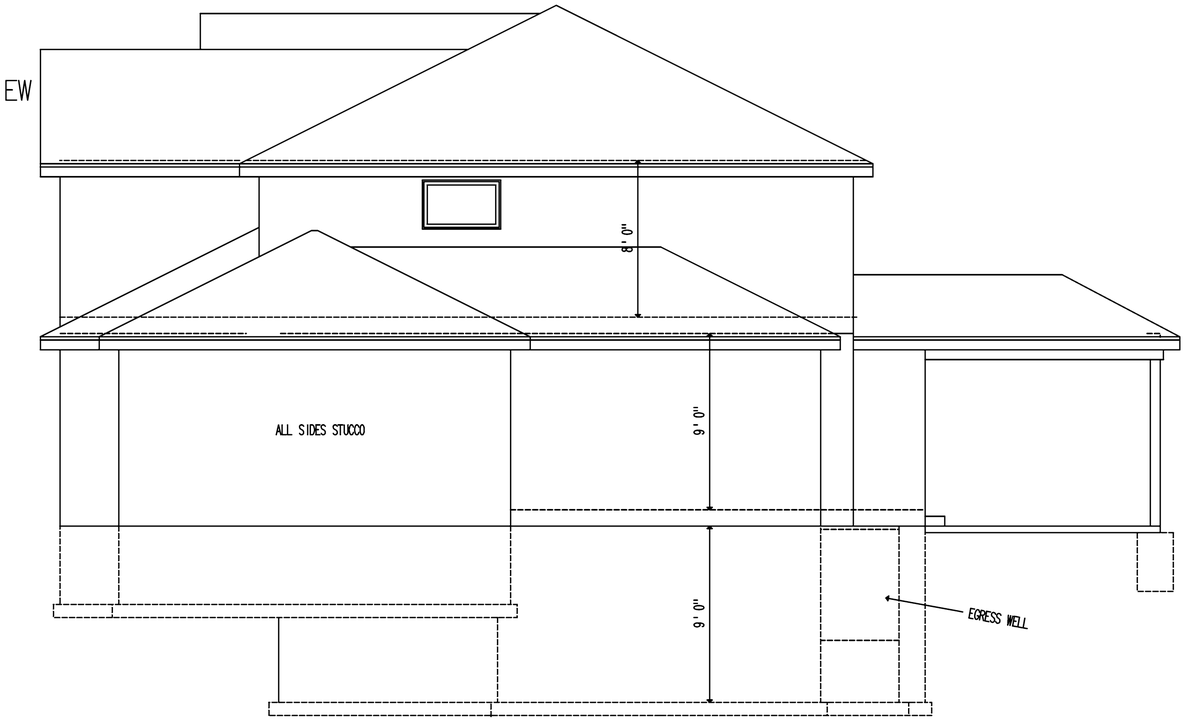
RIGHT VIEW



FRONT VIEW

STUCCO FRONT WITH MODEL STONE
CONFIRM W/BUILDER

* ALL CONSTRUCTION TO COMPLY WITH
INTERNATIONAL RESIDENTIAL CODE
AND LOCAL RESTRICTIONS
ROOF SHINGLES: COMPOSITION

ADDRESS: 1521 SW HEDGE LANE LEES SUMMIT, MO 64081		
RESIDENTIAL LIVING AREA		
MAIN FLOOR	1266	SQ.FT.
BASEMENT FINISH	1339	SQ.FT.
TOTAL	2605	SQ.FT.
RESIDENTIAL BASEMENT	1266	SQ.FT.
RESIDENTIAL UNFIN.BASEMENT	1266	SQ.FT.
RESIDENTIAL GARAGE	662	SQ.FT.
COVERED PATIO	144	SQ.FT.
ROOFING MATERIALS	COMPOSITION	
NUMBER OF BEDROOMS/FLEX ROOM	5	
NUMBER OF LIVING UNITS	1	
NUMBER OF BATHROOMS	3	
NUMBER OF STORIES	2 +BASEMENT	
TOTAL LIVING AREA	2605	SQ.FT.

FULL BASEMENT 9 WALLS

GTS Homes LLC

RESIDENTIAL PLANS
by JIM SKINNER
(913)268-3154

PLAN #WG-14
REF TG2121M
EXTERIORS
PAGE 1-- 1/4"=1'0"

JANE KELLY GR W/ BASEMENT - LOT 14 WG
1521 SW. HEDGEWOOD LN., LEE'S SUMMIT, MO.

1 09/22/2022 PLAN UPDATE

STATE OF MISSOURI
CHRIS SAATHOFF
NUMBER 2008001865
09/22/2022
REGISTERED PROFESSIONAL ENGINEER

STRUCTURAL REVIEW
HD#: 43710

HD ENGINEERING & DESIGN, INC
11656 W. 76TH STREET
SHAWNEE, KS 66214
WWW.HDENGINEERS.COM
913.631.2222
SERVICE@HDENGINEERS.COM

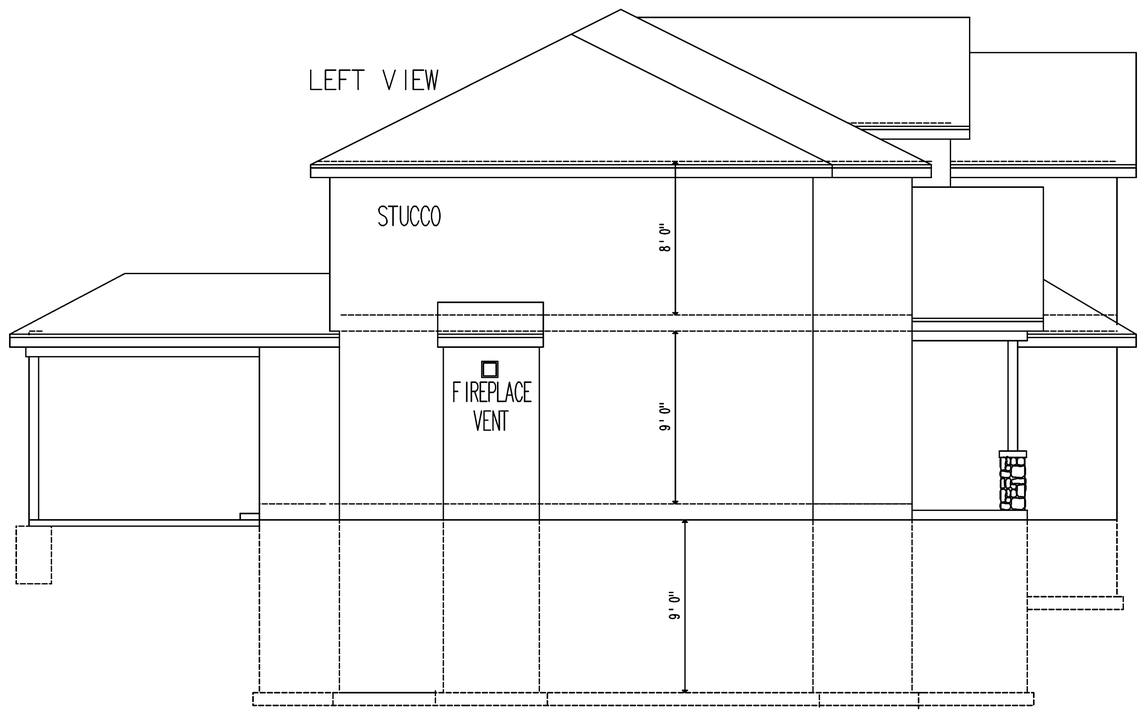
Digitally signed by Kim Brennan
Reason: Release for Construction
Date: 2022.09.26 08:18:18-05'00'
Kim Brennan

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
Development Services
LEE'S SUMMIT, MISSOURI

REAR VIEW

STUCCO ALL SIDES FRONT AND REAR
COMPOSITION ROOF SHINGLES
LOCATE ROOF AND SOFFIT VENTS PER CODE
ADJUST FOUNDATION TO GRADE

LEFT VIEW



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FULL BASEMENT

GTS Homes LLC

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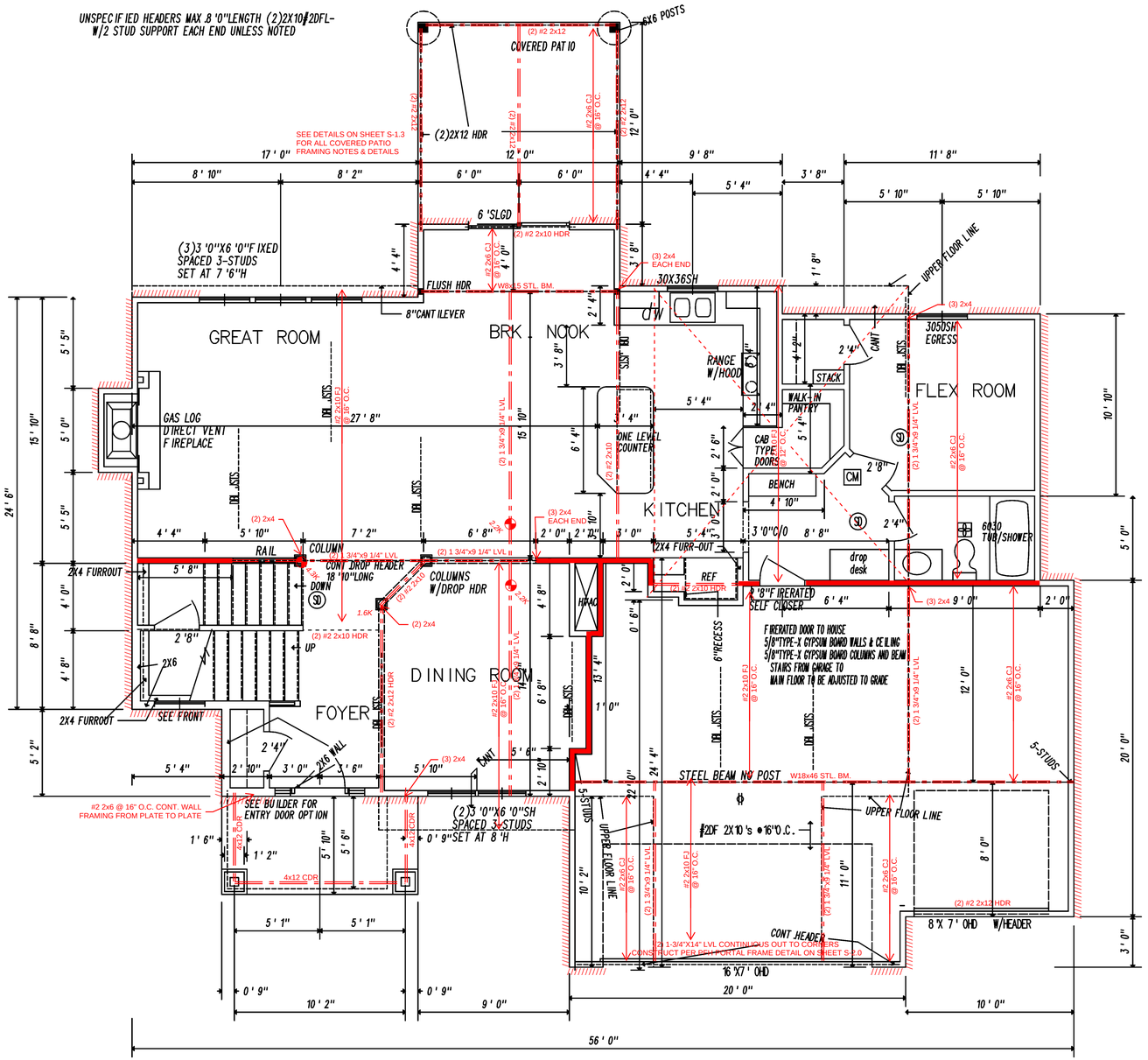

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GTS Homes LLC

RESIDENTIAL PLANS by JIM SKINNER (913)268-3154

PLAN #WG-14
REF TG2121M
FLOOR PLAN
1266 SQ.FT.
PAGE 3 — 1/4"=1'0"

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- 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 "UFER" GROUND PER IRC SECTION 3608.1.5
-OVERHEAD GARAGE DOORS MUST MEET DASMA REQUIREMENTS SEE DETAIL SHEET S-1.0
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-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
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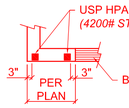
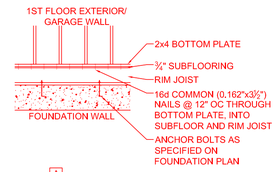
TYPICAL TIE DOWN AT NARROW WALL

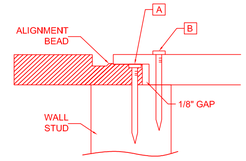


BRACED WALLS:
SEE CALCULATIONS ON SHEET S-2.0, PER ASCE7-10 REQUIREMENTS AS ALLOWED BY IRC 2018 R301.2.1

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





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

3/8" APA REQUIRED NAILING PATTERN FOR SHIPLAP PANEL SHEATHING

RELEASE FOR CONSTRUCTION
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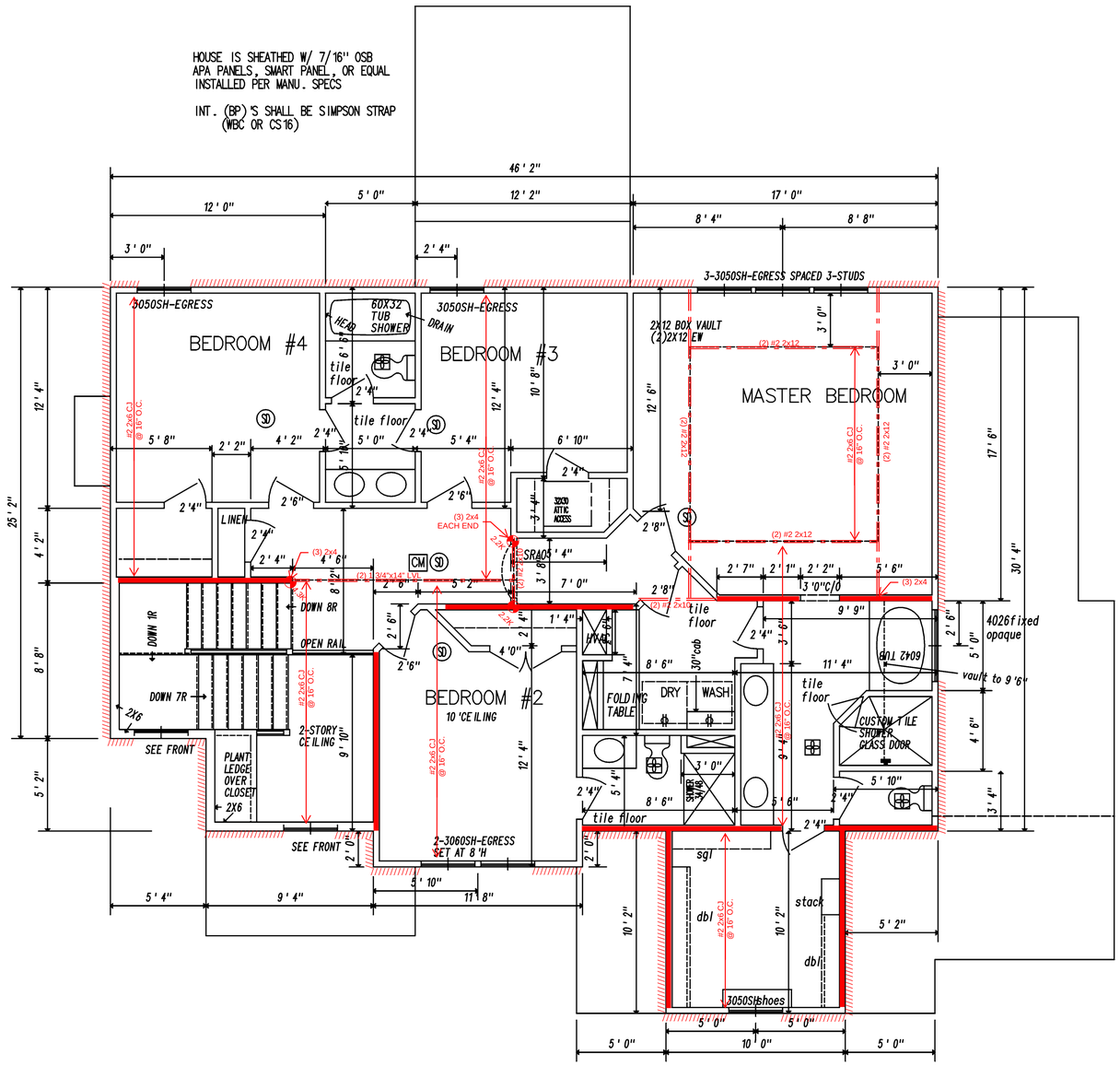

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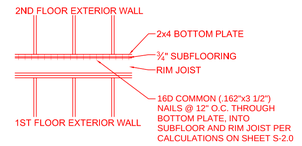

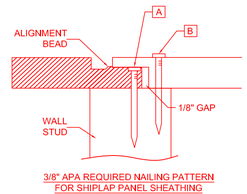

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ROOFING MATERIALS	COMPOSITION	
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NUMBER OF STORIES	2 +BASEMENT	
TOTAL LIVING AREA	2605 SQ.FT.	

