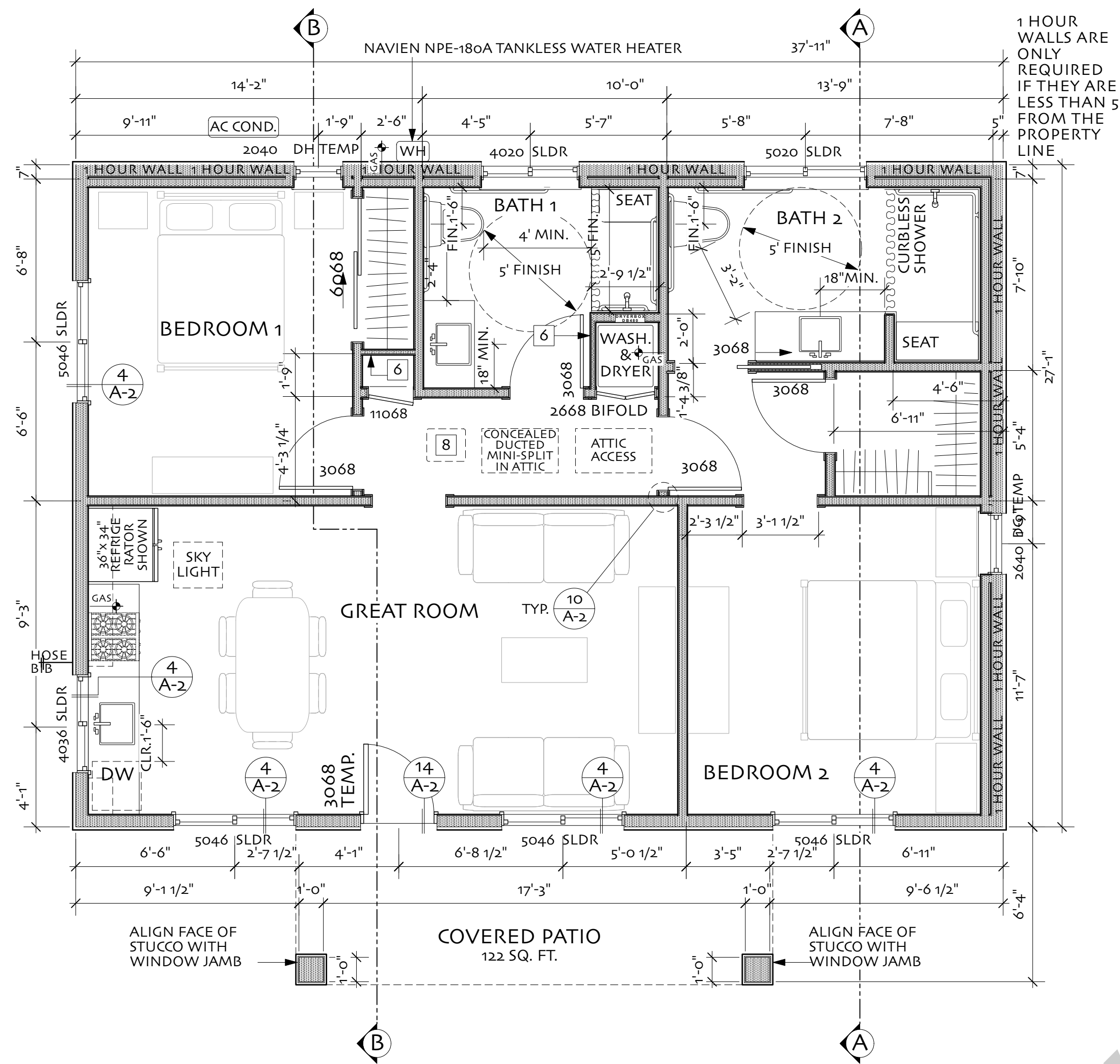
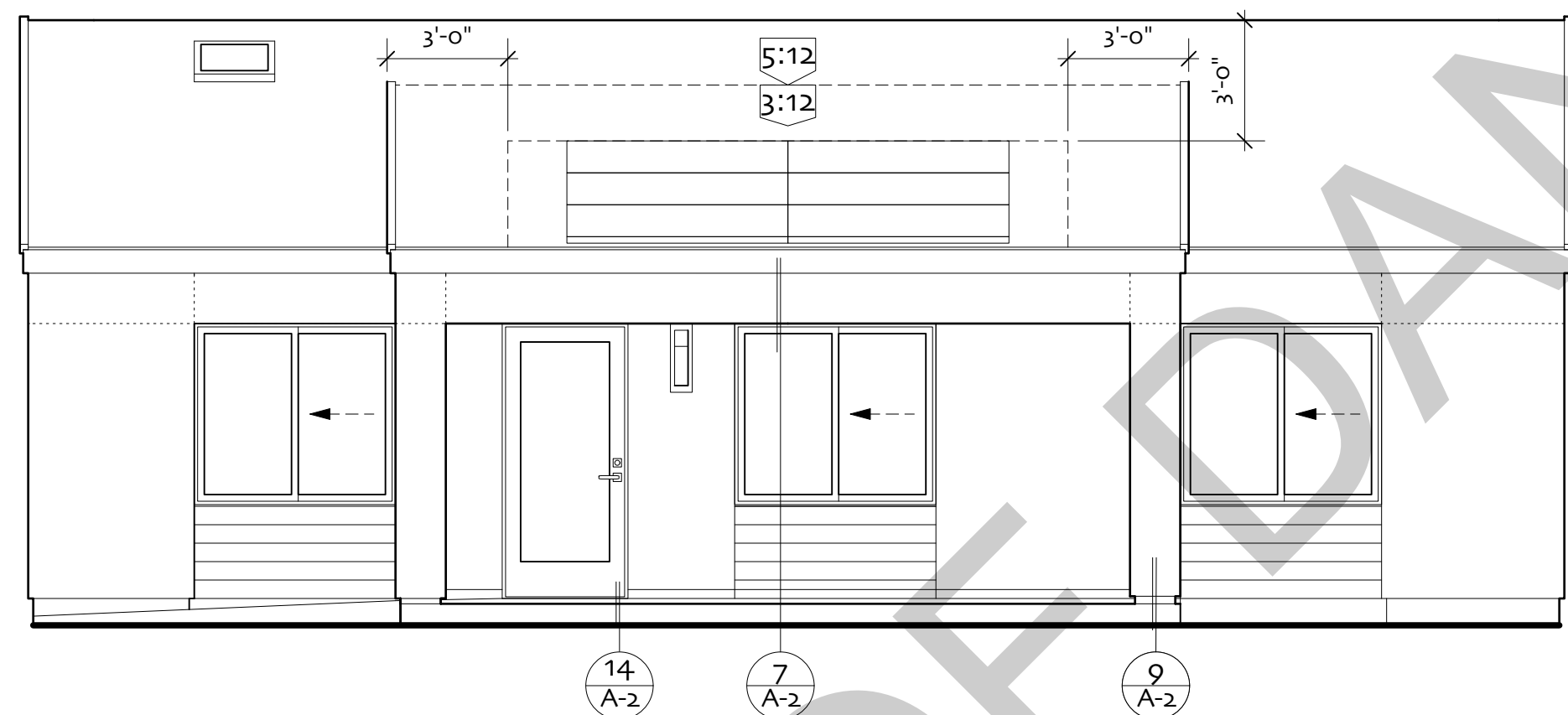
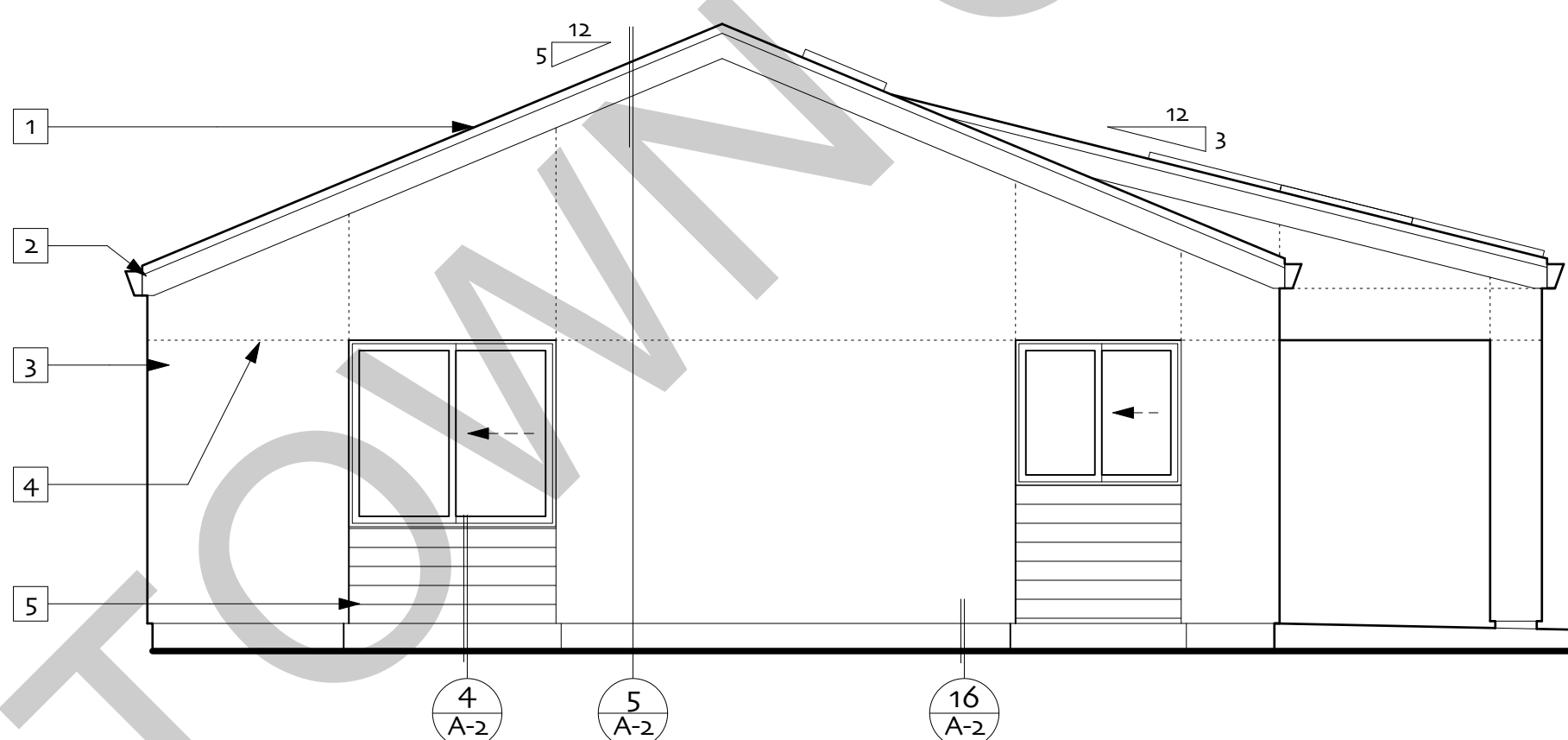




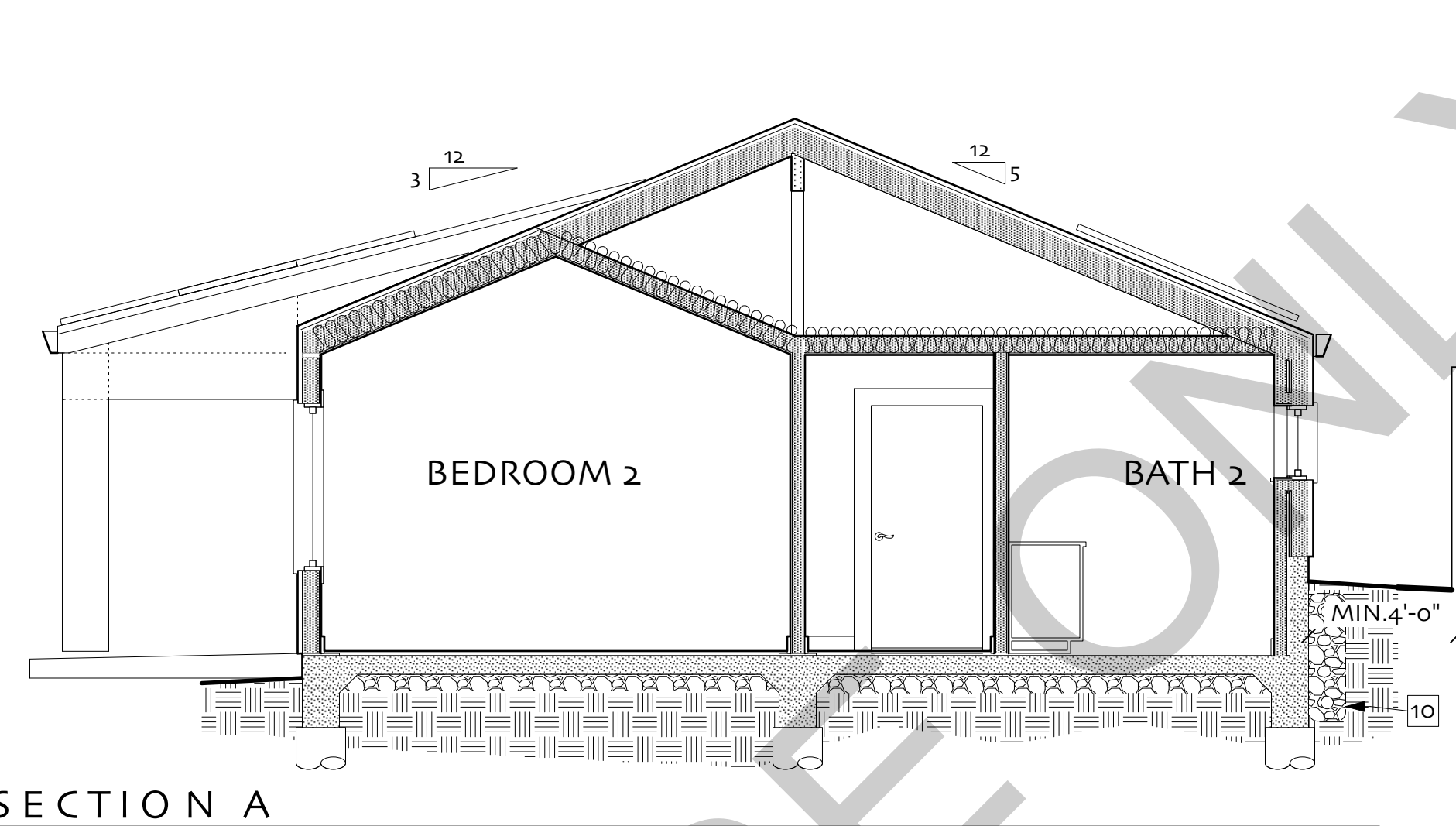
1000 SQ. FT. FLOOR PLAN  
SCALE 1/4"=1'-0"



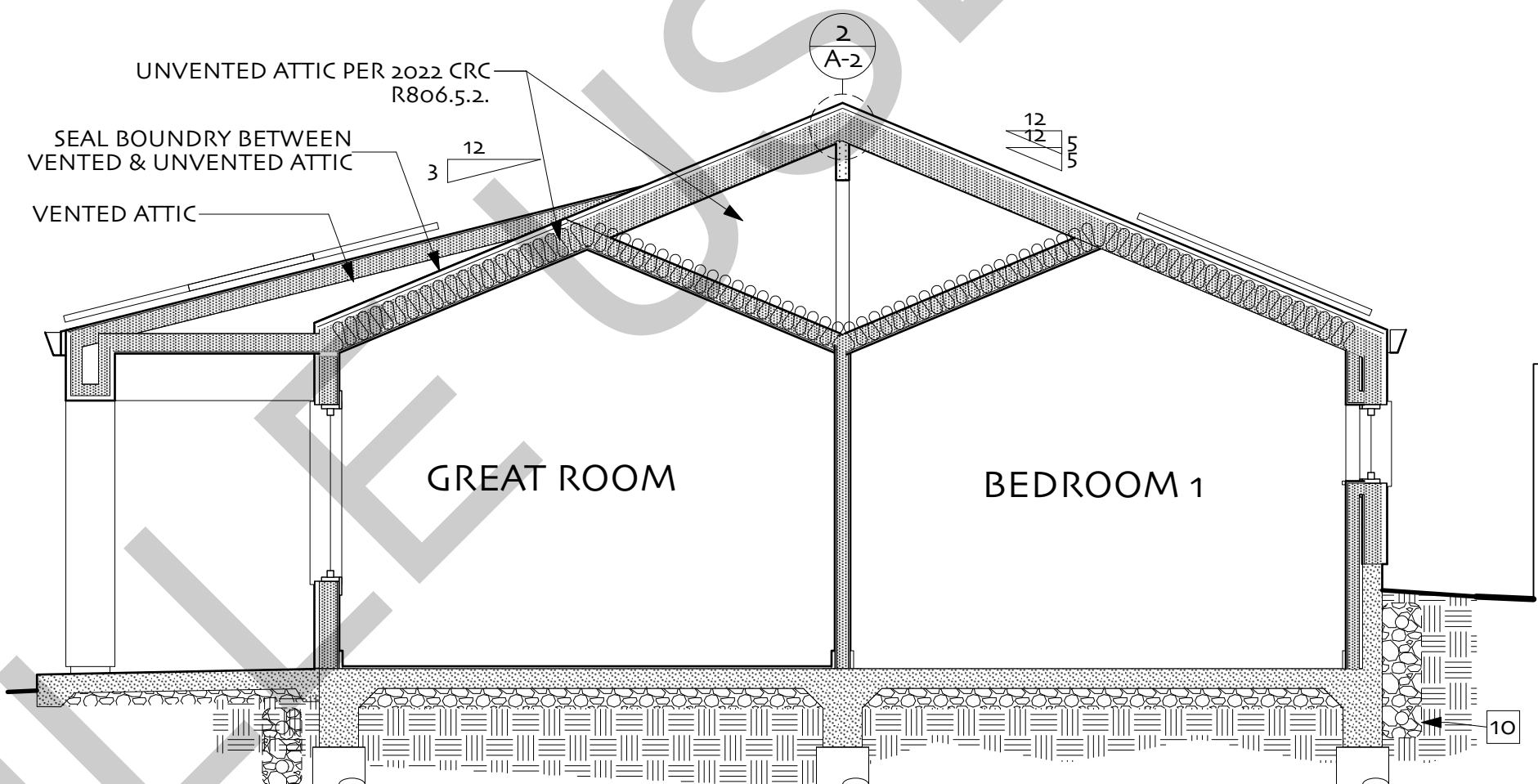
FRONT ELEVATION



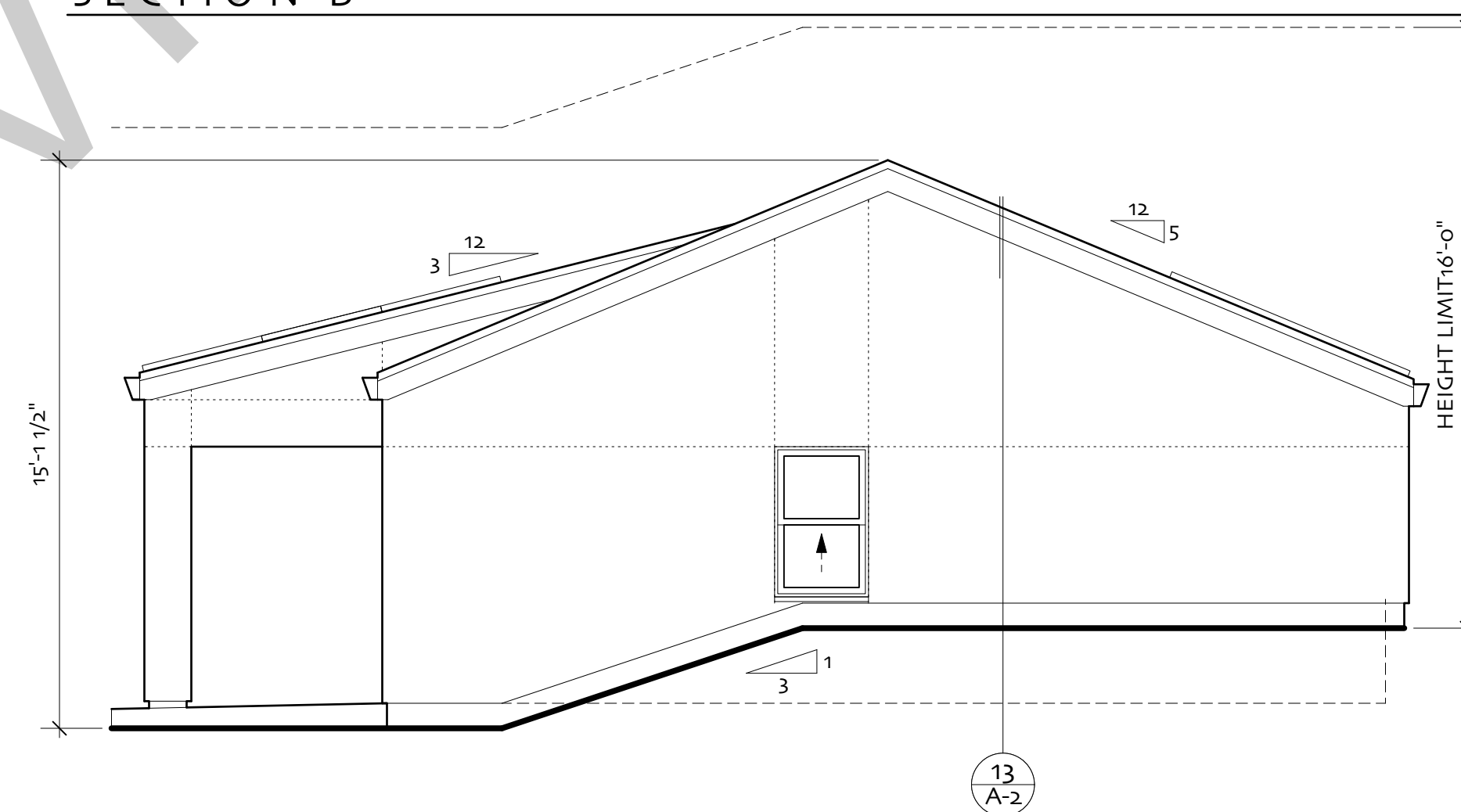
SIDE ELEVATION



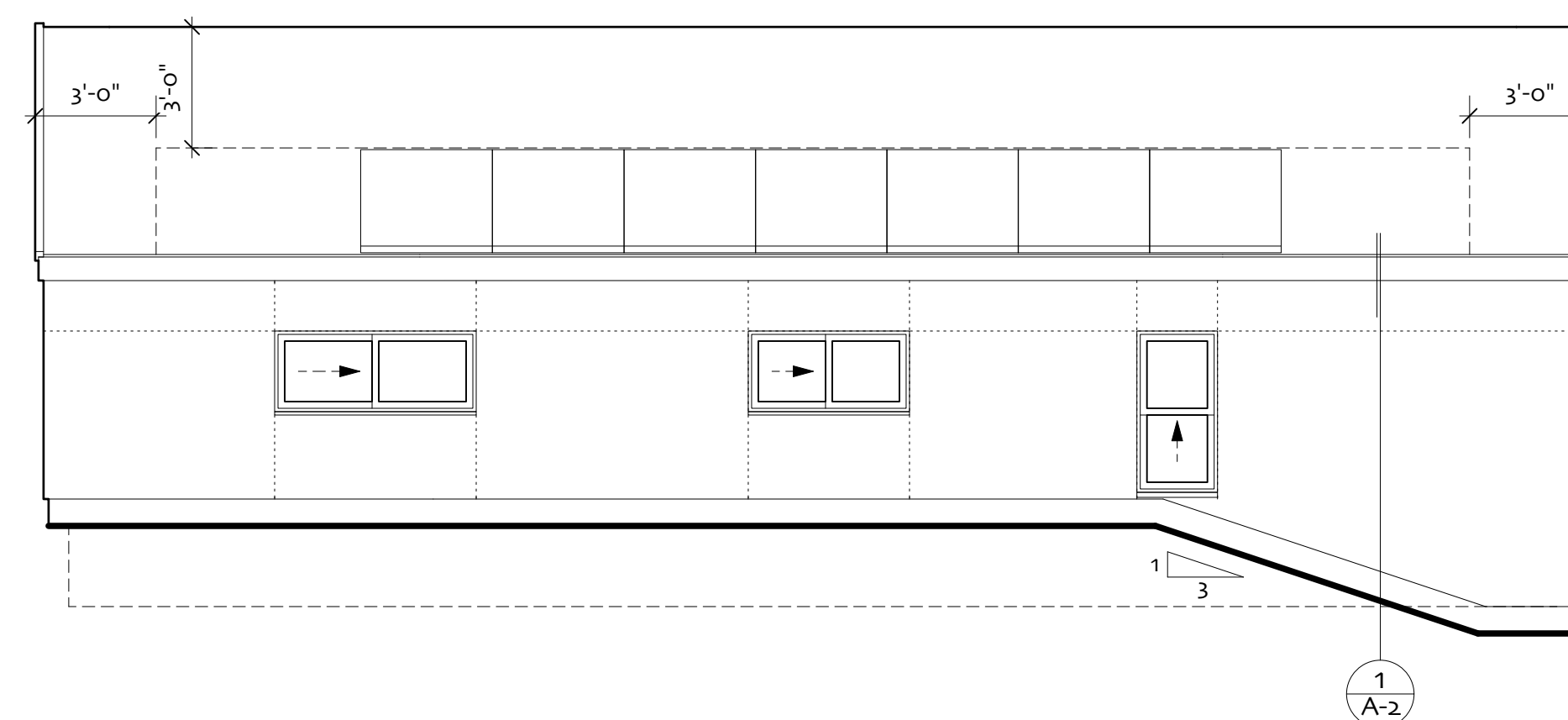
SECTION A



SECTION B



SIDE ELEVATION



BACK ELEVATION

### FLOOR PLAN NOTES

1. PROVIDE BLOCKING FOR 42 INCH MINIMUM LENGTH GRAB BAR PER CBC 11B-604.3.1
2. THE LAVATORY HEIGHT OF THE RIM OR COUNTER SURFACE SHALL NOT EXCEED 34 INCHES MAXIMUM HEIGHT PER CBC 11B-606.3.
3. BATHROOM SINKS SHALL BE A MINIMUM OF 18 INCHES TO THE SIDEWALL FROM THE CENTERLINE OF THE SINK.
4. STANDARD ROLLING TYPE SHOWER COMPARTMENT SHALL BE 30 INCH MINIMUM WIDTH BY 60 INCH MINIMUM CLEAR DEPTH WITH A FULL OPENING WITH ON THE LONG SIDE OF 60 INCHES MINIMUM PER CBC 11B-608.2.2.
5. MAXIMUM FLOOR SLOPE IN SHOWER STILL NOT EXCEED 1/2 INCH PER FOOT. 2 INCH MINIMUM DEPTH TO DRAIN INLET.
6. 2x6 FLAT STUDS @ 12" O.C. ALL OTHER INTERIOR STUDS ARE 2x4 AND EXTERIOR STUDS 2x6 UNLESS NOTED OTHERWISE.
7. INSULATE CEILINGS AND WALLS BETWEEN BEDROOMS AND GREAT ROOM WITH R-11 SOUND ATTENUATION BATTS.
8. PANASONIC FV-10VE1 ENERGY RECOVERY VENTILATOR SET TO 50 CFM
9. WEATHER STRIP & TEMPERED GLASS ON EXTERIOR DOOR.
10. CONTINUOUS DRAIN SYSTEM ON 4 SIDES OF HOUSE: SDR-35 PVC PIPES WITH 1% MIN. SLOPE TO DRAIN. TOP PIPE IS SOLID 4" O FOR RAIN LEADERS. BOTTOM PIPE IS SEPARATE SYSTEM OF 4" O PIPES WITH PERFORATIONS DOWN. PIPES IN 12" WIDE FILTER FABRIC WRAPPED TRENCH WITH CLASS II DRAIN ROCK FILL. 6" COMPACTED NATIVE SOIL OVER TRENCH. SLOPE SURFACE GRADE 5% MINIMUM AWAY FROM BUILDING.

### ELEVATION NOTES

- THESE ARE SUGGESTED EXTERIOR MATERIALS. CONSULT WITH TOWN OF DANVILLE TO DETERMINE WHICH MATERIALS WILL BE COMPATIBLE WITH THE MATERIALS AND COLORS OF THE PRIMARY RESIDENCE.
1. ASPHALT COMP ROOF AT 3:12 AND 5:12 (ENGINEERED FOR CONCRETE TILE IN CASE MAIN HOUSE HAS CONCRETE TILE ROOF).
  2. 6" SOLDERED BONDERIZED GSM FASCIA GUTTERS WITH NO RIBBING AND WITH CONCEALED DOWNSPOUT 2" I.D. PVC DOWNSPOUTS.
  3. 7/8" 3 COAT STUCCO WITH SMOOTH FINISH OVER EXPANDED METAL LATH OVER 2 LAYERS 30 LB. BUILDING PAPER OVER 1/2" CDX PLYWOOD.
  4. DOUBLE V-GROOVE 26 GA. BONDERIZED STUCCO SCREED 1/2" BETWEEN POINTS.
  5. ACCENT PANEL OF CEDAR RAIN SCREEN, LAP SIDING, PORCELAIN WOOD LOOK TILE, OR ANOTHER TILE SELECTED BY OWNER ON 2x4 STUD WALLS BELOW WINDOWS ONLY. SEE DETAIL 4/A-2 TO RECESS FOUNDATION 1 1/2" BY WIDTH OF WINDOW R.O. + 3"

### SHEET INDEX

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### CODE COMPLIANCE

OCCUPANCY GROUP: R3  
TYPE OF CONSTRUCTION: VB  
2022 CALIFORNIA RESIDENTIAL CODE  
2022 CALIFORNIA MECHANICAL CODE  
2022 CALIFORNIA PLUMBING CODE  
2022 CALIFORNIA ELECTRICAL CODE  
2022 CALIFORNIA ENERGY CODE  
2022 CALIFORNIA BUILDING GREEN STANDARDS CODE  
2022 CALIFORNIA BUILDING CODE (STRUCTURAL ONLY)  
TYPE V CONSTRUCTION

THE FOLLOWING TO BE DEFERRED AND/OR REVIEWED AND APPROVED UNDER A SEPARATE PERMIT  
A. FIRE SPRINKLERS (consult Danville if required per NFPA 13D)  
B. GAS LINE SIZING CALCULATIONS  
C. ELECTRICAL LOAD CALCULATIONS  
D. PHOTOVOLTAIC SYSTEM

### STRUCTURAL ENGINEER & TITLE 24

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ADVANCED ENGINEERING  
3361 WALNUT BLVD. SUITE 100  
BRENTWOOD CA 94513  
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1000 S.F. 2 BEDROOM  
A.D.U. FOR THE  
TOWN OF DANVILLE

| Rev. No.                                          | Revision                    |
|---------------------------------------------------|-----------------------------|
| 1                                                 | PLAN CHECK RESPONSE 4-21-23 |
| Drawn: FG<br>Date: 3-24-2023<br>Scale: 1/4"=1'-0" |                             |

CONTEMPORARY  
UPSLOPE  
RIGHT PLAN  
WITH PIERS

A-1

FILE NAME  
2-CO-RU-P 4-21-23



1. ALL PERMITS EXCEEDING \$1,000.00 IN VALUATION SHALL REQUIRE INSTALLATION OF APPROVED SMOKE AND CARBON MONOXIDE DETECTORS WITHIN THE DWELLING.

3. BUILDING ADDRESS NUMBERS MUST BE A MINIMUM OF 4 INCHES IN HEIGHT OR 3 INCHES IN HEIGHT AND SELF-ILLUMINATED.

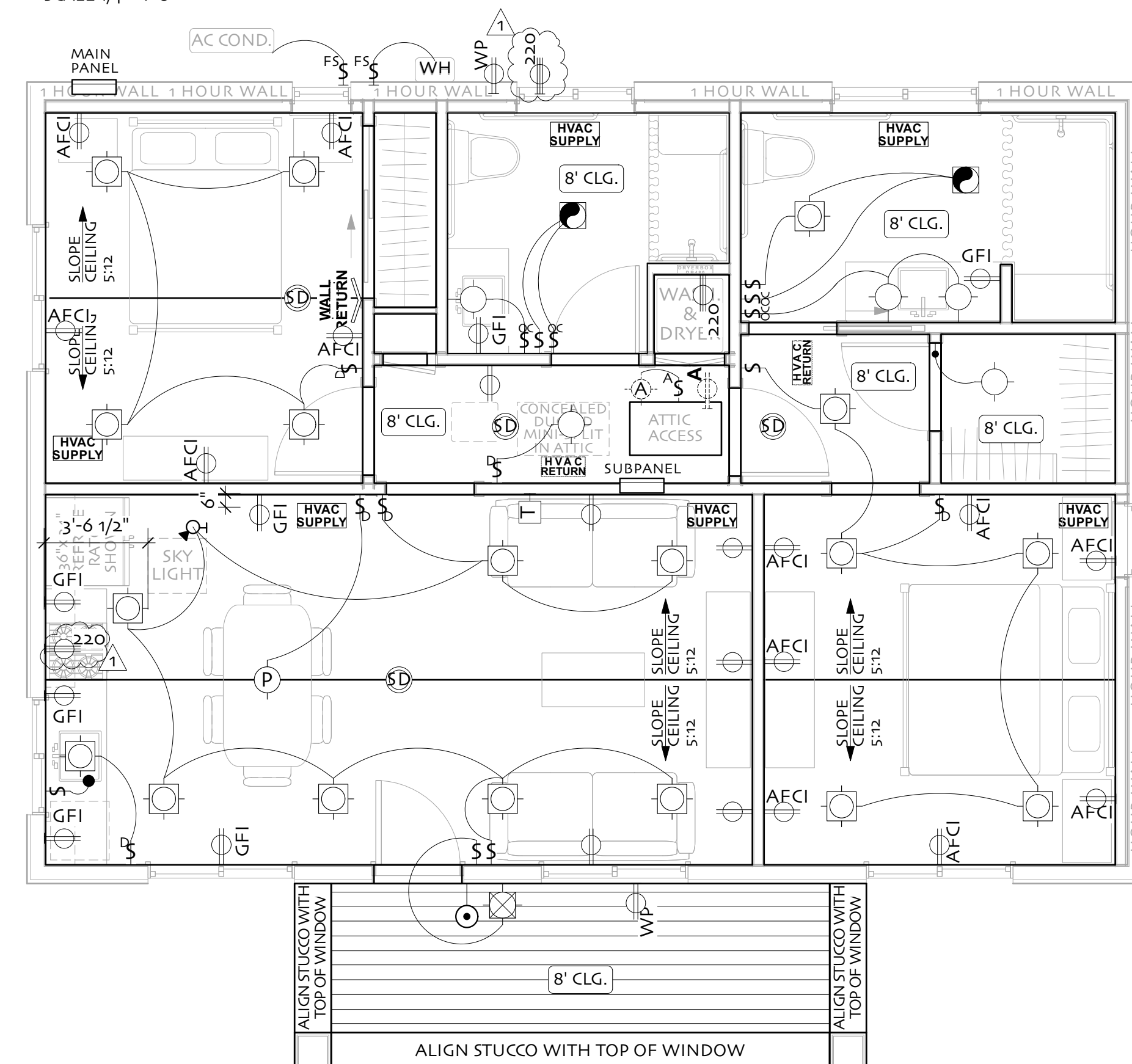
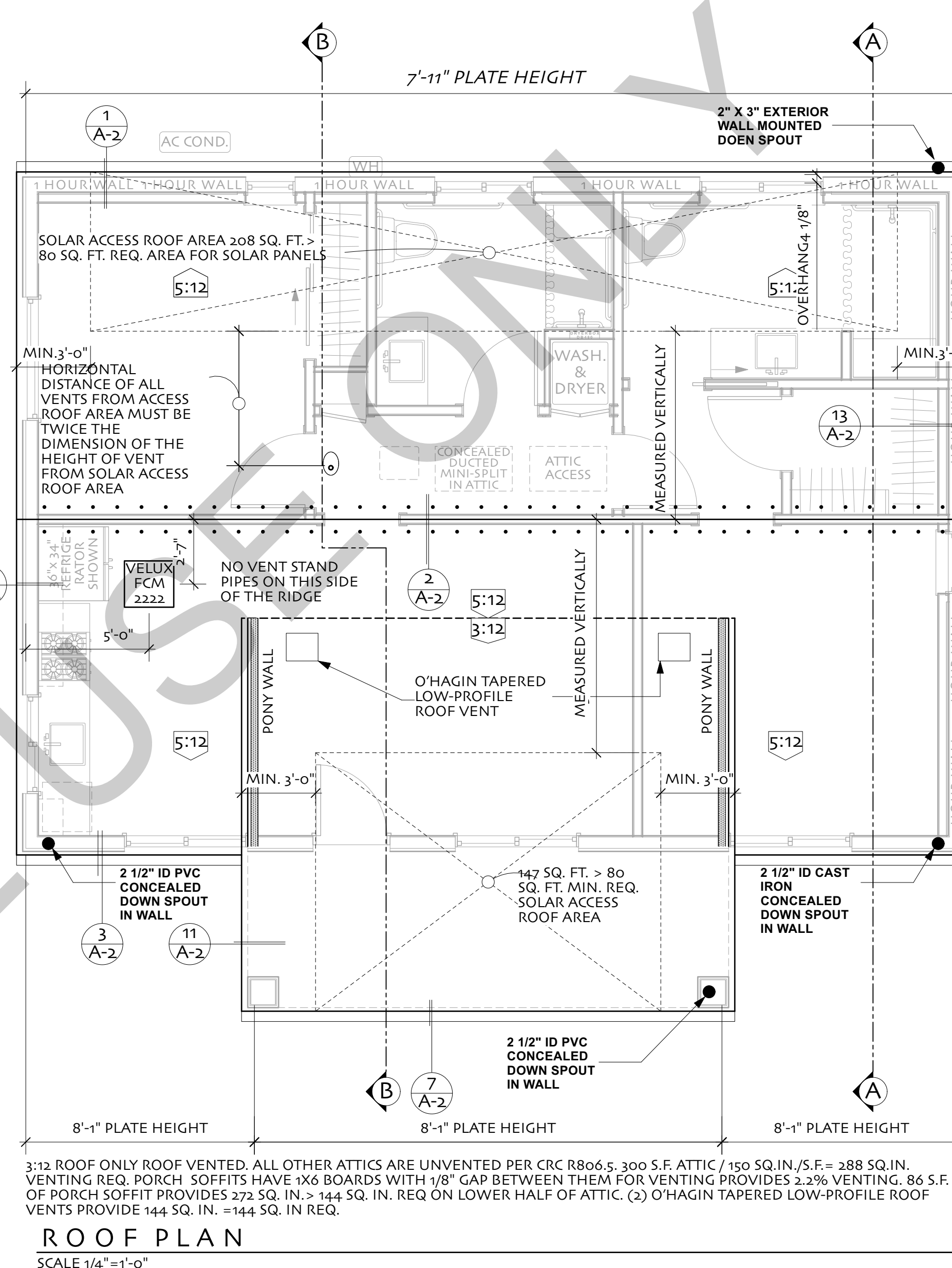
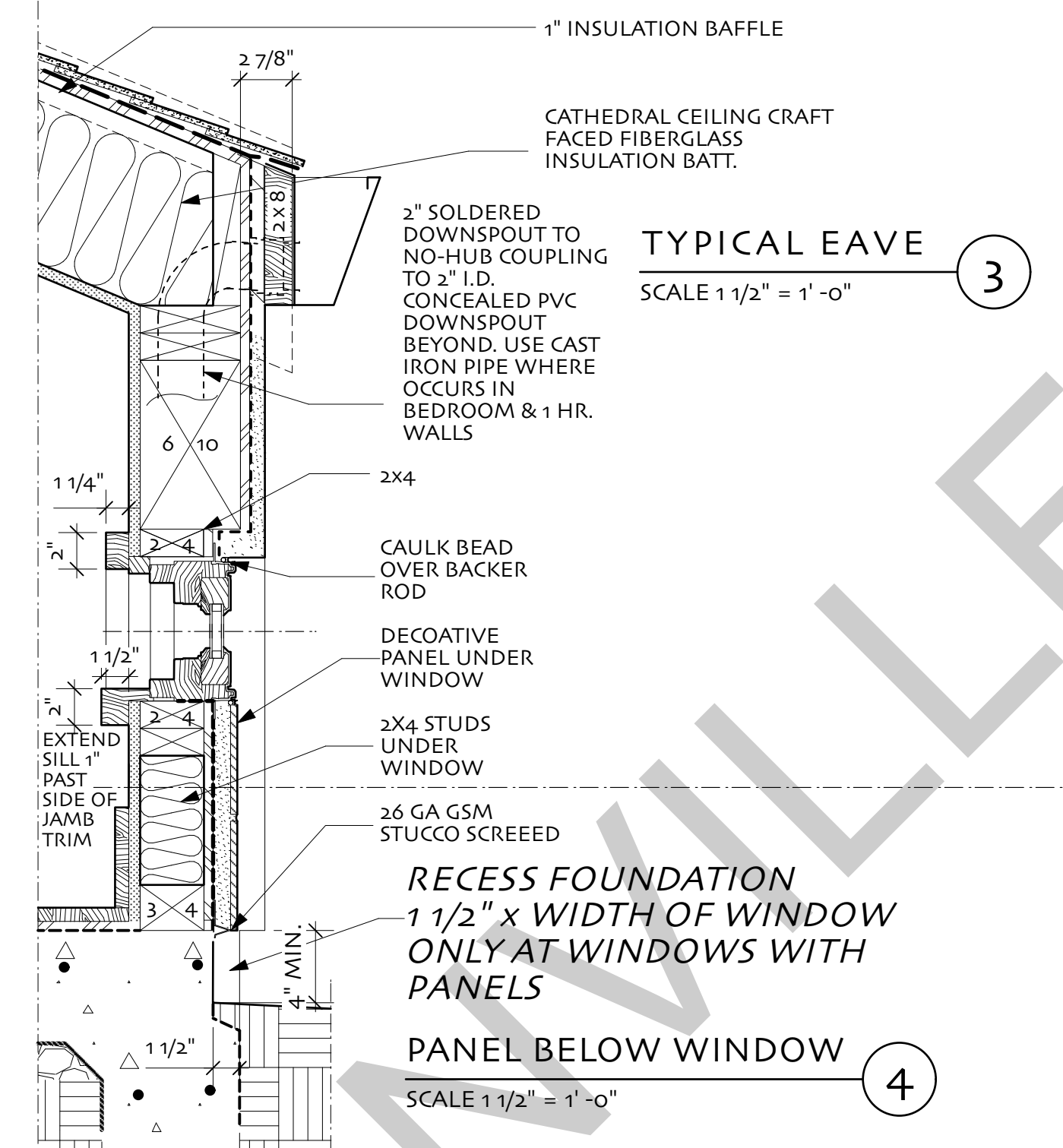
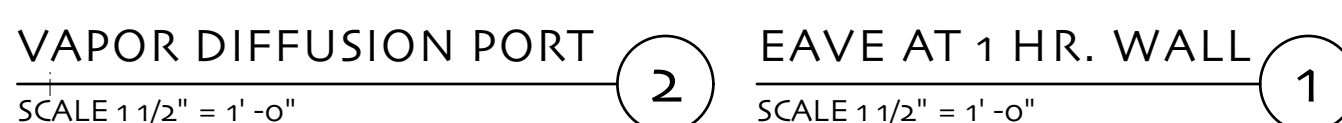
4. PER THE GREEN BUILDING STANDARDS CODE, THE CONSTRUCTION AND DEMOLITION ORDINANCE (C&D) APPLIES.

