

STRUCTURAL NOTES

(THESE NOTES ARE TYPICAL UNLESS NOTED OR DETAILED OTHERWISE ON DRAWINGS)

CODE

ALL MATERIALS, WORKMANSHIP, DESIGN, AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE INTERNATIONAL BUILDING CODE (IBC), 2018 EDITION. SPECIFICATIONS AND STANDARDS WHERE REFERENCED ON THE DRAWINGS ARE TO BE THE LATEST EDITION.

DESIGN LOADS

DEAD LOADS:
ROOF 10 PSF

LIVE LOADS:
ROOF (SNOW LOAD) 248 PSF (310 PSF * 0.8 SLOPE FACTOR)

EARTHQUAKE LOADS:

EQUIVALENT LATERAL FORCE PROCEDURE PER ASCE 7-16 SECTION 12.8.

SITE CLASS (ASSUMED)	D
SHORT PERIOD SPECTRAL RESPONSE ACCEL (S_s)	0.807
ONE SECOND SPECTRAL RESPONSE ACCEL (S)	0.292
SHORT PERIOD DESIGN SPECTRAL RESPONSE ACCEL (S_{SD})	0.646
ONE SECOND DESIGN SPECTRAL RESPONSE ACCEL (S_{SD})	0.389
RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR (I_e)	1.0
SEISMIC DESIGN CATEGORY	D
BASIC SEISMIC FORCE-RESISTING-SYSTEM	WOOD SHEAR WALLS
RESPONSE MODIFICATION FACTOR, (R)	6.5
REDUNDANCY FACTOR (p)	1.3
SEISMIC RESPONSE COEFFICIENT (C_e)	0.099

W = TOTAL SEISMIC DEAD LOAD AS DEFINED PER ASCE 7-16 SECTION 12.7.2.

BASE SHEAR (V), $V = C_e W = \frac{S_{SD}}{R} W$

WIND LOADS:

BASIC WIND SPEED (3 SECOND GUST)	110 MPH
EXPOSURE	B
K_{zt}	1.0

SEE PLANS FOR ADDITIONAL DESIGN LOADS.

STATEMENT OF SPECIAL INSPECTIONS

SPECIAL INSPECTIONS ARE NOT REQUIRED.

STRUCTURAL OBSERVATION OF THE STRUCTURAL SYSTEM BY THE ENGINEER IS NOT REQUIRED.

LUMBER

ALL GRADES SPECIFIED ARE MINIMUM GRADES REQUIRED. ALL LUMBER SHALL BE IN ACCORDANCE WITH WHPA GRADING RULES, KILN-DRIED TO MC 19 AND OF THE FOLLOWING MINIMUM STANDARDS:

SIZE CLASSIFICATION	SPECIES	GRADE	Fb (PSI)	Fc (PSI)
LIGHT FRAMING (STUDS)	DOUG-FIR	STUD	675	800
2x JOISTS AND PLANKS	DOUG-FIR	#2	900	-
PLATES AND BLOCKING	DOUG-FIR	#2	850	-
4x AND SMALLER BEAMS AND STRINGERS	DOUG-FIR	#2	850	-
ALL POSTS AND TIMBERS	DOUG-FIR	#1	1200	1000

REFER TO PLAN NOTES, SCHEDULES, AND DETAILS FOR MORE SPECIFIC LUMBER SIZE AND GRADE REQUIREMENTS.

UNLESS NOTED OTHERWISE IN THE PLANS, ALL WOOD AND WOOD-BASED MEMBERS EXPOSED TO WEATHER OR IN CONTACT WITH CONCRETE, MASONRY, OR WITHIN 8" OF SOIL SHALL BE PRESERVATIVE-TREATED BY VACUUM-PRESSURE IMPREGNATION IN ACCORDANCE WITH AWPA STANDARD U1.

NAILS, BOLTS, AND METAL CONNECTORS FOR WOOD

ALL NAILS SHALL CONFORM TO THE STANDARDS SET FORTH BY THE NATIONAL DESIGN STANDARDS (NDS) FOR WOOD CONSTRUCTION, LATEST EDITION. NAILING NOT SPECIFIED SHALL BE PER IBC TABLE 2304.10.1 NAILING SCHEDULE. ALL NAILS CALLED OUT ON PLANS SHALL BE COMMON NAILS UNLESS NOTED OTHERWISE AND SHALL MEET OR EXCEED THE FOLLOWING MINIMUM GUIDELINES:

NAIL	SHANK Ø	MIN LENGTH
8d COMMON	0.131Ø	2 1/2" SHANK
10d COMMON	0.148Ø	3" SHANK
12d COMMON	0.148Ø	3 1/4" SHANK
16d COMMON	0.162Ø	3 1/2" SHANK

10d BOX NAILS MAY BE SUBSTITUTED FOR 8d COMMON NAILS WITH NO CHANGE IN NAIL SPACING. FRAMING MEMBERS MAY BE NAILED WITH 16d SINKERS (0.148"Ø x 3 1/4"), BUT ONLY 16d COMMON NAILS SHALL BE USED WHERE 16d NAILS ARE INDICATED IN THIS DRAWING SET. ENGINEER MAY APPROVE OTHER NAILS IF NAIL LABELS ARE SUBMITTED TO ENGINEER PRIOR TO START OF CONSTRUCTION.

ALL BOLTS IN WOOD MEMBERS SHALL CONFORM TO ASTM A307. PROVIDE WASHERS UNDER THE HEADS AND NUTS OF ALL BOLTS AND LAG SCREWS BEARING ON WOOD. LEAD HOLES FOR LAG BOLTS SHALL BE BORED FOR THE SHANK AND THREADED PORTIONS PER NDS 12.1.4.2.

CONNECTORS CALLED OUT BY LETTERS AND NUMBERS SHALL BE "STRONG-TIE" BY SIMPSON COMPANY, CATALOG TO BE THE LATEST EDITION, OR ENGINEER APPROVED EQUAL. CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND WITH THE NUMBER AND SIZE OF FASTENERS AS SPECIFIED BY THE MANUFACTURER. WHERE CONNECTOR STRAPS CONNECT TWO MEMBERS, PLACE ONE-HALF OF THE NAILS, SCREWS, OR BOLTS IN EACH MEMBER.

INSTALL SOLID BLOCKING AT ALL BEARING POINTS. ALL SHIMS SHALL BE SEASONED, DRIED, AND THE SAME GRADE (MINIMUM) AS MEMBERS CONNECTED.

CONCRETE

ALL CONCRETE SHALL BE MIXED, PROPORTIONED, CONVEYED, AND PLACED IN ACCORDANCE WITH CHAPTER 26 OF ACI 318 AND THE AMERICAN CONCRETE INSTITUTE'S SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 301).

ALL CONCRETE SHALL BE STONE-AGGREGATE CONCRETE HAVING A UNIT WEIGHT OF APPROXIMATELY 150 POUNDS PER CUBIC FOOT.

CONCRETE STRENGTHS AT 28 DAYS (F_c) AND MIX CRITERIA SHALL BE AS FOLLOWS:

TYPE OF CONSTRUCTION	f _c *	MAXIMUM WATER/CEMENT RATIO	MIN CEMENT CONTENT PER CUBIC YARD	MAXIMUM SHRINKAGE STRAIN
SLABS ON GRADE	3000 PSI	0.55	5 1/2 SACK	N/A

THE MINIMUM AMOUNT OF CEMENT LISTED ABOVE MAY BE CHANGED IF A CONCRETE PERFORMANCE MIX IS SUBMITTED TO THE ENGINEER AND THE BUILDING DEPARTMENT FOR APPROVAL TWO WEEKS PRIOR TO PLACING ANY CONCRETE. THE PERFORMANCE MIX SHALL INCLUDE THE AMOUNTS OF CEMENT, FINE AND COARSE AGGREGATE, WATER, AND ADMIXTURES AS WELL AS THE WATER-CEMENT RATIO, SLUMP, CONCRETE YIELD, AND SUBSTANTIATING STRENGTH DATA IN ACCORDANCE WITH CHAPTER 26 OF ACI 318.

