

FOOTING SCHEDULE		
MARK	SIZE	REINFORCING
F16	8"x16" x CONT	UNREINFORCED.
F24	10"x24" x CONT	1-#5 CONT EA EDGE & #4 TRANSVERSE @ 24"oc 3" CLR
F30	10"x30" x CONT	2-#5 CONT EA EDGE & #4 TRANSVERSE @ 24"oc 3" CLR. FOOTING IS OFF-CENTER PER 1/S2.1
FP36	10"x36" SQ	4-#4 EA WAY, 3" CLR OF BOT, PROJECT 4-#4 DOWELS TO CONC COL PER 6/S2.2
NOTES:		
• FOOTINGS TO BE SET A MIN. 30" BELOW FINISHED GRADE, CENTERED BELOW BEARING ELEMENTS, ON UNDISTURBED SOIL PER SOILS ENGR.		
• F24 WALL FOOTING IS TYPICAL U.N.O		

WALL SCHEDULE			
MARK	THICKNESS	T.B.R. REIN.	NOTES
W8	8"	2-#5	#5@12 EA WAY @ MID THICKNESS
W10	10"	2-#5	#5@12 EA WAY @ MID THICKNESS
NOTES:			
• W8 IS TYPICAL U.N.O.			
• SEE TYPICAL FOUNDATION DETAILS ON SHEET S2.1 FOR ADD'L INFO			

TYP. SLAB-ON-GRADE:
4" CONCRETE SLAB-ON-GRADE W/
REIN. PER GC.



FOUNDATION PLAN

PLAN NORTH 1/4" = 1'-0"

ELEV 100'-0" = TOP OF SUB FLOOR = 5998.0'

- DO NOT BACKFILL BASEMENT WALLS PRIOR TO BASEMENT/GARAGE SLAB INSTALLATION
- INDICATES SHD14RJ HOLDDOWN @ 2-2x6 STUDS ABOVE. INSTALL PER TYPICAL FOUNDATION DETAIL 11/S2.1 & PER MANUF. RECOMMENDATIONS W/ FULL 16d NAILING. CONTRACTOR TO VERIFY LOCS W/ ARCH DWGS PRIOR TO CONCRETE POUR.
- INDICATES STEP TOP OF WALL (T.O.W.)
- INDICATES STEEL EMBED PLATE SET IN FDN WALL (T.O.PLATE = 4/8" LOWER THAN T.O.W.) PER DETAIL 5/S2.2 AT STEEL FRAME ABOVE.
- INDICATES STEEL EMBED PLATE PER DETAIL 10/S2.2 AT STEEL BEAM CONNECTION.

SEE SHEET S1.2 FOR GENERAL STRUCTURAL NOTES

No.	Description

GENERAL STRUCTURAL NOTES

DESIGN LIVE LOADS:

Design loads are per the 2012 - 2015 IRC and 2012-2015 IBC unless noted otherwise.

- Snow 28 psf Min Roof Snow, Slipd Ground Snow
- Floors 40 psf
- Balcony 60 psf
- Exterior Decks 40 psf
- Wind speed (3 sec, V_{ult}) 131 mph, Exposure C
- Wind speed (V_{ult}) 165 mph, Exposure C
- Seismic Category B

STRUCTURAL ERECTION, BRACING, OBSERVATION and SHOP DRAWINGS

- The structural drawings illustrate the completed structure with all elements in their final positions, properly supported and braced. The Contractor, in the proper sequence, shall provide proper shoring and bracing as may be required to achieve the final completed structure.
- WALL BRACING - Shear Wall bracing design is in accordance with accepted engineering practice in accordance with the 2006 - 2015 IBC code as permitted by section R501.1.3 and R602.10 of the 2006 - 2015 IRC. Reference plan notes and details for wall sheathing type, nailing, and anchorage requirements.
- Observations of foundation reinforcing or framing required by the Owner, lender, insurer, building department or any other party will be accomplished by the engineer at the Owner's expense. At least 48 hours advance notice is requested.
- Fabricator and / or supplier of structural components (such as structural steel) and performance-specified components (such as prefabricated wood trusses) shall submit shop and erection drawings for architect and engineer review. Submit PDF files for each drawing to architect and engineer. Allow five working days for review.

DEFERRED SUBMITTALS:

- Non-structural items that the building official requires to be reviewed or designed by the "engineer of record" and that are not included in these drawings shall be submitted as a Deferred Submittal. Documents for deferred submittal shall be submitted to On Site Structural Engineering, the Architect, and the owner for review prior to construction. Common Deferred Submittal items are: Stair Stringer design and connections, Handrail and rail post at floor openings and raised decks, Solar Racking System and connections to structure. OSS's review of these items will be for structural support only, based on the current IRC and IBC code Live Loads.

FOUNDATION:

- Foundation design is in accordance with recommendations contained in soils investigation Report Number 16477 prepared by Edward Glasgow dated Oct. 13, 2016. The report is hereby referenced, and all recommendations and precautions contained in that report shall be adhered to by the Owner and Contractor except where otherwise specifically noted.
- Design bearing pressures for footings are as follows:
 - Maximum design soil pressure: 2000 psf Non-Expansive
- Footings shall be placed on undisturbed natural soil or compacted fill tested and approved by soils engineer.
- All slabs on grade shall be separated from adjacent structural and finish elements to allow free movement of the slab, unless specifically shown and noted otherwise.

BASEMENT WALLS:

- Design lateral soil pressures (equivalent fluid pressures) are as follows:
 - Basement Walls: 50 psf.
 - Building retaining walls: 50 psf.
 - Site retaining walls: 50 psf.
- Backfill all but the top two feet (2'-0") of all retaining walls with free draining granular material.
- Provide perimeter drain system per soils engineer recommendations
- Place concrete continuously without horizontal cold joints.
- Basement slab and main level floor joists must be in place prior to backfilling or provide adequate shoring and bracing for review.

CONCRETE AND REINFORCEMENT:

- Concrete shall conform to applicable provisions of ACI 301 and 318.
- Minimum 28-day compressive strength (f'_c) of all concrete shall be 3,500 psi. All cement shall be Type III. Concrete with High Weathering Potential such as porches, carport slabs, and garage floor slabs shall be 3,500psi Air entrained (air content between 5% and 7%) per R402.2.
 - Concrete exposed to soil shall have cement Type XX. All other cement shall be Type III.
- All deformed reinforcement shall be ASTM A615 grade 60, except bars specified to be field bent, stirrups, and ties which shall be grade-40. Reinforcement shall be fabricated and placed per ACI Manual of Standard Practice (ACI 315). At splices, lap bars 50 diameters unless noted otherwise. (2'-1" for #4 bars; 2'-8" for #5 bars; 3'-2" for #6 bars.)
- Add two (2) #5 bars around all four sides of all openings, extending 2'-0" minimum beyond openings.
- Minimum concrete cover over reinforcement shall be: 1-1/2" for concrete placed against forms or 3" for concrete placed against earth. See also drawings.
- Keep reinforcement clean and free of dirt, oil, scale. Oil forms prior to placing reinforcement.

STRUCTURAL STEEL:

