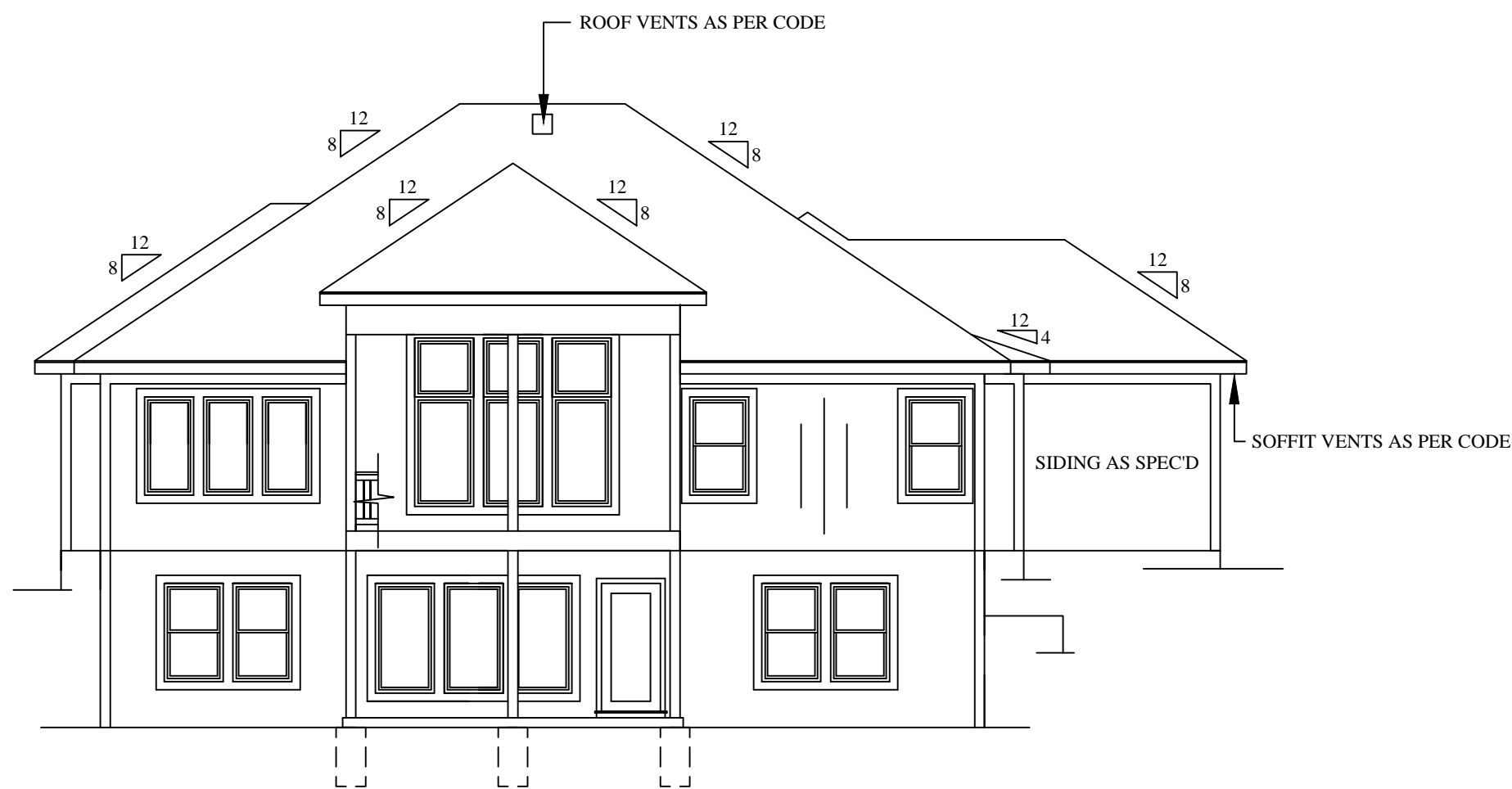


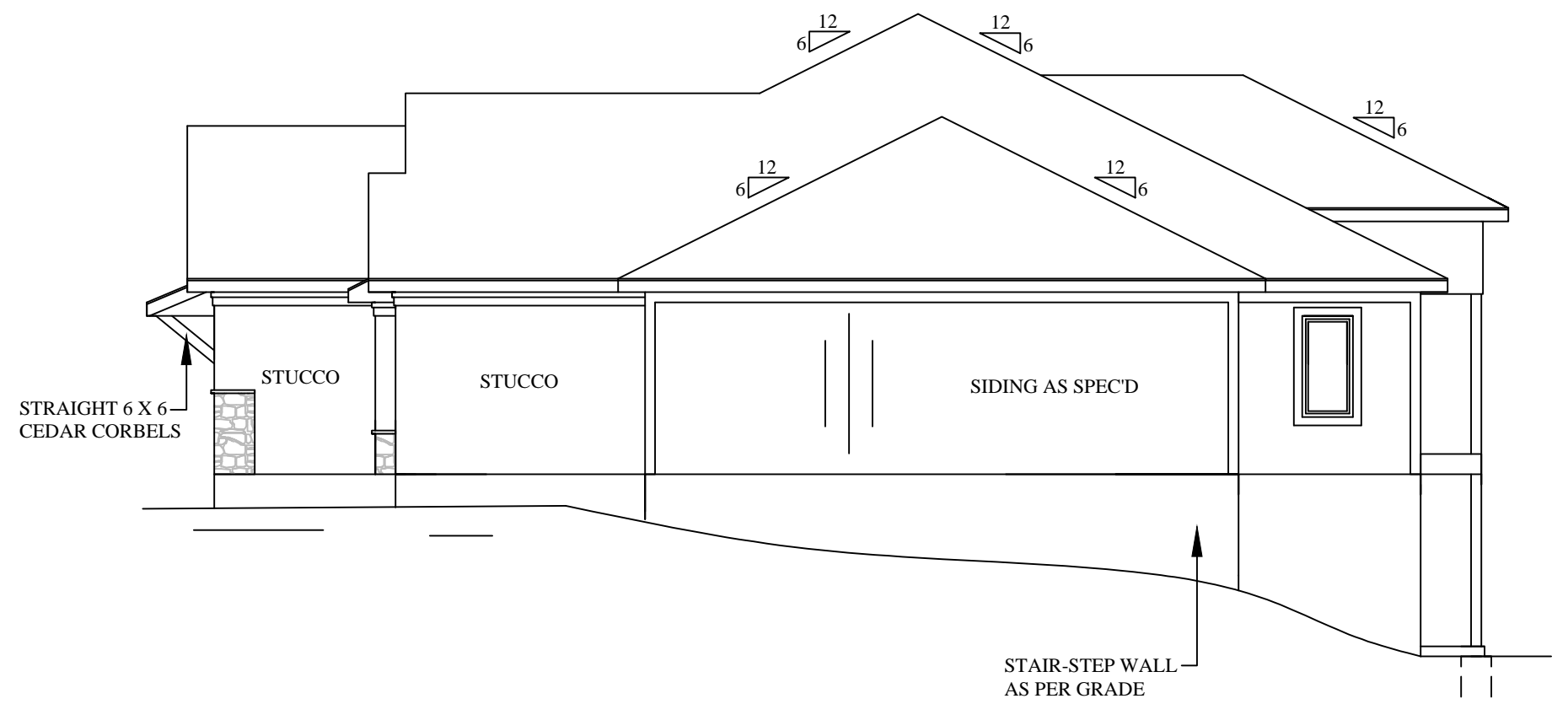
LEFT ELEVATION

1/8" = 1'-0"



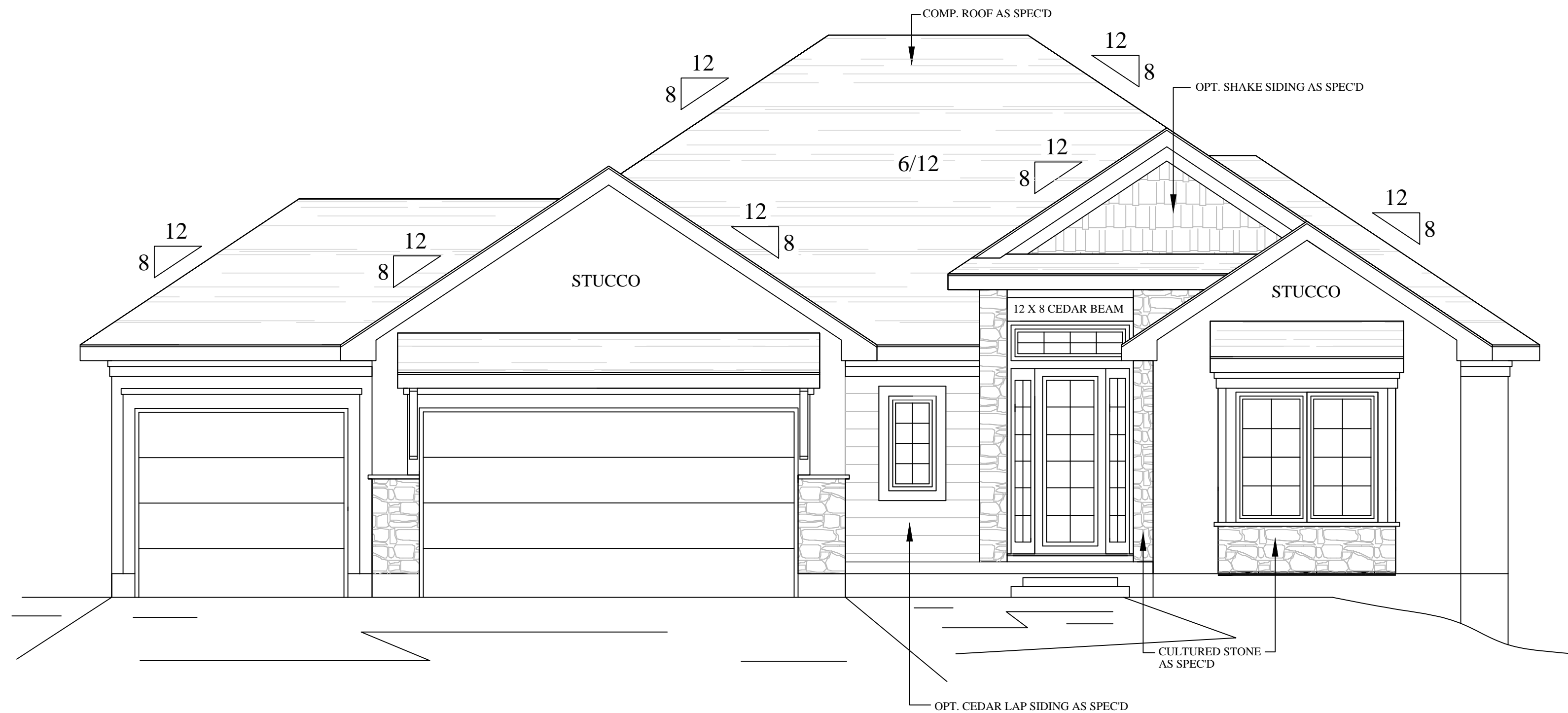
REAR ELEVATION

1/8" = 1'-0"



RIGHT ELEVATION

1/8" = 1'-0"



FRONT ELEVATION

1/4" = 1'-0"

RELEASE FOR CONSTRUCTION  
AS NOTED ON PLANS REVIEW  
CODES ADMINISTRATION  
LEE'S SUMMIT, MISSOURI  
07/01/2020

THIS PLAN HAS BEEN DESIGNED TO  
CONFORM WITH THE 2018  
INTERNATIONAL RESIDENTIAL CODE



STRUCTURAL REVIEW  
HD ENGINEERING & DESIGN  
11656 W. 75TH ST  
SHAWNEE, KS 66214  
V: 913-631-2222  
F: 800-780-8608  
SERVICE@HDEngineers.com  
HD: 39328 | DATE: 06/02/2020

3129 SW BLUE RIBBON, LEE'S SUMMIT, MO

STEWART BUILDERS, LLC

PHONE: (816) 510-7850

"NOT A REGISTERED ARCHITECT"

PLAN: MACKENZIE II - 2019

DATE: 12-5-2019

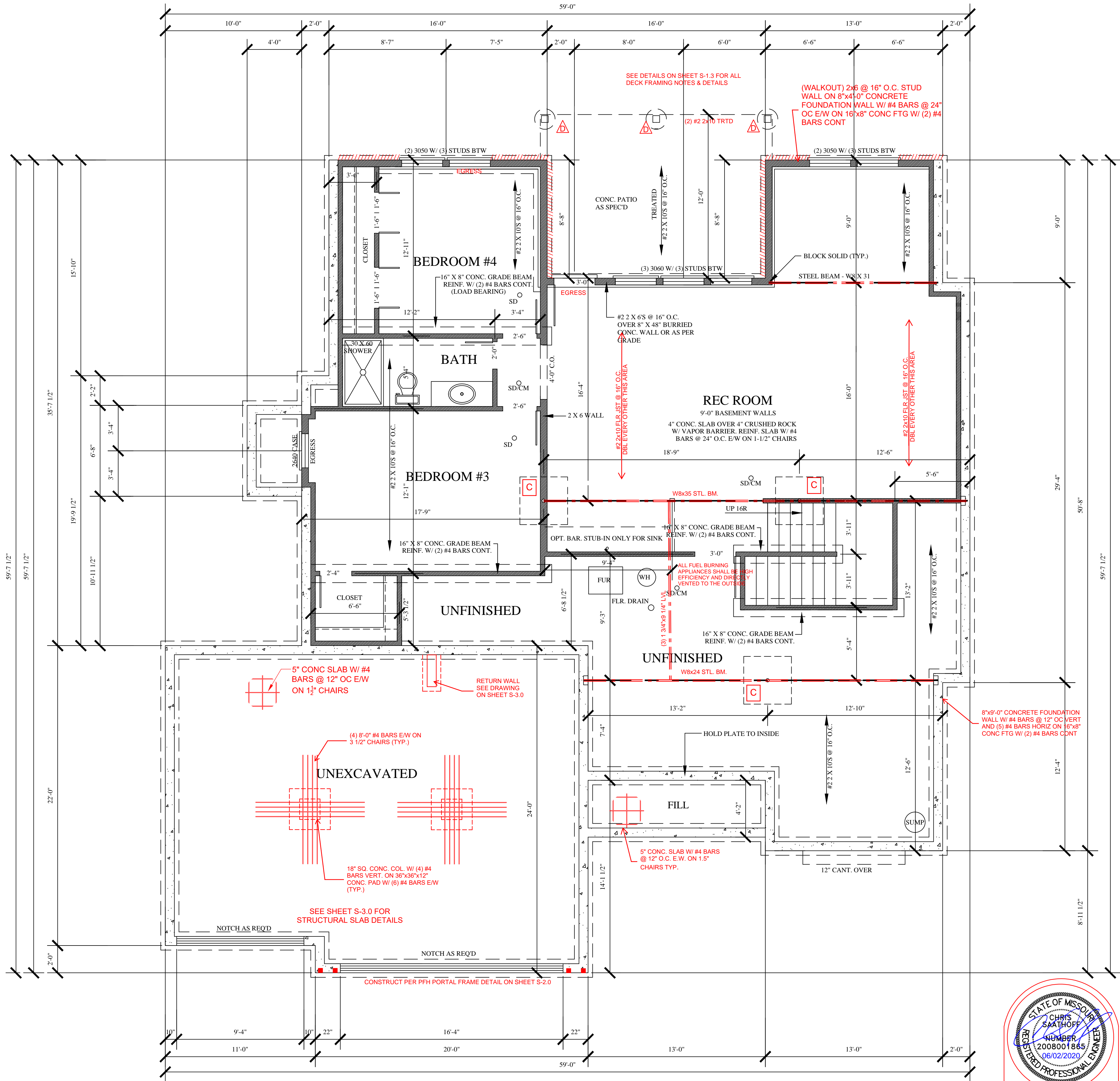
PAGE: 1 OF 4

CONTRACTOR TO CHECK AND VERIFY ALL  
DIMENSIONS AND JOB SITE CONDITIONS  
PRIOR TO CONSTRUCTION.

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NOTE: THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS STRUCTURE IS BUILT IN STRICT  
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DECK PIER SCHEDULE

- MIN. 6X6 TRTD/CDR POST ON 12" CONC PIER WITH USP PAU 66 BASE OR = (1177# MAX)
- MIN. 6X6 TRTD/CDR POST ON 16" CONC PIER WITH USP PAU 66 BASE OR = (2050# MAX)
- MIN. 6X6 TRTD/CDR POST ON 18" CONC PIER WITH USP PAU 66 BASE OR = (2549# MAX)
- MIN. 6X6 TRTD/CDR POST ON 24" CONC PIER WITH USP PAU 66 BASE OR = (4710# 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.

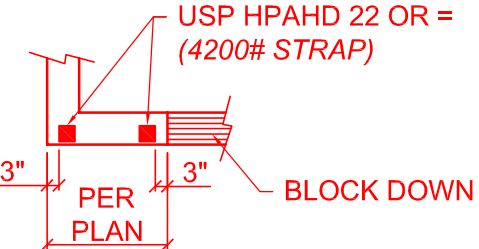
COLUMN PAD SCHEDULE

- A 3" SCH. 40 STL. COL. ON 30"x30"x12" CONC. PAD W/ (5) #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" SCH. 40 STL. COL. ON 42"x42"x12" CONC. PAD W/ (7) #4 BARS E.W. (18.4K MAX.)
- D 3 1/2" SCH. 40 STL. COL. ON 48"x48"x12" CONC. PAD W/ (8) #4 BARS E.W. (24K MAX.)
- E 3 1/2" SCH. 40 STL. COL. ON 54"x54"x16" CONC. PAD W/ (9) #4 BARS E.W. (30.4K MAX.)
- F 3 1/2" SCH. 40 STL. COL. ON 60"x60"x16" CONC. PAD W/ (10) #4 BARS E.W. (37.5K MAX.)

NOTES:  
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 AHJ. 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.

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 DASMA REQUIREMENTS SEE DETAIL SHEET S-1.0  
-ALL HEADERS NOT LABELED SHALL BE MIN (2) #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

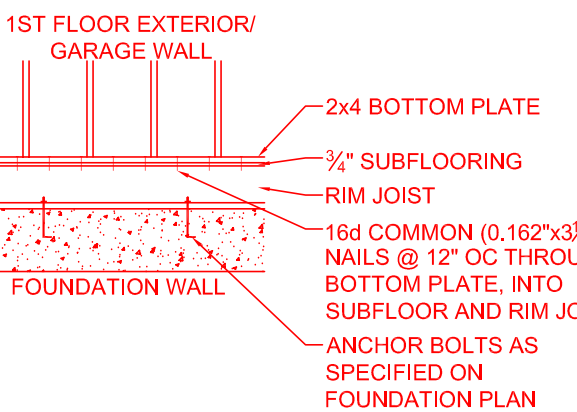
TYPICAL TIE DOWN AT NARROW WALL



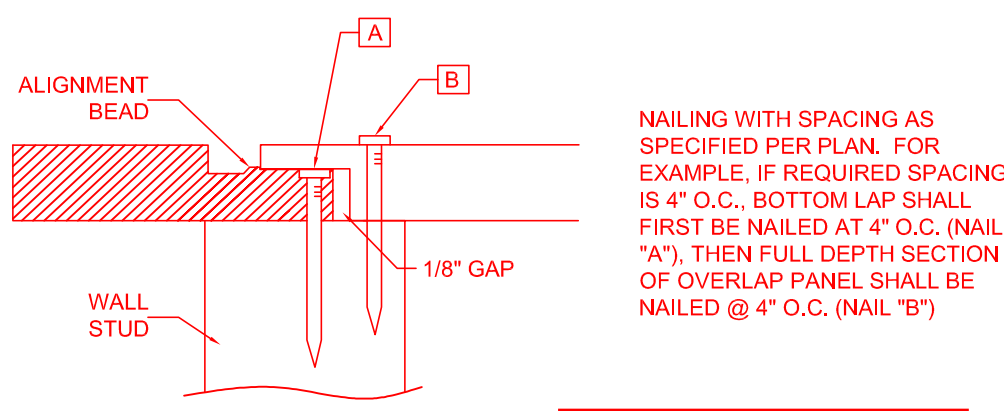
BRACED WALLS:  
SEE CALCULATIONS ON SHEET S-2.0, PER ASCET-10 REQUIREMENTS AS ALLOWED BY IRC 2018 R301.2.1

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 6d 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 8'-12" FROM THE END OF EACH SECTION OF SILL PLATE ALONG ENTIRE PERIMETER OF FOUNDATION



THIS PLAN HAS BEEN DESIGNED TO CONFORM WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE

FOUNDATION PLAN NOTES

3129 SW BLUE RIBBON, LEE'S SUMMIT, MO

STEWART BUILDERS, LLC

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PLAN: MACKENZIE B - 2019 DATE: 12-5-2019

PAGE: 2 OF 4

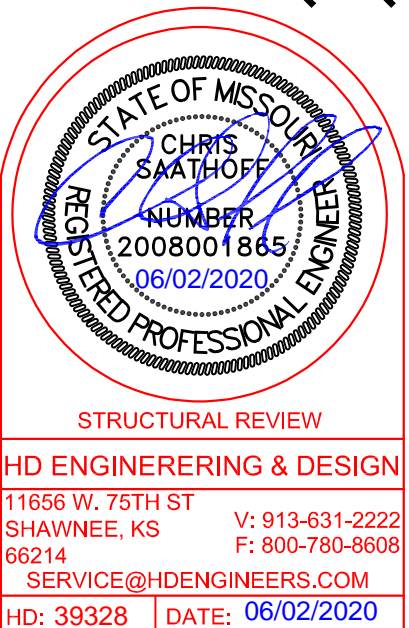
BASEMENT PLAN

1/4" = 1'-0"  
1036 FIN. SQ. FT.  
850 SF UNFINISHED

NOTE: THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS STRUCTURE IS BUILT IN STRICT COMPLIANCE WITH ALL GOVERNING CODES (COUNTY, STATE, & FED.).

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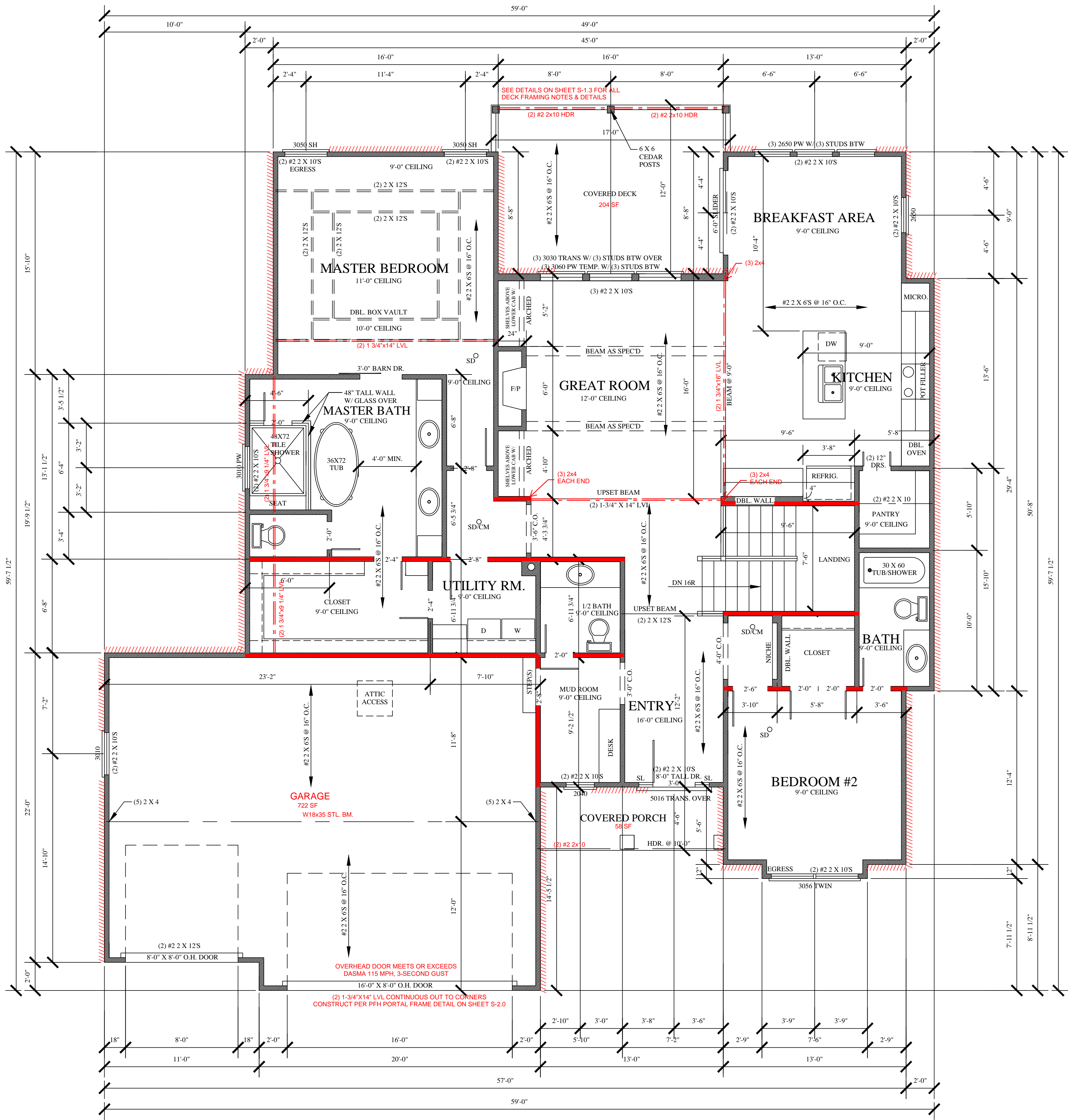


STRUCTURAL REVIEW  
HD ENGINEERING & DESIGN  
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SERVICE@HDEENGINEERS.COM  
HD: 39328 DATE: 06/02/2020

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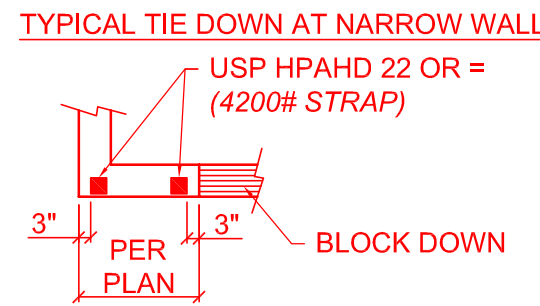
RELEASE FOR CONSTRUCTION  
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LEE'S SUMMIT, MISSOURI  
07/01/2020





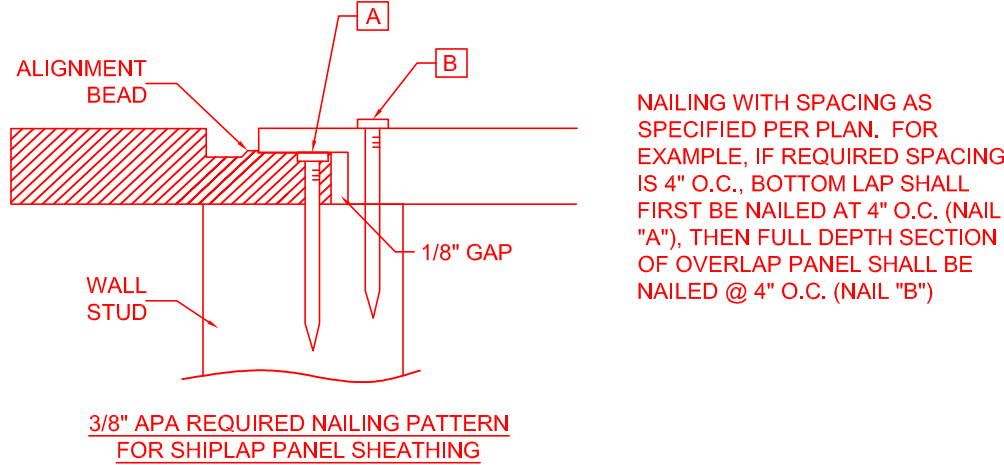
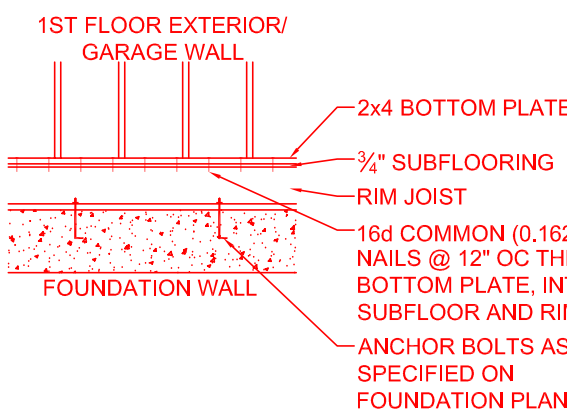
- LOAD BEARING WALL
- - - - - LOAD BEARING BEAM
- SD - SMOKE DETECTOR
- CO - CARBON MONOXIDE SENSOR

**GENERAL NOTES:**  
-WINDOW SHALL HAVE FALL PROTECTION PER IRC 312.2.4  
-HOUSE WILL BE PROVIDED WITH A "JIFER" GROUND PER IRC SECTION 3608.1.5  
-OVERHEAD GARAGE DOORS MUST MEET DASMA REQUIREMENTS SEE DETAIL SHEET S-1.0  
-ALL HEADERS NOT LABELED SHALL BE MIN (2) #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-4.9 SHALL NOT BE CONSIDERED A COMPLETE SET OF CONSTRUCTION DOCUMENTS  
-INSTALL W6X15 STEEL BEAM MIN. UNDER ALL F.P. WALLS/HEARTHES (THAT WILL RECEIVE ROCK) UNLESS NOTED AS A LARGER BEAM. ANY STONE OVER 2" DEEP, NOTIFY ENG. TO VERIFY LOADS  
-FOUNDATION SHALL BE CONSTRUCTED PER JOHNSON COUNTY RESIDENTIAL FOUNDATION GUIDELINE. SEE ATTACHED  
-ICE AND WATER SHIELD AS REQUIRED PER IRC



**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



FIRST FLOOR PLAN NOTES

STATE OF MISSOURI  
REGISTERED PROFESSIONAL ENGINEER  
CHRIS SAATHOFF  
NUMBER 2008001865  
06/02/2020

STRUCTURAL REVIEW  
HD ENGINEERING & DESIGN  
11656 W. 75TH ST  
SHAWNEE, KS  
66214  
SERVICE@HDENGINEERS.COM  
HC: 39328 DATE: 06/02/2020

THIS PLAN HAS BEEN DESIGNED TO CONFORM WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE

MAIN LEVEL

1/4" = 1'-0" 1886 SQ. FT.