5. BATHTUB AND SHOWER FLOORS AND WALLS ABOVE BATHTUBS WITH INSTALLED SHOWER HEADS AND IN SHOWER COMPARTMENTS SHALL BE FINISHED WITH A NONABSORBENT SURFACE. SUCH WALL SURFACES SHALL EXTEND TO A HEIGHT OF NOT LESS THAN 6 FEET ABOVE THE FLOOR. CRC R307.2

6. GYPSUM BOARD SHALL NOT BE USED WHERE THERE WILL BE DIRECT EXPOSURE TO WATER, OR IN AREAS SUBJECT TO CONTINUOUS HIGH HUMIDITY. CRC R702.3.

7. BATHROOMS EXHAUST SHALL TERMINATE 3'-0" FROM PROPERTY LINE AND 3'-0" FROM OPENINGS INTO THE BUILDING PER CMC 502

8. WALLS WITHIN 5' FEET OF THE PROPERTY LINE SHALL BE ONE-FOUR HOUR FIRE RATED FIRE RESISTIVE ASSEMBLY IN ACCORDANCE WITH CBC 721 TABLE 721.1.(1) ITEM NUMBER 15-1, 2" X 6" FIRE-RETARDANT-TREATED WOOD STUDS 16" ON CENTER, INTERIOR AND EXTERIOR, 1/2" ON CENTER, TYPE X GYPSUM WITH THE BASE LAYER PLACED VERTICALLY AND ATTACHED WITH 6D BOX NAILS 12" ON CENTER, THE FACE LAYER IS PLACED HORIZONTALLY AND ATTACHED WITH 6D BOX NAILS 8" ON CENTER, INTERIOR AND 12" ON CENTER, EXTERIOR, 1/2" ON CENTER, TYPE X GYPSUM SHEATHING PLACED VERTICALLY WITH 6D BOX NAILS 8" ON CENTER AT JOINTS AND 12" ON CENTER ELSEWHERE. AN APPROVED BUILDING PAPER IS NEXT APPLIED FOLLOWED BY A CURRANT EXTERIOR WALL ATTACHED WITH A 3/8" DIAMETER CEMENT PLASTER ROOFING NAIL SPACED WITH A 3/8" DIAMETER HEAD AND SPACED 6" ON CENTER ALONG EACH STUD. CEMENT PLASTER CONSISTING OF A 1/2" BROWN COAT THEN APPLIED, THE SCRATCH COAT IS MIXED IN THE PROPORTION OF 1 PART HYDRATED LIME AND 3 POUNDS OF HYDRATED LIME AND 3 POUNDS OF APPROVED ADDITIVES OR ADMIXTURES PER SACK OF CEMENT, THE BROWN COAT IS MIXED IN THE PROPORTION OF 1:4 BY WEIGHT, CEMENT TO SAND WITH THE SAME AMOUNTS OF APPROVED ADDITIVES OR ADMIXTURES AND ADMIXTURE USED IN THE SCRATCH COAT.



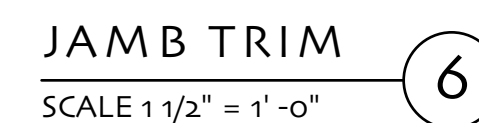
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1000 S.F. 2 BEDROOM  
A.D.U. FOR THE  
TOWN OF DANVILLE

|                                                                                       |                             |
|---------------------------------------------------------------------------------------|-----------------------------|
| Rev. No.                                                                              | Revision                    |
| 1                                                                                     | PLAN CHECK RESPONSE 4-21-23 |
|  | Drawn: FG                   |
|                                                                                       | Date: 3-24-2023             |
|                                                                                       | Scale: AS NOTED             |
|                                                                                       |                             |

CONTEMPORARY  
RIGHT PLAN  
UP SLOPE LOT  
ROOF & ELECTRICAL  
PLANS & DETAILS

A-2



SCALE 1/4"=1'-0"



SPECIFICATIONS

SEE ALL STRUCTURAL NOTES BY STRUCTURAL ENGINEER. WHERE CONFLICTS OCCUR STRUCTURAL ENGINEERS NOTES SHALL GOVERN.

CONCRETE & CONCRETE BLOCK

A. CONCRETE

- Concrete shall be machine mixed with a maximum 7 1/2 gallons of water per sack of cement.
- Mixing water shall be clean and free from injurious amounts of oil, acids, alkalis, organic materials or other deleterious substances.
- Concrete aggregate shall be hard, durable crushed stone or gravel graded per ASTM C33.
- Sand shall be clean, hard, durable, washed free from silt, loam, or clay.
- Concrete shall conform to ASTM 94 and reach a minimum strength of 2500 P.S.I. in 28 days or as specified in the soils report.
- Concrete quality shall conform to provisions of Sec. 1905 CBC
- Cement shall conform to ASTM C150, Type I or II.
- All concrete shall be thoroughly consolidated during placement, using a mechanical vibrator.
- Except where detailed on structural drawings, reinforcement shall not be displaced or cut to provide clearance for penetrations, inserts, or embedments.
- Removal of forms: supporting vertical surfaces min. 2 days: supporting horizontal surfaces min. 14 days.
- Only one grade of concrete shall be permitted on the job site at one time.

B. CONCRETE BLOCK

- All concrete blocks shall be grade N load bearing unit F=1500 #PSI (U.N.O.) conforming to A.S.T.M. C-90 (medium weight concrete blocks).
- Mortar (type S mortar) mix shall be 1 part cement, 4-1/2 parts sand, and a maximum of part lime putty or dry hydrated lime.
- Mortar joints shall be a minimum of 3/8 and shall be full head and bed.
- Grout mix shall be 1 part cement, 3 parts sand, 2 parts pea gravel, and sufficient water to cause the grout to flow into all joints without segregation.
- GROUT posts shall not exceed 4 feet in height Grout cells as noted on plans, F C 2000 P.S.I. min.
- When grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout 1-1/2" below the top of the uppermost unit.
- Vertical reinforcement shall be held in position at the top and bottom and at intervals not exceeding 192 bar diameters.
- Dry pack shall be 1:2 stiff mix.
- Concrete block retaining walls shall conform to provisions set forth in CBC Chapter 16 for structural masonry walls.
- Provide an approved waterproofing on earth side of retaining wall with protection board before backfilling. Provide back of wall drain or weep holes as per detail.
- Block units shall have a moisture content not to exceed 30% at time of laying to prevent dehydration of mortar and grout, and shall be free of all substances which might impair the bond of the units to mortar and grout.
- Proper units shall be used to provide for all windows, doors, bond beams, lintels, pilasters etc. with a minimum of cutting.
- Lay masonry in running bond except as designated otherwise on drawings. Provide masonry bonds at all corners and intersections-
- All grout shall be thoroughly consolidated and re--consolidated, using a mechanical masonry vibrator.
- Masonry Fireplaces shall be constructed and reinforced per code, and according to the recommendations of the Masonry Institute of America. Chimneys shall have terra cotta flue linings. Install ash dump at each fireplace.

STEEL

A. STRUCTURAL STEEL AND MISCELLANEOUS METALS

- Structural steel shapes and plates shall conform to ASTM A36 identified with mark and mill certification.
- Steel pipe columns shall conform to ASTM A53 Type E or S Grade B. Note dimension on plans shows out side diameter.
- Steel tube columns shall conform to ASTM A500, Grade B.
- All welding shall conform to standard code and A.W.S. for arc and gas welding. Use the electric arc process F-70 electrodes: low hydrogen electrodes for welding bolts and rebar as per ASTM A233.
- All welding shall be performed by certified welders in a shop approved by local ordinances.
- Structural field welding shall have special inspection, in accordance with CBC 1704.
- Fasteners: Bolts and nuts shall conform to ASTM A307. All bolt heads and nuts that bear on wood shall have malleable iron washers if exposed or cut washers if concealed. All anchor bolts shall be hook bolts (with 2 hook), see plan for spacing.
- Exposed exterior steel shall be galvanized, UNO
- Exposed interior steel shall be shop primed and field (final) coated.

B. REINFORCING STEEL

- Reinforcing steel shall be deformed bars conforming to ASTM designation A615-40, intermediate grade.
- Wire fabric shall be electrically welded steel, ASTM A185. Lap 6 at edges.
- Detailing fabrication and placing of reinforcing steel shall conform to or equal that set forth in the Manual of Standard Practice for Detailing Reinforced Concrete Structures, and better where required by the drawings.
- Standard hooks shall comply with recommended sizes as shown in above manual, unless otherwise noted.
- Lap all bar splices, 36 diameters in concrete and 40 diameters in concrete block, or 24", whichever is greater; stagger splices: bars shall be continuous in length as long as possible.
- Suitable devices shall be used to hold the reinforcing in its true horizontal and vertical positions. These devices shall be sufficiently rigid and numerous to prevent displacement of the reinforcing during the placing of the concrete.
- All dowels, anchor bolts and other inserts shall be well secured in place prior to pouring concrete.
- All pipes and ducts through concrete to be sleeved. Verify openings with plumber and electrician.

- All welded wire fabric shall be tied at three places to each dowel except locations where slab is designed as a floating slab.

- Clear distance of reinforcement shall be as follows:  
a) Wall surface = 1"  
b) Formed surface in contact w/earth = 2"  
c) Unformed surface in contact w/earth = 3"  
d) Clear distance between bars = 2"

WOOD

A. MATERIALS

- All lumber shall be Douglas Fir, and shall be stamped with a grademark of the following grades by an approved grading agency UNO

- Studs and plates- standard grade min.
- Joists and rafter- #2 grade min. UNO
- Beam and lintel - #1 grade min. UNO

- D. Post: 4X post - #2 grade, U.N.O. (exposed #1)  
6x post & larger - #1 grade

2. Glu-Laminated Timber Beams

A. Industrial appearance grade UNO

- All members shall be composed of 1-1/2" laminations, Fbx-2400 PSI, dry use condition. Each member shall bear specific identification for location and shall be accompanied by a Certificate of Inspection by the inspection agency- Standard camber.

- C. Prior to fabrication, shop drawings shall be prepared and submitted to the Architect for approval. Taper seats for level bearing.

- D. Design, fabrication and construction of structural glu-lam members shall conform in all applicable respects to the following governing standards:

- The American Institute of Timber Construction Standards, Manual #301.
- The commercial standard for structural glued laminated timber, CS-253.

- WCLAI Comb. F, DF.

- WCLIB certificate of lumber grades.

- Approved inspection certificate in gluing procedures to be submitted to the building department prior to erection.

- Each piece to be imprinted with standard identification marks.

- Structural plywood shall be graded per A.P.A. PSI-83, and shall be interior type sheathing C-D grade with exterior glue, UNO All horizontal plywood shall be laid with face grain perpendicular to joists and with staggered joints.

B. CONNECTIONS

- Nailing: Minimum nailing requirements for standard connections unless specifically shown or noted otherwise.

- Timber Nailing Schedule  
Taken from CBC Table 2304.9.1

- A. Plywood sheathing: (at floors) UNO  
Use T&G plywood (PI 48/24, CDX) w/rod common nails.  
Supported panel edges nailed @ 6" o.c. Intermediate nailed @ 12" o.c.  
Glu plywood to floor joist.  
Nail immediately after gluing.

- B. Plywood sheathing: (at roof) UNO  
Use plywood (CDX) w/8d common nails.  
Supported panel edges nailed @ 6" o.c. Intermediate nailed @ 12" o.c.  
Blocking not required UNO

- For flush framing of joists, use Simpson std. U joist hanger or equal. Provide rafter ties 4'-0" o.c. immediately above ceiling joists where ceiling joists are not parallel to roof rafters.

- All manufactured connection hardware shall be as designated on drawings and installed and full nailed in conformance to manufacturer's instructions and applicable ICGO approvals.

- Install lag screws in drilled lead holes with a diameter equal to of the shank diameter (lag screws shall not be hammered in). Wax or soap lag screws. Provide washers under heads bearing on wood. Holes shall be properly aligned.

- Bolt holes shall be drilled 1/16" larger than the bolt diameter. Provide washers under all bolt heads and nuts bearing on wood. Holes shall be properly aligned. In case shall misalignment be allowed which prevents proper bearing or alignment of members. Oversized holes shall not be allowed. Nuts shall be tightened snug.

- Nails to be common wire nails.

C. INSTALLATION

- Cutting and Notching of Studs:

- 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.

- A hole not greater in diameter than 40% of the stud width may be bored in any wood stud. Bored holes not greater than 60% of the width of the stud are permitted in non-bearing partitions. In no case shall the edge of the bored hole be nearer than 5/8" to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch.

- All lumber in contact with concrete shall be pressure treated (Wolminized) Douglas Fir or construction grade Redwood.

- All stud walls shown on Structural Drawings shall have 2 x 4 studs placed at 16" o.c. except where noted otherwise.

- Top plates shall be doubled on all stud walls. UNO

- Cripples under headers shall be continuous to sole plate.

- Block all stud walls as required for sheathing.

- Provide blocking 2x wide of equal depth of the members between all joists and rafters at their supports, unless members are nailed to a rim joist

- Install all horizontal members with crown up.

- All members in bearing shall be accurately cut and aligned so that full bearing is provided without the use of shims.

- Bearing posts shall have full blocking or support under.

- Double joist under all parallel non-bearing partitions. Use 2-16d nails at 16" o.c. to nail double joist together unless noted otherwise.

- All joists shall have a minimum of 2" bearing at supports. Lapping joists shall have 6" laps centered over interior supports.

- Provide 2X solid blocking on joists and rafters @ 8'-0" o.c. and at supports.

- Sills and Plates:  
Sills and plates at shear walls shall be continuous and free of cuts and notches. Perforations shall be allowed with a maximum of 1 3/4" diameter and shall be located as close to the center as possible. Sill plates shall be pressure treated Douglas Fir. Sill bolts shall have 7" minimum embedment and be 12" maximum from ends of sills and corners. Provide metal washers under all bolt heads and nuts bearing on wood. All bolts through wood to be drive fit. At least 2 bolts shall be provided for each board.

- Double joists around all openings

17. Non-Bearing Stud Wall Requirements:

- Maximum Height  
Up to 12' 2 x 4 @ 16" o.c  
Up to 18' 2 x 6 @ 16" o.c  
Up to 20' 2 x 8 @ 16" o.c.  
Lintels as Follows: (U.N.O.)  
Roof Lintel Floor Lintel  
Opening = 8'-0" Use 4 x 8  
Opening = 6'-0" Use 4 x 6  
Opening = 4'-0" Use 4 x 4  
Opening = 8'-0" Use 4x10  
Opening = 6'-0" Use 4x8  
Opening = 4'-0" Use 4x6

- Provide double trimmers at all openings 6'-0" wide or greater UNO

- Fire stops are required at the following locations:

- A. In concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor levels and at 10 foot intervals along the length of the wall.

- B. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.

- C. In concealed spaces between stair stringers at the top and bottom of the run and between studs along and incline with the run of stairs if the walls under the stairs are unfinished.

- D. In openings around vents, pipes, ducts, chimneys, fireplaces and similar openings that afford a passage for fire at ceiling and floor levels, with non-combustible materials.

- E. Gas vents and non-combustible piping, in walls, passing through three floors or less shall be effectively draft stopped at each floor or ceiling.

- F. Lap 4'-0" minimum at top plate splice, with 8-16d nails at each side of splice U.N.O. Splices in upper and lower plates shall be staggered at least 10 feet.

- All wood posts shall be 4X width of beam (UNO) 4 X 10 and larger beams/headers shall have post caps at ends, where indicated on plan.

- Plywood at shear walls to be continuous at wall and door jamb intersections.

- Provide boundary nailing to end posts at each shear wall.

- Structural members shall not be cut for pipe, ducts, sleeves, etc., unless specifically noted or detailed.

- Provide 3/8" min. particle board (underlayment under vinyl floors).

THERMAL AND MOISTURE PROTECTION

A. INSULATION

- Minimum insulation to be as follows:  
Roof and ceiling - Refer to Exterior walls - Title 24  
Floors wood - Notes  
Sound Attenuation- See notes on Floor Plan

- Cold Walls:  
Portion of building between living space and an unheated garage, storage room and portion of wall above ceiling of an adjacent section of a split-level dwelling to be insulated same as roof, walls, or floor of dwelling.

- It may be necessary to increase the depth of framing members to accommodate thicker insulation materials than that shown on drawings. Verify with Architect.

- Install ceiling insulation as required to allow air circulation at eave vents.

- 5 studs must be constructed, installed, and insulated as per Chapter 6, CMC

- All insulation must meet California Energy Commission quality standards and be certified by the manufacturer

- Provide water heater insulation blanket (R-12 or greater) or combined interior/exterior insulation (R-16 or greater): first 5 feet of pipes closest to tank insulated (R-3 or greater).

- Insulate recirculating hot water piping in unheated spaces.

- Insulation installer shall post in a conspicuous location in the building a certificate signed by the installer and builder stating that the installation conforms with the requirements of Title 24, chapter 2-53 and that the materials installed conform with the requirements of Title 20, Chapter 2, Subchapter 4, Article 3.

- All insulation materials shall have a flame spread rating not to exceed 25 and a smoke density not to exceed 450.

- UNO, leave 1" dead air space between the insulation and roof sheathing for venting.

B. GYPSUM WALLBOARD

- Gypsum board work and materials shall meet all requirements of ANSI No.97-1, for the Application and Finishing of Wallboard. Joint compound system mixed, applied, and finished in compliance with manufacturers printed directions, to be invisible after finished, including all metal corner beads and trim.

- Gypsum wallboard on stud walls: (Nailed Application): Cooler nails at 7" o.c. all studs, plates, and blocking, use sd nails with wallboard and 6d nails with 5/8" wallboard unless otherwise noted on drawings. Avoid breaking face paper.

- Gypsum wallboard on stud walls: (Screwed Application): USC (or equal) Type W screws spaced 16" o.c. max. for walls, 12" o.c. max. for ceilings.

- Use 1/2" gypsum wallboard where stud spacing is 16" o.c. and 5/8" where stud spacing is greater than 16" o.c.

- Use 5/8" type "X" gypsum board on all garage ceilings, walls and beams, and on all framing supporting stairs. Framing shall be at 16"oc max. Provide perimeter blocking between the ceiling joists for solid backing for the attachment of the sheetrock to the ceiling.

- Use "Durorock" or equal backing board where tile is to be applied to walls UNO. All tub/shower walls shall have a smooth, hard, nonabsorbent surface over a moisture resistant underlayment to a height of 72 inches above the drain inlet (min). CBC R 307.2 (min).

C. LATH AND PLASTER

- Stucco lath shall be key mesh bond lath self furred paper backed lath stapled to all studs, top and bottom plates, and blocking with 16 gauge staples 6" o.c.

- All horizontal or sloping surfaces to receive exterior finishes shall have one layer of (min) 30# felt underlayment.

- Plaster soffits to be over expanded metal lath.

- Exterior cement plaster shall consist of three coats over paper backed metal lath.

- Provide exterior plaster weep screed at grade beam/sill plate line.

D. TILE

- Provide materials obtained from only one source for each type of tile and color to minimize variations in appearance and quality.

- All tile installed over wood studs or solid wood backing: Studs shall be protected from moisture by 15# felt or 4 mil. polyethylene film. Metal lath shall be nailed at 4" o.c. vertical and 16" o.c. horizontal. Tile to be installed over 3 part mortar bed: scratch coat, floating coat, and bond coat. All work shall be done in accordance with the Ceramic Tile Institute's most current handbook and A.N.S.I. A108.1.

- Grout joints for marble and granite tile shall be held as tight as possible and shall be uniform in width.

- Grout joints for ceramic tile shall be as per manufacturer's recommendations and shall be uniform in width.

- Where tile meets another flooring material (i.e., carpet, wood), concealed stripping as required shall be used to form the tightest possible joining. Door thresholds shall be correctly located and centered under the closed door line. Exposed screws or nails are not acceptable.

E. CAULKING AND SEALANTS

- Apply in strict accordance with manufacturer's printed instructions.

- Seal all joints around openings to provide a watertight and airtight seal. Clean joints thoroughly. Areas adjacent to joints shall be masked if necessary to obtain a neat sealant line, free of stains on adjacent surfaces. Joints shall be filled with back-up material as required by manufacturer.

- All locations indicated on drawings and wherever air, water, or dust may infiltrate between construction members and as directed by builder shall be caulked. Set exterior edges or all exterior thresholds in sealant to provide weather tight seal.

- Caulk and/or seal all exposed exterior and interior joints above and below grade and all those exterior and interior joints and appendages concealed by other building materials, flashing, etc.. Caulking and/or sealant material at exposed areas shall be in color as near as possible to match abutting natural or painted finishes.

- Caulking and sealant compounds indicated on drawings and corresponding to the following list shall be Standard Dry Wall products, Inc., or as otherwise approved and complying with the applicable Federal Specifications: Neoprene Sealing Tapes and Strips shall be as manufactured by Dupont, Elastomer Chemicals Department.

GLAZING

- Glass in doors or within 18" of floor, within 24" of door, and immediately adjacent to tubs & showers to be fully tempered float glass. Leave labels attached until final inspection.

- All skylights within building to be double-glazed. All glass in skylights shall be fully tempered, safety glass, or wire glass. Approved plastics may be used. Skylights to comply with Chapter 24 of the California Building Code.

- All egress or rescue windows from sleeping rooms shall have a minimum net clear opening of 5.7 square feet. Minimum net opening height shall be 24", minimum net width 20" with finished sill height not more than 44" above the floor.

SHEET METAL

- Provide galvanized sheet metal (G.S.M.) side wall flashing at full perimeter of chimneys. G.S.M. saddle at high side.

- Provide G.S.M. sheet metal flashing at any roof valley: edge of flashing shall be minimum 7" from center of valley.

- Provide G.S.M. flashing for all vents or pipes penetrating roofs or roof decks.

- Provide G.S.M. flashing at all roof-to-wall intersections.

- Provide G.S.M. gutters continuous at full perimeter of roof. Provide exposed G.S.M. downspouts as noted on roof plan and building elevations. See gutter details for profile.

- Provide all additional G.S.M. flashing as shown on construction documents or as may be otherwise required.

- All flashing is to be 26 gauge galvanized sheet steel unless noted otherwise: meeting requirements of ASTM A525, mill prepared to receive paint finish, fabricated and installed in accordance with latest edition SMACNA requirements.

MECHANICAL AND PLUMBING

- The plumbing and HVAC mechanical systems shall be designed by the Mechanical Subcontractor or his representative based upon energy calculations provided. The Mechanical Subcontractor shall size and specify equipment, provide duct layout and sizing.

- Water meter, water line pipe and gas line pipe sizing calculations along with one line isometric drawings may be required to be provided if the building inspector requests these items.

- Plumbing drain waste and vent and/or mechanical ducting along with electrical panel/wiring sizing calculations may be required to be provided by contractor if the field inspector requests these items. See deferred submittals

- Installation instructions for all listed equipment shall be provided to the field inspector, time of inspection.

- The Mechanical Subcontractor shall verify location of all registers and return air grills with Architect prior to commencing the work.

- Setback thermostats are to be used on all heating systems.

- Gas-fired space heating equipment to have intermittent ignition devices.

- Attic Furnace Shall Be Set On Vibration Isolation Mounts. Provide a level working platform not less than 30" in depth in front of firebox side. If the furnace temperature-limit control, air filter, fuel-control valve, vent collar or air-handling unit is not serviceable from firebox side of furnace, a continuous floor not less than 24" in width shall be provided from platform in front of the firebox side of the furnace to in front of this equipment.

- All air ducts penetrating separation wall or ceiling between garage and living area shall be 26 gauge minimum w/ R-6 insulation

- All fixed appliances are to be securely fastened into place per UMC Section 304-4.

- Sinks and water closets to have flexible pipe to water supply. Water closets shall have maximum 1.28 gpf + WaterSense. Lavatory, and sink faucets shall have a maximum flow rate of 1.2 gpm @ 60psi; minimum 0.8 gpm @ 20psi. Kitchen faucets shall have a flow rate of 1.8 gpm @ 60psi. May temporarily increase to 2.2gpm @60psi, but must default to 1.8 gpm. Shower heads shall have a maximum flow rate of 2.0 gpm @80psi +WaterSense per California Energy Commission.

- All shower doors and sliding glass tub doors shall be 3/16" minimum fully tempered clear glass. Glass enclosure doors and panels must be labeled Category II. Swing door outward. Net area of shower receptor shall be not less than 7.1 square feet of floor area and encompass a 30" diameter circle.

- Under floor Clean-outs shall be within 20 feet of the crawl space access, per Sect 707.1 All Clean-outs shall be water tight and air tight per Sect. 707.3

- Pressure test is required for all gas lines prior to final inspection. (Minimum 1-1/2 times proposed maximum working pressure for half an hour. Maximum range for the pressure gage shall not exceed five times the test pressure per Sect. 1214-3.1

- Provide 15" min. between the center of plumbing fixtures such as water closets and sinks and the nearest wall or object, per Sect. 407.6

- Provide approved Excess Gas Shut-Off Valve (motion sensitive to be triggered when the gas flow exceeds the design flow limit) at each connection of a gas appliance to a gas line per C.C.Co. Ordinance 2004-27.

- Provide approved Excess Gas Shut-Off Device (non-motion sensitive such as earthquake and to be triggered after 300,000 BTU flow) at the downstream meter per C.C.Co. Ordinance 2000-11.

- Provide water supply at each refrigerator .

- Drain pipes from upper level to be cast iron and wrapped in insulation for sound dampening. All plumbing shall be separated from structure with plumbing pipe isolators.

- At water heater provide temperature and pressure relief valve with drain to exterior 6" to 24" to grade with pipe end pointed down.

- Provide washer & dryer space with recessed water supply, fuel gas connection. 4" dia., 14 foot max. smooth metal dryer vent to outside air.

- Termination of all environmental air ducts shall be a minimum of three feet from property lines or any openings into the building.

- Provide min. 60 sq in. of screened louvered monoxide vents per car 12" from floor

- Attic furnace shall be set on vibration isolation mounts on 3/4" plywood platform with 30" min space of platform w/ a minimum 24" wide access walk within 20 ft. of access portal of at least 30" x 30" at unit for service.

- All gas fired mechanical appliances shall be provided with seismic anchorage. Vent cooktop to outside air; provide fuel gas and electrical components as required.

- Verify locations of FAU and exterior condenser units.

- Prefabricated metal fireplace unit, U. Listed or ICGO unit to have tight fitting glass doors and outside air supply. Install per CBC chapter with manufacturers flue and cap. provide spark arrestors for fireplace chimney. Verify surround and mantel materials and layout with owner.

- Provide underfloor access with insulated door 18" x 24".

- Flush and raised hearths shall be minimum 20" deep and 12" beyond each side of fireplace opening. Verify finish material with owner.

- Tubs and showers shall have tempered glass enclosures and door U.N.O

- All shower heads shall have 1.8 gpm maximum rate; lavatory faucets 1.2 gpm maximum rate and kitchen sink faucets shall have 1.8 gpm maximum rate. Toilets shall be 1.28 gallons per flush.

ELECTRICAL

A. GENERAL

- Electrical Plan is a suggested layout. Consult with Owner for specialty electrical features such as central vacuum system, intercom, security system, cable televisions outlets, phone outlets, special lighting, etc., prior to construction.

- The Electrical Contractor is responsible to perform all electrical wiring and installations to meet all applicable state and local code requirements, industry standards, and utility company requirements.

- Electrical contractor is responsible to supply lateral service to building and to provide power to all mechanical systems and appliances as required per manufacturer's specifications.

- For services exceeding 200 amps, submit a SCI letter from PG&E indicating the short-circuit current available at the service supply terminals (NEC 230--65). Provide at least 36" x 30" work space from finish grade to 6'-6" above finish grade.

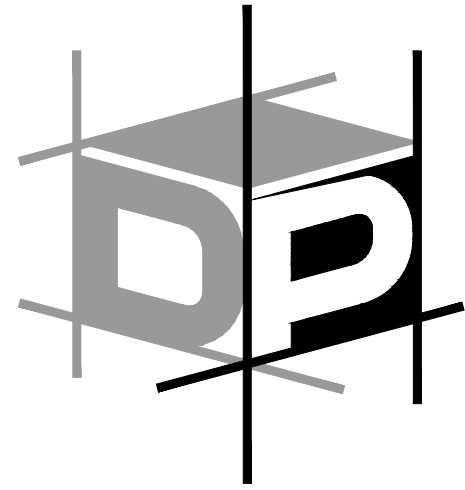
- Electrical system shall have a concrete enclosed electrode (UFER) electrical ground per (NEC 250-81).

- Over and under gas and electric meters are not allowed.







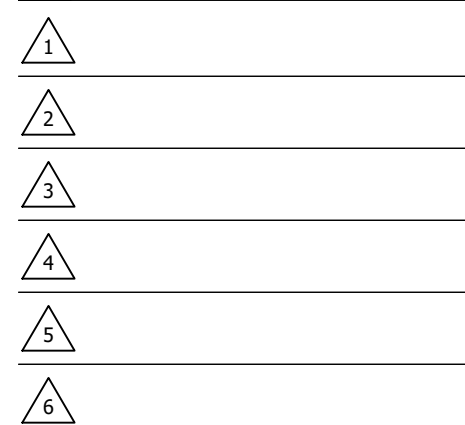


## ADVANCED ENGINEERING

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 MARGINS, 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 SYSTEM 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



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

### ENERGY CALCULATIONS

#### PERFORMANCE CERTIFICATE RESIDENTIAL CF-1R

Initial Issue Date: March 27, 2023

Energy Analyst: J. Bennett Ext. 26

Project Manager: J. Peek Ext. 23

Job No. G010120

Sheet No.

# EC

**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**  
Project Name: Danville ADU\_Below Grade  
Calculation Description: Title 24 Analysis

Calculation Date/Time: 2023-03-23T16:09:19-07:00  
Input File Name: Danville ADU\_BelowGrade.rbd22x

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| GENERAL INFORMATION |                                        |
|---------------------|----------------------------------------|
| 01                  | Project Name: Danville ADU_Below Grade |
| 02                  | Run Title: Title 24 Analysis           |
| 03                  | Project Location: N/A                  |
| 04                  | City: Danville                         |
| 05                  | Zip code: 94526                        |
| 06                  | Software Version: EnergyPro 9.1        |
| 07                  | Climate Zone: 12                       |
| 08                  | Building Type: Single family           |
| 09                  | Number of Dwelling Units: 1            |
| 10                  | Building Type: Newly Constructed       |
| 11                  | Number of Bedrooms: 2                  |
| 12                  | Number of Bathrooms: 1                 |
| 13                  | Existing Cond. Floor Area (ft²): N/A   |
| 14                  | Penetration Average U-factor: 0.3      |
| 15                  | Glazing Percentage (%) 16.40%          |
| 16                  | Total Cond. Floor Area (ft²): 1500     |
| 17                  | ADU Bedrooms Count: N/A                |

**COMPLIANCE RESULTS**

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

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CA Building Energy Efficiency Standards - 2022 Residential Compliance

Registration Date/Time: 2023-03-27 17:53:21  
Report Version: 2022.0.000  
Schema Version: rev 20230901

HERS Provider: CaCERTS, Inc.  
Report Generated: 2023-03-23 16:10:00

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| ENERGY USE INTENSITY | Standard Design (kBtu/ft²·yr) | Proposed Design (kBtu/ft²·yr) | Compliance Margin (kBtu/ft²·yr) | Margin Percentage |
|----------------------|-------------------------------|-------------------------------|---------------------------------|-------------------|
| North Facing         |                               |                               |                                 |                   |
| Gross EU¹            | 23.02                         | 21.46                         | 1.56                            | 6.78              |
| Net EU²              | 11.8                          | 11.9                          | -0.1                            | -0.85             |
| East Facing          |                               |                               |                                 |                   |
| Gross EU¹            | 23.02                         | 21.46                         | 1.56                            | 6.69              |
| Net EU²              | 11.8                          | 11.92                         | -0.12                           | -1.02             |
| South Facing         |                               |                               |                                 |                   |
| Gross EU¹            | 23.02                         | 21.3                          | 1.72                            | 7.47              |
| Net EU²              | 11.8                          | 11.74                         | 0.06                            | 0.51              |
| West Facing          |                               |                               |                                 |                   |
| Gross EU¹            | 23.02                         | 21.46                         | 1.56                            | 6.78              |
| Net EU²              | 11.8                          | 11.9                          | -0.1                            | -0.85             |

Notes:  
1. Gross EU is Energy Use Total (not including PV) / Total Building Area.  
2. Net EU is Energy Use Total (including PV) / Total Building Area.