ALL CONCRETE EXPOSED TO WEATHER OR TO FREEZING TEMPERATURES SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ACI 318 TABLE 19.3.3.1 FOR MODERATE EXPOSURE CLASS F1.

*PROVIDE F_c SPECIFIED IN TABLE FOR DURABILITY REQUIREMENTS. 2500 PSI CONCRETE MEETS STRENGTH REQUIREMENTS, THEREFORE SPECIAL INSPECTION IS NOT REQUIRED.

REINFORCING STEEL

WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. PROVIDE WELDED WIRE FABRIC IN SHEETS NOT ROLLS. LAP WELDED WIRE FABRIC 12" AT SIDES AND ENDS.

GALVANIZATION

UNLESS NOTED OTHERWISE, STEEL CONNECTORS IN CONTACT WITH TREATED WOOD SHALL BE GALVANIZED ACCORDING TO THE FOLLOWING TABLE:

GALVANIZATION	UNTREATED WOOD	CCA-C	SBX	ACQ-C ACQ-D	CBA-A CA-B	OTHER BORATE	ACZA	OTHER PT WOOD
G90	X	X	X					
G185	X	X	X	X	X	X	X	
HDG	X	X	X	X	X	X	X	
STT300	X	X	X	X	X	X	X	X

G90 = 0.90 OZ. OF ZINC PER SQUARE FOOT OF AREA

G185 = 1.85 OZ. OF ZINC PER SQUARE FOOT OF AREA

HDG = HOT DIP GALVANIZED

SST300 = TYPE 316L STAINLESS STEEL

RATED SHEATHING

RATED SHEATHING SHALL BE GRADE C-D INT-APA WITH EXTERIOR GLUE OR OSB SHEATHING WITH EXTERIOR GLUE IN CONFORMANCE WITH IBC STANDARD 2303.1.5.

TYPICAL FRAMING NOTES

1. BEARING WALL FRAMING

2x STUDS @ 16" OC FOR ALL SHEAR AND/OR BEARING WALLS UNO.

REFER TO FRAMING PLAN NOTES FOR TYPICAL DOOR & WINDOW HEADERS NOT CALLED OUT ON THE PLANS. HEADERS SHALL BE SUPPORTED BY A MINIMUM OF (1) CRIPPLE AND (1) FULL HEIGHT STUD UNO.

COLUMNS BELOW FLUSH MULTIPLE JOIST BEAMS SHALL BE EQUAL IN WIDTH TO THE BEAM. ALL COLUMNS NOT CALLED OUT OTHERWISE SHALL BE TWO STUDS.

2. WALL BASE PLATE ON CONCRETE

WALL PLATES BEARING ON CONCRETE SHALL BE PRESSURE-TREATED. FOR ALL EXTERIOR AND INTERIOR WALLS, BOLT PLATES OR SILLS TO CONCRETE STEM WALLS OR THICKENED SLAB FOOTINGS WITH 3/4 INCH DIAMETER ANCHOR BOLTS WITH 7 INCH MINIMUM EMBEDMENT. PLACE AT 5'-0" OC MAXIMUM FOR SHEAR WALLS. USE MINIMUM OF TWO ANCHOR BOLTS PER SILL AND PLACE ONE WITHIN 12 INCHES OF END OF PLATES. TYPICAL UNLESS NOTED OR DETAILED OTHERWISE. REFER TO SHEAR WALL SCHEDULE. AT ALL SILL PLATE ANCHOR BOLTS, CONTRACTOR SHALL INSTALL 1/4" x 3" x 3" FLAT PLATE WASHERS.

3. ROOF FRAMING

PROVIDE 1 1/2" FULL DEPTH BLOCKING FOR JOISTS AND RAFTERS AT ALL SUPPORTS AND AT 8'-0" OC MAXIMUM UNO. INTERMEDIATE 8'-0" OC BLOCKING NOT REQ'D IF GWB CEILING IS INSTALLED DIRECTLY TO UNDERSIDE OF FRAMING.

4. DIAPHRAGM NAILING

ALL SHEAR WALLS AND ROOF DIAPHRAGM NAILINGS SHALL BE AS CALLED OUT ON SCHEDULES OR ON THE PLANS. EXTERIOR WALLS NOT INDICATED AS SHEAR WALLS SHALL BE SHEATHED AND NAILED TO SUPPORTING FRAMING WITH 8d NAILS AT 6" OC AT ALL PANEL EDGES AND 12" OC AT ALL INTERMEDIATE SUPPORTS.

THE USE OF NAIL GUNS WILL BE APPROVED IF NAILING INTO THE DIAPHRAGMS CAN BE INSTALLED FLUSH WITH FACE OF SHEATHING. NAIL PENETRATIONS GREATER THAN 1/16" ARE NOT ACCEPTABLE.

5. ALLOWABLE STUD AND PLATE PENETRATIONS

CUTTING AND/OR NOTCHING OF WOOD STUDS OR PLATES SHALL NOT EXCEED 25% OF THE STUD/PLATE WIDTH IN EXTERIOR AND BEARING WALLS AND SHALL NOT EXCEED 40% OF THE STUD/PLATE WIDTH IN ANY NON-BEARING PARTITIONS. BORED HOLE DIAMETER IS LIMITED TO 40% OF STUD/PLATE WIDTH IN ANY STUD AND MAY BE 60% IN NONBEARING PARTITIONS OR IF STUD IS DOUBLED. MAINTAIN 5/8" MINIMUM EDGE DISTANCE FROM HOLE EDGE.

6. GYPSUM WALLBOARD NAILING

ALL GYPSUM WALLBOARD SHALL BE NAILED TO ALL STUDS AND TOP AND BOTTOM PLATES WITH 6d COOLER NAILS OR NO. 13 GAUGE x 1 5/8" @ 7" OC (5d COOLER NAILS FOR 1/2 INCH GYPSUM SHEATHING). TYPICAL UNLESS NOTED OTHERWISE. INSTALLATION OF GWB SHALL BE SUCH THAT JOINTS ARE STAGGERED ON EACH SIDE OF A SINGLE WALL.

EXISTING BUILDING

CONTRACTOR SHALL VERIFY ALL DIMENSIONS, MEMBER SIZES AND CONDITIONS OF THE EXISTING BUILDING DEPICTED IN THE DRAWINGS, AND NOTIFY THE STRUCTURAL ENGINEER OF ANY DISCREPANCIES FOR POSSIBLE REDESIGN.

CONTRACTOR RESPONSIBLE FOR COMPLETELY SEALING ALL AREAS WHERE EXISTING ROOF MATERIAL IS PENETRATED OR REMOVED. PROVIDE WATER PROOFING AS REQUIRED BY THE ARCH.

GENERAL

STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS FOR BIDDING AND CONSTRUCTION. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS FOR COMPATIBILITY BEFORE PROCEEDING. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING.

CONTRACTOR TO SEE ARCHITECTURAL DRAWINGS FOR SIZE AND LOCATION OF PIPE, VENT, DUCT AND OTHER OPENINGS AND DETAILS NOT SHOWN ON THESE DRAWINGS.

CONTRACTOR SHALL BE RESPONSIBLE FOR ERECTION STABILITY AND TEMPORARY SHORING AS NECESSARY UNTIL PERMANENT SUPPORT AND STIFFENING ARE INSTALLED.

CONTRACTOR-INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ON SHOP DRAWINGS ONLY WILL NOT SATISFY THIS REQUIREMENT.

DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF A SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND THE STRUCTURAL ENGINEER.

LEGEND

DEFINITION	SYMBOL	DEFINITION	SYMBOL
DIRECTION OF FRAMING		NATIVE SOIL	
EXTENT OF FRAMING		GRANULAR FILL	
COLUMNS		STRUCTURAL STEEL	
COLUMN BEARING ON BEAM		RATED SHEATHING	
BEAM CONTINUOUS OVER SUPPORT		SHEAR WALL (SEE SCHEDULE)	SWX
CONCRETE WALL		COLUMN MARK (SEE SCHEDULE)	
BEARING STUD WALL		FOOTING MARK (SEE SCHEDULE)	
NON-BEARING STUD WALL		HOLDOWN MARK (SEE SCHEDULE)	
BEARING STUD SHEAR WALL		HANGER MARK (SEE SCHEDULE)	
NON-BEARING STUD SHEAR WALL		FLAG NOTE (SEE PLAN NOTES)	
CMU WALL		STEEL MOMENT FRAME CONN.	