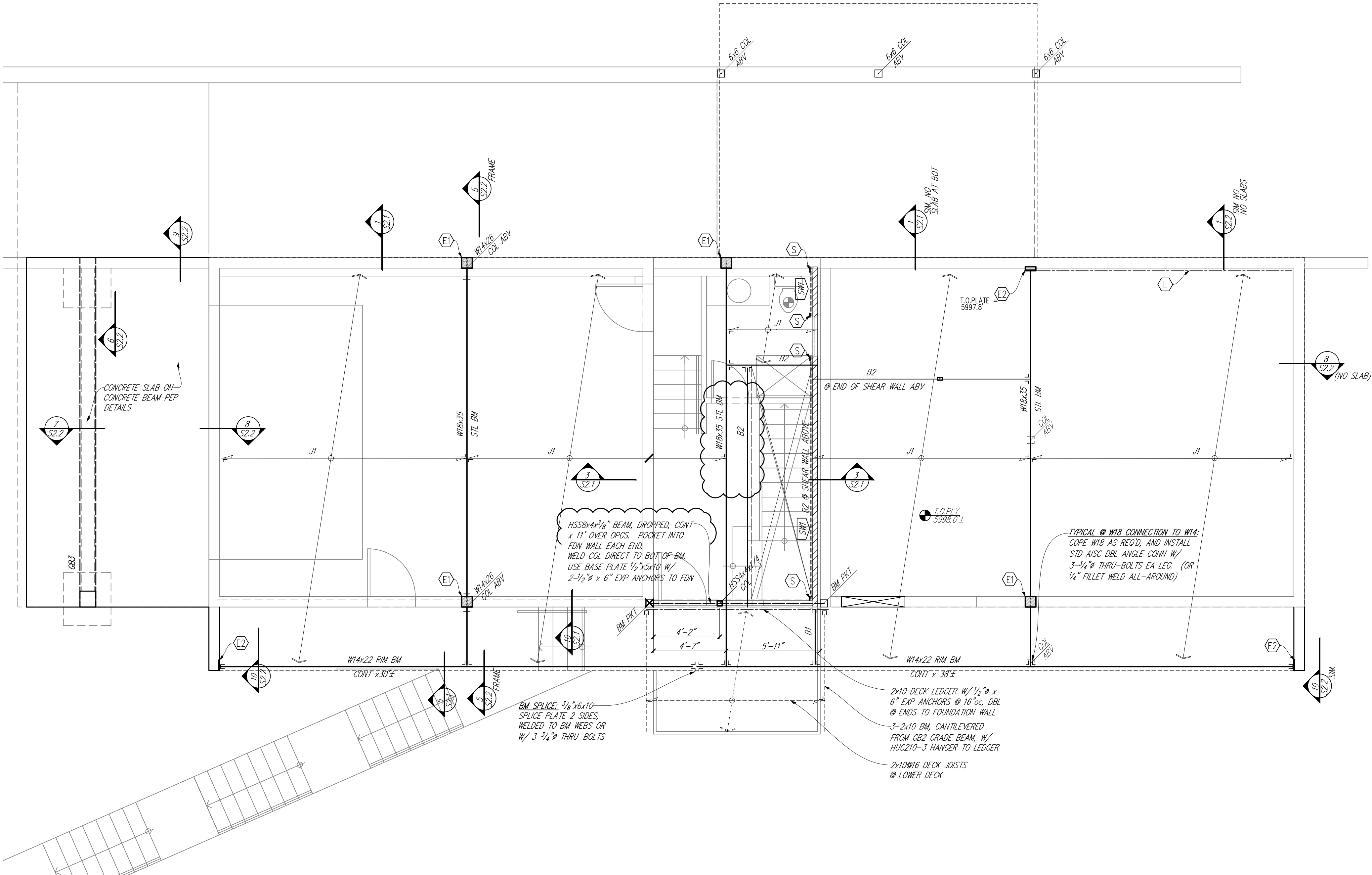
- Steel material shall be as follows unless specifically noted otherwise:
 - Structural Beams: ASTM A992
 - Angles, misc: ASTM A36
 - Anchor Bolts: ASTM A307 or A36
 - Standard pipe columns: ASTM A 53, Grade B, 35 ksi
 - Tube steel (HSS): ASTM A500, Grade B, 46 ksi
 - Connector bolts: ASTM A307
- All structural steel shall be fabricated and erected per the current edition of AISC Steel Construction Manual.
- Welding shall be by qualified welders. Use E70XX electrodes and 5/16" fillet welds unless noted otherwise.
- Non-shrink grout beneath column base and beam bearing plates shall be non-metallic with minimum compressive strength of 5,000 psi.
- All beams shall have full depth web stiffeners each side of webs above and below columns.

WOOD FRAMING:

- All framing and details not specifically specified shall comply with the prescriptive (non-engineered) requirements of the International Residential Code.
- Sawn Lumber and Timbers:
 - Nominal 2x, 3x, and 4x dimension lumber shall be Hem-Fir, Grade No. 2 except as noted below:
 - 2x4 and 2x6 studs $\leq 9'-0"$ in length may be Hem-Fir Stud Grade.
 - At contractor's option, Douglas Fir may be substituted for Hem-Fir.
 - Still plates and ledgers in contact with concrete or masonry shall be Hem Fir, preservative treated with zinc-borate or Southern Yellow Pine "1-2 Outdoor" lumber, or "Strandguard" LSL. NCC treatment is NOT acceptable.
 - 5"x5" or larger timber used as a beam or stringer shall be Douglas Fir No. 1, $F_y=1,350$ psi, E=1,600,000 psi.
 - 5"x5" or larger timber used as a post or column shall be Douglas Fir No. 1, $F_y=1,200$ psi, E=1,600,000 psi.
 - All deck framing lumber to be "1-2 Outdoor Lumber", Southern Yellow Pine, GRADE #1.
- Engineered Wood:
 - Laminated Veneer Lumber (LVL): Manufactured 1-3/4" wide Microlams (ML) by i-Level or equivalent with $F_y=2,600$ psi, E=2,000,000 psi, $F_c=285$ psi.
 - LSL Joist Joists: Manufacture 1-1/4" laminated strand lumber by Trus Joist. No substitutions.
- Plywood and OSB Sheathing:
 - All plywood and oriented strand board (OSB) sheathing shall be engineered grades with APA grade stamp indicating appropriate maximum spacing of supports.
 - Floor sheathing: nominal 3/4", APA Stud+floor at 24 inch o.c. tongue & groove glued and nailed.
 - Roof sheathing: minimum 15/32" CDX plywood, OSB, APA S216, nailed.
 - Exterior Wall sheathing: 15/32" CDX plywood or 7/16" OSB, APA 2416, all edges blocked and nailed.
- Wall, Floor, and Roof Framing:
 - All wall studs shall be continuous from floor to floor or from floor to roof.
 - All prefabricated plywood Web I-type joists shall be installed per the manufacturer's recommendations. See manufacturer's literature for web-stiffener installation, and minimum connections at bearing locations. Do not cut or notch chords in any manner. Holes in webs shall not exceed manufacturer's published limit criteria.
 - Layout joists to avoid plumbing and other floor penetrations. Pre-engineered I-joists shall be continuous over intermediate bearings as is possible and shown on plan. Block between joists under bearing walls and over interior shear walls.
- Steel Beam Framing:
 - Typical Wood Nailer: 2x nailer to match beam width and attach to top flange with construction adhesive and .145" diameter ramset pins at 24"oc or 1/2" diameter thru-bolts at 32"oc, staggered.
 - At Dash steel beams which receive top mounted hangers, nip 2x nailer to exact beam width plus 3/8" Plate shall overhang beam flange (at least 18" but not more than 1-4") on both sides to prevent hangers from contacting steel beam.
 - Typical blocked steel beam web: Block beam web with solid 2x blocking, bear tight to bottom flange and glue & ramset to flange with .145" diameter pins at 24"oc unless noted otherwise. Use a minimum of 5 pins or 3 - 1/2" thru-bolts.
 - At dropped steel beams bearing on built-up studs, bear beams on stud end grain. Install 2x6 vertical blocking between beam flanges and nail king studs thereto with at least (6) 16d nails each side unless noted otherwise.
 - At interior columns, brace bottom of beams with 2x diagonals cut to fit tight to beam web at bottom flange. Nail braces to joists.
- Roof Trusses:
 - Pre-engineered, prefabricated trusses shall be designed for the fabricator by a Professional Engineer Registered in the State of construction, and shall comply with Code and the Truss Plate Institute Requirements. Manufacture and installation of trusses shall comply with ANSI/TPI 1 "National Design Standard for Metal-Plate-Connected Wood Truss Construction", TPI HB "Commentary and Recommendations for Handling Installing and Bracing Metal Plate Connected Wood Trusses", and TPI DSB "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses".
 - Unless noted otherwise on plan, trusses shall be designed for the following loads:
 - Top chord Live Load: Snow Load per Design Notes
 - Top chord Dead Load: 12 psf
 - Bottom chord Dead Load: 8 psf
 - Maximum allowable deflections shall be as follows:
 - Maximum deflection of truss under full Live load: Span / 360
 - Maximum deflection of truss under full Dead + Live load: Span / 240 or 1/4", whichever is lesser
 - Solid block between trusses at bearings.
 - Unless otherwise indicated, trusses shall be designed for perpendicular to grain bearing on Hem Fir plates (405 psi). End grain bearing is not allowed unless accepted in writing by On Site Structural Engineering, LLC. Design truss bearings for bearing blocks or Truss Bearing Enhancers as required to compensate for over stresses. Specify size, species and nailing for bearing blocks.
 - All truss-to-truss connections shall be specified by truss supplier, unless specifically noted on the drawings.

