

Building permits are required for decks in the City of Watertown.

SUBMITTALS REQUIRED FOR PERMIT

- ☐ [Building Permit Application](#)
- ☐ Survey or an accurate, dimensioned Site Plan showing the proposed deck.
- ☐ Construction plans showing proposed designs and materials.

Drawings should be drawn to scale and include:

- **Site Plan** – showing lot dimensions and locations of existing and proposed structure(s)
- **Standard plate deck plan**- providing deck and stair locations and dimensions; lumber type; size and spacing of footings, posts, beams, joists, headers, decking, guardrails and handrails

rear or side views showing the deck height from grade; diameter and depth of footings; guardrail height and spacing of intermediate rails; and rise and run of stairs

ZONING SETBACKS AND LOCATIONS

Decks must not be installed in or over drainage, utility and other public easements.
The Zoning Code requires decks to follow the same setbacks as the primary structure:

ZONING DISTRICT ¹	Yard Setbacks			
	Front	Side Fronting on a Public Street	Side	Rear ²
R-1	25'	25'	9'	25'
R-2	25'	25'	7'	25'
R-3	30'	30'	9'	25'
R-4	25'	25'	6'	15'
PUD <i>Planned Unit Development</i>	Varies by PUD	Varies by PUD	Varies by PUD	Varies by PUD
<p><i>Notes:</i></p> <p>¹ Set backs may vary based on lot width and number of stories of a structure, please reference title 21 of City of Watertown Ordinance (21.1001 . sections A-j and 21.1002. sections A-j)</p>				

BUILDING CODE REQUIREMENTS

INSPECTIONS:

The following inspections must be requested during construction:

- **Footing Inspection** – Prior to placement of concrete.
- **Framing** – Prior to concealing ledgers, joists and structural connections.
- **Final** – Upon completion of the deck.

Please call (605) 882 – 6201 to schedule an inspection. Please have your address and permit number available.

FOOTINGS:

Where attached to or serving a building with a frost foundation, deck footings must extend at least 48" below grade or provide equal resistance to frost heave. Freestanding decks may be constructed without frost resistant foundations. The base of the footings must provide sufficient load bearing area – typically 12" to 24" in diameter. For a single level deck, the total of all loads are at least 50 lbs. per square foot of deck. Distribution of those loads to the footings must be determined. If the deck may be converted to a porch, then additional loads must be considered in sizing footings – Consult with the Community Development Division.

LOAD-BEARING VALUES OF UNDISTURBED SOILS

CLASS OF MATERIAL	LOAD-BEARING CAPACITY (lbs. per square foot)
Sandy gravel and/or gravel	3,000
Sand, silty sand, clayey sand, silty gravel and clayey gravel	2,000
Clay, sandy clay, silty clay, clayey silt, silt and sandy silt	1,500

LUMBER & CONSTRUCTION:

Lumber exposed to weather or soil must be naturally resistant or treated to resist rot. Wood that is to be used underground must be pressure-preservative treated (.60 AC2 or *approved equal*). Where treated lumber is cut or drilled, the exposed surface must be thoroughly field treated with a wood preservative containing copper naphthenate – available at most home improvement and paint stores.

The wood structural members for decks must be designed to support a total load of at least 50 pounds per square foot (*see attached chart for lumber sizing*). Wood decking must be at least 1 ¼" in thickness for floor joists spaced 24" on center, and 1" in thickness for floor joists spaced 16" on center. *Note: If you are using composite decking be sure to check the manufacturer's specifications for joist spacing. Some brands may require joists to be spaced 12" on center or less.*

Ledger boards must be securely attached to the load bearing structure of the house. Connections between deck and dwelling must be flashed and caulked. Joists and headers must be supported by approved framing anchors such as joist hangers. All hardware and fasteners must be corrosion resistant.