ABBREVIATIONS

(A)	ABOVE	HORIZ	HORIZONTAL
AB	ANCHOR BOLT	KP	KING POST
ALT	ALTERNATE	KSI	KIPS PER SQUARE INCH
ARCH	ARCHITECT	MECH	MECHANICAL
(B)	BELOW	MF	MOMENT FRAME
BLKG	BLOCKING	NS	NEAR SIDE
BM	BEAM	OC	ON CENTER
BOT	BOTTOM	OPP	OPPOSITE
BTWN	BETWEEN	PL	PLATE
CJP	COMPLETE JOINT PENETRATION	PLCS	PLACES
CLR	CLEAR	PSI	POUNDS PER SQUARE INCH
CMU	CONCRETE MASONRY UNIT	PSF	POUNDS PER SQUARE FOOT
COL	COLUMN	P/T	POST TENSIONED
CONC	CONCRETE	PT	PRESSURE TREATED
CONN	CONNECTION	REINF	REINFORCING
CONT	CONTINUOUS	REQ'D	REQUIRED
DBL	DOUBLE	SCHED	SCHEDULE
DET	DETAIL	SIM	SIMILAR
DIM	DIMENSION	SOG	SLAB ON GRADE
EA	EACH	STD	STANDARD
ELEV	ELEVATION	SW	SHEAR WALL
EXIST	EXISTING	TOC	TOP OF CONCRETE
EXP	EXPANSION	TOS	TOP OF STEEL
FLR	FLOOR	TOW	TOP OF WALL
FDN	FOUNDATION	TYP	TYPICAL
FTG	FOOTING	UNO	UNLESS NOTED OTHERWISE
FS	FAR SIDE	VFY	VERIFY
FH	FULL HEIGHT	VIF	VERIFY IN FIELD
GLB	GLUE-LAMINATED BEAM	VERT	VERTICAL



06/02/22

MARK	DATE	DESCRIPTION
	06/02/22	PERMIT SUBMITTAL

DESIGN: BEL
DRAWN: JOS
CHECK: DTR
JOB NO: 22165.10
DATE: 06/02/22

MEANY LODGE ZOO ADDITION
FOREST ROAD 420
EASTON, WA 98155

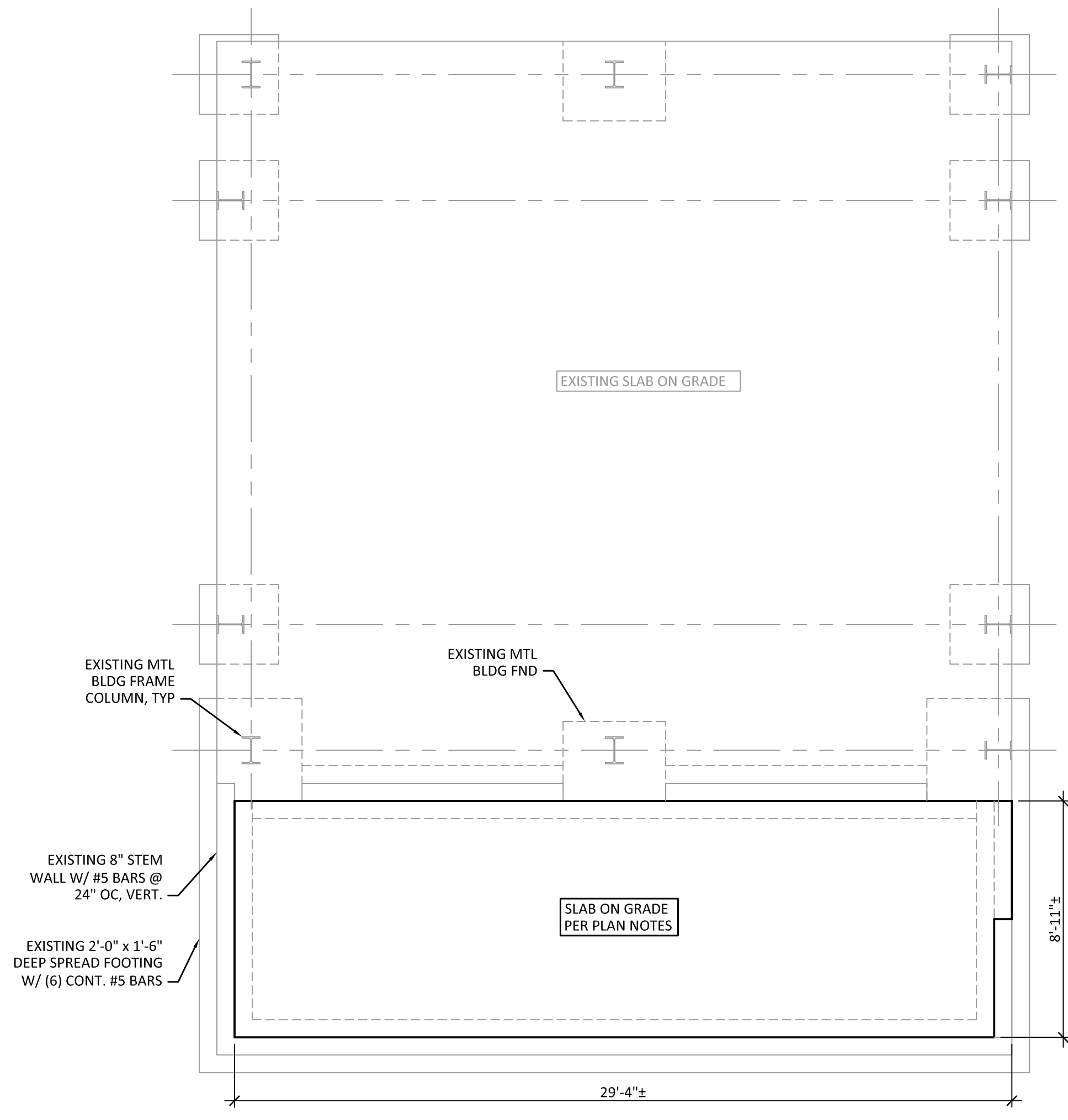
STRUCTURAL NOTES

SHEET:

S1.1

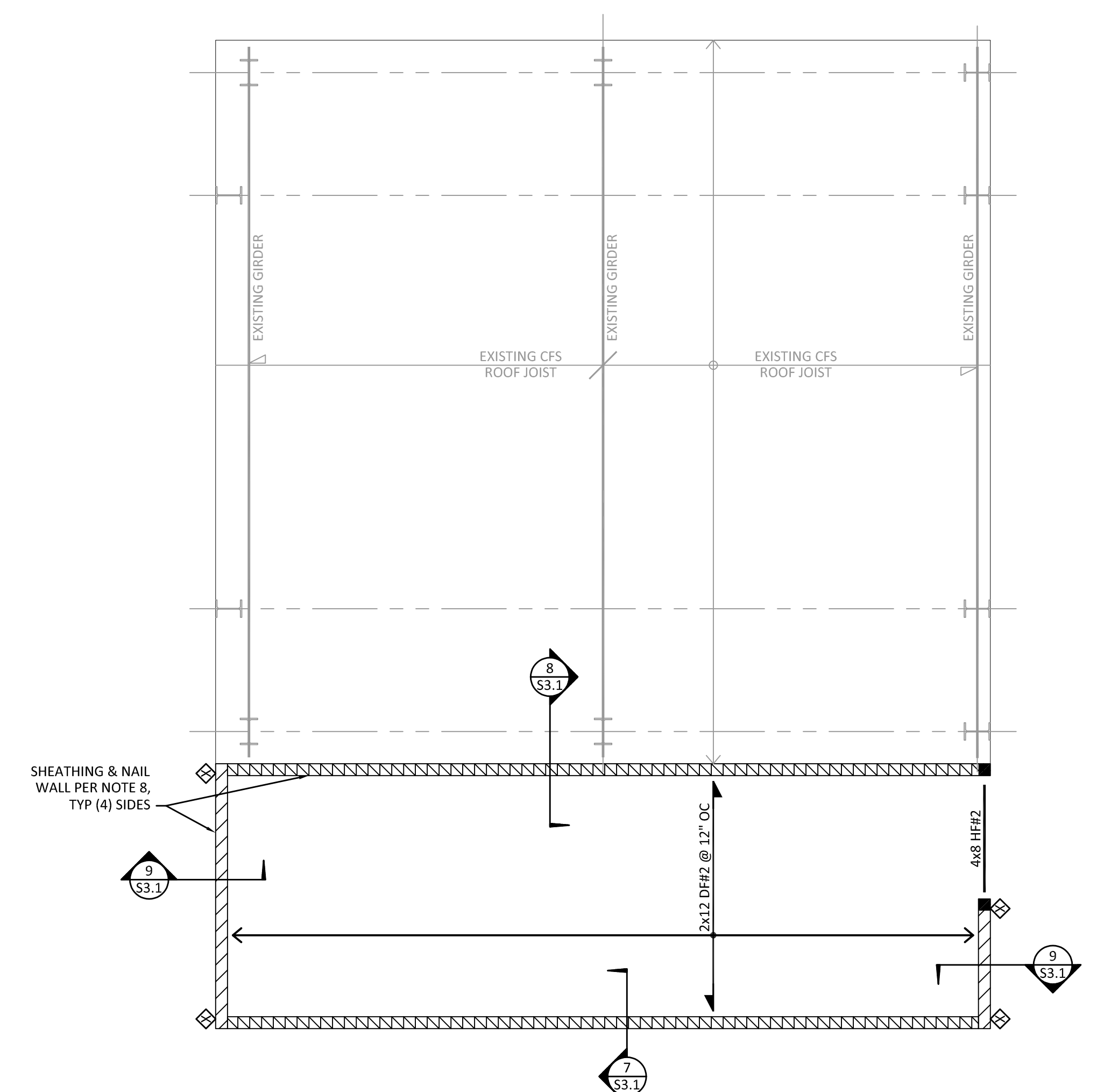


06/02/22



1 FOUNDATION PLAN
 SCALE: 1/4" = 1'-0"
 2'-0" 0 2'-0" 4'-0"

- FOUNDATION PLAN NOTES:**
- FOUNDATIONS SHALL BE ON FIRM NATIVE SOIL OR COMPACTED STRUCTURAL FILL.
 - WHERE SLAB ON GRADE IS INDICATED, SLAB SHALL BE 4" THICK W/ 6x6-W1.4 x W1.4 WELDED WIRE FABRIC REINF CENTERED IN SLAB DEPTH. SLAB SHALL BE POURED OVER A 10 MIL VAPOR BARRIER OVER 4" OF 5/8" CRUSHED ROCK.
 - REFER TO 1/S3.1 AND STRUCTURAL NOTES FOR SILL PLATE ANCHORAGE. CONTRACTOR TO FIELD VERIFY ANCHOR BOLTS ARE 3/4" Ø x 12" J-BOLTS AT 4'-0" OC MAX. NOTIFY STRUCTURAL ENGINEER IF ANCHOR BOLT SPACING IS GREATER.



2 ROOF FRAMING PLAN
 SCALE: 1/4" = 1'-0"
 2'-0" 0 2'-0" 4'-0"

- TYPICAL ROOF FRAMING PLAN NOTES:**
- WALLS SHOWN ON ROOF FRAMING PLAN ARE WALLS BELOW ROOF FRAMING.
 - ROOF SHEATHING SHALL BE 3/4" P1 40/20 WITH 10d COMMON NAILS SPACED AT 6" OC AT ALL DIAPHRAGM BOUNDARIES, PANEL EDGES, SHEAR WALLS, COLLECTOR TRUSSES, AND BLOCKING OR TRUSS BLOCKING PANELS INDICATED ON PLANS. NAILING AT INTERMEDIATE FRAMING SHALL BE 10d COMMON NAILS @ 12" OC. REFER TO DETAIL 2/S3.1 FOR SHEATHING LAYOUT AND NAILING.
 - STUD WALL FRAMING SHALL BE 2x DF STUDS @ 16" OC FOR ALL STUD WALLS SHOWN ON THE PLAN.
 - REFER TO SHEET S3.1 FOR TYPICAL ROOF FRAMING DETAILS.
 - ATTACH ALL JOISTS TO WALLS BELOW WITH SIMPSON H2.5A HURRICANE TIES.
 - UNO, ALL POST SHOWN ON PLAN SHALL BE (2) CRIPPLE STUD AND (1) KING STUD.
 - INDICATES SIMPSON HOLDDOWN HDU5 W/ (2) 2x STUD CHORDS PER DETAIL 10/S3.1
 - SHEATH ALL WALLS WITH 15/32" APA-RATED PLYWOOD. PROVIDE 8d NAILS @ 6" OC AT ALL PANEL EDGES. PROVIDE 4x4 DF BLOCKING AT HORIZONTAL ADJOINING PANEL EDGES. PROVIDE 8d NAILS @ 12" OC IN FIELD.

MARK	DATE	DESCRIPTION
	06/02/22	PERMIT SUBMITTAL

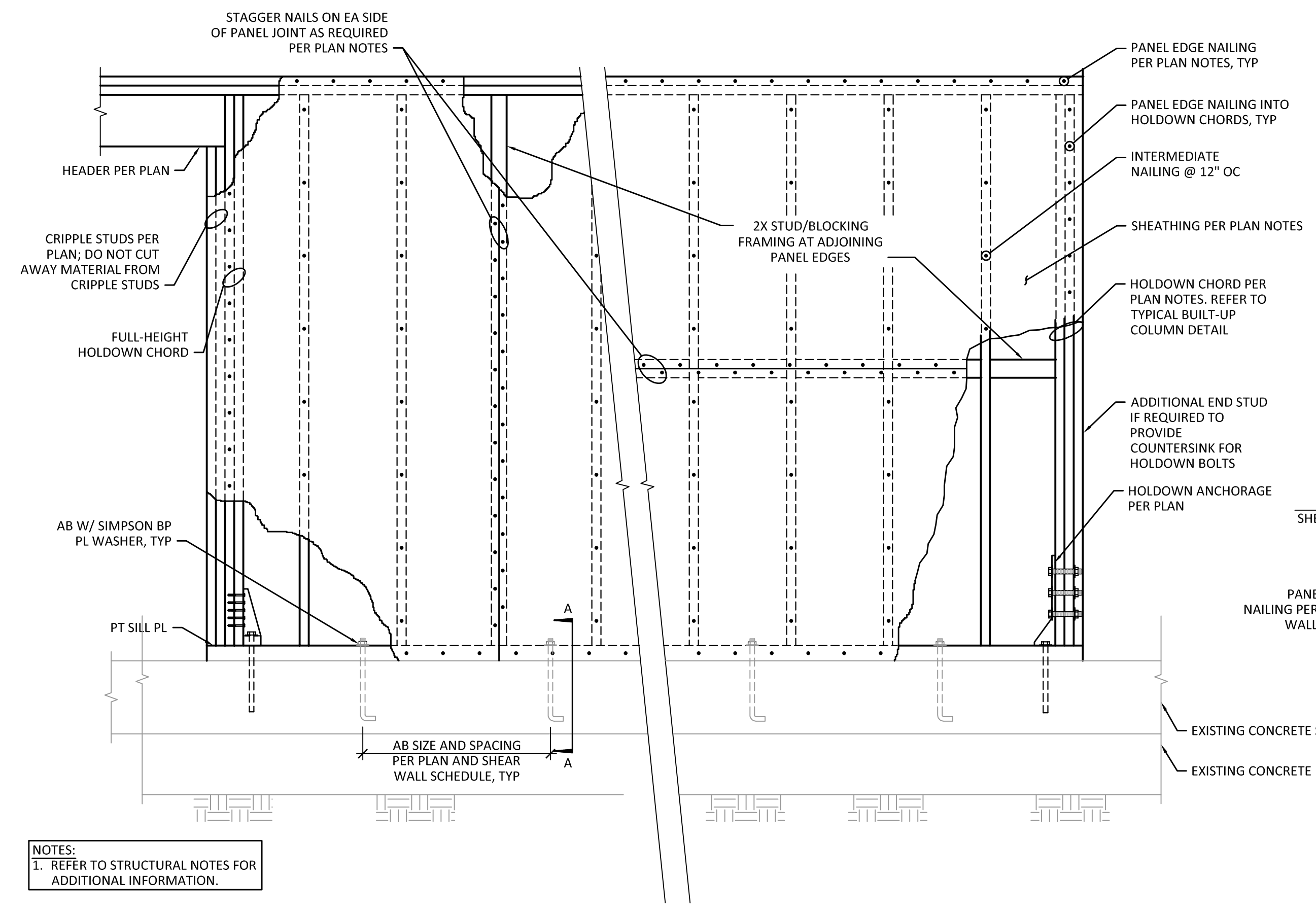
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DRAWN:	JOS
CHECK:	DTR
JOB NO:	22165.10
DATE:	06/02/22

