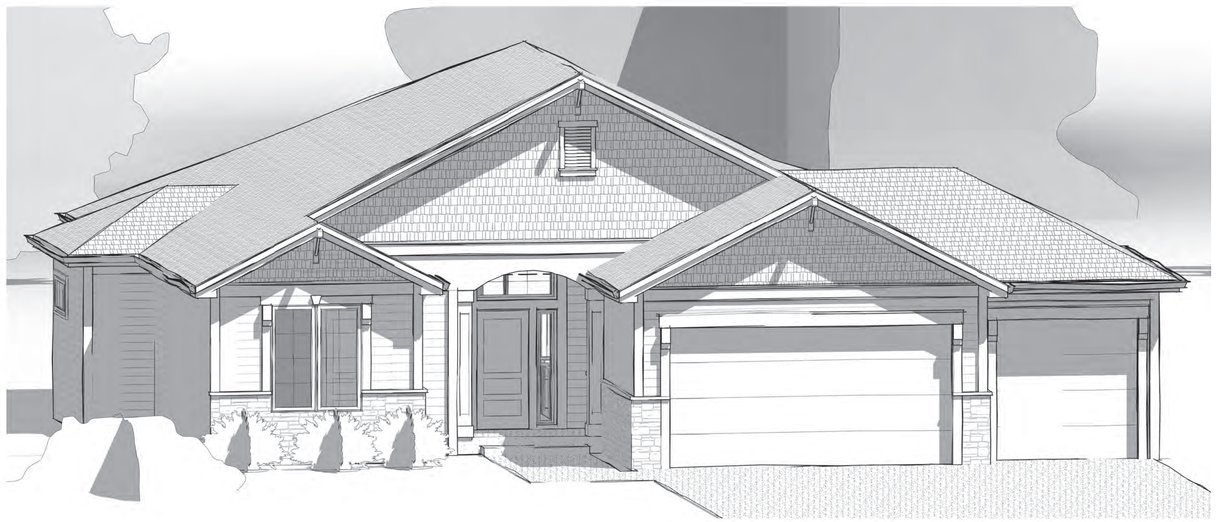
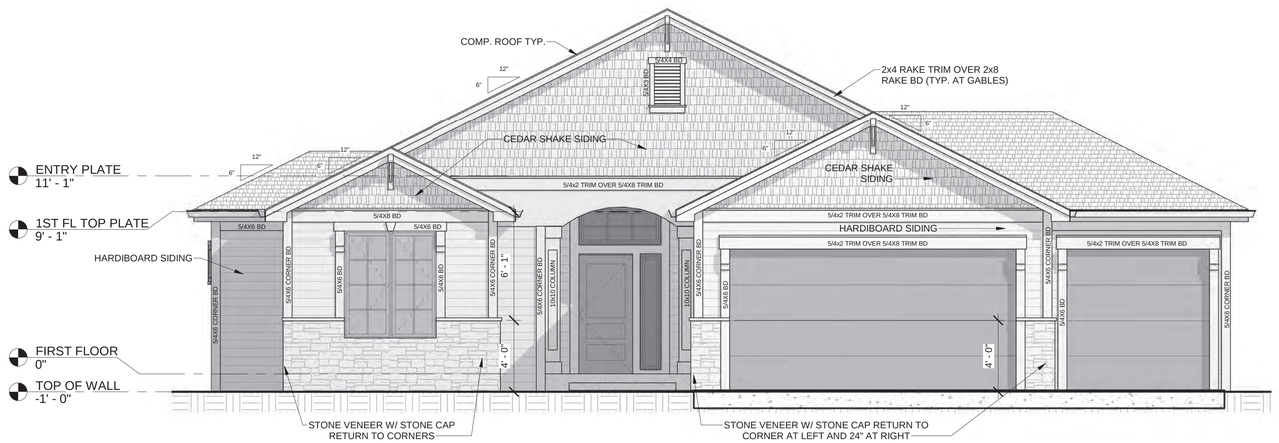
THIS PLAN HAS BEEN DESIGNED TO CONFORM WITH THE 2018 IRC



2 3D VIEW



1 FRONT ELEVATION
1/4" = 1'-0"

SQUARE FOOTAGE	
COVERED DECK	175 SF
FINISHED BASEMENT	1216 SF
FIRST FLOOR	1562 SF
FRONT STOOP	45 SF
GARAGE	426 SF
UNFINISHED BASEMENT	345 SF

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STATE OF MISSOURI
CHRIS SAATHOFF
NUMBER 2008001865
REGISTERED PROFESSIONAL ENGINEER
3/23/20

KS. COA. #E1312
MO. COA. #2006034946-F

ELEVATION OPTION A

FIRST CHOICE CUSTOM HOMES
MCKINLEY COTTAGE, 1627 SW Blackstone Place
LEE'S SUMMIT, MO

REVISION TABLE

Date:	3/23/2020
HD #:	38982
Drawn By:	PJH
Reviewed By:	CLS

FRONT ELEVATION

SHEET NUMBER:
1A

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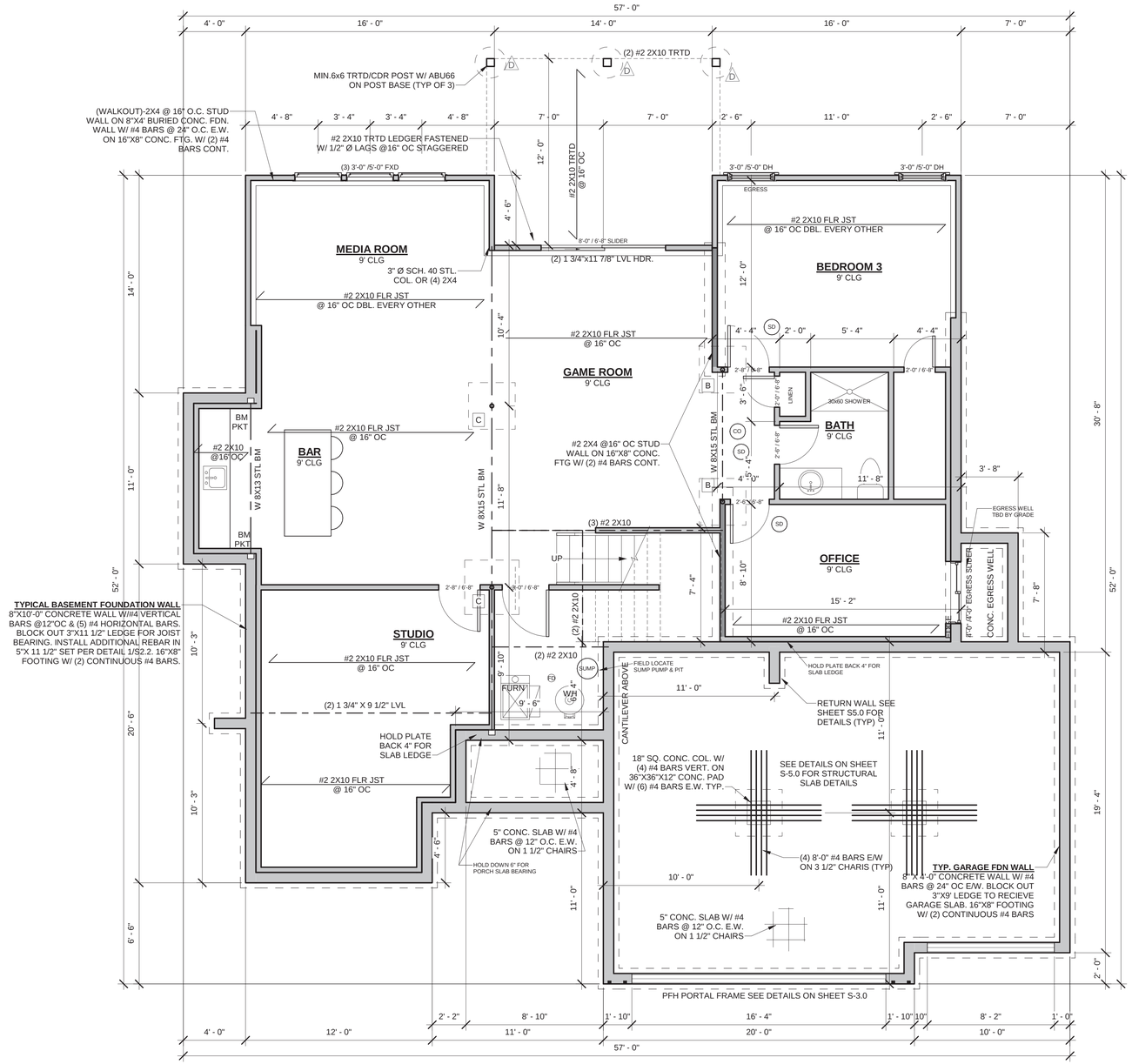


1 FOUNDATION PLAN

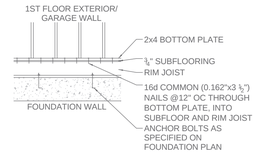
1/4" = 1'-0"

COLUMN PAD SCHEDULE

A	3" SCH. 40 STEEL COL. ON 30"x30"x12" CONCRETE PAD W/ (5) #4 BARS EACH WAY *(9.4K MAX)*
B	3" SCH. 40 STEEL COL. ON 36"x36"x12" CONCRETE PAD W/ (6) #4 BARS EACH WAY *(13.5K MAK)*
C	3" SCH. 40 STEEL COL. ON 42"x42"x14" CONCRETE PAD W/ (7) #4 BARS EACH WAY *(18.4K MAX)*
D	3-1/2" SCH. 40 STEEL COL. ON 48"x48"x16" CONCRETE PAD W/ (8) #4 BARS EACH WAY *(24.0K MAX)*
E	3-1/2" SCH. 40 STEEL COL. ON 54"x54"x16" CONCRETE PAD W/ (9) #4 BARS EACH WAY *(30.4K MAX)*
F	3-1/2" SCH. 40 STEEL COL. ON 60"x60"x18" CONCRETE PAD W/ (10) #4 BARS EACH WAY *(37.5K MAX)*

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



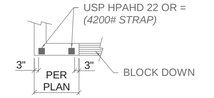
DECK PIER SCHEDULE

A	MIN. 6X6 TRTD/CDR POST ON 12" Ø CONC PIER WITH USP PAU 66 BASE OR = *(1570# MAX)*
B	MIN. 6X6 TRTD/CDR POST ON 16" Ø CONC PIER WITH USP PAU 66 BASE OR = *(2787# MAX)*
C	MIN. 6X6 TRTD/CDR POST ON 18" Ø CONC PIER WITH USP PAU 66 BASE OR = *(3535# MAX)*
D	MIN. 6X6 TRTD/CDR POST ON 24" Ø CONC PIER WITH USP PAU 66 BASE OR = *(6283# 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.

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
-ALL TALL STUD WALLS TO BE CONSTRUCTED PER TABLE R602.3.1 ON SHEET S-2.0 ANY STUD WALL OVER 10 FEET TALL IS TO BE A CONTINUOUS STUD WALL
-OVERHEAD GARAGE DOORS MUST MEET DASMA 90 MPH REQUIREMENTS
-ALL HEADERS NOT LABELED SHALL BE MIN (2) #2-2X10 DFL
-DBL ALL JST UNDER ISLAND
-INSTALL W8X15 STEEL BEAM MIN. UNDER ALL F.P. WALLS/HEARTHS (THAT WILL RECEIVE ROCK) UNLESS NOTED AS A LARGER BEAM. ANY STONE OVER 2" DEEP, NOTIFY ENG. TO VERIFY LOADS

TYPICAL TIE DOWN AT NARROW WALL



LEGEND / NOTES:

- LOAD BEARING WALL
- LOAD BEARING BEAM
- USP HPAHD 22 OR EQUAL 4200# STRAP
- SD - SMOKE DETECTOR
- CM - CARBON MONOXIDE DETECTOR

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MCKINLEY COTTAGE, 1627 SW Blackstone Place
LEE'S SUMMIT, MO

REVISION TABLE

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FOUNDATION PLAN

SHEET NUMBER: 2

FIRST CHOICE CUSTOM HOMES
1627 SW BLACKSTONE PL., LEE'S SUMMIT, MO

Combustion Air

Per IRC 2018 G2407.5.1

Fuel Burning Appliance #1	Furnace	100000	Btu/h
Fuel Burning Appliance #2		50000	Btu/h
Fuel Burning Appliance #3		NA	Btu/h
Total Btu/h		150000	Btu/h
Area of Usable Space		72	sq. ft
Ceiling Heigh in Usuable Space (no sheetrock)		9	ft

Required Volume of Air = Total Btu/h * (50 cu.ft./1000 Btu/h)

= 7500 cu.ft.

