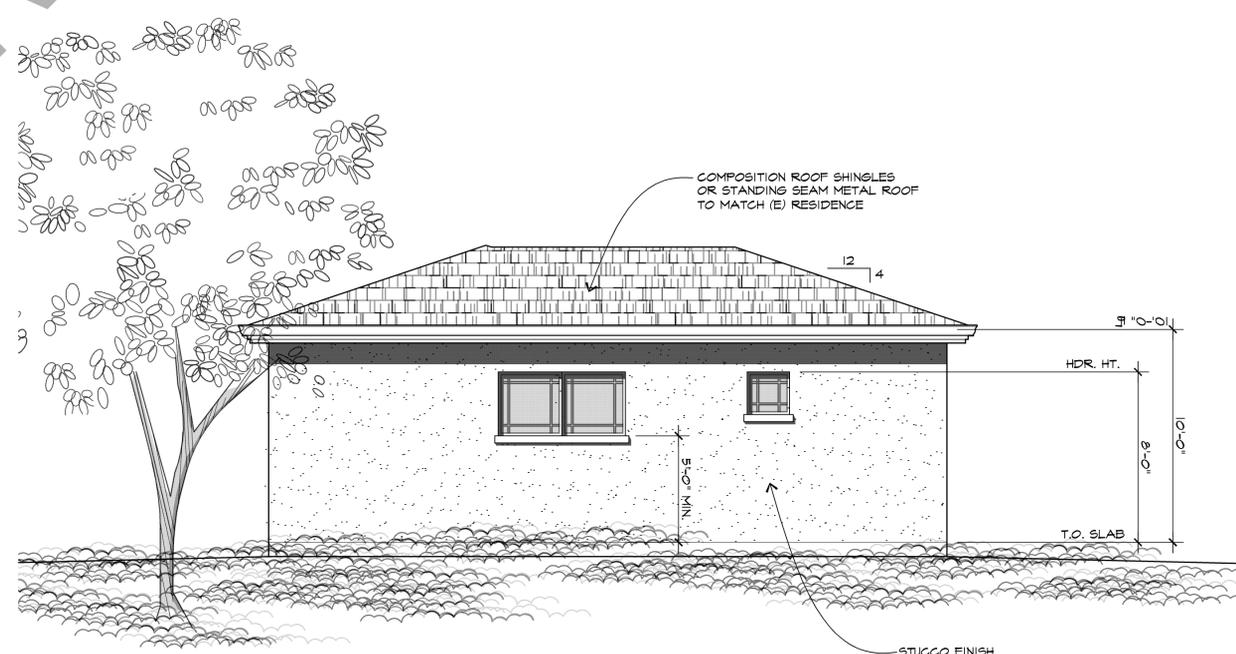
**FRONT ELEVATION (CONTEMPORARY STYLE)**

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



**LEFT ELEVATION (CONTEMPORARY STYLE)**

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



**REAR ELEVATION (CONTEMPORARY STYLE)**

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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<b>DRAWN</b>	JJ
<b>CHECKED</b>	WW
<b>DATE</b>	03-30-23
<b>SCALE</b>	AS SHOWN
<b>JOB NO.</b>	20.921R
<b>SHEET</b>	

**A3**  
OF SHEETS

Apr. 26, 2025 - 5:00pm A3 Studio Contemporary style.dwg

REVISIONS	DATE



**DANVILLE ACCESSORY DWELLING UNITS - STUDIO**

DANVILLE CA 94526

**WILLIAM WOOD ARCHITECTS**  
 301 HARTZ AVENUE, SUITE 203  
 DANVILLE, CALIFORNIA 94526  
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**DRAWN** JJ  
**CHECKED** WW  
**DATE** 03-30-23  
**SCALE** AS SHOWN  
**JOB NO.** 20.921R  
**SHEET**

**A4**

OF SHEETS

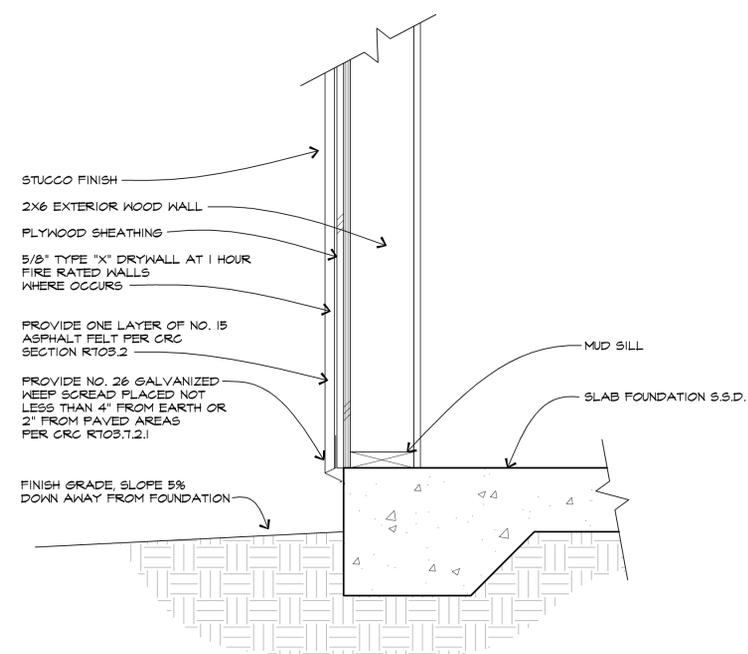
Apr 26, 2023 - 3:47pm A4 Studio Contemporary styling

**ELECTRICAL/MECHANICAL KEY**

- # SWITCHED RECEPTACLE OUTLET @ 12" U.N.O.
- Ⓜ AFCI DUPLEX RECEPTACLE OUTLET @ 12" U.N.O. W/ ARC-FAULT CIRCUIT INTERRUPTER
- Ⓜ eFCI DUPLEX RECEPTACLE OUTLET W/ GROUND FAULT CIRCUIT INTERRUPTER
- Ⓜ eRo WEATHER PROOF DUPLEX RECEPTACLE OUTLET (GFCI PROTECTED PER NEC210-8(g)(3))
- Ⓜ 220 DUPLEX RECEPTACLE OUTLET - 220 VOLT
- \$ SINGLE POLE SWITCH @ 48" U.N.O.
- Ⓜ 3 THREE-WAY SWITCH
- Ⓜ 4 SWITCH W/ DIMMER
- Ⓜ 5 SWITCH W/ MOTION LIGHT
- Ⓜ M MOTION SENSOR
- CEILING MOUNTED LIGHT FIXTURE
- WALL MOUNTED LIGHT FIXTURE
- Ⓜ W WALL MOUNTED LIGHT FIXTURE - SHALL BE SUITABLE FOR DAMP LOCATIONS
- HANGING LIGHT
- Ⓜ R RECESSED LED CEILING LIGHT FIXTURE
- Ⓜ RLP RECESSED LED LOW VOLTAGE CEILING LIGHT
- Ⓜ RLP RECESSED LIGHT FIXTURE - SHALL BE LABELED SUITABLE FOR DAMP LOCATIONS
- Ⓜ E EXHAUST FAN
- Ⓜ SD SMOKE DETECTOR - (110V W/ BATTERY BACK-UP) HARD WIRED & INTERCONNECTED
- Ⓜ CO CARBON MONOXIDE DETECTOR - (110V W/ BATTERY BACK-UP) HARD WIRED & INTERCONNECTED
- ▽ TELEVISION OUTLET
- Ⓜ HB HOSE BIBB (1/2" CW) W/ NON-REMOVABLE ANTI-SIPHON DEVICE (FOR OUTSIDE BIBB)
- Ⓜ G GAS OUTLET
- Ⓜ T THERMOSTAT
- Ⓜ CA CEILING SUPPLY AIR REGISTER
- Ⓜ FA FLOOR AIR SUPPLY REGISTER
- Ⓜ RA COLD AIR RETURN @ CEILING

