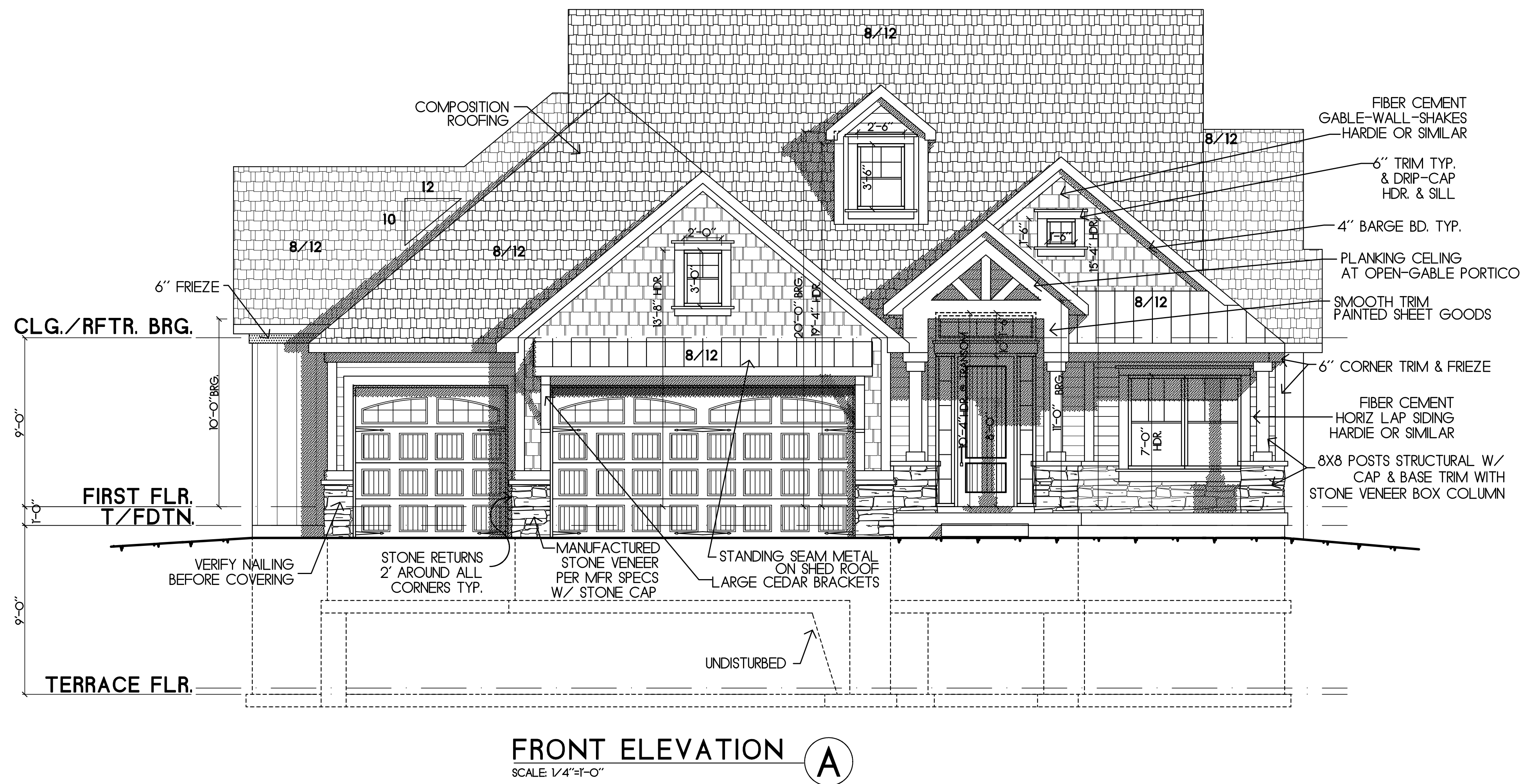
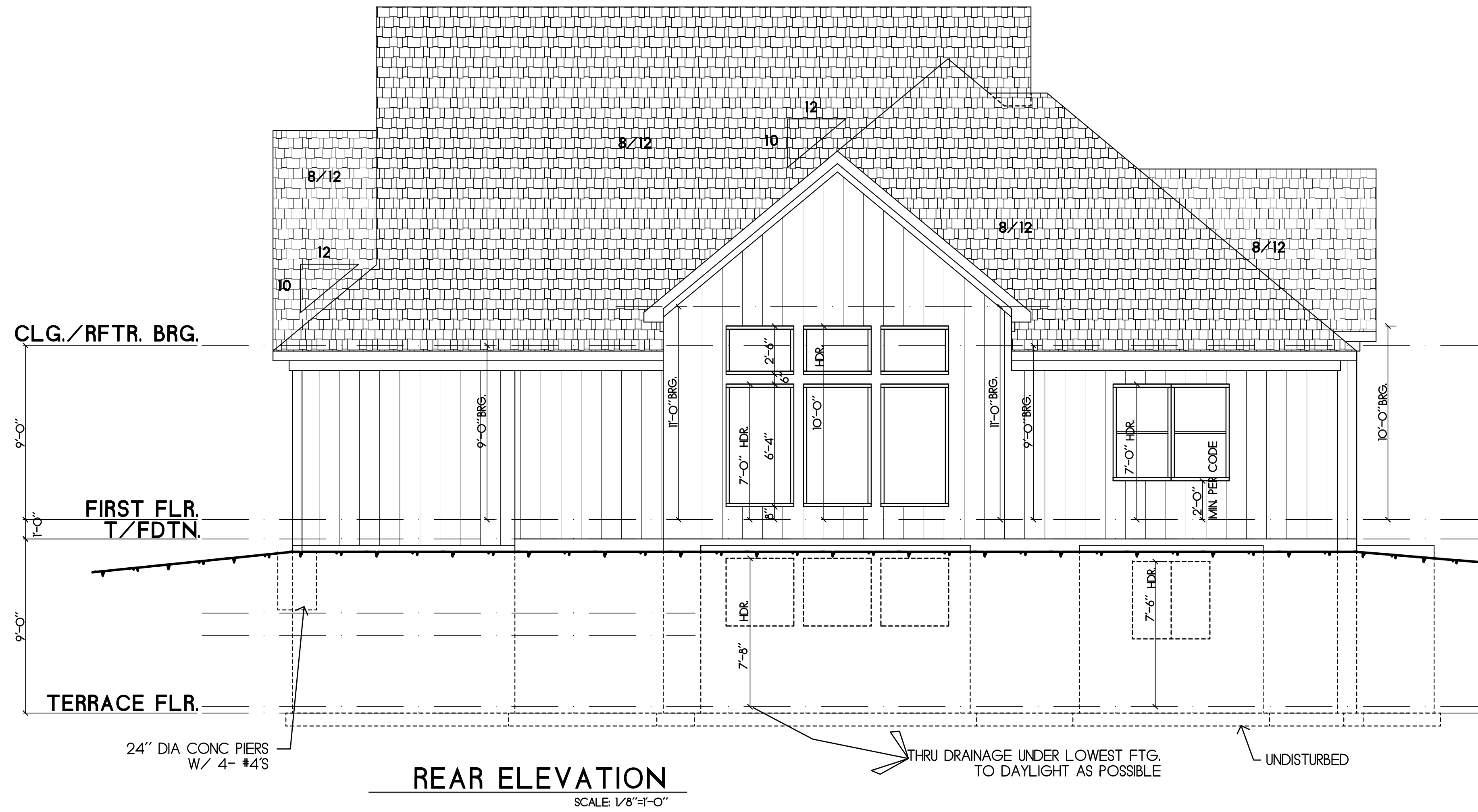




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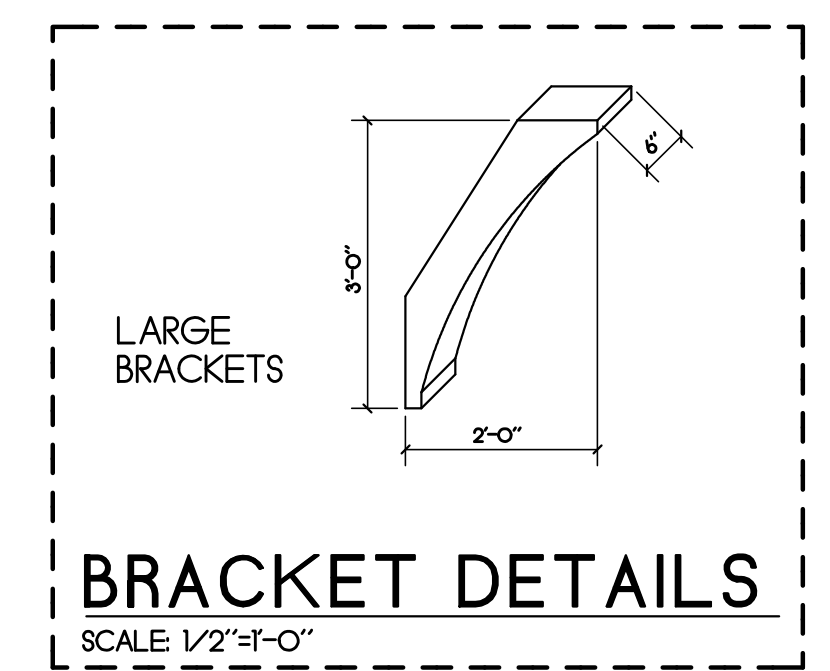
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SQUARE FOOTAGE SUMMARY:	
MAIN FLOOR FINISH	1,972 SF
LOWER FLOOR FINISH	0 SF
FOUNDATION SLAB	1,843 SF
GARAGE SLAB	632 SF
FRONT PORCH	220 SF
COVERED DECK	158 SF

- NOTE FOR S.A.B. BUILD-JOBS:
- \* FINAL DETAILS INCLUDING FINIALS, SHUTTERS BRACKETS AND OTHER EXTERIOR ACCESSORIES MUST BE SELECTED AND ADDED TO THE CONTRACT OR CHANGE ORDER.
- CONTRACTOR TO COORDINATE THE FOLLOWING:
- \* VERIFY EACH WALL BRG HEIGHT & WINDOW HDR HEIGHT
  - \* STEP DOWNS @ T/FDTN PER GRADE
  - \* RETAINING WALL TRANSITIONS PER GRADE
  - \* ROOF AND SOFFIT VENTS PER CODE
  - \* SEE ROOF PLAN TO CONFIRM OVERHANGS PER LOCATION
  - \* CONTRACTOR TO VERIFY ALL DIMENSIONS
  - \* MINI-CANS / EAVE LIGHTS TYP AT ALL HORIZ SOFFITS ON FRONT CONSULT ARCHITECT IF LOC. IS IN QUESTION



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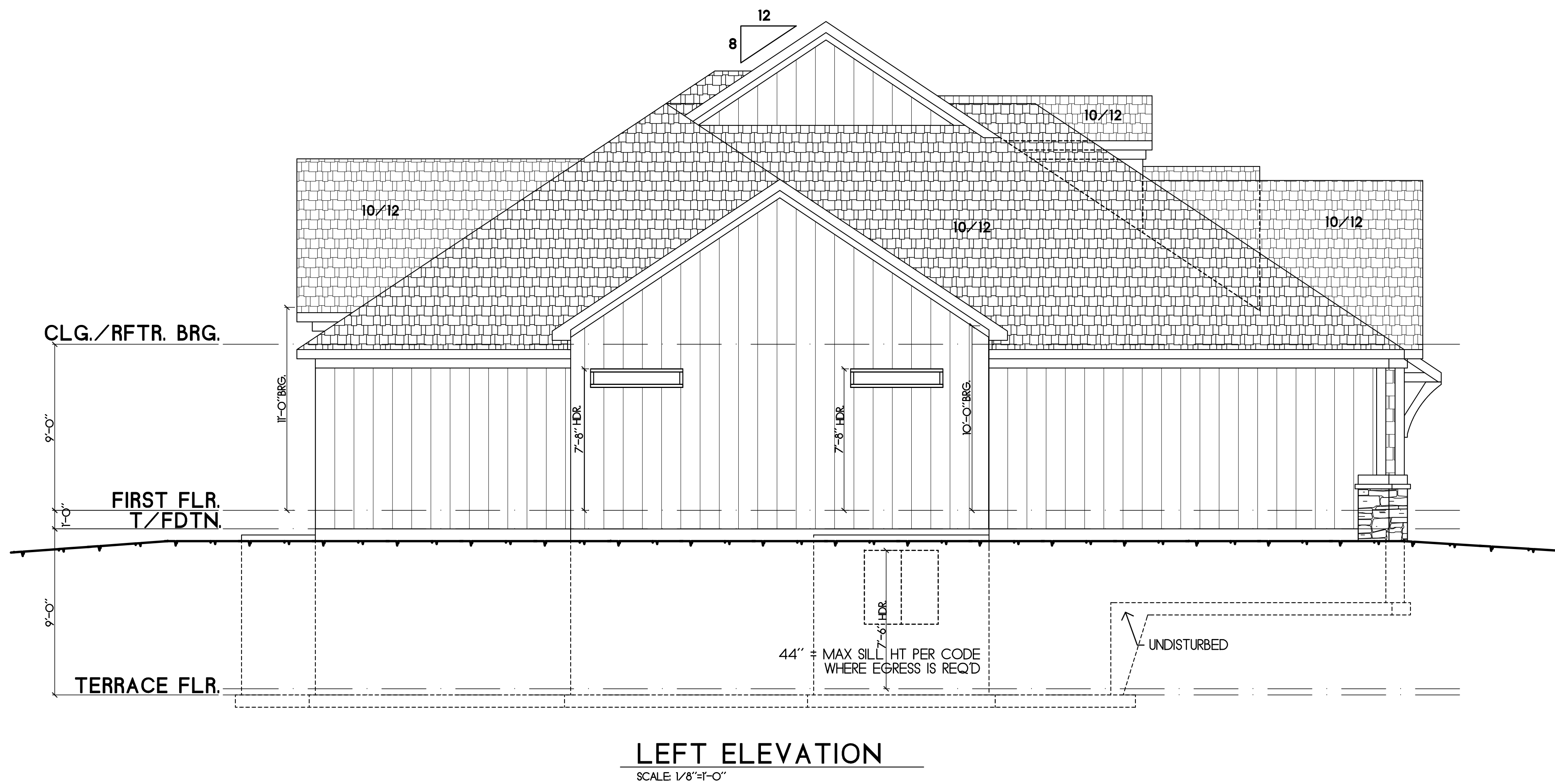
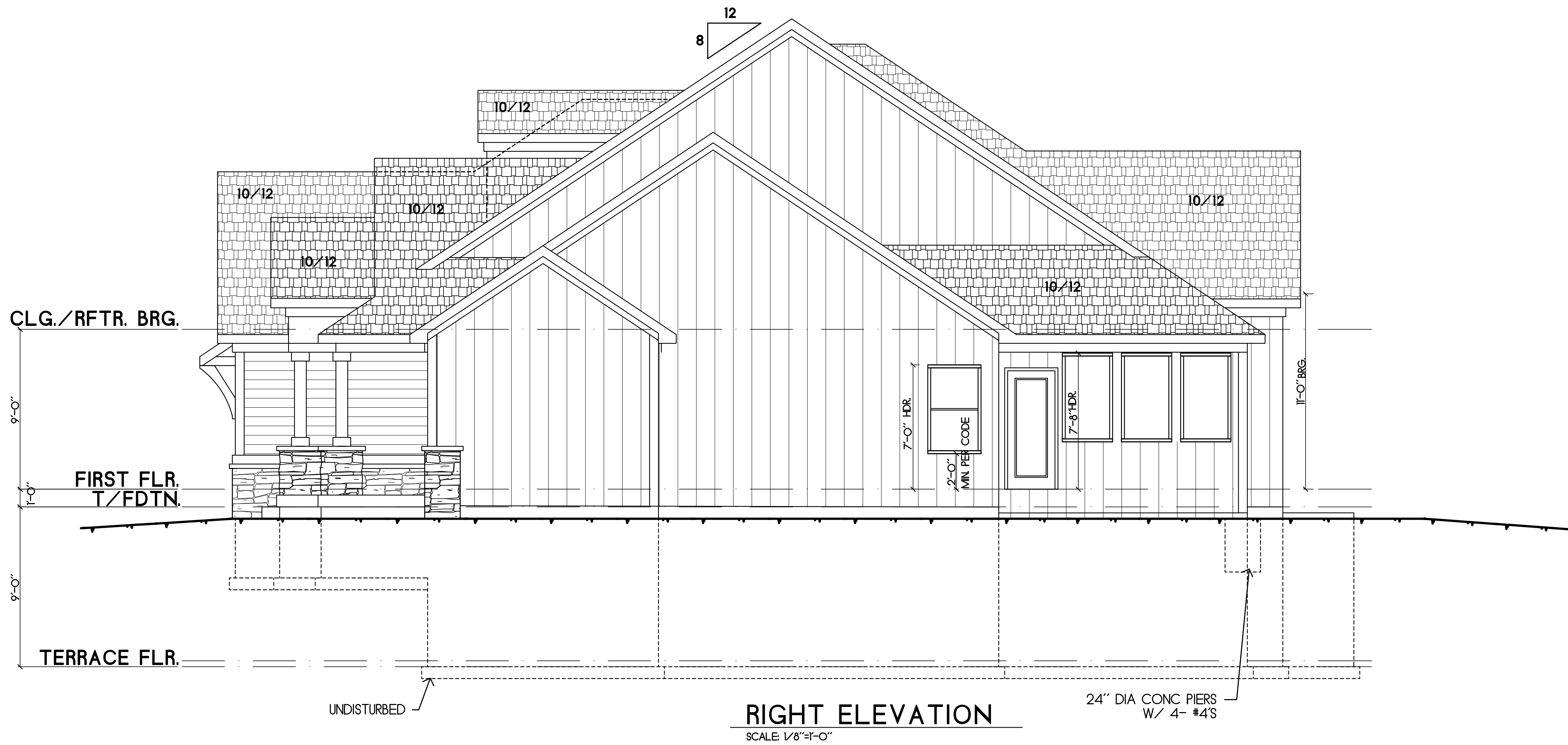


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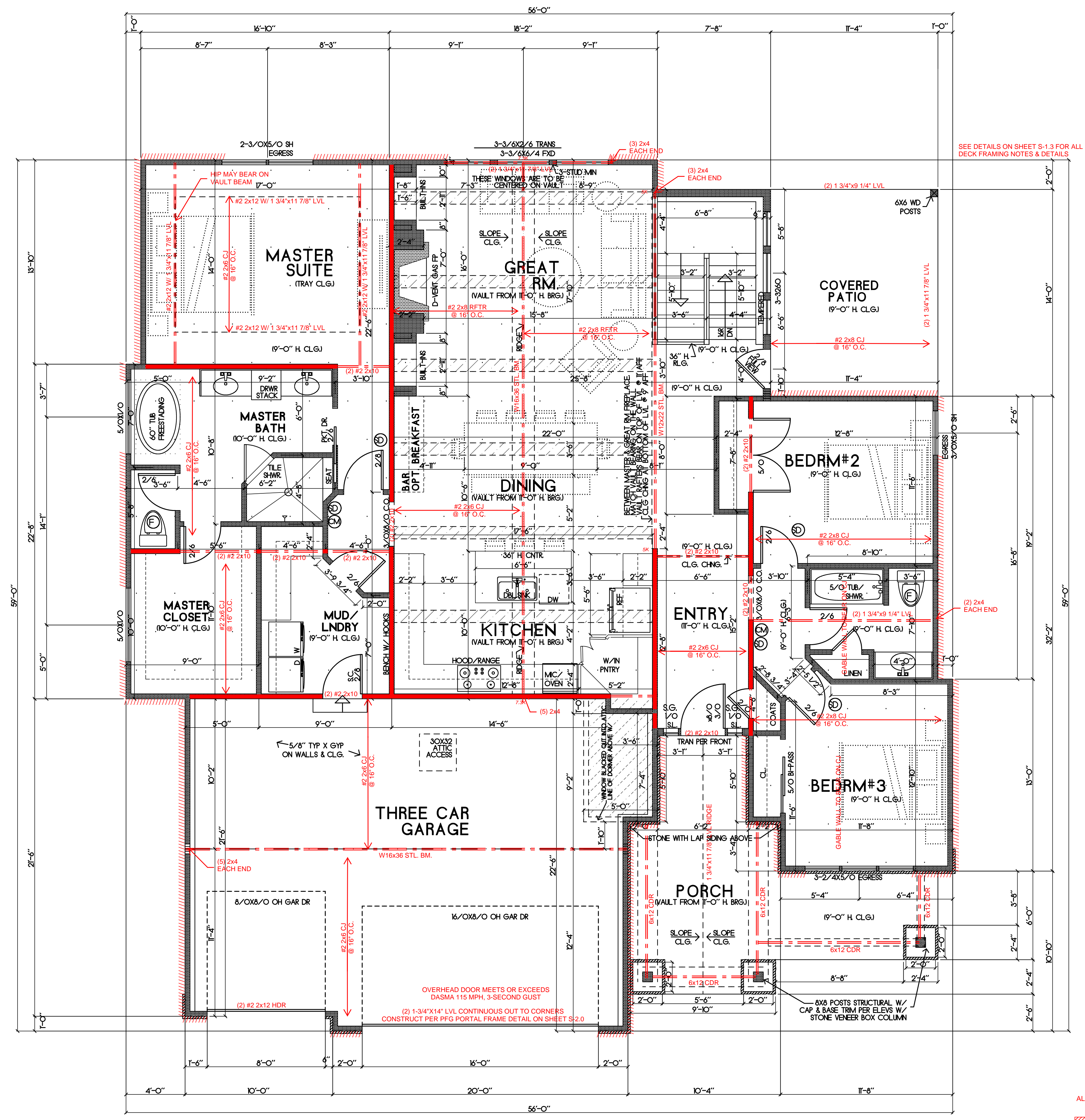
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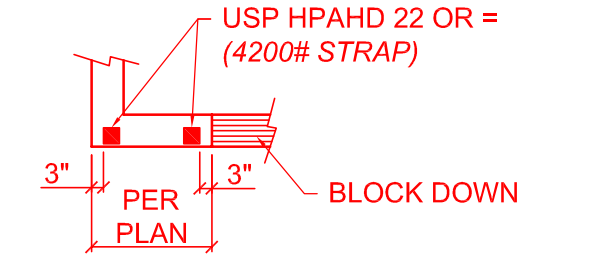


SEE DETAILS ON SHEET S-1.3 FOR ALL  
DECK FRAMING NOTES & DETAILS

- LOAD BEARING WALL
- LOAD BEARING BEAM
- SMOKE DETECTOR
- CARBON MONOXIDE SENSOR

**GENERAL NOTES:**  
 - WINDOW SHALL HAVE FALL PROTECTION PER IRC 312.2.4  
 - HOUSE WILL BE PROVIDED WITH A "UFER" GROUND PER IRC SECTION 3608.1.5  
 - OVERHEAD GARAGE DOORS MUST MEET DASHA REQUIREMENTS SEE DETAIL SHEET S-1.0  
 - ALL HEADERS NOT LABELED SHALL BE MIN (2) #2-2X10 DFL  
 - DBL ALL LST UNDER ISLAND  
 - SOILS IN THIS AREA COMMONLY HAVE A VERY HIGH SHRINK SWELL CAPACITY, OUR FIRM RECOMMENDS ALL SITES BE EVALUATED BY A GEOTECHNICAL FIRM PRIOR TO PLACEMENT OF FOUNDATIONS  
 - PROVIDE CARBON MONOXIDE AND SMOKE DETECTORS PER IRC REQUIREMENTS  
 - ANY PORTION OF THESE PRINTS ISSUED WITHOUT A MIN. OF S-1.0 - S-4.0 SHALL NOT BE CONSIDERED A COMPLETE SET OF CONSTRUCTION DOCUMENTS  
 - ICE AND WATER SHIELD AS REQUIRED PER IRC

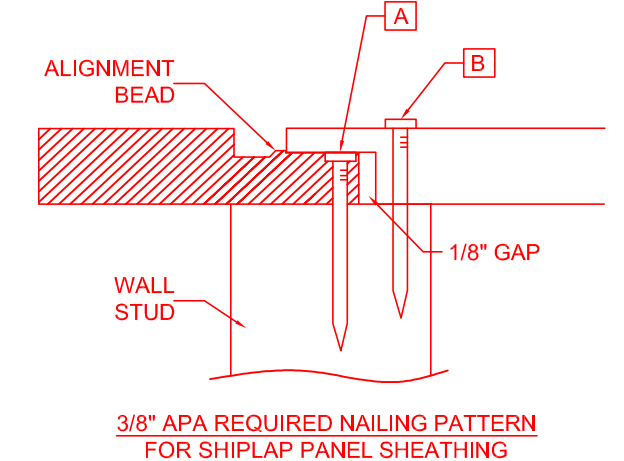
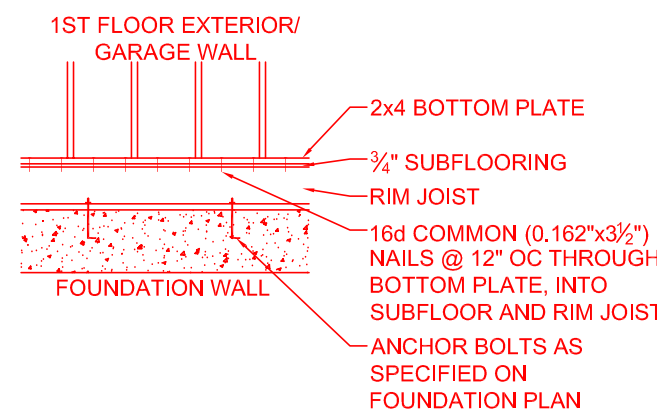
**TYPICAL TIE DOWN AT NARROW WALL**



**BRACED WALLS:**  
 SEE CALCULATIONS ON SHEET S-2.0, PER ASC7-10 REQUIREMENTS AS ALLOWED BY IRC 2018 R301.2.1

ALL EXTERIOR WALLS SHALL BE SHEATHED PER ANY ONE OF THE FOLLOWING OPTIONS:  
 - 7/16" APA-RATED PLYWOOD/OSB WITH 8d NAILS @ 6" O.C. AT EDGES AND @ 12" O.C. IN THE FIELD  
 - 7/16" SHIPLAP PANEL SHEATHING (I.E. LP SMARTSIDE OR EQUIVALENT) WITH 8d NAILS @ 6" O.C. AT EDGES AND @ 12" O.C. IN THE FIELD  
 - 3/8" SHIPLAP PANEL SHEATHING (I.E. LP SMARTSIDE OR EQUIVALENT) WITH 8d NAILS @ 4" O.C. AT EDGES AND @ 12" O.C. IN THE FIELD

INTERIOR BRACED WALL LOCATIONS ONLY SHOWN WHEN REQUIRED BY ADDITIONAL BRACING SECTION OF CALCULATIONS ON SHEET S-2.0

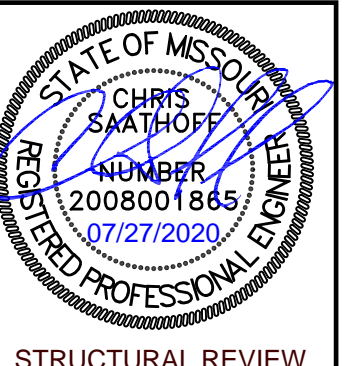


NAILING WITH SPACING AS SPECIFIED PER PLAN. FOR EXAMPLE, IF REQUIRED SPACING IS 4" O.C., BOTTOM LAP SHALL FIRST BE NAILED AT 4" O.C. (NAIL "A"), THEN FULL DEPTH SECTION OF OVERLAP PANEL SHALL BE NAILED @ 4" O.C. (NAIL "B")

**MAIN FLOOR PLAN**  
 SCALE: 1/4"=1'-0"  
 AREA= 1,972 SF

ALL ELECTRIC HOME WITH PROPANE AND SEPTIC SYSTEMS  
 NOTE: 2X6 STUDS AT ANY WALL TALLER THAN 12' TALL  
 WINDOW NOTES:  
 SEE ELEVATIONS FOR HDR. HTS

OVERHEAD DOOR MEETS OR EXCEEDS  
 OASMA 115 MPH, 3-SECOND GUST  
 (2) 1-3/4"x11/8" LVL CONTINUOUS OUT TO CORNERS  
 CONSTRUCT PER PFG PORTAL FRAME DETAIL ON SHEET S-2.0



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1. COLUMN AND PIER PAD SIZES SHOWN ARE FOR MAX. COLUMN HEIGHT OF 10'-0" TALL.  
2. COLUMN AND PIER PAD SIZES SHOWN ARE BASED ON AN ASSUMED 1500 PSF. THIS IS THE CAPACITY REQUIRED BY AHI. UNDERLINED GENERAL NOTES ON S-1.0 FOR MORE DETAILS.  
3. ALL STEEL COLUMNS SHALL BE ISOLATED FROM SLABS WITH APPROVED ISOLATION DEVICE OR JOINT.

**DECK PIER SCHEDULE**

- MIN. 6X6 TRTD/CDR POST ON 12" CONC PIER WITH USP PAU 66 BASE OR = (177# MAX)
- MIN. 6X6 TRTD/CDR POST ON 16" CONC PIER WITH USP PAU 66 BASE OR = (205# MAX)
- MIN. 6X6 TRTD/CDR POST ON 18" CONC PIER WITH USP PAU 66 BASE OR = (264# MAX)
- MIN. 6X6 TRTD/CDR POST ON 24" CONC PIER WITH USP PAU 66 BASE OR = (471# MAX)

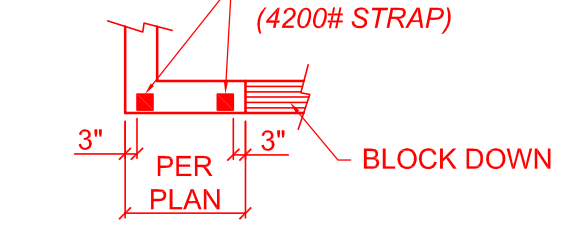
PIERS TO TERMINATE ON ORIGINAL SOIL OF 1500 PSF MINIMUM BEARING.  
PIERS TO TERMINATE AT A POINT 36" MINIMUM BELOW FINISH GRADE.  
POST ARE NOT TO EXCEED AN UNBRACED LENGTH OF 12' WITHOUT CONTACTING HD ENGINEERING FOR GUIDANCE.

**COLUMN PAD SCHEDULE**

- A 3" SCH. 40 STL. COL. ON 30"x30"x12" CONC. PAD W/ (6) #4 BARS E.W. (9.4K MAX.)
- B 3" SCH. 40 STL. COL. ON 36"x36"x12" CONC. PAD W/ (6) #4 BARS E.W. (13.5K MAX.)
- C 3 1/2" SCH. 40 STL. COL. ON 42"x42"x14" CONC. PAD W/ (7) #4 BARS E.W. (18.4K MAX.)
- D 3 1/2" SCH. 40 STL. COL. ON 48"x48"x16" CONC. PAD W/ (8) #4 BARS E.W. (24K MAX.)
- E 3 1/2" SCH. 40 STL. COL. ON 54"x54"x18" CONC. PAD W/ (9) #4 BARS E.W. (30.4K MAX.)
- F 3 1/2" SCH. 40 STL. COL. ON 60"x60"x18" CONC. PAD W/ (10) #4 BARS E.W. (37.5K MAX.)

