



Cumberland County Deck Guide

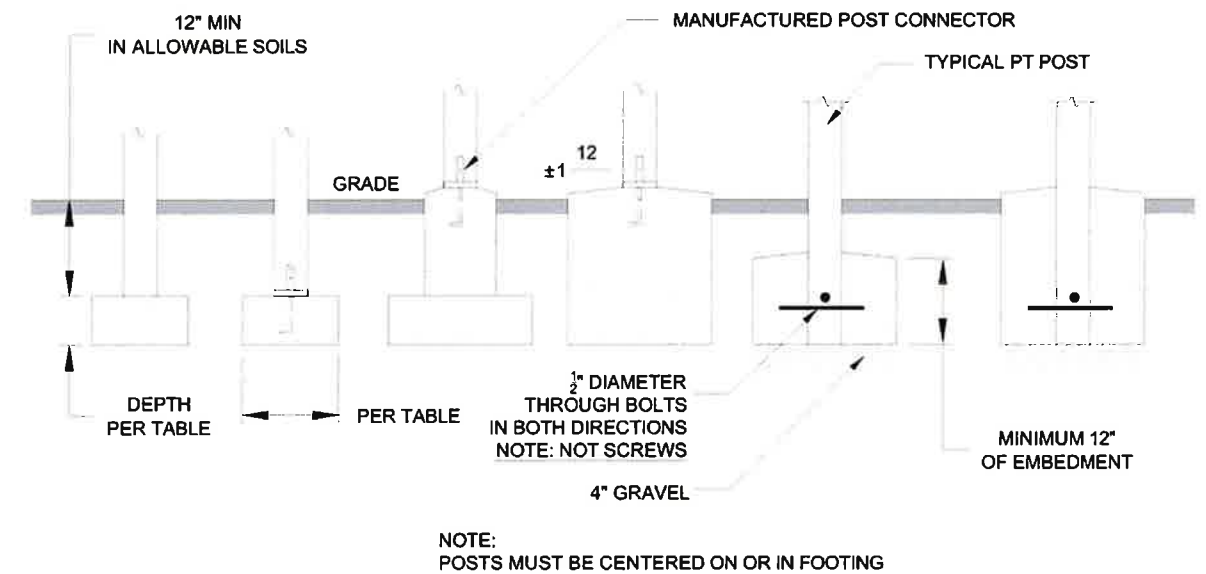
Cumberland County Department of Building Inspections has prepared this guide for basic decks, porches, stairs, and ramps. This guide is to help in planning and preparing before filing for a permit and does not include all construction methods or cover all code requirements. All information used in this guide is subject to plan review and site inspection. This guide is based of the 2018 Virginia Residential Code. All charts are based on Southern Yellow Pine at #2 grade. Cumberland County has a frost line depth of 18". A 40lb live load design on decks and a Ground Snow Load design category of 25psf for roof construction. Decks and porches are not to be attached to manufactured homes unless it's a modular.

Inspections Required

- Footing
- Framing
- Final

Footing, Framing, and Final can be inspected together if the solid precast blocks are used and the hole is left open and the deck is high enough off the ground to see underneath. (The precast blocks intended for post to slide in with slots are not allowed)

Footing Information



LIVE OR GROUND SNOW LOAD ^b (psf)	TRIBUTARY AREA (sq. ft.)	1500 ^c		
		Side of a square footing (Inches)	Diameter of a round footing (Inches)	Thickness (Inches)
40	20	12	14	6
	40	14	16	6
	60	17	19	6
	80	20	22	7
	100	22	25	8
	120	24	27	9
	140	26	29	10
	160	28	31	11

Minimum Beam Size

SPECIES ^c	SIZE ^d	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)							
		6	8	10	12	14	16	18	
Southern pine	1 - 2 × 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8	
	1 - 2 × 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5	
	1 - 2 × 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0	
	1 - 2 × 12	8-3	7-1	6-4	5-10	5-5	5-0	4-9	
	2 - 2 × 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0	
	2 - 2 × 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0	
	2 - 2 × 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0	
	2 - 2 × 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0	
	3 - 2 × 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0	
	3 - 2 × 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4	
	3 - 2 × 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6	
	3 - 2 × 12	15-3	13-3	11-10	10-9	10-0	9-4	8-10	

- This chart is for beams supporting deck joists from one side only
 - Beam size shall be the same or larger than joists

