

MARSHALL HOME DESIGN:  
**BUILDERS PLAN DEFINITION**

THE TERM 'BUILDERS PLAN' REFERS TO A CERTAIN LEVEL OF DEVELOPMENT OF THE DRAWINGS, AS THE NAME IMPLIES. THESE PLANS REQUIRE THAT THE CONTRACTOR POSSESSES COMPETENCE IN RESIDENTIAL CONSTRUCTION. THE CONTRACTOR WARRANTS TO MARSHALL HOME DESIGN, LLC AND ANY ITS CONSULTANTS, THAT THEY POSSESS THE PARTICULAR COMPETENCE AND SKILL IN CONSTRUCTION NECESSARY TO BUILD THE PROJECT WITHOUT FULL ENGINEERING AND ARCHITECTURAL DESIGN SERVICES, AND FOR THAT REASON THE CONTRACTOR OR HOME OWNER HAS RESTRICTED THE SCOPE OF PROFESSIONAL SERVICES. THE CONSTRUCTION DOCUMENTS PROVIDED BY THE LIMITED SERVICES SHALL BE TERMED 'BUILDERS PLAN' IN RECOGNITION OF THE CONTRACTOR'S RESPONSIBILITY. ALTHOUGH MARSHALL HOME DESIGN, LLC, AND ITS CONSULTANTS HAVE PERFORMED THEIR SERVICES WITH DUE CARE AND DILIGENCE, WE CANNOT GUARANTEE PERFECTION. ANY AMBIGUITY OR DISCREPANCY DISCOVERED BY THE USER OF THESE PLANS SHALL BE REPORTED IMMEDIATELY TO MARSHALL HOME DESIGN, LLC. CONSTRUCTION MAY REQUIRE THAT THE CONTRACTOR ADAPT THE 'BUILDERS PLAN' TO THE FIELD CONDITIONS ENCOUNTERED AND MAKE LOGICAL ADJUSTMENTS IN FIT, FORM, DIMENSION AND QUALITY. CHANGES MADE FROM THE PLANS WITHOUT THE CONSENT OF MARSHALL HOME DESIGN, LLC, AND ITS CONSULTANTS ARE UNAUTHORIZED. IT IS ALSO UNDERSTOOD THAT THE CONTRACTOR WILL BE RESPONSIBLE FOR MEETING ALL APPLICABLE BUILDING CODES. IN THE EVENT ADDITIONAL DETAIL OR GUIDANCE IS REQUIRED BY THE CONTRACTOR OR HOMEOWNER FOR THE CONSTRUCTION OF ANY ASPECT OF THE PROJECT MARSHALL HOME DESIGN, LLC, OR A QUALIFIED ARCHITECT OR ENGINEER SHALL IMMEDIATELY BE RETAINED. FAILURE TO NOTIFY MARSHALL HOME DESIGN, LLC, OF THESE NEEDS, OR OF CHANGES TO THE PLANS, SHALL RELIEVE MARSHALL HOME DESIGN, LLC, AND ITS CONSULTANTS OF ALL RESPONSIBILITIES OF THE CONSEQUENCES. STRUCTURAL DESIGN, SOILS TESTING, HVAC, MEP DESIGNS, SITE PLANNING, GRADING, FOUNDATION DRAINAGE DESIGN, BRACED WALL PANEL DESIGN AND ENERGY INSULATION DESIGN BY OTHERS.

**ROOF FRAMING NOTES**

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

ROOF SYSTEM IS DESIGNED TO MEET REQUIREMENTS  
OF IRC 802

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

**CODE MINIMUM**

RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	AT 24" OC	11'-7"
#2-2x6	AT 16" OC	14'-2"
#2-2x8	AT 24" OC	14'-8"
#2-2x8	AT 16" OC	17'-11"
#2-2x10	AT 24" OC	17'-10"
#2-2x10	AT 16" OC	21'-11"

NOTE: CODE MINIMUM ALLOWS FOR A RAFTER DEFLECTION OF L/180 TOTAL LOAD

**HIGHER PERFORMANCE**

RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	AT 24" OC	8'-6"
#2-2x6	AT 16" OC	9'-9"
#2-2x8	AT 24" OC	11'-3"
#2-2x8	AT 16" OC	12'-9"
#2-2x10	AT 24" OC	14'-3"
#2-2x10	AT 16" OC	16'-3"

APEX ENGINEERS, INC. RECOMMENDED  
DEFLECTION = L/360 LIVE LOAD, L/240 TOTAL LOAD

\*RIDGE BOARDS ARE (UNLESS OTHERWISE NOTED)

#2-2x10 UP TO 9:12 PITCH

#2-2x12 OVER 9:12 PITCH

\*ALL HIP AND VALLEYS ARE (UNLESS OTHERWISE NOTED)

#2-2x10 UP TO 9:12 PITCH

#2-2x12 OVER 9:12 PITCH

\*PURLINS ARE 2x6 MIN

- PURLIN STRUTS ARE AT 4'-0" OC

- PURLIN STRUTS SHALL BE INSTALLED AT NOT LESS  
THAN A 45 DEGREE ANGLE WITH THE HORIZONTAL

- ALL PURLIN STRUTS SHALL HAVE A MAX 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 AND (1)2x6	12'-0"
(1)2x6 AND (1)2x8	20'-0"
(2)2x6 AND (1)2x8	30'-0"
CONSULT ARCH ENGR	>30'-0"

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

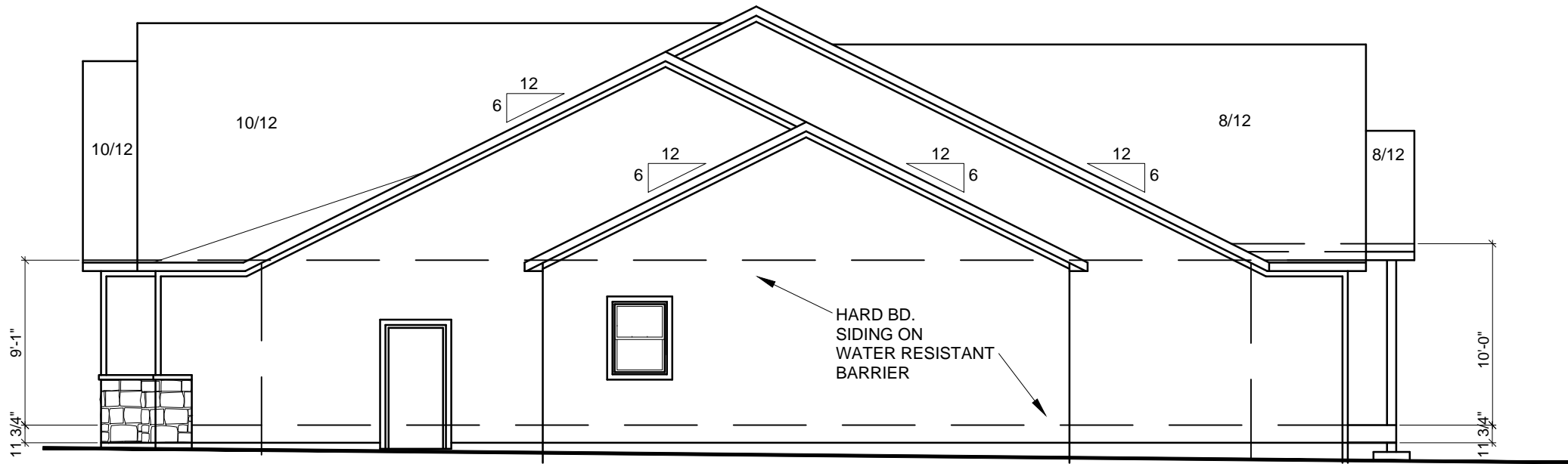
\*RIDGE BRACERS ARE SAME AS PURLIN BRACES-SPACING,  
SIZE, CONFIGURATION, AND INSTALLATION (SEE PURLIN  
BRACE NOTES ABOVE)

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

— = ROOF BRACE/STRUT (PER CHART)  
-SLASH IS TOP END OF BRACE  
-CIRCLE IS BOTTOM END OF BRACE

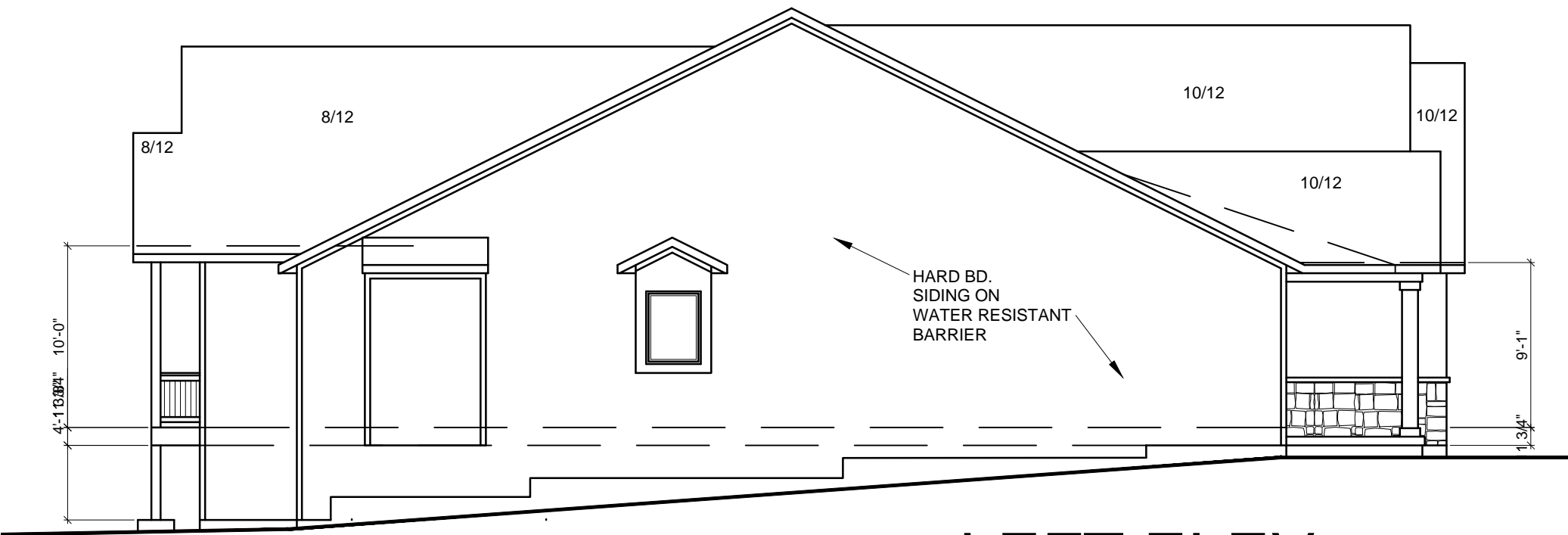
— = PURLIN STRUTS AT 48" OC (PER CHART) U.N.O.  
-SLASH IS TOP END OF BRACE  
-ARROW IS BEARING LOCATION

— DENOTES BEARING WALL  
— DENOTES PURLIN  
— DENOTES BEARING STRUCTURE



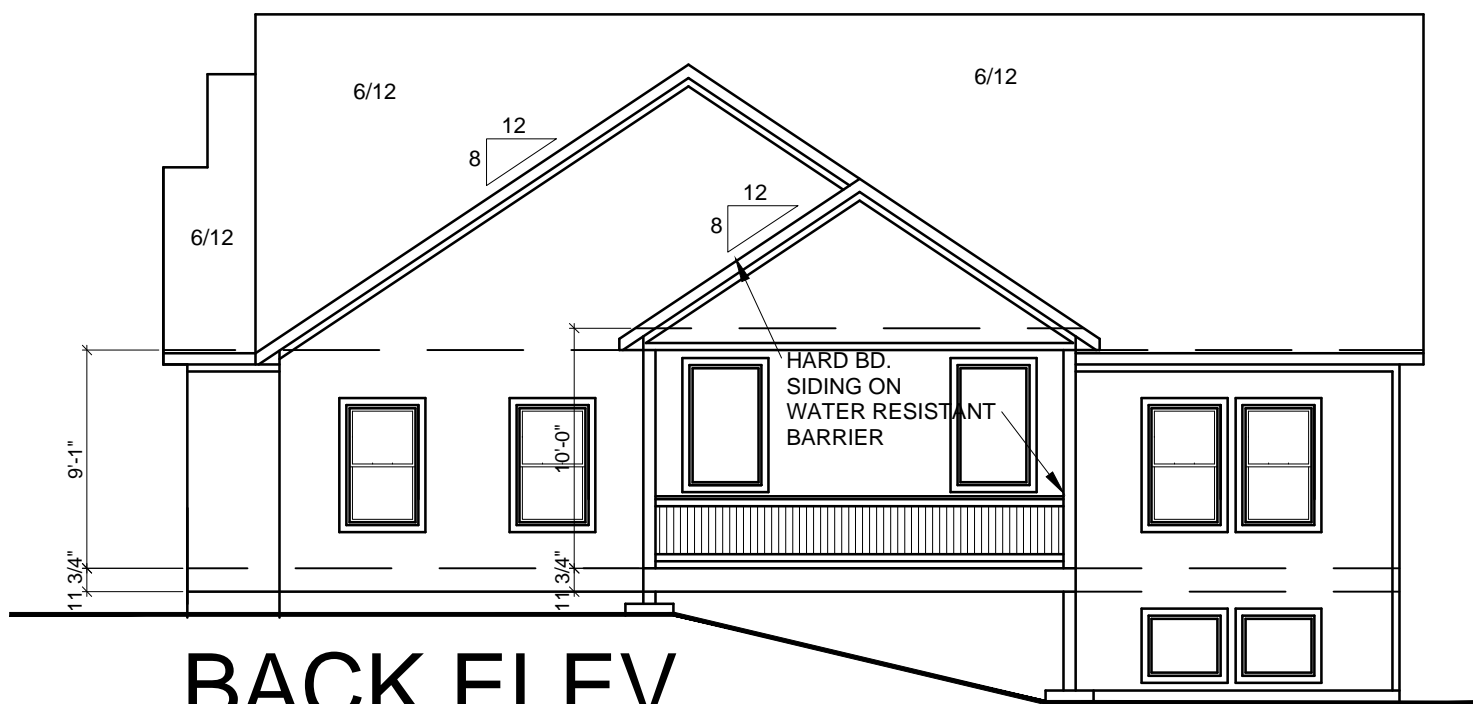
**RIGHT ELEV.**

SCALE 1/8"=1'-0"



**LEFT ELEV.**

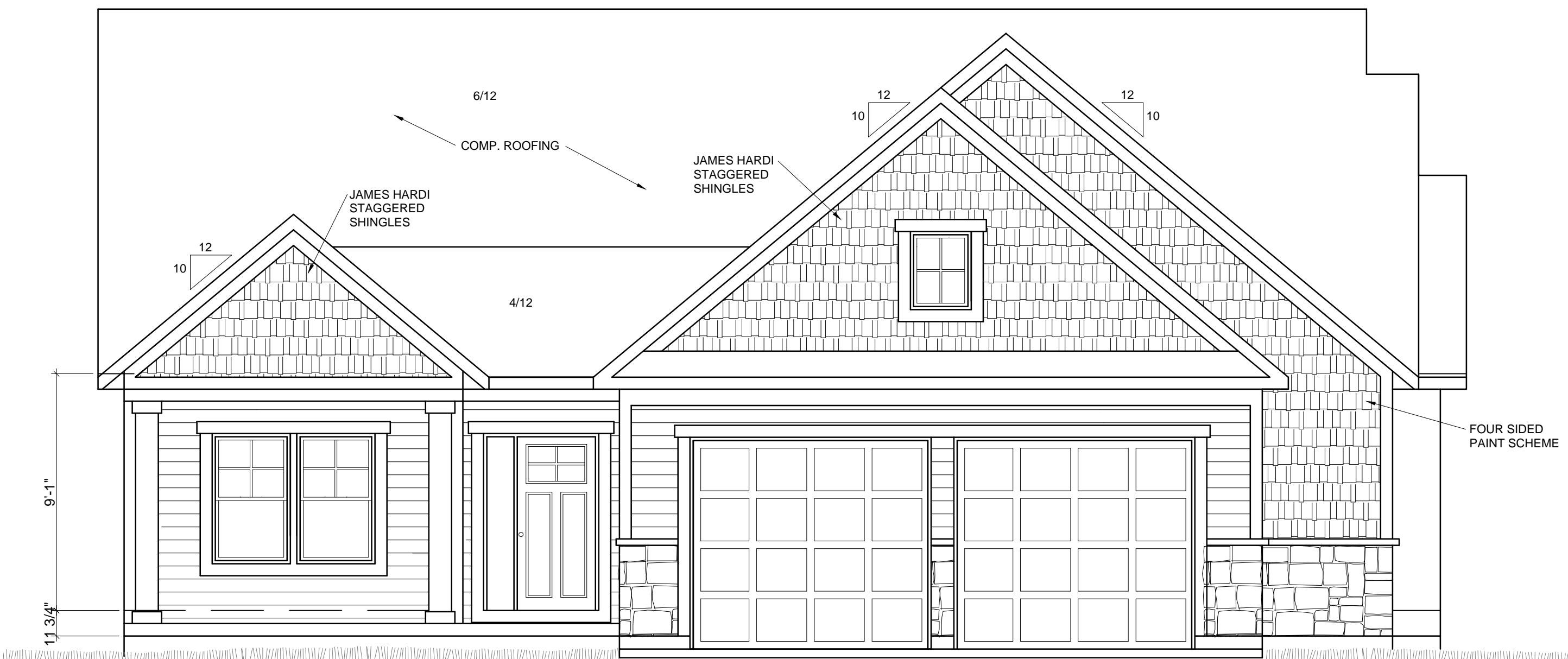
SCALE 1/8"=1'-0"



**BACK ELEV.**

SCALE 1/8"=1'-0"

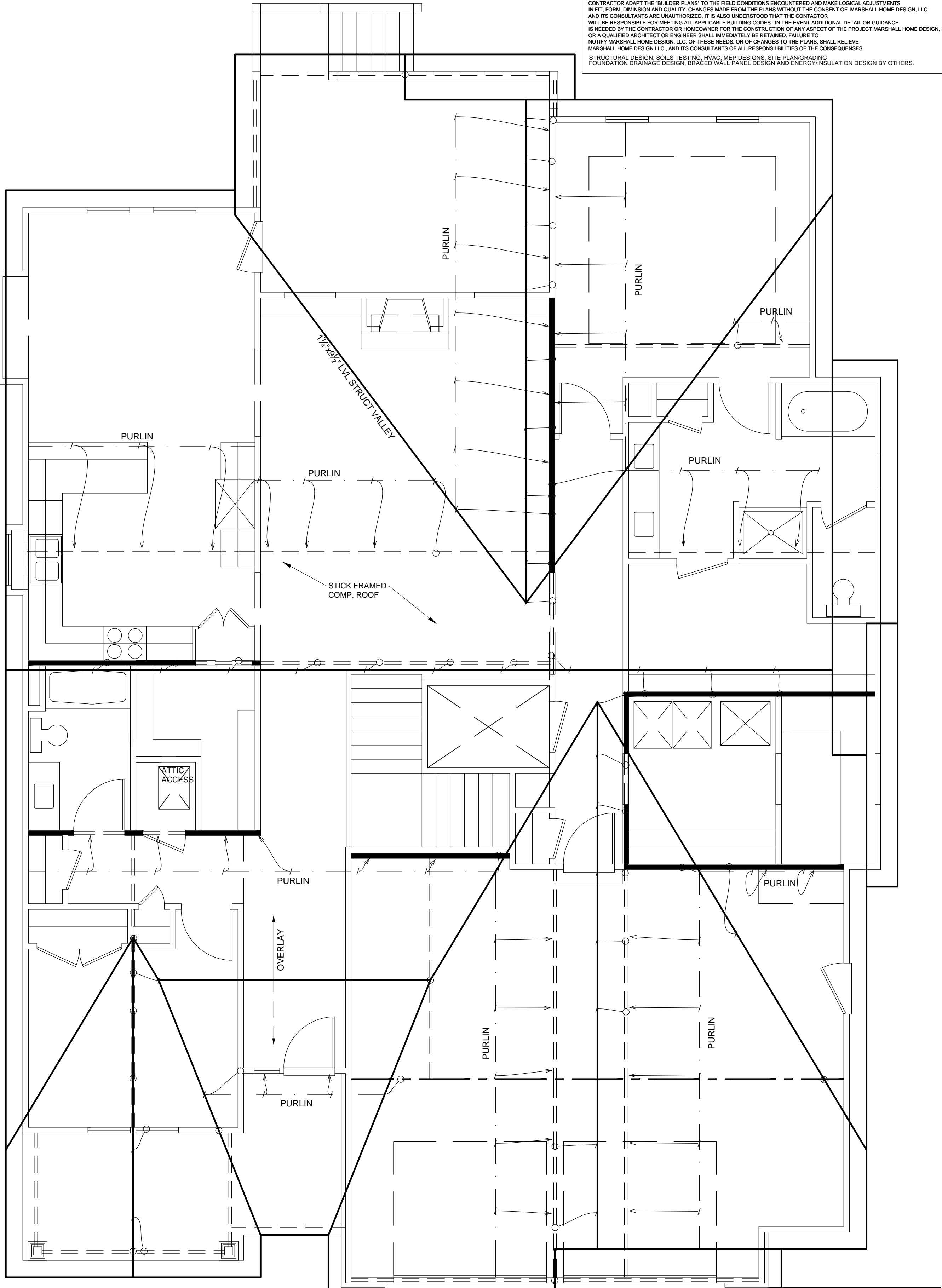
STRUCTURAL NOTES:  
- ALL UNMARKED HEADERS MIN  
(2)#2-2x10  
- ALL HEADERS AND BEAMS MIN #2  
GRADE DF/L (OR EQ.)  
- — = BEARING WALL  
- XXXXXXXXXX = 4'-0" LONG PANEL,  
UNO



**FRONT ELEVATION**

SCALE 1/4"=1'-0"

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO  
CONSTRUCT THIS DWELLING IN COMPLIANCE WITH ALL  
LOCAL BUILDING CODES AND REQUIREMENTS AS  
ADOPTED BY THE CITY OF LEE'S SUMMIT, MO.



**ROOF PLAN**

SCALE 1/4"=1'-0"

HOMEBUILDER:  
**GALE HOMES, INC.**



APEX ENGINEERS, INC.  
1626 LOCUST ST.  
KANSAS CITY, MO 64108  
816.421.3232  
STRUCTURAL DESIGN REVIEW  
KANSAS ENGINEERING LICENSE: 892  
MISSOURI ENGINEERING LICENSE: 20030473

PLAN NAME:  
**MURDOCK RESIDENCE**  
3041 N.W. THOREAU LANE, LEE'S SUMMIT, MO.  
LOT 1479 WINTERSET VALLEY, LEE'S SUMMIT, MO.

**MARSHALL HOME DESIGN, LLC.**  
1723 N.W. 57TH COURT, KANSAS CITY, MO. 64151

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4-13-21 4-29-21  
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BUILDERS PLAN DEFINITION

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COLUMN & PIER PAD SCHEDULE (REF. 5/S2.0)

COLUMN MARK	PAD SIZE	REINFORCEMENT	COLUMN SIZE	COLUMN TYPE
A	30" x 30" x 12"	(4) #4 BAR E.W.	3" NOMINAL	SCHEDULE 40 STEEL PIPE (FY = 36 (KSI MIN.))
B	36" x 36" x 12"	(4) #4 BAR E.W.	3" NOMINAL	
C	42" x 42" x 12"	(5) #4 BAR E.W.	3" NOMINAL	
D	48" x 48" x 12"	(6) #4 BAR E.W.	3" NOMINAL	
E	54" x 54" x 12"	(8) #4 BAR E.W.	3 1/2" NOMINAL (4" OD)	
F	60" x 60" x 16"	(10) #4 BAR E.W.	3 1/2" NOMINAL (4" OD)	

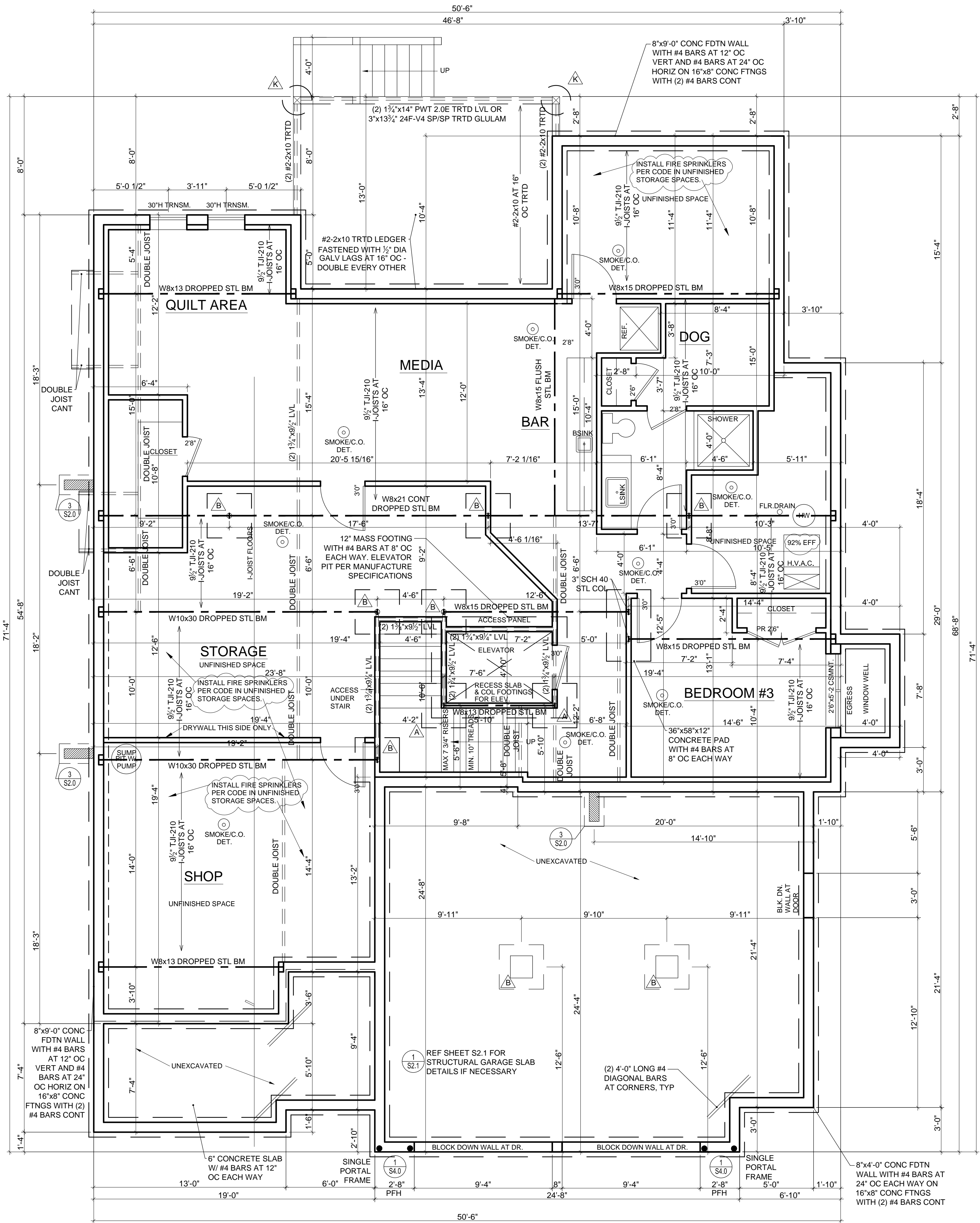
- COLUMN & PAD SIZES SHOWN ARE FOR MAXIMUM COLUMN HEIGHT OF 10'-0". REQUIRES SEPARATE ENG'D DESIGN IF GREATER THAN 10'-0" TALL.
- COLUMN & PIER PAD SIZES SHOWN ARE BASED ON AN ASSUMED MINIMUM ALLOWABLE SOIL BEARING CAPACITY OF 1,500PSF.

MARK	COLUMN SIZE	PIER DIA.
A	6x6	12"
H	6x6	16"
A	6x6	18"
K	6x6	24"
A	6x6	28"

- ALL PIERS TO BEAR ON ORIGINAL UNDISTURBED SOIL OF 1,500 PSF BEARING CAPACITY OR FILL COMPACTED AND TESTED TO CONFORM TO THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
- PIERS SHALL EXTEND BELOW THE FROST LINE: MIN. DEPTH OF 36" BELOW GRADE.
- POST SHALL BE TREATED OR CEDAR WITH SIMPSON ABU66 POST BASE

DETAIL REFERENCES

- 1 S2.0 TYPICAL FOUNDATION WALL DETAIL
- 2 S2.0 TYPICAL "UNRESTRAINED" FOUNDATION WALL DETAIL
- 3 S2.0 TYPICAL DEAD MAN DETAIL
- 4 FOUNDATION WALL JUMP DETAIL
- 5 S2.0 COLUMN PAD DETAIL
- 1 S2.1 TYPICAL STRUCTURAL GARAGE SLAB PLAN
- 2 S2.1 STRUCTURAL GARAGE SLAB PIER PAD DETAIL
- 3 S2.1 STRUCTURAL GARAGE SLAB / WALL SECTION
- 6 S2.1 TYPICAL OVERDIG DETAIL AT BASEMENT SLAB
- 1 S4.0 ALTERNATE BRACED WALL PANEL DETAIL
- 1 S4.0 APA NARROW WALL BRACING METHOD WITHOUT HOLD-DOWNS ALT.
- A COLUMN AND PIER PAD SCHEDULE (SHEET S2.0)

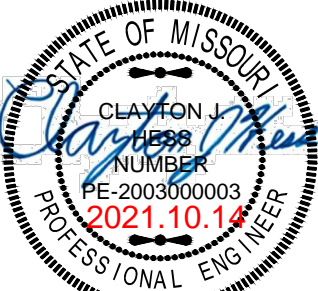


FOUNDATION PLAN

SCALE 1/4"=1'-0"

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONSTRUCT THIS DWELLING IN COMPLIANCE WITH ALL LOCAL BUILDING CODES AND REQUIREMENTS AS ADOPTED BY THE CITY OF LEE'S SUMMIT, MO.

HOMEBUILDER:  
GALE HOMES, INC.



APEX ENGINEERS, INC.  
1626 LOCUST ST  
KANSAS CITY, MO 64108  
816.421.3222  
STRUCTURAL DESIGN REVIEW  
KANSAS ENGINEERING LICENSE: 692  
MISSOURI ENGINEERING LICENSE: 20030473

PLAN NAME:

MURDOCK RESIDENCE  
3041 N.W. THOREAU LANE, LEE'S SUMMIT, MO.  
LOT 1479 WINTERSET VALLEY, LEE'S SUMMIT, MO.

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STRUCTURAL DESIGN, SOILS TESTING, HVAC, MEP DESIGN, SITE PLANNING/PAVING, FOUNDATION DRAINAGE DESIGN, BRACED WALL PANEL DESIGN AND ENERGY/INSULATION DESIGN BY OTHERS.

BRACED WALL METHODOLOGY:  
CONTINUOUS EXTERIOR SHEATHING PER WSP METHOD (BELOW)  
UNLESS OTHERWISE NOTED ON THE PLAN

XXXX EXTERIOR BRACED WALLS:

WSP METHOD: WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN  $\frac{3}{8}$ " WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING THICKNESS NOT LESS THAN  $\frac{1}{8}$ " WITH MINIMUM SPAN RATING OF  $\frac{24}{8}$  FOR 24" OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD.  
(NOTE: FRAMING MEMBERS 16" OC MAX UNBLOCKED, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS)



//// INTERIOR BRACED WALLS (REF 2-S4.0):

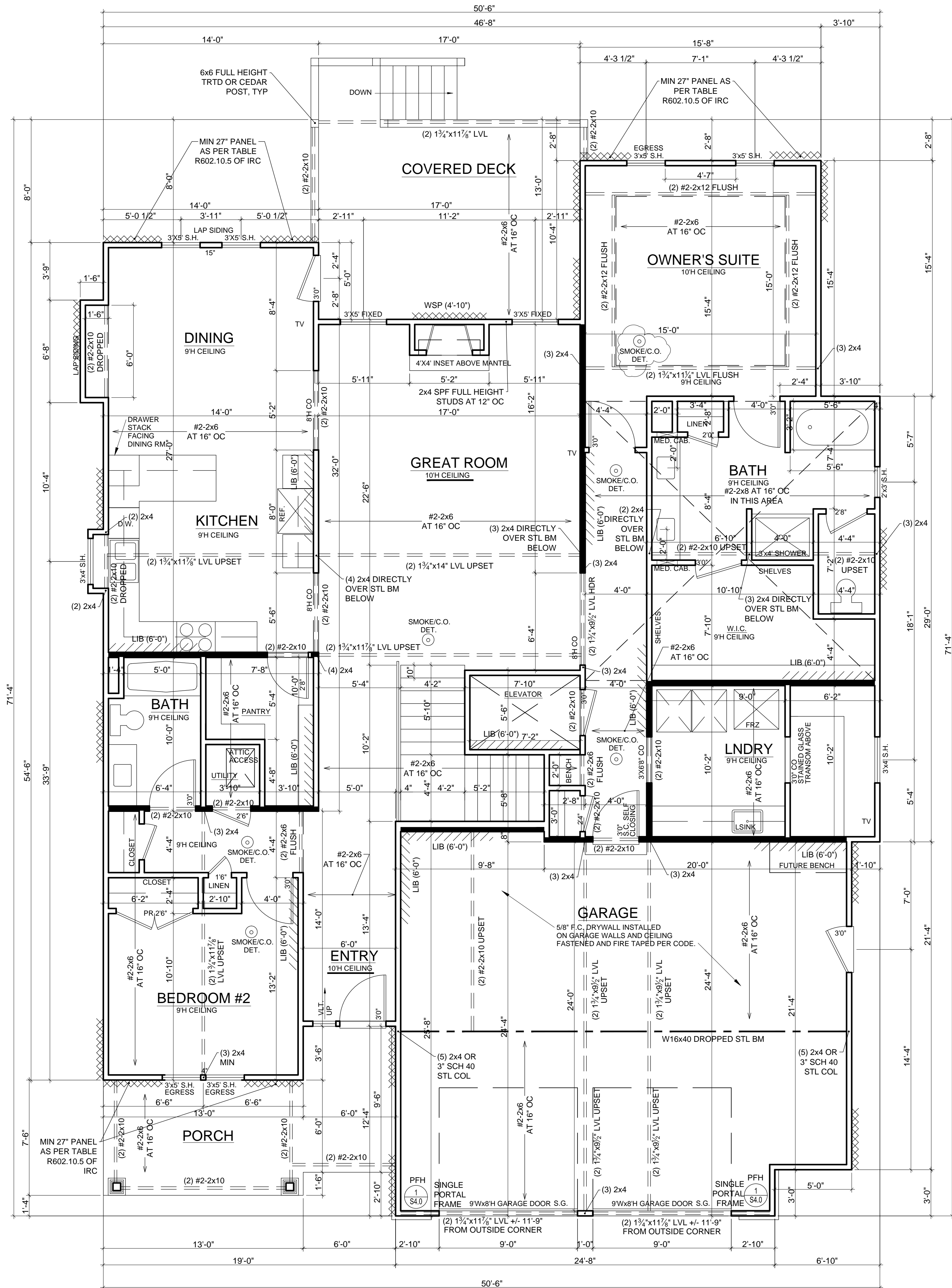
GB METHOD:  $\frac{1}{2}$ " MIN. GYPSUM BOARD OVER STUDS SPACED 24" MAX. FASTENED WITH No 6 -  $\frac{1}{4}$ " TYPE 'W' OR 'S' DRYWALL SCREWS AT 7" OC EDGES AND FIELD (MIN. 4'-0" SECTION FOR BOTH SIDES.)