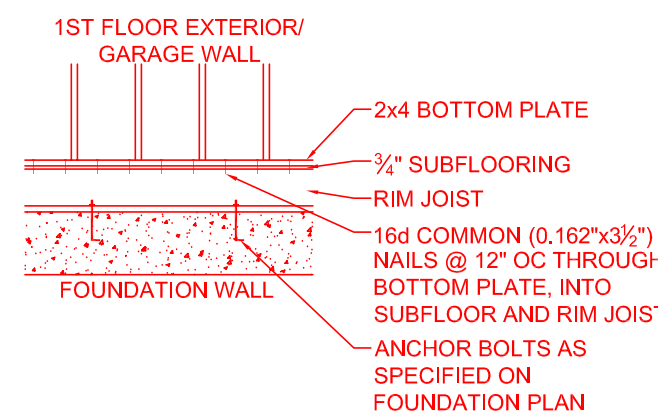
**GENERAL NOTES:**  
- WINDOW SHALL HAVE FALL PROTECTION PER IRC 312.2.4  
- HOUSE WILL BE PROVIDED WITH A "UFER" GROUND PER IRC SECTION 9008.1.5  
- OVERHEAD GARAGE DOORS MUST MEET DASMA REQUIREMENTS SEE DETAIL SHEET S-1.0  
- ALL HEADERS NOT LABELED SHALL BE MIN (2) #2X10 DFL  
- DBL ALL JST UNDER ISLAND  
- SOILS IN THIS AREA COMMONLY HAVE A VERY HIGH SHRINK SWELL CAPACITY. OUR FIRM RECOMMENDS ALL SITES BE EVALUATED BY A GEOTECHNICAL FIRM PRIOR TO PLACEMENT OF FOUNDATIONS  
- PROVIDE CARBON MONOXIDE AND SMOKE DETECTORS PER IRC REQUIREMENTS  
- ANY PORTION OF THESE PRINTS ISSUED WITHOUT A MIN. OF S-1.0 S-4.0 SHALL NOT BE CONSIDERED A COMPLETE SET OF CONSTRUCTION DOCUMENTS  
- ICE AND WATER SHIELD AS REQUIRED PER IRC

**TYPICAL TIE DOWN AT NARROW WALL**

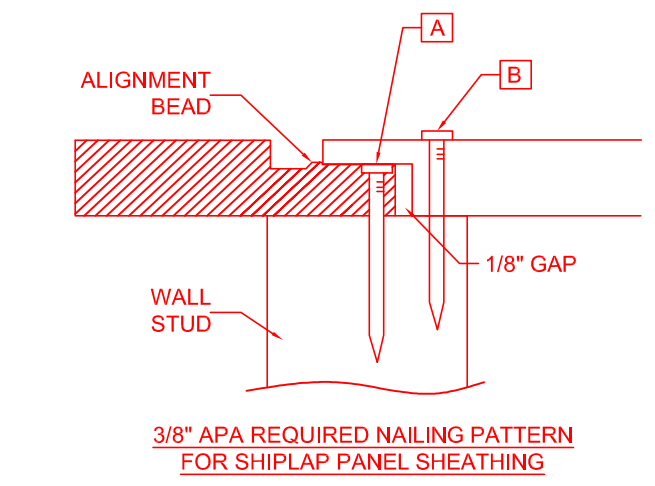


**BRACED WALLS:**

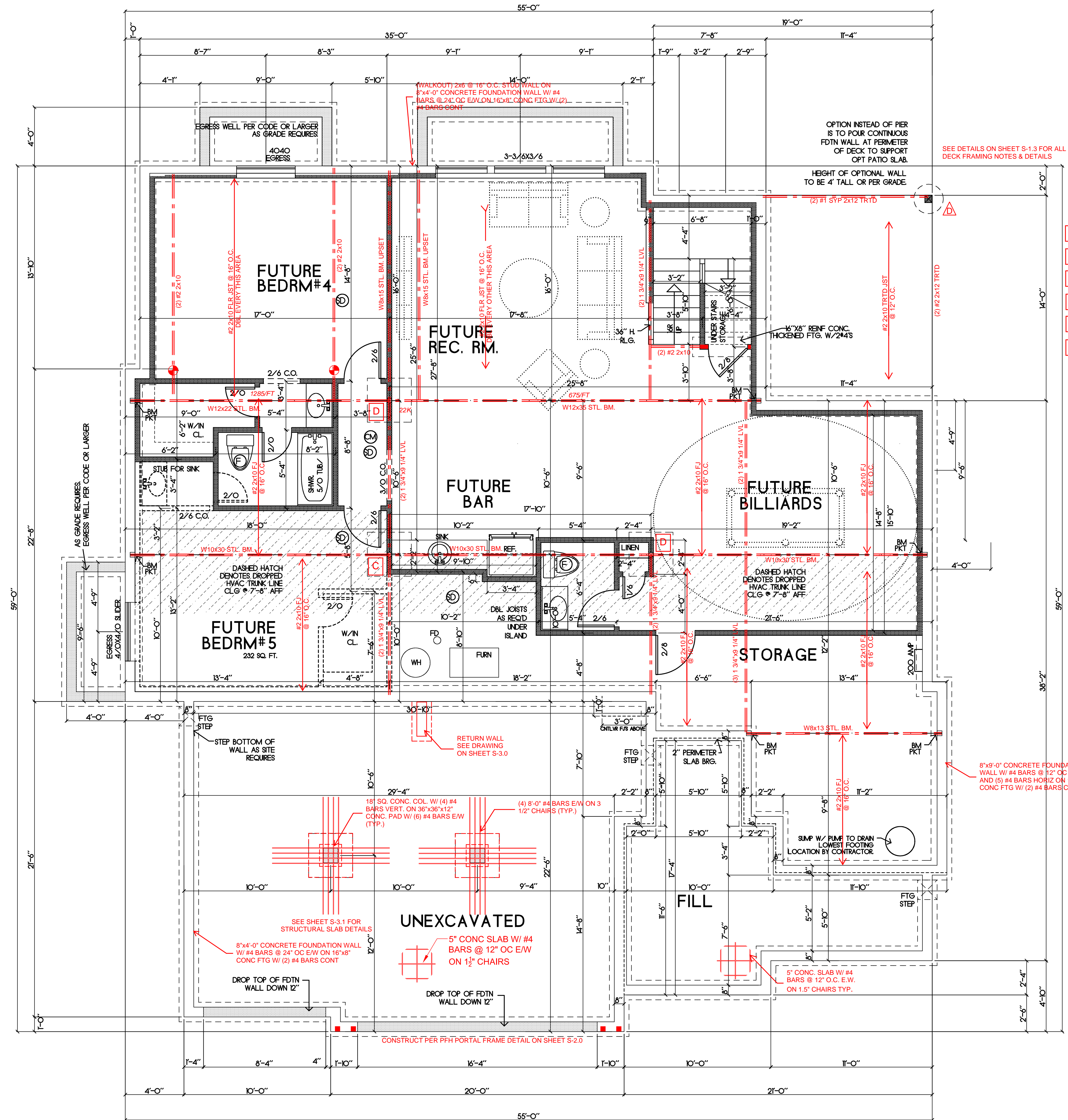
SEE CALCULATIONS ON SHEET S-2.0, PER ASCE7-10 REQUIREMENTS AS ALLOWED BY IRC 2018 R301.2.1  
ALL EXTERIOR WALLS SHALL BE SHEATHED PER ANY ONE OF THE FOLLOWING OPTIONS:  
- 7/16" APA-RATED PLYWOOD/OSB WITH 8d NAILS @ 6" O.C. AT EDGES AND @ 12" O.C. IN THE FIELD  
- 7/16" SHIPLAP PANEL SHEATHING (I.E. LP SMARTSIDE OR EQUIVALENT) WITH 8d NAILS @ 6" O.C. AT EDGES AND @ 12" O.C. IN THE FIELD  
- 3/8" SHIPLAP PANEL SHEATHING (I.E. LP SMARTSIDE OR EQUIVALENT) WITH 8d NAILS @ 4" O.C. AT EDGES AND @ 12" O.C. IN THE FIELD  
INTERIOR BRACED WALL LOCATIONS ONLY SHOWN WHEN REQUIRED BY ADDITIONAL BRACING SECTION OF CALCULATIONS ON SHEET S-2.0



**FOUNDATION ANCHORING NOTES:**  
- MIN. 1/2" ANCHOR BOLTS SHALL BE INSTALLED @ 36" O.C. MAX AND WITHIN 6"-12" FROM THE END OF EACH SECTION OF SILL PLATE ALONG ENTIRE PERIMETER OF FOUNDATION



NAILING WITH SPACING AS SPECIFIED PER PLAN. FOR EXAMPLE, IF REQUIRED SPACING IS 4" O.C., BOTTOM LAP SHALL FIRST BE NAILED AT 4" O.C. (NAIL "A"), THEN FULL DEPTH SECTION OF OVERLAP PANEL SHALL BE NAILED @ 4" O.C. (NAIL "B")



**LOWER FLOOR PLAN**  
SCALE 1/4"=1'-0" FINISH AREA= O SF

NOTE  
REIN. CONC. SLAB OVER  
GAS METER AND SIMP PIT LOCATION  
4" O.C. OF 1/2" CLEAN GRAVEL  
THICK & REIN. AS RECD BY FILL

ELECT. PANEL, SEWER LINES,  
GAS METER AND SIMP PIT LOCATION  
MAY VARY ACCORDING TO UTILITY  
ACCESS/GRADE CONDITIONS, & ARE  
TO BE DETERMINED BY BUILDER  
BASED ON SITE REQUIREMENTS.

1/2" GYP REQUIRED ON ALL I-JOISTS  
OVER UNFINISHED/STORAGE SPACES.  
OTHERWISE STRUCTURAL FLR JSTS  
MUST BE USED.

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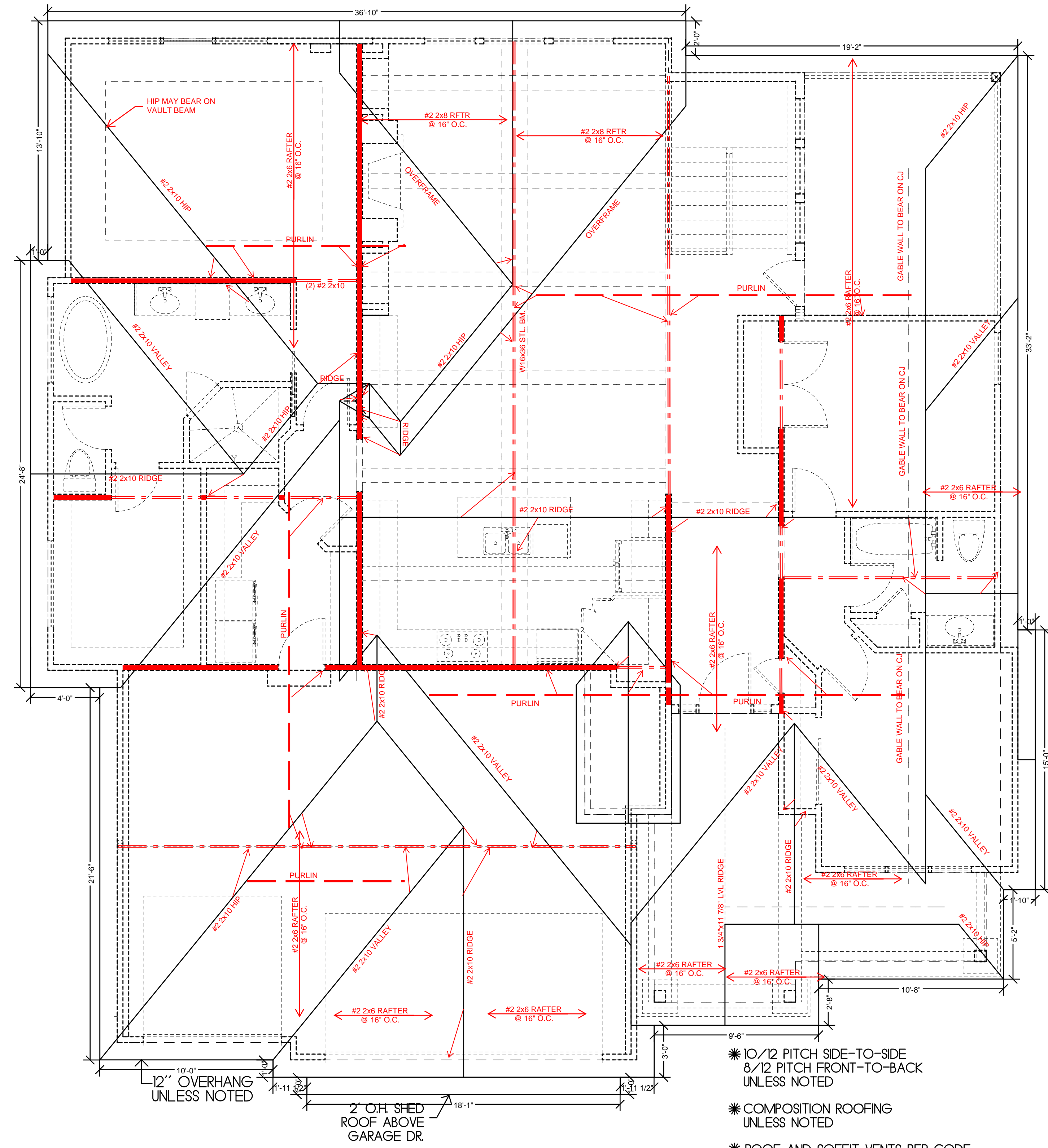
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**A5**



**NOTES**

ROOF DESIGNED FOR LIGHT ROOF COVERING 30PSF  
TOTAL LOAD (10PSF DL, 20PSF LL (SL))

RAFTERS (DOUG-FIR, OR EQUAL):  
SEE SPAN CHARTS BELOW

CODE MINIMUM	RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	@24" O.C.	11'-11"	
#2-2x6	@16" O.C.	14'-1"	
#2-2x8	@24" O.C.	15'-1"	
#2-2x8	@16" O.C.	18'-5"	
#2-2x10	@24" O.C.	18'-5"	
#2-2x10	@16" O.C.	22'-6"	

NOTE: CODE MINIMUM L/240 DEFLECTION

GREATER THAN CODE	RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	@24" O.C.	8'-8"	
#2-2x6	@16" O.C.	9'-9"	
#2-2x8	@24" O.C.	11'-3"	
#2-2x8	@16" O.C.	12'-9"	
#2-2x10	@24" O.C.	14'-3"	
#2-2x10	@16" O.C.	16'-3"	

DEFLECTION = L/360 LIVE LOAD, L/240 TOTAL LOAD  
VAULTS TO BE 2x10 DEPTH

ALL RIDGES, HIP, AND VALLEYS NOT MARKED SHALL BE (1)  
NOMINAL SIZE LARGER THAN THE INTERSECTING RAFTERS

PURLINS ARE 2x6 MIN.  
PURLIN STRUTS ARE AT 4'-0" O.C.  
PURLIN STRUTS SHALL BE INSTALLED AT NOT LESS  
THAN A 45 DEGREE ANGLE WITH THE HORIZONTAL  
ALL PURLIN STRUTS SHALL HAVE A MAXIMUM UNBRACED  
LENGTH OF 8'-0"  
PURLIN STRUTS SHALL BE CONSTRUCTED IN A "T"  
CONFIGURATION AND PER THE FOLLOWING CHART

PURLIN STRUT	MAX PURLIN STRUT LENGTH
(2) 2x4	8'-0"
(1) 2x4 & (1) 2x6	12'-0"
(1) 2x6 & (1) 2x8	20'-0"
(2) 2x6 & (1) 2x8	30'-0"
CONSULT ARCH/ENGR.	>30'-0"

EACH END OF STRUT SHALL BE FASTENED WITH MIN.  
(3) 8d OR (2) 16d NAILS

RIDGE BRACES ARE SAME AS PURLIN BRACES;  
SPACING, SIZE, CONFIGURATION, AND INSTALLATION  
(SEE PURLIN BRACE NOTE ABOVE)

HIP AND VALLEY BRACES ARE THE SAME AS PURLIN  
SIZE, CONFIGURATION, AND INSTALLATION (SEE PURLIN  
BRACE NOTES ABOVE)

SEE DETAILS 1, 5, 6, 7, 11, 12, 13, & 14 ON S-1.2  
FOR ROOF FRAMING AND INSULATION OPTIONS

- PURLIN
- LOAD BEARING WALL
- LOAD BEARING BEAM/  
GIRDER PER PLAN

SEE DETAIL 12S-1.2 FOR RAFTER TIE CONNECTION FOR  
CLG JOISTS PERPENDICULAR TO HIP RAFTERS

ALL RIDGES, HIP, & VALLEYS SHALL BE FASTENED TO  
EXTERIOR WALLS, BEAMS, OR LOAD BEARING WALL TOP  
PLATE PER FRAME FASTENING SCHEDULE ON S-1.0, AND  
PER R802.11, ALL UPLIFT OVER 200# SHALL BE FASTENED  
AS SHOWN ON THIS PLAN SHEET

ALL RAFTERS SHALL BE FASTENED TO TOP PLATE WITH (3)  
10d COMMON NAILS

IF ADDITIONAL HOLD DOWN STRAP REQUIRED: X=UPLIFT  
FORCE (POUNDS), REQUIRED SIMPSON HOLD-DOWN

SIMPSON STRAP FASTENED TO STRUCTURAL HIP, VALLEY,  
OR RIDGE AND STRUT SUPPORT, MUST ALSO STRAP  
BOTTOM END OF STRUT TO BEAM/WALL BELOW WITH  
SAME SIZE STRAP

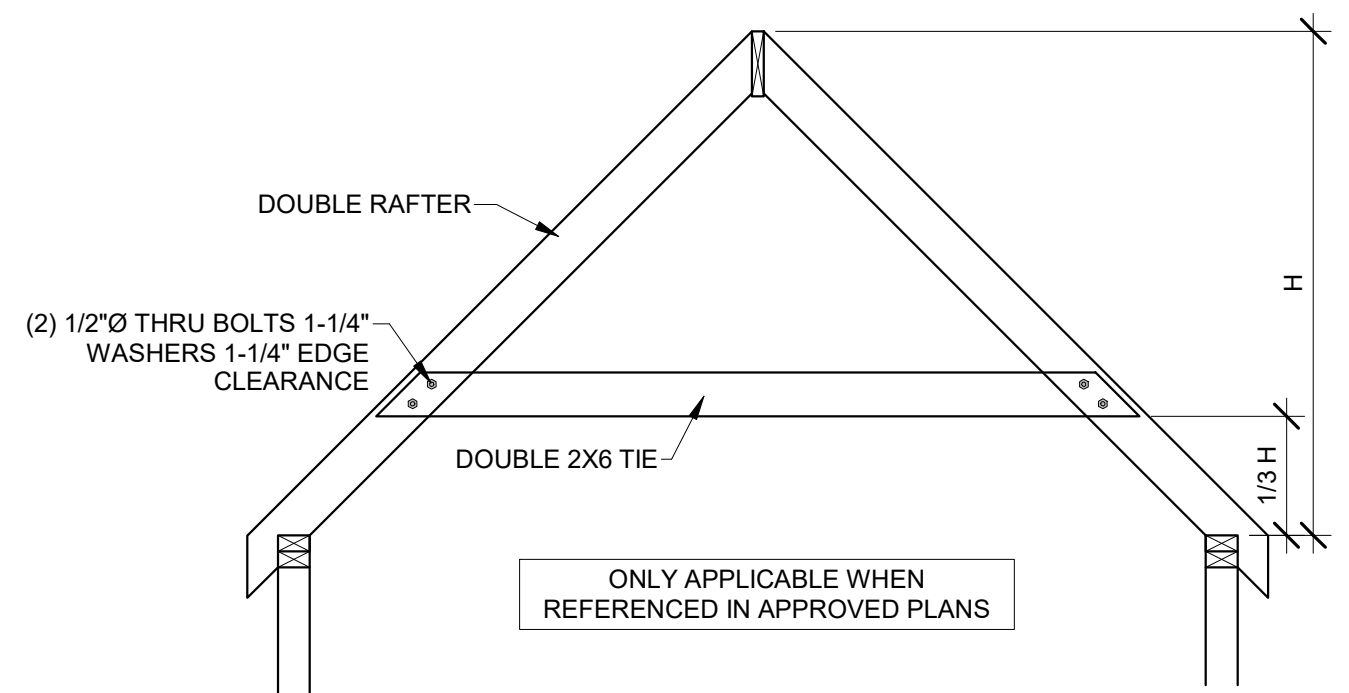
**ROOF FRAMING PLAN** (A)

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

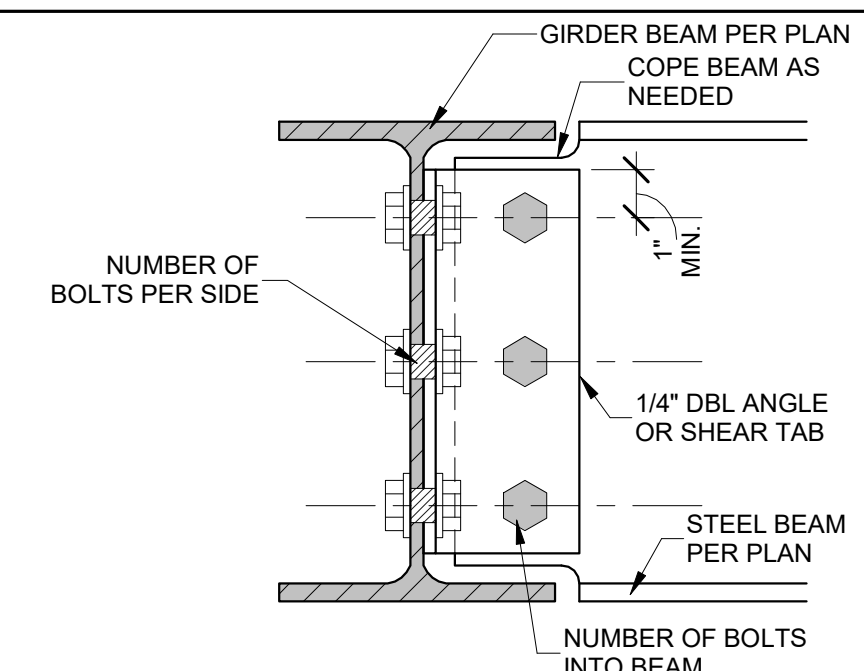
- \* 10/12 PITCH SIDE-TO-SIDE  
8/12 PITCH FRONT-TO-BACK  
UNLESS NOTED
- \* COMPOSITION ROOFING  
UNLESS NOTED
- \* ROOF AND SOFFIT VENTS PER CODE
- \* SEE ELEVATIONS TO CONFIRM OVERHANGS PER LOCATION





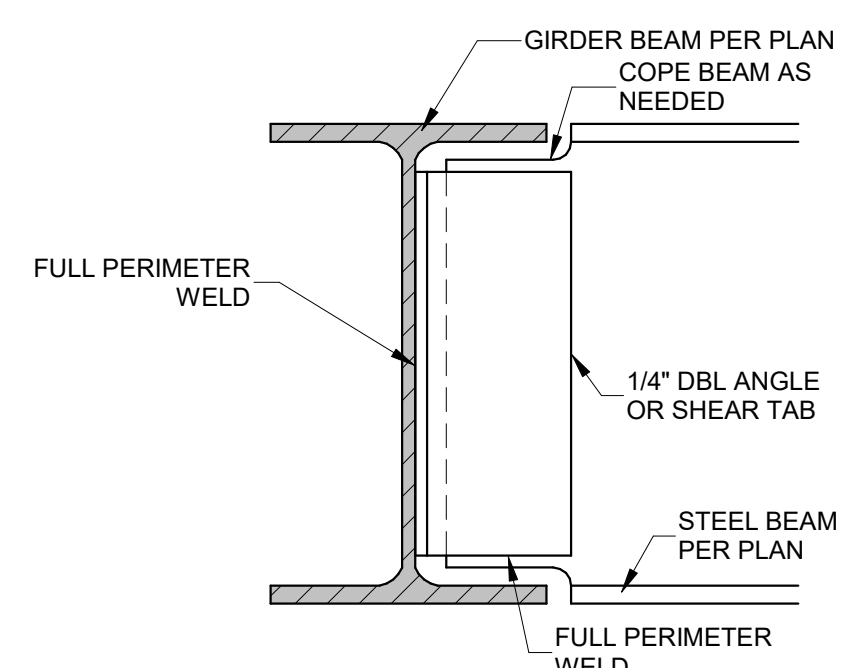


**11 HIP SUPPORT FRAME**  
3/8" = 1'-0"



BEAM CONNECTION SCHEDULE		
BEAM SIZE	# OF BOLTS PER SIDE	ANGLE
W8, W10	2	(4" LONG)
W12, W14	3	(8" LONG)
W16, W18	4	(10" LONG)

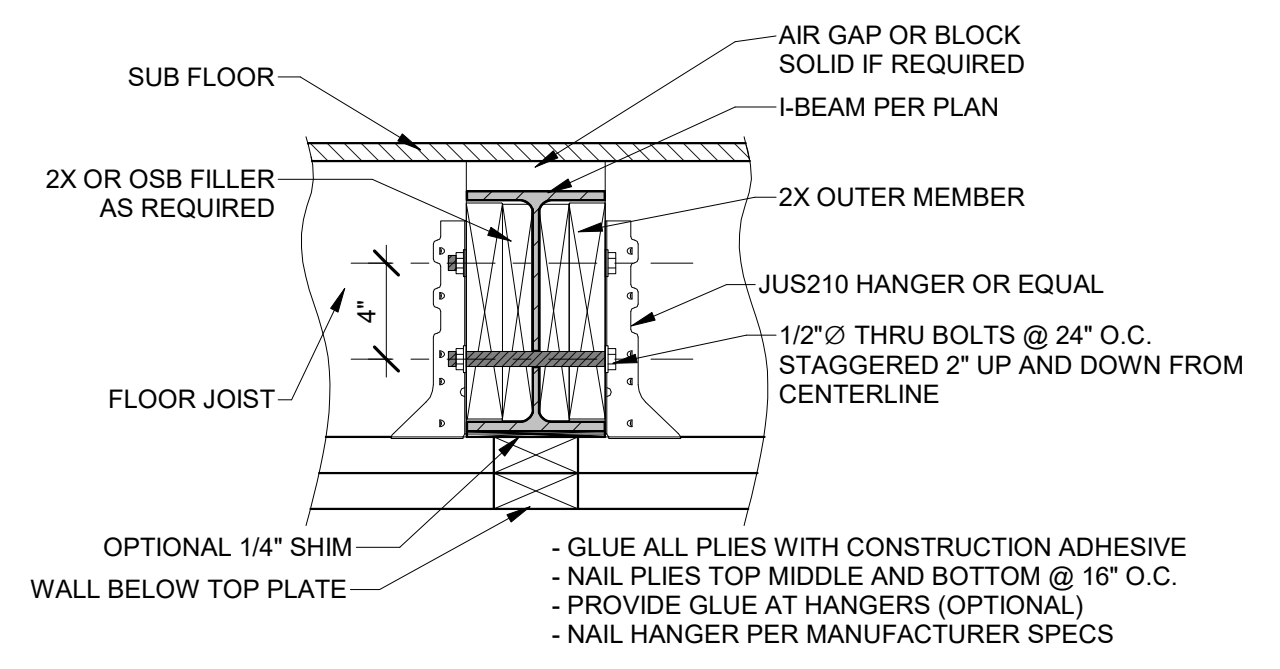
NOTES:  
1. NUMBER OF BOLTS DETERMINED BY SMALLER OF TWO BEAMS BEING CONNECTED  
2. ALL BOLTS, 3/4" DIAMETER A325-N, UNO  
3. BOLTS SHALL BE EVENLY SPACED TOP TO BOTTOM



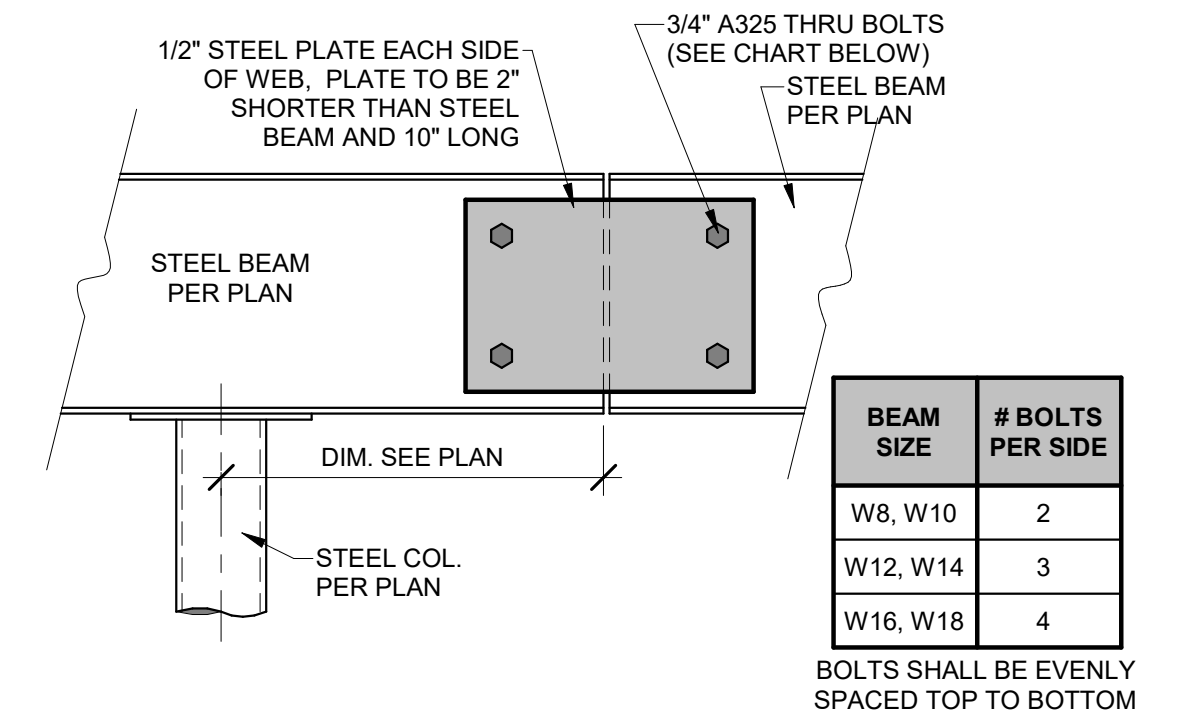
EITHER METHOD ACCEPTABLE

BEAM CONNECTION SCHEDULE	
BEAM SIZE	ANGLE
W8, W10	1.5x1.5x1/4 (4" LONG)
W12, W14	3x3x3/8 (8" LONG)
W16, W18	3.5x3.5x3/8 (10" LONG)