GTS Homes LLC

RESIDENTIAL PLANS
by JIM SKINNER
(913)268-3154

PLAN #WG-14
REF TG2121W
UPPER FLOOR
1342 SQ.FT.
PAGE 1 -- 1/4"=1'0"

 — 9-18-22

RELEASE FOR CONSTRUCTION
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Development Services
LEE'S SUMMIT, MISSOURI

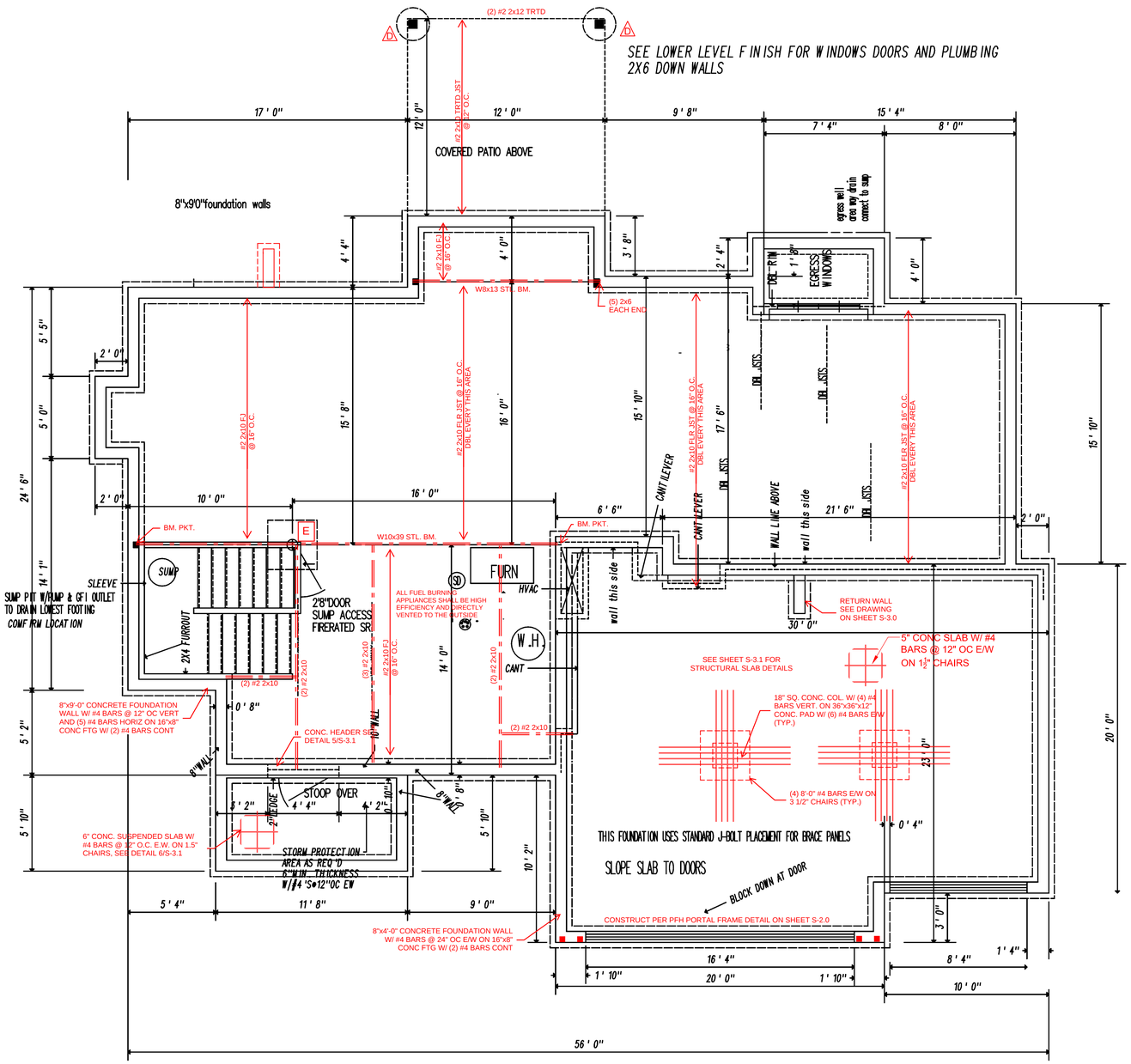
NOTE: CONFIRM BACK WATER VALVES
BASEMENT PLUMBING FIXTURES
TO PROVIDE MEANS OF CONTROLLING
PRESSURE CAUSED BY THERMAL
EXPANSION

NOTE: SUMP PIT SHALL BE
EQUIPPED WITH A PUMP
AND RECEPTACLE, IN
UNFINISHED PORTIONS OF
BASEMENT. RECEPTACLES
SHALL HAVE GFI PROTECTION

ALL SILLS & SLEEPERS SUPPORTED ON CONCRETE OR MASONRY AND ALL FURRING ATTACHED TO CONCRETE OR MASONRY SHALL BE OF DECAY-RESISTANT MATERIALS
INTERIOR NO-BEARING WALL OTHER THAN THOSE RESTING DIRECTLY ON FOOTING, SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE

ELECTRICAL PANEL, SEWER LINES, GAS METER, AND SUMP PIT LOCATION MAY VARY ACCORDING TO UTILITY ACCESS AND GRADE CONDITIONS

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



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FULL BASEMENT

GTS Homes LLC

RESIDENTIAL PLANS
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(913)268-3154

PLAN #WG-14
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FOUNDATION
PAGE 5-- 1/4"=1'0"

1 09/22/2022 PLAN UPDATE

DECK PIER SCHEDULE

1 MIN. 6X6 TRTD/CDR POST ON 12" ØCONC PIER WITH USP PAU 66 BASE OR = (1177# MAX)

2 MIN. 6X6 TRTD/CDR POST ON 16" ØCONC PIER WITH USP PAU 66 BASE OR = (2050# MAX)

3 MIN. 6X6 TRTD/CDR POST ON 18" ØCONC PIER WITH USP PAU 66 BASE OR = (2649# MAX)

4 MIN. 6X6 TRTD/CDR POST ON 24" ØCONC 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.
· ALL TREATED WOOD SHALL BE MIN. #2 SYP
· ALL EXTERIOR STEEL SHALL BE GALVANIZED OR WRAPPED/SEALED WEATHER TIGHT "AND" ALL EXTERIOR FASTENERS SHALL BE RATED FOR APPROPRIATE USE.

COLUMN PAD SCHEDULE

A	3" ØSCH. 40 STL. COL. ON 30"x30"x12" CONC. PAD W/ (5) #4 BARS E.W. (9.4K MAX.)
B	3" ØSCH. 40 STL. COL. ON 36"x36"x12" CONC. PAD W/ (6) #4 BARS E.W. (13.5K MAX.)
C	3 1/2" ØSCH. 40 STL. COL. ON 42"x42"x14" CONC. PAD W/ (7) #4 BARS E.W. (18.4K MAX.)
D	3 1/2" ØSCH. 40 STL. COL. ON 48"x48"x16" CONC. PAD W/ (8) #4 BARS E.W. (24K MAX.)
E	3 1/2" ØSCH. 40 STL. COL. ON 54"x54"x16" CONC. PAD W/ (9) #4 BARS E.W. (30.4K MAX.)
F	3 1/2" ØSCH. 40 STL. COL. ON 60"x60"x18" 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 ISSOLATION DEVICE OR JOINT.

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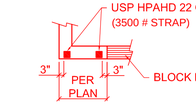

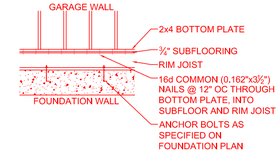

FOUNDATION ANCHORING NOTES
- MIN. 1/2" ANCHOR BOLTS SHALL BE INSTALLED @ 36" O.C. MAX AND WITHIN 6"-12" FROM THE END OF EACH SECTION OF SILL PLATE ALONG ENTIRE PERIMETER OF FOUNDATION

STATE OF MISSOURI
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09/22/2022
REGISTERED PROFESSIONAL ENGINEER

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	COMP.	TILE
PURLIN	LEG OC	LEG OC
2X6	4'0"	--
2X8	5'4"	5'4"
2X10#3	6'8"	--
2X10#2	8'0"	8'0"

ATTIC VENTILATION
VENT EACH ENCLOSED ATTIC SPACE
NET AREA OPENING = 1/150TH OF VENTED AREA
OR 1/300TH IF 50-80% OF VENTING NEAR TOP

	COMP	TILE
SUPPORT LEG	MAX	MAX
2X4 W/2X4 T-BRACE	9'1"	7'11"
2X6 W/2X4 T-BRACE	9'6"	8'0"
2X6 W/2X6 T-BRACE	17'2"	14'10"
2X8 W/2X4 T-BRACE	9'10"	6'8"
2X8 W/2X6 T-BRACE	17'4"	15'0"

HEEL JOINT CONNECTION FACTOR

HC/HR	
1/3	1.5
1/4	1.33
1/5	1.25
1/8	1.2
1/10 OR LESS	1.11

HC - HEIGHT OF CEILING OR RAFTER TIES MEASURED VERTICALLY ABOVE TOP OF RAFTER SUPPORT WALL
HR= HEIGHT OF ROOF RIDGE MEASURED VERTICALLY ABOVE THE TOP OF THE RAFTER SUPPORT WALL

**ALL FRAMING MEMBERS ARE SIZED AS BEAMS AND BRACED TO LBW's, HEADERS, OR OTHER STRUCTURE

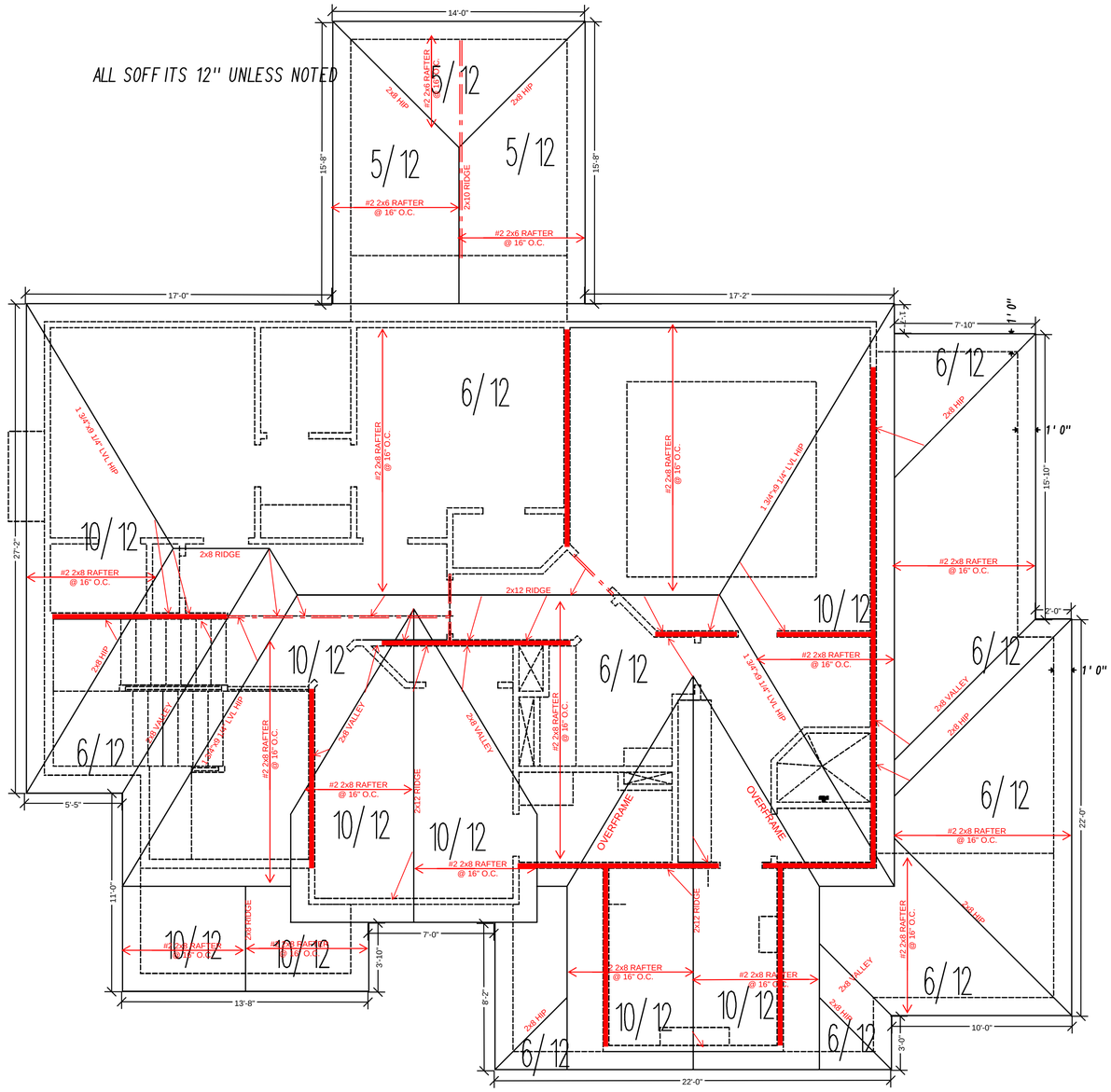
ROOF
ASPHALT SHINGLES - 2/12 MIN
FLASH AND COUNTER FLASH ALL ROOF PENETRATIONS AND INTERSECTIONS

RAFTERS & CEILING JOISTS
COLLAR TIE AT UPPER THIRD POINT 48"OC 2X4 MIN
CEILING JOISTS ARE TURNED AS REQUIRED FOR RAFTER TIES
RIDGE/RAFTERS HANGERS AND STRAPS AS REQ'D
OUTRIGGERS REQ'D AT GABLE END SOFFITS FOR COMP ROOF W/SOFFITS > 12"
OUTRIGGERS REQ'D AT GABLE END SOFFITS FOR TILE ROF

UNLESS NOTED
RAFTERS ARE 2X6#2 DFL @16"OC
MAX SPAN 11' +/-

PROVIDE VERTICAL LOAD SUPPORT AT THE NOTED
LOAD POINTS FOR HIPS, VALLEYS, PURLINS & RIDGES
LET-IN SUPPORT LEG TO PURLIN
ALL HIPS, VALLEYS & RIDGES ARE SIZED FOR THE RAFTER DEPTH,PITCH, AND LOAD

ALL SOFFITS 12" UNLESS NOTED



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RESIDENTIAL BASEMENT	1266 SQ.FT.
RESIDENTIAL UNFIN.BASEMENT	1266 SQ.FT.
RESIDENTIAL GARAGE	662 SQ.FT.
COVERED PORCH	144 SQ.FT.
ROOFING MATERIALS	COMPOSITION
NUMBER OF BEDROOMS/FLEX ROOM	5
NUMBER OF LIVING UNITS	1
NUMBER OF BATHROOMS	3
NUMBER OF STORIES	2 +BASEMENT
TOTAL LIVING AREA	2605 SQ.FT.