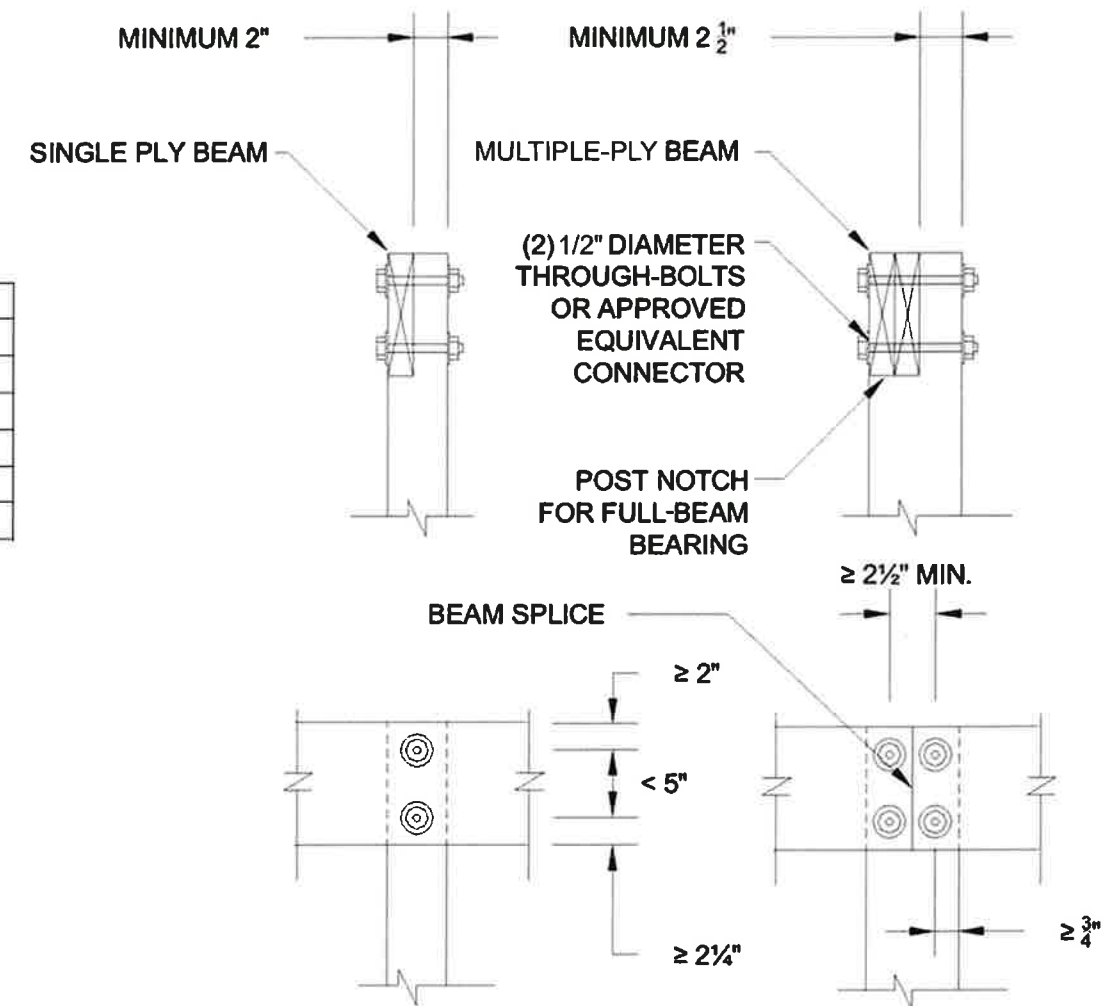
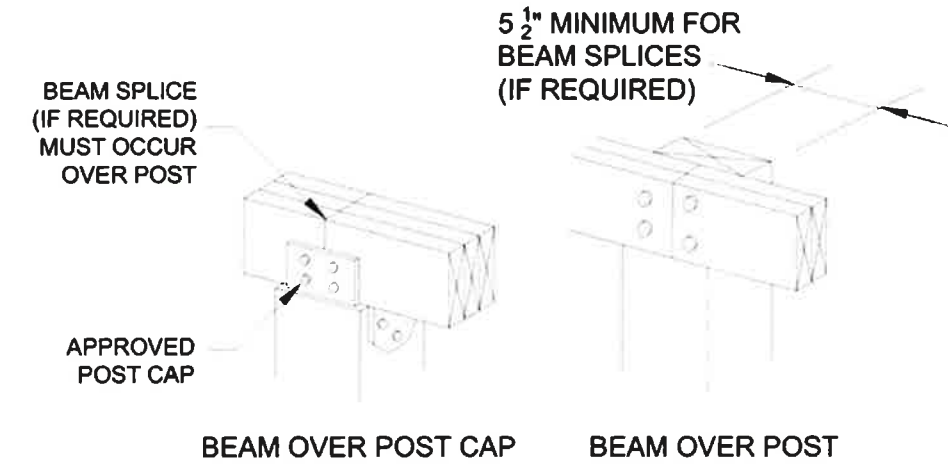
Maximum Joist Spans

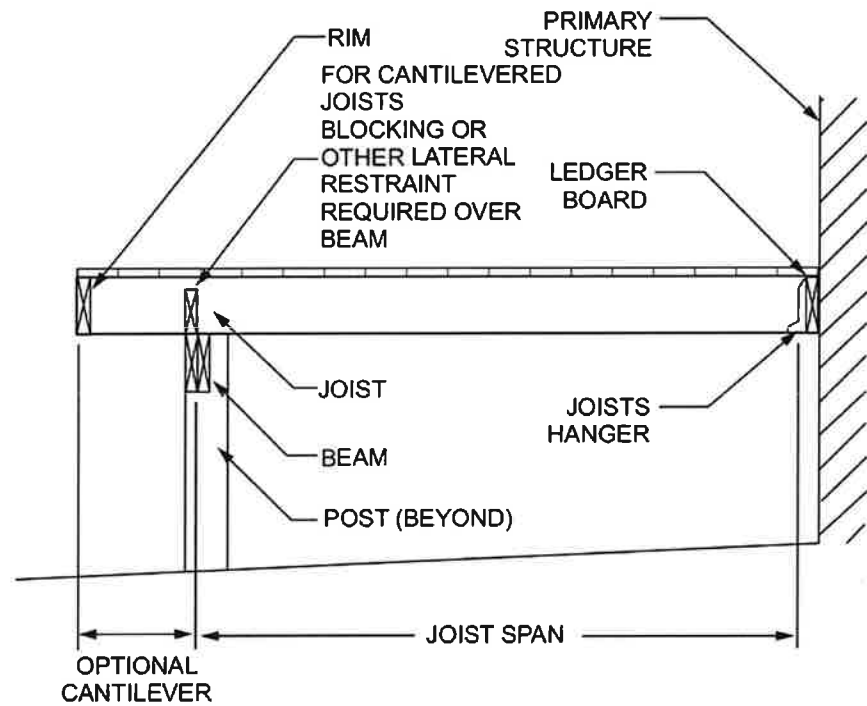
SPECIES ^a	SIZE	ALLOWABLE JOIST SPAN ^b			MAXIMUM CANTILEVER ^{c, f}		
		SPACING OF DECK JOISTS (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS ^c (inches)		
		12	16	24	12	16	24
Southern pine	2 × 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 × 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 × 10	16-2	14-0	11-5	3-4	3-6	2-10
	2 × 12	18-0	16-6	13-6	4-6	4-2	3-4