MEANY LODGE ZOO ADDITION
 FOREST ROAD 420
 EASTON, WA 98155
 FOUNDATION AND
 ROOF FRAMING PLAN

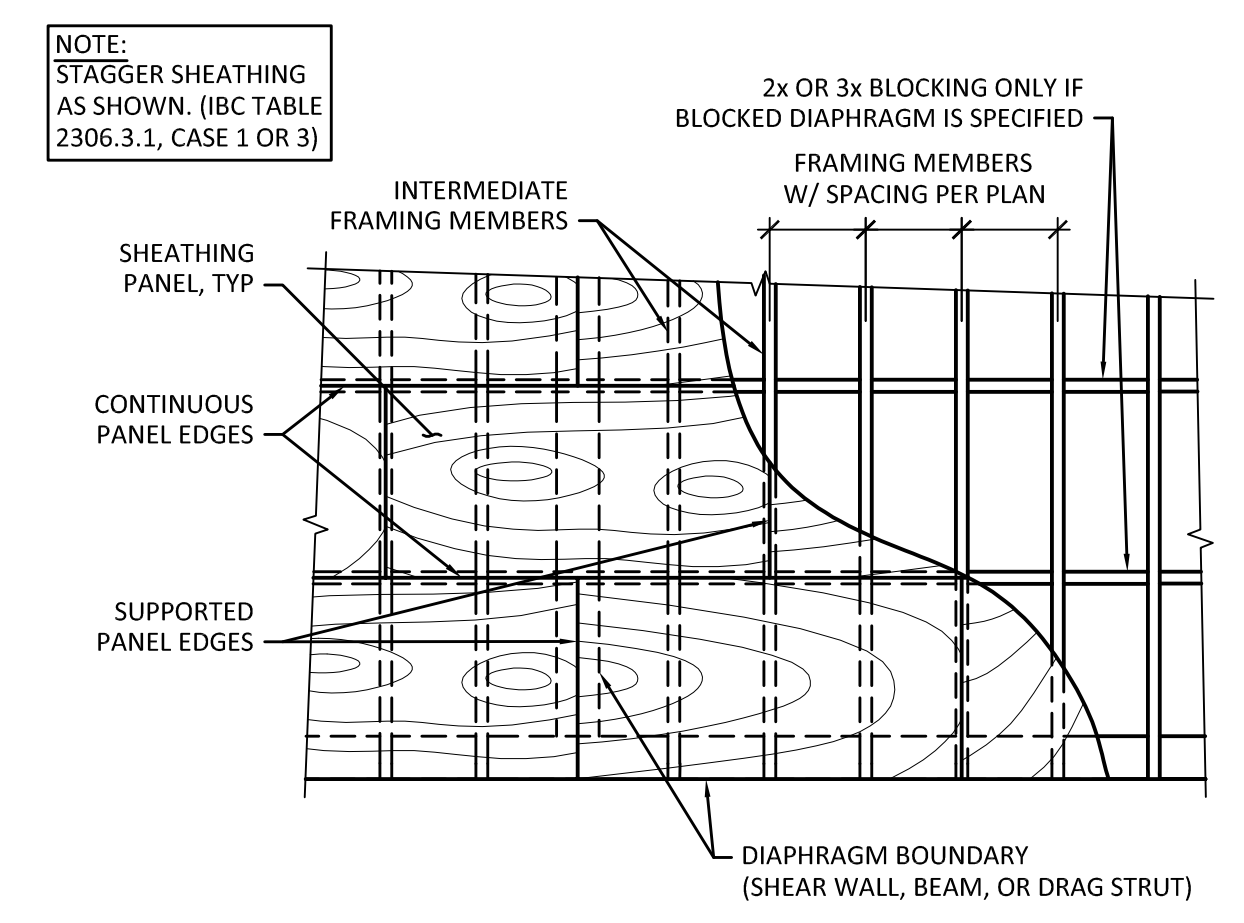
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S2.1