GTS Homes LLC

RESIDENTIAL PLANS
by JIM SKINNER
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PLAN #WG-14
REF TG2121M
ROOF PLAN
PAGE 6-- 1/4"=1'0"

--- 9-18-22

⚠1 09/22/2022 PLAN UPDATE

NOTES

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

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

CODE MINIMUM

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

NOTE: CODE MINIMUM L/240 DEFLECTION

GREATER THAN CODE

RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	@24" O.C.	8'-6"
#2-2x6	@16" O.C.	9'-9"
#2-2x8	@24" O.C.	11'-3"
#2-2x8	@16" O.C.	12'-9"
#2-2x10	@24" O.C.	14'-3"
#2-2x10	@16" O.C.	16'-3"

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

ALL RIDGES, 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 PURLINS STRUTS SHALL HAVE A MAXIMUM UNBRACED LENGTH OF 8'-0"
PURLINS STRUTS SHALL BE CONSTRUCTED IN A "T" CONFIGURATION AND PER THE FOLLOWING CHART

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

-EACH END OF STRUT SHALL BE FASTENED WITH MIN. (3) 8d OR (2) 16d NAILS
-RIDGE BRACES ARE SAME AS PURLIN BRACES; SPACING, SIZE, CONFIGURATION, AND INSTALLATION (SEE PURLIN BRACE NOTE ABOVE)
-HIP AND VALLEY BRACES ARE THE SAME AS PURLINS SIZE, CONFIGURATION, AND INSTALLATION (SEE PURLIN BRACE NOTES ABOVE)

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

— — — - PURLIN
━━━━ - LOAD BEARING WALL
═ = ═ = ═ - LOAD BEARING BEAM/ GIRDER PER PLAN

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

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

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

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

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

STATE OF MISSOURI
CHRIS SAATHOFF
NUMBER 2008001865
09/22/2022
REGISTERED PROFESSIONAL ENGINEER

STRUCTURAL REVIEW
HD#: 43710

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JANE KELLY GR W/ BASEMENT - LOT 14 WG
1521 SW. HEDGEWOOD LN., LEE'S SUMMIT, MO.

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
Development Services
LEE'S SUMMIT, MISSOURI

ALLOWABLE LOADS FOR PNEUMATIC OR MECHANICALLY DRIVEN NAILS AND STAPLES

FASTENER DESCRIPTION	NAIL GUN NAILS/ WIRE DIAMETER	WIRE GAGE	PENETRATION REQUIRED INTO MAIN MEMBER FOR LATERAL STRENGTH (INCHES)	ALLOWABLE LOADS (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							
6d RING SHANK NAIL	.120	11	1-3/8	89	81	41	32
6d SCREW SHANK NAIL							
8d RING SHANK NAIL							
8d SCREW SHANK NAIL							
10d COOLER NAIL	.128	10-1/2	1-1/2	89	81	36	31
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							
8d COMMON NAILS	.131	10-1/4	1-1/2	106	97	41	32
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							
10d COMMON NAILS	.148	9	1-5/8	128	118	46	36
12d COMMON NAILS							
16d SINKER NAILS							
20d BOX NAILS							
30d BOX NAILS							
16d RING SHANK NAILS	.148	9	1-3/4	128	118	50	40
16d SCREW SHANK NAILS							
16d COMMON NAILS	.162	8	1-3/4	154	141	50	40
40d BOX NAILS							
20d RING SHANK NAILS	.177	7	2-1/8	178	163	59	47
20d SCREW SHANK NAILS							
20d SINKER NAILS	.177	7	2-1/8	178	163	54	43
20d COMMON NAILS	.148	9	2-1/8	170	166	59	47
30d SINKER NAILS							

MINIMUM SHEATHING REQUIREMENTS

BUILDING COMPONENT	MATERIAL
ROOF SHEATHING	7/16" PLYWOOD
	1 x 4 #3 FURRING
FLOOR SHEATHING	3/4" T&G YELLOW PINE PLYWOOD
WALL COVERING	1/2" GYPSUM SHEATHING
CEILING COVERING	1/2" GYPSUM SHEATHING
EXTERIOR WALL SHEATHING	7/16" APA RATED SHEATHING
	RATED PANEL SIDING, RATED 16" O.C. 7/16" THICK

ALL SHEATHING MATERIALS TO BE APPLIED PERPENDICULAR TO JOISTS AND ENDS STAGGERED
REFER TO TABLE R602.3(1) ON S-1.1 FOR FASTENING SCHEDULE

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"

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
	COLLAR TIE TO RAFTERS	FACENAIL W/ (3) 10D
CEILING JOISTS	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
	BLOCKING BETWEEN JOISTS/RAFTERS TO TOP PLATE	TOENAIL W/ (3) 8D
BEAMS	BUILT-UP BEAMS, 2" LUMBER LAYERS, FACENAIL OPPOSITE SIDES, (2) @ EACH END PLUS	10D @ 32" O.C. STAGGERED, TOP & BOTTOM, OPPOSITE SIDES
	BUILT-UP BEAMS OF ENGINEERED LUMBER, FACE NAIL OPPOSITE SIDES	(2) ROWS @ 12" O.C.
	BUILT-UP HEADER, TWO PIECES W/ A 1/2" SPACER	16D @ 16" O.C. ALONG EDGES
	BUILT-UP HEADER, TWO PIECES W/ NO 1/2" SPACER	3" x 0.131" NAILS @ 12" O.C. 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 @ 6" O.C.
	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 ½" FROM THE END
	RIM JOIST TO I-JOIST	FACENAIL W/ (2) 10D BOX - ONE INTO EACH FLANGE
	SOLE PLATE TO LSL RIM BOARD	16D BOX @ 12" O.C.
	SINGLE JOIST HANGERS*	10D FACENAILS AND TOENAILS
	DOUBLE JOIST HANGERS*	16D FACENAILS AND TOENAILS
WALLS	TOP AND 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" O.C.
	DOUBLE TOP PLATE LAP SPLICE	FACENAIL W/ (8) 16D
	TOP PLATE LAPS AND INTERSECTIONS	FACENAIL W/ (2) 16D
	DOUBLE STUDS	FACENAIL W/ 16D @ 24" O.C.
	BUILT-UP CORNER STUDS	FACENAIL W/ 16D - 2 ROWS @ 24" O.C.
	STEEL "X" BRACING	FACENAIL W/ (2) 16D IN EACH TOP AND BOTTOM PLATE AND (1) 8D PER STUD
	SOLE PLATE TO JOIST OR BLOCKING	FACENAIL W/ 16D @ 16" O.C.
	SOLE PLATE TO JOIST OR BLOCKING AT BRACED WALL LINES, PERPENDICULAR TO FRAMING	FACENAIL W/ (3) 16D @ 16" O.C. ALONG BRACED WALL PANEL
	TOP PLATE TO JOIST OR BLOCKING AT BRACED WALL LINES, PERPENDICULAR TO FRAMING	TOENAIL W/ 8D @ 6" O.C. ALONG BRACED WALL PANEL
	SOLE PLATE TO JOIST OR BLOCKING AT BRACED WALL LINES, PARALLEL TO FRAMING, BLOCKING @ 16" O.C.	FACENAIL W/ (3) 16D @ 16" O.C. ALONG BRACED WALL PANEL AND AT EACH BLOCK
	TOP PLATE TO JOIST OR BLOCKING AT BRACED WALL LINES, PARALLEL TO FRAMING, BLOCKING @ 16" O.C.	TOENAIL W/ 8D @ 6" O.C. ALONG BRACED WALL PANEL AND AT EACH BLOCK
	NON-STRUCT. SIDING OVER STRUCT. SHEATHING	(1) 6D BOX IN EACH STUD
	FIBER-CEMENT PLANK SIDING	(1) 6D GALVANIZED IN EACH STUD
	WINDOW INSTALLATION NAILING	1 ¾" - 2" ROOFING NAILS @ 12" O.C. MAX.

* JOIST HANGER NOTES:
a. NO JOIST HANGER NAILS ALLOWED FOR TOENAILS.
b. NO GUN NAILS OR SCREWS ALLOWED IN CONNECTORS.
c. 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 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 D1.1-92 AS AN ALTERNATIVE, AND WOULD NEED TO BE INSPECTED BY AN AWS-CERTIFIED INSPECTOR.

DUCT SEALING METHOD, PER 2018 IRC 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 HINGE EFFECT.
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 100FT² (9.29m²) 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 100FT² (9.29m²) 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 100FT² (9.29m²) 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:
1. PLANS SHALL COMPLY WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE, ICC AS ADOPTED BY AHJ, 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.
2. WHERE DISCREPANCIES EXIST BETWEEN THE STANDARD COMMENTS, NOTES FOR THE DESIGN PROFESSIONAL OR THE CODE, THE MOST RESTRICTIVE SHALL APPLY.
3. THE CONTRACTUAL OBLIGATION OF THESE PLANS IS TO PROVIDE THE OWNER/BUILDER AND THE AHJ WITH A SET OF PLANS THAT MEET AHJ AND CODE REQUIREMENTS FOR A SINGLE SITE 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.
4. 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.
5. DUE TO THE WIDE VARIETY OF SOIL CONDITIONS, PLASTICITY INDEXES, AND SOIL BEARING CAPACITIES IN OUR AREA, 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:
1. THE FOUNDATION DESIGN SHALL COMPLY WITH THE ENFORCING JURISDICTION RESIDENTIAL FOUNDATION STANDARD IN LIEU OF ENGINEERING REPORT REQUIREMENTS BASED ON ACTUAL SITE CONDITIONS.
2. FOUNDATION WALLS SHALL BE DAMP-PROOFED PER IRC SECTION R406.
3. 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.
4. FOUNDATION DESIGN SHALL BE BASED ON A MINIMUM SOIL BEARING CAPACITY OF 1500 PSF.
5. FOOTINGS SHALL BE A MINIMUM OF 16" WIDE AND 8" DEEP WITH (2) #4 BARS CONTINUOUS, LOCATED A MINIMUM OF 3" CLEAR FROM THE BOTTOM. FOOTINGS SHALL BE A MINIMUM OF 36" BELOW GRADE FOR FROST PROTECTION.
6. COLUMN PADS SHALL BE A MINIMUM OF 24"x24"x8" WITH (3) #4 BARS EACH WAY.
7. FOUNDATION WALLS SHALL BE A MINIMUM OF 8" THICK WITH MINIMUM #4 BARS @ 24" O.C. HORIZONTAL AND VERTICAL WITH THE TOP BAR WITHIN 8" OF THE TOP OF THE WALL UNLESS NOTED OTHERWISE ON PLAN.
8. REINFORCEMENT SHALL LAP A MINIMUM OF 24".
9. INTERIOR BEARING WALLS AND COLUMNS SHALL BE ISOLATED FROM THE BASEMENT FLOOR SLAB.
10. INTERIOR NON-BEARING WALLS, OTHER THAN THOSE RESTING DIRECTLY ON THE FOOTING, SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE BY A SEPARATION OF ½".
11. CONCRETE FLOOR SLABS ON GRADE SHALL BE A MINIMUM OF 4" THICK OVER A MINIMUM 4" BASE OF SAND, GRAVEL, OR CRUSHED STONE. BASEMENT SLABS SHALL HAVE A MINIMUM 6 MIL POLYETHYLENE OR APPROVED VAPOR RETARDER WITH JOINTS LAPPED NOT LESS THAN 6" AND SHALL BE PLACED BETWEEN THE FLOOR SLAB AND THE BASE COURSE.
12. 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.
13. BASEMENT FOUNDATION SILL PLATES SHALL BE ANCHORED TO THE FOUNDATION WITH MINIMUM ½" DIAMETER ANCHOR BOLTS EMBEDDED AT LEAST 7" INTO THE CONCRETE AND SPACED NOT MORE THAN 3' ON CENTER AND WITHIN 12" OF EACH END OF THE PLATE SECTION PER IRC SECTION R403.1.6.
14. FOUNDATION WINDOW WELLS FOR SECONDARY MEANS OF EGRESS SHALL PROVIDE A MINIMUM 3'x3' HORIZONTAL AREA.
15. 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 SATURATED, WE RECOMMEND THAT THE AFFECTED MATERIAL BE REMOVED PRIOR TO PLACING CONCRETE.
16. 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 THE DEEPENING OF FOUNDATION ELEMENTS, OR THE UNDERCUTTING OF UNSUITABLE MATERIALS AND REPLACEMENT WITH ENGINEERED FILL.

STAIRWAY NOTES:
1. STAIRWAYS SHALL PROVIDE A MAXIMUM 7 ¾" RISE AND A MINIMUM 10" RUN.
2. PROVIDE MINIMUM 36" GUARDRAILS ON THE OPEN SIDES OF RAISED FLOORS, PORCHES, AND BALCONIES. PROVIDE 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 4" DIAMETER SPHERE.
3. 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.
4. HANDRAILS SHALL HAVE A CIRCULAR CROSS-SECTION OF 1 ¼" MINIMUM TO 2" MAXIMUM OR ANOTHER APPROVED GRASPABLE SHAPE PER IRC SECTION R311.7.8.5.
5. PROVIDE A MINIMUM 6'-8" OF HEADROOM CLEARANCE IN STAIRWAYS.
6. ENCLOSED ACCESSIBLE SPACE UNDER STAIRWAYS SHALL HAVE WALLS AND THE UNDERSIDE OF THE STAIR AND LANDING PROTECTED WITH ½" GYPSUM BOARD ON THE ENCLOSURE SIDE.
7. WINDERS SHALL PROVIDE A MINIMUM TREAD OF 6" AT ANY POINT WITHIN CLEAR WIDTH OF STAIRS. WINDER TREAD PROPORTION IS TO COMPLY WITH IRC SECTION R311.7.5.2.1.

GLAZING NOTES:
1. 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 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 OPERABLE PANELS EXCEEDING 9 S.F. AND WHOSE BOTTOM EDGE IS LESS THAN 18" ABOVE THE FLOOR OR WALKING SURFACE WITHIN 36".
2. IN DWELLING UNITS WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72" ABOVE THE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24" 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" DIAMETER SPHERE WHERE SUCH OPENINGS ARE LOCATED WITHIN 24" OF THE FINISHED FLOOR.

FRAMING NOTES:
1. ALL LUMBER SIZES ARE FOR DOUGLAS FIR-LARCH UNLESS NOTED OTHERWISE.
2. ALL HEADERS ARE TO BE A MINIMUM OF (2) #2 2x10'S UNLESS NOTED OTHERWISE.
3. BLOCK CANTILEVERS, DOOR JAMBS, AND OVER BEAMS.
4. ALL HEADERS/BEAMS ARE TO BEAR ON A MINIMUM OF (2) 2x4 POSTS UNLESS NOTED OTHERWISE.
5. INTERIOR NON-BEARING WALLS, OTHER THAN THOSE RESTING DIRECTLY ON THE FOOTING, SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE.
6. WHERE JOISTS RUN PARALLEL TO FOUNDATION WALLS, SOLID BLOCKING FOR A MINIMUM OF (2) JOIST SPACES SHALL BE PROVIDED AT A MAXIMUM OF 4' ON CENTER 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.
7. IF DUCTS ARE INSTALLED IN THE FIRST JOIST SPACE(S), NAIL 2x4'S FLAT AT 4' ON CENTER 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.
8. ALL SILLS AND SLEEPERS SUPPORTED ON CONCRETE OR MASONRY AND FURRING ATTACHED TO CONCRETE OR MASONRY SHALL BE OF DECAY RESISTANT MATERIALS.
9. JOISTS UNDER BEARING PARTITIONS SHALL BE SIZED TO CARRY THE DESIGN LOAD IN ACCORDANCE WITH IRC SECTION R502.4.
10. JOISTS FRAMING FROM OPPOSITE SIDES OVER BEARING SUPPORTS SHALL LAP A MINIMUM OF 3" AND SHALL BE NAILED TOGETHER WITH MINIMUM 10D FACE NAILS.
11. JOISTS FRAMING INTO A WOOD GIRDER OR BEAM SHALL BE SUPPORTED BY APPROVED FRAMING ANCHORS OR ON MINIMUM 2"x2" LEDGER STRIPS.
12. 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.
13. JOISTS AT SUPPORTS SHALL BE SUPPORTED LATERALLY AT THE ENDS BY FULL-DEPTH SOLID BLOCKING NOT LESS THAN 2" IN 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.
14. ALL WALL COVERINGS ARE TO COMPLY WITH IRC SECTIONS 702 AND 703.
15. ALL RAFTER / COLLAR TIES ARE TO COMPLY WITH IRC SECTION 802.
16. ALL RAFTERS ARE TO HAVE 2x4 COLLAR TIES @ 48" O.C. IN THE UPPER 1/3 OF DISTANCE BETWEEN THE CEILING AND ROOF.
17. BLOCKING BETWEEN JOISTS UNDER A PERPENDICULAR LOAD-BEARING WALL IS NOT REQUIRED.
18. THE BOTTOM OF ALL FLOOR ASSEMBLIES SHALL BE PROVIDED WITH A ½" GYPSUM WALLBOARD MEMBRANE (IF REQUIRED BY LOCAL CODE).
19. I-JOIST AND FLOOR TRUSS SYSTEMS SHALL BE FIRE PROTECTED PER IRC AS ADOPTED BY AHJ.
20. STUDS SHALL BE CONTINUOUS FROM THE FLOOR TO THE ROOF / CEILING DIAPHRAGM PER IRC SECTION 602.3

CONCRETE NOTES:
1. CONCRETE SHALL BE AIR-ENTRAINED (5%-7%) WITH A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 2500 PSI FOR BASEMENT AND INTERIOR FLOOR SLABS, 3000 PSI FOR BASEMENT AND FOUNDATION WALLS, AND 3500 PSI FOR PORCHES, CARPORTS AND GARAGE FLOOR SLABS.