Required Area of Usable Space	833 sq.ft.
Standard Method Work?	BAD

Combustion Air Transfer Grille

Per IRC 2018 G2407.5.3.1
Required Opening Free Space = 1 sq.in./1000 Btu/h

=	160 in.sq.
Size of Grill(s) to be used =	(2) 14"X8"

Note: If Fuel Burning Appliances are enclosed, (1) opening is required within 12" of floor and (1) opening is required within 12" of top of enclosure

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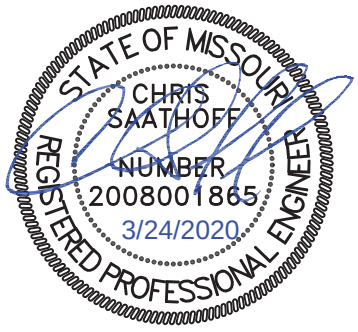

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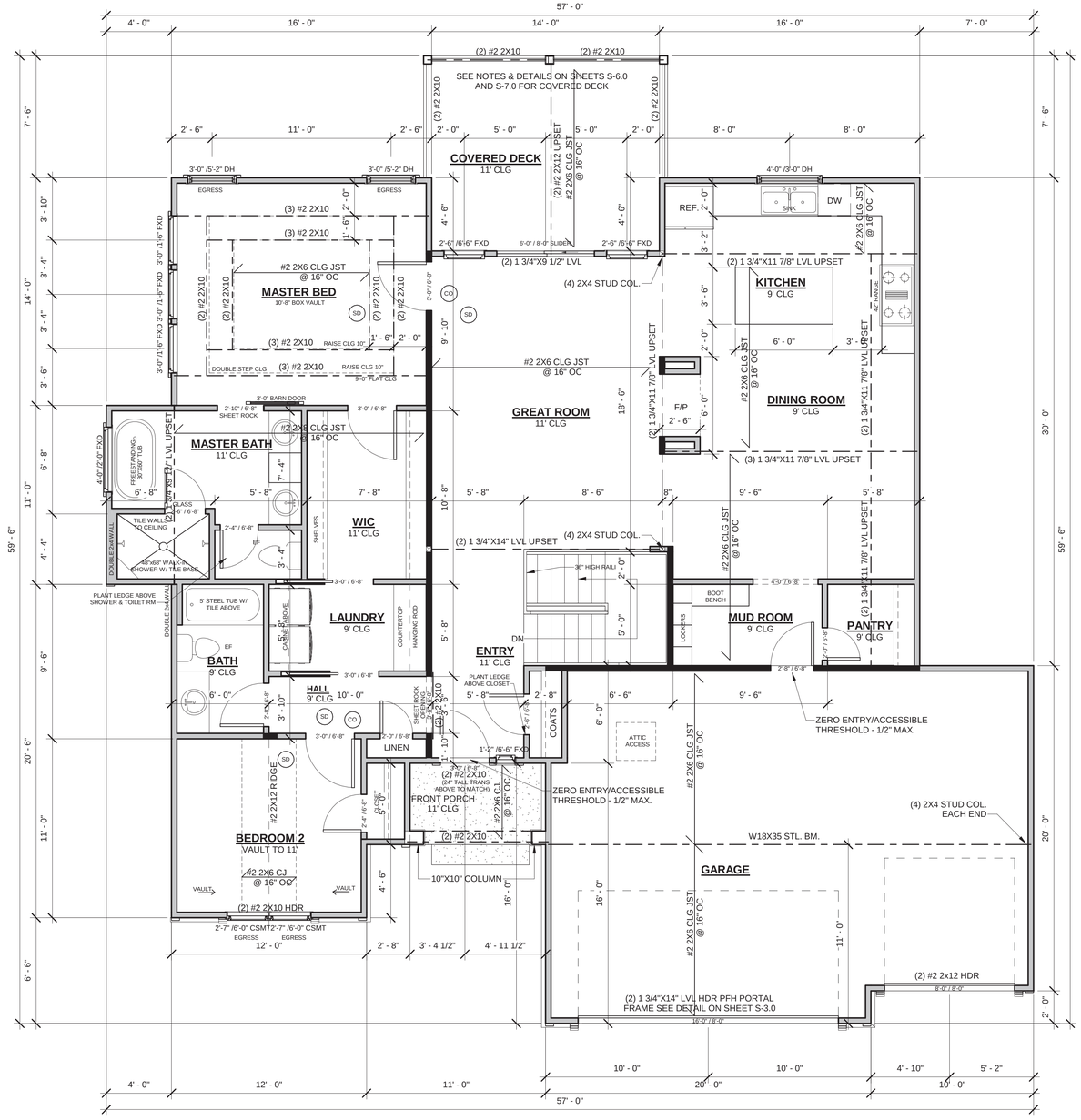
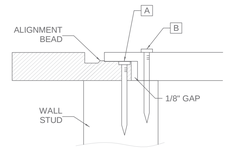


1 FIRST FLOOR PLAN

1/4" = 1'-0"

SEE S-6.0 & S-7.0 FOR ALL DECK FRAMING NOTES AND DETAILS



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

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

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
-ALL TALL STUD WALLS TO BE CONSTRUCTED PER TABLE R602.3.1 ON SHEET S-2.0
-OVERHEAD GARAGE DOORS MUST MEET DASMA 90 MPH REQUIREMENTS

ALL TALL STUD WALLS TO BE CONSTRUCTED PER TABLE R602.3.1 ON SHEET S-2.0

BRACED WALLS:
SEE CALCULATIONS ON SHEET S-3.0, PER ASCE7-10 REQUIREMENTS AS ALLOWED BY IRC 2012 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
- 3/8" SHIPLAP PANEL SHEATHING (I.E. LP SMARTSIDE OR EQUIVALENT) WITH 8d NAILS @ 6" O.C. AT EDGES AND @ 12" O.C. IN THE FIELD
- ½" SHIPLAP PANEL SHEATHING (I.E. LP SMARTSIDE OR EQUIVALENT) WITH 6d NAILS @ 4" O.C. AT EDGES AND @ 12" O.C. IN THE FIELD

LEGEND / NOTES:

- LOAD BEARING WALL
- LOAD BEARING BEAM
- (SD) - SMOKE DETECTOR
- (CM) - CARBON MONOXIDE DETECTOR

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FIRST FLOOR PLAN

SHEET NUMBER: 3

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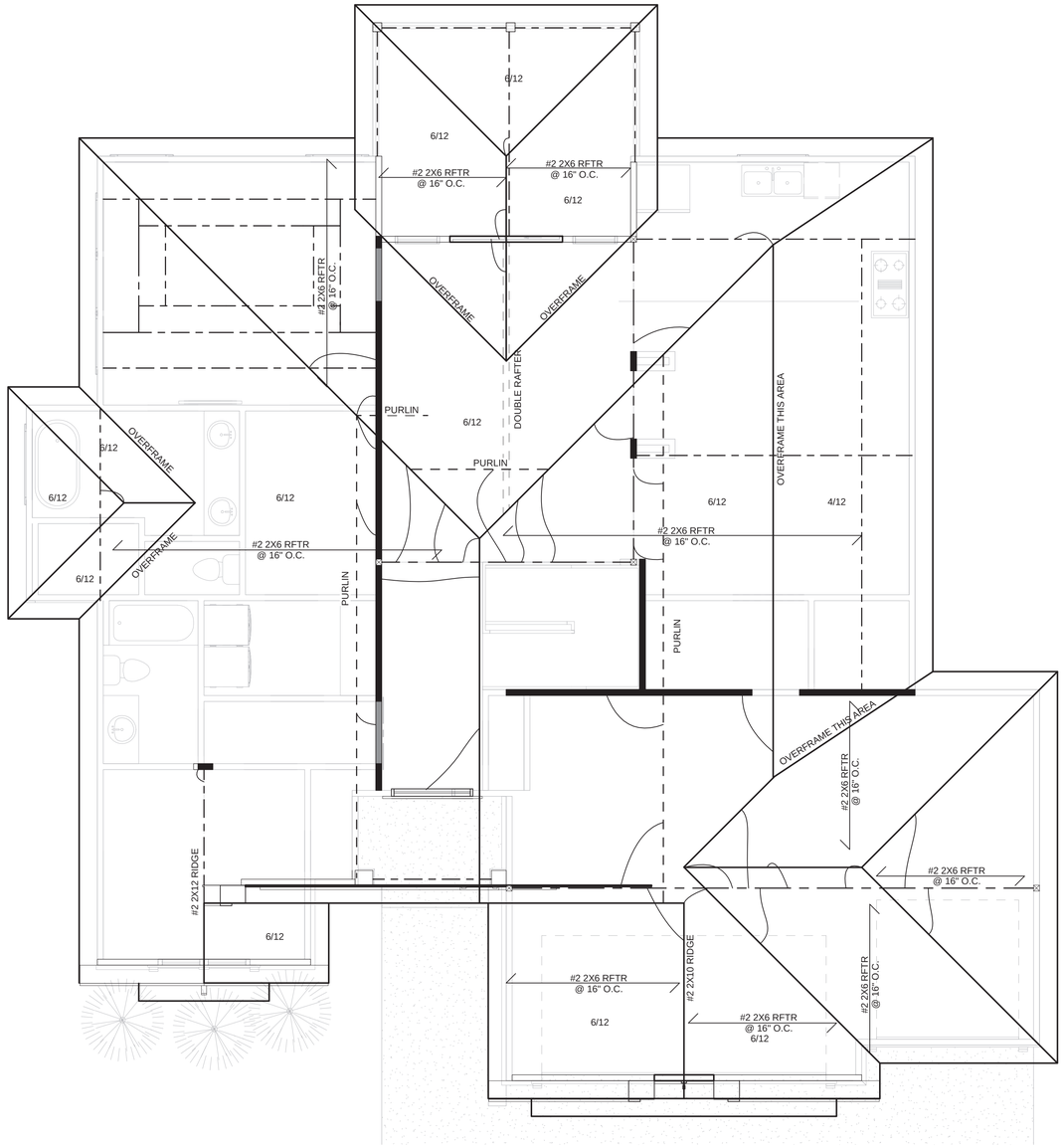

1 ROOF PLAN
1/4" = 1'-0"

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'-9"
#2-2x6	@16" O.C.	14'-1"
#2-2x8	@24" O.C.	14'-10"
#2-2x8	@16" O.C.	18'-2"
#2-2x10	@24" O.C.	18'-2"
#2-2x10	@16" O.C.	22'-3"

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"

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
-ALL TALL STUD WALLS TO BE CONSTRUCTED PER TABLE R602.3.1 ON SHEET S-2.0
-OVERHEAD GARAGE DOORS MUST MEET DASMA 90 MPH REQUIREMENTS

LEGEND / NOTES:
- LOAD BEARING WALL
- LOAD BEARING BEAM
- PURLIN

ELEVATION OPTION A

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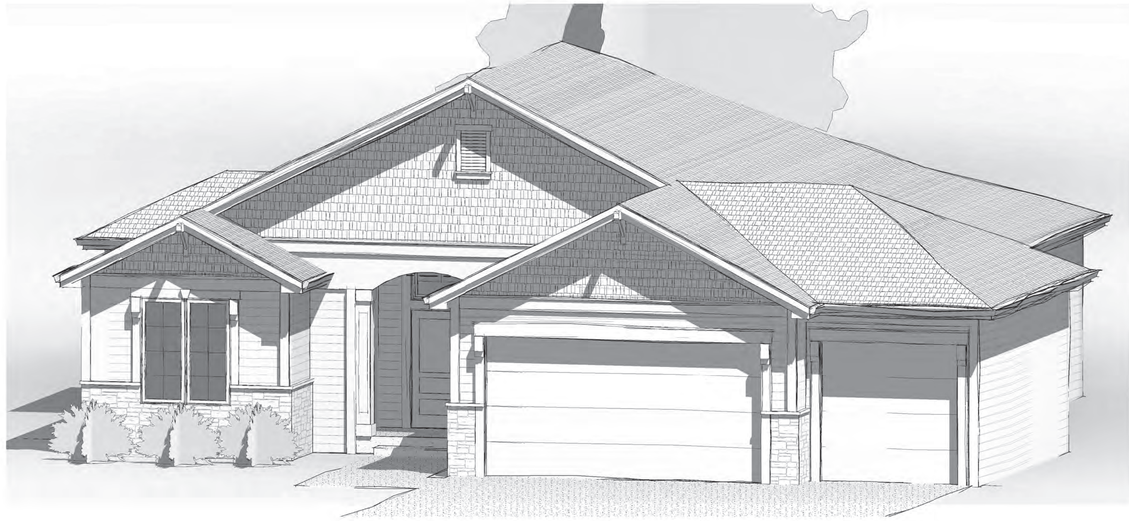
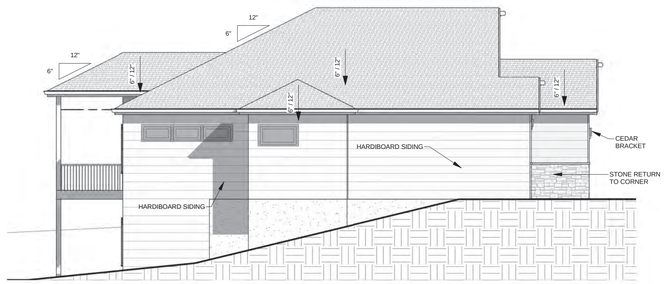
ROOF PLAN

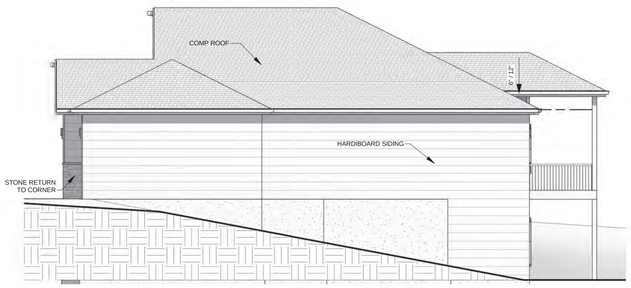
SHEET NUMBER:
4A



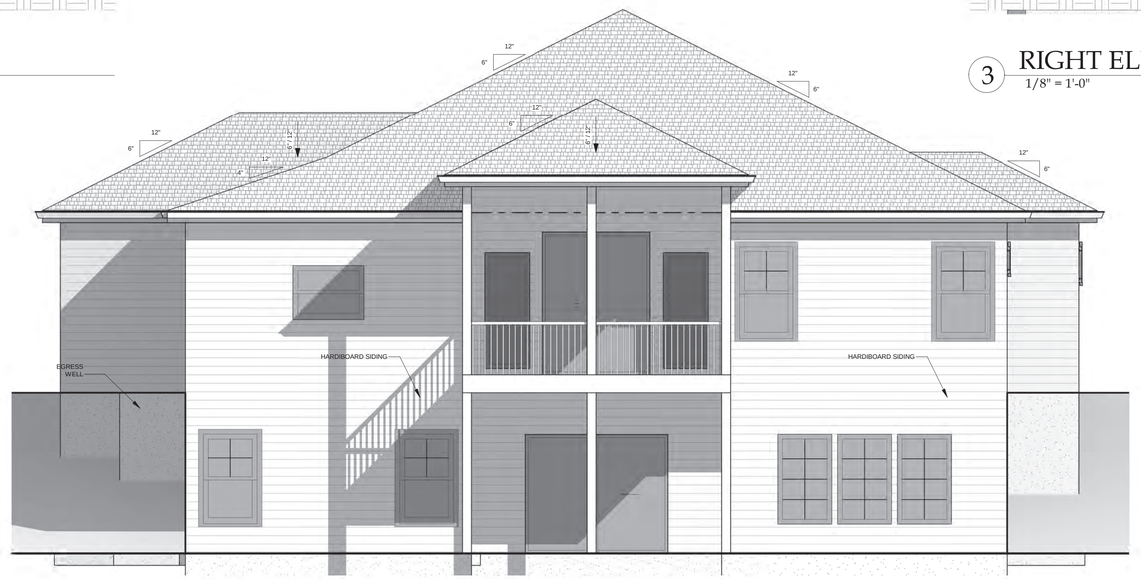
1 PERSPECTIVE



2 LEFT ELEVATION
1/8" = 1'-0"



3 RIGHT ELEVATION
1/8" = 1'-0"



4 REAR ELEVATION
1/4" = 1'-0"

ELEVATION OPTION A

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ELEVATIONS

SHEET NUMBER:
5A

GENERAL NOTES:

1. PLANS SHALL COMPLY WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE, 2018 IECC, AND ALL AMENDMENTS AS ADOPTED BY THE AHJ. IF ANY CHANGES OR DEVIATIONS ARE MADE FROM THESE PLANS THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE AUTHORITY AND THE ENGINEER TO EVALUATE THE CHANGES AND MAKE ANY APPROPRIATE MODIFICATIONS TO THE PLANS.
2. WHERE DISCREPANCIES EXIST BETWEEN THE STANDARD COMMENTS, NOTES FOR THE DESIGN PROFESSIONAL OR THE CODE, THE MOST RESTRICTIVDE 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 CLIET, 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 FILL MATERIAL OR A POTENTIAL SOIL BEARING CAPACITY BELOW 1500 PSF SHOULD BE EVALUATED BY OUR FIRM OR AN HD ENGINEERING REFERRED GEOTECHINICAL FIRM PRIOR TO PLACING FOOTINGS.
5. DUE TO THE WIDE VARIETY OF SOIL CONDITIONS IN OUR AREA AND THE WIDE VARIETY OF PLASTICITY INDEX AND SOIL BEARING CAPACITIES OUR FIRM RECOMMENDS ALL SITES BE EVALUATED BY HD ENGINEERING OR AN HD ENGINEERING REFERRED GEOTECHNICAL FIRM PRIOR TO PLACEMENT OF ANY "STANDARD" FOUNDATIONS.

FOUNDATION NOTES:

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 MIN. OF 16" WIDE AND 8" DEEP W/ (2) #4 BARS CONTINUOUS, LOCATED A MIN. OF 3" CLEAR FROM BOTTOM. FOOTINGS SHALL BE A MINIMUM OF 36" BELOW GRADE FOR FROST PROTECTION.
6. COLUMN PADS SHALL BE A MINIMUM OF 24"X24"X8" WITH (3) #4 BARS EACH WAY.
7. FOUNDATION WALLS SHALL BE A MINIMUM 8" THICK W/ MINIMUM #4 BARS @ 24" O.C. HORIZONTAL AND VERTICAL W/ THE TOP BAR WITHIN 8" OF THE TOP OF THE WALL UNLESS NOTED OTHERWISE ON PLAN.
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 $\frac{1}{2}$".
11. CONCRETE FLOOR SLABS ON GRADE, SHALL BE A MINIMUM 4" THICK OVER A MINIMUM 4" BASE OF SAND, GRAVEL, OR CRUSHED STONE. BASEMENT SLABS SHALL HAVE A MIN. 6 MIL POLYETHYLENE OR APPROVED VAPOR RETARDER WITH JOINTS LAPPED NOT LESS THAN 6" SHALL BE PLACED BETWEEN THE FLOOR SLAB AND THE BASE COURSE.
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 BOLTED TO THE FOUNDATION W/ A MINIMUM OF 1/2" ANCHOR BOLTS EMBEDDED AT LEAST 7" INTO THE CONCRETE AND SPACED NOT MORE THAN 3' ON CENTER AND WITHIN 12" OF EACH END PIECE PER IRC SECTION R403.1.6.
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 DEEPENING OF FOUNDATION ELEMENTS, OR UNDERCUTTING OF UNSUITABLE MATERIALS AND REPLACEMENT WITH ENGINEERED FILL.

STAIRWAY NOTES:

1. STAIRWAYS SHALL PROVIDE A MAXIMUM 7 3/4" RISE AND MIN. 10" RUN.
2. PROVIDE MINIMUM 36" GUARDRAILS ON THE OPEN SIDES OF RAISED FLOORS, PORCHES AND BALCONIES. MINIMUM 34" GUARDRAILS ON THE OPEN SIDES OF STAIRWAYS LOCATED MORE THAN 30" ABOVE THE FLOOR OR GRADE BELOW. GUARDRAIL ENCLOSURES SHALL HAVE INTERMEDIATE RAILS OR ORNAMENTAL PATTERNS THAT DO NOT ALLOW PASSAGE OF A SPHERE 4" IN DIAMETER.
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 THREADS.
4. HANDRAILS SHALL HAVE A CIRCULAR CROSS-SECTION OF 1 1/4" MINIMUM TO 2" MAXIMUM OR OTHER APPROVED GRABABLE 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 1/2" GYPSUM BOARD ON ENCLOSURE SIDE.
7. WINDERS SHALL PROVIDE A MINIMUM TREAD OF AT LEAST 6" AT ANY POINT WITHIN CLEAR WIDTH OF STAIRS. WINDER TREAD PROPORTION TO COMPLY WITH IRCR311.7.5.2.1.

GLAZING NOTES:

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 INCHES ABOVE THE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24 INCHES ABOVE THE FINISHED FLOOR OF THE ROOM IN WHICH THE WINDOW IS LOCATED. OPERABLE SECTIONS OF WINDOWS SHALL NOT PERMIT OPENINGS THAT ALLOW PASSAGE OF A 4 INCH DIAMETER SPHERE WHERE SUCH OPENINGS ARE LOCATED WITHIN 24 INCHES OF THE FINISHED FLOOR.

FRAMING NOTES:

1. ALL LUMBER SIZES ARE FOR DOUGLAS FIR-LARCH UNLESS OTHERWISE NOTED.
2. ALL HEADERS TO BE A MINIMUM OF (2) #2-2X10'S UNLESS OTHERWISE NOTED.
3. BLOCK CANTILEVERS, DOOR JAMBS, AND OVER BEAMS.
4. ALL HEADERS/BEAMS 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' CENTERS TO TRANSFER LATERAL LOADS ON THE WALL TO THE FLOOR DIAPHRAGM. THE BLOCKING SHALL BE SECURELY NAILED TO THE JOISTS AND FLOORING. NAIL JOISTS AND BLOCKING TO SILL PLATE WITH (4) 10D NAILS.
7. IF DUCTS ARE INSTALLED IN THE FIRST JOIST SPACE(S) , NAIL 2X4'S FLAT AT 4' CENTERS WITHIN THE JOIST SPACE(S) AND THEN PROVIDE SOLID BLOCKING, INSTALLED UPRIGHT, IN THE NEXT TWO JOIST SPACES. SECURE THE 2X4'S TO THE SILL PLATE WITH (4) 10D NAILS.
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 A 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" 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 TO COMPLY WITH IRC SECTION 702 AND 703
15. ALL RAFTER / COLLAR TIES TO COMPLY WITH IRC SECTIONS 804
16. ALL RAFTERS TO HAVE 2x4 COLLAR TIES @ 48" OC IN UPPER 1/3 OF DISTANCE BETWEEN CEILING AND ROOF
17. BLOCKING BETWEEN JOISTS UNDER A PERPENDICULAR LOAD-BEARING WALL IS NOT REQUIRED
18. 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 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.

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 3/8" SOLID WOOD, SOLID OR HONEY-COMBED CORE STEEL DOOR NOT LESS THAN 1 3/8" THICK, OR 20 - MINUTE FIRE - RATED EQUIPPED WITH SELF CLOSING DEVICE PER IRC2018 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 IRC2018 R301.2.1
4. THE GARAGE SHALL BE SEPARATED FROM THE DWELLING AND ITS ATTIC AREAS BY MINIMUM 5/8" GYPSUM BOARD APPLIED TO THE GARAGE SIDE. WHERE HABITABLE SPACE OCCURS ABOVE THE GARAGE, THE FLOOR CEILING ASSEMBLY SHALL BE PROTECTED WITH MINIMUM 5/8" 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 5/8" 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 3/4"X.120" NAILS AT 7" CENTERS STAGGERED WITH (7) 3 1/4"X.120" NAILS THRU THE JAMB INTO THE HEADER, MINIMUM 2X8 HEADER FOR ATTACHMENT OF COUNTER BALANCE SYSTEM.
6. ANY ATTACHED GARAGE TO THE MAIN HOUSE SHALL BE PROVIDED WITH A SINGLE HEAT DETECTOR. HEAT DETECTOR SHALL BE HARDWIRED AND INTERCONNECETED WITH THE HOUSEHOLD SMOKE ALARM SYSTEM. HEAT DETECTOR SHALL BE LISTED FOR THE AMBIENT ENVIRONMENT AND INSTALLED PER MANF. INSTRUCTIONS.

MECHANICAL/INSULATION:

1. BUILDING ENVELOPE INSULATION SHALL COMPLY WITH IRC TABLE N1102.1.1 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 1/8" TO 1/4" OPENINGS. THE TOTAL FREE VENTILATING AREA SHALL NOT BE LESS THAN 1/150 OF THE AREA OF SPACE VENTILATED, EXCEPT WHERE THE VENTILATORS AREA LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED THE REQUIRED AREA MAY BE REDUCED TO 1/300.

SHEATHING SCHEDULE

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

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

FRAME FASTENING SCHEDULE

BUILDING COMPONENT	FASTEN TO	FASTEN W/
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 OR RAFTERS TO TOP PLATE	TOENAIL W/ (3) 8D
BEAMS	BUILT-UP BEAMS, 2" LUMBER LAYERS, FACENAIL OPPOSITE SIDES, (2) @ EACH END PLUS	10D @ 32" OC STAGGERED, TOP & BOTTOM, OPPOSITE SIDES
	BUILT-UP BEAMS OF ENGINEERED LUMBER, FACE NAIL OPPOSITE SIDES	(2) ROWS @ 12" OC
	BUILT-UP HEADER, TWO PIECES W/ ½" SPACER	16D @16" OC ALONG EDGES
	BUILT-UP HEADER, TWO PIECES, NO ½" SPACER	3" x 0.131" NAILS @ 12" OC ALONG EDGES
FLOOR JOISTS	BEARING	TOENAIL W/ (2) 18D @ EACH END
	RIM JOIST TO SILL OR TOP PLATE	TOENAIL W/ 8D COMMON OR 10D BOX NAILS @ 6" OC
	JOIST TO SILL OR GIRDER	TOENAIL W/ (3) 8D
	JOIST TO RIM JOIST	FACENAIL W/ (3) 16D
	BRIDGING TO JOIST	TOENAIL W/ (2) 8D
	I-JOIST TO BEARING PLATE	TOENAIL W/ (2) 8D - ONE INTO EACH SIDE AT LEAST 1½" FROM THE END
	RIM JOIST TO I-JOIST	FACENAIL W/ (2) 10D BOX NAILS - ONE INTO EACH FLANGE
	SOLE PLATE TO LSL RIM BOARD	16D BOX NAILS @ 12" OC
	SINGLE JOIST HANGERS *	10D FACENAILS AND TONAILS
	DOUBLE JOIST HANGERS *	16D FACENAILS AND TOENAILS
WALLS	TOP & SOLE PLATE TO STUD	END NAIL W/ (2) 16D
	STUD TO SOLE AND TOP PLATE	TOENAIL W/ (4) 8D
	DOUBLE TOP PLATES	FACENAIL W/ 16D @ 16" OC
	DOUBLE TOP PLATE LAP SPLICE	FACENAIL W/ (8) 16D
	TOP PLATE LAPS & INTERSECTIONS	FACENAIL W/ (2) 16D
	DOUBLE STUDS	FACENAIL W/ 16D @ 24" OC
	BUILT-UP CORNER STUDS	FACENAIL W/ 16D - 2 ROWS @ 24" OC
	STEEL "X" BRACING	FACENAIL W/ (2) 16D IN EACH TOP & BOTTOM PLATE & (1) 8D PER STUD
	SOLE PLATE TO JOIST OR BLOCKING	FACENAIL W/ 16D @ 16" OC
	SOLE PLATES TO JOIST OR BLOCKING AT BRACED WALL LINES, PERPENDICULAR TO FRAMING	FACENAIL W/ (3) 16D @ 16" OC ALONG BRACED WALL PANEL
	TOP PLATE TO JOIST OR BLOCKING AT BW LINES, PERPENDICULAR TO FRAMING	TOENAIL W/ 8D @ 6" OC ALONG BRACED WALL PANEL
	SOLE PLATES TO JOIST OR BLOCKING AT BW LINES PARALLEL TO FRAMING, BLOCKING @ 16" OC	FACENAIL W/ (3) 16D @ 16" OC ALONG BW PANEL & AT EACH BLOCK
	TOP PLATE TO JOIST OR BLOCKING AT BW LINES, PARALLEL TO FRAMING, BLOCKING @ 16" OC	TOENAIL W/ 8D @ 6" OC ALONG BW PANEL & AT EACH BLOCK
	NON-STRUCT. SIDING OVER STRUCT. SHEATHING	(1) 6D BOX NAIL IN EACH STUD
	FIBER CEMENT PLANK SIDING	(1) 6D GALVANIZED NAIL IN EACH STUD
	WINDOW INSTALLATION NAILING	1¾" - 2" ROOFING NAILS @ 12" OC MAX.