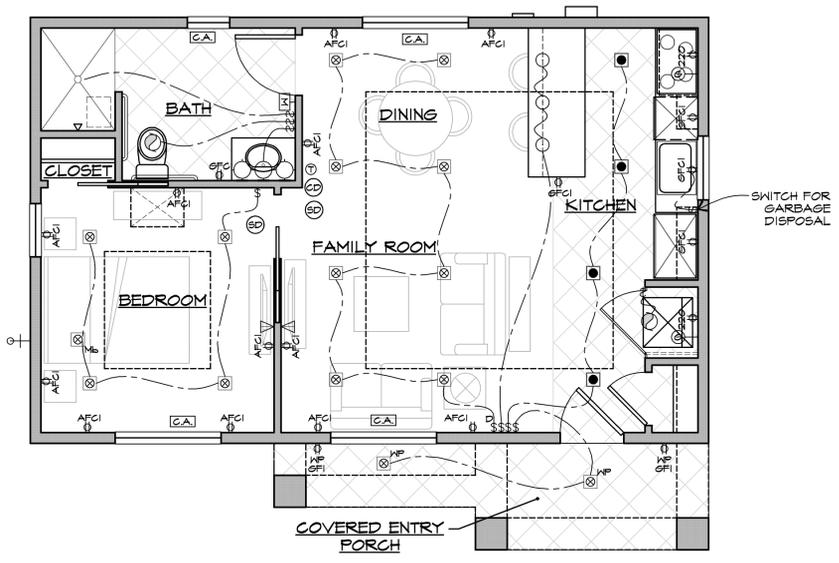
**ELECTRICAL NOTES**

- 1) THERMOSTAT LOCATION TO BE DETERMINED BY HVAC DESIGNER.
- 2) CEILING AIR REGISTERS TO BE DETERMINED BY HVAC DESIGNER.
- 3) KITCHEN & BATHROOM LIGHTING SHALL MEET EFFICIENCY REQUIREMENT OF 2022 TITLE 24.
- 4) CONTRACTOR TO PROVIDE A COLD WATER CONNECTION @ THE REFRIGERATOR.
- 5) CONTRACTOR TO PROVIDE THE OPTION OF GAS OR 220V @ THE COOK TOP (VERIFY W/ OWNER).
- 6) WATER CLOSETS TO BE MAX 1.28 GALLONS PER FLUSH PER CAL GREEN SECTION 4.303.1.1.
- 7) INSTALLATION INSTRUCTIONS FOR ALL EQUIP. SHALL BE PROVIDED TO THE FIELD INSPECTOR @ THE TIME OF INSPECTION.
- 8) 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.
- 9) PROVIDE A DEDICATED 20-AMP BRANCH CIRCUIT TO SUPPLY THE LAUNDRY RECEPTACLE OUTLET.
- 10) PROVIDE AN ARC-FAULT CIRCUIT INTERRUPTER TO PROTECT ALL RECEPTABLES IN THE BEDROOMS.
- 11) PROVIDE RECEPTABLE 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 RECEPTABLES 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, (IE, WASHER).
  - D. IN ANY HALLWAY 10 FT OR MORE IN LENGTH.
- 12) KITCHEN COUNTERTOP RECEPTABLES SHALL BE LOCATED ABOVE THE COUNTERTOP NOT MORE THAN 18", AND MAY NOT BE INSTALLED FACE-UP IN THE COUNTER.
- 13) 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.
- 14) 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.
- 15) EXHAUST FANS TO BE 50 CFM INTERMITTENT OR 20 CFM CONTINUOUS IN WATER CLOSETS, 50 CFM CONTINUOUS.
- 16) ALL RECEPTABLES 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(g).
- 17) CONDUIT IN CONCRETE SLAB IS TO BE RATED FOR WET LOCATIONS. CEC 430.
- 18) PROVIDE DEDICATED CIRCUITS FOR FOR BATHROOM CIRCUITS SERVING ONLY THE RECEPTABLES PER CEC201.11(c)(3).
- 19) PROVIDE TAMPER RESISTANT RECEPTABLES IN ALL NEW CIRCUITS PER CEC SECTION 408.12 & 408.41(D)(3).
- 20) OUTDOOR LIGHTS TO BE "HIGH EFFICACY" OR "LOW EFFICACY" AND ON PHOTO/MOTION SENSOR PER CA ENERGY SECTION 150.0(K)(4).
- 21) HOSE BIBBS SHALL HAVE NON-REMOVABLE BACKFLOW PREVENTER OR BIB-TYPE VACUUM BREAKER.
- 22) WATER CLOSETS TO BE 1.28 GALLONS PER FLUSH MAXIMUM OR DUAL FLUSH PER CFC 411.2.
- 23) KITCHEN FAUCET TO BE 1.8 GALLONS PER MINUTE, MAXIMUM PER CFC 4.303.1.4.4.
- 24) LAVATORY FAUCET TO BE 1.2 GALLONS PER MINUTE, MAXIMUM, PER CFC 407.2.2.
- 25) SHOWER HEADS TO BE 1.8 GALLONS PER MINUTE AT 80 PSI, MAXIMUM, PER CFC 403.3.



**TYPICAL WALL DETAIL**

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



**ELECTRICAL/MECHANICAL PLAN**

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

# 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 Contemporary Studio

**Calculation Date/Time:** 2023-03-30T18:32:03-07:00

**(Page 1 of 13)**

**Calculation Description:** Title 24 Analysis

**Input File Name:** Danville ADU\_Contemporary\_Studio.ribd22

GENERAL INFORMATION					
01	<b>Project Name</b>	Danville ADU Contemporary Studio			
02	<b>Run Title</b>	Title 24 Analysis			
03	<b>Project Location</b>	Varies			
04	<b>City</b>	Danville, CA	05	<b>Standards Version</b>	2022
06	<b>Zip code</b>	94526	07	<b>Software Version</b>	CBECC-Res 2022.2.1
08	<b>Climate Zone</b>	12	09	<b>Front Orientation (deg/ Cardinal)</b>	All orientations
10	<b>Building Type</b>	Single family	11	<b>Number of Dwelling Units</b>	1
12	<b>Project Scope</b>	Newly Constructed	13	<b>Number of Bedrooms</b>	1
14	<b>Addition Cond. Floor Area (ft<sup>2</sup>)</b>	0	15	<b>Number of Stories</b>	1
16	<b>Existing Cond. Floor Area (ft<sup>2</sup>)</b>	n/a	17	<b>Fenestration Average U-factor</b>	0.3
18	<b>Total Cond. Floor Area (ft<sup>2</sup>)</b>	640	19	<b>Glazing Percentage (%)</b>	17.30%
20	<b>ADU Bedroom Count</b>	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-P010038750A-000-000-0000000-0000