EMERGENCY EGRESS AND RESCUE NOTES:
1. PROVIDE ONE WINDOW FOR EACH BEDROOM THAT HAS A MINIMUM OPENABLE AREA OF 5.7 S.F. WITH A MINIMUM OPENABLE HEIGHT OF 24" AND WIDTH OF 21". IN ADDITION, THE OPENABLE PORTION OF EGRESS WINDOWS SHALL NOT EXCEED 44" ABOVE THE ADJOINING FLOOR OR PERMANENT STEP.
2. PROVIDE SMOKE ALARMS IN EACH SLEEPING ROOM, OUTSIDE OF EACH SLEEPING AREA, AND ON EACH FLOOR INCLUDING BASEMENTS. ALARMS SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTIVATION OF ONE ALARM WILL ACTIVATE ALL OF THE ALARMS IN THE DWELLING.
3. PROVIDE CARBON MONOXIDE ALARMS AS REQUIRED PER IRC. CARBON MONOXIDE ALARMS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA. WHERE FUEL-BURNING APPLIANCES ARE LOCATED WITHIN A BEDROOM OR ITS ATTACHED BATHROOM, A CARBON MONOXIDE ALARM SHALL BE INSTALLED IN THE BEDROOM.

GARAGE NOTES:
1. THE GARAGE FLOOR SHALL SLOPE TOWARDS THE GARAGE DOORWAYS OR SLOPE TO A TRENCH OR UNTRAPPED DRAIN THAT DISCHARGES DIRECTLY TO THE EXTERIOR ABOVE GRADE.
2. DOORS BETWEEN THE GARAGE AND DWELLING - MINIMUM 1 ⅜" THICK SOLID WOOD, MINIMUM 1 ⅜" THICK SOLID OR HONEY-COMB-CORE STEEL DOOR, OR 20-MINUTE FIRE-RATED EQUIPPED WITH A SELF-CLOSING DEVICE PER IRC SECTION R302.5.1.
3. GARAGE VEHICLE DOORS AND FRAMES SHALL BE DESIGNED AND INSTALLED TO MEET THE 115-MPH 3-SECOND GUST LOADING PER DASMA 108 AND ASTM E 330-96 PER IRC SECTION R301.2.1.
4. THE GARAGE SHALL BE SEPARATED FROM THE DWELLING AND ITS ATTIC AREAS BY MINIMUM ⅝" GYPSUM BOARD APPLIED TO THE GARAGE SIDE. WHERE HABITABLE SPACE OCCURS ABOVE THE GARAGE, THE FLOOR/CEILING ASSEMBLY SHALL BE PROTECTED WITH MINIMUM ⅝" TYPE X GYPSUM BOARD ON THE GARAGE CEILING. WHERE A FLOOR/CEILING SPACE IS PROVIDED ABOVE THE GARAGE, COLUMNS AND BEAMS SUPPORTING THE SEPARATION SHALL ALSO BE PROTECTED WITH ⅝" GYPSUM BOARD OR EQUIVALENT.
5. GARAGE DOOR H-FRAME FOR THE ATTACHMENT OF THE TRACK AND COUNTER BALANCE SHALL CONSIST OF THE FOLLOWING: 2x6 VERTICAL JAMBS RUNNING FROM FLOOR TO CEILING ATTACHED WITH 1 ¼"x0.120" NAILS AT 7" ON CENTER STAGGERED WITH (7) 3 ¼"x0.120" NAILS THROUGH THE JAMB INTO THE HEADER, MINIMUM 2x8 HEADER FOR ATTACHMENT OF THE COUNTER BALANCE SYSTEM.
6. ANY ATTACHED GARAGE TO THE MAIN HOUSE SHALL BE PROVIDED WITH A SINGLE HEAT DETECTOR. THE HEAT DETECTOR SHALL BE HARDWIRED AND INTERCONNECTED WITH THE HOUSEHOLD SMOKE ALARM SYSTEM. THE HEAT DETECTOR SHALL BE LISTED FOR THE AMBIENT ENVIRONMENT AND INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

MECHANICAL/INSULATION:
1. BUILDING ENVELOPE INSULATION SHALL COMPLY WITH IRC TABLE N1102.1.2 OR THE 2018 IECC. (SEE S-6.0 FOR MORE DETAILS)

VENTILATION:
1. ENCLOSED ATTICS SHALL HAVE CROSS VENTILATION FOR EACH SEPARATE SPACE BY VENTILATING OPENINGS PROTECTED AGAINST THE ENTRANCE OF RAIN OR SNOW. VENTILATING OPENINGS SHALL BE PROVIDED WITH CORROSION-RESISTANT WIRE MESH, WITH ⅛" TO ¼" OPENINGS. THE TOTAL FREE VENTILATING AREA SHALL NOT BE LESS THAN 1/150th OF THE AREA OF SPACE VENTILATED. WHERE THE VENTILATORS ARE LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED, THE REQUIRED AREA MAY BE REDUCED TO 1/300th.

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09/22/2022
REGISTERED PROFESSIONAL ENGINEER

GTS HOMES
JANE KELLY GR W/ BASEMENT - LOT 14 WG
1521 SW. HEDGEWOOD LN., LEE'S SUMMIT, MO.
STRUCTURAL DETAILS & NOTES

HD#: 43710
DATE: 09/22/2022
CHECKED BY: CLS

NO.	ISSUE/REVISION	Revision Date

GENERAL NOTES

S-1.0

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW

TABLE R602.3(1) FASTENING SCHEDULE

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c]	SPACING AND LOCATION
	ROOF		
1	BLOCKING BETWEEN CEILING JOISTS OR RAFTERS TO TOP PLATE	4-8D BOX (2 ½" x 0.113"); OR 3-8D COMMON (2 ½" x 0.131"); OR 3-10D BOX (3" x 0.128"); OR 3-3" x 0.131" NAILS	TOE NAIL
2	CEILING JOISTS TO PLATE		PER JOIST, TOE NAIL
3	CEILING JOISTS NOT ATTACHED TO PARALLEL RAFTER, LAPS OVER PARTITIONS (SEE SECTION R802.5.2 AND TABLE R802.5.2)	4-10D BOX (3" x 0.128"); OR 3-16D COMMON (3 ½" x 0.162"); OR 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 ¼" x 20 GA. RIDGE STRAP TO RAFTER	4-10D BOX (3" x 0.128"); OR 3-10D COMMON (3" x 0.148"); OR 4-3" x 0.131" NAILS	FACE NAIL EACH RAFTER
6	RAFTER OR ROOF TRUSS TO PLATE	3-16D BOX NAILS (3 ½" x 0.135"); OR 3-10D COMMON NAILS (3" x 0.148"); OR 4-10D BOX (3" x 0.128"); OR 4-3" x 0.131" NAILS	2 TOE NAILS ON ONE SIDE AND 1 TOE NAIL ON OPPOSITE SIDE OF EACH RAFTER OR TRUSS[i]
7	ROOF RAFTERS TO RIDGE, VALLEY OR HIP RAFTERS OR ROOF RAFTER TO MINIMUM 2" RIDGE BEAM	4-16D (3 ½" x 0.135"); OR 3-10D COMMON (3" x 0.148"); OR 4-10D BOX (3" x 0.128"); OR 4-3" x 0.131" NAILS	TOE NAIL
		3-16D BOX (3 ½" x 0.135"); OR 2-16D COMMON (3 ½" x 0.162"); OR 3-10D BOX (3" x 0.128"); OR 3-3" x 0.131" NAILS	END NAIL
	WALL		
8	STUD TO STUD (NOT BRACED WALL PANELS)	16D COMMON (3 ½" x 0.162")	24" O.C. FACE NAIL
		10D BOX (3" x 0.128"); OR 3" x 0.131" NAILS	16" O.C. FACE NAIL
9	STUD TO STUD AND ABUTTING STUDS AT INTERSECTING WALL CORNERS (AT BRACED WALL PANELS)	16D BOX (3 ½" x 0.135"); OR 3" x 0.131" NAILS	12" O.C. FACE NAIL
		16D COMMON (3 ½" x 0.162")	16" O.C. FACE NAIL
10	BUILT-UP HEADER (2" TO 2" HEADER WITH ½" SPACER)	16D COMMON (3 ½" x 0.162")	16" O.C. EACH EDGE FACE NAIL
		16D BOX (3 ½" x 0.135")	12" O.C. EACH EDGE FACE NAIL
11	CONTINUOUS HEADER TO STUD	5-8D BOX (2 ½" x 0.113"); OR 4-8D COMMON (2 ½" x 0.131"); OR 4-10D BOX (3" x 0.128")	TOE NAIL
12	TOP PLATE TO TOP PLATE	16D COMMON (3 ½" x 0.162")	16" O.C. FACE NAIL
		10D BOX (3" x 0.128"); OR 3" x 0.131" NAILS	12" O.C. FACE NAIL
13	DOUBLE TOP PLATE SPLICE	8-16D COMMON (3 ½" x 0.162"); OR 12-16D BOX (3 ½" 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 ½" x 0.162")	16" O.C. FACE NAIL
		16D BOX (3 ½" x 0.135"); OR 3" x 0.131" NAILS	12" O.C. FACE NAIL
15	BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING (AT BRACED WALL PANEL)	3-16D BOX (3 ½" x 0.135"); OR 2-16D COMMON (3 ½" x 0.162"); OR 4-3" x 0.131" NAILS	3 EACH 16" O.C. FACE NAIL 2 EACH 16" O.C. FACE NAIL 4 EACH 16" O.C. FACE NAIL
16	TOP OR BOTTOM PLATE TO STUD	4-8D BOX (2 ½" x 0.113"); OR 3-16D BOX (3 ½" x 0.135"); OR 4-8D COMMON (2 ½" x 0.131"); OR 4-10D BOX (3" x 0.128"); OR 4-3" x 0.131" NAILS	TOE NAIL
		3-16D BOX (3 ½" x 0.135"); OR 2-16D COMMON (3 ½" x 0.162"); OR 3-10D BOX (3" x 0.128"); OR 3-3" x 0.131" NAILS	END NAIL
17	TOP PLATES, LAPS AT CORNERS AND INTERSECTIONS	3-10D BOX (3" x 0.128"); OR 2-16D COMMON (3 ½" x 0.162"); OR 3-3" x 0.131" NAILS	FACE NAIL
18	1" BRACE TO EACH STUD AND PLATE	3-8D BOX (2 ½" x 0.113"); OR 2-8D COMMON (2 ½" x 0.131"); OR 2-10D BOX (3" x 0.128"); OR 2 STAPLES 1 ¾"	FACE NAIL
19	1" x 6" SHEATHING TO EACH BEARING	3-8D BOX (2 ½" x 0.113"); OR 2-8D COMMON (2 ½" x 0.131"); OR 2-10D BOX (3" x 0.128"); OR 2 STAPLES, 1" CROWN, 16 GA., 1 ¾" LONG	FACE NAIL
20	1" x 8" AND WIDER SHEATHING TO EACH BEARING	3-8D BOX (2 ½" x 0.113"); OR 3-8D COMMON (2 ½" x 0.131"); OR 3-10D BOX (3" x 0.128"); OR 3 STAPLES, 1" CROWN, 16 GA., 1 ¾" LONG	FACE NAIL
		WIDER THAN 1" x 8" 4-8D BOX (2 ½" x 0.113"); OR 3-8D COMMON (2 ½" x 0.131"); OR 3-10D BOX (3" x 0.128"); OR 4 STAPLES, 1" CROWN, 16 GA., 1 ¾" LONG	
	FLOOR		
21	JOIST TO SILL, TOP PLATE OR GIRDER	4-8D BOX (2 ½" x 0.113"); OR 3-8D COMMON (2 ½" x 0.131"); 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 ½" x 0.113")	4" O.C. TOE NAIL
		8D COMMON (2 ½" x 0.131"); OR 10D BOX (3" x 0.128"); OR 3" x 0.131" NAILS	6" O.C. TOE NAIL
23	1" x 6" SUBFLOOR OR LESS TO EACH JOIST	3-8D BOX (2 ½" x 0.113"); OR 2-8D COMMON (2 ½" x 0.131"); OR 3-10D BOX (3" x 0.128"); OR 2 STAPLES, 1" CROWN, 16 GA., 1 ¾" LONG	FACE NAIL
	FLOOR		
24	2" SUBFLOOR TO JOIST OR GIRDER	3-16D BOX (3 ½" x 0.135"); OR 2-16D COMMON (3 ½" x 0.162")	BLIND AND FACE NAIL
25	2" PLANKS (PLANK & BEAM-FLOOR AND ROOF)	3-16D BOX (3 ½" x 0.135"); OR 2-16D COMMON (3 ½" x 0.162")	AT EACH BEARING, FACE NAIL
26	BAND OR RIM JOIST TO JOIST	3-16D COMMON (3 ½" x 0.162"); OR 4-10D BOX (3" x 0.128"); OR 4-3" x 0.131" NAILS; OR 4-3" x 14 GA. STAPLES, 7/16" CROWN	END NAIL
27	BUILT-UP GIRDERS AND BEAMS, 2-INCH LUMBER LAYERS	20D COMMON (4" x 0.192"); OR	NAIL EACH LAYER AS FOLLOWS: 32" O.C. AT TOP AND BOTTOM AND STAGGERED.
		10D BOX (3" x 0.128"); OR 3" x 0.131" NAILS	24" O.C. FACE NAIL AT TOP AND BOTTOM STAGGERED ON OPPOSITE SIDES
		AND: 2-20D COMMON (4" x 0.192"); OR 3-10D BOX (3" x 0.128"); OR 3-3" x 0.131" NAILS	FACE NAIL AT ENDS AND AT EACH SPLICE
28	LEDGER STRIP SUPPORTING JOISTS OR RAFTERS	4-16D BOX (3 ½" x 0.135"); OR 3-16D COMMON (3 ½" 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 ½" x 0.131" OR 2-3" x 0.131") NAILS	EACH END, TOE NAIL

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

a. 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 NAIL), 90 KSI FOR SHANK DIAMETERS LARGER THAN 0.142 INCH BUT NOT LARGER THAN 0.177 INCH, AND 100 KSI FOR SHANK DIAMETERS 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. FOUR-FOOT BY 8-FOOT OR 4-FOOT BY 9-FOOT PANELS SHALL BE APPLIED VERTICALLY.
e. SPACING OF FASTENERS NOT INCLUDED IN THIS TABLE SHALL BE BASED ON TABLE R602.3(2).
f. FOR WOOD STRUCTURAL PANEL ROOF SHEATHING ATTACHED TO GABLE END ROOF FRAMING AND TO INTERMEDIATE SUPPORTS WITHIN 48 INCHES OF ROOF EDGES AND RIDGES, NAILS SHALL BE SPACED AT 6 INCHES ON CENTER WHERE THE ULTIMATE DESIGN WIND SPEED IS LESS THAN 130 MPH AND SHALL BE SPACED 4 INCHES ON CENTER WHERE THE ULTIMATE DESIGN WIND SPEED IS 130 MPH OR GREATER BUT LESS THAN 140 MPH.
g. GYPSUM SHEATHING SHALL CONFORM TO ASTM C1396 AND SHALL BE INSTALLED IN ACCORDANCE WITH GA 253. FIBERBOARD SHEATHING SHALL CONFORM TO ASTM C208.
h. SPACING OF FASTENERS ON FLOOR SHEATHING PANEL EDGES APPLIES TO PANEL EDGES SUPPORTED BY FRAMING MEMBERS AND REQUIRED BLOCKING AND AT FLOOR PERIMETERS ONLY. SPACING OF FASTENERS ON ROOF SHEATHING PANEL EDGES APPLIES TO PANEL EDGES SUPPORTED BY FRAMING MEMBERS AND REQUIRED 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.
i. 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 TOE NAILS FROM THE CEILING JOIST TO TOP PLATE IN ACCORDANCE WITH THIS SCHEDULE. THE TOE NAIL ON THE OPPOSITE SIDE OF THE RAFTER SHALL NOT BE REQUIRED.
j. RSRS-01 IS A ROOF SHEATHING RING SHANK NAIL MEETING THE SPECIFICATIONS IN ASTM F1667.