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| OPAQUE DOORS |                  |            |          |
|--------------|------------------|------------|----------|
| 01           | 02               | 03         | 04       |
| Name         | Side of Building | Area (ft²) | U-factor |
| Entry Door 2 | Front Wall       | 20         | 0.2      |

| OVERHANDS AND FINIS |       |         |             |              |          |       |        |        |        |       |        |        |         |         |
|---------------------|-------|---------|-------------|--------------|----------|-------|--------|--------|--------|-------|--------|--------|---------|---------|
| 01                  | 02    | 03      | 04          | 05           | 06       | 07    | 08     | 09     | 10     | 11    | 12     | 13     | 14      |         |
| Window              | Depth | Dist Up | Left Extent | Right Extent | Flap Ht. | Depth | Top Up | Dist L | Dist R | Depth | Top Up | Dist R | Dist Up | Dist Up |
|                     |       |         |             |              |          |       |        |        |        |       |        |        |         |         |
| Bed2 5046           | 2     | 0.1     | 2           | 2            | 0        | 0     | 0      | 0      | 0      | 0     | 0      | 0      | 0       | 0       |
| Grafton L 5046      | 9.5   | 0.1     | 2           | 2            | 0        | 0     | 0      | 0      | 0      | 0     | 0      | 0      | 0       | 0       |
| Entry Door          | 9.5   | 0.1     | 2           | 2            | 0        | 0     | 0      | 0      | 0      | 0     | 0      | 0      | 0       | 0       |
| Grafton R 5046      | 2     | 0.1     | 2           | 2            | 0        | 0     | 0      | 0      | 0      | 0     | 0      | 0      | 0       | 0       |
| Bed1 2040           | 0.75  | 0.1     | 2           | 2            | 0        | 0     | 0      | 0      | 0      | 0     | 0      | 0      | 0       | 0       |
| Bath1 4020          | 0.75  | 0.1     | 2           | 2            | 0        | 0     | 0      | 0      | 0      | 0     | 0      | 0      | 0       | 0       |
| Bath2 5020          | 0.75  | 0.1     | 2           | 2            | 0        | 0     | 0      | 0      | 0      | 0     | 0      | 0      | 0       | 0       |

| SLAB FLOORS   |                    |            |                |                               |                               |                   |        |
|---------------|--------------------|------------|----------------|-------------------------------|-------------------------------|-------------------|--------|
| 01            | 02                 | 03         | 04             | 05                            | 06                            | 07                | 08     |
| Name          | Zone               | Area (ft²) | Perimeter (ft) | Edge Insul. R-value and Depth | Edge Insul. R-value and Depth | Carpeted Fraction | Heated |
| Slab-on-Grade | Accessory Dwelling | 1000       | 128.33         | none                          | 0                             | 100%              | No     |

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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 |
| Air Distribution System 1-hrs-dia     | 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 (W/CFM) | Name               |
| HVAC Fan 1         | HVAC Fan | 0.45              | HVAC Fan 3-hrs-fan |

| HVAC FAN SYSTEMS - HERS VERIFICATION |                                 |                                     |
|--------------------------------------|---------------------------------|-------------------------------------|
| 01                                   | 02                              | 03                                  |
| Name                                 | Verified Fan Watt Draw Required | Required Fan Efficiency (Watts/CFM) |
| HVAC Fan 3-hrs-fan                   | Required                        | 0.45                                |

| INDOOR AIR QUALITY (IAQ) FANS |               |                        |              |                                  |                                  |                                   |                   |        |
|-------------------------------|---------------|------------------------|--------------|----------------------------------|----------------------------------|-----------------------------------|-------------------|--------|
| 01                            | 02            | 03                     | 04           | 05                               | 06                               | 07                                | 08                | 09     |
| Dwelling Unit                 | Airflow (CFM) | Fan Efficiency (W/CFM) | IAQ Fan Type | Includes Inlet/Exhaust Recovery? | IAQ Recovery Effectiveness - SRE | Includes Fault Indicator Display? | HERS Verification | Status |
| 5Fm IAQVentor 1-1             | 53            | 0.54717                | Balanced     | Yes                              | 83                               | No                                | Yes               |        |

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| ENERGY DESIGN RATINGS |                                  |                       |                      |                                  |                       |
|-----------------------|----------------------------------|-----------------------|----------------------|----------------------------------|-----------------------|
| Energy Design Ratings |                                  | Compliance Margins    |                      |                                  |                       |
| Source Energy (EDEL)  | Efficiency EDR (EDR2/Efficiency) | Total EDR (EDR2total) | Source Energy (EDR1) | Efficiency EDR (EDR2/Efficiency) | Total EDR (EDR2total) |
| Standard Design       | 89                               | 47.5                  | 95.8                 |                                  |                       |
| Proposed Design       |                                  |                       |                      |                                  |                       |
| North Facing          | 38.4                             | 39.8                  | 34.2                 | 0.6                              | 7.7                   |
| East Facing           | 38.4                             | 39.4                  | 33.9                 | 0.6                              | 8.1                   |
| South Facing          | 38.1                             | 38.2                  | 33.3                 | 0.9                              | 9.3                   |
| West Facing           | 38.4                             | 40.4                  | 34.6                 | 0.6                              | 7.1                   |

**RESULT: PASS**

Efficiency EDR includes improvements like a better building envelope and more efficient equipment.  
Total EDR includes efficiency and demand response modules such as a programmable thermostat and demand response.  
Building margins where source energy and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded.

- Standard Design PV Capacity: 2.0 MW
- Proposed PV Capacity Scaling: North (2.0 kW/kW) East (2.0 kW/kW) South (2.0 kW/kW) West (2.0 kW/kW)

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**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  | Aimuth (deg) | Tilt Input | Array Angle (deg) | Tilt (x in 12) | Inverter Eff. (%) | Annual Solar Access (%) |
| 2.1                   | NA        | Standard (14-17%) | Fixed      | none              | true | 105-300      | N/A        | N/A               | <17.12         | 96                | 95                      |

**REQUIRED SPECIAL FEATURES**

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

- Indoor air quality, balanced fan
- IAQ Ventilation System as low as 0.54717 W/CFM
- IAQ Ventilation System Heat Recovery minimum 80 SRE and 83 ASH
- IAQ Ventilation System supply outside air HE, filter, and n/ERV cores accessible per RACH Reference Manual
- IAQ Ventilation System: back indicator display
- Insulation below roof deck
- Window overhang and/or fins

**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.

- Quality insulation installation (QI)
- Indoor air quality ventilation
- Kitchen range hood
- Minimum Airflow
- Verified EER/SEER
- Verified SEER/SEER2
- Verified Refrigerant Charge
- Fan Efficiency W/CFM
- Verified n/ERV
- Verified heat pump rated heating capacity
- Duct leakage testing

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| OPAQUE SURFACE CONSTRUCTIONS  |                        |                        |                     |                      |                                        |          |                                                                                                                                                                   |
|-------------------------------|------------------------|------------------------|---------------------|----------------------|----------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01                            | 02                     | 03                     | 04                  | 05                   | 06                                     | 07       | 08                                                                                                                                                                |
| Construction Name             | Surface Type           | Construction Type      | Framing             | Total Cavity R-value | Interior / Exterior Continuous R-value | U-factor | Assembly Layers                                                                                                                                                   |
| Exterior 2x6 Wall             | Exterior Walls         | Wood Framed Wall       | 2x6 @ 16 in. O. C.  | R-21                 | None / None                            | 0.066    | Inside Finish: Gypsum Board<br>Cavity / Frame: R-21 / 2x6<br>Exterior Finish: Wood Siding/shedding/locking<br>Siding/shedding/locking                             |
| Rafter Roof                   | Cathedral Ceilings     | Wood Framed Ceiling    | 2x10 @ 24 in. O. C. | R-30                 | None / None                            | 0.034    | Roofing: 30 PSF (Roof/Deck/Gap)<br>Tie Gap: present<br>Roof Deck: Wood Siding/shedding/locking<br>Cavity / Frame: R-30 / 2x10<br>Inside Finish: Gypsum Board      |
| Attic Roof/Accessory Dwelling | Attic Roofs            | Wood Framed Ceiling    | 2x4 @ 24 in. O. C.  | R-30                 | None / None                            | 0.04     | Roofing: 30 PSF (Roof/Deck/Gap)<br>Tie Gap: present<br>Roof Deck: Wood Siding/shedding/locking<br>Cavity / Frame: R-30 / 2x4<br>Around Roof Joists: R-17.8 Insul. |
| Unvented Roof Attic           | Ceilings (below attic) | Wood Framed Ceiling    | 2x4 @ 24 in. O. C.  | R-0                  | None / None                            | 0.481    | Cavity / Frame: no insul. / 2x4<br>Inside Finish: Gypsum Board                                                                                                    |
| Concrete Wall + 2x4           | Underground Walls      | Concrete / CIP / Block | None                | N/A                  | 15 / None                              | 0.073    | Inside Finish: Gypsum Board<br>Insulation/Purring: R-15 / 3 in. wt. Mass Layer: 10 in. Concrete                                                                   |

**BUILDING ENVELOPE - HERS VERIFICATION**

| 01                                   | 02                                 | 03                            | 04    | 05    |
|--------------------------------------|------------------------------------|-------------------------------|-------|-------|
| Quality Insulation Installation (QI) | High R-value Space Foam Insulation | Building Envelope Air Leakage | CFM50 | CFM50 |
| Required                             | Not Required                       | N/A                           | n/a   | n/a   |

Registration Number: 223-P010038080A-000-000-0000000-0000  
CA Building Energy Efficiency Standards - 2022 Residential Compliance

Registration Date/Time: 2023-03-27 17:53:21  
Report Version: 2022.0.000  
Schema Version: rev 20230901

HERS Provider: CaCERTS, Inc.  
Report Generated: 2023-03-23 16:10:00

**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**  
Project Name: Danville ADU\_Below Grade  
Calculation Description: Title 24 Analysis

Calculation Date/Time: 2023-03-23T16:09:19-07:00  
Input File Name: Danville ADU\_BelowGrade.rbd22x

CF1R-PRF-01E  
(Page 14 of 14)

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

I, certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Jason E Bennett

Signature Date: 2023-03-27 17:21:06

224 HERS certification identification (if applicable): R19-21-30042

Phone: 925-516-3502

**RESPONSIBLE PERSON'S DECLARATION STATEMENT**

I hereby declare under penalty of perjury under the laws of the State of California:

- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
- I certify that the energy ratings and performance identifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
- The building design features and 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 for the enforcement of the building energy code.

Responsible Designer Name: Francis Garcia

Responsible Designer Signature: Francis Garcia

Signature Date: 2023-03-27 17:53:21

Address: 14 Norwood Ave

City/Location: Kensington, CA 94707

Phone: 925-984-9983

Digitally signed by CaCERTS. 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.



**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**  
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CF1R-PRF-01E  
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| ENERGY USE SUMMARY                       |                                                    |                                                |                                                    |                                                |                          |                          |
|------------------------------------------|----------------------------------------------------|------------------------------------------------|----------------------------------------------------|------------------------------------------------|--------------------------|--------------------------|
| Energy Use                               | Standard Design Source Energy (EDR1) (kBtu/ft²·yr) | Standard Design TDV Energy (EDR2) (kWh/ft²·yr) | Proposed Design Source Energy (EDR1) (kBtu/ft²·yr) | Proposed Design TDV Energy (EDR2) (kWh/ft²·yr) | Compliance Margin (EDR1) | Compliance Margin (EDR2) |
| Space Heating                            | 6.86                                               | 30.12                                          | 3.95                                               | 15                                             | 4.91                     | 15.12                    |
| Space Cooling                            | 0.65                                               | 21.45                                          | 0.64                                               | 21.1                                           | 0.01                     | 0.35                     |
| IAQ Ventilation                          | 0.82                                               | 8.78                                           | 0.64                                               | 6.86                                           | 0.18                     | 1.92                     |
| Water Heating                            | 2.66                                               | 27.12                                          | 7.21                                               | 30.34                                          | -4.55                    | -3.22                    |
| Self Utilization/Feasibility Credit      |                                                    |                                                | 0                                                  |                                                |                          | 0                        |
| North Facing Efficiency Compliance Total | 10.99                                              | 87.47                                          | 10.44                                              | 73.3                                           | 0.55                     | 14.17                    |
| Space Heating                            | 6.86                                               | 30.12                                          | 3.95                                               | 14.83                                          | 4.91                     | 15.29                    |
| Space Cooling                            | 0.65                                               | 21.45                                          | 0.64                                               | 20.54                                          | 0.01                     | 0.91                     |
| IAQ Ventilation                          | 0.82                                               | 8.78                                           | 0.64                                               | 6.86                                           | 0.18                     | 1.92                     |
| Water Heating                            | 2.66                                               | 27.12                                          | 7.21                                               | 30.34                                          | -4.55                    | -3.22                    |
| Self Utilization/Feasibility Credit      |                                                    |                                                | 0                                                  |                                                |                          | 0                        |
| East Facing Efficiency Compliance Total  | 10.99                                              | 87.47                                          | 10.44                                              | 72.57                                          | 0.55                     | 14.9                     |

Registration Number: 223-P010038080A-000-000-0000000-0000  
CA Building Energy Efficiency Standards - 2022 Residential Compliance

Registration Date/Time: 2023-03-27 17:53:21  
Report Version: 2022.0.000  
Schema Version: rev 20230901

HERS Provider: CaCERTS, Inc.  
Report Generated: 2023-03-23 16:10:00

**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**  
Project Name: Danville ADU\_Below Grade  
Calculation Description: Title 24 Analysis

Calculation Date/Time: 2023-03-23T16:09:19-07:00  
Input File Name: Danville ADU\_BelowGrade.rbd22x

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**BUILDING - FEATURES INFORMATION**

| 01                       | 02                           | 03                       | 04                 | 05              | 06                                    | 07                              |
|--------------------------|------------------------------|--------------------------|--------------------|-----------------|---------------------------------------|---------------------------------|
| Project Name             | Conditioned Floor Area (ft²) | Number of Dwelling Units | Number of Bedrooms | Number of Zones | Number of Ventilation Cooling Systems | Number of Water Heating Systems |
| Danville ADU_Below Grade | 1000                         | 1                        | 2                  | 1               | 0                                     | 1                               |

**ZONE INFORMATION**

| 01                 | 02          | 03               | 04                    | 05                  | 06                     | 07     |
|--------------------|-------------|------------------|-----------------------|---------------------|------------------------|--------|
| Zone Name          | Zone Type   | HVAC System Name | Zone Floor Area (ft²) | Avg. Ceiling Height | Water Heating System 1 | Status |
| Accessory Dwelling | Conditioned | HVAC System1     | 1000                  | 8                   | DHW Sys 1              | New    |

**OPAQUE SURFACES**

| 01             | 02                 | 03                   | 04     | 05          | 06               | 07                         | 08         |
|----------------|--------------------|----------------------|--------|-------------|------------------|----------------------------|------------|
| Name           | Zone               | Construction         | Aimuth | Orientation | Gross Area (ft²) | Window and Door Area (ft²) | Tilt (deg) |
| Front Wall     | Accessory Dwelling | Exterior 2x6 Wall    | 0      | Front       | 225              | 107.33                     | 90         |
| Left Wall      | Accessory Dwelling | Exterior 2x6 Wall    | 30     | Left        | 160              | 10                         | 90         |
| Back Wall      | Accessory Dwelling | Exterior 2x6 Wall    | 180    | Back        | 225              | 26                         | 90         |
| Right Wall     | Accessory Dwelling | Exterior 2x6 Wall    | 270    | Right       | 160              | 36.5                       | 90         |
| Attic Roof     | Accessory Dwelling | Unvented Roof Attic  | N/A    | N/A         | 602              | N/A                        | N/A        |
| Retaining Wall | Accessory Dwelling | Cathedral Wall + 2x4 | N/A    | N/A         | 256.6            | N/A                        | N/A        |

**OPAQUE SURFACES - CATHEDRAL CEILING**

| 01                   | 02                 | 03           | 04     | 05          | 06         | 07                  | 08                  | 09               | 10             | 11        |
|----------------------|--------------------|--------------|--------|-------------|------------|---------------------|---------------------|------------------|----------------|-----------|
| Name                 | Zone               | Construction | Aimuth | Orientation | Area (ft²) | Skylight Area (ft²) | Roof Rise (x in 12) | Roof Reflectance | Roof Emittance | Cool Roof |
| Vaulted Roof - Front | Accessory Dwelling | Rafter Roof  | 0      | Front       | 256        | 4                   | 5                   | 0.1              | 0.85           | No        |
| Vaulted Roof - Back  | Accessory Dwelling | Rafter Roof  | 180    | Back        | 77         | 0                   | 5                   | 0.1              | 0.85           | No        |





### 2022 Single-Family Residential Mandatory Requirements Summary

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

#### Building Envelope:

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 110.8(a)1: | <b>Air Leakage.</b> Manufactured fenestration, exterior doors, and exterior pet doors must limit air leakage to 0.3 CFM per square foot or less when tested per NFRC-400, ASTM E283, or AAMA/WDMA/CSA 1011 S.2/A440-2011. *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| § 110.8(a)5: | <b>Labeling.</b> Fenestration products and exterior doors must have a label meeting the requirements of § 10-111(a).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| § 110.8(b):  | <b>Field-fabricated exterior doors and fenestration products</b> must use U-factors and solar heat gain coefficient (SHGC) values from Tables 110.8.4, 110.8.6-B, or J44.5 for exterior doors. They must be caulked and/or weather-stripped.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| § 110.7:     | <b>Air Leakage.</b> All joints, penetrations, and other openings in the building envelope that are potential sources of air leakage must be caulked, gasketed, or weather stripped.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| § 110.8(a):  | <b>Insulation Certification by Manufacturers.</b> Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| § 110.8(g):  | <b>Insulation Requirements for Heated Slab Floors.</b> Heated slab floors must be insulated per the requirements of § 110.8(g).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| § 110.8(f):  | <b>Roofing Products Solar Reflectance and Thermal Emittance.</b> The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(f) and be labeled per §10-113 when the installation of a cool roof is specified on the CFR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| § 110.8(j):  | <b>Radiant Barrier.</b> When required, radiant barriers must have an emittance of 0.05 or less and be certified to the Department of Consumer Affairs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| § 150.0(a):  | <b>Roof Deck, Ceiling and Rafter Roof Insulation.</b> Roof decks in newly constructed attics in climate zones 4 and 8-16 area-weighted average U-factor not exceeding U-0.184. Ceiling and rafter roofs minimum R-22 insulation in wood-frame ceiling; or area-weighted average U-factor must not exceed 0.043. Rafter roof alterations minimum R-19 or area-weighted average U-factor of 0.054 or less. All attic access doors must have permanently attached insulation using adhesive or mechanical fasteners. The attic access must be gasketed to prevent air leakage. Insulation must be installed in direct contact with a roof or ceiling which is sealed to limit infiltration and exfiltration, as specified in § 110.7, including but not limited to placing insulation either above or below the roof deck or on top of a drywall ceiling. * |
| § 150.0(b):  | <b>Loose-fill Insulation.</b> Loose fill insulation must meet the manufacturer's required density for the labeled R-value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| § 150.0(c):  | <b>Wall Insulation.</b> Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less, or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. Opaque non-framed assemblies must have an overall assembly U-factor not exceeding 0.102. Masonry walls must meet Tables 150.1-A or B. *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| § 150.0(d):  | <b>Raised-floor Insulation.</b> Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor. *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| § 150.0(f):  | <b>Slab Edge Insulation.</b> Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone without facings, no greater than 0.3 percent; have a water vapor permeance no greater than 2.0 perm per inch; be protected from physical damage and UV light deterioration; and, when installed as part of a heated slab floor, meet the requirements of § 110.8(g).                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| § 150.0(g)1: | <b>Vapor Retarder.</b> In climate zones 1 through 16, the earth floor of unvented crawl space must be covered with a Class I or Class II vapor retarder. This requirement also applies to controlled ventilation crawl space buildings complying with the exception to § 150.0(d).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| § 150.0(g)2: | <b>Vapor Retarder.</b> In climate zones 14 and 16, a Class I or Class II vapor retarder must be installed on the conditioned space side of all insulation in all exterior walls, vented attics, and unvented attics with air-permeable insulation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| § 150.0(h):  | <b>Fenestration Products.</b> Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.45; or area-weighted average U-factor of all fenestration must not exceed 0.45.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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

|              |                                                                                                                                                                                                                                                                        |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 110.5(e)   | <b>Pilot Light.</b> Continuously burning pilot lights are not allowed for indoor and outdoor fireplaces.                                                                                                                                                               |
| § 150.0(e)1: | <b>Closable Doors.</b> Masonry or factory-built fireplaces must have a closable metal or glass door covering the entire opening of the firebox.                                                                                                                        |
| § 150.0(e)2: | <b>Combustion Intake.</b> Masonry or factory-built fireplaces must have a combustion outside air intake, which is at least six square inches in area and is equipped with a readily accessible, operable, and a tight-fitting damper or combustion-air control device. |
| § 150.0(e)3: | <b>Flue Damper.</b> Masonry or factory-built fireplaces must have a flue damper with a readily accessible control. *                                                                                                                                                   |

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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 110.0-§ 110.3: | <b>Certification.</b> Heating, ventilation, and air conditioning (HVAC) equipment, water heaters, showerheads, faucets, and all other regulated appliances must be certified by the manufacturer to the California Energy Commission.                                                                                                                                                                                                                                                                               |
| § 110.2(a):      | <b>HVAC Efficiency.</b> Equipment must meet the applicable efficiency requirements in Table 110.2-A through Table 110.2-N. *                                                                                                                                                                                                                                                                                                                                                                                        |
| § 110.2(b):      | <b>Controls for Heat Pumps with Supplementary Electric Resistance Heaters.</b> Heat pumps with supplementary electric resistance heaters must have controls that prevent supplementary heater operation when the heating load can be met by the heat pump alone; and in which the cut-on temperature for compression heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating. |
| § 110.2(c):      | <b>Thermostats.</b> All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a setback thermostat. *                                                                                                                                                                                                                                                                                                                                                            |
| § 110.3(c)3:     | <b>Insulation.</b> Unfired service water heater storage tanks and solar water-heating backup tanks must have adequate insulation, or tank surface heat loss rating.                                                                                                                                                                                                                                                                                                                                                 |
| § 110.3(c)6:     | <b>Isolation Valves.</b> Instantaneous water heaters with an input rating greater than 6.8 kBTU per hour (2 kW) must have isolation valves with hose bibbs or other fittings on both cold and hot water lines to allow for flushing the water heater when the valves are closed.                                                                                                                                                                                                                                    |

5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 150.0(k)1G: | <b>Screw based luminaires.</b> Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8. *                                                                                                                                                                                                                                                                                                                                                                           |
| § 150.0(k)1H: | <b>Light Sources in Enclosed or Recessed Luminaires.</b> Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.                                                                                                                                                                                                                                   |
| § 150.0(k)1I: | <b>Light Sources in Drawers, Cabinets, and Linen Closets.</b> Light sources internal to drawers, cabinetry or linen closets are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided that they are rated to consume no more than 5 watts of power, emit no more than 150 lumens, and are equipped with controls that automatically turn the lighting off when the drawer, cabinet or linen closet is closed.                                                      |
| § 150.0(k)2A: | <b>Interior Switches and Controls.</b> All forward phase cut dimmers used with LED light sources must comply with NEMA SSL 7A.                                                                                                                                                                                                                                                                                                                                                                      |
| § 150.0(k)2B: | <b>Interior Switches and Controls.</b> Exhaust fans must be controlled separately from lighting systems. *                                                                                                                                                                                                                                                                                                                                                                                          |
| § 150.0(k)2A: | <b>Accessible Controls.</b> Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned on and off. *                                                                                                                                                                                                                                                                                                                                                 |
| § 150.0(k)2B: | <b>Multiple Controls.</b> Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the dimmer or sensor is installed to comply with § 150.0(k).                                                                                                                                                                                                                                                                                                                            |
| § 150.0(k)2C: | <b>Mandatory Requirements.</b> Lighting controls must comply with the applicable requirements of § 110.9.                                                                                                                                                                                                                                                                                                                                                                                           |
| § 150.0(k)2D: | <b>Energy Management Control Systems.</b> An energy management control system (EMCS) may be used to comply with dimming, occupancy, and control requirements if it provides the functionality of the specified control per § 110.9 and the physical controls specified in § 150.0(k)2A.                                                                                                                                                                                                             |
| § 150.0(k)2E: | <b>Automatic Shutoff Controls.</b> In bathrooms, garages, laundry rooms, utility rooms and walk-in closets, at least one installed luminaire must be controlled by an occupancy or vacancy sensor providing automatic-off functionality. Lighting inside drawers and cabinets with opaque fronts or doors must have controls that turn the light off when the drawer or door is closed.                                                                                                             |
| § 150.0(k)2F: | <b>Dimmers.</b> Lighting in habitable spaces (e.g., living rooms, dining rooms, kitchens, and bedrooms) must have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down. Forward phase cut dimmers controlling LED light sources in these spaces must comply with NEMA SSL 7A.                                                                                                                                                               |
| § 150.0(k)2K: | <b>Independent controls.</b> Integrated lighting of exhaust fans shall be controlled independently from the fans. Lighting under cabinets or shelves, lighting in display cabinets, and switched outlets must be controlled separately from ceiling-installed lighting.                                                                                                                                                                                                                             |
| § 150.0(k)3A: | <b>Residential Outdoor Lighting.</b> For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or to other buildings on the same lot, must have a manual on/off switch and either a photocell and motion sensor or automatic time switch control; or an astronomical time clock. An energy management control system that provides the specified control functionality and meets all applicable requirements may be used to meet these requirements. |
| § 150.0(k)4:  | <b>Internally illuminated address signs.</b> Internally illuminated address signs must either comply with § 140.8 or consume no more than 5 watts of power.                                                                                                                                                                                                                                                                                                                                         |
| § 150.0(k)5:  | <b>Residential Garages for Eight or More Vehicles.</b> Lighting for residential parking garages for eight or more vehicles must comply with the applicable requirements for nonresidential garages in §§ 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.                                                                                                                                                                                                                                              |

#### Solar Readiness:

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 110.10(a)1:  | <b>Single-family Residences.</b> Single-family residences located in subdivisions with 10 or more single-family residences and where the application for a tentative subdivision map for the residences has been deemed complete and approved by the enforcement agency, which do not have a photovoltaic system installed, must comply with the requirements of § 110.10(b)-(e).                                                                                                                                                                                                                                                                                                                                                                                                              |
| § 110.10(b)1A: | <b>Minimum Solar Zone Area.</b> The solar zone must have a minimum total area as described below. The solar zone must comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other parts of Title 24 or in any requirements adopted by a local jurisdiction. The solar zone total area must be comprised of areas that have no dimension less than 5 feet and are no less than 80 square feet each for buildings with roof areas less than or equal to 10,000 square feet or no less than 160 square feet each for buildings with roof areas greater than 10,000 square feet. For single-family residences, the solar zone must be located on the roof or overhang of the building and have a total area no less than 250 square feet. * |
| § 110.10(b)2:  | <b>Azimuth.</b> All sections of the solar zone located on steep-sloped roofs must have an azimuth between 90-300° of true north.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| § 110.10(b)3A: | <b>Shading.</b> The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| § 110.10(b)3B: | <b>Shading.</b> Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the horizontal distance of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane. *                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| § 110.10(b)4:  | <b>Structural Design Loads on Construction Documents.</b> For areas of the roof designated as a solar zone, the structural design loads for roof dead load and roof live load must be clearly indicated on the construction documents.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| § 110.10(c):   | <b>Interconnection Pathways.</b> The construction documents must indicate a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection with the electrical service; and for single-family residences and central water-heating systems, a pathway reserved for routing plumbing from the solar zone to the water-heating system.                                                                                                                                                                                                                                                                                                                                                                 |
| § 110.10(d):   | <b>Documentation.</b> A copy of the construction documents or a comparable document indicating the information from § 110.10(b)-(c) must be provided to the occupant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| § 110.10(e)1:  | <b>Main Electrical Service Panel.</b> The main electrical service panel must have a minimum busbar rating of 200 amps.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| § 110.10(e)2:  | <b>Main Electrical Service Panel.</b> The main electrical service panel must have a reserved space to allow for the installation of a double pole circuit breaker for a future solar electric installation. The reserved space must be permanently marked as "For Future Solar Electric."                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

#### Electric and Energy Storage Ready:

5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 110.5:      | <b>Pilot Lights.</b> Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces; household cooking appliances (except appliances without an electrical supply voltage connection with pilot lights that consume less than 150 Btu per hour); and pool and spa heaters. *                                                                                                                                                                                                                                                                                 |
| § 150.0(h)1:  | <b>Building Cooling and Heating Loads.</b> Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; the SMACNA Residential Comfort System Installation Standards Manual; or the ACCA Manual J using design conditions specified in § 150.0(h)2.                                                                                                                                                                                                                                                |
| § 150.0(h)3A: | <b>Clearances.</b> Air conditioner and heat pump outdoor condensing units must have a clearance of at least five feet from the outlet of any dryer.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| § 150.0(h)3B: | <b>Liquid Line Drier.</b> Air conditioners and heat pump systems must be equipped with liquid line filter driers if required, as specified by the manufacturer's instructions.                                                                                                                                                                                                                                                                                                                                                                                                            |
| § 150.0(j)1:  | <b>Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation.</b> All domestic hot water piping must be insulated as specified in § 609.11 of the California Plumbing Code. *                                                                                                                                                                                                                                                                                                                                                                        |
| § 150.0(j)2:  | <b>Insulation Protection.</b> Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by § 120.3(b). Insulation exposed to weather must be water retardant and protected from UV light (no adhesive tapes). Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space must include, or be protected by, a Class I or Class II vapor retarder. Pipe insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve. |
| § 150.0(n)1:  | <b>Gas or Propane Water Heating Systems.</b> Systems using gas or propane water heaters to serve individual dwelling units must designate a space at least 2.5' x 2.5' x 7' suitable for the future installation of a heat pump water heater, and meet electrical and plumbing requirements, based on the distance between this designated space and the water heater location; and a condensate drain no more than 2' higher than the base of the water heater.                                                                                                                          |
| § 150.0(n)3:  | <b>Solar Water-heating Systems.</b> Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the executive director.                                                                                                                                                                                                                                             |

#### Ducts and Fans:

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 110.8(d)3:  | <b>Ducts.</b> Insulation installed on an existing space-conditioning duct must comply with § 604.0 of the California Mechanical Code (CMC). If a contractor installs the insulation, the contractor must certify to the customer, in writing, that the insulation meets this requirement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| § 150.0(m)1:  | <b>CMC Compliance.</b> All air-distribution system ducts and plenums must meet CMC §§ 601.0-605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to R-6.0 or higher; ducts located entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8) do not require insulation. Connections of metal ducts and inner core of flexible ducts must be mechanically fastened. Openings must be sealed with mastic, tape, or other duct-closure system that meets the applicable UL requirements, or aerosol sealant that meets UL 723. The combination of mastic and either mesh or tape must be used to seal openings greater than 1/2". If mastic or tape is used, Building cavities, air handler support platforms, and plenums designed or constructed with materials other than sealed sheet metal, duct board or flexible duct must not be used to convey conditioned air. Building cavities and support platforms may contain ducts; ducts installed in these spaces must not be compressed. * |
| § 150.0(m)2:  | <b>Factory-Fabricated Duct Systems.</b> Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth backer rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| § 150.0(m)3:  | <b>Field-Fabricated Duct Systems.</b> Field-fabricated duct systems must comply with applicable requirements for: pressure-sensitive tapes, mastics, sealants, and other requirements specified for duct construction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| § 150.0(m)7:  | <b>Backdraft Damper.</b> Fan systems that exchange air between the conditioned space and outdoors must have backdraft or automatic dampers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| § 150.0(m)8:  | <b>Gravity Ventilation Dampers.</b> Gravity ventilating systems serving conditioned space must have either automatic or readily accessible, manually operated dampers in all openings to the outside, except combustion inlet and outlet air openings and elevator shaft vents.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| § 150.0(m)9:  | <b>Protection of Insulation.</b> Insulation must be protected from damage due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather must be suitable for outdoor service (e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover). Cellular foam insulation must be protected as above or painted with a water retardant and aluminum-resistant coating.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| § 150.0(m)10: | <b>Porous Inner Core Flex Duct.</b> Porous inner cores of flex ducts must have a non-porous layer or air barrier between the inner core and outer vapor barrier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| § 150.0(m)11: | <b>Duct System Sealing and Leakage Test.</b> When space conditioning systems use forced air duct systems to supply conditioned air to an occupiable space, the ducts must be sealed and duct leakage tested, as confirmed through field verification and diagnostic testing, in accordance with Reference Residential Appendix RA3.1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| § 150.0(m)12: | <b>Air Filtration.</b> Space conditioning systems with ducts exceeding 100 feet and the supply side of ventilation systems must have MERV 13 or equivalent filters. Filters for space conditioning systems must have a two inch depth or can be one inch if sized per Equation 150.0-A. Clean-filter pressure drop and labeling must meet the requirements in §150.0(m)12. Filters must be accessible for regular service. Filter racks or grilles must use gaskets, sealing, or other means to close gaps around the inserted filters to and prevent air from bypassing the filter. *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

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

\*Exceptions may apply.

5/6/22



### 2022 Single-Family Residential Mandatory Requirements Summary

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 150.0(m)13: | <b>Space Conditioning System Airflow Rate and Fan Efficacy.</b> Space conditioning systems that use ducts to supply cooling must have a hole for the placement of a static pressure probe, or a permanently installed static pressure probe in the supply plenum. Airflow must be ≥ 350 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≥ 0.45 watts per CFM for gas furnace air handlers and ≤ 0.58 watts per CFM for all others. Small duct high velocity systems must provide an airflow ≥ 250 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≥ 0.62 watts per CFM. Field verification testing is required in accordance with Reference Residential Appendix RA3.3. * |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### Ventilation and Indoor Air Quality:

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

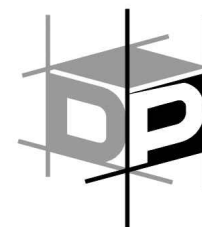
#### Pool and Spa Systems and Equipment:

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 110.4(a):  | <b>Certification by Manufacturers.</b> Any pool or spa heating system or equipment must be certified to have all of the following: compliance with the Appliance Efficiency Regulations and listing in MAEDb5; an on-off switch mounted outside of the heater that allows shutting off the heater without adjusting the thermostat setting; a permanent weatherproof plate or card with operating instructions; and must not use electric resistance heating. * |
| § 110.4(b)1: | <b>Piping.</b> Any pool or spa heating system or equipment must be installed with at least 3/8 inches of pipe between the filter and the heater, or dedicated suction and return lines, or built-in or built-up connections to allow for future solar heating.                                                                                                                                                                                                  |
| § 110.4(b)2: | <b>Covers.</b> Outdoor pools or spas that have a heat pump or gas heater must have a cover.                                                                                                                                                                                                                                                                                                                                                                     |
| § 110.4(b)3: | <b>Directional Inlets and Time Switches for Pools.</b> Pools must have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.                                                                                                                                                                                                          |
| § 110.5:     | <b>Pilot Light.</b> Natural gas pool and spa heaters must not have a continuously burning pilot light.                                                                                                                                                                                                                                                                                                                                                          |
| § 150.0(p):  | <b>Pool Systems and Equipment Installation.</b> Residential pool systems or equipment must meet the specified requirements for pump sizing, flow rate, piping, filters, and valves.                                                                                                                                                                                                                                                                             |

#### Lighting:

|               |                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| § 110.9:      | <b>Lighting Controls and Components.</b> All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9. *                                                                                                                                                                                                     |
| § 150.0(k)1A: | <b>Luminaire Efficacy.</b> All installed luminaires must meet the requirements in Table 150.0-A, except lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, and garage door openers; navigation lighting less than 5 watts; and lighting integral to drawers, cabinets, and linen closets with an efficacy of at least 45 lumens per watt. |
| § 150.0(k)1B: | <b>Screw based luminaires.</b> Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8. *                                                                                                                                                                                                                                           |
| § 150.0(k)1C: | <b>Recessed Downlight Luminaires in Ceilings.</b> Luminaires recessed into ceilings must not contain screw based sockets, must be airtight, and must be sealed with a gasket or caulk. California Electrical Code § 410.116 must also be met.                                                                                                                       |
| § 150.0(k)1D: | <b>Light Sources in Enclosed or Recessed Luminaires.</b> Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.                                                                                                   |
| § 150.0(k)1E: | <b>Blank Electrical Boxes.</b> The number of electrical boxes that are more than five feet above the finished floor and do not contain a luminaire or other device shall be no more than the number of bedrooms. These boxes must be served by a dimmer, vacancy sensor control, low voltage wiring, or fan speed control.                                          |
| § 150.0(k)1F: | <b>Lighting Integral to Exhaust Fans.</b> Lighting integral to exhaust fans (except when installed by the manufacturer in kitchen exhaust hoods) must meet the applicable requirements of § 150.0(k).                                                                                                                                                               |

5/6/22



## ADVANCED ENGINEERING

STRUCTURAL ENGINEERING SOLUTIONS

### ENVELOPE INSULATION

EXTERIOR WALLS:  
R-21 1N 2x6  
R-15 1N 2X4 FURRED RETAINING WALLS  
FOUNDATION:  
SLAB  
ROOF OVER LIVING SPACE:  
R-30 BETWEEN RAFTERS  
UNVENTILATED ATTIC

### WINDOW PERFORMANCE

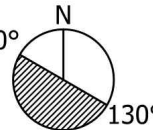
MAXIMUM WINDOW PERFORMANCE VALUES (U-FACTOR / SHGC)  
WINDOWS: .29/.21  
FRENCH DOORS: .32/.16  
MAXIMUM SKYLIGHT PERFORMANCE VALUES (U-FACTOR / SHGC)  
FIXED: .48/.29 [VELUX FCM OR EQUIV.]