Registration Date/Time:

2023-03-31 08:33:37

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 18:32:45

**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**

**CF1R-PRF-01E**

**Project Name:** Danville ADU Contemporary Studio

**Calculation Date/Time:** 2023-03-30T18:32:03-07:00

**(Page 2 of 13)**

**Calculation Description:** Title 24 Analysis

**Input File Name:** Danville ADU\_Contemporary\_Studio.ribd22

ENERGY DESIGN RATINGS						
	Energy Design Ratings			Compliance Margins		
	Source Energy (EDR1)	Efficiency <sup>1</sup> EDR (EDR2efficiency)	Total <sup>2</sup> EDR (EDR2total)	Source Energy (EDR1)	Efficiency <sup>1</sup> EDR (EDR2efficiency)	Total <sup>2</sup> EDR (EDR2total)
<b>Standard Design</b>	41	44.1	58.6			
<b>Proposed Design</b>						
<b>North Facing</b>	33.8	40.4	56.4	7.2	3.7	2.2
<b>East Facing</b>	34	41.4	57	7	2.7	1.6
<b>South Facing</b>	33.5	39.6	55.9	7.5	4.5	2.7
<b>West Facing</b>	34.1	43	57.9	6.9	1.1	0.7
<b>RESULT<sup>3</sup>: PASS</b>						
<sup>1</sup> Efficiency EDR includes improvements like a better building envelope and more efficient equipment <sup>2</sup> Total EDR includes efficiency and demand response measures such as photovoltaic (PV) system and batteries <sup>3</sup> 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						
<ul style="list-style-type: none"> <li>Standard Design PV Capacity: 0.00 kWdc</li> <li>Proposed PV Capacity Scaling: North (0.00 kWdc) East (0.00 kWdc) South (0.00 kWdc) West (0.00 kWdc)</li> </ul>						

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**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**

**CF1R-PRF-01E**

**Project Name:** Danville ADU Contemporary Studio

**Calculation Date/Time:** 2023-03-30T18:32:03-07:00

**(Page 3 of 13)**

**Calculation Description:** Title 24 Analysis

**Input File Name:** Danville ADU\_Contemporary\_Studio.ribd22

<b>ENERGY USE SUMMARY</b>						
<b>Energy Use</b>	<b>Standard Design Source Energy (EDR1) (kBtu/ft<sup>2</sup> -yr)</b>	<b>Standard Design TDV Energy (EDR2) (kTDV/ft<sup>2</sup> -yr)</b>	<b>Proposed Design Source Energy (EDR1) (kBtu/ft<sup>2</sup> -yr)</b>	<b>Proposed Design TDV Energy (EDR2) (kTDV/ft<sup>2</sup> -yr)</b>	<b>Compliance Margin (EDR1)</b>	<b>Compliance Margin (EDR2)</b>
Space Heating	7.13	31.36	3.26	24.98	3.87	6.38
Space Cooling	1.06	31.57	0.99	33.34	0.07	-1.77
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
<b>North Facing Efficiency Compliance Total</b>	<b>12.65</b>	<b>110.03</b>	<b>8.27</b>	<b>100.78</b>	<b>4.38</b>	<b>9.25</b>
Space Heating	7.13	31.36	3.24	24.63	3.89	6.73
Space Cooling	1.06	31.57	1.14	36.21	-0.08	-4.64
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
<b>East Facing Efficiency Compliance Total</b>	<b>12.65</b>	<b>110.03</b>	<b>8.4</b>	<b>103.3</b>	<b>4.25</b>	<b>6.73</b>

Registration Number:

223-P010038750A-000-000-0000000-0000

Registration Date/Time:

2023-03-31 08:33:37

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**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**

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**(Page 4 of 13)**

**Calculation Description:** Title 24 Analysis

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ENERGY USE SUMMARY						
Energy Use	Standard Design Source Energy (EDR1) (kBtu/ft <sup>2</sup> -yr)	Standard Design TDV Energy (EDR2) (kTDV/ft <sup>2</sup> -yr)	Proposed Design Source Energy (EDR1) (kBtu/ft <sup>2</sup> -yr)	Proposed Design TDV Energy (EDR2) (kTDV/ft <sup>2</sup> -yr)	Compliance Margin (EDR1)	Compliance Margin (EDR2)
Space Heating	7.13	31.36	3.12	23.56	4.01	7.8
Space Cooling	1.06	31.57	0.99	32.77	0.07	-1.2
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
<b>South Facing Efficiency Compliance Total</b>	<b>12.65</b>	<b>110.03</b>	<b>8.13</b>	<b>98.79</b>	<b>4.52</b>	<b>11.24</b>
Space Heating	7.13	31.36	3.19	24.44	3.94	6.92
Space Cooling	1.06	31.57	1.26	40.32	-0.2	-8.75
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
<b>West Facing Efficiency Compliance Total</b>	<b>12.65</b>	<b>110.03</b>	<b>8.47</b>	<b>107.22</b>	<b>4.18</b>	<b>2.81</b>

Registration Number:

223-P010038750A-000-000-0000000-0000

Registration Date/Time:

2023-03-31 08:33:37

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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 Contemporary Studio

**Calculation Date/Time:** 2023-03-30T18:32:03-07:00

**(Page 5 of 13)**

**Calculation Description:** Title 24 Analysis

**Input File Name:** Danville ADU\_Contemporary\_Studio.ribd22

ENERGY USE INTENSITY				
	Standard Design (kBtu/ft <sup>2</sup> - yr )	Proposed Design (kBtu/ft <sup>2</sup> - yr )	Compliance Margin (kBtu/ft <sup>2</sup> - yr )	Margin Percentage
<b>North Facing</b>				
Gross EUI <sup>1</sup>	32.25	26.59	5.66	17.55
Net EUI <sup>2</sup>	32.25	26.59	5.66	17.55
<b>East Facing</b>				
Gross EUI <sup>1</sup>	32.25	26.84	5.41	16.78
Net EUI <sup>2</sup>	32.25	26.84	5.41	16.78
<b>South Facing</b>				
Gross EUI <sup>1</sup>	32.25	26.41	5.84	18.11
Net EUI <sup>2</sup>	32.25	26.41	5.84	18.11
<b>West Facing</b>				
Gross EUI <sup>1</sup>	32.25	26.94	5.31	16.47
Net EUI <sup>2</sup>	32.25	26.94	5.31	16.47
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-P010038750A-000-000-0000000-0000

Registration Date/Time:

2023-03-31 08:33:37

HERS Provider:

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CA Building Energy Efficiency Standards - 2022 Residential Compliance

Report Version: 2022.0.000

Schema Version: rev 20220901

Report Generated: 2023-03-30 18:32:45

**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**

**CF1R-PRF-01E**

**Project Name:** Danville ADU Contemporary Studio

**Calculation Date/Time:** 2023-03-30T18:32:03-07:00

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**Calculation Description:** Title 24 Analysis