NOTE: THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS STRUCTURE IS BUILT IN STRICT COMPLIANCE WITH ALL GOVERNING CODES (COUNTY, STATE, & FED.).

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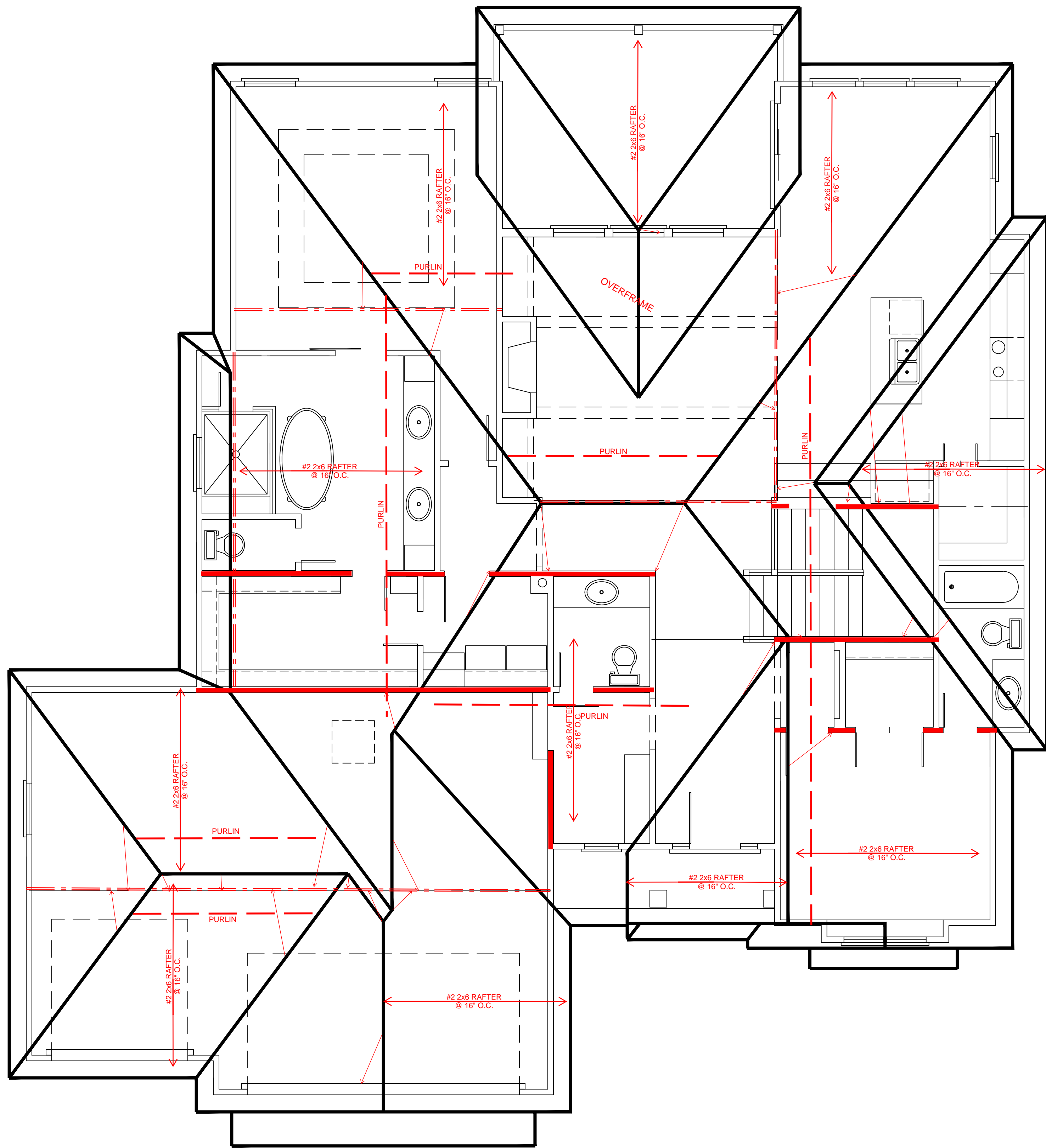
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3129 SW BLUE RIBBON, LEE'S SUMMIT, MO

STEWART BUILDERS, LLC

PHONE: (816) 510-7850 "NOT A REGISTERED ARCHITECT"  
PLAN: MACKENZIE II - 2019 DATE: 12-5-2019 PAGE: 3 OF 4

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07/01/2020



## ROOF PLAN

1/4" = 1'-0"

### NOTES

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

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"
	#2-2x6	@24" O.C.	15'-1"
	#2-2x6	@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

GREATER THAN CODE	RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
	#2-2x6	@24" O.C.	8'-6"
	#2-2x6	@16" O.C.	9'-9"
	#2-2x6	@24" O.C.	11'-3"
	#2-2x6	@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, HIPs, 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) 2x6	20'-0"
(2) 2x6 & (1) 2x6	30'-0"
CONSULT ARCH/ENGR.	>30'-0"

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

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STRUCTURAL REVIEW

HD ENGINEERING & DESIGN

11656 W. 75TH ST V: 913-631-2222  
SHAWNEE, KS F: 800-780-8608  
66214  
SERVICE@HDENGINEERS.COM  
HD: 39328 DATE: 06/02/2020

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DATE: 12-5-2019

PAGE: 4 OF 4

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07/01/2020



## ALLOWABLE LOADS FOR PNEUMATIC OR MECHANICALLY DRIVEN NAILS AND STAPLES

FASTENER DESCRIPTION	NAIL GUN NAILS/ WIRE DIA.	WIRE GA.	PENETRATION REQUIRED INTO MAIN MEMBER FOR LATERAL STRENGTH (IN.)	ALLOWABLE LOADS (IN POUNDS)			
				LATERAL STRENGTH		WITHDRAWAL STRENGTH	
				SP	DF/L	SP	DF/L
16 GA. STAPLE	.063	16	1	51		36	32
15 GA. STAPLE	.072	15	1	64		42	37
14 GA. STAPLE	.080	14	1	75		46	41
6d COOLER NAIL	.092	13	1	46		27	23
6d SINKER NAIL							
6d BOX NAIL	.099	12-1/2	1-1/8	61	55	31	24
6d CASING NAIL							
7d COOLER NAIL							
6d COMMON NAIL	.113	11-1/2	1-1/4	79	72	35	28
8d COOLER NAIL							
8d SINKER NAIL							
8d BOX NAIL							
8d CASING NAIL	.120	11	1-3/8	89	81	41	32
6d RING SHANK NAIL							
6d SCREW SHANK NAIL							
8d RING SHANK NAIL							
8d SCREW SHANK NAIL	.128	10-1/2	1-1/2	89	81	36	31
10d Cooler Nail							
10d Sinker Nail							
12d Short							
10d Box Nails	.128	10-1/2	1-1/2	101	93	40	31
12d Box Nails							
10d Casing Nails	.131	10-1/4	1-1/2	106	97	41	32
8d Common Nails							
16d Short							
12d Sinkers	.135	10	1-1/2	113	103	42	33
16d Box Nails							
10d Ring Shank Nails	.135	10	1-5/8	113	103	46	36
10d Screw Shank Nails							
12d Ring Shank Nails							
12d Screw Shank Nails	.148	9	1-5/8	128	118	46	36
10d Common Nails							
12d Common Nails							
16d Sinker Nails							
20d Box Nails	.148	9	1-3/4	128	118	50	40
30d Box Nails							
16d Ring Shank Nails							
16d Screw Shank Nails	.162	8	1-3/4	154	141	50	40
16d Common Nails							
40d Box Nails	.177	7	2-1/8	178	163	59	47
20d Ring Shank Nails							
20d Screw Shank Nails	.177	7	2-1/8	178	163	54	43
20d Sinker Nails							
20d Common Nails	.148	9	2-1/8	170	166	59	47
30d Sinker Nails							

## SHEATHING SCHEDULE

ALL SHEATHING MATERIALS TO BE APPLIED PERPENDICULAR TO JOISTS AND ENDS STAGGERED

BUILDING COMPONENT	MATERIAL	FASTENING
ROOF SHEATHING	7/16" PLYWOOD	16 GA X 1 3/4" STAPLES @ 6" OC EDGES & 12" OC IN FIELD
	1x 4 #3 FURRING	1/2" CROWN STAPLES
FLOOR SHEATHING	3/4" T&G YELLOW PINE PLYWOOD	14 GA X 1 3/4" STAPLES @ 6" OC EDGES & 12" OC IN FIELD
		12.5 GA X 1 1/2" RING OR SCREW SHANK NAILS @ 6" OC EDGES & 12" OC IN FIELD
WALL COVERING	1/2" GYPSUM SHEATHING	6D COMMON NAILS - 1 5/8" GALVANIZED STAPLES; 1 1/4" SCREWS, TYPE W OR S @ 4" OC EDGES & 8" OC IN FIELD
CEILING COVERING	1/2" GYPSUM SHEATHING	7" OC NAILED / 12" OC SCREWED W/ 13GA, 1 3/8" LONG, 19/64" HEAD; 0.098 Ø, 1 1/4" LONG, ANG-RINGED; 5D COOLER NAIL, 0.086 Ø, 1 5/8" LONG, 15/64" HEAD; OR GYP BD NAIL, 0.086 Ø, 1 5/8" LONG, 19/64" HEAD
EXTERIOR WALL SHEATHING	7/16" APA RATED SHEATHING	8D COMMON NAILS @ 6" OC EDGES & 12" OC IN THE FIELD
	RATED PANEL SIDING, RATED 16" O.C. 7/16" THICK	8D BOX OR SINKER NAILS @ 6" OC EDGES & 12" OC IN THE FIELD

## FRAME FASTENING SCHEDULE

BUILDING COMPONENT	FASTEN TO	FASTEN WITH
RAFTERS	RIDGE / VALLEY / HIP	TOENAIL W/ (4) 16D, FACENAIL W/ (3) 16D
	PLATE	TOENAIL W/ (3) 10D
	LEDGER STRIPS SUPPORTING JOISTS OR RAFTERS	FACENAIL W/ (3) 16D
CEILING JOISTS	COLLAR TIE TO RAFTERS	FACENAIL W/ (3) 10D
	TOP PLATE	TOENAIL W/ (3) 8D @ EACH END
	WHERE CLG JST RUN PARALLEL TO RAFTERS	FACENAIL TO RAFTERS W/ (3) 10D MINIMUM
	LAPS OVER PARTITIONS	FACENAIL W/ (3) 10D
BEAMS	BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE	TOENAIL W/ (3) 8D
	BUILT-UP BEAMS, 2" LUMBER LAYERS, FACENAIL OPPOSITE SIDES, (2) @ EACH END PLUS	10D @ 32" OC STAGGERED, TOP & BOTTOM, OPPOSITE SIDES
	BUILT-UP BEAMS OF ENGINEERED LUMBER, FACE NAIL OPPOSITE SIDES	(2) ROWS @ 12" OC
	BUILT-UP HEADER, TWO PIECES W/ 1/2" SPACER	16D @ 16" OC ALONG EDGES
	BUILT-UP HEADER, TWO PIECES, NO 1/2" SPACER	3" x 0.131" NAILS @ 12" OC ALONG EDGES
FLOOR JOISTS	BEARING	TOENAIL W/ (2) 18D @ EACH END
	RIM JOIST TO SILL OR TOP PLATE	TOENAIL W/ 8D COMMON OR 10D BOX NAILS @ 6" OC
	JOIST TO SILL OR GIRDER	TOENAIL W/ (3) 8D
	JOIST TO RIM JOIST	FACENAIL W/ (3) 16D
	BRIDGING TO JOIST	TOENAIL W/ (2) 8D
	I-JOIST TO BEARING PLATE	TOENAIL W/ (2) 8D - ONE INTO EACH SIDE AT LEAST 1 1/2" FROM THE END
	RIM JOIST TO I-JOIST	FACENAIL W/ (2) 10D BOX NAILS - ONE INTO EACH FLANGE
	SOLE PLATE TO LSL RIM BOARD	16D BOX NAILS @ 12" OC
	SINGLE JOIST HANGERS *	10D FACENAILS AND TOENAILS
	DOUBLE JOIST HANGERS *	16D FACENAILS AND TOENAILS
WALLS	TOP & SOLE PLATE TO STUD	END NAIL W/ (2) 16D
	STUD TO SOLE AND TOP PLATE	TOENAIL W/ (4) 8D
	DOUBLE TOP PLATES	FACENAIL W/ 16D @ 16" OC
	DOUBLE TOP PLATE LAP SPLICE	FACENAIL W/ (8) 16D
	TOP PLATE LAPS & INTERSECTIONS	FACENAIL W/ (2) 16D
	DOUBLE STUDS	FACENAIL W/ 16D @ 24" OC
	BUILT-UP CORNER STUDS	FACENAIL W/ 16D - 2 ROWS @ 24" OC
	STEEL "X" BRACING	FACENAIL W/ (2) 16D IN EACH TOP & BOTTOM PLATE & (1) 8D PER STUD
	SOLE PLATE TO JOIST OR BLOCKING	FACENAIL W/ 16D @ 16" OC
	SOLE PLATES TO JOIST OR BLOCKING AT BRACED WALL LINES, PERPENDICULAR TO FRAMING	FACENAIL W/ (3) 16D @ 16" OC ALONG BRACED WALL PANEL
	TOP PLATE TO JOIST OR BLOCKING AT BW LINES, PERPENDICULAR TO FRAMING	TOENAIL W/ 8D @ 6" OC ALONG BRACED WALL PANEL
	SOLE PLATES TO JOIST OR BLOCKING AT BW LINES PARALLEL TO FRAMING, BLOCKING @ 16" OC	FACENAIL W/ (3) 16D @ 16" OC ALONG BW PANEL & AT EACH BLOCK
	TOP PLATE TO JOIST OR BLOCKING AT BW LINES, PARALLEL TO FRAMING, BLOCKING @ 16" OC	TOENAIL W/ 8D @ 6" OC ALONG BW PANEL & AT EACH BLOCK
	NON-STRUCT. SIDING OVER STRUCT. SHEATHING	(1) 6D BOX NAIL IN EACH STUD
	FIBER CEMENT PLANK SIDING	(1) 6D GALVANIZED NAIL IN EACH STUD
	WINDOW INSTALLATION NAILING	1 3/4" - 2" ROOFING NAILS @ 12" OC MAX.

\* JOIST HANGER NOTES: 1) NO JOIST HANGER NAILS ALLOWED FOR TOENAILS, 2) NO GUN NAILS OR SCREWS ALLOWED IN CONNECTORS, 3) TOENAILS SHALL ALWAYS BE A FULL 3" OR 3.5" NAIL

COLUMN CONNECTION TO STEEL BEAMS SHALL BE WITH A CLIP POST CAP WITH ALL FOUR TAB ENDS BENT AROUND THE BOTTOM FLANGE OF THE BEAM. FOR A BEARING PLATE, FOUR HOLES SHALL BE DRILLED IN THE BOTTOM FLANGE OF THE STEEL BEAM TO MATCH THE HOLE PATTERN OF THE PLATE. 1/2"x2" BOLTS SHOULD THEN BE INSTALLED WITH A FLAT WASHER, LOCK WASHER, AND A NUT IN EACH OF THE HOLES. THE POST CAP MAY BE WELDED TO THE STEEL BEAM IN ACCORDANCE WITH AWS D1.1-92 AS AN ALTERNATIVE, AND WOULD NEED TO BE INSPECTED BY AN AWS-CERTIFIED INSPECTOR.

## DUCT SEALING METHOD, PER IRC2018 W1103.3.2

**N1103.2.2 (R403.2.2) SEALING (MANDATORY)** DUCTS, AIR HANDLERS, AND FILTER BOXES SHALL BE SEALED. JOINTS AND SEAMS SHALL COMPLY WITH SECTION M1601.4.1 OF THIS CODE.

EXCEPTIONS:

1. AIR-IMPERMEABLE SPRAY FOAM PRODUCTS SHALL BE PERMITTED TO BE APPLIED WITHOUT ADDITIONAL JOINT SEALS.

2. WHERE A DUCT CONNECTION IS MADE THAT IS PARTIALLY INACCESSIBLE, THREE SCREWS OR RIVETS SHALL BE EQUALLY SPACED ON THE EXPOSED PORTION OF THE JOINT SO AS TO PREVENT A HOLE EFFECT.

3. CONTINUOUSLY WELDED AND LOCKING-TYPE LONGITUDINAL JOINTS AND SEAMS IN DUCTS OPERATING AT STATIC PRESSURE - LESS THAN 2 INCHES OF WATER COLUMN (500 Pa) PRESSURE CLASSIFICATION SHALL NOT REQUIRE ADDITIONAL CLOSURE SYSTEMS.

DUCT TIGHTNESS SHALL BE VERIFIED BY EITHER OF THE FOLLOWING:

1. POST CONSTRUCTION TEST: TOTAL LEAKAGE SHALL NOT BE LESS THAN OR EQUAL TO 4 CFM (113.3 L/MIN) PER 100FT<sup>2</sup> (9.29m<sup>2</sup>) OF CONDITIONED FLOOR AREA WHEN TESTED AT A PRESSURE DIFFERENTIAL OF 0.1 INCHES W.G. (25 Pa) ACROSS THE ENTIRE SYSTEM, INCLUDING THE MANUFACTURER'S AIR HANDLER ENCLOSURE. ALL REGISTER BOOTS SHALL BE TAPED OR OTHERWISE SEALED DURING THE TEST.

2. ROUGH-IN TEST: TOTAL AIR LEAKAGE SHALL BE LESS THAN OR EQUAL TO 4 CFM (113.3 L/MIN) PER 100FT<sup>2</sup> (9.29m<sup>2</sup>) OF CONDITIONED FLOOR AREA WHEN TESTED AT A PRESSURE DIFFERENTIAL OF 0.1 INCHES W.G. (25 Pa) ACROSS THE ENTIRE SYSTEM, INCLUDING THE MANUFACTURER'S AIR HANDLER ENCLOSURE. ALL REGISTERS SHALL BE TAPED OR OTHERWISE SEALED DURING THE TEST. IF THE AIR HANDLER IS NOT INSTALLED AT THE TIME OF THE TEST, TOTAL AIR LEAKAGE SHALL BE LESS THAN OR EQUAL TO 3 CFM (85 L/MIN) PER 100FT<sup>2</sup> (9.29m<sup>2</sup>) OF CONDITIONED FLOOR AREA.

**EXCEPTION:** THE TOTAL LEAKAGE IS NOT REQUIRED FOR DUCTS AND AIR HANDLERS LOCATED ENTIRELY WITHIN THE BUILDING THERMAL ENVELOPE.

### GENERAL NOTES:

- PLANS SHALL COMPLY WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE, 2018 IECC, AND ALL AMENDMENTS AS ADOPTED BY THE AHJ. IF ANY CHANGES OR DEVIATIONS ARE MADE FROM THESE PLANS THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE AUTHORITY AND THE ENGINEER TO EVALUATE THE CHANGES AND MAKE ANY APPROPRIATE MODIFICATIONS TO THE PLANS.
- WHERE DISCREPANCIES EXIST BETWEEN THE STANDARD COMMENTS, NOTES FOR THE DESIGN PROFESSIONAL OR THE CODE, THE MOST RESTRICTIVE SHALL APPLY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE OWNER, ARCHITECT AND THE AHJ WITH A SET OF PLANS THAT MEET ALL CODE REQUIREMENTS FOR A SINGLE STORY CONSTRUCTION PROJECT, UNLESS REQUESTED BY OUR CLIENT. CODE/AHJ MINIMUM DESIGNS WILL BE UTILIZED. ALSO, UNLESS REQUESTED BY THE OWNER, OUR FIRM CAN NOT AND WILL NOT BE AUTHORIZED TO VISIT THE SITE TO EVALUATE THE SITE OR ANY CONSTRUCTION FOR THIS PROJECT. IMPLEMENTATION OF ALTERNATES TO THE DESIGNS INCLUDING BUT NOT LIMITED TO PIER DESIGNS, FOUNDATION ALTERATIONS, OR ANY STRUCTURAL CHANGES NOT PROVIDED BY HD ENGINEERING OR A PROFESSIONAL REFERRED BY HD ENGINEERING SHALL RELEASE HD ENGINEERING FROM ALL LIABILITY ASSOCIATED WITH THIS DESIGN.
- OUR FIRM HIGHLY RECOMMENDS THAT ANY SITE WITH GREATER THAN A 15% GRADE, ANY SITE WHERE A PREVIOUS STRUCTURE WAS LOCATED, OR ANY SITE WITH POTENTIAL FILL MATERIAL OR A POTENTIAL SOIL BEARING CAPACITY BELOW 1500 PSF SHOULD BE EVALUATED BY OUR FIRM OR AN HD ENGINEERING REFERRED GEOTECHNICAL FIRM PRIOR TO PLACING FOOTINGS. THE ATTACHED PLANS HAVE BEEN DESIGNED WITH THE UNDERSTANDING THAT OUR FIRM HAS NOT AND CAN NOT VISIT OR INSPECT THE SITE WITHOUT WRITTEN CONSENT/REQUEST OF THE OWNER/BUILDER. DUE TO THIS FACT OUR FIRM CAN ONLY DESIGN THE ATTACHED PLANS TO CERTAIN CODE REQUIREMENTS WHICH ARE DETAILED THROUGHOUT THE PLAN AND ATTACHED DETAIL SHEETS, IF THE OWNER DESIRES GREATER THAN CODE DESIGNS THAT REQUEST MUST BE MADE CLEARLY AND IN WRITING PRIOR TO ENGINEERING OF THE PLAN.
- 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.

### FOUNDATION NOTES:

- THE FOUNDATION DESIGN SHALL COMPLY WITH THE ENFORCING JURISDICTION RESIDENTIAL FOUNDATION STANDARD IN LIEU OF ENGINEERING REPORT REQUIREMENTS BASED ON ACTUAL SITE CONDITIONS.
- FOUNDATION WALLS SHALL BE DAMP-PROOFED PER IRC SECTION R406.
- PROVIDE A MINIMUM 4" PERFORATED DRAIN AROUND USABLE SPACE BELOW GRADE OR OTHER EQUIVALENT MATERIALS PER IRC SECTION 405.1. THE PIPE SHALL BE COVERED WITH NOT LESS THAN 6" OF WASHED GRAVEL OR CRUSHED ROCK. THE DRAIN SHALL DAYLIGHT TO THE EXTERIOR BELOW THE FLOOR LEVEL OR TERMINATE IN A MINIMUM 20 GALLON SUMP PIT.
- FOUNDATION DESIGN SHALL BE BASED ON A MINIMUM SOIL BEARING CAPACITY OF 1500 PSF.
- FOOTINGS SHALL BE A MIN. OF 16" WIDE AND 8" DEEP W/ (2) #4 BARS CONTINUOUS, LOCATED A MIN. OF 3" CLEAR FROM BOTTOM. FOOTINGS SHALL BE A MINIMUM OF 36" BELOW GRADE FOR FROST PROTECTION.
- COLUMN PADS SHALL BE A MINIMUM OF 24"x24"x8" WITH (3) #4 BARS EACH WAY.
- FOUNDATION WALLS SHALL BE A MINIMUM 8" THICK W/ MINIMUM #4 BARS @ 24" O.C. HORIZONTAL AND VERTICAL W/ THE TOP BAR WITHIN 8" OF THE TOP OF THE WALL UNLESS NOTED OTHERWISE ON PLAN.
- REINFORCEMENT SHALL LAP A MINIMUM OF 24"
- 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 BY A SEPARATION OF 1/2".
- CONCRETE FLOOR SLABS ON GRADE SHALL BE A MINIMUM 4" THICK OVER A MINIMUM 4" BASE OF SAND, GRAVEL, OR CRUSHED STONE. BASEMENT SLABS SHALL HAVE A MIN. 6 MIL POLYETHYLENE OR APPROVED VAPOR RETARDER WITH JOINTS LAPPED NOT LESS THAN 6" SHALL BE PLACED BETWEEN THE FLOOR SLAB AND THE BASE COURSE.
- FLOOR SLABS SUPPORTED BY FILL CONSISTING OF MORE THAN 24" OF GRANULAR FILL OR 8" OF EARTH SHALL BE REINFORCED PER A SEPARATE ENGINEERING DESIGN.
- BASEMENT FOUNDATION SILL PLATES SHALL BE BOLTED TO THE FOUNDATION W/ A MINIMUM OF 1/2" ANCHOR BOLTS EMBEDDED AT LEAST 7" INTO THE CONCRETE AND SPACED NOT MORE THAN 3' ON CENTER AND WITHIN 12" OF EACH END PIECE PER IRC SECTION R403.1.6.
- FOUNDATION WINDOW WELLS FOR SECONDARY MEANS OF EGRESS SHALL PROVIDE A MINIMUM 3'X3' HORIZONTAL AREA.
- THE BASE OF ALL FOOTING EXCAVATIONS SHOULD BE FREE OF ALL WATER AND LOOSE MATERIAL PRIOR TO PLACING CONCRETE. CONCRETE SHOULD BE PLACED AS SOON AS POSSIBLE AFTER EXCAVATING SO THAT EXCESSIVE DRYING OR DISTURBANCE OF BEARING MATERIALS DOES NOT OCCUR. SHOULD THE MATERIALS AT BEARING LEVEL BECOME EXCESSIVELY DRY OR SANDY, WE RECOMMEND THAT THE AFFECTED MATERIAL BE REMOVED PRIOR TO PLACING CONCRETE.
- IT IS RECOMMENDED THAT ALL FOOTING EXCAVATIONS BE EVALUATED AND TESTED BY A GEOTECHNICAL ENGINEER IMMEDIATELY PRIOR TO PLACEMENT OF FOUNDATION CONCRETE. UNSUITABLE AREAS IDENTIFIED AT THIS TIME SHOULD BE CORRECTED. CORRECTIVE PROCEDURES WOULD BE DEPENDENT UPON CONDITIONS ENCOUNTERED AND MAY INCLUDE DEEPENING OF FOUNDATION ELEMENTS, OR UNDERCUTTING OF UNSUITABLE MATERIALS AND REPLACEMENT WITH ENGINEERED FILL.

