



Deck Construction Guidelines

Community Development Department - Construction Permits and Inspection Services
215 Sycamore St Muscatine, IA 52761 - PH 563.262.4141 - FAX 563.262.4142
www.muscatineiowa.gov/26/Community-Development

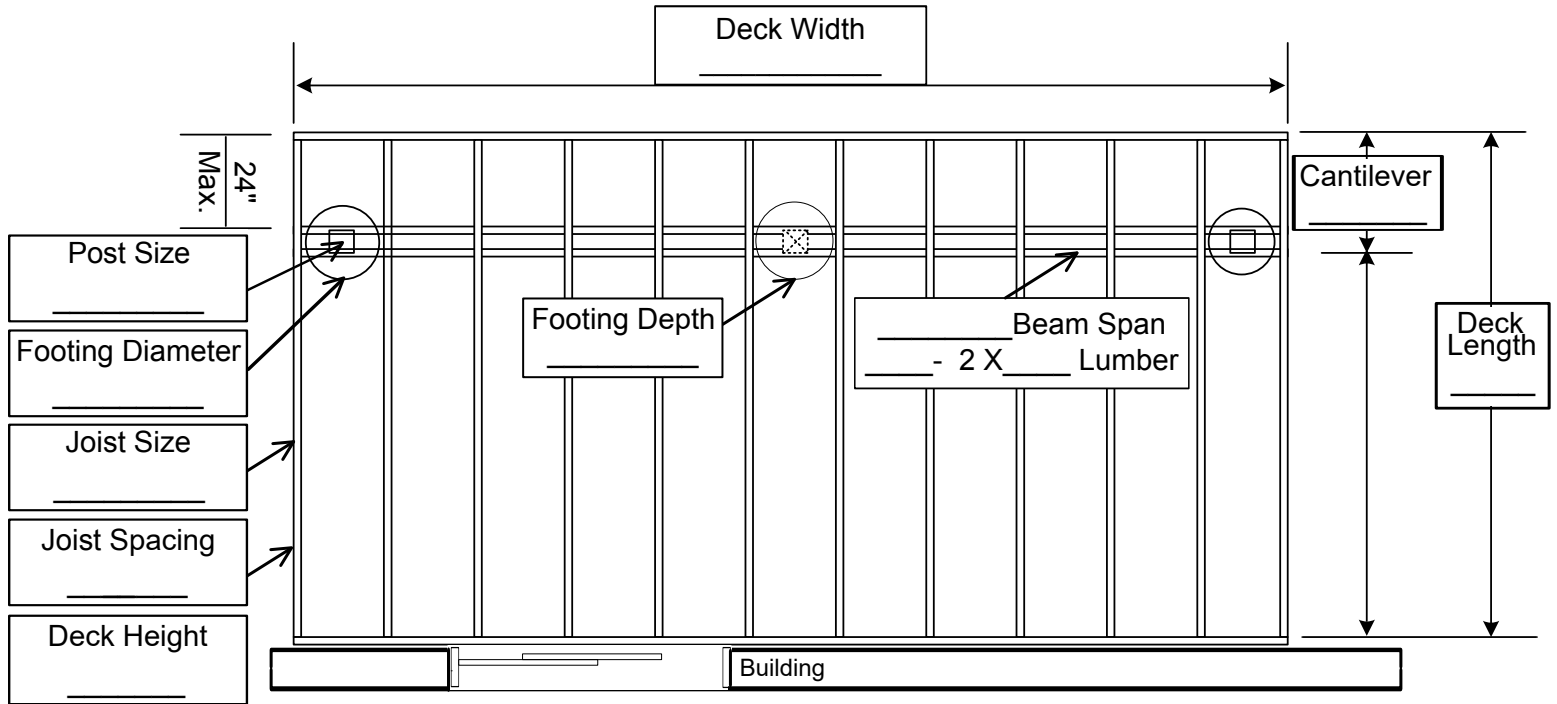
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Page 1 of 8