Deck Post height

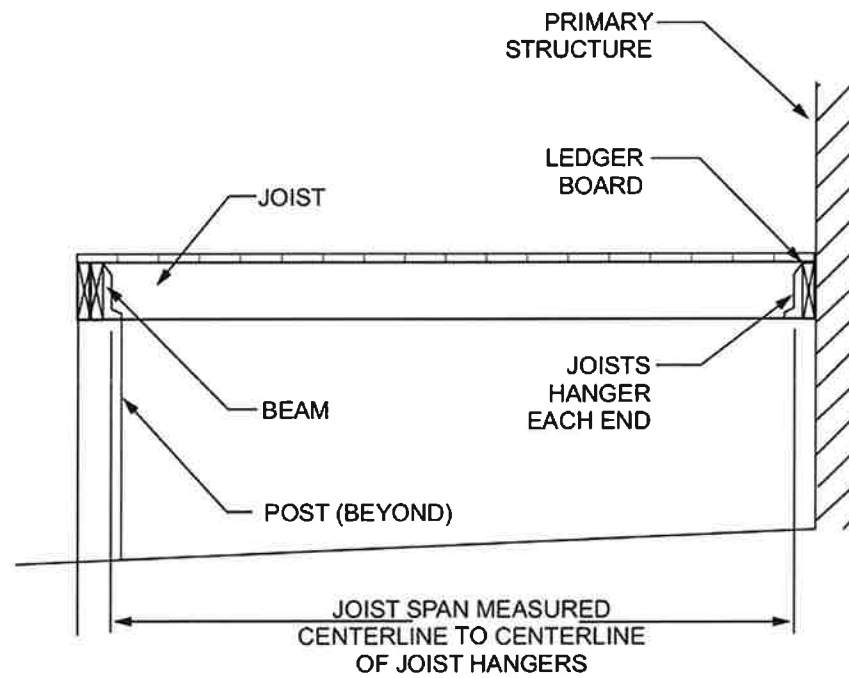
DECK POST SIZE	MAXIMUM HEIGHT ^{a, b} (feet-inches)
4 × 4	6-9 ^c
4 × 6	8
6 × 6	14
8 × 8	14

C = Maximum permitted height for one and two-ply beams is 8', for 3 ply beam on a post cap is 6'9"