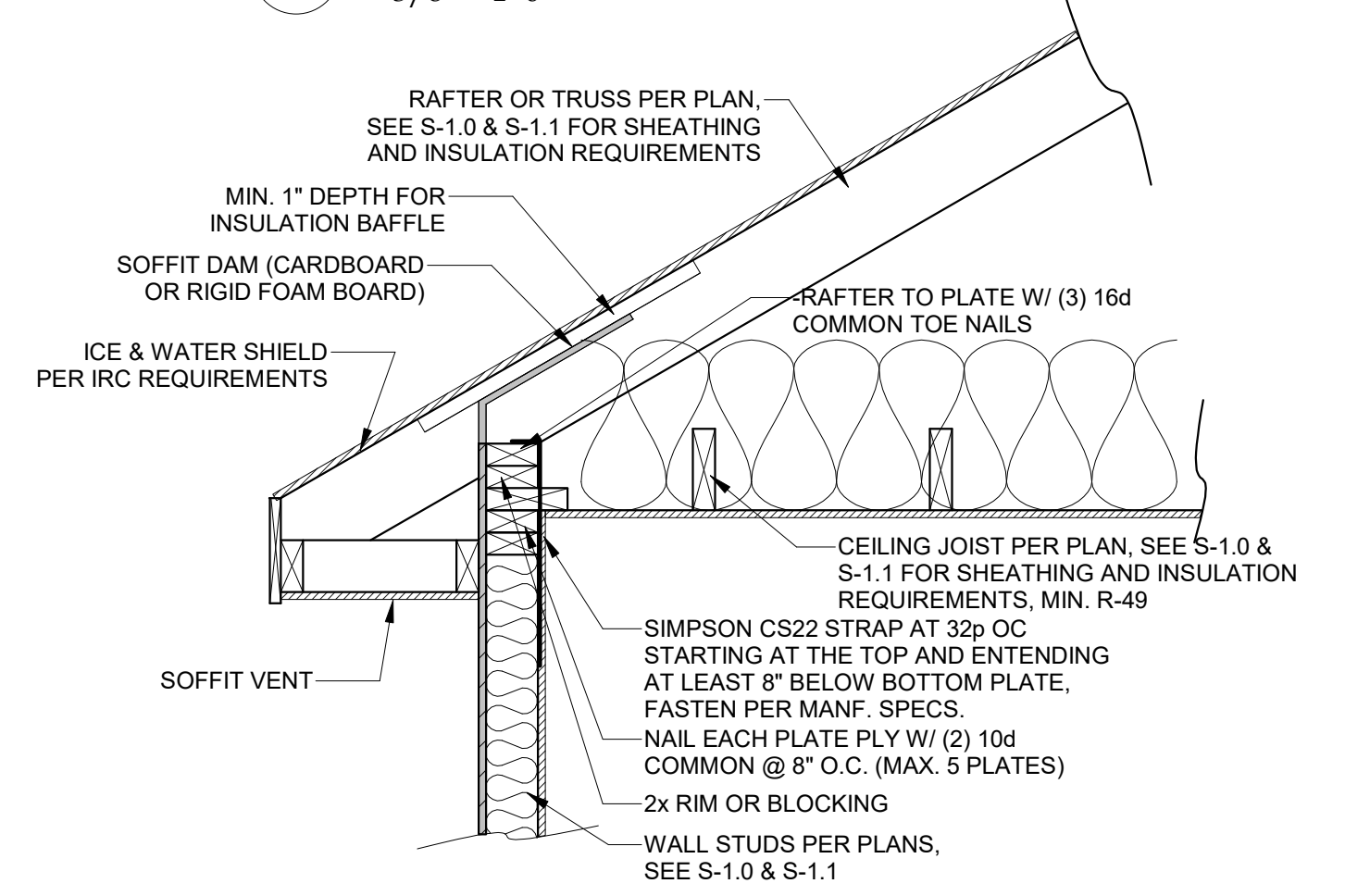
**10 BEAM TO GIRDER CONNECTION**  
3" = 1'-0"



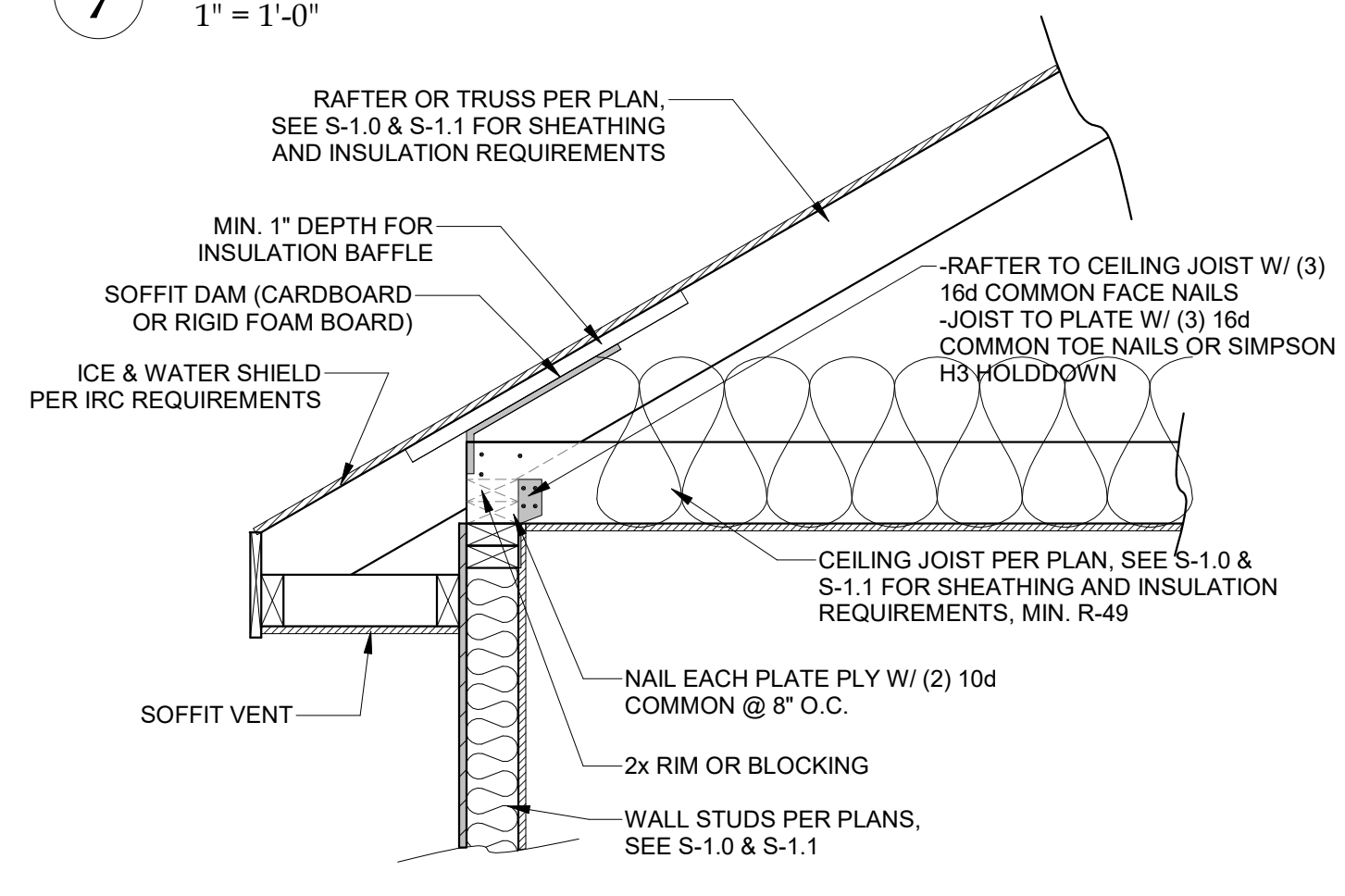
**8 UPSET STEEL BEAM DETAIL**  
1 1/2" = 1'-0"



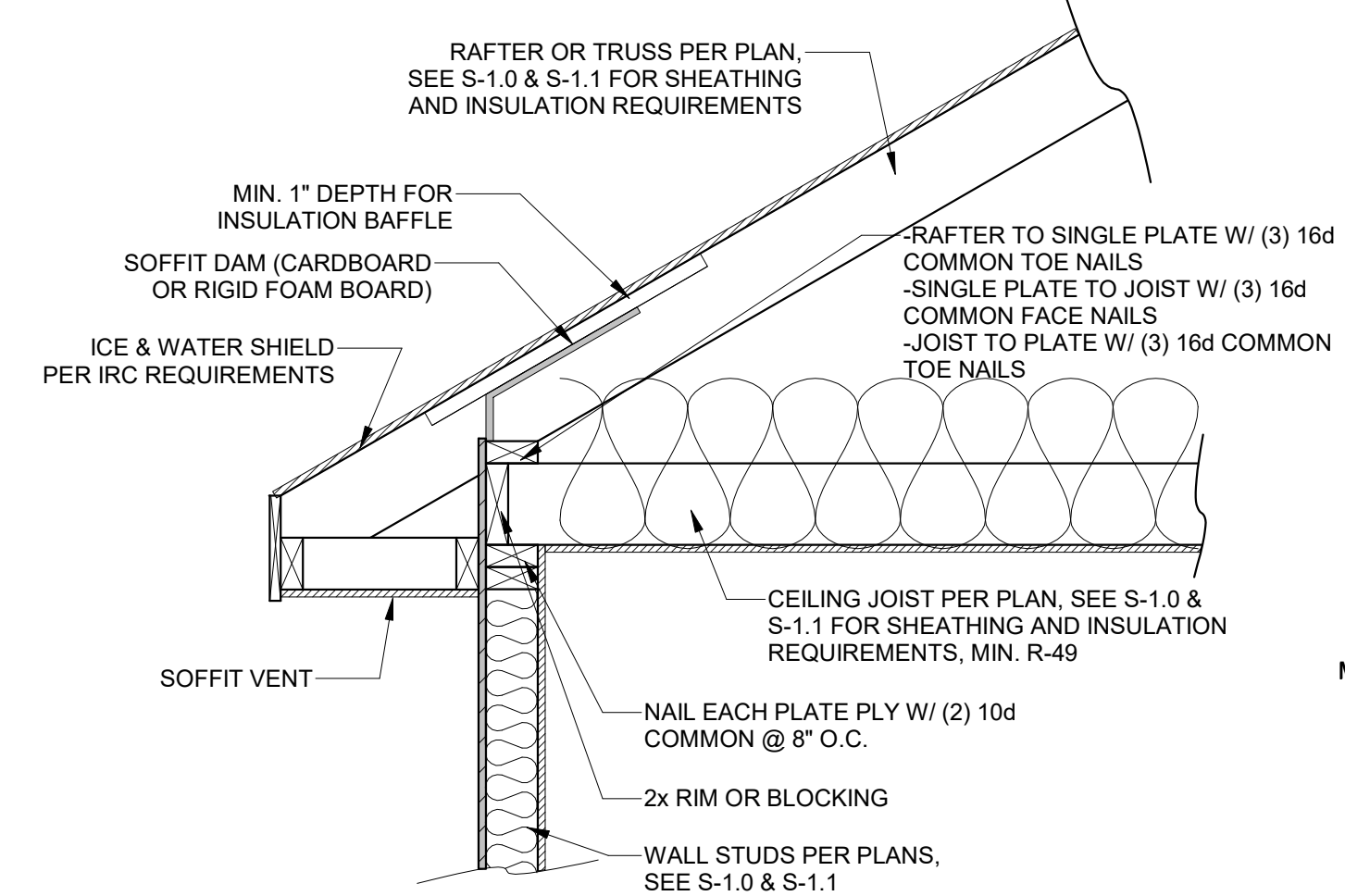
**9 STEEL BEAM SPLICE DETAIL**  
1 1/2" = 1'-0"



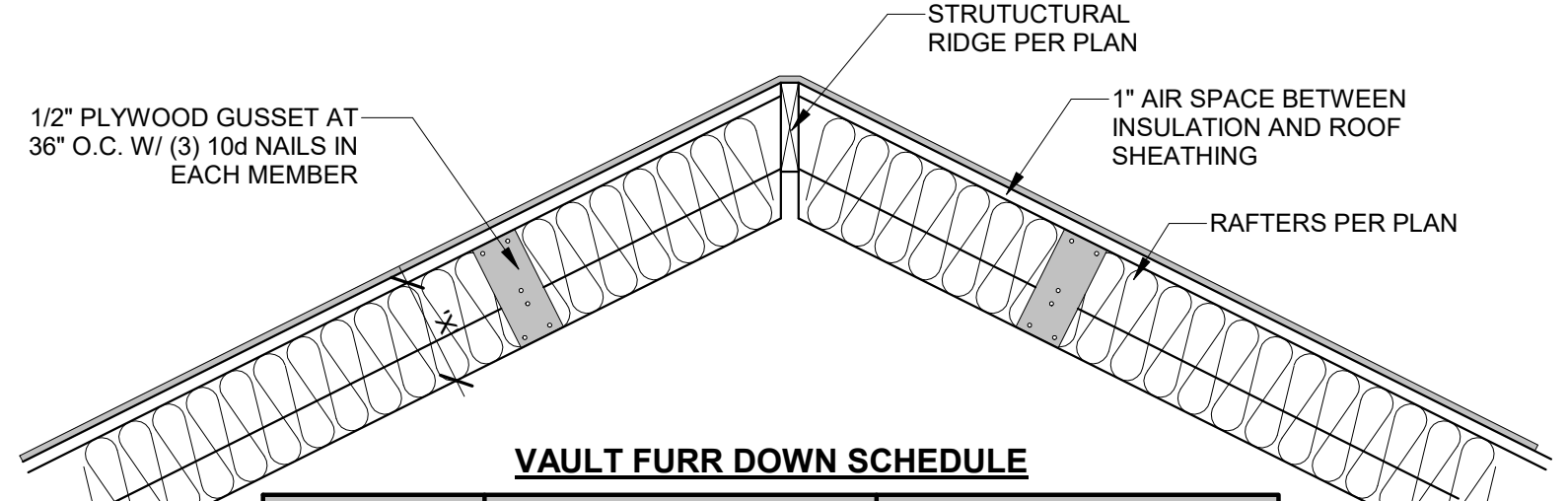
**7 OPTION 4 RAFTER BEARING**  
1" = 1'-0"



**6 OPTION 3 RAFTER BEARING**  
1" = 1'-0"



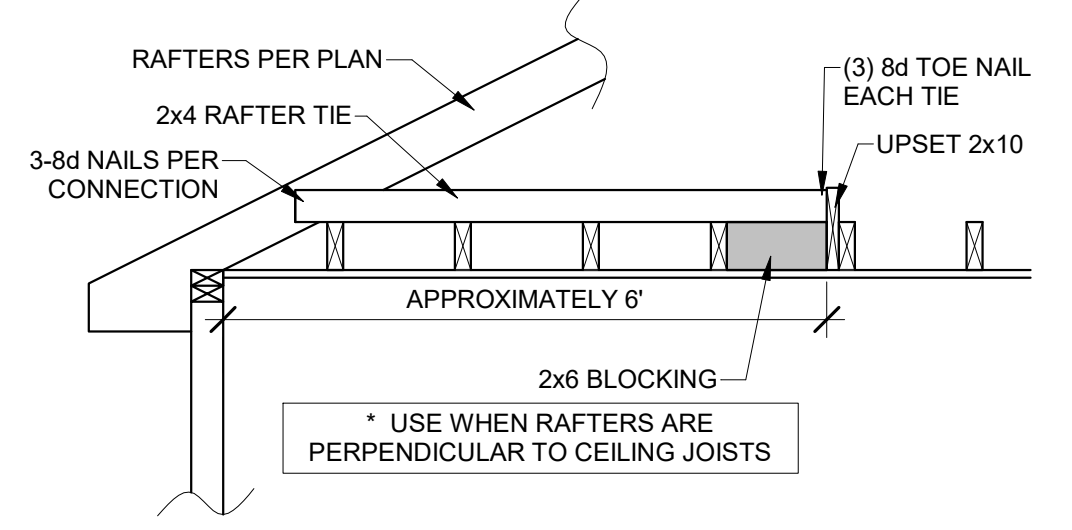
**5 OPTION 2 RAFTER BEARING**  
1" = 1'-0"  
THIS OPTION NOT AVAILABLE IN KC, MO



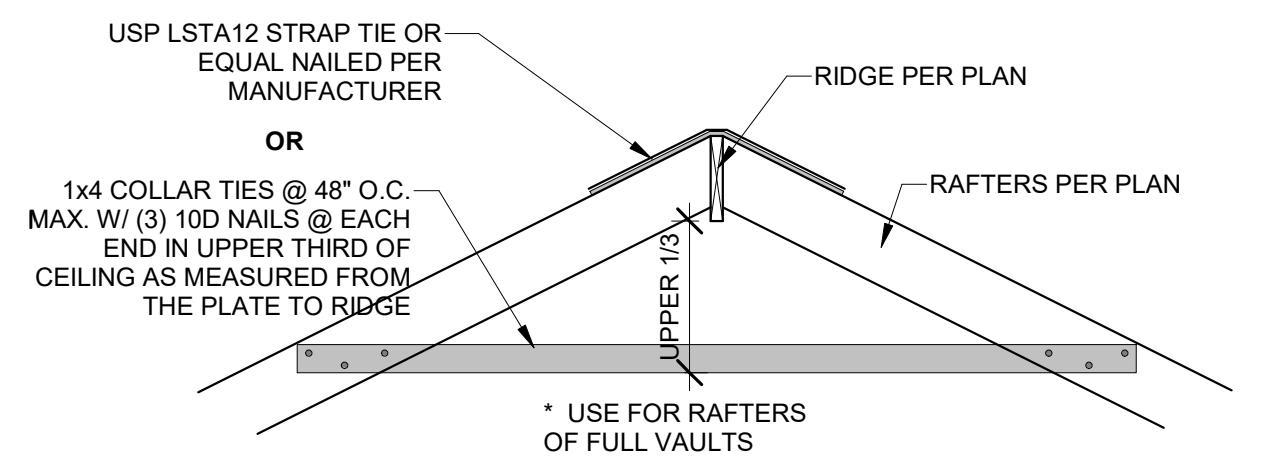
VAULT FURR DOWN SCHEDULE		
RAFTER SIZE	R-30C INSULATION (X = 9 1/4")	R-38C INSULATION (X = 11 1/4")
2x6	2x6	2x8
2x8	2x4	2x6
2x10	NOT REQUIRED	2x4
2x12	NOT REQUIRED	2x2

NOTES:  
1. ALL VAULTS SHALL BE FURRED DOWN WITH 2x FRAMING TO THE REQUIRED DEPTH OF INSULATION, PLUS 1" AIR SPACE.  
2. R-38C REQUIRED = 11" WITH AIR SPACE.  
3. ALL VAULTED RAFTERS SHALL BE MIN. #2 2x6 DFL @ 16" O.C. OR PER ROOF PLAN.

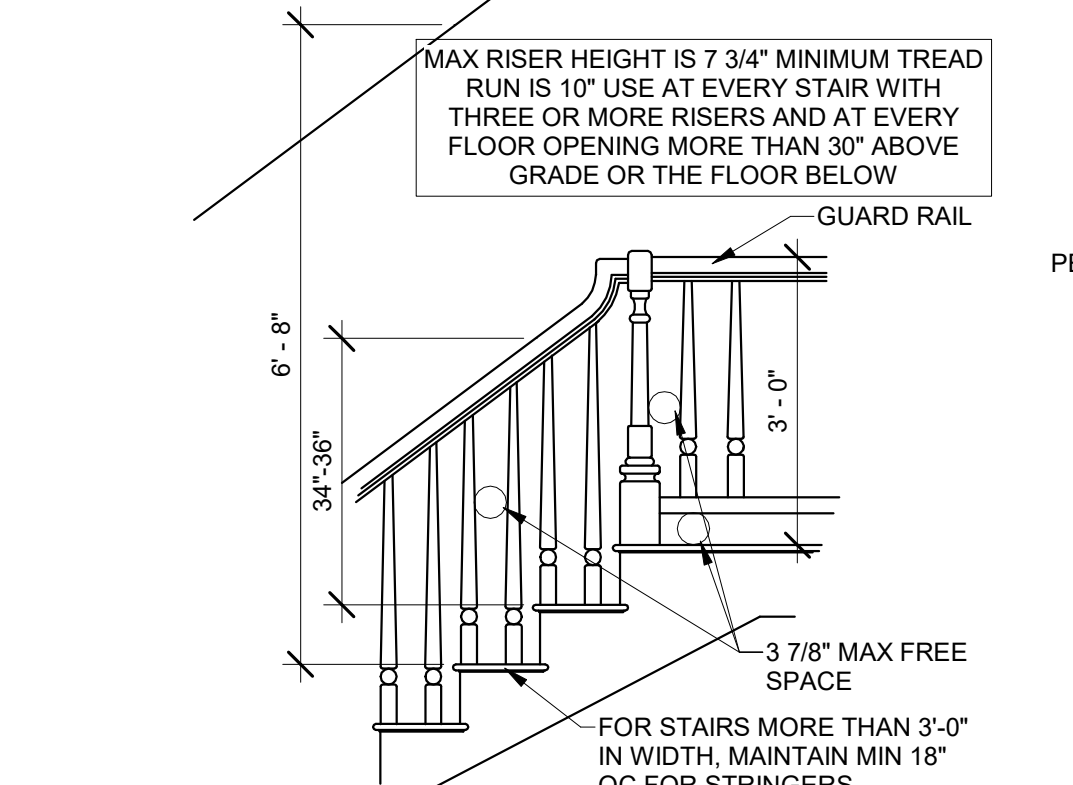
**14 VAULTED RAFTER INSULATION**  
3/4" = 1'-0"



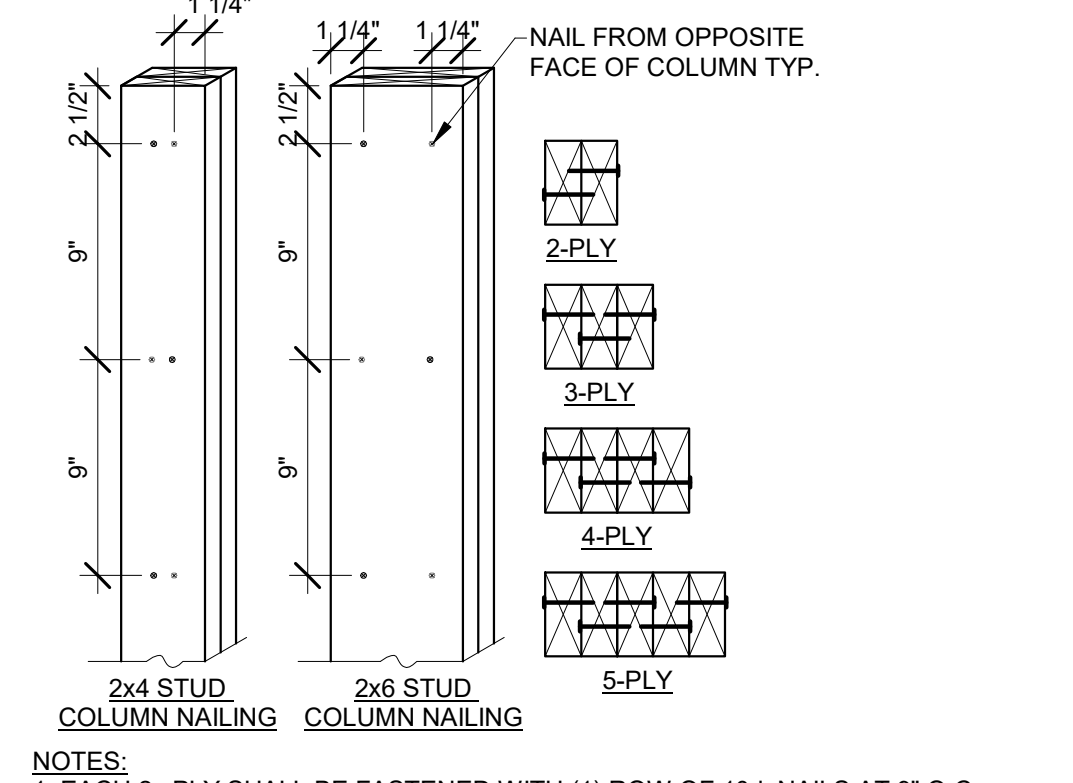
**12 RAFTER TIE CONNECTION**  
1/2" = 1'-0"



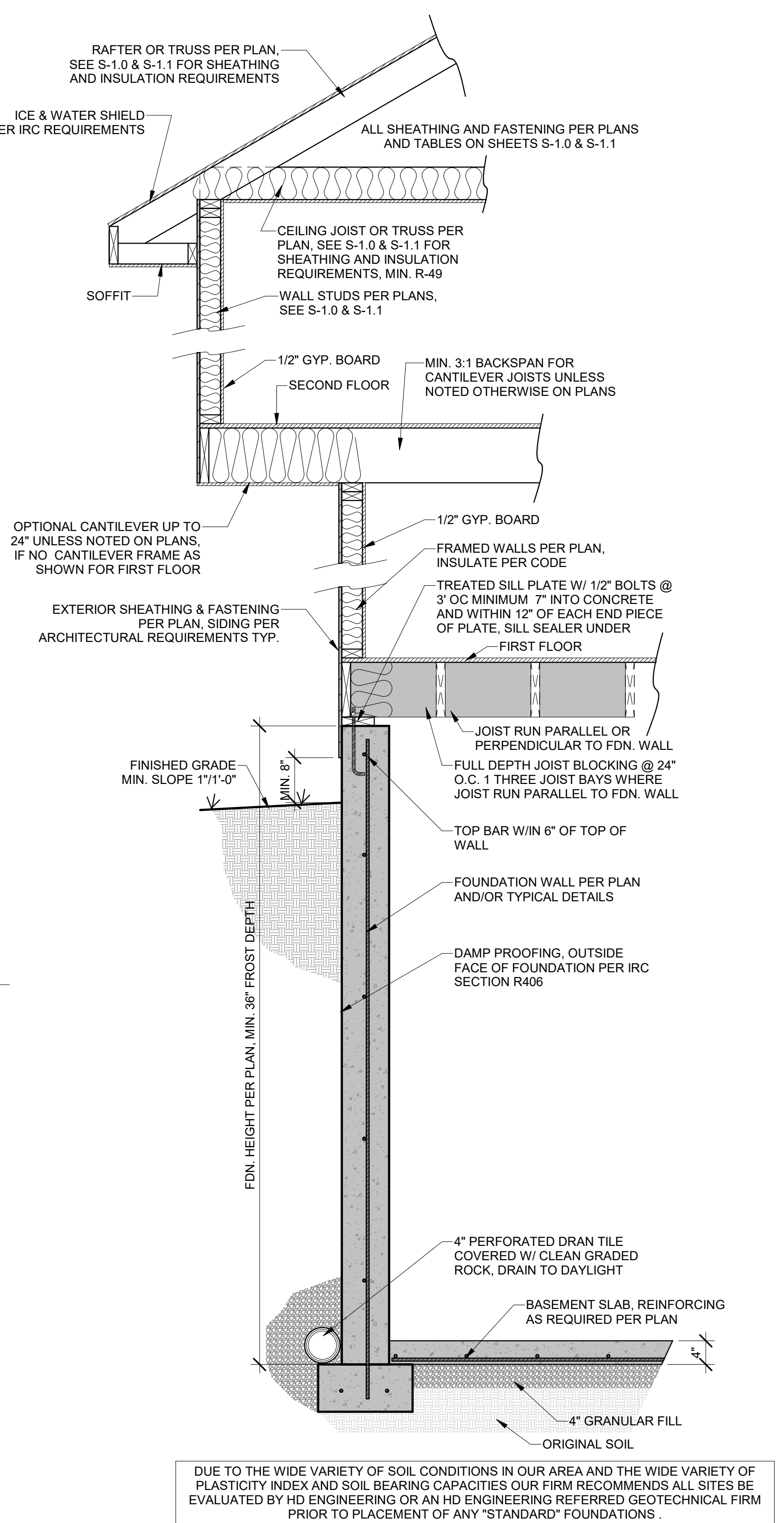
**13 RIDGE SUPPORT**  
1/2" = 1'-0"



**4 STAIR/ RAIL DETAIL**  
1/2" = 1'-0"



**3 BUILT-UP STUD COLUMN**  
1 1/2" = 1'-0"



**1 TYPICAL WALL SECTION**  
3/4" = 1'-0"

DUE TO THE WIDE VARIETY OF SOIL CONDITIONS IN OUR AREA AND THE WIDE VARIETY OF PLASTICITY INDEX AND SOIL BEARING CAPACITIES OUR FIRM RECOMMENDS ALL SITES BE EVALUATED BY HD ENGINEERING OR AN HD ENGINEERING REFERRED GEOTECHNICAL FIRM PRIOR TO PLACEMENT OF ANY "STANDARD" FOUNDATIONS.