WOOD FRAMING: HARDWARE, CONNECTORS, AND FASTENERS:

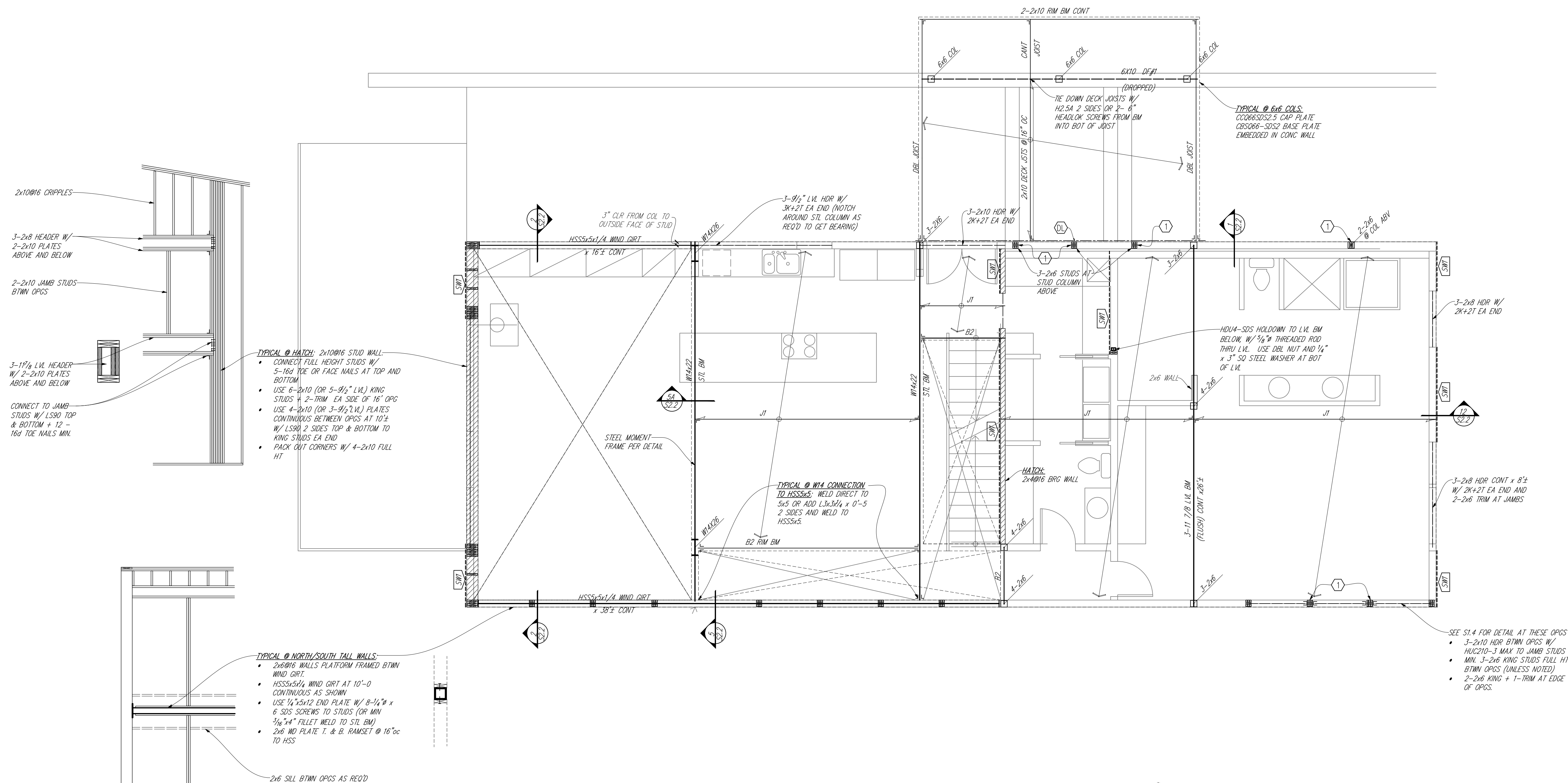
- Metal connectors shall be by Simpson Strong Tie and installed with nailing to achieve maximum rated capacity unless noted otherwise. Note that heavy duty and skewed hangers may require special order.
- FASTENERS:
 - Nails in roof, wall, and floor sheathing, as well as nails designated as "Rd" nails on plan, shall be Rd ring shank gun nails (0.113" diameter x 2 1/2" long) unless noted otherwise. Nail all sheathing with Rd @ 6"12" minimum unless noted otherwise.
 - Framing nails in 2x lumber shall be 12d common nails (0.131" diameter x 3 1/2" long) unless noted otherwise. These nails are commonly referred to as "short sixteen" or "16d gen nails". Nails called out as "16d" on plan shall be 12d common nails except as noted below or on plan.
- "Ramped Pins" indicate .145" diameter powder actuated drive pins. Use appropriate length to penetrate steel material per manufacturer recommendations.
- SDS SCREWS - 1/4" screws with length indicated, per SIMPSON STRONG TIE. NO SUBSTITUTIONS.
- TIMBERLOK or LEDGERLOK Screws - per Fastenmaster, pre-drilling w/ 1/8" bit is acceptable if required. Substituting SDS screws of same length is acceptable.





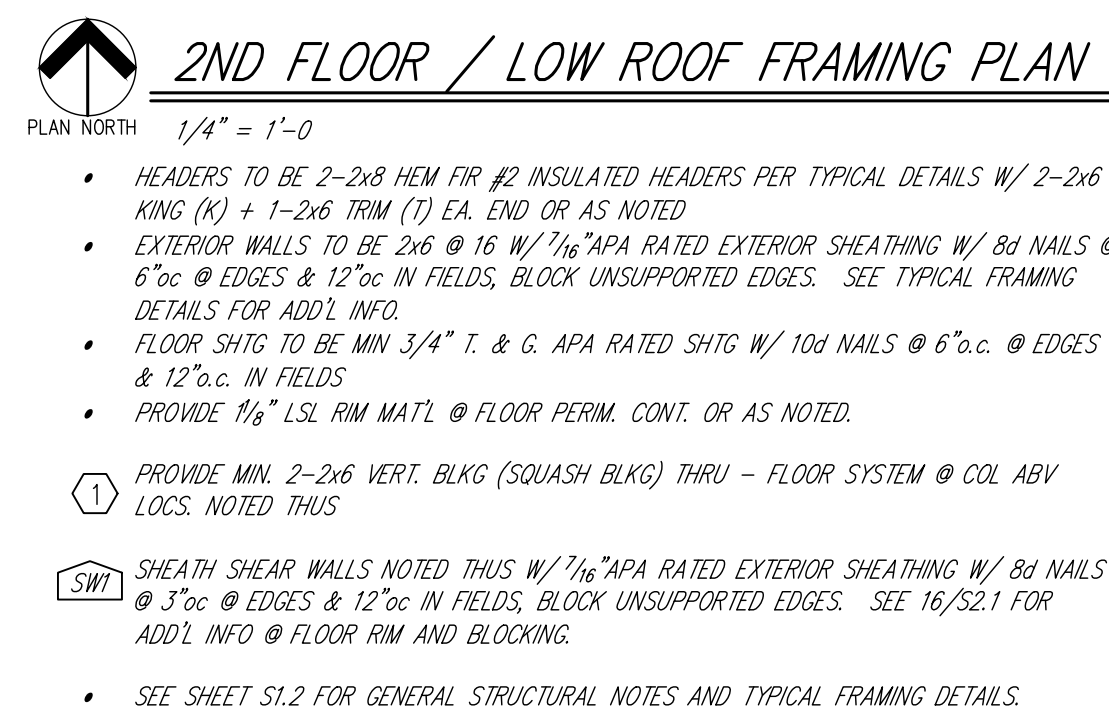
LAM RESIDENCE
980 WAGONWHEEL GAP ROAD
BOULDER, CO 80302

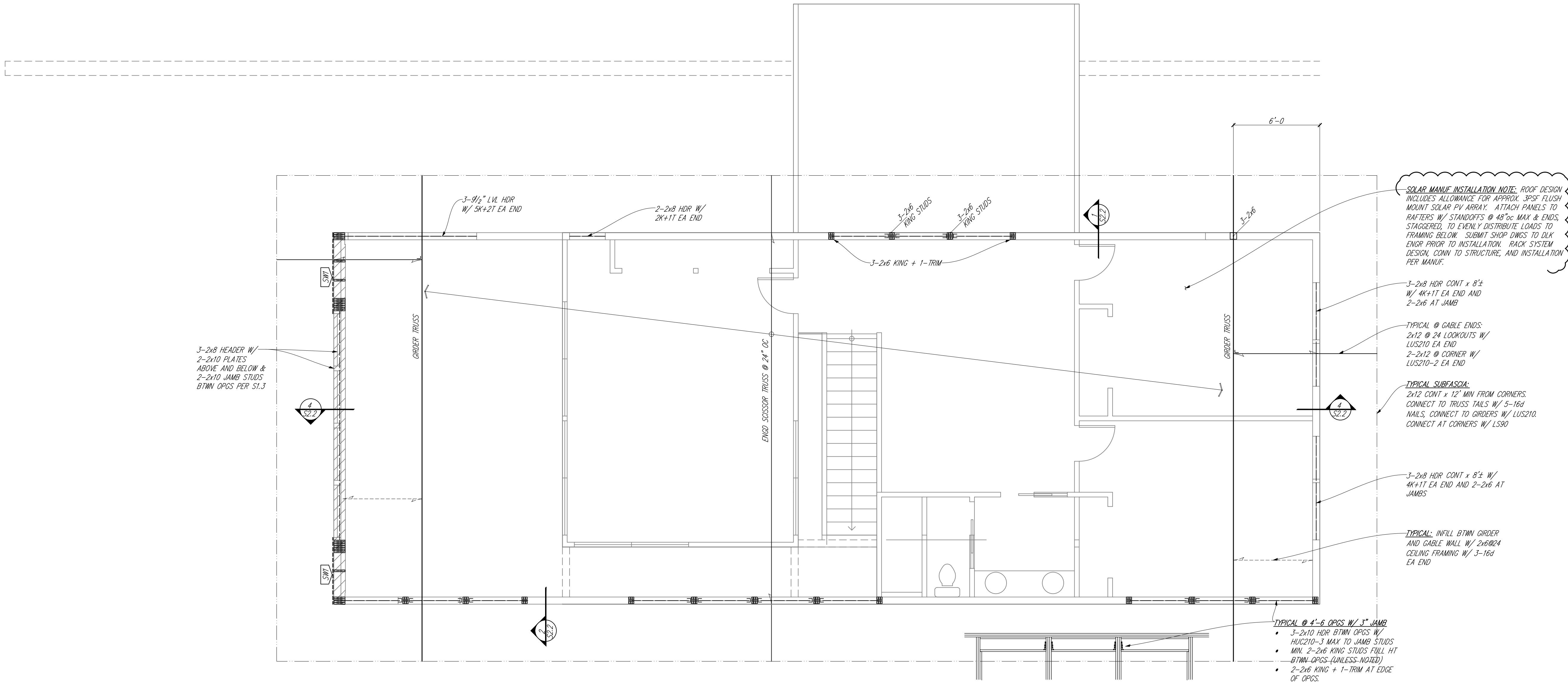
[illegible]