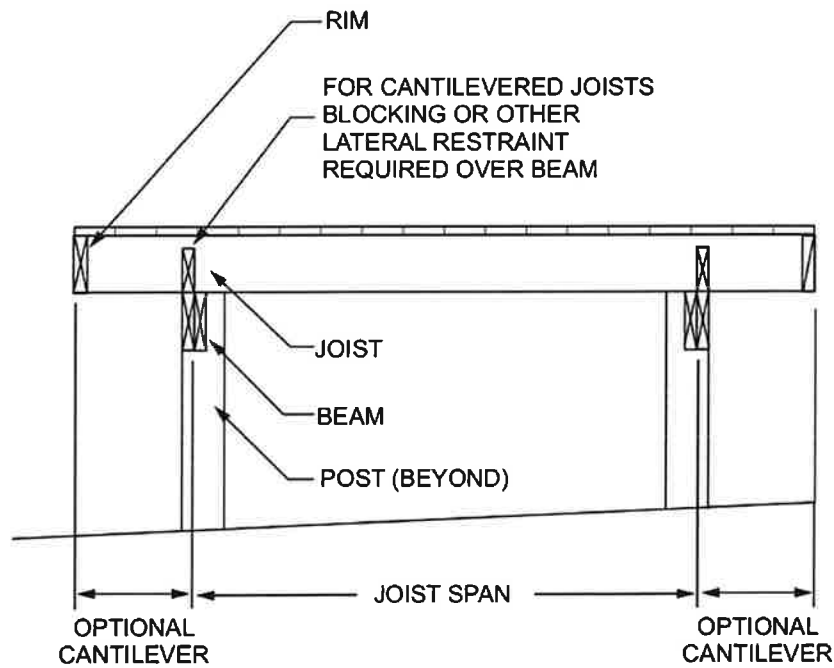




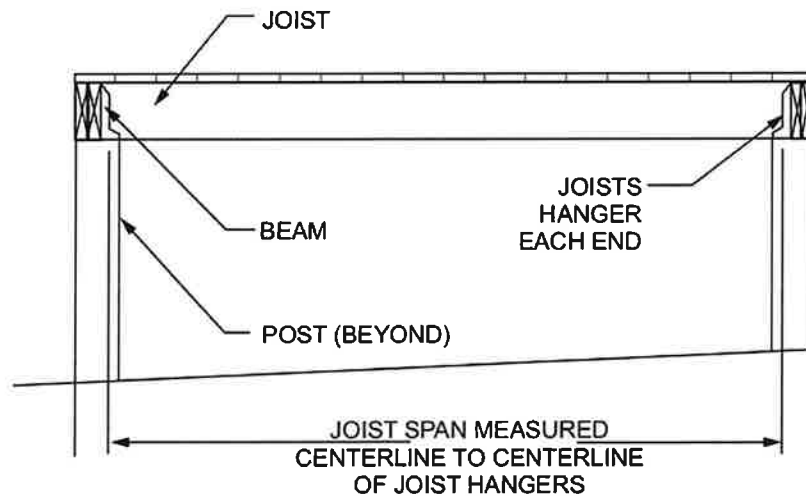
CANTILEVERED JOISTS WITH DROPPED BEAM



JOISTS WITH FLUSH BEAM



JOISTS ON FREE-STANDING DECK WITH DROPPED BEAM



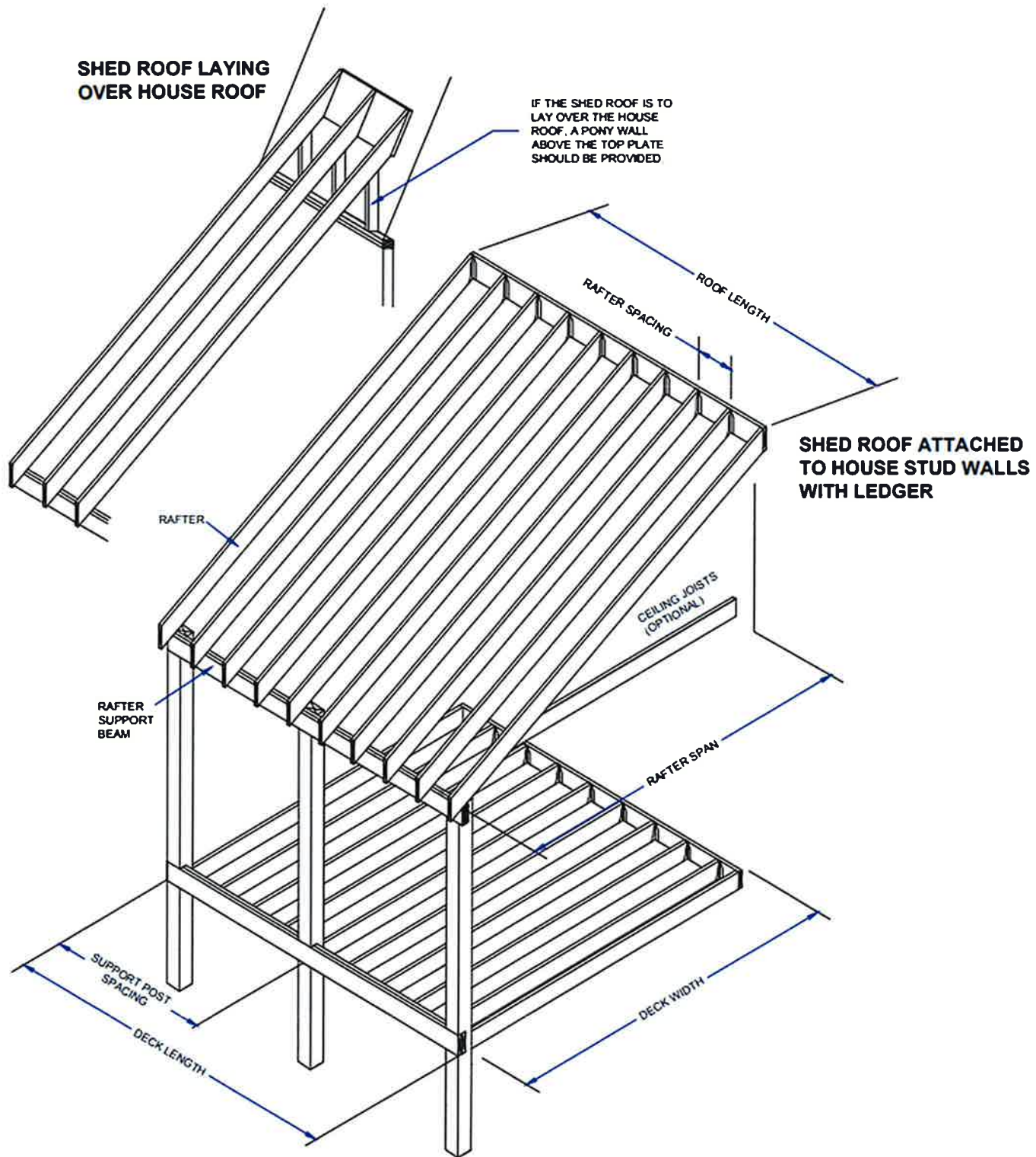
JOISTS ON FREE-STANDING DECK WITH FLUSH BEAM

Maximum Joist Spacing for Decking

1 ¼" thick boards 16" O.C. / 12" O.C. if diagonal joists

2" thick boards 24" O.C. / 16" O.C. if diagonal joists

Plastic composite needs to be in accordance with R507.2

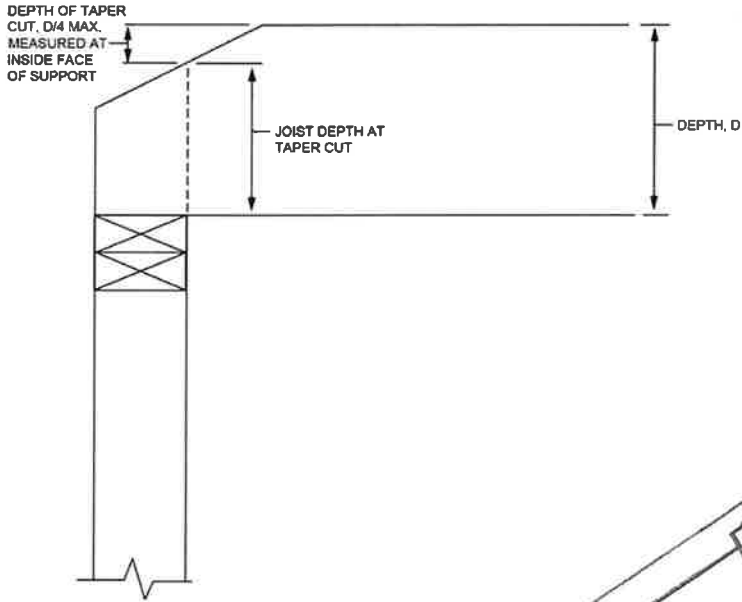
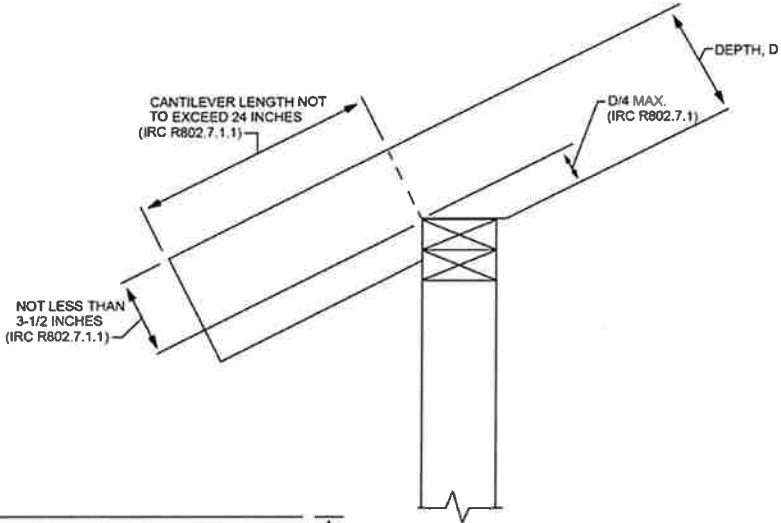