**Input File Name:** Danville ADU\_Contemporary\_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.
<ul style="list-style-type: none"> <li>PV exception 2: No PV required when minimum PV size (Section 150.1(c)14) &lt; 1.8 kWdc (0 kW)</li> <li>Indoor air quality, balanced fan</li> <li>IAQ Ventilation System Heat Recovery: minimum 67 SRE and 73 ASRE</li> <li>IAQ Ventilation System: supply outside air inlet, filter, and H/ERV cores accessible per RACM Reference Manual</li> <li>IAQ Ventilation System: fault indicator display</li> <li>Insulation below roof deck</li> <li>Window overhangs and/or fins</li> <li>Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed</li> </ul>

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
<ul style="list-style-type: none"> <li>Indoor air quality ventilation</li> <li>Kitchen range hood</li> <li>Minimum Airflow</li> <li>Verified SEER/SEER2</li> <li>Verified Refrigerant Charge</li> <li>Fan Efficacy Watts/CFM</li> <li>Verified HSPF</li> <li>Verified heat pump rated heating capacity</li> <li>Duct leakage testing</li> </ul>

**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**

**CF1R-PRF-01E**

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**Calculation Description:** Title 24 Analysis

**Input File Name:** Danville ADU\_Contemporary\_Studio.ribd22

BUILDING - FEATURES INFORMATION						
01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft <sup>2</sup> )	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
Danville ADU Contemporary 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 <sup>2</sup> )	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 <sup>2</sup> )	Window and Door Area (ft <sup>2</sup> )	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

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**Calculation Description:** Title 24 Analysis

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FENESTRATION / GLAZING													
01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft <sup>2</sup> )	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
Front Door	Window	Front Wall	Front	0	3	8	1	24	0.32	NFRC	0.16	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 FINES													
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	6	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

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OVERHANGS AND FINNS													
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 <sup>2</sup> )	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	0.078	Roofing: Light Roof (Asphalt Shingle) 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

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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

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**Calculation Description:** Title 24 Analysis

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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

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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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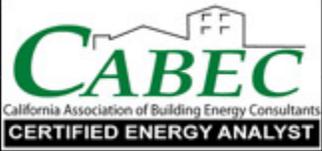
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**Input File Name:** Danville ADU\_Contemporary\_Studio.ribd22

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: <i>Jason Bennett</i>
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:	
<ol style="list-style-type: none"> <li>I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.</li> <li>I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.</li> <li>The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.</li> </ol>	
Responsible Designer Name: William Wood	Responsible Designer Signature: <i>William Wood</i>
Company: William Wood Architects	Date Signed: 2023-03-31 08:33:37
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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Registration Number:  
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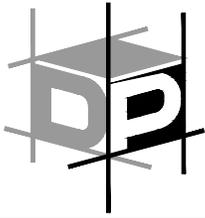
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## ENVELOPE INSULATION

### 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)

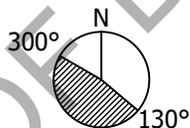
(NOT REQUIRED; CALCULATED SIZE IS <1.8 KW)

## 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

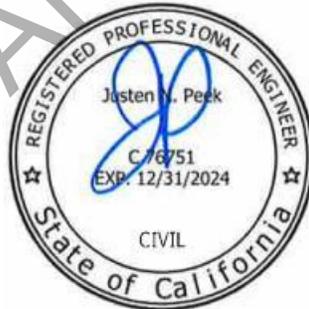
BROAN ERV100S ENERGY RECOVERY VENTILATOR OR EQUIV.

## 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**

TOWN OF DANVILLE USE ONLY



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 <sub>s</sub> .....	2.500	ASCE 7-16 Sect. 11.4.2
S <sub>1</sub> .....	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 <sub>a</sub> .....	1.200	ASCE 7-16 Sect. 11.4.4
F <sub>v</sub> .....	1.700	ASCE 7-16 Sect. 11.4.4

**Table 11.4-1 Short-Period Site Coefficient F<sub>a</sub>**

Site Class	S <sub>s</sub> ≤ 0.25	S <sub>s</sub> = 0.50	S <sub>s</sub> = 0.75	S <sub>s</sub> = 1.00	S <sub>s</sub> = 1.25	S <sub>s</sub> ≥ 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	<i>Site-Specific Response Analysis Required</i>					

**Table 11.4-2 Short-Period Site Coefficient F<sub>v</sub>**

Site Class	S <sub>1</sub> ≤ 0.10	S <sub>1</sub> = 0.20	S <sub>1</sub> = 0.30	S <sub>1</sub> = 0.40	S <sub>1</sub> = 0.50	S <sub>1</sub> ≥ 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	<i>Site-Specific Response Analysis Required</i>					

S <sub>MS</sub> = F <sub>a</sub> S <sub>s</sub> .....	3.000	(EQ. 11.4-1)
S <sub>M1</sub> = F <sub>v</sub> S <sub>1</sub> .....	2.040	(EQ. 11.4-2)
S <sub>DS</sub> = (2/3)S <sub>MS</sub> .....	2.000 g	(EQ. 11.4-3)
S <sub>D1</sub> = (2/3)S <sub>M1</sub> .....	1.360 g	(EQ. 11.4-4)

**Seismic Design Category Based on Short-Period Response Accelerations:**

VALUE OF S <sub>DS</sub>	1 OR 11	111	1V
S <sub>DS</sub> < 0.167g	A	A	A
0.167g ≤ S <sub>DS</sub> < 0.33g	B	B	C
0.33g ≤ S <sub>DS</sub> < 0.50g	C	C	D
0.50g ≤ S <sub>DS</sub>	D	D	D

S<sub>1</sub> IS GREATER THAN 0.75  
USE CATEGORY E  
PER CBC 1613.2.5

**Seismic Design Category Based on 1-Second Response Accelerations:**

VALUE OF S <sub>D1</sub>	1 OR 11	111	1V
S <sub>D1</sub> < 0.067g	A	A	A
0.067g ≤ S <sub>D1</sub> < 0.133g	B	B	C
0.133g ≤ S <sub>D1</sub> < 0.20g	C	C	D
0.20g ≤ S <sub>D1</sub>	D	D	D

S<sub>1</sub> IS GREATER THAN 0.75  
USE CATEGORY E  
PER CBC 1613.2.5



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:**

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

**SEISMIC BASE SHEAR:**

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	UNIT	Redundancy	ASD DESIGN	ASD DESIGN
		FORCE (lb)	SHEAR (psf)		Factor	FORCE (lb)
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



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**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 <sub>z</sub>
Leeward Wall	0-1	-0.5	q <sub>h</sub>
	2	-0.3	
	>4	-0.2	
Side Wall	All Values	-0.7	q <sub>h</sub>

**Determine Cp Values**

Level	Direction	L/B Values	Windward C <sub>p</sub> Value	Leeward C <sub>p</sub> Value
Roof	East/West	1.28	0.80	-0.444

Level	Direction	L/B Values	Windward C <sub>p</sub> Value	Leeward C <sub>p</sub> 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 DEISGN	UNIT	ASD DESIGN	ASD DESIGN
		FORCE (lb)	SHEAR (plf)		
Roof	North/South	4305	135	<b>2583</b>	<b>81</b>
Roof	East/West	3218	129	<b>1931</b>	<b>77</b>