### STAIRWAY NOTES:

- STAIRWAYS SHALL PROVIDE A MAXIMUM 7 3/4" RISE AND MIN. 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 3 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 R311.7.8.5
- 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.
- WINDERS SHALL PROVIDE A MINIMUM TREAD OF AT LEAST 6" AT ANY POINT WITHIN CLEAR WIDTH OF STAIRS. WINDER TREAD PROPORTION TO COMPLY WITH IRCR311.7.5.2.1.

### GLAZING NOTES:

- 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 OPERABLE 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 ENCLOSEING 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 OPERABLE PANELS EXCEEDING 9 S.F. AND WHOSE BOTTOM EDGE IS LESS THAN 18" ABOVE THE FLOOR OR WALKING SURFACE WITHIN 36"
- IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72 INCHES ABOVE THE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24 INCHES ABOVE THE FINISHED FLOOR OF THE ROOM IN WHICH THE WINDOW IS LOCATED. OPERABLE SECTIONS OF WINDOWS SHALL NOT PERMIT OPENINGS THAT ALLOW PASSAGE OF A 4 INCH DIAMETER SPHERE WHERE SUCH OPENINGS ARE LOCATED WITHIN 24 INCHES OF THE FINISHED FLOOR.

### FRAMING NOTES:

- ALL LUMBER SIZES ARE FOR DOUGLAS FIR-LARCH UNLESS OTHERWISE NOTED.
- ALL HEADERS TO BE A MINIMUM OF (2) #2-2X10'S UNLESS OTHERWISE NOTED.
- BLOCK CANTILEVERS, DOOR JAMBS, AND OVER BEAMS.
- ALL HEADERS/BEAMS TO BEAR ON A MINIMUM OF (2) 2X4 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 SHALL BE PROVIDED AT A MAXIMUM OF 4' 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 (4) 10D NAILS.
- IF DUCTS ARE INSTALLED IN THE FIRST JOIST SPACE(S), NAIL 2X4'S FLAT AT 4' CENTERS WITHIN THE JOIST SPACE(S) AND THEN PROVIDE SOLID BLOCKING, INSTALLED UPRIGHT, IN THE NEXT TWO JOIST SPACES. SECURE THE 2X4'S TO THE SILL PLATE WITH (4) 10D NAILS.
- ALL SILLS AND SLEEPERS SUPPORTED ON CONCRETE OR MASONRY AND FURRING ATTACHED TO CONCRETE OR MASONRY SHALL BE OF DECAY RESISTANT MATERIALS.
- JOISTS UNDER BEARING PARTITIONS SHALL BE SIZED TO CARRY THE DESIGN LOAD IN ACCORDANCE WITH IRC SECTION R502.4.
- JOISTS FRAMING FROM OPPOSITE SIDES OVER BEARING SUPPORTS SHALL LAP A MINIMUM OF 3" 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 ON MINIMUM 2"x2" LEDGER STRIPS.
- HEADER 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' FROM THE TRIMMER JOIST BEARING. WHEN THE HEADER SPAN EXCEEDS 4', 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.
- ALL WALL COVERINGS TO COMPLY WITH IRC SECTION 702 AND 703
- ALL RAFTER / COLLAR TIES TO COMPLY WITH IRC SECTIONS 804
- ALL RAFTERS TO HAVE 2x4 COLLAR TIES @ 48" OC IN UPPER 1/3 OF DISTANCE BETWEEN CEILING AND ROOF
- BLOCKING BETWEEN JOISTS UNDER A PERPENDICULAR LOAD-BEARING WALL IS NOT REQUIRED.
- BOTTOM OF ALL FLOOR ASSEMBLIES SHALL BE PROVIDED WITH A 1/2" GYPSUM WALLBOARD MEMBRANE (IF REQUIRED BY LOCAL CODE)
- I-JOIST AND FLOOR TRUSS SYSTEMS SHALL BE FIRE PROTECTED PER IRC AS ADOPTED BY AHJ
- STUDS SHALL BE CONTINUOUS FROM THE FLOOR TO THE ROOF/ CEILING DIAPHRAGM PER IRC 602.3

### CONCRETE NOTES:

- CONCRETE SHALL BE AIR-ENTRAINED (5%-7%) WITH A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 2500 PSI FOR BASEMENT



TABLE R602.3(1)  
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER <sup>a,b,c</sup>	SPACING OF FASTENERS
ROOF			
1	BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE, TOE NAIL	4-8D BOX (2 1/2" X 0.113") 3-8D (2 1/2" X 0.113") 3-10D (3"X0.128") 3-3"X 0.131" NAILS	TOE NAIL
2	CEILING JOISTS TO PLATE, TOE NAIL		PER JOIST, TOE NAIL
3	CEILING JOISTS NOT ATTACHED TO PARALLEL RAFTER, LAPS OVER PARTITIONS (SEE SECTION R802.5.2 AND TABLE R802.52)	4-10D BOX (3"X 0.128") 3-16D COMMON (3 1/2"X 0.162") 4-3"X 0.131" NAILS	FACE NAIL
4	CEILING JOIST ATTACHED TO PARALLEL RAFTER (HEEL JOINT) SEE SECTION R802.5.2 AND TABLE R802.5.2)	TABLE R802.5.2	FACE NAIL
5	COLLAR TIE TO RAFTER, FACE NAIL OR 1 1/4" X 20GA. RIDGE STRAP TO RAFTER	4-10D BOX (3" X 0.128") 3-10D COMMON (3" X 0.148") 4-3" X 0.131" NAILS	FACE NAILS EACH RAFTER
6	RAFTER OR ROOF TRUSS TO PLATE	3-16D BOX NAILS (3 1/2" X0.135") 3-10D COMMON NAILS (3" X 0.148") 4-10D BOX (3" X 0.128") 4-3" X0.131" NAILS	2 TOE NAILS ON ONE SIDE AND 1 TOE NAIL ON OPPOSITE SIDE OF EACH RAFTER OR TRUSS <sup>1</sup>
7	ROOF RAFTERS TO RIDGE, VALLEY OR HIP RAFTERS OR ROOF RAFTER TO MINIMUM 2" RIDGE BEAM	4-16D(3 1/2" X 0.135"); OR 3-10D COMMON (3" X 0.148") 4-10D BOX (3" X 0.128"); OR 4-3" X 0.131" NAILS 3-16D(3 1/2" X0.135"); OR 2-16D COMMON (3 1/2" X0.162") 3-10D BOX (3" X 0.128"); OR 3-3" X 0.131" NAILS	TOE NAIL
WALL			
8	STUD TO STUD (NOT BRACED WALL PANELS)	16D (3 1/2" X 0.162") 10D BOX (3" X 0.128"); OR 3" X 0.131" NAILS	24" OC FACE NAIL 16" OC FACE NAIL
9	STUD TO STUD AND ABUTTING STUDS AT INTERSECTING WALL CORNERS (AT BRACED WALL PANELS)	16D BOX (3 1/2" X 0.135"); OR 3" X 0.131" NAILS 16D COMMON (3 1/2" X 0.162")	12" OC FACE NAIL 16" OC FACE NAIL
10	BUILT-UP HEADER (2" TO 2" HEADER WITH 1/2" SPACER)	16D COMMON (3 1/2" X 0.162") 16D BOX (3 1/2" X 0.135")	16" OC EACH EDGE FACE NAIL 12" OC EACH EDGE FACE NAIL
11	CONTINUOUS HEADER TO STUD	5-8D BOX (2 1/2" X 0.113") or 4-8D COMMON (2 1/2" X 0.131") 4-10D BOX (3" X 0.128")	TOE NAIL
12	TOP PLATE TO TOP PLATE	16D COMMON (3 1/2" X 0.162") 10D BOX (3" X 0.128") OR 3" X 0.131" NAILS	16" OC FACE NAIL 12" OC FACE NAIL
13	DOUBLE TOP PLATE SPLICE	8-16D COMMON (3 1/2" X 0.162"); or 12-16D BOX (3 1/2" X 0.135"); or 12-10D BOX (3" X 0.128"); or 12-3" X 0.131" NAILS	FACE NAIL ON EACH SIDE OF END JOINT (MINIMUM 24" LAP SPLICE LENGTH EACH SIDE OF END JOINT)
14	BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING (NOT AT BRACED WALL PANELS)	16D COMMON (3 1/2" X 0.162") 16D BOX (3 1/2" X 0.135"); OR 3" X 0.131" NAILS	16" OC FACE NAIL 12" OC FACE NAIL
15	BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING (NOT AT BRACED WALL PANELS)	3-16D BOX (3 1/2" X 0.135"); or 2-16D COMMON (3 1/2" X0.162"); or 4-3" X 0.131" NAILS	3, 2, OR 4 EACH 16" OC FACE NAIL
16	TOP OR BOTTOM PLATE TO STUD	4-8D BOX (2 1/2" X 0.113"); or 3-16D BOX (3 1/2" X0.135"); or 4-8D COMMON (2 1/2" X0.131"); or 4-10D BOX (3" X 0.128"); or 3-3" X 0.131" NAILS 3-16D BOX (3 1/2" X 0.135"); or 2-16D COMMON (3 1/2" X0.162"); or 3-10D BOX (3" X 0.128"); or 3-3" X 0.131" NAILS	TOE NAIL END NAIL
17	TOP PLATES, LAPS AT CORNERS AND INTERSECTIONS	3-10D BOX (3" X 0.128"); or 2-16D COMMON (3 1/2" X0.162"); or 3-3" X 0.131" NAILS	FACE NAIL
18	1" BRAVE TO EACH STUD AND PLATE	3-8D BOX (2 1/2" X 0.113"); or 2-8D COMMON (2 1/2" X0.131") or 2-10D BOX (3" X 0.128"); or 2 STAPLES 1 3/4"	FACE NAIL
19	1" X 6" SHEATHING TO EACH BEARING	3-8D BOX (2 1/2" X 0.113"); or 2-8D COMMON (2 1/2" X0.131") or 2-10D BOX (3" X 0.128"); or 2 STAPLES 1" CROWN, 16GA., 1 3/4" LONG	FACE NAIL
20	1" X 8" AND WIDER SHEATHING TO EACH BEARING	3-8D BOX (2 1/2" X 0.113"); or 3-8D COMMON (2 1/2" X0.131") or 3-10D BOX (3" X 0.128"); or 3 STAPLES, 1" CROWN, 16GA., 1 3/4" LONG WIDER THAN 1" X 8" 4-8D BOX (2 1/2" X 0.113"); or 3-8D COMMON (2 1/2" X0.131") or 3-10D BOX (3" X 0.128"); or 4 STAPLES, 1" CROWN, 16GA., 1 3/4" LONG	FACE NAIL
FLOOR			
21	JOIST TO SILL, TOP PLATE OR GIRDER	4-8D BOX (2 1/2" X 0.113"); or 3-8D COMMON (2 1/2" X0.131") or 3-10D BOX (3" X 0.128"); or 3-3" X 0.131" NAILS	TOE NAIL
22	RIM JOIST, BAND JOIST OR BLOCKING TO SILL OR TOP PLATE (ROOF APPLICATIONS ALSO)	8D BOX (2 1/2" X 0.113") 8D COMMON (2 1/2" X 0.131"); or 10D BOX(3" X0.128") or 3-3" X 0.131" NAILS	4" OC TOE NAIL 6" OC TOE NAIL
23	1" X 6" SUBFLOOR OR LESS TO EACH JOIST	3-8D BOX (2 1/2" X 0.113"); or 2-8D COMMON (2 1/2" X0.131") or 3-10D BOX (3" X 0.128"); or 2 STAPLES, 1" CROWN, 16GA., 1 3/4" LONG	FACE NAIL
24	2" SUBFLOOR TO JOIST OR GIRDER	3-16D BOX (3 1/2" X 0.135"); or 2-16D COMMON (3 1/2" X0.162")	BLIND AND FACE NAIL
25	2" PLANKS (PLANK & BEAM-FLOOR AND ROOF)	3-16D BOX (3 1/2" X 0.135"); or 2-16D COMMON (3 1/2" X0.162")	AT EACH BEARING, FACE NAIL
26	BAND OR RIM JOIST TO JOIST	3-16D COMMON (3 1/2" X 0.162"); or 4-10D BOX (3" X0.128") or 4-3" X 0.131" NAILS or 4-3" X 14GA. STAPLES, 7/16" CROWN	END NAIL
27	BUILT-UP GIRDERS AND BEAMS, 2-INCH LUMBER LAYERS	20D COMMON (4" X 0.192"); or 10D BOX (3" X 0.128"); or 3" X 0.131" NAILS AND: 2-20D COMMON (4" X 0.192"); or 3-10D BOX (3" X 0.128; or 3-3" X 0.131" NAILS	NAIL EACH LAYER AS FOLLOWS: 32" OC AT TIP AND BOTTOM AND STAGGERED 24" OC FACE NAIL AT TOP AND BOTTOM STAGGERED ON OPPOSITE SIDES FACE NAIL AT END AND AT EACH SPLICE
28	LEDGER STRIP SUPPORTING JOISTS OR RAFTERS	4-16D BOX (3 1/2" X 0.135"); or 3-26D COMMON (3 1/2" X 0.162"); or 4-10D BOX (3" X 0.128"); or 4-3" X 0.131" NAILS	AT EACH JOIST OR RAFTER, FACE NAIL
29	BRIDGING OR BLOCKING TO JOIST	2-10D BOX (3" X 0.128"); or 2-8D COMMON (2 1/2" X 0.131" or 2-3" X 0.131") NAILS	EACH END, TOE NAIL

a. ALL NAILS ARE SMOOTH COMMON, BOX OR DEFORMED SHANKS EXCEPT WHERE OTHERWISE STATED. NAILS USED FOR FRAMING AND SHEATHING CONNECTIONS SHALL HAVE MINIMUM AVERAGE BENDING YIELD STRENGTHS AS SHOWN: 80 KSI FOR SHANK DIAMETER OF 0.192 INCH (20D COMMON), NAILS FOR SHANK DIAMETERS LARGER THAN 0.192 INCH BUT NOT LARGER THAN 0.171 INCH, AND 100 KSI FOR SHANK DIAMETER OF 0.142 INCH OR LESS.  
b. STAPLES ARE 16 GAGE WIRE AND HAVE A MINIMUM 7/16" INCH ON DIAMETER CROWN WIDTH.  
c. NAILS SHALL BE SPACED AT NOT MORE THAN 6 INCHES ON CENTER AT ALL SUPPORTS WHERE SPANS ARE 48 INCHES OR GREATER.  
d. FOURFOOT BY 6FOOT OR 4FOOT BY 8FOOT PANELS SHALL BE APPLIED VERTICALLY.  
e. SPACING OF FASTENERS NOT INCLUDED IN THIS TABLE SHALL BE BASED ON TABLE R602.3(2).  
f. FOR REGIONS HAVING BASIC WIND SPEED OF 110 MPH OR GREATER, 8D DEFORMED (2 1/2" X 0.120) NAILS SHALL BE USED FOR ATTACHING PLYWOOD AND WOOD STRUCTURAL PANEL ROOF SHEATHING TO FRAMING WITHIN MINIMUM 48-INCHES DISTANCE FROM GABLE END WALLS; IF MEAN ROOF HEIGHT IS MORE THAN 25 FEET, UP TO 35 FEET MAXIMUM.  
g. FOR REGIONS HAVING BASIC WIND SPEED OF 110 MPH OR LESS, NAILS FOR ATTACHING WOOD STRUCTURAL PANEL ROOF SHEATHING TO GABLE END WALL FRAMING SHALL BE SPACED 6 INCHES ON CENTER, WHEN BASIC WIND SPEED IS GREATER THAN 100 MPH, NAILS FOR ATTACHING PANEL ROOF SHEATHING TO INTERMEDIATE SUPPORTS SHALL BE SPACED 8 INCHES ON CENTER FOR MINIMUM 48-INCH DISTANCE FROM RIDGES, EAVES AND GABLE END WALLS, AND 4 INCHES ON CENTER TO GABLE END WALL FRAMING.  
h. GYPSUM SHEATHING SHALL CONFORM TO ASTM C 1396 AND SHALL BE INSTALLED IN ACCORDANCE WITH GA 283. FIBERBOARD SHEATHING SHALL CONFORM TO ASTM C 208.  
i. SPACING OF FASTENERS ON FLOOR SHEATHING PANEL EDGES SUPPORTED BY FRAMING MEMBERS AND REQUIRE BLOCKING AND AT ALL FLOOR PERIMETERS ONLY. SPACING OF FASTENERS ON ROOF SHEATHING PANEL EDGES APPLIES TO PANEL EDGES SUPPORTED BY FRAMING MEMBERS AND REQUIRE BLOCKING, BLOCKING OF ROOF OR FLOOR SHEATHING PANEL EDGES PERPENDICULAR TO THE FRAMING MEMBERS NEED NOT BE PROVIDED EXCEPT AS REQUIRED BY OTHER PROVISIONS OF THIS CODE. FLOOR PERIMETER SHALL BE SUPPORTED BY FRAMING MEMBERS OR SOLID BLOCKING.  
j. WHERE A RAFTER IS FASTENED TO AN ADJACENT PARALLEL CEILING JOIST IN ACCORDANCE WITH THIS SCHEDULE, PROVIDE TWO TOE NAILS ON ONE SIDE OF THE RAFTER AND TWO NAILS FROM CEILING JOIST TO TOP PLATE IN ACCORDANCE WITH THIS SCHEDULE. THE TOE NAIL ON THE OPPOSITE SIDE OF THE RAFTER SHALL NOT BE REQUIRED.

CONTINUED TABLE R602.3(1)  
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER <sup>a,b,c</sup>	SPACING OF FASTENERS EDGES (INCHES), <sup>d</sup> INTERMEDIATE <sup>e,f</sup> SUPPORTS (INCHES)
WOOD STRUCTURAL PANELS, SUBFLOOR, ROOF AND INTERIOR WALL SHEATHING TO FRAMING AND PARTICLEBOARD WALL SHEATHING TO FRAMING [SEE TABLE R602.3(3) FOR WOOD STRUCTURAL PANEL EXTERIOR WALL SHEATHING TO WALL FRAMING]			
30	3/8" - 1/2"	6D COMMON (2"X 0.113" NAIL (SUBFLOOR, WALL); 8D COMMON (2 1/2" X 0.131" NAIL (ROOF); or RRSR-01 (2 3/8" X 0.113" NAIL (ROOF) )	6 12 1
31	19/32" - 1"	8D COMMON NAIL (2 1/2" X 0.131; or RRSR-01; 2 3/8" X 0.113) NAIL ROOF )	6 12 1
32	1 1/8" - 1 1/4"	10D COMMON NAIL (3" X 0.148) NAIL; or 8D (2 1/2" X 0.131") DEFORMED NAIL	6 12
OTHER WALL SHEATHING <sup>g</sup>			
33	1/2" STRUCTURAL CELLULOSE FIBERBOARD SHEATHING	1 1/2" GALVANIZED ROOF NAIL, 7/16" HEAD DIAMETER, OR 1 1/4" LONG 16GA. STAPLE WITH 7/16" OR 1" CROWN	3 6
34	25/32" STRUCTURAL CELLULOSE FIBERBOARD SHEATHING	1 3/4" GALVANIZED ROOF NAIL, 7/16" HEAD DIAMETER, OR 1 1/2" LONG 16GA. STAPLE WITH 7/16" OR 1" CROWN	3 6
35	1/2" GYPSUM SHEATHING <sup>h</sup>	1 1/2" GALVANIZED ROOF NAIL, STAPLE GALVANIZED, 11/2" LONG; 1 1/4" SCREWS, TYPE W or S	7 7
36	5/8" GYPSUM SHEATHING <sup>h</sup>	1 3/4" GALVANIZED ROOF NAIL, STAPLE GALVANIZED, 1 5/8" LONG; 1 5/8" SCREWS, TYPE W or S	7 7
WOOD STRUCTURAL PANELS, COMBINATION SUBFLOOR UNDERLAYMENT TO FRAMING			
37	3/4" AND LESS	6D DEFORMED (2" X 0.120") NAIL OR 8D COMMON (2 1/2" X 0.131") NAIL	6 12
38	7/8" - 1"	8D COMMON (2 1/2" X 0.131") NAIL OR 8D DEFORMED (2 1/2" X 0.120") NAIL	6 12
39	1 1/8" - 1 1/4"	10D COMMON (3" X 0.148") NAIL OR 8D DEFORMED (2 1/2" X 0.120") NAIL	6 12

For St: 1 inch = 25.4mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1 ksi = 6.895 MPa.

TABLE R 602.3(5) SIZE, HEIGHT, AND SPACING OF WOOD STUDS

STUD SIZE (IN)	BEARING WALLS					NON-BEARING WALLS	
	LATERALLY UNSUPPORTED STUD HEIGHT <sup>a</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>a</sup> (inches)	LATERALLY UNSUPPORTED STUD HEIGHT <sup>a</sup> (feet)	LATERALLY UNSUPPORTED STUD HEIGHT (feet)
2x3 <sup>b</sup>	---	---	---	---	---	10	16
2x4	10	24 <sub>c</sub>	16 <sub>c</sub>	---	24	14	24
3x4	10	24	24	16	24	14	24
2x5	10	24	24	---	24	16	24
2x6	10	24	24	16	24	20	24

FOR ST: 1 INCH = 25.4mm, 1 FOOT = 304.8mm  
a. LISTED HEIGHTS ARE DISTANCES BETWEEN POINTS OF LATERAL SUPPORT PLACED PERPENDICULAR TO THE PLANE OF THE WALL. BEARING WALL 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 PRACTICES.  
b. SHALL NOT BE USED IN EXTERIOR WALLS.  
c. A HABITABLE ATTIC ASSEMBLY SUPPORTED BY 2X4 STUDS IS LIMITED TO A ROOF SPAN OF 32 FEET. WHERE THE ROOF SPAN EXCEEDS 32 FEET, THE WALL STUDS SHALL BE INCREASED TO 2X6 OR THE STUDS SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

MINIMUM MECHANICAL EQUIPMENT EFFICIENCY  
VALUES BY COMPONENT, PER IRC2018 N1103.6.1

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 HOOD	ANY	2.8 CFM/WATT	ANY
IN-LINE FAN	ANY	2.8 CFM/WATT	ANY
BATHROOM UTILITY FAN	10	1.4 CFM/WATT	<90
BATHROOM UTILITY FAN	90	2.8 CFM/WATT	ANY

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

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	15	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

**BUILDER'S PLANS:** THE TERM "BUILDER'S PLANS" 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 AND A THOROUGH UNDERSTANDING OF THE INTERNATIONAL RESIDENTIAL CODE (IRC). THE CONTRACTOR WARRANTS TO HD ENGINEERING & DESIGN THAT HE POSSESSES THE PARTICULAR COMPETENCE AND SKILL IN CONSTRUCTION NECESSARY TO BUILD THIS PROJECT WITHOUT FULL ENGINEERING AND 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 "BUILDER'S PLANS" IN RECOGNITION OF THE CONTRACTOR'S SOPHISTICATION. ALTHOUGH HD ENGINEERING & DESIGN HAVE PERFORMED THEIR SERVICES WITH DUE CARE AND DILIGENCE, WE CANNOT GUARANTEE PERFECTION. ANY AMBIGUITY OR DISCREPANCY DISCOVERED BY THE USE OF THESE PLANS SHALL BE REPORTED IMMEDIATELY TO HD ENGINEERING. CONSTRUCTION MAY REQUIRE THAT THE CONTRACTOR ADAPT THE "BUILDER'S PLANS" TO THE FIELD CONDITIONS ENCOUNTERED AND MAKE LOGICAL ADJUSTMENTS IN FIT, FORM, DIMENSION AND QUANTITY. CHANGES MADE FROM THE PLANS WITHOUT THE CONSENT OF HD ENGINEERING & DESIGN ARE UNAUTHORIZED. IT IS ALSO UNDERSTOOD THAT THE CONTRACTOR WILL BE RESPONSIBLE FOR MEETING ALL APPLICABLE BUILDING CODES INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL AND PLUMBING CODE REQUIREMENTS (WHICH IS EXCLUDED FROM THESE PLANS). IN THE EVENT ADDITIONAL DETAIL OR GUIDANCE IS NEEDED BY THE CONTRACTOR OR HOMEOWNER FOR CONSTRUCTION OF ANY ASPECT OF THE PROJECT, HD ENGINEERING & DESIGN OR A QUALIFIED ENGINEER SHALL IMMEDIATELY BE RETAINED. FAILURE TO NOTIFY US OF THESE NEEDS OR OF CHANGES TO THE PLANS SHALL RELIEVE HD ENGINEERING & DESIGN OF ALL RESPONSIBILITIES OF THE CONSEQUENCES.

DESIGN LOADS (PSF)

THE DWELLING SHALL COMPLY WITH THE FOLLOWING LOAD CONDITIONS

AREA	MIN DEAD LOAD	MIN LIVE LOAD
EXTERIOR BALCONIES	10	60
DECKS, STAIRS	10	40
CEILING JOISTS / ATTICS NO STORAGE - SCUTTLE ACCESS ONLY ROOF SLOPE 3:12 OR LESS	10	10
CEILING JOISTS / ATTICS NO STORAGE - SCUTTLE ACCESS ONLY ROOF SLOPE OVER 3:12	10	10
CEILING JOISTS / ATTICS WITH STORAGE - DOOR PULL DOWN LADDER ACCESS	10	20
ROOMS: NON-SLEEPING	10	40
ROOMS: SLEEPING	10	30
ROOF: LIGHT ROOF COVERING	10	20
ROOF: HEAVY ROOF COVERING / CONCRETE / TILE / SLATE	20	20
GUARDRAILS, HANDRAILS	200# LL NORMAL	

HEAVY ROOF COVERING MATERIAL (TILE, CONCRETE, SLATE, ETC.) SHALL NOT BE USED UNLESS 20 PSF DEAD LOAD AND HEAVY ROOF IS NOTED ON THE ROOF PLAN. IF HEAVY ROOFING IS TO BE USED AND NOT NOTED ON THE ROOF PLAN NOTIFY ENGINEER PRIOR TO ANY CONSTRUCTION, INCLUDING FOUNDATION AND SITE WORK. IF THE PLAN HAS BEEN DESIGNED FOR HEAVY ROOF LOADS IT WILL BE NOTED IN THE ROOF NOTES ON THE ROOF PLAN.