### DOMESTIC HOT WATER

GAS TANKLESS WATER HEATER (96% UEF MINIMUM)

### SOLAR

2.12 KW MINIMUM (ALL WALLS ABOVE GRADE)  
2.10 KW MINIMUM (WALLS BELOW GRADE)  
ACCEPTABLE ORIENTATION:  
(DEGREES EAST OF TRUE NORTH) 300°



### TITLE 24 SUMMARY OF FEATURES

PROJECT: TOWN OF DANVILLE ADU DATE: 3-23-23  
JOB NO: G010120 ANALYST: J. BENNETT  
ADDRESS: VARIES

### HERS VERIFICATIONS

- BUILDING
- QUALITY INSULATION INSTALLATION (QII)
  - INDOOR AIR QUALITY VENTILATION
  - KITCHEN RANGE HOOD
  - MINIMUM AIRFLOW [350 CFM/TON]
  - VERIFIED EER [12.6]
  - VERIFIED SEER [18.3]
  - VERIFIED REFRIGERANT CHARGE
  - FAN EFFICACY WATTS/CFM [0.45]
  - VERIFIED HSPF [11.2]
  - VERIFIED HEAT PUMP RATED HEATING CAPACITY
  - DUCT LEAKAGE TESTING [5%]

### SPACE HEATING & COOLING

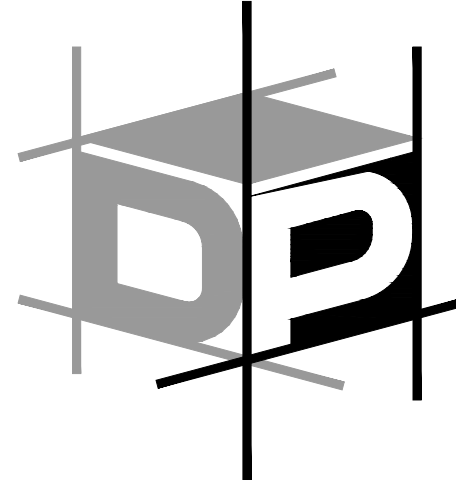
HEAT PUMP (11.2 HSPF, 18.3 SEER, 12.6 EER MINIMUM)  
MITSUBISHI MXZ-SM36NAM OR EQUIVALENT  
AHRI # 207517151

### DUCTS

SUPPLY AIR DUCTS IN ATTIC  
DUCTS IN UNCONDITIONED SPACE TO HAVE R-6 INSULATION

### INDOOR AIR QUALITY

PANASONIC FV-10VE2 ENERGY RECOVER VENTILATOR OR EQ.

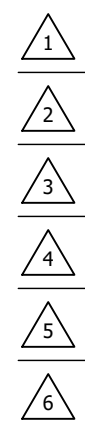


## ADVANCED ENGINEERING

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, MARGIN, 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 OR 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 DP ADVANCED ENGINEERING, INC. BEFORE BEGINNING WORK IF THERE IS ANY ERROR IN ANY CALCULATION THAT WOULD PREVENT THE SUB-CONTRACTOR FROM WARRANTING THE PERFORMANCE OF HIS PRODUCT WHICH INCLUDED ANY ENERGY STAR PROCEDURES.

## TOWN OF DANVILLE ACCESSORY DWELLING UNIT



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

Sheet Description:

### ENERGY CALCULATIONS

### 2022 SINGLE FAMILY RESIDENTIAL MANDATORY MEASURES SUMMARY AND SUPPLEMENTARY SHEETS

Initial Issue Date: March 27, 2023

Energy Analyst: J. Bennett Ext. 26

Project Manager: J. Peek Ext. 23

Job No. G010120

Sheet No.



GENERAL NOTES

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

FOUNDATION NOTES

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

SYMBOLS LEGEND

- NOT ALL SYMBOLS USED IN THE DRAWING ARE LISTED BELOW. REFER TO AMERICAN WELDING SOCIETY PUBLICATIONS FOR WELDING SYMBOLS.
- (LENGTH)  
SW - INDICATES SHEARWALL NUMBER AND MINIMUM DESIGN LENGTH. SHEARWALLS SHALL BE AS NOTED IN THE SHEARWALL SCHEDULE.
- SD1 INDICATES HOLDOWN TYPE AS MANUFACTURED BY THE "SIMPSON STRONGTIE COMPANY." HOLDOWNS SHALL BE AS NOTED IN THE HOLDOWN SCHEDULE, PER
- SD1 INDICATES INTERIOR BEARING WALL BELOW

SHEARWALL NOTES

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

OBSERVATION OF CONSTRUCTION

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

SPECIAL INSPECTIONS PER 2022 CBC 1701

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

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

| ITEM | DESCRIPTION OF CONNECTION                                                                       | FASTENING (NOTE 1, 4, 8) |                             |                            |
|------|-------------------------------------------------------------------------------------------------|--------------------------|-----------------------------|----------------------------|
|      |                                                                                                 | COMMON / BOX             | SMOOTH SHANK                | STAPLES                    |
| 1    | JOIST TO SILL OR GIRDER, TOE-NAIL                                                               | (3) 8d                   | (3) 3" x 0.131"             | (3) 3"-14 GA.              |
| 2    | BRIDGING TO JOIST, TOE-NAIL EA. END                                                             | (2) 8d                   | (2) 3" x 0.131"             | (2) 3"-14 GA.              |
| 3    | 1" x 6" SUBFLOOR OR LESS, TO EACH JOIST, FACE NAIL                                              | (2) 8d                   | N.A.                        | N.A.                       |
| 4    | WIDER THAN 1" x 6" SUBFLOOR TO EACH JOIST, FACE NAIL                                            | (3) 8d                   | N.A.                        | N.A.                       |
| 5    | 2" SUBFLOOR TO JOIST OR GIRDER, BLIND AND FACE NAIL                                             | (2) 16d                  | N.A.                        | N.A.                       |
| 6    | SOLE PLATE TO JOIST OR BLOCKING, TYPICAL FACE NAIL                                              | 16d AT 16"               | 3" x 0.131" AT 8" O.C.      | 3"-14 GA. AT 12" O.C.      |
|      | SOLE PLATE TO JOIST OR BLOCKING, AT BRACED WALL PANELS                                          | (3) 16d AT 16"           | (4) 3" x 0.131" AT 16" O.C. | (4) 3"-14 GA. PER 16" O.C. |
| 7    | TOP PLATE TO STUD, END NAIL                                                                     | (2) 16d                  | (3) 3" x 0.131"             | (3) 3"-14 GA.              |
| 8    | STUD TO SOLE PLATE, END NAIL                                                                    | (2) 16d                  | (3) 3" x 0.131"             | (3) 3"-14 GA.              |
|      | STUD TO SOLE PLATE, TOE-NAIL                                                                    | (4) 8d                   | (4) 3" x 0.131"             | (3) 3"-14 GA.              |
| 9    | DOUBLE STUDS, FACE NAIL                                                                         | 16d AT 24"               | 3" x 0.131" AT 8" O.C.      | 3"-14 GA. AT 8" O.C.       |
| 10   | DOUBLED TOP PLATES, TYP. FACE NAIL                                                              | 16d AT 16"               | 3" x 0.131" AT 12" O.C.     | 3"-14 GA. AT 12" O.C.      |
|      | DOUBLED TOP PLATES, LAP SPLICE                                                                  | (8) 16d                  | (12) 3" x 0.131"            | (12) 3"-14 GA.             |
| 11   | BLOCKING BETWEEN JOISTS OR RAFTERS, TO TOP PLATE, TOE-NAIL                                      | (3) 8d                   | (3) 3" x 0.131"             | (3) 3"-14 GA.              |
| 12   | RIM JOIST TO TOP PLATE, TOE-NAIL                                                                | 8d AT 6"                 | 3" x 0.131" AT 6" O.C.      | 3"-14 GA.                  |
| 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 2308.10.4.1)                  | (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 2308.10.4.1)                    | (3) 16d MIN.             | (4) 3" x 0.131"             | (4) 3"-14 GA.              |
| 19   | RAFTER TO PLATE, TOE-NAIL (SEE C.B.C. TABLE 2308.10.1)                                          | (3) 8d                   | (3) 3" x 0.131"             | (3) 3"-14 GA.              |
| 20   | 1" DIAGONAL BRACE TO EACH STUD AND PLATE, FACE NAIL                                             | (2) 8d                   | (2) 3" x 0.131"             | (3) 3"-14 GA.              |
| 21   | 1" x 8" SHEATHING OR LESS TO EACH BEARING, FACE NAIL                                            | (3) 8d                   | N.A.                        | N.A.                       |
| 22   | WIDER THAN 1" x 8" SHEATHING TO EACH BEARING, FACE NAIL                                         | (3) 8d                   | N.A.                        | N.A.                       |
| 23   | BUILT-UP CORNER STUDS                                                                           | 16d AT 24"               | 3" x 0.131" AT 16" O.C.     | 3"-14 GA. AT 16" O.C.      |
| 24   | BUILT-UP GIRDER AND BEAMS, FACE NAIL TOP AND BTM STAGG. ON OPP. SIDE                            | 20d AT 32"               | 3" x 0.131" AT 24" O.C.     | 3"-14 GA. AT 24" O.C.      |
|      | BUILT-UP GIRDER AND BEAMS, FACE NAIL AT ENDS AND AT EACH SPLICE                                 | (2) 20d                  | (3) 3" x 0.131"             | (3) 3"-14 GA.              |
| 25   | 2" PLANK TO EACH BEARING                                                                        | 16d                      | N.A.                        | N.A.                       |
| 26   | COLLAR TIE TO RAFTER, FACE NAIL                                                                 | (3) 10d                  | (4) 3" x 0.131"             | (4) 3"-14 GA.              |
| 27   | JACK RAFTER TO HIP, TOE-NAIL                                                                    | (3) 10d                  | (4) 3" x 0.131"             | (4) 3"-14 GA.              |
|      | JACK RAFTER TO HIP, FACE NAIL                                                                   | (2) 16d                  | (3) 3" x 0.131"             | (3) 3"-14 GA.              |
| 28   | ROOF RAFTER TO 2x RIDGE BEAM, TOE-NAIL OR 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):                                   |                          |                             |                            |
| 32   | 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.                       |
|      | PANEL SIDING TO FRAMING (NOTE 2):                                                               |                          |                             |                            |
| 32   | 1/2" AND LESS                                                                                   | 6d (NOTE 6)              | N.A.                        | N.A.                       |
|      | 5/8"                                                                                            | 8d (NOTE 6)              | N.A.                        | N.A.                       |

NOTES: FOR S1: 1 inch = 25.4 mm

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

NAIL SCHEDULE

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

NOTES:

1. ALL NAILS IN MANUF. HARDWARE SHALL BE PER MANUFACTURERS' SPECIFICATIONS AS NOTED TO ACHIEVE MAX HARDWARE VALUE.
2. FASTENERS, INCLUDING NUTS AND WASHERS, IN CONTACT WITH SODIUM BORATE SBX/DOT PRESERVATIVE-TREATED WOOD IN AN INT., DRY ENVIRONMENT SHALL BE PERMITTED.
3. 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.

REFERENCE TO STRUCTURAL CALCULATIONS FOR THE BENEFIT OF THE BUILDING OFFICIAL

INDICATES REVISION NUMBER AND PLAN REVISIONS INSIDE CLOUD

REFERENCE TO STRUCTURAL CALCULATIONS FOR THE BENEFIT OF THE BUILDING OFFICIAL

INDICATES HANGER.

ABBREVIATION LEGEND

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



GENERAL FRAMING NOTES

1.

NO STRUCTURAL MEMBER SHALL BE CUT OR NOTCHED UNLESS SPECIFICALLY SHOWN, NOTED, OR APPROVED BY THE ENGINEER. NOTCH DETAILS, IF PROVIDED, ARE FOR GENERAL GUIDANCE ONLY. THE ENGINEER SHALL BE CONTACTED TO APPROVE LOCATIONS OF PROPOSED NOTCHES. STUDS IN EXTERIOR WALLS AND BEARING PARTITIONS MAY BE CUT OR NOTCHED TO A DEPTH NOT EXCEEDING 25% OF STUD WIDTH. CUTTING OR NOTCHING OF STUDS IN NON-BEARING PARTITIONS SHALL NOT EXCEED 40% OF THE WIDTH. SEE DETAIL 

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 FOR MORE INFORMATION.

2.

**TYPICAL FRAMING AND STRUCTURAL MATERIALS:**  
ALL FRAMING LUMBER SHALL BE DOUGLAS FIR, AND SHALL BE STAMPED WITH A GRADE MARK WITH THE FOLLOWING GRADES. FRAMING LUMBER SHALL CONFORM TO GRADING RULES OF WVPA AND COMPLIES WITH DOC PS 20.  
**MAXIMUM MOISTURE CONTENT SHALL NOT EXCEED 19% AT THE TIME OF CONSTRUCTION.**

| FRAMING MATERIAL                   | GRADE                  | FRAMING MATERIAL                       | GRADE                |
|------------------------------------|------------------------|----------------------------------------|----------------------|
| TYPICAL WALL STUDS                 | PER NOTE 6 BELOW       | RAFTERS (2x DIMENSIONAL)               | D.F. #2, MIN. U.N.O. |
| SOLE PLATES (2x MIN.) <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.  |

1.

SOLE PLATES, AS NOTED ABOVE, ARE ALL INTERIOR SILL PLATES NOT IN CONTACT WITH CONCRETE. MATERIAL SHALL BE UC1 INTERIOR/DRY CATEGORY AS DEFINED BY AWPA STANDARD U1.

2.

MUDSILLS, AS NOTED ABOVE, ARE ALL INTERIOR SILL PLATES IN DIRECT CONTACT WITH CONCRETE. MATERIAL SHALL BE UC2 INTERIOR/DAMP CATEGORY AS DEFINED BY AWPA STANDARD U1.

3.

LUMBER EXPOSED TO WEATHER, AS NOTED ABOVE, IS ALL EXTERIOR LUMBER ABOVE GROUND AND EXPOSED TO WEATHER. MATERIAL SHALL BE UC3B ABOVE GROUND EXPOSED CATEGORY AS DEFINED BY AWPA STANDARD U1.

3.

**PRESERVATIVE TREATED OR NATURALLY DURABLE MATERIALS:**  
LUMBER SHALL BE TREATED WITH TYPICAL WATERBORNE PRESERVATIVES: ALKALINE COPPER QUAT (ACQ-C, ACQ-D, ACQ-D CARBONATE), COPPER AZOLE (CA-B & CA-C, MCA-C) AND SODIUM BORATES (SBX/DOT). THESE TREATMENTS ARE OFTEN REFERRED TO BY "TRADE NAMES SUCH AS: WOLMANIZED NATURAL SELECT"<sup>®</sup> (COPPER AZOLE), PRESERVE AND NATUREWOOD<sup>®</sup> (ACQ), MICROPRO<sup>™</sup>, SMART SENSE<sup>™</sup> (MCQ), AND ADVANCE GUARD<sup>®</sup> (BORATE).

1.

A.

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

1.

PLAIN CARBON STEEL FASTENERS, INCLUDING NUTS AND WASHERS, IN CONTACT WITH SODIUM BORATE SBX/DOT PRESERVATIVE-TREATED WOOD IN AN INTERIOR, DRY ENVIRONMENT SHALL BE PERMITTED.

B.

ALL EXTERIOR ABOVE GROUND CONSTRUCTION (INCL. DECK FRAMING), UC3B CATEGORY, SHALL BE TREATED WITH ALKALINE COPPER QUAT (ACQ-C, ACQ-D, ACQ-D CARBONATE), OR COPPER AZOLE (CA-B & CA-C, MCA-C)

1.

ALL FASTENERS AND CONNECTORS IN CONTACT WITH PRESERVATIVE-TREATED TREATED WOOD USING ALKALINE COPPER QUAT (ACQ-C, ACQ-D, ACQ-D CARBONATE), OR COPPER AZOLE (CA-B & CA-C, MCA-C) SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL IN ACCORDANCE WITH GOVERNING CBC SEC. 2304.10 AND SHALL BE IN ACCORDANCE WITH ASTM A 153.

C.

WOOD JOISTS OR WOOD STRUCTURAL FLOORS THAT ARE CLOSER THAN 18 INCHES OR WOOD GIRDERS THAT ARE CLOSER THAN 12 INCHES TO EXPOSED GROUND IN CRAWL SPACES OR UNEXCAVATED AREAS LOCATED WITHIN THE PERIMETER OF THE BUILDING FOUNDATION SHALL BE PRESERVATIVE-TREATED WOOD IN ACCORDANCE CBC.

4.

**GLUE-LAMINATED STRUCTURAL MATERIALS:**  
STANDARD SPECIFICATIONS FOR GLUE-LAMINATED STRUCTURAL MEMBERS, ANSI/AITC A 190.1 AND ASTM D3737. GLUE-LAMINATED BEAMS SHALL BE INSPECTED AND A CERTIFICATE PROVIDED TO THE FILED INSPECTOR AT THE TIME OF FRAMING INSPECTION. FABRICATION SHALL BE PERFORMED IN ACCORDANCE WITH CBC 1705.5. ALL GLUE-LAMINATED BEAMS THAT ARE CONTINUOUS OVER SUPPORTS OR CANTILEVERED SHALL HAVE TENSION LAMINATIONS ON TOP OF BEAMS.  
**MAXIMUM MOISTURE CONTENT SHALL NOT EXCEED 16% AT THE TIME OF CONSTRUCTION.**

A.

GLULAM MEMBERS IN DRY SERVICE USE SHALL BE DOUGLAS-FIR 24F-V4 (SINGLE SPAN) OR COMBINATION 24F-V8 (MULTI-SPAN & CANTILEVER) U.N.O. BEAMS SHALL BE ARCHITECTURAL GRADE WHEN EXPOSED TO VIEW, S.A.D.

1.

GLULAM MEMBERS, SEE PLAN SPECIFICATIONS FOR CAMBER WHERE OCCURS.

| MATERIAL GRADE | E (x10 <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      |

B.

GLULAM MEMBERS IN WET SERVICE USE SHALL BE ALASKAN CEDAR 20F-V12 (SINGLE SPAN) OR COMBINATION 20F-V13 (MULTI-SPAN & CANTILEVER) U.N.O.

1.

GLULAM MEMBERS, SEE PLAN SPECIFICATIONS FOR CAMBER WHERE OCCURS.

| MATERIAL GRADE | E (x10 <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      |

C.

DESIGN, FABRICATION AND CONSTRUCTION OF STRUCTURAL GLULAM MEMBERS SHALL CONFORM TO THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION STANDARD, MANUAL No. 301 AND THE COMMERCIAL STANDARD FOR STRUCTURAL GLUED LAMINATED TIMBER, CS 253.

D.

STRUCTURAL PLYWOOD SHALL BE GRADED PER APA PSI-83AND SHALL BE INTERIOR TYPE SHEATHING C-D GRADE WITH EXTERIOR GLUE. EQUIVALENT O.S.B. WOOD STRUCTURAL PANEL MAY BE USED AS AN ALTERNATE TO PLYWOOD. HOWEVER, IN ACCORDANCE WITH THE TILE COUNCIL OF AMERICA RECOMMENDATIONS, O.S.B. SHALL NOT BE USED BELOW TILE MORTAR. ALL HORIZONTAL PLYWOOD SHALL BE LAID WITH FACE GRAIN PERPENDICULAR TO FRAMING MEMBERS, WITH STAGGERED JOINTS.

5.

**STRUCTURAL COMPOSITE LUMBER (SCL) MATERIALS:**  
ALL STRUCTURAL COMPOSITE LUMBER (SCL) SHALL BE MANUFACTURED PER ASTM D5055 AND ASTM D5456. STRUCTURAL COMPOSITE LUMBER SHALL BE MANUFACTURED BY BOISE CASCADE, OR EQUAL. ALTERNATE MANUFACTURERS ARE PERMITTED AND CONSIDERED AN EQUIVALENT SUBSTITUTION IF THE SUBSTITUTED MATERIAL MEETS, OR EXCEEDS, ALL THE DESIGN PROPERTIES LISTED BELOW.

| SPECIFICATION | MATERIAL         | WIDTH (in.) <sup>2</sup> | E (x10 <sup>3</sup> psi) | Fb (psi) | Fv (psi) | Fc <sub>1</sub> (psi) | Fc <sub>II</sub> (psi) |
|---------------|------------------|--------------------------|--------------------------|----------|----------|-----------------------|------------------------|
| RIM JOIST     | VERSA-STRAND LVL | 1-5/16                   | 1.4                      | 1800     | 225      | 525                   | 2500                   |
| LVL COLUMN    | VERSA-LAM LVL    | 3.3, 5.25, 7             | 1.7                      | 2650     | 285      | 750                   | 3000                   |
| LVL STUD      | VERSA-STUD LVL   | 1.5                      | 1.7                      | 2617     | 285      | 450                   | 3000                   |
| LVL BEAM      | VERSA-LAM 2.0E   | 1.75                     | 2.0                      | 2800     | 285      | 750                   | 3000                   |
| LVL BEAM      | VERSA-LAM 2.0E   | 3.5, 5.25, 7             | 2.0                      | 3100     | 285      | 750                   | 3000                   |

1.

BEAM DEPTH IS ASSUMED TO MATCH FLOOR FRAMING DEPTH U.N.O.

2.

MFR BEAM MEMBERS MAY BE BUILT UP TO ACHIEVE SPECIFIED WIDTHS PER DETAIL 

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 U.N.O. ON PLANS.

6.

ALL STUD WALLS SHOWN ON STRUCTURAL DRAWINGS SHALL BE FRAMED AS FOLLOWS (U.O.N.):  
EXTERIOR WALL STUD HEIGHT TABLE (L/360 DEFL.)

| MAX. PLATE HT | STUD TYPE           | SPACING  |
|---------------|---------------------|----------|
| 21'-5"        | (2) 2x6 DOUG-FIR #1 | 12" O.C. |
| 19'-5"        | (2)-2x6 DOUG-FIR #1 | 16" O.C. |
| 15'-1"        | 2x6 DOUG-FIR #2     | 16" O.C. |
| 12'-1"        | (2)-2x4 DOUG-FIR #1 | 16" O.C. |
|               | 2x6 STUD GRADE      | 16" O.C. |
| 10'-1"        | 2x4 DOUG-FIR #1     | 16" O.C. |
|               | 2x6 STUD GRADE      | 16" O.C. |
| 9'-1"         | 2x4 DOUG-FIR #2     | 16" O.C. |
|               | 2x6 STUD GRADE      | 16" O.C. |
| 8'-1"         | 2x4 STUD GRADE      | 16" O.C. |
|               | 2x6 STUD GRADE      | 16" O.C. |

INTERIOR WALL STUD HEIGHT TABLE (L/240 DEFL.)

| MAX. PLATE HT | STUD TYPE      | SPACING  |
|---------------|----------------|----------|
| 21'-5"        | 2x6 STUD GRADE | 12" O.C. |
| 19'-5"        | 2x6 STUD GRADE | 16" O.C. |
| 15'-1"        | 2x6 STUD GRADE | 16" O.C. |
| 12'-1"        | 2x4 STUD GRADE | 16" O.C. |
|               | 2x6 STUD GRADE | 16" O.C. |

NOTE:

A.

STUD HEIGHTS EXCEEDING 10'-1" SHALL BE BRACED MID-HEIGHT USING FULL DEPTH 2x BLOCKING.

7.

TOP PLATES SHALL BE DOUBLED ON ALL STUD WALLS. LAP 4'-0" MINIMUM AT TOP PLATE SPLICES, WITH (12) 16d NAILS EACH SIDE OF SPLICE, U.N.O. SPLICES IN UPPER AND LOWER PLATES SHALL BE STAGGERED 4'-0" MINIMUM.

8.

POSTS IN WALLS MAY BE MADE WITH MULTIPLE STUDS OF EQUIVALENT WIDTH AND DEPTH, U.O.N. SECURE MULTIPLE STUDS WITH 16d NAILS AT 8" O.C. STAGGERED.

9.

PROVIDE KING STUDS AT THE ENDS OF ALL HEADERS OR OTHER BEAMS INSTALLED IN WALLS, SEE DETAIL 

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.

10.

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

11.

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

12.

INSTALL HORIZONTAL MEMBERS WITH CROWN UP. WHERE KNOTS EXIST NEAR THE TOP OR BOTTOM OF HORIZONTAL MEMBERS, INSTALL MEMBER WITH KNOTS UP. CANTILEVERED DECK JOISTS SHALL BE CAREFULLY NOTCHED AND TRIMMED (IF NECESSARY) TO PROVIDE SLOPE WITHOUT OVER-CUTTING.

13.

PROVIDE FULL DEPTH BLOCKING OR CONTINUOUS RIM JOIST AT ALL FLOOR AND ROOF FRAMING SUPPORTS. FRAMING MEMBERS SHALL HAVE A MINIMUM OF 2" BEARING AT SUPPORTS. LAPPING JOISTS SHALL HAVE 6" MINIMUM OVERLAP CENTERED OVER INTERIOR SUPPORTS.

14.

ALL BOLTED WOOD CONNECTIONS SHALL HAVE A WASHER UNLESS A STEEL PLATE IS SPECIFIED. HOLES SHALL BE PROPERLY ALIGNED. OVERSIZED HOLES ARE NOT ALLOWED. NUTS SHALL BE SNUG TIGHTENED. BOLT HOLES SHALL BE NOMINAL DIAMETER OF BOLT PLUS 1/16".

15.

NAILED WOOD CONNECTIONS SHALL USE COMMON WIRE NAILS, U.N.O. MIN. NAILING REQUIREMENTS FOR STANDARD CONNECTIONS SHALL BE IN ACCORDANCE WITH THE GOVERNING C.B.C. FASTENING SCHEDULE (TABLE 2304.10.1).

16.

ALL MANUFACTURED CONNECTION HARDWARE SHALL BE AS DESIGNATED ON DRAWINGS AND INSTALLED (WITH ALL NAIL HOLES FILLED) IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPLICABLE ICC APPROVALS.

17.

INSTALL LAG SCREWS IN DRILLED LEAD HOLES WITH A DIA. EQUAL TO 3/4" OF THE SHANK DIAMETER. LAG SCREWS SHALL NOT BE HAMMERED IN. PROVIDE WASHERS UNDER HEADS BEARING ON WOOD. HOLES SHALL BE PROPERLY ALIGNED.

CONCRETE NOTES

CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2022 BUILDING CODE (C.B.C.) AND THE LATEST EDITION OF THE AC1318-14, UNLESS NOTED OTHERWISE.

1.

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

|                          | MINIMUM COMPRESSIVE STRENGTH (psi) (AT 28 DAYS) | SLUMP (+/- 1/2") | AGGREG. SIZE | SPEC. INSP. REQD | MAXIMUM WATER TO CEMENT RATIO (NOTE 1F) | CEMENT TYPE ASTM C150 |
|--------------------------|-------------------------------------------------|------------------|--------------|------------------|-----------------------------------------|-----------------------|
| GRADE BEAMS & STEM WALLS | 3000                                            | 4"               | 3/4"         | NO **            | .55                                     | II OR V               |
| CONCRETE PIERS           | 3000                                            | 4"               | 3/4"         | NO **            | .55                                     | II OR V               |
| FOOTINGS ON GRADE        | 3000                                            | 4"               | 1"           | NO **            | .55                                     | II OR V               |
| FLOOR SLABS ON GRADE     | 3000                                            | 4"               | 1"           | NO **            | .45                                     | II OR V               |

\*\*

**SPECIAL INSPECTION IS NOT REQUIRED, DESIGN COMPRESSIVE STRENGTH IS 2500 psi. HIGHER STRENGTHS HAVE BEEN SPECIFIED FOR QUALITY CONTROL.**

A.

COARSE AGGREGATE SHALL BE HARD, DURABLE CRUSHED STONE OR GRAVEL GRADED PER ASTM C33. MAXIMUM SIZE OF AGGREGATE SHALL BE AS NOTED IN SCHEDULE ABOVE AND DEFINED BELOW. SAND SHALL BE CLEAN, HARD, DURABLE, WASHED FREE FROM SILT, LOAM OR CLAY.

1.

GRADE BEAMS, STEM WALLS, RETAINING WALLS AND OTHER CONCRETE FRAMEWORK LESS THAN 10" WIDE SHALL USE 3/4" AGGREGATE CONFORMING TO ASTM C33 WITH 100% PASSING 1" SIEVE AND 90% (MINIMUM) PASSING 3/4" SIEVE. TO ENSURE PROPER CONCRETE COVER AND CONSOLIDATION.

2.

FOOTING AND SLABS ON GRADE, INCLUDING POST-TENSION AND MAT SLABS, SHALL USE 1" AGGREGATE CONFORMING TO ASTM C33 WITH 95% (MINIMUM) PASSING 1" SIEVE.

B.

MIXING WATER SHALL BE CLEAN AND FREE FROM INJURIOUS AMOUNTS OF OIL, ACIDS, ALKALIES, ORGANIC MATERIALS OR OTHER DELETERIOUS SUBSTANCES.

C.

CONCRETE EXPOSED TO SULFATE SHALL USE TYPE V CEMENT WITH POZZOLAN.

D.

FLY ASH OR POZZOLANS, IF USED, SHALL CONFORM WITH ASTM C618, COAL FLY ASH AND RAW OR CALCINED NATURAL POZZLAN FOR USE AS A MINERAL ADMXTURE IN CONCRETE. USAGE SHALL NOT EXCEED 25 PERCENT, BY WEIGHT OF THE TOTAL CEMENTITIOUS MATERIALS. WHEN POZZOLANS ARE USED TO MITIGATE THE EFFECT OF SULFATE CONTAINING SOILS THEY SHALL BE OF A TYPE THAT HAS DEMONSTRATED SUCH ABILITY BY TEST OR SERVICE RECORD.

E.

ADMXTURES CONTAINING CALCIUM CHLORIDE SHALL NOT BE USED.

F.

CEMENT SHALL CONFORM WITH ASTM C150 & C 595, PORTLAND CEMENT AND BLENDED HYDRAULIC CEMENTS

G.

TRANSIT MIX SHALL BE PER ASTM C-94.

H.

MIX DESIGN SHALL MEET THE RECOMMENDED SPECIFICATION UNLESS AN ALTERNATE MIX IS SUBMITTED AND REVIEWED BY THE ENGINEER.

2.

SPECIAL INSPECTION OF CONCRETE WORK IS REQD WHERE NOTED ABOVE. WHEN REQD, SPECIAL INSPECTION SHALL INCLUDE THE INSPECTION OF THE PLACEMENT OF REINFORCEMENT, AND THE INSPECTION OF THE CONCRETE PLACEMENT OPERATIONS AS WELL AS CONCRETE CYLINDER TESTS, PER C.B.C. SECTION 1705.3. THE FOLLOWING THREE CRITERIA ESTABLISH THE REQD MINIMUM SAMPLING FREQUENCY FOR EACH CLASS OF CONCRETE:

A.

ONE EACH DAY A GIVEN CLASS IS PLACED, NOR LESS THAN

B.

ONCE FOR EACH 150 yd OF EACH CLASS PLACED EACH DAY, NOR LESS THAN

C.

ONCE FOR EACH 5000 ft OF SLAB OR WALL SURFACE AREA PLACED EACH DAY.

3.

SPLICES OF CONTINUOUS REINFORCEMENT SHALL HAVE A MINIMUM LAP PER DETAILS 

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 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.

SD2

 AND 

SD2

4.

REINFORCING SHALL BE NEW STOCK, DEFORMED BARS, NO. 3 AND SMALLER: GRADE 40 CONFORMING TO ASTM A-615 AS FOLLOWS (U.N.O.) : NO. 4 AND LARGER: GRADE 60

A.

ALL BARS TO BE WELDED SHALL MEET THE REQUIREMENTS OF ASTM A706, GRADE 60.

B.

WELDED WIRE FABRIC SHALL CONFORM TO ASTM

A.

A-185, FLAT SHEETS ONLY. LAP FABRIC 6" MINIMUM.

C.

REINFORCEMENT PLACEMENT SHALL CONFORM TO DETAIL 

A

D.

ANCHOR BOLTS SHALL BE ASTM A307, U.N.O. AND SHALL CONFORM TO DETAIL 

SD3

5.

REINFORCEMENT COVER: ALL DIMENSIONS SHOWING THE LOCATIONS OF REINFORCEMENT STEEL NOT NOTED AS "CLEAR", ARE TO THE CENTER OF THE STEEL. MINIMUM CLEAR COVERAGE OF REINFORCEMENT SHALL BE AS FOLLOWS:

A.

CONCRETE CAST AGAINST EARTH, EXCEPT SLABS ON GRADE: 3" SLABS ON GRADE: 1-1/2" U.N.O.

B.

CONCRETE CAST IN FORMS, BUT EXPOSED TO EARTH OR WEATHER: No. 5 REINFORCING AND SMALLER: 1-1/2" No. 6 REINFORCING AND LARGER: 2"

C.

CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND: SLABS, WALLS AND JOISTS: 3/4" BEAMS AND COLUMNS: 1-1/2"

6.

UNFORMED CONCRETE SURFACE CURING:

A.

CURE FOR ONE TO SEVEN DAYS BY MAINTAINING TEMPERATURE ABOVE 50 DEGREES FAHRENHEIT, AND IN A MOIST CONDITION.

B.

APPLY MEMBRANE-FORMING CURING COMPOUND TO DAMP CONCRETE IMMEDIATELY AFTER COMPLETION OF THE MOIST-CURING PERIOD.

7.

THE CONTRACTOR SHALL INFORM THE ENGINEER AT LEAST TWO DAYS PRIOR TO POURING ANY STRUCTURAL CONCRETE SO THAT OBSERVATION OF THE WORK MAY BE PERFORMED AS REQUIRED BY THE ENGINEER'S CONTRACT OR THE CODE.

8.

FOOTING/GRADE BEAM CONSTRUCTION JOINTS SHALL CONFORM TO DETAIL 

204

9.

CRACK CONTROL JOINTS SHALL BE PLACED IN CONCRETE SLABS ON GRADE AT A SPACING OF 12'-0" MAX. O.C. EACH WAY (U.N.O. ON PLAN) PER DETAIL 

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 

SD2

 AND 

205B

10.

ALL PIPES AND DUCTS THROUGH CONCRETE SHALL BE SLEEVED. VERIFY OPENINGS WITH PLUMBER AND ELECTRICIAN. SEE DETAIL 

206

11.

IF SPECIFIED, WELDED WIRE FABRIC SHALL BE 6x6-W1.4xW1.4. WIRE FABRIC SHALL BE ELECTRICALLY WELDED STEEL PER ASTM A185. LAP 6" MINIMUM AT ALL EDGES AND TIE AT THREE PLACES TO REINFORCING DOWELS (WHERE OCCUR) EXCEPT LOCATIONS WHERE SLAB IS INDEPENDENT OF FOUNDATION. CONTRACTOR SHALL PROVIDE SUPPORT CHAIRS TO ENSURE FABRIC IS LOCATED IN THE CENTER OF THE SLAB.

12.

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

STRUCTURAL STEEL NOTES

1.

THE FOLLOWING SECTION APPLIES TO ALL STRUCTURAL STEEL 1/8" THICK OR LARGER.

2.

ALL WORK SHALL BE IN ACCORDANCE WITH THE CBC CHAPTER 22, AISC 15th EDITION, AND THE 2015 A.W.S. D1.1.

3.

STEEL MATERIALS SHALL CONFORM TO THE FOLLOWING:

A.

PLATES AND SHAPES, U.N.O. ASTM A992 (fy = 50 ksi), OR ASTM A572, GRADE 50

B.

STRUCTURAL TUBE COLUMNS AND BEAMS: ASTM A500, GRADE B.

C.

PIPE COLUMNS: ASTM A53, TYPE E OR S, GRADE B

D.

ROD ASTM A36 (fy = 36 ksi)

4.

FASTENERS SHALL CONFORM TO THE FOLLOWING:

A.

ANCHOR BOLTS: ASTM A307, U.N.O.

B.

STEEL TO WOOD CONNECTIONS: ASTM A307, U.N.O. USE CUT WASHERS (IF CONCEALED) AND MALLEABLE IRON WASHERS (IF EXPOSED)

5.

WELDING ELECTRODES SHALL CONFORM TO 2015 A.W.S. D1.1 AND SHALL BE LOW HYDROGEN MATCHING FILLER METAL.

6.

SURFACES OF STEEL TO BE FIELD WELDED SHALL BE FREE AND CLEAR OF ALL PAINT, DIRT, GREASE, OR OTHER DELETERIOUS COATINGS.

7.

STEEL FRAMING, EXCEPT THOSE PORTIONS TO BE EMBEDDED IN CONCRETE, CONCEALED IN FRAMING, FIELD WELDED, OR HIGH STRENGTH BOLTED SHALL BE SHOP-PAINTED PER THE SPECIFICATIONS.

8.

FIELD PAINT ALL EXPOSED STEEL SURFACES AFTER INSTALLATION, PER THE SPECIFICATIONS.

9.

ALL WELDERS SHALL BE QUALIFIED BY A.W.S. PROCEDURES FOR THE REQUIRED WELDING.

10.

SUBMIT CERTIFICATION OF COMPLIANCE FOR ALL STEEL MATERIALS.

ADVANCED ENGINEERING

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Brentwood, CA 94513  
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TOWN OF DANVILLE  
ACCESSORY DWELLING UNIT  
CONTEMPORARY

DANVILLE, CALIFORNIA

|                                 |          |
|---------------------------------|----------|
| <div>PLAN CHECK RESPONSES</div> | 04-19-23 |
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Engineering Seal:

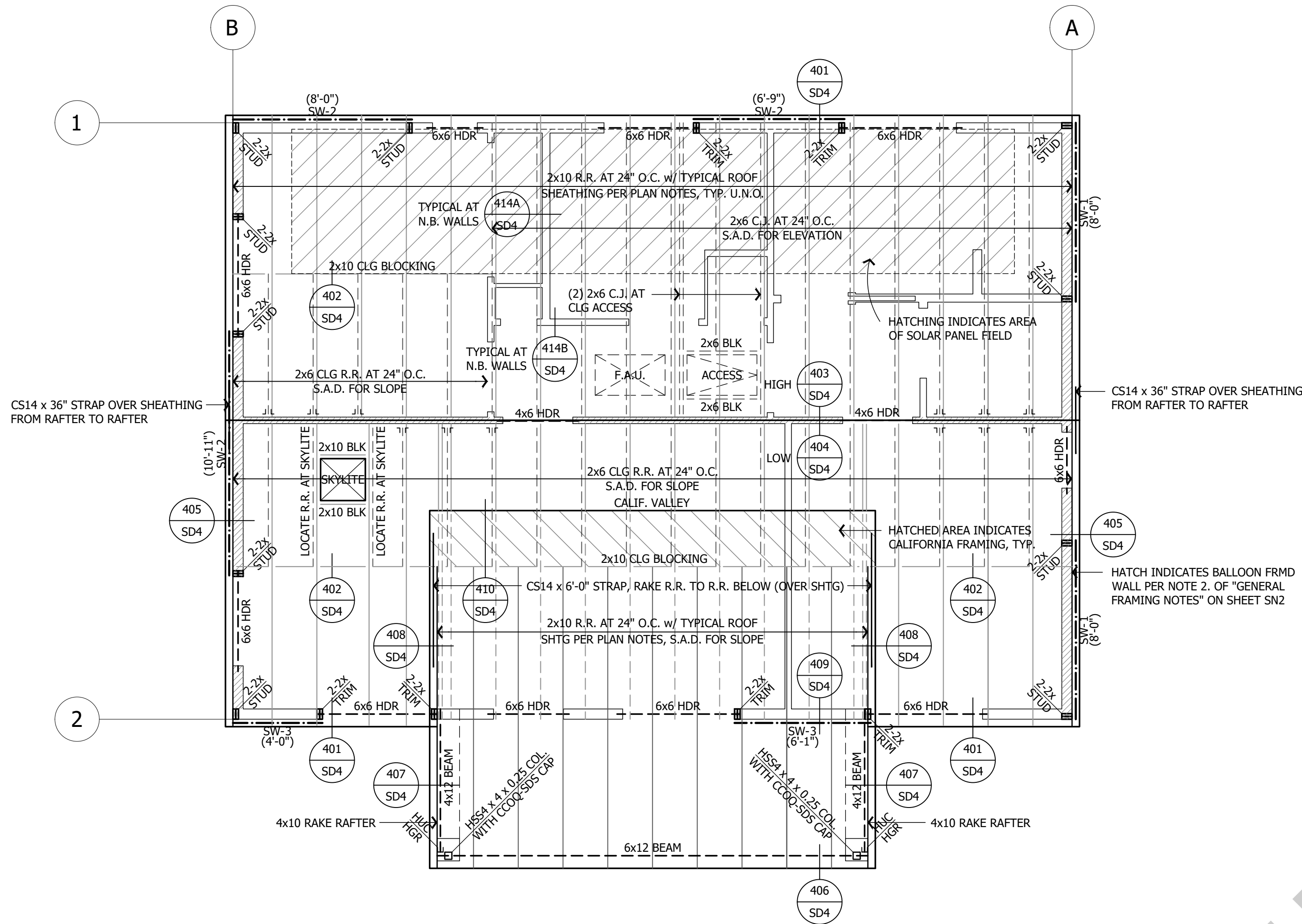
|                                             |                 |
|---------------------------------------------|-----------------|
| Sheet Description:                          |                 |
| GENERAL STRUCTURAL SPECIFICATIONS AND NOTES |                 |
| No Scale                                    |                 |
| Initial Issue Date:                         | March 24, 2023  |
| Drawn By:                                   | E. Bennett      |
| Project Designer:                           | J. Peek         |
| Project Manager:                            | J. Peek Ext. 23 |
| Job No.                                     | G010120         |

Sheet No.  