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DATE: 3/24/2023

**SHEARWALL DESIGN: ROOF LEVEL**

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

<b>SHEAR LINE ID:</b>	<b>1</b>	<b>2</b>
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**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
<i>Sec. 4.3.4.2 Capacity Reduction</i>	1.00	1.00
Wall 2 Design Shear (plf):	206	436
<i>Sec. 4.3.4.2 Capacity Reduction</i>	1.00	0.93
Wall 3 Design Shear (plf):		
<i>Sec. 4.3.4.2 Capacity Reduction</i>		
Wall 4 Design Shear (plf):		
<i>Sec. 4.3.4.2 Capacity Reduction</i>		
Wall 5 Design Shear (plf):		
<i>Sec. 4.3.4.2 Capacity Reduction</i>		

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



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DATE: 3/24/2023

**SHEARWALL DESIGN (CONT.): ROOF LEVEL**

<b>SHEAR LINE ID:</b>	<b>1</b>	<b>2</b>
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**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<sub>d</sub>=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 1 Drift Check (in):	OK	OK
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:	25 ft
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PROJECT: Town of Danville Studio ADU

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CALCS BY: J. Peek

DATE: 3/24/2023

**SHEARWALL DESIGN: ROOF LEVEL**

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

<b>SHEAR LINE ID:</b>	<b>A</b>	<b>B</b>
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**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
<i>Sec. 4.3.4.2 Capacity Reduction</i>	1.00	1.00
Wall 2 Design Shear (plf):		
<i>Sec. 4.3.4.2 Capacity Reduction</i>		
Wall 3 Design Shear (plf):		
<i>Sec. 4.3.4.2 Capacity Reduction</i>		
Wall 4 Design Shear (plf):		
<i>Sec. 4.3.4.2 Capacity Reduction</i>		
Wall 5 Design Shear (plf):		
<i>Sec. 4.3.4.2 Capacity Reduction</i>		

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

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DATE: 3/24/2023

**SHEARWALL DESIGN (CONT.): ROOF LEVEL**

SHEAR LINE ID:	A	B
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**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<sub>d</sub>=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
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**CALCS BY:** J. Peek

**DATE:** 3/24/2023

**ROOF DIAPHRAGM DESIGN:**

**DIMENSIONS:**

L = 32 ft

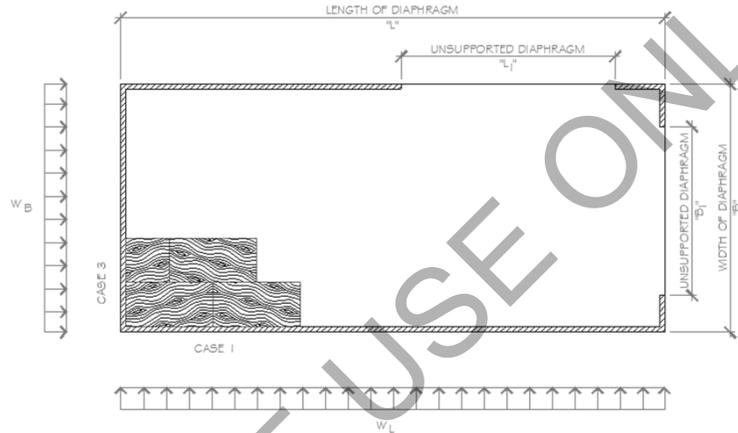
B = 25 ft

B<sub>1</sub> = 0 ft

L<sub>1</sub> = 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<sub>L</sub> = 281 plf

**LATERAL FORCE ALONG B SIDE:**

w<sub>B</sub> = 277 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<sub>MAX</sub> along Side V<sub>L</sub> = w<sub>B</sub>\*B / 2\*L = 108 plf

Shear<sub>MAX</sub> along Side V<sub>B</sub> = w<sub>L</sub>\*L / 2\*B = 180 plf

**Chord Forces:**

Side L: T<sub>L</sub> = C<sub>L</sub> = w<sub>L</sub>\*L<sup>2</sup> / 8\*B = 1439 lb

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

Side B: T<sub>B</sub> = C<sub>B</sub> = w<sub>B</sub>\*B<sup>2</sup> / 8\*L = 676 lb

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

**Drag Forces:**

Side L: F<sub>L</sub> = V<sub>L</sub>\*L<sub>1</sub> = 0 lb

\*\* Min. Strap Req'd - NONE

Side B: F<sub>B</sub> = V<sub>B</sub>\*B<sub>1</sub> = 0 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 (in<sup>2</sup>): 5.25

G<sub>v</sub>t<sub>v</sub> of ply (lb/in): 83500

E (psi): 1600000

e<sub>n</sub> (in) = (V<sub>n</sub>/616)<sup>3.018</sup>: 0.045

ν (plf): 180

S (D<sub>c</sub>X) (in): 2.50

**D = 0.37 in**

D<sub>ALLOW</sub> = 0.025 \* Story Height = 3.7 in

**Deflection OK**



**PROJECT:** Town of Danville Studio ADU

0

**CLIENT:** Town of Danville

**JOB NO.:** W021420

**CALCS BY:** J. Peek

**DATE:** 45009

**ROOF DIAPHRAGM DESIGN:**

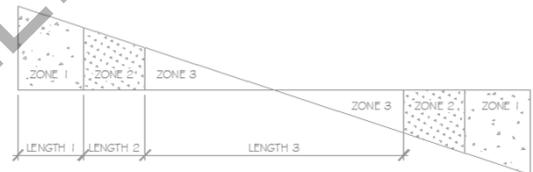
**NAILING PATTERN -**

Panel Grade	Common Nail	Min. Pen. (in)	Min. Thick. (in)	Member Width (in)	Blocked Nail Spacing				Unblocked	
					Boundary / Other Edges				Case 1	Others
					6 / 6	4 / 6	2.5 / 4	2 / 3		
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**

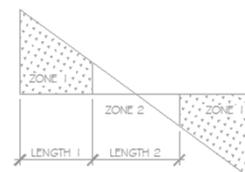
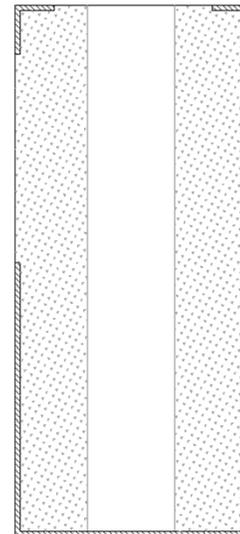
UNBLOCKED 15/32 SHEATHING WITH 8 d COMMON NAILS  
6.0 IN O.C. BOUNDARY/ 12 IN O.C. EDGES/ 12 IN O.C. FIELD



**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

File: W021420 - Town of Danville ADU\_Enercalc (Studio).ec6  
 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.6.27  
 DP ADVANCED ENGINEERING INC.