COLUMN SCHEDULE

BASED ON FOOTING SIZE (ASSUME 1500 PSF SOIL)

PAD SIZE	REINFORCEMENT	COL. MIN.	COL. TYPE	MAX. LOAD
24x24x12	(4) #4 BARS E/W	3"	SCH40	6K
30x30x12	(5) #4 BARS E/W	3"	SCH40	9.4K
36x36x12	(6) #4 BARS E/W	3"	SCH40	13.5K
42x42x14	(7) #4 BARS E/W	3 1/2"	SCH40	18.4K
48x48x16	(8) #4 BARS E/W	3 1/2"	SCH40	24.0K
54x54x16	(9) #4 BARS E/W	3 1/2"	SCH40	30.4K
60x60x18	(10) #4 BARS E/W	3 1/2"	SCH40	37.5K

COLUMN CONNECTION TO STEEL BEAMS SHALL BE WITH A CLIP POST CAP WITH ALL FOUR TAB EARS BENT AROUND THE BOTTOM FLANGE OF THE BEAM. FOR A BEARING PLATE, FOUR HOLES SHALL BE DRILLED IN THE BOTTOM FLANGE OF THE STEEL BEAM TO MATCH THE HOLE PATTERN OF THE PLATE. 1/2" X 2" BOLTS SHOULD THEN BE INSTALLED WITH A FLAT WASHER, LOCK WASHER, AND A NUT IN EACH OF THE HOLES. THE POST CAP MAY BE WELDED TO THE STEEL BEAM IN ACCORDANCE WITH AWS D1.9-92 AS AN ALTERNATIVE, AND WOULD NEED TO BE INSPECTED BY AN AWS-CERTIFIED INSPECTOR.

ENGINEERED LUMBER

MIN. DESIGN REQUIREMENTS

	F <sub>b</sub> (psi)	E (psi)	F <sub>v</sub> (psi)
LVL	2600	1.8x10	285
GLULAM	2400	1.8x10	190
PARALAM	2600	2.0x10	290

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
	R-13, 3 1/2"	R-19, 6 1/4"	CONDENSED R-38, 8 1/4"
			R-38, 10 1/4"



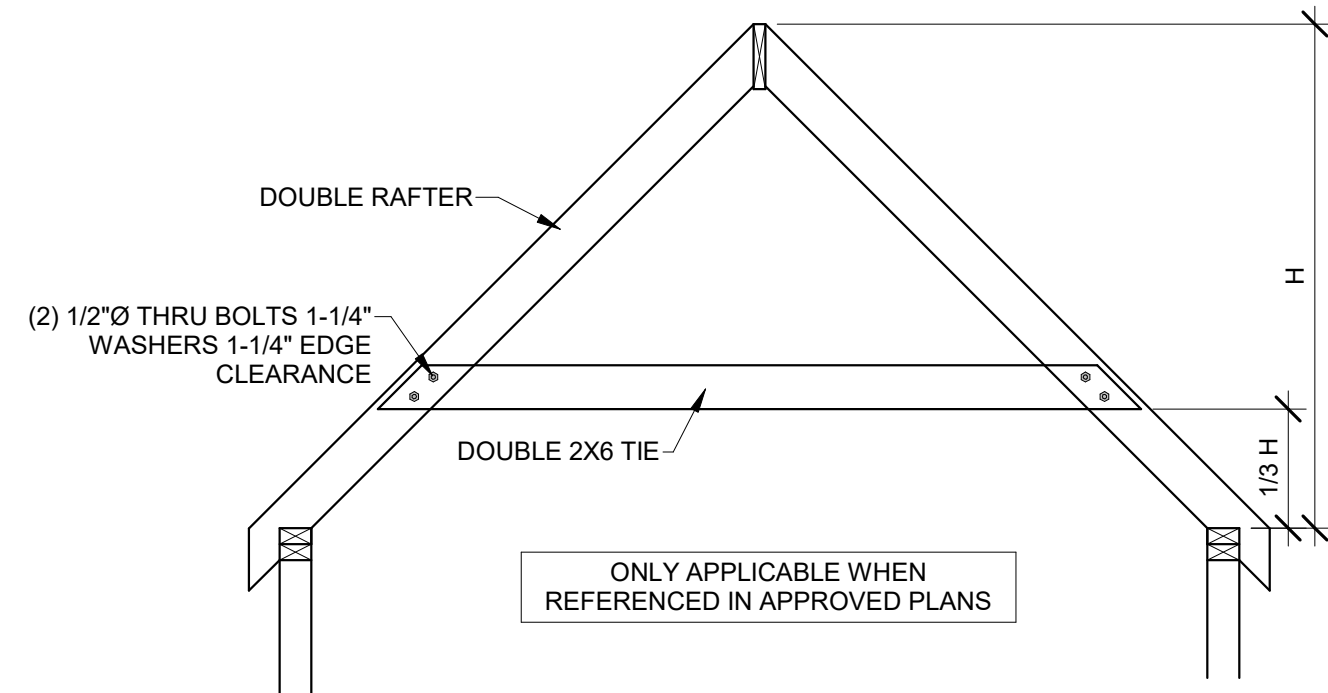
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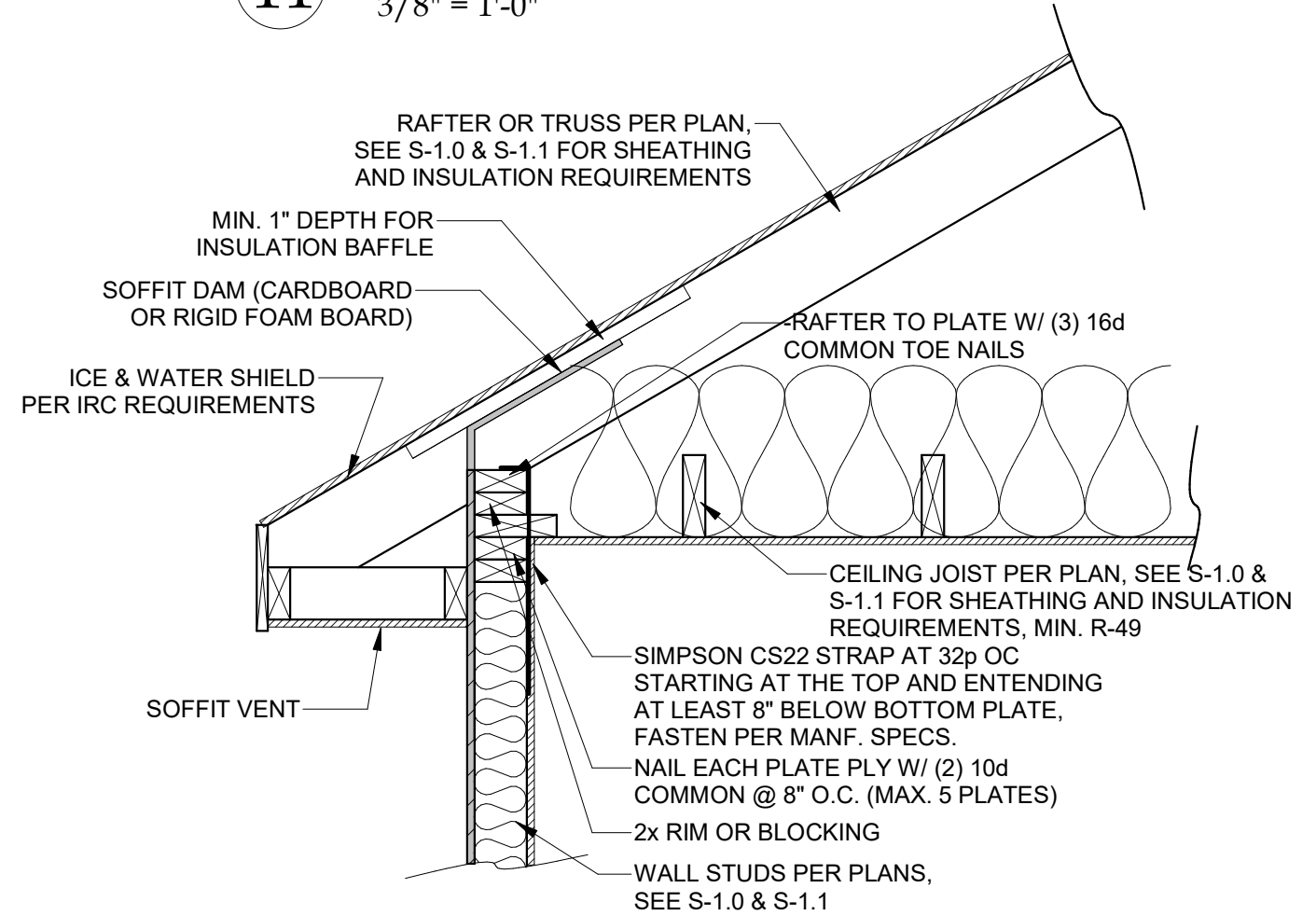
NO.	ISSUE/REVISION	Revision Date

GENERAL NOTES

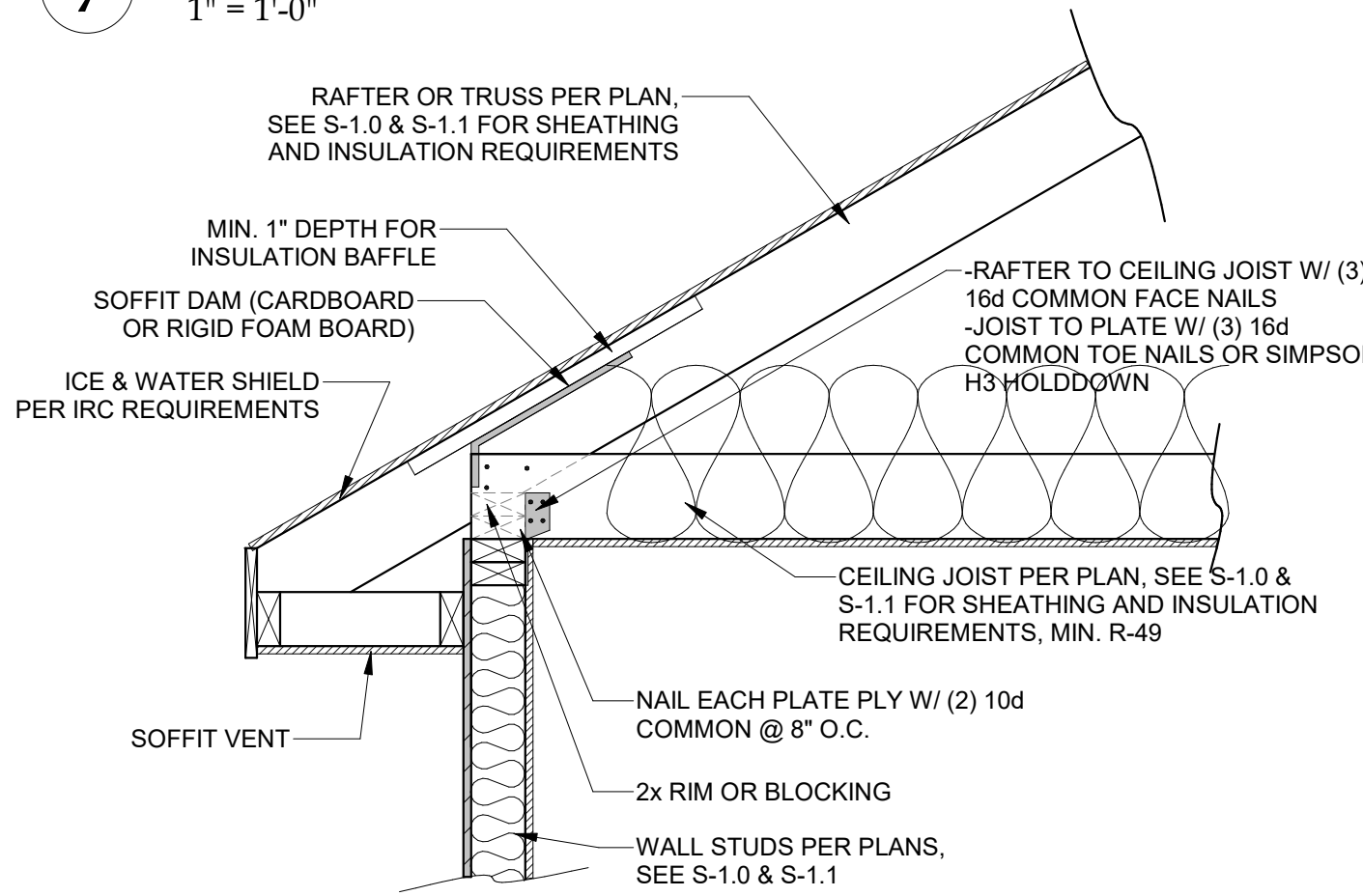




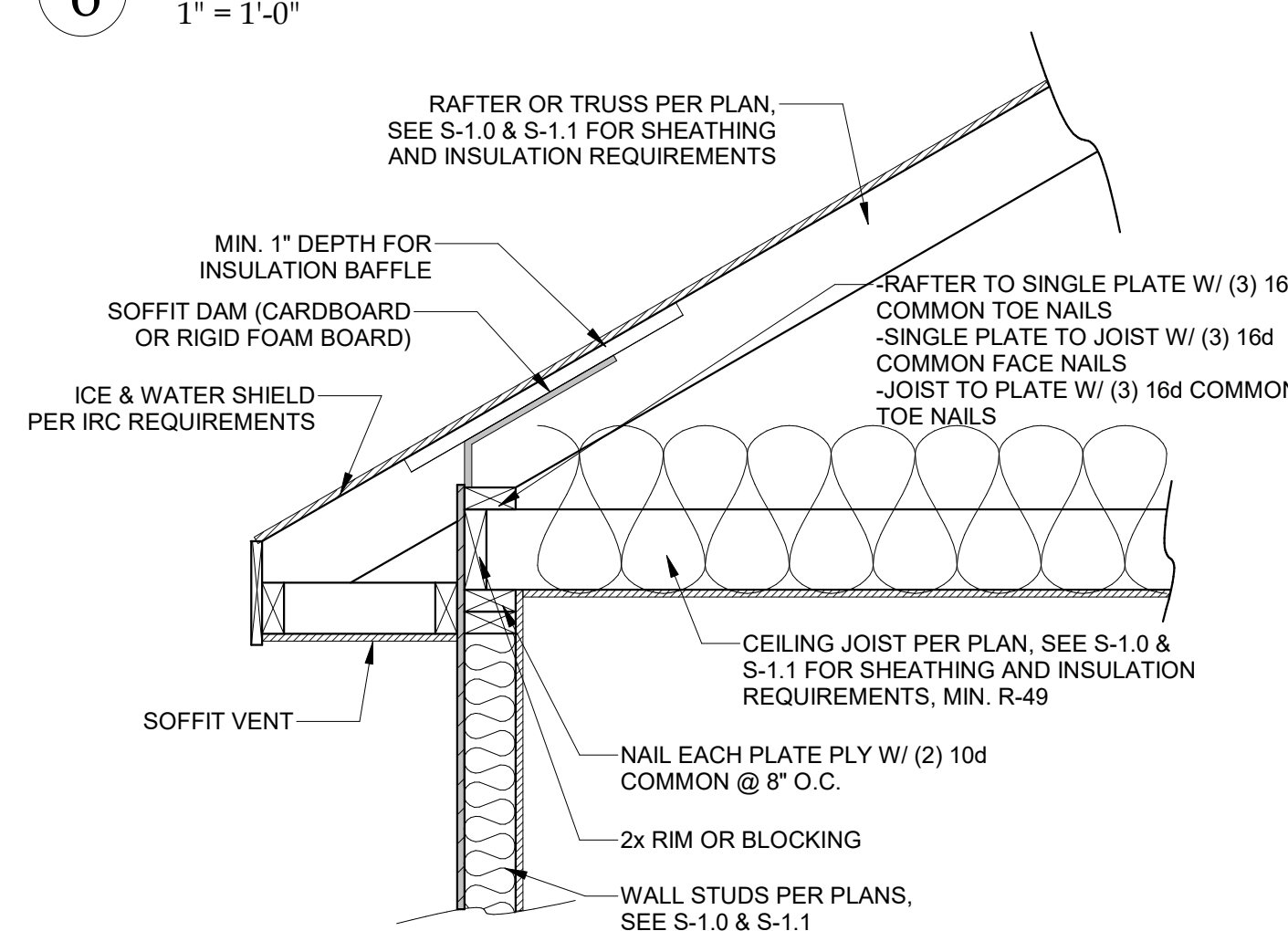
11 HIP SUPPORT FRAME  
3/8" = 1'-0"



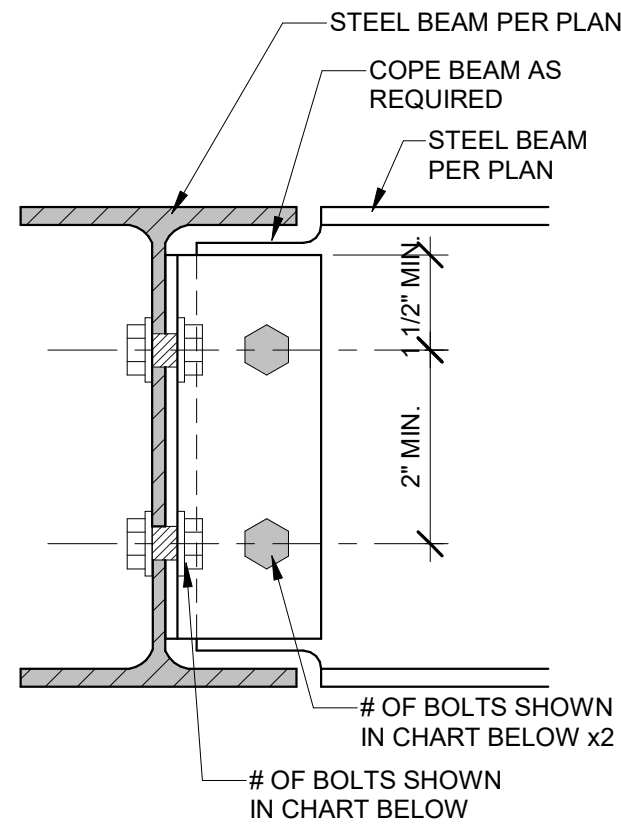
7 OPTION 4 RAFTER BEARING  
1" = 1'-0"



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



5 OPTION 2 RAFTER BEARING  
1" = 1'-0"



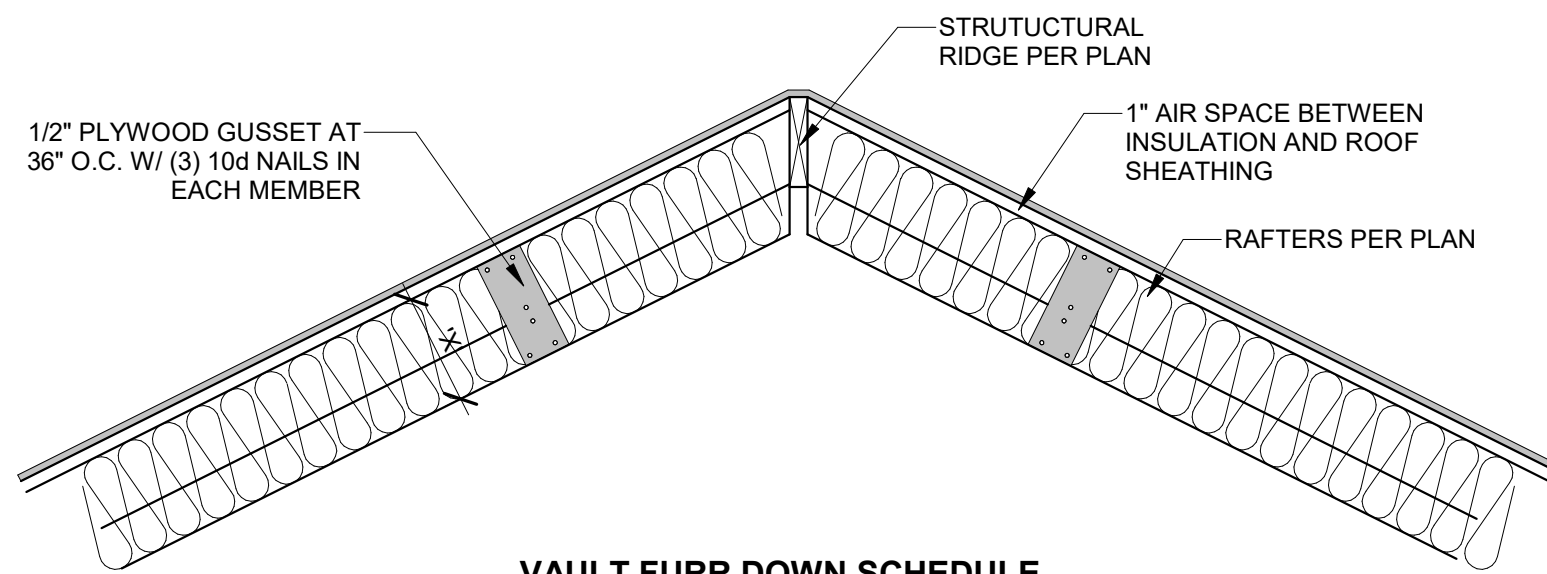
10 BEAM TO GIRDER CONNECTION  
3" = 1'-0"

BEAM CONNECTION SCHEDULE	
BEAM SIZE	# OF BOLT IN CONNECTION
W8, W10	2
W12, W14	3
W16, W18	4

NOTES:  
1. NUMBER OF BOLTS DETERMINED BY SMALLER OF TWO BEAMS BEING CONNECTED  
2. ALL BOLTS, 3/4" DIAMETER A325-N, UNO  
3. FULL PERIMETER 1/4" FILLET WELD MAY BE SUBSTITUTED FOR EITHER OR BOTH BOLTED CONNECTIONS

HIP/ VALLEY ALLOWABLE SPAN TABLE

TYPE	MAX. UNSUPPORTED SPAN				
	2x8	2x10	2x12	1 3/4"x9 1/2" LVL	1 3/4"x11 7/8" LVL
HIP RAFTER	11'-3"	13'-3"	15'-2"	15'-8"	18'-2"
VALLEY RAFTER	8'-11"	10'-6"	12'-0"	13'-2"	15'-3"

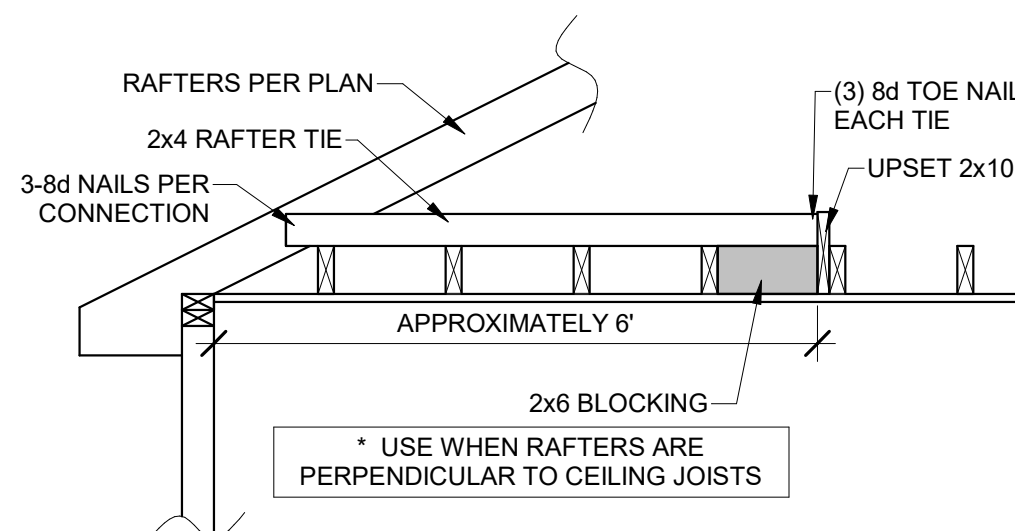


VAULT FURR DOWN SCHEDULE

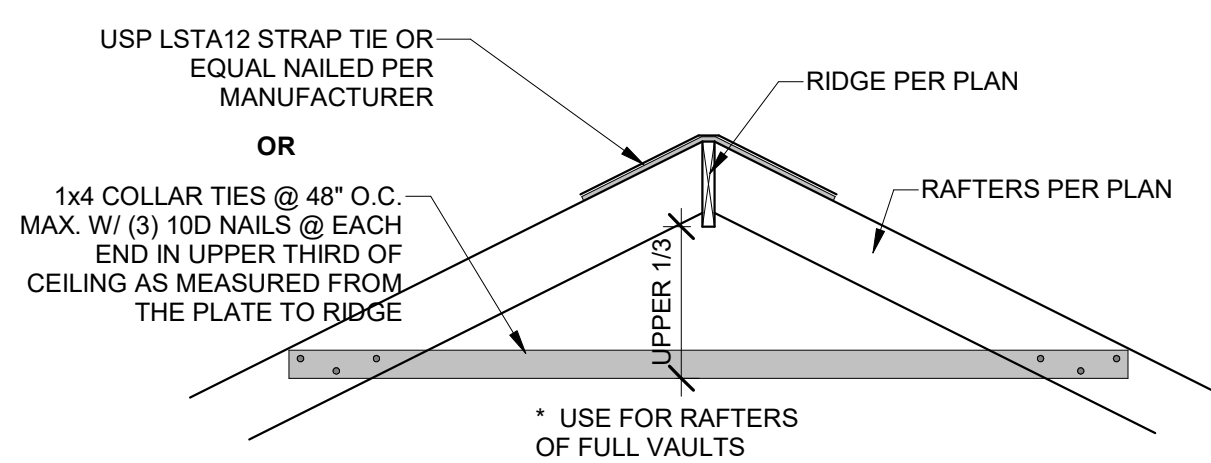
RAFTER SIZE	R-30C INSULATION (X = 9 1/4")	R-38C INSULATION (X = 11 1/4")
2x6	2x6	2x8
2x8	2x4	2x6
2x10	NOT REQUIRED	2x4
2x12	NOT REQUIRED	2x2

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.