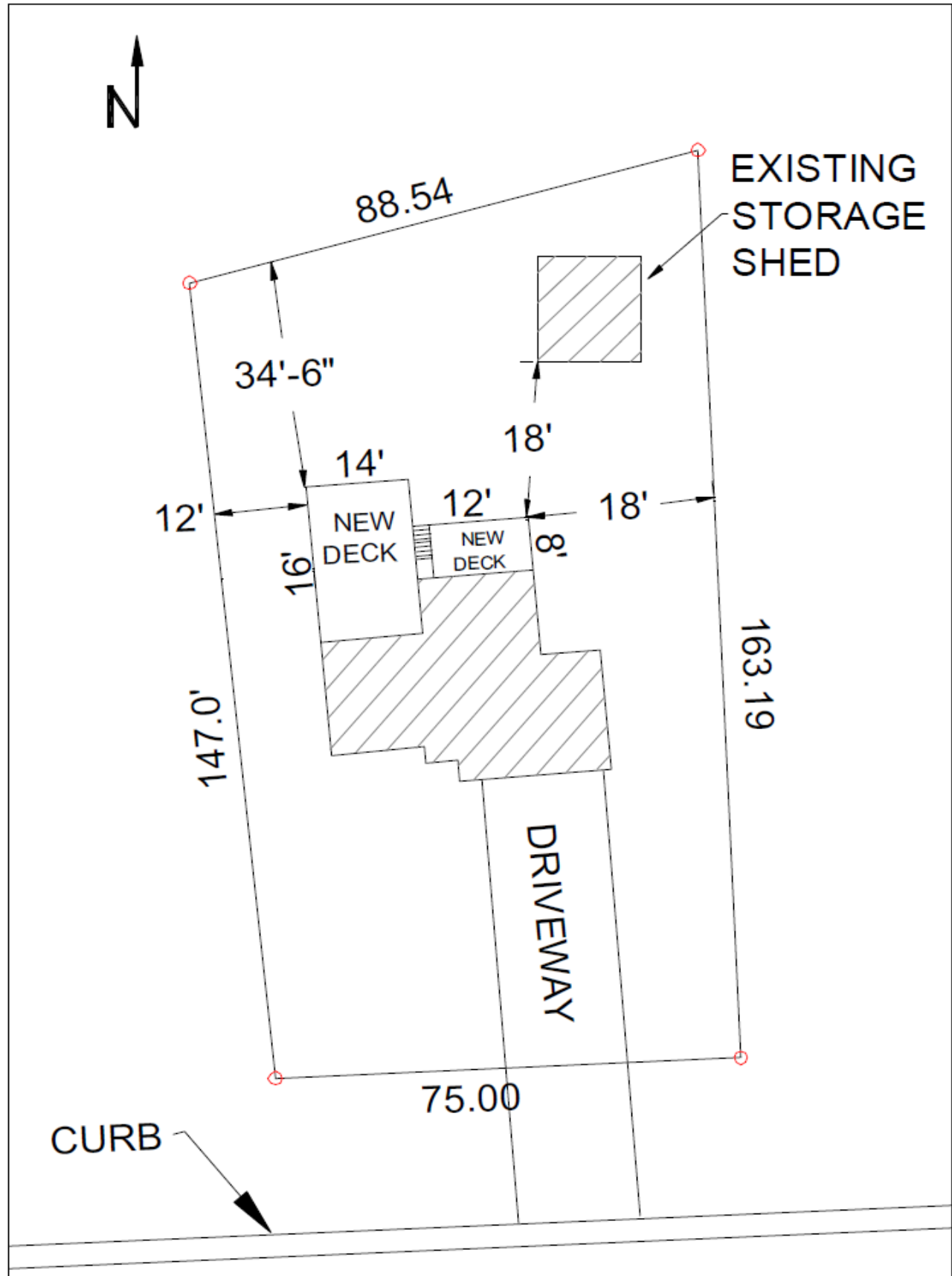
GUARDRAILS: Guardrails must be installed where the walking surfaces are over 30" above grade. Guardrails must be at least 36" in height and must not permit the passage of a 5" sphere through the intermediate rails or pickets.

STAIRWAYS: Stairways must be at least 36" in width, with risers no higher than 8" and treads at least 10" long. Variations in riser heights or in tread lengths must not exceed 3/8".