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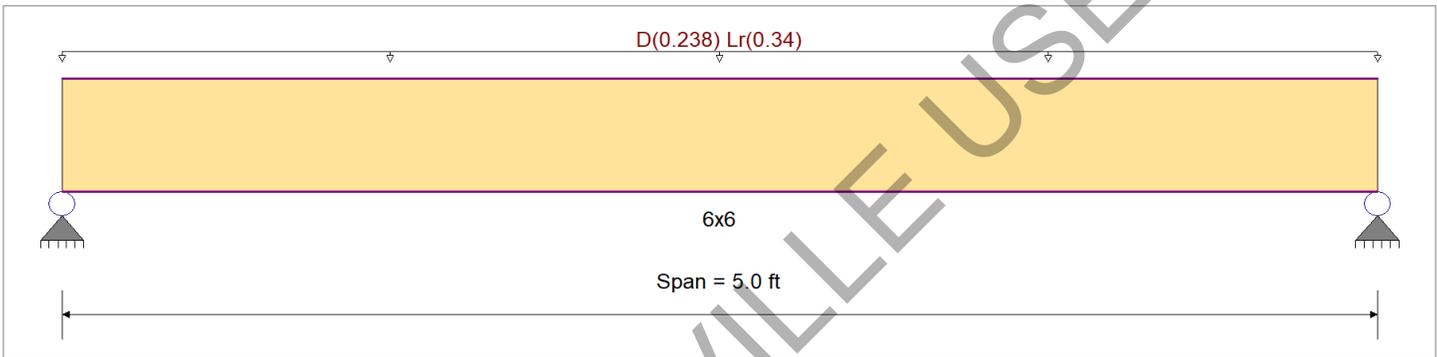
DESCRIPTION: Typical Header

## CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16  
 Load Combination Set : ASCE 7-16

## Material Properties

Analysis Method : <b>Allowable Stress Design</b>	Fb +	1,350.0 psi	E : Modulus of Elasticity
Load Combination : <b>ASCE 7-16</b>	Fb -	1,350.0 psi	Ebend- xx
	Fc - Prll	925.0 psi	Eminbend - xx
Wood Species : <b>Douglas Fir-Larch</b>	Fc - Perp	625.0 psi	
Wood Grade : <b>No.1</b>	Fv	170.0 psi	
	Ft	675.0 psi	Density
Beam Bracing : <b>Beam is Fully Braced against lateral-torsional buckling</b>			31.210pcf



## 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 =	<b>0.468</b> : 1	Maximum Shear Stress Ratio =	<b>0.279</b> : 1
Section used for this span =	<b>6x6</b>	Section used for this span =	<b>6x6</b>
	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 =	2.500ft	Location of maximum on span =	0.000ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
<b>Maximum Deflection</b>			
Max Downward Transient Deflection	0.039 in	Ratio =	1522 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.068 in	Ratio =	885 >=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 <sub>d</sub>	C <sub>F/V</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv	F'v					
D Only	Length = 5.0 ft	1	0.272	0.162	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.76	330.73	1215.00	0.00	0.00	0.00	0.50	24.78	153.00
+D+Lr	Length = 5.0 ft	1	0.468	0.279	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.83	790.53	1687.50	0.00	0.00	0.00	0.00	59.24	212.50
+D+0.750Lr	Length = 5.0 ft	1	0.400	0.238	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.56	675.58	1687.50	0.00	0.00	0.00	0.00	50.63	212.50
+0.60D	Length = 5.0 ft	1	0.092	0.055	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.46	198.44	2160.00	0.00	0.00	0.00	0.00	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

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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

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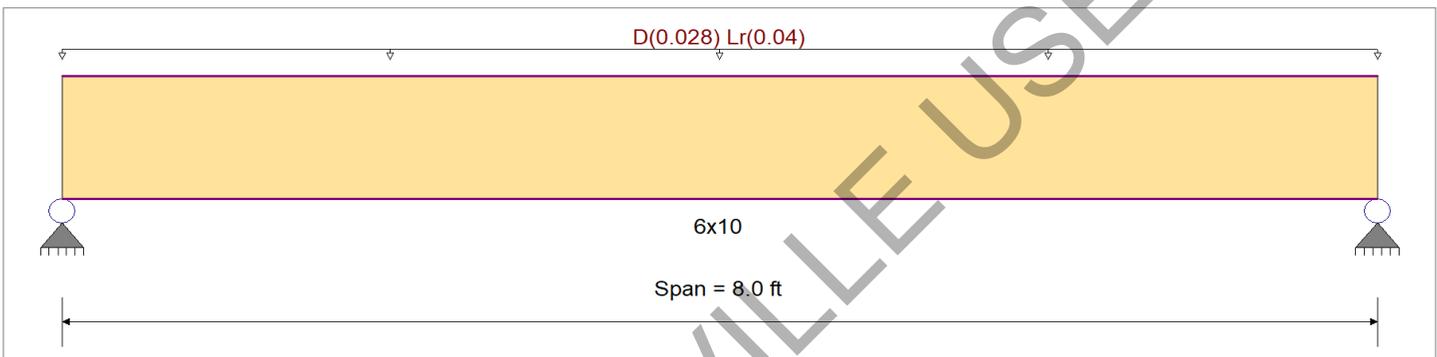
DESCRIPTION: B1

## 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	Fb +	1,350.0 psi	E : Modulus of Elasticity
Load Combination : ASCE 7-16	Fb -	1,350.0 psi	Ebend- xx
	Fc - Prll	925.0 psi	Eminbend - xx
Wood Species : Douglas Fir-Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	170.0 psi	
	Ft	675.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			31.210pcf



## 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	=	<b>0.055</b> : 1	Maximum Shear Stress Ratio	=	<b>0.034</b> : 1
Section used for this span		<b>6x10</b>	Section used for this span		<b>6x10</b>
	=	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	=	4.000ft	Location of maximum on span	=	7.212 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
<b>Maximum Deflection</b>					
Max Downward Transient Deflection		0.006 in	Ratio =	16278	>=360
Max Upward Transient Deflection		0.000 in	Ratio =	0	<360
Max Downward Total Deflection		0.012 in	Ratio =	8208	>=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 <sub>d</sub>	C <sub>F/V</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv	F'v				
D Only	Length = 8.0 ft	1	0.038	0.024	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.31	45.63	1215.00	0.00	0.00	0.00	0.13	3.63	153.00
+D+Lr	Length = 8.0 ft	1	0.055	0.034	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.63	92.05	1687.50	0.00	0.00	0.00	0.25	7.31	212.50
+D+0.750Lr	Length = 8.0 ft	1	0.048	0.030	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.55	80.45	1687.50	0.00	0.00	0.00	0.22	6.39	212.50
+0.60D	Length = 8.0 ft	1	0.013	0.008	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.19	27.38	2160.00	0.00	0.00	0.00	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

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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