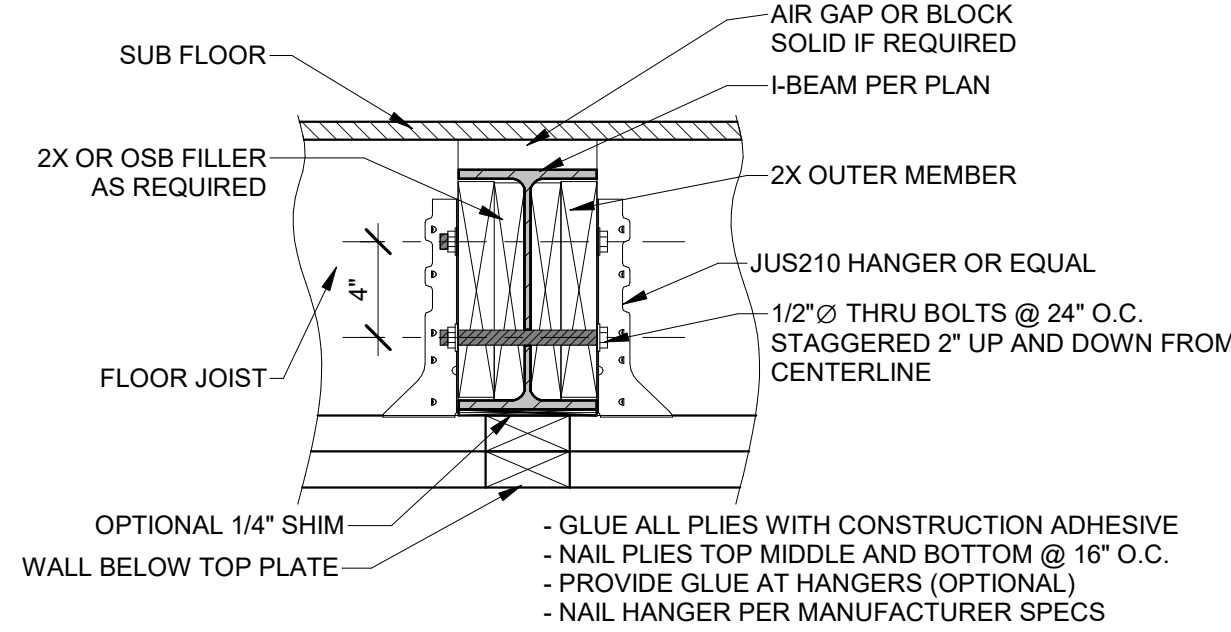
14 VAULTED RAFTER INSULATION  
3/4" = 1'-0"



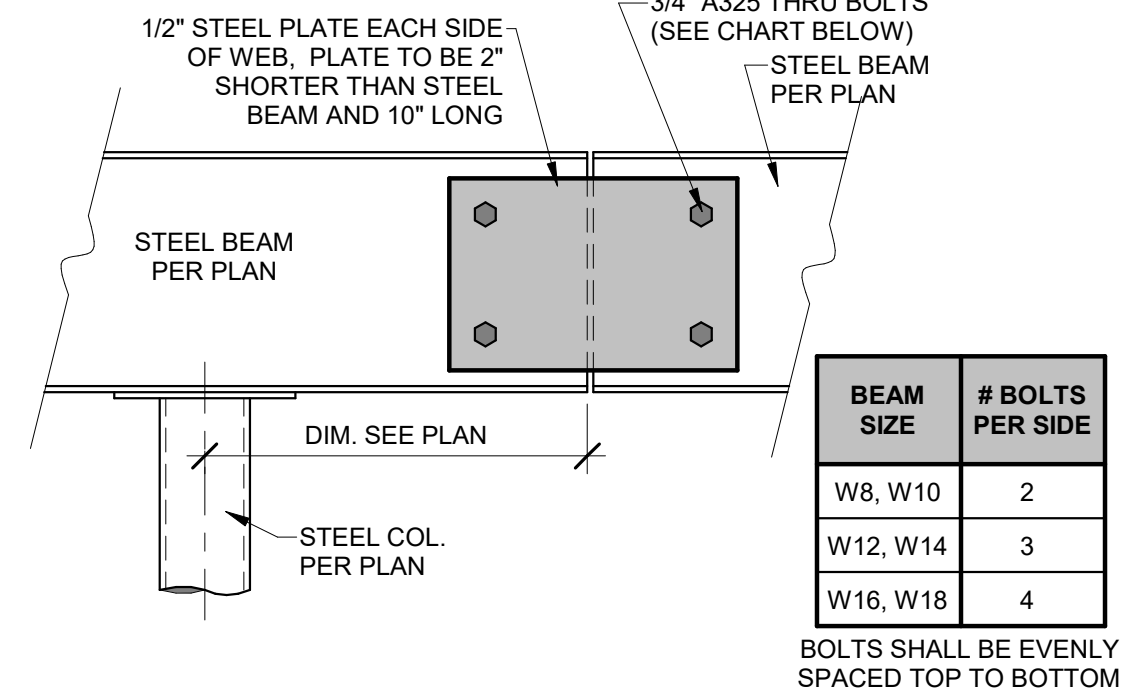
12 RAFTER TIE CONNECTION  
1/2" = 1'-0"



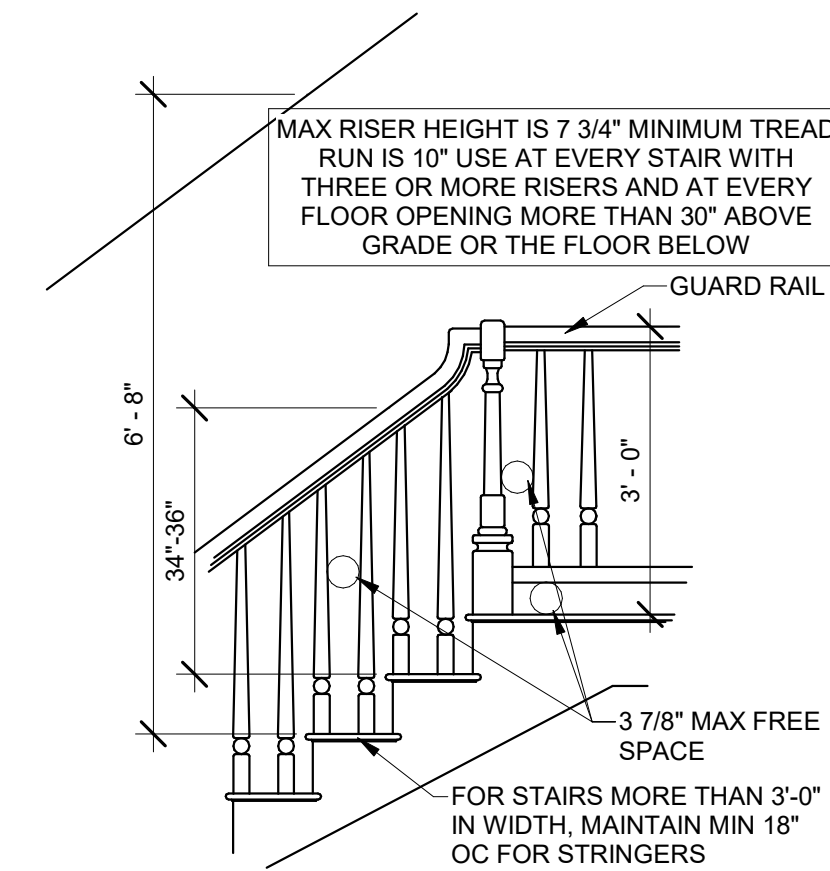
13 RIDGE SUPPORT  
1/2" = 1'-0"



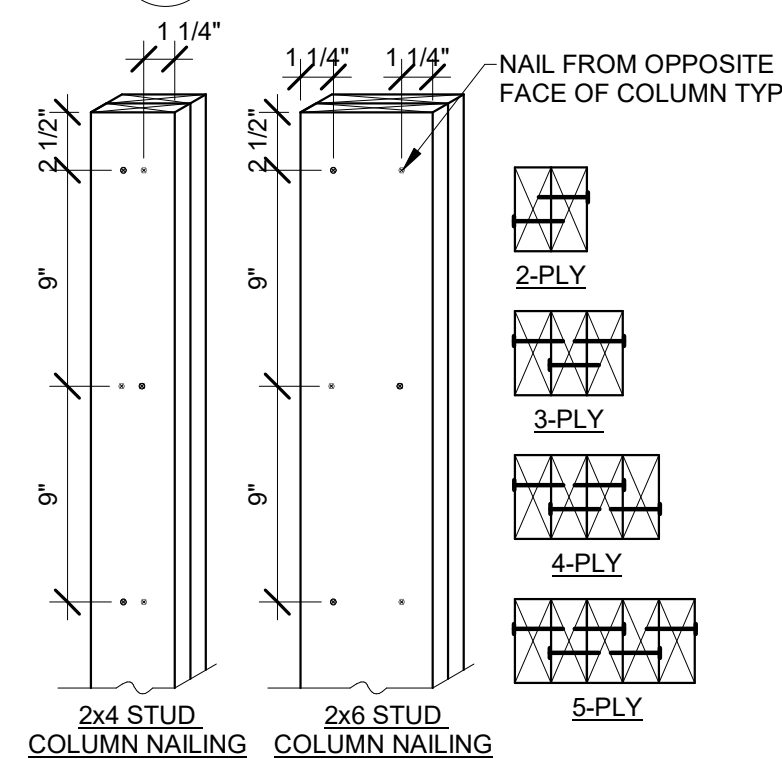
8 UPSET STEEL BEAM DETAIL  
1 1/2" = 1'-0"



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

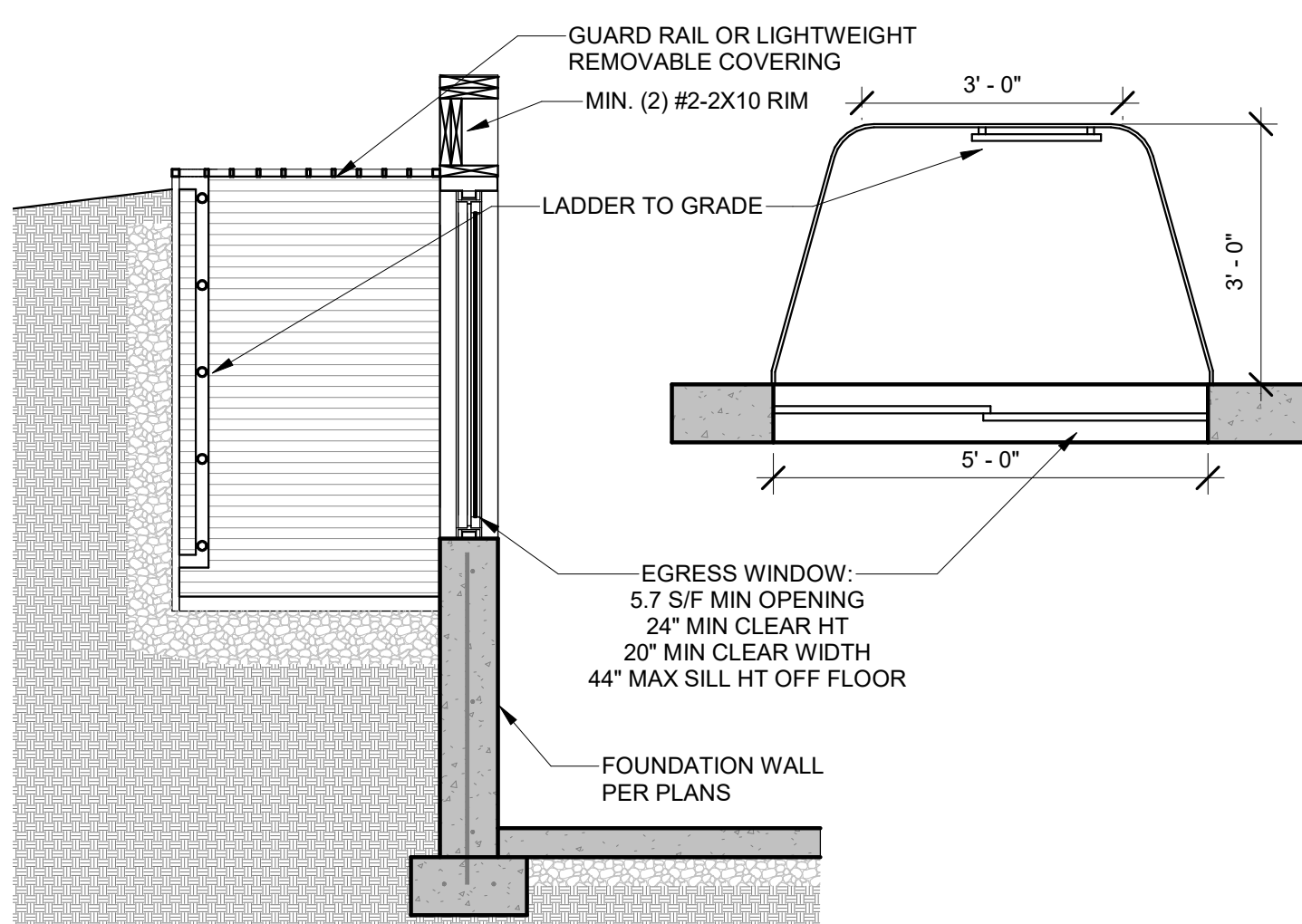


4 STAIR/ RAIL DETAIL  
1/2" = 1'-0"

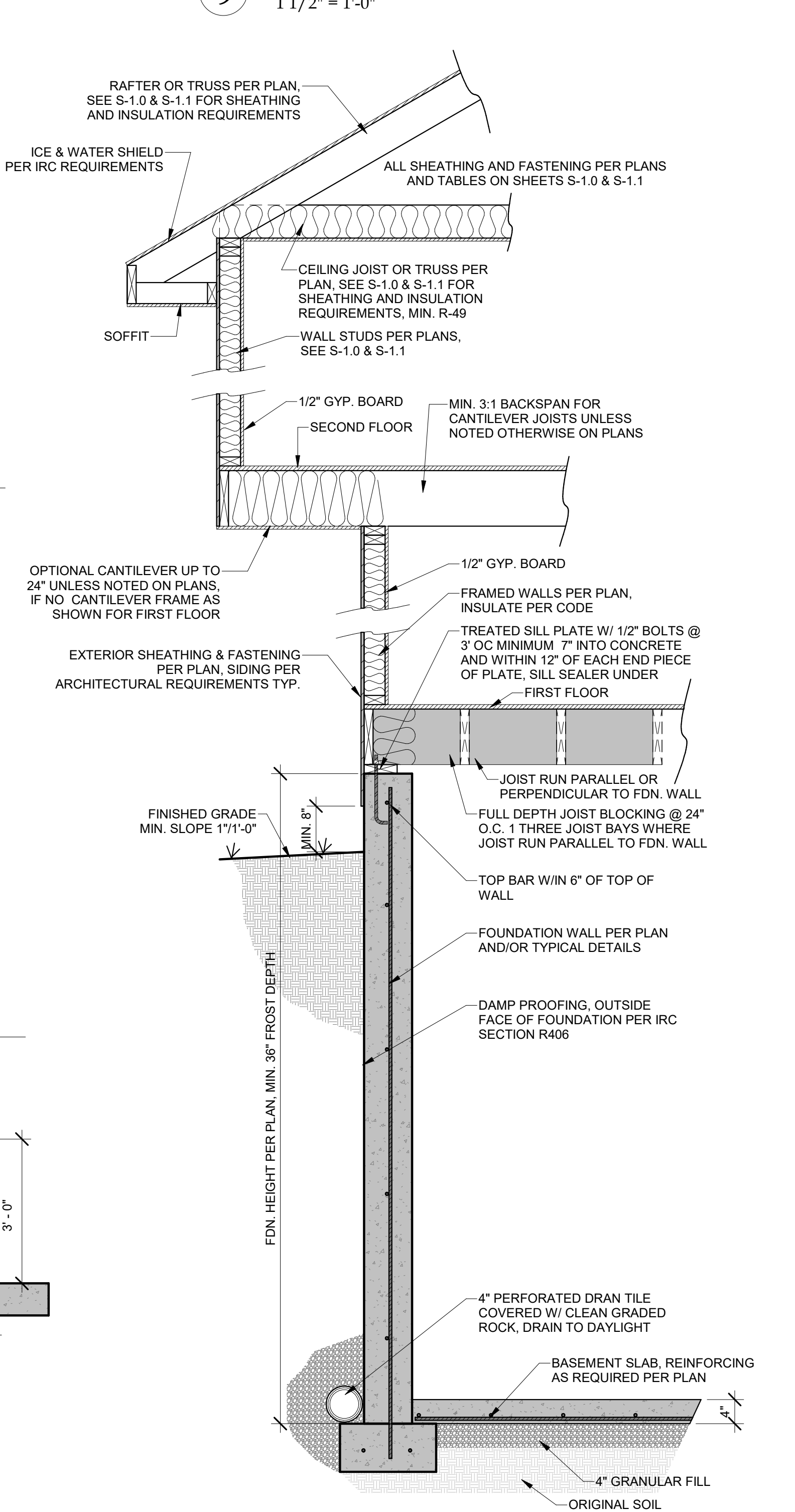


NOTES:  
1. EACH 2x PLY SHALL BE FASTENED WITH (1) ROW OF 10d NAILS AT 9" O.C. ALTERNATING SIDE TO SIDE  
2. 1 1/4" MIN. EDGE DISTANCE, AND STARTING 2 1/2" FROM EACH END.  
3. EXTEND FULL AREA OF COLUMN AS SOLID BLOCKING THROUGH JOIST BAYS AND WALLS TO LOAD-BEARING BEAM/WALL BELOW.

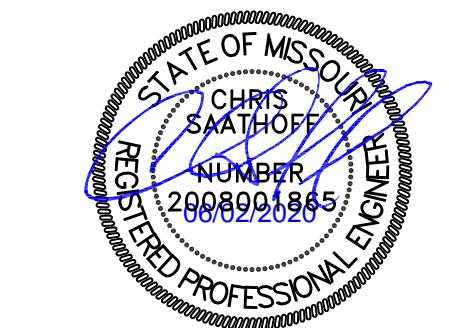
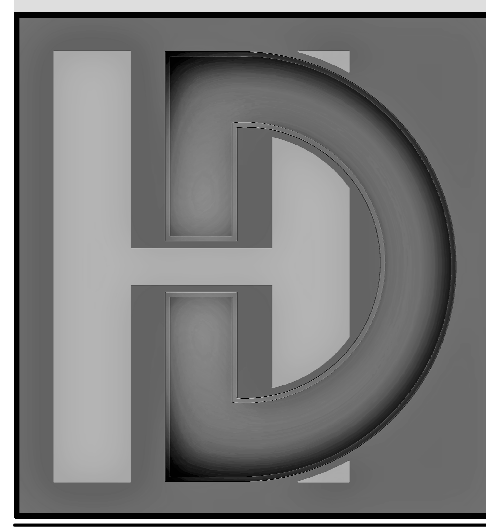
3 BUILT-UP STUD COLUMN  
1 1/2" = 1'-0"



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



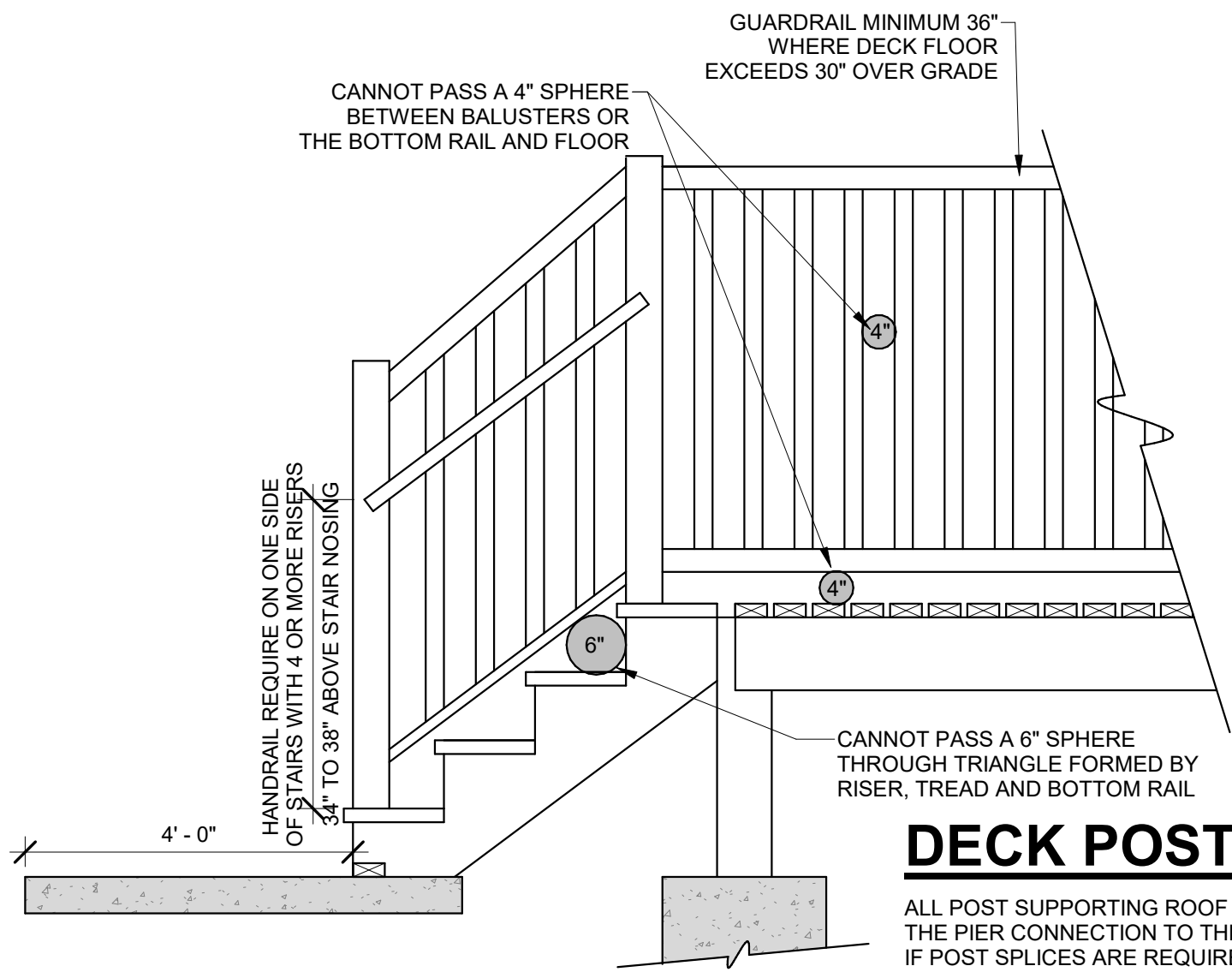
1 TYPICAL WALL SECTION  
3/4" = 1'-0"



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NO.	ISSUE/REVISION	Revision Date

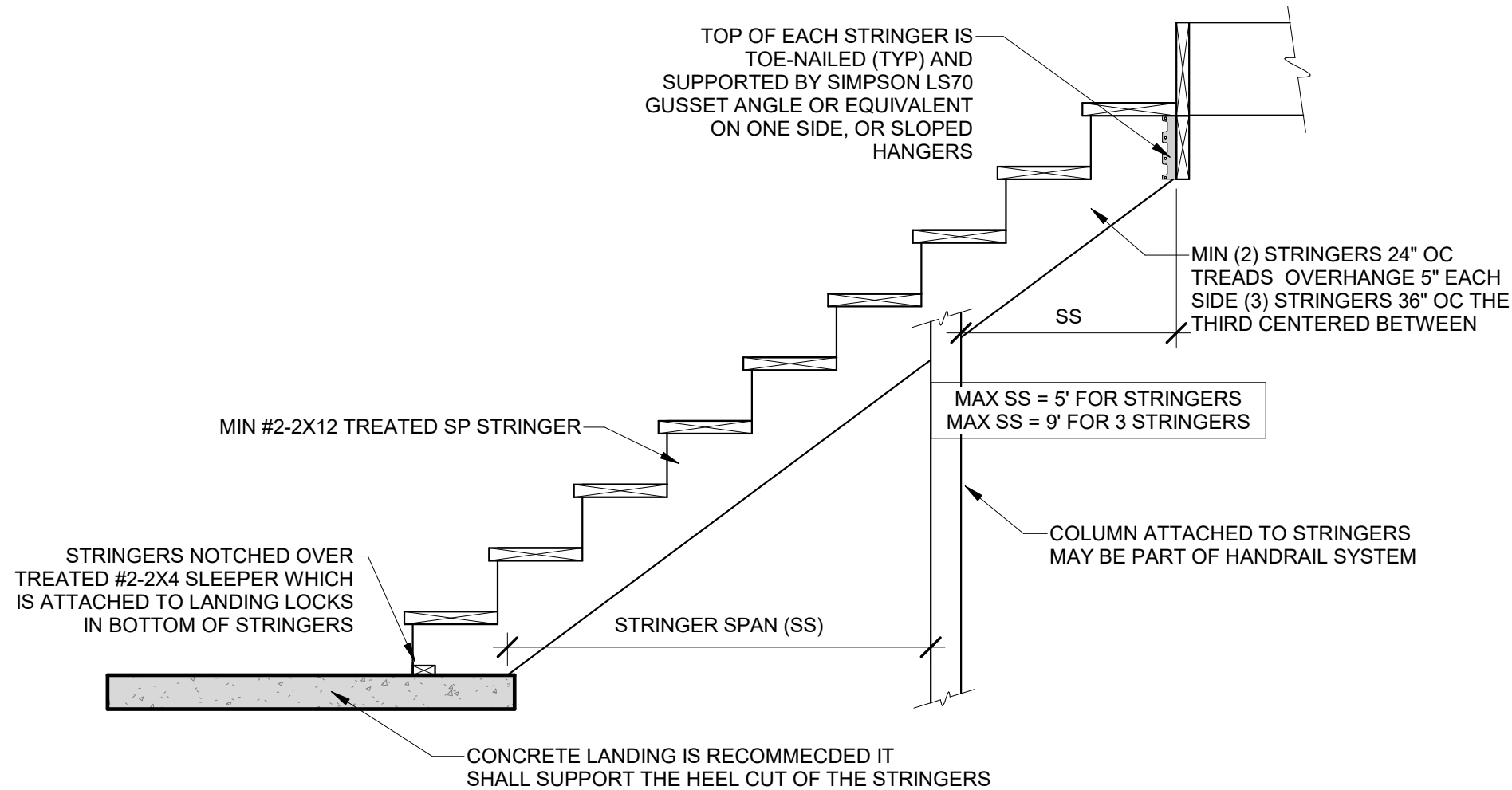
S-1.2





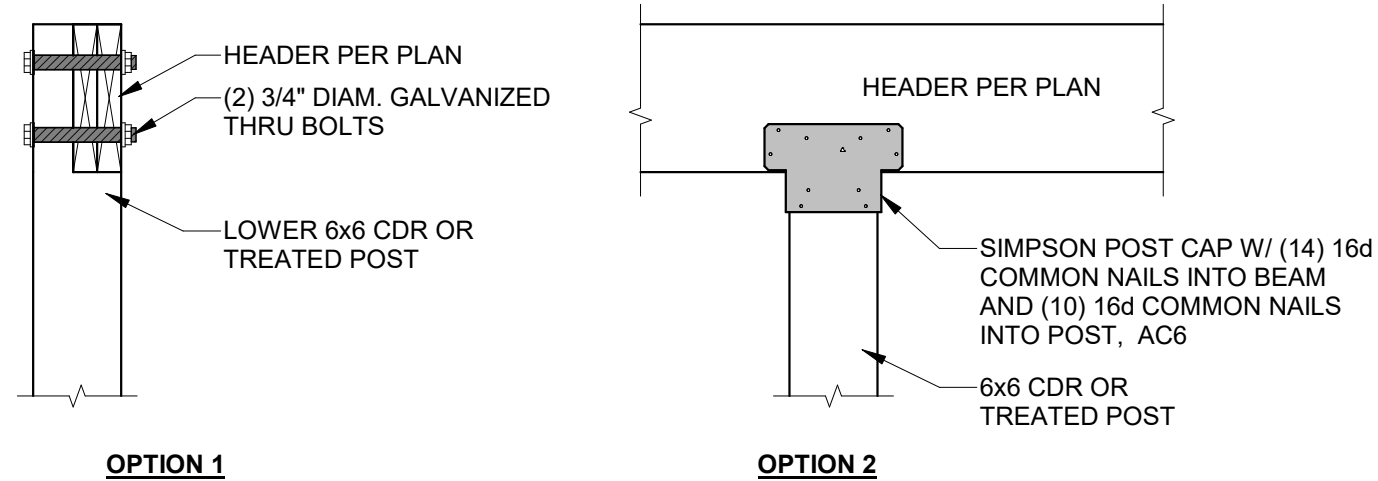
## 8 GUARD RAIL

1/2" = 1'-0"