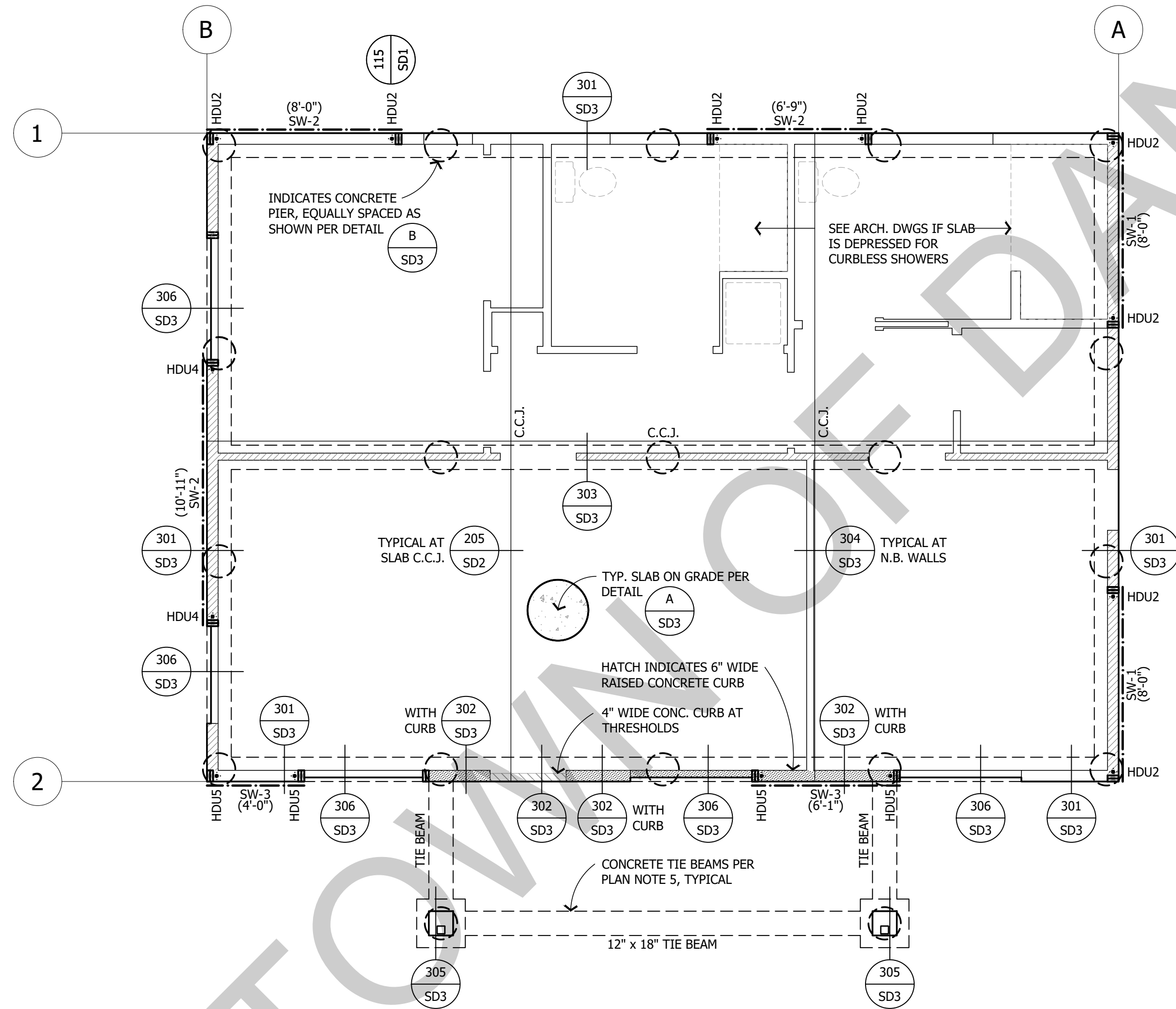
SN2

DO NOT SCALE THESE DRAWINGS





A ROOF FRAMING PLAN - CONTEMPORARY (MIRRORED)



B FOUNDATION PLAN - CONTEMPORARY (MIRRORED) - 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 (b) SD3  
A. 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. TIE BEAM REINFORCEMENT SHALL CONTINUE THROUGH FOUNDATION ELEMENTS OR SHALL BE PROPERLY TIED TO FOUNDATION REINFORCING.
- LANDSCAPE SLABS SHALL BE INDEPENDENT OF THE FOUNDATION. THE CONTRACTOR SHALL INSTALL ASPHALT-IMPREGNATED EXPANSIVE JOINT MATERIAL BETWEEN SLABS AND THE FOUNDATION.
- HOLDOWNS:  
HOLDOWNS NOTED OCCUR AT THE LEVEL OF FRAMING SHOWN FOR CONNECTION OF WALLS ABOVE TO FOOTING.  
A. ALL HOLDOWN MEMBERS IN CONTACT WITH P.T. MATERIAL SHALL BE HOT-DIP GALVANIZED. USE HOT-DIPPED GALVANIZED ANCHOR BOLTS WITH 3" x 3" x 1/4" PLATE WASHERS. PLAIN CARBON STEEL FASTENERS IN SBX/DOT AND ZINC BORATE PRESERVATIVE-TREATED WOOD SHALL BE PERMITTED.  
B. ALL HOLDOWNS SHALL BE INSTALLED WITH ANCHORS PER DETAIL (112) SD1  
C. CONTRACTOR SHALL REVIEW HOLDOWN ANCHOR REQUIREMENTS FOR EMBEDMENT CONDITIONS THAT REQUIRE DEEPENED STEM WALL. REFER TO (112) SD1 FOR REQUIREMENTS.  
D. PROVIDE POSTS AT ALL HOLDOWNS 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 HOLDOWN PER FRAMER SHALL CONFIRM LAYOUT BEFORE CONCRETE IS POURED. NOTIFY ENGINEER OF CONFLICTS PRIOR TO PROCEEDING.
- CONTRACTOR SHALL REVIEW HOLDOWN ANCHOR REQUIREMENTS FOR EMBEDMENT CONDITIONS THAT REQUIRE DEEPENED FTG. REFER TO (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

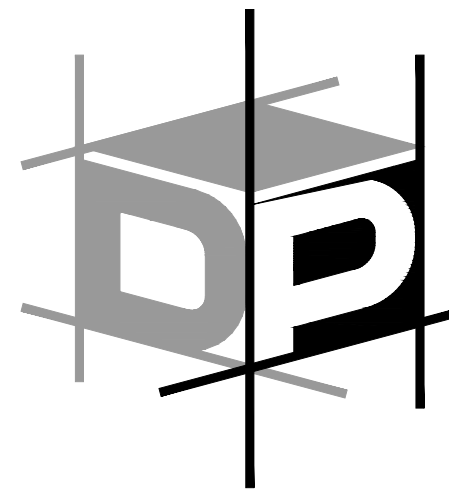
## ROOF FRAMING NOTES

- 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:  
A. **DROPPED:** BEAM IS SET BELOW ROOF FRAMING WITH TOP OF BEAM SET AT BOTTOM OF ROOF FRAMING.  
B. **DOWNSSET:** BEAM IS DEEPER THAN THE ROOF FRAMING AND SET WITH TOP OF BEAM EQUAL TO TOP OF ROOF FRAMING. BOTTOM OF BEAM EXTENDS BELOW ROOF FRAMING.  
C. **UPSET:** BEAM IS DEEPER THAN THE ROOF FRAMING AND SET WITH BOTTOM OF BEAM EQUAL TO BOTTOM OF ROOF FRAMING. TOP OF BEAM EXTENDS ABOVE ROOF FRAMING.  
D. **"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:  
RAFTERS SHALL BE SIZED AS SPECIFIED ON THE ROOF PLAN. DOUBLE RAFTERS AND RAFTER HEADERS SHALL BE PROVIDED AROUND ALL OPENINGS IN THE ROOF. DOUBLE RAFTERS BELOW DORMER AND OTHER ROOF MOUNTED WALLS. RAFTER FRAMING SHALL BE PER THE FOLLOWING SCHEDULE, AND SPACED AT 2'-0" MAX. ON CENTER AS SHOWN ON THESE PLANS. SEE TYPICAL ROOF RAFTER DETAILS ON SHEET SD4 FOR TYPICAL DETAILING.

| MAX. (HORIZ.) SPAN | JOIST TYPE (U.N.O.) | SPACING, U.N.O. |
|--------------------|---------------------|-----------------|
| 15'-6"             | 2x10 D.F. No. 2     | 2'-0" O.C.      |
|                    |                     |                 |
|                    |                     |                 |
|                    |                     |                 |
|                    |                     |                 |

- RAFTER SIZES ABOVE ARE MINIMUM. USE LARGER RAFTERS IF NOTED ON THE FRAMING PLANS OR AS REQUIRED ON THE ARCHITECTURAL PLANS FOR INSULATING PURPOSES, EXPOSED, ETC.
- BLOCKING OF EQUAL DEPTH OF THE RAFTERS SHALL BE PROVIDED BETWEEN ALL RAFTERS AT THEIR SUPPORTS.
- USE (3) 16d AT 16" O.C. TO NAIL DOUBLE MEMBERS TOGETHER OR 3/4" DIA. THRU BOLTS AT 16" O.C. TO BOLT THREE OR MORE MEMBERS TOGETHER U.N.O.
- MANUFACTURED BEAM FRAMING:  
ALL MANUFACTURED WOOD BEAMS SHALL BE MANUFACTURED BY "TRUS 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.  
A. PLYWOOD SHEETS LOCATED AT ROOF EDGES OR CHANGES IN FRAMING SHALL BE AT LEAST 24 INCHES WIDE OR SHALL BE EDGE BLOCKED AND NAILED. EDGE NAIL PLYWOOD TO ALL GABLE AND SHEAR TRUSSES (TRUSSES WITH DRAG LOADS).  
B. EDGE NAIL ROOF PLYWOOD TO ALL DRAG MEMBERS (RAFTERS OR BEAMS w/ HORIZ. STRAPS).
- SUPPORT OF BEAMS, HIPS, GIRDERS, ETC.:  
INSTALL POSTS (POST SIZE TO MATCH BEAM AND WALL SIZE), MINIMUM BELOW ALL ROOF BEAMS AND GIRDERS. CONTRACTOR SHALL VERIFY FRAMING LAYOUT TO ENSURE CONTINUOUS AND SOLID BLOCKING UNDER ALL CONCENTRATED LOADS.
- CRICKETS AND/OR CALIFORNIA (BUILT-UP FRAMING):  
CRICKETS AND/OR CALIFORNIA FRAMING SHALL BE CONSTRUCTED WITH 2x6 MEMBERS AT 24" O.C. SUPPORTED TO THE ROOF BELOW AT 48 INCHES ON CENTER. ROOF PLY SHALL CONTINUE BELOW CRICKETS AND/OR CALIFORNIA FRAMING.
- HEADERS:  
WINDOW AND DOOR HEADERS SHALL CONFORM TO THE HEADER SCHEDULE, U.N.O. ON THE PLAN (210) SD2
- TOP PLATE SPLICES:  
TOP PLATE SPLICES OF ALL WALLS SHALL CONFORM TO DETAIL (209) SD2  
INSTALL CS14 x 3'-0" LONG STRAPS AT TOP PLATE SLOPE CHANGES AND OTHER DISCONTINUOUS TOP PLATE CONDITIONS.
- TOP CONNECTORS SHALL BE INSTALLED AT EXTERIOR WALL TOP PLATES AT 4'-0" O.C. MINIMUM WHERE SHEAR IS NOT NOTED ON PLANS.**
- SEE GENERAL NOTES FOR ADDITIONAL REQUIREMENTS. ALL DETAIL CALLOUTS SHALL BE CONSIDERED TYPICAL. THE CONTRACTOR SHALL REVIEW THE DETAIL SHEETS FOR DETAILS NOT SPECIFICALLY REFERENCED.
- SHEARWALLS AT OPENING TRIMMERS:  
WHERE SHEARWALL LENGTH SPECIFIED ON PLANS REQUIRES EDGE NAILING TO WINDOW AND/OR DOOR TRIMMERS, REFER TO DETAIL (108) SD1
- SHEARWALLS:  
LENGTHS OF SHEARWALLS ARE SHOWN ABOVE OR BELOW SHEARWALL NUMBER (SEE PLAN). THE NUMBERS INDICATE THE MIN. DESIGN LENGTH OF THE SHEARWALL. SEE (103) SD1
- HOLDOWN STRAPS  
WHERE HOLDOWN STRAPS ARE SPECIFIED ON PLANS, INSTALL PER DETAIL (112) SD1 (113) SD1

A. ALL NAIL HOLES SHALL BE FILLED ON HOLDOWN STRAPS



## ADVANCED ENGINEERING

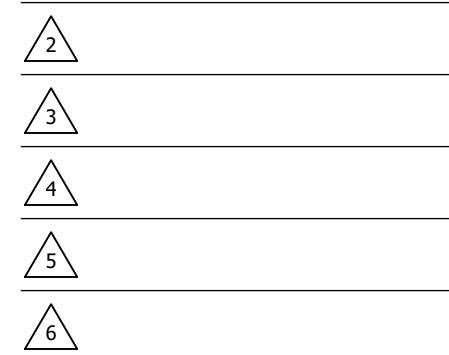
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DANVILLE, CALIFORNIA

PLAN CHECK RESPONSES 04-19-23



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Sheet Description:  
STRUCTURAL ROOF FRAMING  
PLAN AND FOUNDATION PLAN

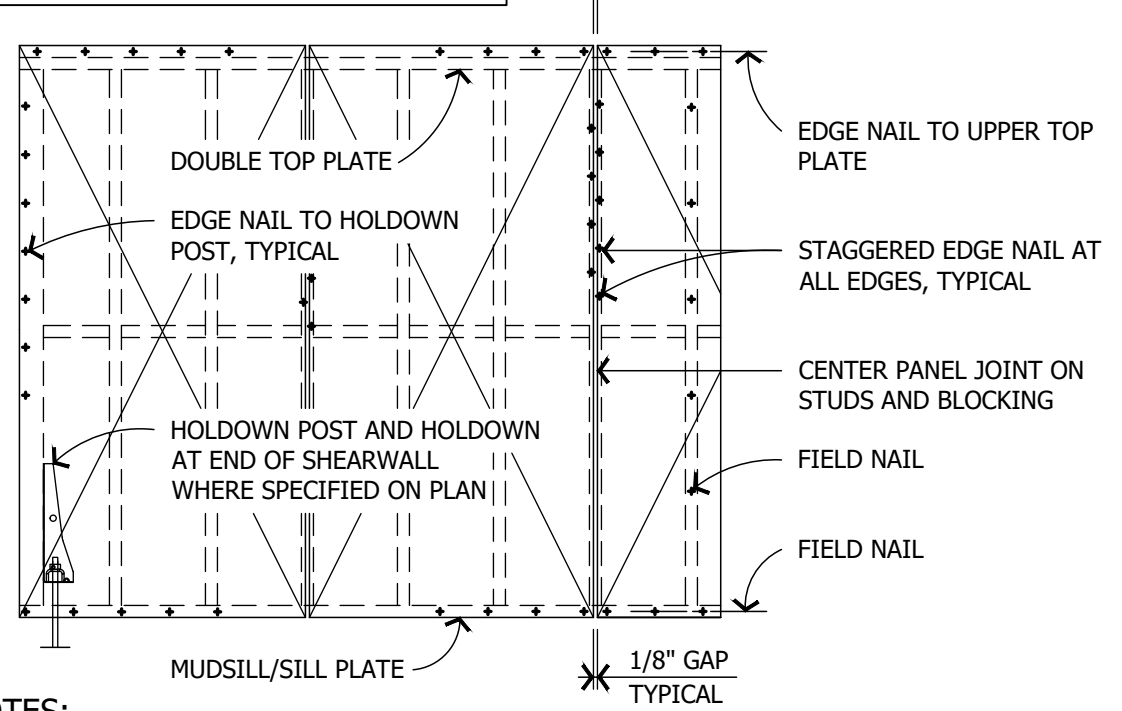
Scale: 1/4" = 1'-0"  
Initial Issue Date: March 24, 2023  
Drawn By: E. Bennett  
Project Designer: J. Peek  
Project Manager: J. Peek Ext. 23  
Job No. G010120

Sheet No.

S1



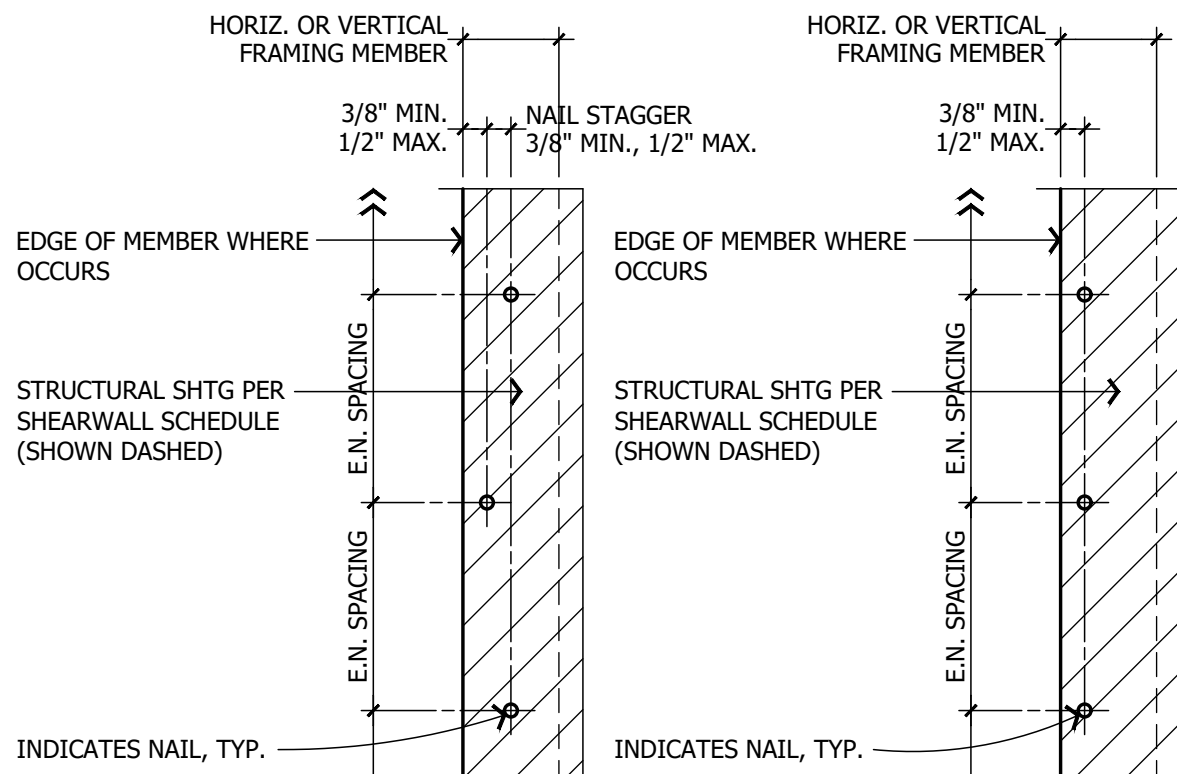
SHEETS MAY BE PLACED HORIZONTALLY (NOT SHOWN), PROVIDE BLOCKING AT ALL EDGES.



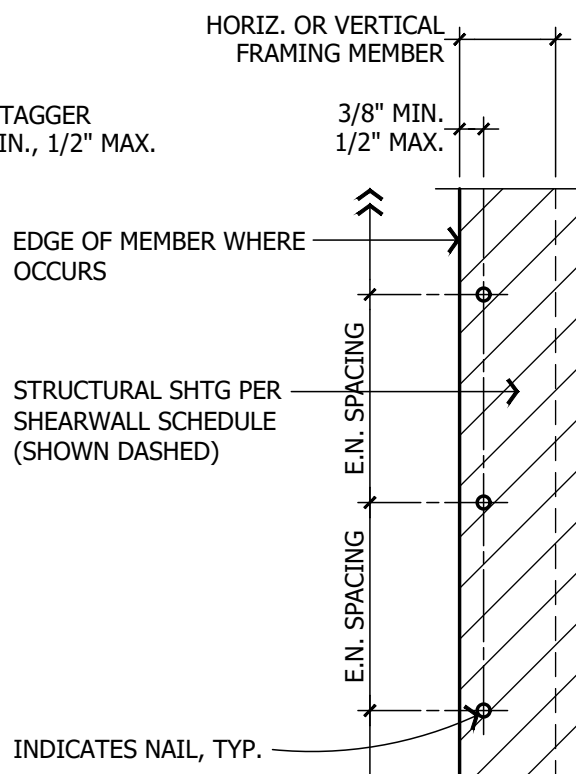
NOTES:

- SEE SHEARWALL SCHEDULE FOR REQUIRED SHEATHING, NAILING, AND SILL CONNECTIONS.
- FOR LOCATION OF TIEDOWNS AND TD POSTS, SEE TYPICAL DETAILS ON SHEET SD2.

101 TYP. SHEARWALL ELEVATION



104A STAGGERED NAILING AT SPACING OF 3" OR LESS



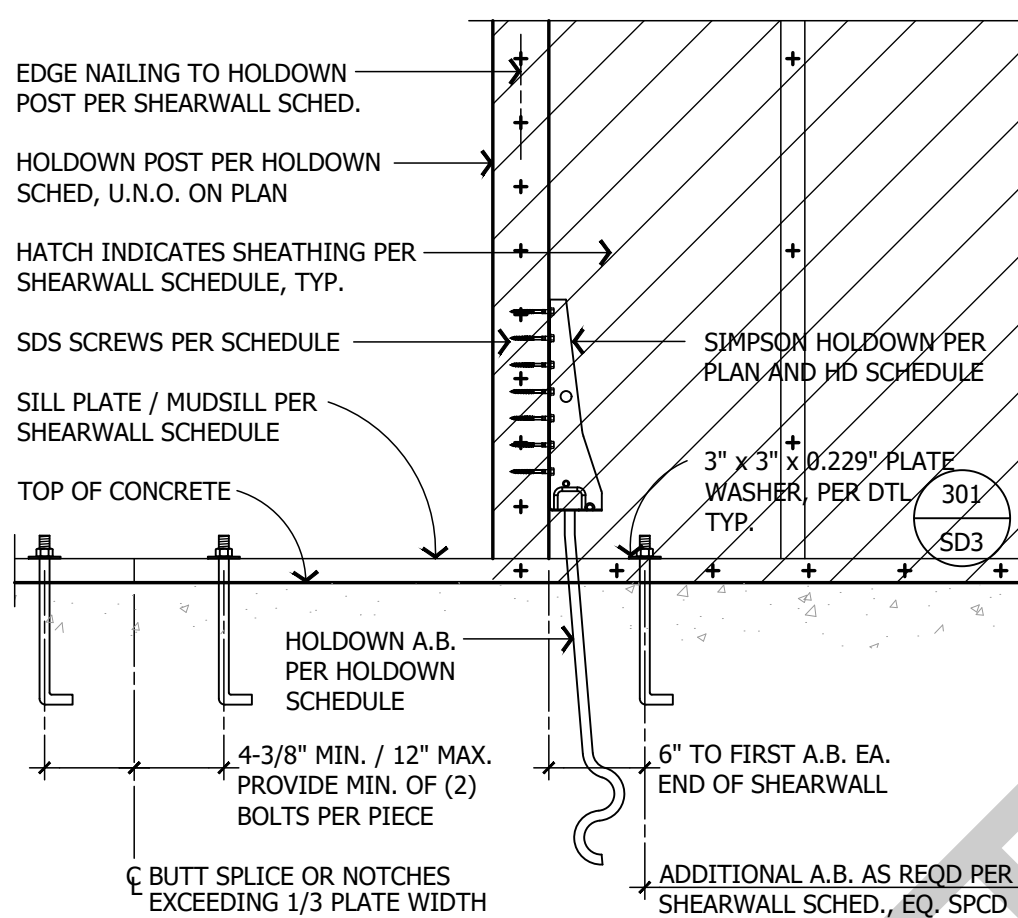
104B STANDARD NAILING AT SPACE OF 4" OR GREATER

104 TYP. SHEARWALL EDGE NAIL PATTERN

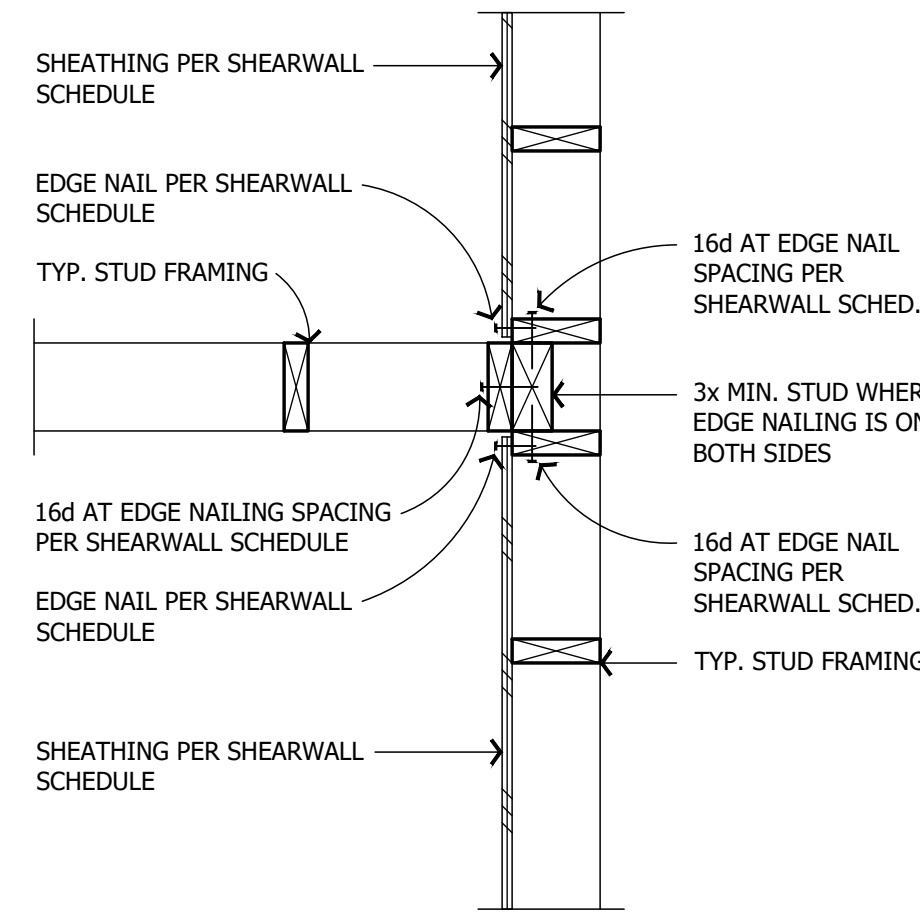
| ALTERNATIVE MUDSILL ANCHORAGE                                                                                                          |                           |                             |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------|--|--|
| THE FOLLOWING ALTERNATIVE ANCHORAGE MAY BE INSTALLED IN LIEU OF 5/8" DIA. ANCHOR BOLTS NOTED IN THE SHEARWALL SCHEDULE AND PLAN NOTES. |                           |                             |  |  |
| SHEARWALL DESIGNATION                                                                                                                  | "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 |  |  |

- SIMPSON "MASA" ANCHORS SHALL BE INSTALLED PER ICC REPORT NO. ESR-2555.
- SIMPSON TITEN HD ANCHORS SHALL BE INSTALLED PER ICC REPORT NO. ESR-2713.