Minimum Rafter Spans	
2x4 – 8'0"	All rafter spans are based on #2 SYP, 16" O.C. @25psf snow load
2x6 – 12'3"	
2x8 – 15'7"	
2x10 – 18'5"	
2x12 – 21'10"	

MINIMUM RAFTER SUPPORT BEAM						
POST SPACING (FT)	RAFTER SPAN (FT)					
	6	8	10	12	14	16
4	(1) 2X6	(1) 2X6	(1) 2X6	(1) 2X6	(1) 2X6	(1) 2X8
5	(1) 2X6	(1) 2X6	(1) 2X6	(1) 2X6	(1) 2X8	(1) 2X8 or (2) 2x6
6	(1) 2X6	(1) 2X6	(1) 2X8	(1) 2X8 or (2) 2x6	(1) 2X8 or (2) 2x6	(1) 2X8 or (2) 2x6
7	(1) 2X6	(1) 2X8 or (2) 2x6	(1) 2X8 or (2) 2x6	(1) 2X10 or (2) 2x6	(1) 2X10 or (2) 2x8	(1) 2X12 or (2) 2x8
8	(1) 2X8 or (2) 2x6	(1) 2X8 or (2) 2x6	(1) 2X10 or (2) 2x6	(1) 2X12 or (2) 2x8	(1) 2X12 or (2) 2x8	(1) 2X12 or (2) 2x8
9	(1) 2X8 or (2) 2x6	(1) 2X10 or (2) 2x6	(1) 2X12 or (2) 2x8	(1) 2X12 or (2) 2x8	(2) 2x10	(2) 2X10
10	(2) 2X8	(2) 2x8	(2) 2x8	(2) 2X10	(2) 2X10	(2) 2X12
11	(2) 2x8	(2) 2x8	(2) 2X10	(2) 2X10	(2) 2X12	(2) 2X12
12	(2) 2x8	(2) 2x10	(2) 2X10	(2) 2X12	(2) 2X12	(3) 2X12

		Ceiling Joist Spans			
		DEAD LOAD = 10 psf			
		2 x 4	2 x 6	2 x 8	2 x 10
		Maximum ceiling joist spans			
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12" O.C.	Southern pine #1	9-10	15-6	20-5	24-0
	Southern pine #2	9-3	13-11	17-7	20-11
	Southern pine #3	7-2	10-6	13-3	16-1
16" O.C.	Southern pine #1	8-11	14-0	17-9	20-9
	Southern pine #2	8-0	12-0	15-3	18-1
	Southern pine #3	6-2	9-2	11-6	14-0

"A" Roof Diagram



If no ceiling joist are desired in the design a structural ridge must be used and sized by a professional. The ridge must post down to a footer/ outside wall to carry the roof load.