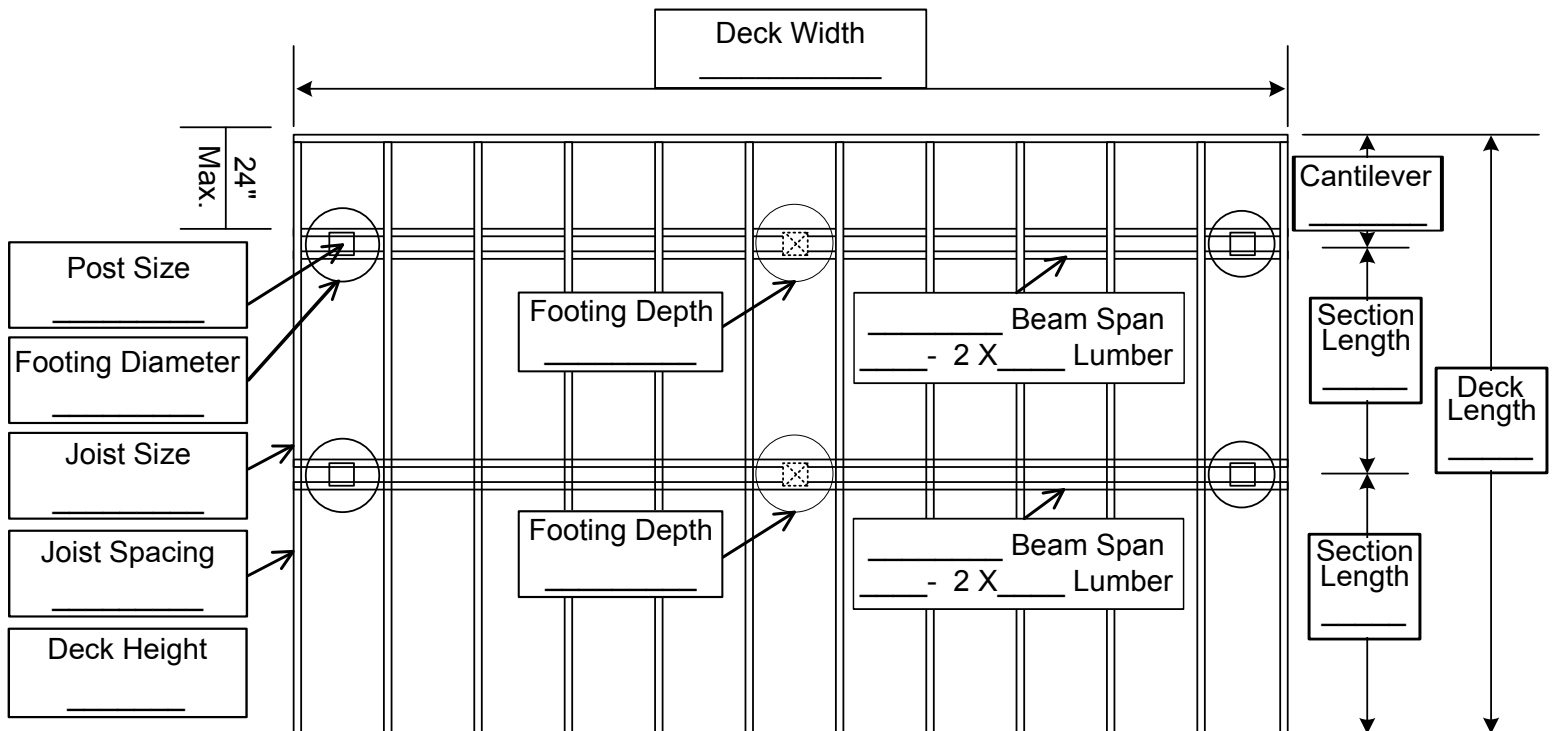
Simple Deck Plan View

All lumber shall be approved pressure treated to .40 retention or naturally resistant to decay (cedar/redwood)

Fill in boxes with dimensions and sizes



Use the below Deck Plan View for free standing decks or larger decks that require multiple beams.





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www.muscatineiowa.gov/26/Community-Development

2015 International Residential Code

Page 2 of 8

Deck Span and Spacing Requirements

TABLE R507.5 — DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft.-in.)

SPECIES	SIZE	SPACING OF DECK JOISTS WITH NO CANTILEVER			SPACING OF DECK JOISTS WITH CANTILEVERS		
		12	16	24	12	16	24
Southern Pine	2 x 6	9-11	9-0	7-7	6-8	6-8	6-8
	2 x 8	13-1	11-10	9-8	10-1	10-1	9-8
	2 x 10	16-2	14-0	11-5	14-6	14-0	11-5
	2 x 12	18-0	16-6	13-6	18-0	16-6	13-6
Spruce-Pine-Fir	2 x 6	9-6	8-8	7-2	6-3	6-3	6-3
	2 x 8	12-6	11-1	9-1	9-5	9-5	9-1
	2 x 10	15-8	13-7	11-1	13-7	13-7	11-1
	2 x 12	18-0	15-9	12-10	18-0	15-9	12-10

TABLE R507.6 — DECK BEAM SPAN LENGTHS (ft.-in.)