CONTINUED TABLE R602.3(1) FASTENING SCHEDULE

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c]	SPACING OF FASTENERS	
			EDGES (INCHES)[h]	INTERMEDIATE SUPPORTS[c, e] (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" - ½"	6D COMMON (2" x 0.113") NAIL (SUBFLOOR, WALL)[i] 8D COMMON (2 ½" x 0.131") NAIL (ROOF); OR RSRS-01 (2 3/8" x 0.113") NAIL (ROOF)	6	12[f]
31	19/32" - 1"	8D COMMON NAIL (2 ½" x 0.131"); OR RSRS-01 (2 3/8" x 0.113") NAIL (ROOF)[i]	6	12[f]
32	1 1/8" - 1 1/4"	10D COMMON (3" x 0.148") NAIL; OR 8D (2 ½" x 0.131") DEFORMED NAIL	6	12
	OTHER WALL SHEATHING[g]			
33	½" STRUCTURAL CELLULOSIC FIBERBOARD SHEATHING	1 ½" GALVANIZED ROOFING NAIL, 7/16" HEAD DIAMETER, OR 1 ¼" LONG 16 GA. STAPLE WITH 7/16" OR 1" CROWN	3	6
34	25/32" STRUCTURAL CELLULOSIC FIBERBOARD SHEATHING	1 ¾" GALVANIZED ROOFING NAIL, 7/16" HEAD DIAMETER, OR 1 ½" LONG 16 GA. STAPLE WITH 7/16" OR 1" CROWN	3	6
35	½" GYPSUM SHEATHING[d]	1 ½" GALVANIZED ROOFING NAIL; STAPLE GALVANIZED, 1 ½" LONG; 1 ¼" SCREWS, TYPE W OR S	7	7
36	5/8" GYPSUM SHEATHING[d]	1 ¾" GALVANIZED ROOFING 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	¾" AND LESS	6D DEFORMED (2" x 0.120") NAIL; OR 8D COMMON (2 ½" x 0.131") NAIL	6	12
38	7/8" - 1"	8D COMMON (2 ½" x 0.131") NAIL; OR 8D DEFORMED (2 ½" x 0.120") NAIL	6	12
39	1 1/8" - 1 1/4"	10D COMMON (3" x 0.148") NAIL; OR 8D DEFORMED (2 ½" x 0.120") NAIL	6	12

TABLE R602.3(2) ALTERNATE ATTACHMENTS TO TABLE R602.3(1)

NOMINAL MATERIAL THICKNESS (INCHES)	DESCRIPTION[a, b] OF FASTENER AND LENGTH (INCHES)	SPACING[c] OF FASTENERS	
		EDGES (INCHES)	INTERMEDIATE SUPPORTS (INCHES)
	WOOD STRUCTURAL PANELS SUBFLOOR, ROOF[g] AND WALL SHEATHING TO FRAMING AND PARTICLEBOARD WALL SHEATHING TO FRAMING[f]		
UP TO ½	STAPLE 15 GA. 1 ¾	4	8
	0.097 - 0.099 NAIL 2 ¼	3	6
	STAPLE 16 GA. 1 ¾	3	6
19/32 AND 5/8	0.113 NAIL 2	3	6
	STAPLE 15 AND 16 GA. 2	4	8
	0.097 - 0.099 NAIL 2 ¼	4	8
23/32 AND ¾	STAPLE 14 GA. 2	4	8
	STAPLE 15 GA. 1 ¾	3	6
	0.097 - 0.099 NAIL 2 ¼	4	8
	STAPLE 16 GA. 2	4	8
1	STAPLE 14 GA. 2 ¼	4	8
	0.113 NAIL 2 ¼	3	6
	STAPLE 15 GA. 2 ¼	4	8
	0.097 - 0.099 NAIL 2 ½	4	8
NOMINAL MATERIAL THICKNESS (INCHES)	**DESCRIPTION[a, b] OF FASTENER AND LENGTH (INCHES)**	**SPACING[c] OF FASTENERS**	
		EDGES (INCHES)	BODY OF PANEL[d] (INCHES)
	FLOOR UNDERLAYMENT; PLYWOOD-HARDBOARD-PARTICLEBOARD[f]-FIBER-CEMENT[h]		
	FIBER-CEMENT		
¼	3D, CORROSION-RESISTANT, RING SHANK NAILS (FINISHED FLOORING OTHER THAN TILE)	3	6
	STAPLE 18 GA., 7/8 LONG, ¾ CROWN (FINISHED FLOORING OTHER THAN TILE)	3	6
	1 ¼ LONG x .121 SHANK x .375 HEAD DIAMETER CORROSION-RESISTANT (GALVANIZED OR STAINLESS STEEL) ROOFING NAILS (FOR TILE FINISH)	8	8
	1 ¼ LONG, NO. 8 x .375 HEAD DIAMETER, RIBBED WAFER-HEAD SCREWS (FOR TILE FINISH)	8	8
	PLYWOOD		
¼ AND 5/16	1 ¼ RING OR SCREW SHANK NAIL-MINIMUM 12 ½ GA. (0.099") SHANK DIAMETER	3	6
	STAPLE 18 GA., 7/8, 3/16 CROWN WIDTH	2	5
11/32, 3/8, 15/32 AND ½	1 ¼ RING OR SCREW SHANK NAIL-MINIMUM 12 ½ GA. (0.099") SHANK DIAMETER	6	8[e]
19/32, 5/8, 23/32 AND ¾	1 ½ RING OR SCREW SHANK NAIL-MINIMUM 12 ½ GA. (0.099") SHANK DIAMETER	6	8
	STAPLE 16 GA.1 ½	6	8
	HARDBOARD[f]		
0.200	1 ½ LONG RING-GROOVED UNDERLAYMENT NAIL	6	6
	4D CEMENT-COATED SINKER NAIL	6	6
	STAPLE 18 GA., 7/8 LONG (PLASTIC COATED)	3	6
	PARTICLEBOARD		
¼	4D RING-GROOVED UNDERLAYMENT NAIL	3	6
	STAPLE 18 GA., 7/8 LONG, 3/16 CROWN	3	6
3/8	6D RING-GROOVED UNDERLAYMENT NAIL	6	10
	STAPLE 16 GA., 1 1/8 LONG, 3/8 CROWN	3	6
1/2, 5/8	6D RING-GROOVED UNDERLAYMENT NAIL	6	10
	STAPLE 16 GA., 1 5/8 LONG, 3/8 CROWN	3	6

FOR SI: 1 inch = 25.4 mm.
a. NAIL IS A GENERAL DESCRIPTION AND SHALL BE PERMITTED TO BE T-HEAD, MODIFIED ROUND HEAD OR ROUND HEAD.
b. STAPLES SHALL HAVE A MINIMUM CROWN WIDTH OF 7/16-INCH ON DIAMETER EXCEPT AS NOTED.
c. NAILS OR STAPLES SHALL BE SPACED AT NOT MORE THAN 6 INCHES ON CENTER AT ALL SUPPORTS WHERE SPANS ARE 48 INCHES OR GREATER. NAILS OR STAPLES SHALL BE SPACED AT NOT MORE THAN 12 INCHES ON CENTER AT INTERMEDIATE SUPPORTS FOR FLOORS.
d. FASTENERS SHALL BE PLACED IN A GRID PATTERN THROUGHOUT THE BODY OF THE PANEL.
e. FOR 5-PLY PANELS, INTERMEDIATE NAILS SHALL BE SPACED NOT MORE THAN 12 INCHES ON CENTER EACH WAY.
f. HARDBOARD UNDERLAYMENT SHALL CONFORM TO CPA/ANSI A135.4
g. SPECIFIED ALTERNATE ATTACHMENTS FOR ROOF SHEATHING SHALL BE PERMITTED WHERE THE ULTIMATE DESIGN WIND SPEED IS LESS THAN 130 MPH. FASTENERS ATTACHING WOOD STRUCTURAL PANEL ROOF SHEATHING TO GABLE END WALL FRAMING SHALL BE INSTALLED USING THE SPACING LISTED FOR PANEL EDGES.
h. FIBER-CEMENT UNDERLAYMENT SHALL CONFORM TO ASTM C1288 OR ISO 8336, CATEGORY C.

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 IS 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
24"x24"x12"	(4) #4 BARS E/W	3"	SCH40	6K
30"x30"x12"	(5) #4 BARS E/W	3"	SCH40	9.4K
36"x36"x12"	(6) #4 BARS E/W	3"	SCH40	13.5K
42"x42"x14"	(7) #4 BARS E/W	3 1/2"	SCH40	18.4K
48"x48"x16"	(8) #4 BARS E/W	3 1/2"	SCH40	24.0K
54"x54"x16"	(9) #4 BARS E/W	3 1/2"	SCH40	30.4K
60"x60"x18"	(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 D1.1-92 AS AN ALTERNATIVE, AND WOULD NEED TO BE INSPECTED BY AN AWS-CERTIFIED INSPECTOR.

ENGINEERED LUMBER

MIN. DESIGN REQUIREMENTS

	F_b(psi)	E (psi)	F_v(psi)
LVL	2600	1.8x10	285
GLULAM	2400	1.8x10	190
PARALAM	2600	2.0x10	290

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 THEY 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.

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STATE OF MISSOURI
CHRIS SAATHOFF
NUMBER 2008001865
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GTS HOMES
JANE KELLY GR W/ BASEMENT - LOT 14 WG
1521 SW. HEDGEWOOD LN., LEE'S SUMMIT, MO.
STRUCTURAL DETAILS & NOTES

HD#: 43710
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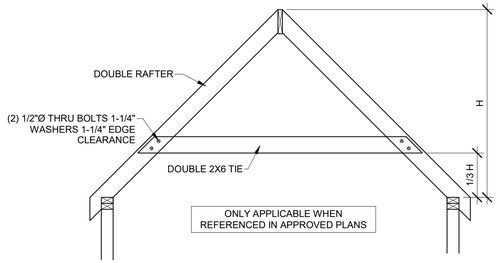
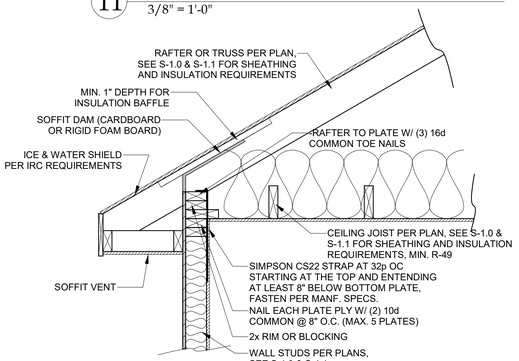
GENERAL NOTES

S-1.1

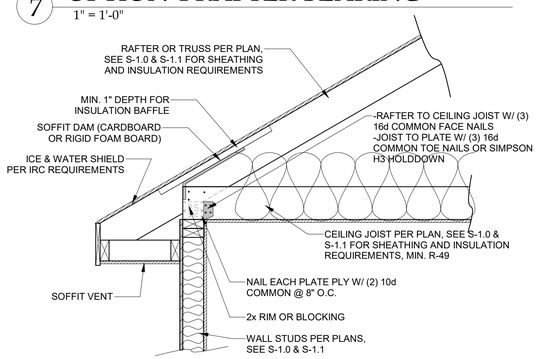
RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
Development Services
LEE'S SUMMIT, MISSOURI



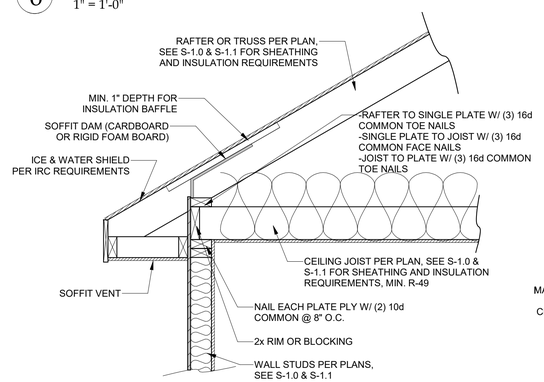
11 HIP SUPPORT FRAME
3/8" = 1'-0"



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

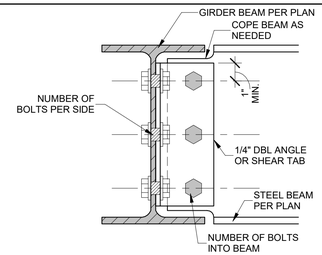


6 OPTION 3 RAFTER BEARING
1" = 1'-0"



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

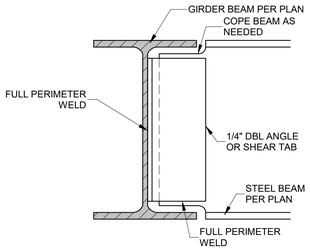
THIS OPTION NOT AVAILABLE IN KC, MO



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

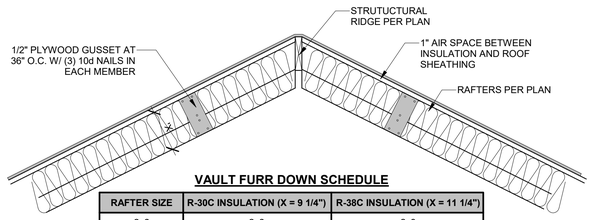
NOTES:
1. NUMBER OF BOLTS DETERMINED BY SMALLER OF TWO BEAMS BEING CONNECTED
2. ALL BOLTS, 3/4" DIAMETER A325-N, UNO
3. BOLTS SHALL BE EVENLY SPACED TOP TO BOTTOM

EITHER METHOD ACCEPTABLE



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

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

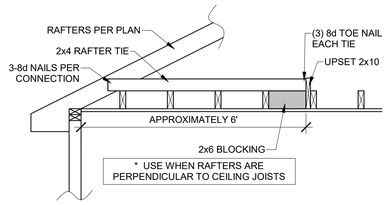


VAULT FURR DOWN SCHEDULE

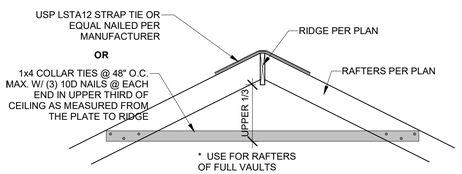
RAFTER SIZE	R-30C INSULATION (X = 9 1/4")	R-38C INSULATION (X = 11 1/4")
2x6	2x6	2x8
2x8	2x4	2x6
2x10	NOT REQUIRED	2x4
2x12	NOT REQUIRED	2x2

NOTES:
1. ALL VAULTS SHALL BE FURRED DOWN WITH 2x FRAMING TO TEH 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.