OR

LIB METHOD: 1x4 WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA. VUON OAUUOUCESIN SBN DOUCOUCUUA +VUA 6-AB-OSOUR OBT WT AT A O.C. STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.

STRUCTURAL NOTES:

- ALL UNMARKED HEADERS MIN (2)#2-2x10
- ALL HEADERS AND BEAMS MIN #2 GRADE DF/L (OR EQ.)
-  = BEARING WALL
-  = 4'-0" LONG PANEL, UNO



FIRST FLOOR PLAN

SCALE 1/4"=1'-0"

2215 S.F FIRST FLOOR  
973 S.F LOWER FLOOR  
3188 S.F TOTAL AREA

155 S.F FRONT PORCH  
244 S.F COVERED DECK  
709 S.F GARAGE

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PLAN NAME:  
MURDOCK RESIDENCE  
3041 N.W. THOREAU LANE, LEE'S SUMMIT, MO.  
LOT 1479 WINTERSET VALLEY, LEE'S SUMMIT, MO.

MARSHALL HOME DESIGN, LLC.  
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2109

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3

HOME BUILDER:  
GALE HOMES, INC.



APEX ENGINEERS, INC.  
1626 LOCUST ST  
KANSAS CITY, MO 64108  
816-421-3232  
STRUCTURAL DESIGN REVIEW  
KANSAS ENGINEERING LICENSE  
692  
MISSOURI ENGINEERING LICENSE  
200304673



SHEATHING AND FRAMING FASTENING SCHEDULE		
BUILDING COMPONENT	MATERIAL	FASTENING
ROOF SHEATHING¹	7/16" PLYWOOD	16 GA x 1-3/4" STAPLES AT 3" OC EDGES AND 6" OC IN FIELD
	1x4 #3 FURRING	1/2" CROWN STAPLES
FLOOR SHEATHING¹	3/4" T&G YELLOW PINE PLYWOOD APPLIED PERPENDICULAR TO JOISTS AND ENDS STAGGERED	8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN THE FIELD
		14 GA x 2" STAPLES AT 4" OC EDGES AND 8" OC IN THE FIELD
CEILING COVERING¹	1/2" GYPSUM SHEATHING	12.5 GA x 1-1/2" RING OR SCREW SHANK NAILS AT 6" OC EDGES AND 8" OC IN THE FIELD
INTERIOR WALL COVERING¹	1/2" GYPSUM SHEATHING	7" OC NAILED / 12" OC SCREWED WITH 13 GA, 1-3/8" LONG, 19/64" HEAD; 0.088 DIA, 1-1/4" LONG, ANG-RINGED; 5d COOLER NAIL, 0.086 DIA, 1-5/8" LONG, 15/64" HEAD; OR GYP BD NAIL, 0.086 DIA, 1-5/8" LONG, 9/32" HEAD
EXTERIOR WALL SHEATHING	MIN 3/8" APA RATED SHEATHING	6d COMMON NAILS; 1-5/8" GALVANIZED STAPLES; 1-1/4" SCREWS, TYPE W OR S- AT 4" OC EDGES AND 8" OC IN THE FIELD
CONVENTIONAL WOOD FRAMED WALLS	*SUPPORTING 2 FLOORS, ROOF, AND CEILING OR LESS. *HEIGHT: 10'-0" OR LESS *SIZE: NOM 2x4 (NOM 2x6 WHEN SUPPORTING 2 FLOORS, CEILING, AND ROOF) *SPECIES: DOUG-FIR, HEM-FIR, SOUTH PINE, SPRUCE-PINE-FIR *MAXIMUM SPACING 16" OC *STUDS 10' LENGTH OR LESS SHALL BE #3 STANDARD, OR STUD GRADE *STUDS OVER 10' LENGTH SHALL BE MIN #2 GRADE	*TOE NAIL RIM JOIST TO SILL OR TOP PLATE: 8d COMMON AT 6" OC, 3"x6, 131" AT 6" OC, 3"x6, 131" AT 6" OC; *TOE NAIL STUD TO TOP AND SOLE PLATE: (4) 8d COMMON, (4) 3"x6, 131" *END NAIL TOP AND SOLE PLATE TO STUD: (2) 16d COMMON, (3) 3"x6, 131" *FACE NAIL BUILT-UP CORNER STUDS: 16d AT 24" OC, 3"x6, 131" AT 16" *FACE NAIL BUILT-UP CORNER STUDS AT BRACED WALL PANELS: 16d COMMON NAILS AT 16" OC, 3"x6, 131" AT 12" OC *FACE NAIL JACK STUDS/TRIMMERS: 10d NAILS AT 6" OC, 16d COMMON AT 16" OC, 3"x6, 131" AT 12" OC, 3"x6, 128" AT 12" OC *SUPPORTING HEADERS WITH: 10d NAILS AT 6" OC, 16d COMMON AT 16" OC, 3"x6, 131" AT 12" OC, 3"x6, 128" AT 12" OC *FACE NAIL DBL TOP PLATE: (8) 16d COMMON, (12) 3"x6, 131", (12) 3"x6, 128" *DBL TOP PLATES WITH MIN 48" OFFSET OF EACH FACE NAIL LAPPED AREA WITH: FACE NAIL DBL TOP PLATES AT LAPPED CORNERS AND INTERSECTIONS WITH: FACE NAIL SOLE PLATE TO FRAMING SYSTEM WITH: FACE NAIL BRIDGING TO JOIST EACH END *FACE NAIL LEDGER STRIPS SUPPORTING JOISTS OR RAFTERS WITH: (3) 16d COMMON, (4) 3"x6, 131", (4) 3"x6, 128"
CONVENTIONAL WOOD HEADER FRAMING	PER PLAN	*TOE NAIL HEADERS TO WALL STUDS WITH (4) 8d NAILS AT EACH END *FACE NAIL DOUBLE PIECE HEADERS WITH 16d NAILS AT 16" CENTERS ALONG EACH EDGE.
RAFTER TIES²	MIN 2x4 MEMBERS AT EACH RAFTER	REF TABLE R802.5.2
COLLAR TIES	MIN 1x4 MEMBERS AT 48" OC	FACENAIL TO RAFTERS IN UPPER 1/3 OF ATTIC SPACE WITH (3) 10d NAILS AT EACH
1. NOTE: ALL SHEATHING MATERIALS TO BE APPLIED PERPENDICULAR TO JOISTS AND ENDS STAGGERED. 2. RAFTER TIES SHALL NOT BE REQUIRED WHEN A STRUCTURAL RIDGE HAS BEEN PROVIDED AND ADEQUATELY DESIGNED (AS IN A FULLY VAULTED ROOM). SUCH SHALL BE NOTED AS "STRUCTURAL" ON THE PLAN.		
BUILDING COMPONENT	FASTEN TO	FASTEN WITH
RAFTERS	TO RIDGE/VALLEYHIP RAFTERS	TOENAIL WITH (4) 16d ENDNAIL WITH (3) 16d
	TO PLATE	TOENAIL WITH (2) 16d
CEILING JOISTS	TO TOP PLATE	TOENAIL WITH (3) 8d AT EACH END
	WHERE CEILING JOISTS RUN PARALLEL TO RAFTERS FACENAIL TO RAFTERS WITH (3) 10d MIN	
FLOOR JOISTS	TO SILL OR GIRDER	TOENAIL WITH: (3) 8d COMMON; (3) 3"x6, 131"; (4) 3"x6, 128"
	TO RIM JOIST	ENDNAIL WITH: (3) 16d COMMON; (4) 3"x6, 131"; (4) 3"x6, 128"
BRACED WALL PANELS PERP TO FRAMING MEMBERS ABOVE/BELOW: PARALLEL TO FRAMING MEMBERS ABOVE/BELOW:	TO FRAMING MEMBER	SOLE PL, 16" OC WITH: (3) 16d COMMON; (4) 3"x6, 131" TOP PL, 6" OC WITH: 8d COMMON, 3"x6, 131"
	TO FRAMING AND BLOCKING AT 16" OC	SOLE PL, 16" OC WITH: (3) 16d COMMON; (4) 3"x6, 131" AND AT EACH BLOCK: (3) 16d COMMON; (4) 3"x6, 131" TOP PL, 6" OC WITH: 8d COMMON, 3"x6, 131" AND AT EACH BLOCK: (3) 8d COMMON, 3"x6, 131"
NOTE: MEMBER THICKNESS AND FASTENING LISTED IN THIS SCHEDULE ARE MINIMUM IRC REQUIREMENTS. SPECIFIC PROJECT REQUIREMENTS NOTED WITHIN THE STRUCTURAL OR ARCHITECTURAL DRAWINGS, IF REQUIRED BY APEX ENGINEERS DESIGN NEEDING TO BE MORE STRINGENT, SHALL BE FOLLOWED.		

## ENERGY REQUIREMENTS

- LIGHTING FIXTURES PENETRATING THE THERMAL ENVELOPE SHALL BE IC-RATED, LEAKAGE RATED, AND SEALED TO THE GYPSUM WALLBOARD AS REQUIRED PER N1102.4.5.
- PROGRAMMABLE THERMOSTATS SHALL BE INSTALLED AS REQUIRED PER N1103.1.1.
- AIR HANDLERS SHALL BE RATED FOR MAXIMUM 2% AIR LEAKAGE RATE PER N1103.3.2.1.
- BUILDING FRAMING CAVITIES SHALL NOT BE USED AS DUCTS OR PLENUMBS PER N1103.3.5
- HOT WATER PIPES SHALL BE INSULATED AS REQUIRED PER N1103.4.
- ALL EXHAUST FANS SHALL TERMINATE TO THE BUILDING EXTERIOR AS REQUIRED PER M1501.1.
- MAKEUP AIR SYSTEMS SHALL BE INSTALLED FOR KITCHEN EXHAUST HOODS THAT EXCEED 400 CFM AS REQUIRED PER M1503.6.
- AN AIR HANDLING SYSTEM SHALL NOT SERVE BOTH THE LIVING SPACE AND THE GARAGE PER M1601.6.

## ENERGY CONSERVATION

THE ENERGY EFFICIENCY OF THE DWELLING SHALL COMPLY WITH THE FOLLOWING TABLE(S) (WHERE THERE ARE DISCREPANCIES BETWEEN THIS TABLE AND THE PLANS, THE MOST RESTRICTIVE SHALL APPLY). IF TABLE 1 IS NOT COMPLETED AND ACCOMPANIED BY RESCHECK CALCULATIONS, THEN TABLE 2 SHALL BE APPLIED.

TABLE 1 - ResCheck COMPLIANCE SOFTWARE (FILL IN APPLICABLE VALUES FROM ResCheck CALCS.)	
BUILDING ELEMENT	MIN VALUE
WALLS - FRAMED	R-
WALLS - BASEMENT	R-
FLOORS - UNCONDITIONED SPACE	R-
FLOORS - OVER OUTSIDE AIR	R-
FLOORS - CRAWL SPACE	R-
SLAB - PERIMETER	R-
CEILING - FLAT	R-
CEILING - CATHEDRAL	R-
DOORS - GLASS	U-
DOORS - SOLID	U-
WINDOWS - OPERABLE	U-
WINDOWS - FIXED	U-
WINDOWS - OTHER	U-
FURNACE	AFUE-
AIR CONDITIONER	SEER-
NOTE: FOR USE OF TABLE 1 A ResCheck COMPLIANCE FORM MUST BE SUBMITTED WITH PLANS.	
TABLE 2 - PRESCRIPTIVE ENVELOPE (MIN PRESCRIPTIVE APPROACH ACCEPTABLE FOR ANY DWELLING.)	
BUILDING ELEMENT	MIN VALUE
CEILING - FLAT	R-49
CEILING - CATHEDRAL**	R-30
CEILING - CATHEDRAL	R-38
FLOORS - UNCONDITIONED SPACED	R-19
FLOORS - OVER OUTSIDE AIR	R-30
WALLS - BASEMENT	R-10 (CONT) OR R-13 (CAVITY)
CONCRETE SLAB ON GRADE	R-10 (FOR 2FT)
SKYLIGHTS	U=0.55
WALLS - EXTERIOR (2x4)	R-13 (CAVITY) + R-5 (CONT)
WALLS - EXTERIOR (2x6)	R-20
WALLS - CRAWL SPACE	R-19
GLAZING*	U<=0.32
GLAZING*	SHGF<=0.40
NOTE: TABLE 2 PER IRC TABLE N1102.1.2 *DEFAULT U-FACTOR FOR DOUBLE PANE, ARGON FILLED LOW-E TREATMENT IS U=0.35 **LIMITED TO AREAS LESS THAN 500 SQ-FT OR 20% OF CEILING AREA.	

## DEFERRED SUBMITTALS

- THE ARCHITECT OR ENGINEER OF RECORD SHALL LIST THE DEFERRED SUBMITTALS ON THE PLANS FOR REVIEW BY THE BUILDING OFFICIAL. DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE ARCHITECT OR ENGINEER OF RECORD WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN THE GENERAL CONFORMANCE TO THE DESIGN OF THE BUILDING. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL. DEFERRED SUBMITTALS ARE DEFINED AS THOSE PORTIONS OF THE DESIGN THAT ARE NOT SUBMITTED AT THE TIME OF THE APPLICATION AND THAT ARE TO BE SUBMITTED TO THE BUILDING OFFICIAL WITH A SPECIFIED PERIOD. DEFERRAL OF ANY SUBMITTAL ITEMS SHALL HAVE THE PRIOR APPROVAL OF THE BUILDING OFFICIAL.
- DEFERRED SUBMITTAL ITEMS (WHEN APPLICABLE):
  - TRUSSES
  - JOISTS
  - GUARDRAILS AND HANDRAILS
  - STEEL FABRICATED STAIRS
  - PRE-MANUFACTURED CANOPIES AND AWNINGS
  - PRECAST HOLLOW CORE SLABS
  - GROUND IMPROVEMENT AND/OR STRUCTURAL FOUNDATION SOLUTIONS (SUCH AS DRILLED PIERS)

## CONCRETE

CONCRETE SHALL BE AIR ENTRAINED WITH A MINIMUM COMPRESSIVE STRENGTH OF 28 DAYS OF 2,500 PSI FOR BASEMENT AND INTERIOR FLOOR SLABS, 3,000 PSI FOR BASEMENT AND FOUNDATION WALLS, AND 3,500 FOR PORCHES, CARPORTS, AND GARAGE FLOOR SLABS.

## GLAZING

GLAZING IN HAZARDOUS LOCATIONS AS IDENTIFIED IN IRC SECTION R308.4 SHALL BE OF APPROVED SAFETY GLAZING MATERIALS: GLASS IN STORM DOORS; INDIVIDUAL FIXED OR OPENABLE PANELS ADJACENT TO A DOOR WHERE THE NEAREST VERTICAL EDGE IS WITHIN A 24" ARCH OF THE DOOR IN A CLOSED POSITION AND WHOSE BOTTOM EDGE IS WITHIN 60" OF THE FLOOR; WALLS ENCLOSING STAIRWAYS AND LANDINGS WHERE THE GLAZING IS WITHIN 60" OF THE TOP OR BOTTOM OF THE STAIR, ENCLOSURES FOR SPAS, TUBS, SHOWERS, AND WHIRLPOOLS; GLAZING IN FIXED OR OPENABLE PANELS EXCEEDING 9 SQUARE FEET AND WHOSE BOTTOM EDGE IS LESS THAN 18" ABOVE THE FLOOR OR WALKING SURFACE WITHIN 36".

## EMERGENCY EGRESS AND RESCUE

- PROVIDE ONE WINDOW FROM EACH BEDROOM THAT HAS A MINIMUM OPENABLE AREA OF 5.7 SQUARE FEET WITH A MINIMUM OPENABLE HEIGHT OF 24 INCHES AND WIDTH OF 20 INCHES.
- BASEMENT EGRESS TO MEET THE REQUIREMENTS OF IRC SECTION 310.
- SMOKE ALARMS SHALL BE INSTALLED AS REQUIRED PER IRC 2018 SECTION R314.
- PROVIDE SMOKE ALARMS IN EACH SLEEPING ROOM, OUTSIDE OF EACH SLEEPING AREA, ON EACH FLOOR INCLUDING BASEMENTS AND HABITABLE ATTICS, AND NOT LESS THAN 3'-0" HORIZONTALLY FROM DOOR OR OPENING OF A BATHROOM THAT CONTAINS A BATHTUB OR SHOWER. ALARMS SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTUATION OF ONE ALARM WILL ACTIVATE ALL OF THE ALARMS IN THE DWELLING.
- CARBON MONOXIDE ALARMS SHALL BE INSTALLED AS REQUIRED PER IRC 2018 SECTION R315.
- CARBON MONOXIDE ALARMS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA, WHERE A FUEL-BURNING APPLIANCE IS LOCATED WITHIN A BEDROOM OR ITS ATTACHED BATHROOM, A CARBON MONOXIDE ALARM SHALL BE INSTALLED WITHIN THE BEDROOM.

## FRAMING GENERAL

- ALL LUMBER SIZES ARE FOR DOUGLAS FIR-LARCH UNLESS NOTED OTHERWISE.
- ALL HEADERS TO BE MIN (2) #2-2x10 UNLESS NOTED OTHERWISE.
- BLOCK CANTILEVERS, DOORJAMBS, AND OVER BEAMS.
- ALL HEADERS TO BEAR ON A MINIMUM OF (2) 2x4 STUD POSTS UNLESS NOTED OTHERWISE.
- INTERIOR NON-BEARING WALLS, OTHER THAN THOSE RESTING DIRECTLY ON THE FOOTING SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE.
- WHERE JOISTS RUN PARALLEL TO FOUNDATION WALLS, SOLID BLOCKING FOR A MINIMUM OF (2) JOIST SPACES BE PROVIDED TO A MAXIMUM OF 2'-0" CENTERS TO TRANSFER LATERAL LOADS ON THE WALL TO THE FLOOR DIAPHRAGM. THE BLOCKING SHALL BE SECURELY NAILED TO THE JOISTS AND FLOORING. NAIL JOISTS AND BLOCKING TO SILL PLATE WITH (3) 10d NAILS (IRC SECTION R802.3.(1)).
- IF DUCTS ARE INSTALLED IN THE FIRST JOIST SPACE(S), NAIL 2x4s FLAT AT 2'-0" CENTERS WITHIN THE JOIST SPACE(S) AND THEN PROVIDE SOLID BLOCKING, INSTALLED UPRIGHT, IN THE NEXT TWO JOIST SPACES. SECURE THE 2x4s TO THE SILL PLATE WITH (4) 10d NAILS.
- ALL SILLS AND CLEERS SUPPORTED ON CONCRETE OR MASONRY AND FURRING ATTACHED TO CONCRETE OR MASONRY SHALL BE OF DECAY RESISTANT MATERIALS.
- JOISTS UNDER BEARING PARTITIONS SHALL BE DOUBLED AND COMPLY WITH IRC SECTION R502.4.
- JOISTS FRAMING FROM OPPOSITE SIDES OVER BEARING SUPPORTS SHALL LAP A MINIMUM 9" AND SHALL BE NAILED TOGETHER WITH A MINIMUM 10d FACE NAILS.
- JOISTS FRAMING INTO A WOOD GIRDER OR BEAM SHALL BE SUPPORTED BY APPROVED FRAMING ANCHORS OR MINIMUM 2"x2" LEDGER STRIPS.
- FRAMING OF OPENINGS - HEADERS AND TRIMMERS SHALL BE OF SUFFICIENT CROSS SECTION TO SUPPORT THE FLOOR FRAMING. TRIMMER JOISTS SHALL BE DOUBLED WHEN THE HEADER IS SUPPORTED MORE THAN 3'-0" FROM THE TRIMMER JOIST BEARING. WHEN THE HEADER SPAN EXCEEDS 4'-0", THE HEADER AND TRIMMER SHALL BE DOUBLED.
- JOISTS AT SUPPORTS SHALL BE SUPPORTED Laterally AT THE ENDS BY FULL-DEPTH SOLID BLOCKING NOT LESS THAN 2" NOMINAL THICKNESS OR BY ATTACHMENT TO A HEADER, BAND OR RIM JOIST OR TO AN ADJOINING STUD OR OTHERWISE PROVIDED WITH LATERAL SUPPORT TO PREVENT ROTATION.
- WATER-RESISTIVE BARRIER SHALL BE PROVIDED OVER ALL EXTERIOR WALLS. ONE LAYER OF No 15 ASPHALT FELT OR ANY OTHER BARRIER THAT MEETS ASTM D228 TYPE 1 FELT 1. (R703.2)
- WHERE CEILING JOISTS ARE NOT INSTALLED CONNECTED TO THE RAFTERS AT THE TOP PLATE AND/OR WHERE CEILING JOISTS ARE NOT INSTALLED PARALLEL TO THE RAFTERS, RAFTER TIES SHALL BE INSTALLED IN THE LOWER 1/3 OF THE ATTIC SPACE AND IN ACCORDANCE WITH TABLE 1-S1.0.
- COLLAR TIES SHALL BE PROVIDED IN THE UPPER 1/3 OF THE ATTIC SPACE IN ACCORDANCE WITH TABLE 1-S1.0.

## GARAGE

- THE GARAGE FLOOR SHALL SLOPE TOWARDS THE GARAGE DOORWAYS.
- DOORS BETWEEN THE GARAGE AND THE DWELLING - MINIMUM 1-3/8" SOLID CORE OR HONEY COMBED STEEL DOOR OR 20-MINUTE FIRE RATED.
- THE GARAGE SHALL BE SEPARATED FROM THE RESIDENCE AND ITS ATTIC AREA BY 5/8", TYPE X GYPSUM BOARD, OR EQUIVALENT MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION, APPLIED TO GARAGE SIDE. WHERE THE SEPARATION IS A FLOOR-CEILING ASSEMBLY, THE STRUCTURE SUPPORTING THE SEPARATION SHALL ALSO BE PROTECTED BY 5/8", TYPE X GYPSUM BOARD, OR MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION OR EQUIVALENT, APPLIED TO THE GARAGE SIDE. PULL DOWN STAIRS LOCATED WITHIN GARAGE SHALL BE RATED TO BE ADEQUATELY PROTECTED WITH MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION. ATTIC ACCESS PANELS LOCATED WITHIN GARAGE SHALL BE OF 5/8", TYPE X GYPSUM BOARD, OR MATERIALS FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION.
- GARAGE DOOR AND FRAME- THE H-FRAME FOR THE ATTACHMENT OF THE TRACK AND COUNTER BALANCE SHALL CONSIST OF THE FOLLOWING: 2x8 VERTICAL JAMBS RUNNING FROM THE FLOOR TO CEILING ATTACHED WITH 1-3/4" x 0.120" NAILS AT 7" OC STAGGERED WITH (7) 3-1/4" x 0.120" NAILS THRU THE JAMB INTO THE HEADER, MINIMUM 2x8 HEADER FOR ATTACHMENT OF COUNTER BALANCE SYSTEM.

## STAIRWAYS

- STAIRWAYS SHALL PROVIDE A MAXIMUM 7-3/4" RISE AND MINIMUM 10" RUN.
- PROVIDE MINIMUM 36" GUARDRAILS ON THE OPEN SIDES OF RAISED FLOORS, PORCHES, AND BALCONIES; MINIMUM 34" GUARDRAILS ON THE OPEN SIDES OF STAIRWAYS LOCATED MORE THAN 30" ABOVE THE FLOOR OR GRADE BELOW.
- GUARDRAIL ENCLOSURES SHALL HAVE INTERMEDIATE RAILS OR ORNAMENTAL PATTERNS THAT DO NOT ALLOW PASSAGE OF A SPHERE 4" IN DIAMETER.
- EACH STAIRWAY OF THREE OR MORE RISERS SHALL PROVIDE A CONTINUOUS HANDRAIL ON AT LEAST ONE SIDE BETWEEN 34" AND 38" ABOVE THE NOSING OF THE TREADS.
- HANDRAILS SHALL HAVE A CIRCULAR CROSS SECTION OF 1-1/4" MINIMUM TO 2" MAXIMUM OR OTHER APPROVED GRASPABLE SHAPE PER IRC SECTION 311.7.8.5.
- PROVIDE A MINIMUM 6'-8" OF HEADROOM CLEARANCE IN STAIRWAYS.
- ENCLOSED ACCESSIBLE SPACE UNDER STAIRWAYS SHALL HAVE WALLS AND THE UNDERSIDE OF THE STAIR AND LANDING PROTECTED WITH 1/2" GYPSUM BOARD ON ENCLOSURE SIDE PER IRC SECTION 302.7.
- SPIRAL STAIRS TO BE CONSTRUCTED PER IRC SECTION 311.7.10.1.
- SPACE STRINGERS AT 16" OC MAX.

## GENERAL

- PLANS SHALL COMPLY WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE WITH AMENDMENTS AS ADOPTED BY THE GOVERNING JURISDICTION, IF ANY CHANGES OR DEVIATIONS FROM THE PLANS ARE MADE DURING CONSTRUCTION, CONTRACTOR SHALL NOTIFY THE APPROPRIATE AUTHORITY AND ENGINEER OF RECORD, EITHER (OR BOTH) OF WHOM MAY REQUIRE REVISED DRAWINGS OR CALCULATIONS AT ITS DISCRETION.
- REPRODUCTION, ALTERATION, OR RE-USE BY ANY METHOD OF ALL OR PORTIONS OF THESE STRUCTURAL PLANS OR VARIATIONS THEREOF WITHOUT WRITTEN PERMISSION FROM APEX ENGINEERS, INC IS STRICTLY PROHIBITED. THE DRAWINGS AND DETAILS OF THIS SHEET SET, BEING INSTRUMENTS OF SERVICE, ARE AND SHALL REMAIN THE PROPERTY OF APEX ENGINEERS, INC. AN UNSEALED VERSION, OR A VERSION VOID OF APEX ENGINEERS LOGO AND/OR TITLE BLOCK, SHALL BE CONSIDERED AN UNAUTHORIZED AND UNCONTROLLED REPRODUCTION.
- WHERE DISCREPANCIES EXIST BETWEEN THE STANDARD COMMENTS, NOTES FROM THE DESIGN PROFESSIONAL OR THE CODE, THE MOST RESTRICTIVE SHALL APPLY. THE DWELLING SHALL COMPLY WITH THE FOLLOWING LOAD CONDITIONS:

AREA	MIN DEAD LOAD	MIN LIVE LOAD
EXTERIOR BALCONIES	10 PSF	60 PSF
DECKS	10 PSF	40 PSF
CEILING JOISTS/ATTICS NO STORAGE - SCUTTLE ACCESS ONLY ROOF SLOPE 3:12 OR LESS	5 PSF	10 PSF
CEILING JOISTS/ATTICS WITHOUT STORAGE - SCUTTLE ACCESS ONLY ROOF SLOPE OVER 3:12 OR LESS	10 PSF	10 PSF
CEILING JOISTS/ATTICS WITH STORAGE - DOOR/PULL DOWN LADDER ACCESS	10 PSF	20 PSF
ROOMS - NON-SLEEPING	10 PSF	40 PSF
ROOMS - SLEEPING	10 PSF	30 PSF
ROOF - LIGHT ROOF COVERING	10 PSF	20 PSF
ROOF - HEAVY ROOF COVERING CONCRETE/TILE/SLATE	20 PSF	20 PSF

NOTE: HEAVY ROOF COVERING WILL NOT BE INSTALLED OR USED IN THE DESIGN CALCULATIONS UNLESS IT IS SPECIFICALLY NOTED ON THE PLANS THAT THE DESIGN IS FOR HEAVY ROOF COVERINGS.

## FOUNDATIONS

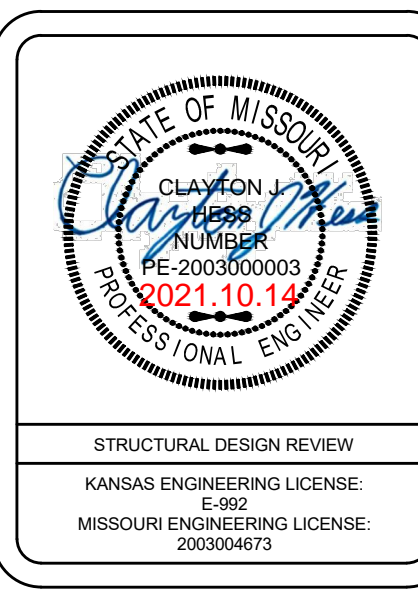
- THE FOUNDATION DESIGN SHALL BE BASED ON A MINIMUM SOIL BEARING CAPACITY OF 2000 PSF, UNLESS OTHERWISE INDICATED ON THE PLANS OR IF MODIFIED BY A SOIL BEARING REPORT BASED ON ACTUAL SITE CONDITIONS.
- CONCRETE SHALL MEET THE FOLLOWING SPECIFIED DESIGN STRENGTH CRITERIA:
  - 2500 PSI FOR BASEMENT FLOOR SLABS ON UNDISTURBED SOIL
  - 3000 PSI FOR FOOTINGS AND FOUNDATION WALLS
  - 3500 PSI FOR GARAGE FLOOR SLABS
- FOOTINGS SHALL EXTEND BELOW THE FROST LINE; MINIMUM DEPTH 36 INCHES BELOW GRADE.
- UNLESS OTHERWISE NOTED ON THE PLANS OR IF SITE CONDITIONS REQUIRE OTHERWISE, FOOTINGS SHALL BE A MINIMUM OF 16" WIDE AND 8" DEEP WITH (2) #4 BARS CONTINUOUS.
- COLUMN PADS SHALL BE A MINIMUM 30"x30"x12" WITH (4) #4 BARS EACH WAY UNLESS NOTED OTHERWISE.
- UNLESS NOTED OTHERWISE ON THE PLANS, FOUNDATION WALLS SHALL BE MINIMUM 8" THICK x 8'-0" (OR 9'-0") TALL AND REINFORCED PER DETAIL 1-S2.0 (AND 2-S2.0 WHERE APPLICABLE). FOUNDATION WALLS GREATER THAN 10'-0" TALL REQUIRE A SEPARATE ENGINEERED DESIGN. PROVIDE A 2'-0" LONG INTERIOR OR EXTERIOR DEAD-MAN FOR ANY STRAIGHT WALL PANELS EXCEEDING 20'-0" IN LENGTH (REF 3-S2.0)
- REINFORCEMENT SHALL BE MINIMUM GRADE 40 UNLESS NOTED OTHERWISE. REINFORCEMENT SHALL LAP A MINIMUM OF 24" AT ENDS, SPLICES, AND AROUND CORNERS.
- FOUNDATION WALLS SHALL BE BACKFILLED WITH A CLEAN LEAN CLAY (OR BETTER) LOW VOLUME CHANGE MATERIAL. ON-SITE MATERIAL MAY BE USED IF DEEMED ACCEPTABLE BY THE GEOTECHNICAL ENGINEER OF RECORD.
- FOUNDATION WALLS WILL NOT ACHIEVE FULL STRENGTH UNTIL THE BASEMENT SLAB AND THE FIRST FLOOR DECK HAVE BEEN PROPERLY PLACED. IF BACKFILLING THE INTERIOR OF THE FOUNDATION WALL WITH GREATER THAN 8" OF EARTHEN FILL OR 24" OF GRANULAR FILL, A STRUCTURAL BASEMENT SLAB, OR ALTERNATE ENGINEERED SOLUTION (i.e. ENGINEERED FILL) WILL BE REQUIRED.
- WHERE JUMPS OR STEPS IN ELEVATION OCCUR FOUNDATION WALLS AND FOOTINGS SHALL BE FORMED CONTINUOUS AND POURED PER DETAIL 4-S2.0.
- CONCRETE FLOOR SLABS SHALL BE A MINIMUM 4" THICK OVER A MINIMUM 4" BASE OF 1/2" OR 3/4" CLEAN GRADED ROCK, UNLESS NOTED OTHERWISE OR IF SITE CONDITIONS REQUIRE OTHERWISE.
- PROVIDE A MIN 6 MIL THICK POLYETHYLENE MOISTURE BARRIER OVER POROUS GRAVEL BASE UNDER BASEMENT FLOOR SLAB PER R405.2.2. LAP JOINTS MINIMUM 6" (NOT REQUIRED FOR GARAGE SLABS OR DETACHED ACCESSORY BUILDINGS).
- FOR A STRUCTURAL REINFORCED CONCRETE FLOOR OVER A USABLE AREA, SUCH AS A GARAGE FLOOR LOCATED OVER A STORAGE AREA, SUBMIT SEPARATE ENGINEERED DETAILS AND CALCULATIONS.
- GARAGE SLABS AND BASEMENT OVERDIGS SUPPORTED BY FILL CONSISTING OF MORE THAN 24" OF GRANULAR FILL OR 8" OF EARTH SHALL BE REINFORCED PER DETAILS 1-S2.1 AND 6-2.1 RESPECTIVELY. WHERE THE LIMITATIONS OF DETAILS 1-S2.1 AND 6-S2.1 ARE NOT MET, A SEPARATE ENGINEERED DESIGN SHALL BE REQUIRED.
- BASEMENT FOUNDATION SILL PLATES SHALL BE BOLTED TO THE FOUNDATION WITH A MINIMUM OF 1/2" ANCHOR BOLTS EMBEDDED AT LEAST 7" INTO THE CONCRETE AND SPACED NOT MORE THAN 3'-0" ON CENTER AND WITHIN 12" OF EACH END PIECE.
- FOUNDATION WALLS SHALL BE DAMP-PROOFED PER IRC SECTION R406.
- PROVIDE A MINIMUM 4" PERFORATED DRAIN AROUND USABLE SPACE BELOW GARAGE FLOOR. DRAINAGE MATERIALS PER IRC SECTION 405.1. THE PIPE SHALL BE PLACED ON A MINIMUM OF 2" OF WASHED GRAVEL OR CRUSHED ROCK AND COVERED WITH NOT LESS THAN 6". THE DRAIN SHALL DAYLIGHT TO THE EXTERIOR BELOW THE FLOOR LEVEL OR TERMINATE IN A MINIMUM 20 GALLON SUMP PIT.
- INTERIOR BEARING WALLS AND COLUMNS SHALL BE ISOLATED FROM THE BASEMENT FLOOR SLAB.
- INTERIOR NON-BEARING WALLS, OTHER THAN THOSE RESTING DIRECTLY ON THE FOOTING, SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE.
- ALL EARTH RETAINING STRUCTURES ON THE SITE GREATER THAN 4'-0" TALL (EXCLUDING CONCRETE FOUNDATION WALLS RESTRAINED AT BOTH TOP AND BOTTOM) SHALL REQUIRE A SEPARATE ENGINEERED DESIGN (i.e. RETAINING WALLS, WING WALLS, ETC.).
- INSULATION SHALL BE INSTALLED FOR ALL BASEMENT WALLS AS REQUIRED PER N1102.2.9.
- A CONCRETE ENCASED GROUNDING ELECTRODE CONNECTION SHALL BE PROVIDED TO THE ELECTRICAL SERVICES PER E360.1.
- ANY GEOTECHNICAL IMPROVEMENT METHODS AND/OR STRUCTURAL SOLUTIONS (SUCH AS DRILLED PIERS) EMPLOYED TO ADDRESS UNACCEPTABLE SUBGRADE CONDITIONS SHALL BE SUBMITTED TO EOR AS ENGINEERED SHOP DRAWINGS FOR REVIEW AND APPROVAL.