SPECIES	SIZE	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern Pine	2 - 2 x 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2 - 2 x 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2 - 2 x 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2 - 2 x 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3 - 2 x 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 - 2 x 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3 - 2 x 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3 - 2 x 12	15-3	13-3	11-10	10-9	10-0	9-4	8-10
Spruce-Pine-Fir	3 x 6 or 2 - 2 x 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 x 8 or 2 - 2 x 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 x 10 or 2 - 2 x 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 x 12 or 2 - 2 x 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 x 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 x 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 x 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 x 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 - 2 x 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 - 2 x 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3 - 2 x 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 - 2 x 12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

TABLE R507.4 — MAXIMUM JOIST SPACING

MATERIAL TYPE AND NOMINAL SIZE	MAXIMUM ON-CENTER JOIST SPACING	
	Perpendicular to joist	Diagonal to joist
1 1/4 inch-thick wood	16 inches	12 inches
2 inch-thick wood	24 inches	16 inches
Plastic composite	In accordance with Section R507.3	In accordance with Section R507.3



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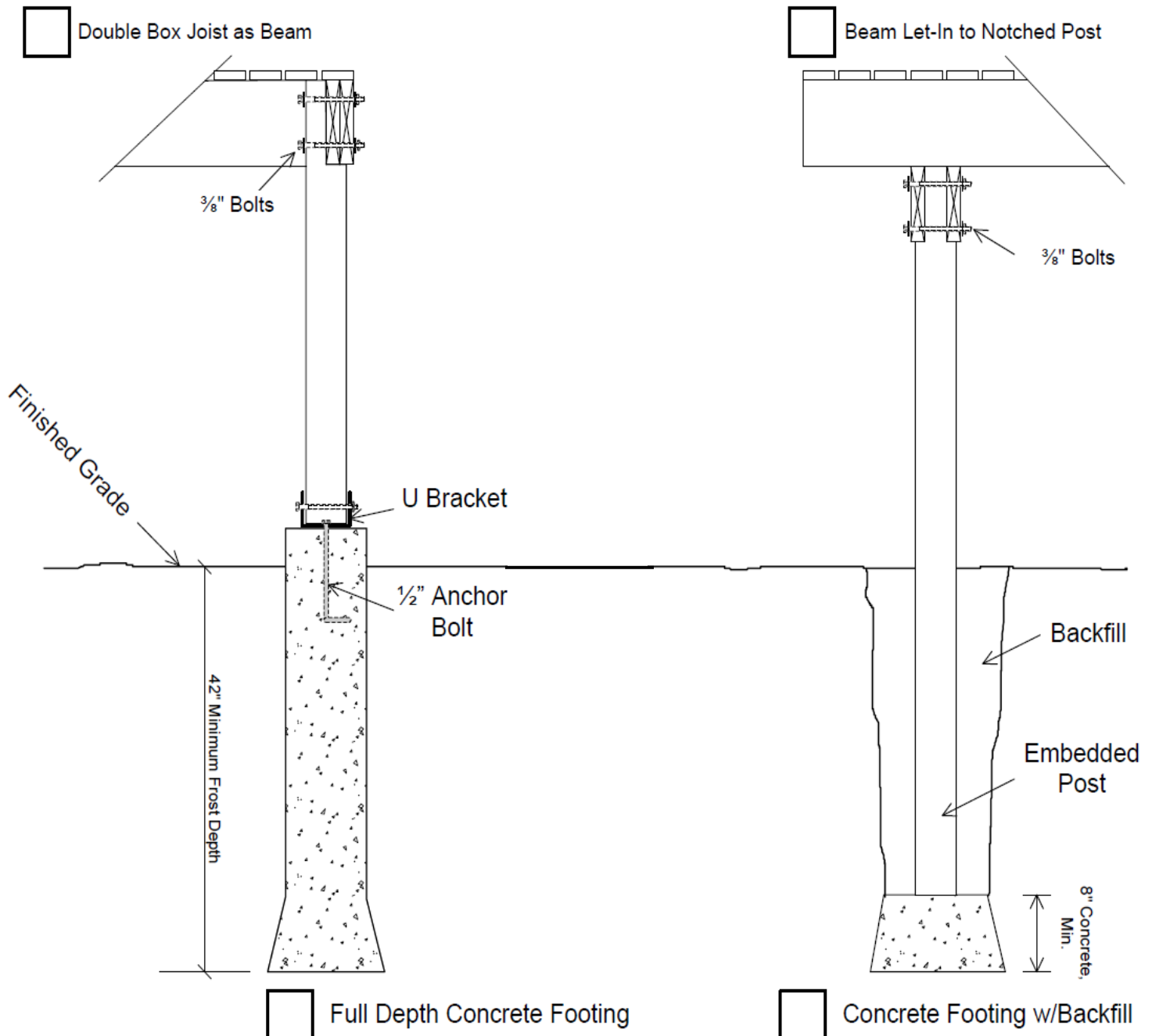
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2015 International Residential Code