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HD ENGINEERING & DESIGN, INC.  
11656 W. 75TH STREET  
SHAWNEE, KS 66214  
WWW.HDENGINEERS.COM  
913.651.2222  
SERVICE@HDENGINEERS.COM



**SAB HOMES, INC.**  
SANTA BARBARA HFR098  
2107 SW HARVEST MOON LN. LEE'S SUMMIT, MO

STRUCTURAL DETAILS & NOTES

HD#: 46333  
DATE: 07/20/2023  
CHECKED BY: CLS

NO.	ISSUE/REVISION	Revision Date

FRAMING SECTIONS

**S-1.2**





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 2107 SW HARVEST MOON LN. LEE'S SUMMIT, MO

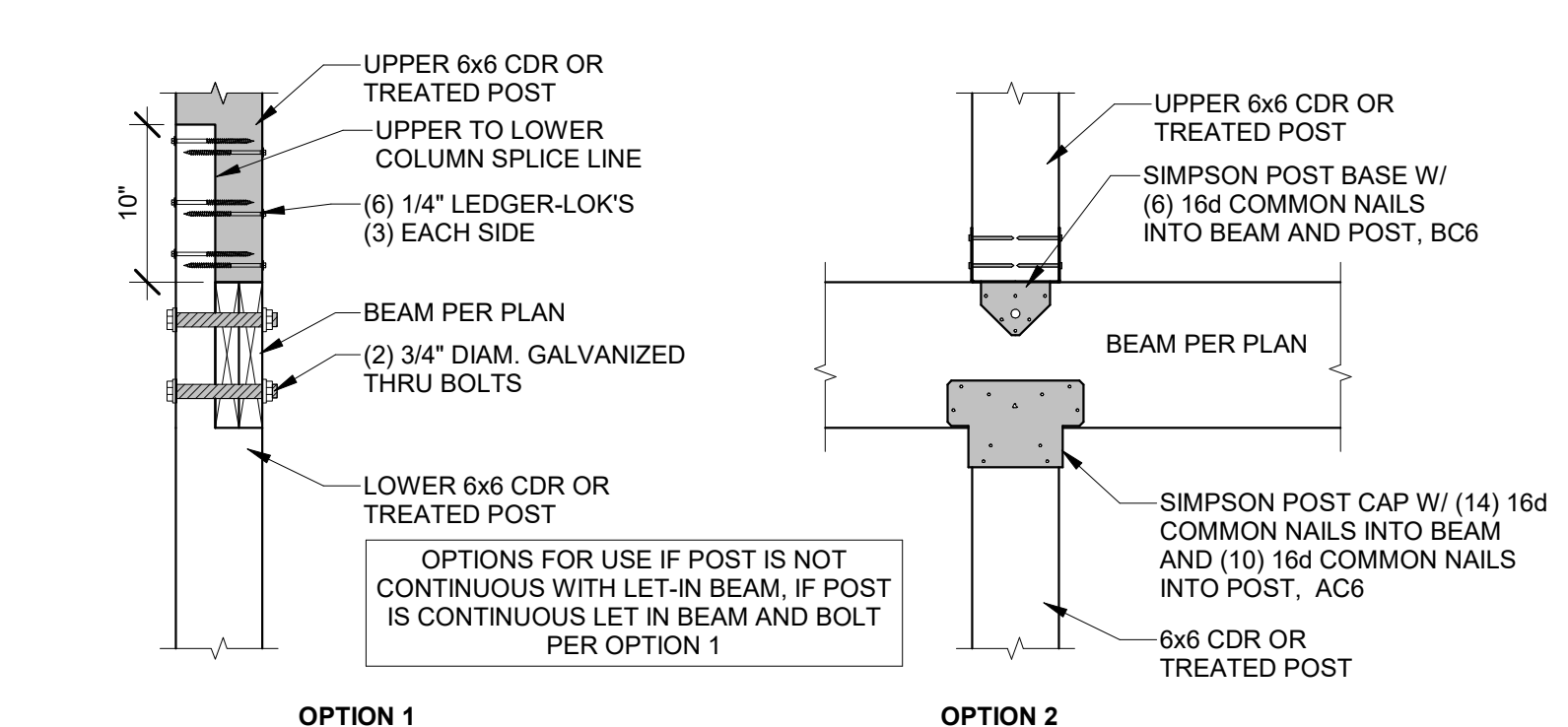
STRUCTURAL DETAILS & NOTES

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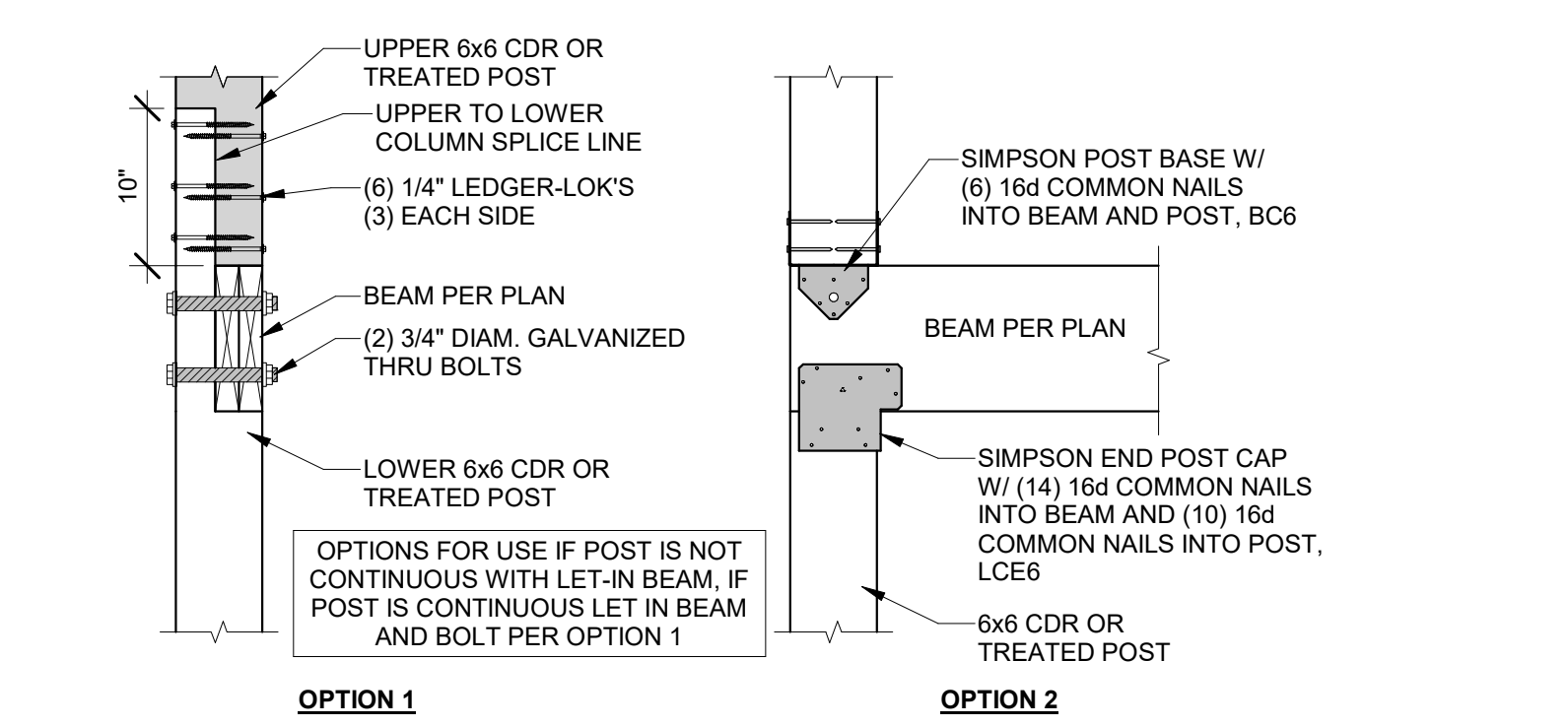
NO.	ISSUE/REVISION	Revision Date

DECK DETAILS

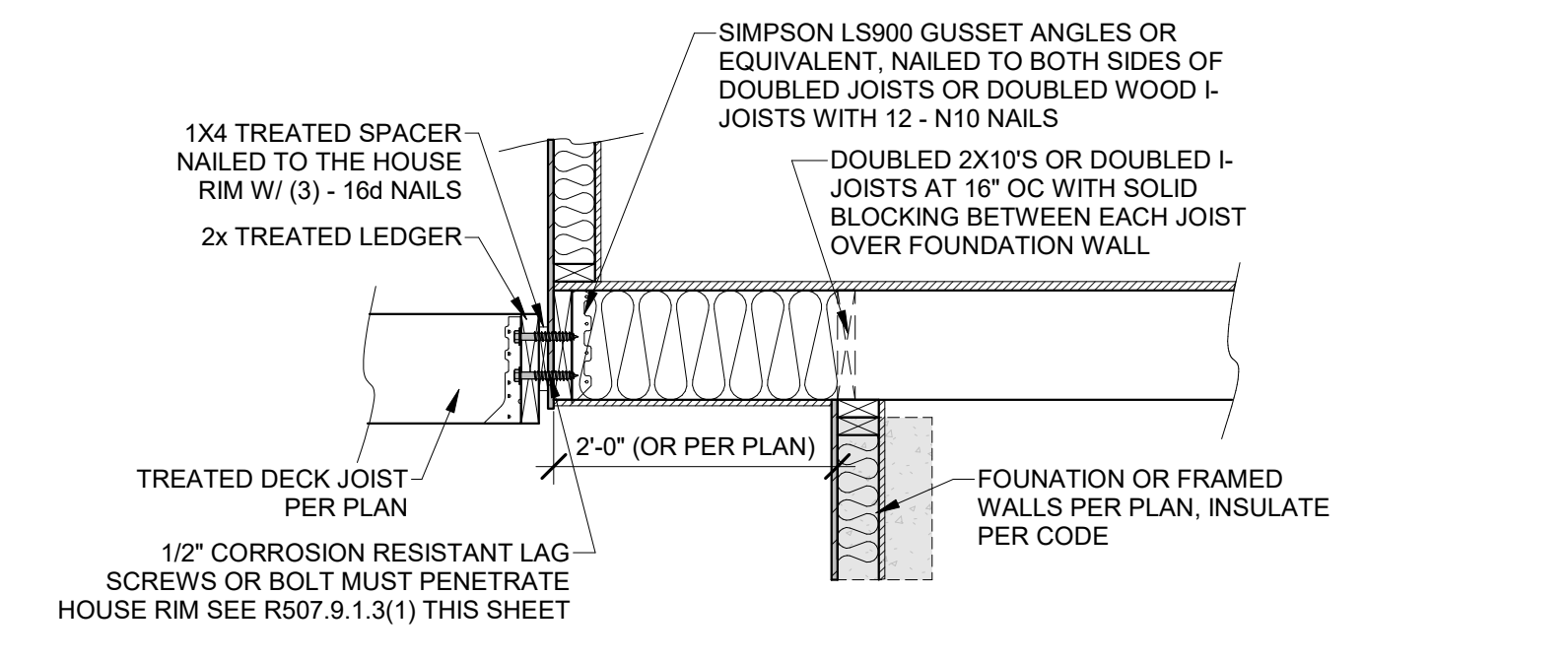
**S-1.3**



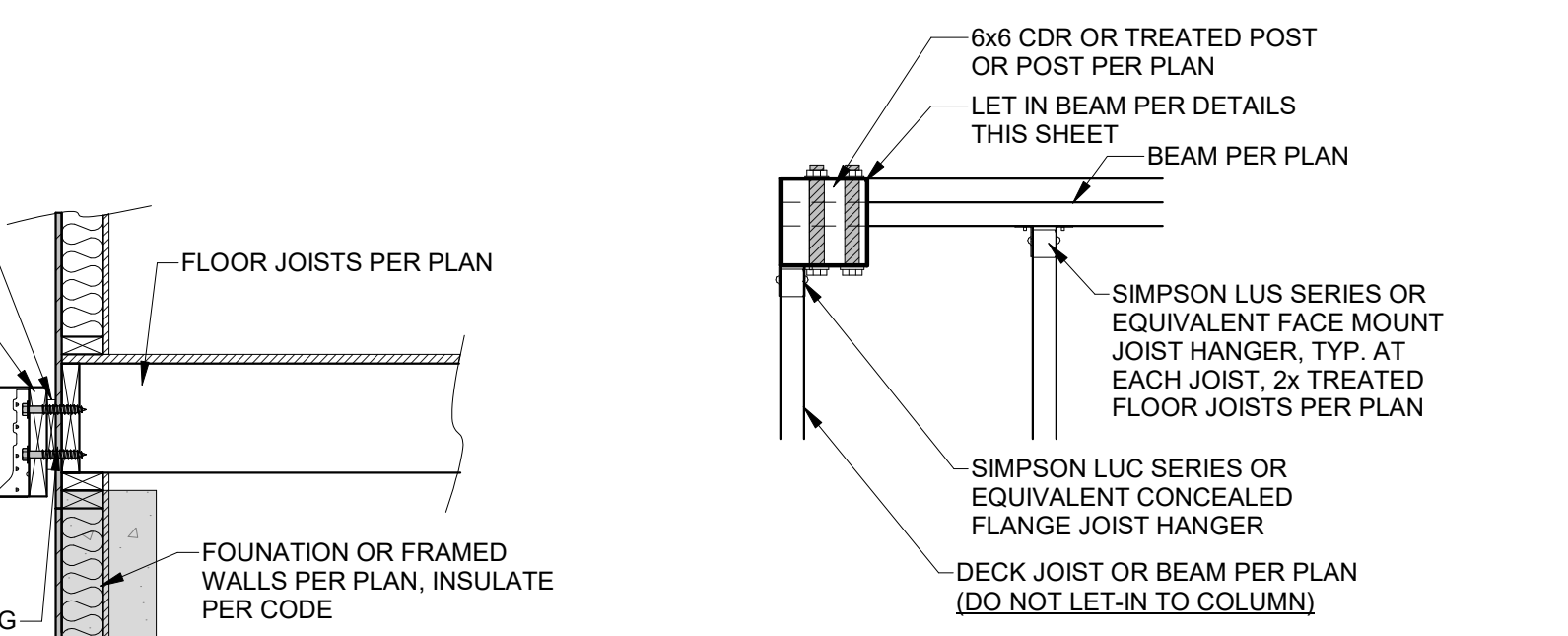
**6 DECK LEVEL INTERIOR BEAM TO COLUMN**  
 1" = 1'-0"



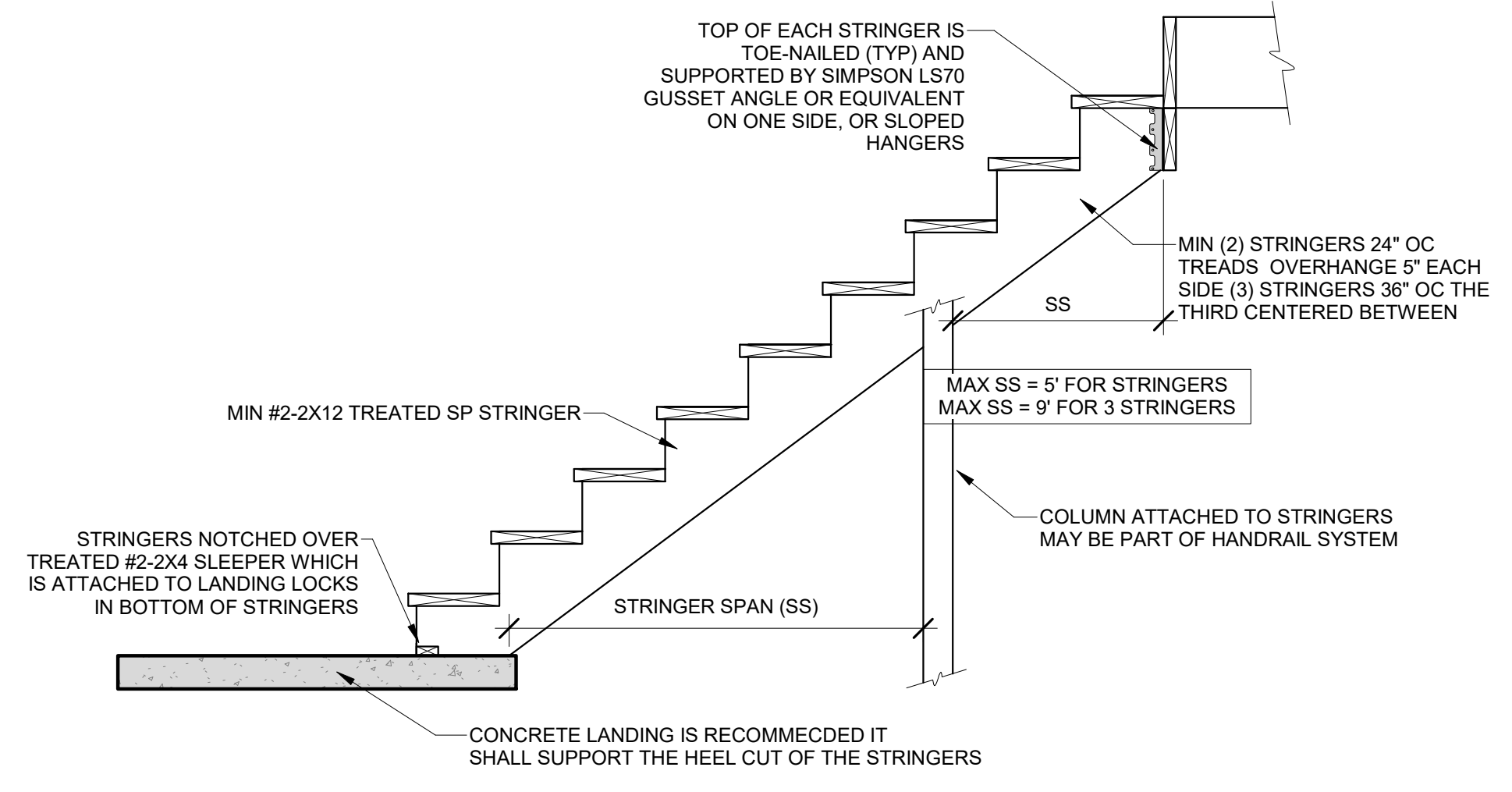
**5 DECK LEVEL EXTERIOR BEAM TO COLUMN**  
 1" = 1'-0"



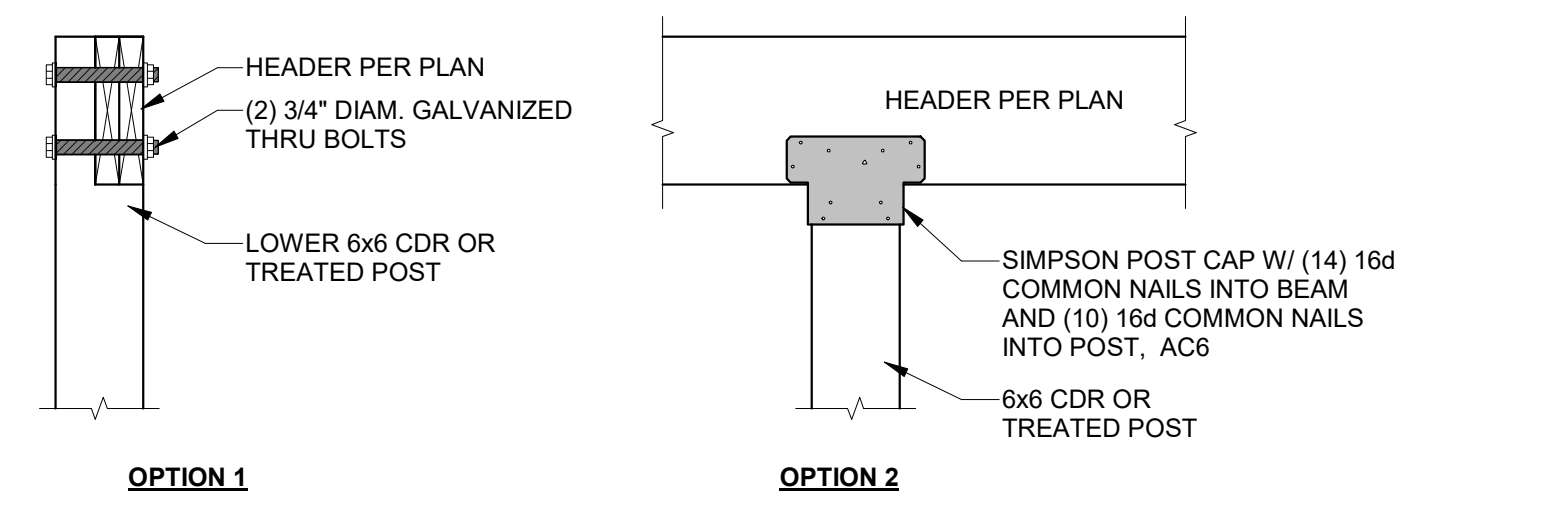
**4 DECK LEDGER TO CANTILEVER**  
 3/4" = 1'-0"



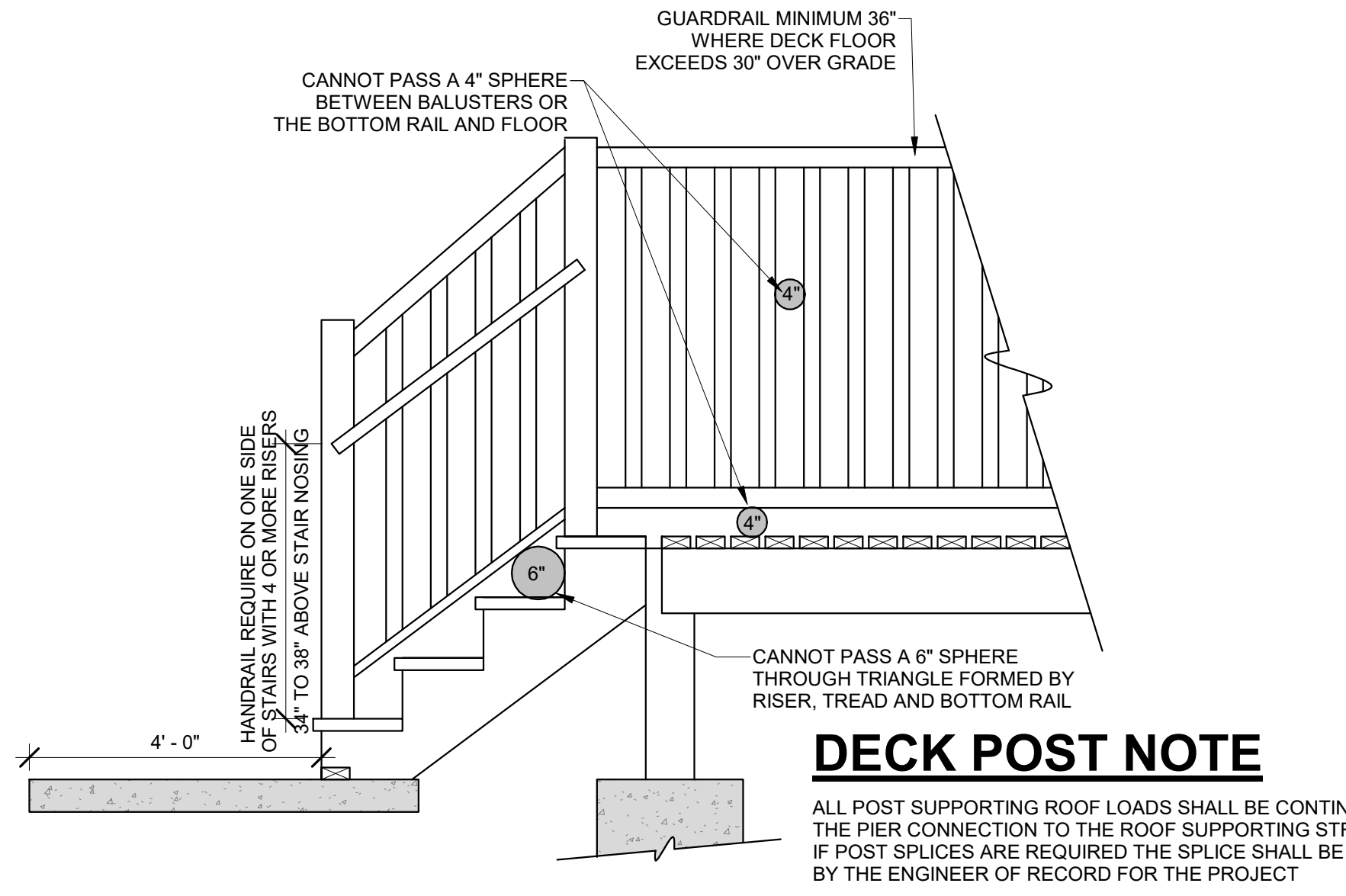
**1 DECK CORNER COLUMN**  
 1" = 1'-0"



**9 STAIR STRINGER DETAIL**  
 1/2" = 1'-0"



**7 ROOF LEVEL INTERIOR BEAM TO COLUMN**  
 1" = 1'-0"



**8 GUARD RAIL**  
 1/2" = 1'-0"

**TABLE IRC2018 R507.9.1.3(1) DECK LEDGER CONNECTION TO BAND JOIST**  
 (DECK LIVE LOAD = 40 PSF, DECK HEAD LOAD = 10 PSF, SNOW LOAD ≤ 40 PSF)

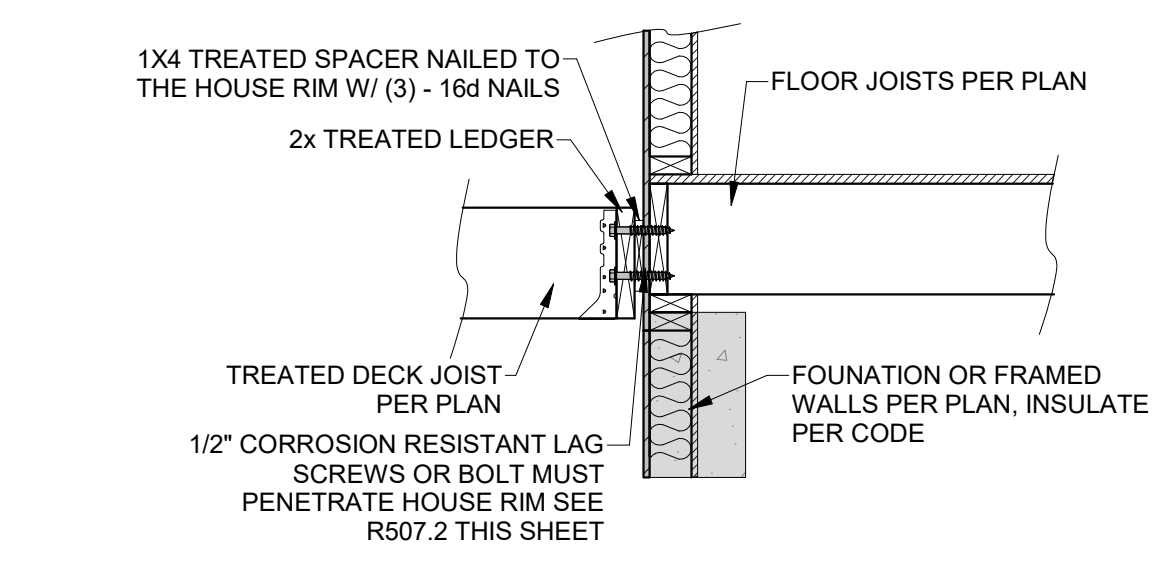
JOIST SPAN	6' AND LESS	6'-1" TO 8'	8'-1" TO 10'	10'-1" TO 12'	12'-1" TO 14'	14'-1" TO 16'	16'-1" TO 18'
CONNECTION DETAILS	ON-CENTER SPACING OF FASTENERS <sup>a, b</sup>						
1/2" LAG SCREW WITH 15/32" MAX. SHEATHING <sup>c, d</sup>	30	23	18	15	13	11	10
1/2" DIAM. BOLT WITH 15/32" MAX. SHEATHING <sup>d</sup>	36	36	34	29	24	21	19
1/2" DIAM. BOLT WITH 15/32" MAX. SHEATHING & 1/2" STACKED WASHERS <sup>e</sup>	36	36	29	24	21	18	16

For SI: 1 inch = 25.4mm, 1 foot = 304.8mm, 1 pound per square foot = 0.0479 kPa  
 a. Ledges shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.  
 b. Snow load shall not be assumed to act concurrently with live load.  
 c. The tip of the lag screw shall fully extend beyond the inside face of the band joist.  
 d. Sheathing shall be wood structural panel or solid sawn lumber.  
 e. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard lumber or foam sheathing. Up to 1/2" thickness of stacked washers shall be permitted to substitute for you to 1/2" of allowable sheathing thickness where combined with wood structural panel or lumbers sheathing.

**TABLE IRC2018 R507.9.1.3(2) PLACEMENT OF LAG SCREWS AND BOLT IN DECK LEDGERS AND BAND JOISTS**

	MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS			
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
LEDGER <sup>a</sup>	2 inches <sup>d</sup>	3/4 inches	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>
BAND JOIST <sup>c</sup>	3/4 inches	2 inches	2 inches	1 5/8 inches <sup>b</sup>

For SI: 1 inch = 25.4mm.  
 a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.9.1.3(1)  
 b. Maximum 5 inches  
 c. For engineered rim joists, the manufacturer's recommendations shall govern.  
 d. The minimum distances from bottom row of lag screws or bolts to the top of the ledger shall be in accordance with Figure R507.9.1.3(1)



**2 DECK LEDGER ATTACHMENT**  
 3/4" = 1'-0"

**TABLE R602.3(5) SIZE, HEIGHT AND SPACING OF WOOD STUDS<sup>a</sup>**

STUD SIZE (INCHES)	BEARING WALLS				NON-BEARING WALLS	
	LATERALLY UNSUPPORTED STUD HEIGHT <sup>b</sup> (FEET)	MAXIMUM SPACING WHERE SUPPORTING A ROOF-CEILING ASSEMBLY OR A HABITABLE ATTIC ASSEMBLY, ONLY (INCHES)	MAXIMUM SPACING WHERE SUPPORTING ONE FLOOR, PLUS A ROOF-CEILING ASSEMBLY OR A HABITABLE ATTIC ASSEMBLY (INCHES)	MAXIMUM SPACING WHERE SUPPORTING TWO FLOORS, PLUS A ROOF-CEILING ASSEMBLY OR A HABITABLE ATTIC ASSEMBLY (INCHES)	MAXIMUM SPACING WHERE SUPPORTING ONE FLOOR HEIGHT <sup>c</sup> (INCHES)	MAXIMUM SPACING (INCHES)
2 x 3 <sup>d</sup>	---	---	---	---	10	16
2 x 4	10	24 <sup>e</sup>	16 <sup>e</sup>	---	14	24
3 x 4	10	24	24	16	14	24
2 x 5	10	24	24	---	16	24
2 x 6	10	24	24	16	20	24

For S1: 1 inch = 25.4 mm, 1 foot = 304.8 mm.  
 a. LISTED HEIGHTS ARE DISTANCES BETWEEN POINTS OF LATERAL SUPPORT PLACED PERPENDICULAR TO THE PLANE OF THE WALL. BEARING WALLS SHALL BE SHEATHED ON NOT LESS THAN ONE SIDE OR BRIDGING SHALL BE INSTALLED NOT GREATER THAN 4 FEET APART MEASURED VERTICALLY FROM EITHER END OF THE STUD. INCREASES IN UNSUPPORTED HEIGHT ARE PERMITTED WHERE IN COMPLIANCE WITH EXCEPTION 2 OF SECTION R602.3.1 OR DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.  
 b. SHALL NOT BE USED IN EXTERIOR WALLS.  
 c. A HABITABLE ATTIC ASSEMBLY SUPPORTED BY 2 x 4 STUDS IS LIMITED TO A ROOF SPAN OF 32 FEET. WHERE THE ROOF SPAN EXCEEDS 32 FEET, THE WALL STUDS SHALL BE INCREASED TO 2 x 6 OR THE STUDS SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

**RESIDENTIAL SEISMIC & WIND ANALYSIS**

DETERMINE WEIGHT OF HOUSE:				INPUT				CALCULATED VALUE				
LOCATION	DEAD LOAD (psf)	AREA (ft <sup>2</sup> )	WEIGHT (lbs)	ROOF	10	3097	30970	FIRST FLOOR	10	2962	29620	
CEILING	10	1972	19720	FIRST FLOOR EXT. WALL DL	10	2260	22600	FIRST FLOOR INT. PARTITION WALL DL	10	1162	11620	
PROJECTED AREAS WIND DESIGN PER 115 MPH 3 SECOND GUST EXPOSURE C AND MEAN ROOF HEIGHT <= 30 FT ASSUMED	FRONT-TO-BACK		SIDE-TO-SIDE		SLOPED ROOF		AREA		LOAD		CUMULATIVE	
VERT. ROOF	209	2588	CUMULATIVE	VERT. ROOF	209	1959	1959	VERT. ROOF	209	2588	CUMULATIVE	209
BSMT	65	751	2862	BSMT	65	689	1864	BSMT	65	751	2862	2862
BSMT	200	2532	25320	BSMT	200	2532	25320	BSMT	200	2532	25320	25320
SLOPED ROOF	ZONE B	11.3	11.3	SLOPED ROOF	ZONE C	11.3	11.3	SLOPED ROOF	ZONE D	7.7	7.7	7.7
VERT. WALL	ZONE A	14.2	14.2	VERT. WALL	ZONE D	7.7	7.7	VERT. WALL	ZONE E	11	11	11
MEAN ROOF HT. (ft)	22	14.2	14.2	MEAN ROOF HT. (ft)	22	14.2	14.2	MEAN ROOF HT. (ft)	22	14.2	14.2	14.2

1) If there is a walkout wall to be sheathed, determine tributary wind area and enter here. If no walkout, enter 0 for area.  
 $Q_{up} = 0.00256 K_z K_{zt} V^2$  (ASCE7-16 Velocity Pressure)  $Q_{up} = 0.00256 V^2$  (Design Velocity Pressure for ASD analysis under ASCE7-16 and IRC/IBC 2018)

1ST FLOOR TRIBUTARY WEIGHT  
 BASEMENT TRIBUTARY WEIGHT  
 $S_s$  (SITE GROUND MOTION - 5% FROM ASCE7 SEISMIC MAP)  
 $F_a$  (from ASCE7 Table 11.4-1)  
 $S_{ps}$  ( $= 2.5 \cdot S_s \cdot F_a$ )  
 $S_{ps}$  (from ASCE7 Table 12.2-1)