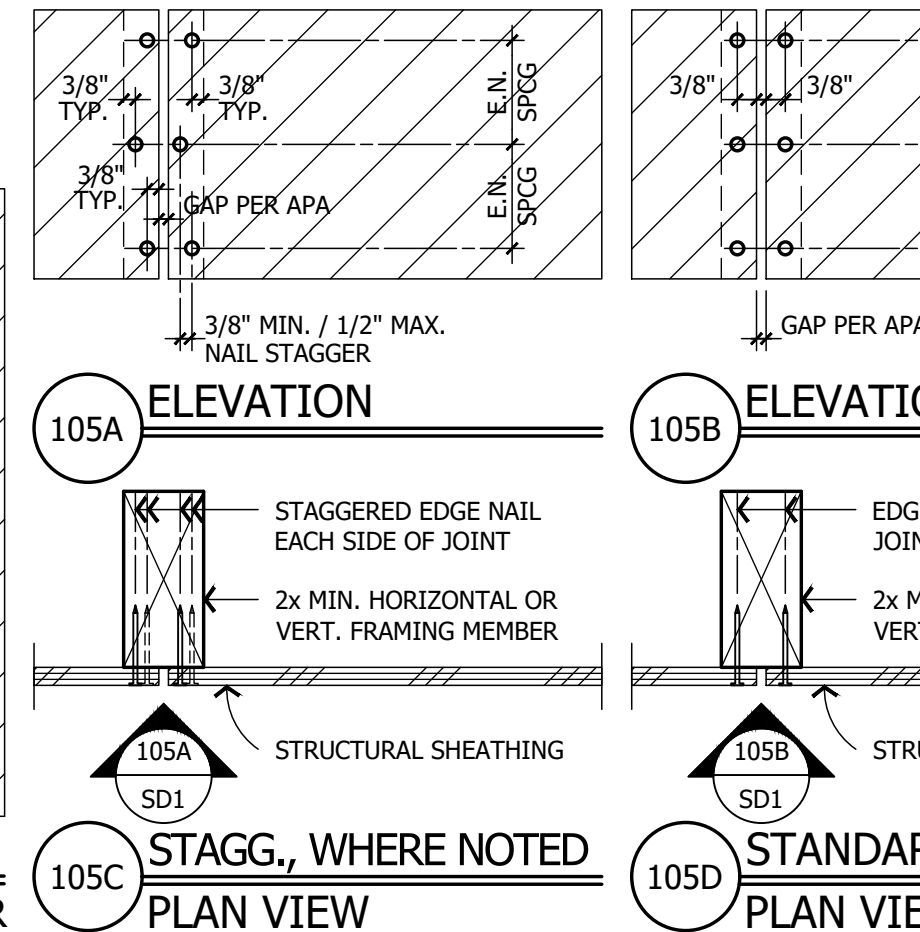
109 ALTERNATIVE MUDSILL ANCHORAGE



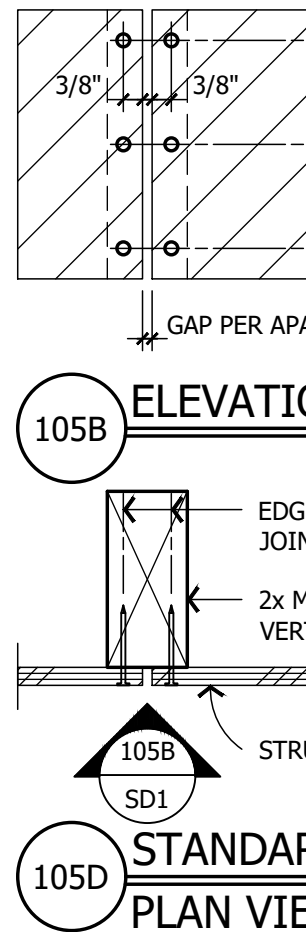
113 TYPICAL HOLDOWN AND HOLDOWN ANCHOR BOLT INSTALLATION



102 SHEARWALL INTERSECTION PLAN

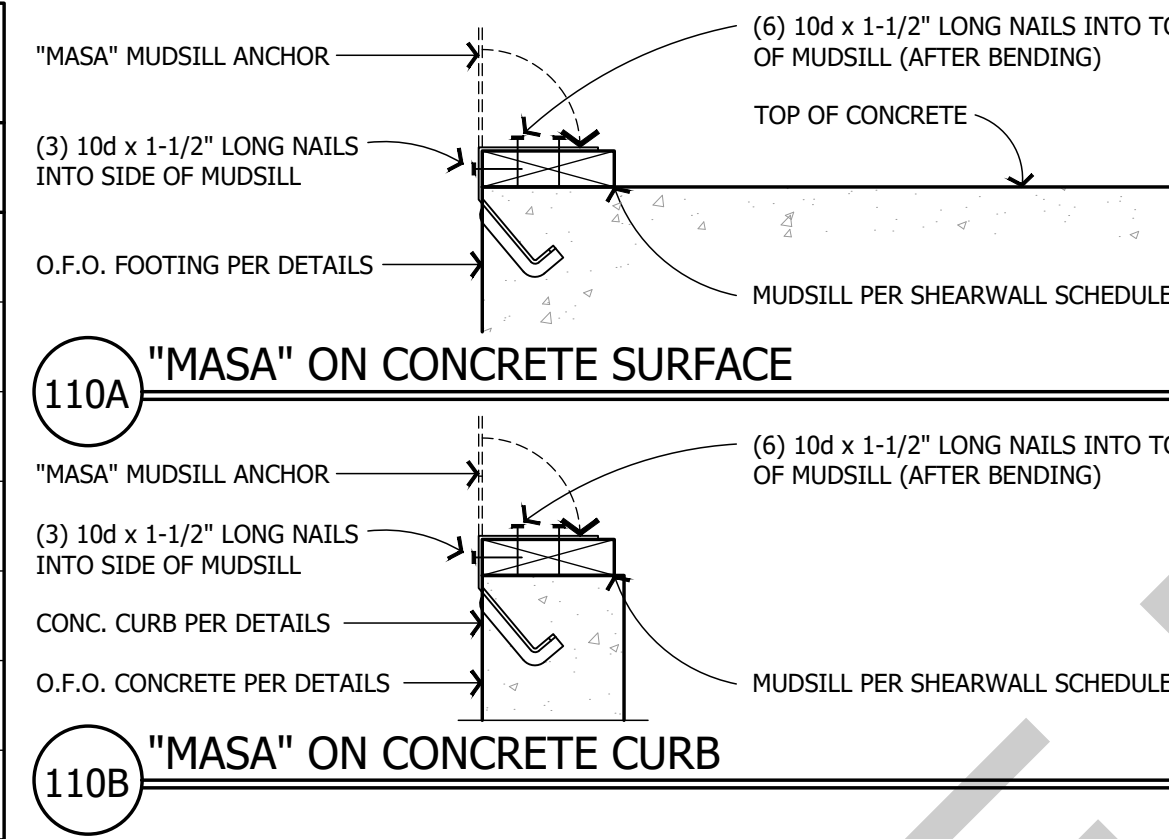


105A ELEVATION



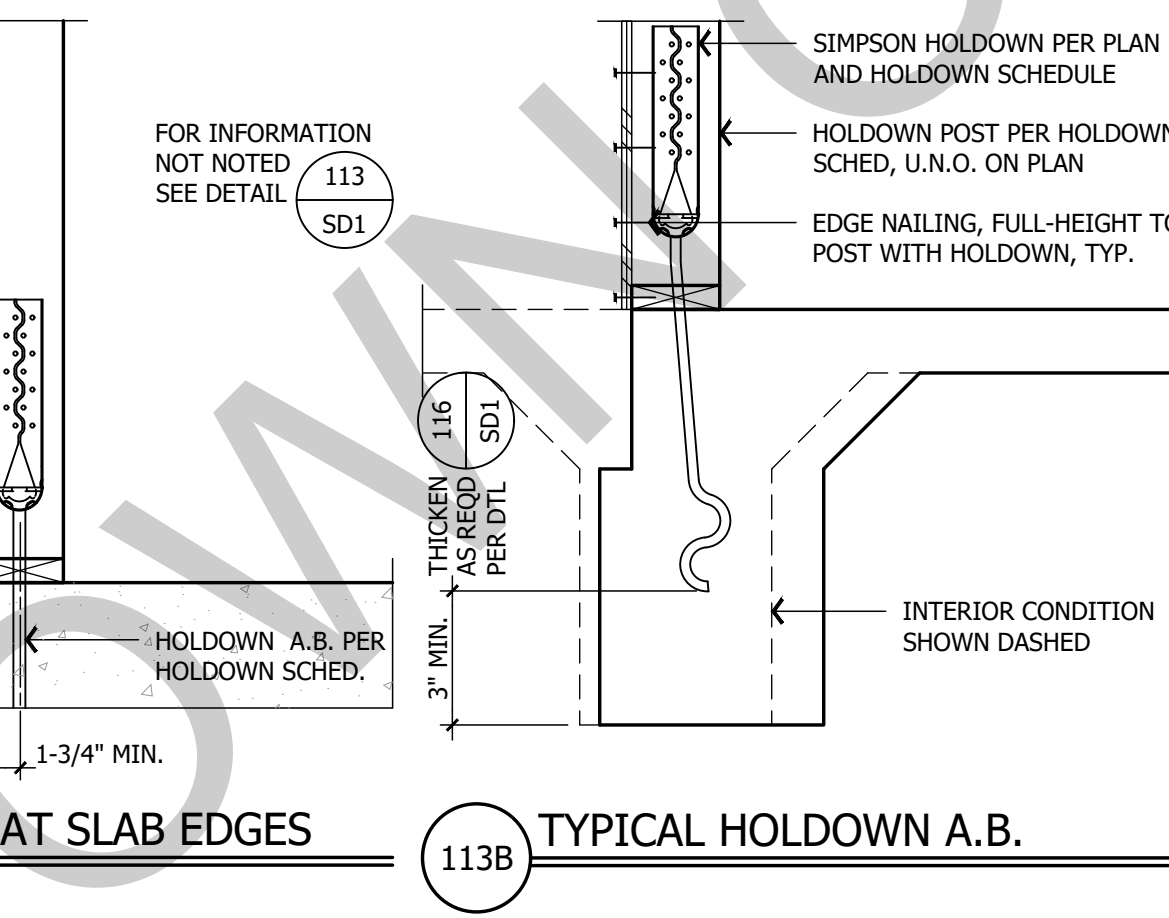
105B ELEVATION

105 SHEARWALL SHEATHING AT JOINT



- FULL LOADS APPLY FOR SPALLS UP TO A MAX OF 1-1/4\"/>
- MINIMUM "MASA" END DISTANCE IS 4\"/>

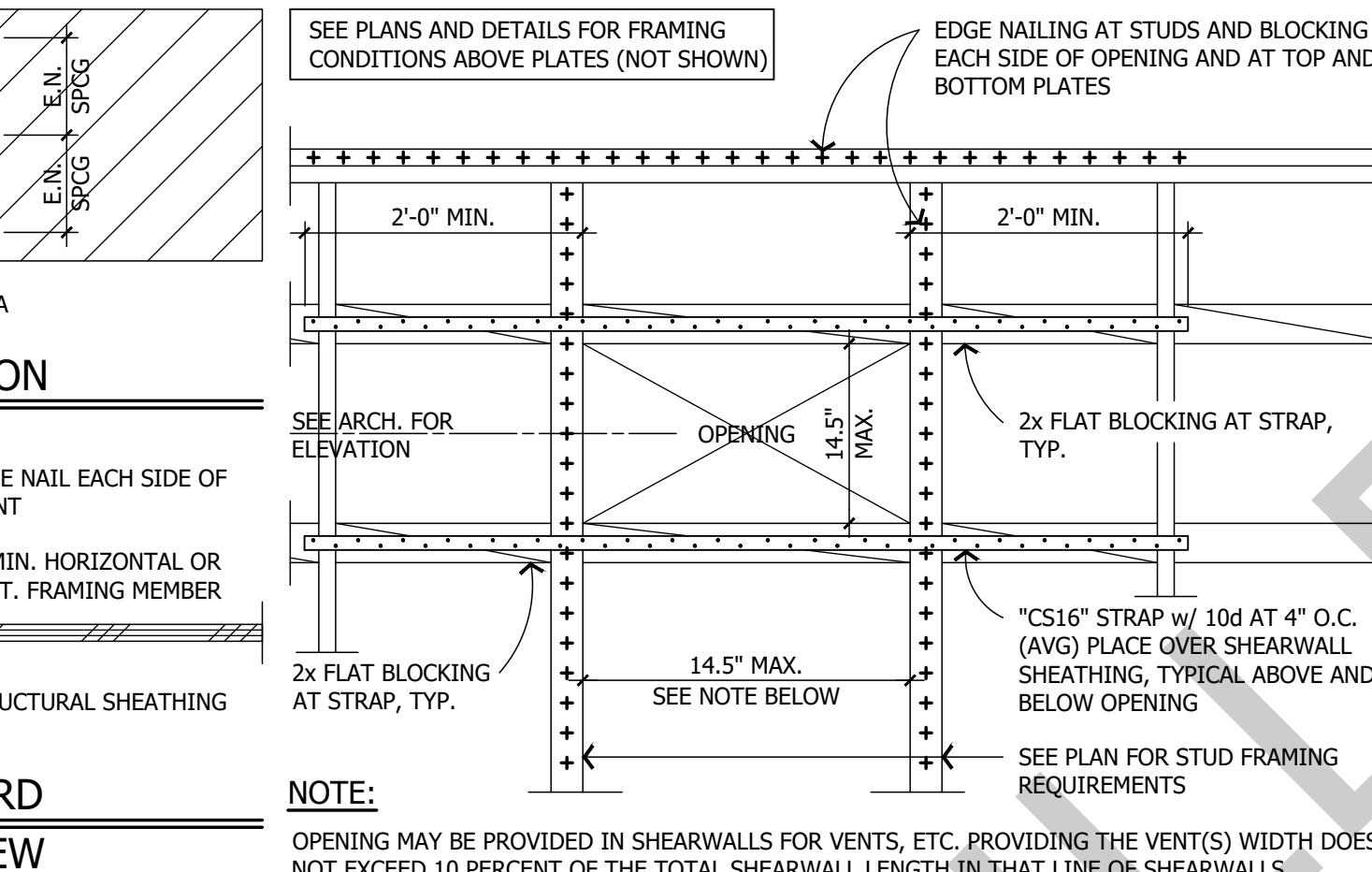
110 MASA ANCHORAGES



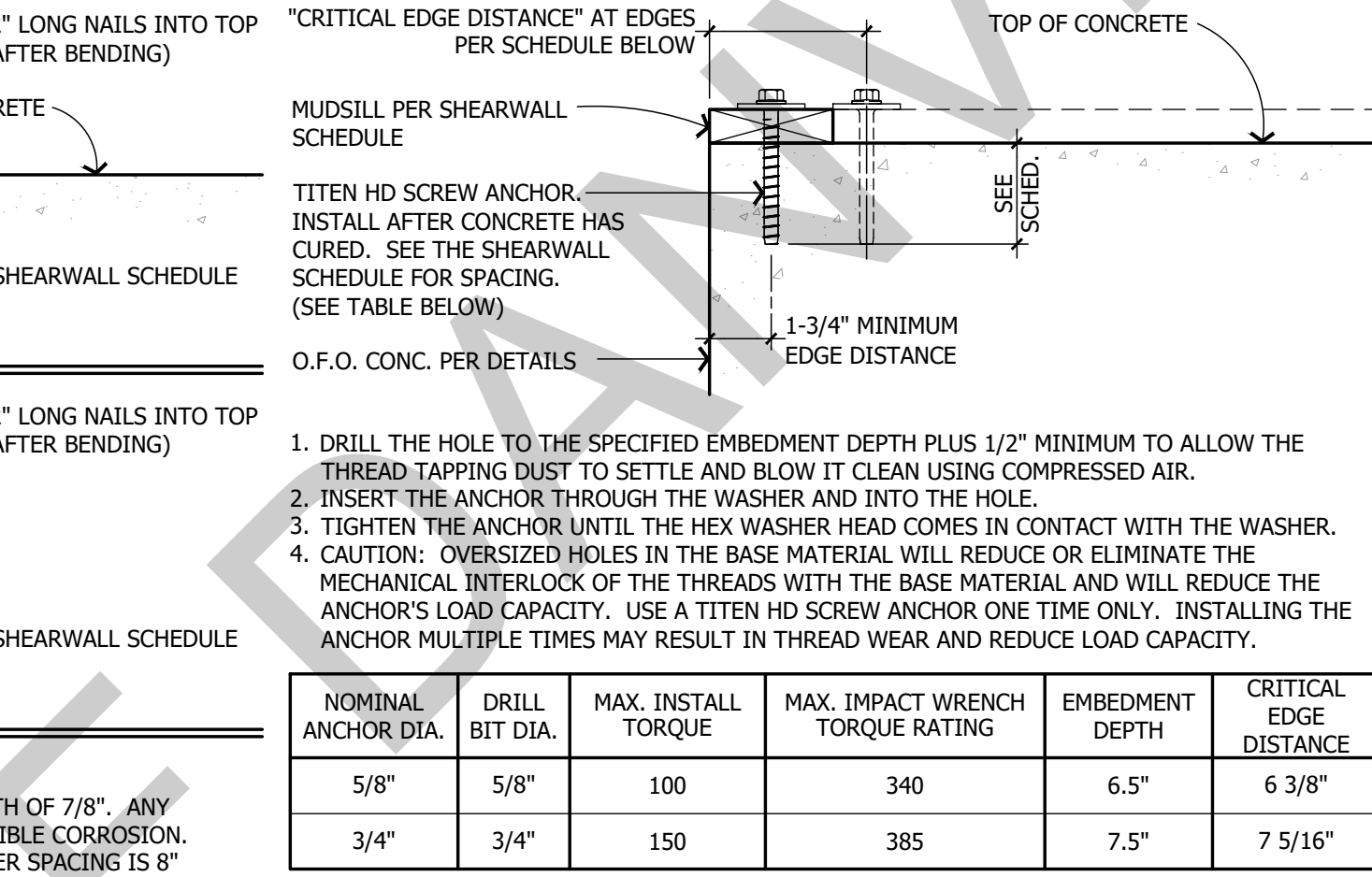
113A AT SLAB EDGES

| SHEARWALL LENGTH: SHEARWALL DESIGNATION: | X"-X" SW-1                    | X"-X" SW-2                    | X"-X" SW-3                             | X"-X" SW-4                                     | X"-X" SW-5                                    |
|------------------------------------------|-------------------------------|-------------------------------|----------------------------------------|------------------------------------------------|-----------------------------------------------|
| APA RATED SHEATHING:                     | 3/8"                          | 3/8"                          | 3/8"                                   | 3/8"                                           | 3/8" STR. 1                                   |
| 8d EDGE NAIL (0.131 DIA.):               | 8d @ 6" O.C.                  | 8d @ 4" O.C.                  | 8d @ 3" O.C.                           | 8d @ 2" O.C.                                   | 8d @ 2" O.C.                                  |
| 8d FIELD NAIL (0.131 DIA.):              | 8d @ 12" O.C.                 | 8d @ 12" O.C.                 | 8d @ 12" O.C.                          | 8d @ 12" O.C.                                  | 8d @ 12" O.C.                                 |
| FRAMING MEMBER AT ADJOINING PANEL EDGES: | SINGLE 2x                     | SINGLE 2x                     | SINGLE 3x, 4x OR 2-2x w/ 10d @ 3" O.C. | SINGLE 3x OR 4x                                | SINGLE 3x OR 4x                               |
| 3x SILL REQUIRED:                        | NO                            | NO                            | NO                                     | NO                                             | NO                                            |
| SILL CONN. (BEAM/BLKG):                  | 16d @ 6" O.C. SDS @ 24" O.C.  | 16d @ 4" O.C. SDS @ 18" O.C.  | 16d @ 4" O.C. SDS @ 12" O.C.           | 16d @ 3" O.C. STAGGERED SDS @ 10" O.C.         | 16d @ 2" O.C. STAGGERED SDS @ 8" O.C.         |
| SILL CONNECTION (RIM):                   | 16d @ 6" O.C. SDS @ 24" O.C.  | 16d @ 4" O.C. SDS @ 18" O.C.  | 16d @ 4" O.C. SDS @ 12" O.C.           | 16d @ 4" O.C. & LTPS @ 36" O.C. SDS @ 10" O.C. | 16d @ 4" O.C. & LTPS @ 24" O.C. SDS @ 8" O.C. |
| 5/8" A.B. W/ 2x MUDSILL:                 | @ 48" O.C. MAX @ 48" O.C. MAX | @ 42" O.C. MAX @ 42" O.C. MAX | @ 36" O.C. MAX @ 36" O.C. MAX          | @ 28" O.C. MAX @ 30" O.C. MAX                  | @ 24" O.C. MAX @ 30" O.C. MAX                 |
| TOP CONNECTION - "RBC"                   | @ 20" O.C. MAX                | @ 12" O.C. MAX                | @ 10" O.C. MAX                         | @ 8" O.C. MAX                                  | @ 6" O.C. MAX                                 |
| TOP CONNECTION - "LTP4"                  | @ 24" O.C. MAX                | @ 18" O.C. MAX                | @ 12" O.C. MAX                         | @ 10" O.C. MAX                                 | @ 8" O.C. MAX                                 |
| TOP CONNECTION - "LS50"                  | @ 24" O.C. MAX                | @ 18" O.C. MAX                | @ 12" O.C. MAX                         | @ 10" O.C. MAX                                 | @ 8" O.C. MAX                                 |
| TOP CONNECTION - "A35"                   | @ 30" O.C. MAX                | @ 22" O.C. MAX                | @ 16" O.C. MAX                         | @ 12" O.C. MAX                                 | @ 10" O.C. MAX                                |

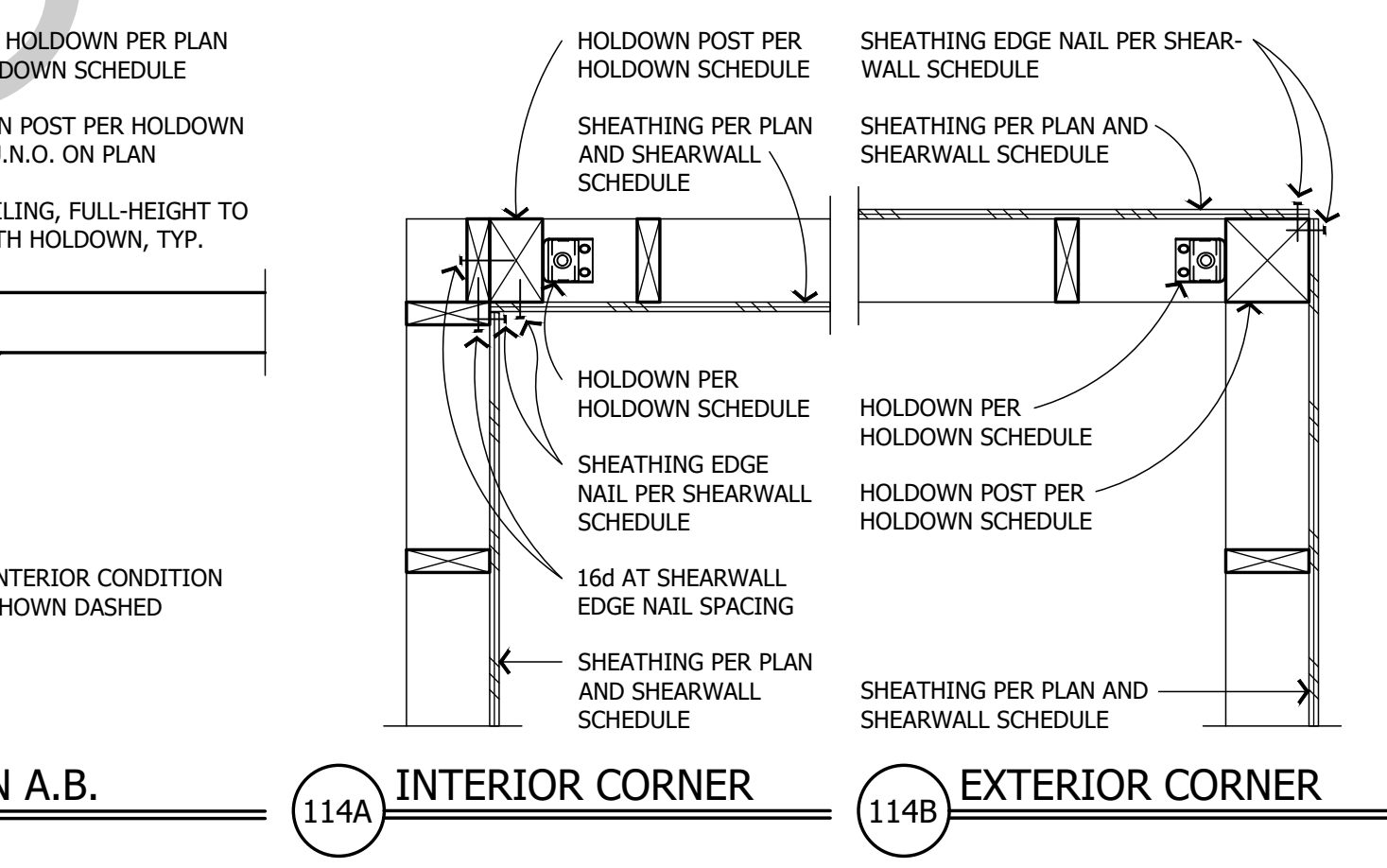
103 SHEARWALL SCHEDULE



106 SMALL OPENING IN SHEARWALL

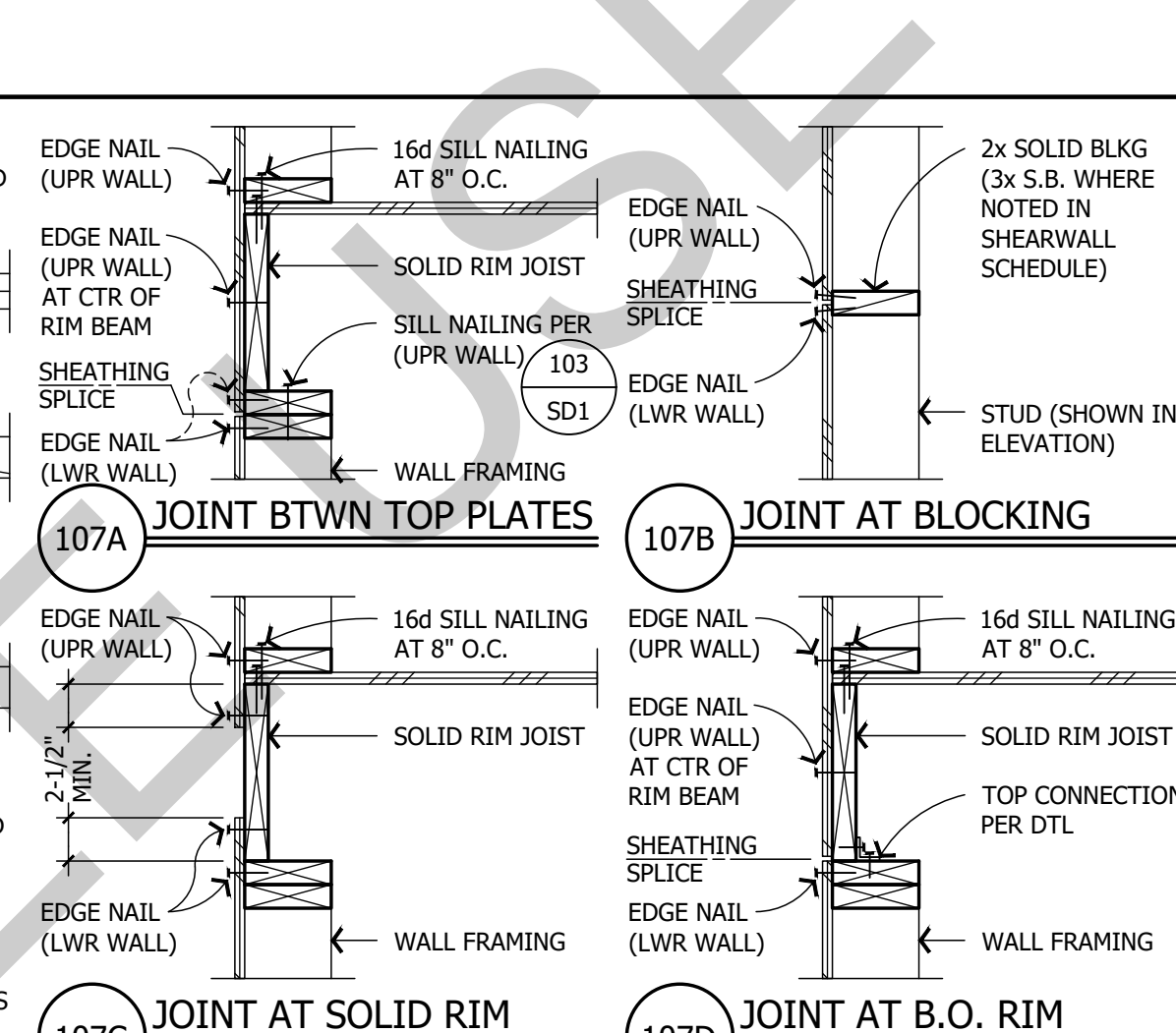


111 "TITEN HD" ANCHORAGE & NOTES

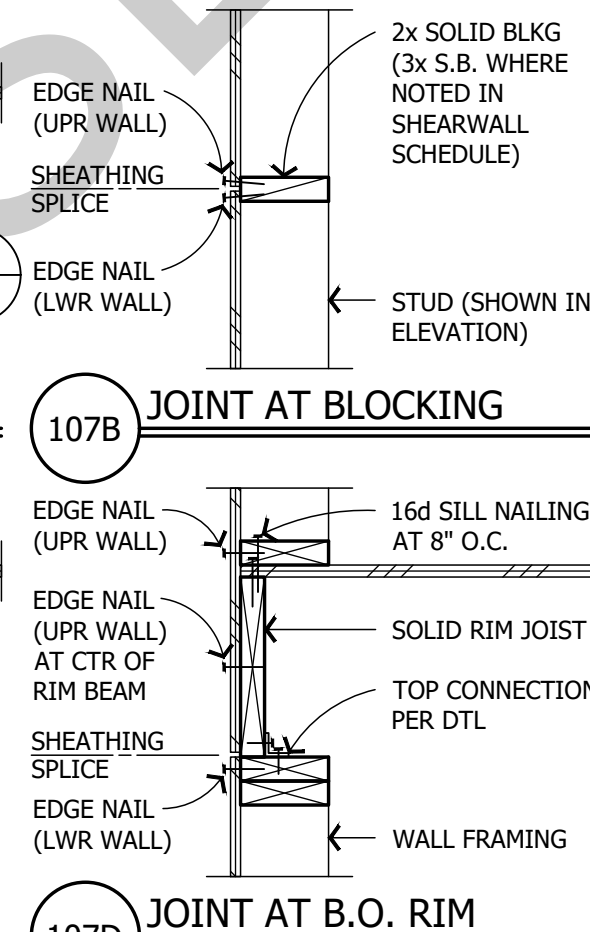


114 HOLDOWN AT SHEARWALL CORNER (PLAN)

| SHEARWALL LENGTH: SHEARWALL DESIGNATION: | X"-X" SW-6                                    | X"-X" SW-7                                    | X"-X" SW-8                                    |
|------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| APA RATED SHEATHING:                     | 15/32" STR. 1                                 | 15/32" STR. 1 EACH FACE                       | 15/32" STR. 1 EACH FACE                       |
| 10d EDGE NAIL (0.148 DIA.):              | 10d @ 2" O.C.                                 | 10d @ 4" O.C.                                 | 10d @ 3" 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 REQUIRED:                        | YES (SEE NOTE 5)                              | YES (SEE NOTE 5)                              | YES (SEE NOTE 5)                              |
| SILL CONN. (BEAM/BLKG):                  | SDS @ 6" O.C. STAGGERED                       | SDS @ 4" O.C. STAGGERED                       | SDS @ 4" O.C. STAGGERED                       |
| SILL CONNECTION (RIM):                   | 16d @ 4" O.C. & LTPS @ 12" O.C. SDS @ 7" O.C. | 16d @ 3" O.C. & LTPS @ 12" O.C. SDS @ 6" O.C. | 16d @ 2" O.C. & LTPS @ 12" O.C. SDS @ 5" O.C. |
| 5/8" A.B. W/ 2x MUDSILL:                 | --                                            | @ 18" O.C. MAX                                | @ 16" O.C. MAX                                |
| TOP CONNECTION - "RBC"                   | @ 6" O.C. MAX                                 | --                                            | --                                            |
| TOP CONNECTION - "LTP4"                  | @ 8" O.C. MAX                                 | @ 6" O.C. MAX                                 | --                                            |
| TOP CONNECTION - "LS50"                  | @ 8" O.C. MAX                                 | @ 6" O.C. MAX                                 | --                                            |
| TOP CONNECTION - "A35"                   | @ 8" O.C. MAX                                 | @ 6" O.C. MAX                                 | @ 6" O.C. MAX                                 |



107A JOINT BTWN TOP PLATES



107B JOINT AT BLOCKING

107C JOINT AT SOLID RIM

- FOR ADDITIONAL EDGE NAIL REQUIREMENTS, SEE DETAIL 104/SD1 AND 105/SD1.
- JOINT FLASHING AT ALL HORIZONTAL SHEATHING JOINTS WHEN EXPOSED TO WEATHER, S.A.D.

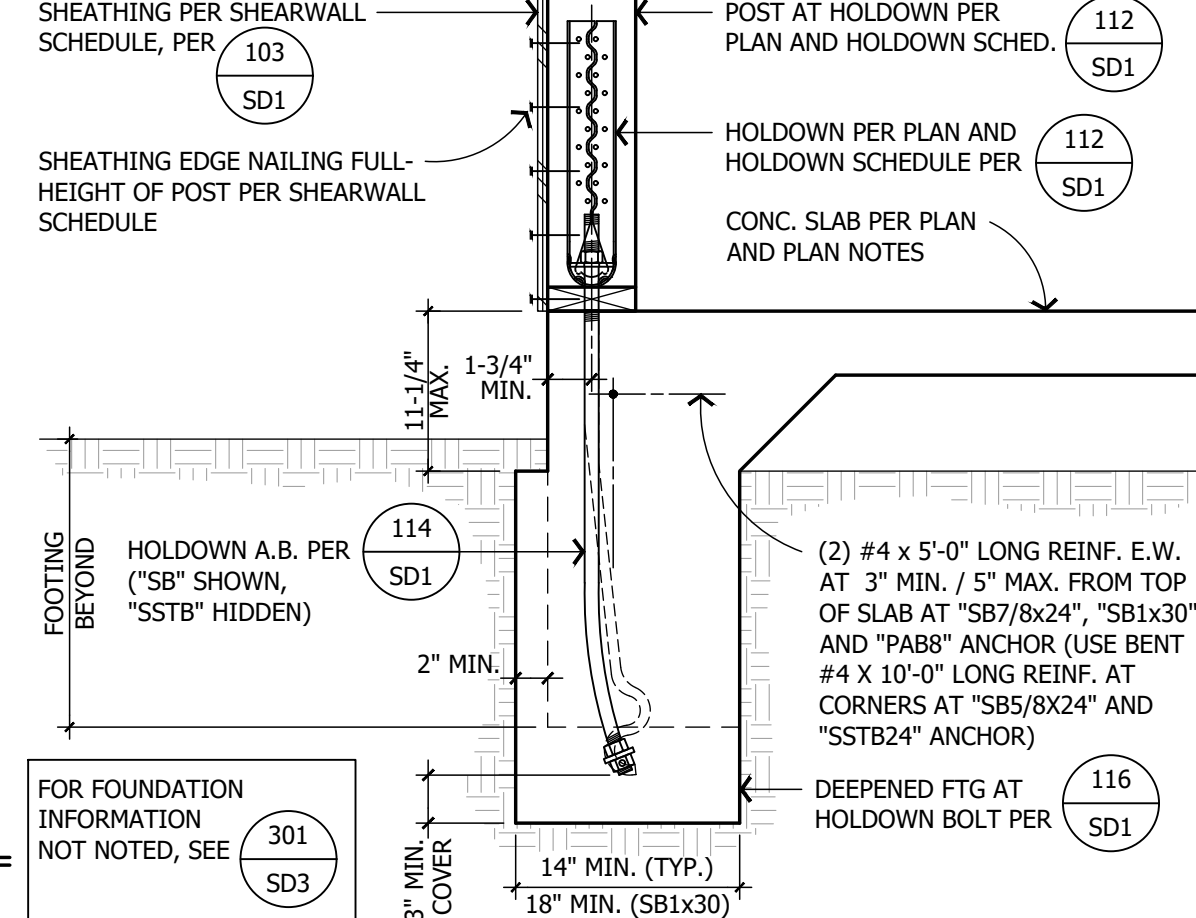
107 SHEATHING JOINT AT RIM OR BLKG

| 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       |

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

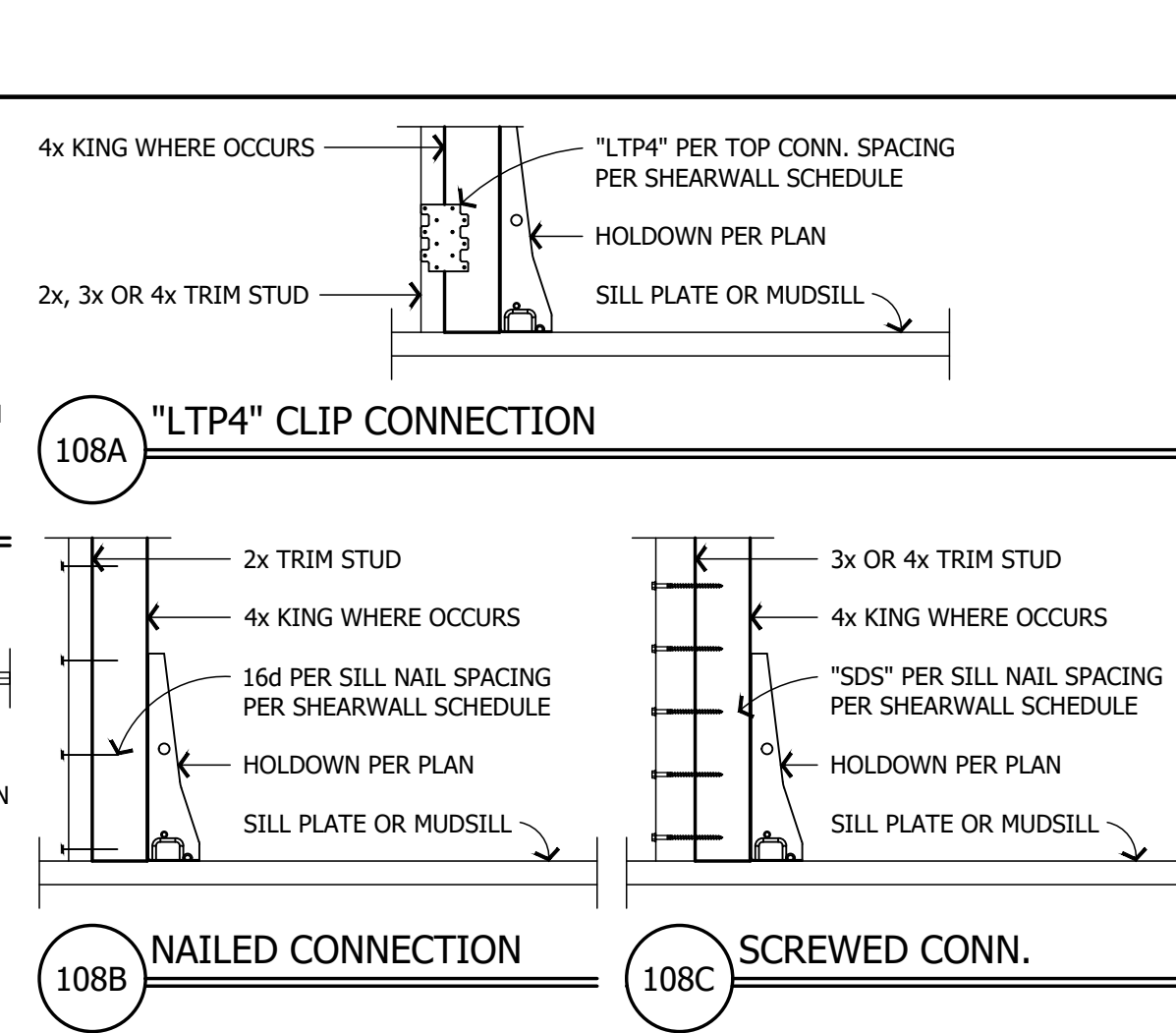
NOTE: A. WHERE NOTED, SB1x30 REQUIRES FOOTING WIDTH TO BE 18" WIDE.

112 SLAB HOLDOWN SCHEDULES



115 HOLDOWN A.B. TO EXTERIOR FOOTING

- APA RATED SHEATHING SHALL BE 4'-0" x 8'-0" MIN. EXPECT AT BOUNDARIES OR AT CHANGES IN FRAMING WHERE A 16" MINIMUM WIDTH IS ALLOWED. ALL PANEL EDGES AND BOUNDARIES SHALL BE NAILED TO 2X FRAMING U.N.O.
- PLYWOOD AND OSB SHALL BE TYPE CDX GRADE OR BETTER (EXCEPT WHERE STRUCTURAL 1 GRADE IS NOTED).
- STR. 1 = STRUCTURAL 1 GRADE PLYWOOD OR O.S.B.
- ALL NAILS SHALL HAVE MINIMUM SHANK DIAMETER AS SPECIFIED IN SCHED.
- GALVANIZED NAILS SHALL BE HOT DIPPED OR TUMBLED.
- ALL FASTENERS THAT ARE INSTALLED INTO OR IN CONTACT WITH PRESSURE TREATED LUMBER ARE TO BE HOT DIPPED GALVANIZED.
- WHEN FASTENERS ARE SPACED LESS THAN 4" ON CENTER, NAILING AT PANEL EDGES SHOULD BE STAGGERED PER DETAIL 104A.
- 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.
- 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 109.
- INSTALL OBL 2x POST MIN. AT END OF SHEARWALLS. SD1.
- SEE DETAIL 203 FOR POST REQUIREMENTS AT HOLDOWNS. SD2.



108A \"LTP4\" CLIP CONNECTION

108B NAILED CONNECTION

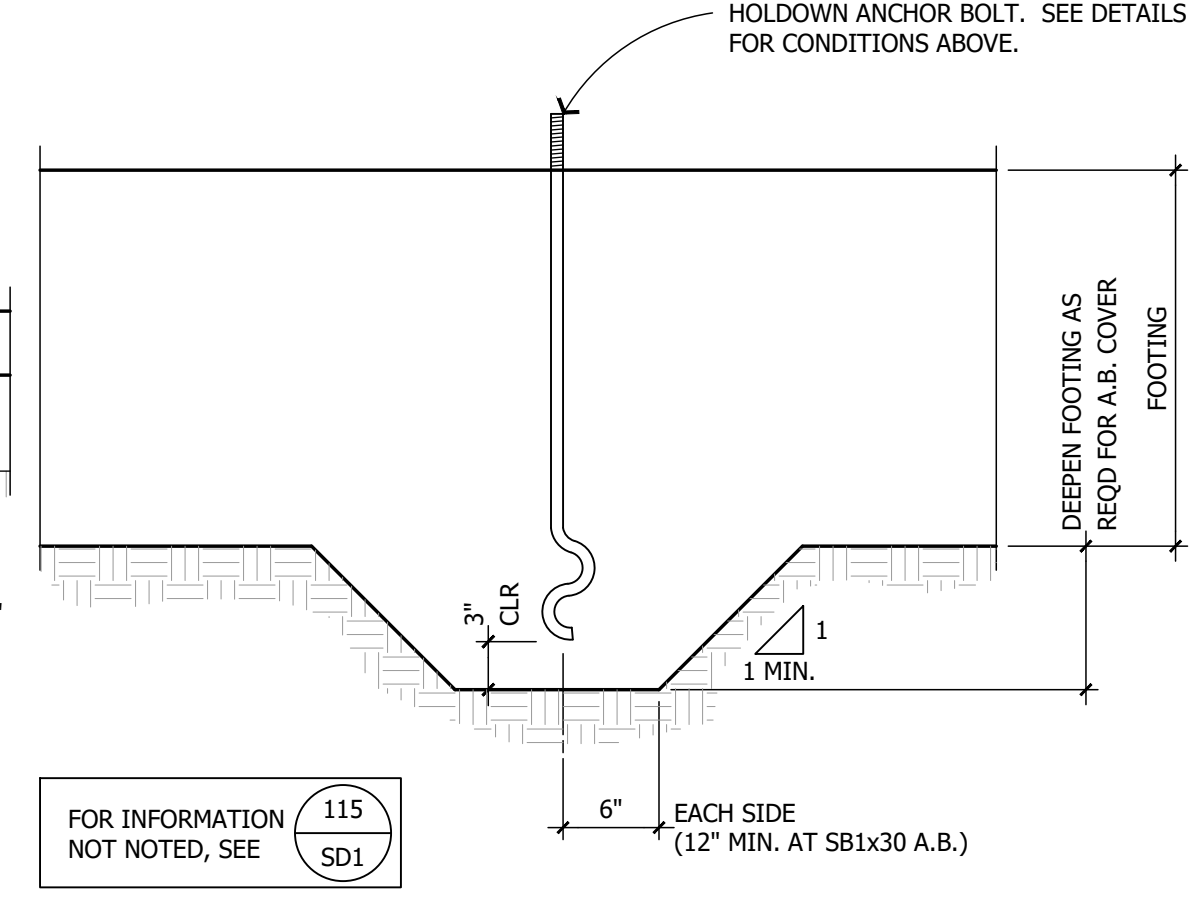
108C SCREWED CONN.