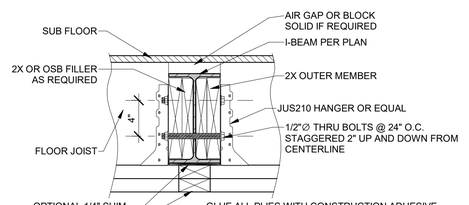
14 VAULTED RAFTER INSULATION
3/4" = 1'-0"



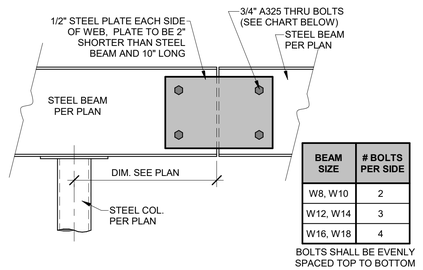
12 RAFTER TIE CONNECTION
1/2" = 1'-0"



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



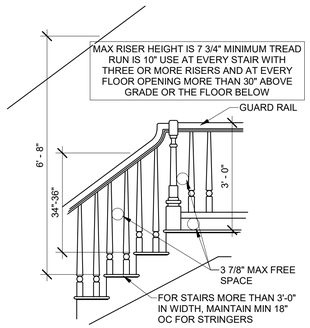
8 UPSET STEEL BEAM DETAIL
1 1/2" = 1'-0"



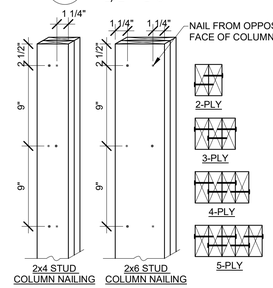
BEAM SIZE	# BOLTS PER SIDE
W8, W10	2
W12, W14	3
W16, W18	4

BOLTS SHALL BE EVENLY SPACED TOP TO BOTTOM

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

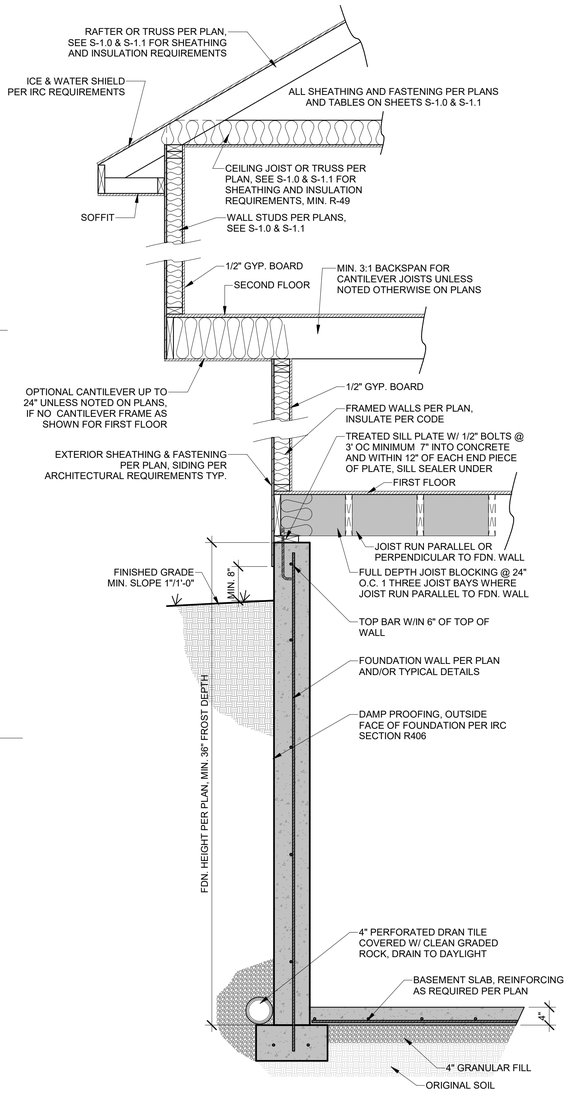


4 STAIR/ RAIL DETAIL
1/2" = 1'-0"



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"



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 .

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

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STRUCTURAL DETAILS & NOTES

HD#: 43710
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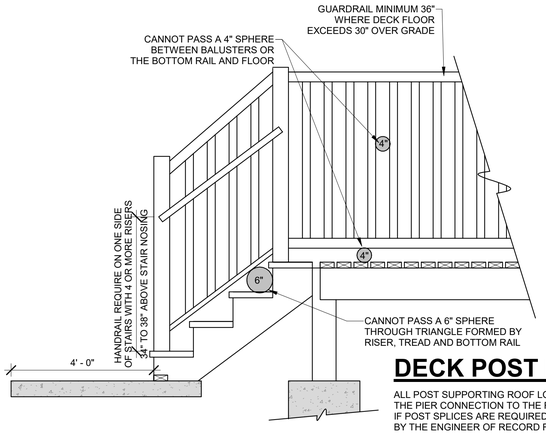
NO.	ISSUE/REVISION	Revision Date

FRAMING SECTIONS

S-1.2

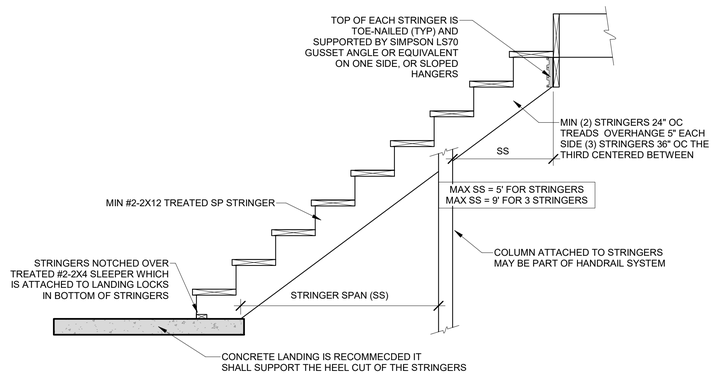
RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
Development Services
LEE'S SUMMIT, MISSOURI



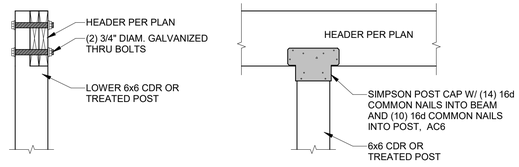
DECK POST NOTE

ALL POST SUPPORTING ROOF LOADS SHALL BE CONTINUOUS FROM THE PIER CONNECTION TO THE ROOF SUPPORTING STRUCTURE. IF POST SPLICES ARE REQUIRED THE SPLICE SHALL BE ENGINEERED BY THE ENGINEER OF RECORD FOR THE PROJECT

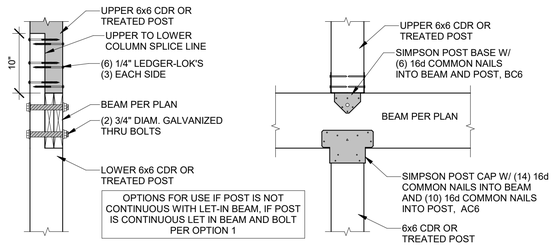
8 GUARD RAIL
1/2" = 1'-0"



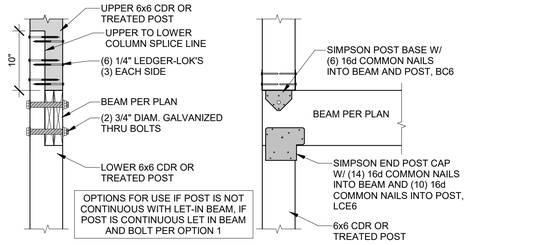
9 STAIR STRINGER DETAIL
1/2" = 1'-0"



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"

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

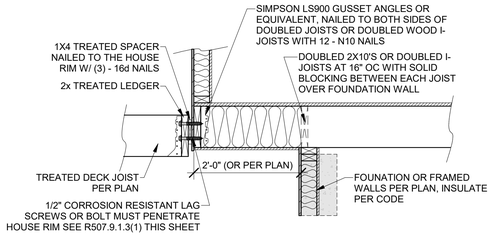
JOIST SPAN	6' AND LESS	6'-1" TO 8'	8'-1" TO 10'	10'-1" TO 12'	12'-1" TO 14'	14'-1" TO 16'	16'-1" TO 18'
CONNECTION DETAILS	ON-CENTER SPACING OF FASTENERS [d, e]						
1/2" LAG SCREW WITH 15/32" MAX. SHEATHING [c,d]	30	23	18	15	13	11	10
1/2" DIAM. BOLT WITH 15/32" MAX. SHEATHING [d]	36	36	34	29	24	21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

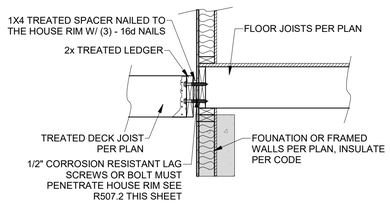
TABLE IRC2018 R507.9.1.3(2)
PLACEMENT OF LAG SCEWS AND BOLT IN DECK LEDGERS AND BAND JOISTS

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

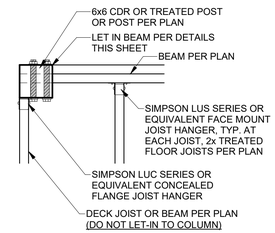
For SI: 1 inch = 25.4mm.
a. Lag screws of bolts shal lbe staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.9.1.3(1)
b. Maximum 5 inces
c. For engineered rim joists, the manufacturer's recommendations shall govern.
d. The minimum distances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



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



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



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

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DECK DETAILS

S-1.3

RELEASE FOR CONSTRUCTION
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LEE'S SUMMIT, MISSOURI

TABLE R602.3(5) SIZE, HEIGHT AND SPACING OF WOOD STUDS[a]

STUD SIZE (INCHES)	BEARING WALLS					NON-BEARING WALLS	
	LATERALLY UNSUPPORTED STUD HEIGHT[a] (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[a] (INCHES)	LATERALLY UNSUPPORTED STUD HEIGHT[a] (FEET)	MAXIMUM SPACING (INCHES)
							
2 x 3[b]	---	---	---	---	---	10	16
2 x 4	10	24[c]	16[c]	---	24	14	24
3 x 4	10	24	24	16	24	14	24
2 x 5	10	24	24	---	24	16	24
2 x 6	10	24	24	16	24	20	24

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. LISTED HEIGHTS ARE DISTANCES BETWEEN POINTS OF LATERAL SUPPORT PLACED PERPENDICULAR TO THE PLANE OF THE WALL. BEARING WALLS SHALL BE SHEATHED ON NOT LESS THAN ONE SIDE OR BRIDGING SHALL BE INSTALLED NOT GREATER THAN 4 FEET APART MEASURED VERTICALLY FROM EITHER END OF THE STUD. INCREASES IN UNSUPPORTED HEIGHT ARE PERMITTED WHERE IN COMPLIANCE WITH EXCEPTION 2 OF SECTION R602.3.1 OR DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

b. SHALL NOT BE USED IN EXTERIOR WALLS.

c. A HABITABLE ATTIC ASSEMBLY SUPPORTED BY 2 x 4 STUDS IS LIMITED TO A ROOF SPAN OF 32 FEET. WHERE THE ROOF SPAN EXCEEDS 32 FEET, THE WALL STUDS SHALL BE INCREASED TO 2 x 6 OR THE STUDS SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

RESIDENTIAL SEISMIC & WIND ANALYSIS

INPUT CALCULATED VALUE

DETERMINE WEIGHT OF HOUSE:

LOCATION		DEAD LOAD (psf)	AREA (ft²)	WEIGHT (lbs.)
ROOF		10	2415	24150
CEILING		10	2172	21720
SECOND FLOOR		10	1504	15040
FIRST FLOOR		10	1297	12970
	WALL LENGTH (ft)	WALL HEIGHT (ft)	WALL UNIT WT. (psf)	WEIGHT (lbs)
SECOND FLOOR EXT. WALL DL	150	10	10	15000
FIRST FLOOR EXT. WALL DL	256	10	10	25600
		DEAD LOAD (psf)	AREA (ft2)	WEIGHT (lbs)
SECOND FLOOR INT. PARTITION WALL DL		6	1504	9024
FIRST FLOOR INT. PARTITION WALL DL		6	1297	7782

PROJECTED AREAS (WIND DESIGN PER 115 MPH 3-SECOND GUST, EXPOSURE C AND MEAN ROOF HEIGHT <= 30 FT ASSUMED)

FRONT-TO-BACK	AREA	LOAD		SIDE-TO-SIDE	AREA	LOAD	
SLOPED ROOF	283	1157		SLOPED ROOF	301	1326	
VERT. ROOF	75	990	CUMULATIVE	VERT. ROOF	0	0	CUMULATIVE
2ND	506	6853	9000	2ND	330	4804	6130
1ST	616	8133	17133	1ST	418	5829	11958
			PRESSURE (PSF) - PER ASCE CH. 26				
SLOPED ROOF	ZONE B	5.9		ZONE C	11.6		2a (FIG. 28.3-1, ASCE7)
WALL/VERT. ROOF	ZONE A	17.4		ZONE D	3.4		7.6
MEAN ROOF HT , h	17.5						

a) If there is a walkout wall to be sheathed, determine tributary wind area and enter here. If no walkout, enter 0 for area.

q_{z10}=0.00256$K_z K_{zt} V^2$ (ASCE7-16 Velocity Pressure) q_{z10_ASD}=0.6q_{z10} (Design Velocity Pressure for ASD analysis under ASCE7-16 and IRC/IBC 2018)

2ND FLOOR TRIBUTARY WEIGHT	53370
1ST FLOOR TRIBUTARY WEIGHT	97734
S_S (SITE GROUND MOTION - %g - FROM ASCE7 SEISMIC MAP)	10.0%
F_a (from ASCE7 Table 11.4-1)	1.1
S_{DS} (= 2/3 * S_s * F_a)	0.073
R (from ASCE7 Table 12.2-1)	6.5

SEISMIC SHEAR

LOCATION	From ASCE7 (Eq. 12.8-1):	V (= 1.25 * S_{DS} * W / R) (lbs.)
2ND FLOOR		783
1ST FLOOR		1378

Sheathing Location	Min. Sheathing Schedule	Fastening Schedule	Allowable Shear (#/LF)	Code Reference
Exterior ***(Option #4)***	7/16" APA Rated Plywood/OSB or shiplap panel sheathing, or 3/8" shiplap panel sheathing with tighter nail spacing	8d Common Nails w/ 1-3/8" penetration @ 6" O.C. Edges, 12" O.C. Field for 7/16" APA-rated plywood/OSB or shiplap panel sheathing OR @ 4" O.C. Edges, 12" O.C. Field for 3/8" shiplap panel sheathing	220	AF&PA 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 2306.4.4
Interior	16 Ga. Simpson/USP Type WB Steel X-Brace (or equal)	(3) 16d @ end studs & (1) 8d @ intermediate studs (per manufacturer specifications - see detail on sheet S3)	325	

EXTERIOR SHEATHING OPTION FOR SECOND FLOOR	4
EXTERIOR SHEATHING OPTION FOR FIRST FLOOR	4

WIDTH OF 1ST STORY (FT.)	56
DEPTH OF 1ST STORY (FT.)	38
BACK WALL OF GARAGE (FT.)	30
GAR. WALL: 1=F-B, 2=S-S	2

WIDTH OF 2ND STORY (FT.)	46
DEPTH OF 2ND STORY (FT.)	30

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.)
2ND FLOOR	64	17920	56	15680	64	25088	56	21952
1ST FLOOR	94	26320	76	21280	94	36848	76	29792

	ADDITIONAL RESISTANCE REQUIRED	
	SEISMIC	WIND
2ND FLOOR FRONT-TO-BACK	0	0
2ND FLOOR SIDE-TO-SIDE	0	0
1ST FLOOR FRONT-TO-BACK	0	0
1ST FLOOR SIDE-TO-SIDE	0	0

Anchor Bolt Spacing (in.)	
diameter (in.)	0.5
Shear value (per NDS)	944
Spacing F-B (inches):	80.6
spacing S-S (inches):	169.8

16d Nail Spacing req'd at bottom plate (in.)	
2nd Floor F-B	23
2nd Floor S-S	49
1st Floor F-B	12
1st Floor S-S	25

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?
2ND FLOOR FRONT-TO-BACK	0					0	YES
2ND FLOOR SIDE-TO-SIDE	0					0	YES
1ST FLOOR FRONT-TO-BACK	0					0	YES
1ST FLOOR SIDE-TO-SIDE	0					0	YES