SEISMIC SHEAR				From ASCE7 (Eq. 12.8-1):				$V = 1.25 \cdot S_{ps} \cdot W / R$ (lbs)			
LOCATION	1ST FLOOR	BASEMENT		1567	1617	1617		1567	1617	1617	
Sheathing Location	Min. Sheathing Schedule	Fastening Schedule	Allowable Shear (k/ft)	[Code Reference]							
Exterior (Option #1)	7/16" APA Rated Plywood/OSB	1-1/2" 16ga. Staples w/ 1" penetration @ 4" O.C. Edges, 6" O.C. Field For 24" stud spacing, 12" O.C. Field For 16" stud spacing	155	per IBC, Table 2306.3(1)							
Exterior (Option #2)	7/16" APA Rated Plywood/OSB	1-1/2" 16ga. Staples w/ 1" penetration @ 4" O.C. Edges, 6" O.C. Field For 24" stud spacing, 12" O.C. Field For 16" stud spacing	230	per IBC, Table 2306.3(1)							
Exterior (Option #3)	7/16" APA Rated Plywood/OSB	1-1/2" 16ga. Staples w/ 1" penetration @ 3" O.C. Edges, 6" O.C. Field For 24" stud spacing, 12" O.C. Field For 16" stud spacing	310	per IBC, Table 2306.3(1)							
Exterior (Option #4)	7/16" APA Rated Plywood/OSB or shiplap panel sheathing, or 3/8" shiplap panel sheathing with tighter nail spacing	8d Common Nails w/ 1-3/8" penetration @ 4" O.C. Edges, 12" O.C. Field for 7/16" APA-rated plywood/OSB or shiplap panel sheathing OR @ 4" O.C. Edges, 12" O.C. Field for 3/8" shiplap panel sheathing	220	AFAPA SDPWS Table 4.3A							
Exterior (Option #5)	7/16" APA Rated Plywood/OSB or shiplap panel sheathing, or 3/8" shiplap panel sheathing with tighter nail spacing	8d Common Nails w/ 1-3/8" penetration @ 4" O.C. Edges, 12" O.C. Field for 7/16" APA-rated plywood/OSB or shiplap panel sheathing OR @ 3" O.C. Edges, 12" O.C. Field for 3/8" shiplap panel sheathing	320	AFAPA SDPWS Table 4.3A							
Exterior (Option #6)	7/16" APA Rated Plywood/OSB or shiplap panel sheathing, or 3/8" shiplap panel sheathing	6d Common Nails w/ 1-3/8" penetration @ 6" O.C. Edges, 12" O.C. Field	200	AFAPA SDPWS Table 4.3A							
Interior	1/2" Gypsum Board	No. 6 - 1 1/2" Type W or S Screws @ 8" O.C. Edges, 12" O.C. Field	60	per IBC, Table 2306.4.4							
Interior	1/2" Gypsum Board	(3) 16d @ end studs & (1) 8d @ intermediate studs per manufacturer specifications - see detail on sheet S3	325								

EXTERIOR SHEATHING OPTION FOR FIRST FLOOR				WIDTH OF 1ST STORY (FT.)			
EXTERIOR SHEATHING OPTION FOR BASEMENT WALLS	4	4	4	80	80	80	80
EXTERIOR SHEATHING OPTION FOR BASEMENT WALLS	4	4	4	98	98	98	98
EXTERIOR SHEATHING OPTION FOR BASEMENT WALLS	4	4	4	30	30	30	30
EXTERIOR SHEATHING OPTION FOR BASEMENT WALLS	4	4	4	1	1	1	1

EXTERIOR STRUCTURAL WALL LENGTHS (L) & RESISTANCES				WIND				
1ST FLOOR	87	24360	87	24360	87	34104	87	34104
BASEMENT	102	29592	102	29592	102	39594	102	39594

ADDITIONAL RESISTANCE REQUIRED				16d Nail Spacing req'd at bottom plate (in.)			
1ST FLOOR FRONT-TO-BACK	0	0	0	1st Floor F-B	10	10	10
1ST FLOOR SIDE-TO-SIDE	0	0	0	1st Floor S-S	10	10	10
BASEMENT FRONT-TO-BACK	0	0	0				
BASEMENT SIDE-TO-SIDE	0	0	0				

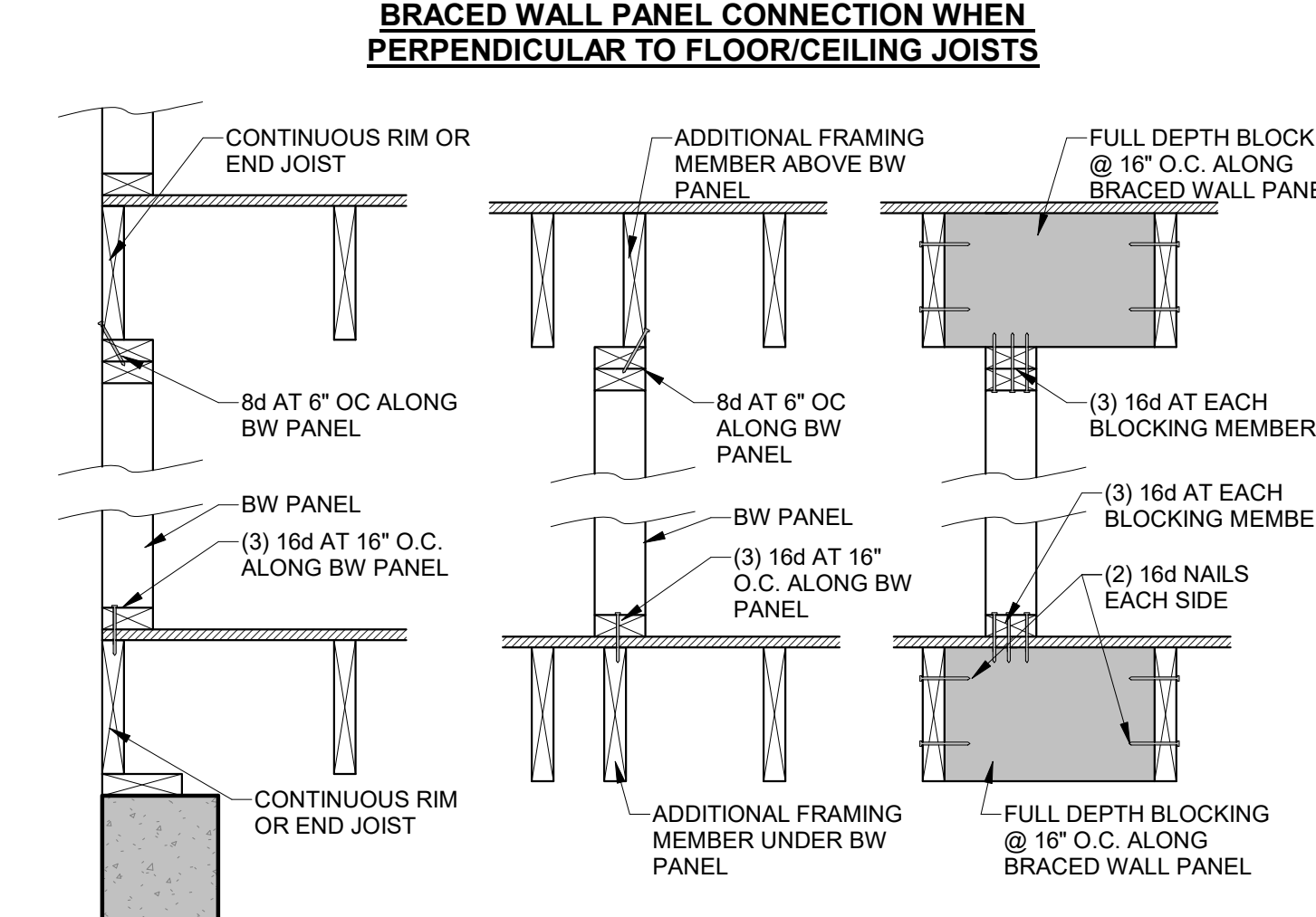
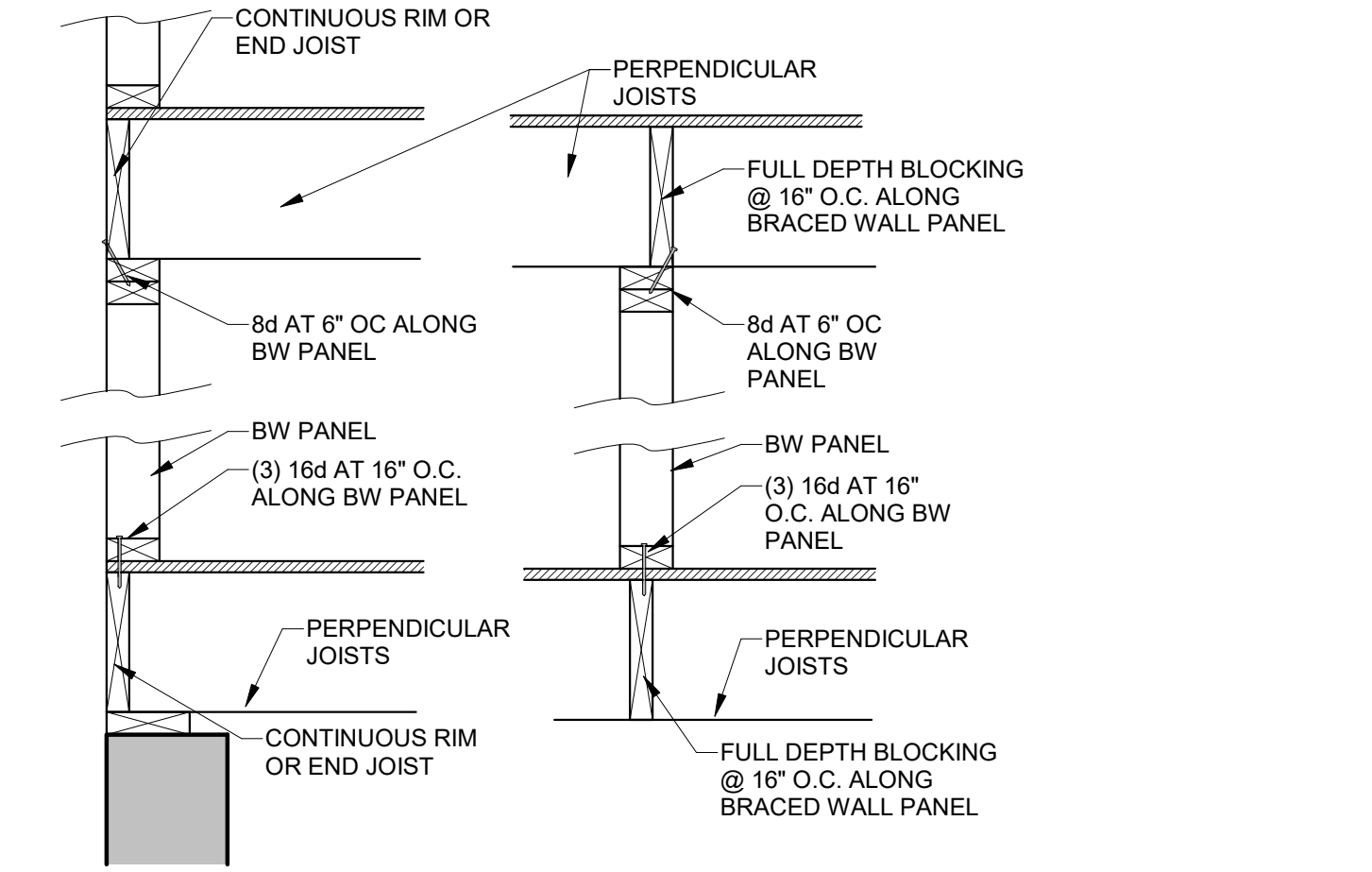
RESISTANCE REQUIRED IN ADDITION TO RESISTANCE PROVIDED BY EXTERIOR WALLS <sup>1</sup>				WIND UPLIFT ANALYSIS			
1ST FLOOR FRONT-TO-BACK	0	0	0	WIND UPLIFT PER FT. (LBS)	0	0	0
1ST FLOOR SIDE-TO-SIDE	0	0	0	WIND UPLIFT PER FT. (LBS)	0	0	0
BASEMENT FRONT-TO-BACK	0	0	0	WIND UPLIFT PER FT. (LBS)	0	0	0
BASEMENT SIDE-TO-SIDE	0	0	0	WIND UPLIFT PER FT. (LBS)	0	0	0

WIND UPLIFT ANALYSIS				WIND UPLIFT ANALYSIS			
ROOF PITCH (MAX)	10	DEGREES	18	WIND UPLIFT PER FT. (LBS)	0	0	0
OVERHANGS	0	LENGTH (FT.)	0	WIND UPLIFT PER FT. (LBS)	0	0	0
MAIN ROOF**	3245	TOTAL AREA (FT <sup>2</sup> )	1914	WIND UPLIFT PER FT. (LBS)	0	0	0
ALONG PERIMETER		TOTAL UPLIFT PER LINEAL FOOT ALONG EXTERIOR PERIMETER	-13.3	WIND UPLIFT PER FT. (LBS)	0	0	0
INSIDE EXTERIOR WALLS		RESISTANCE DUE TO DEAD WEIGHT & 104 TENSILES	258.6	WIND UPLIFT PER FT. (LBS)	0	0	0

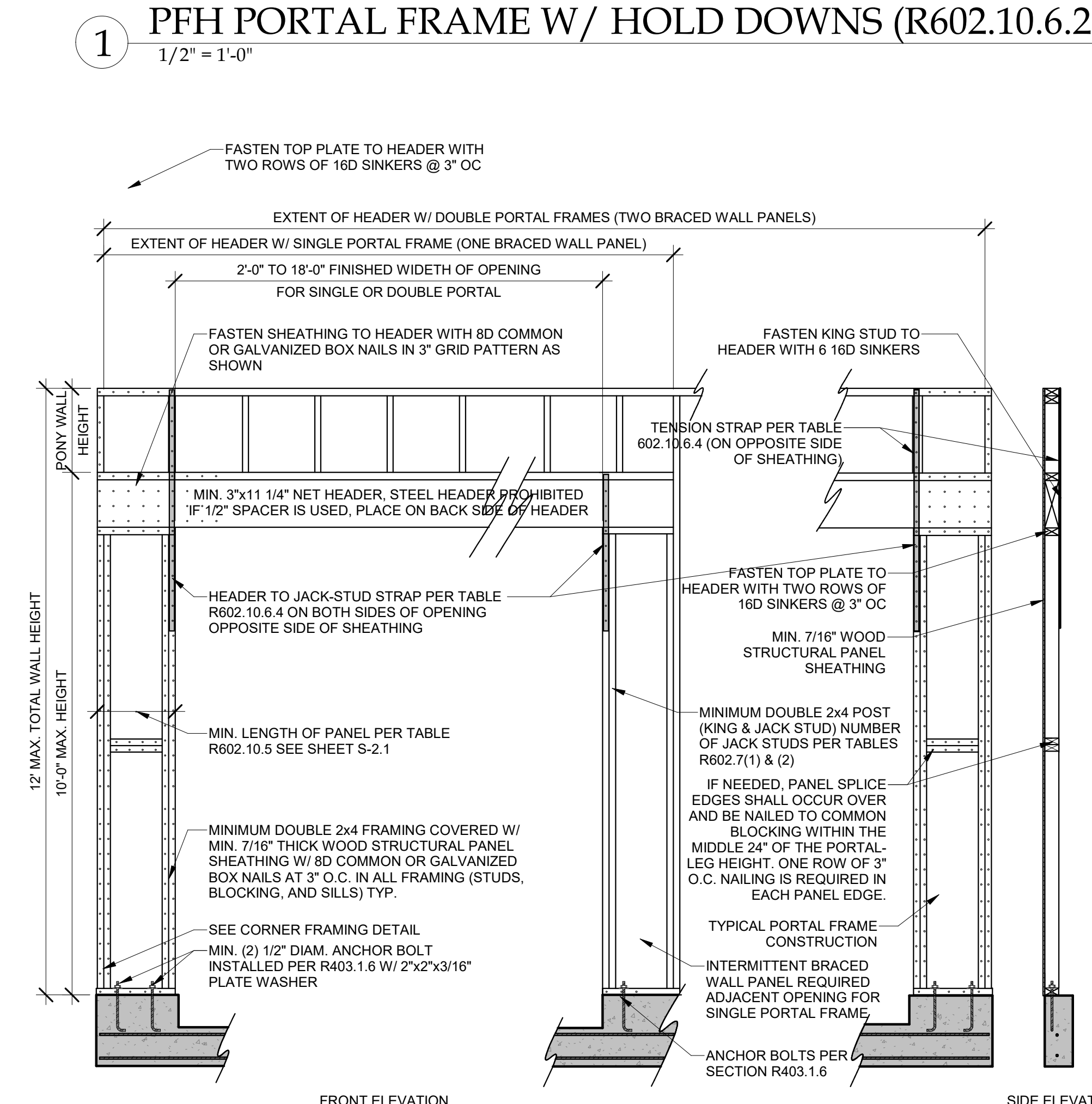
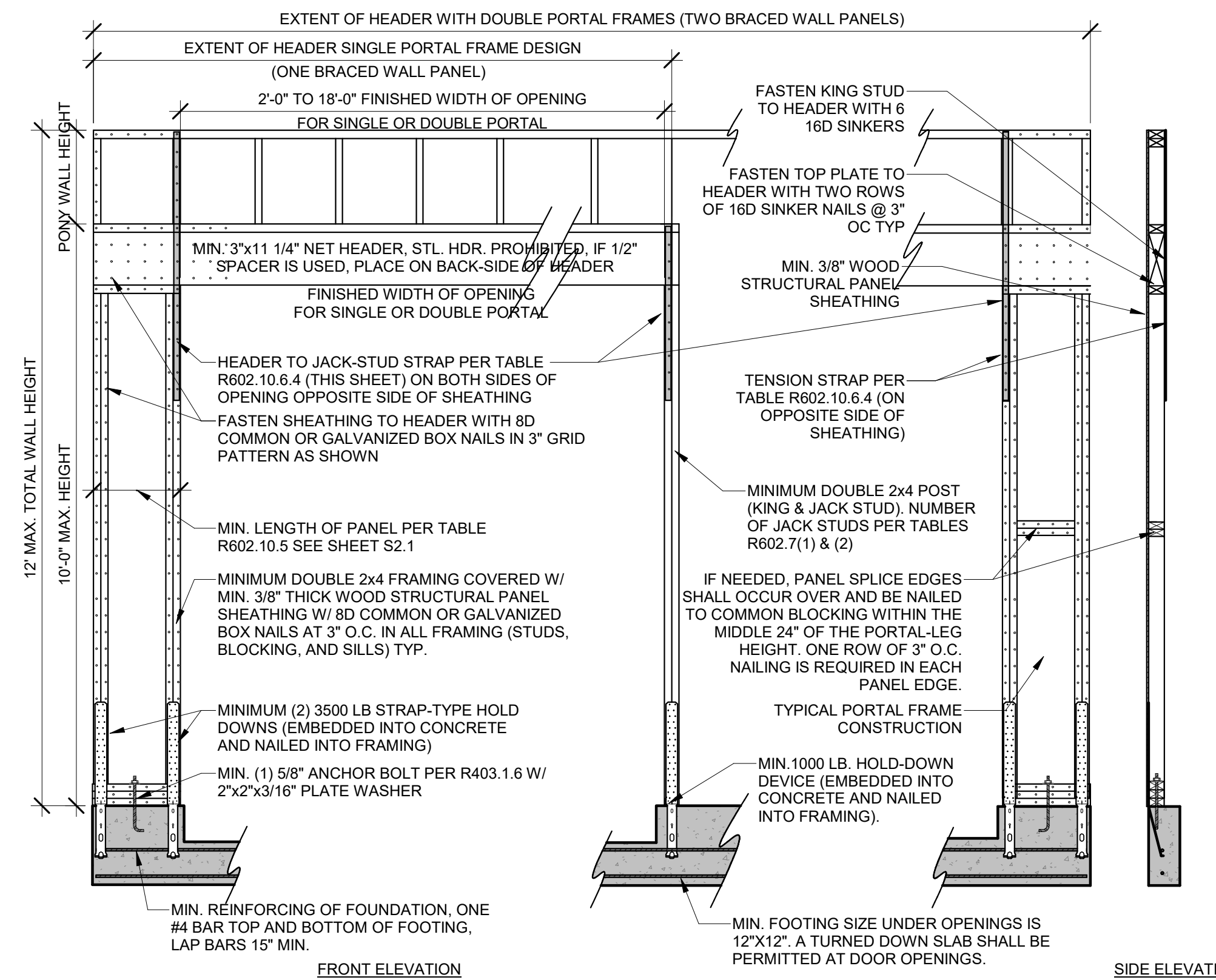
**NOTE FOR CONSTRUCTION:**  
 THE CONTINUOUS STRUCTURAL PANEL SHEATHING BRACING METHOD REQUIRES USE OF THE ABOVE TABLE FOR SHEATHING OF THE ENTIRE STRUCTURE. IN ADDITION, FRAMING MEMBERS SHALL BE @ 16" O.C. MAX. UNBLOCKED, AND W/ SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS.

**NOTE FOR DESIGN:**  
 ALL WALLS USED IN THE CALCULATION OF THE RESISTANCE FOR THIS STRUCTURE SHALL HAVE A MINIMUM UNINTERRUPTED HEIGHT OF 8' AND LENGTH OF 2'-6". ALLOWABLE RESISTANCES HAVE BEEN W/FT AND INCREASED BY 40% FOR WIND LOADS. PER VALUES IN 2018 IBC SECTION 2306 AND AFAPA SDPWS TABLE 4.3A. FOR EXAMPLE, 7/16" APA-RATED SHEATHING WITH 8d @ 6" & 12" HAS A SEISMIC SHEAR VALUE OF 200 A WIND SHEAR VALUE OF 3356 FT - 40% GREATER THAN THAT OF SEISMIC.

**NOTE:** SOIL SITE CLASS ASSUMED TO BE CLASS D. IF SITE CONDITIONS ARE DETERMINED TO BE CLASS E OR F, CONSULT ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.



**3 BRACED WALL PANEL CONNECTIONS**  
 1" = 1'-0"



**2 PFG PORTAL FRAME W/OUT HOLD DOWNS (R602.10.6.3)**  
 1/2" = 1'-0"

**HD ENGINEERING & DESIGN, INC**  
 11656 W. 75TH STREET  
 SHAWNEE, KS 66214  
 WWW.HDENGINEERS.COM  
 913.651.2222  
 SERVICE@HDENGINEERS.COM

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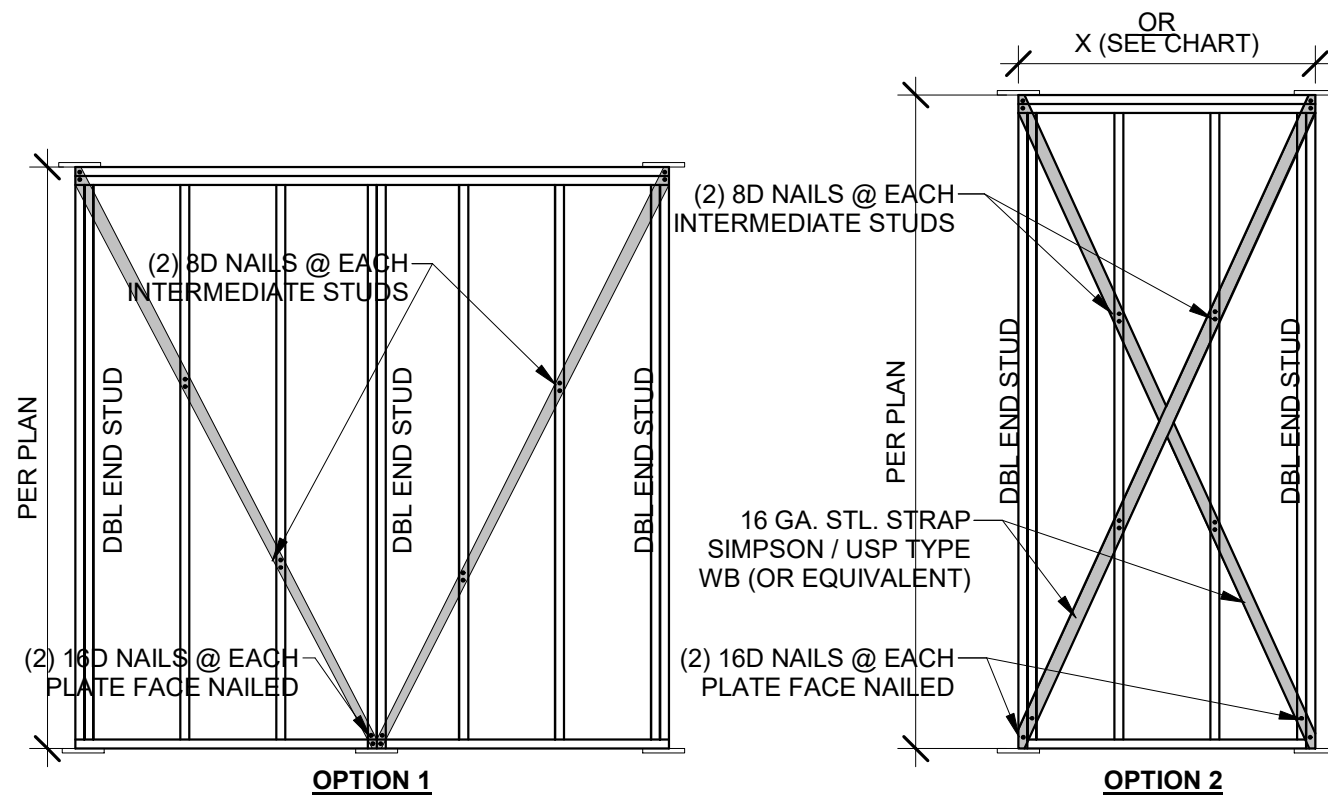
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BRACED WALL NOTES & DETAILS

**S-2.0**

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## TENSION STRAP CAPACITY REQUIRED FOR RESISTING WIND PRESSURES PERPENDICULAR TO METHOD PFH, PFG AND CS-PF BRACED WALL PANELS IRC2018 TABLE R602.10.6.4



BRACED WALL PANEL LENGTH BASED ON WALL HEIGHT FOR IRC, LIB		
WALL HEIGHT	MIN. WALL LENGTH (X)	MAX. WALL LENGTH (X)
8'-0"	4'-7"	8'-0"
9'-0"	5'-2"	9'-0"
10'-0"	5'-9"	10'-0"
11'-0"	NP	---
12'-0"	NP	---

### 6 LIB BRACING 3/8" = 1'-0"

FOR IRC CODE PRESCRIPTIVE METHOD  
**TABLE R602.10.5 MINIMUM LENGTH OF BRACED WALL PANELS**

METHOD (SEE TABLE R602.10.4)	MINIMUM LENGTH (INCHES) <sup>a</sup>					CONTRIBUTING LENGTH (INCHES)	
	WALL HEIGHT						
	8 FEET	9 FEET	10 FEET	11 FEET	12 FEET		
DWB,WSP,SFB,PBS,PCP,HPS,BV-WSP	48	48	48	53	58	ACTUAL <sup>b</sup>	
GB	48	48	48	53	58	DOUBLE SIDED = ACTUAL SINGLE SIDED = .5xACTUAL	
LIB	55	62	69	NP	NP	ACTUAL <sup>b</sup>	
ABW	SDC A, B, AND C ULTIMATE DESIGN WIND SPEED <140	28	32	34	38	42	48
	SDC D, D, D ULTIMATE DESIGN WIND SPEED <140	32	32	34	NP	NP	
PFH	SUPPORTING ROOF ONLY	16	16	16	NOTE C	NOTE C	48
	SPTNG. ONE STORY & ROOF	24	24	24	NOTE C	NOTE C	
PFG	24	27	30	NOTE D	NOTE D	1.5 x ACTUAL <sup>b</sup>	
CS-G	24	27	30	33	36	ACTUAL <sup>b</sup>	
CS-PF	16	18	20	NOTE E	NOTE E	ACTUAL <sup>b</sup>	
ADJACENT CLEAR OPENING HEIGHT (INCHES)	≤64	24	27	30	33	36	ACTUAL <sup>b</sup>
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100	-	44	40	38	38	
	104	-	49	43	40	39	
	108	-	54	46	43	41	
	112	-	-	50	45	43	
	116	-	-	55	48	45	
	120	-	-	60	52	48	
124	-	-	-	56	51		
128	-	-	-	61	54		
132	-	-	-	66	58		
136	-	-	-	-	62		
140	-	-	-	-	66		
144	-	-	-	-	72		

<sup>a</sup> LINEAR INTERPOLATION SHALL BE PERMITTED  
<sup>b</sup> USE THE ACTUAL LENGTH WHEN IT IS GREATER THAN OR EQUAL TO THE MINIMUM LENGTH  
<sup>c</sup> MAX. HEADER HEIGHT FOR PFH IS 10' IN ACCORDANCE WITH R602.10.6.2. WALL HEIGHT MAY BE INCREASED TO 12' WITH PONY WALL  
<sup>d</sup> MAX. OPENING HEIGHT FOR PFG IS 10' IN ACCORDANCE WITH R602.10.6.3. WALL HEIGHT MAY BE INCREASED TO 12' WITH PONY WALL  
<sup>e</sup> MAX. OPENING HEIGHT FOR CS-PF IS 10' IN ACCORDANCE WITH R602.10.6.4. WALL HEIGHT MAY BE INCREASED TO 12' WITH PONY WALL

**BRACED WALL PRESCRIPTIVE METHOD:**  
CONTINUOUS EXTERIOR SHEATHING (CS-WSP) PER WSP METHOD (BELOW) UNLESS OTHERWISE NOTED ON THE PLAN

**EXTERIOR BRACED WALL METHOD: (SEE ON THIS SHEET) WSP METHOD:**

WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN 3/8" WITH MINIMUM SPAN RATING OF 24/0 FOR 16" O.C. STUD SPACING WITH 6d COMMON NAILS @ 6" O.C. EDGES AND 12" O.C. FIELD OR SHEATHING THICKNESS NOT LESS THAN 7/16" WITH MINIMUM SPAN RATING OF 24/16 FOR 24" O.C. SPACING WITH 8d COMMON NAILS @ 6" O.C. EDGES AND 12" O.C. IN FIELD (NOTE: FRAMING MEMBERS 16" O.C. MAX. UNBLOCKED, AND W/ SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS).