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# Wood Beam

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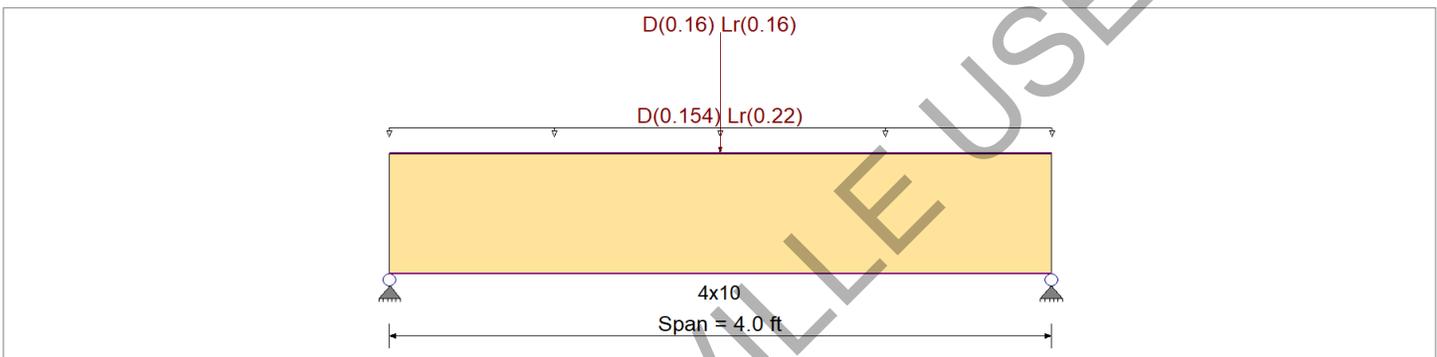
DESCRIPTION: B2

## 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	Fb +	1,350.0 psi	E : Modulus of Elasticity
Load Combination : ASCE 7-16	Fb -	1,350.0 psi	Ebend- xx
	Fc - Prll	925.0 psi	Eminbend - xx
Wood Species : Douglas Fir-Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	170.0 psi	
	Ft	675.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			31.210pcf



## 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 =	<b>0.128</b> : 1	Maximum Shear Stress Ratio =	<b>0.138</b> : 1
Section used for this span =	<b>4x10</b>	Section used for this span =	<b>4x10</b>
=	260.15psi	=	29.32 psi
=	2,025.00psi	=	212.50 psi
Load Combination =	+D+Lr	Load Combination =	+D+Lr
Location of maximum on span =	2.000ft	Location of maximum on span =	3.241 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
<b>Maximum Deflection</b>			
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	C <sub>d</sub>	C <sub>F/V</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	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	1.00	0.48	115.89	1458.00	0.00	0.00	0.00	0.28	12.96	153.00
+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	1.00	1.08	260.15	2025.00	0.63	29.32	212.50	0.00	0.00	0.00
+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	1.00	0.93	224.08	2025.00	0.54	25.23	212.50	0.00	0.00	0.00
+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	1.00	0.29	69.54	2592.00	0.17	7.78	272.00	0.00	0.00	0.00

## 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

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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

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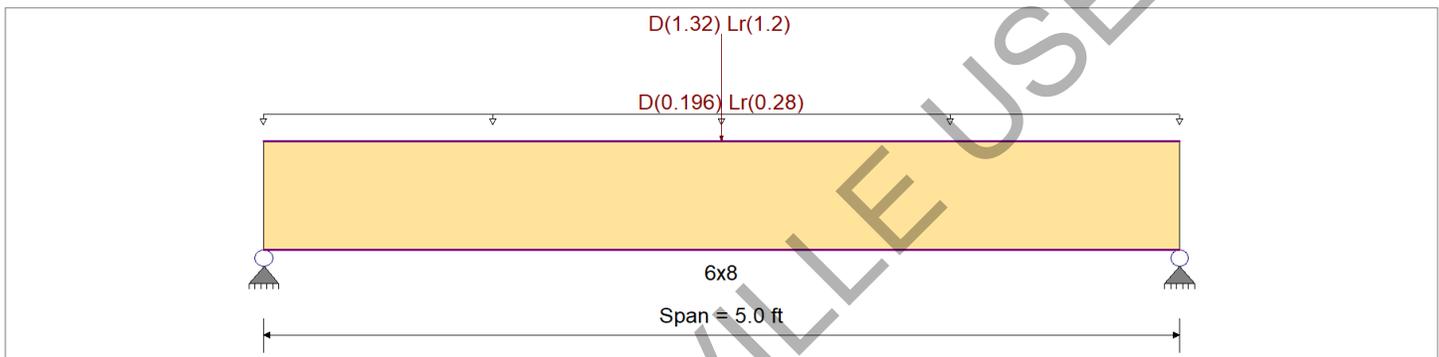
DESCRIPTION: B3

## 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	Fb +	1,350.0 psi	E : Modulus of Elasticity
Load Combination : ASCE 7-16	Fb -	1,350.0 psi	Ebend- xx
	Fc - Prll	925.0 psi	Eminbend - xx
Wood Species : Douglas Fir-Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	170.0 psi	Density
	Ft	675.0 psi	31.210pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



## 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 =	<b>0.643</b> : 1	Maximum Shear Stress Ratio =	<b>0.372</b> : 1
Section used for this span =	<b>6x8</b>	Section used for this span =	<b>6x8</b>
	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 =	2.500ft	Location of maximum on span =	0.000ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
<b>Maximum Deflection</b>			
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 <sub>d</sub>	C <sub>F/V</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv	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	1.00	1.00	2.29	533.05	1215.00	0.00	0.00	0.00	1.05	38.01	153.00
+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	1.00	1.00	4.67	1,085.77	1687.50	0.00	0.00	0.00	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	1.00	1.00	4.07	947.59	1687.50	0.00	0.00	0.00	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	1.00	1.00	1.37	319.83	2160.00	0.00	0.00	0.00	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

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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

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# Wood Column

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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
<i>( Used for non-slender calculations )</i>					
Wood Species	Douglas Fir-Larch			Exact Width	5.50 in
Wood Grade	No.2			Exact Depth	5.50 in
Fb +	750.0 psi	Fv	170.0 psi	Area	30.250 in <sup>2</sup>
Fb -	750.0 psi	Ft	475.0 psi	Ix	76.255 in <sup>4</sup>
Fc - Prll	700.0 psi	Density	31.210 pcf	Iy	76.255 in <sup>4</sup>
Fc - Perp	625.0 psi			Incising Factors :	
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial	for Bending	0.80
	Basic	1,300.0	1,300.0	for Elastic Modulus	0.95
	Minimum	470.0	470.0		
			1,300.0 ksi		
				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
					Allow Stress Modification Factors
					Cf or Cv for Bending 1.0
					Cf or Cv for Compression 1.0
					Cf or Cv for Tension 1.0
					Cm : Wet Use Factor 1.0
					Ct : Temperature Factor 1.0
					Cfu : Flat Use Factor 1.0
					Kf : Built-up columns 1.0 NDS 15.3.2
					Use Cr : Repetitive ? No

## 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**

Load Combination +D+Lr

Governing NDS Formula **Comp Only, fc/Fc'**

Location of max. above base 0.0 ft

At maximum location values are . . .

Applied Axial	1.539 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	558.95 psi

**Maximum SERVICE Lateral Load Reactions . .**

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

**Maximum SERVICE Load Lateral Deflections . . .**

Along Y-Y	0.0 in	at	0.0 ft	above base
for load combination : n/a				
Along X-X	0.0 in	at	0.0 ft	above base
for load combination : n/a				

**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

Other Factors used to calculate allowable stresses . . .