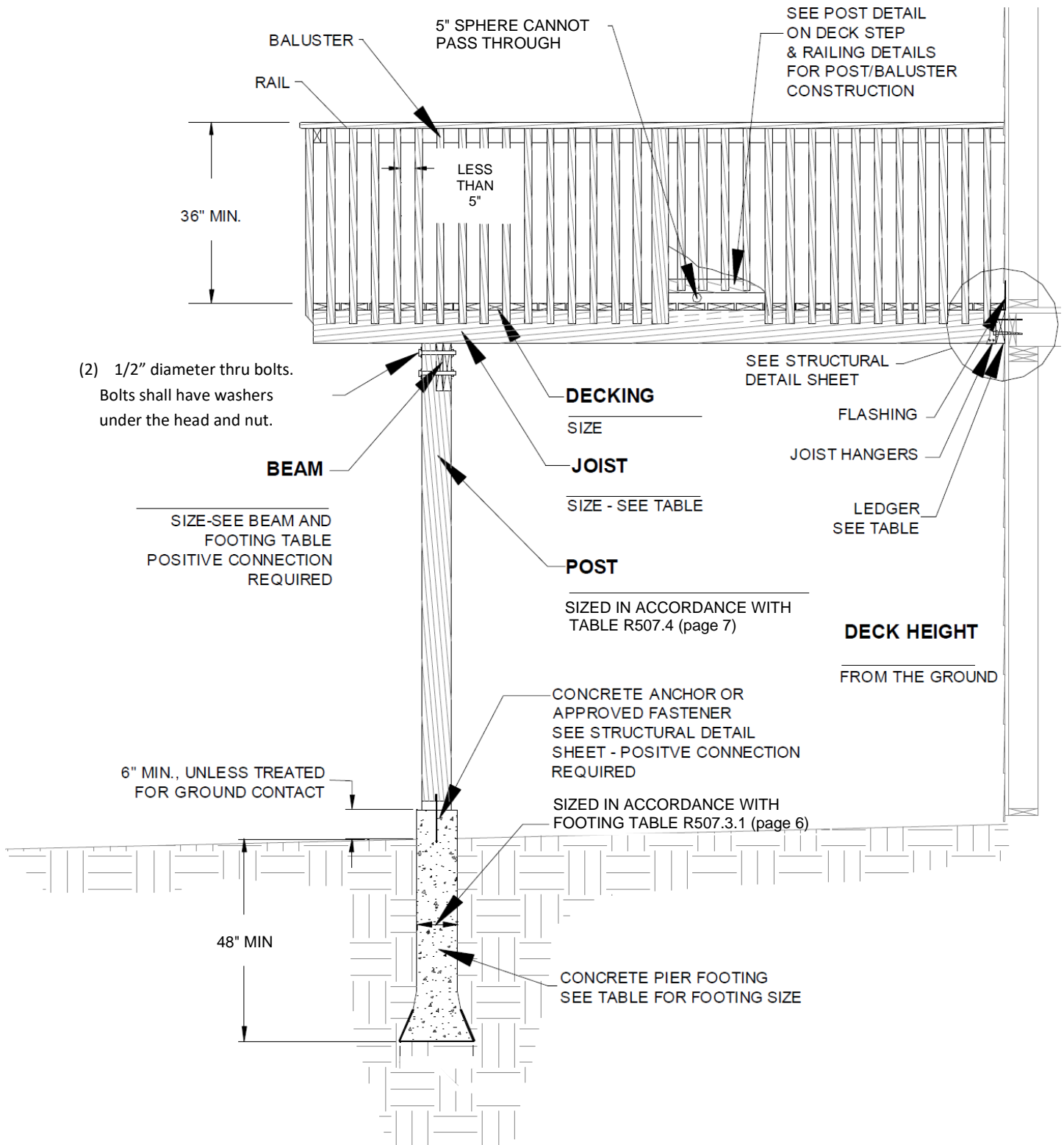
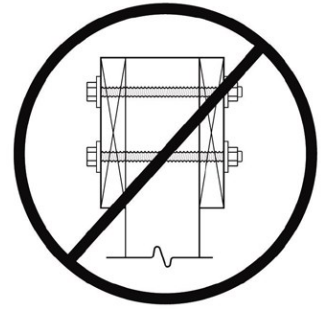
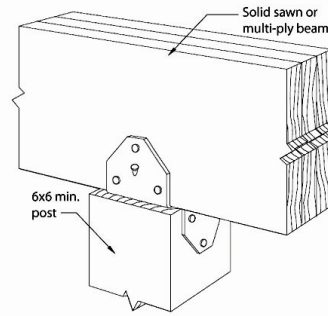
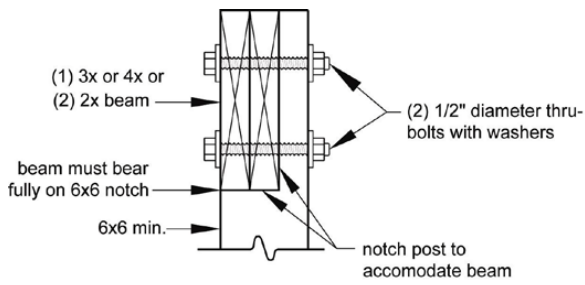
HANDRAILS: Stairways having 4 or more risers must have a grippable handrail on at least one side. Handrail height must be between 34" and 38" in height above the nosings of treads and extend continuously for the full length of the stairway. Handrails must have a space of not less than 1 ½" between the wall and the handrail. The grippable portion of the handrail must be smooth and at least 1 ¼" but no more than 2" in diameter. Handrails must be returned to the guardrail or supporting wall at each end.