SHEET NO.
S1.3



JOIST, RAFTER, & BEAM SCHEDULE			
MARK	MEMBER	CONNECTION	NOTES:
J1	1 $\frac{1}{2}$ " T&B 210 @ 16 FLOOR JOIST	IUS OR ITS HANGERS	
B1	1 - 1 $\frac{1}{2}$ " LVL BEAM	HU11 HANGER	
B2	2 - 1 $\frac{1}{2}$ " LVL BEAM	HU412 OR HUC412	
	2x10 LEDGER W/ 3- 1 $\frac{1}{4}$ " ϕ x 3 $\frac{1}{2}$ " SDS SCREWS @ 16"oc TO FIM		
	1 $\frac{1}{2}$ " LVL LEDGER W/ 2-1 $\frac{1}{2}$ " ϕ x 6" EXP ANCHORS @ 16"oc TO FDN WALL OR 3-1 $\frac{1}{4}$ " ϕ x 3 $\frac{1}{2}$ " SDS SCREWS TO STUD @ 16"		
<u>NOTES:</u>			
JOISTS: FRAME JOISTS CONTINUOUS WHERE POSSIBLE. BLOCK BTWN JOISTS @ BEARING W/ 1-JOISTS. PROVIDE MIN. 1 $\frac{1}{4}$ " BEARING. LAYOUT TO AVOID DRAINS, ETC. SEE MANUF FOR MAX. HOLE SIZE AND LOCATIONS. JOIST SUBSTITUTIONS MAY BE MADE W/ OSS'S WRITTEN APPROVAL PRIOR TO CONSTRUCTION			
<u>BEAMS:</u> PROVIDE MIN 3" BEARING AT ENDS ON BEAM OR 1-STUD FOR EACH PLY OF LVL			





ROOF FRAMING PLAN

1/4" = 1'-0"

- HEADERS TO BE 2-2x8 HEM FIR #2 INSULATED HEADERS PER TYPICAL FRAMING DETAILS W/ 1-2x6 KING (K) + 1-2x6 TRIM (T) EA. END OR AS NOTED
- EXTERIOR WALLS TO BE 2x6 @ 16" W/ 7/16" APA RATED EXTERIOR SHEATHING W/ Bd NAILS @ 6"oc @ EDGES & 12"oc IN FIELDS, BLOCK UNSUPPORTED EDGES. SEE TYPICAL FRAMING DETAILS FOR ADD'L INFO.
- ROOF SHTG TO BE MIN. 15/32" APA RATED OSB SHTG W/ Bd NAILS @ 6"oc @ EDGES & 12"oc IN FIELDS
- ENG'D TRUSS DESIGN, TRUSS TO TRUSS CONNECTIONS, AND MEMBER BRIDGING DESIGN BY TRUSS MANUF. FOR LOADS SPECIFIED IN GENERAL NOTES
- TIE DOWN TRUSSES, AND LOOKOUTS @ BRG W/ H2.5A TIE 2 SIDES, OR AS NOTED
- TIE DOWN GIRDER TRUSSES @ BRG W/ S118 OR MTS18 2 SIDES
- SEE SHEET S1.2 FOR GENERAL STRUCTURAL NOTES & TYPICAL FRAMING DETAILS



357 S. McCoslin Ste 200,
Louisville CO 80027

PAK: Jonathan Wallace, PE
Cell: 720.341.7083
Email: jrw@kesseng.com
PAK: Dana Michel, PE
Cell: 303.913.6474
Email: dana@kesseng.com