Page 3 of 8

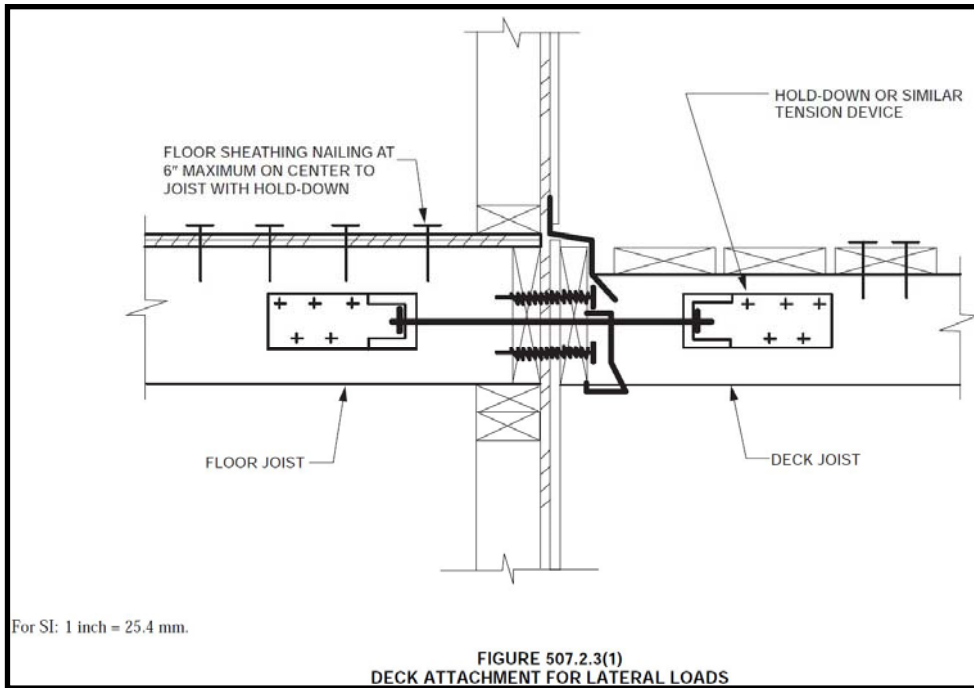
Deck Section Drawings — Footing, Post, and Beam Details:

- Check beam construction for this deck.
- Check footing design for this deck.



All lumber shall be approved pressure treated to .40 retention or naturally resistant to decay (cedar/redwood).

Ledger Board, Joist Hangers, and Flashing



Fasten the ledger board to the framing of the house or the foundation.

- Too often decks are nailed or bolted to whatever looks sturdy. Take the time to investigate and find where the band/rim joist is for the floor system. **Deck ledgers shall be bolted to the rim joist as required by Table R507.2.**
- Flash ledger board to keep water from seeping behind the ledger and infiltrating the wall.
- **Approved corrosion resistant joist hangers, nails, brackets, and uplift clips shall be used.**

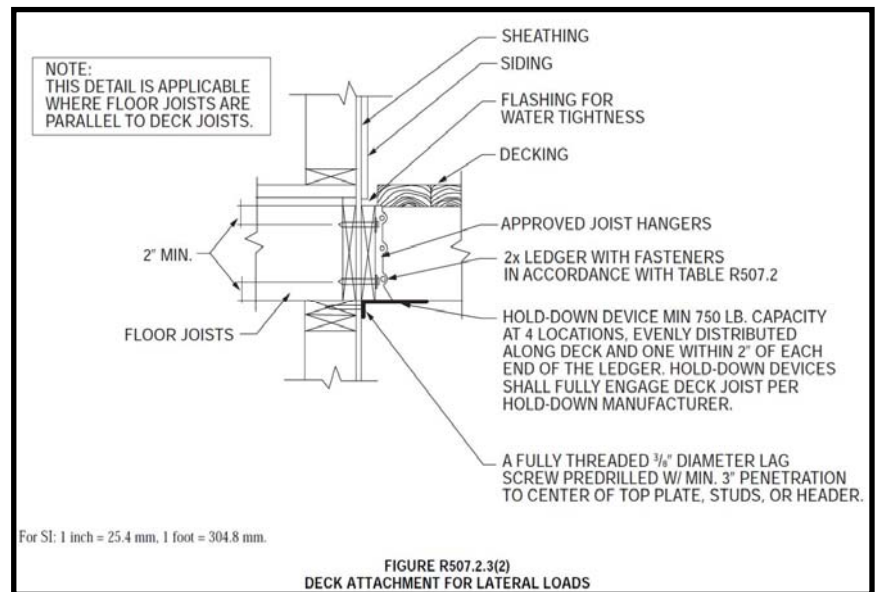


TABLE R507.2
DECK LEDGER CONNECTION TO BAND JOIST^{a, b}
(Deck live load = 40 psf, deck dead load = 10 psf, snow load ≤ 40 psf)

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.