* JOIST HANGER NOTES: 1) NO JOIST HANGER NAILS ALLOWED FOR TOENAILS, 2) NO GUN NAILS OR SCREWS ALLOWED IN CONNECTORS, 3) TOENAILS SHALL ALWAYS BE A FULL 3" OR 3½" 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. ½" 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.

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	

ENGINEERED LUMBER

MIN DESIGN REQUIREMENTS

	F_b (psi)	E (psi)	F_V (psi)
LVL	2600	1.8x10^6	285
GLULAM	2400	1.8x10^6	190
PARALLAM	2600	2.0x10^6	290

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STATE OF MISSOURI
CHRIS SAATHOFF
NUMBER 2008001865
3/23/2020
REGISTERED PROFESSIONAL ENGINEER

KS. COA. # E1312
MO. COA. # 2006034946-F

FIRST CHOICE CUSTOM HOMES

1627 SW BLACKSTONE PLACE
MCKINELY COTTAGE LEE'S SUMMIT, MO
STRUCTURAL DETAILS

REVISION TABLE

Date: 3/23/2020
HD #: 38982
Drawn by: AWH
Reviewed by: CLS

STRUCTURAL DETAILS
SHEET NUMBER:
S-1.0

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

STUD SIZE (inches)	BEARING WALLS						NONBEARING WALLS	
	LATERALLY UNSUPPORTED STUD HEIGHT [a] (feet)	MAXIMUM SPACING WHERE SUPPORTING A ROOF-CEILING ASSEMBLY OR 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 (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 = 25.4mm, 1 FOOT = 304.8mm

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

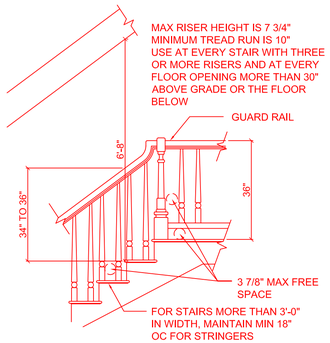
b. SHALL NOT BE USED IN EXTERIOR WALLS

c. A HABITABLE ATTIC ASSEMBLY SUPPORTED BY 2X4 STUDS IS LIMITED TO A ROOF SPAN OF 32 FEET. WHERE THE ROOF SPAN EXCEEDS 32 FEET, THE WALL STUDS SHALL BE INCREASED TO 2X6 OR THE STUDS SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

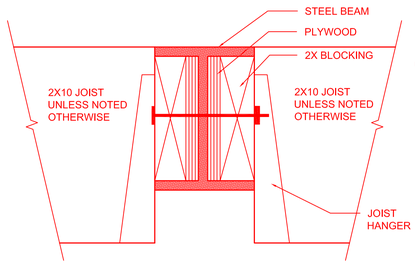
COLUMN CONNECTION TO STEEL BEAMS SHALL BE WITH A CLIP POST CAP WITH ALL FOUR TAB EARS BENT AROUND THE BOTTOM FLANGE OF THE BEAM. FOR A BEARING PLATE, FOUR HOLES SHALL BE DRILLED IN THE BOTTOM FLANGE OF THE STEEL BEAM TO MATCH THE HOLE PATTERN OF THE PLATE. ⅝" X 2" BOLTS SHOULD THEN BE INSTALLED WITH A FLAT WASHER, LOCK WAHER, 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.

COLUMN SCHEDULE
BASED ON FOOTING SIZE (ASSUME 1500 PSF SOIL)

PAD SIZE	REINFORCEMENT	COL MIN	COL TYPE	MAX LOAD
24x24x12	(4) #4 BARS E/W	3"	SCH40	6K
30x30x12	(5) #4 BARS E/W	3"	SCH40	9.4K
36x36x12	(6) #4 BARS E/W	3"	SCH40	13.5K
42x42x14	(7) #4 BARS E/W	3"	SCH40	18.4K
48x48x16	(8) #4 BARS E/W	3"	SCH40	24.0K
54x54x16	(9) #4 BARS E/W	3½"	SCH40	30.4K
60x60x18	(10) #4 BARS E/W	3½"	SCH40	37.5K

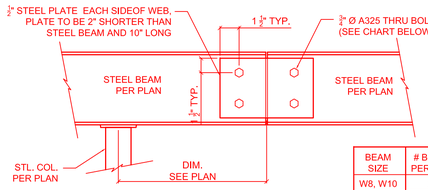


6 S2.0 **STAIR / RAIL DETAIL**
NTS



BOLT 3/4" PLYWOOD & 2x8'S TO W 8xXX STEEL BEAM W/ ¾" DIA STL BOLTS @12" O.C. NAIL JOIST HANGERS INTO 2x8 W/ N8 NAILS.

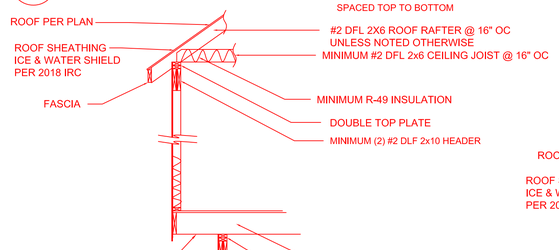
1 S2.0 **UPSET STEEL BEAM / JOIST CONNECTION**
NTS



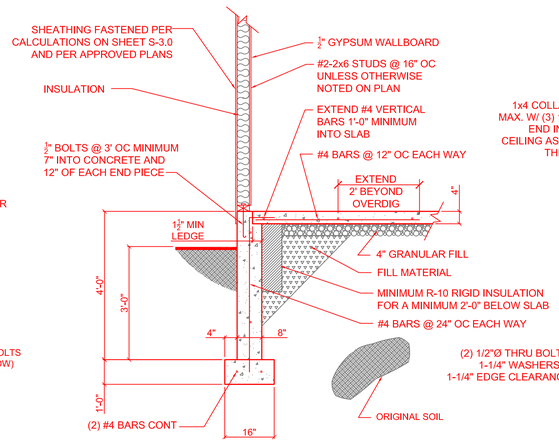
BEAM SIZE	# BOLTS PER SIDE
W8, W10	2
W12, W14	3
W16, W18	4

BOLTS SHALL BE EVENLY SPACED TOP TO BOTTOM

9 S2.0 **STEEL BEAM SPLICE DETAIL**
NTS



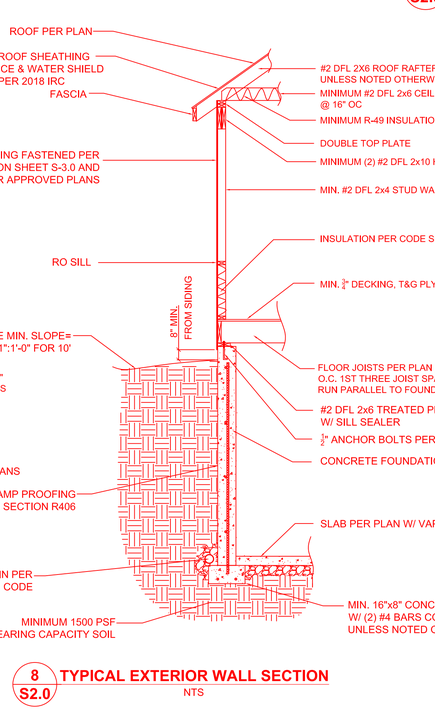
7 S2.0 **TYPICAL EXTERIOR CANTILEVER WALL SECTION**
NTS



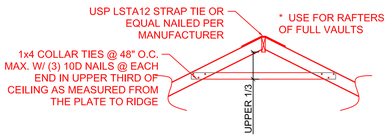
(MAX. 4' OVERDIG AT WALKOUT)

2 S2.0 **WALK-OUT BASEMENT FLOOR SLAB**
NTS

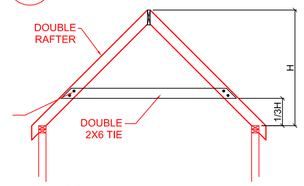
ANY SLAB WITH GREATER THAT 2' OF GRADED ROCK OR 8" OF FILL SOIL BELOW SHALL BE DESIGNED AS STRUCTURAL PER PLAN. OUR FIRM SHOULD BE CONTACTED IMEDIATELY FOR DESIGN RECOMMENDATIONS.



8 S2.0 **TYPICAL EXTERIOR WALL SECTION**
NTS

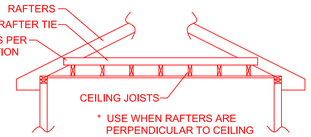


3 S2.0 **RIDGE/RAFTER SUPPORT DETAIL***
NTS

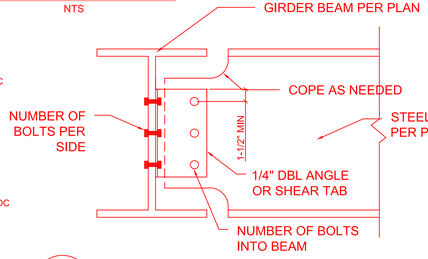


4 S2.0 **HIP SUPPORT FRAME**
NTS

ONLY APPLICABLE WHEN REFERENCED IN APPROVED PLANS



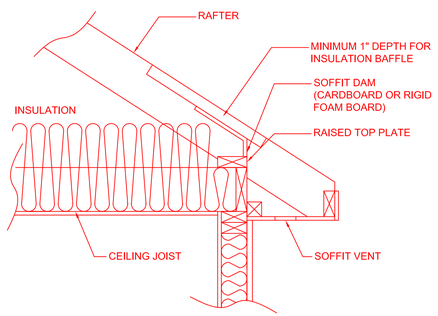
5 S2.0 **RAFTER TIE CONNECTION***
NTS



10 S2.0 **BEAM TO GIRDER CONNECTION**
NTS

BOLTS SHALL BE EVENLY SPACED TOP TO BOTTOM

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



11 S2.0 **RAFTER ON RAISED TOP PLATE**
NTS

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STATE OF MISSOURI
CHRIS L. SCHUTTE
NUMBER 2008001865
REGISTERED PROFESSIONAL ENGINEER
3/23/2020

KS. COA. # E1312
MO. COA. # 2006034946-F

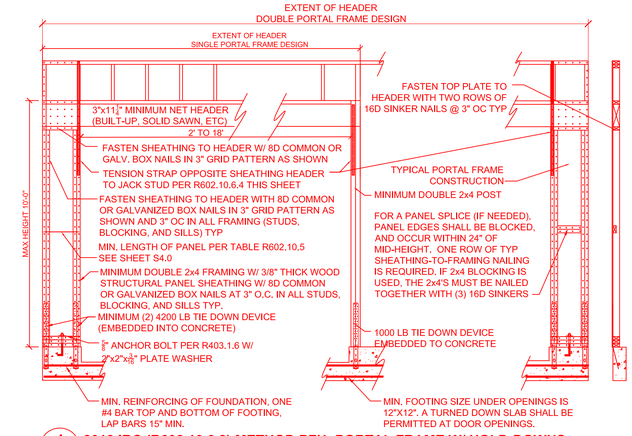
FIRST CHOICE CUSTOM HOMES
1627 SW BLACKSTONE PLACE
MCKINELY COTTAGE LEE'S SUMMIT, MO
STRUCTURAL DETAILS

REVISION TABLE

Date:	3/23/2020
HD #:	38982
Drawn by:	AWH
Reviewed by:	CLS

STRUCTURAL DETAILS

SHEET NUMBER:
S-2.0



1 / S3.0 — 2018 IRC (R602.10.6.2) METHOD PFH- PORTAL FRAME W/ HOLD-DOWNS

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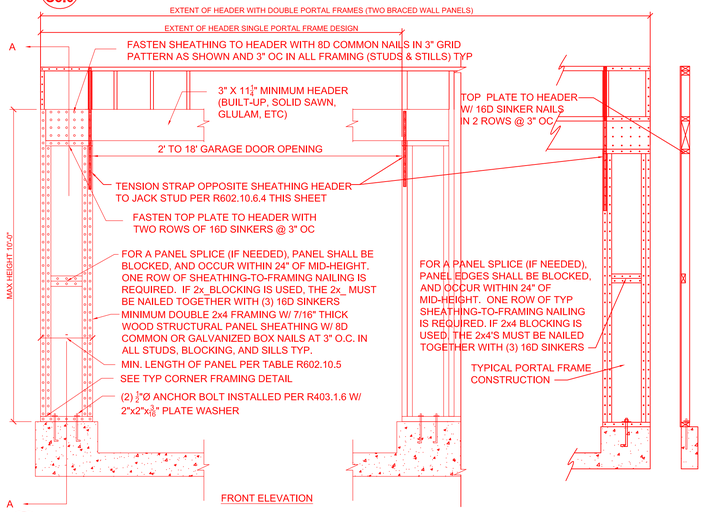

2 / S3.0 — METHOD PFG- PORTAL FRAME AT GARAGE DOOR OPENING (R602.10.6.3)

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

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_{ult} (MPH)					
				110	115	130	110	115	130
				EXPOSURE B			EXPOSURE C		
2X4 NO. 2 GRADE	0	10	18	1,000	1,000	1,000	1,000	1,000	1,050
	1	10	9	1,000	1,000	1,000	1,000	1,000	1,750
			16	1,000	1,025	2,050	2,075	2,500	3,950
			18	1,000	1,275	2,375	2,400	2,850	DR
	2	10	9	1,000	1,000	1,475	1,500	1,875	3,125
			16	1,175	2,175	3,525	3,550	4,125	DR
			18	2,075	2,500	3,950	3,975	DR	DR
	2	12	9	1,150	1,500	2,650	2,675	3,175	DR
			16	2,875	3,375	DR	DR	DR	DR
			18	3,425	3,975	DR	DR	DR	DR
	4	12	9	2,275	2,750	DR	DR	DR	DR
			12	3,225	3,775	DR	DR	DR	DR
2X6 STUD GRADE	2	12	9	1,000	1,000	1,700	1,700	2,025	3,050
			16	1,825	2,150	3,225	3,225	3,675	DR
			18	2,200	2,550	3,725	3,750	DR	DR
	4	12	9	1,450	1,750	2,700	2,725	3,125	DR
			16	2,050	2,400	DR	DR	DR	DR
			18	3,350	3,800	DR	DR	DR	DR

