

R802.5.2 Ceiling Joist and Rafter Connections

Where ceiling joists run parallel to rafters, they shall be connected to rafters at the top wall plate in accordance with Table R802.5.2. Where ceiling joists are not connected to the rafters at the top wall plate, they shall be installed in the bottom third of the rafter height in accordance with Figure R802.4.5 and Table R802.5.2. Where the ceiling joists are installed above the bottom third of the rafter height, the ridge shall be designed as a beam. Where ceiling joists do not run parallel to rafters, the ceiling joists shall be connected to top plates in accordance with Table R602.3(1). Each rafter shall be tied across the structure with a rafter tie or a 2-inch by 4-inch (51 mm x 102 mm) kicker connected to the ceiling diaphragm with nails equivalent in capacity to Table R802.5.2.

TABLE R802.5.2 RAFTER/CEILING JOIST HEEL JOINT CONNECTIONS ^{a, b, c, d, e, f}																	
RAFTER SLOPE	RAFTER SPACING (inches)	GROUND SNOW LOAD (psf)															
		20'					50					70					
		Roof span (feet)															
		12	20	28	36	12	20	28	36	12	20	28	36	12	20	28	36
Required number of 16d common nails ^b per heel joint splice ^{c, d, e}																	
3:12	12	4	6	8	10	4	6	8	11	5	8	12	15	6	11	15	20
	16	5	8	10	13	5	8	11	14	6	11	15	20	8	14	20	26
	24	7	11	15	19	7	11	16	21	9	16	23	30	12	21	30	39
4:12	12	3	5	6	8	3	5	6	8	4	6	9	11	5	8	12	15
	16	4	6	8	10	4	6	8	11	5	8	12	15	6	11	15	20
	24	5	8	12	15	5	9	12	16	7	12	17	22	9	16	23	29
5:12	12	3	4	5	6	3	4	5	7	3	5	7	9	4	7	9	12
	16	3	5	6	8	3	5	7	9	4	7	9	12	5	9	12	16
	24	4	7	9	12	4	7	10	13	6	10	14	18	7	13	18	23
7:12	12	3	4	4	5	3	4	4	5	3	4	5	7	3	5	7	9
	16	3	4	5	6	3	4	5	6	3	5	7	9	4	6	9	11
	24	3	5	7	9	3	5	7	9	4	7	10	13	5	9	13	17
9:12	12	3	3	4	4	3	3	4	3	3	4	5	3	4	5	7	7
	16	3	4	4	5	3	3	4	5	3	4	5	7	3	5	7	9
	24	3	4	6	7	3	4	6	7	3	6	8	10	4	7	10	13
12:12	12	3	3	3	3	3	3	3	3	3	3	3	4	3	3	4	5
	16	3	3	4	4	3	3	4	3	3	4	5	3	4	5	7	7
	24	3	4	4	5	3	3	4	6	3	4	6	8	3	6	8	10

For S1: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

- a. 40d box nails shall be permitted to be substituted for 16d common nails.
- b. Nailing requirements shall be permitted to be reduced 25 percent if nails are clinched.
- c. Heel joint connections are not required where the ridge is supported by a load-bearing wall, header or ridge beam.
- d. Where intermediate support of the rafter is provided by vertical struts or purlins to a load-bearing wall, the tabulated heel joint connection requirements shall be permitted to be reduced proportionally to the reduction in span.
- e. Equivalent nailing patterns are required for ceiling joist to ceiling joist lap splices.
- f. Applies to roof live load of 20 psf or less.
- g. Tabulated heel joint connection requirements assume that ceiling joists or rafter ties are located at the bottom of the attic space. Where ceiling joists or rafter ties are located higher in the attic, heel joint connection requirements shall be increased by the following factors:
- | H _c /H _r | Heel Joint Connection Adjustment Factor |
|--------------------------------|---|
| 1/3 | 1.5 |
| 1/4 | 1.33 |
| 1/5 | 1.25 |
| 1/6 | 1.2 |
| 1/10 or less | 1.11 |
- where:
- H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.
- H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