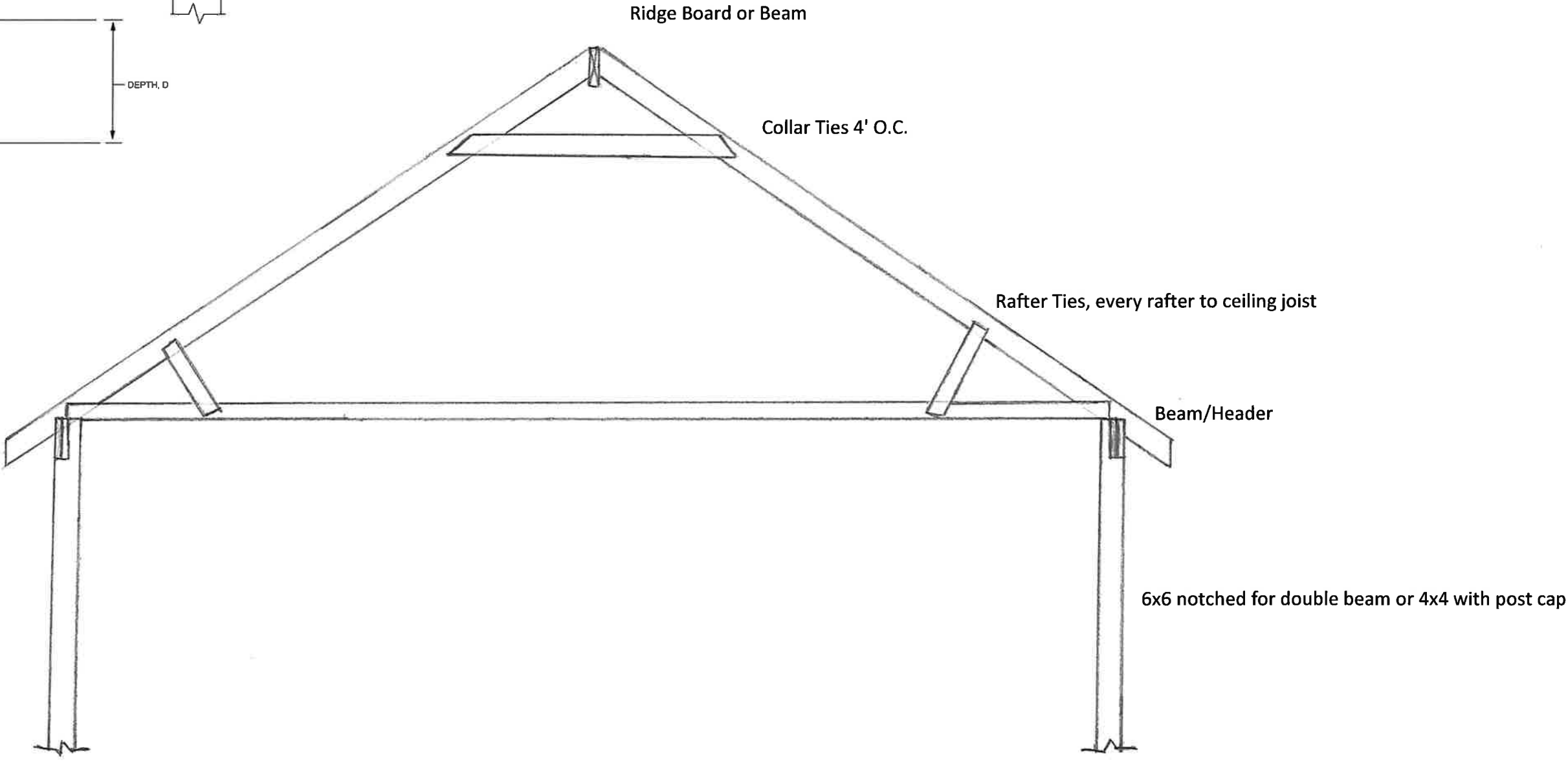


TABLE R507.9.1.3(1) DECK LEDGER CONNECTION TO BAND JOIST^{a, b} (Deck live load = 40 psf, deck dead load = 10 psf, snow load ≤ 40 psf)

CONNECTION DETAILS	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'
	On-center spacing of fasteners						
1/2-inch diameter lag screw with 1/2-inch maximum sheathing ^{c, d}	30	23	18	15	13	11	10
1/2-inch diameter bolt with 1/2-inch maximum sheathing ^d	36	36	34	29	24	21	19
1/2-inch diameter bolt with 1-inch maximum sheathing ^e	36	36	29	24	21	18	16

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

- a. Ledgers 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-inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

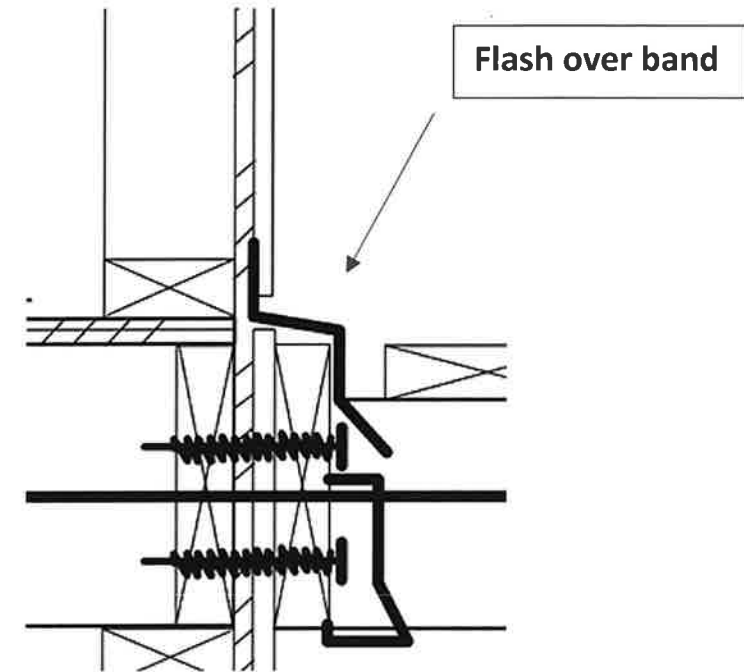
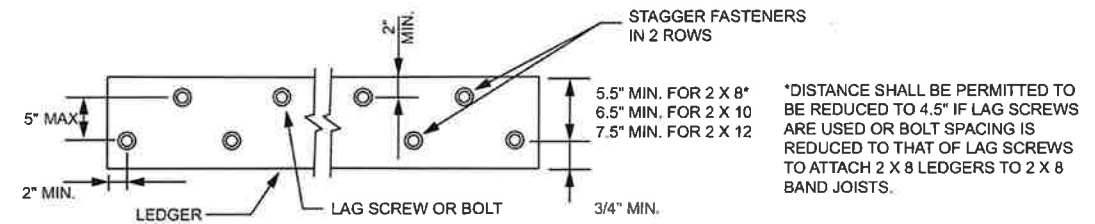