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

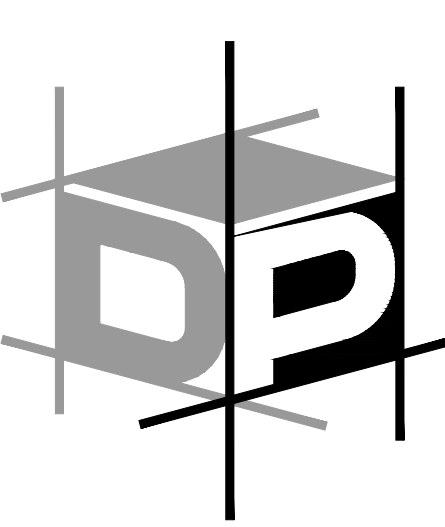
108 TRIM STUD TO HOLDOWN POST

- RE-TIGHTEN ALL BOLTS PRIOR TO SHEARWALL CLOSE-IN.
- DOUBLE 2x HOLDOWN POSTS SHALL BE SISTERED TOGETHER PER SILL NAILING REQUIREMENTS FOR SHEARWALL TYPE. SEE DETAIL FOR MORE INFORMATION.
- CONTRACTOR'S OPTION TO SUBSTITUTE "STHD" TYPE HOLDOWNS:

| 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    |



116 DEEPENED FOUNDATION (FOR A.B.)



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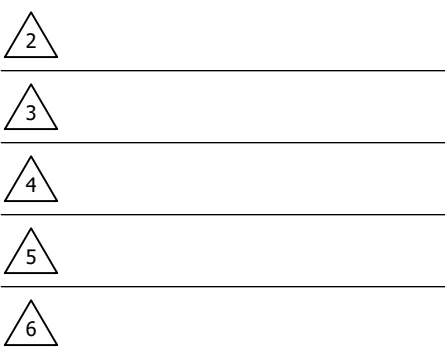
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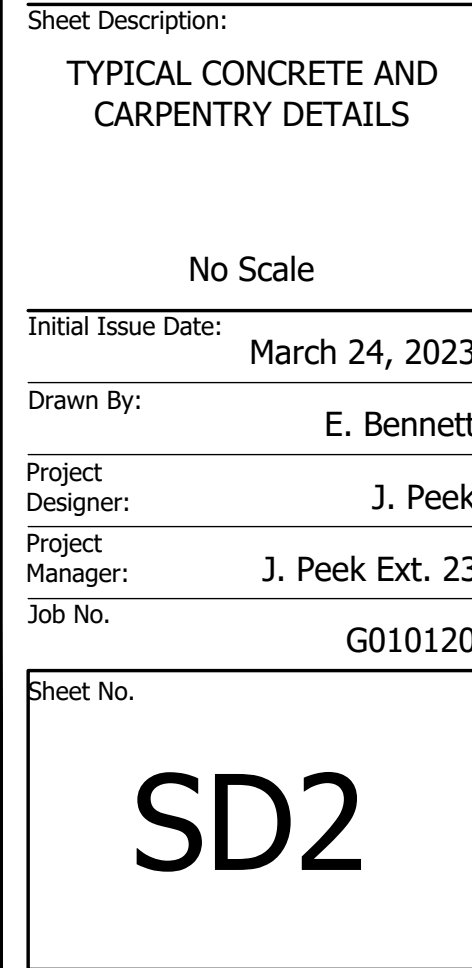
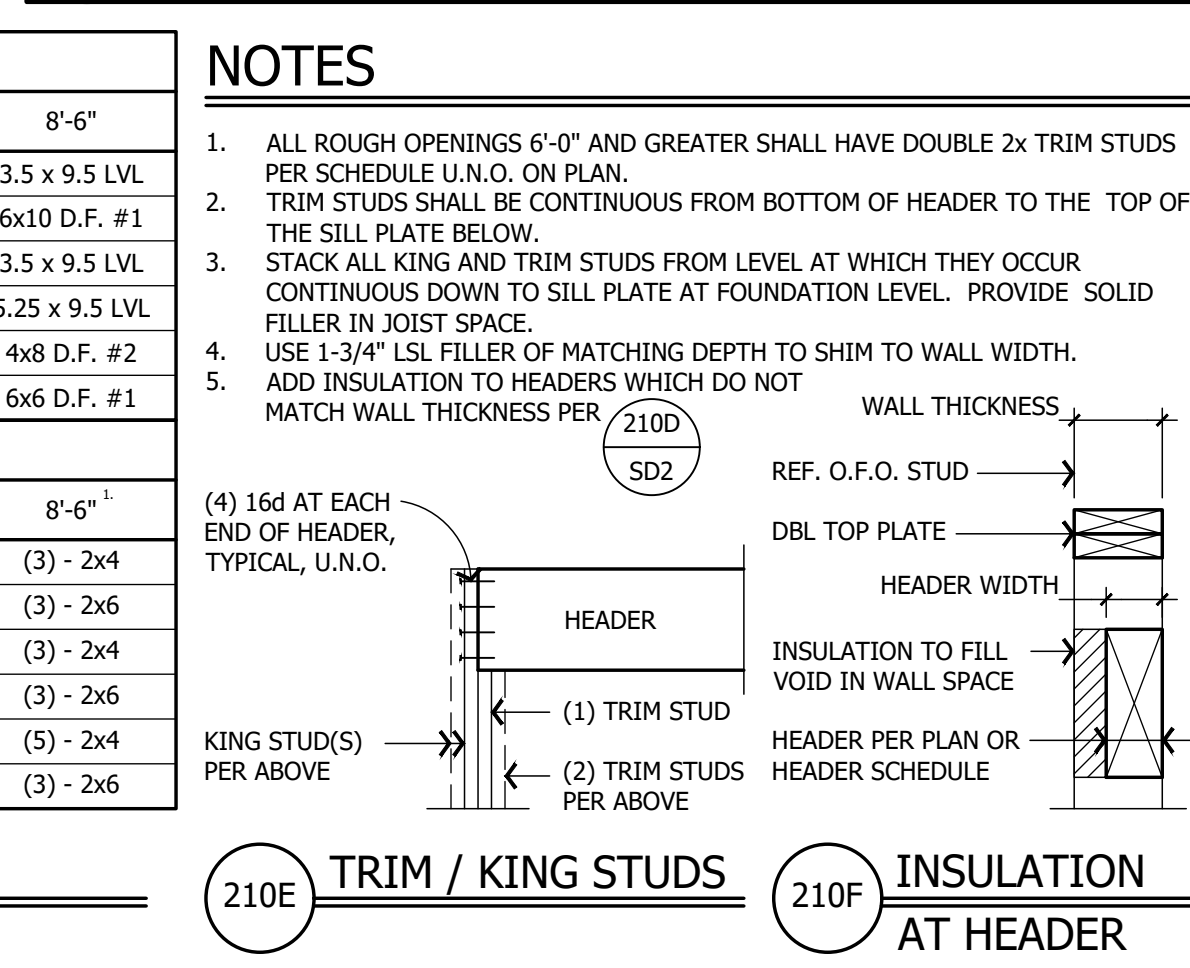
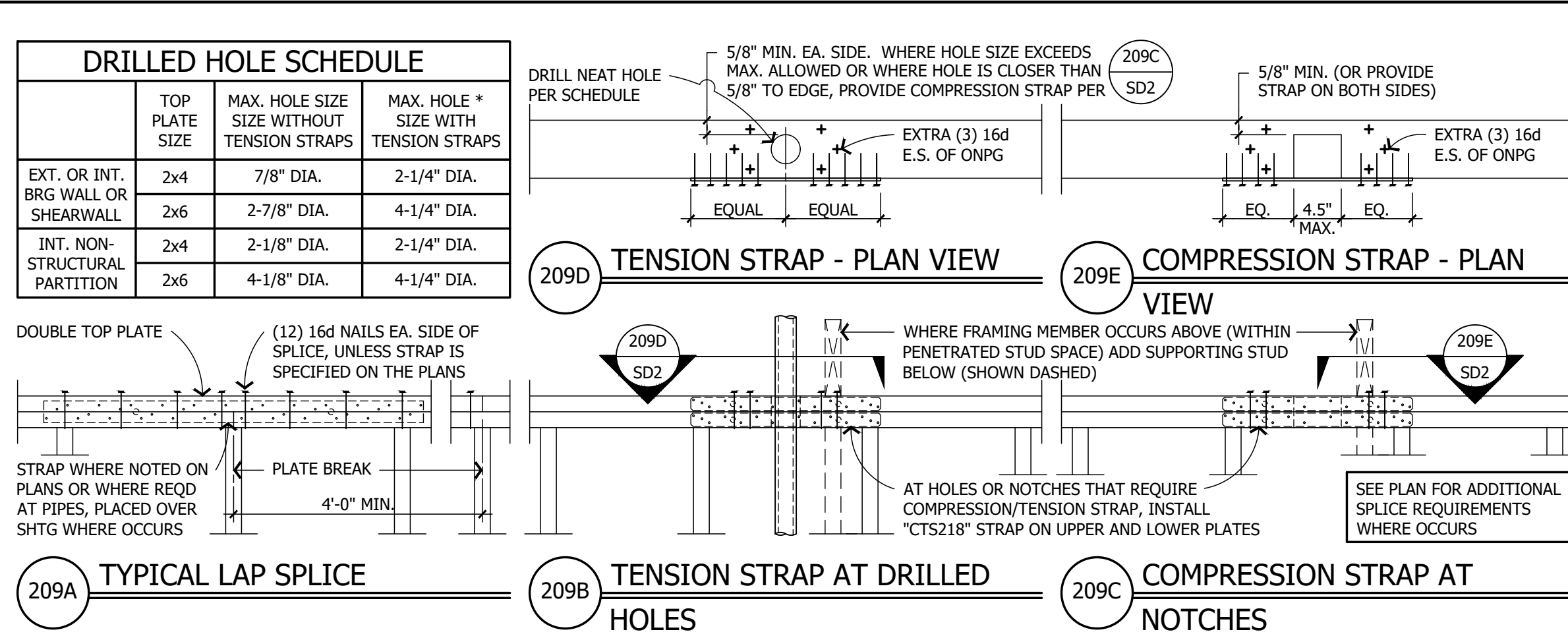
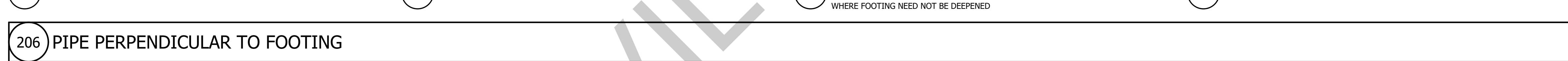
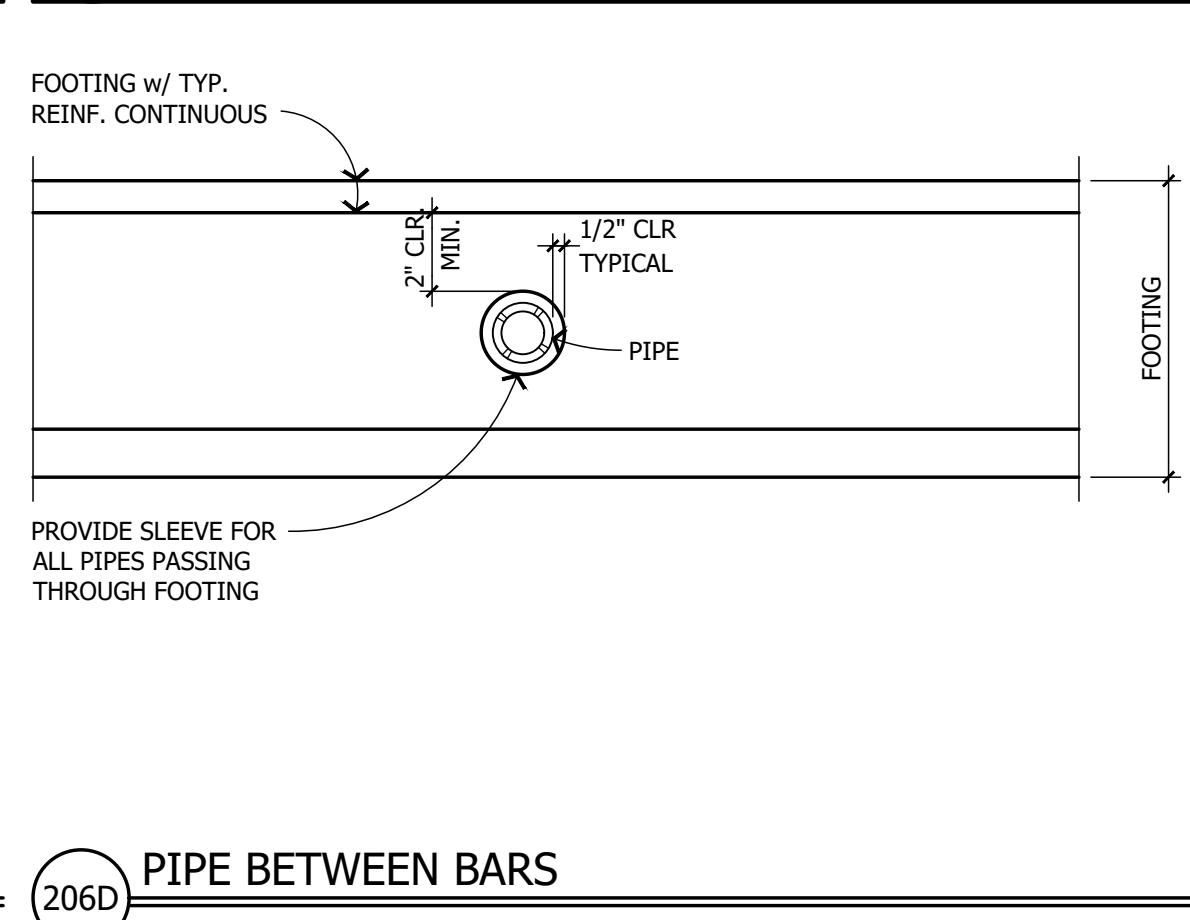
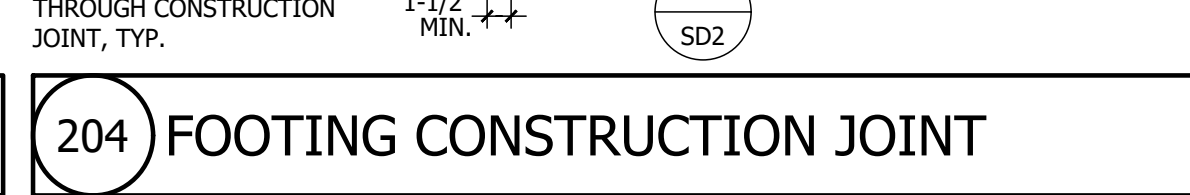
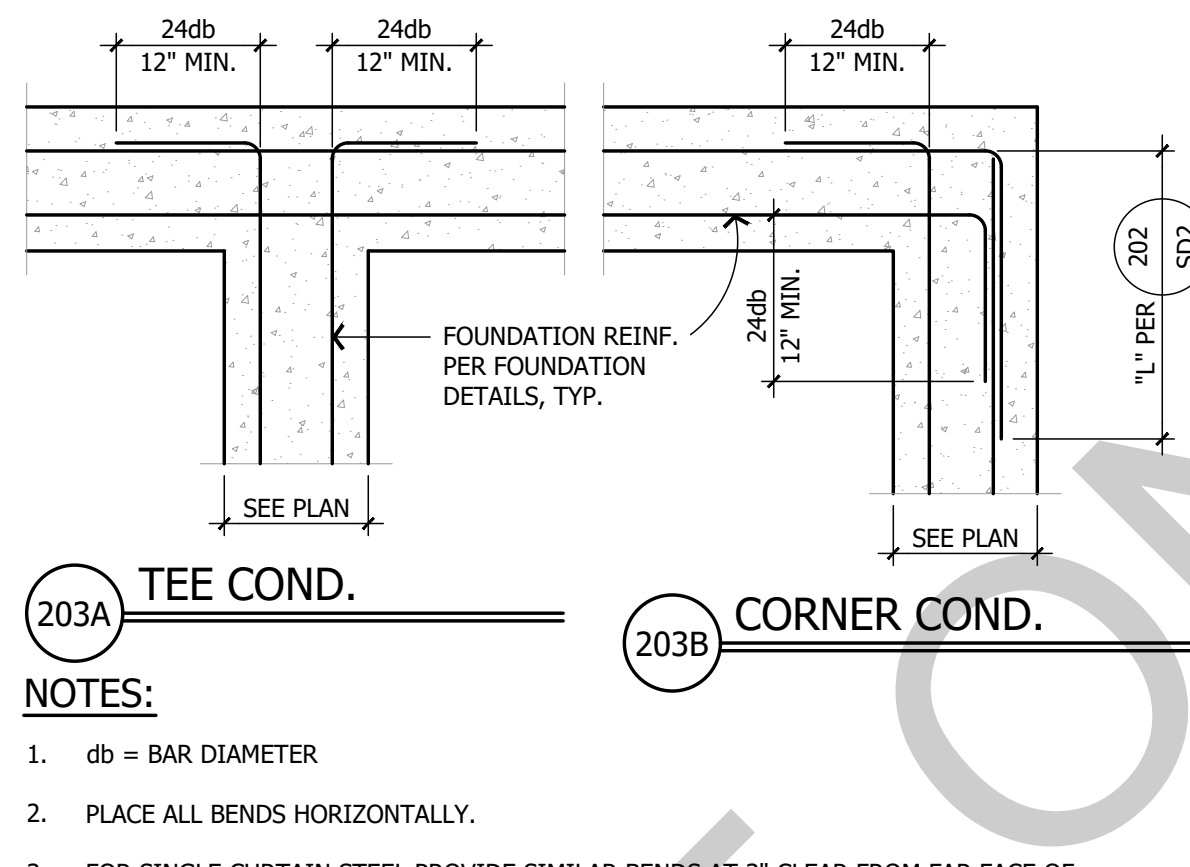
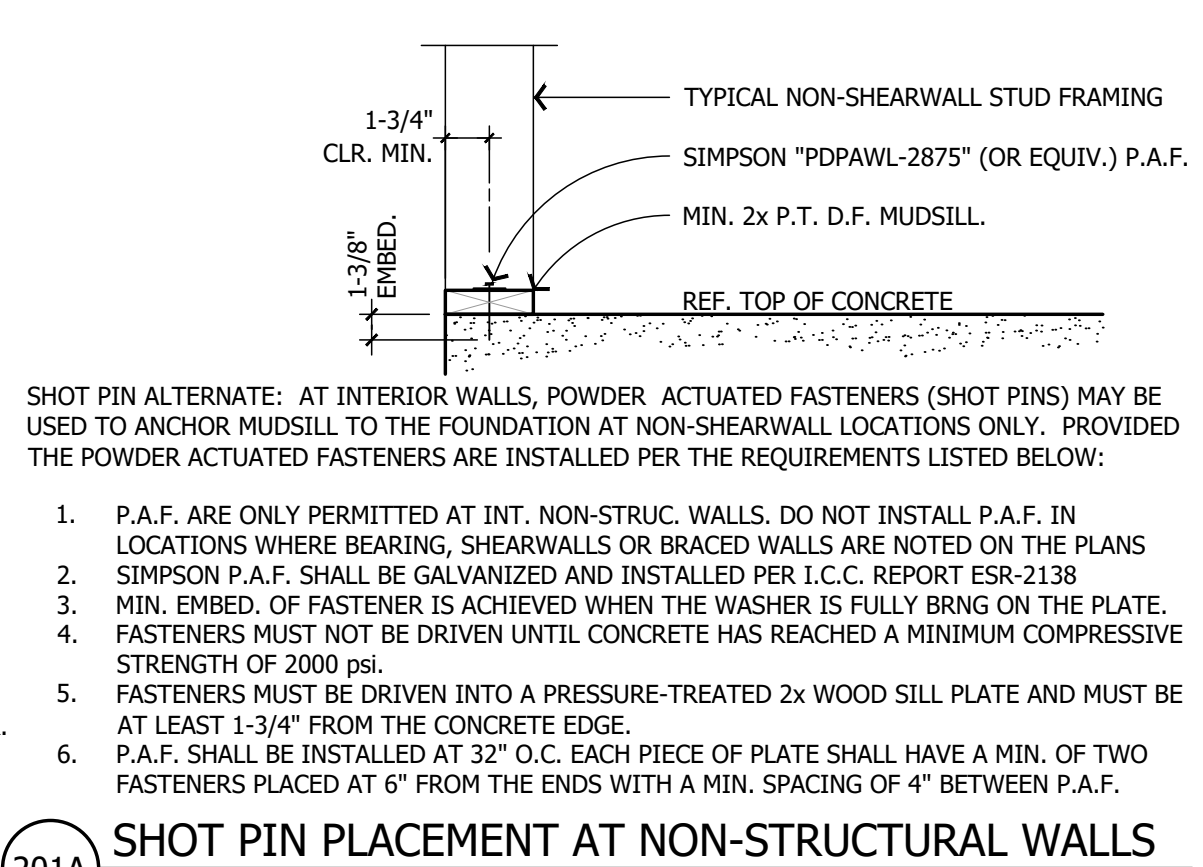
Sheet Description:  
SHEARWALL SCHEDULE AND HOLDOWN SCHEDULE AND TYPICAL DETAILS

No Scale  
Initial Issue Date: March 24, 2023  
Drawn By: E. Bennett  
Project Designer: J. Peek  
Project Manager: J. Peek Ext. 23  
Job No. G010120  
Sheet No.

SD1

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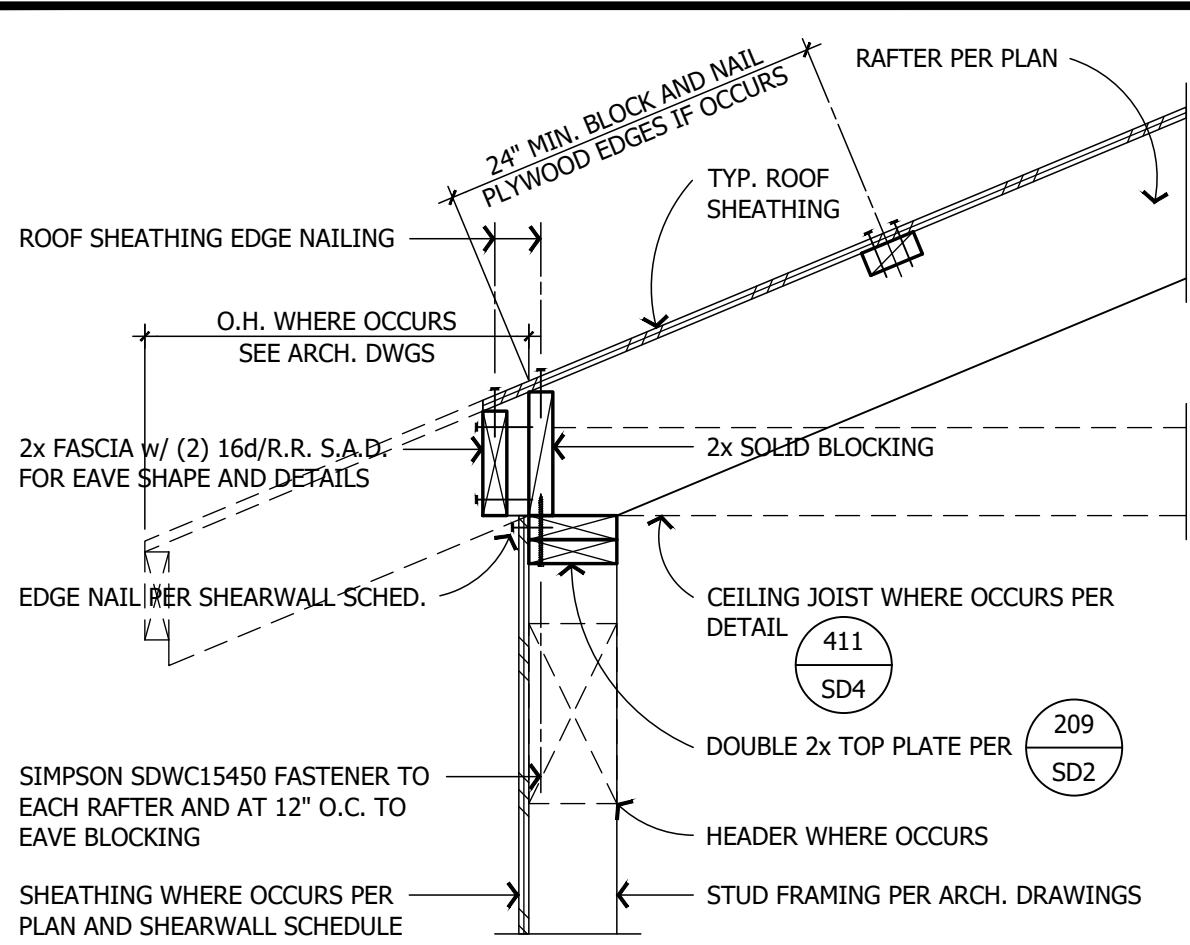