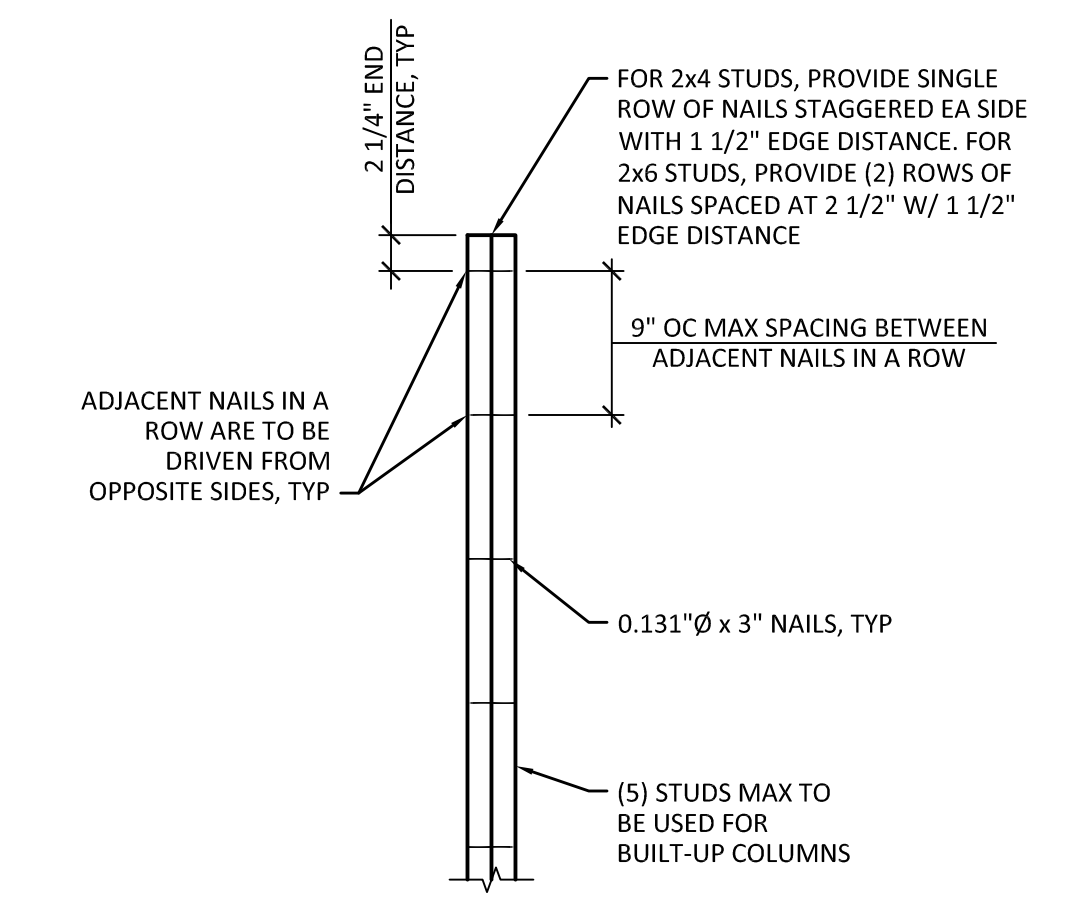
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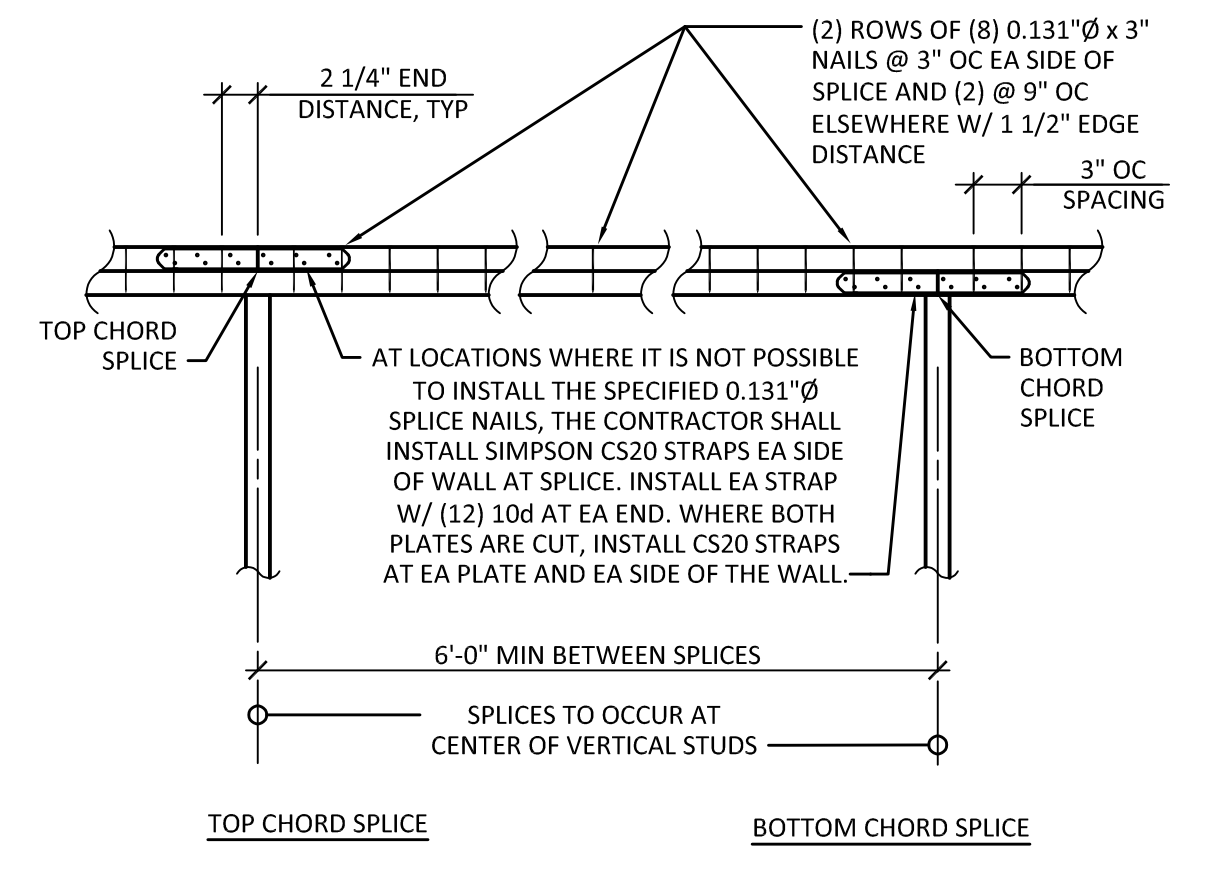
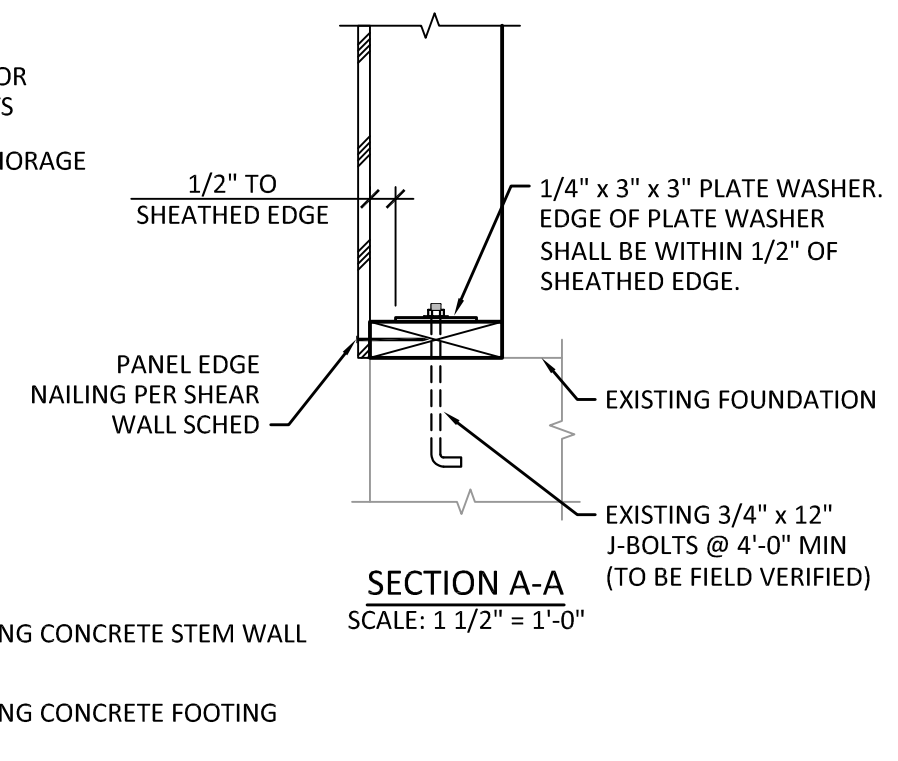
1 TYPICAL SHEAR WALL DETAIL
 SCALE: 3/4" = 1'-0"



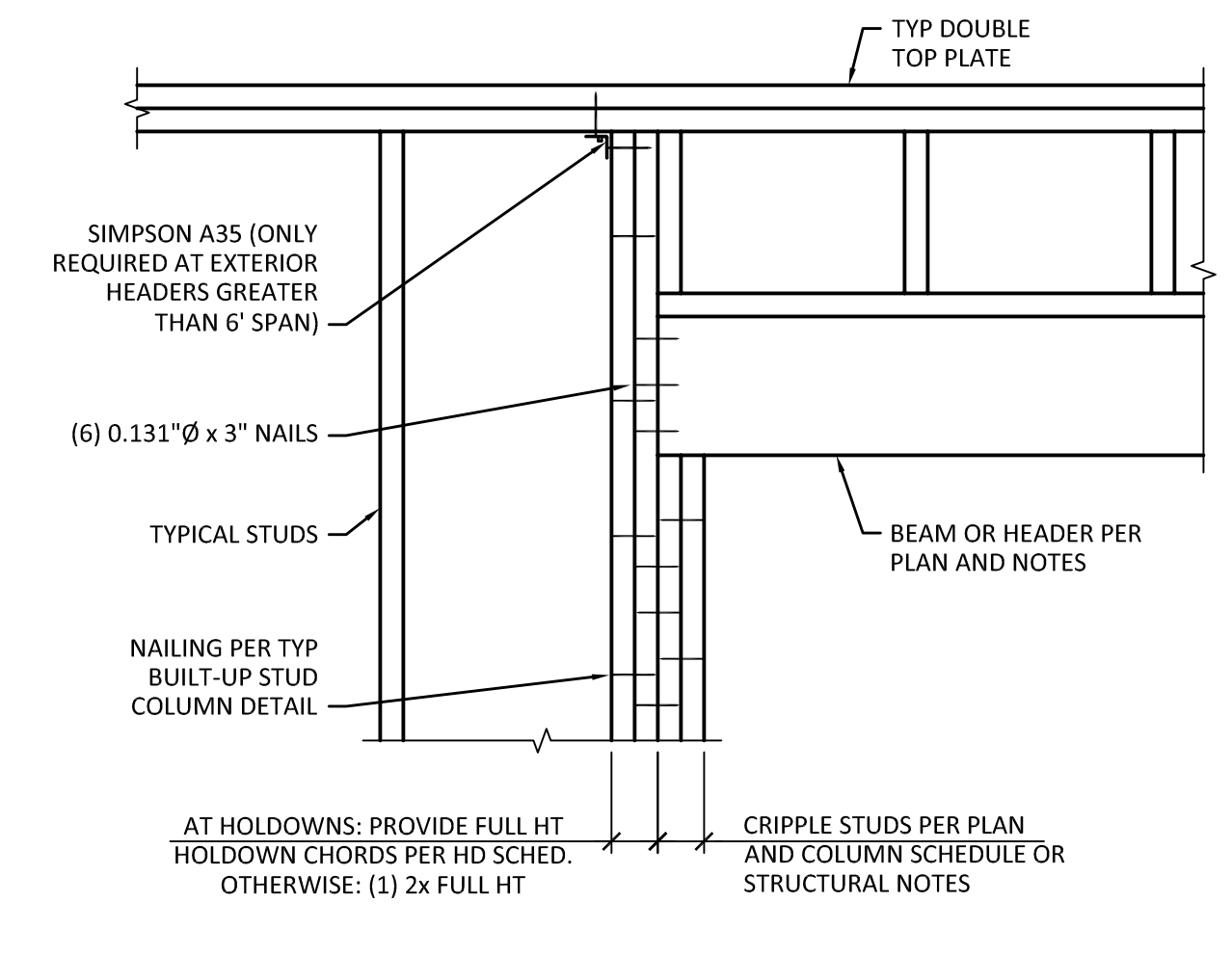
2 TYPICAL ROOF SHEATHING DETAIL
 SCALE: NTS