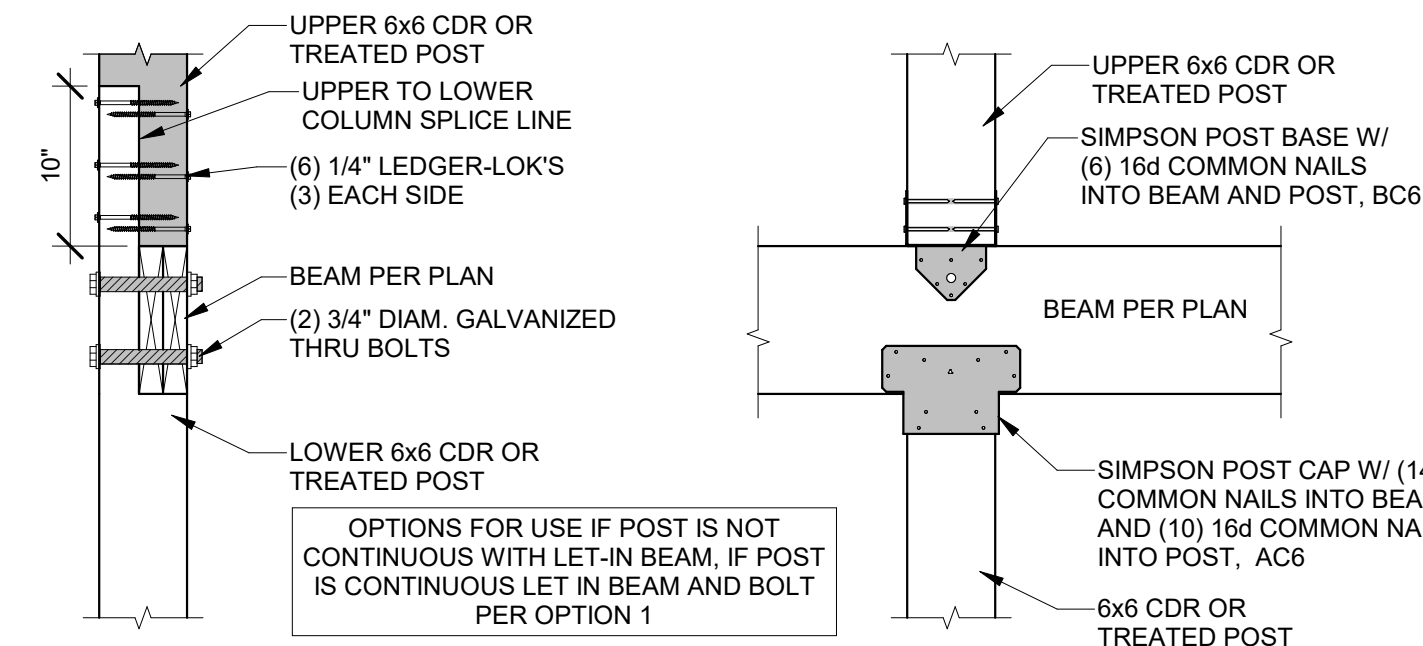
## 9 STAIR STRINGER DETAIL

1/2" = 1'-0"



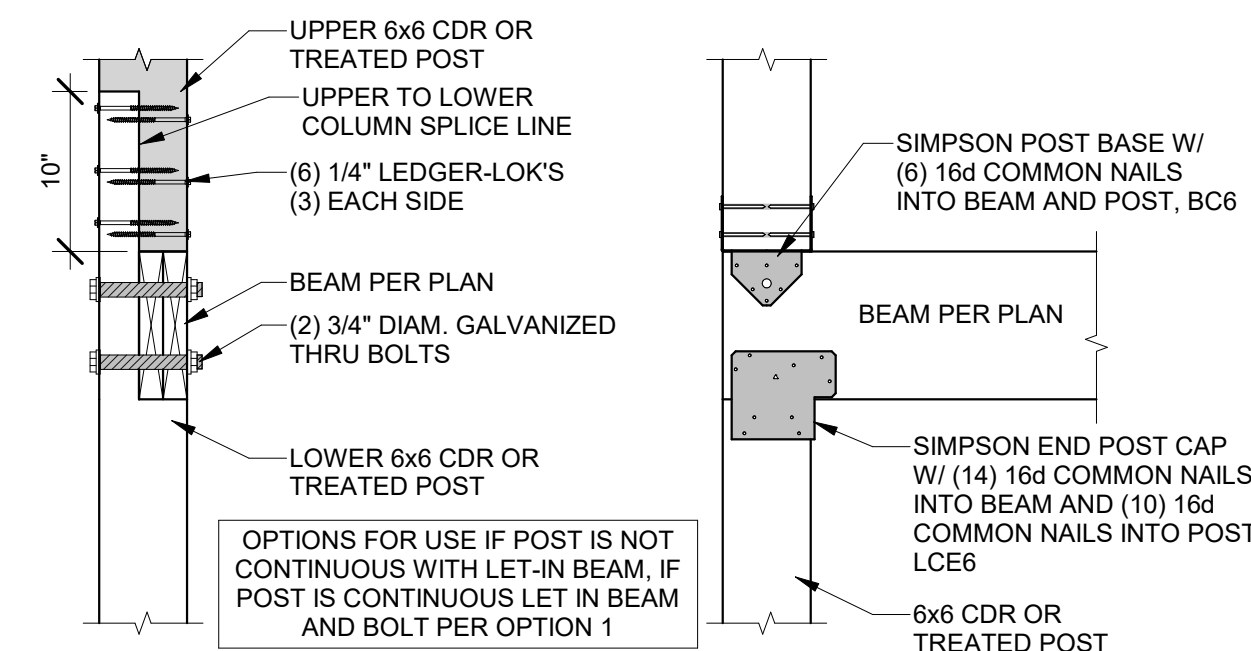
## 7 ROOF LEVEL INTERIOR BEAM TO COLUMN

1" = 1'-0"



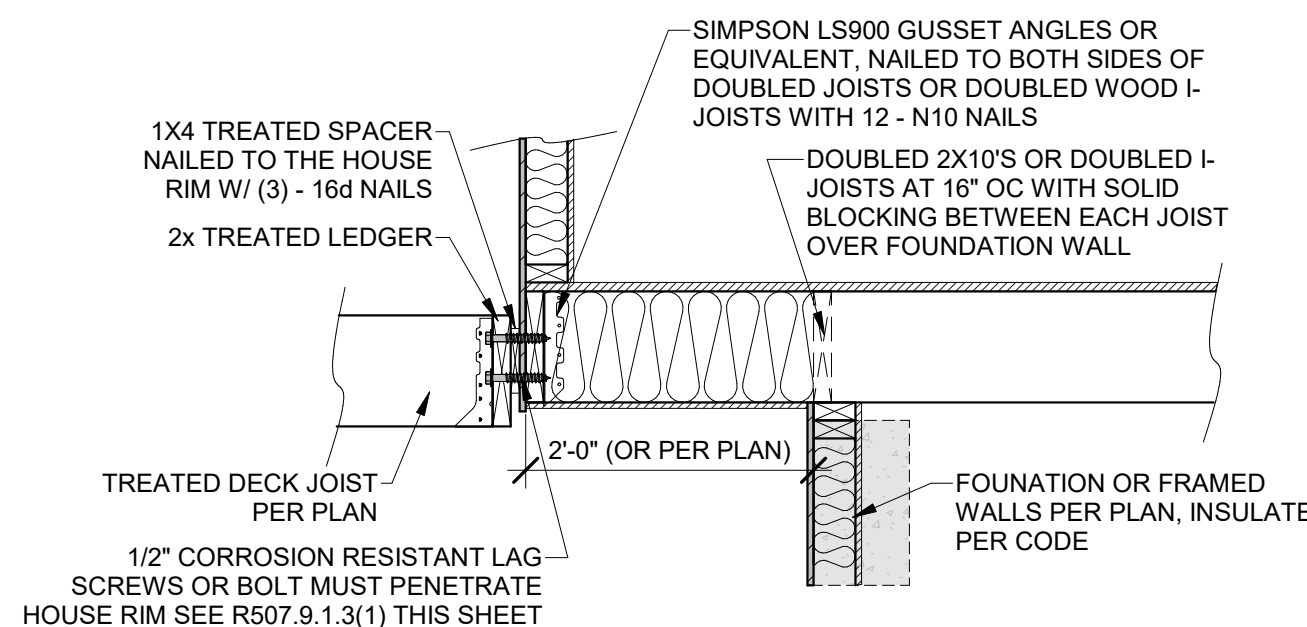
## 6 DECK LEVEL INTERIOR BEAM TO COLUMN

1" = 1'-0"



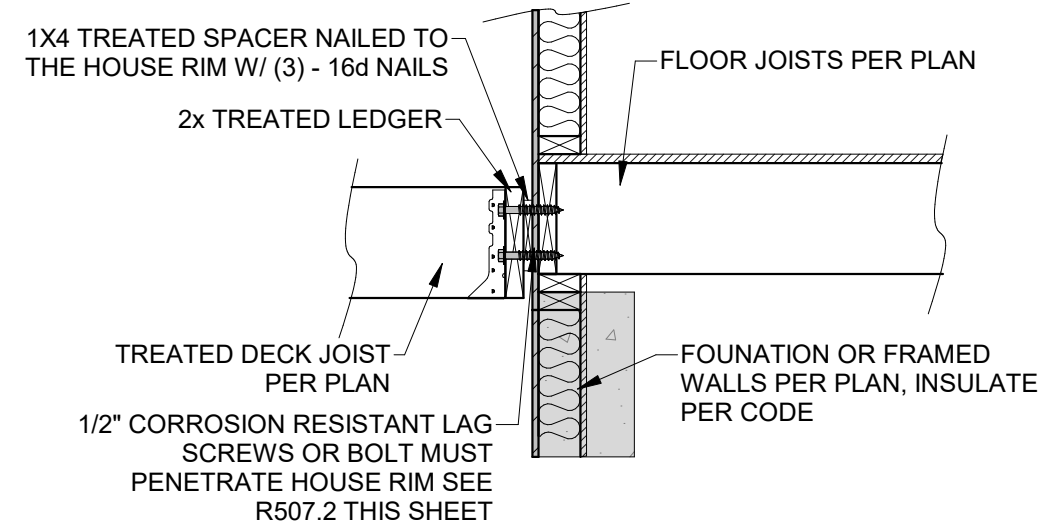
## 5 DECK LEVEL EXTERIOR BEAM TO COLUMN

1" = 1'-0"



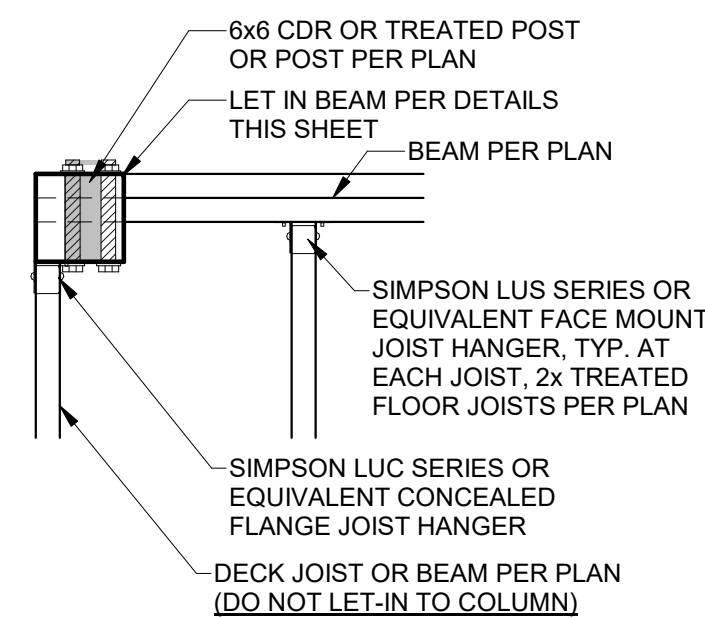
## 4 DECK LEDGER TO CANTILEVER

3/4" = 1'-0"



## 2 DECK LEDGER ATTACHMENT

3/4" = 1'-0"



## 1 DECK CORNER COLUMN

1" = 1'-0"

### TABLE IRC2018 R507.9.1.3(1) DECK LEDGER CONNECTION TO BAND JOIST<sup>a,b</sup> (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>c,e</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 SCEWS 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)

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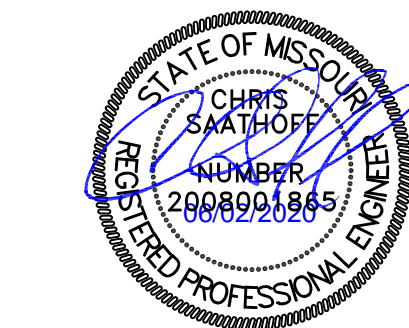
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STEWART BUILDERS  
LOT 57 SUMMIT VIEW FARMS  
31129 SW BLUE RIBBON, LEE'S SUMMIT, MO  
STRUCTURAL DETAILS & NOTES

HD#: 39328

DATE: 06/02/2020

CHECKED BY: CLS

NO.	ISSUE/REVISION	Revision Date

DECK DETAILS

S-1.3

RELEASE FOR CONSTRUCTION  
AS NOTED ON PLANS REVIEW  
CODES ADMINISTRATION  
LEE'S SUMMIT, MISSOURI

07/01/2020



## RESIDENTIAL SEISMIC & WIND ANALYSIS

DETERMINE WEIGHT OF HOUSE:						INPUT	
						CALCULATED VALUE	
LOCATION					DEAD LOAD (psf)	AREA (ft²)	WEIGHT (lbs.)
ROOF					10	3210	32100
CEILING					10	2970	29700
FIRST FLOOR					10	1860	18600
	WALL LENGTH (ft)				WALL HEIGHT (ft)	WALL UNIT WT (psf)	WEIGHT (lbs)
FIRST FLOOR EXT. WALL DL	200				10	0	20000
					DEAD LOAD (psf)	AREA (ft²)	WEIGHT (lbs)
FIRST FLOOR INT. PARTITION WALL DL	0				1000	0	11310

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				
AREA	LOAD		AREA	LOAD		AREA	LOAD		
SLOPED ROOF	256	2079		SLOPED ROOF	113				
VERT. ROOF	256	256	CUMULATIVE	VERT. ROOF	0				CUMULATIVE
1ST	140	1080		1ST	693	8712			9129
	SLOPED ROOF	ZONE B	PRESSURE (PSF) - PER ASCE CH. 6						
	WALL/VERT. ROOF	ZONE A	8.7		ZONE C		11.3		2a (FIG. 28.6-1, ASCE7)
	MEAN ROOF HT., ft		16.2		ZONE D		7.7		5.5

a) If there is a walkout wall to be checked, determine tributary wind area and enter here. If no walkout, enter 0 for area.  
 $q_{10, ASD} = 0.0256 K_d K_{zt} K_{e1} V^2$  (ASCE7-10 Velocity Pressure)  
 $q_{10, ASD} = 0.64 q_s$  (Design Velocity Pressure for ASD analysis under ASCE7 and IRC-B12)

1ST FLOOR TRIBUTARY WEIGHT	71850
S <sub>2</sub> (SITE GROUND MOTION - 1%g - FROM ASCE7 SEISMIC MAP)	12.0%
F <sub>a</sub> (from ASCE7 Table 11.4-1)	1.5
$q_{10} = 0.25 \cdot S_2 \cdot F_a \cdot F_1$	0.128
R (from ASCE7 Table 12.2-1)	6.5

SEISMIC SHEAR					
LOCATION 1ST FLOOR			From ASCE7 (Eq. 12.8-1):	V (F = 1.2 * S <sub>ps</sub> * W / R) (lbs.)	1698
Sheathing Location	Min. Sheathing Schedule	Pastoring Schedule	Allowable Shear (k/ft)		Code Reference
Exterior ( <a href="#">Option #1</a> )	7/16" APA Rated Plywood/OSB	1-1/2" 16ga. Staples w/ 1" penetration @ 6" OC Edges, 6" OC Field For 24" stud spacing, 12" OC Field For 16" stud spacing	155		per IBC, Table 2306.3(1)
Exterior ( <a href="#">Option #2</a> )	7/16" APA Rated Plywood/OSB	1-1/2" 16ga. Staples w/ 1" penetration @ 6" OC Edges, 6" OC Field For 24" stud spacing, 12" OC Field For 16" stud spacing	230		per IBC, Table 2306.3(1)
Exterior ( <a href="#">Option #3</a> )	7/16" APA Rated Plywood/OSB	1-1/2" 16ga. Staples w/ 1" penetration @ 6" OC Edges, 6" OC Field For 24" stud spacing, 12" OC Field For 16" stud spacing	310		per IBC, Table 2306.3(1)
Exterior ( <a href="#">Option #4</a> )	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 @ 6" OC Edges, 12" O.C. Field for 7/16" APA-rated plywood/OSB or shiplap panel sheathing OR @ 4" OC Edges, 12" O.C. Field for 3/8" shiplap panel sheathing	220		A/FAPA SDPWS Table 4.3A
Exterior ( <a href="#">Option #5</a> )	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" OC 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		A/FAPA SDPWS Table 4.3A
Exterior ( <a href="#">Option #6</a> )	7/16" APA Rated Plywood/OSB or shiplap panel sheathing, or 3/8" shiplap panel sheathing with tighter nail spacing and double studs at each panel edge	8d Common Nails w/ 1-3/8" penetration @ 3" O.C. Edges, 12" O.C. Field	410		A/FAPA SDPWS Table 4.3A
Interior	1/2" Gypsum Board	No. 6, 1 1/4" Type W or S Screws @ 8" O.C. Edges, 12" O.C. Field	60		per IBC, Table 2306.4.1
Interior	16 Ga. Simpson/USP Type WB Steel X-Brace (or equal)	(3) 16d @ end studs and (1) 8d @ intermediate studs (per manufacturer specifications - see detail on sheet #3)	325		

EXTERIOR SHEATHING OPTION FOR FIRST FLOOR	4
---	---

EXTERIOR STRUCTURAL WALL LENGTHS (ft.) & RESISTANCES								
	SEISMIC				WIND			
	FRONT-TO-BACK	RESISTANCE (lbs.)	SIDE-TO-SIDE	RESISTANCE (lbs.)	FRONT-TO-BACK	RESISTANCE (lbs.)	SIDE-TO-SIDE	RESISTANCE (lbs.)
1ST FLOOR	54	15120	39	10920	54	21168	39	15268
	ADDITIONAL RESISTANCE REQUIRED				Anchor Bolt Spacing (in.)		16d Nail Spacing req'd at bottom plate (in.)	
	SEISMIC	WIND			diameter (in.)	0.5	1st Floor F-B	34
1ST FLOOR FRONT-TO-BACK	0	0			Shear value (per NDS)	844	1st Floor S-S	35
1ST FLOOR SIDE-TO-SIDE	0	0			Spacing F-B (inches)	226.3		
					spacing S-S (inches)	236		

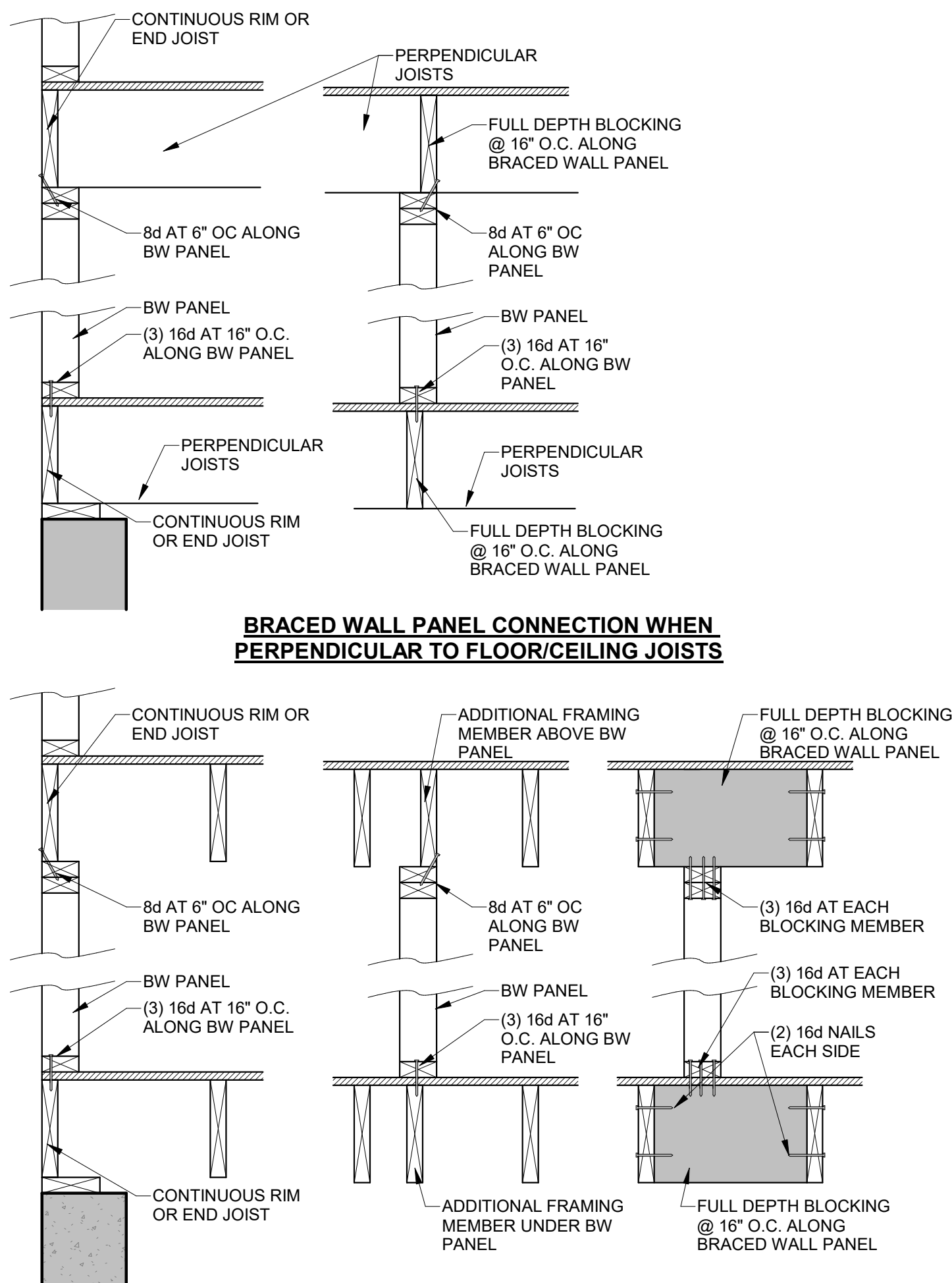
RESISTANCE REQUIRED IN ADDITION TO RESISTANCE PROVIDED BY EXTERIOR WALLS**							
	ADDITIONAL RESISTANCE REQUIRED (POUNDS)	PORTAL FRAMES OR PERF. SHEAR WALL RESISTANCE	INTERIOR X-BRACES (325#/BRACE)	INTERIOR WALL LENGTH W/ 1/2" GYPSUM BOARD PER TABLE (FT.)	INT. WALL LENGTH SHEATHED W/ OSB (TOTAL LENGTH, ONE SIDE, FT.)	RESISTANCE PROVIDED BY ADDITIONAL METHODS (POUNDS)	OK?
1ST FLOOR FRONT-TO-BACK	0					0	YES
1ST FLOOR SIDE-TO-SIDE	0					0	YES

WIND UPLIFT ANALYSIS									
ROOF PITCH (MAX)	X12 8	DEGREES 33.7		PITCH OF 6 OR LESS: EOH -13.3, E -7.2, G -3.2					
	LENGTH (FT.)	PRESSURE (PSF)	LINEAL FT. OF OH	UPLIFT PER FT. (LBS)					
OVERHANG	1.0	-1.08	246	-1.08					
	TOTAL AREA (FT²)	ZONE 4 AREA (FT²)	ZONE 4 AREA (FT²)	PRESSURE ZN 4 (PSF)	PRESSURE ZN 4 (PSF)	TOTAL FORCE (LBS)	FORCE PER LINEAL FT @ PERIMETER (LBS)		
MAIN ROOF**	3717	-1.08	3620.04	-1.08	-0.36	-1264			
TOTAL UPLIFT PER LINEAL FOOT ALONG EXTERIOR (POUNDS)				4.3		UPLIFT OK			
**INSIDE EXTERIOR WALLS				251.6					
				RESISTANCE DUE TO DEAD WEIGHT & 0.152 TYPICAL					

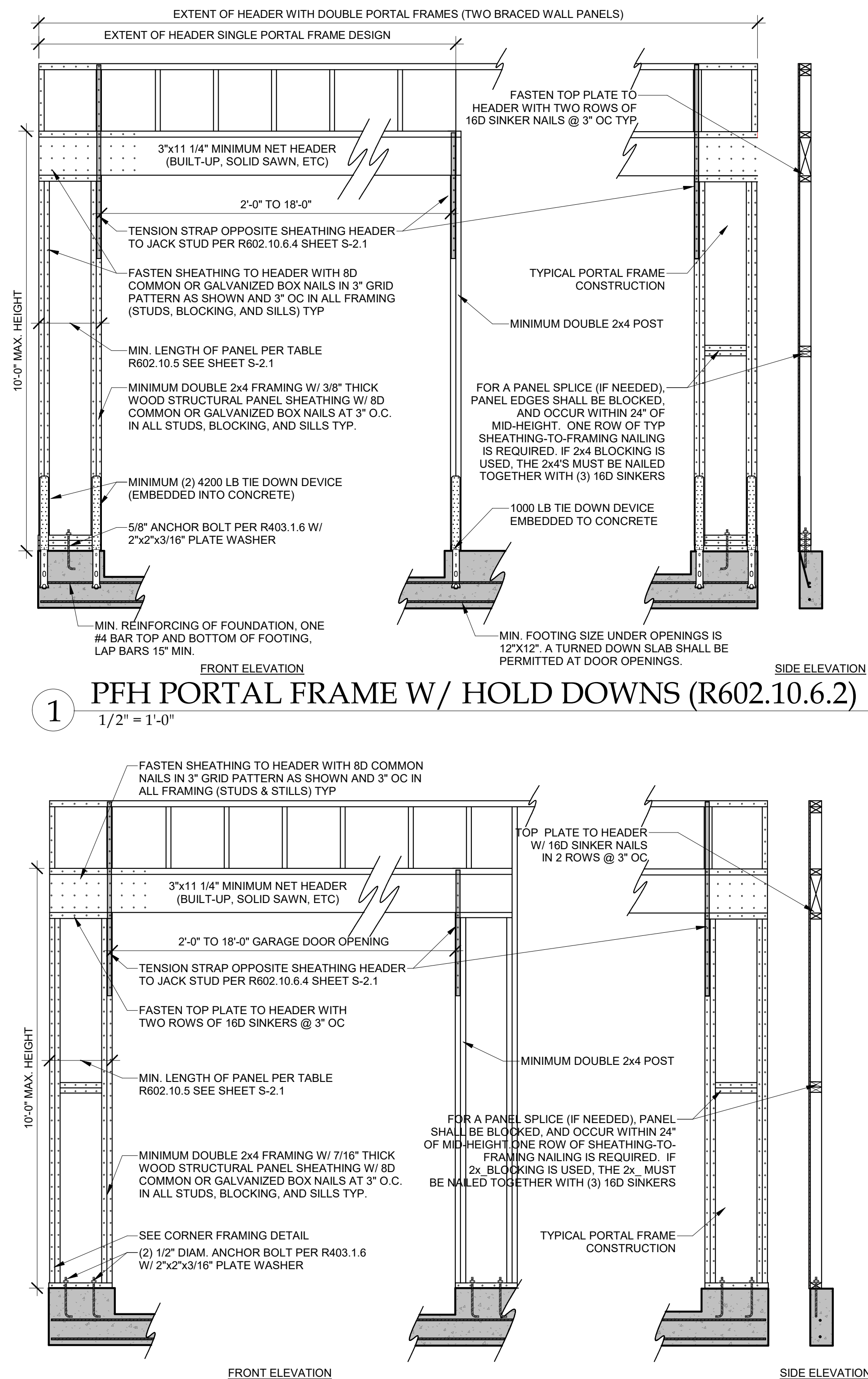
**NOTE FOR CONSTRUCTION:** THE CONTINUOUS STRUCTURAL PANEL SHEATHING BRACING METHOD REQUIRES USE OF THE ABOVE TABLE FOR SHEATHING OF THE ENTIRE STRUCTURE. IN ADDITION, FRAMING MEMBERS SHALL BE @ 16" O.C. MAX., UNBLOCKED, AND W/ SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS

**NOTE FOR DESIGN:** ALL WALLS USED IN THE CALCULATION OF THE RESISTANCE FOR THIS STRUCTURE SHALL HAVE A MINIMUM UNINTERRUPTED HEIGHT OF 8'-0" AND LENGTH OF 2'-0". ALLOWABLE RESISTANCES HAVE BEEN #17T AND INCREASED BY 40% FOR WIND LOADS. PER VALUES IN 2012 IBC SECTION 2306 AND AF&PA SDPWS TABLE 4.3A. FOR EXAMPLE, 7/16" APA-RATED SHEATHING WITH 6@ 6" S 12" HAS A SEISMIC SHEAR VALUE OF 220 A WIND SHEAR VALUE OF 335K LIFT - 40% GREATER THAN THAT OF SEIMIC)