### EXPANSIVE SOILS DISCLAIMER:

THESE PLANS HAVE BEEN PREPARED BASED ON A PRESUMPTIVE ALLOWABLE BEARING CAPACITY AS ALLOWED BY IRC CODE AND THE LOCAL ENFORCING JURISDICTION.

APEX ENGINEERS, INC. (APEX) RECOMMENDS THAT ALL FOOTING EXCAVATIONS BE EVALUATED BY A LICENSED GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF ANY FOUNDATION ELEMENTS. GEOTECHNICAL INVESTIGATION AND/OR TESTING IS NOT A SERVICE PROVIDED OR OFFERED BY APEX.

APEX HAS NOT BEEN RETAINED TO DETERMINE THE EXPANSIVE SOIL CHARACTERISTICS OF THE SUBGRADE SOIL AND THEREFORE CANNOT BE HELD RESPONSIBLE FOR THE VOLUMETRIC CHANGES OF THE SOIL (INCLUDING BELOW THE BASEMENT SLAB). BY USE OF THESE PLANS WITHOUT AN ACCOMPANYING GEOTECHNICAL ENGINEERING REPORT, APEX SHALL NOT BE HELD LIABLE FOR ANY FUTURE MOVEMENT AND/OR DIFFERENTIAL MOVEMENT OF THE PROPOSED STRUCTURE AND THE POSSIBLE DAMAGE THAT MAY BE CAUSED AS A RESULT OF SUCH MOVEMENT. DAMAGE FROM EXPANSIVE SOILS AND/OR SETTLEMENT CAN RESULT IN AMONGST OTHER THINGS, THE FOLLOWING: BASEMENT SLAB HEAVE, SHEETROCK CRACKS, WINDOWS AND DOOR BECOMING OUT OF PLUMB AND STICKING AND/OR NOT OPENING, DAMAGE TO TILE, MOULDING, AND OTHER COSMETIC FINISHES.



STRUCTURAL DESIGN REVIEW
KANSAS ENGINEERING LICENSE: E-692
MISSOURI ENGINEERING LICENSE: 2003004673

PROJECT:  
Murdock Residence  
Lot 1479 Winterset Valley  
Lee's Summit, MO

CUSTOMER:  
Cate Home Builders, Inc.  
400 SW Longview Blvd  
Lee's Summit, MO

PROJECT #:	42177
DRAWN BY:	BCH
CHECKED BY:	BDC
SUBMITTAL DATE:	2021.10.14

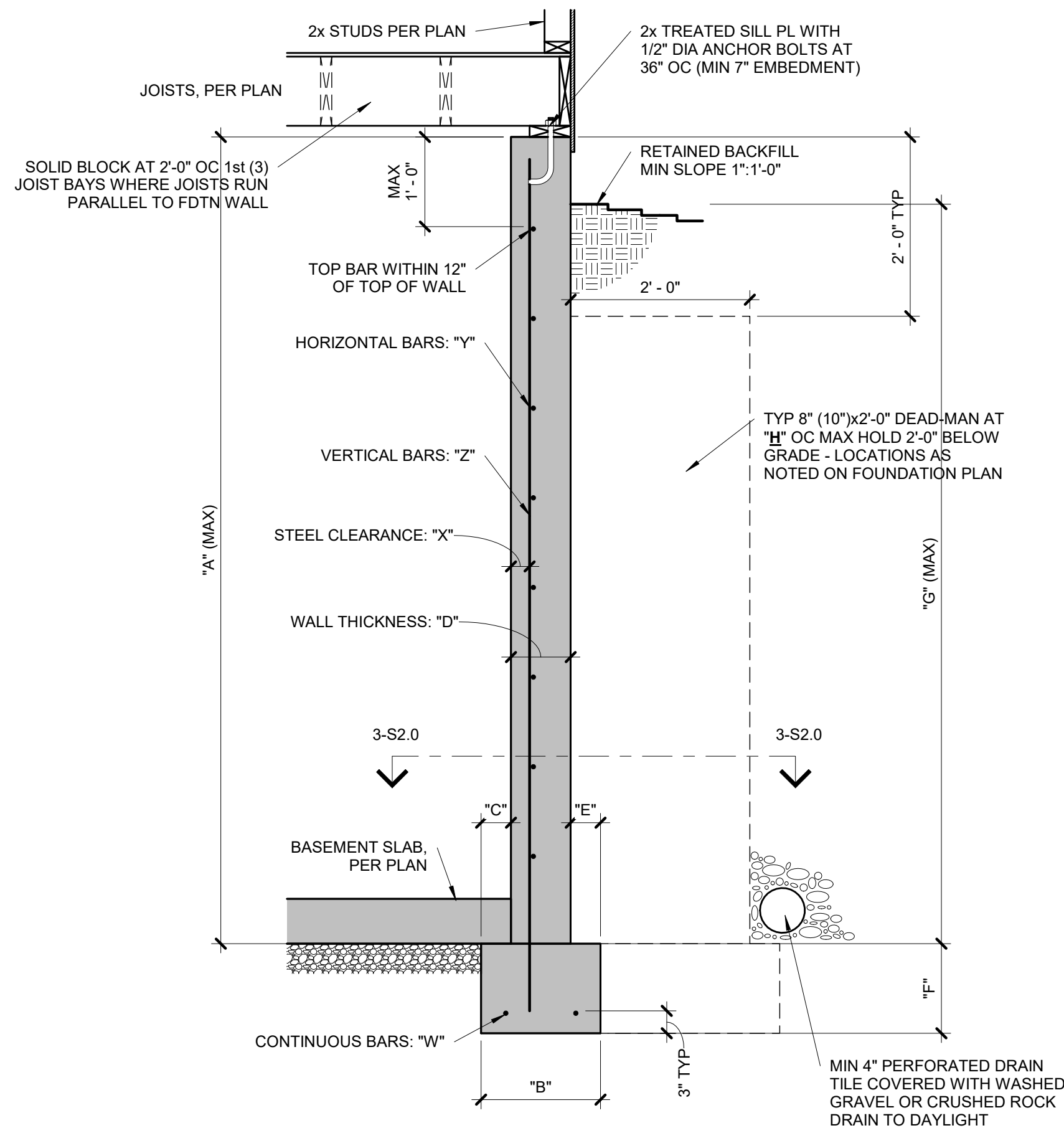
COMMENTS	
DATE	
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SHEET:

GENERAL NOTES

S1.0





#### CONCRETE DIMENSIONS

"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
8'-0"	1'-4"	4"	8"	4"	8"	7'-6"	20'-0"
9'-0"	1'-4"	4"	8"	4"	8"	8'-6"	20'-0"
10'-0"	1'-8"	5"	10"	5"	10"	9'-6"	20'-0"

#### NOTES:

- DIMENSION SHOWN IS FOR MAXIMUM UNINTERRUPTED WALL PANEL LENGTH BEFORE A DEAD-MAN SHALL BE INSTALLED. NOTE, A MINIMUM 2'-0" RETURN OR OFFSET IN THE FOUNDATION WALL SHALL SUBSTITUTE AS A DEAD-MAN AND/OR BREAK IN THE WALL PANEL LENGTH.
- VERTICAL REINFORCING STEEL TO EXTEND TO WITHIN 8" OF TOP WALL. MINIMUM (1) #4 HORIZONTAL BAR WITHIN 12" OF TOP AND BOTTOM OF WALL.
- BURIED CONCRETE FOUNDATION WALLS UP TO 9'-0" TALL MAY BE 8" NOMINAL THICKNESS WITH #4 BARS AT 24" OC BOTH WAYS OVER 16"x8" CONCRETE FOOTINGS WITH (2) #4 BARS CONTINUOUS, UNLESS OTHERWISE REQUIRED BY ENGINEERING REPORT BASED ON ACTUAL SITE CONDITIONS.
- WALL WILL NOT ACHIEVE FULL STRENGTH UNTIL FIRST FLOOR DECK AND BASEMENT SLAB HAVE BEEN PLACED.

#### TYPICAL FOUNDATION WALL

##### 1 DETAIL

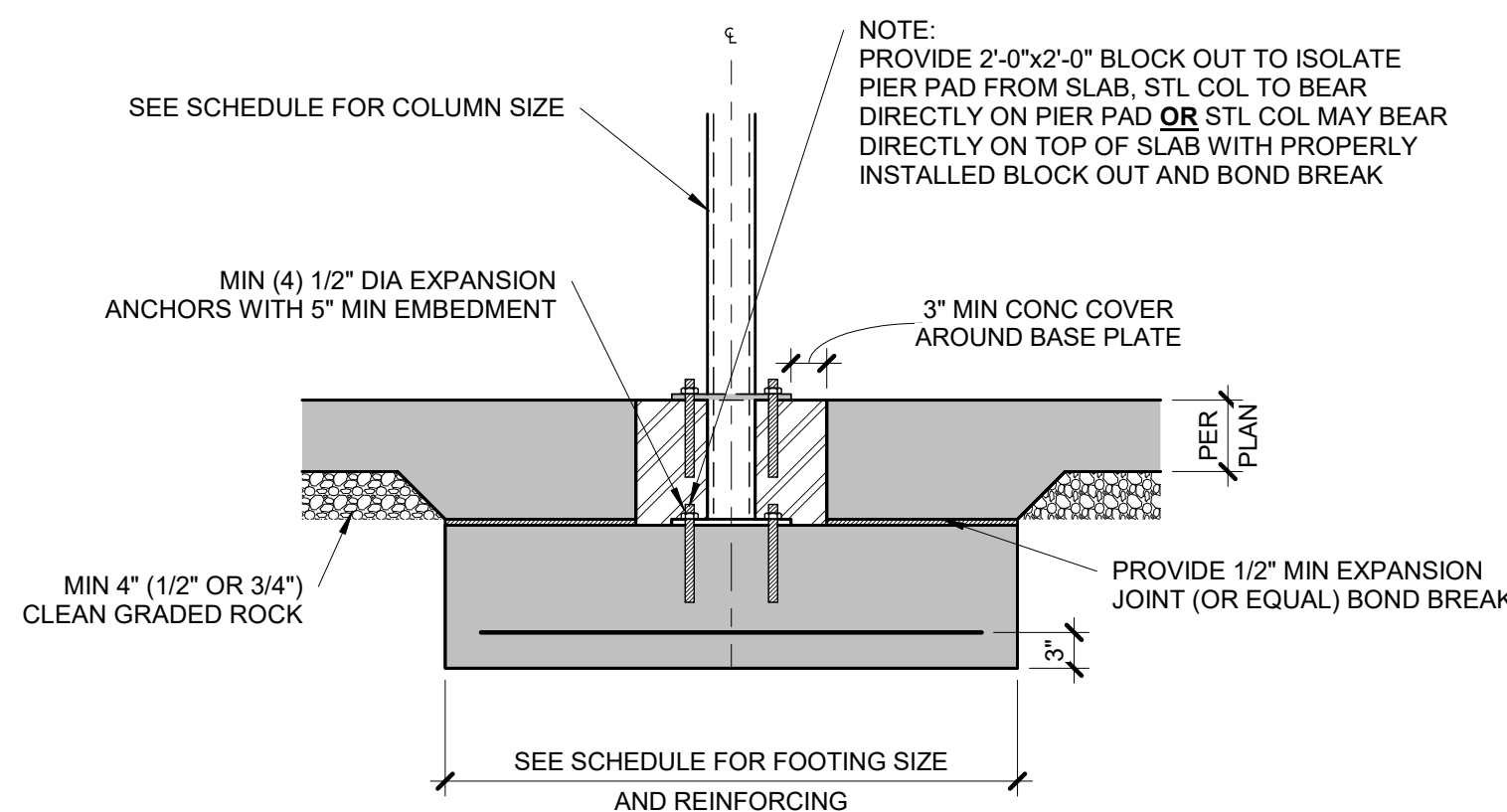
S2.0 3/4" = 1'-0"

#### COLUMN AND PIER PAD SCHEDULE

COLUMN MARK	PAD SIZE	REINFORCING	COL SIZE	COL TYPE
A	30"x30"x12"	(4) #4 BARS E-W	3" NOMINAL	SCHEDULE 40 STEEL COLUMN (FY = 58 ksi MIN)
B	36"x36"x12"	(4) #4 BARS E-W	3" NOMINAL	
C	42"x42"x12"	(5) #4 BARS E-W	3" NOMINAL	
D	48"x48"x12"	(6) #4 BARS E-W	3" NOMINAL	
E	54"x54"x16"	(8) #4 BARS E-W	3 1/2" NOMINAL (4" OD)	
F	60"x60"x16"	(10) #4 BARS E-W	3 1/2" NOMINAL (4" OD)	

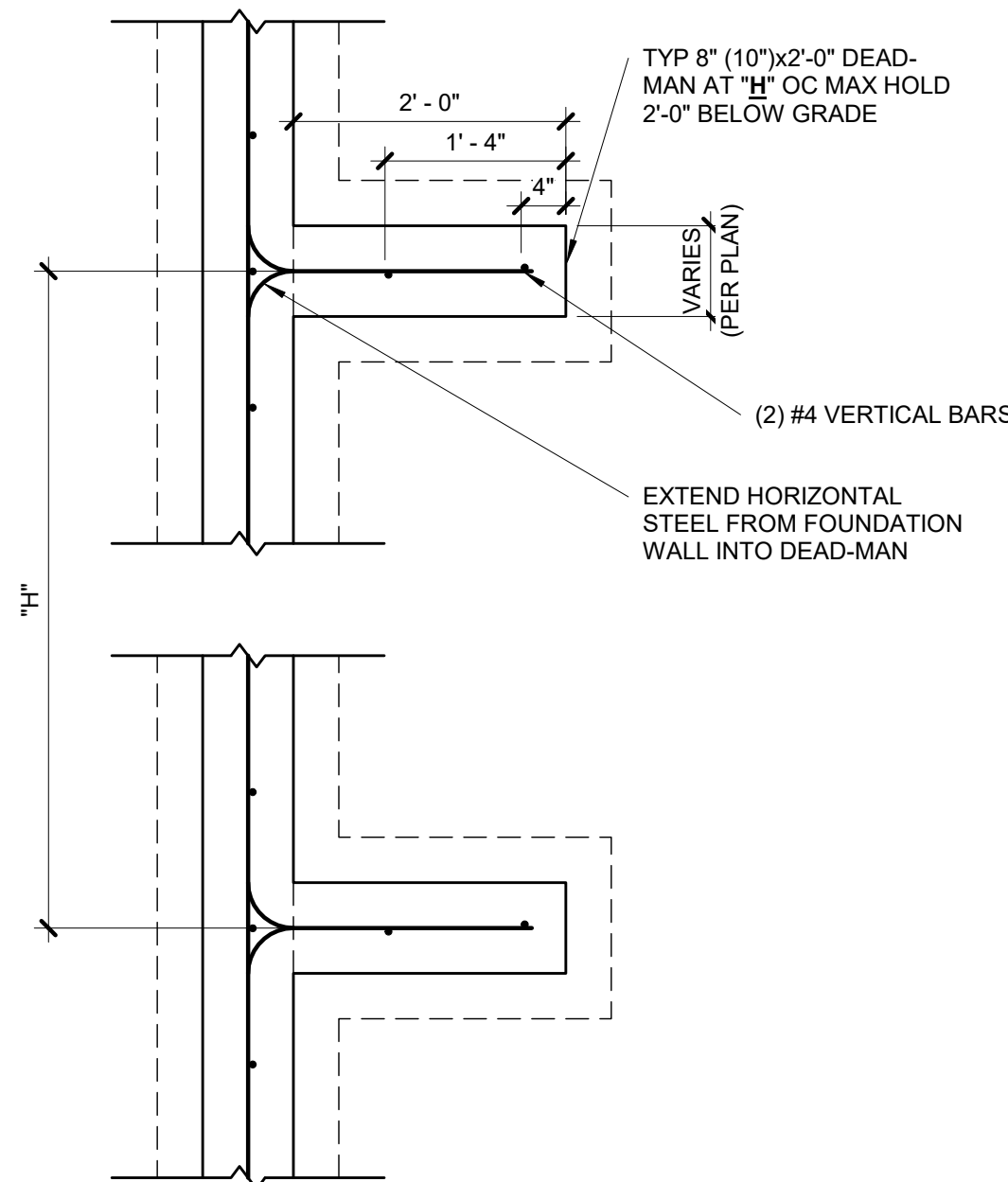
#### NOTES:

- COLUMN AND PIER PAD SIZES SHOWN ARE FOR MAXIMUM COLUMN HEIGHT OF 10'-0". REQUIRES SEPARATE ENGINEERED DESIGN IF GREATER THAN 10'-0"
- COLUMN AND PIER PAD SIZES SHOWN ARE BASED ON AN ASSUMED MINIMUM ALLOWABLE SOIL BEARING CAPACITY OF 2,000 PSF.



#### 5 COLUMN PAD DETAIL

S2.0 3/4" = 1'-0"

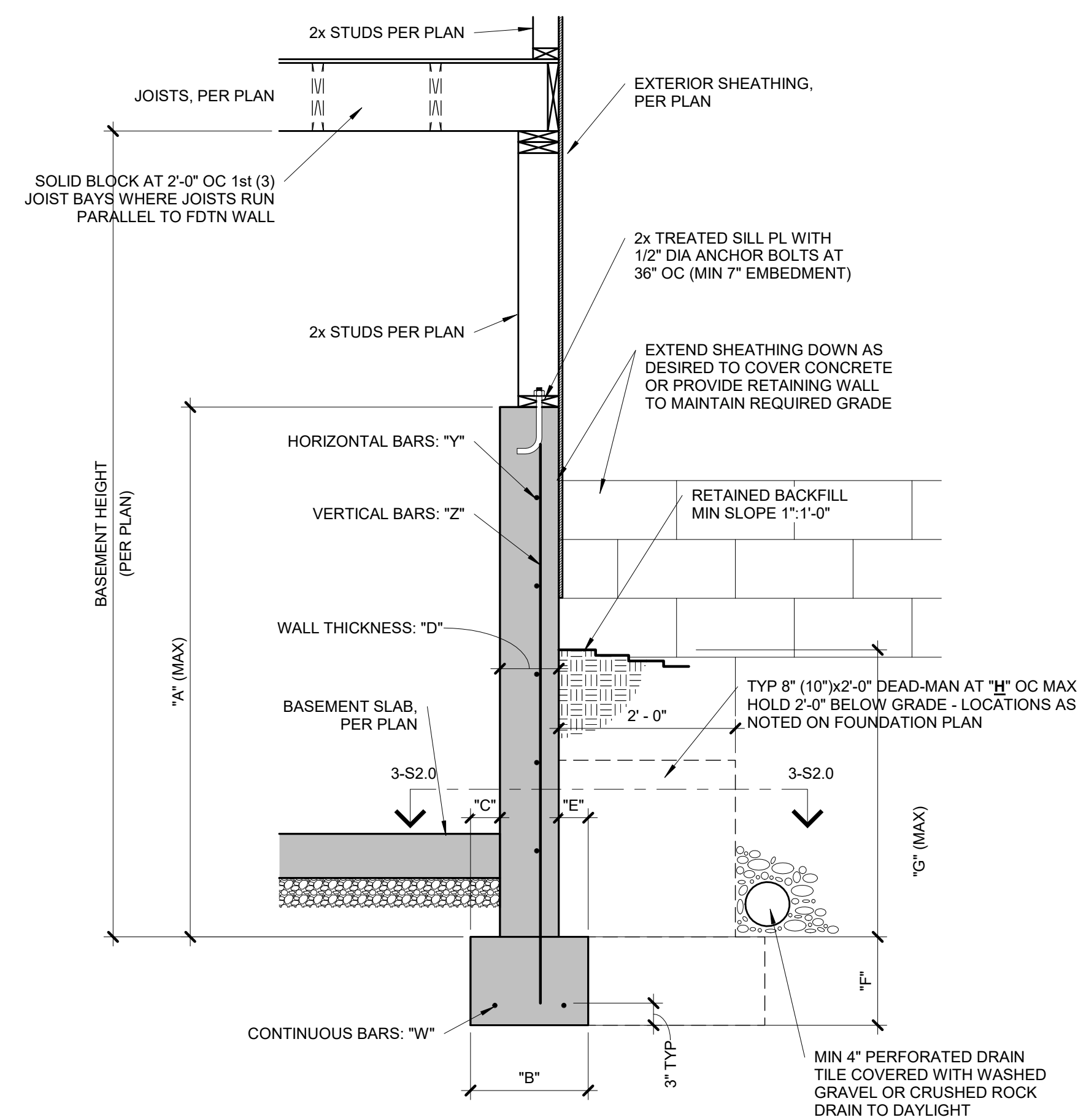


#### NOTES:

- MIN 3000 PSI FOOTING COMPRESSIVE CONCRETE STRENGTH.
- MIN 3000 PSI WALL COMPRESSIVE CONCRETE STRENGTH.
- AIR ENTRAINMENT BETWEEN 5% & 7% OF CONCRETE VOLUME.
- GRADE 40 REINFORCING STEEL UNLESS OTHERWISE NOTED.
- LAP SPLICES 24" MIN.
- WALL SHALL BE BACK-FILLED WITH CLEAN, LEAN CLAY (OR BETTER) LOW VOLUME CHANGE MATERIAL. ON-SITE MATERIAL MAY BE USED IF DEEMED ACCEPTABLE BY THE GEOTECHNICAL ENGINEER.
- ASSUMED 2,000 PSF BEARING (TO BE VERIFIED BY GEOTECHNICAL ENGINEER).

#### 3 TYPICAL DEAD-MAN SECTION

S2.0 3/4" = 1'-0"



#### CONCRETE DIMENSIONS

"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
4'-0"	1'-4"	4"	8"	4"	8"	3'-4"	20'-0"
6'-0"	1'-4"	4"	8"	4"	8"	4'-4"	20'-0"
9'-0"	1'-8"	5"	8"	4"	8"	4'-4"	20'-0"

#### REINFORCING BARS (GRADE 40 BARS)

"W"	"X"	"Y"	"Z"
(2) #4	N/A	#4 BARS AT 24" OC	#4 BARS AT 24" OC
(2) #4	N/A	#4 BARS AT 24" OC	#4 BARS AT 24" OC
(2) #4	N/A	#4 BARS AT 24" OC	#4 BARS AT 24" OC

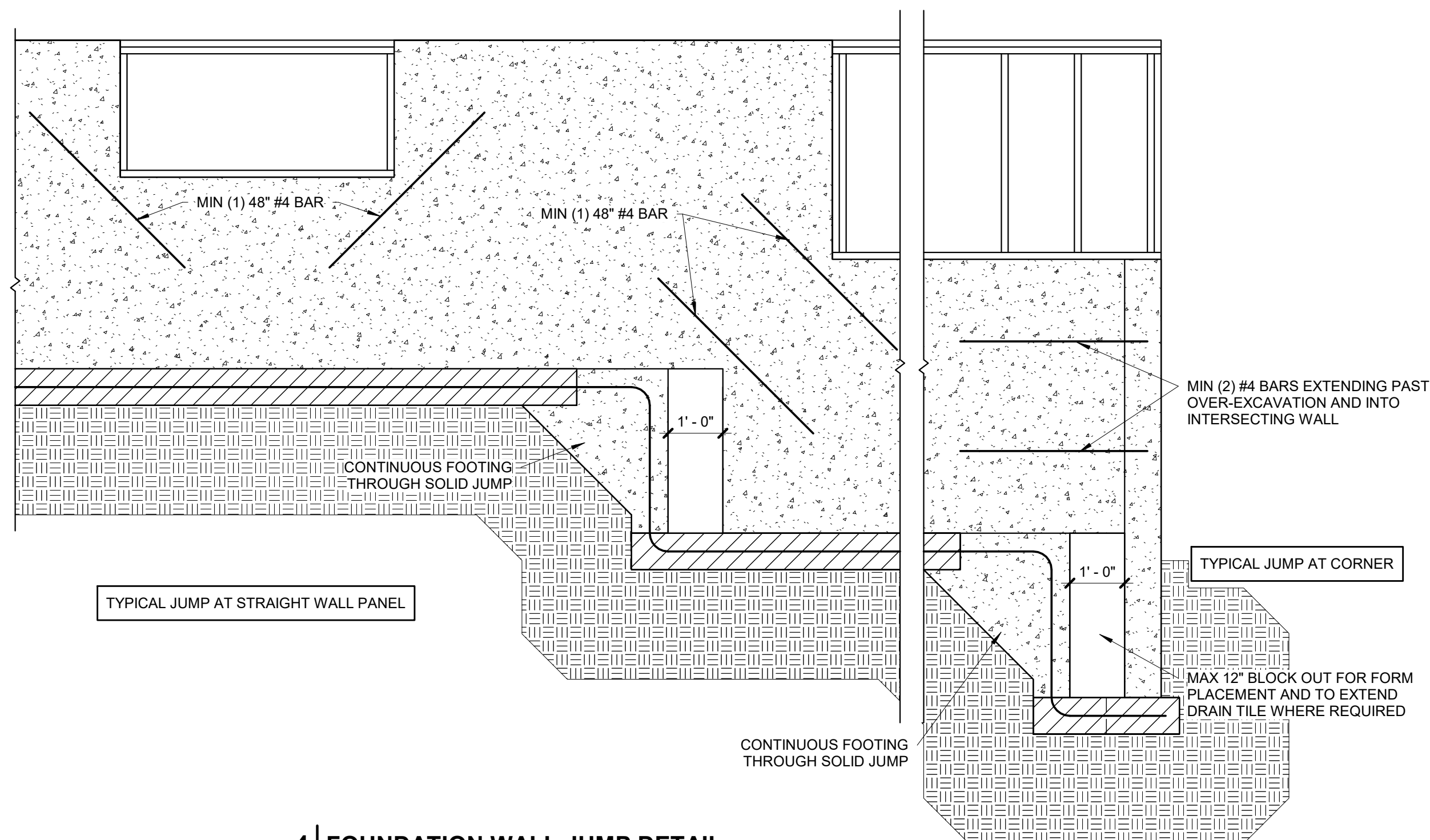
#### NOTES:

- DIMENSION SHOWN IS FOR MAXIMUM UNINTERRUPTED WALL PANEL LENGTH BEFORE A DEAD-MAN SHALL BE INSTALLED. NOTE, A MINIMUM 2'-0" RETURN OR OFFSET IN THE FOUNDATION WALL SHALL SUBSTITUTE AS A DEAD-MAN AND/OR BREAK IN THE WALL PANEL LENGTH.
- VERTICAL REINFORCING STEEL TO EXTEND TO WITHIN 8" OF TOP WALL. MINIMUM (1) #4 HORIZONTAL BAR WITHIN 12" OF TOP AND BOTTOM OF WALL.
- THE BASEMENT SLAB IS AN INTEGRAL PART OF THE 'UNRESTRAINED' FOUNDATION WALL DESIGN THEREFORE, IF THE WALL IS BACKFILLED PRIOR TO PLACEMENT OF THE BASEMENT SLAB, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY BRACING THE WALL UNTIL THE BASEMENT SLAB HAS BEEN PLACED.