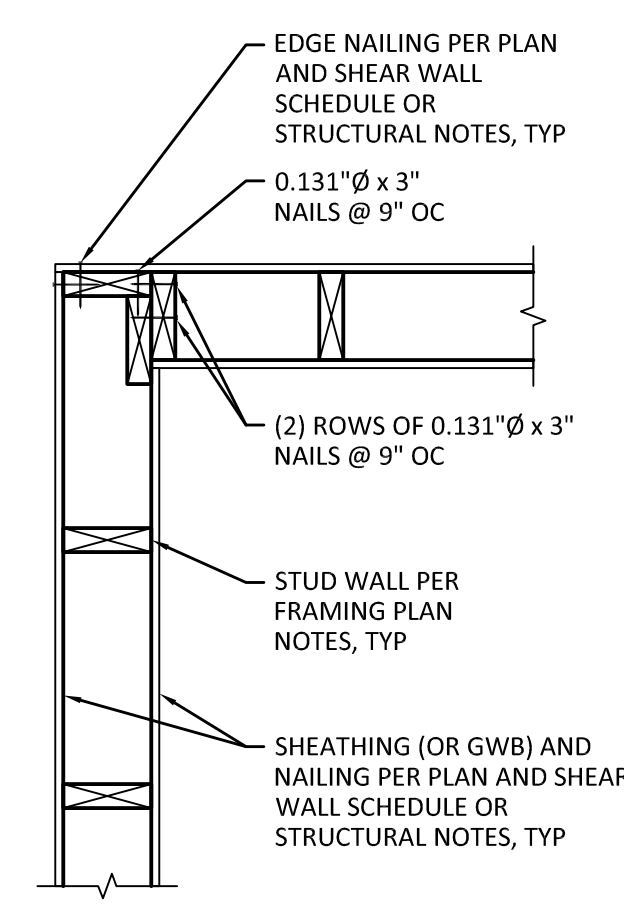
3 TYPICAL BUILT-UP STUD COLUMN DETAIL
 SCALE: 1" = 1'-0"



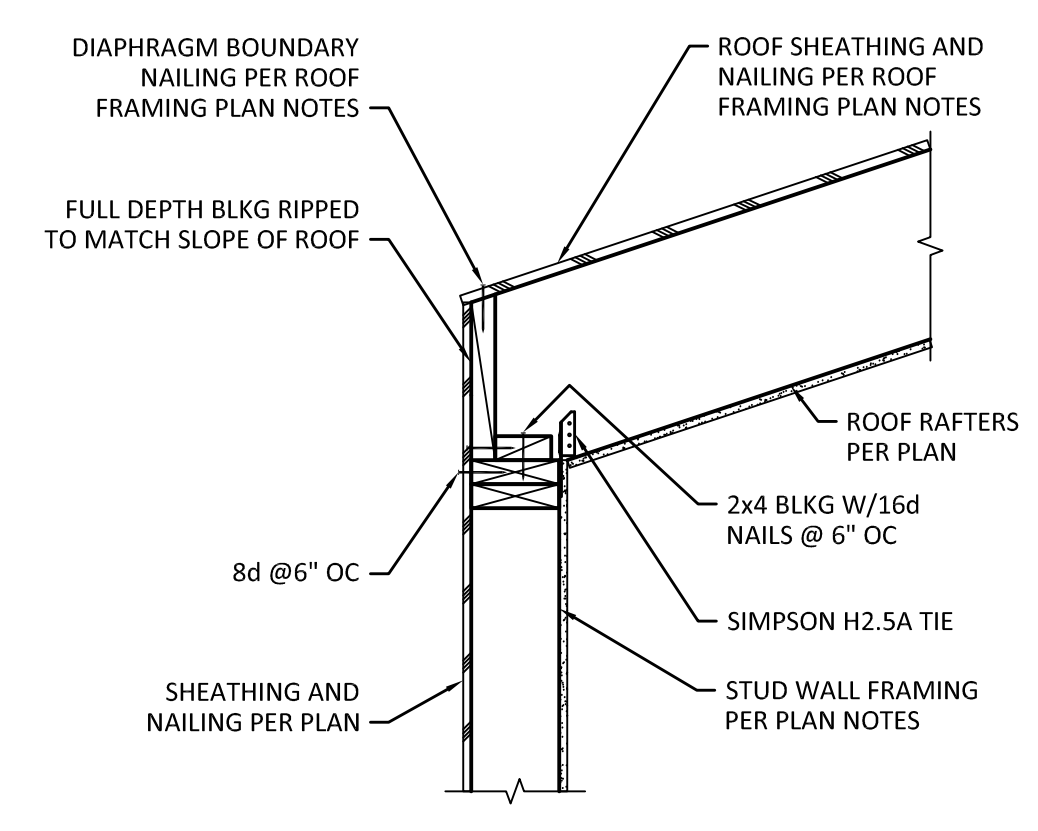
4 TYPICAL TOP PLATE SPLICE DETAIL
 SCALE: 1" = 1'-0"



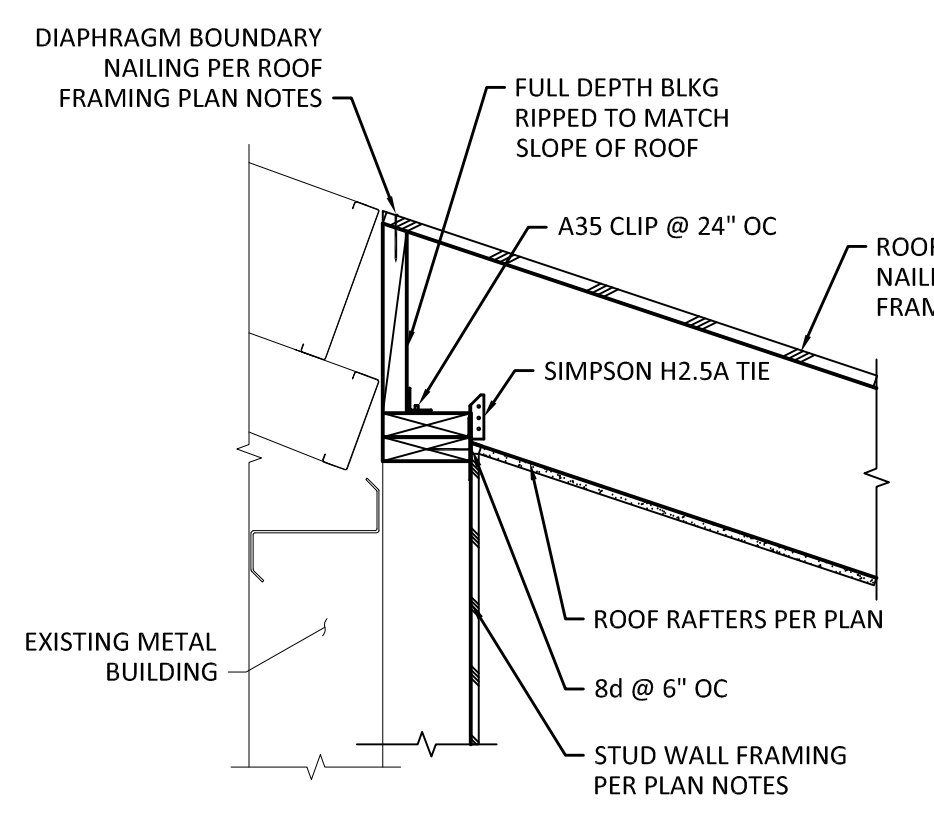
5 TYPICAL HEADER DETAIL
 SCALE: 1" = 1'-0"