LAM RESIDENCE
980 WAGONWHEEL GAP ROAD
BOULDER, CO 80302

JRW18165 :JOB #

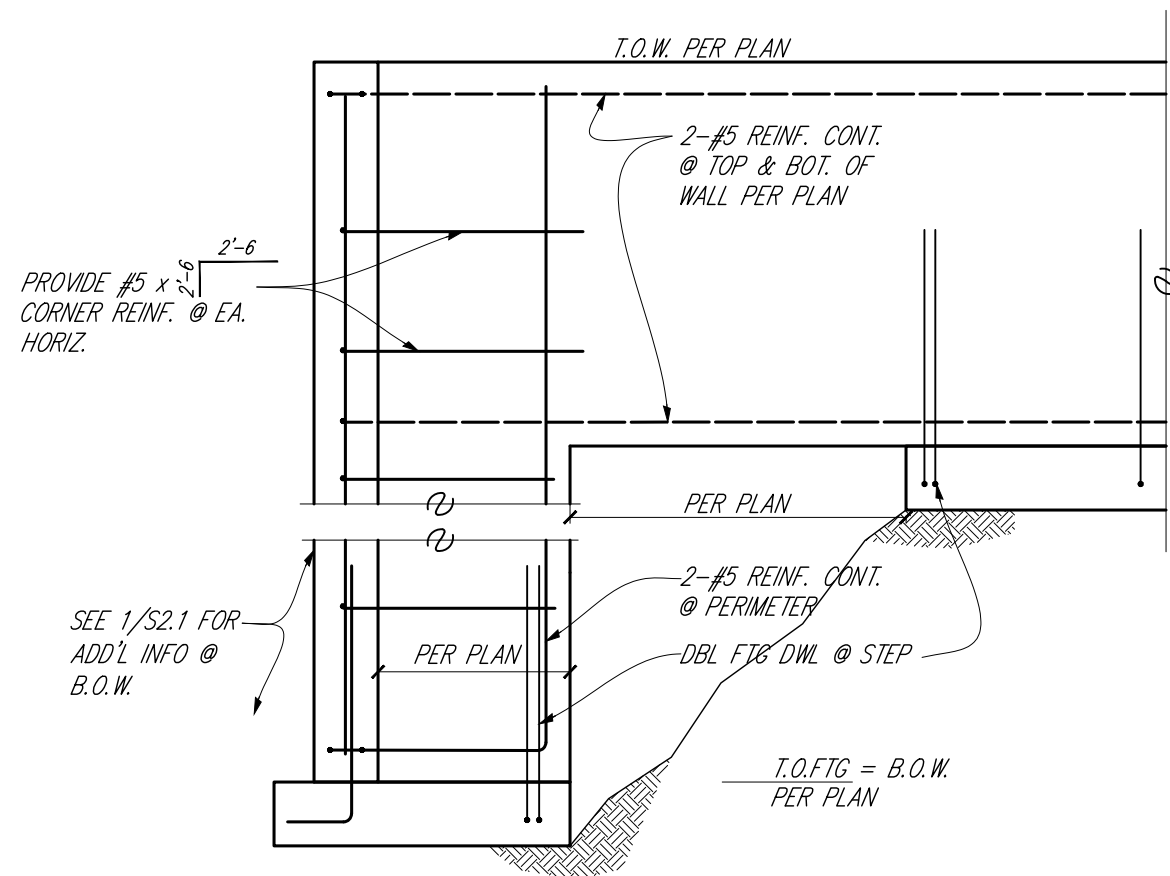
12/07/2018 :DATE

JRW + THB :DESIGN BY

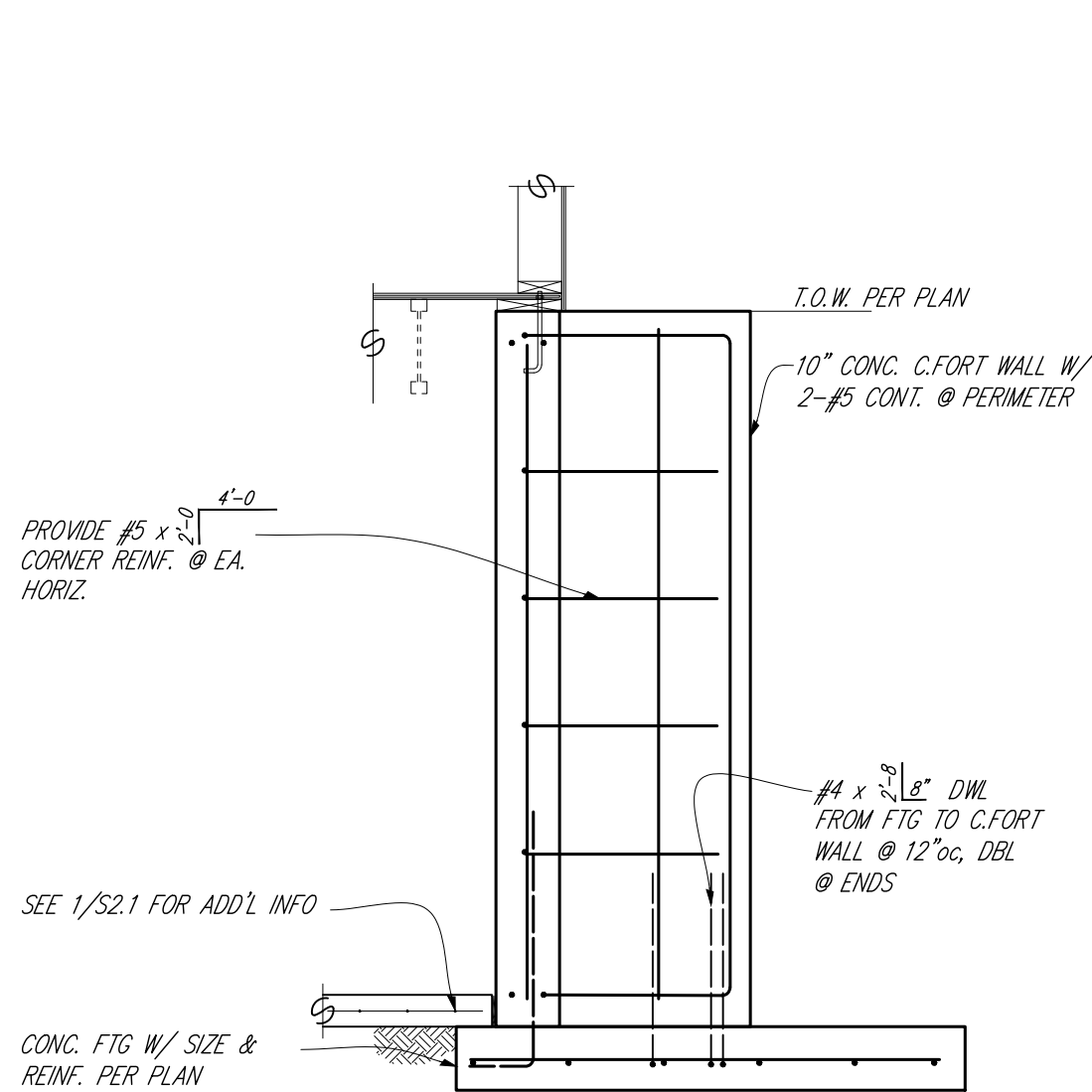
REVISIONS:

No.	Description

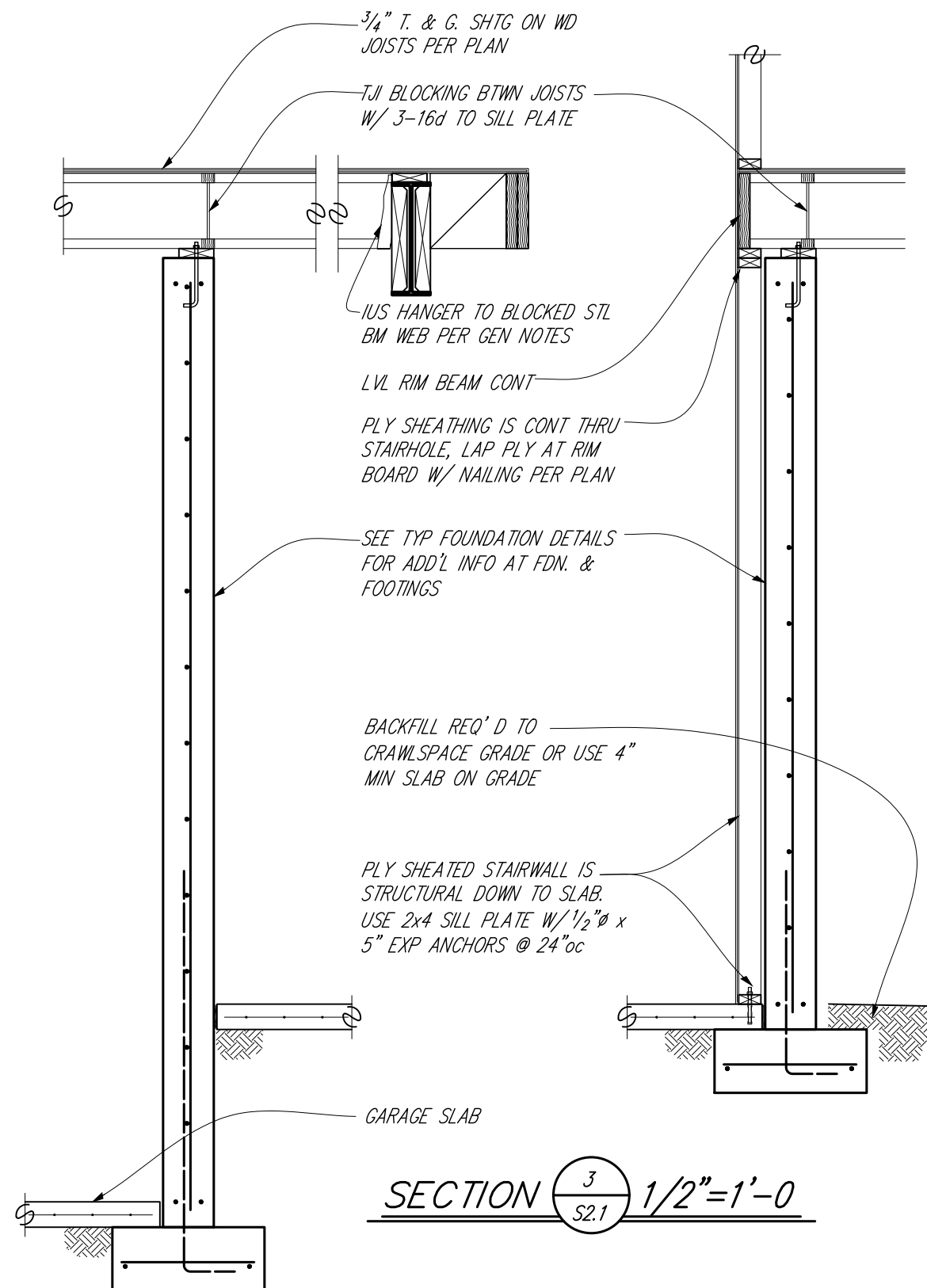
SHEET NO.
S1.4



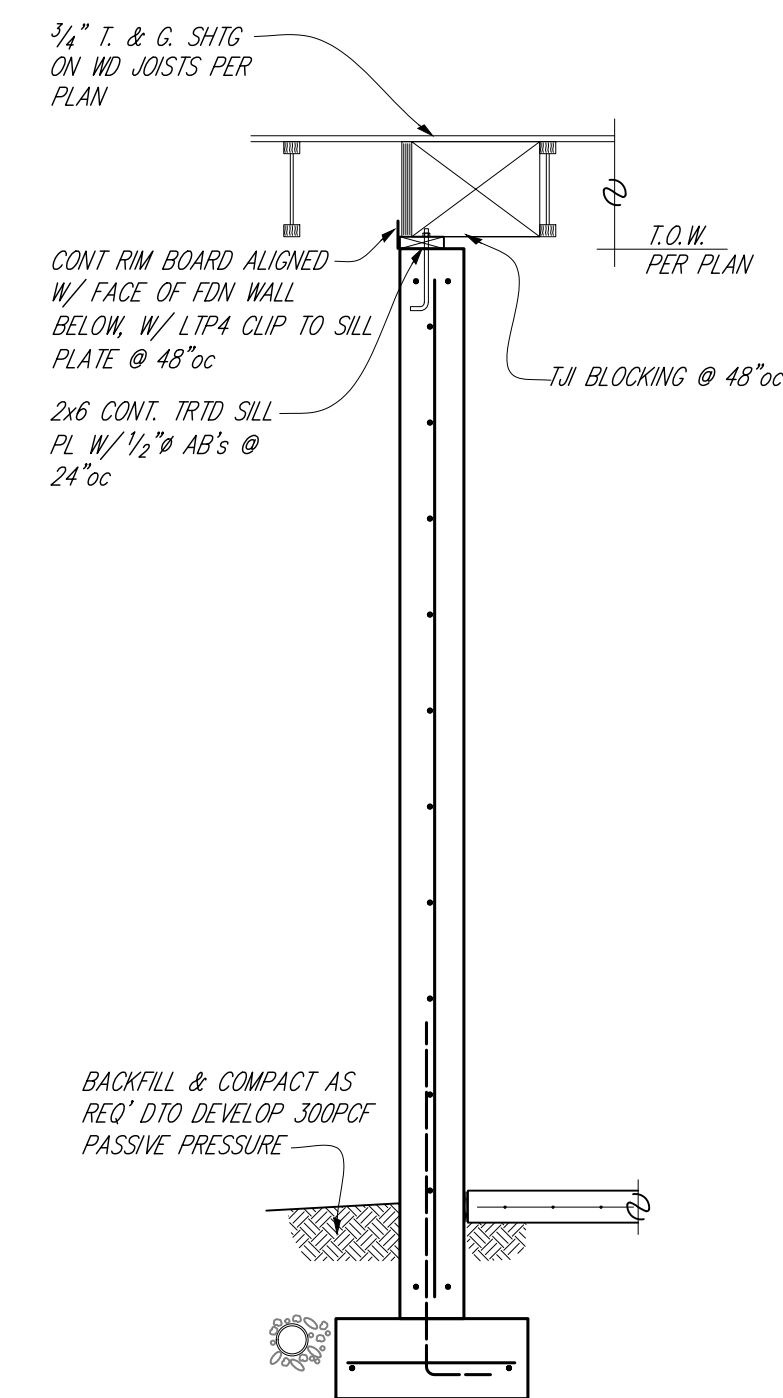
SECTION $\frac{5}{S2.1}$ 1/2"=1'-0"



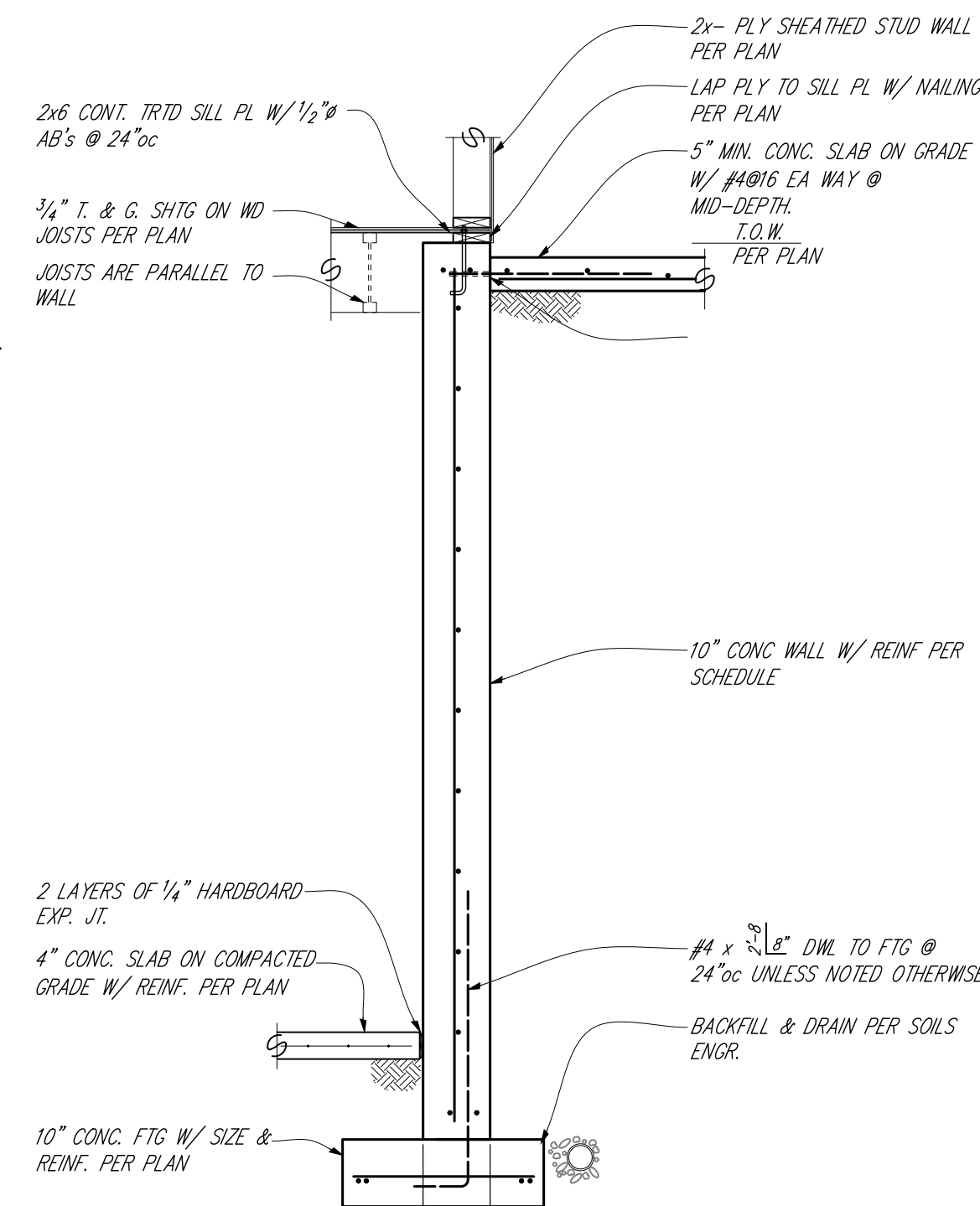
SECTION $\frac{4}{S2.1}$ 1/2"=1'-0"



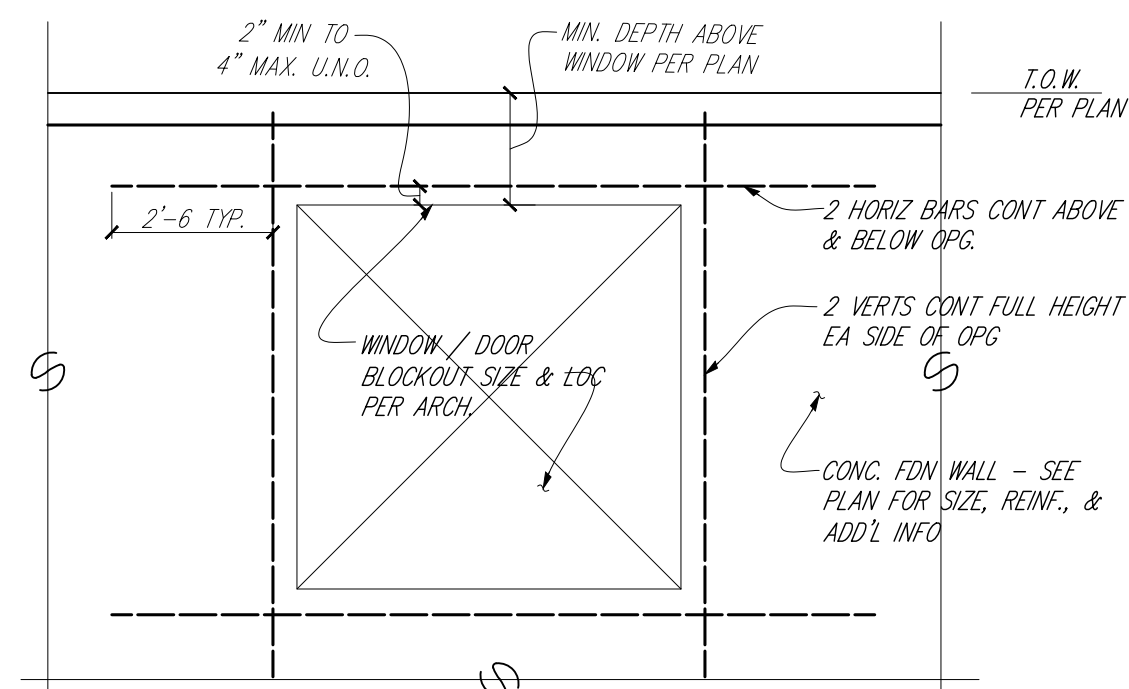
SECTION $\frac{3}{S2.1}$ 1/2"=1'-0"