#### TYPICAL 'UNRESTRAINED'

##### 2 FOUNDATION WALL DETAIL

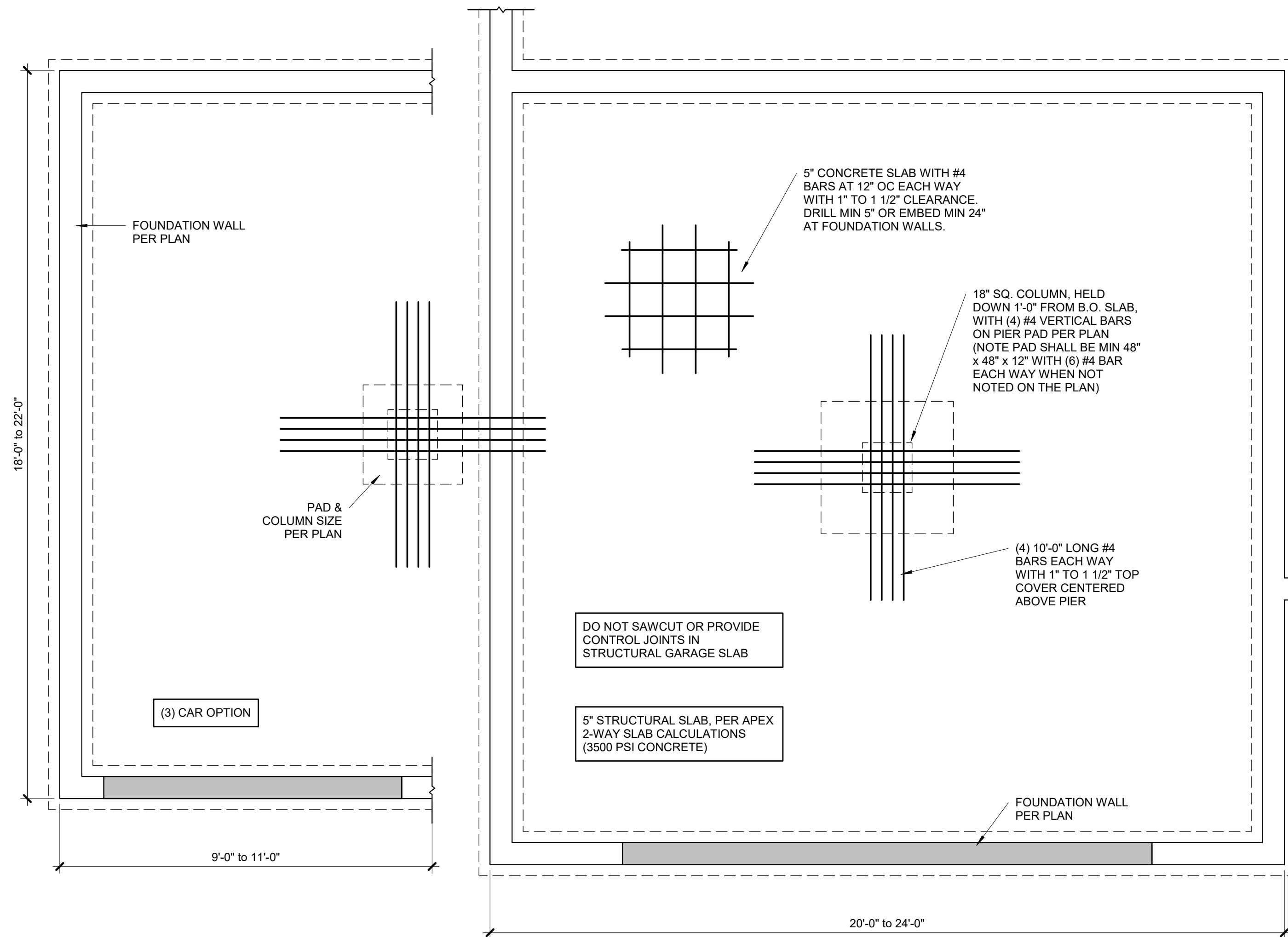
S2.0 3/4" = 1'-0"



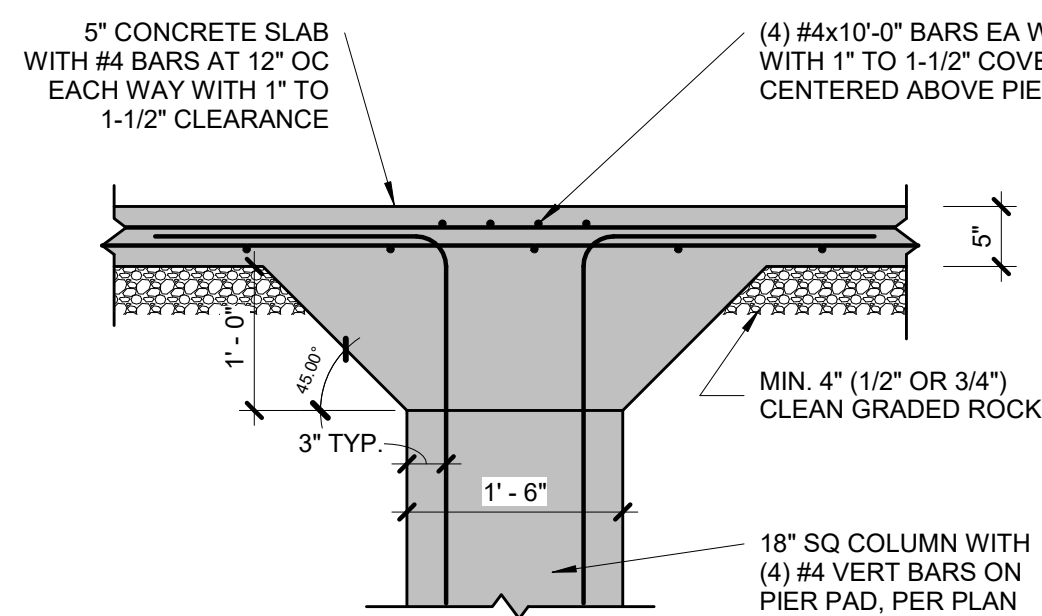
#### 4 FOUNDATION WALL JUMP DETAIL

S2.0 1/2" = 1'-0"

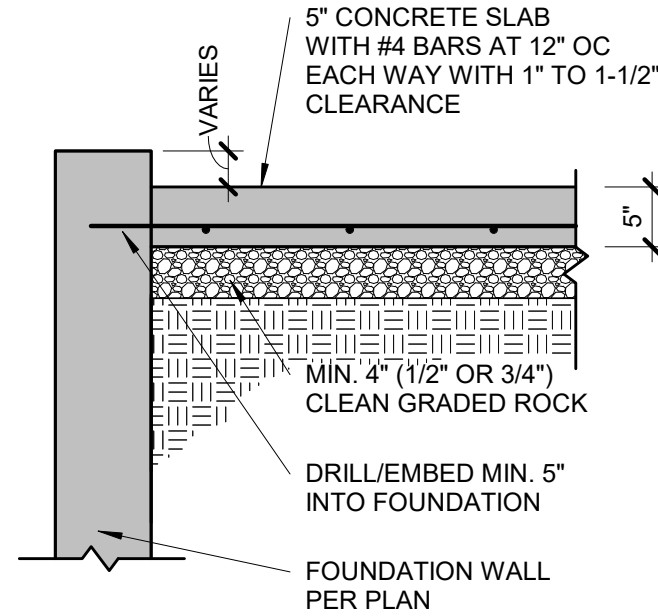




**1 TYPICAL STRUCTURAL GARAGE SLAB PLAN**  
S2.1 3/8" = 1'-0"

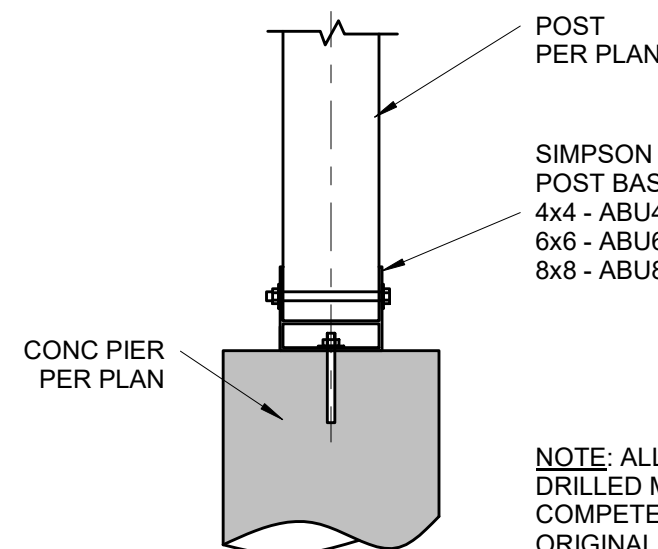


**2 STRUCTURAL GARAGE SLAB PIER PAD DETAIL**  
S2.1 3/4" = 1'-0"



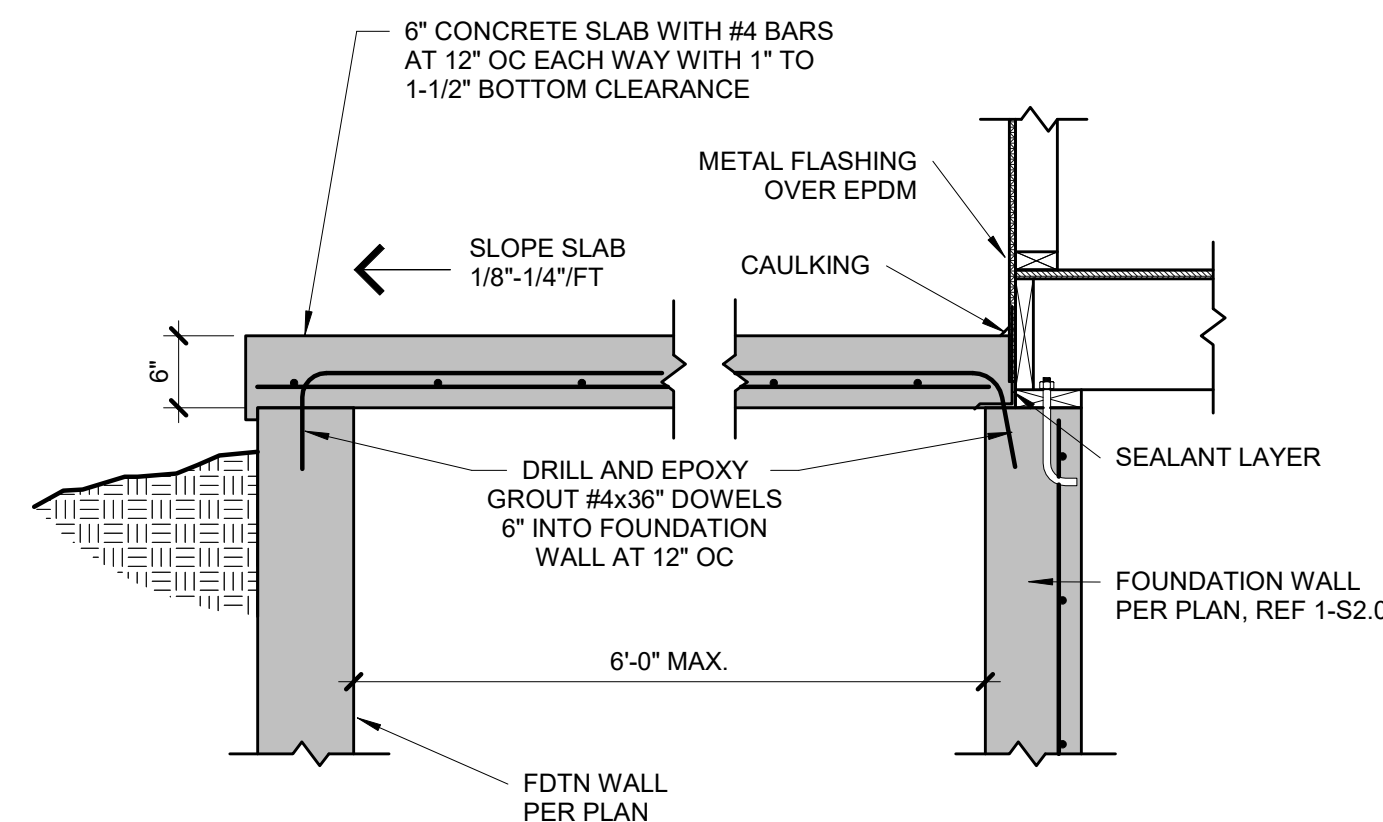
**3 STRUCTURAL GARAGE SLAB/WALL SECTION**  
S2.1 3/4" = 1'-0"

PIER SCHEDULE		
COLUMN MARK	COL SIZE	PIER DIAMETER
G	PER PLAN	12"
H	PER PLAN	16"
J	PER PLAN	18"
K	PER PLAN	24"
L	PER PLAN	28"



NOTE: ALL CONC. PIERS SHALL BE DRILLED MIN 36" DEEP TO COMPETENT ORIGINAL SOIL WITH MIN 2,000 PSF BEARING CAPACITY (TYP UNO)

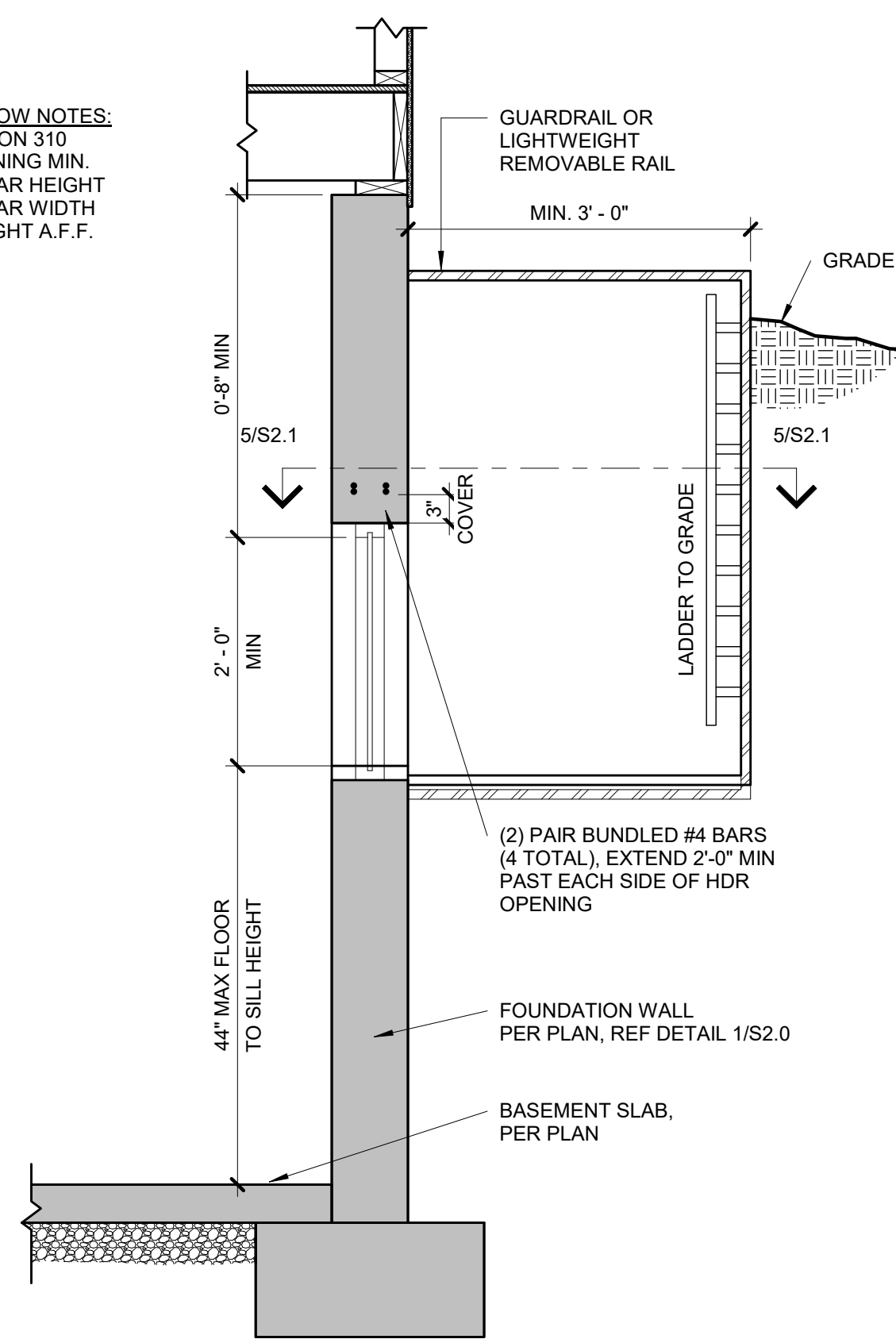
**8 POST BASE DETAIL**  
S2.1 3/4" = 1'-0"



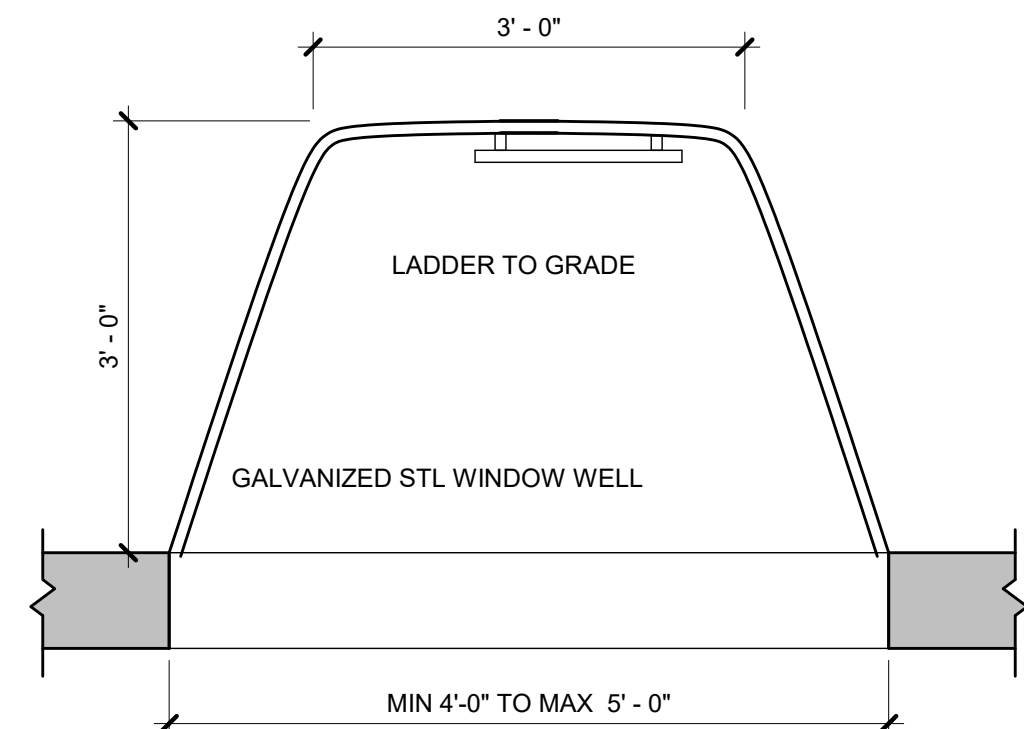
FORMWORK OPTIONS:  
1. PROVIDE VULCRAFT 2VLI (OR EQUAL) CORRUGATED DECKING (SHORE AT MID-SPAN DURING CONSTRUCTION), OR  
2. PLYWOOD FORMS WITH EXPANDABLE BAR JOISTS OR TEMPORARY FRAMED WALLS BY CONTRACTOR.

**7 SUSPENDED PORCH STOOP DETAIL**  
S2.1 3/4" = 1'-0"

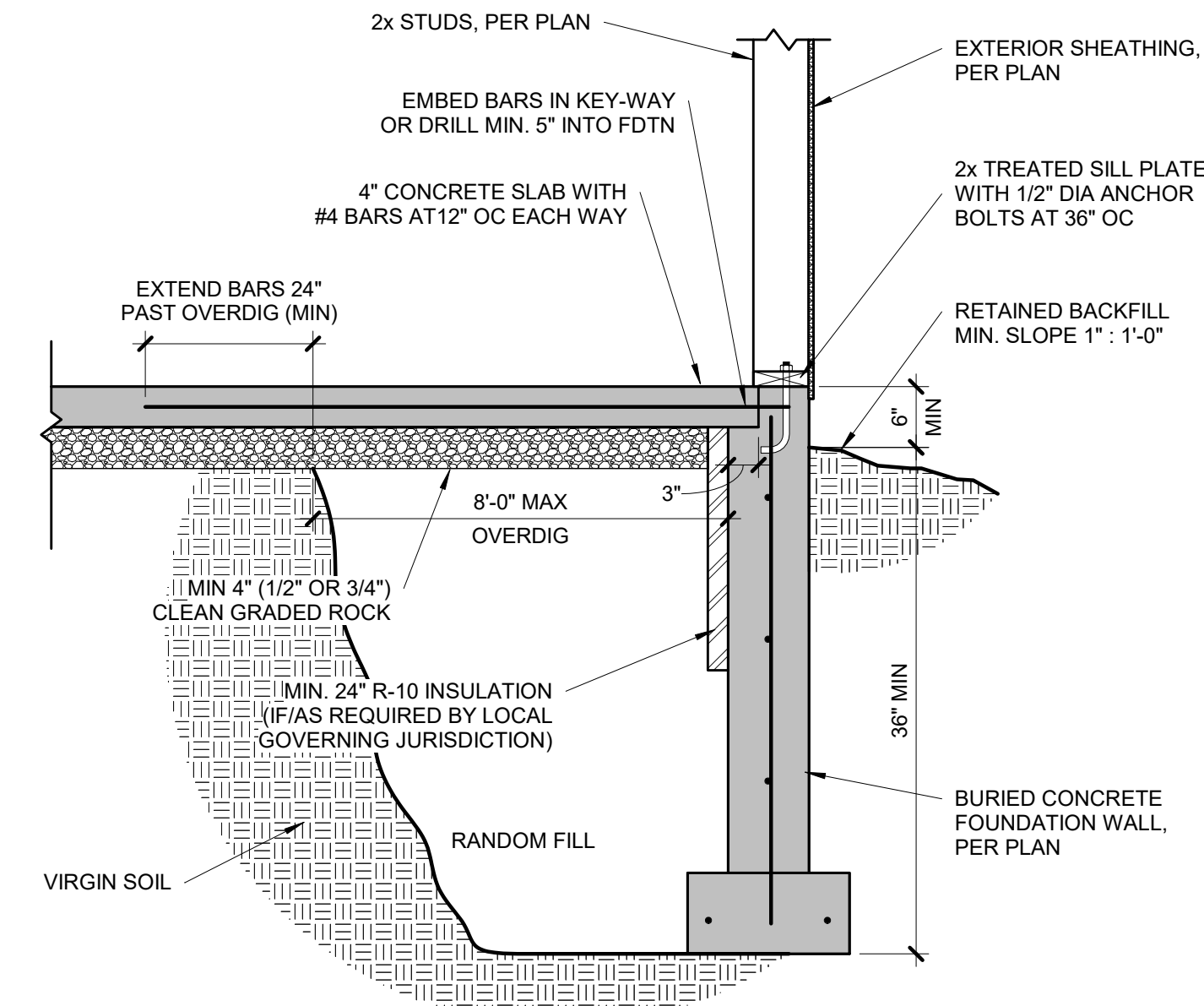
EGRESS WINDOW NOTES:  
PER IRC SECTION 310  
1. 5.7 S.F. OPENING MIN.  
2. 24" MIN. CLEAR HEIGHT  
3. 20" MIN. CLEAR WIDTH  
4. 44" MAX HEIGHT A.F.F.



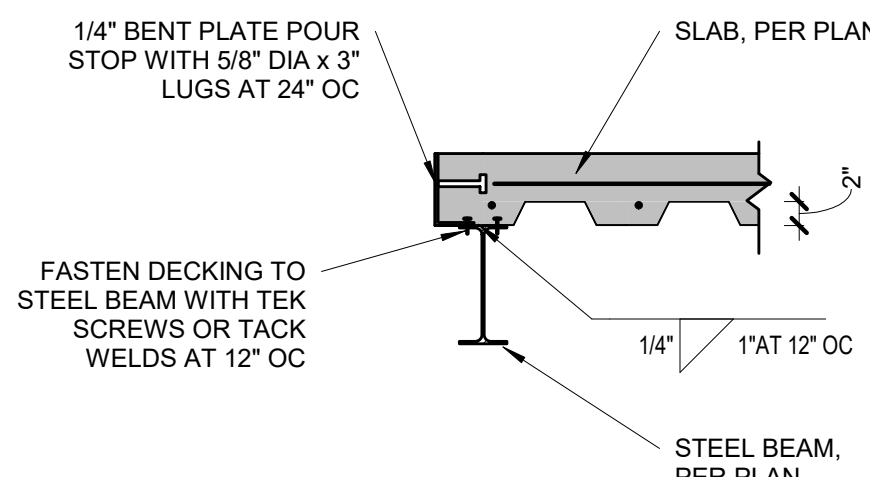
**4 TYPICAL EGRESS WINDOW SECTION DETAIL**  
S2.1 3/4" = 1'-0"



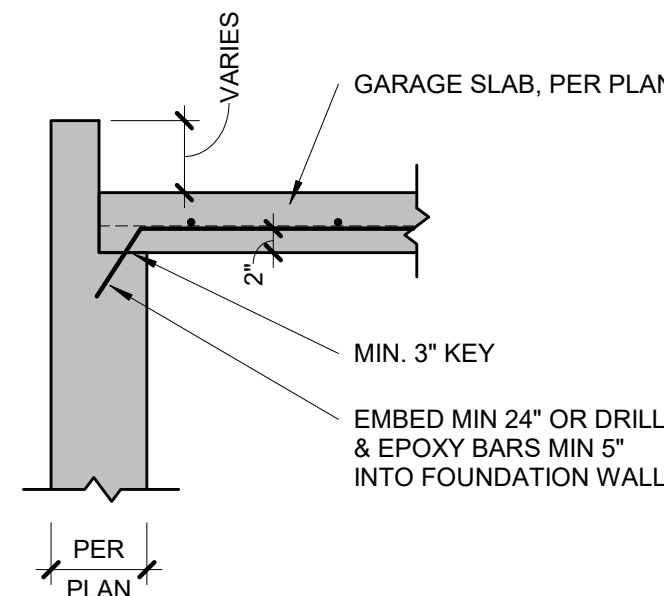
**5 TYPICAL EGRESS WINDOW PLAN**  
S2.1 3/4" = 1'-0"



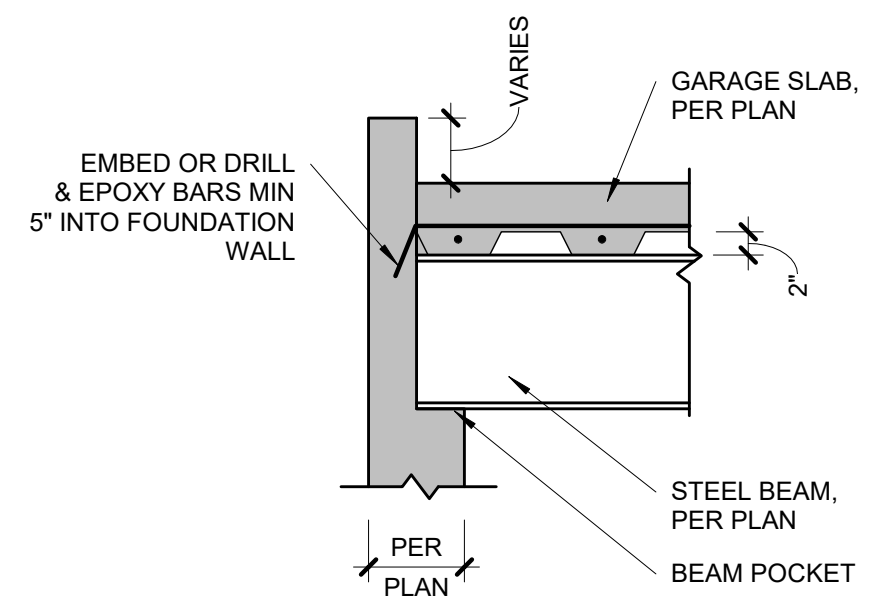
**6 TYPICAL OVERDIG DETAIL AT BASEMENT SLAB**  
S2.1 3/4" = 1'-0"



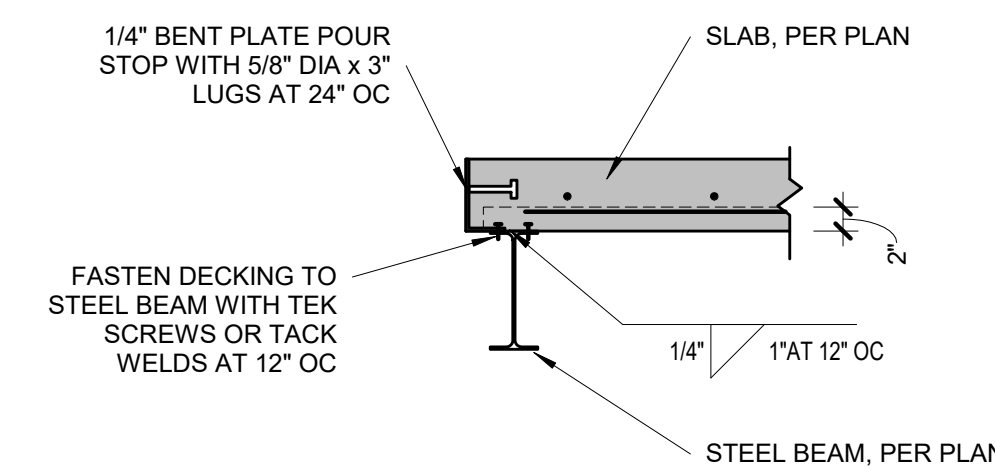
**9 POUR STOP DETAIL**  
S2.1 3/4" = 1'-0"



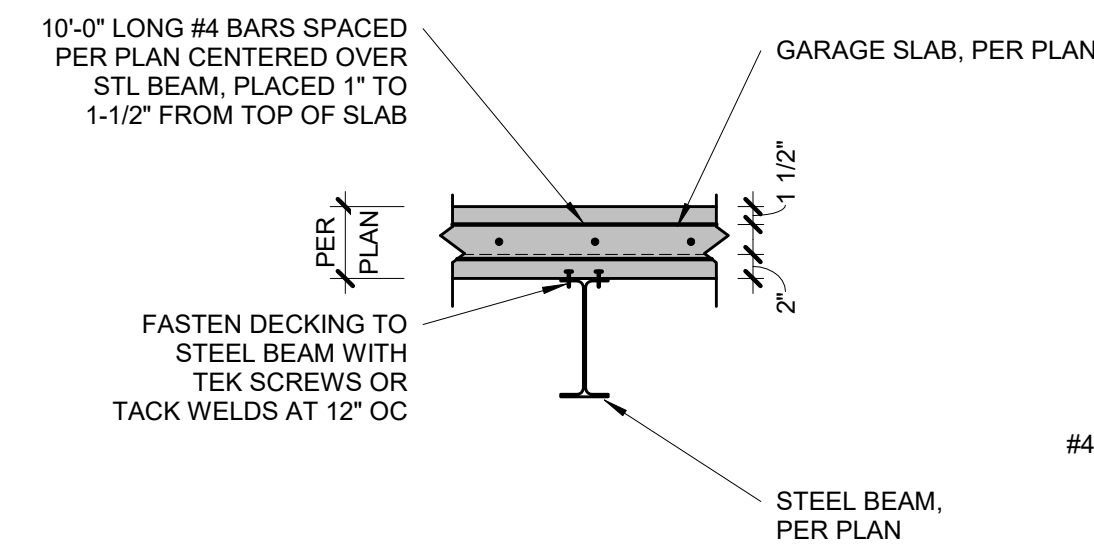
**10 GARAGE SLAB BEARING**  
S2.1 3/4" = 1'-0"



**11 GARAGE SLAB BEAM BEARING**  
S2.1 3/4" = 1'-0"

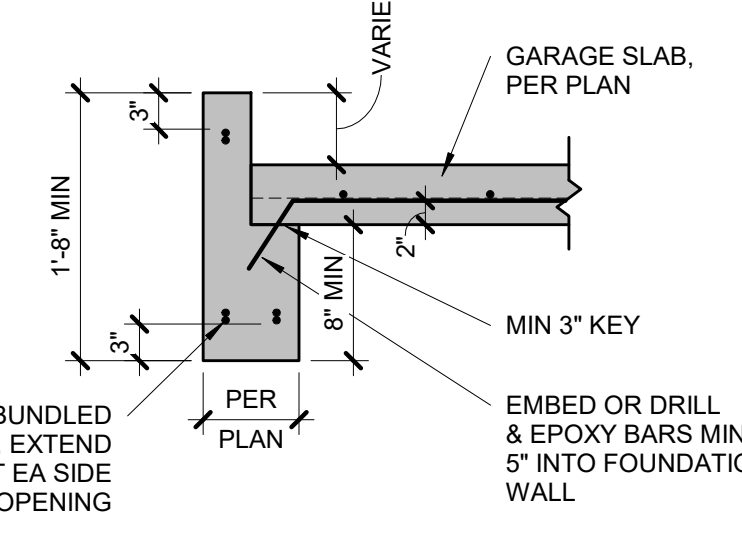


**12 POUR STOP DETAIL**  
S2.1 3/4" = 1'-0"



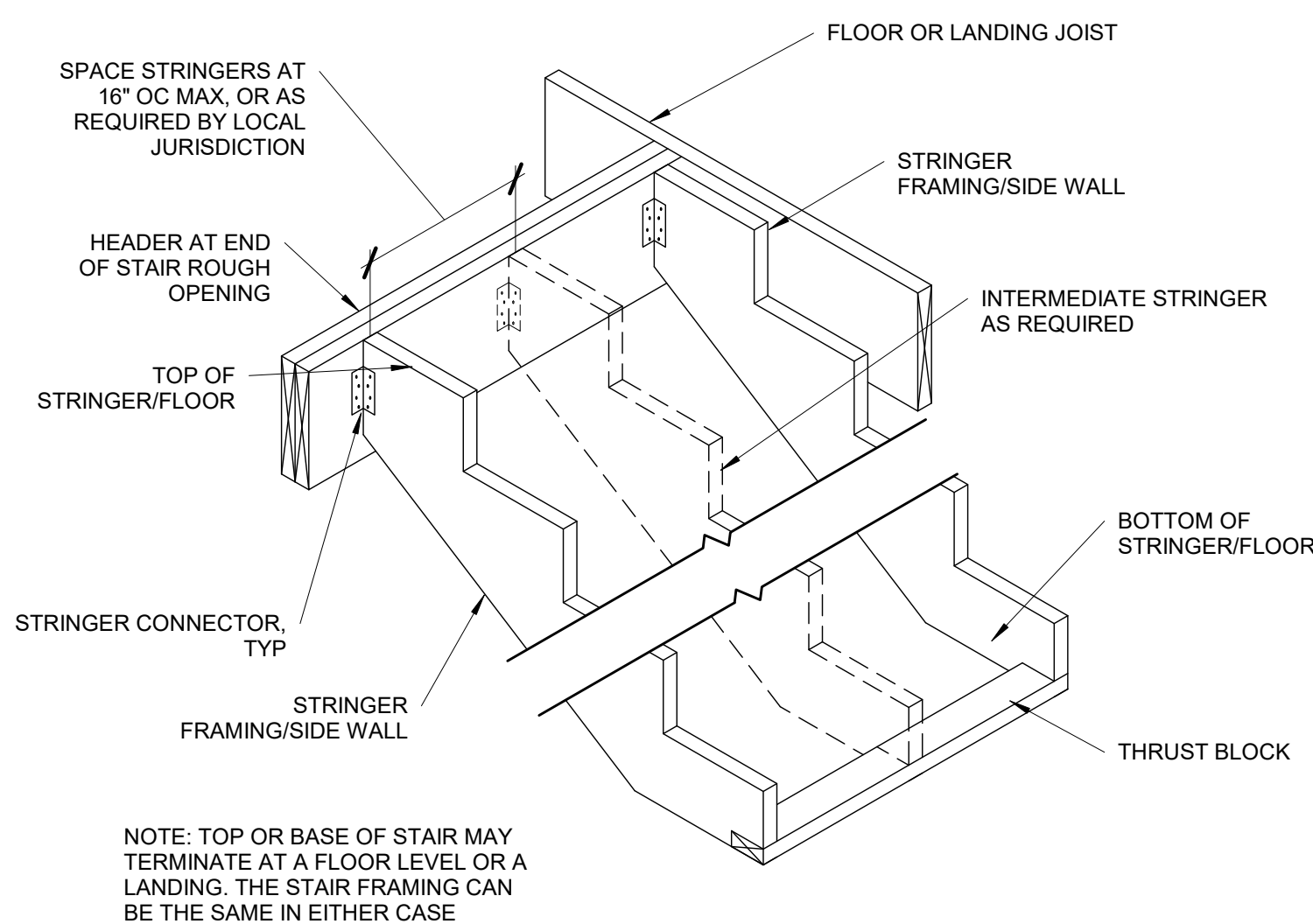
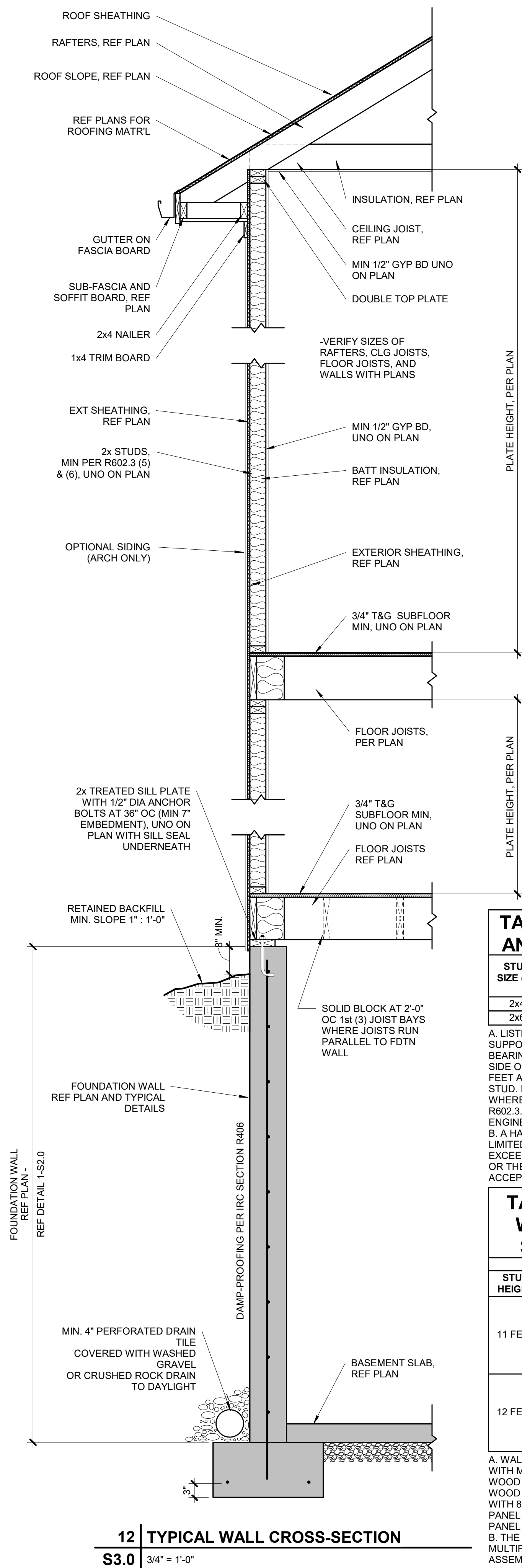
**13 GARAGE SLAB BEAM BEARING**  
S2.1 3/4" = 1'-0"