**NOTES: 1) SEE ATTACHED CALCULATIONS FOR PORTAL FRAME OR PERFORATED SHEAR WALL RESISTANCE CAPACITIES (IF APPLICABLE).
2) SEE SHEET S1 FOR INTERIOR STEEL X-BRACE INSTALLATION. 3) INTERIOR WALLS SHEATHED WITH OSB SHALL BE ATTACHED WITH SAME STAPLE/NAILING PATTERN AS EXTERIOR OSB ON SAME FLOOR (SEE TABLE ABOVE) AND ARE ONLY APPLICABLE FOR FULL-HEIGHT SECTIONS OF 2'-8" OR LONGER

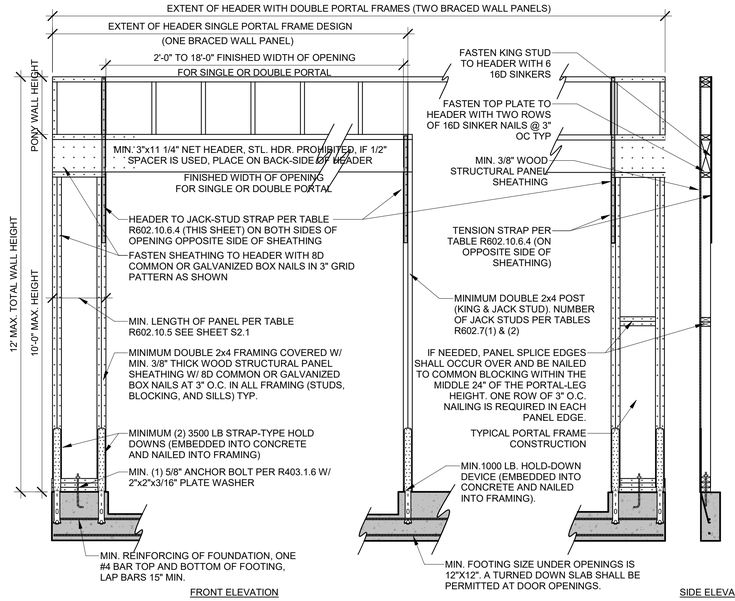
WIND UPLIFT ANALYSIS

	X/12	DEGREES					
ROOF PITCH (MAX.)	6	26.6	PITCH OF 6 OR LESS: EQH -13.3, E -7.2, G -5.2				
		ASCE 7					
	LENGTH (FT.)	PRESSURE (PSF)	LINEAL FT. OF OH	UPLIFT PER FT* (LBS)			
OVERHANG	1	16.56	190	16.56			
	TOTAL AREA (FT²)	ZONE E AREA (FT²)	ZONE G AREA (FT²)	PRESSURE ZN. E (PSF)	PRESSURE ZN. G (PSF)	TOTAL FORCE (LBS)	FORCE PER LINEAL FT @ PERIMETER (LBS)
MAIN ROOF**	2128	924.16	1203.84	15.12	10.5	26614	141.8
*ALONG PERIMETER	TOTAL UPLIFT PER LINEAL FOOT ALONG EXTERIOR (POUNDS)				158.1	UPLIFT OK	
**INSIDE EXTERIOR WALLS	RESISTANCE DUE TO DEAD WEIGHT & (1) 16d TOENAILS				251.6		

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

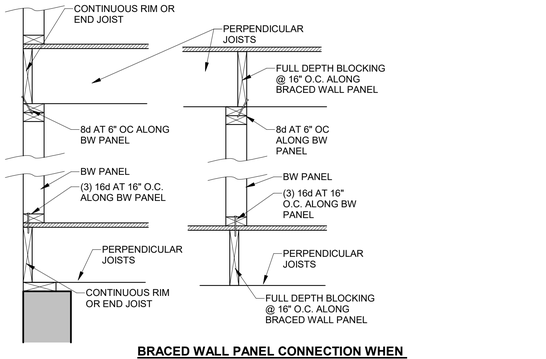
NOTE FOR DESIGN:
ALL WALLS USED IN THE CALCULATION OF THE RESISTANCE FOR THIS STRUCTURE SHALL HAVE A MINIMUM UNINTERRUPTED HEIGHT OF 8'-0" AND LENGTH OF 2'-6". ALLOWABLE RESISTANCES HAVE BEEN #/FT AND INCREASED BY 40% FOR WIND LOADS, PER VALUES IN 2018 IBC SECTION 2306 AND AF&PA SDPWS TABLE 4.3A. FOR EXAMPLE, 7/16" APA-RATED SHEATHING WITH 8d @ 6" & 12" HAS A SEISMIC SHEAR VALUE OF 2; A WIND SHEAR VALUE OF 3358#/FT - 40% GREATER THAN THAT OF SEISMIC

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

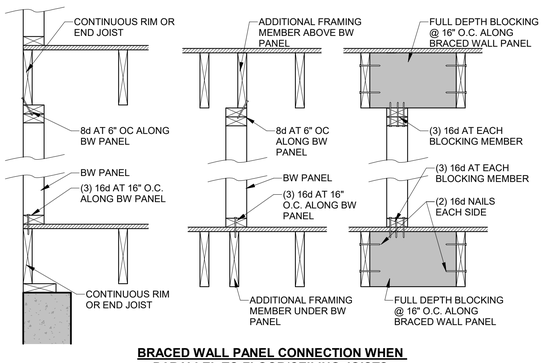


1 PFH PORTAL FRAME W/ HOLD DOWNS (R602.10.6.2)

1/2" = 1'-0"



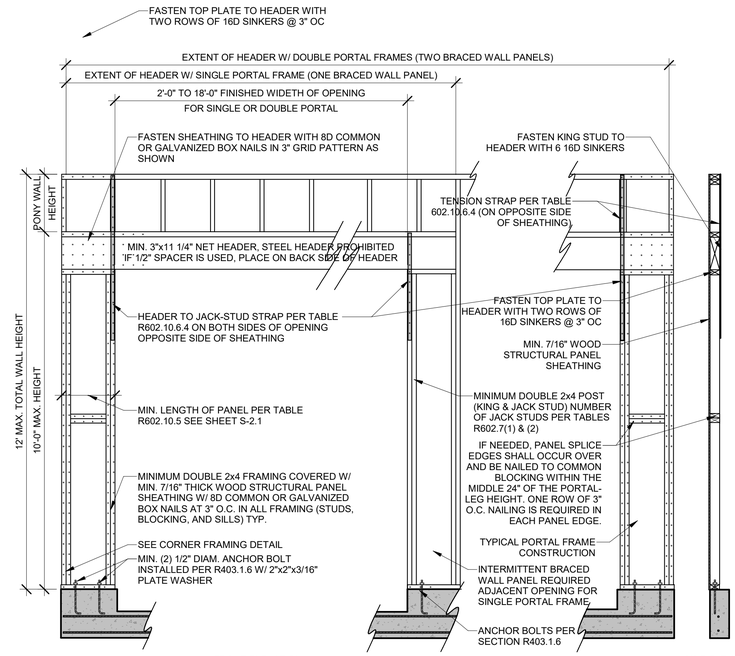
BRACED WALL PANEL CONNECTION WHEN PERPENDICULAR TO FLOOR/CEILING JOISTS



BRACED WALL PANEL CONNECTION WHEN PARALLEL TO FLOOR/CEILING JOISTS

3 BRACED WALL PANEL CONNECTIONS

1" = 1'-0"



2 PFG PORTAL FRAME W/OUT HOLD DOWNS (R602.10.6.3)

1/2" = 1'-0"

HD ENGINEERING & DESIGN, INC
11656 W. 75TH STREET
SHAWNEE, KS 66214
WWW.HDENGINEERS.COM
913.631.2222
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STATE OF MISSOURI
CHRIS SAATHOFF
NUMBER 2008001865
09/22/2022
REGISTERED PROFESSIONAL ENGINEER

GTS HOMES

JANE KELLY GR W/ BASEMENT - LOT 14 WG
1521 SW. HEDGEWOOD LN., LEE'S SUMMIT, MO.

STRUCTURAL DETAILS & NOTES

HD#: 43710

DATE: 09/22/2022

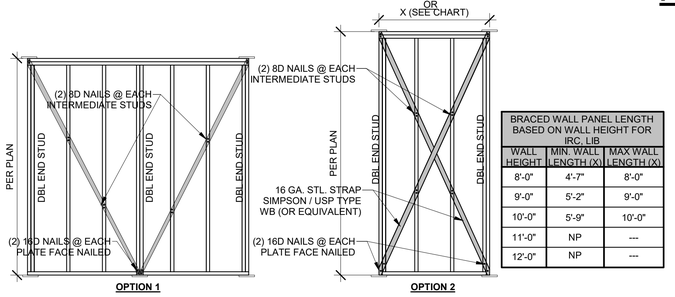
CHECKED BY: CLS

NO.	ISSUE/REVISION	Revision Date

BRACED WALL NOTES & DETAILS

S-2.0

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
Development Services
LEE'S SUMMIT, MISSOURI



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

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

FOR IRC CODE PRESCRIPTIVE METHOD

TABLE R602.10.5 MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (SEE TABLE R602.10.4)		MINIMUM LENGTH (INCHES) [a] WALL HEIGHT 8 FEET	9 FEET	10 FEET	11 FEET	12 FEET	CONTRIBUTING LENGTH (INCHES)
DWB,WSP,SFB,PBS,PCP,HPS,BV-WSP		48	48	48	53	58	ACTUAL [b]
GB		48	48	48	53	58	DOUBLE SIDED = ACTUAL SINGLE SIDED=.5xACTUAL
LIB		55	62	69	NP	NP	ACTUAL [b]
ABW	SDC A, B, AND C ULTIMATE DESIGN WIND SPEED<140	28	32	34	38	42	48
	SDC D, D_1, D_2ULTIMATE DESIGN WIND SPEED<140	32	32	34	NP	NP	
PFH	SUPPORTING ROOF ONLY	16	16	16	NOTE C	NOTE C	48
	SPTNG. ONE STORY & ROOF	24	24	24	NOTE C	NOTE C	48
PFG		24	27	30	NOTE D	NOTE D	1.5 x ACTUAL [b]
CS-G		24	27	30	33	36	ACTUAL [b]
CS-PF		16	18	20	NOTE E	NOTE E	ACTUAL [b]
CS-WSP, CS-SFB	ADJACENT CLEAR OPENING HEIGHT (INCHES)						
	≤64	24	27	30	33	36	ACTUAL [b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100	-	44	40	38	38	
	104	-	49	43	40	39	
	108	-	54	46	43	41	
	112	-	-	50	45	43	
	116	-	-	55	48	45	
	120	-	-	60	52	48	
	124	-	-	-	56	51	
	128	-	-	-	61	54	
	132	-	-	-	66	58	
	136	-	-	-	-	62	
	140	-	-	-	-	66	
	144	-	-	-	-	72	

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

BRACED WALL PRESCRIPTIVE METHOD:

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

EXTERIOR BRACED WALL METHOD: (SEE ON THIS SHEET)

WSP METHOD:

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

INTERIOR BRACED WALLS (SEE ON THIS SHEET)

- GB METHOD:

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

OR

LIB METHOD:

1X4 WOOD FASTENED W/ (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA. TYPE WB (OR EQUIVALENT) STL. X-BRACE(S) @ 45° TO 60° ANGLES, MAXIMUM 16" O.C. STUDS FASTENED PER MANUF. SPECS.

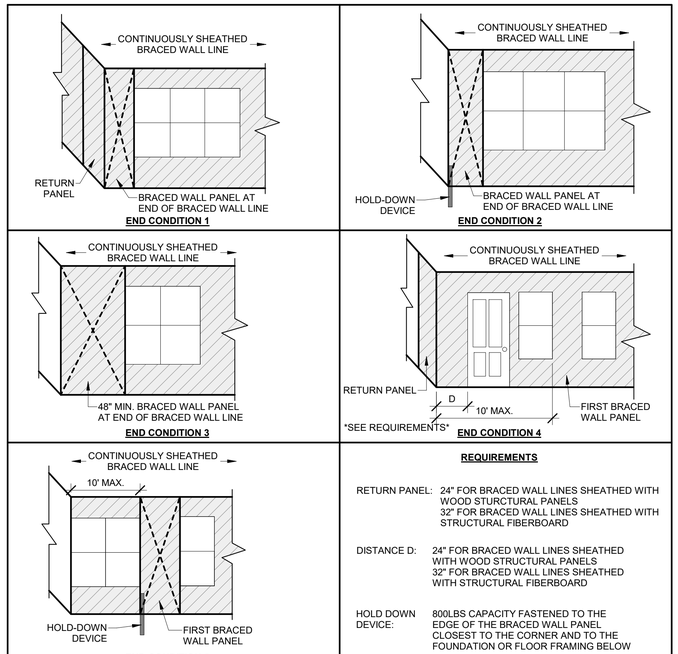
TENSION STRAP CAPACITY REQUIRED FOR RESISTING WIND PRESSURES PERPENDICULAR TO METHOD PFH, PFG AND CS-PF BRACED WALL PANELS IRC2018 TABLE R602.10.6.4

MINIMUM WALL STUD FRAMING NOMINAL SIZE & GRADE	MAX. PONY WALL HEIGHT (FEET)	MAX. TOTAL WALL HEIGHT (FEET)	MAX. OPENING WIDTH (FEET)	TENSION STRAP CAPACITY REQUIRED (POUNDS)[a] ULTIMATE DESIGN WIND SPEED V (MPH) 115 EXPOSURE B	115 EXPOSURE C
2X4 NO. 2 GRADE	0	10	18	1,000	1,000
	1	10	9	1,000	1,000
			16	1,025	2,500
			18	1,275	2,850
	2	10	9	1,000	1,875
			16	2,175	4,125
			18	2,500	DR
	2	12	9	1,500	3,175
			16	3,375	DR
			18	3,975	DR
	4	12	9	2,750	DR
			12	3,775	DR
2X6 STUD GRADE	2	12	9	1,000	2,025
			16	2,150	3,675
			18	2,550	DR
	4	12	9	1,750	3,125
			16	2,400	DR
			18	3,800	DR

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

END WALL CONDITIONS

FOR CONTINUOUSLY SHEATHED BRACED WALL LINES

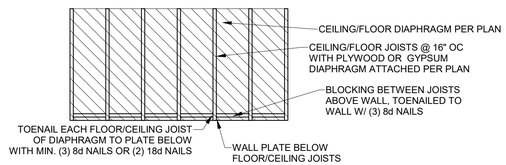


REQUIREMENTS

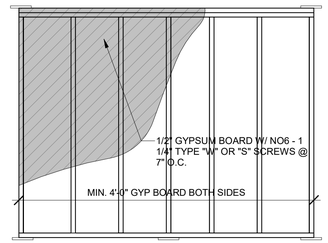
RETURN PANEL: 24" FOR BRACED WALL LINES SHEATHED WITH WOOD STURCTURAL PANELS
32" FOR BRACED WALL LINES SHEATHED WITH STRUCTURAL FIBERBOARD

DISTANCE D: 24" FOR BRACED WALL LINES SHEATHED WITH WOOD STRUCTURAL PANELS
32" FOR BRACED WALL LINES SHEATHED WITH STRUCTURAL FIBERBOARD

HOLD DOWN DEVICE: 800LBS CAPACITY FASTENED TO THE EDGE OF THE BRACED WALL PANEL CLOSEST TO THE CORNER AND TO THE FOUNDATION OR FLOOR FRAMING BELOW