**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

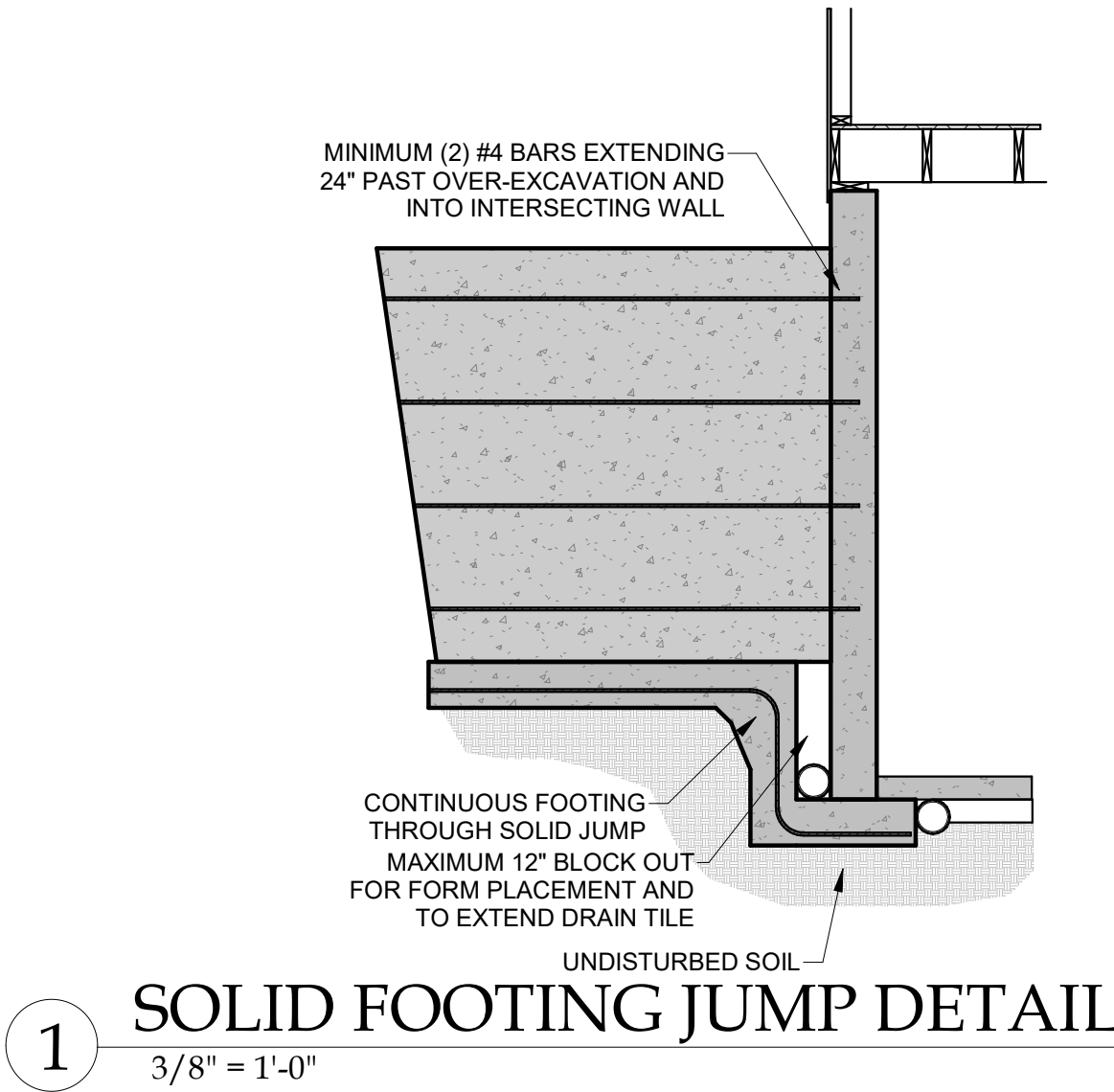


### 3 BRACED WALL PANEL CONNECTIONS

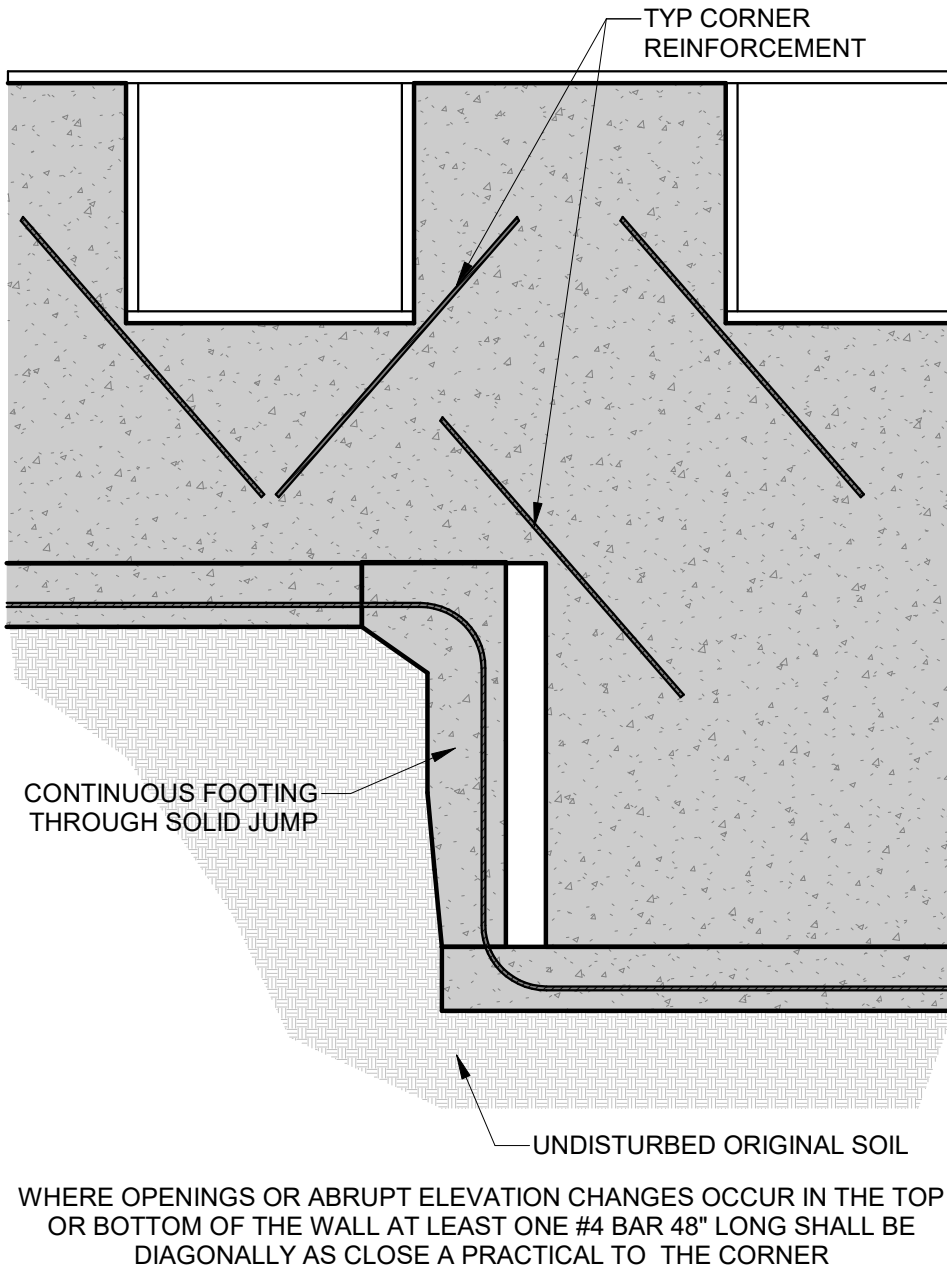


2 PFG PORTAL FRAME W/OUT HOLD DOWNS (R602.10.6.3)  
1/2" = 1'-0"

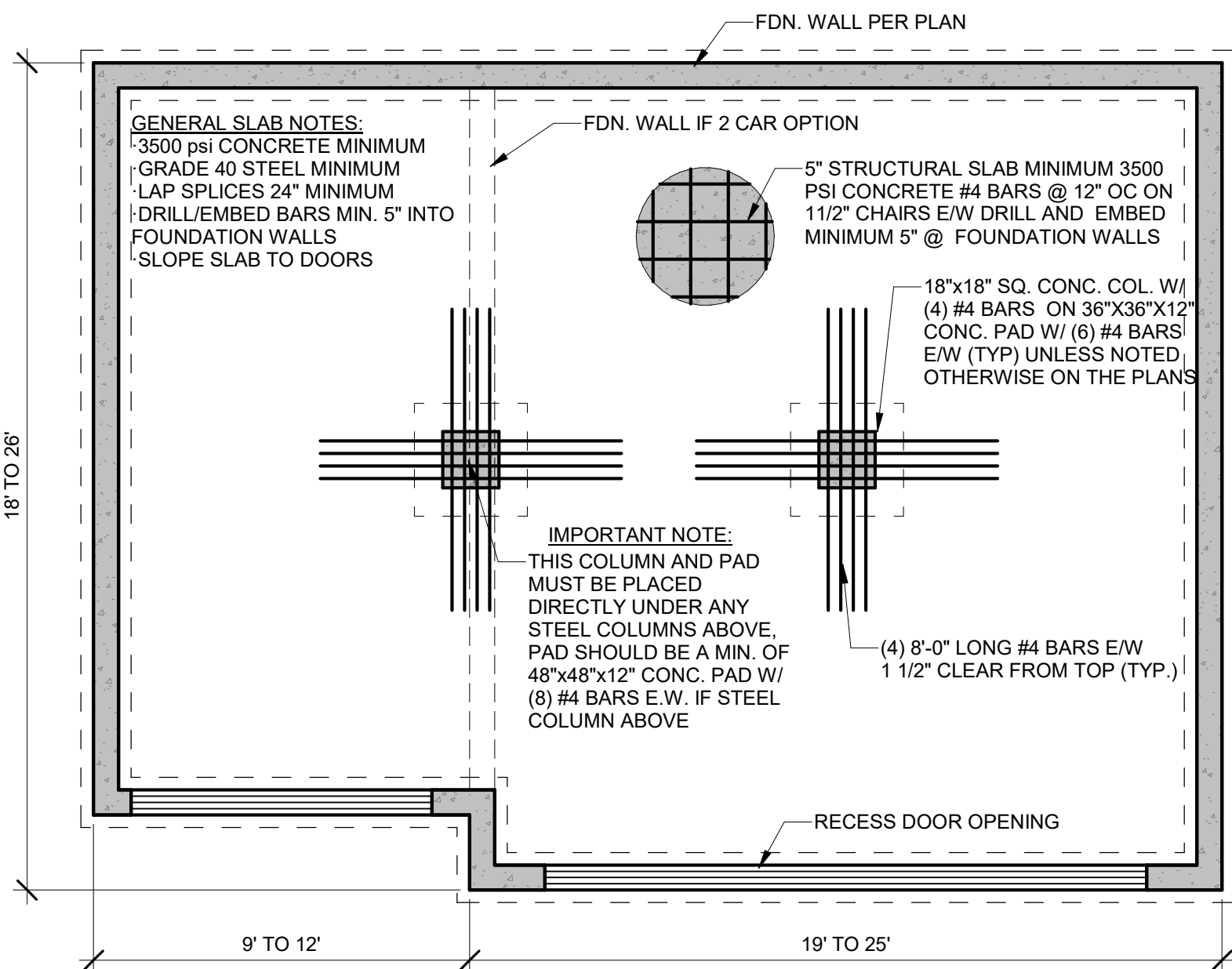




1 SOLID FOOTING JUMP DETAIL  
3/8\" = 1'-0"



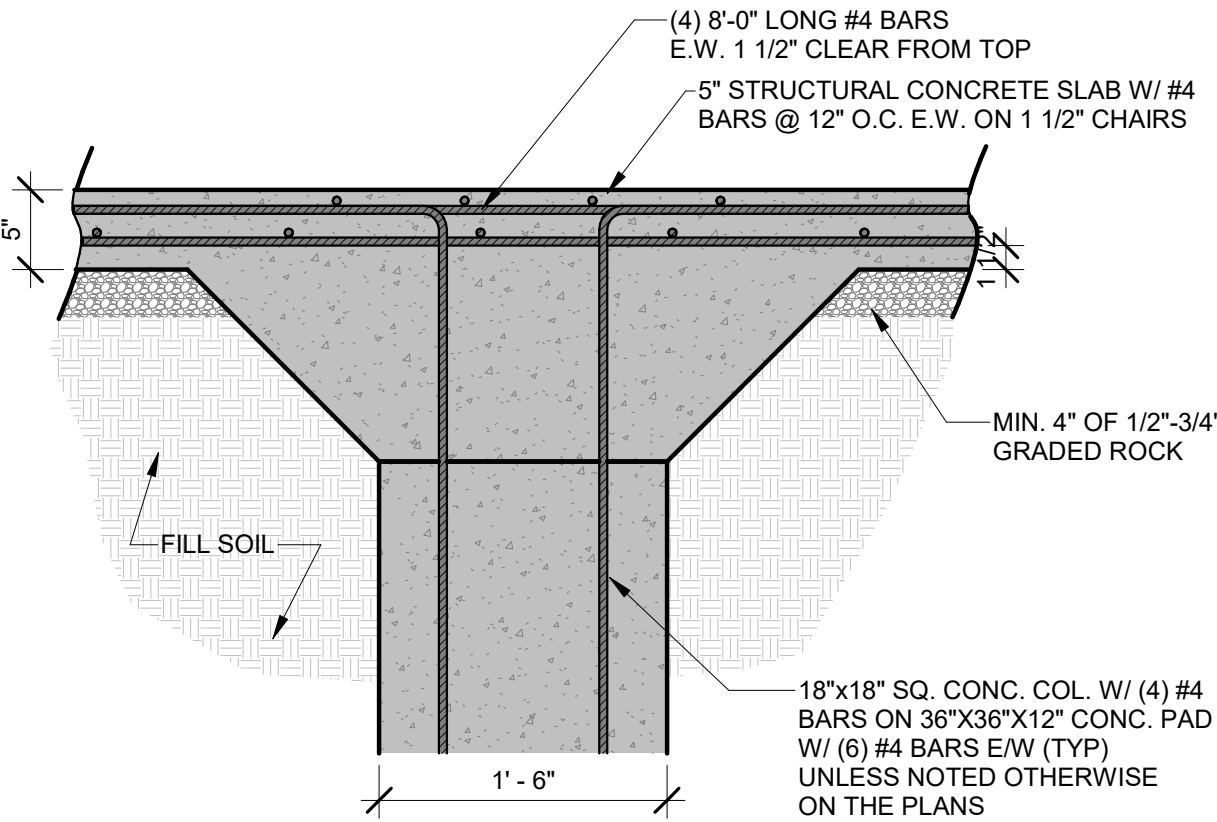
2 RETURN WALL DETAIL  
1/2\" = 1'-0"



3 GARAGE SLAB COLUMN DETAIL  
1\" = 1'-0"

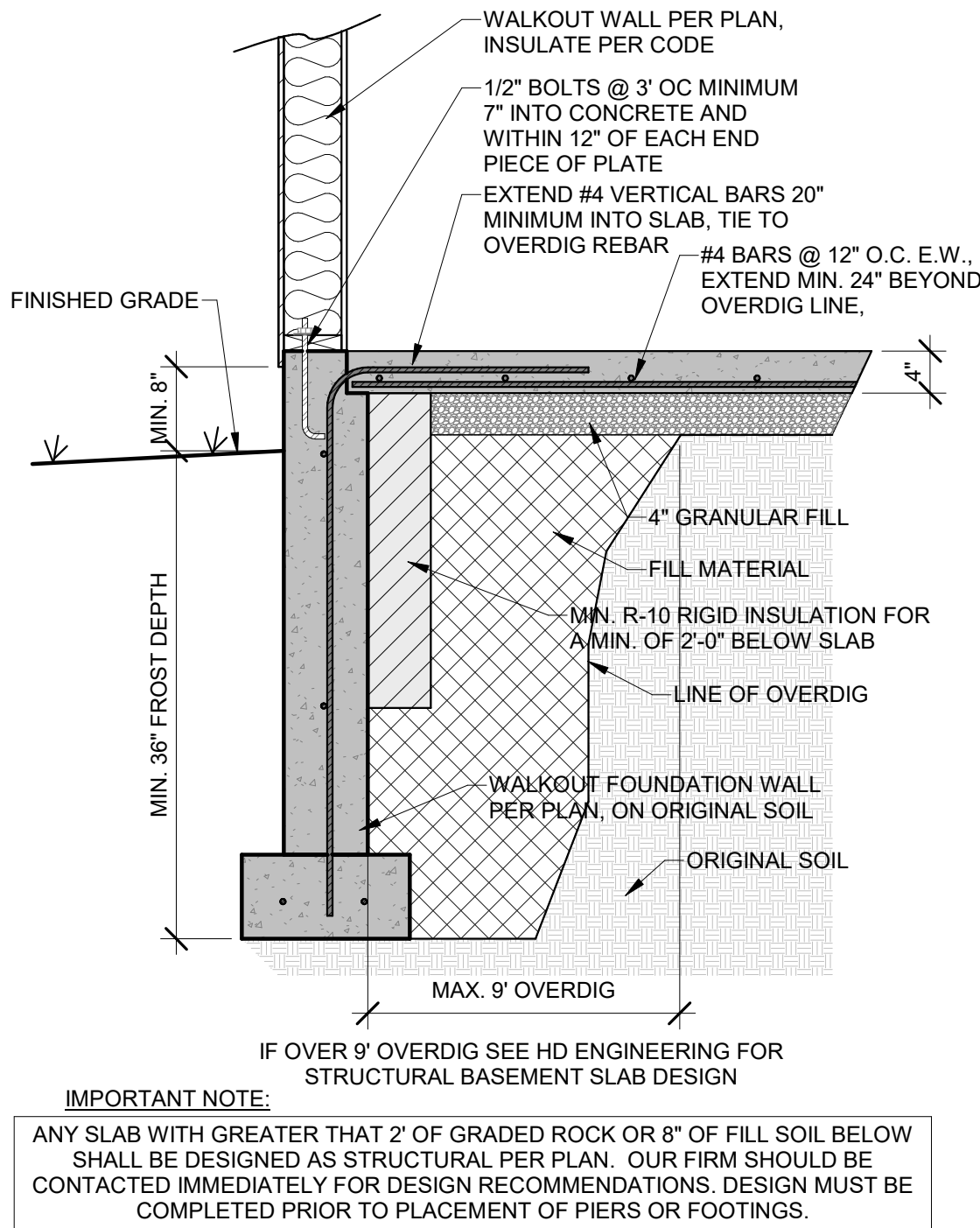


4 RETURN WALL PLACEMENT  
3/16\" = 1'-0"



5 TYPICAL GARAGE SLAB  
1/4\" = 1'-0"

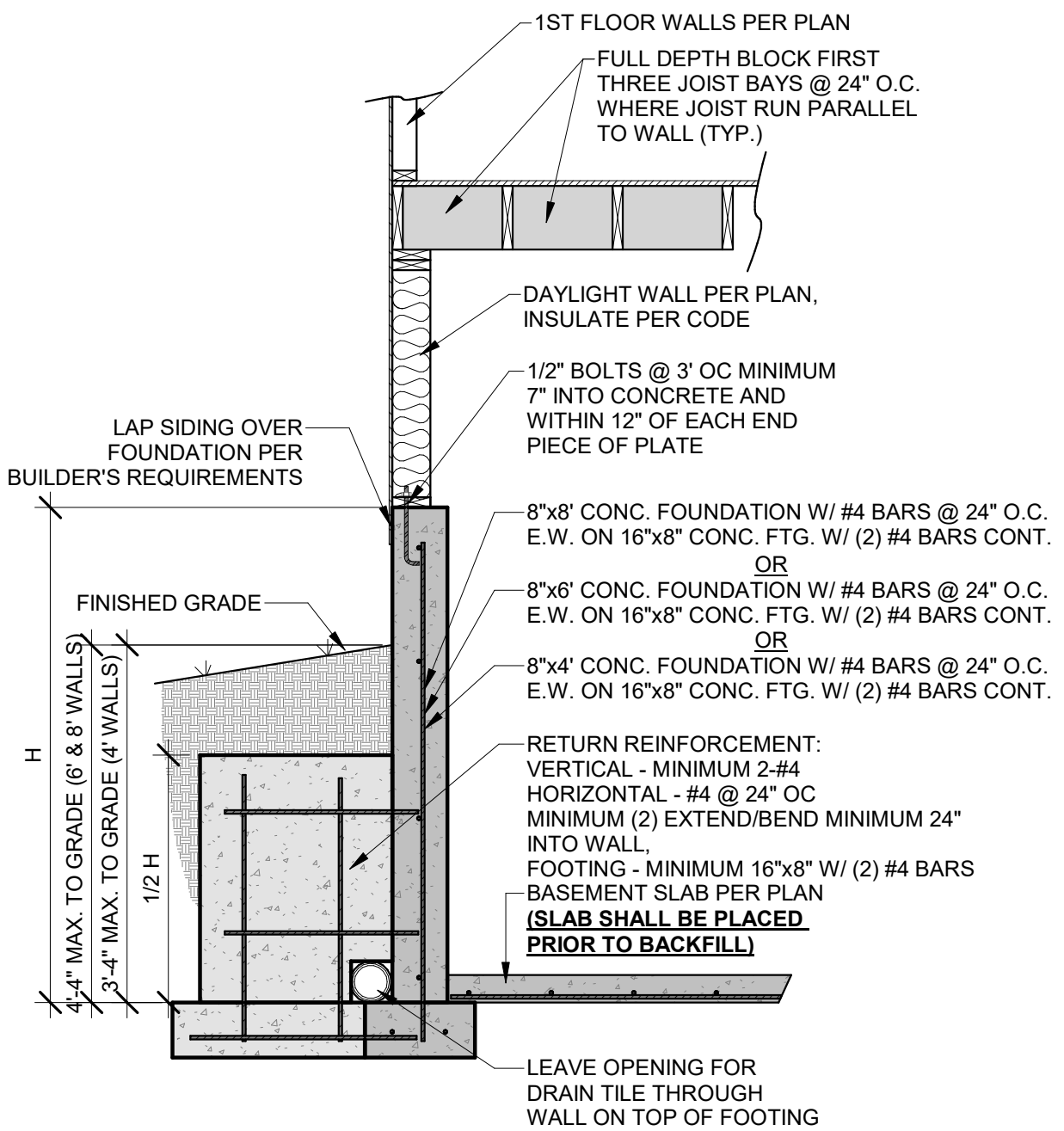
6 ZERO ENTRY GARAGE DETAIL  
1 1/2\" = 1'-0"



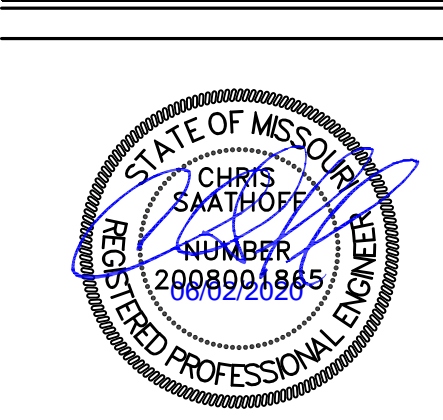
6 ZERO ENTRY GARAGE DETAIL  
1 1/2\" = 1'-0"

VERTICAL REINFORCEMENT SPACING* 60 PSF SOIL; 40 & 60 KSI STEEL					
CONCRETE STRENGTH	8" THICK WALL			10" THICK WALL	
	8"	9"	10"	8"	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