STEEL DECKING NOTES:  
• MINIMUM 1-1/2" BEARING  
• FASTEN TO SUPPORT STEEL WITH 5/8" VISIBLE PUDDLE WELDS AT EDGE RIBS AND 12" CENTERS ALONG END BEARING  
• FASTEN SIDE LAPS AND PERIMETER EDGES AT 36" CENTERS WITH #10 TEK SCREWS OR 5/8" PUDDLE WELDS  
• MAX UNSUPPORTED CONSTRUCTION SPAN 6'-0", UNO ON PLANS BY APEX



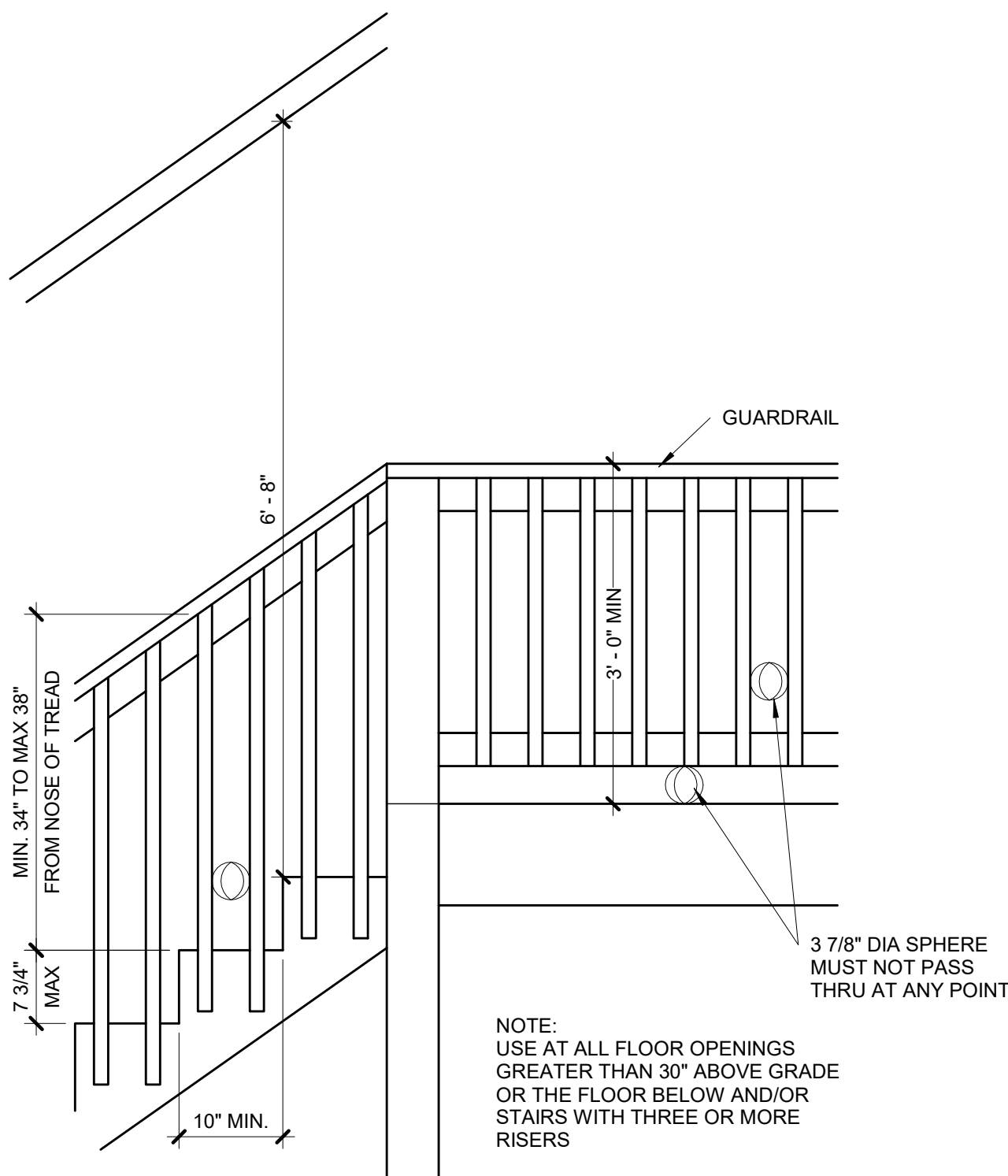
**14 CONCRETE HEADER DETAIL**  
S2.1 3/4" = 1'-0"





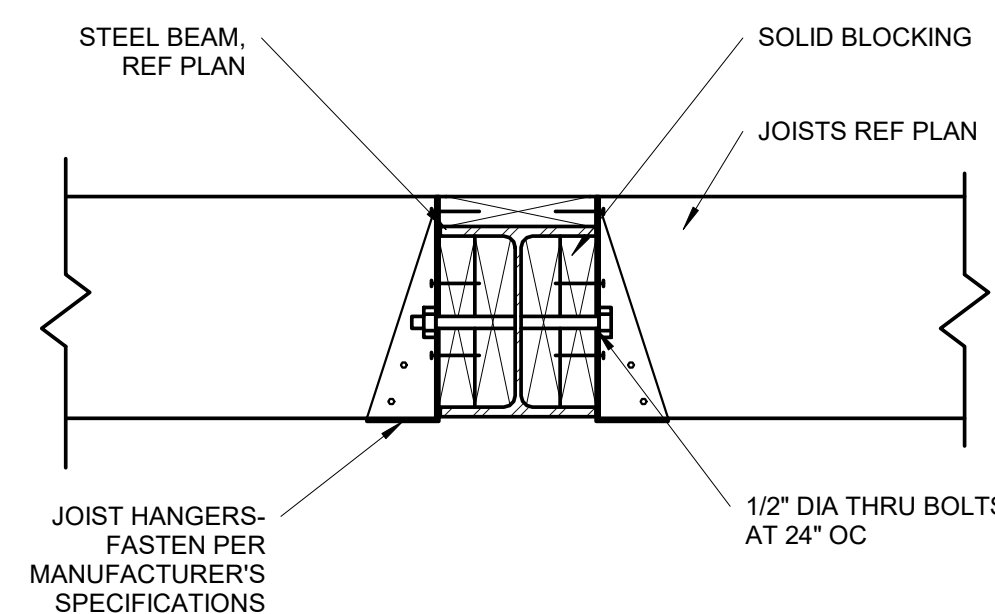
## 11 | TYPICAL STRINGER DETAIL

<b>S3.0</b>	$3/4" = 1'-0"$
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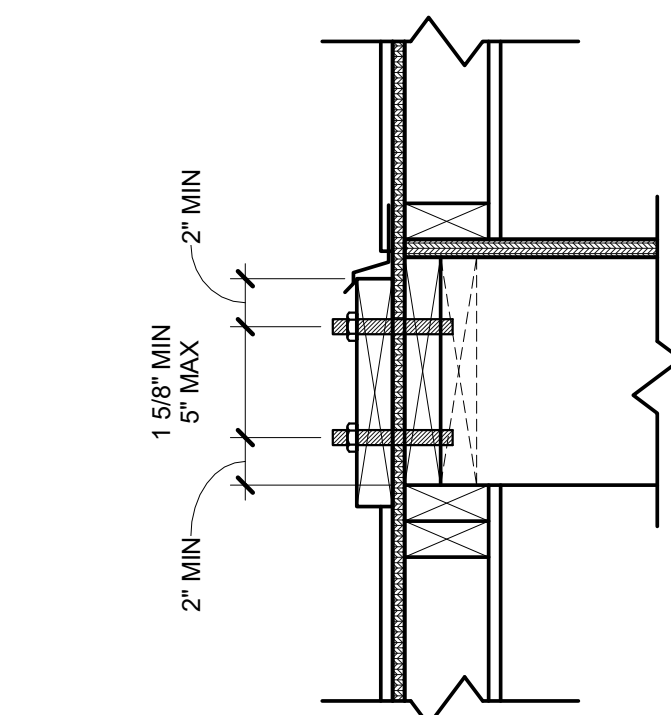
## 10 | TYPICAL STAIR/RAIL DETAIL

<b>S3.0</b>	$3/4" = 1'-0"$
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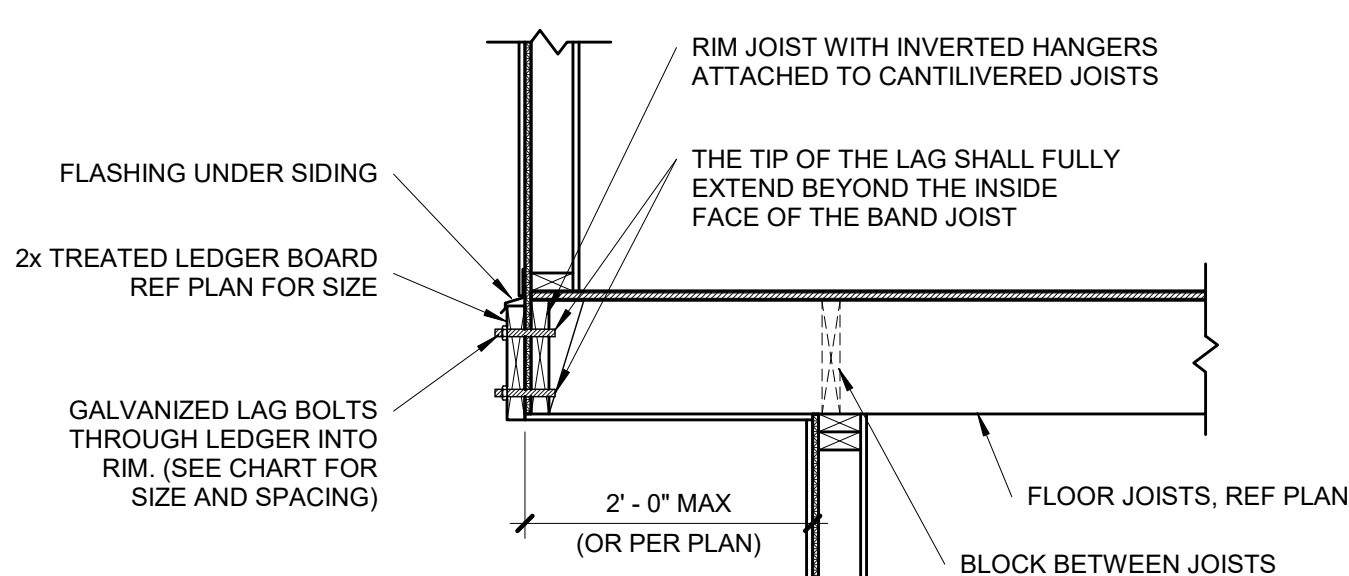
## UPSET STEEL BEAM/JOIST

9	CONNE
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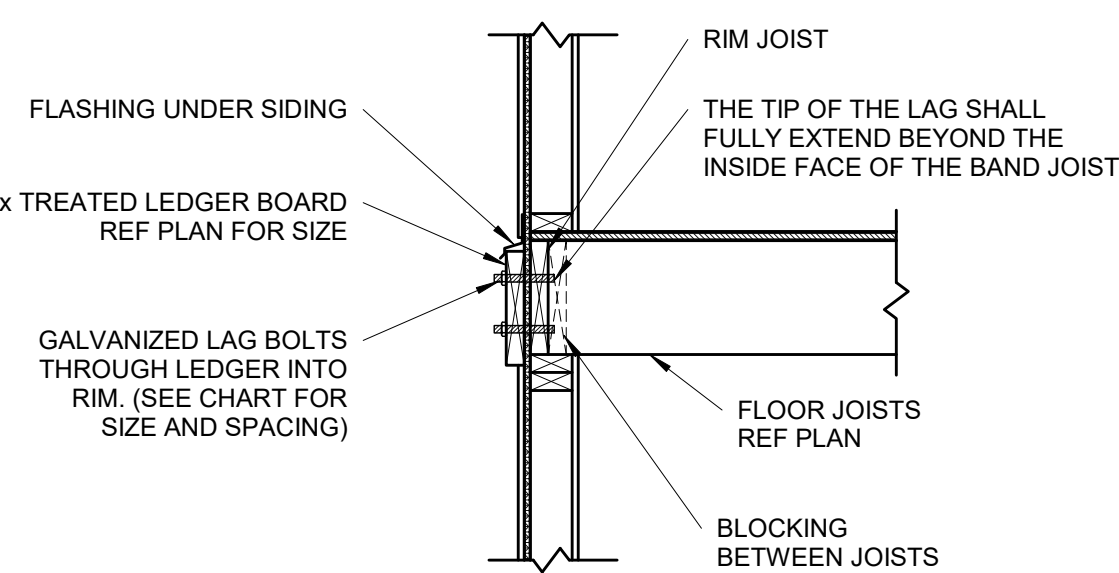
## 8 | LEDGER FASTENER PLACEMENT

<b>S3.0</b>	1 1/2" = 1'-0"
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## TYPICAL CANTILEVER FRAMING

7	WITH
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## DECK LEDGER ATTACHMENT CHART

DECK JOIST SPAN	1/2" DIA LAG SPACING	EQUIVALENT SPACING FOR 16" OC JOIST BAYS
UP TO 10'-0"	16" OC	N/A
10'-1" TO 12'-0"	15" OC	16" OC DBL EVERY OTHER
12'-1" TO 14'-0"	13" OC	16" OC DBL EVERY OTHER
14'-1" TO 16'-0"	11" OC	16" OC DBL EVERY JOIST BAY
16'-1" TO 18'-0"	10" OC	16" OC DBL EVERY JOIST BAY

NOTE:  
CHART IS APPLICABLE ONLY WHEN DECK IS SHOWN ON APPROVED PLAN

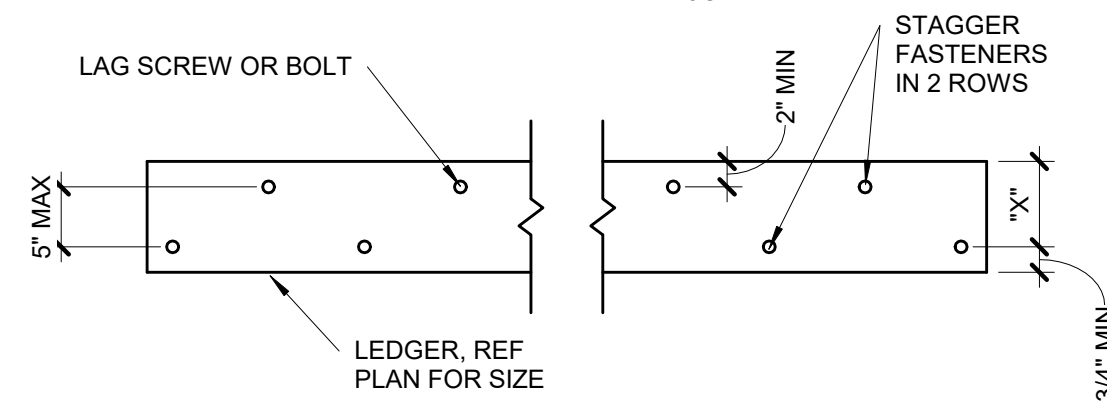
NOTE:  
CHART IS APPLICABLE ONLY WHEN DECK IS SHOWN ON APPROVED PLAN

## 6 | TYPICAL LEDGER ATTACHMENT

<b>S3.0</b>	$3/4" = 1'-0"$
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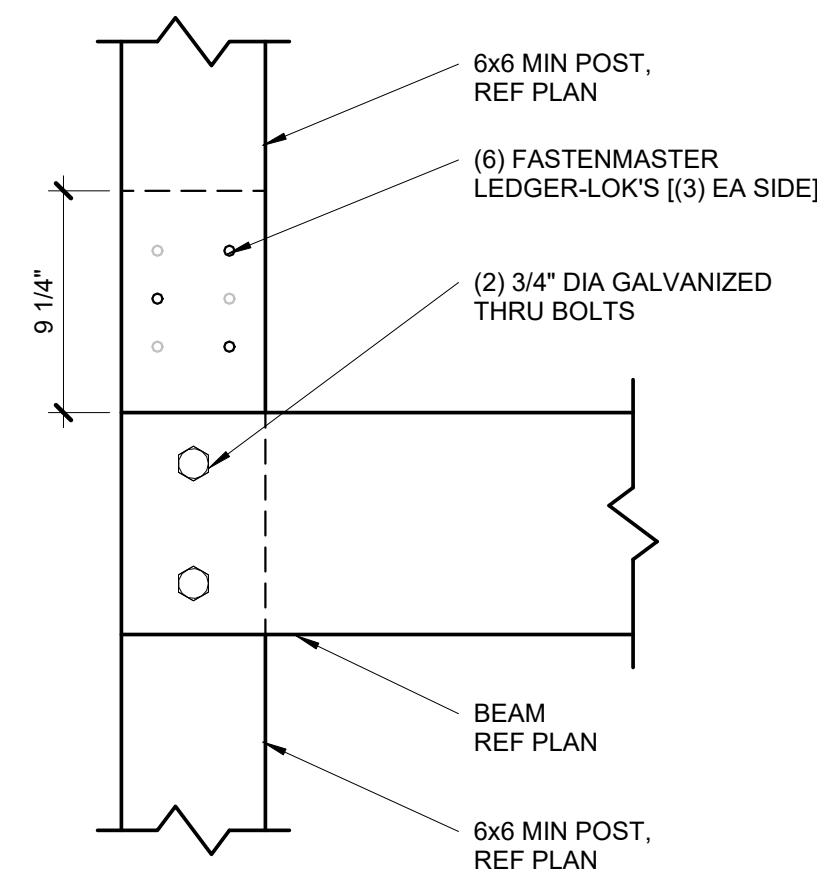
BEAM SIZE	"X"
2x8*	5 1/2" MIN
2x10	6 1/2" MIN
2x12	7 1/2" MIN

\*DISTANCE SHALL BE PERMITTED TO BE REDUCED TO 4 1/2" IF LAG SCREWS ARE USED OR BOLT SPACING IS REDUCED TO THAT OF LAG SCREWS TO ATTACH 2x8 LEDGERS TO 2x8 BAND JOISTS

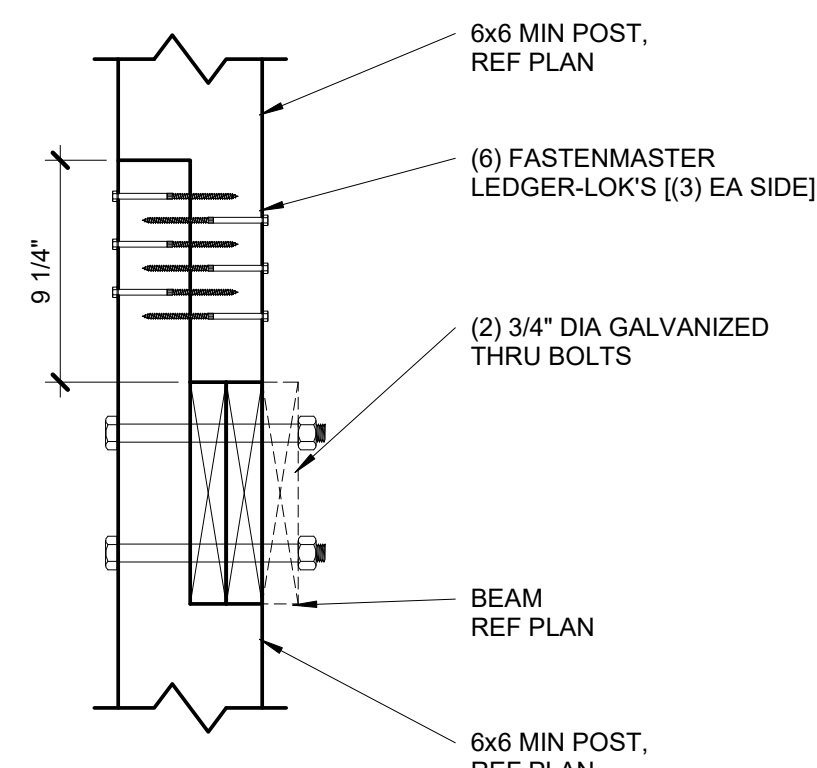


## 5 | TYPICAL LEDGER BOLT SPACING

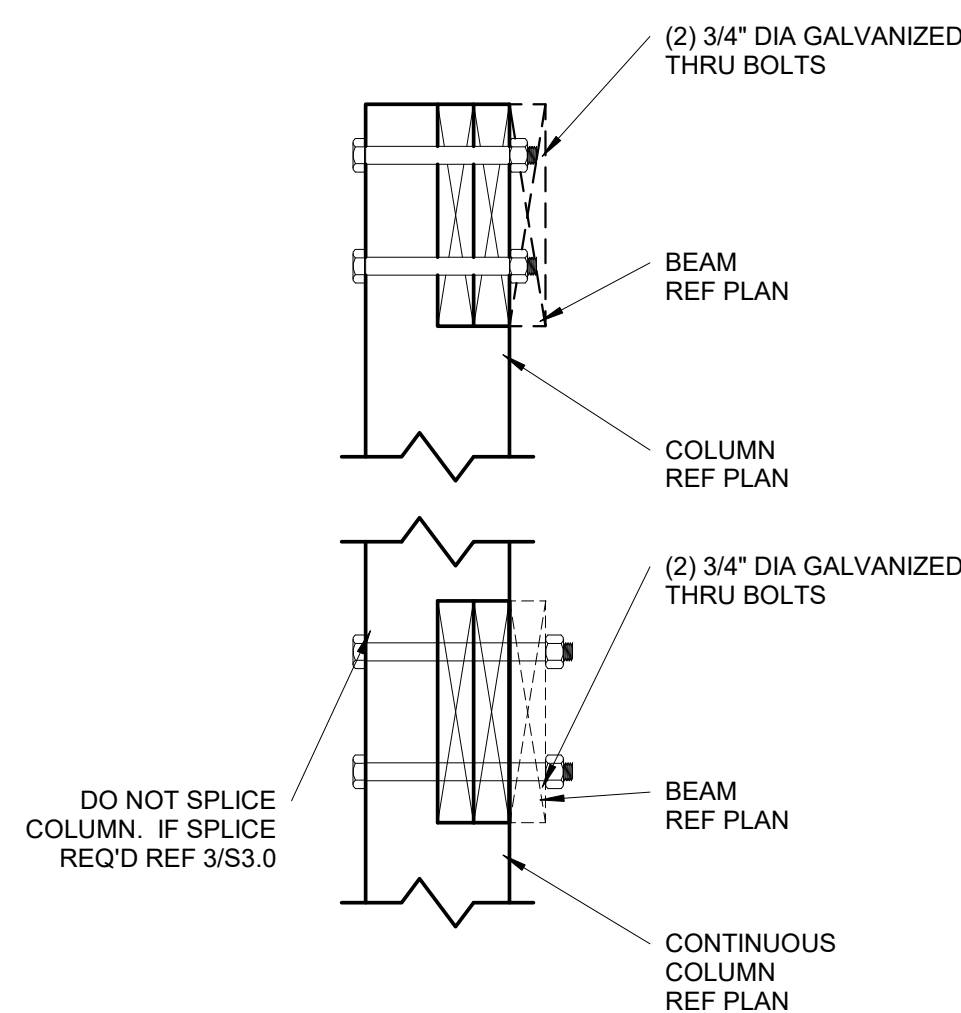
<b>S3.0</b>	3/4" = 1'-0"
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**SPLICED DECK COLUMN**

4	CONNEC
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**SPLICED DECK COLUMN**

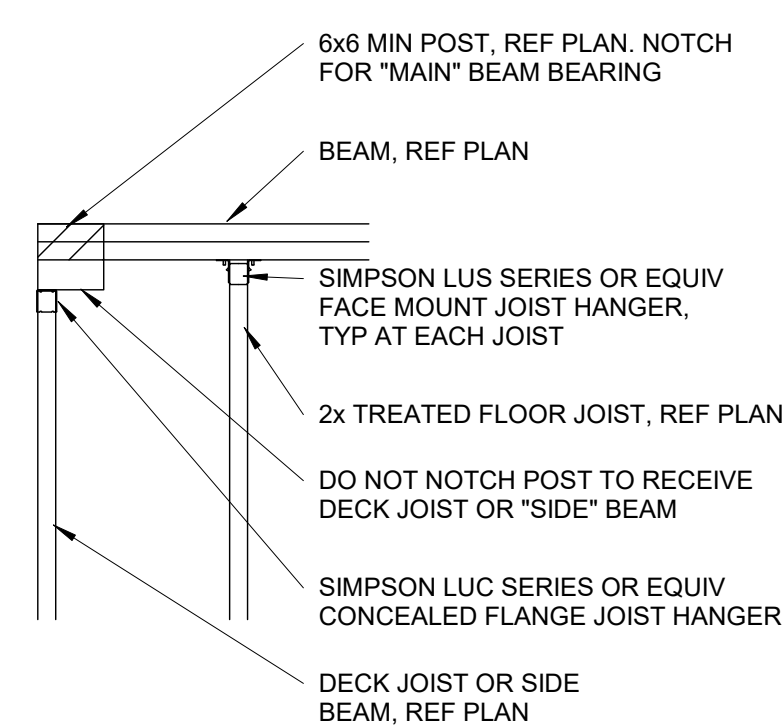
3	CONNEC
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DO NOT SPLICE  
COLUMN. IF SPLICE  
REQ'D REF 3/S3.0

## DECK BEAM/COLUMN

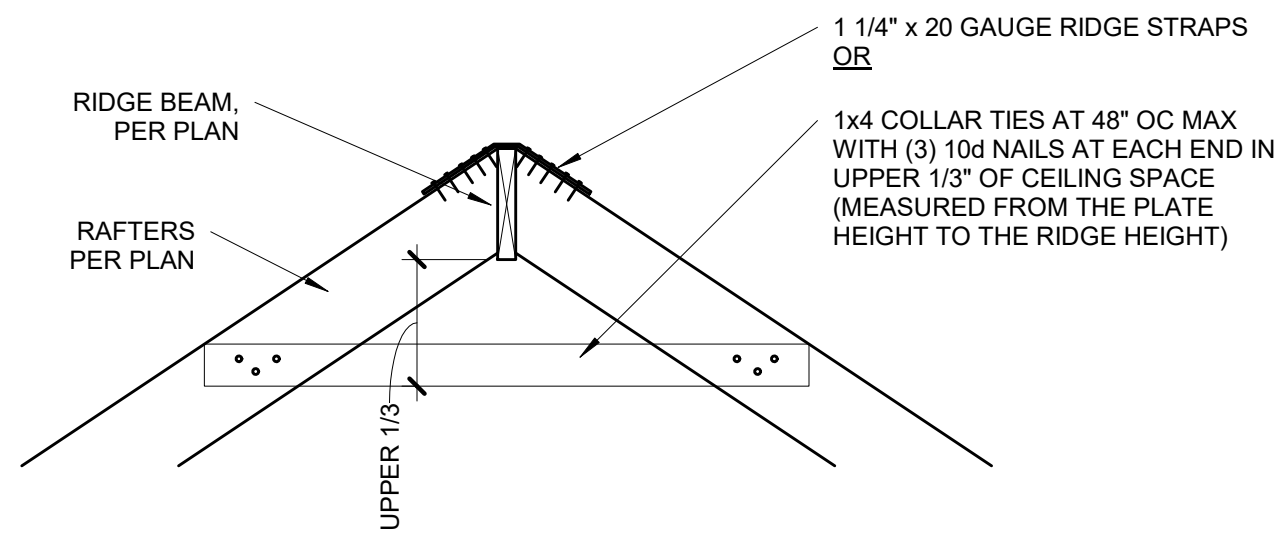
2	CONNEC
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**DECK BEAM/COLUMN CORNER**

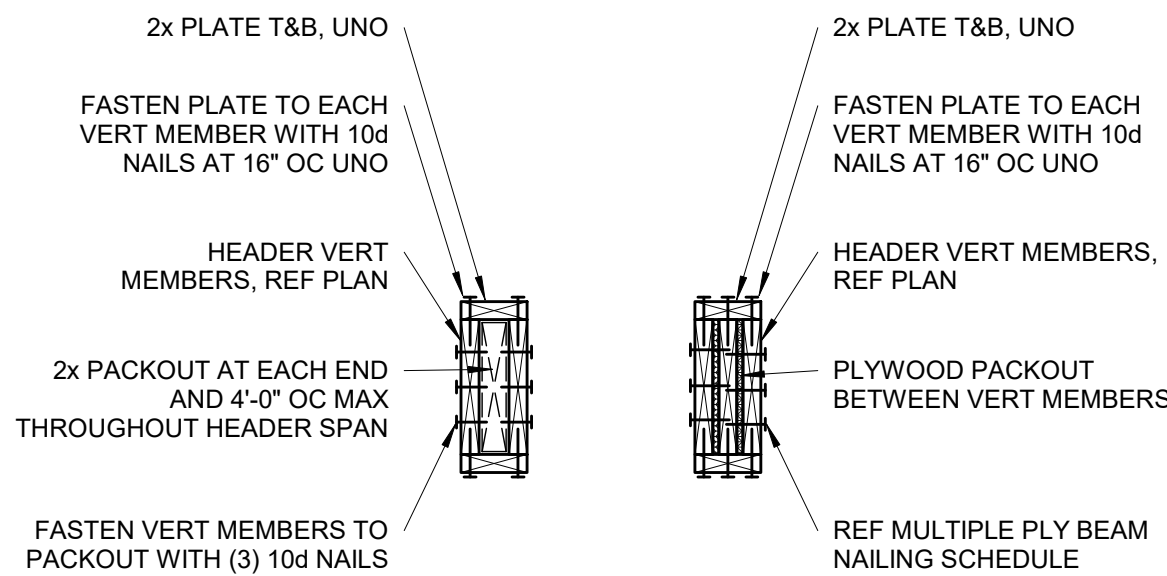
1	CONDIT
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## 12 RIDGE BEAM DETAIL

S3.1 3/4" = 1'-0"



HEADERS WITH GREATER THAN 1" GAP BETWEEN VERT MEMBERS

HEADERS WITH 1" AND LESS GAP BETWEEN VERT MEMBERS

## 11 TYPICAL WOOD HEADER DETAIL

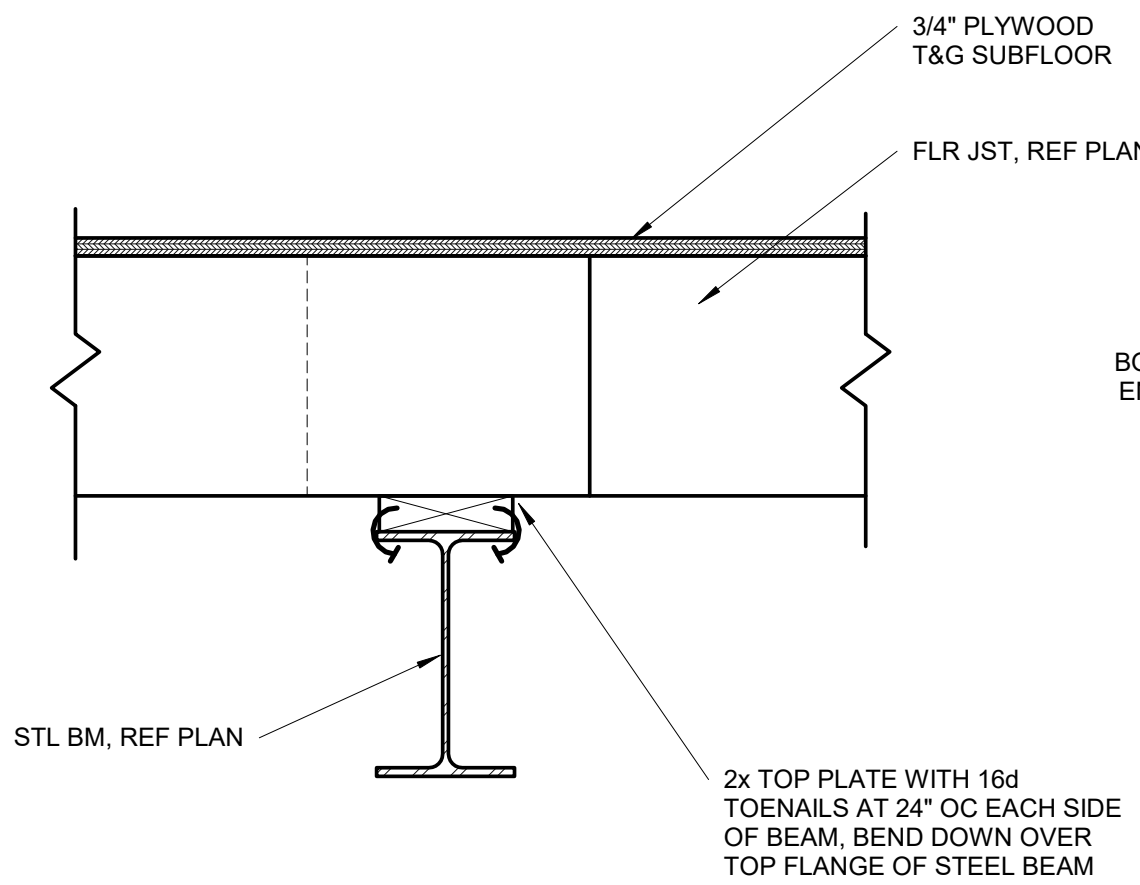
S3.1 NOT TO SCALE

2 - PLY	3 - PLY	4 - PLY
(3) ROWS OF 16d x 3-1/2" NAILS AT 6" OC	(3) ROWS OF 16d x 3-1/2" NAILS AT 4" OC	(2) ROWS OF 1/2" DIA. A307 THRU-BOLTS AT 12" OC STAGGERED
<b>NOTES:</b> 1. NAILING SHOWN APPLIES UNLESS SPECIFICALLY NOTED IN DETAILS. 2. SPACE NAILS EVENLY THROUGHOUT DEPTH OF BEAM.		