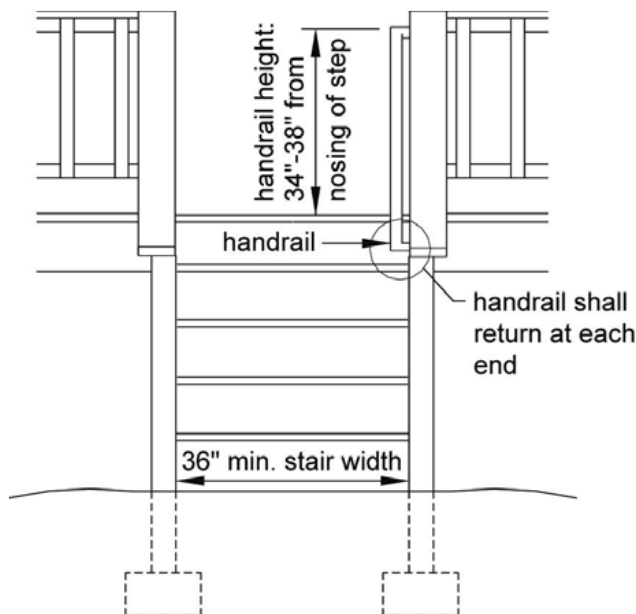
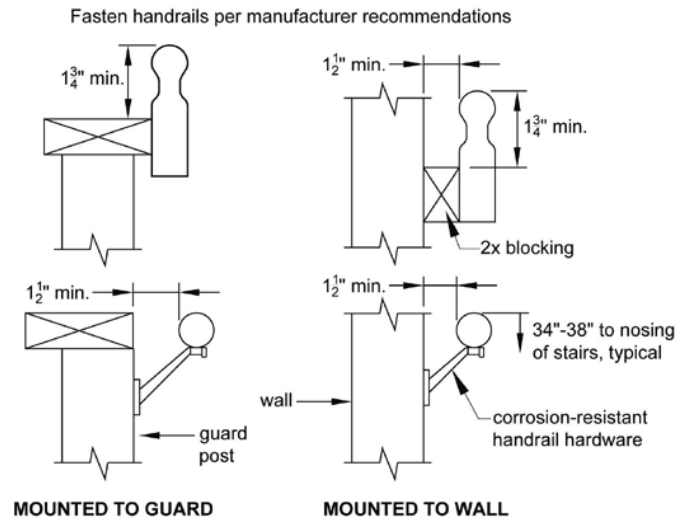
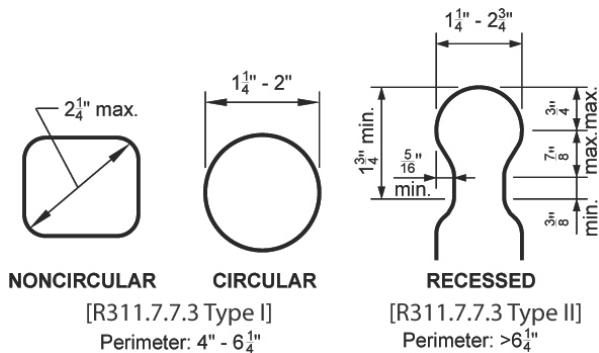
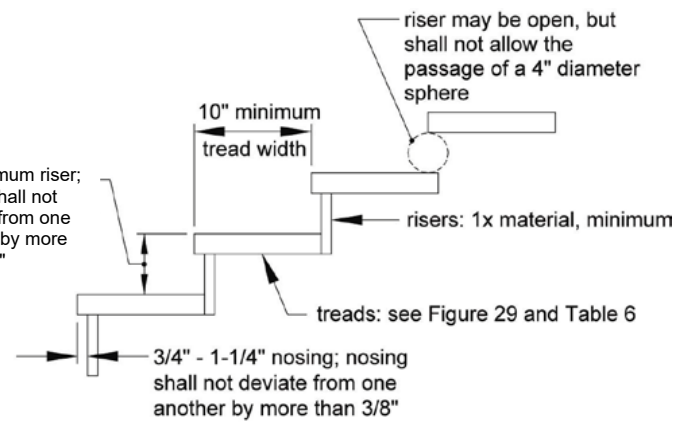
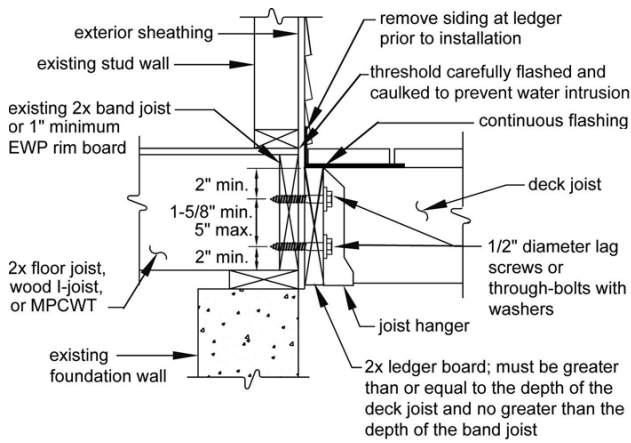
LANDINGS: Exterior stairs must be provided with a level landing at the top and bottom. The landing must be as wide as the width of the stair and at least 3' in the direction of travel.