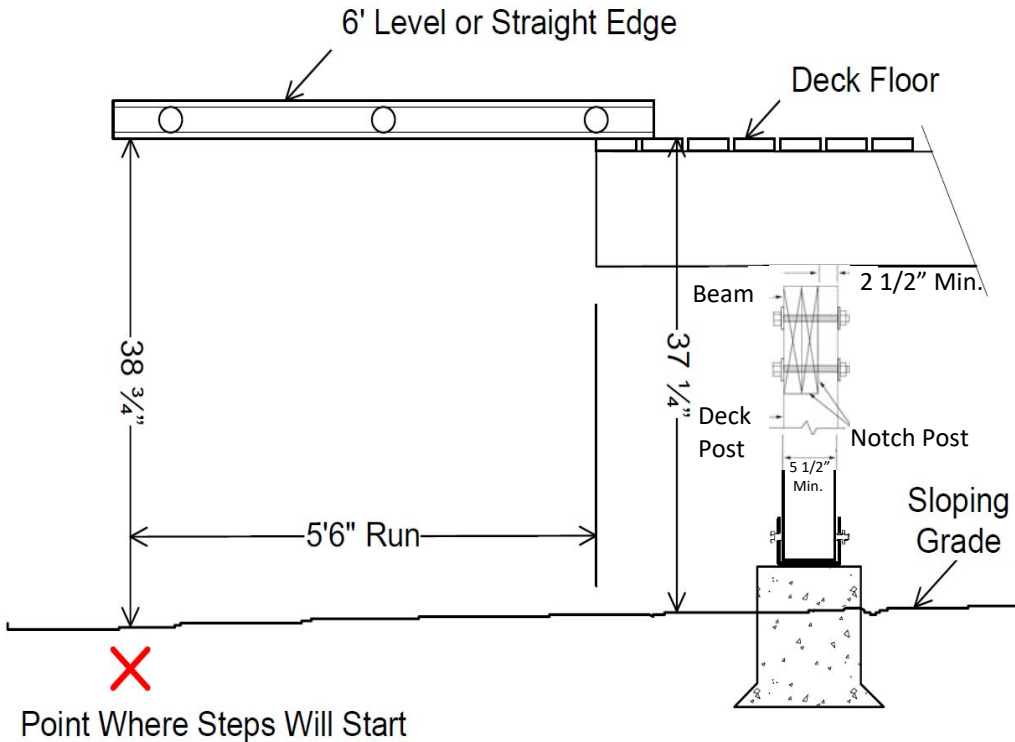
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2015 International Residential Code

Page 5 of 8

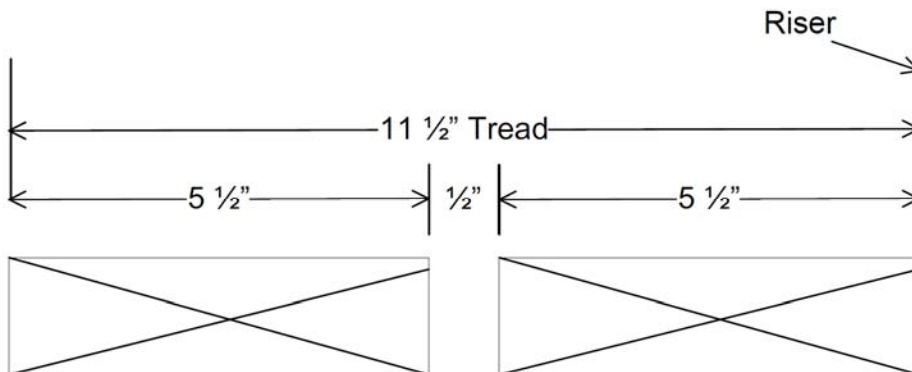
Stairs, Guardrails, and Handrails



Determine total rise at point where steps will start, not at the deck. In this example, 5 steps would get a total rise of 38 3/4" (7 3/4" is the max riser, so $5 \times 7 \frac{3}{4} = 38 \frac{3}{4}$ total rise). Commercial steps cannot exceed 7" in rise; therefore, a 38 3/4" total rise would require 6 risers ($38 \frac{3}{4} / 6 = 6.45$ or approximately 6-7/16" per rise). See table to convert decimals to fractions.

Table

.06" = 1/16"	.56" = 9/16
.13" = 1/8"	.63" = 5/8"
.19" = 3/16"	.69" = 11/16"
.25" = 1/4"	.75" = 3/4"
.31" = 5/16"	.81" = 13/16"
.38" = 3/8"	.88" = 7/8"
.44" = 7/16"	.94" = 15/16"
.50" = 1/2"	



Know what you want to use for tread material & determine your run.

Remember that minimum residential run is 10"; minimum commercial run is 11".