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



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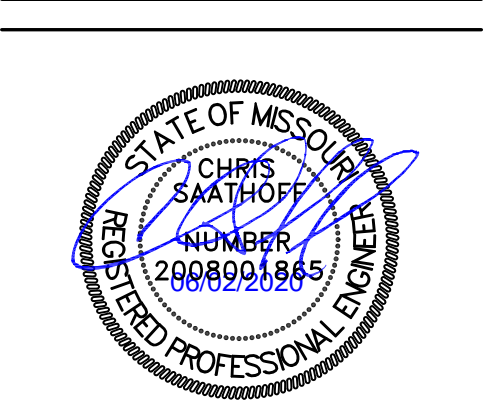
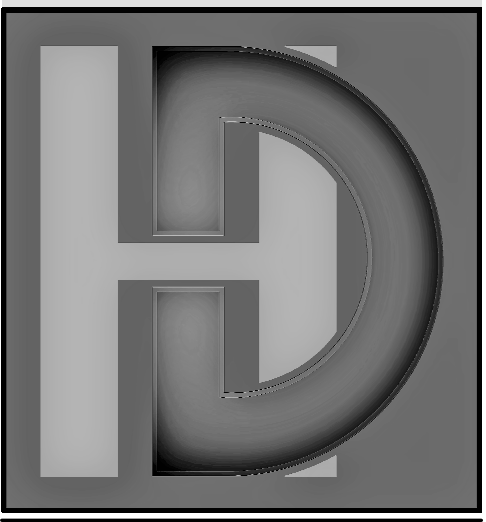
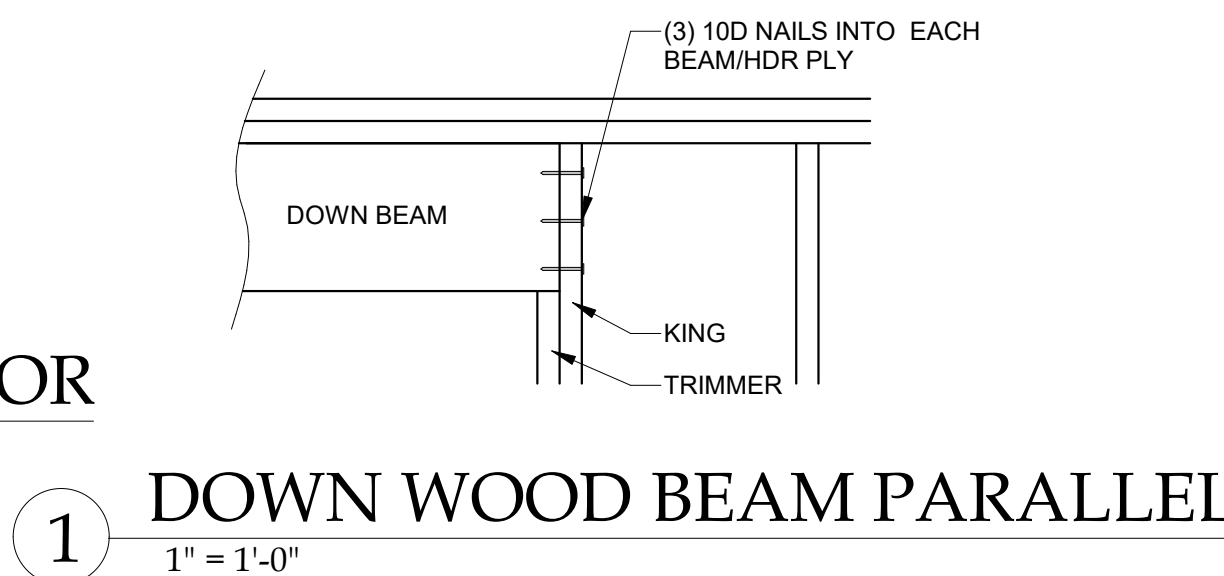
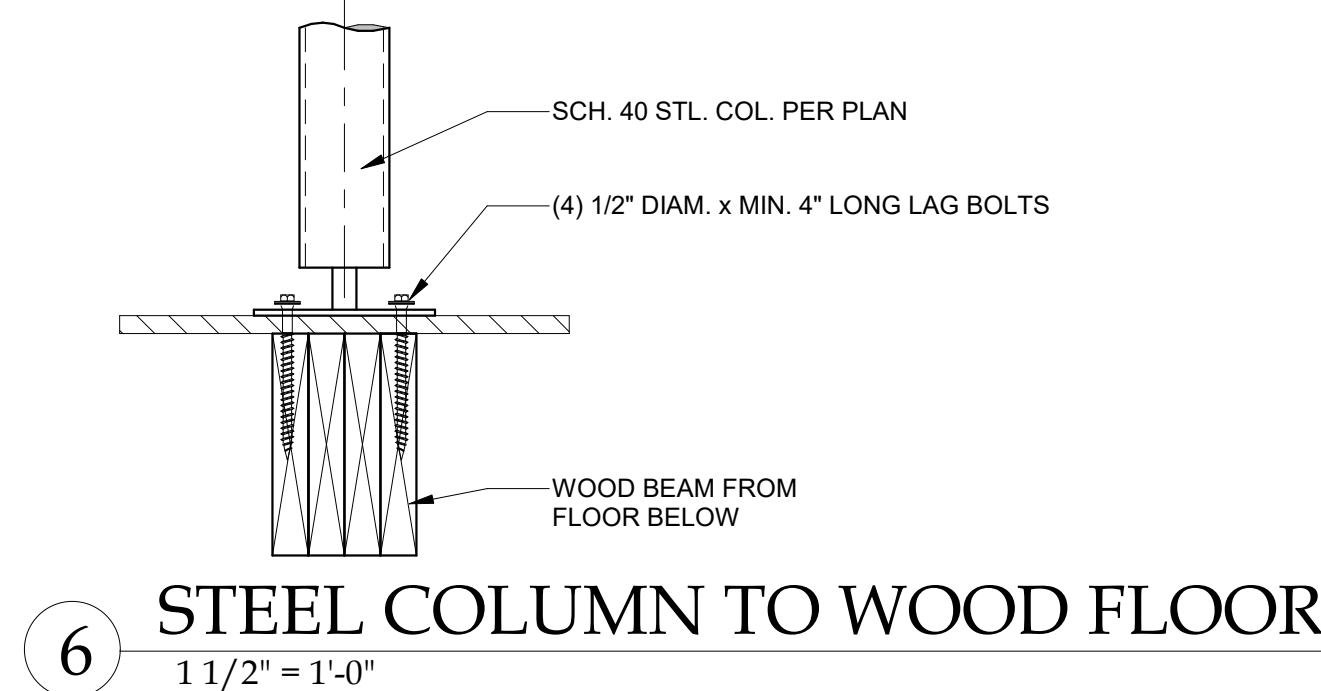
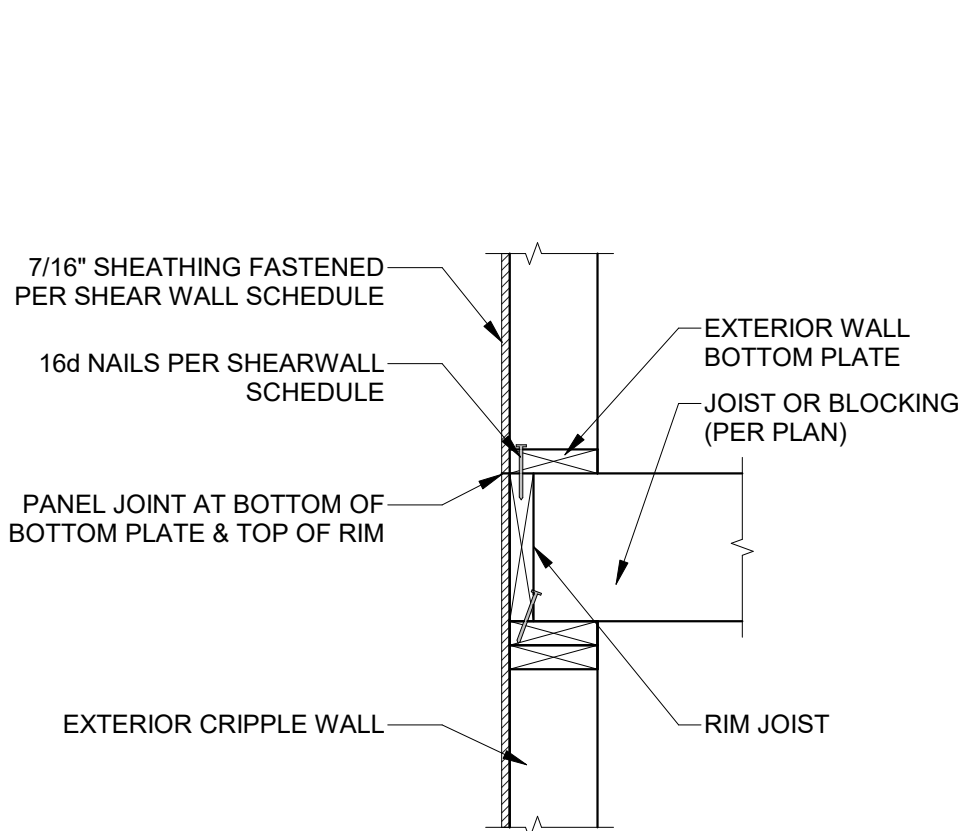
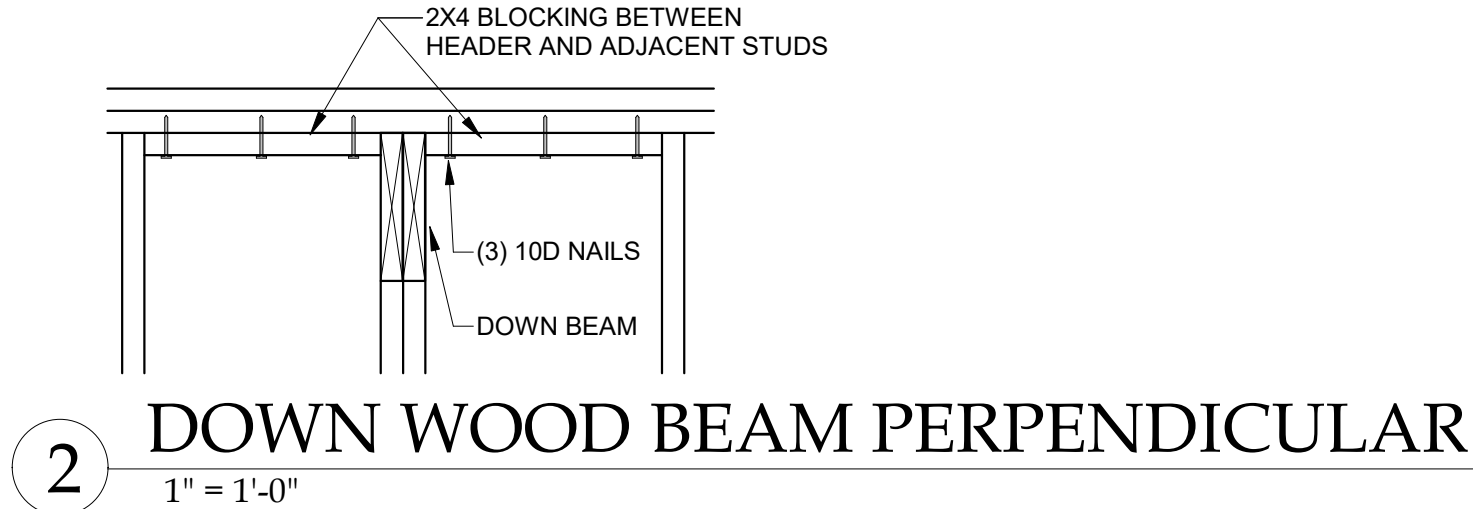
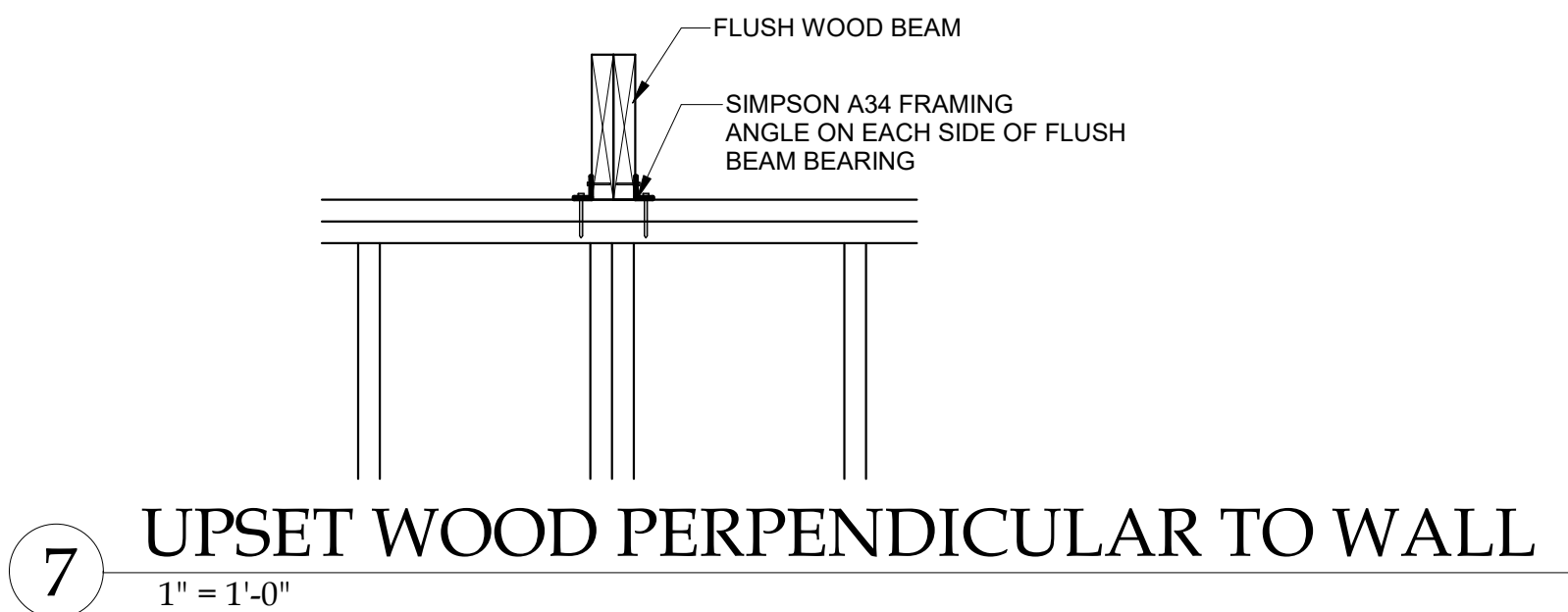
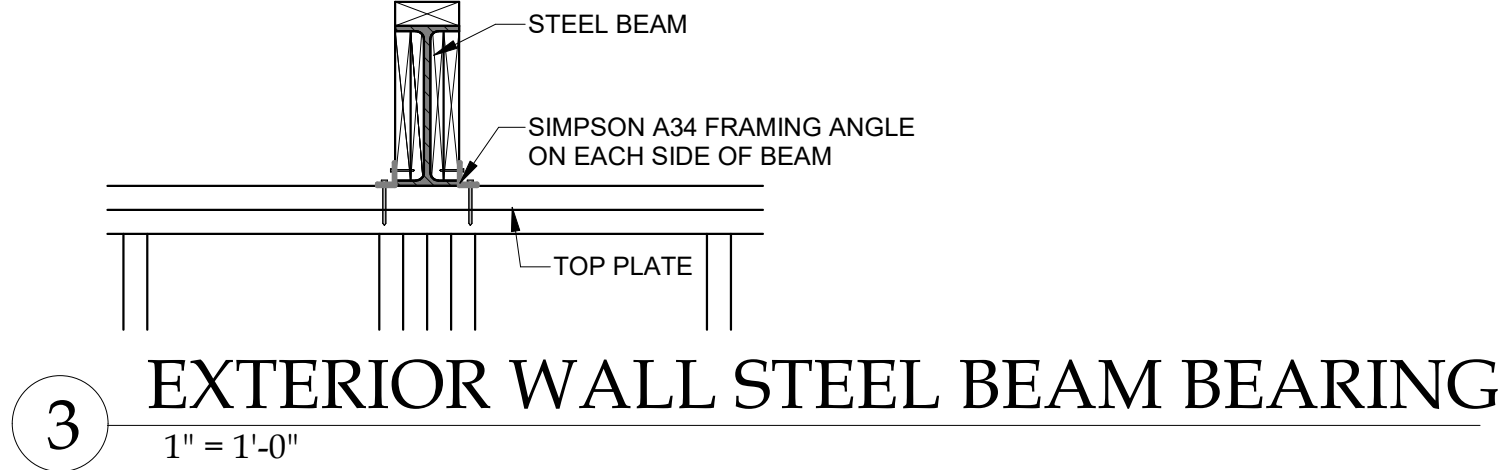
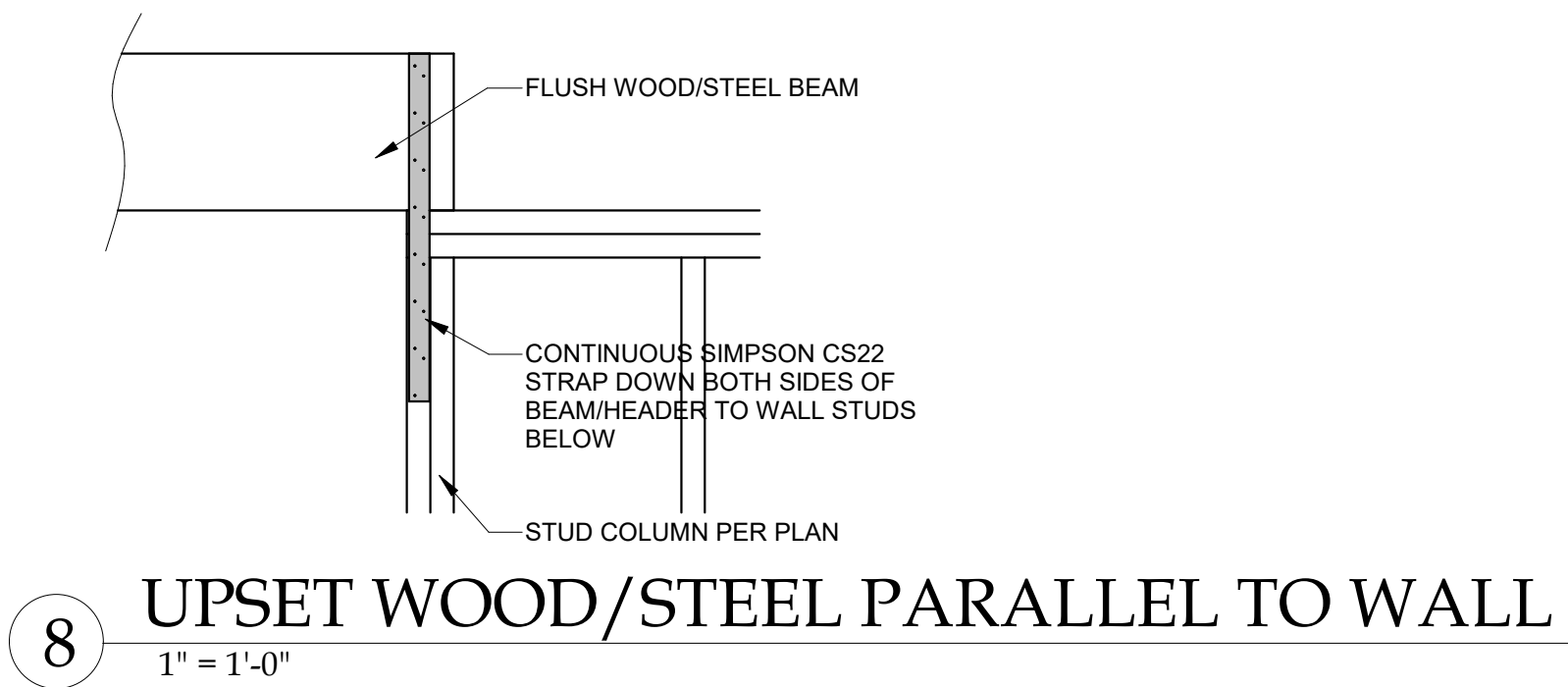
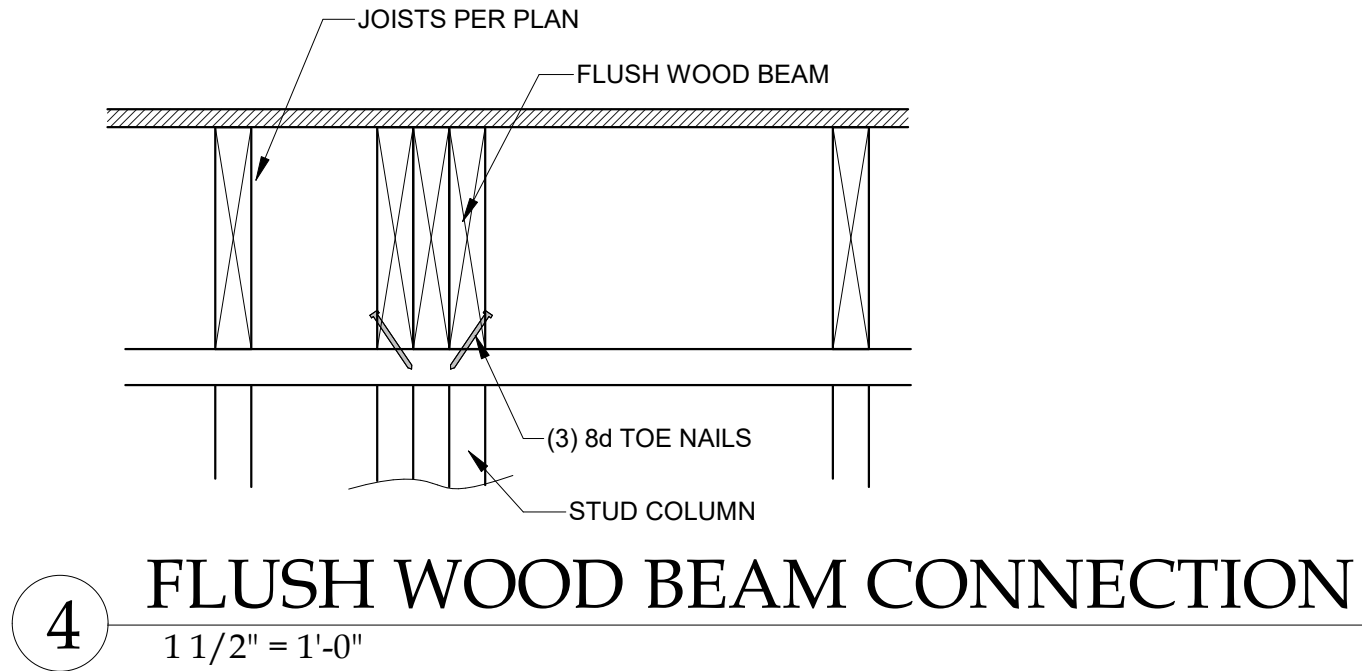
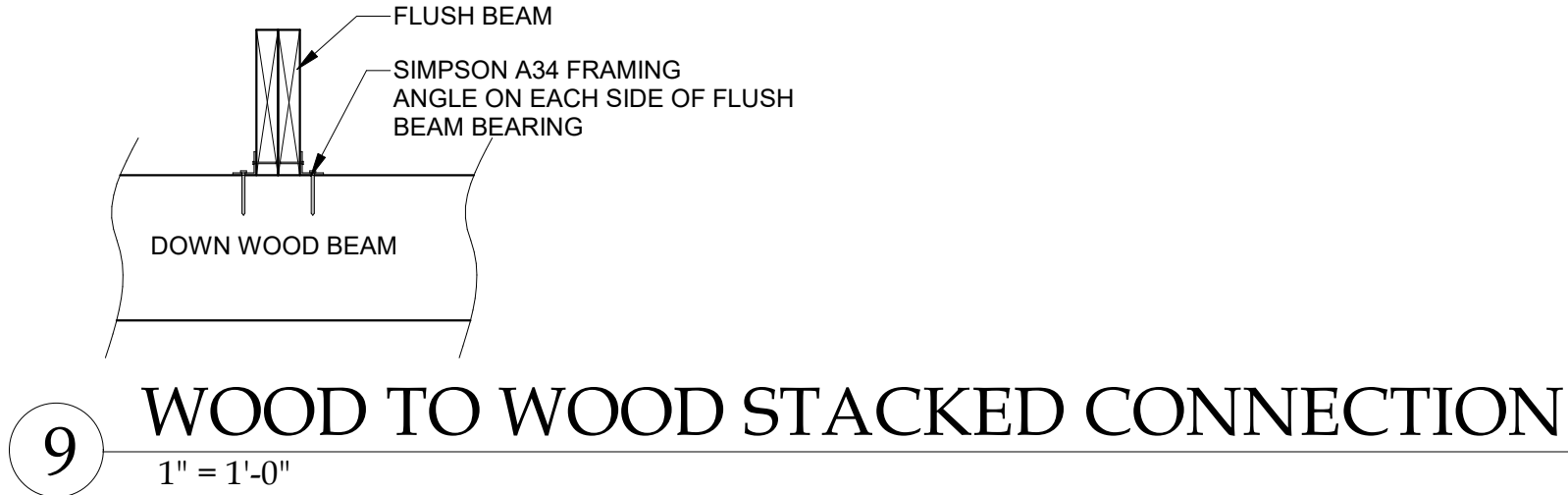
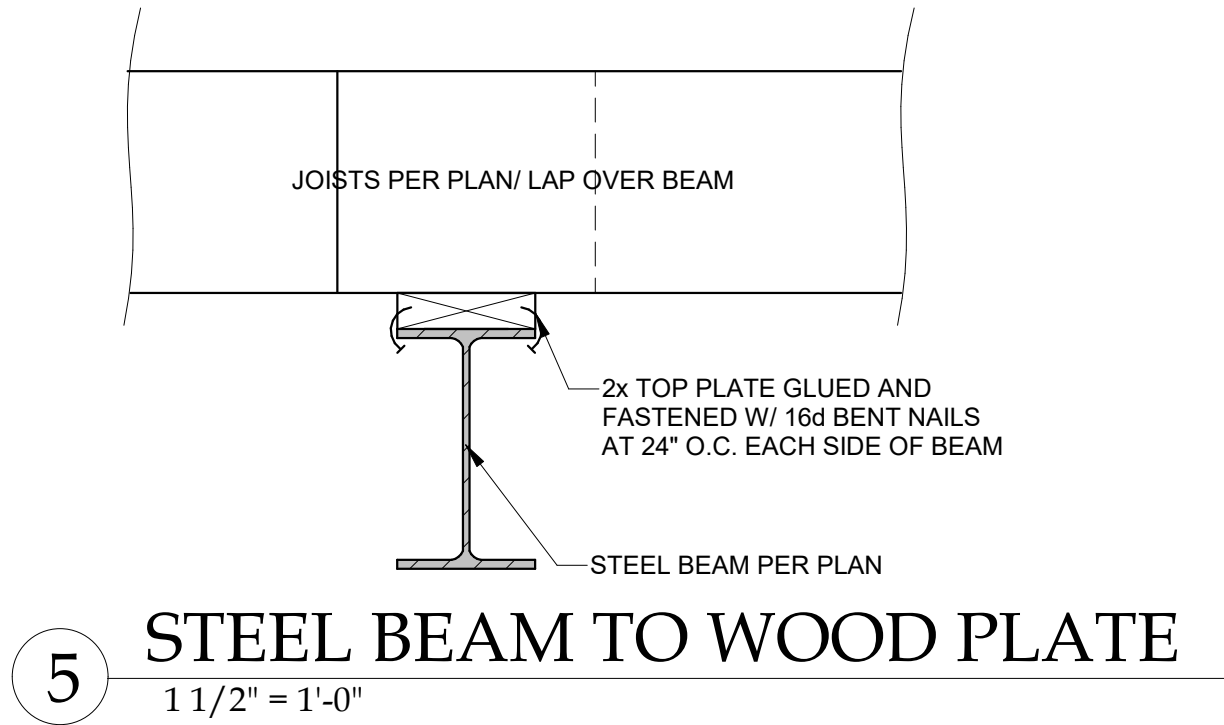
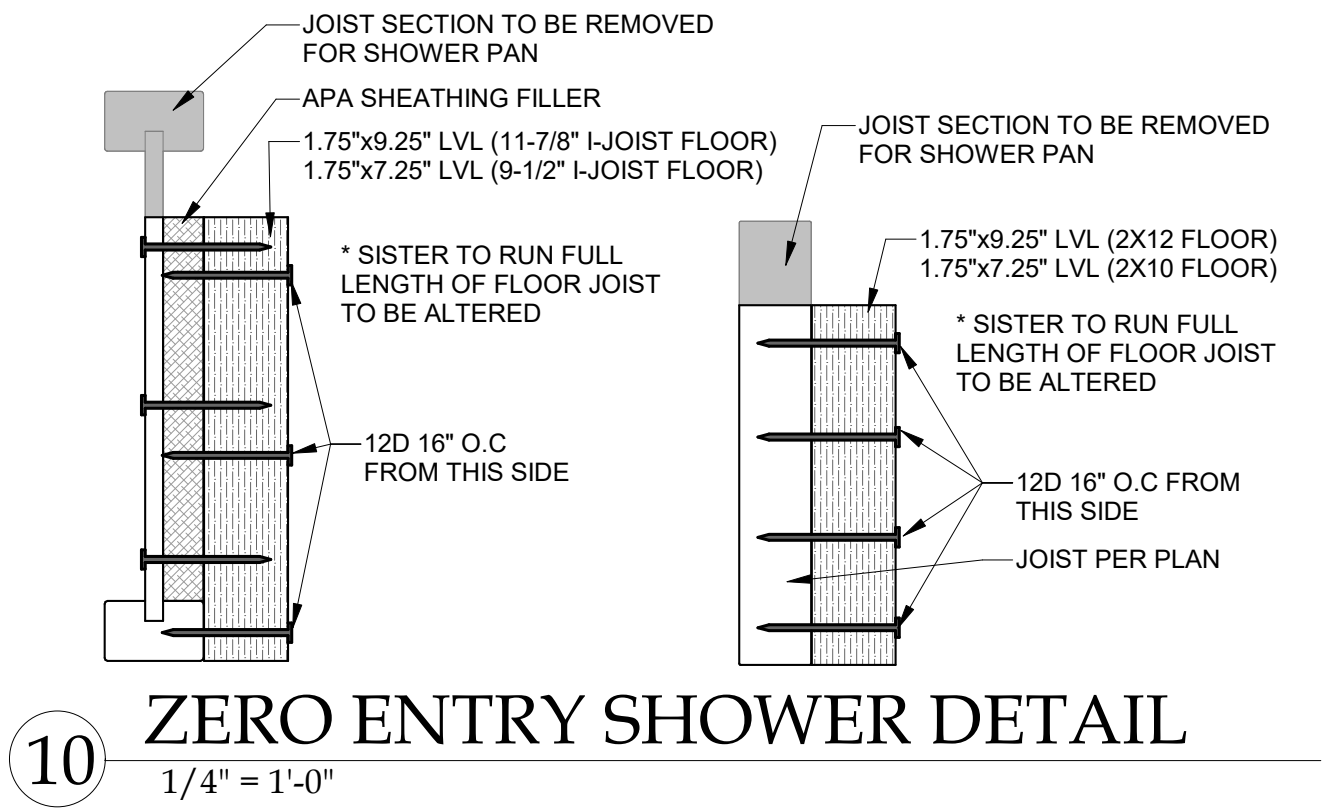
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