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

RESIDENTIAL SEISMIC & WIND ANALYSIS

DETERMINE WEIGHT OF HOUSE:				INPUT CALCULATED VALUE
LOCATION		DEAD LOAD (psf)	AREA (ft^2)	WEIGHT (lbs.)
ROOF		10	2550	25500
CEILING		10	2408	24080
FIRST FLOOR		10	1559	15590
	WALL LENGTH (ft)	WALL HEIGHT (ft)	WALL UNIT WT. (psf)	WEIGHT (lbs)
FIRST FLOOR EXT. WALL DL	240	9	9	19440
		DEAD LOAD (psf)	AREA (ft^2)	WEIGHT (lbs)
FIRST FLOOR INT. PARTITION WALL DL		6	1559	9354

PROJECTED AREAS (WIND DESIGN PER 115 MPH 3-SECOND GUST, EXPOSURE C AND MEAN ROOF HEIGHT <= 30 FT ASSUMED)						
FRONT-TO-BACK				SIDE-TO-SIDE		
	AREA	LOAD			AREA	LOAD	
SLOPED ROOF	70	308		SLOPED ROOF	501	2186	
VERT. ROOF	247.5	3451	CUMULATIVE	VERT. ROOF	0	0	CUMULATIVE
1ST	5	70	3972	1ST	595	8239	10568
BSMT[a]	0	0	0	BSMT[a]	100	1740	12308
PRESSURE (PSF) - PER ASCE CH. 6						
SLOPED ROOF	ZONE B	5.9		ZONE C	11.6	2a (FIG. 28.6-1, ASCE7)	
WALL/VERT. ROOF	ZONE A	17.4		ZONE D	3.4	11.4	
MEAN ROOF HT., h	24						

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

$q_{z10}=0.00256K_zK_{zt}K_dV^2$ (ASCE7-10 Velocity Pressure) $q_{z10\_ASD}=0.6q_{z10}$ (Design Velocity Pressure for ASD analysis under ASCE7-10 and IRC/IBC 2012)

1ST FLOOR TRIBUTARY WEIGHT	59300
BASEMENT TRIBUTARY WEIGHT	59300
S_S (SITE GROUND MOTION - %g - FROM ASCE7 SEISMIC MAP)	12.0%
F_a (from ASCE7 Table 11.4-1)	1.6
S_{DS} (= 2/3 * S_S * F_a)	0.128
R (from ASCE7 Table 12.2-1)	6.5

SEISMIC SHEAR

LOCATION	From ASCE7 (Eq. 12.8-1):	V (= 1.2 * S_{DS} * W / R) (lbs.)
1ST FLOOR		1401
BASEMENT		1401

EXTERIOR SHEATHING OPTION FOR FIRST FLOOR	4
EXTERIOR SHEATHING OPTION FOR BASEMENT WALLS	5

WIDTH OF 1ST STORY (FT.)	57
DEPTH OF 1ST STORY (FT.)	59.5
BACK WALL OF GARAGE (FT.)	20
GAR. WALL: 1=F-B, 2=S-S	2

EXTERIOR STRUCTURAL WALL LENGTHS (ft.) & RESISTANCES								
	SEISMIC				WIND			
	FRONT-TO-BACK	RESISTANCE (lbs.)	SIDE-TO-SIDE	RESISTANCE (lbs.)	FRONT-TO-BACK	RESISTANCE (lbs.)	SIDE-TO-SIDE	RESISTANCE (lbs.)
1ST FLOOR	77	21550	42	11760	77	30184	42	16464
BASEMENT	0	0	16	6080	0	0	16	8512

	ADDITIONAL RESISTANCE REQUIRED	
	SEISMIC	WIND
1ST FLOOR FRONT-TO-BACK	0	0
1ST FLOOR SIDE-TO-SIDE	0	0
BASEMENT FRONT-TO-BACK	0	0
BASEMENT SIDE-TO-SIDE	0	3796

Anchor Bolt Spacing (in.)	
diameter (in.)	0.5
Shear value (per NDS):	944
Spacing F-B (inches)	543.0
spacing S-S (inches)	195.5

16d Nail Spacing req'd at bottom plate (in.)	
1st Floor F-B	81
1st Floor S-S	29

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.)	BURIED CONCRETE FOUNDATION WALL MIN. LATERAL RESISTANCE /FT (1500#/FT)	RESISTANCE PROVIDED BY ADDITIONAL METHODS (POUNDS)	OK?
1ST FLOOR FRONT-TO-BACK	0					0	YES
1ST FLOOR SIDE-TO-SIDE	0					0	YES
BASEMENT FRONT-TO-BACK	0				62	24304	YES
BASEMENT SIDE-TO-SIDE	3796				64	25088	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: EOH -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	235	16.56			
	TOTAL AREA (FT^2)	ZONE E AREA (FT^2)	ZONE G AREA (FT^2)	PRESSURE ZN. E (PSF)	PRESSURE ZN. G (PSF)	TOTAL FORCE (LBS)	FORCE PER LINEAL FT @ PERIMETER (LBS)
MAIN ROOF**	3391.5	-474.24	3865.74	15.12	10.5	33420	143.4
*ALONG PERIMETER	TOTAL UPLIFT PER LINEAL FOOT ALONG EXTERIOR (POUNDS)				160.0	UPLIFT OK	
**INSIDE EXTERIOR WALLS	RESISTANCE DUE TO DEAD WEIGHT & (3) 10d 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'-8". ALLOWABLE RESISTANCES HAVE BEEN #/FT AND INCREASED BY 40% FOR WIND LOADS, PER VALUES IN 2012 IBC SECTION 2306 AND AF&PA SDPWS TABLE 4.3A. FOR EXAMPLE, 7/16" APA-RATED SHEATHING WITH 8d @ 6" & 12" HAS A SEISMIC SHEAR VALUE OF 220 A WIND SHEAR VALUE OF 335#/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

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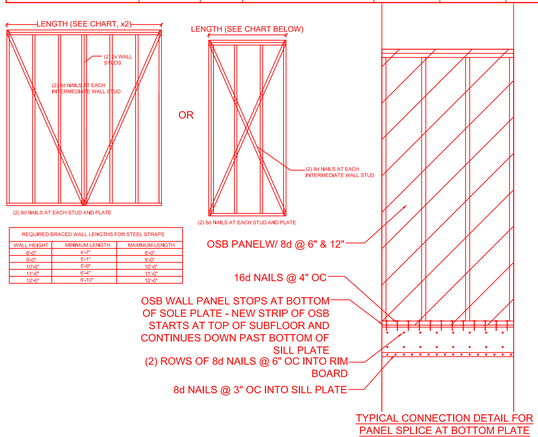
ALLOWABLE LOADS FOR PNEUMATIC OR MECHANICALLY DRIVEN NAILS AND STAPLES

FASTENER DESCRIPTION	NAIL GUN NAILS/ WIRE DIA.	WIRE GA.	PENETRATION REQUIRED INTO MAIN MEMBER FOR LATERAL STRENGTH (IN.)	ALLOWABLE LOADS (IN POUNDS)			
				LATERAL STRENGTH		WITHDRAWL 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							



REQUIRED BRACED WALL LENGTHS FOR STEEL STRAPS

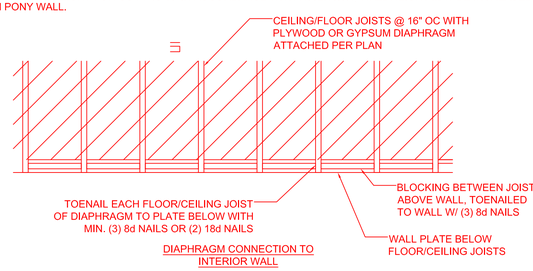
WALL HEIGHT	MINIMUM LENGTH	MAXIMUM LENGTH
8'-0"	4'-0"	8'-0"
9'-0"	5'-1"	9'-0"
10'-0"	5'-8"	10'-0"
11'-0"	6'-4"	11'-0"
12'-0"	6'-10"	12'-0"

TYPICAL CONNECTION DETAIL FOR PANEL SPLICE AT BOTTOM PLATE

TABLE R602.10.5 MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (SEE TABLE R602.10.4)		MINIMUM LENGTH [a] (INCHES) WALL HEIGHT					CONTRIBUTING LENGTH (INCHES)
		8 FEET	9 FEET	10 FEET	11 FEET	12 FEET	
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_0,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[c]	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.



FOR SI: 1 INCH= 25.4 MM, 1 FOOT= 304.8 MM, 1 MILE PER HOUR =0.447 M/S; 1 KS= 6.895 MPa

A. ALL NAILS ARE SMOOTH-COMMON, BOX OR DEFORMED SHANKS EXCEPT WHERE OTHERWISE STATED. NAILS USED FOR FRAMING AND SHEATHING CONNECTIONS SHALL HAVE MINIMUM AVERAGE BENDING YIELD STRENGTHS AS SHOWN: 80 KSI FOR SHANK DIAMETER OF 0.192 INCH (20D COMMON), NAILS FOR SHANK DIAMETERS LARGER THANK 0.142 INCH BUT NOT LARGER THANK 0.177 INCH, AND 100 KSI FOR SHANK DIAMETER OF 0.142 INCH OR LESS.
B. STAPLES ARE 16 GAGE WIRE AND HAVE A MINIMUM 7/16 - INCH ON DIAMETER CROWN WIDTH.
C. NAILS SHALL BE SPACED AT NOT MORE THAN 6 INCHES ON CENTER AT ALL SUPPORTS WHERE SPANS ARE 48 INCHES OR GREATER.
D. 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 REGIONS HAVING BASIC WIND SPEED OF 110 MPH OR GREATER, 8D DEFORMED (2 $\frac{1}{2}$" X 0.120) NAILS SHALL BE USED FOR ATTACHING PLYWOOD AND WOOD STRUCTURAL PANEL ROOF SHEATHING TO FRAMING WITHIN MINIMUM 48-INCHES DISTANCE FROM GABLE END WALLS. IF MEAN ROOF HEIGHT IS MORE THAN 25 FEET, UP TO 35 FEET MAXIMUM.
G. FOR REGIONS HAVING BASIC WIND SPEED OF 100 MPH OR LESS, NAILS FOR ATTACHING WOOD STRUCTURAL PANEL ROOF SHEATHING TO GABLE END WALL FRAMING SHALL BE SPACED 6 INCHES ON CENTER. WHEN BASIC WIND SPEED IS GREATER THAN 100 MPH, NAILS FOR ATTACHING PANEL ROOF SHEATHING TO INTERMEDIATE SUPPORTS SHALL BE SPACED 6 INCHES ON CENTER FOR MINIMUM 48-INCH DISTANCE FROM RIDGES, EAVES AND GABLE END WALLS; AND 4 INCHES ON CENTER TO GABLE END WALL FRAMING.
H. GYPSUM SHEATHING SHALL CONFORM TO ASTM C 1396 AND SHALL BE INSTALLED IN ACCORDANCE WITH GA 253. FIBERBOARD SHEATHING SHALL CONFORM TO ASTM C 208.
I. SPACING OF FASTENERS ON FLOOR SHEATHING PANEL EDGES SUPPORTED BY FRAMING MEMBERS AND REQUIRE BLOCKING AND AT ALL FLOOR PERIMETERS ONLY. SPACING OF FASTENERS ON ROOF SHEATHING PANEL EDGES APPLIES TO PANEL EDGES SUPPORTED BY FRAMING MEMBERS AND 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.
J. WHERE A RAFTER IS FASTENED TO AN ADJACENT PARALLEL CEILING JOIST IN ACCORDANCE WITH THIS SCHEDULE, PROVIDE TWO TOE NAILS ON ONE SIDE OF THE RAFTER AND TOE NAILS FROM CEILING JOIST TO TOP PLATE IN ACCORDANCE WITH THIS SCHEDULE. THE TOE NAIL ON THE OPPOSITE SIDE OF THE RAFTER SHALL NOT BE REQUIRED.