Note:

- Risers will be equal in size to within 3/8"
- There is always one less run total than required risers



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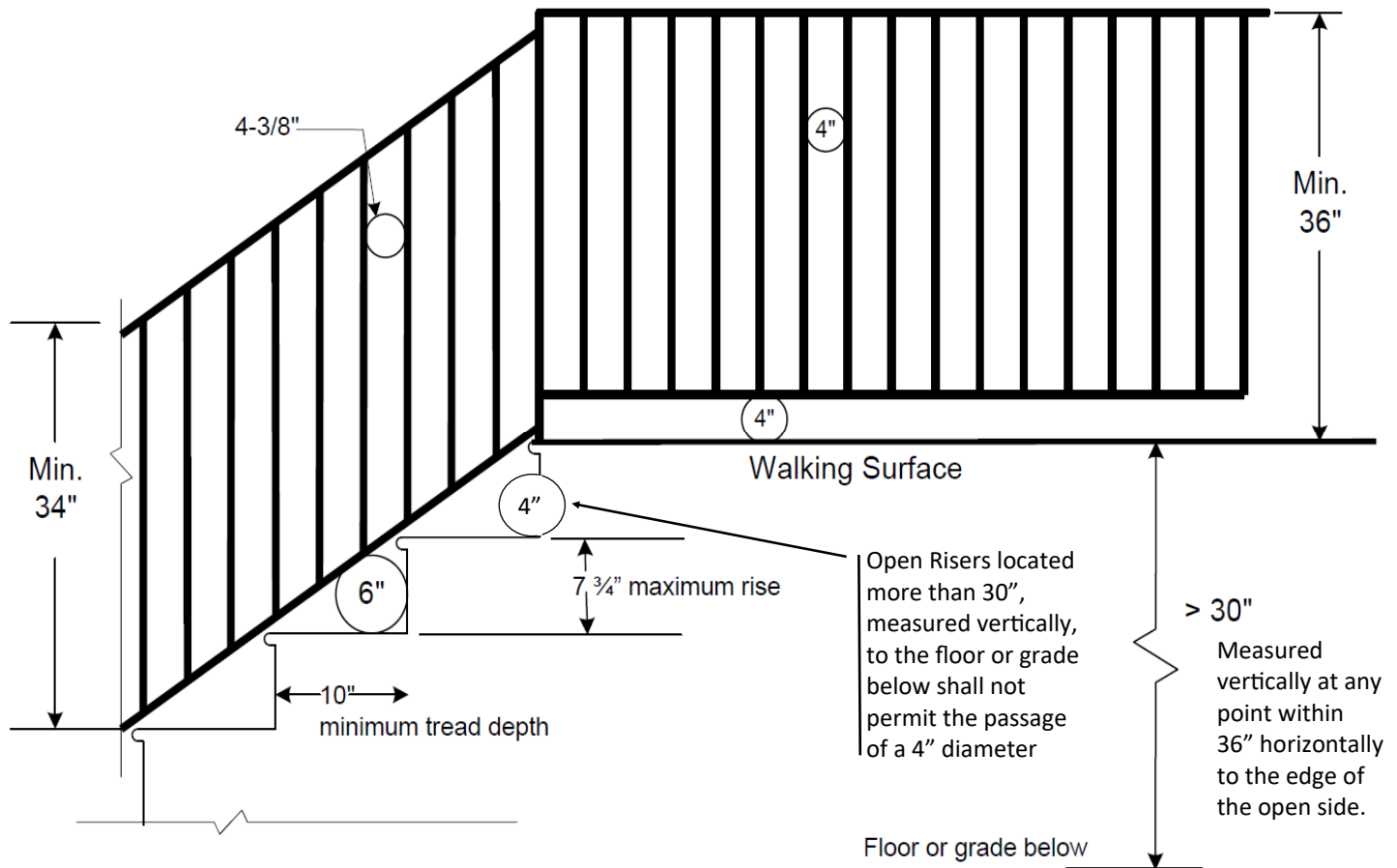
Page 6 of 8

Guardrails are required at unenclosed floor openings and open sides of stairways, landings, ramps, porches and decks which are more than 30 inches above grade or the floor below. Minimum guardrail height is 36". Intermediate rails shall be spaced so that a 4" sphere cannot pass through.

Stairs shall have a maximum rise of 7 $\frac{3}{4}$ ", minimum net tread of 10", minimum width of 36" and minimum headroom height of 6'8".

Open Risers located more than 30", measured vertically, to the floor or grade below shall not permit the passage of a 4" diameter sphere.

Handrails are required on one side of any stairway having four or more risers. Handrails shall be 34" – 38" above the nose of the tread, have a graspable shape with a cross section dimension of 1 $\frac{1}{4}$ " minimum to 2 $\frac{5}{8}$ " maximum and be **continuous** throughout the flight. Continuous means the handrail is not interrupted by a newel post or other obstruction for the entire flight of stairs.