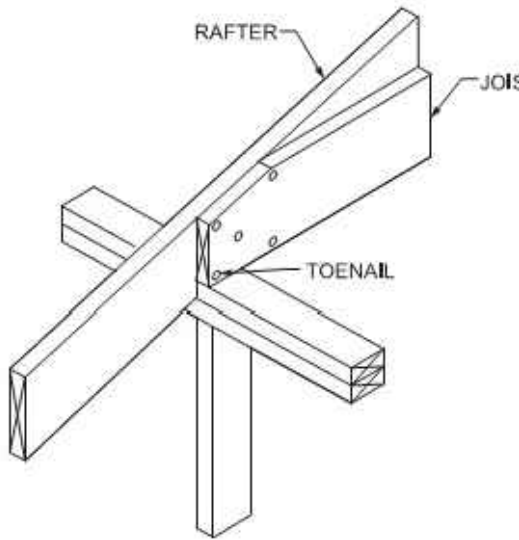
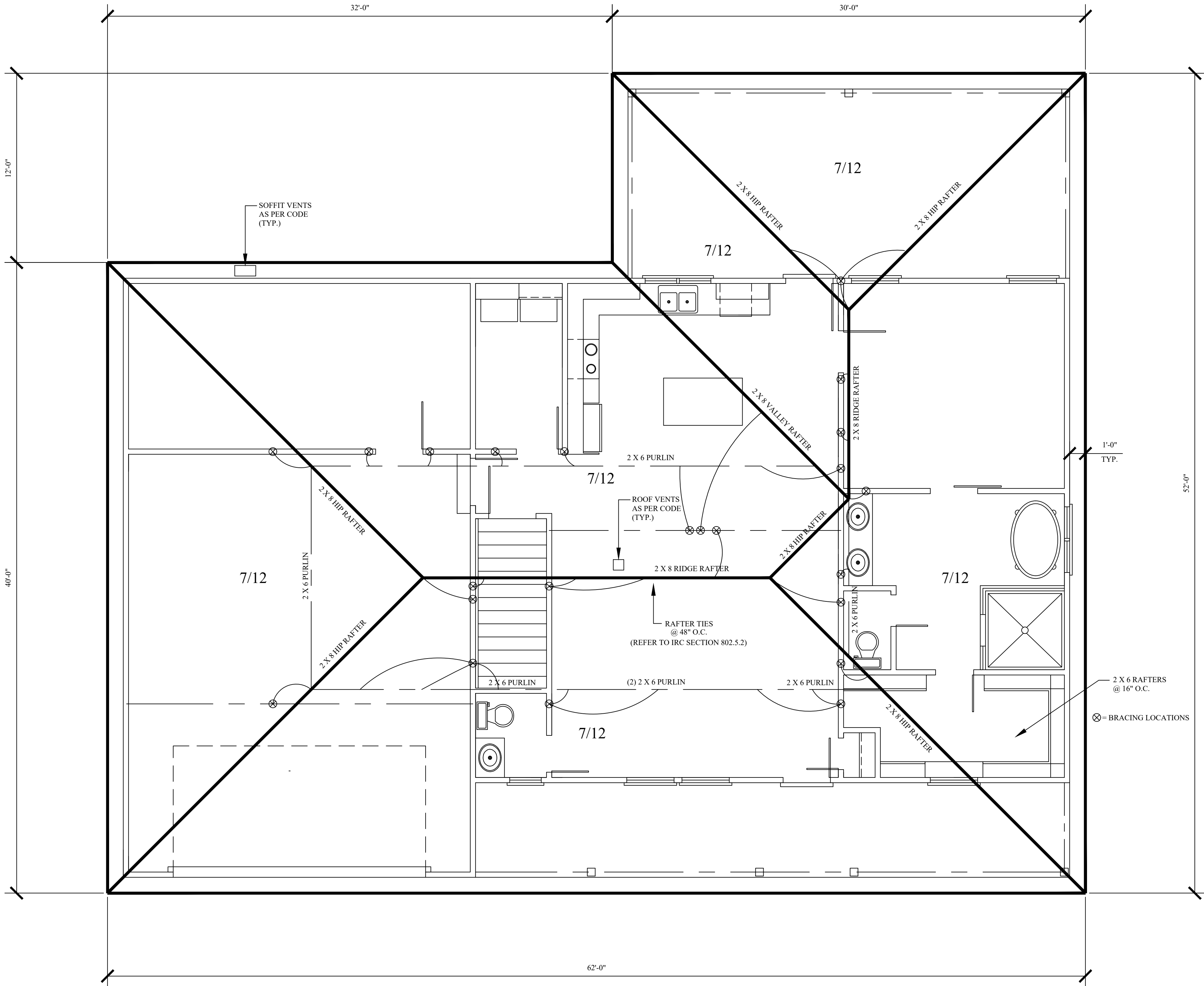
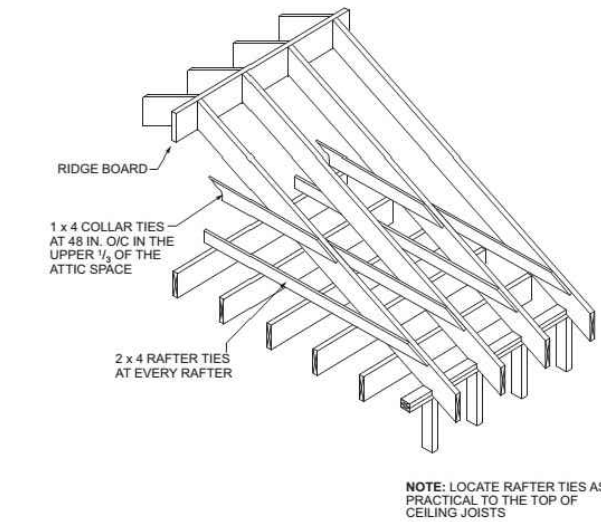