<b>Bending</b>	<b>Compression</b>	<b>Tension</b>
----------------	--------------------	----------------

## Load Combination Results

Load Combination	C <sub>D</sub>	C <sub>P</sub>	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		Y-Y Axis Reaction		Axial Reaction @ Base	My - End Moments		Mx - End Moments	
	@ 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

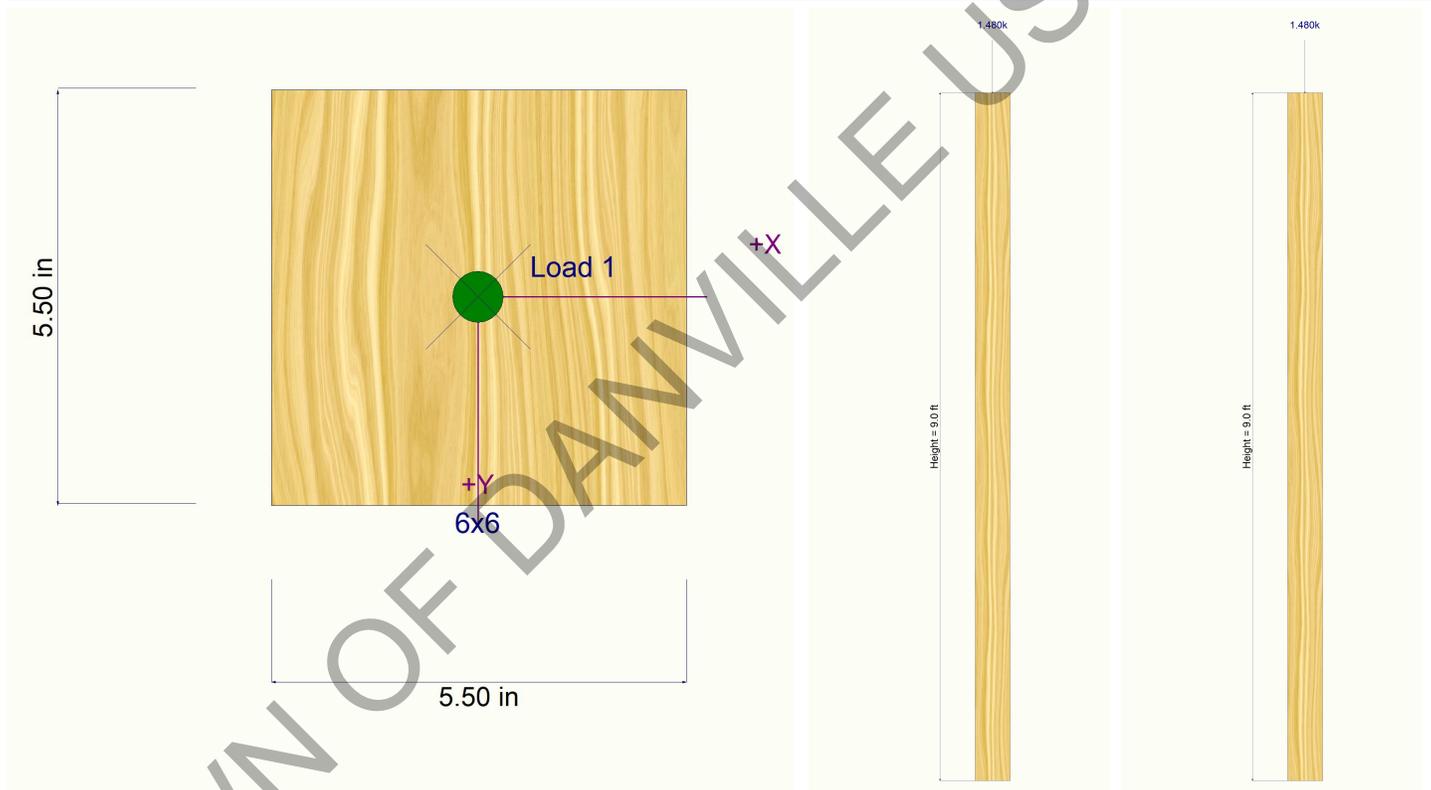
Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction @ Base	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ 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:**

<u>Allowable Stress:</u>		<u>Footing Reinf:</u>	
fy (ksi):	60	(2) #4 in Top	As used: 0.4
f'c (psi):	2500	(2) #4 in Bottom	

<b>Grid Line:</b>	<b>1</b>	<b>2</b>	<b>A</b>	<b>B</b>
<b><u>Footing Design Criteria:</u></b>				
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
<b><u>Uniform Loads:</u></b>				
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
<b>TOTAL DL (plf):</b>	<b>412</b>	<b>456</b>	<b>544</b>	<b>544</b>
<b>TOTAL Lr (plf):</b>	<b>220</b>	<b>260</b>	<b>340</b>	<b>340</b>
<b>TOTAL LL (plf):</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b><u>Point Load:</u></b>				
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
<b><u>Soil Analysis:</u></b>				
q (psf):	1247	1331	723	771
q/ q <sub>ALLOW</sub> :	0.83	0.89	0.48	0.51
<b>M<sub>max</sub> (ft-lb):</b>	7026 ft-lb	7391 ft-lb	5417 ft-lb	5674 ft-lb
<b>V<sub>max</sub> (lb):</b>	3869 lbs	4161 lbs	2993 lbs	2993 lbs
<b>Allowable M<sub>max</sub> (ft-lb):</b>	25253 ft-lb	25253 ft-lb	25253 ft-lb	25253 ft-lb
<b>Allowable V<sub>max</sub> (lb):</b>	7395 lbs	7395 lbs	7395 lbs	7395 lbs
Footing A(s) req'd:	0.40	0.40	0.40	0.40
	<b>O.K.</b>	<b>O.K.</b>	<b>O.K.</b>	<b>O.K.</b>



**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:**

<u>Allowable Stress:</u>		<u>Grade Beam Reinf:</u>	
fy (ksi):	60	(3) #5 in Top	As used: 0.93
f'c (psi):	2500	(3) #5 in Bottom	

<b>Grid Line:</b>	<b>1</b>	<b>2</b>	<b>A</b>	<b>B</b>
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**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
<b>TOTAL DL (plf):</b>	<b>637</b>	<b>681</b>	<b>769</b>	<b>769</b>
<b>TOTAL Lr (plf):</b>	<b>220</b>	<b>260</b>	<b>340</b>	<b>340</b>
<b>TOTAL LL (plf):</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**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:**

<b>M<sub>max</sub> (ft-lb):</b>	15942 ft-lb	16877 ft-lb	11764 ft-lb	12176 ft-lb
<b>V<sub>max</sub> (lb):</b>	6219 lbs	6686 lbs	5869 lbs	5869 lbs
<b>Allowable M<sub>max</sub> (ft-lb):</b>	56104 ft-lb	56104 ft-lb	56104 ft-lb	56104 ft-lb
<b>Allowable V<sub>max</sub> (lb):</b>	7395 lbs	7395 lbs	7395 lbs	7395 lbs
Grade Beam A(s) req'd:	0.93	0.93	0.93	0.93
	<b>O.K.</b>	<b>O.K.</b>	<b>O.K.</b>	<b>O.K.</b>

**Pier Analysis:**

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