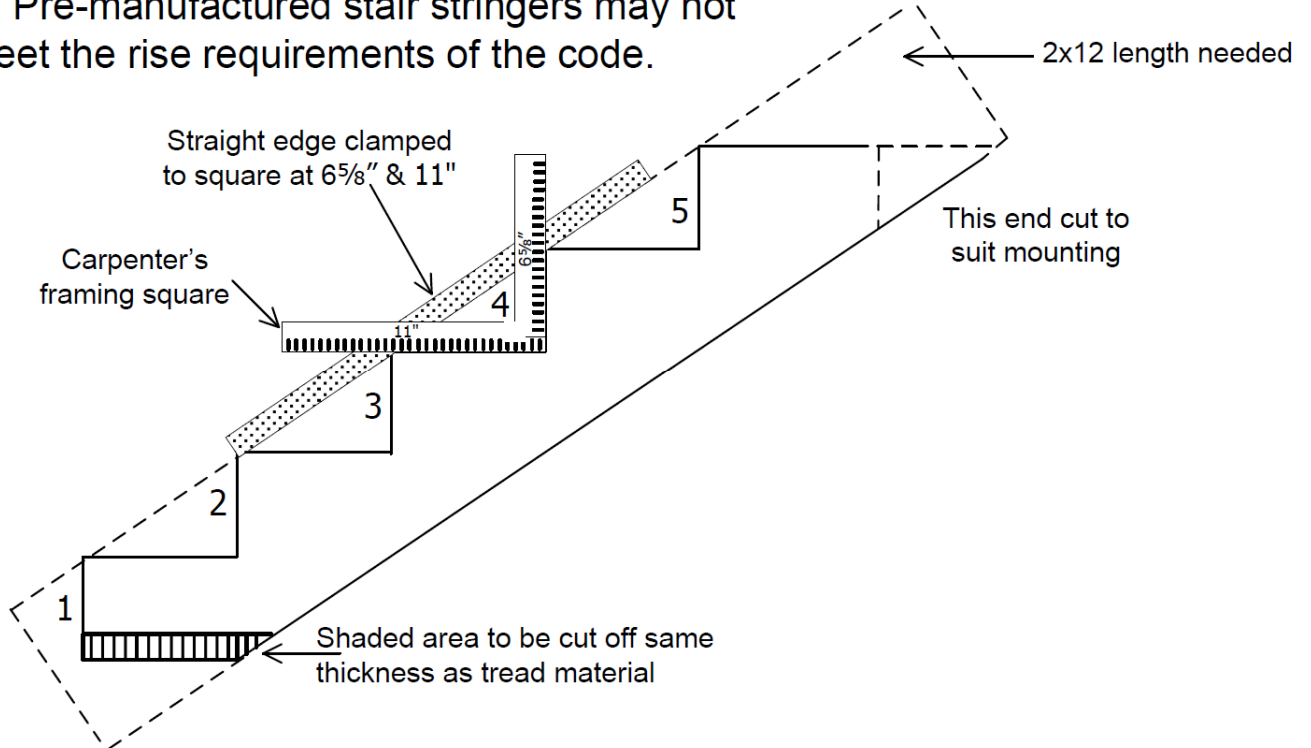
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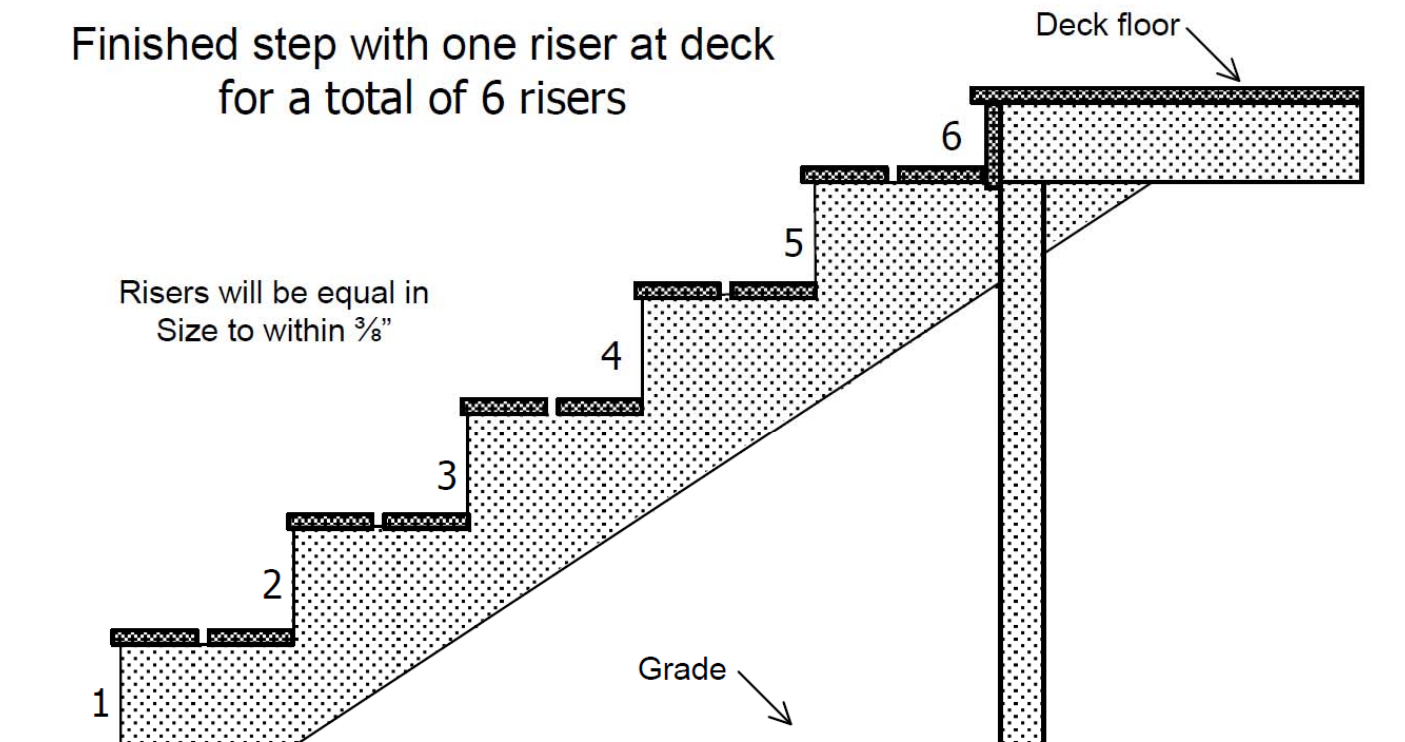
2015 International Residential Code