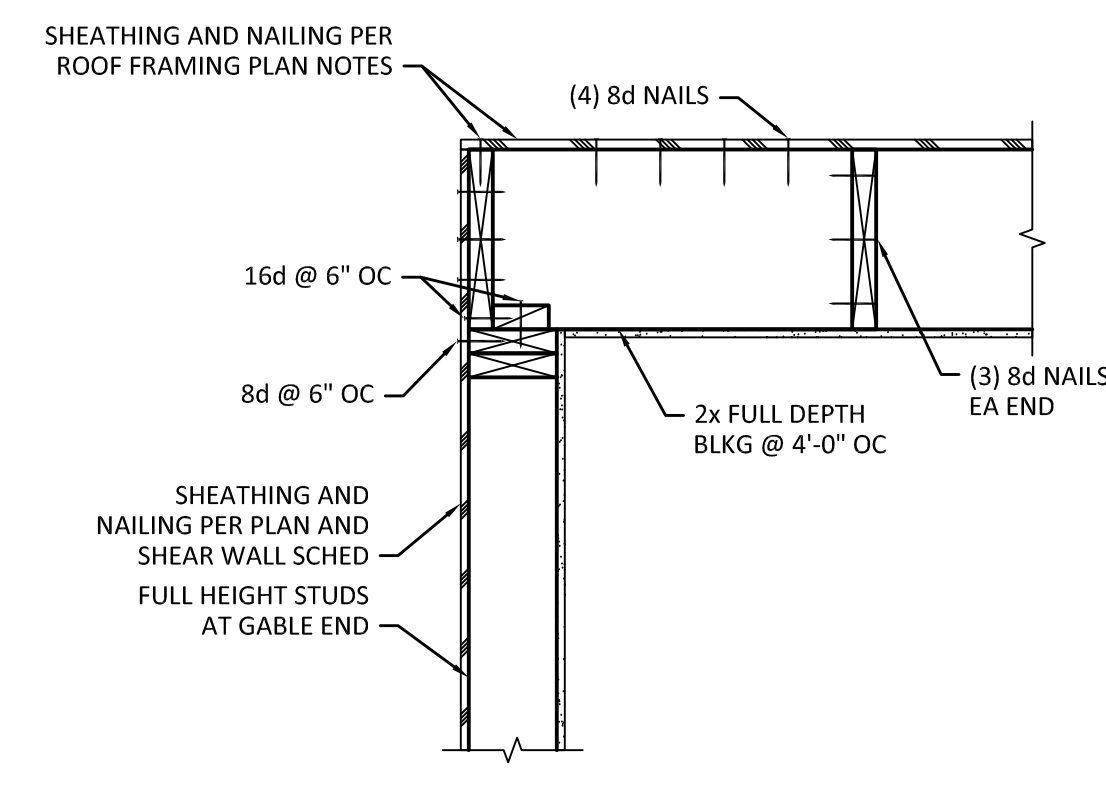
6 TYPICAL WALL INTERSECTION DETAIL
 SCALE: 1" = 1'-0"



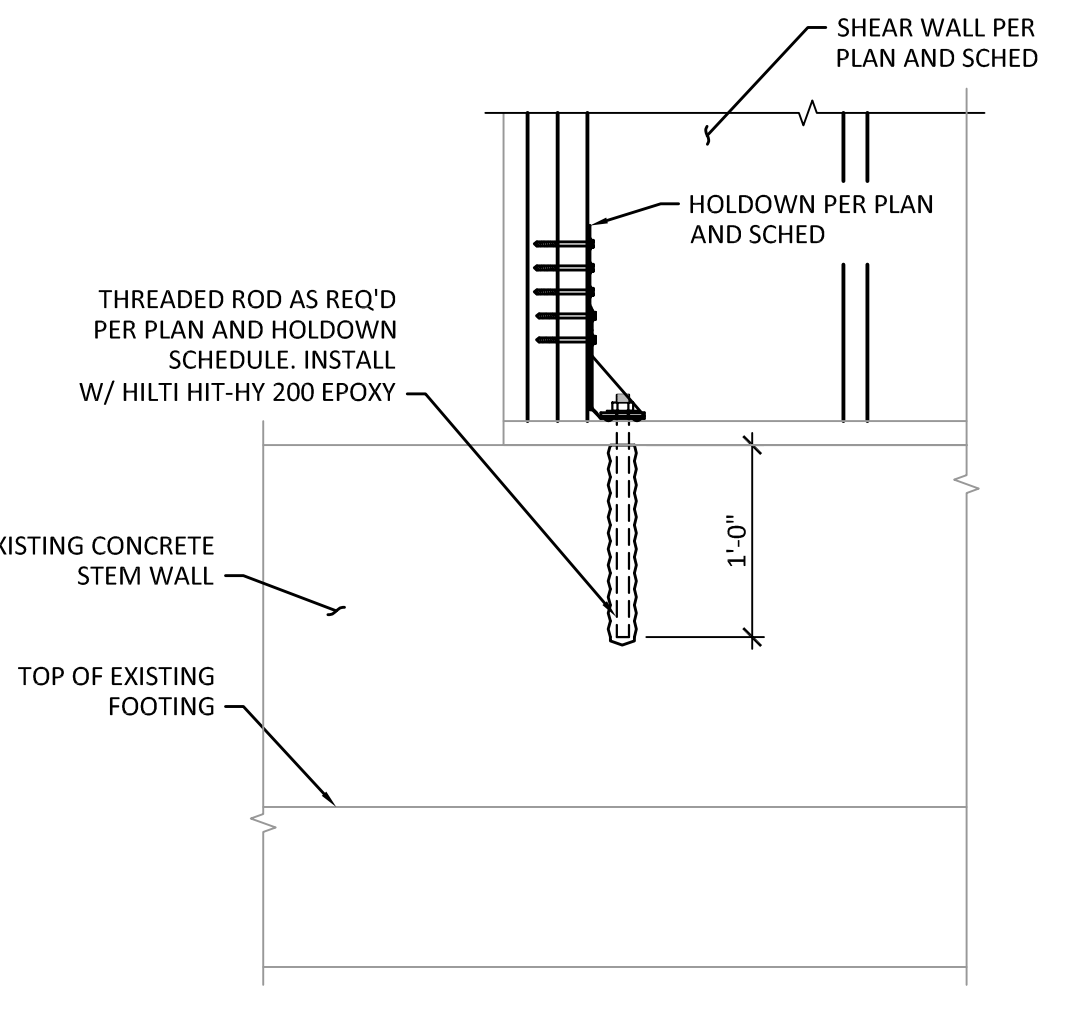
7 TYPICAL RAFTER SUPPORT DETAIL
 SCALE: 1" = 1'-0"



8 TYPICAL RAFTER SUPPORT DETAIL
 SCALE: 1" = 1'-0"



9 TYPICAL RAFTER GABLE END
 SCALE: 1" = 1'-0"



10 HOLDOWN DETAIL (EXIST FOOTING)
 SCALE: 1" = 1'-0"

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WOOD FRAMING DETAILS