**INTERIOR BRACED WALLS (SEE ON THIS SHEET) GB METHOD:**

1/2" MINIMUM GYPSUM BOARD OVER STUDS SPACED @ 24" MAXIMUM FASTENED W/ #6 - 1 1/4" TYPE "W" OR "S" DRYWALL SCREWS @ 7" O.C. EDGES AND FIELD (MIN. 4'-0" SECTION FOR BOTH SIDES) OR

**LIB METHOD:**

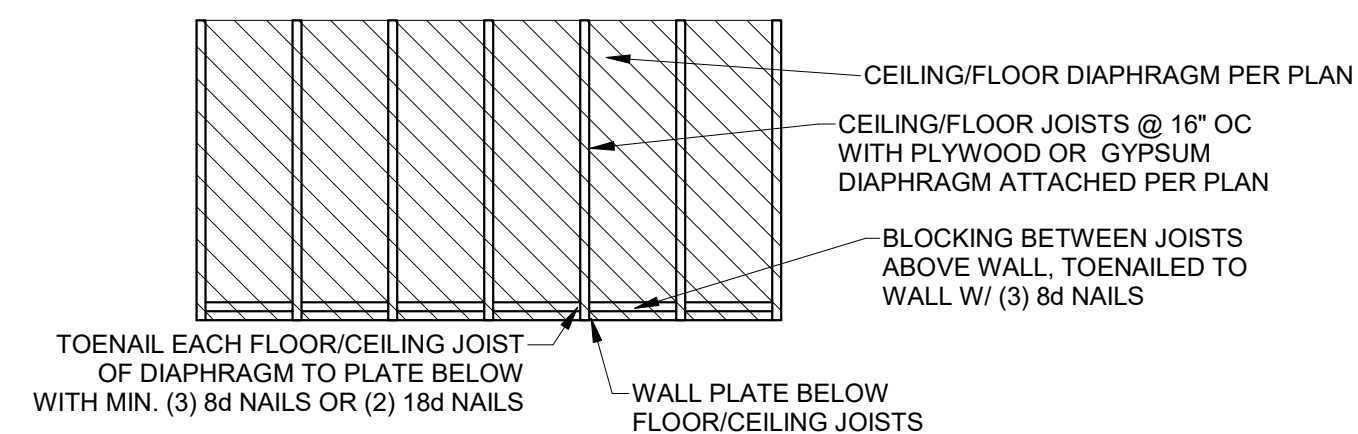
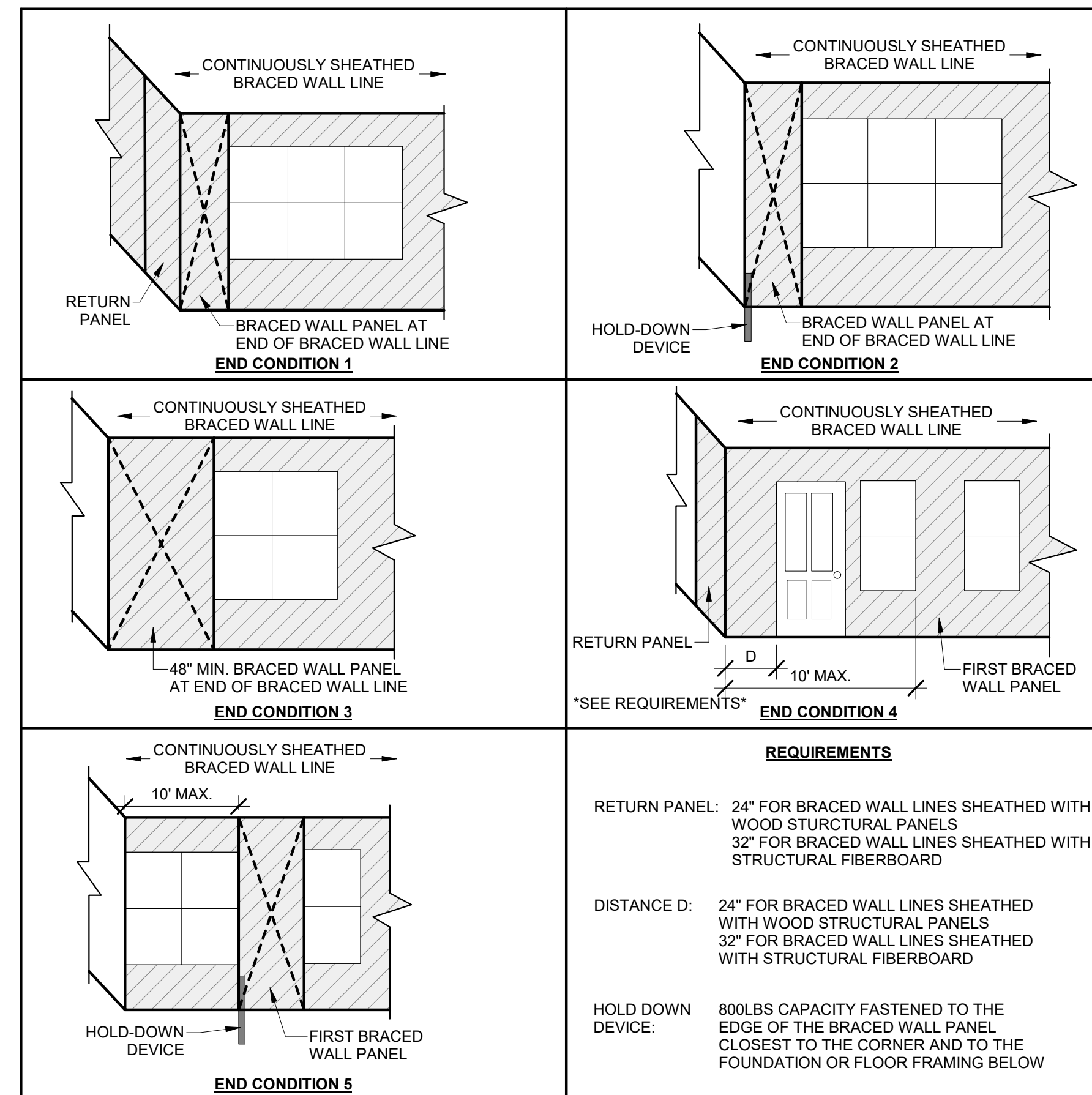
1x4 WOOD FASTENED W/ (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA. TYPE WB (OR EQUIVALENT) STL. X-BRACE(S) @ 45° TO 60° ANGLES, MAXIMUM 16" O.C. STUDS FASTENED PER MANUF. SPECS.

MINIMUM WALL STUD FRAMING NOMINAL SIZE & GRADE	MAX. PONY WALL HEIGHT (FEET)	MAX. TOTAL WALL HEIGHT (FEET)	MAX. OPENING WIDTH (FEET)	TENSION STRAP CAPACITY REQUIRED (POUNDS) <sup>a</sup>	
				ULTIMATE DESIGN WIND SPEED V (MPH)	
				115	115
				EXPOSURE B	EXPOSURE C
2x4 NO. 2 GRADE	0	10	18	1,000	1,000
			9	1,000	1,000
			16	1,025	2,500
			18	1,275	2,850
			9	1,000	1,875
			11	2,175	4,125
	2	10	18	2,500	DR
			9	1,500	3,175
			16	3,375	DR
			18	3,975	DR
			9	2,750	DR
			12	3,775	DR
2x6 STUD GRADE	2	12	9	1,000	2,025
			16	2,150	3,675
			18	2,550	DR
			9	1,750	3,125
			16	2,400	DR
			18	3,800	DR
	4	12	9	1,750	3,125
			16	2,400	DR
			18	3,800	DR
			9	1,750	3,125
			16	2,400	DR
			18	3,800	DR

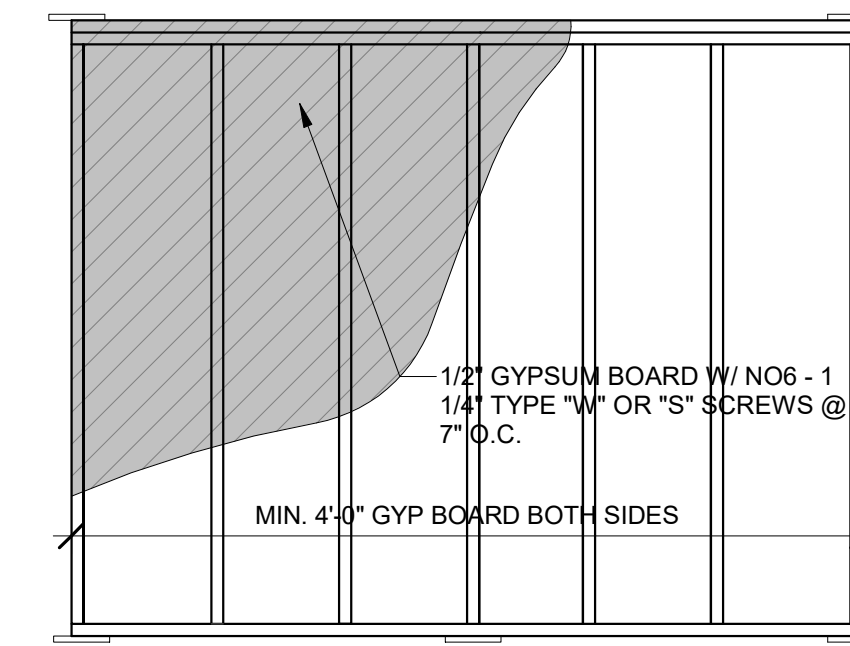
a. DR = DESIGN REQUIRED  
b. STRAP SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

### END WALL CONDITIONS

FOR CONTINUOUSLY SHEATHED BRACED WALL LINES

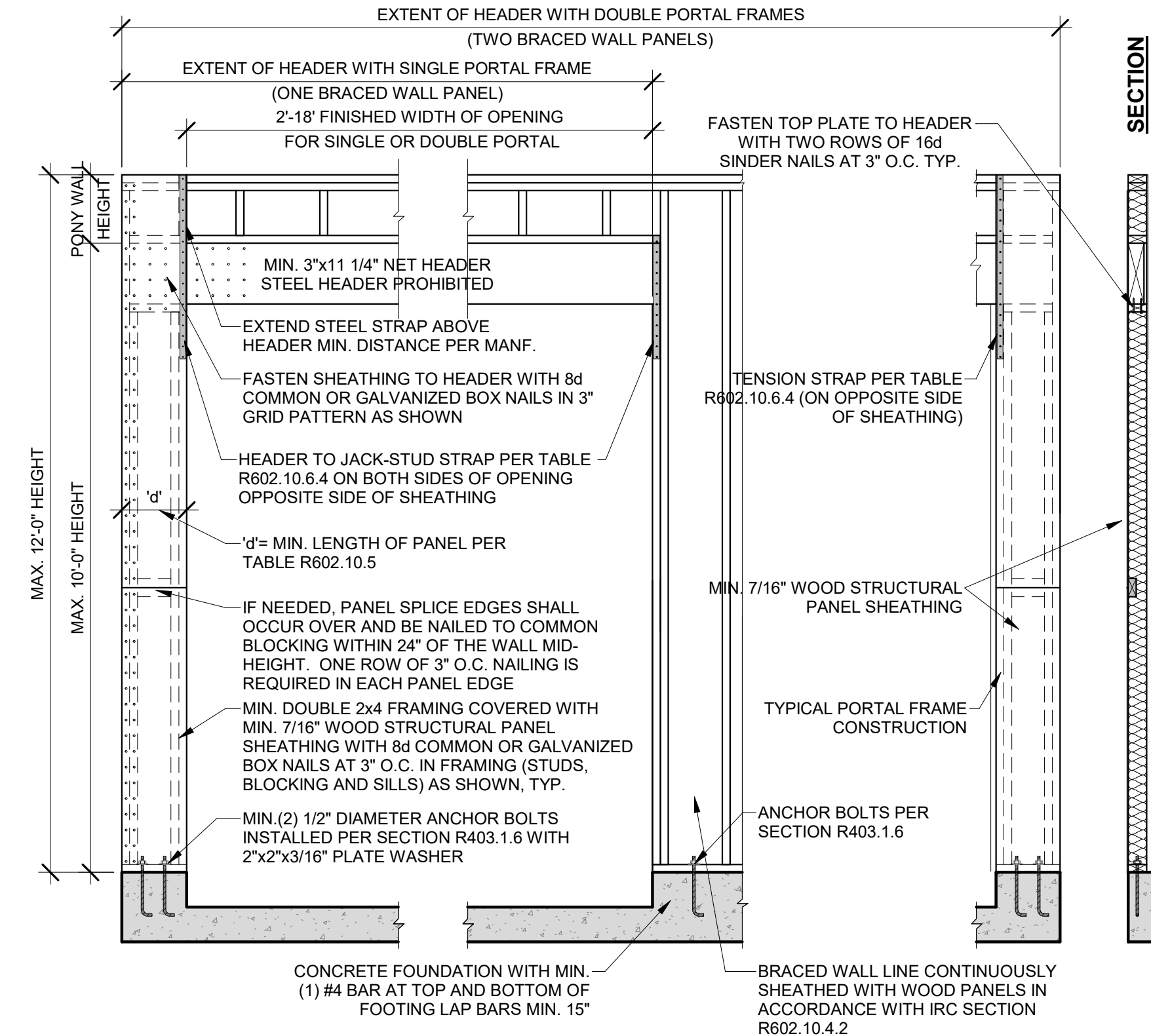


### 1 DIAPHRAGM CONNECTION TO INTERIOR WALL 3/8" = 1'-0"

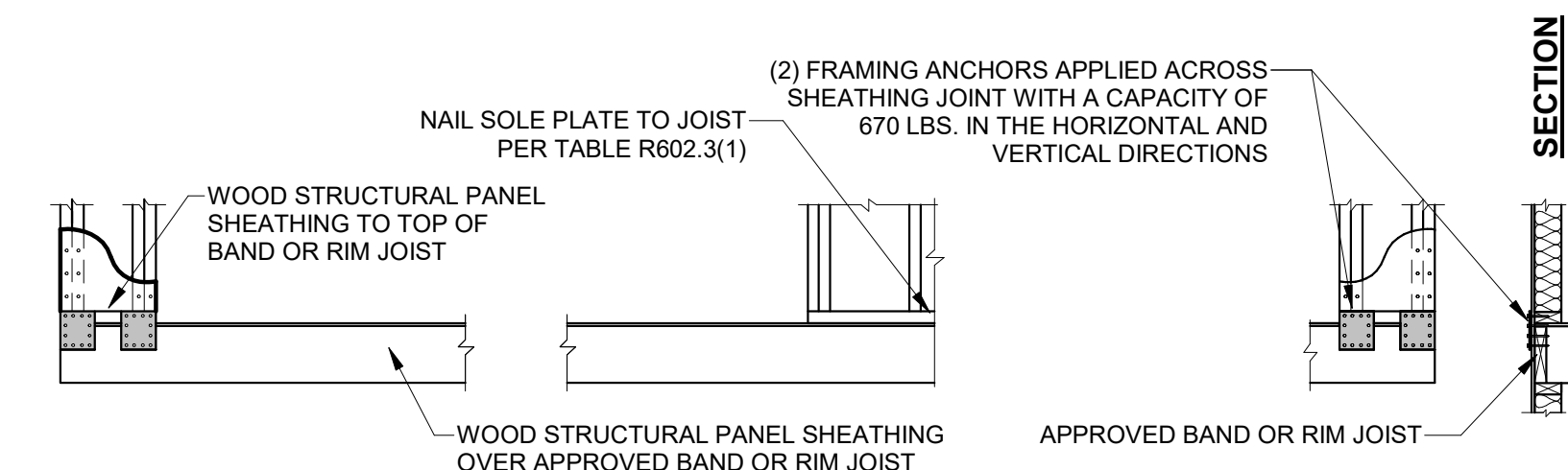


### 5 GB BRACING 1/2" = 1'-0"

### FRONT ELEVATION

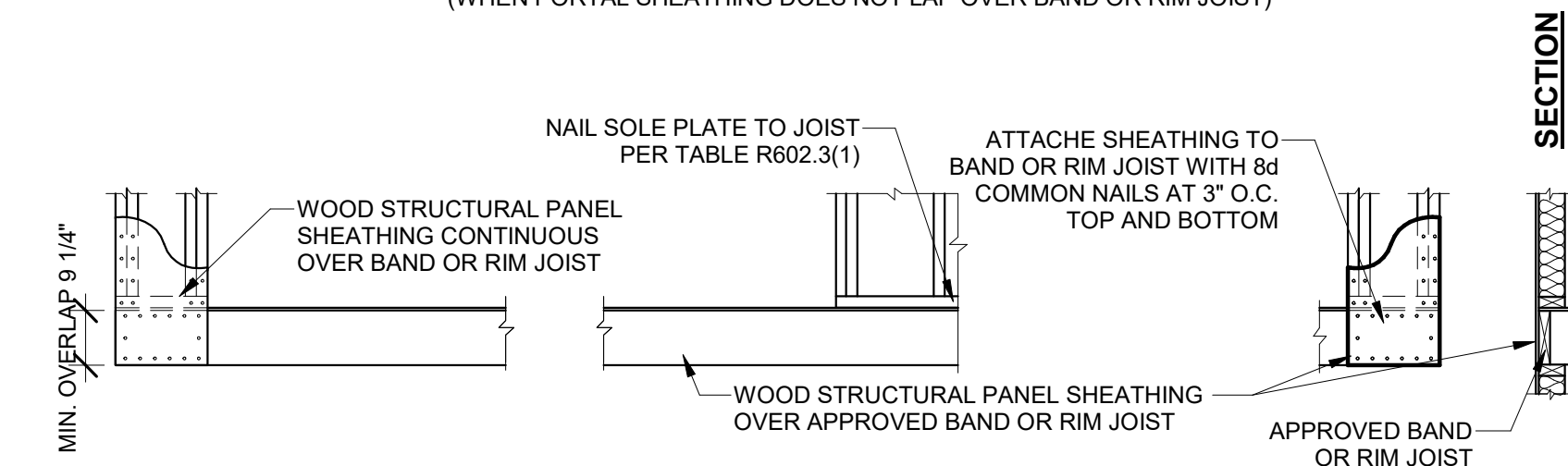


### OVER CONCRETE OR MASONRY BLOCK FOUNDATION



### OVER RAISED WOOD FLOOR - FRAMING ANCHOR OPTION

(WHEN PORTAL SHEATHING DOES NOT LAP OVER BAND OR RIM JOIST)



### OVER RAISED WOOD FLOOR - OVERLAP OPTION

(WHEN PORTAL SHEATHING LAPS OVER BAND OR RIM JOIST)

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 HD ENGINEERING & DESIGN, INC.  
 11656 W. 75TH STREET  
 SHAWNEE, KS 66214  
 WWW.HDENGINEERS.COM  
 913.651.2222  
 SERVICE@HDENGINEERS.COM



**SAB HOMES, INC.**  
 SANTA BARBARA HFR098  
 2107 SW HARVEST MOON LN. LEE'S SUMMIT, MO  
 STRUCTURAL DETAILS & NOTES

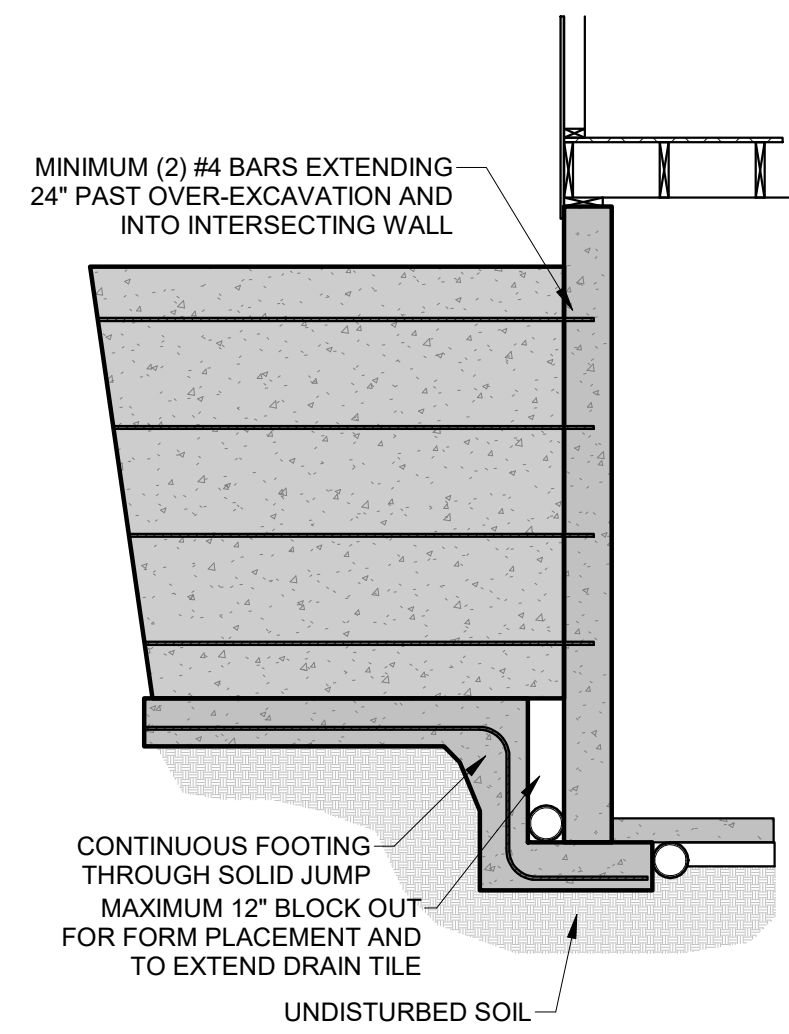
HD#: 46333

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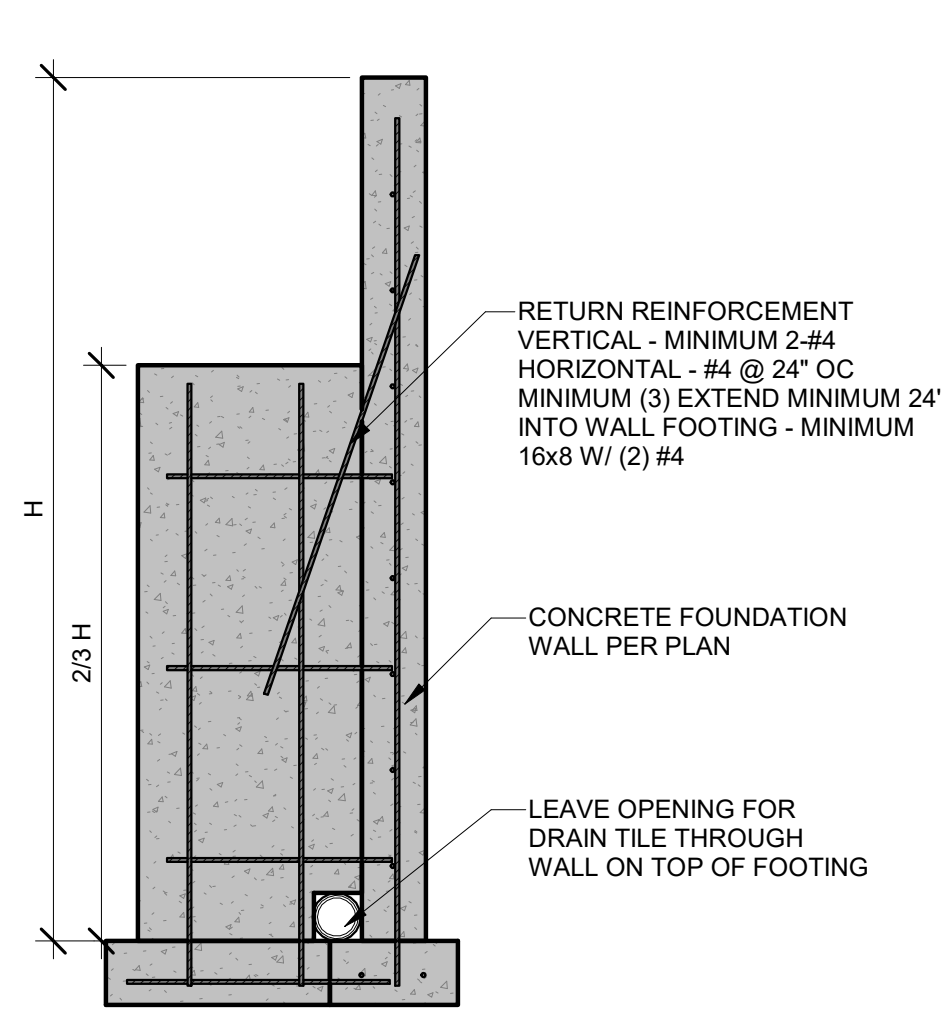
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BRACED WALLS NOTES & DETAILS

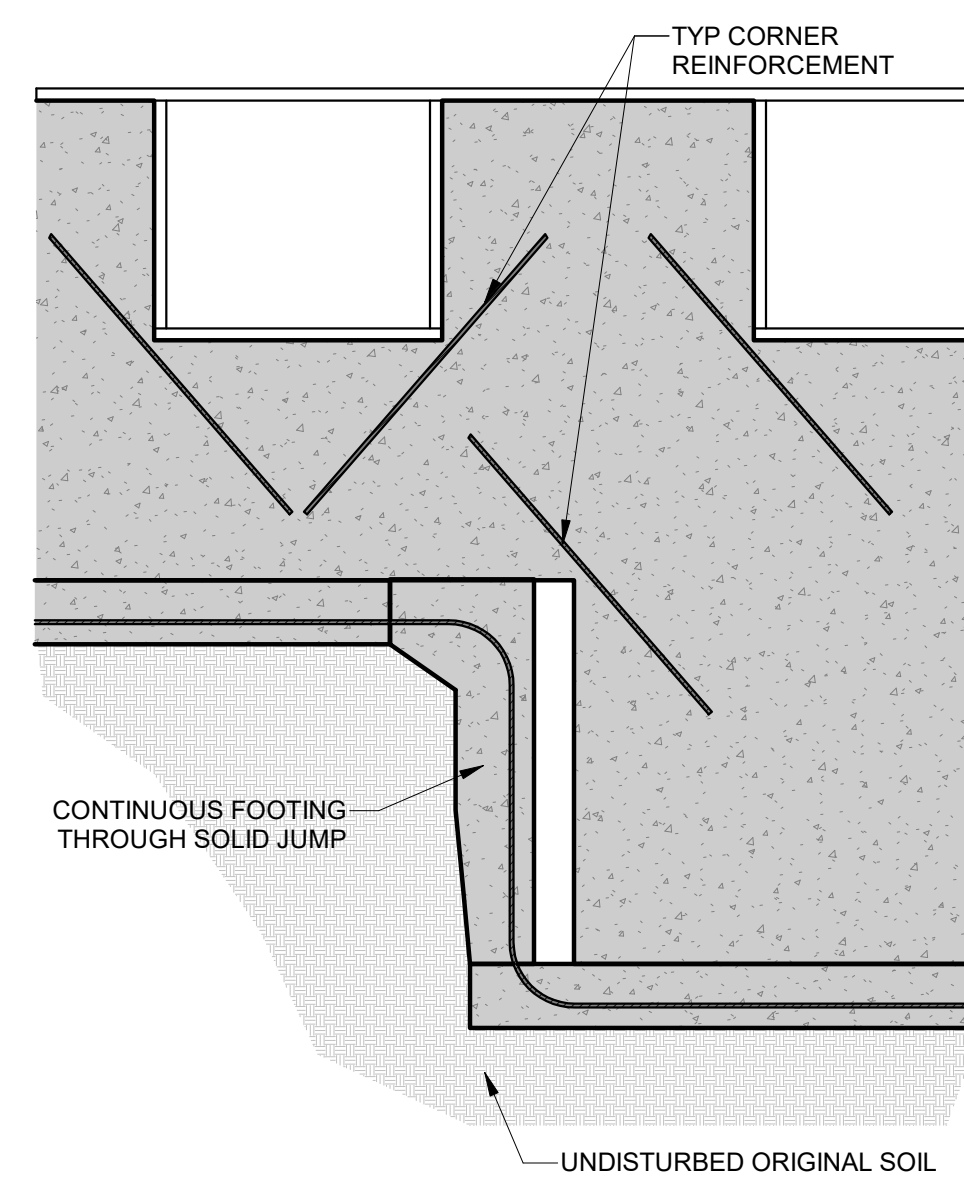
## S-2.1



**1** SOLID FOOTING JUMP DETAIL  
3/8" = 1'-0"

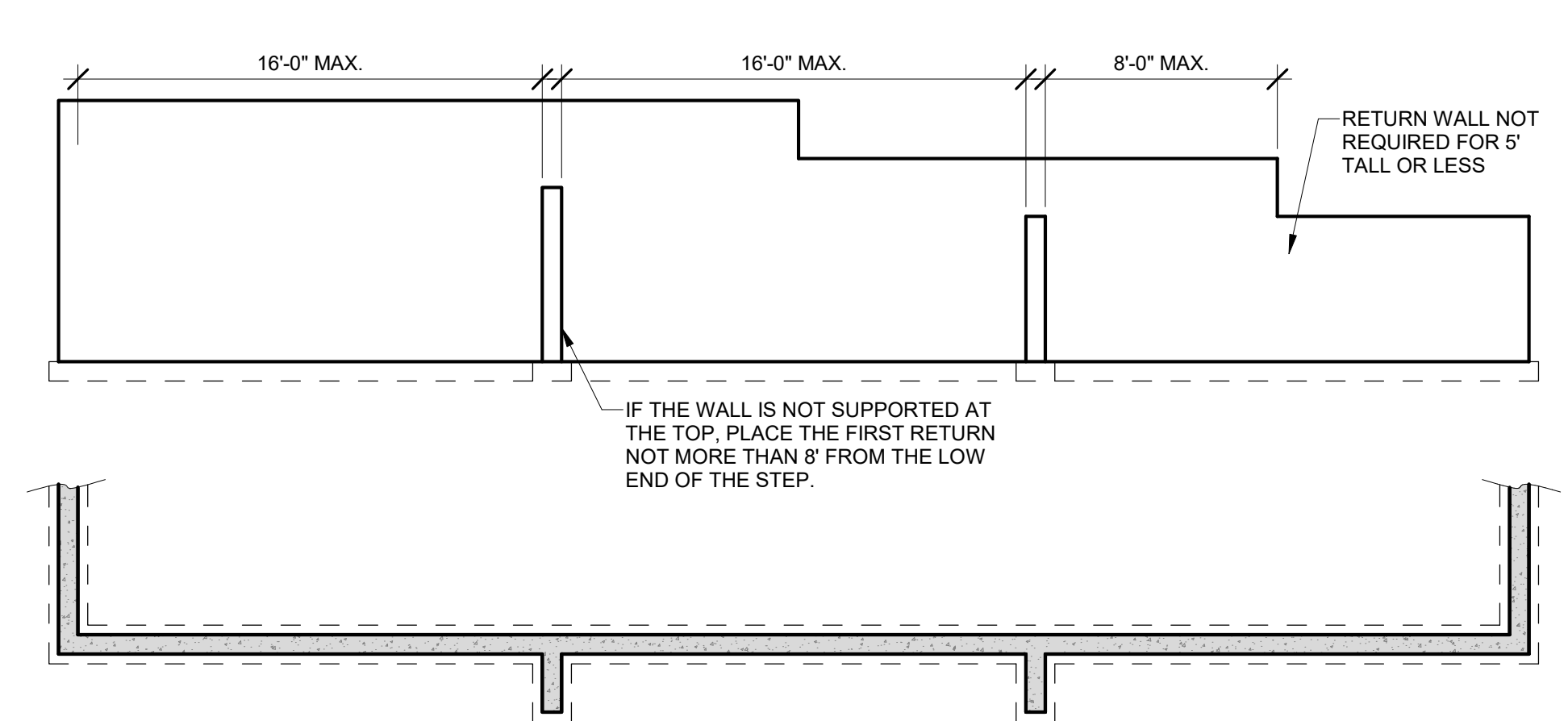


**2** RETURN WALL DETAIL  
1/2" = 1'-0"

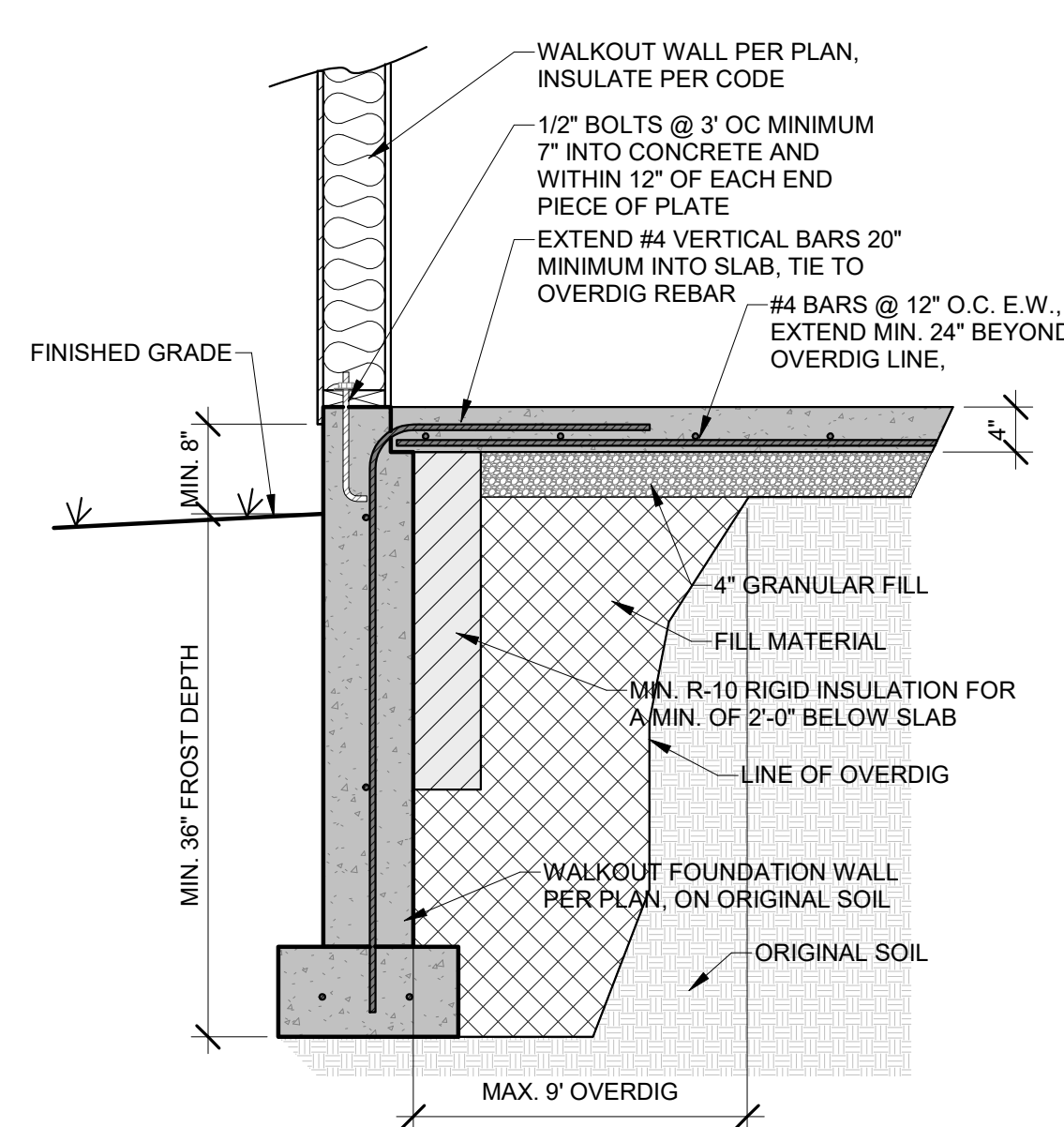


WHERE OPENINGS OR ABRUPT ELEVATION CHANGES OCCUR IN THE TOP OR BOTTOM OF THE WALL AT LEAST ONE #4 BAR 48" LONG SHALL BE DIAGONALLY AS CLOSE A PRACTICAL TO THE CORNER