Page 7 of 8

NOTE: Pre-manufactured stair stringers may not meet the rise requirements of the code.



Finished step with one riser at deck
for a total of 6 risers



Handrails & guardrails required but omitted for clarity



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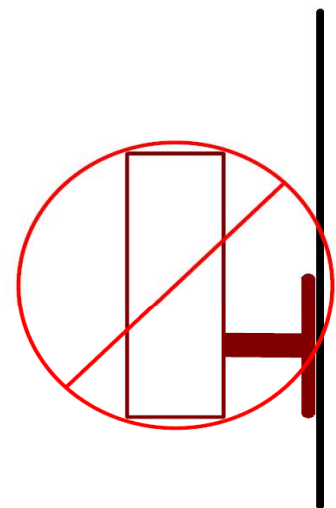
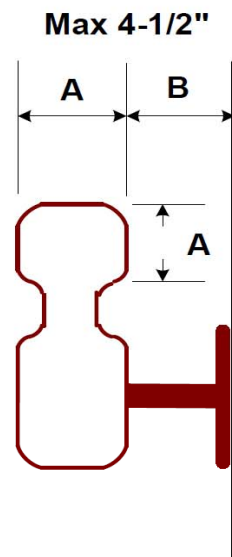
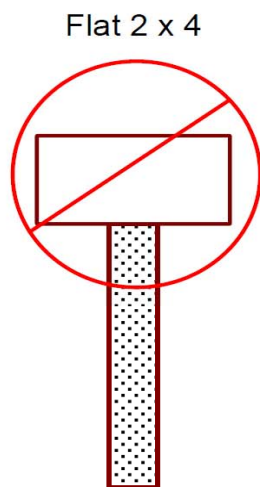
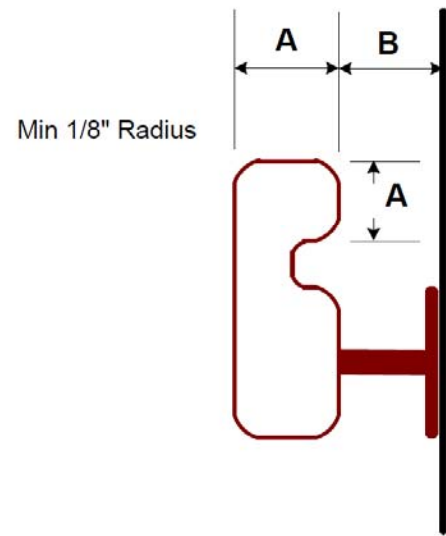
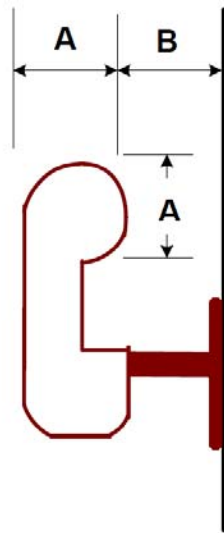
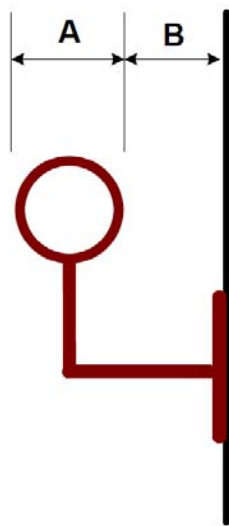
Page 8 of 8

Residential stairs require a handrail on one side. The handrail must be an approved shape for grasping while walking up or down the stairs. Handrails must also be continuous. Continuous means the handrail is not interrupted by a newel post or other obstruction for the entire flight of stairs.

Handrail mounting height is 34" - 38" measured vertically from the nose of the tread to the top of the rail.

A = 1 1/4" to 2 5/8"

B = 1 1/2" Minimum



Other shapes may be acceptable if they provide equivalent gripping surface.