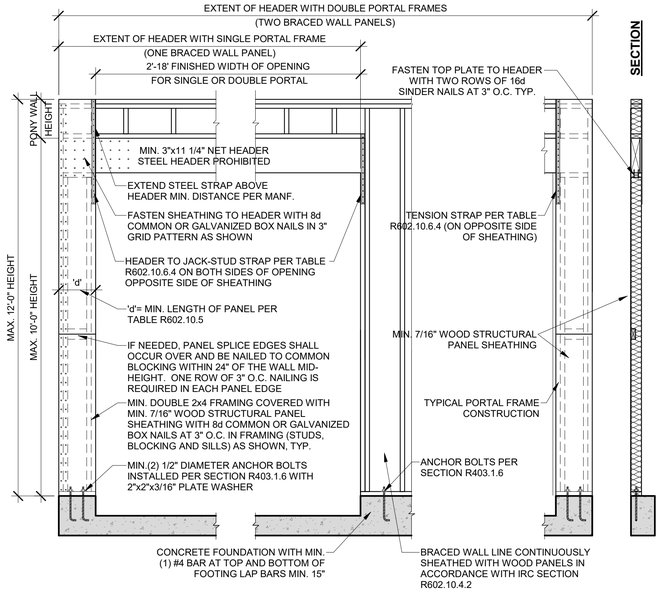


1 DIAPHRAGM CONNECTION TO INTERIOR WALL
3/8" = 1'-0"

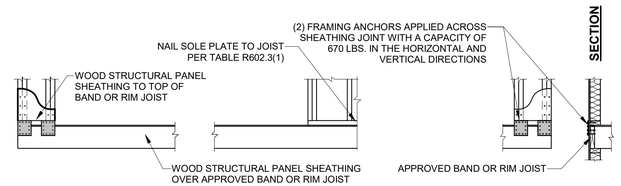


5 GB BRACING
1/2" = 1'-0"

FRONT ELEVATION

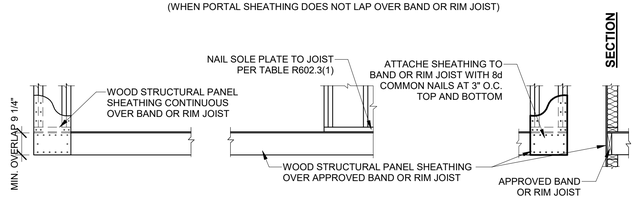


OVER CONCRETE OR MASONRY BLOCK FOUNDATION



OVER RAISED WOOD FLOOR - FRAMING ANCHOR OPTION

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



OVER RAISED WOOD FLOOR - OVERLAP OPTION

(WHEN PORTAL SHEATHING LAPS OVER BAND OR RIM JOIST)

4 CS-PF
1/2" = 1'-0"

HD ENGINEERING & DESIGN, INC
11656 W. 75TH STREET
SHAWNEE, KS 66214
WWW.HDENGINEERS.COM
913.631.2222
SERVICE@HDENGINEERS.COM

STATE OF MISSOURI
CHRIS SAATHOFF
NUMBER 2008001865
09/22/2022
REGISTERED PROFESSIONAL ENGINEER

GTS HOMES
JANE KELLY GR W/ BASEMENT - LOT 14 WG
1521 SW. HEDGEWOOD LN., LEE'S SUMMIT, MO.
STRUCTURAL DETAILS & NOTES

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BRACED WALLS NOTES & DETAILS

S-2.1

RELEASE FOR CONSTRUCTION
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Development Services
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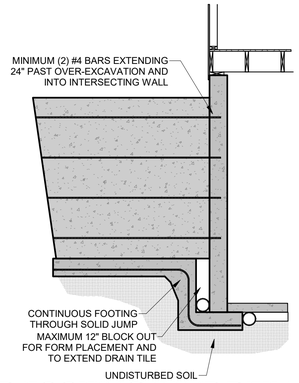
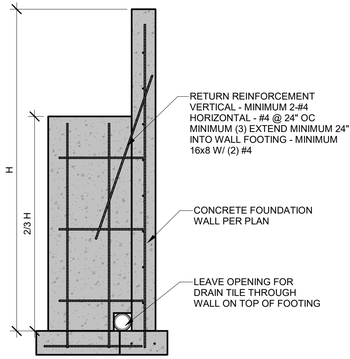
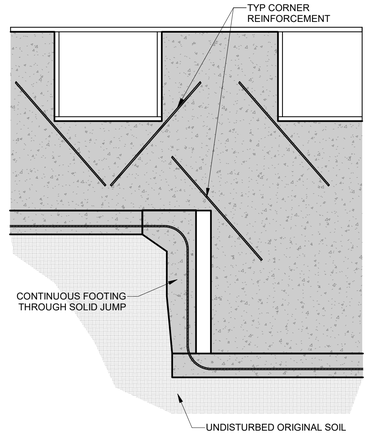


1 SOLID FOOTING JUMP DETAIL
3/8" = 1'-0"

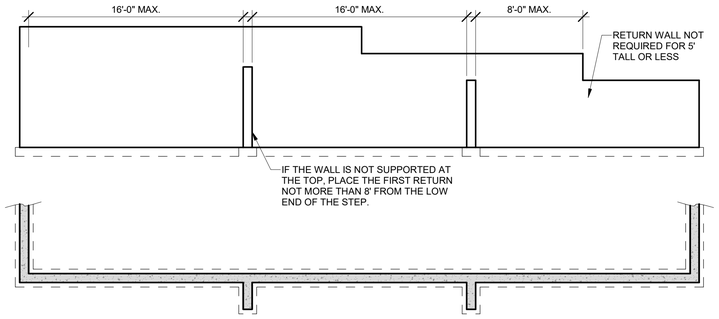


2 RETURN WALL DETAIL
1/2" = 1'-0"



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

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



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

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

IMPORTANT NOTE:

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

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

8"x4', 8"x6', AND 8"x8' DAYLIGHT FOUNDATION

IF SLAB IS NOT PLACED PRIOR TO BACKFILL CONTRACTOR IS RESPONSIBLE FOR BRACING THE FOUNDATION AS REQUIRED

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

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

VERTICAL REINFORCEMENT SPACING* 60 PSF SOIL; 40 & 60 KSI STEEL					
CONCRETE STRENGTH	8" THICK WALL		10" THICK WALL		
	8'	9'	8'	9'	10'
3000 PSI/ 40 KSI	16	12	24	16	12
3500 PSI/ 40 KSI	16	12	24	24	12
3000 PSI/ 60 KSI	24	16	24	20	16
3500 PSI/ 60 KSI	24	16	24	24	16
HORIZONTAL REINFORCEMENT**					
ONE BAR 12" FROM TOP OF WALL; MAX. SPACING 24" O.C.	4- #4	5- #4	4- #4	5- #4	6- #4

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

** #4 BARS @ 24" ON CENTER.
** #4 BAR WITHIN 12 OF TOP AND BOTTOM OF WALL.
** MINIMUM GRADE 40 (40ksi) STEEL (PER ACI 332).
** HORIZONTAL REINFORCEMENT SHALL BE INSTALLED ON THE COMPRESSION SIDE (SOIL SIDE) OF THE VERTICAL REINFORCEMENT

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CHRIS SAATHOFF
NUMBER 2008001865
REGISTERED PROFESSIONAL ENGINEER
09/22/2022

GTS HOMES

JANE KELLY GR W/ BASEMENT - LOT 14 WG
1521 SW. HEDGEWOOD LN., LEE'S SUMMIT, MO.

STRUCTURAL DETAILS & NOTES

HD#: 43700

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CONCRETE DETAILS

S-3.0

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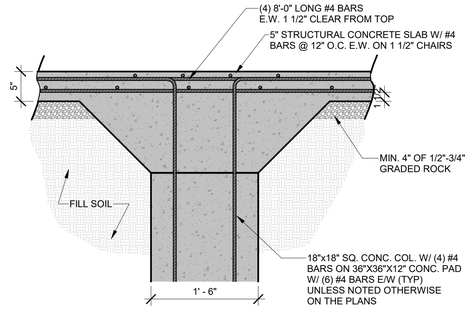
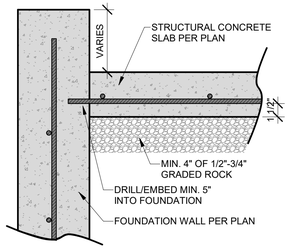
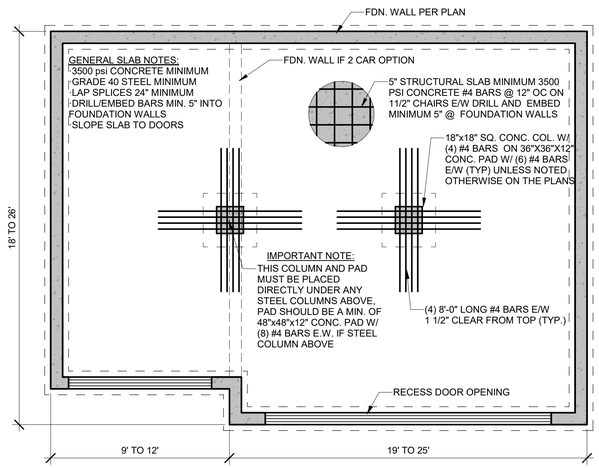


8 GARAGE SLAB COLUMN DETAIL
1" = 1'-0"

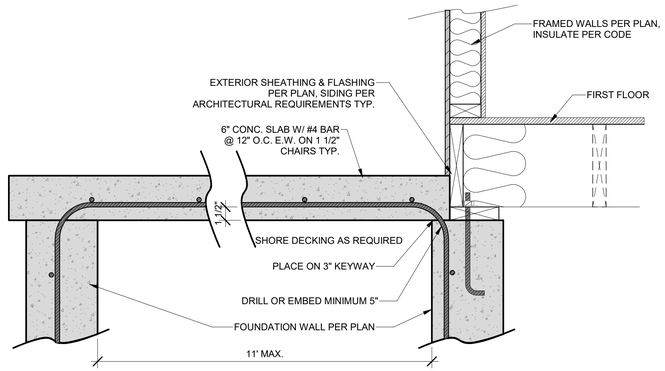


9 STRUCTURAL SLAB/ WALL
1 1/2" = 1'-0"



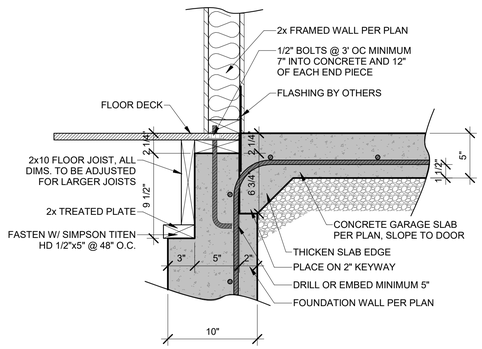
10 TYPICAL GARAGE SLAB
1/4" = 1'-0"

HD ENGINEERING STRUCTURAL GARAGE SLAB DETAILS

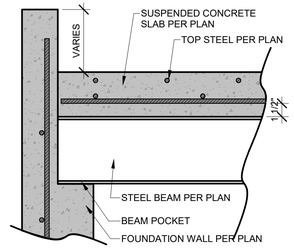


FOR SUSPENDED SLABS A MAXIMUM OF 10' ABOVE FLOOR BELOW: TEMPORARY SHORING WALLS SHALL BE PLACED AT A MAXIMUM OF 4' O.C./ #2-2X4 STUDS AT 16" O.C. W/ TOP AND BOTTOM PLATE, WALL TO HAVE CONTINUOUS DIAGONAL BRACING. LATERAL BRACING TO BE RUN FROM WALL TO WALL AT MID HEIGHT 4' ON CENTER. SHORING TO REMAIN IN PLACE FOR AT LEAST 21 DAYS.

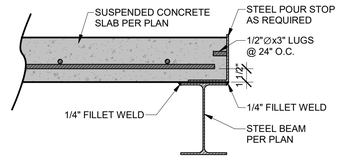
6 SUSPENDED PORCH STOOP SLAB
1 1/2" = 1'-0"



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

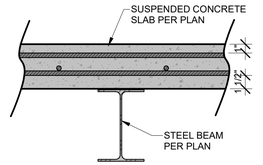


1 SUSPENDED SLAB BEAM/WALL CONNECTION
1 1/2" = 1'-0"

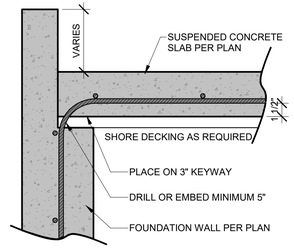


*FASTEN STEEL ANGLE TO BEAM W/ TEK SCREWS OR 2"x1/4" FILLET WELD @ 12" O.C.

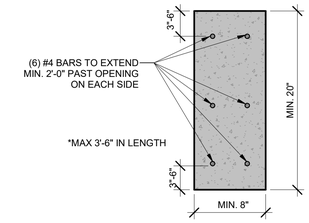
2 SUSPENDED SLAB POUR STOP
1 1/2" = 1'-0"



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



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



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

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

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SUSPENDED SLAB DETAILS

S-3.1

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

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

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

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

CATHEDRAL / VAULTED CEILING FRAMING AND INSULATION

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

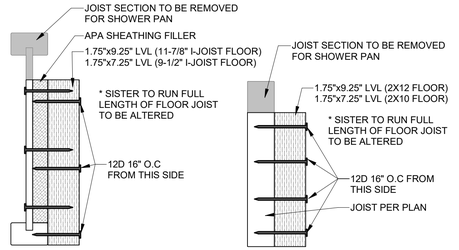
WHERE THE CEILING IS APPLIED DIRECTLY TO THE BOTTOM OF THE RAFTERS, A MINIMUM 1" AIR SPACE SHALL BE PROVIDED BETWEEN THE TOP OF THE INSULATION AND THE SHEATHING FOR VENTILATION (R806.3)
NOTE: RAFTER SIZES SPECIFIED ON PLANS ARE THE MINIMUM REQUIRED FOR STRUCTURAL PURPOSES ONLY.
BUILDER TO VERIFY:
IF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

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

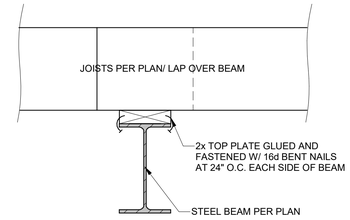
TABLE N1103.6.1 (R403.6.1) WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY[a]

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

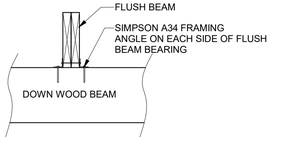
For SI: 1 cubic foot per minute = 28.3 L/min.
a. WHEN TESTED IN ACCORDANCE WITH HVI STANDARD 916



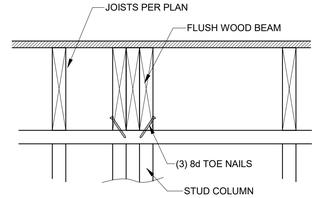
10 ZERO ENTRY SHOWER DETAIL
1/4" = 1'-0"



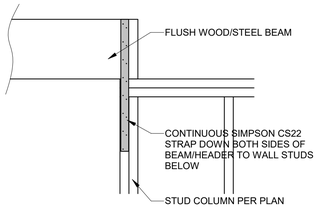
5 STEEL BEAM TO WOOD PLATE
1 1/2" = 1'-0"



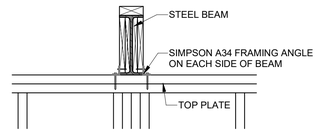
9 WOOD TO WOOD STACKED CONNECTION
1" = 1'-0"



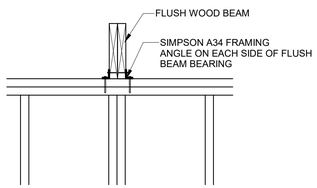
4 FLUSH WOOD BEAM CONNECTION
1 1/2" = 1'-0"



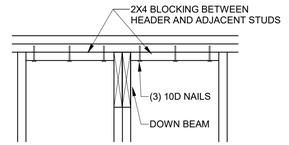
8 UPSET WOOD/STEEL PARALLEL TO WALL
1" = 1'-0"



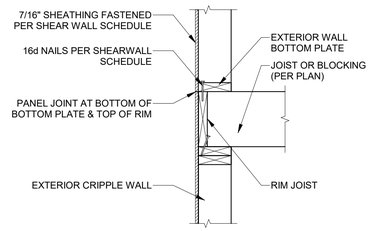
3 EXTERIOR WALL STEEL BEAM BEARING
1" = 1'-0"



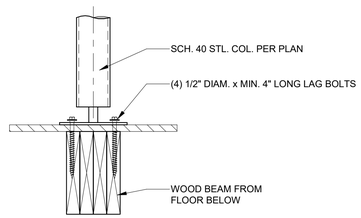
7 UPSET WOOD PERPENDICULAR TO WALL
1" = 1'-0"



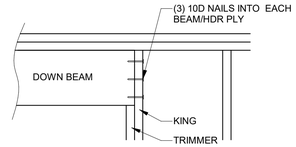
2 DOWN WOOD BEAM PERPENDICULAR
1" = 1'-0"



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



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



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

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