**9** REINFORCEMENT AT CORNERS AND STEPS  
1/2" = 1'-0"



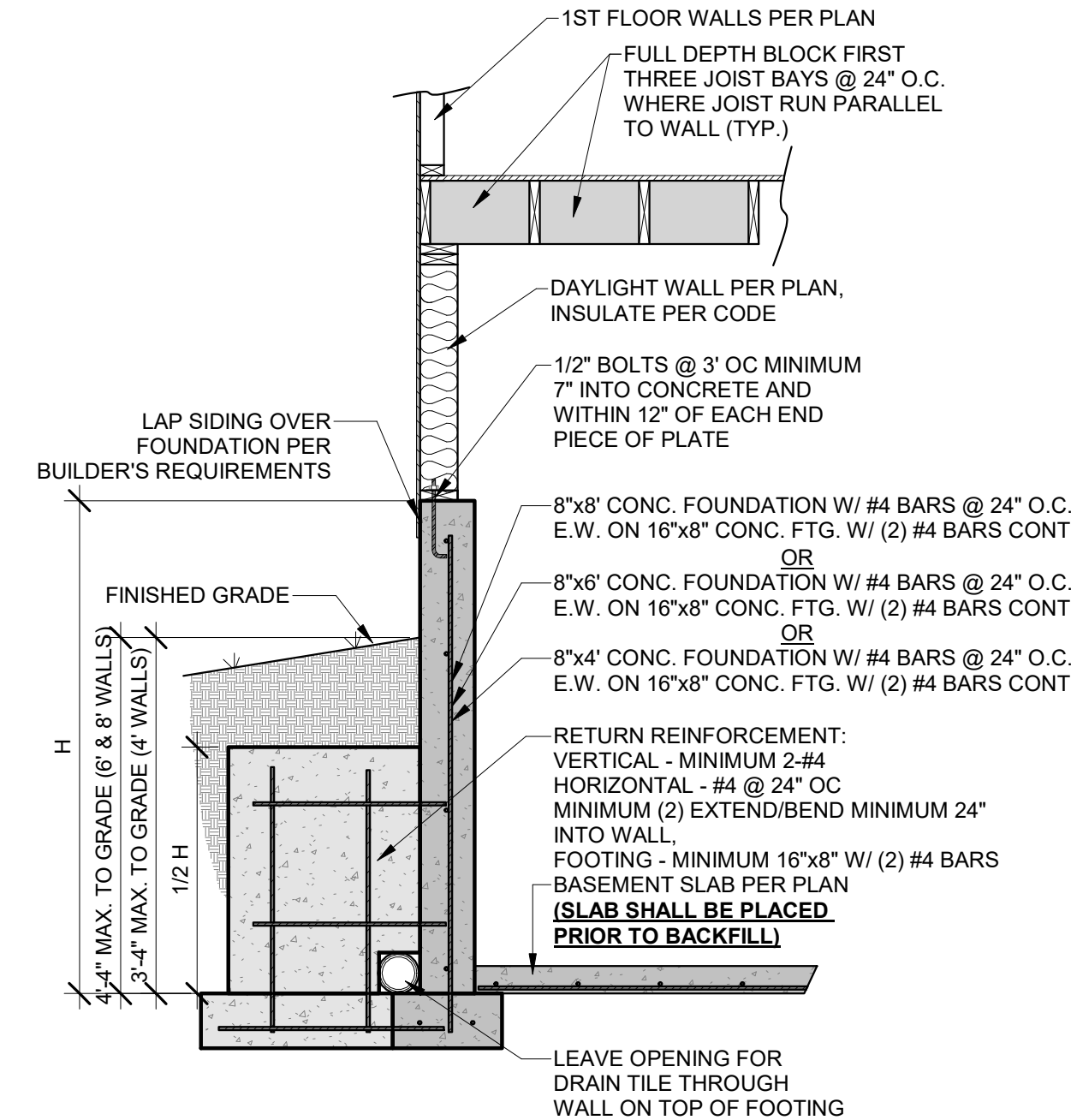
**4** RETURN WALL PLACEMENT  
3/16" = 1'-0"



IF OVER 9' OVERDIG SEE HD ENGINEERING FOR STRUCTURAL BASEMENT SLAB DESIGN

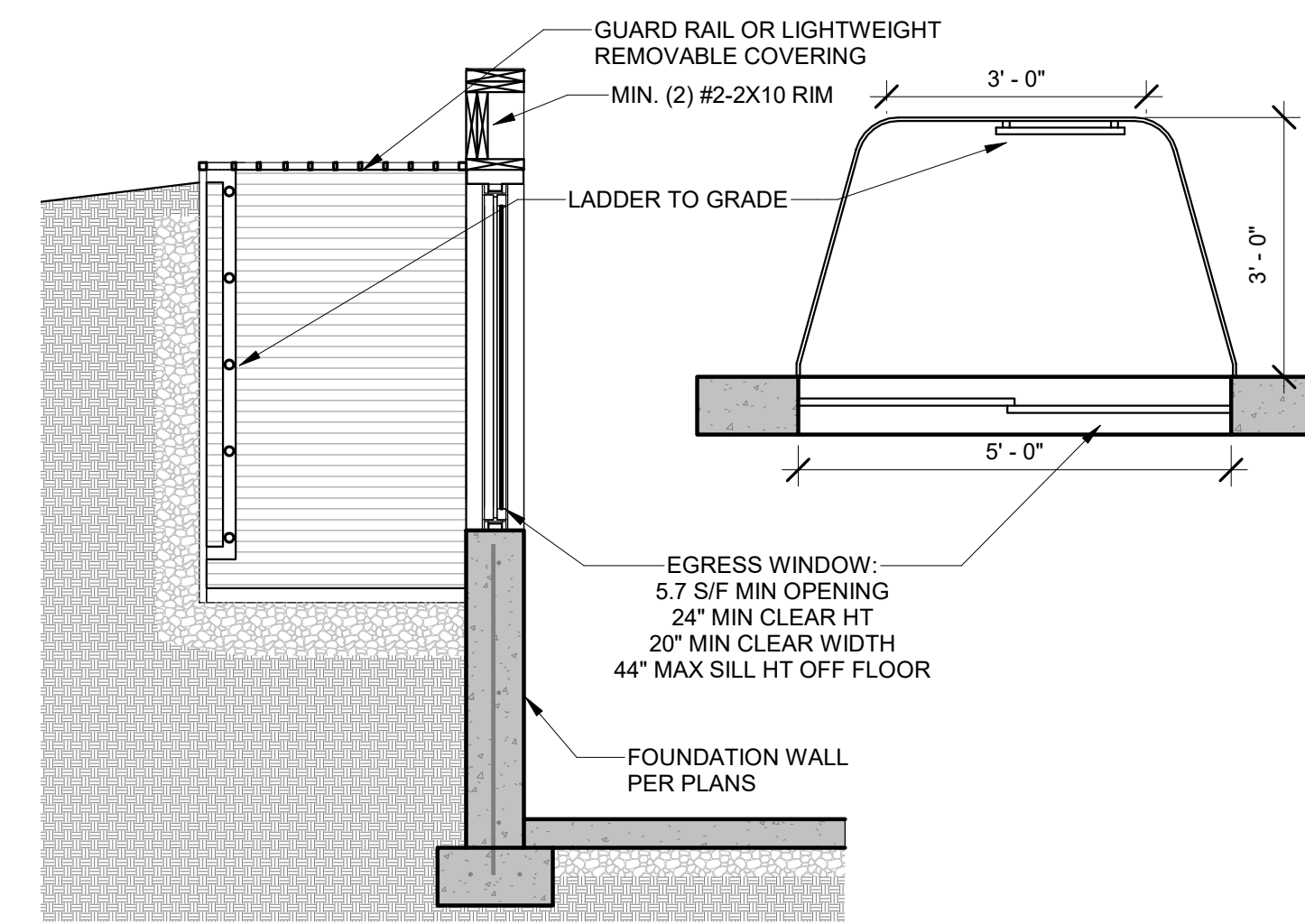
**IMPORTANT NOTE:**  
ANY SLAB WITH GREATER THAN 2' OF GRADED ROCK OR 8" OF FILL SOIL BELOW SHALL BE DESIGNED AS STRUCTURAL PER PLAN. OUR FIRM SHOULD BE CONTACTED IMMEDIATELY FOR DESIGN RECOMMENDATIONS. DESIGN MUST BE COMPLETED PRIOR TO PLACEMENT OF PIERS OR FOOTINGS.

**10** WALKOUT DETAIL  
3/4" = 1'-0"



**8"x4', 8"x6', AND 8"x8' DAYLIGHT FOUNDATION**  
IF SLAB IS NOT PLACED PRIOR TO BACKFILL CONTRACTOR IS RESPONSIBLE FOR BRACING THE FOUNDATION AS REQUIRED

**7** UNRESTRAINED FOUNDATION WALL  
1/2" = 1'-0"



**11** EGRESS WINDOW SECTION  
1/2" = 1'-0"

VERTICAL REINFORCEMENT SPACING*						
60 PSF SOIL; 40 & 60 KSI STEEL						
CONCRETE STRENGTH	8" THICK WALL			10" THICK WALL		
	8'	9'	8'	9'	10'	
3000 PSI/ 40 KSI	16	12	24	16	12	
3500 PSI/ 40 KSI	16	12	24	24	12	
3000 PSI/ 60 KSI	24	16	24	20	16	
3500 PSI/ 60 KSI	24	16	24	24	16	

HORIZONTAL REINFORCEMENT**						
ONE BAR 12" FROM TOP OF WALL; MAX. SPACING 24" O.C.	4-#4	5-#4	4-#4	5-#4	6-#4	

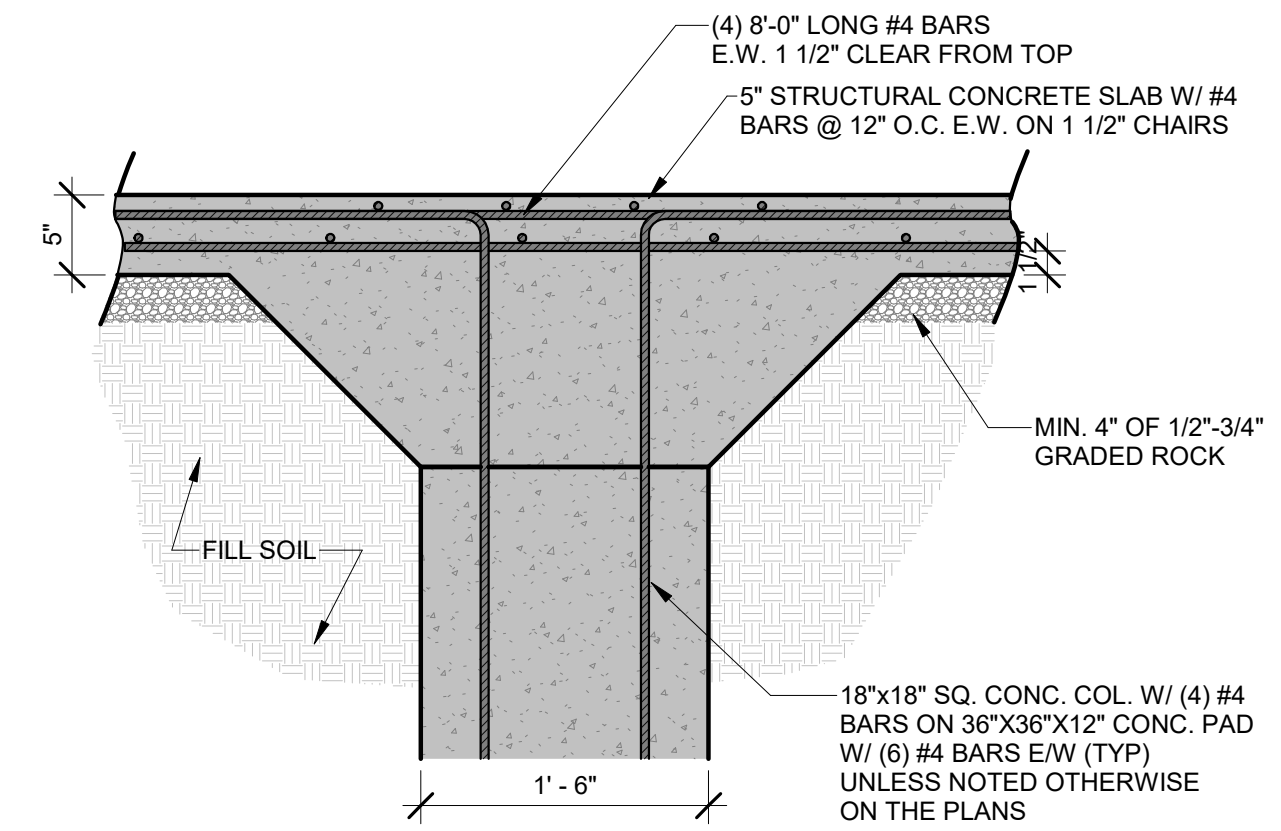
\* CONCRETE SHALL HAVE AIR ENTRAINMENT OF 5-7%.  
\* MINIMUM REQUIREMENT FOR VERTICAL REBAR IN PLAIN CONCRETE WALLS IS #4 @ 36" ON CENTER (ACI 332).  
\* VERTICAL BARS SHALL BE CONTINUED UP TO WITHIN 8" OF THE TOP OF THE WALL.  
\* REBAR SHALL BE POSITIONED AT THE TENSION FACE OF THE WALL (2" FROM THE INSIDE FACE).  
\* REINFORCEMENT SHALL LAP A MINIMUM OF 24 INCHES AT ENDS, SPLICES, AND AROUND CORNERS.  
\*\* #4 BARS @ 24" ON CENTER.  
\*\* #4 BAR WITHIN 12 OF TOP AND BOTTOM OF WALL.  
\*\* MINIMUM GRADE 40 (40ksi) STEEL (PER ACI 332).  
\*\* HORIZONTAL REINFORCEMENT SHALL BE INSTALLED ON THE COMPRESSION SIDE (SOIL SIDE) OF THE VERTICAL REINFORCEMENT



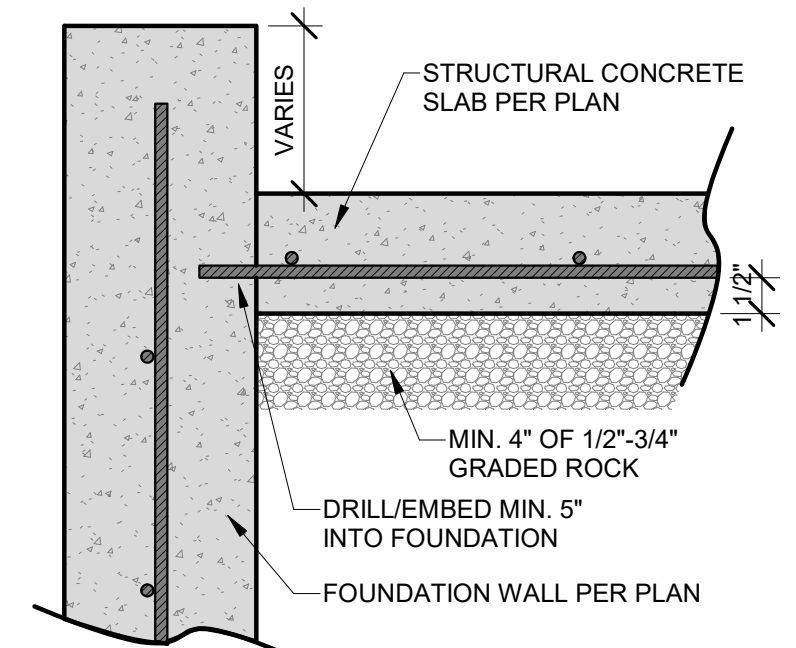
HD#: 46333  
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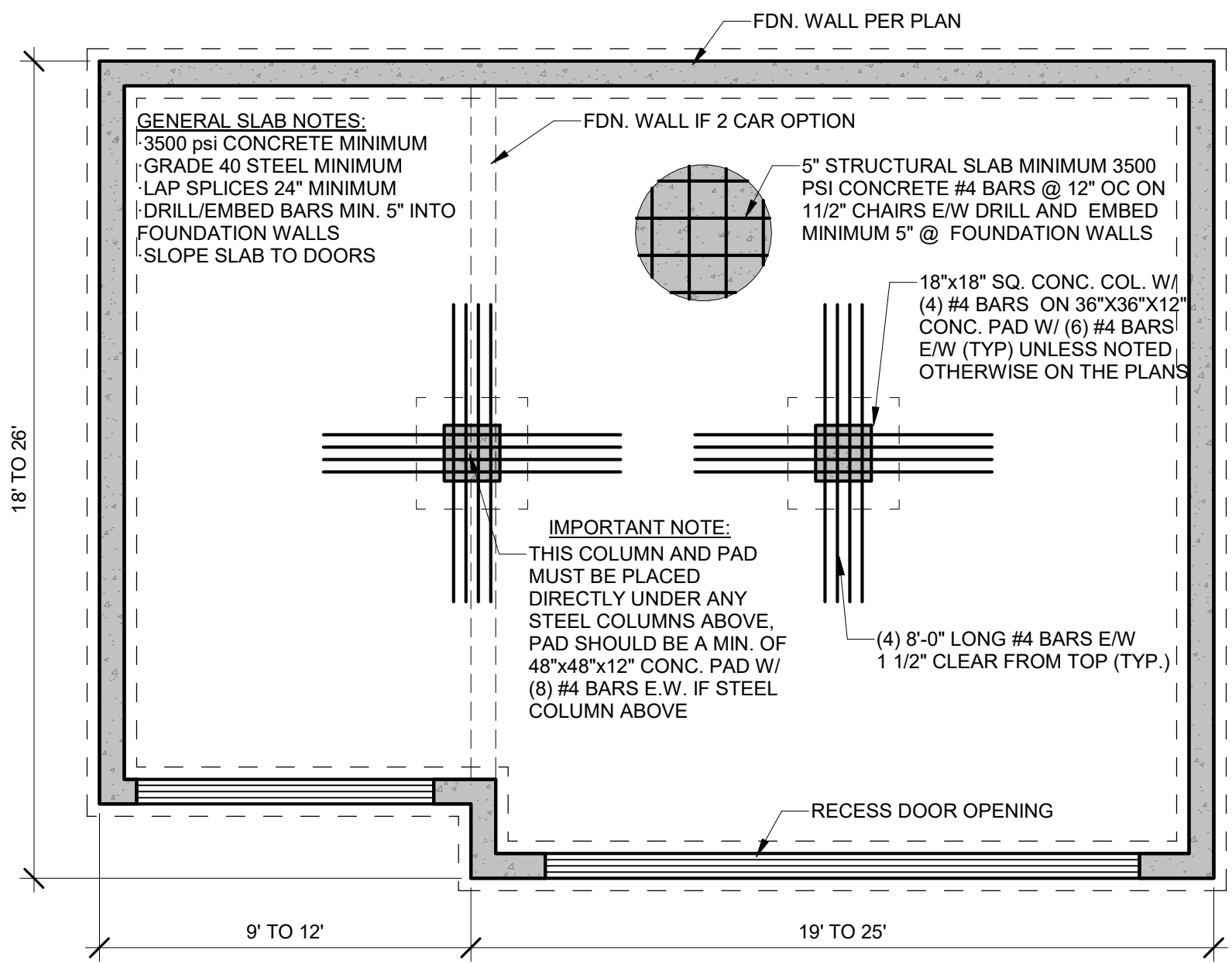
CONCRETE DETAILS



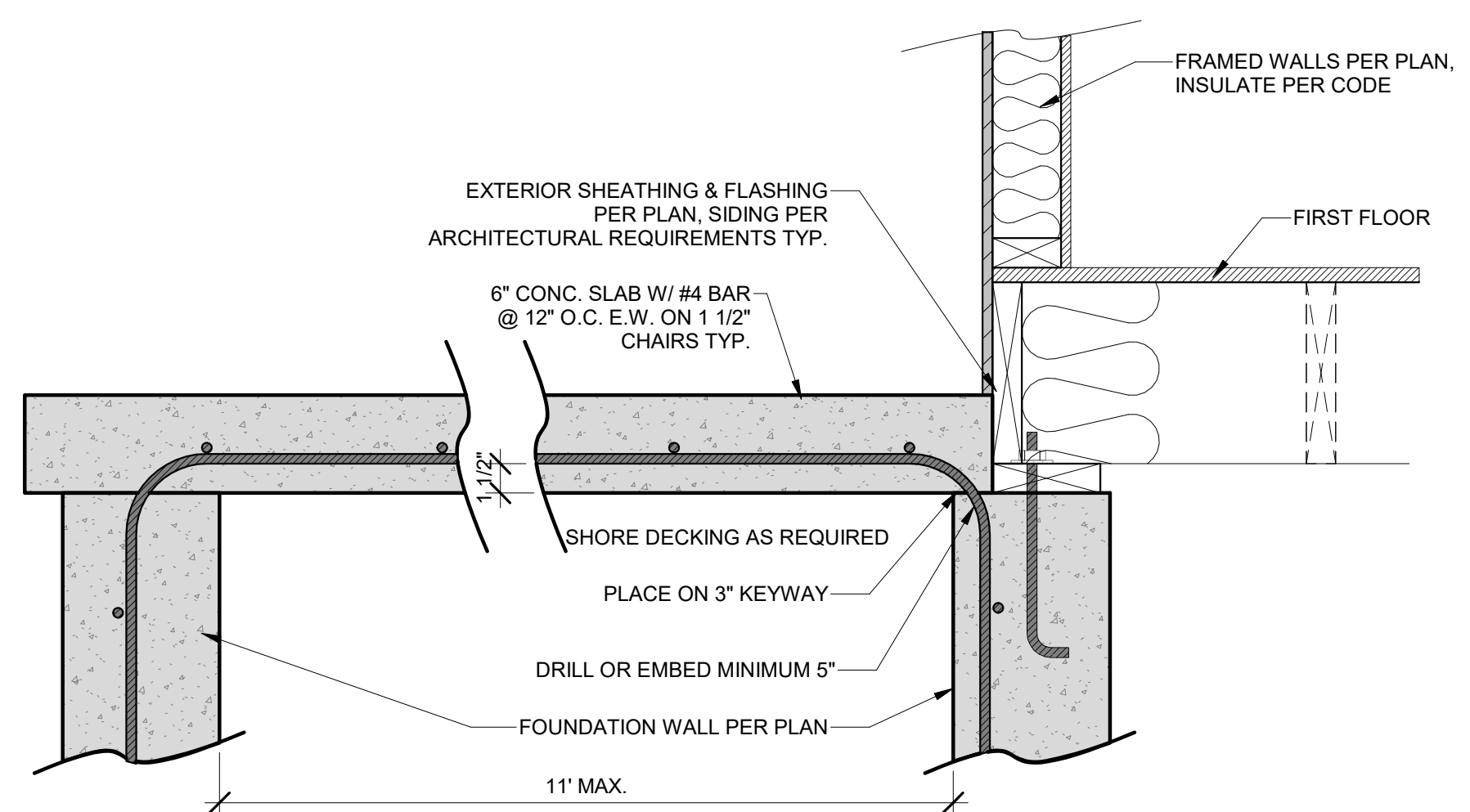
8 GARAGE SLAB COLUMN DETAIL  
1" = 1'-0"



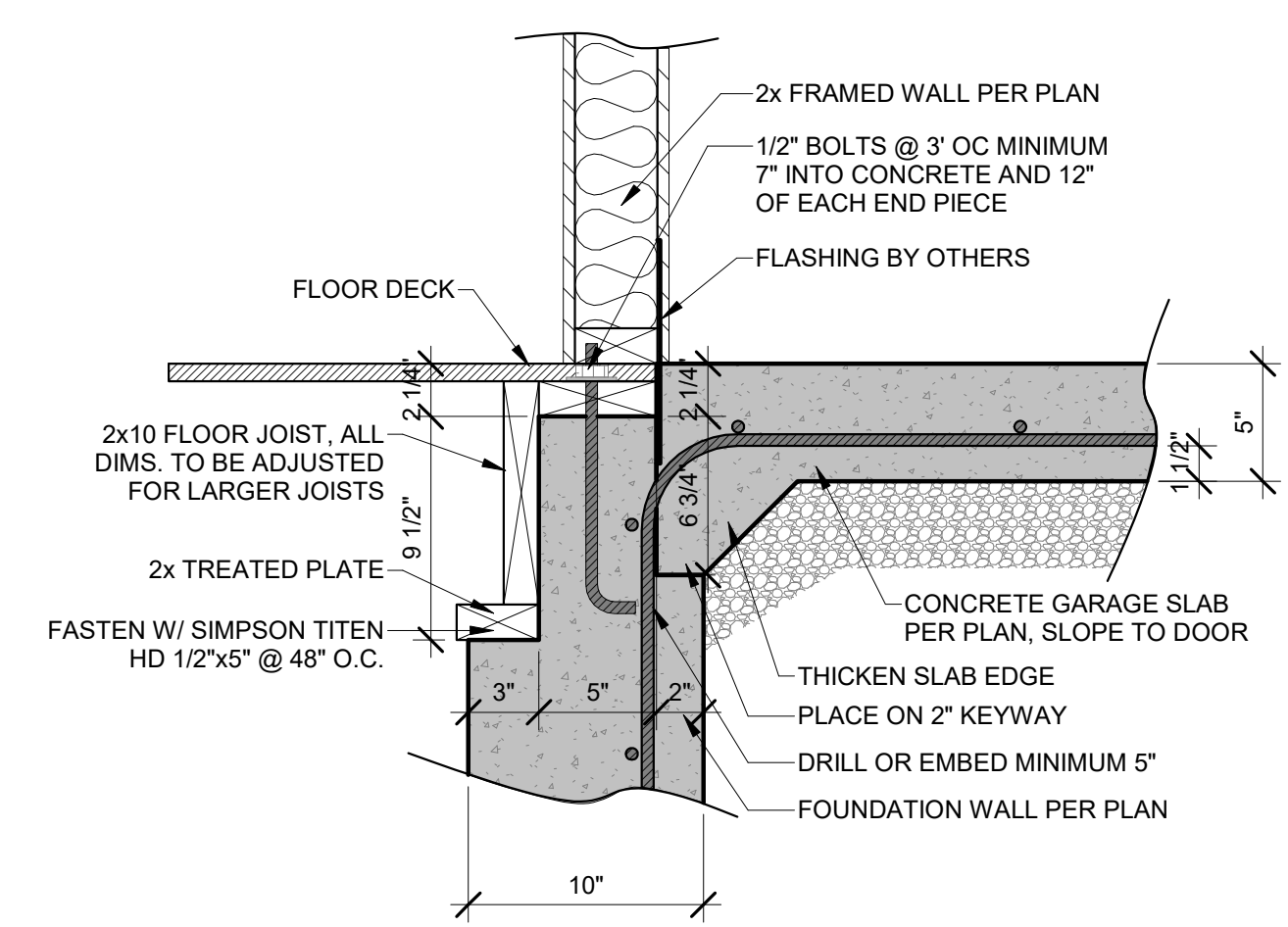
9 STRUCTURAL SLAB/ WALL  
1 1/2" = 1'-0"