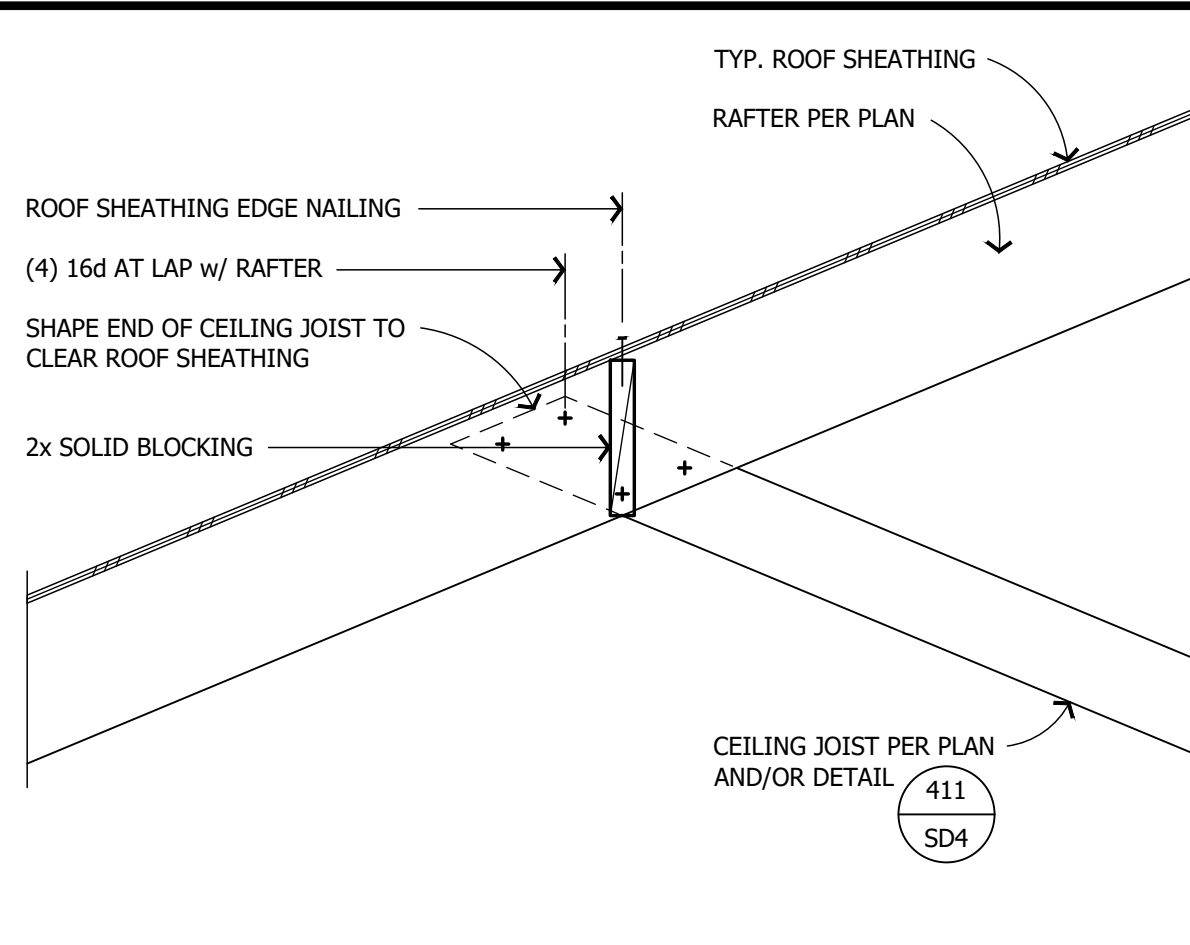




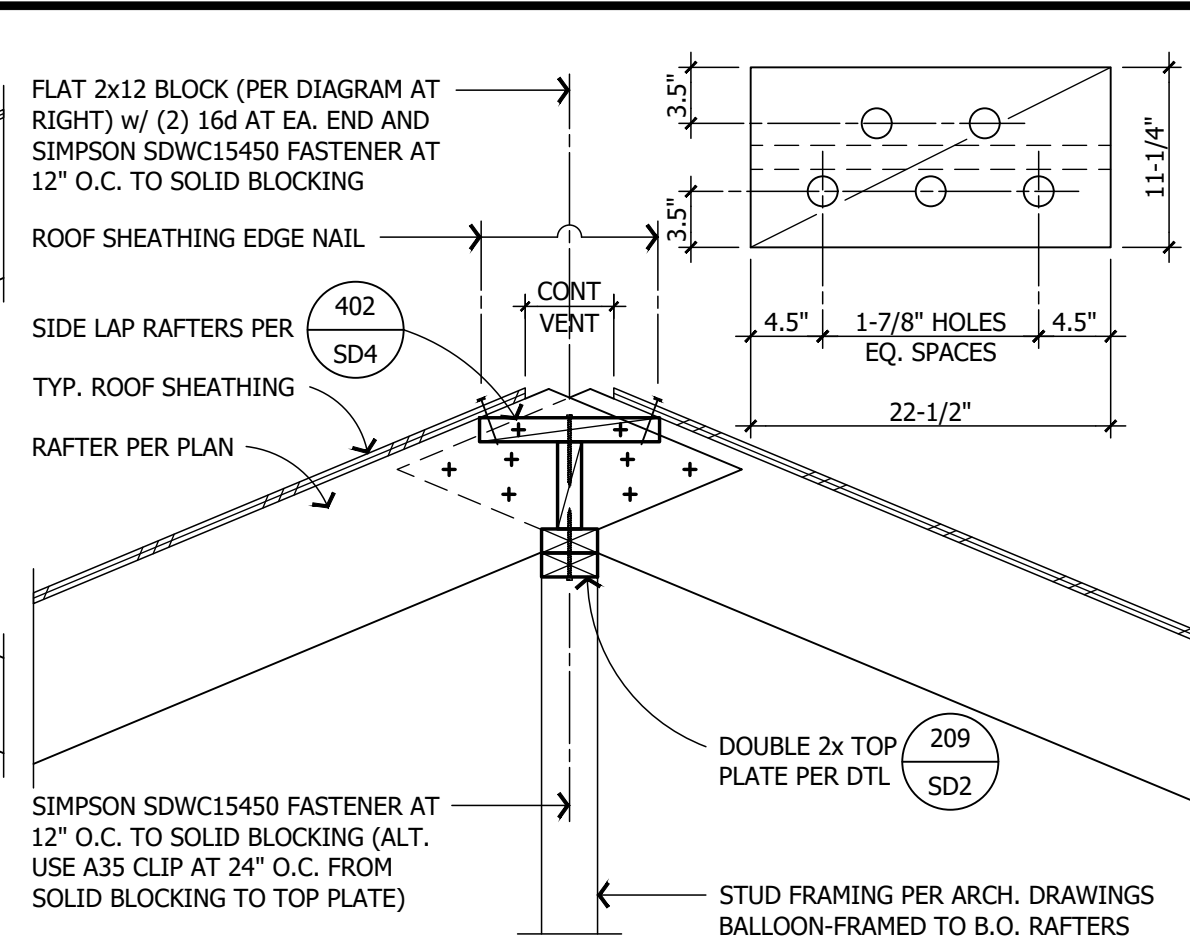




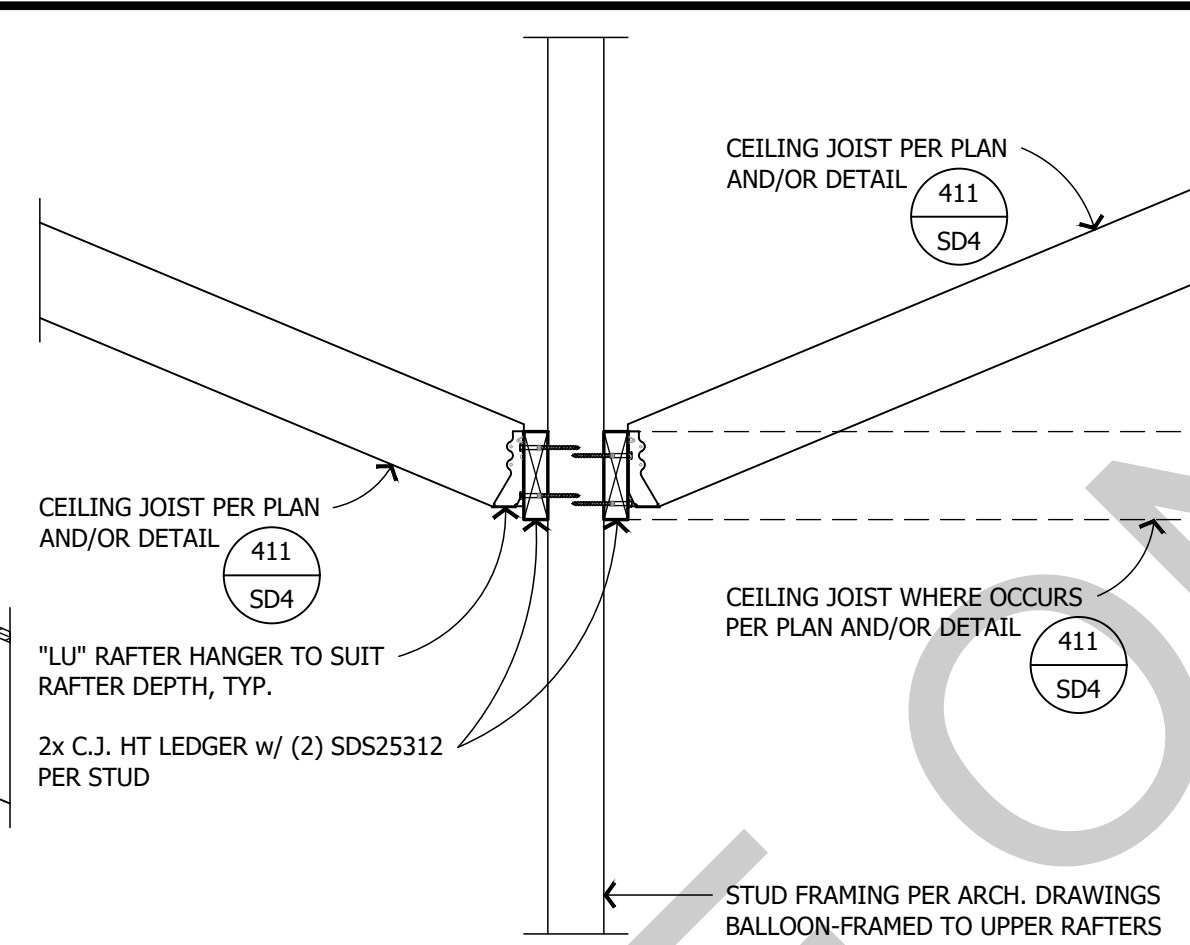
401 RAFTER PERPEND. TO EXTERIOR WALL



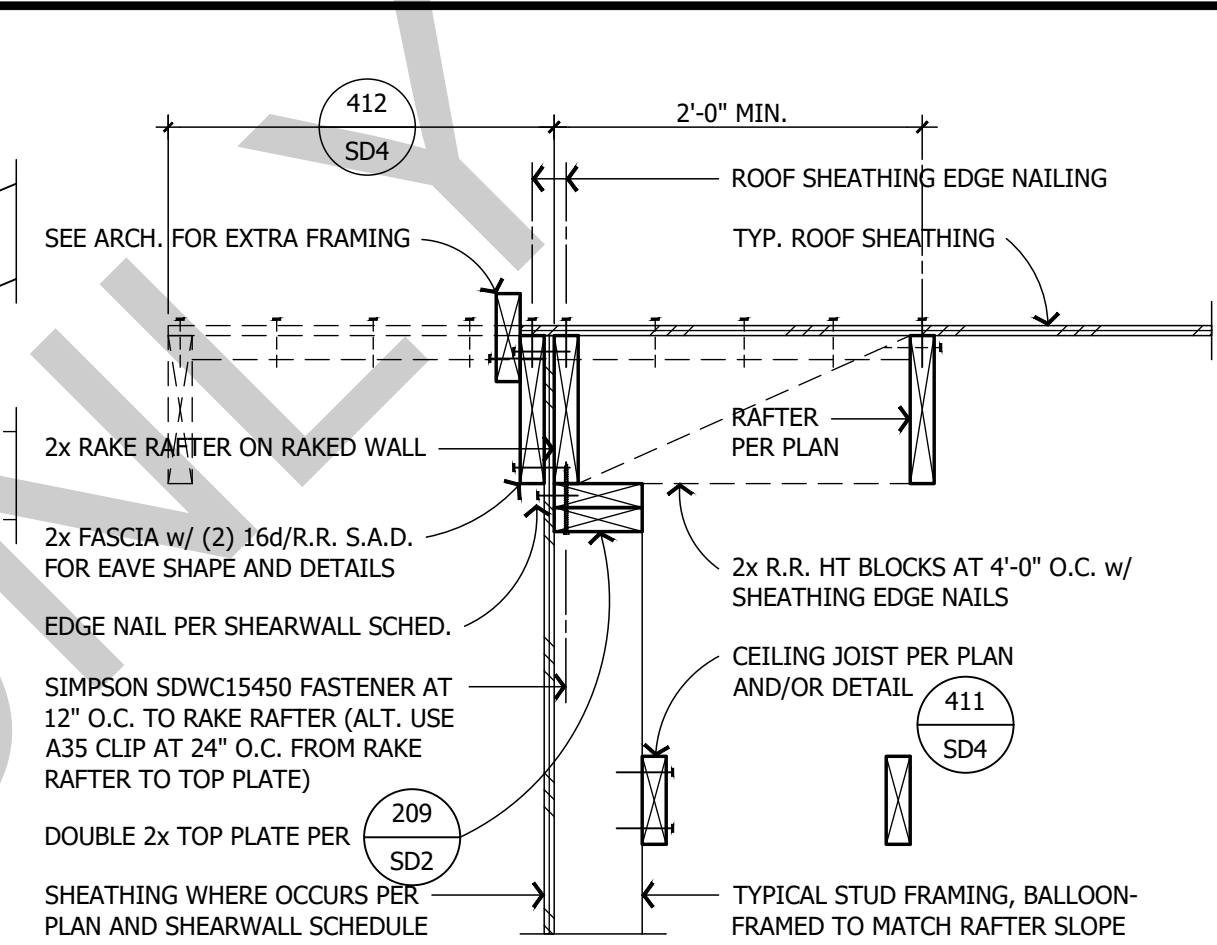
402 CEILING JOIST LAP WITH RAFTER



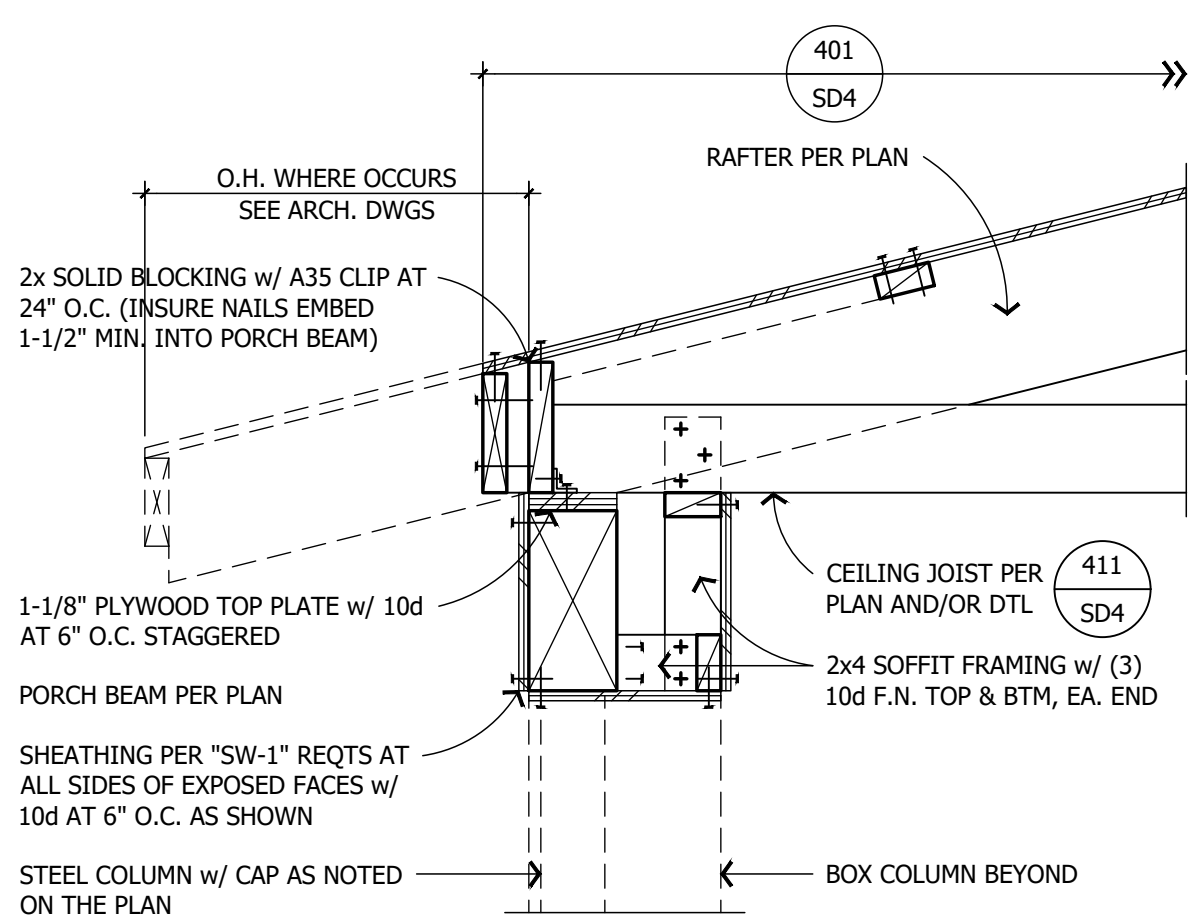
403 RAFTERS AT RIDGE



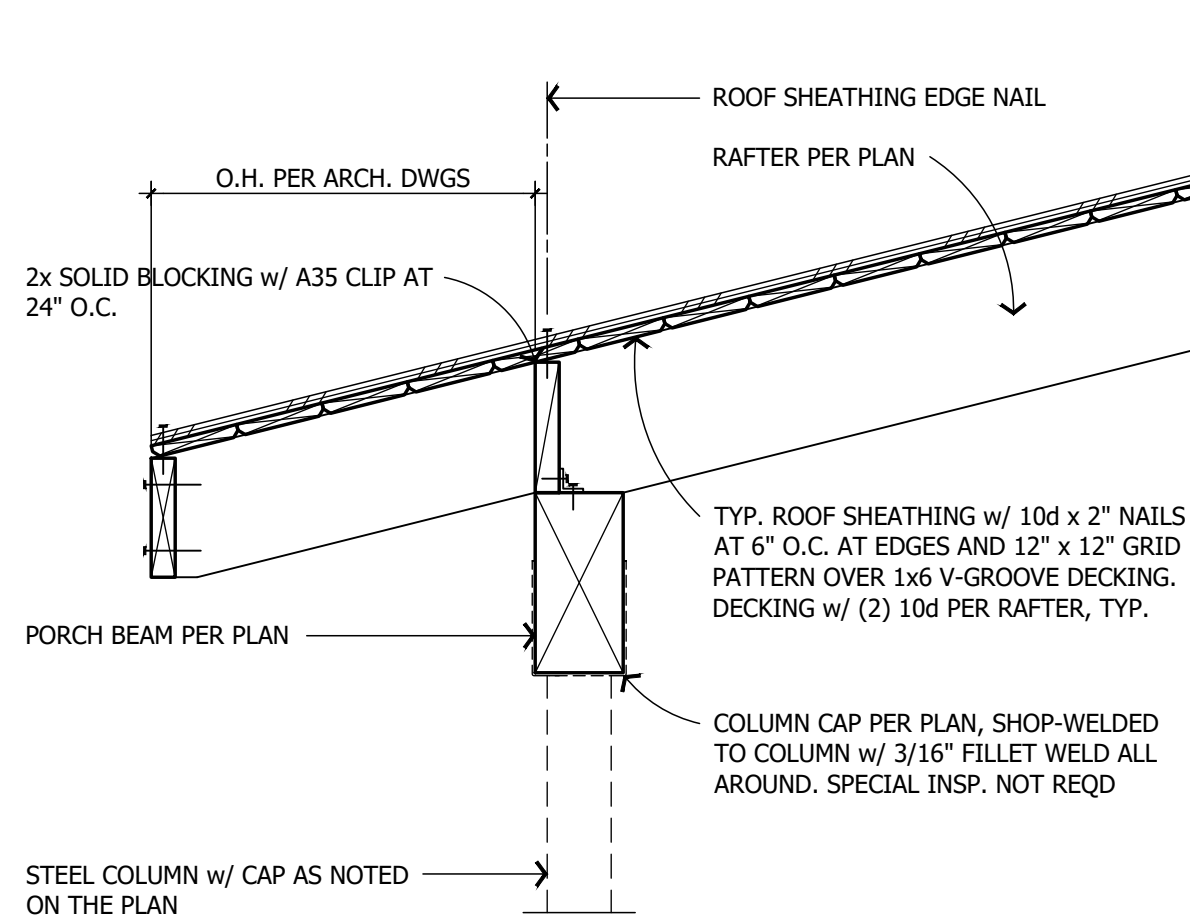
404 CLG JOISTS AT BALLOON-FRAMED WALL



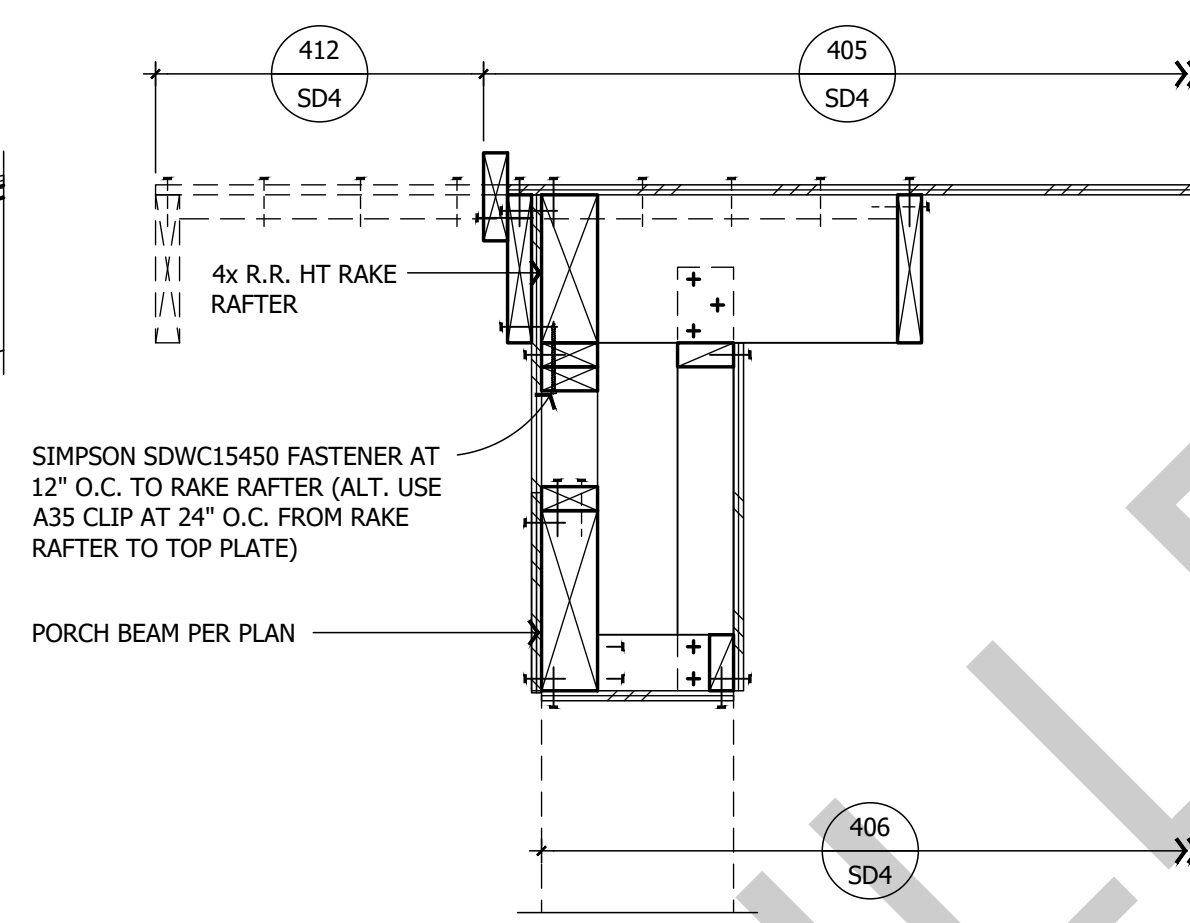
405 RAFTER PARALLEL TO EXTERIOR WALL



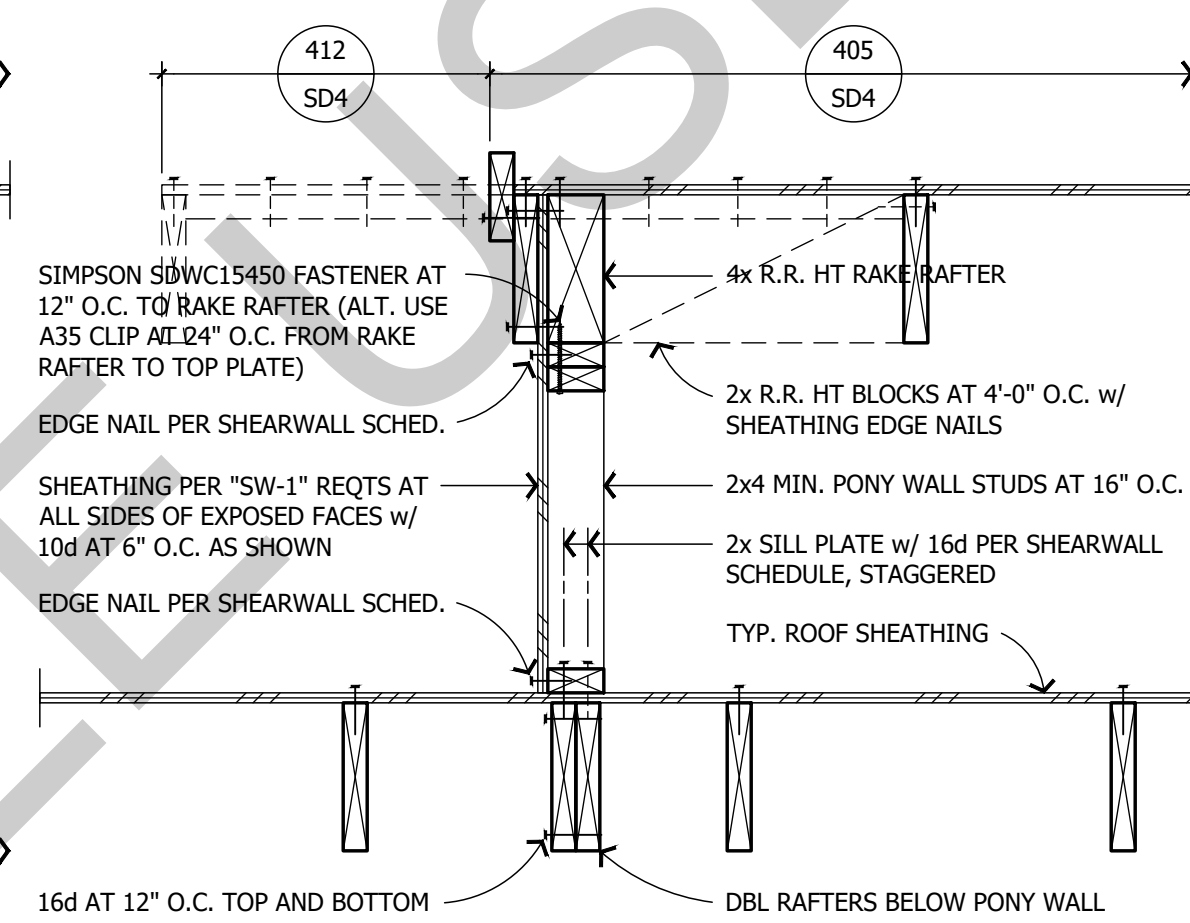
406 PORCH RAFTER PERPEND. TO PORCH BEAM



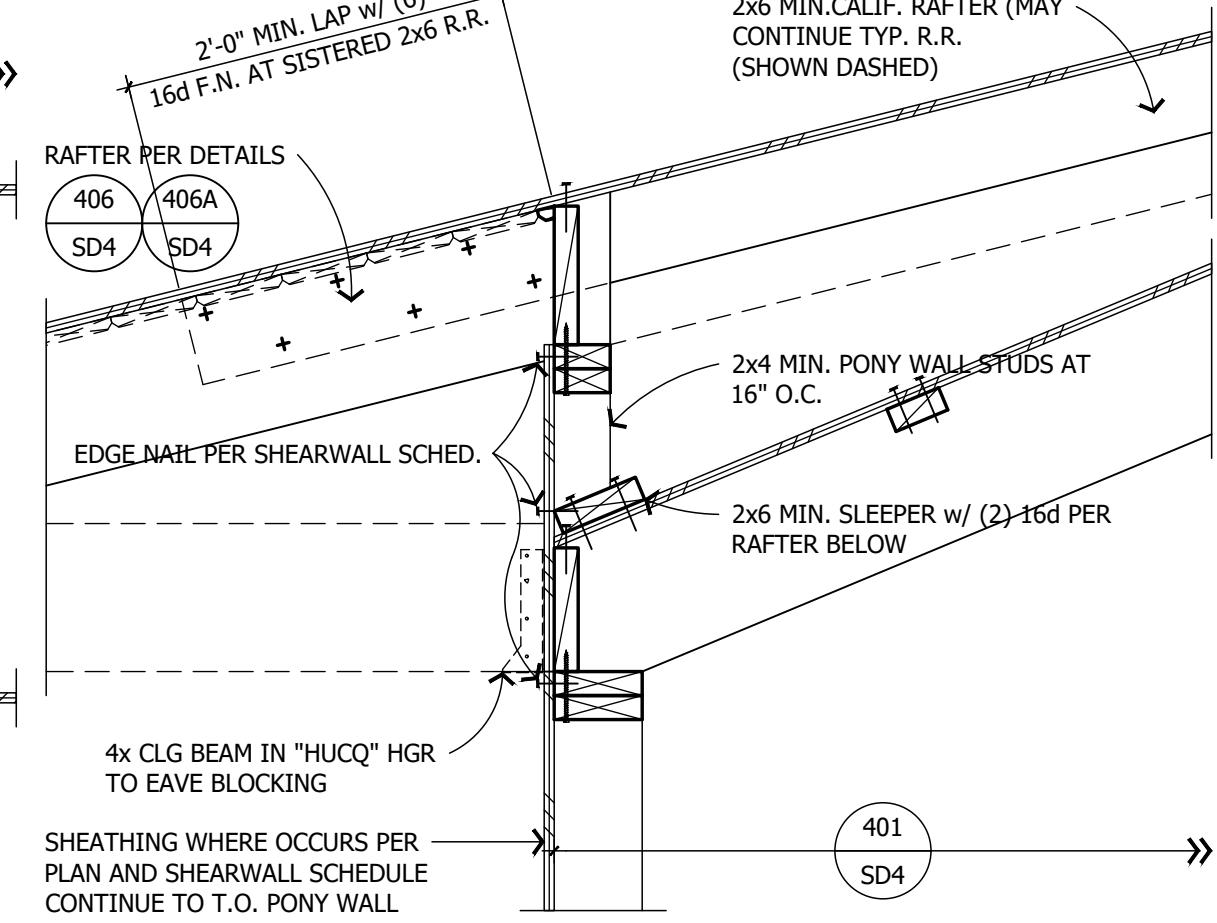
406A PORCH RAFTER - MEDITERRANEAN UNIT



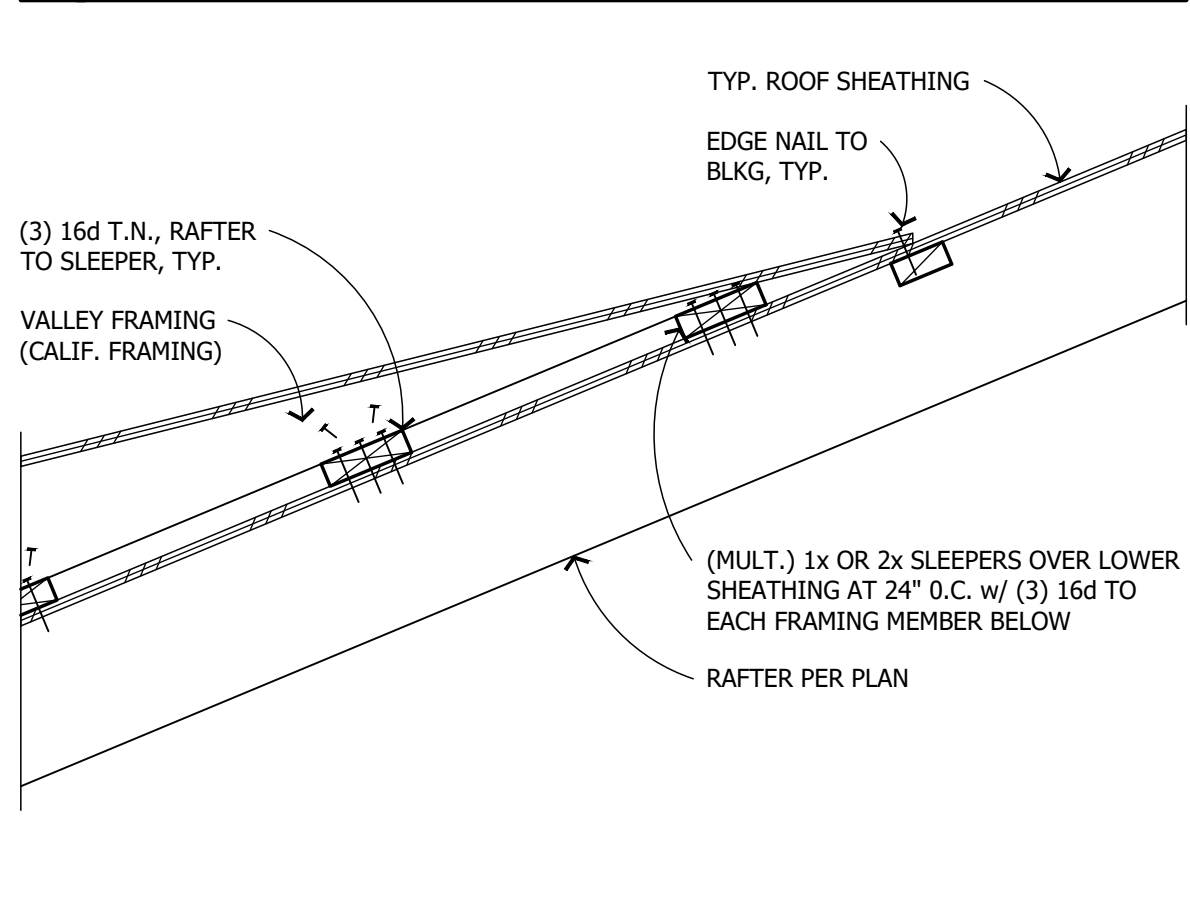
407 PORCH RAFTER PARALLEL TO PORCH BEAM



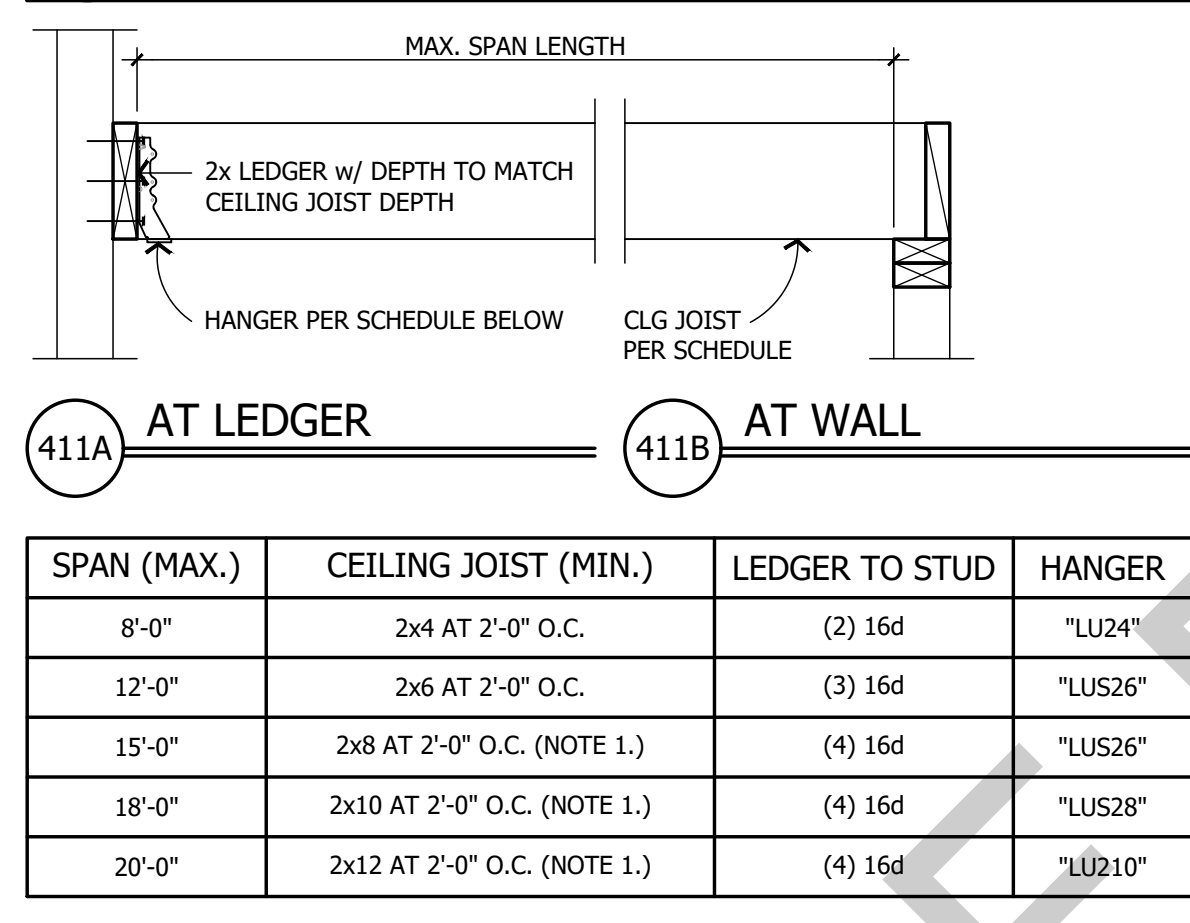
408 ROOF STEP WITH PONYWALL BELOW



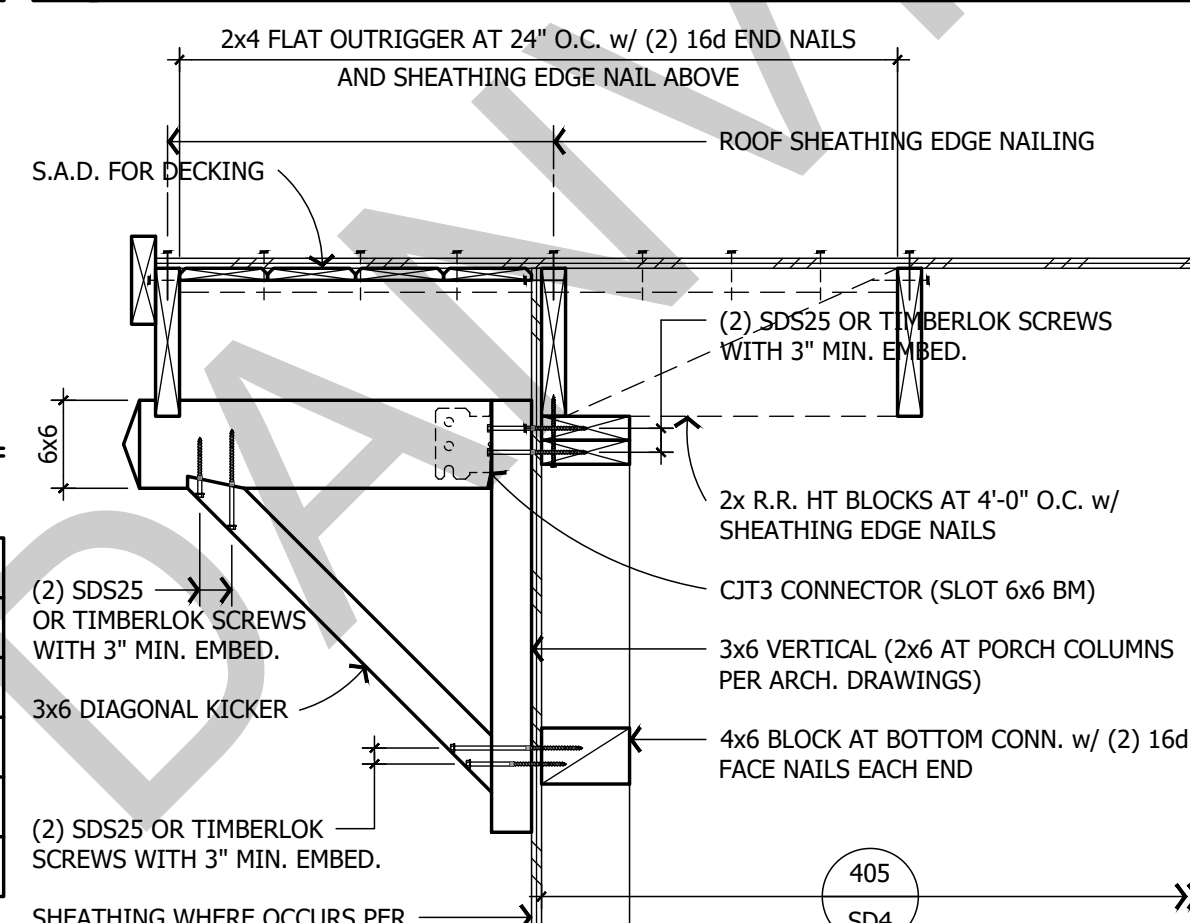
409 RAFTER PERPEND. TO PONYWALL BELOW



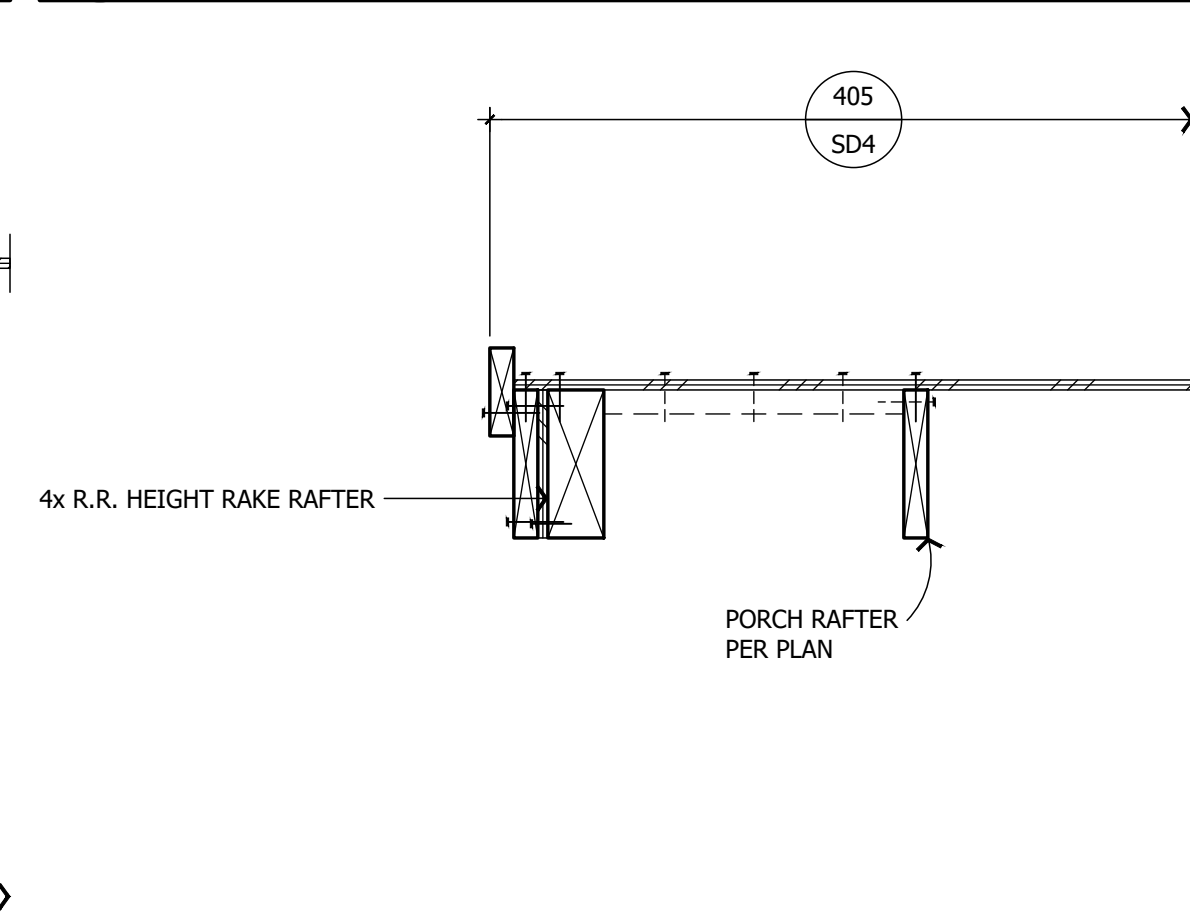
410 CALIFORNIA VALLEY



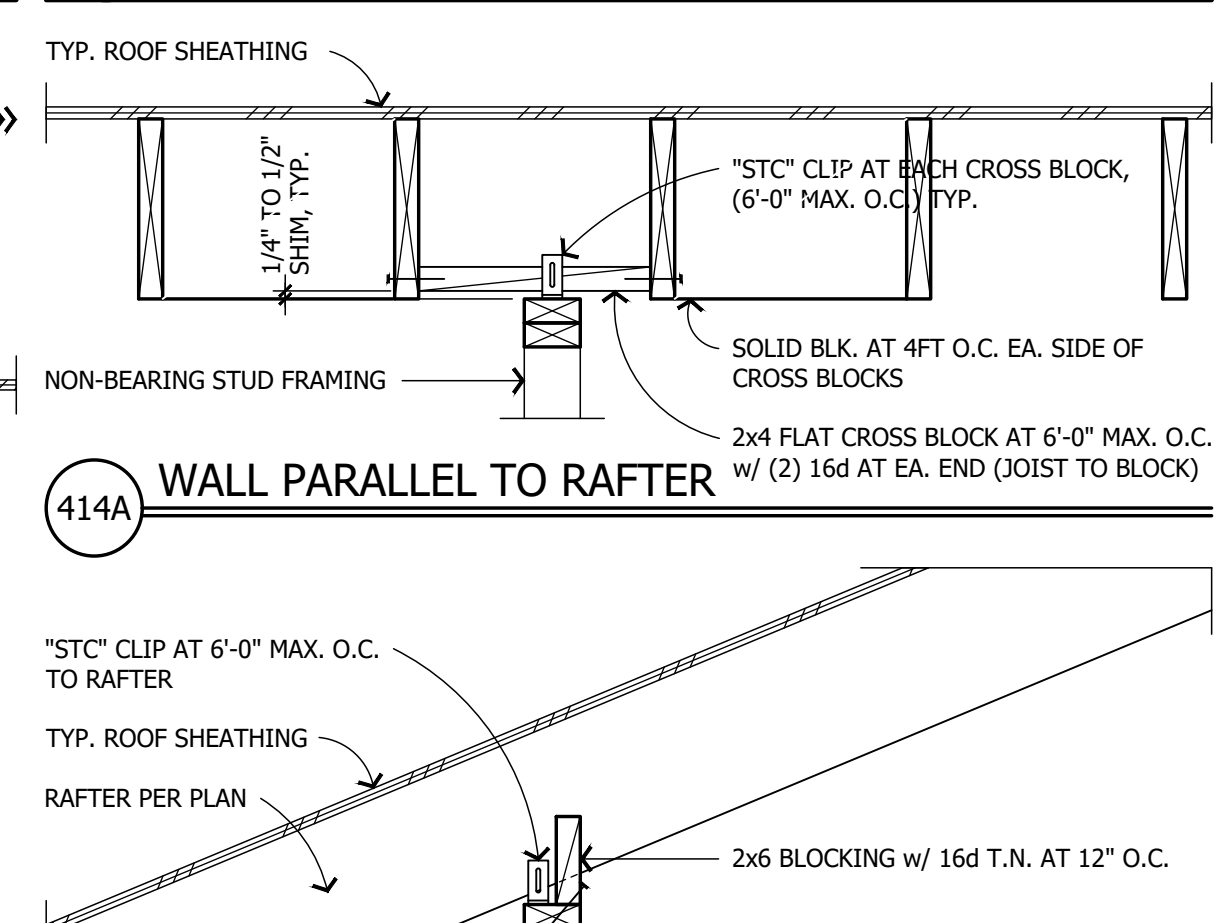
411 CEILING JOIST SCHEDULE



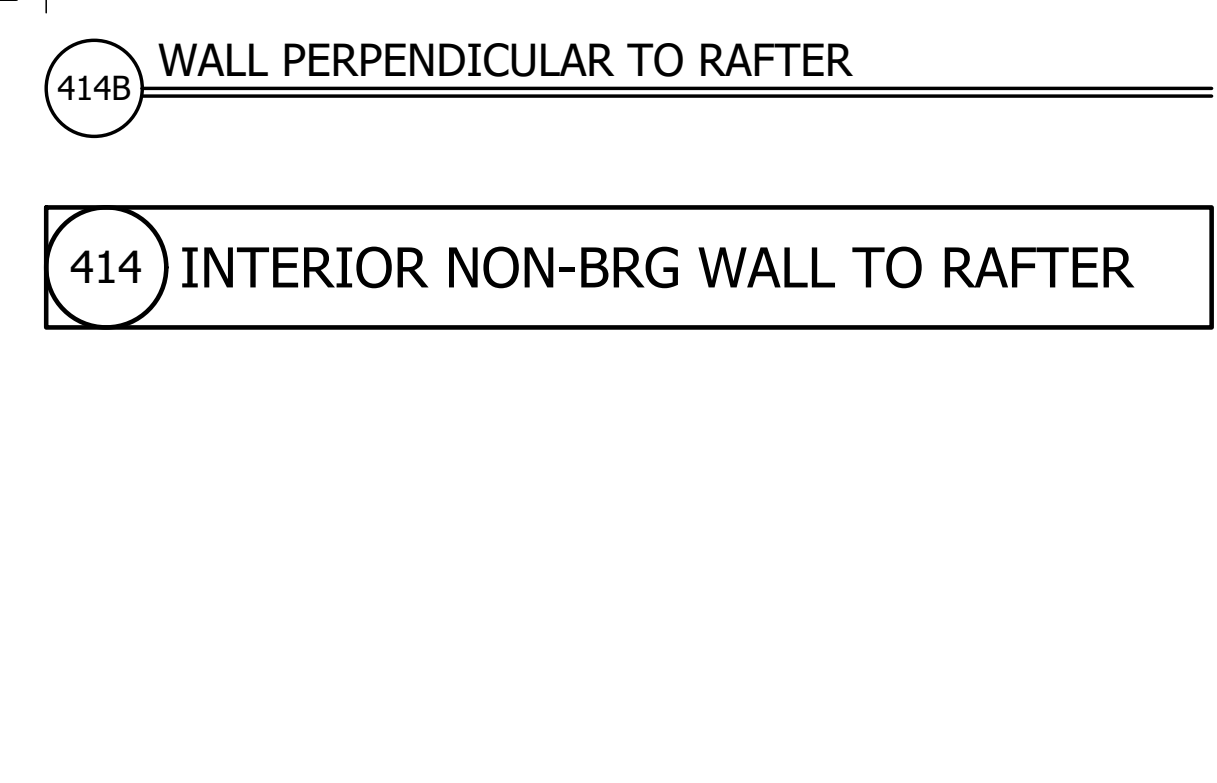
412 BRACKET TO EXTERIOR WALL



413 PORCH RAFTER PARALLEL TO PORCH BEAM



414 WALL PARALLEL TO RAFTER



414 INTERIOR NON-BRG WALL TO RAFTER

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Engineering Seal:

Sheet Description:  
ROOF FRAMING DETAILS

Scale: 1" = 1'-0"

Initial Issue Date: March 24, 2023

Drawn By: E. Bennett

Project Designer: J. Peek

Project Manager: J. Peek Ext. 23

Job No. G010120

Sheet No.

SD4

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