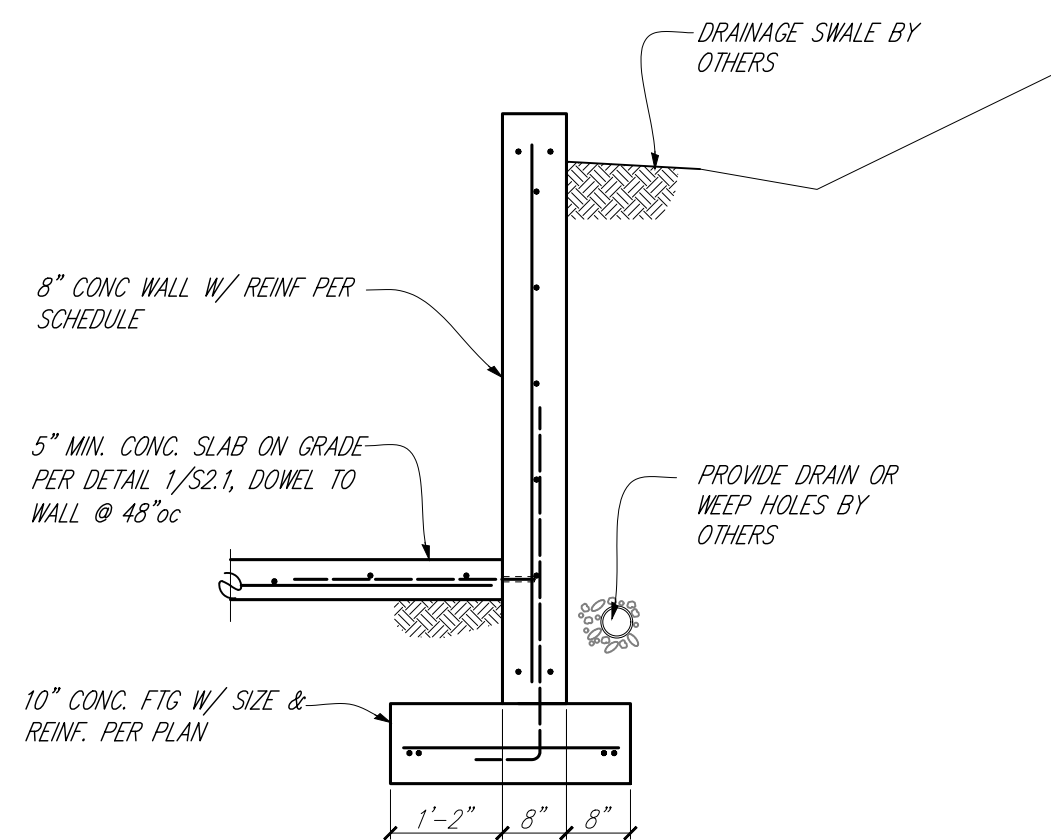
SECTION $\frac{2}{S2.1}$ 1/2"=1'-0"



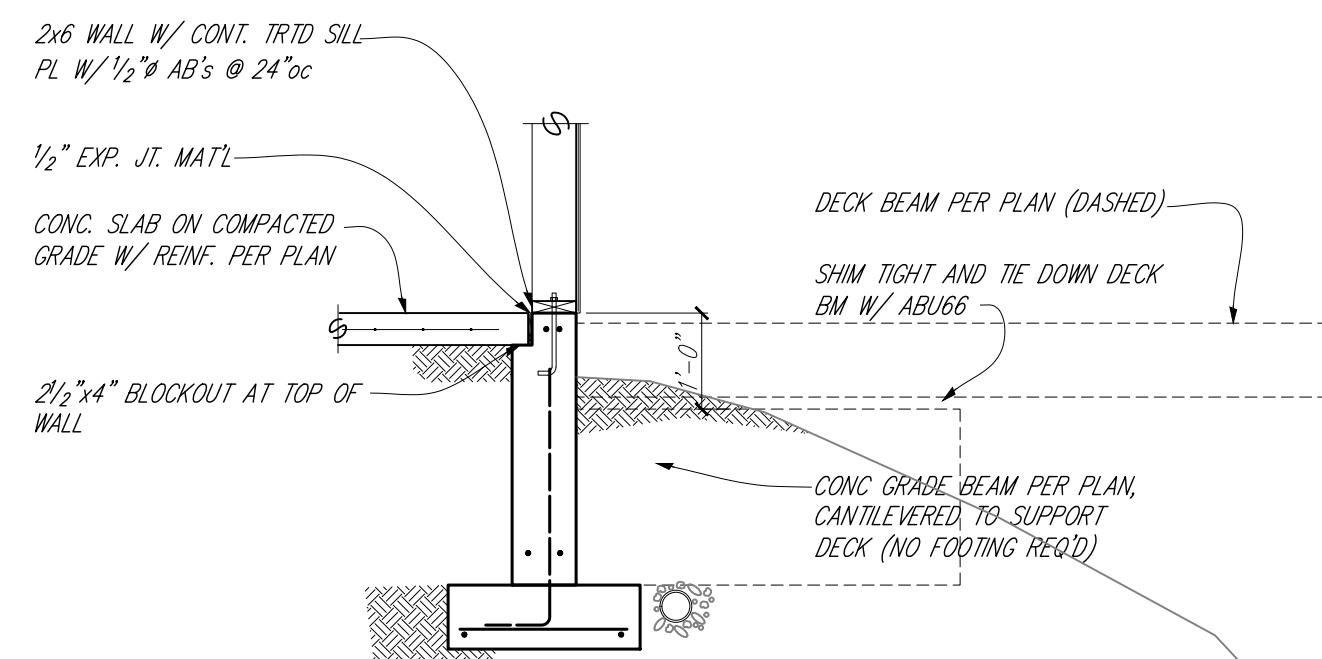
SECTION $\frac{1}{S2.1}$ 1/2"=1'-0"



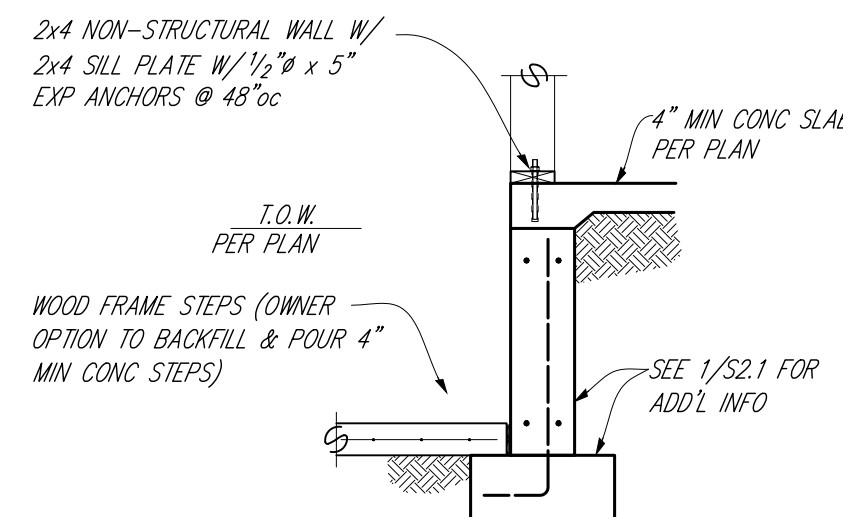
TYPICAL FDN WALL BLOCKOUT REINF. ELEVATION $\frac{9}{S2.1}$ 1/2"=1'-0"



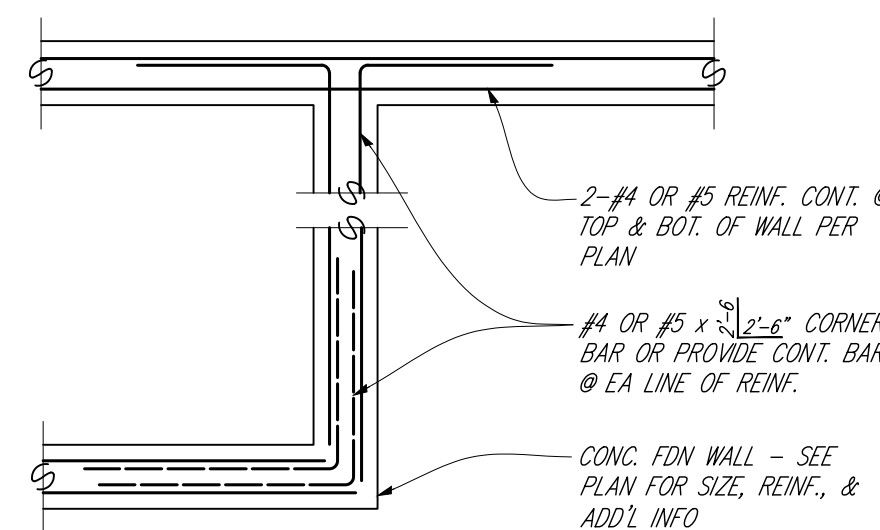
SECTION $\frac{8}{S2.1}$ 1/2"=1'-0"