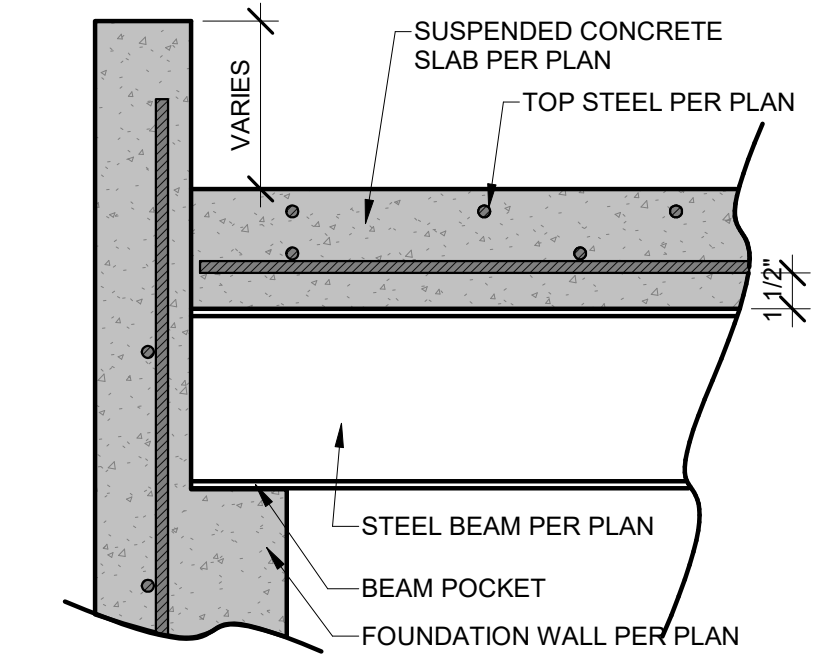
10 TYPICAL GARAGE SLAB  
1/4" = 1'-0"



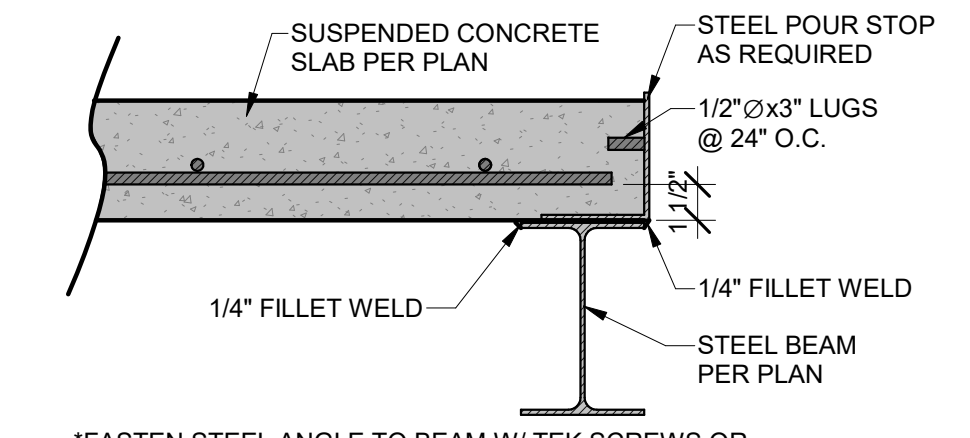
6 SUSPENDED PORCH STOOP SLAB  
1 1/2" = 1'-0"



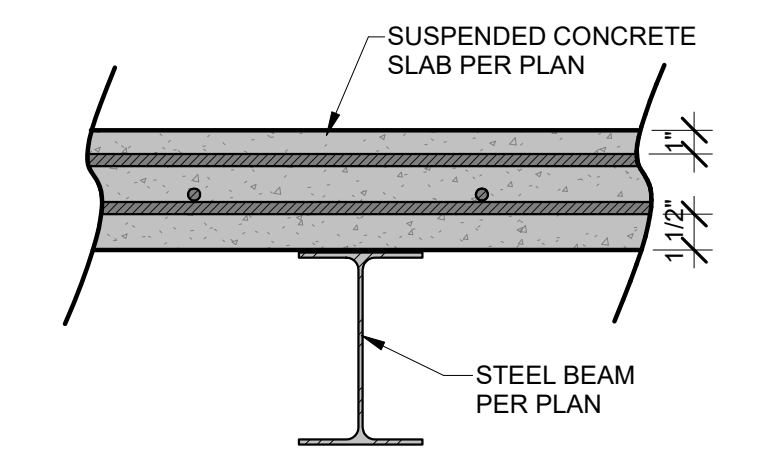
7 ZERO ENTRY GARAGE DETAIL  
1 1/2" = 1'-0"



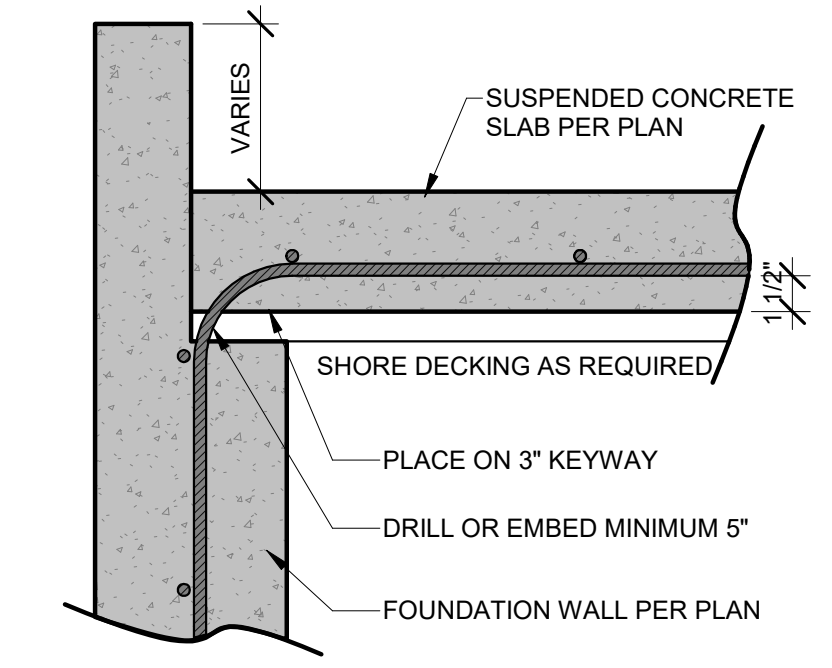
1 SUSPENDED SLAB BEAM/WALL CONNECTION  
1 1/2" = 1'-0"



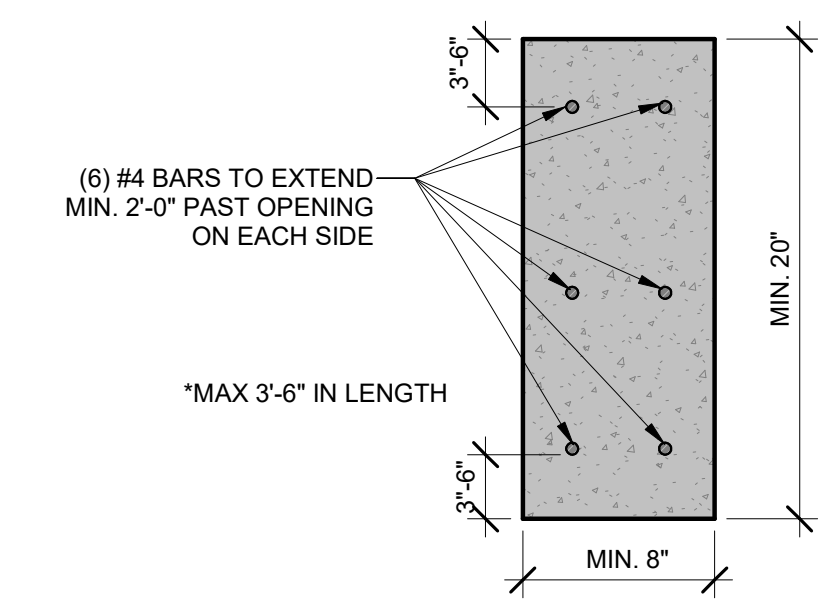
2 SUSPENDED SLAB POUR STOP  
1 1/2" = 1'-0"



3 SUSPENDED SLAB/STEELBEAM CROSS SECTION  
1 1/2" = 1'-0"



4 SUSPENDED SLAB/WALL CONNECTION  
1 1/2" = 1'-0"



5 CONCRETE HEADER DETAIL  
1 1/2" = 1'-0"

**IMPORTANT NOTE:**  
FOR SUSPENDED SLABS A MAXIMUM OF 10' ABOVE FLOOR BELOW: TEMPORARY SHORING WALLS SHALL BE PLACED AT A MAXIMUM OF 4' O.C. / #2-2X4 STUDS AT 16" O.C. W/ TOP AND BOTTOM PLATE. WALL TO HAVE CONTINUOUS DIAGONAL BRACING. LATERAL BRACING TO BE RUN FROM WALL TO WALL AT MID HEIGHT 4' ON CENTER. SHORING TO REMAIN IN PLACE FOR AT LEAST 21 DAYS.  
ANY CAST IN PLACE SLABS FORMED MORE THAN 10' ABOVE THE FLOOR BELOW SHALL HAVE A SITE SPECIFIC SHORING DESIGN DONE. OUR FIRM SHOULD BE CONSULTED FOR THIS DESIGN ONCE FOUNDATION WALLS ARE IN PLACE TO EVALUATE ALL FIELD CONDITIONS. IT SHOULD BE NOTED THAT FAILURE TO HAVE AN ADEQUATE SHORING DESIGN CAN RESULT IN FORM COLAPSE AND/OR CATASTROPHIC FAILURE.

**HD ENGINEERING STRUCTURAL GARAGE SLAB DETAILS**

HD ENGINEERING & DESIGN, INC  
17656 W. 75TH STREET  
SHAWNEE, KS 66214  
WWW.HDENGINEERS.COM  
913.651.2222  
SERVICE@HDENGINEERS.COM



**SAB HOMES, INC.**  
SANTA BARBARA HFR098  
2107 SW HARVEST MOON LN. LEE'S SUMMIT, MO  
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SUSPENDED SLAB DETAILS

**S-3.1**

# MINIMUM INSULATION & FENSTRATION VALUES BY COMPONENT, PER IRC2018 N1102.1.2

VALUES BELOW ARE PER 2018 IECC. ACTUAL VALUES MAY VARY BASED ON ALTERNATE ENERGY COMPLIANCE PATH CHOSEN (IN JURISDICTIONS WHERE ALTERNATIVE PATHS ARE AVAILABLE)

CLIMATE ZONE	FENSTRATION U-FACTOR	SKYLIGHT U-FACTOR	GLAZED SHGC FENSTRATION	INSULATED METAL DOOR U-VALUE	INSULATED WOOD DOOR U-VALUE	CEILING R-VALUE	WOOD FRAMED WALL R-VALUE	FLOOR R-VALUE	BASEMENT WALL R-VALUE	SLAB R-VALUE & DEPTH	CRAWL SPACE WALL R-VALUE	DUCTWORK OVER OUTSIDE R-VALUE	DUCTWORK (ALL OTHER) R-VALUE
4 EXCEPT MARINE	0.32	0.55	0.40	0.60	0.50	49	20 OR 13 CAV. +5	19	10 CONTINUOUS OR 13 CAVITY	R-10, 2 FT.	10 CONTINUOUS OR 13 CAVITY	8	6

NOTES: 1) BUILDING THERMAL ENVELOPE IS REQUIRED TO BE SEALED WITH AN AIR BARRIER AS PER N1102.4.1 OF THE 2018 IRC  
 2) RECESSED LIGHTING SHALL BE SEALED TO PREVENT LEAKAGE BETWEEN THE CONDITIONED SPACE AND UNCONDITIONED SPACE  
 3) ALL DUCTS, AIR HANDLERS, FILTER BOXES, AND BUILDING CAVITIES USED AS DUCTS SHALL BE SEALED AS PER N1103.2 OF THE 2018 IRC

## CATHEDRAL / VAULTED CEILING FRAMING AND INSULATION

MINIMUM R-38 INSULATION REQUIRED, SEE DETAIL 14/S-1.2

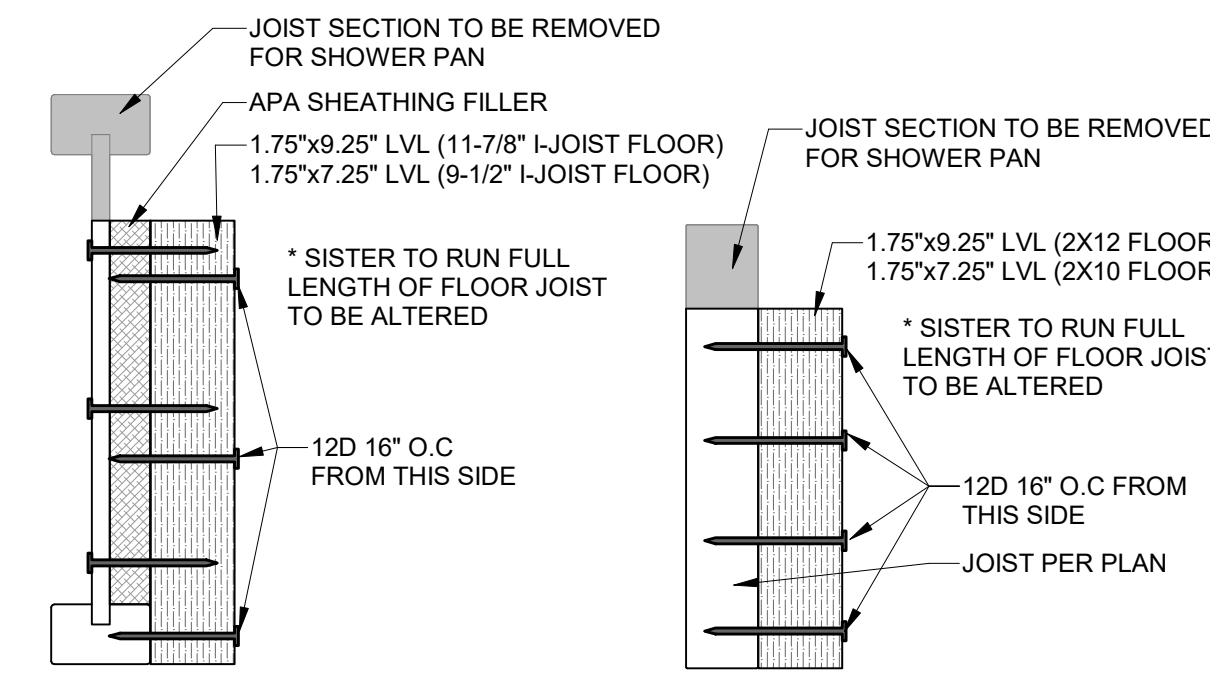
WHERE THE CEILING IS APPLIED DIRECTLY TO THE BOTTOM OF THE RAFTERS, A MINIMUM 1" AIR SPACE SHALL BE PROVIDED BETWEEN THE TOP OF THE INSULATION AND THE SHEATHING FOR VENTILATION (R806.3)  
 NOTE: RAFTER SIZES SPECIFIED ON PLANS ARE THE MINIMUM REQUIRED FOR STRUCTURAL PURPOSES ONLY. BUILDER TO VERIFY.  
 IF FULL RAFTER DEPTH IS NOT ADEQUATE FOR MINIMUM INSULATION VALUE, RAFTER SIZES WILL NEED TO BE INCREASED, OR ADEQUATE FURRING SHALL BE USED TO OBTAIN THE MINIMUM JOIST DEPTH FOR THE REQUIRED INSULATION. IN ADDITION, IF THE RAFTER SIZE IS INCREASED IT SHALL BE VERIFIED THAT THE RIDGE BE A MINIMUM OF ONE NOMINAL SIZE LARGER THAN THE RAFTERS BEING RECEIVED. (SEE CHART BELOW)

MAXIMUM INSULATION VALUE 1" AIR SPACE (FIBERGLASS)	2x6	2x8	2x10	2x12
	R-13, 3 1/2"	R-19, 6 1/4"	CONDENSED R-38, 8 1/4"	R-38, 10 1/4"

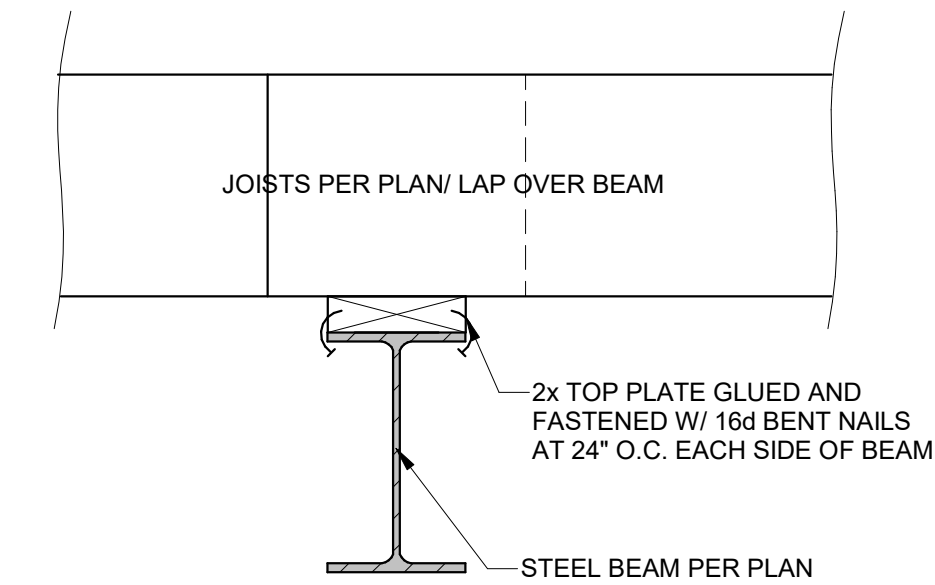
## TABLE N1103.6.1 (R403.6.1) WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY<sup>a</sup>

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
HRV OR ERV	ANY	1.2 CFM/WATT	ANY
RANGE HOODS	ANY	2.8 CFM/WATT	ANY
IN-LINE FAN	ANY	2.8 CFM/WATT	ANY
BATHROOM, UTILITY ROOM	10	1.4 CFM/WATT	< 90
BATHROOM, UTILITY ROOM	90	2.8 CFM/WATT	ANY

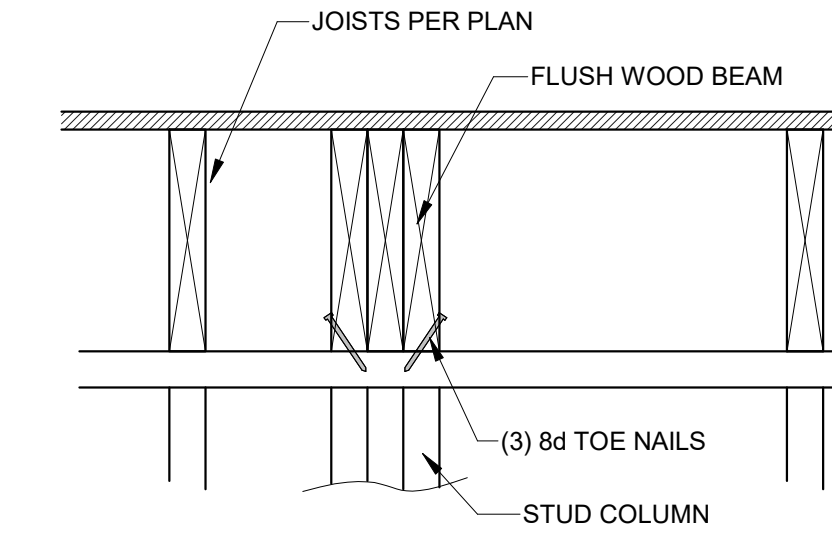
For SI: 1 cubic foot per minute = 28.3 L/min.  
<sup>a</sup> WHEN TESTED IN ACCORDANCE WITH THE STANDARD ONE



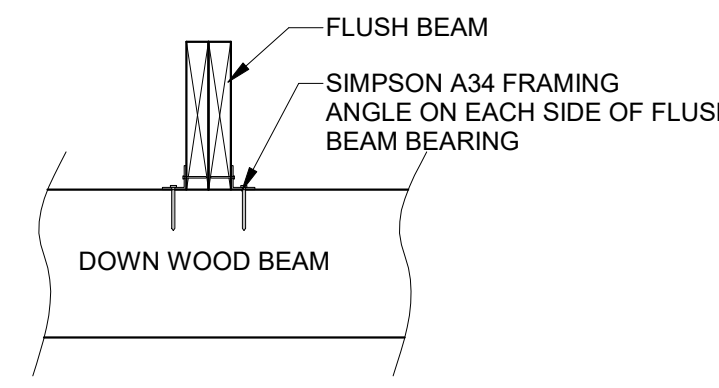
10 ZERO ENTRY SHOWER DETAIL  
1/4" = 1'-0"



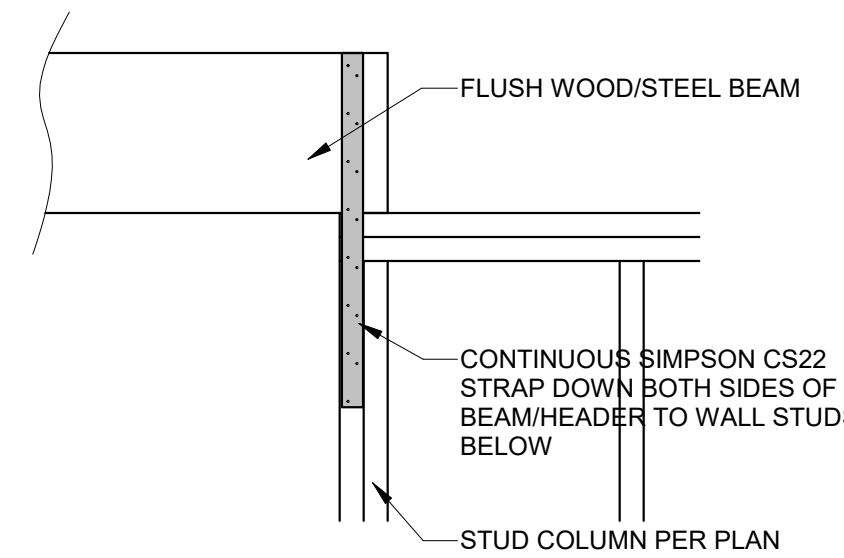
5 STEEL BEAM TO WOOD PLATE  
1 1/2" = 1'-0"



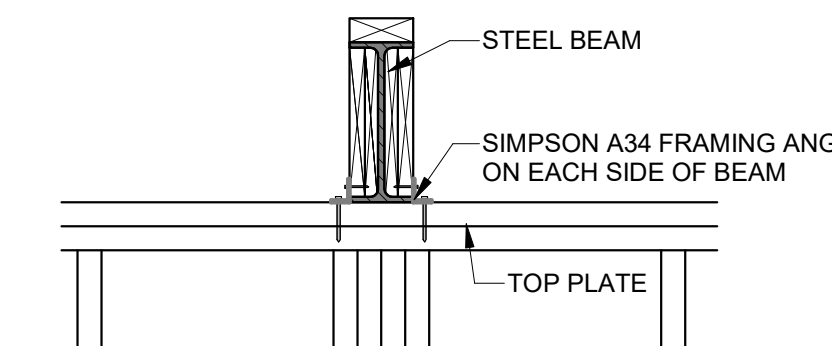
4 FLUSH WOOD BEAM CONNECTION  
1 1/2" = 1'-0"



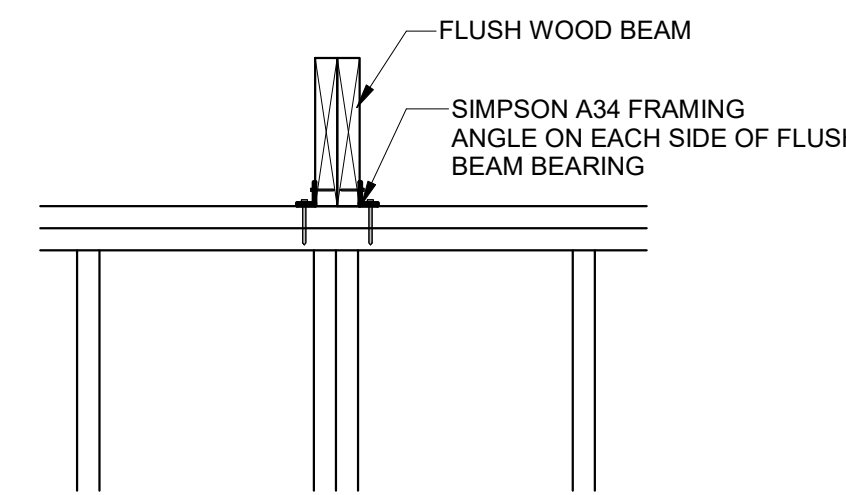
9 WOOD TO WOOD STACKED CONNECTION  
1" = 1'-0"



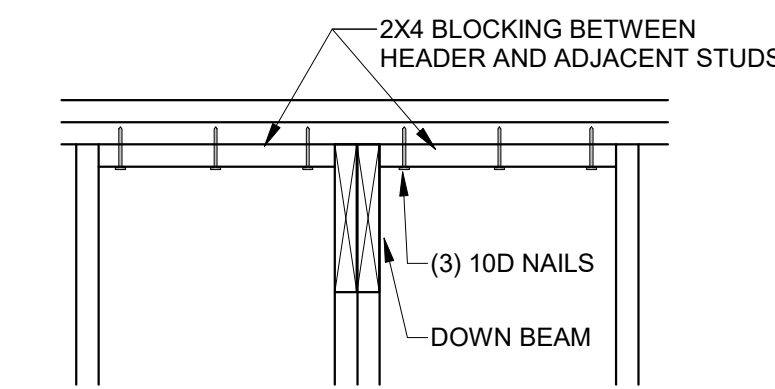
8 UPSET WOOD/STEEL PARALLEL TO WALL  
1" = 1'-0"



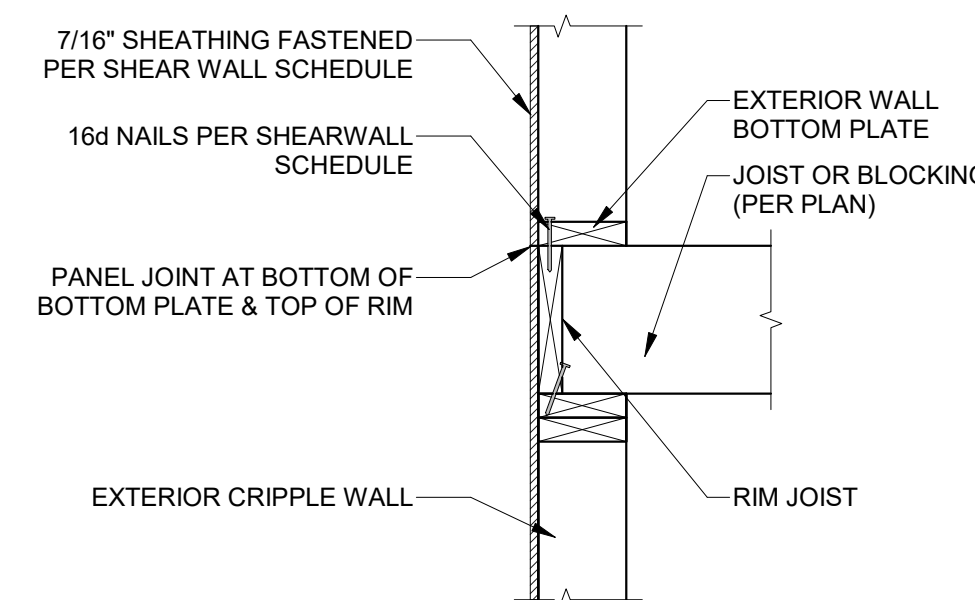
3 EXTERIOR WALL STEEL BEAM BEARING  
1" = 1'-0"



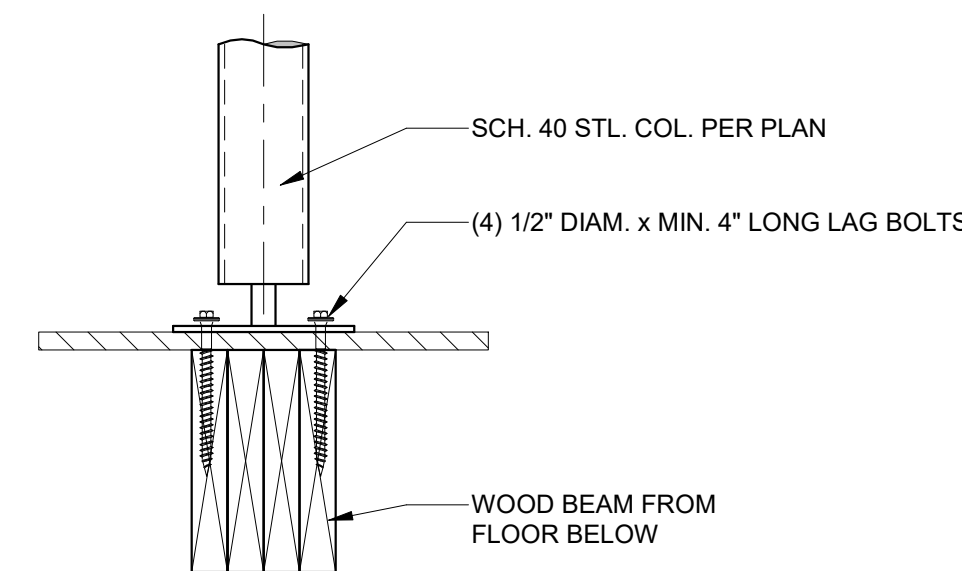
7 UPSET WOOD PERPENDICULAR TO WALL  
1" = 1'-0"



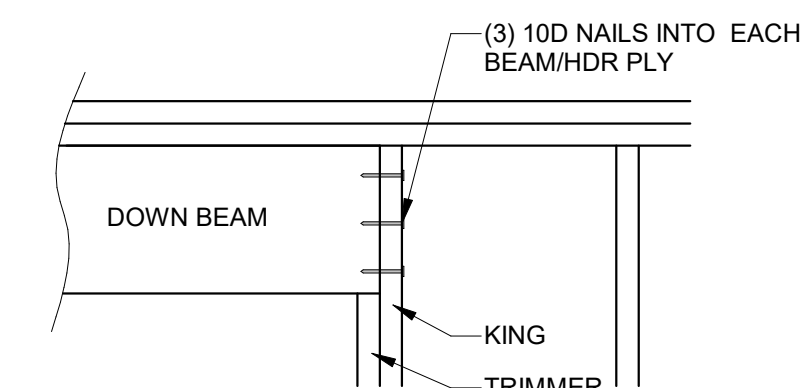
2 DOWN WOOD BEAM PERPENDICULAR  
1" = 1'-0"



11 SHEATHING JOINT LOCATION  
1" = 1'-0"

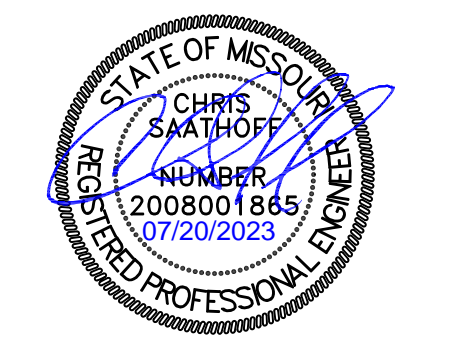


6 STEEL COLUMN TO WOOD FLOOR  
1 1/2" = 1'-0"



1 DOWN WOOD BEAM PARALLEL  
1" = 1'-0"

HD ENGINEERING & DESIGN, INC  
 11656 W. 75TH STREET  
 SHAWNEE, KS 66214  
 WWW.HDENGINEERS.COM  
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GENERAL DETAILS

**S-4.0**