## MULTIPLE PLY BEAM NAILING

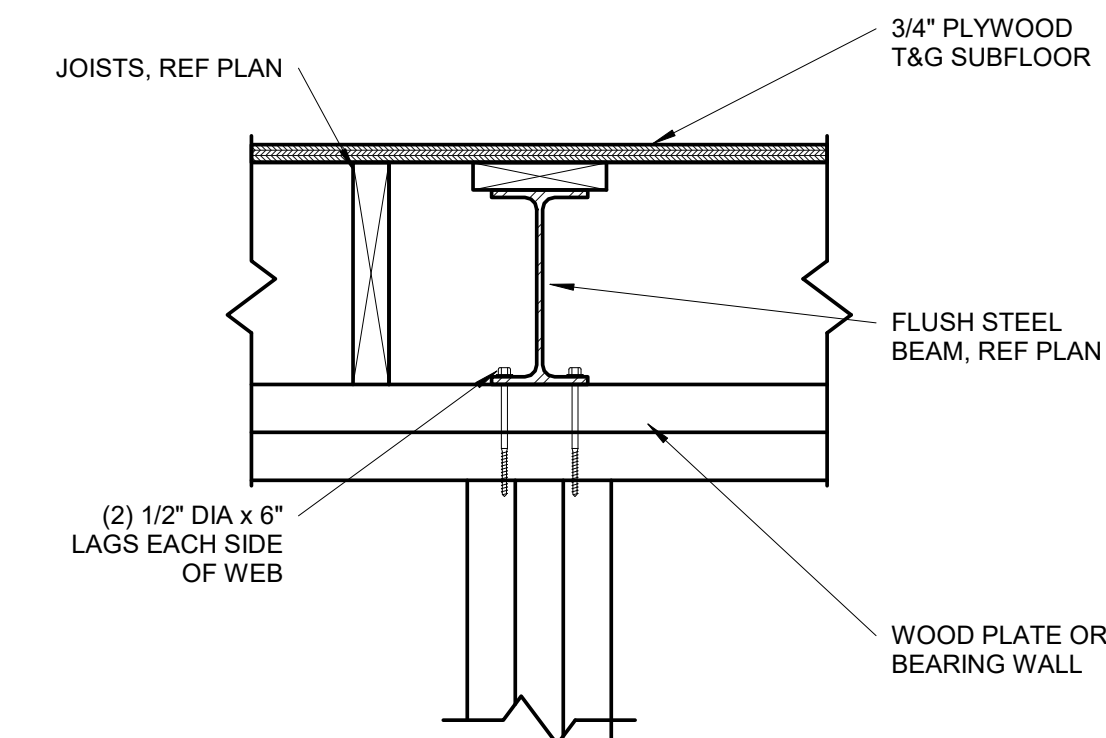
### 10 SCHEDULE

S3.1 NOT TO SCALE



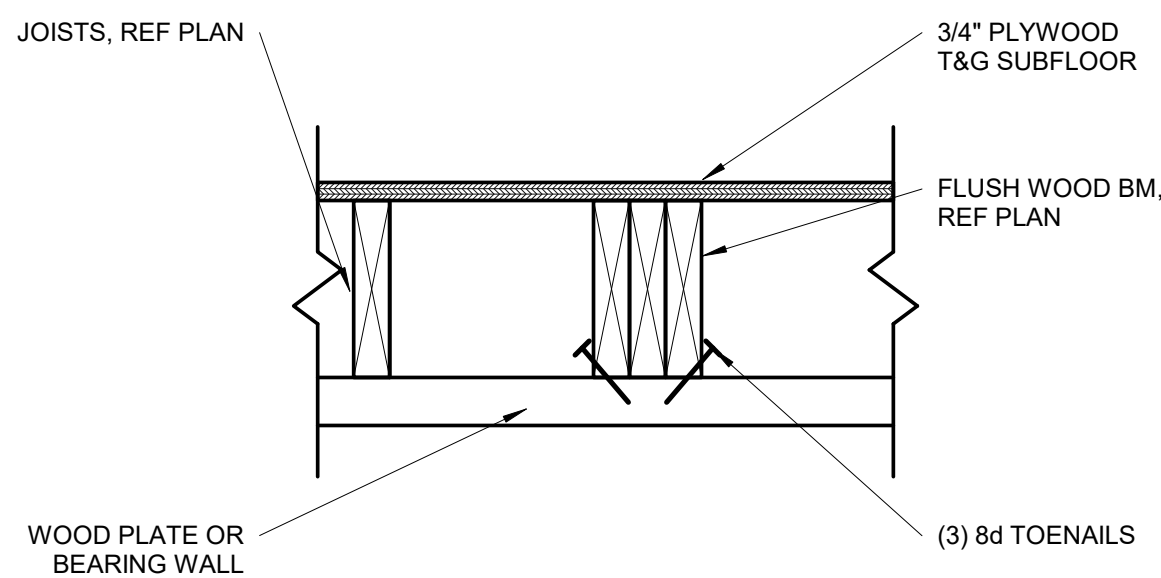
## 9 WOOD PLATE TO STEEL BEAM CONNECTION

S3.1 1 1/2" = 1'-0"



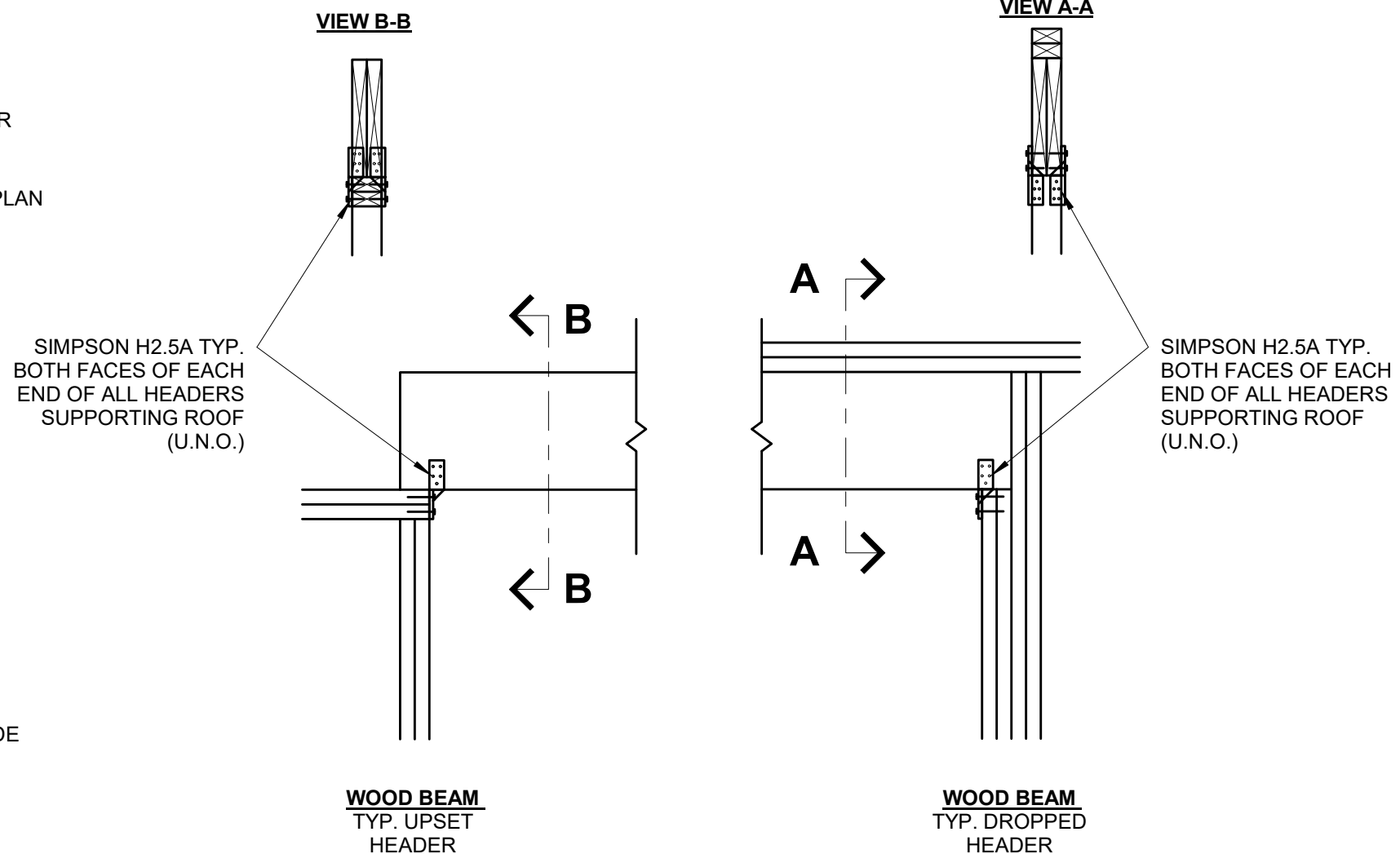
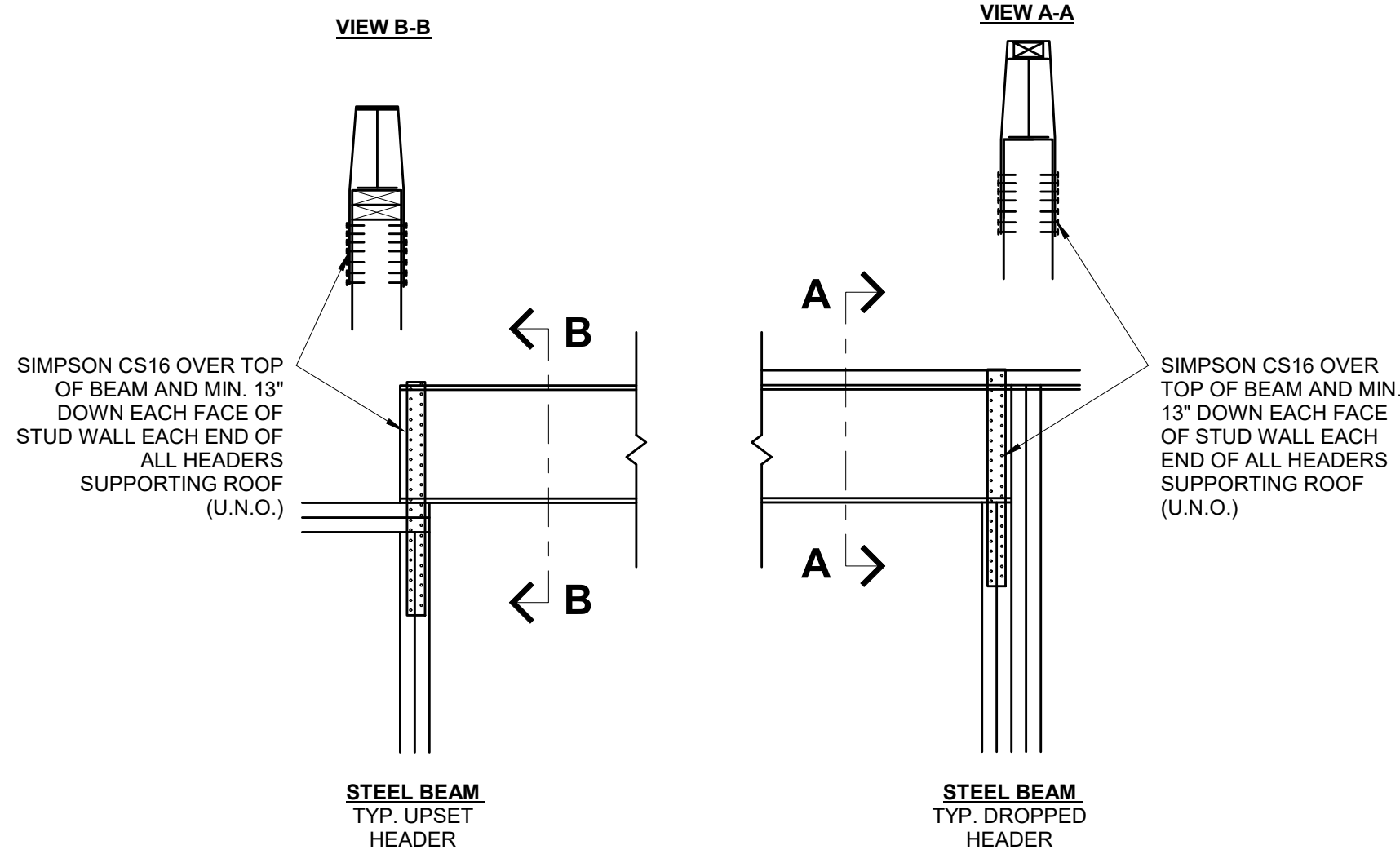
## 8 FLUSH STEEL BEAM CONNECTION

S3.1 1 1/2" = 1'-0"



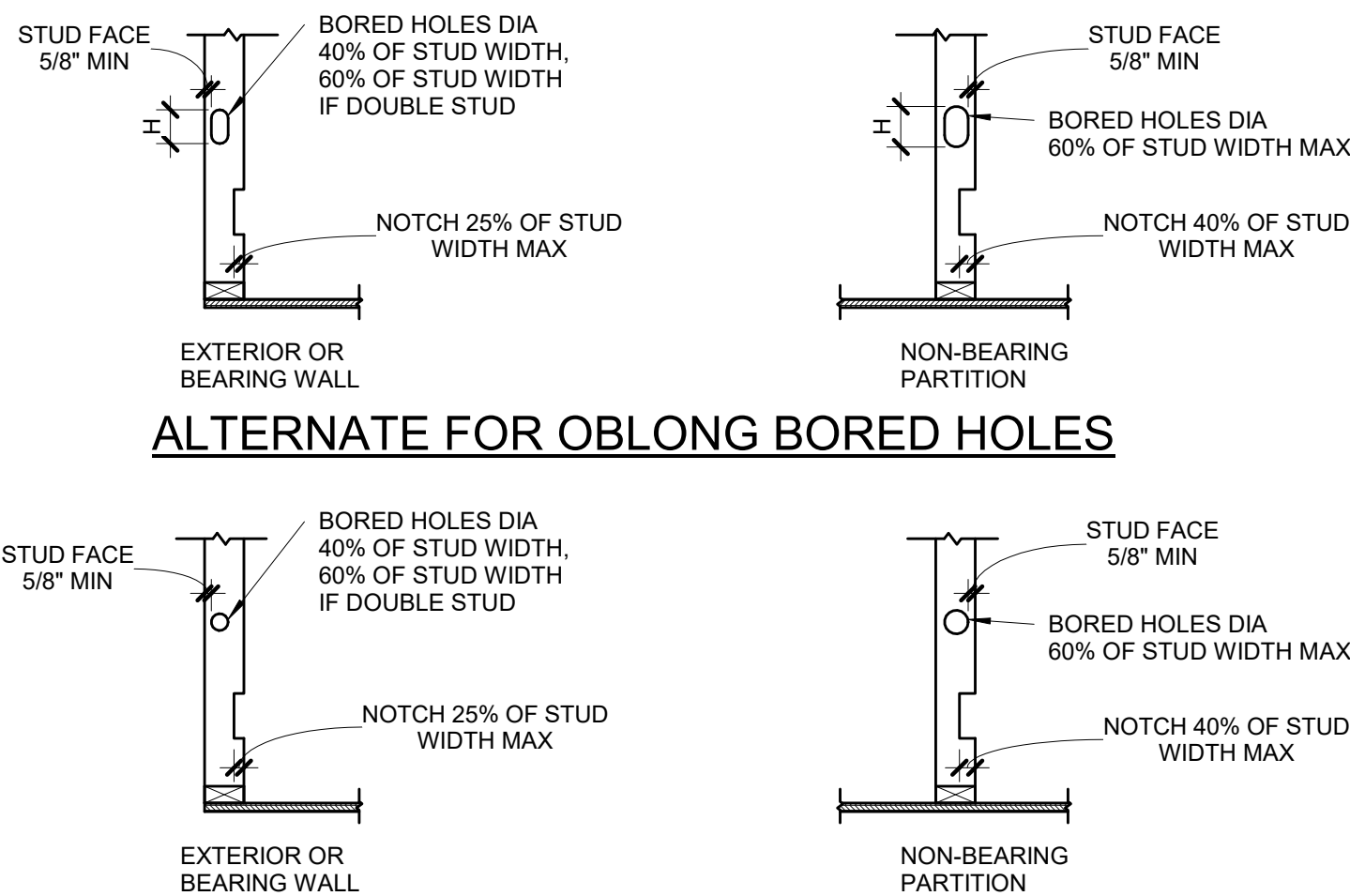
## 7 FLUSH WOOD BEAM CONNECTION

S3.1 1 1/2" = 1'-0"



## 6 ROOF SUPPORTING BEAM HOLD DOWN

S3.1 3/4" = 1'-0" (COMPLIANCE WITH IRC R802.11)



## ALTERNATE FOR OBLONG BORED HOLES

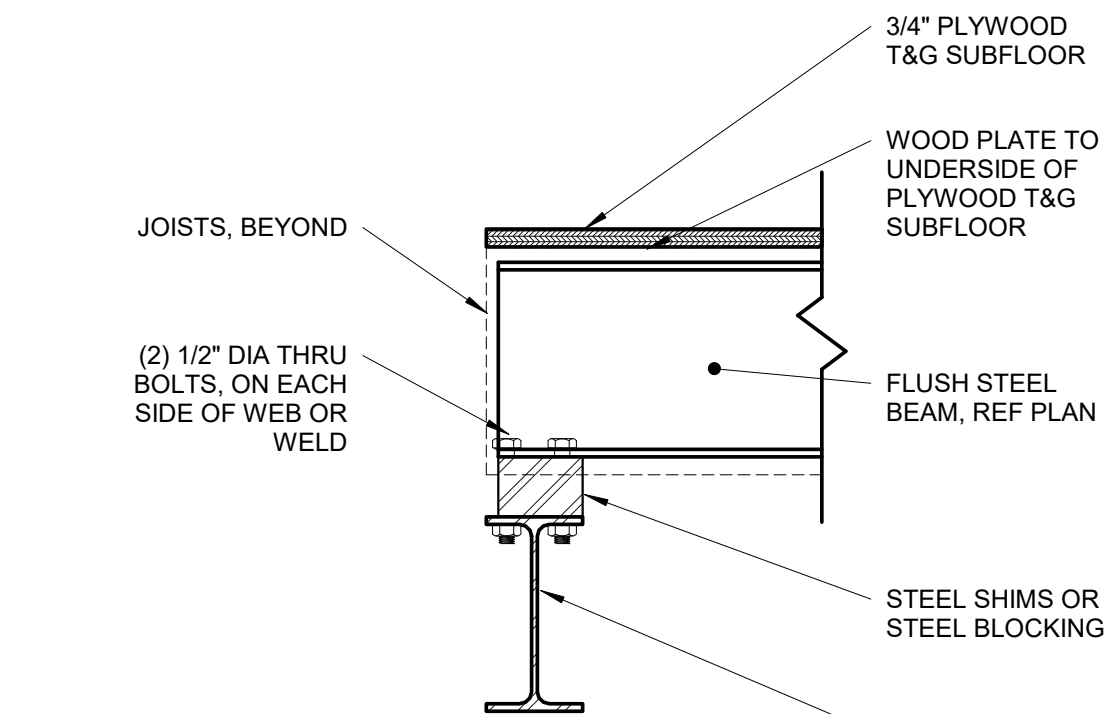
WALL SIZE	BORED HOLE SIZE		WALL NOTCH	
	STUDS LOAD BEARING OR EXTERIOR WALL	NON LOAD BEARING WALL	LOAD BEARING WALL	NON LOAD BEARING WALL
	40%	60%	25%	40%
2x4	1 3/8"	-	2 1/8"	1 3/8"
(2) 2x4	-	2 1/8"	7/8"	1 3/8"
2x6	2 1/4"	2 1/8"	1 3/8"	2 1/4"
(2) 2x6	-	3 5/16"	1 3/8"	2 1/4"
2x8	2 7/8"	-	1 13/16"	2 7/8"
(2) 2x8	-	4 3/8"	1 13/16"	2 7/8"

PLATES:  
TOP AND BOTTOM PLATE HOLE, CUT OR NOTCH THAT IS 50% MORE OF WIDTH MUST BE REPAIRED USING 16 GA (MIN) METAL TIE THAT IS AT LEAST 1-1/2" WIDE IF WALL IS A SHEAR WALL IT MUST BE REPAIRED USING HARDY FRAME SADDLE (HFS).

NOTE:  
SEE SECTION R602.6 AND FIGURES R602.6.1 AND R602.6.2

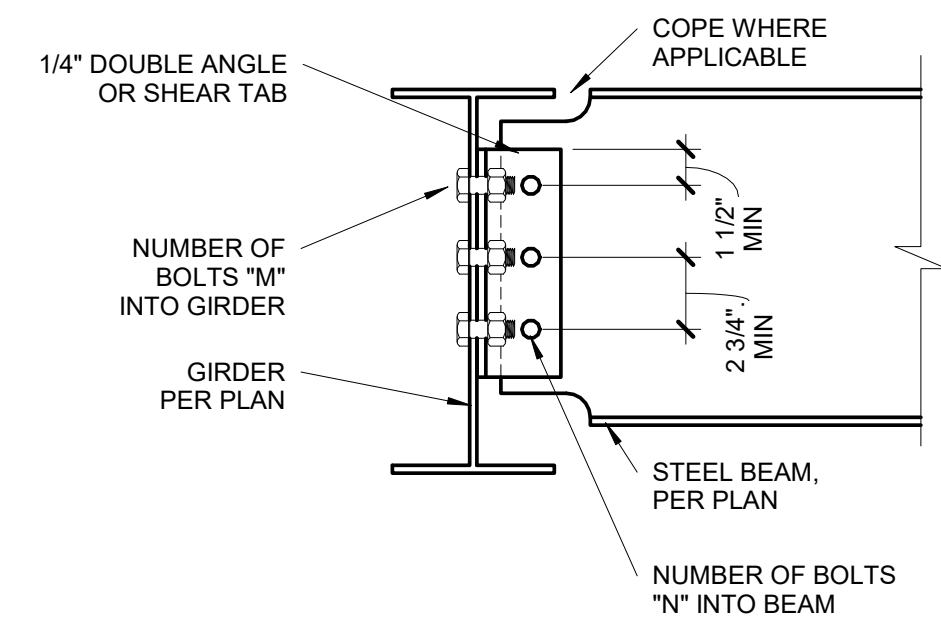
## 5 DRILLING & NOTCHING DETAIL

S3.1 3/4" = 1'-0"



## 4 FLUSH STEEL BEAM TO STEEL BEAM

S3.1 1 1/2" = 1'-0"



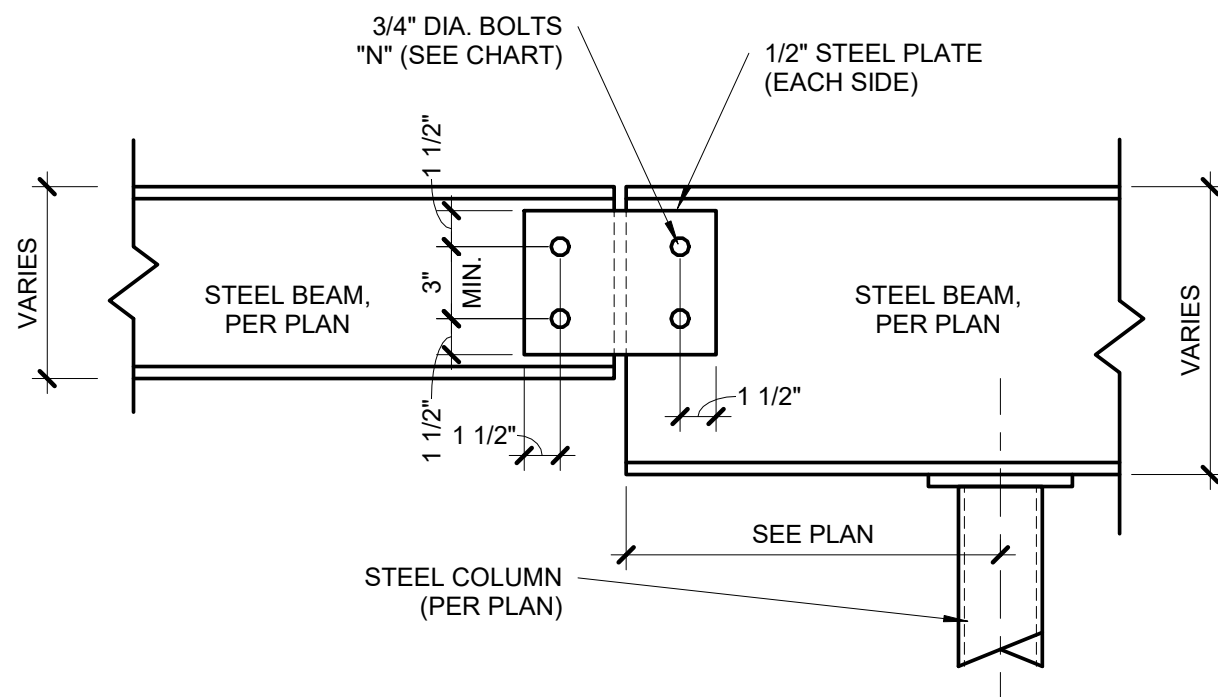
## 3 BEAM TO GIRDER CONNECTION

S3.1 1 1/2" = 1'-0"

## BEAM CONNECTION SCHEDULE

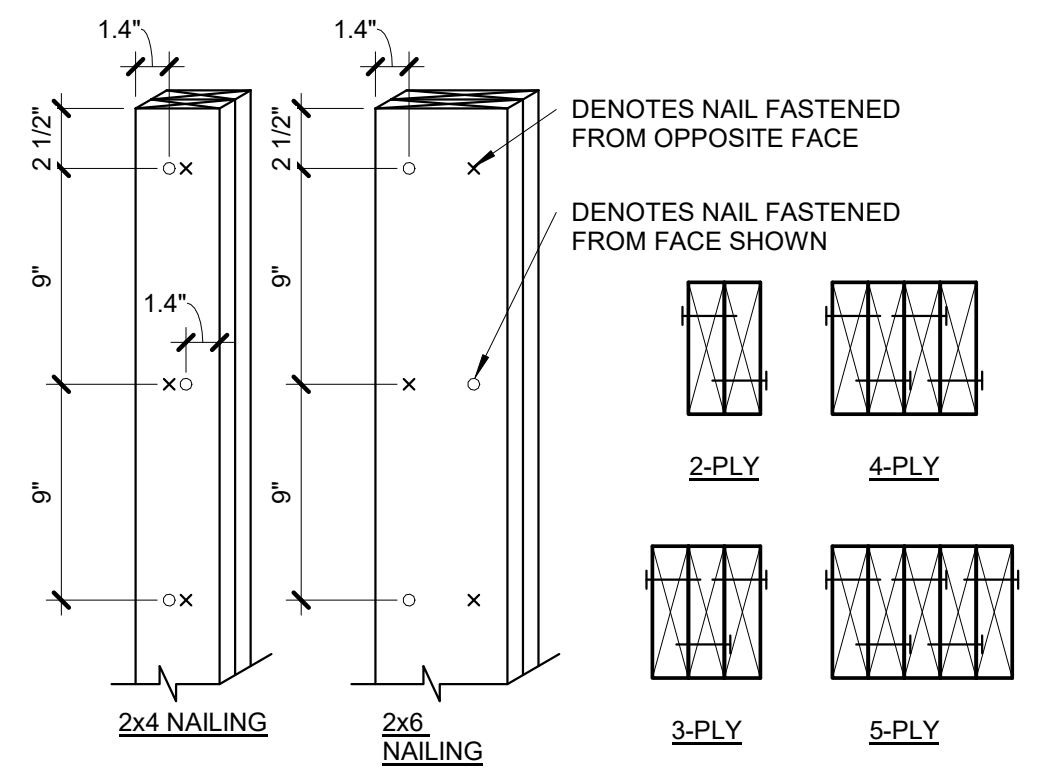
BEAM SIZE	# OF BOLTS "N"	# OF BOLTS "M"
W8, W10	2	4
W12, W14	3	6
W16, W18	4	8

NOTES:  
1. THESE CONNECTIONS ARE TYPICAL, UNO.  
2. NUMBER OF BOLTS IN UPSET BEAM CONNECTIONS DETERMINED BY SMALLER OF TWO BEAMS AT CONNECTION.  
3. ALL AROUND 1/4" FILLET WELD MAY BE SUBSTITUTED FOR EITHER BOLTED CONNECTION.  
4. ALL BOLTS, 3/4" DIAMETER, A325-N, UNO.



## 2 BEAM SPLICE DETAIL

S3.1 1 1/2" = 1'-0"

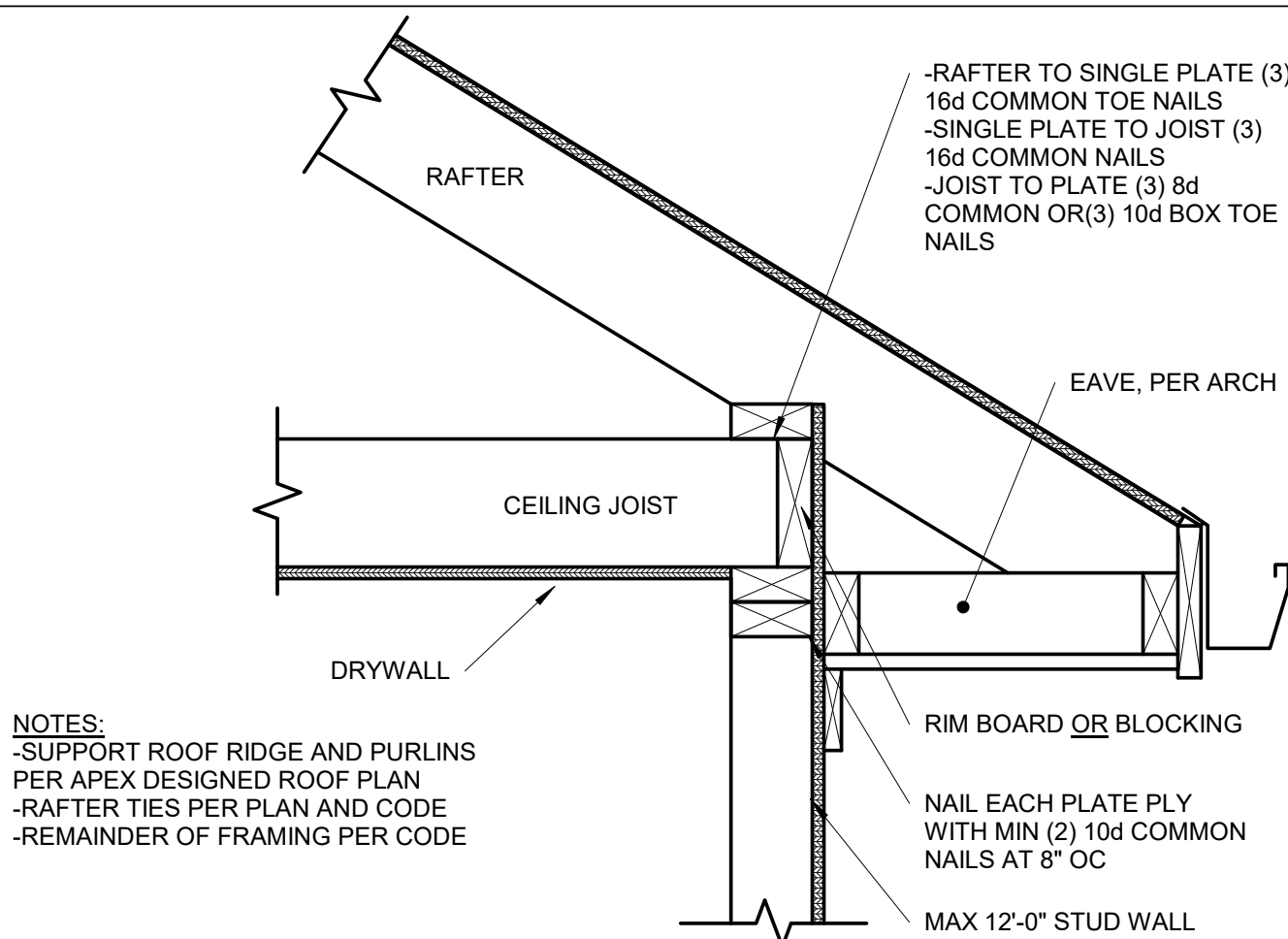


NOTES:  
1. EACH 2x PLY SHALL BE FASTENED WITH (1) ROW OF 10d NAILS AT 9" OC, ALTERNATING SIDE TO SIDE.  
2. 1.4" MIN EDGE DISTANCE, AND STARTING 2 1/2" FROM EACH END.  
3. EXTEND FULL AREA OF COLUMN AS SOLID BLOCKING THROUGH JOIST BAYS AND WALLS TO LOAD-BEARING BEAM/WALL BELOW