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

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER [a,b,c]	SPACING OF FASTENERS
	ROOF		
1	BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE, TOE NAIL	4-8D BOX (2 $\frac{1}{2}$" X 0.113") 3-8D (2 $\frac{1}{2}$" X 0.113") 3-10D (3"X0.128") 3-3"X 0.131" NAILS	TOE NAIL
2	CEILING JOISTS TO PLATE, TOE NAIL		PER JOIST, TOE NAIL
3	CEILING JOISTS NOT ATTACHED TO PARALLEL RAFTER, LAPS OVER PARTITIONS (SEE SECTION R802.5.2 AND TABLE R802.5)2	4-10D BOX (3"X 0.128") 3-16D COMMON (3 $\frac{1}{2}$"X 0.162") 4-3"X 0.131"NAILS	FACE NAIL
4	CEILING JOIST ATTACHED TO PARALLEL RAFTER (HEEL JOINT) SEE SECTION R802.5.2 AND TABLE R802.5,2)	TABLE R802.5.2	FACE NAIL
5	COLLAR TIE TO RAFTER, FACE NAIL OR 1 $\frac{1}{2}$" X 20GA, RIDGE STRAP TO RAFTER	4-10D BOX (3" X 0.128") 3-10D COMMON (3" X 0.148") 4-3" X 0,131" NAILS	FACE NAILS EACH RAFTER
6	RAFTER OR ROOF TRUSS TO PLATE	3-16D BOX NAILS (3 $\frac{1}{2}$" X0.135") 3-10D COMMON NAILS (3"X 0.148" 4-10D BOX (3" X 0.128" 4-3" X0.131" NAILS	2 TOE NAILS ON ONE SIDE AND 1 TOE NAIL ON OPPOSITE SIDE OF EACH FAGTER OR TRUSS[i]
7	ROOF RAFTERS TO RIDGE, VALLEY OR HIP RAFTERS OR ROOF RAFTER TO MINIMUM 2" RIDGE BEAM	4-16D(3 $\frac{1}{2}$" X 0.135"); OR 3-10D COMMON (3" X 0.148") 4-10D BOX (3" X 0.128"); OR 4-3" X 0.131" NAILS	TOE NAIL
		3-16D(3 $\frac{1}{2}$" X0.135"); OR 2-16D COMMON (3 1/2" X0.162") 3-10D BOX (3" X 0.128"); OR 3-3" X 0.131" NAILS	
	WALL		
8	STUD TO STUD (NOT BRACED WALL PANELS)	16D (3 $\frac{1}{2}$" X 0.162")	24" OC FACE NAIL
		10D BOX (3" X 0.128"); OR 3" X 0.131" NAILS	16" OC FACE NAIL
9	STUD TO STUD AND ABUTTING STUDS AT INTERSECTING WALL CORNERS (AT BRACED WALL PANELS)	16D BOX (3 1/2" X 0.135"); OR 3" X 0.131" NAILS	12" OC FACE NAIL
		16D COMMON (3 $\frac{1}{2}$" X 0.162")	16" OC FACE NAIL
10	BUILT-UP HEADER (2" TO 2" HEADER WITH $\frac{1}{2}$" SPACER)	16D COMMON (3 $\frac{1}{2}$" X 0.162")	16" OC EACH EDGE FACE NAIL
		16D BOX (3 $\frac{1}{2}$" X 0.135")	12" OC EACH EDGE FACE NAIL
11	CONTINUOUS HEADER TO STUD	5-8D BOX (2 $\frac{1}{2}$" X 0.113") or 4-8D COMMON (2 $\frac{1}{2}$" X 0.131") 4-10D BOX (3" X 0.128")	TOE NAIL
12	TOP PLATE TO TOP PLATE	16D COMMON (3 $\frac{1}{2}$" X 0.162")	16" OC FACE NAIL
		10D BOX (3" X 0.128") OR 3" X 0.131" NAILS	12" OC FACE NAIL
13	DOUBLE TOP PLATE SPLICE	8-16D COMMON (3 $\frac{1}{2}$" X 0.162"); or 12-16D BOX (3 $\frac{1}{2}$" X 0.135"); or 12-10D BOX (3" X 0.128"); or 12-3" X 0.131" NAILS	FACE NAIL ON EACH SIDE OF END JOINT (MINIMUM 24" LAP SPLIC 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 $\frac{1}{2}$" X 0.162")	16" OC FACE NAIL
		16D BOX (3 1/2" X 0.135"); OR 3" X 0.131" NAILS	12" OC FACE NAIL
15	BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING (NOT AT BRACED WALL PANELS	3-16D BOX (3 1/2" X 0.135"); or 2-16D COMMON (3 1/2" X0.162"); or 4-3" X 0.131" NAILS	3 EACH 16" OC FACE NAIL 2 EACH 16" OC FACE NAIL 4 EACH 16" OC FACE NAIL
16	TOP OR BOTTOM PLATE TO STUD	4-8D BOX (2 $\frac{1}{2}$" X 0.113"); or 3-16D BOX (3 $\frac{1}{2}$" X0.135"); or 4-8D COMMON (2 $\frac{1}{2}$" X0.131"cor 4-10D BOX (3" X0.128"); or 3-3" X 0.131" NAILS	TOE NAIL
		3-16D BOX (3 $\frac{1}{2}$" X 0.135"); or 2-16D COMMON (3 $\frac{1}{2}$" X0.162"); or 3-10D BOX (3" X0.128"cor 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 $\frac{1}{2}$" X0.162"); or 3-3" X 0.131" NAILS	FACE NAIL
18	1" BRAVE TO EACH STUD AND PLATE	3-8D BOX (2 $\frac{1}{2}$" X 0.113"); or 2-8D COMMON (2 $\frac{1}{2}$" X0.131" or 2-10D BOX (3" X 0.128"); or 2 STAPLES 1 $\frac{1}{2}$"	FACE NAIL
19	1" X 6" SHEATHING TO EACH BEARING	3-8D BOX (2 $\frac{1}{2}$" X 0.113"); or 2-8D COMMON (2 $\frac{1}{2}$" X0.131" or 2-10D BOX (3" X 0.128"); or 2 STAPLES 1" CROWN, 16GA., 1 $\frac{1}{2}$" LONG	FACE NAIL
20	1" X 8" AND WIDER SHEATHING TO EACH BEARING	3-8D BOX (2 $\frac{1}{2}$" X 0.113"); or 3-8D COMMON (2 $\frac{1}{2}$" X0.131" or 3-10D BOX (3" X 0.128"); or 3 STAPLES, 1" CROWN, 16GA., 1 $\frac{1}{2}$" LONG	FACE NAIL
		WIDER THAN 1" X 8" 4-8D BOX (2 $\frac{1}{2}$" X 0.113"); or 3-8D COMMON (2 $\frac{1}{2}$" X0.131" or 3-10D BOX (3" X 0.128"); or 4 STAPLES, 1" CROWN, 16GA., 1 $\frac{1}{2}$" LONG	
	FLOOR		
21	JOIST TO SILL, TOP PLATE OR GIRDER	4-8D BOX (2 $\frac{1}{2}$" X 0.113"); or 3-8D COMMON (2 $\frac{1}{2}$" X0.131") or 3-10D BOX (3" X 0.128"); or 3-3" X 0.131 NAILS	TOE NAIL
22	RIM JOIST, BAND JOIST OR BLOCKING TO SILL OR TOP PLATE (ROOF APPLICATIONS ALSO)	8D BOX (2 $\frac{1}{2}$" X 0.113")	4" OC TOE NAIL
		8D COMMON (2 $\frac{1}{2}$" X 0.131"); or 10D BOX (3" X0.128") or 3-3" X 0.131" NAILS	6" OC TOE NAIL
23	1" X 6" SUBFLOOR OR LESS TO EACH JOIST	3-8D BOX (2 $\frac{1}{2}$" X 0.113"); or 2-8D COMMON (2 $\frac{1}{2}$" X0.131") or 3-10D BOX (3" X 0.128"); or 2 STAPLES, 1" CROWN, 16GA., 1 $\frac{1}{2}$" LONG	FACE NAIL
24	2" SUBFLOOR TO JOIST OR GIRDER	3-16D BOX (3 $\frac{1}{2}$" X 0.135"); or 2-16D COMMON (3 $\frac{1}{2}$" X0.162")	BLIND AND FACE NAIL
25	2" PLANKS (PLANK & BEAM-FLOOR AND ROOF)	3-16D BOX (3 $\frac{1}{2}$" X 0.135"); or 2-16D COMMON (3 $\frac{1}{2}$" X0.162")	AT EACH BEARING, FACE NAIL
26	BAND OR RIM JOIST TO JOIST	3-16D COMMON (3 $\frac{1}{2}$" X 0.162"); or 4-10D BOX (3" X0.128") or 4-3" X 0.131" NAILS; or 4-3" X 14GA, STAPLES, $\frac{7}{16}$" 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" OC AT TIP AND BOTTOM AND STAGGERED
		10D BOX (3" X 0.128"); or 3" X 0.131" NAILS	24" OC 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 END AND AT EACH SPLICE
28	LEDGER STRIP SUPPORTING JOISTS OR RAFTERS	4-16D BOX (3 $\frac{1}{2}$" X 0.135"); or 3-26D COMMON (3 $\frac{1}{2}$" X 0.162"); or 4-10D BOX (3" X 0.128"); or 4-3" X 0.131" NAILS	AT EACH JOIST OR RAFTER, FACE NAIL
29	BRIDGING OR BLOCKING TO JOIST	2-10D BOX (3" X 0.128"); or 2-8D COMMON (2 $\frac{1}{2}$" X 0.131" or 2-3" X 0.131") NAILS	EACH END, TOE NAIL
ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER [a,b,c]	SPACING OF FASTENERS: EDGES (INCHES) [h]
	WOOD STRUCTURAL PANELS, SUBFLOOR, ROOF AND INTERIOR WALL SHEATHING TO FRAMING AND PARTICLEBOARD WALL SHEATHING TO FRAMING [SEE TABLE R602.3(3) FOR WOOD SRUCTURAL PANEL EXTERIOR WALL SHEATHING TO WALL FRAMING]		
30	$\frac{3}{8}$"- $\frac{1}{2}$"	6D COMMON (2"X 0.113" NAIL [SUBFLOOR, WALL)' 6D COMMON (2 $\frac{1}{2}$" X 0.131 NAIL (ROOF); or RSRS-01 (2 $\frac{1}{2}$" X 0.113" NAIL (ROOF)	6
31	$\frac{15}{32}$"- 1"	8D COMMON NAIL (2 $\frac{1}{2}$" X 0.131; or RSRS-01 2 $\frac{1}{2}$" X 0.113) NAIL ROOF [f]	6
32	1 $\frac{1}{8}$" - 1 $\frac{1}{4}$"	10D COMMON NAIL (3" X 0.148) NAIL; or 8D (2 $\frac{1}{2}$" X 0.131") DEFORMED NAIL	6
	OTHER WALL SHEATHING [g]		
33	$\frac{1}{2}$" STRUCTURAL CELLULOSIC FIBERBOARD SHEATHING	1 $\frac{1}{2}$" GALVANIZED ROOF NAIL, $\frac{7}{16}$" HEAD DIAMETER, OR 1 $\frac{1}{2}$" LONG 16GA. STAPLE WITH $\frac{7}{16}$" OR 1" CROWN	3
34	$\frac{25}{32}$" STRUCTURAL CELLULOSIC FIBERBOARD SHEATHING	1 $\frac{3}{4}$" GALVANIZED ROOF NAIL, $\frac{7}{16}$" HEAD DIAMETER, OR 1 $\frac{3}{4}$" LONG 16GA. STAPLE WITH $\frac{7}{16}$" OR 1" CROWN	3
35	$\frac{1}{2}$" GYPSUM SHEATHING [d]	1 $\frac{1}{4}$" GALVANIZED ROOF NAIL, STAPLE GALVANIZED, 1 $\frac{1}{2}$" LONG; 1 $\frac{1}{4}$" SCREWS, TYPE W or S	7
36	$\frac{5}{8}$" GYPSUM SHEATHING [d]	1 $\frac{3}{4}$" GALVANIZED ROOF NAIL; STAPLE GALVANIZED, 1 $\frac{3}{4}$" LONG; 1 $\frac{5}{8}$" SCREWS, TYPE W or S	7
	WOOD STRUCTURAL PANELS, COMBINATION SUBFLOOR UNDERLAYMENT TO FRAMING		
37	$\frac{3}{4}$" AND LESS	6D DEFORMED (2" X 0.120") NAIL OR 8D COMMON (2 $\frac{1}{2}$" X 0.131") NAIL	6
38	$\frac{7}{8}$" - 1"	8D COMMON (2 $\frac{1}{2}$" X 0.131") NAIL OR 8D DEFORMED (2 $\frac{1}{2}$" X 0,120") NAIL	6
39	1 $\frac{1}{8}$" - 1 $\frac{1}{4}$"	10D COMMON (3" X 0.148") NAIL OR 8D DEFORMED (2 $\frac{1}{2}$" X 0,120") NAIL	6

For SI: 1 inch = 25,4mm, 1 foot = 304,8 mm, 1 mile per hour = 0,447 m/s; 1 ksi = 6,895 MPa.

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STATE OF MISSOURI
CHRIS SMITHOFF
NUMBER 2008001845
3/23/2020
REGISTERED PROFESSIONAL ENGINEER

KS. COA. # E1312
MO. COA. # 2006034946-F

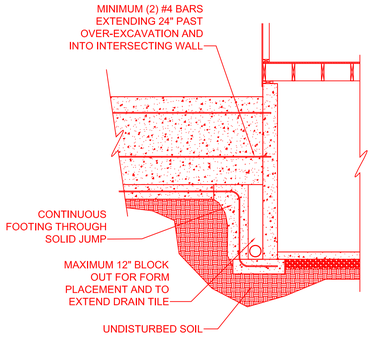
FIRST CHOICE CUSTOM HOMES
1627 SW BLACKSTONE PLACE
MCKINELY COTTAGE LEE'S SUMMIT, MO
STRUCTURAL DETAILS

REVISION TABLE

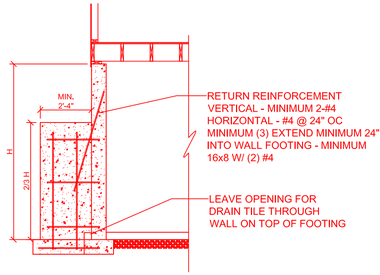
Date:	3/23/2020
HD #:	38982
Drawn by:	AWH
Reviewed by:	CLS

STRUCTURAL DETAILS

SHEET NUMBER:
S-4.0



1 S5.0 SOLID FOOTING JUMP DETAIL
NTS



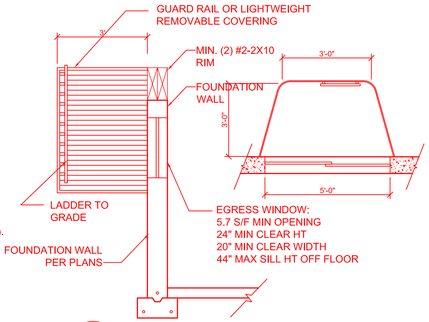
2 S5.0 RETURN WALL DETAIL
NTS

FOUNDATION WALL REINFORCEMENT

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



6 S5.0 EGRESS WINDOW DETAIL
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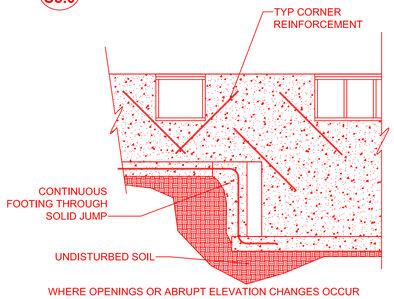