Figure R802.3.1(1) CEILING JOIST AT SUPPORTS



For S1: 1 inch = 25.4 mm.

Figure R802.3.1(2) ROOF FRAMING WITH CEILING JOISTS NOT PARALLEL TO RAFTERS

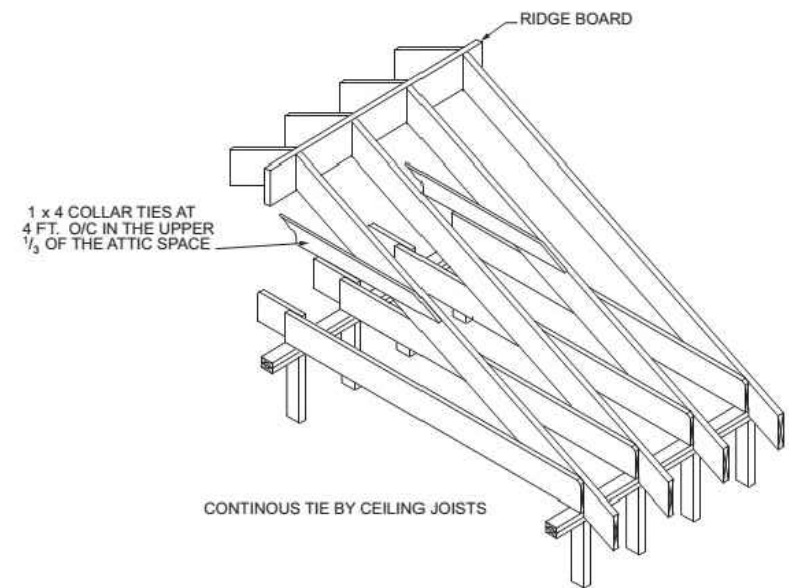


Figure R802.3.1(3) ROOF FRAMING WITH CEILING JOISTS PARALLEL TO RAFTERS

ROOF PLAN

1/4" = 1'-0"

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

NOTE: THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS STRUCTURE IS BUILT IN STRICT
COMPLIANCE WITH ALL GOVERNING CODES (COUNTY, STATE, & FED).
ALL CONSTRUCTION TO MEET 2018 IRC AND LOCAL BUILDING PRACTICES.
ANY DEVIATION FROM PLANS MUST BE APPROVED BY OWNER PRIOR TO EXECUTION.
FOLEY CAD SERVICES OR AFFILIATES OR ASSIGNS SHALL NOT BE LIABLE FOR STRUCTURAL DESIGN OR FUNCTION OF THESE HOUSE PLANS.

BUILDING ADDRESS: 1404 NE Ernest Way
Lees Summit MO 64086

FOLEY CAD SERVICES, LLC

PHONE: (816) 318-3973

"NOT A REGISTERED ARCHITECT"

PLAN: MEDLIN

DATE: 12/26/2023

PAGE: 4 OF 4