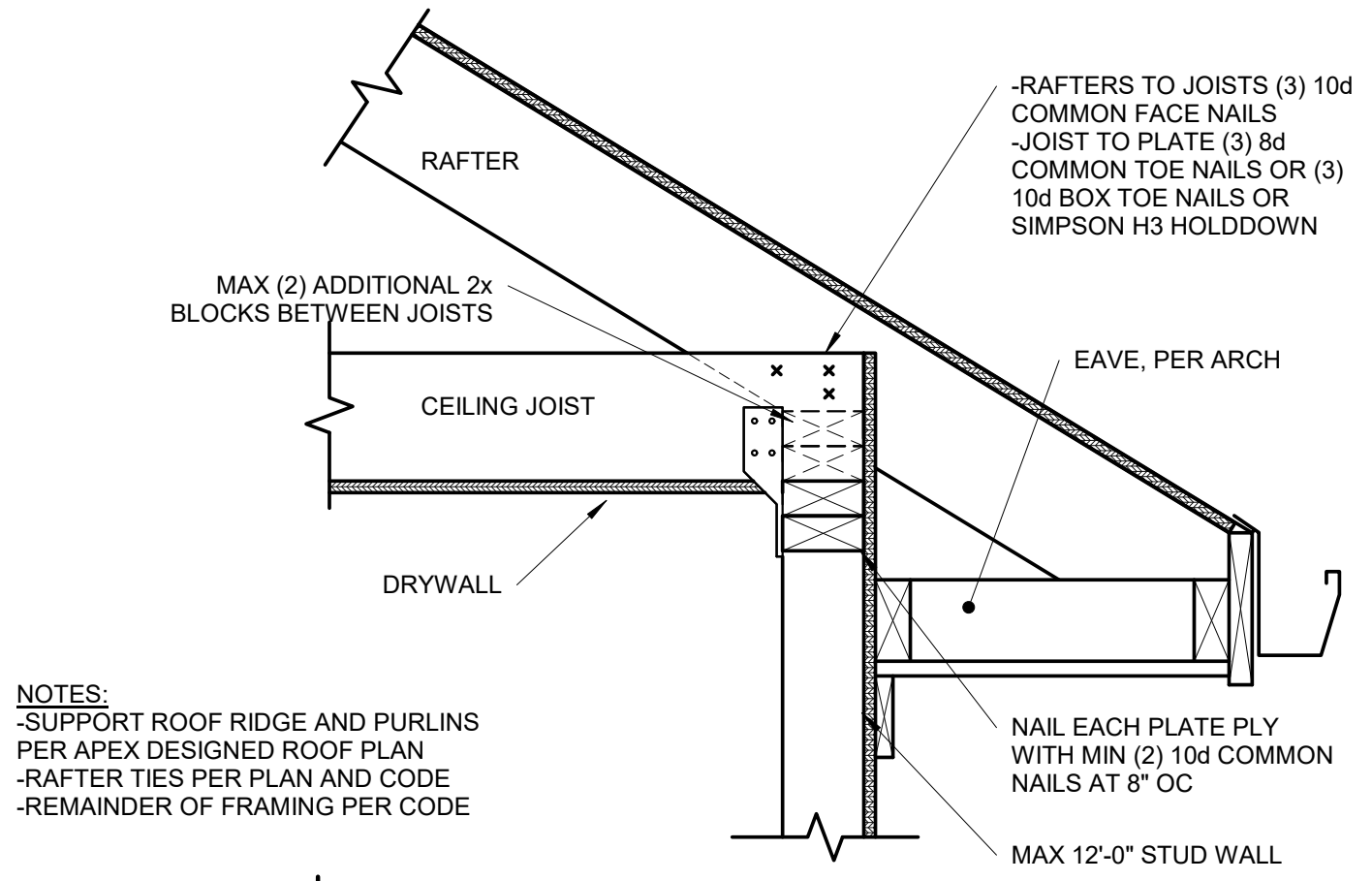
## 1 BUILT-UP STUD COLUMN

S3.1 1 1/2" = 1'-0"

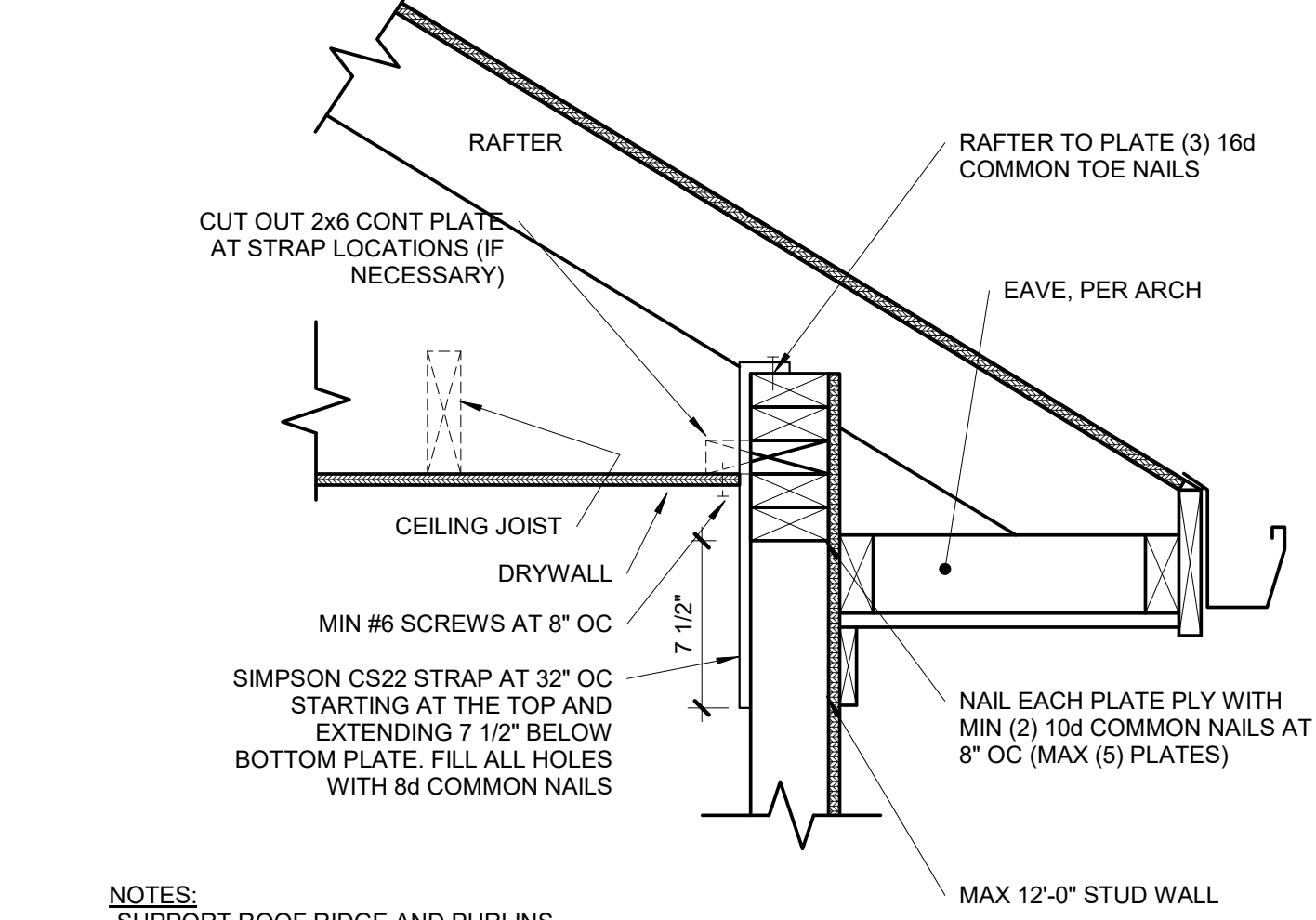




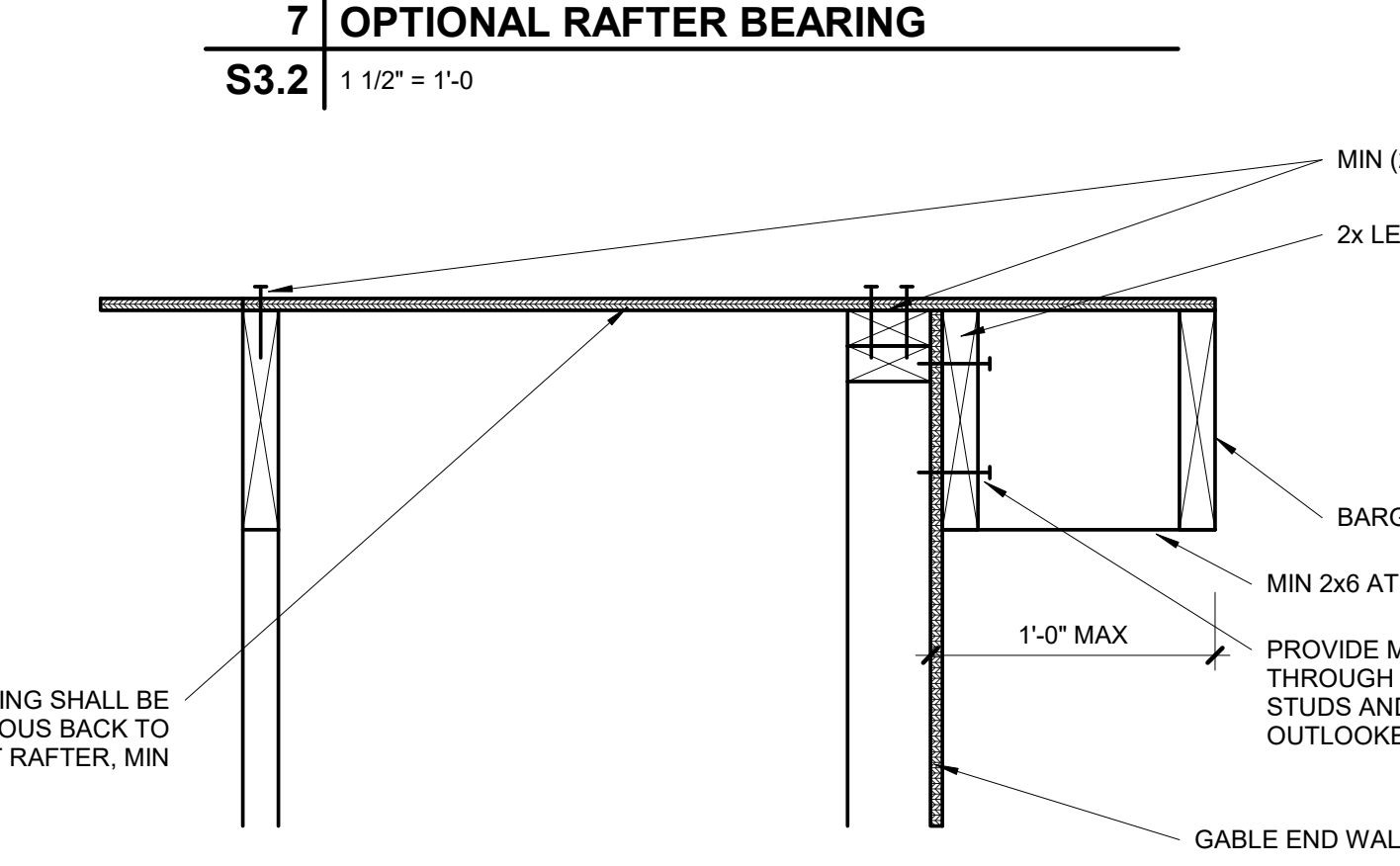
9 | OPTIONAL RAFTER BEARING  
S3.2 | 1 1/2" = 1'-0"



8 | OPTIONAL RAFTER BEARING  
S3.2 | 1 1/2" = 1'-0"



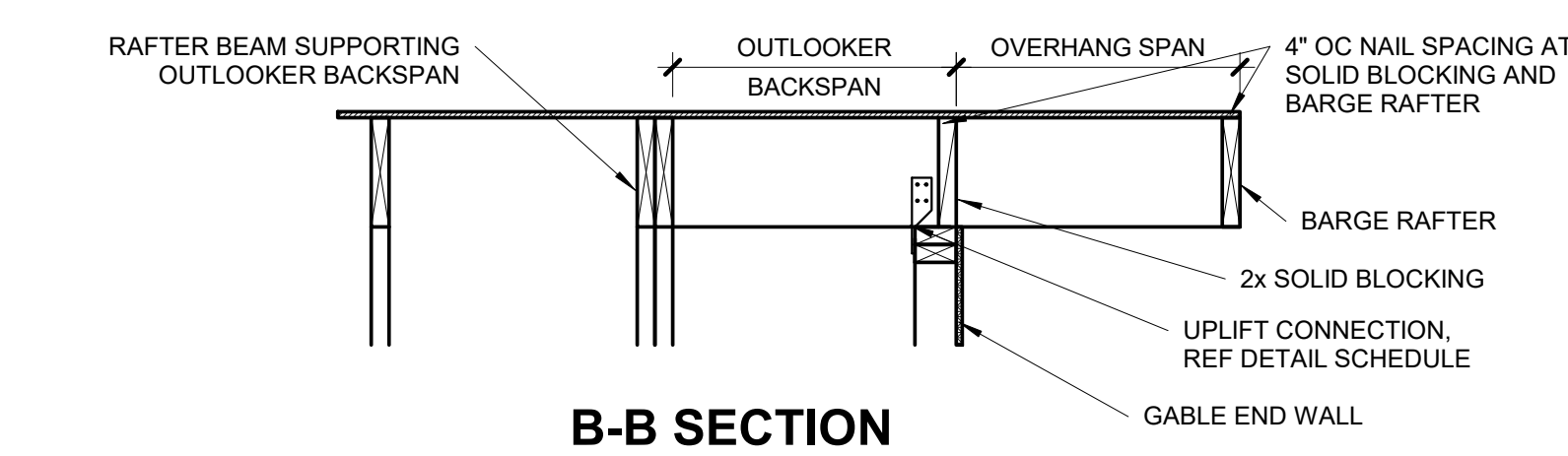
5 | OUTLOOKER RAFTERS ROOF FRAMING  
S3.2 | NOT TO SCALE



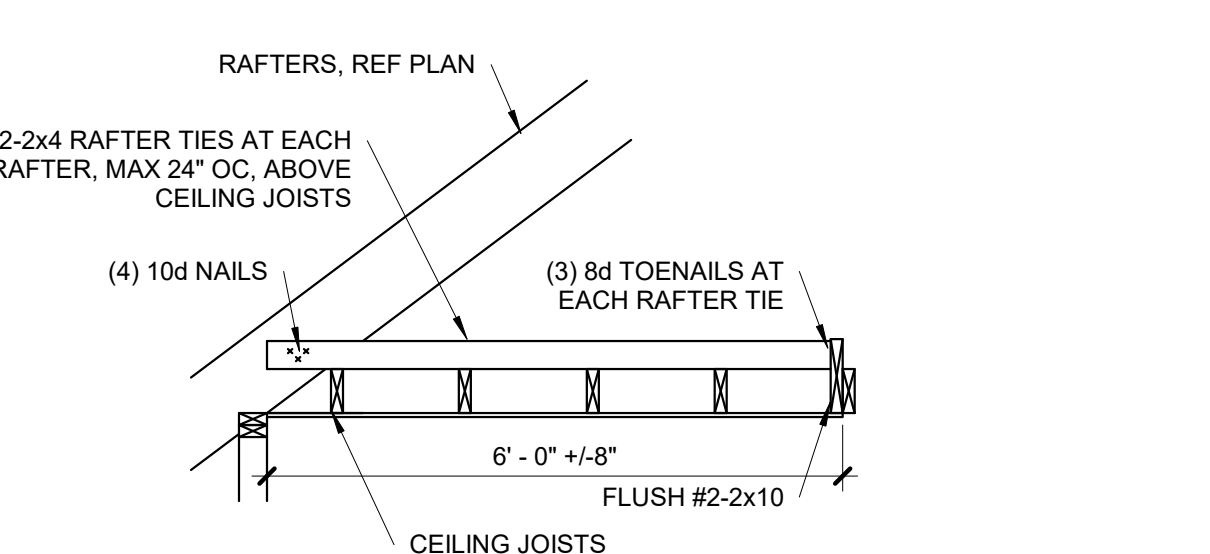
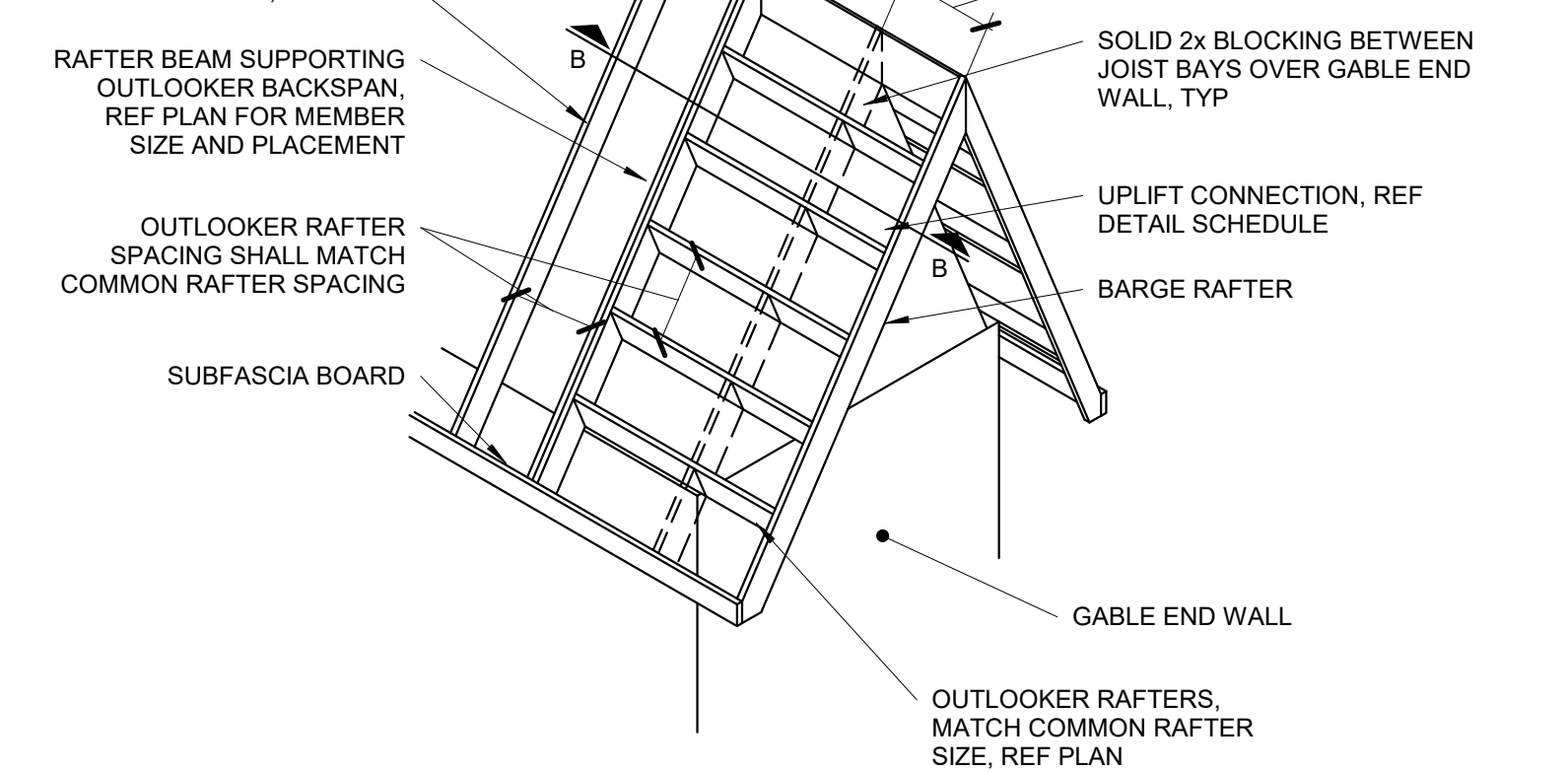
7 | OPTIONAL RAFTER BEARING  
S3.2 | 1 1/2" = 1'-0"

6 | OPTIONAL OVERHANG 1'-0" OR LESS  
S3.2 | 1 1/2" = 1'-0"

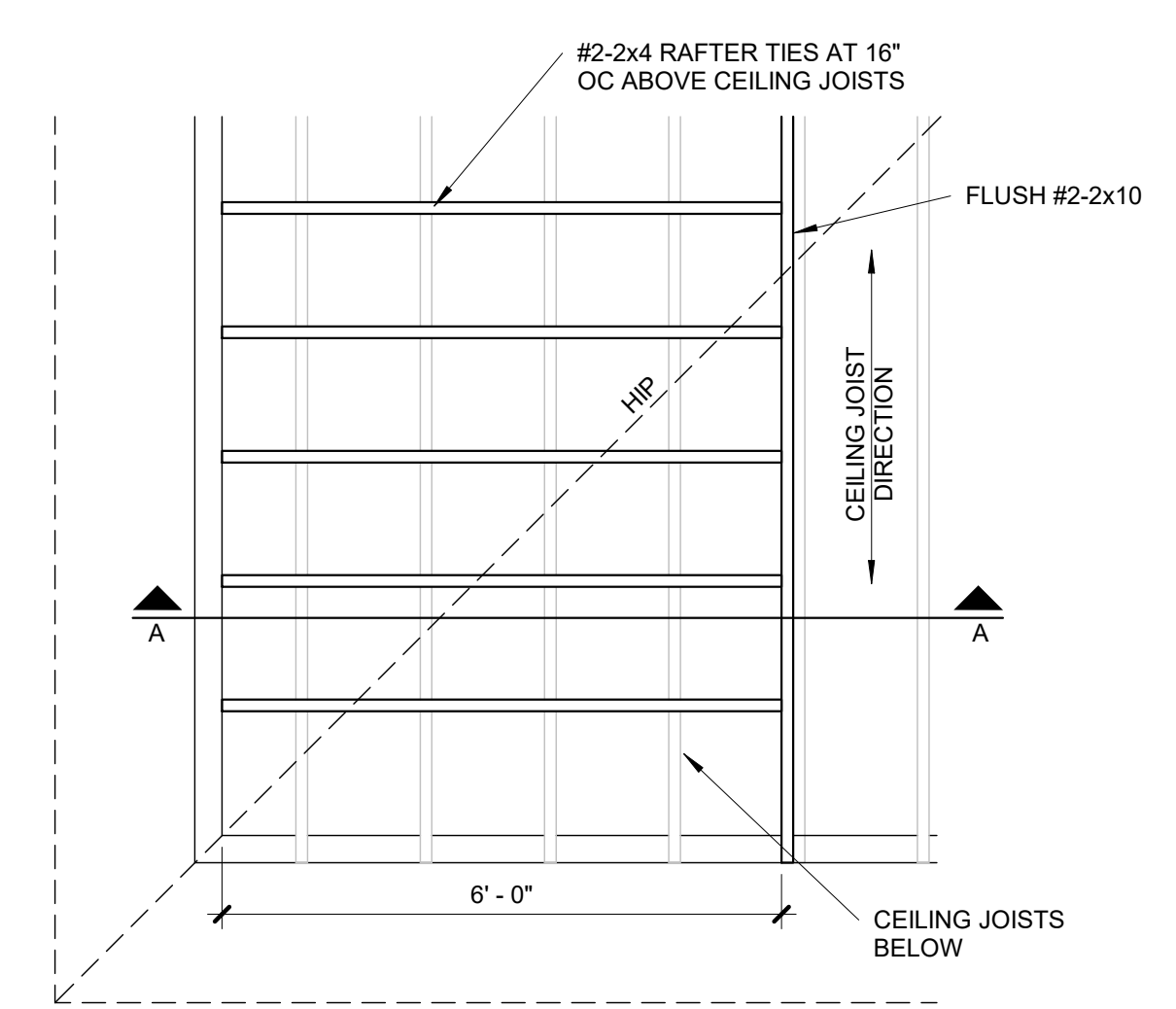
UPLIFT CONNECTION SCHEDULE			
OVERHANG SPAN: 1'-1" TO 1'-9"			
RAFTER SPACING	UPLIFT CONNECTOR	EXPOSURE B	EXPOSURE C
12" OC	SIMPSON H2.5A	(1) AT 24" OC	(1) AT 24" OC
16" OC	SIMPSON H2.5A	(1) AT 32" OC	(1) AT 16" OC
24" OC	SIMPSON H2.5A	(1) AT 24" OC	(1) AT 24" OC
OVERHANG SPAN: 1'-10" TO 2'-6"			
RAFTER SPACING	UPLIFT CONNECTOR	EXPOSURE B	EXPOSURE C
12" OC	SIMPSON H2.5A	(1) AT 12" OC	(1) AT 12" OC
16" OC	SIMPSON H2.5A	(1) AT 16" OC	(2) AT 16" OC
24" OC	SIMPSON H2.5A	(2) AT 24" OC	(2) AT 24" OC
OVERHANG SPAN: 2'-7" TO 3'-9"			
RAFTER SPACING	UPLIFT CONNECTOR	EXPOSURE B	EXPOSURE C
12" OC	SIMPSON H2.5A	(2) AT 12" OC	(2) AT 12" OC
16" OC	SIMPSON H2.5A	(2) AT 16" OC	(2) AT 16" OC
24" OC	SIMPSON H2.5A	(2) AT 24" OC	N/A



4 | TAPERED VALLEY  
S3.2 | 3/4" = 1'-0"

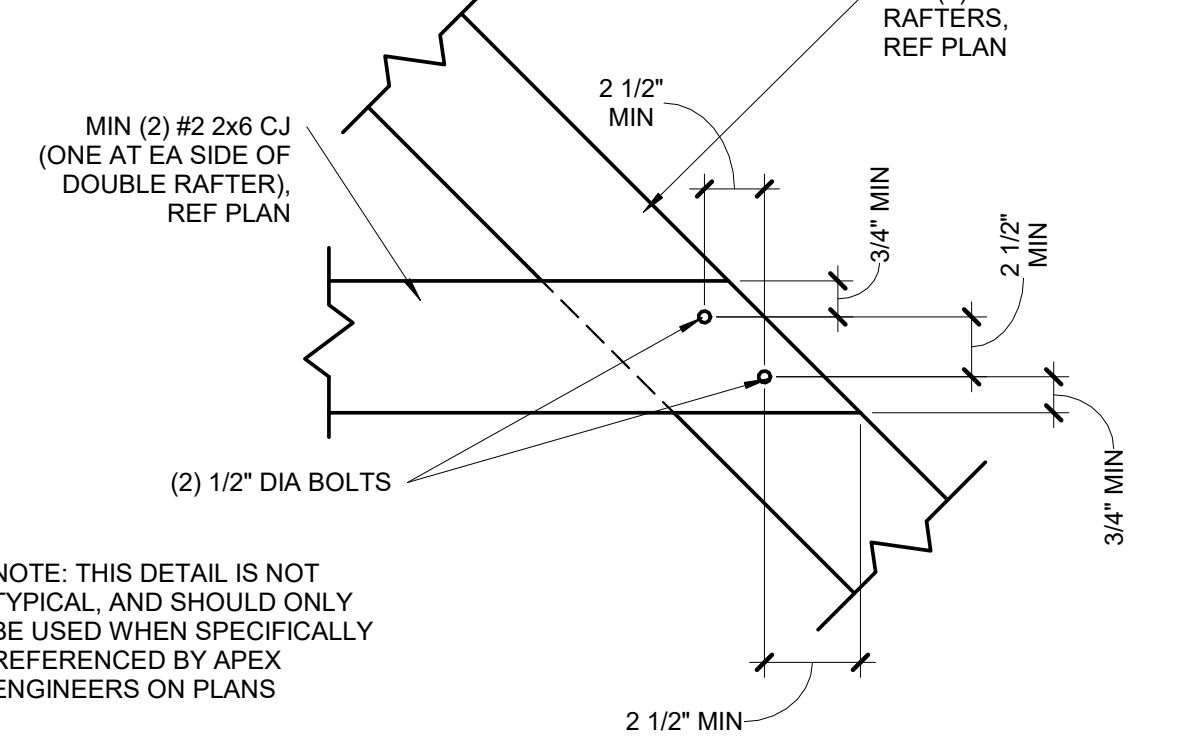


A-A SECTION

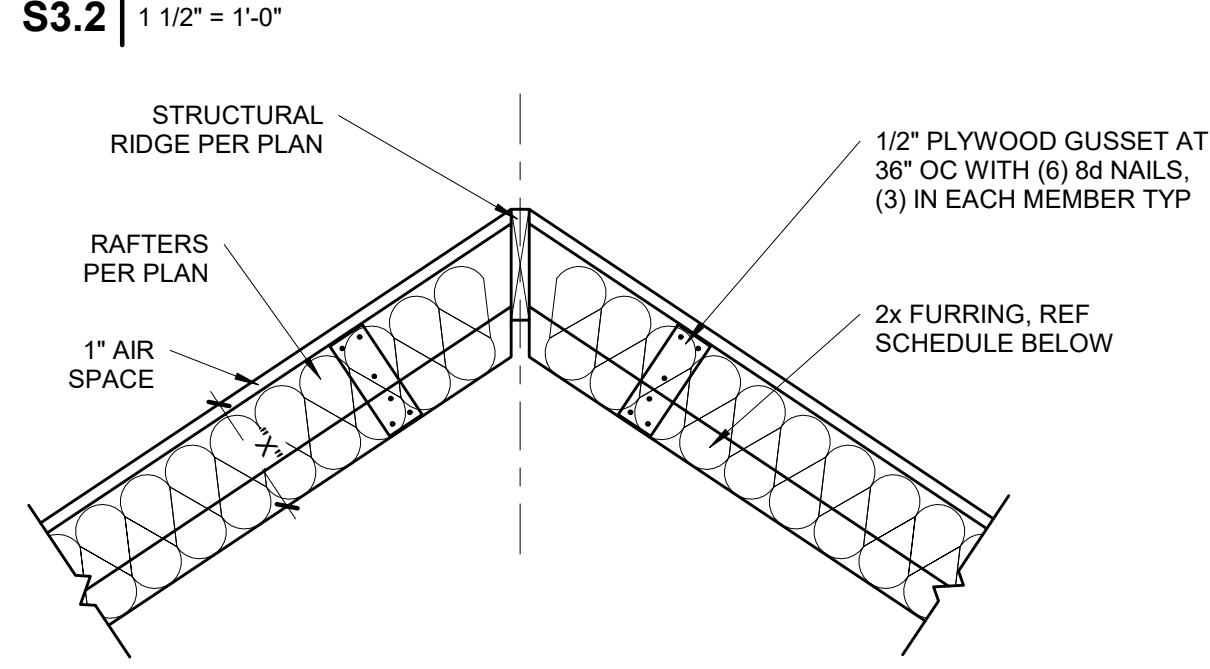


3 | ROOF WITH PERP CEILING JOISTS

S3.2 | 1/2" = 1'-0"



2 | BOLTED RAFTER HIP CONNECTION  
S3.2 | 1 1/2" = 1'-0"



FURR OUT 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	REQUIRED

NOTES:  
1. ALL VAULTED RAFTERS SHALL BE #2-2x6 DF-L, MINIMUM, AT 16" OC, PER SPAN CHART, UNLESS NOTED OTHERWISE.  
2. ALL VAULTS SHALL BE FURRED DOWN WITH 2x FRAMING TO THE REQUIRED DEPTH OF INSULATION, PLUS 1" AIR SPACE.  
3. R-30C INSULATION = 8 1/4" THICK  
4. R-38C INSULATION = 10 1/4" THICK  
5. INSULATION REQUIREMENTS MAY BE REDUCED TO R30 IF ROOF/CEILING ASSEMBLY DOES NOT ALLOW SUFFICIENT SPACE BUT IS LIMITED TO VAULTED CEILING AREAS THAT ARE LESS THAN 500 SQUARE FEET OR 20 PERCENT OF THE TOTAL INSULATED CEILING AREA, WHICHEVER IS LESS. (PER N1102.2.2)

1 | VAULTED RAFTER INSULATION  
S3.2 | 3/4" = 1'-0"



STRUCTURAL DESIGN REVIEW  
KANSAS ENGINEERING LICENSE:  
5-692  
MISSOURI ENGINEERING LICENSE:  
2003004673

PROJECT:  
Murdock Residence  
Lot 1479 Winterset Valley  
Lee's Summit, MO  
CLIENT:  
Gale Home Builders, Inc.  
400 SW Longview Blvd  
Lee's Summit, MO

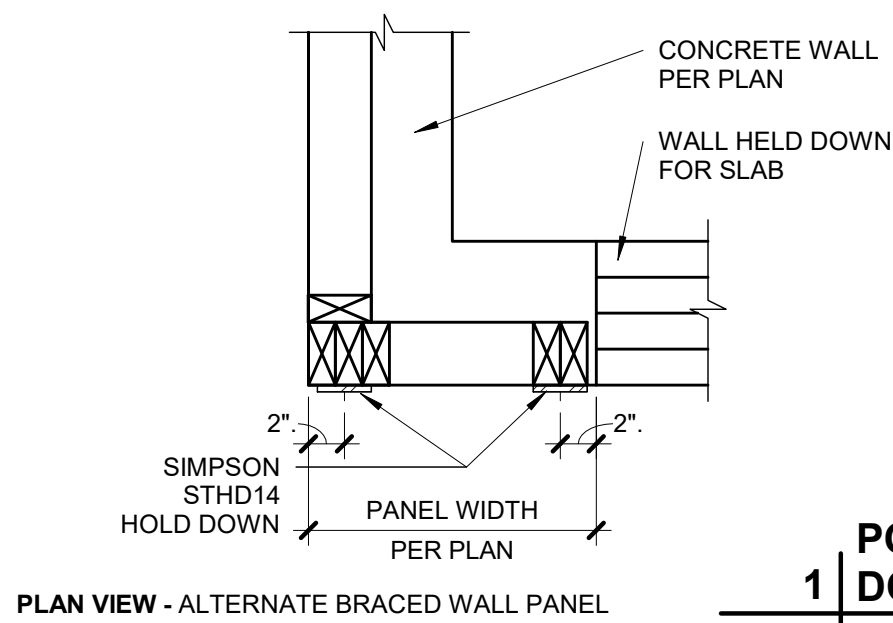
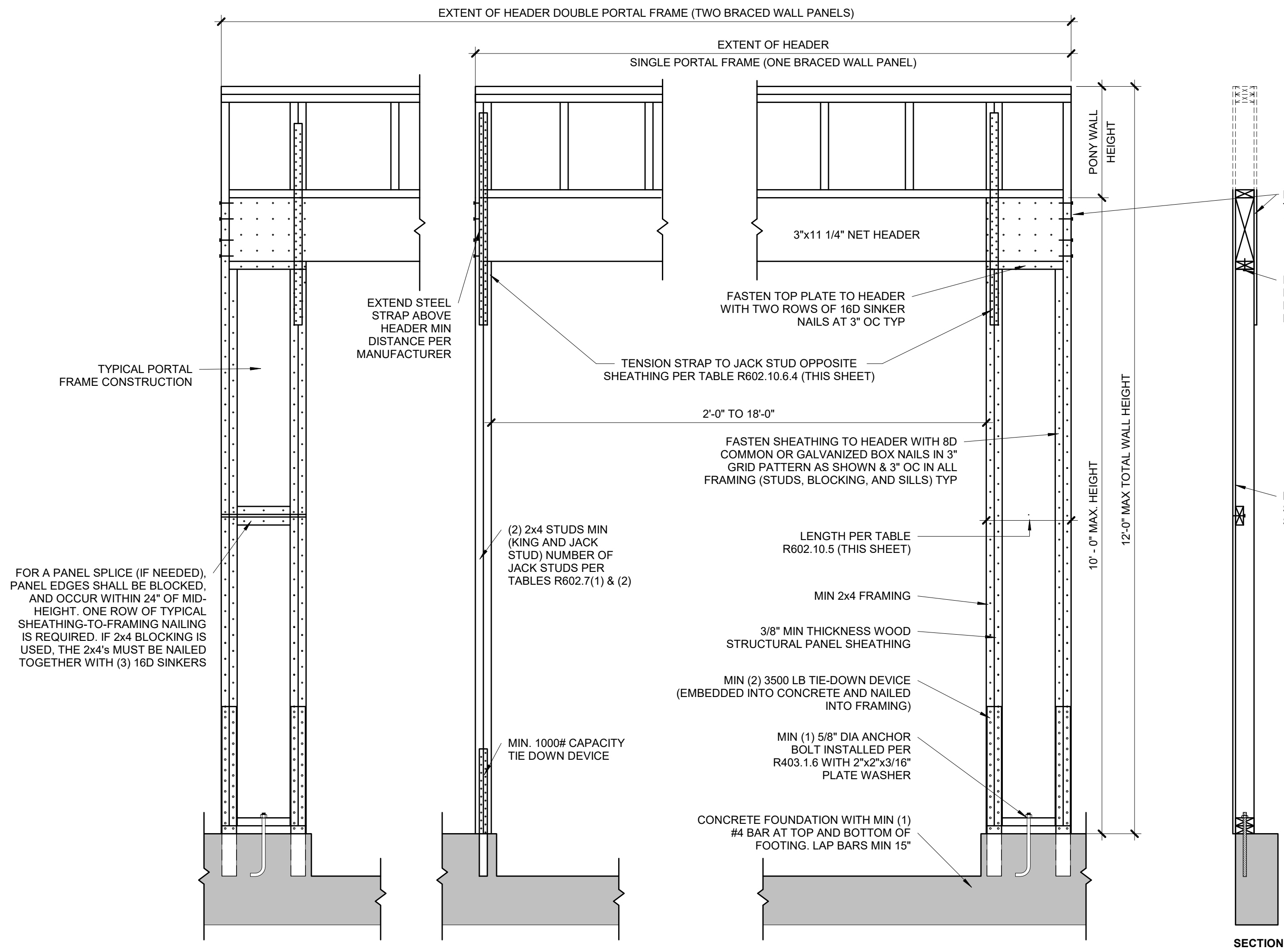
PROJECT #: 42177  
DRAWN BY: BCH  
CHECKED BY: BDC  
SUBMITTAL DATE: 2021.10.14