3 S5.0 REINFORCEMENT AT CORNERS AND STEPS
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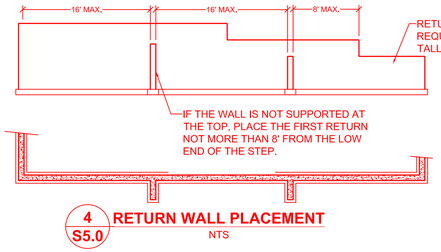
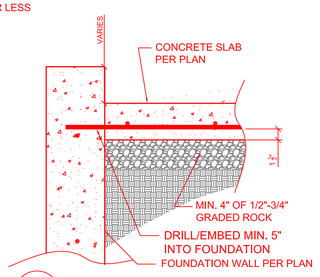
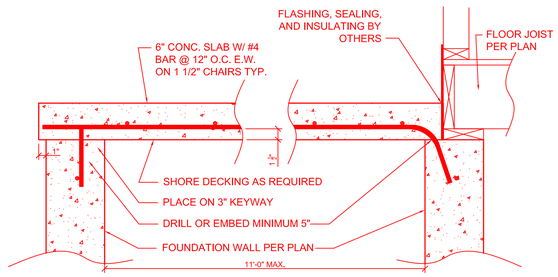


4 S5.0 RETURN WALL PLACEMENT
NTS

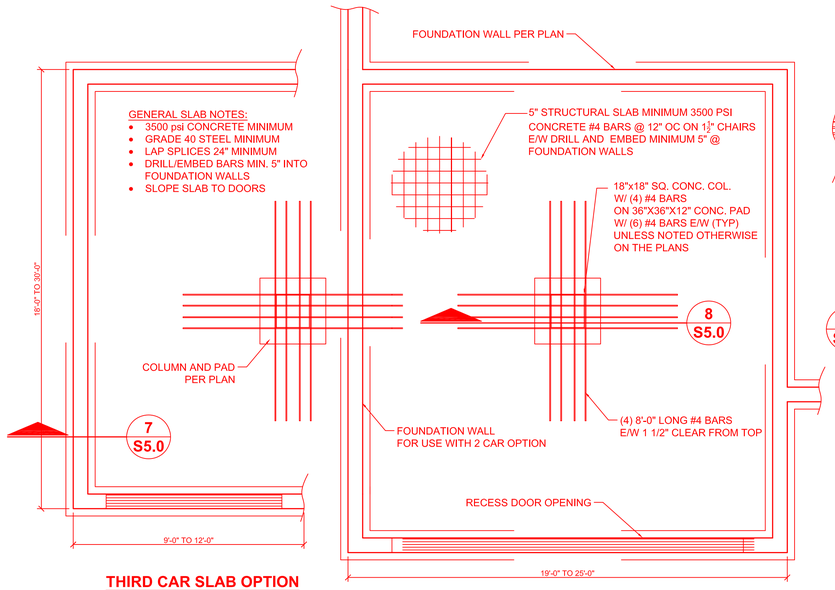


7 S5.0 STRUCTURAL SLAB / WALL CONNECTION
NTS



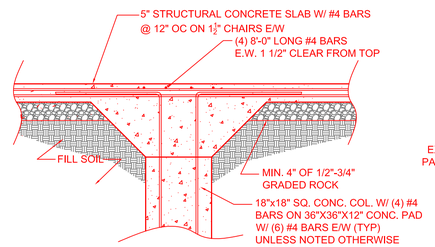
10 S5.0 SUSPENDED PORCH STOOP SLAB
SCALE: N.T.S.

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.

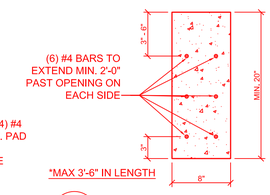


THIRD CAR SLAB OPTION
NTS

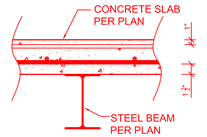
9 S5.0 TYPICAL GARAGE SLAB
NTS



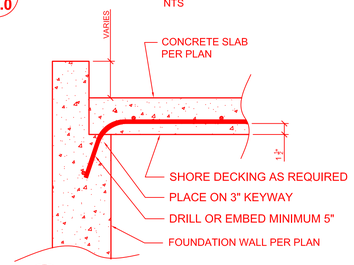
8 S5.0 STRUCTURAL GARAGE COLUMN DETAIL
NTS



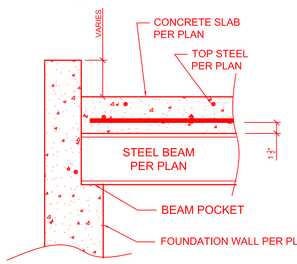
11 S5.0 CONCRETE HEADER DETAIL



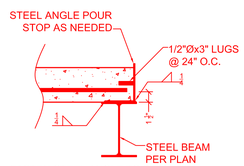
12 S5.0 SUSPENDED SLAB/ STEEL BEAM CROSS SECTION
NTS



13 S5.0 SUSPENDED SLAB / WALL CONNECTION
NTS



14 S5.0 SUSPENDED SLAB BEAM/WALL SECTION
NTS



15 S5.0 SUSPENDED SLAB POUR STOP CROSS SECTION
NTS

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.

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FIRST CHOICE CUSTOM HOMES

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STRUCTURAL DETAILS

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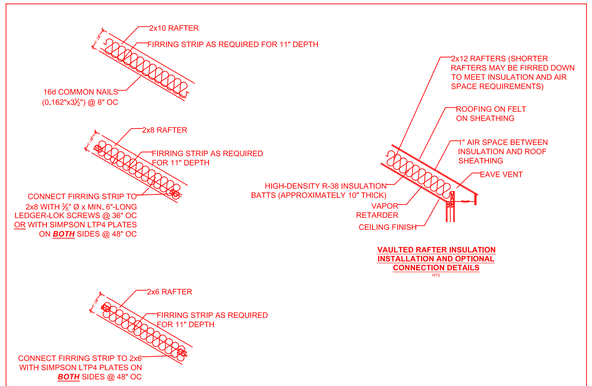
S-5.0



1 S6.0 **VAULTED RAFTER INSULATION DETAILS**
NTS

CATHEDRAL / VAULTED CEILING FRAMING AND INSULATION

MINIMUM R-38 INSULATION REQUIRED

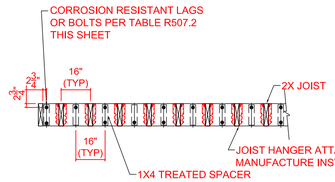
WHERE THE CEILING IS APPLIED DIRECTLY TO THE BOTTOM OF THE RAFTERS, A MINIMUM 1" AIR SPACE SHALL BE PROVIDED BETWEEN THE TOP OF THE INSULATION AND THE SHEATHING FOR VENTILATION (R806.3)

NOTE: RAFTER SIZES SPECIFIED ON PLANS ARE THE MINIMUM REQUIRED FOR STRUCTURAL PURPOSES ONLY.

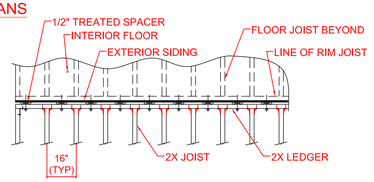
BUILDER TO VERIFY:
IF FULL RAFTER DEPTH IS NOT ADEQUATE FOR MINIMUM INSULATION VALUE, RAFTER SIZES WILL NEED TO BE INCREASED, OR ADEQUATE FURRING SHALL BE USED TO OBTAIN THE MINIMUM JOIST DEPTH FOR THE REQUIRED INSULATION. IN ADDITION, IF THE RAFTER SIZE IS INCREASED IT SHALL BE VERIFIED THAT THE RIDGE BE A MINIMUM OF ONE NOMINAL SIZE LARGER THAN THE RAFTERS BEING RECEIVED. (SEE CHART BELOW)

MAXIMUM INSULATION VALUE	2x6	2x8	2x10 CONDENSED	2x12
1" AIR SPACE (FIBERGLASS)	R-13 3½"	R-19 6¼"	R-38 8¼"	R-38 10¼"

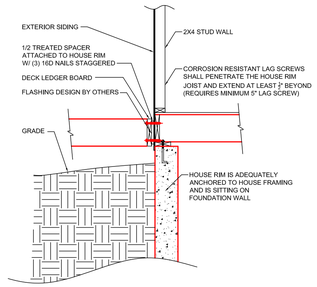
DECK DETAILS ARE ONLY APPLICABLE WHEN DECK IS SHOWN AND DESIGNED ON APPROVED PLANS



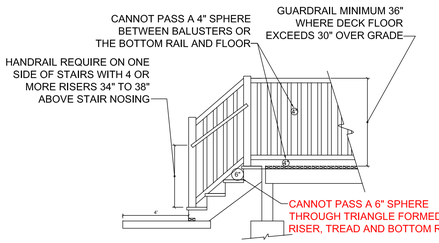
2 S6.0 LEDGER ATTACHMENT - FRONT ELEVATION



3 S6.0 LEDGER ATTACHMENT - PLAN SECTION



4 S6.0 LEDGER ATTACHMENT - SECTION VIEW



5 S6.0 GUARDRAIL DETAIL
SCALE: ¾" = 1'-0"

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

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)

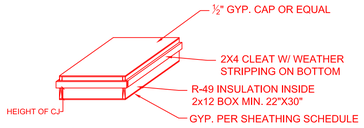
JOIST SPAN	6' AND LESS	6'-1" TO 8'	8'-1" TO 10'	10'-1" TO 12'	12'-1" TO 14'	14'-1" TO 16'	16'-1" TO 18'
CONNECTION DETAILS	ON-CENTER SPACING OF FASTENERS [c,e]						
1/2" LAG SCREW WITH 15/32" MAX. SHEATHING [d,e]	30	23	18	15	13	11	10
1/2" DIAM. BOLT WITH 15/32" MAX. SHEATHING [e]	36	36	34	29	24	21	19
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 ½" thickness of stacked washers shall be permitted to substitute for you to ½" 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 ADN BAND JOISTS

MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS				
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
LEDGER [a]	2 inches [d]	¾ inches	2 inches [b]	1 ⅝ inches [c]
BAND JOIST [c]	¾ inches	2 inches	2 inches [b]	1 ⅝ inches [c]

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)



6 S6.0 ATTIC ACCESS DETAIL

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

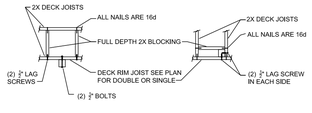
CLIMATE ZONE	FENSTRATION U-FACTOR	SKYLIGHT U-FACTOR	GLAZED SHGC FENSTRATION	INSULATED METAL DOOR U-VALUE	INSULATED WOOD DOOR U-VALUE	CEILING R-VALUE	WOOD FRAMED WALL R-VALUE	FLOOR R-VALUE	BASEMENT WALL R-VALUE	SLAB R-VALUE & DEPTH	CRAWL SPACE WALL R-VALUE	DUCTWORK OVER OUTSIDE R-VALUE	DUCTWORK (ALL OTHER) R-VALUE
4 EXCEPT MARINE	0.32	0.55	0.40	0.60	0.50	49	15	19	10 CONTINUOUS OR 13 CAVITY	R-10 2 FT.	10 CONTINUOUS OR 13 CAVITY	8	6

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

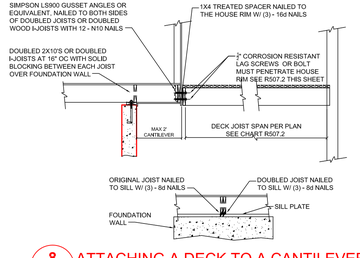
FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY CFM/WATT	AIR FLOW RATE MAXIMUM (CFM)
HRV OR ERV	ANY	1.2 CFM/WATT	ANY
RANGE HOOD	ANY	2.8 CFM/WATT	ANY
IN-LINE FAN	ANY	2.8 CFM/WATT	ANY
BATHROOM UTILITY FAN	10	1.4 CFM/WATT	< 90
BATHROOM UTILITY FAN	90	2.8 CFM/WATT	ANY

For SI: 1 cubic foot per min = 28.3 L/min.
a. When tested in accordance with HVI Standard 916.

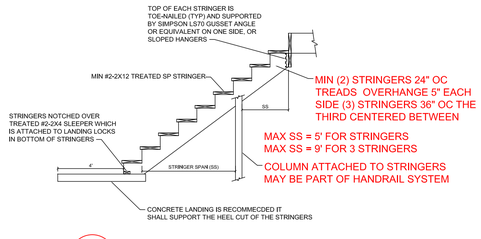
NOTES:
1) BUILDING THERMAL ENVELOPE IS REQUIRED TO BE SEALED WITH AN AIR BARRIER AS PER N1102.4.1 OF THE 2012 IRC
2) RECESSED LIGHTING SHALL BE SEALED TO PREVENT LEAKAGE BETWEEN THE CONDITIONED SPACE AND UNCONDITIONED SPACE
3) ALL DUCTS, AIR HANDLERS, FILTER BOXES, AND BUILDING CAVITIES USED AS DUCTS SHALL BE SEALED AS PER N1103.2 OF THE 2012 IRC



7 S6.0 REINFORCED POST CONNECTIONS
SCALE: ½" 1'-0"



8 S6.0 ATTACHING A DECK TO A CANTILEVER
SCALE: ½" = 1'-0"



9 S6.0 STAIR STRINGER DETAIL
SCALE: ½" 1'-0"

DUCT SEALING METHOD, PER IRC2018 W1103.3.2

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

EXCEPTIONS:
1. AIR-IMPERMEABLE SPRAY FOAM PRODUCTS SHALL BE PERMITTED TO BE APPLIED WITHOUT ADDITIONAL JOINT SEALS.
2. WHERE A DUCT CONNECTION IS MADE THAT IS PARTIALLY INACCESSIBLE, THREE SCREWS OR RIVETS SHALL BE EQUALLY SPACED ON THE EXPOSED PORTION OF THE JOINT SO AS TO PREVENT A HINGE EFFECT.
3. CONTINUOUSLY WELDED AND LOCKING-TYPE LONGITUDINAL JOINTS AND SEAMS IN DUCTS OPERATING AT STATIC PRESSURE LESS THAN 2 INCHES OF WATER COLUMN (500 Pa) PRESSURE CLASSIFICATION SHALL NOT REQUIRE ADDITIONAL CLOSURE SYSTEMS.