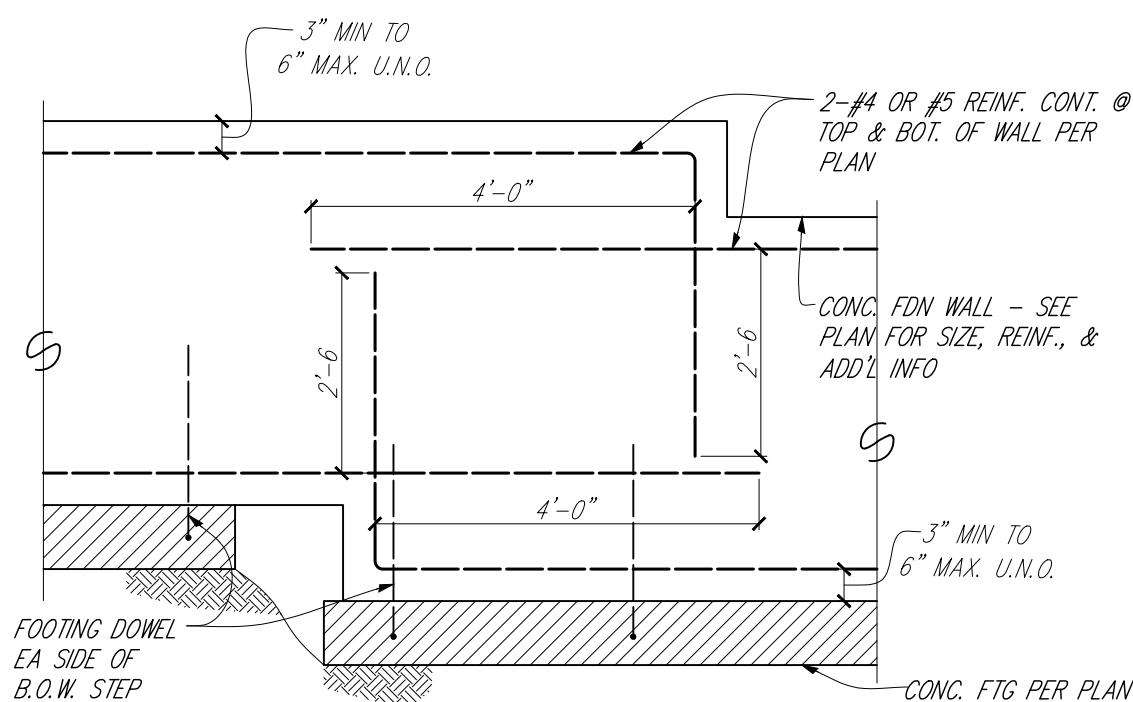
SECTION $\frac{7}{S2.1}$ 1/2"=1'-0"



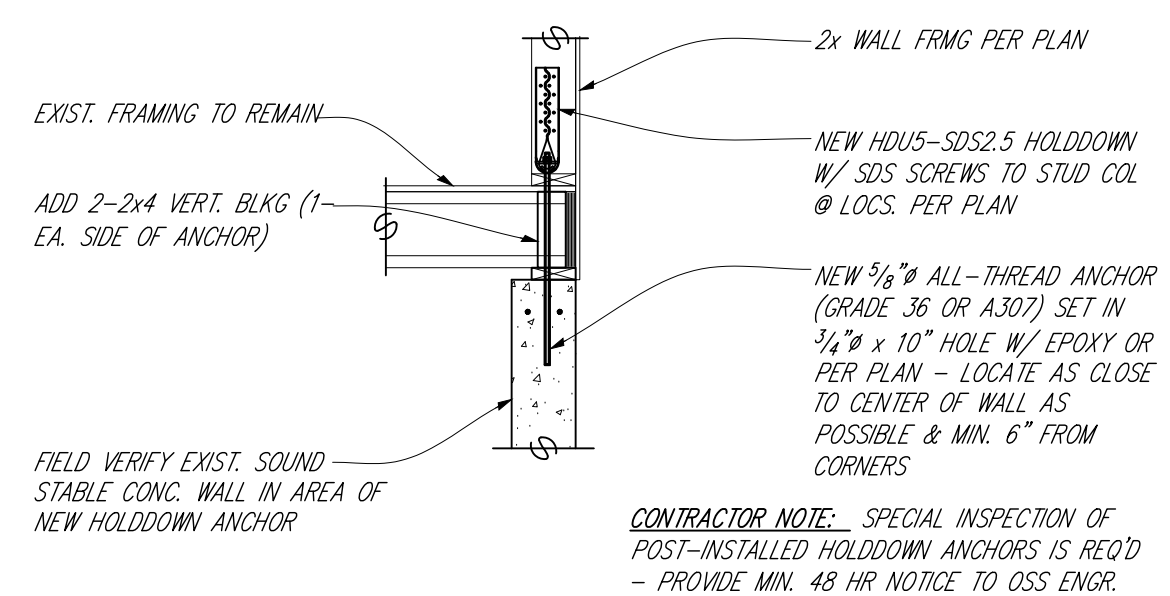
SECTION $\frac{6}{S2.1}$ 1/2"=1'-0"



TYPICAL CORNER REINF. PLAN VIEW NOT TO SCALE

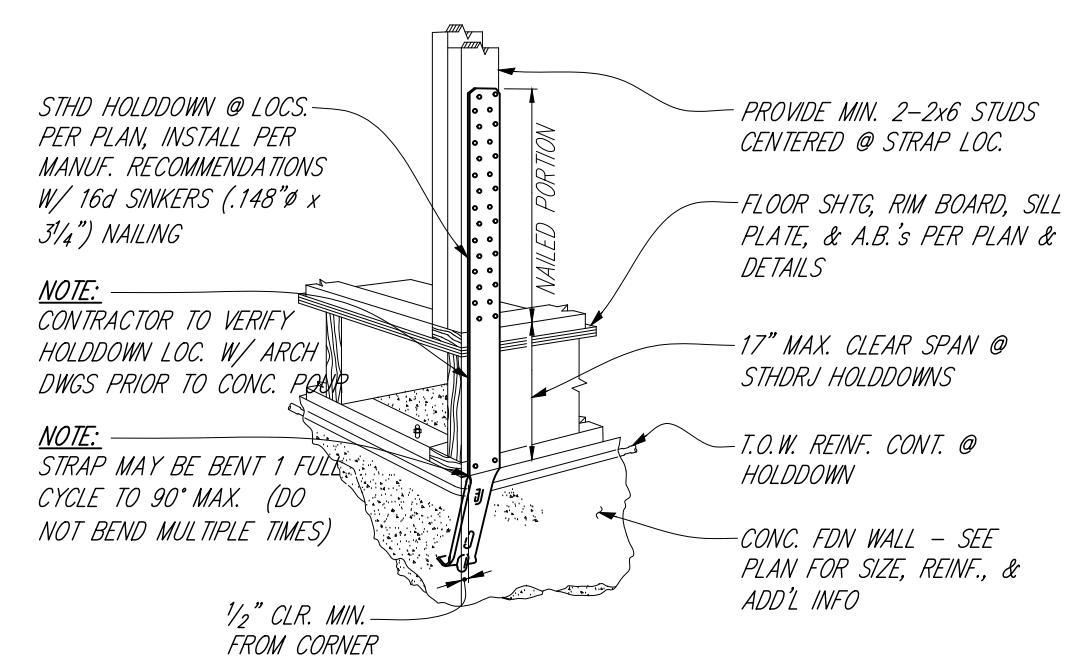


TYPICAL @ WALL STEPS ELEVATION NOT TO SCALE



TYPICAL HDU5-SDS2.5 HOLDDOWN SECTION NOT TO SCALE 11A/S2.1

EPOXY NOTES:
 • CLEAN OUT HOLE W/ BRUSH AND COMPRESSED AIR TO REMOVE DUST.
 • BASE MATERIAL MUST HAVE MIN 40° TEMP FOR 72 HOURS FOR SET EPOXY. CONTACT OSS FOR LOW TEMP ALTERNATIVES



TYPICAL STHDRJ HOLDDOWN PERSPECTIVE NOT TO SCALE 11/S2.1

NOTES:
 • DO NOT WETSET HOLDDOWN. USE STRAPMATE (BY SIMPSON) OR OTHER METHOD TO SECURE HOLDDOWN TO FORMS PRIOR TO CONC POUR
 • NAIL STRAP FROM BOTTOM UP
 • STRAP MAY BE NAILED THRU PLY SHTG TO STUDS, OR DIRECTLY TO STUDS

REVISIONS:	
No.	Description