TABLE R507.9.1.3(2) PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

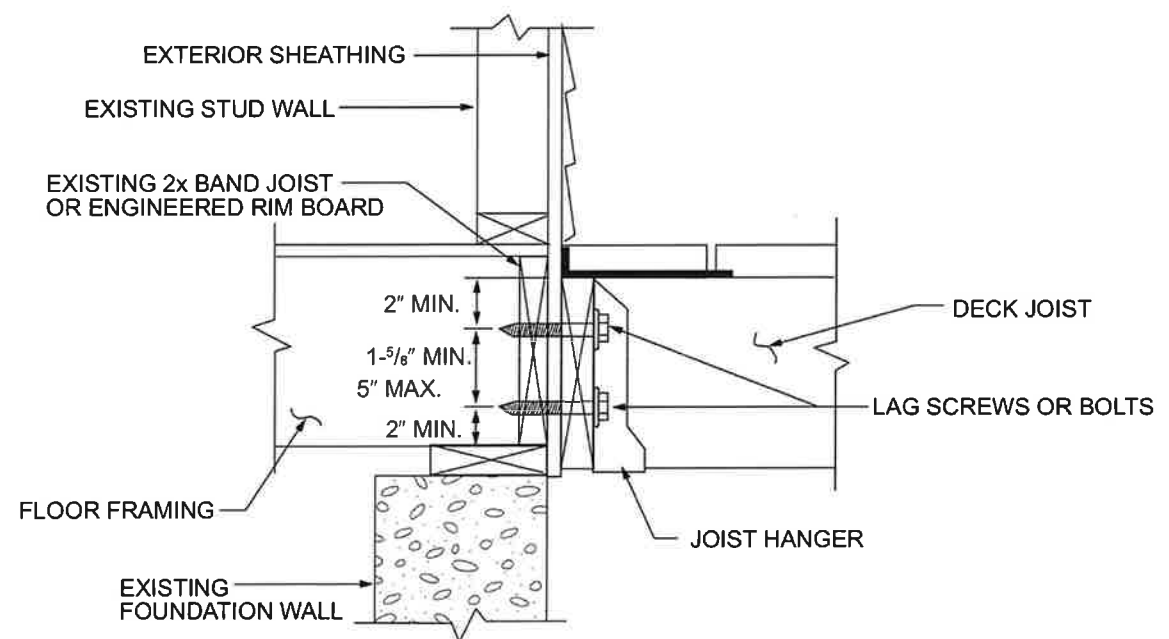
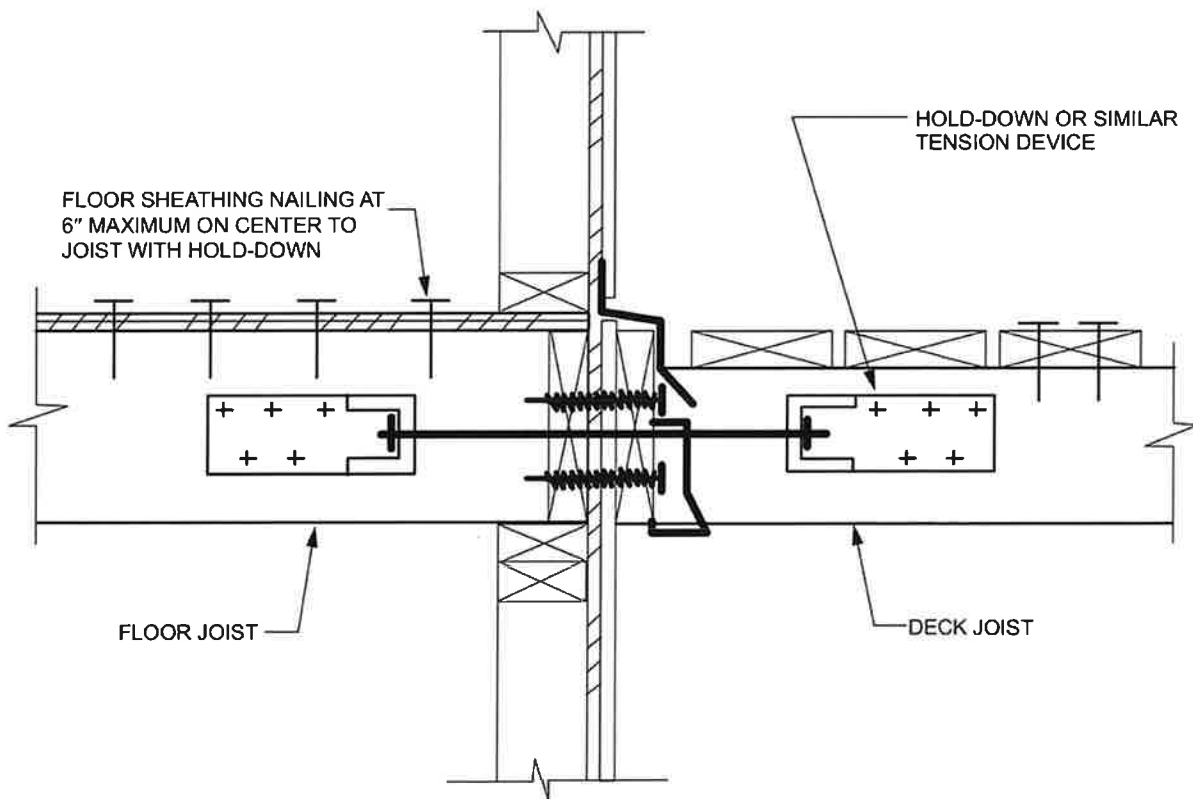
	MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS			
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger ^a	2 inches ^d	3/4 inch	2 inches ^b	1 5/8 inches ^b
Band Joist ^c	3/4 inch	2 inches	2 inches ^b	1 5/8 inches ^b