DUCT TIGHTNESS SHALL BE VERIFIED BY EITHER OF THE FOLLOWING:
1. POSTCONSTRUCTION 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.

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STATE OF MISSOURI
CHRIS SAATHOFF
NUMBER 2008001885
REGISTERED PROFESSIONAL ENGINEER
3/23/2020

KS. COA. # E1312
MO. COA. # 2006034946-F

FIRST CHOICE CUSTOM HOMES
1627 SW BLACKSTONE PLACE
MCKINELY COTTAGE LEE'S SUMMIT, MO
STRUCTURAL DETAILS

REVISION TABLE

Date:	3/23/2020
HD #:	38982
Drawn by:	AWH
Reviewed by:	CLS

STRUCTURAL DETAILS
SHEET NUMBER:
S-6.0

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 AND WELDED. 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. ½" X 2" BOLTS SHOULD THEN BE INSTALLED WITH A FLAT WASHER, LOCK WAHER, 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.

BUILDING SECURITY:

1. BUILDING SHALL COMPLY WITH THE PHYSICAL SECURITY ORDINANCE OF THE KANSAS CITY BUILDING AND REHABILITATION CODE SECTION 326

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 1/8" TO 1/4" OPENINGS, THE TOTAL FREE VENTILATING AREA SHALL NOT BE LESS THAN 1/150 OF THE AREA OF SPACE VENTILATED, EXCEPT WHERE THE VENTILATORS AREA LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED THE REQUIRED AREA MAY BE REDUCED TO 1/300.

** WHEN I-JOISTS ARE USED FOR FIRST FLOOR FRAMING, BLOCKING AT JOISTS PARALLEL TO FOUNDATION WALL IS NOT REQUIRED IF
1. JOIST MANUFACTURER'S INSTALLATION INSTRUCTIONS DO NOT CALL FOR BLOCKING OF JOISTS PARALLEL TO FOUNDATION WALL
2. THE SUBFLOOR IS FASTENED TO THE I-JOISTS PER THE SHEATHING SCHEDULE ON THIS SHEET
3. ANCHOR BOLTS ARE INSTALLED AS REQUIRED BY CODE
4. A SOLID RIM JOIST IS PLACED AND FASTENED FLUSH WITH THE OUTSIDE FACE OF THE FOUNDATION WALL
5. THE UNINTERRUPTED FOUNDATION WALL SECTION FOR FULL-HEIGHT FOUNDATION WALLS DOES NOT EXCEED 16 FEET IN LENGTH OR, IF GREATER THAN 16 FEET IN LENGTH, PILASTERS MUST BE INSTALLED ON THE INSIDE OR OUTSIDE OF THE FOUNDATION WALL AT A MAXIMUM OF 16'-0" OC

TWOWAY SLAB DESIGN METHOD

enter case
1 - 7 here 8 or 9 here

Case type (1-9) : 4
Location of Slab Panel :

f'c = 3500 psi
weight of concrete = 150 pcf
fy = 40000 psi
live load = 50 psf
l_n short = 15.00 ft
l_n long = 15.00 ft
m = l_n / l_s = 1.00

min. thickness = 4.00 in
design thickness = 5 in
dead load = 62.5 psf
factored live load = 85 psf
factored dead load = 87.5 psf
total design load = 172.5 psf

M_u / (ϕh*b*d^2) :
phi = 0.9
covor = 1 in

Short Direction
bar no. (midspan) = 4
bar dia. = 0.5 in
bar no. (continuous) = 4
bar dia. = 0.5 in
bar# (discontinuous) = 4
bar dia. = 0.5 in

Long Direction
bar no. (midspan) = 4
bar dia. = 0.5 in
bar no. (continuous) = 4
bar dia. = 0.5 in
bar#(discontinuous) = 4
bar dia. = 0.5 in

Shear Check
max. allow. V_u = 4828 lbs
long beam (V_u) = 647 lbs OK
short beam (V_u) = 647 lbs OK

Pad Size (NA HERE)
L1 = 25.5 ft
L2 = 25 ft
159 ft^2
2.99413 ft
USE 3 X 3 Square Pad

Interpolated coefficient information
Requires input from graph
Results

coefficient if case 1 - 7 | coefficient if case 8 or 9

$C_{a,neg}$ = 0.05000 please enter 8 or 9 — **Negative Moments at Continuous Edges (Table 12.3)**
$C_{b,neg}$ = 0.05000 please enter 8 or 9
$M_{a,neg}$ = 23288 in-lbs
$M_{b,neg}$ = 23288 in-lbs

Positive Moments (Table 12.4 and 12.5)
$C_{a,pos,dl}$ = 0.02700 please enter 8 or 9 — $M_{a,pos,dl}$ = 6379 in-lbs
$C_{a,pos,ll}$ = 0.03200 please enter 8 or 9 — $M_{a,pos,ll}$ = 7344 in-lbs
$M_{a,pos,tot}$ = 13723 in-lbs
$C_{b,pos,dl}$ = 0.02700 please enter 8 or 9 — $M_{b,pos,dl}$ = 6379 in-lbs
$C_{b,pos,ll}$ = 0.03200 please enter 8 or 9 — $M_{b,pos,ll}$ = 7344 in-lbs
$M_{b,pos,tot}$ = 13723 in-lbs

Negative Moments at Discontinuous Edges (1/3 X Positve Moments)
$C_{a,neg}$ = 0.33 — $M_{a,neg}$ = 4574 in-lbs
$C_{b,neg}$ = 0.33 — $M_{b,neg}$ = 4574 in-lbs

Short Direction R (look @ chart if above 150 roe (from Graph A.1)

					formula info
midspan	79 psi	0.0042	As =	0.20 in^2	0.20
continuous edge	135 psi	0.0042	As =	0.20 in^2	0.20
discontinuous edge	26 psi		As =	0.07 in^2	0.07

Long Direction

midspan	104 psi	0.0042	As =	0.18 in^2	0.18
continuous edge	135 psi	0.0042	As =	0.20 in^2	0.20
discontinuous edge	26 psi		As =	0.06 in^2	0.06

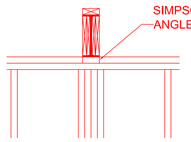
Beam Width 12 in.

2000-lb Concentrated Load
p/in^2 = 20 in^2
r = 2.52 in
C = $2*pi*r$
C = 15.85 in
Area = 79.27 in^2
Vp= 9379 lb
Vp= 2000 ok

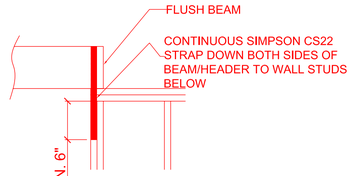
L1 and L2 enter actual garage dimensions

R<150 use .0042

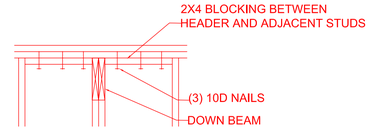
bar size	spacing (from Table A.4)		
# 4	bar @	12 in.	o.c.
# 4	bar @	12 in.	o.c.
# 4	bar @	12 in.	o.c.
# 4	bar @	12 in.	o.c.
# 4	bar @	12 in.	o.c.
# 4	bar @	12 in.	o.c.



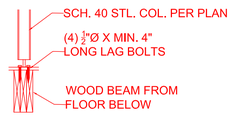
13 S7.0 EXT. WALL STEEL BEAM BEARING
SCALE: ½" = 1'-0"



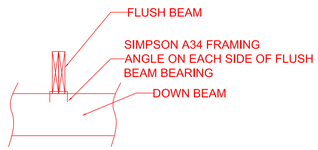
11 S7.0 UPSET WOOD/STEEL BEAM PARALLEL TO WALL
SCALE: ½" = 1'-0"



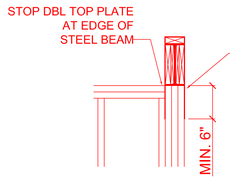
15 S7.0 DOWN WOOD BEAM PERP. TO WALL
SCALE: ½" = 1'-0"



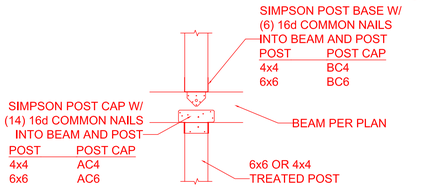
16 S7.0 STEEL COLUMN TO WOOD FLOOR
SCALE: ½" = 1'-0"



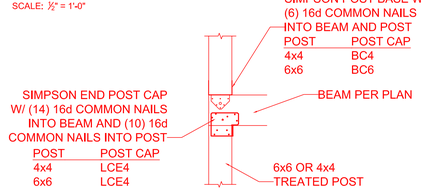
9 S7.0 WOOD BEAM ON TOP OF OTHER
SCALE: ½" = 1'-0"



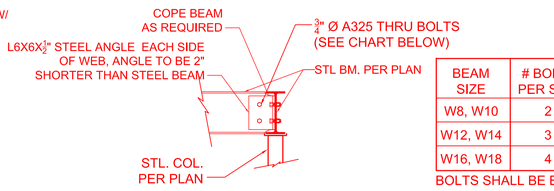
12 S7.0 EXT. WALL STEEL BEAM BEARING
SCALE: ½" = 1'-0"



1 S7.0 DECK LEVEL INTERIOR BEAM-TO COLUMN CONNNECTION
SCALE: ½" = 1'-0"



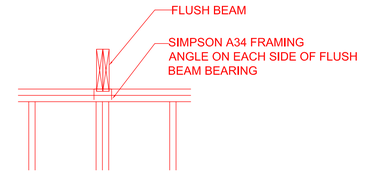
2 S7.0 DECK LEVEL EXTERIOR BEAM-TO-COLUMN CONNECTION
SCALE: ½" = 1'-0"



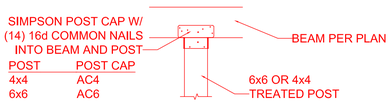
BEAM SIZE	# BOLTS PER SIDE
W8, W10	2
W12, W14	3
W16, W18	4

BOLTS SHALL BE EVENLY SPACED TOP TO BOTTOM

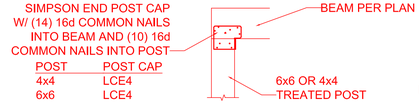
17 S7.0 STEEL BEAM TO STEEL BEAM
SCALE: ½" = 1'-0"



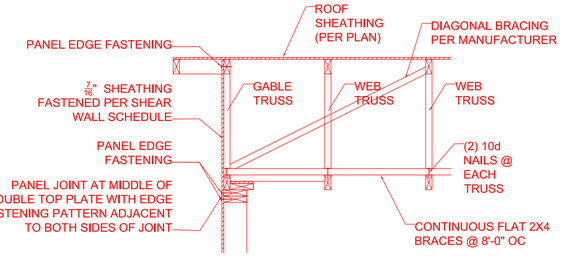
10 S7.0 UPSET WOOD BEAM PERP TO WALL
SCALE: ½" = 1'-0"



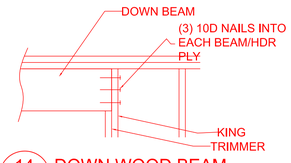
3 S7.0 ROOF LEVEL INTERIOR BEAM-TO COLUMN CONNNECTION
SCALE: ½" = 1'-0"



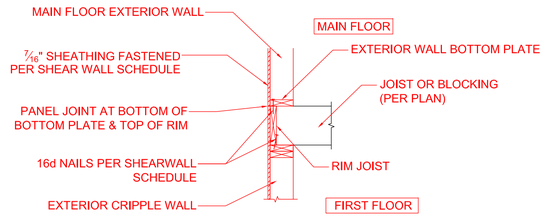
4 S7.0 ROOF LEVEL EXTERIOR BEAM-TO-COLUMN CONNECTION
SCALE: ½" = 1'-0"



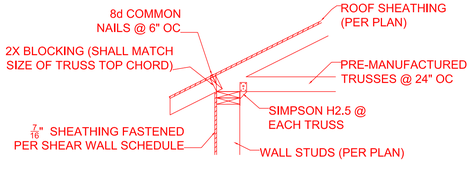
5 S7.0 TRUSS FRAMING DETAIL
NTS



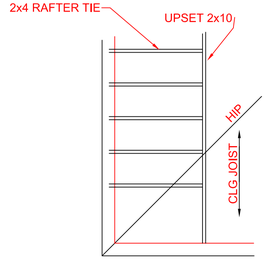
14 S7.0 DOWN WOOD BEAM PARALLEL TO WALL
SCALE: ½" = 1'-0"

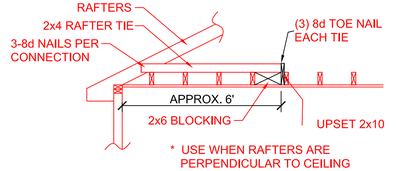


6 S7.0 SHEATHING JOINT LOCATION
NTS



7 S7.0 TRUSS TO TOP PLATE CONNECTION
NTS





* USE WHEN RAFTERS ARE PERPENDICULAR TO CEILING JOISTS

8 S7.0 RAFTER TIE CONNECTION
NTS

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STATE OF MISSOURI
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