COMMENTS	
#	DATE

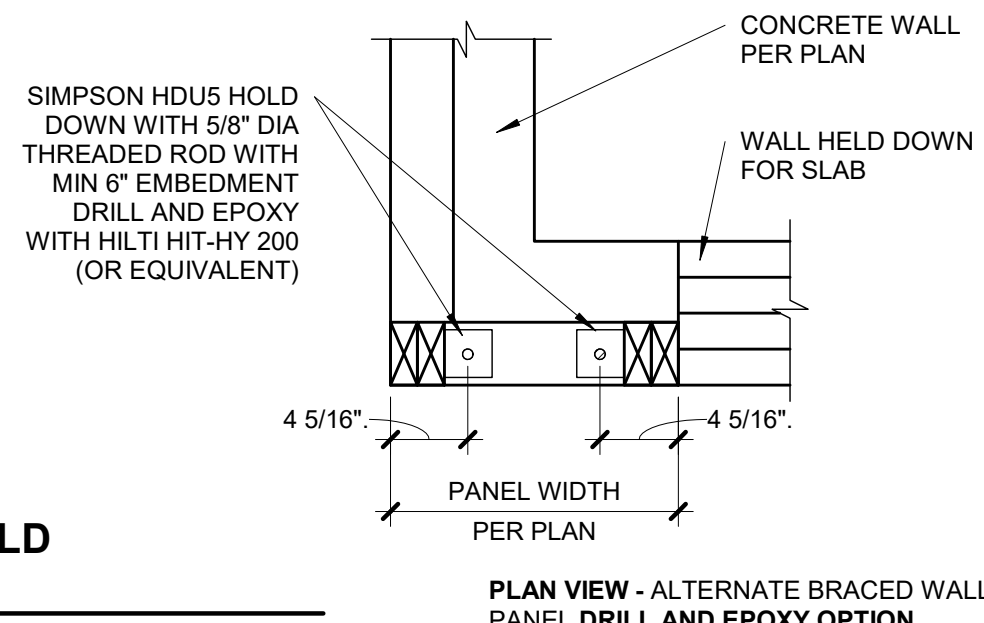
SHEET:  
FRAMING DETAILS

S3.2

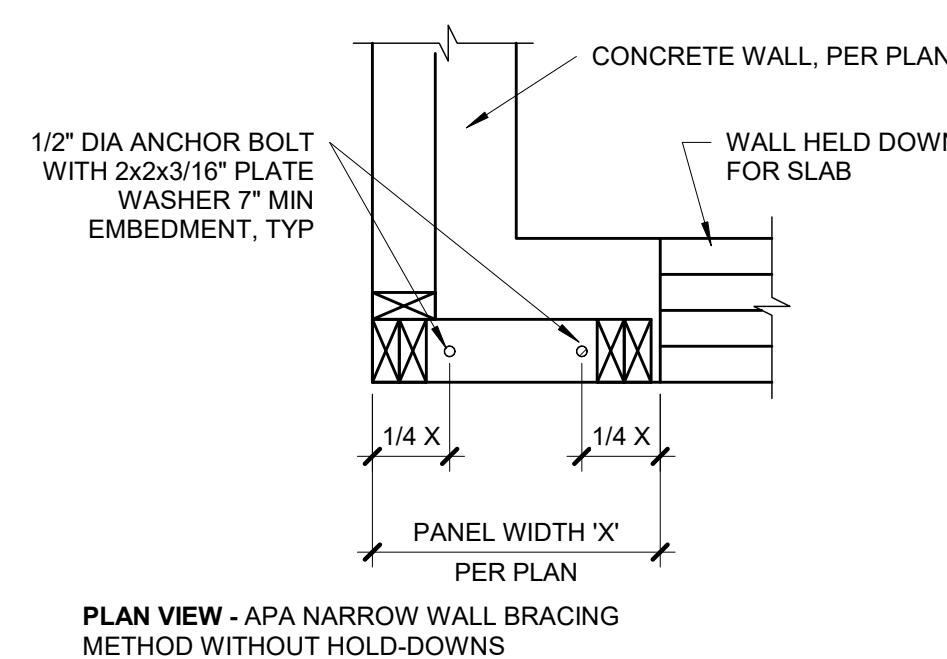
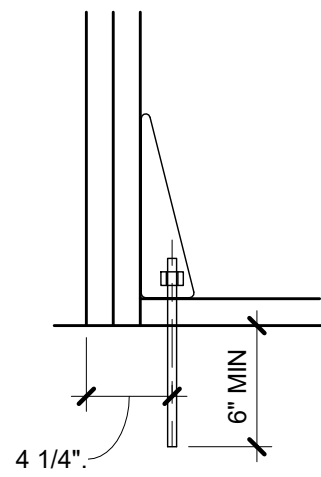




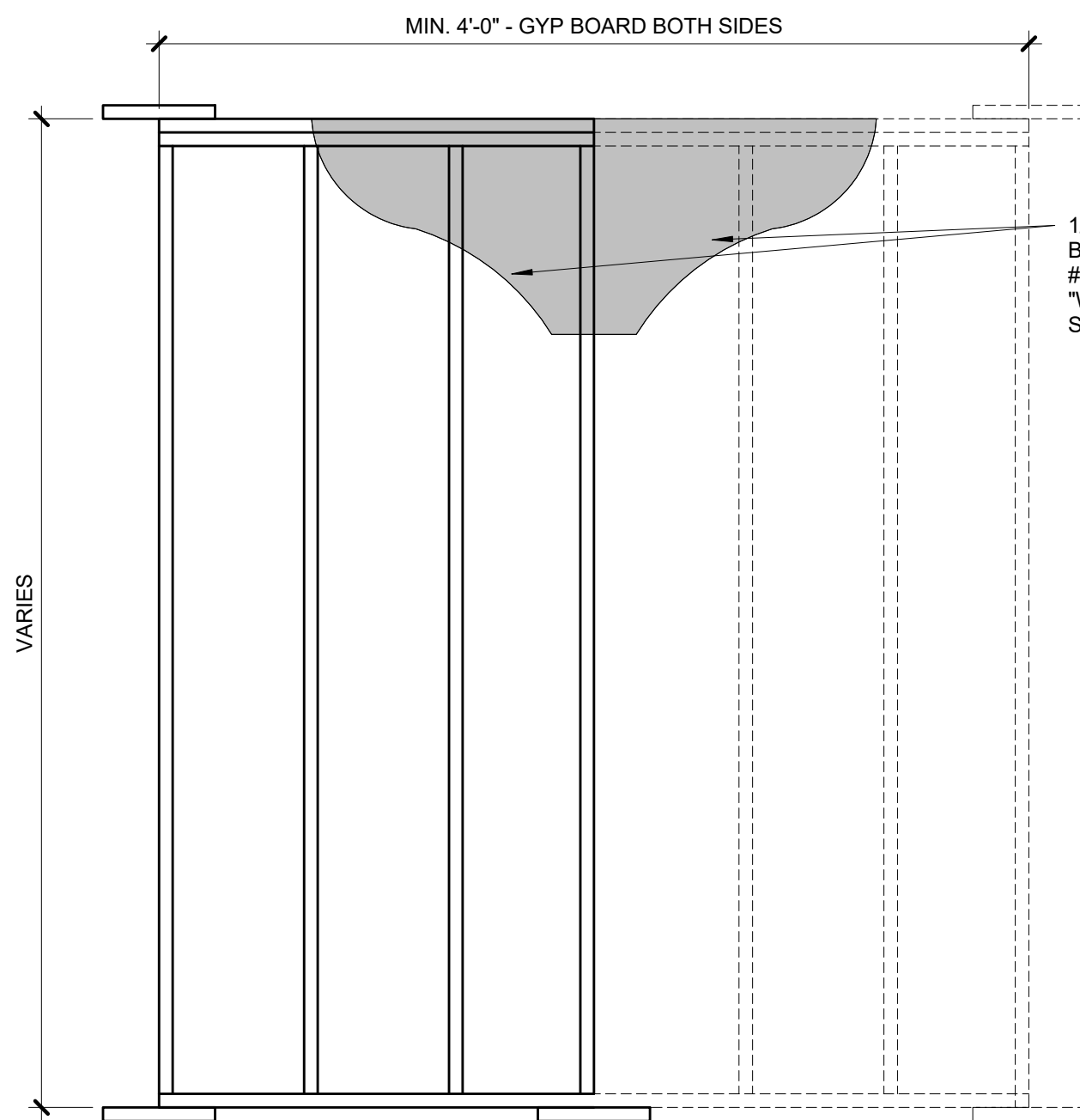
**1 PORTAL FRAME WITH HOLD  
DOWNS (METHOD PFH)**  
**S4.0** 3/4" = 1'-0" (PER IRC R602.10.6.2)



**PLAN VIEW - ALTERNATE BRACED WALL  
PANEL DRILL AND EPOXY OPTION**



**PLAN VIEW - APA NARROW WALL BRACING  
METHOD WITHOUT HOLD-DOWNS**



**GB**

BRACED WALL PANEL SCHEDULE		
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	-

NOTE: BRACED WALL PANEL LENGTHS BASED ON WALL HEIGHT FOR IRC, LIB

**BRACED WALL PANEL-IRC  
2 METHODS LIB AND GB**

**S4.0** 3/4" = 1'-0"



**PORTAL FRAME AT GARAGE  
DOOR WITHOUT HOLD DOWNS  
(METHOD PFG)**

**1** 3/4" = 1'-0" (ALT ALLOWED AT GARAGE DOOR ONLY)  
**S4.0** ALT (PER IRC R602.10.6.3)

TABLE R602.10.5 (PARTIAL)						
MINIMUM LENGTH OF BRACED WALL PANELS						
METHOD	MIN LENGTH (INCHES)					
	8 FEET	9 FEET	10 FEET	11 FEET	12 FEET	
1 SUPPORTING ROOF ONLY	16	16	16	16	16	
2 ONE STORY AND ROOF	24	24	24	24	24	
PFG	24	27	30	30	30	

NOTE: MAX HEADER HEIGHT IS 10'-0", BUT WALL HEIGHT SHALL BE PERMITTED TO BE INCREASED TO 12'-0" WITH PONY WALL

TABLE R602.10.6.4				
TENSION CAPACITY STRAP TABLE				
MIN WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAX PONY WALL HEIGHT (FEET)	MAX TOTAL WALL HEIGHT (FEET)	MAX OPENING WIDTH (FEET)	TENSION STRAP CAPACITY REQ (LBS)
2x4 #2 GRADE	0	10	18	1,000
			9	1,000
			16	1,025
			18	1,275
	1	10	9	1,000
			16	2,175
			18	2,500
			9	1,500
	2	12	16	3,375
			18	3,975
2x6 STUD GRADE	4	12	9	2,750
			12	3,775
			9	1,000
			16	2,150
	2	12	18	2,550
			9	1,750
			16	2,400
			18	3,800

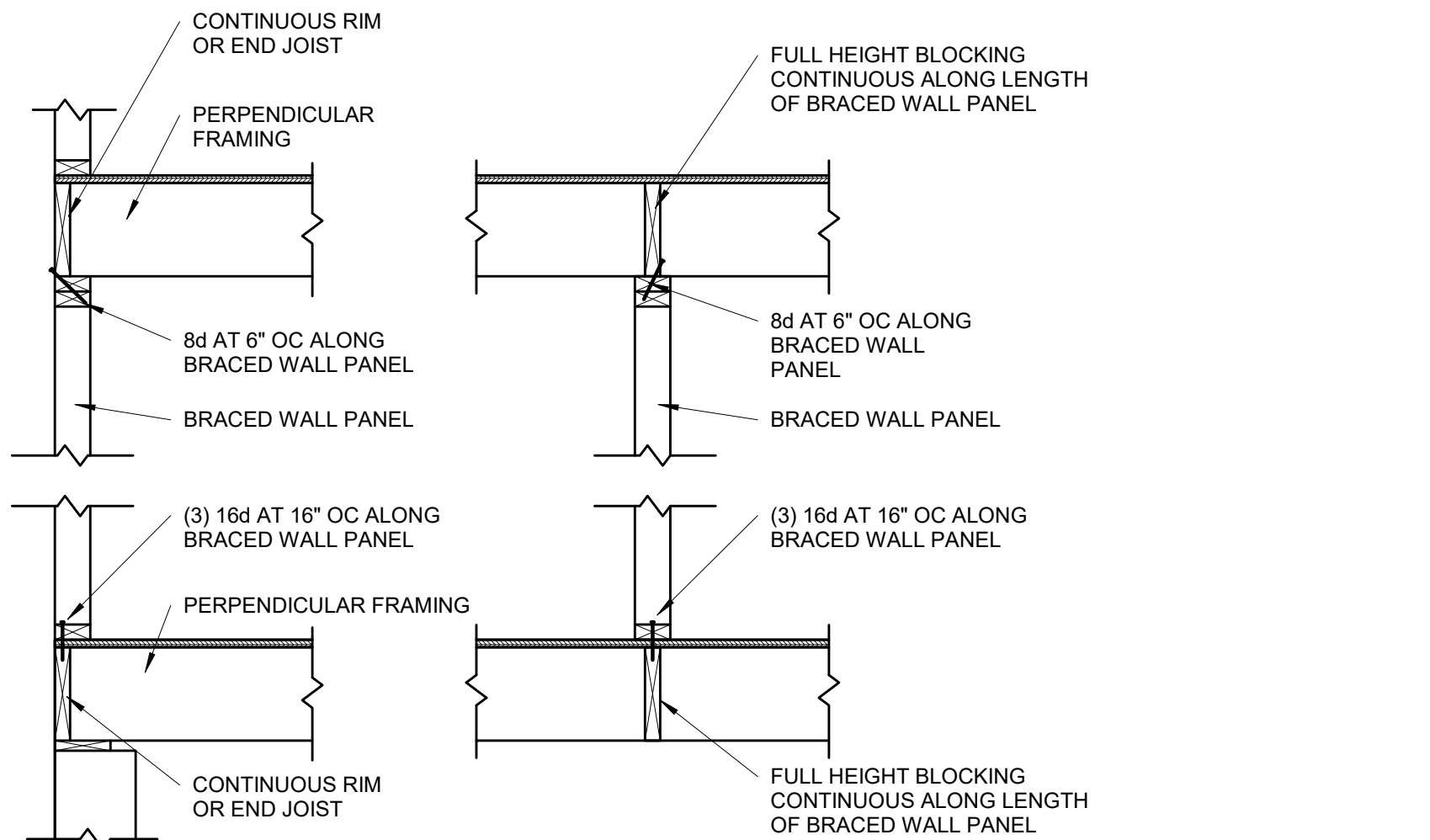
**BRACED WALL METHODOLOGY**  
CONTINUOUS EXTERIOR SHEATHING (CS-WSP) PER WSP METHOD (BELOW)  
UNLESS OTHERWISE NOTED ON THE PLAN

**XXXX EXTERIOR BRACED WALLS:**  
WSP METHOD:  
WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN 3/8" WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING THICKNESS NOT LESS THAN 7/16" WITH MINIMUM SPAN RATING OF 24/16 FOR 24" OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD.  
(NOTE: FRAMING MEMBERS 16" OC MAX, UNBLOCKED, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS)

**///// INTERIOR BRACED WALLS (REF 2/S4.0):**  
GB METHOD:  
1/2" MIN GYPSUM BOARD OVER STUDS SPACED 24" MAX FASTENED WITH #6 - 1 1/4" TYPE 'W' OR 'S' DRYWALL SCREWS AT 7" OC EDGES AND FIELD (MIN. 4'-0" SECTION FOR BOTH SIDES).  
OR  
LIB METHOD:  
1/4" WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA TYPE WB (OR EQUAL) STL X-BRACE(S) AT 45° TO 60° ANGLES, MAXIMUM 16" OC STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.

COMMENTS	
#	DATE

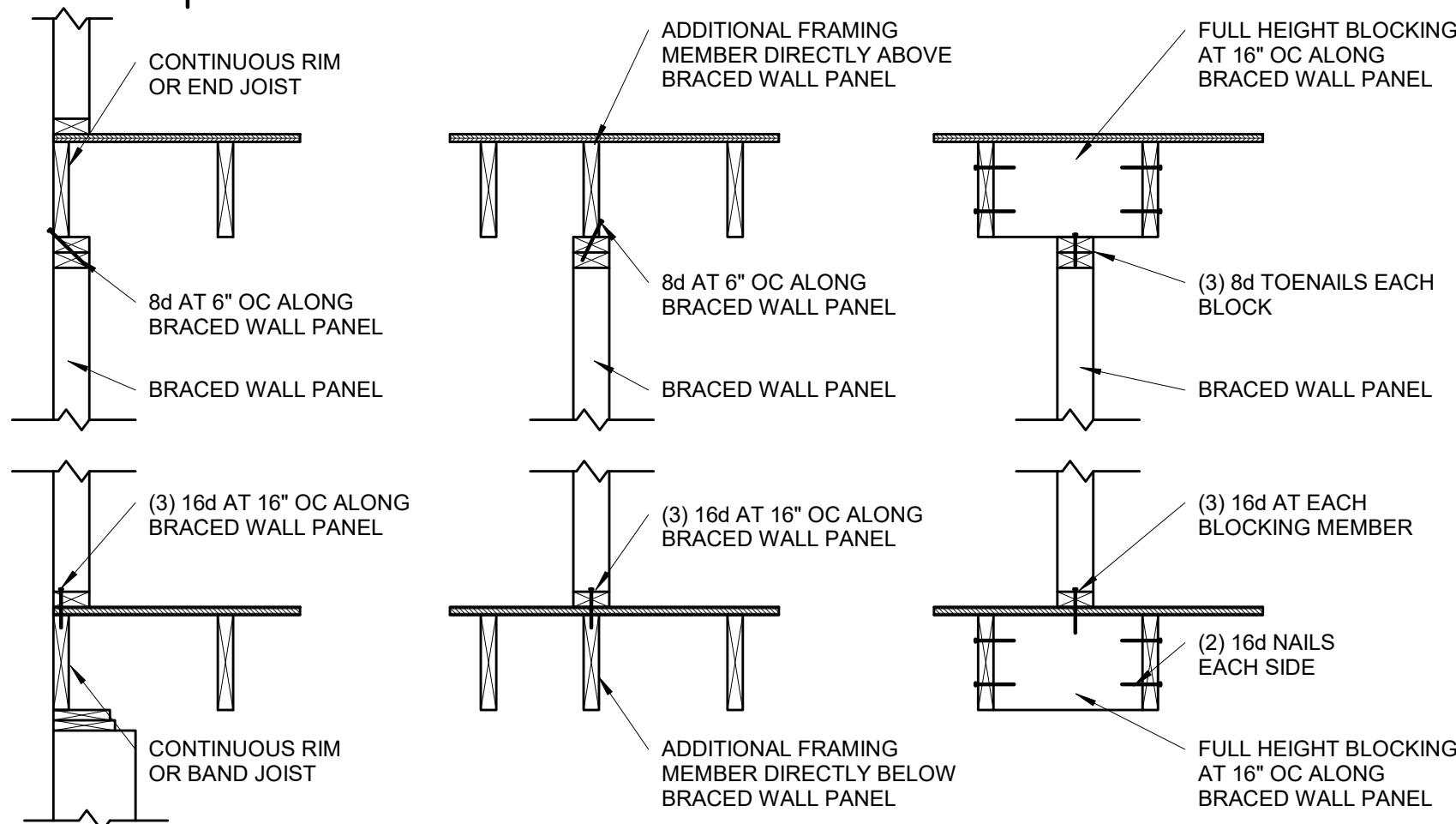




**BRACED WALL PANEL  
CONNECTION WHEN  
PERPENDICULAR TO  
FLOOR/CEILING FRAMING**

**S4.1**

3/4" = 1'-0"

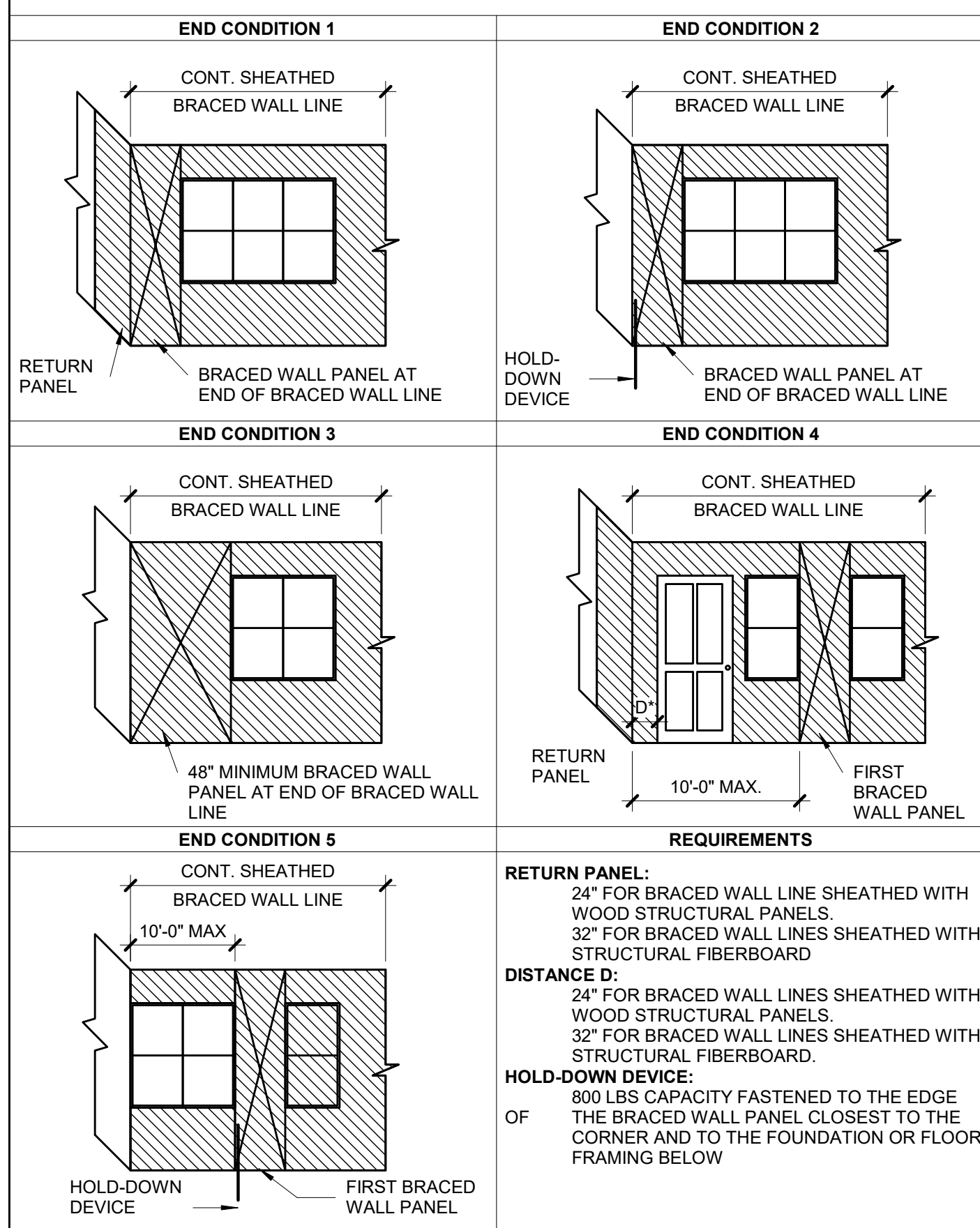


**BRACED WALL PANEL  
CONNECTION WHEN PARALLEL  
TO FLOOR/CEILING FRAMING**

**S4.1**

3/4" = 1'-0"

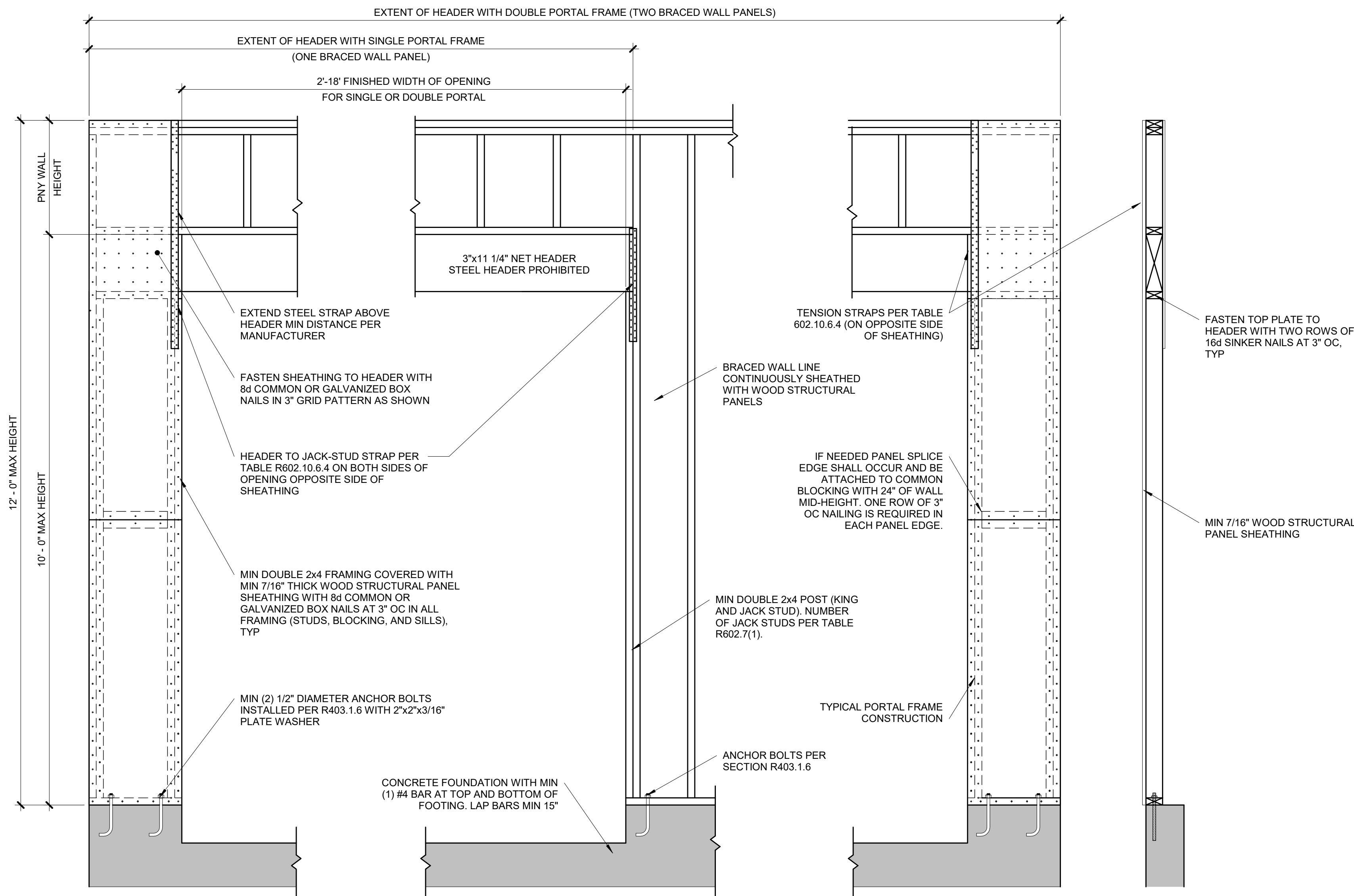
**CONT. SHEATHED BRACED WALL END CONDITIONS**



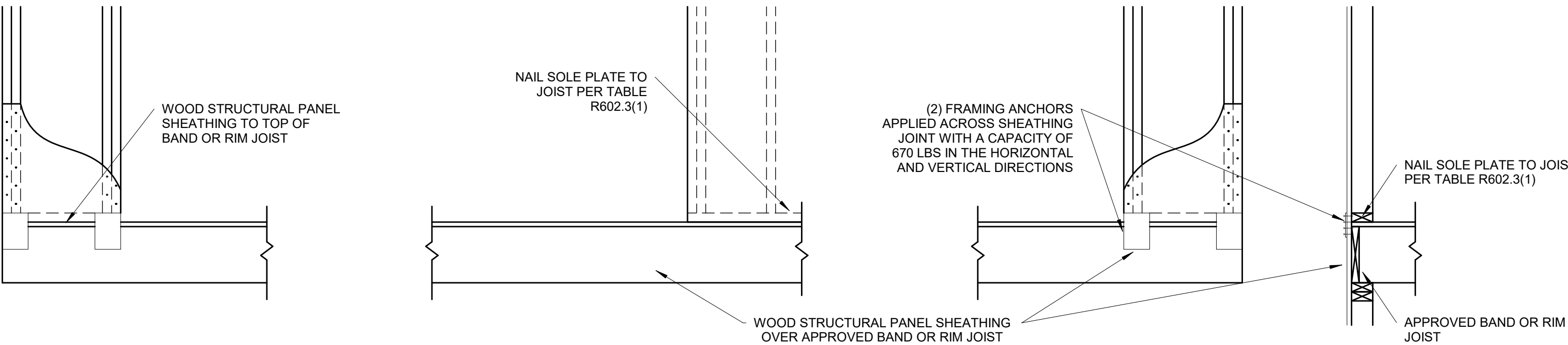
**CONTINUOUS SHEATHED BRACED  
WALL END CONDITIONS**

**S4.1**

NOT TO SCALE (COMPLIANCE WITH IRC R602.10.7)

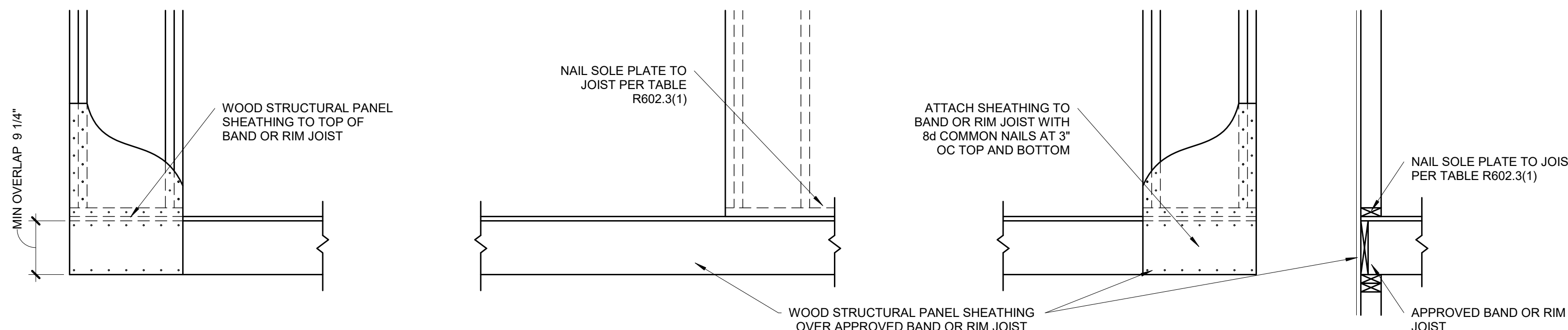


**OVER CONCRETE OR MASONRY BLOCK FOUNDATION**



**OVER RAISE WOOD FLOOR - FRAMING ANCHOR OPTION**

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



**OVER RAISE WOOD FLOOR - OVERLAP OPTION**

(WHEN PORTAL SHEATHING LAPS OVER BAND OR RIMBOARD)

**BRACED WALL PANEL-IRC  
METHOD CS-PF CONTINUOUSLY  
SHEATHED PORTAL FRAME  
PANEL CONSTRUCTION**

**S4.1**

3/4" = 1'-0"

(PER IRC R602.10.6.4)