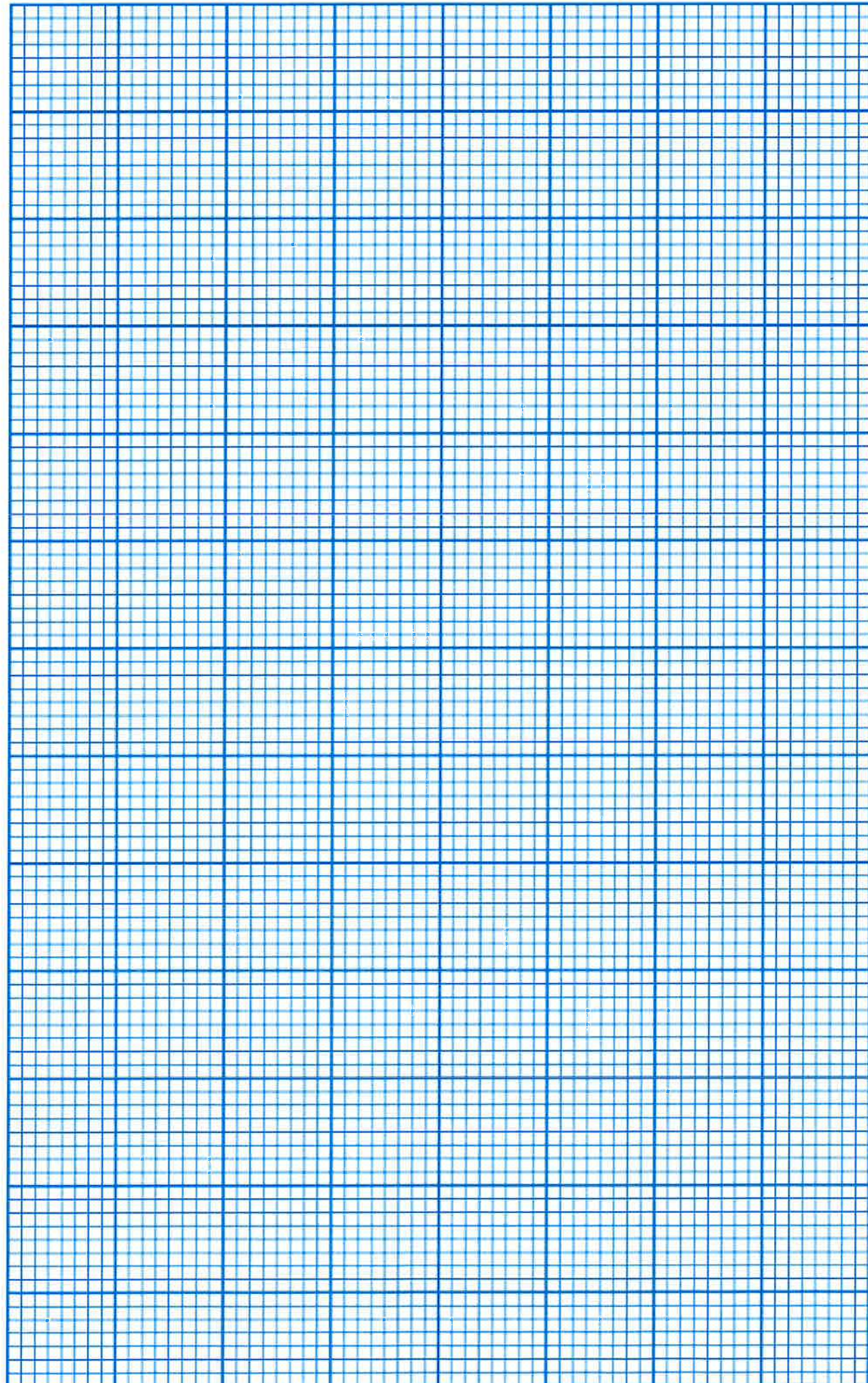
For SI: 1 inch = 25.4 mm.

- a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.9.1.3(1).
- b. Maximum 5 inches.
- c. For engineered rim joists, the manufacturer's recommendations shall govern.
- d. The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.9.1.3(1).



*DISTANCE SHALL BE PERMITTED TO BE REDUCED TO 4.5" IF LAG SCREWS ARE USED OR BOLT SPACING IS REDUCED TO THAT OF LAG SCREWS TO ATTACH 2 X 8 LEDGERS TO 2 X 8 BAND JOISTS.





DECK PLAN SPECIFICATIONS

Fill in all the blanks

OVERALL DIMENSIONS

LENGTH _____ FT
 WIDTH _____ FT
 MAX. HEIGHT ABOVE GRADE _____ FT

Example

10 FT
 8 FT
 3 FT

FREE STANDING _____ YES OR NO
 (i.e. minimum of 2 beams)

YES

CANTILEVERS _____ BEAMS _____ IN
 (0 means there is none) JOISTS _____ IN

24 IN
 0 IN

DECK POSTS

POST SIZE OR PIER SIZE _____ x _____ IN
 (see sheet 3)

6 x 6 IN

POST SPACING _____ FT O.C.

5 FT O.C.

FOOTINGS

FOOTING SIZE _____ x _____ x _____ IN

12 x 12 x 8 IN

FOOTING DEPTH (minimum 12" of backfill around post or mechanical fastener required) _____ IN

18 IN

NUMBER OF FOOTINGS _____ TOTAL

6 TOTAL

BEAMS

BEAM SIZE (_____) 2 x _____

(2) 2 x 8

JOISTS

JOIST SIZE 2 x _____ @ _____ IN O.C.

2 x 8 @ 16" O.C.

DECKING

DECKING BOARD SIZE _____
 2X6, 5/8" BOARDS OR OTHER

5/8" BOARDS

PORCH (ROOF) SPECIFICATIONS

IF APPLICABLE - Fill in all the blanks

ARE YOU CONSTRUCTING A PORCH ON NEW FOOTINGS?

_____ YES _____ NO

ARE YOU ADDING A ROOF TO AN EXISTING DECK?

_____ YES _____ NO

PORCH (ROOF) SPECIFICATIONS

(IF APPLICABLE)

PORCH ROOF SIZE BEING BUILT

ROOF LENGTH _____ FT

ROOF SPAN _____ FT

ROOF SLOPE _____ : _____ (example 4:12)

ROOF SUPPORT POSTS

POST SIZE _____ X _____

POST SPACING _____ FT

RAFTER SUPPORT BEAM

SIZE (_____) _____ X _____

RAFTERS

SIZE 2 x _____ @ _____ IN O.C.