ACCURATE, DIMENSIONED EXAMPLE SITE PLAN



123 Example Street





Handrails shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals.

Landings for stairways: There shall be a floor or landing at the top and bottom of each stairway. The width perpendicular to the direction of travel shall be not less than the width of the flight served. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36".

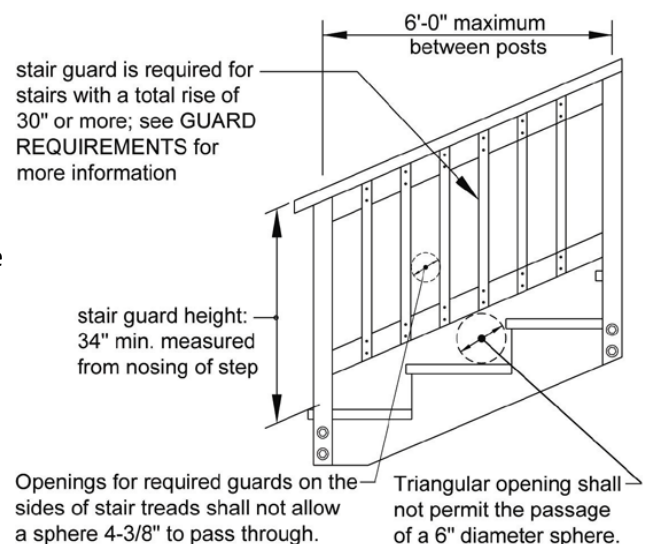


TABLE R507.3.1 MINIMUM FOOTING SIZE FOR DECKS



LIVE OR GROUND SNOW LOAD ^b (psf)	TRIBUTARY AREA (sq. ft.)	LOAD BEARING VALUE OF SOILS ^{a, c, d} (psf)							
		1500 ^e			2000 ^e			2500 ^e	
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)
40	20	12	14	6	12	14	6	12	14
	40	14	16	6	12	14	6	12	14
	60	17	19	6	15	17	6	13	15
	80	20	22	7	17	19	6	15	17
	100	22	25	8	19	21	6	17	19
	120	24	27	9	21	23	7	19	21
	140	26	29	10	22	25	8	20	23
	160	28	31	11	24	27	9	21	24
50	20	12	14	6	12	14	6	12	14
	40	15	17	6	13	15	6	12	14
	60	19	21	6	16	18	6	14	16
	80	21	24	8	19	21	6	17	19
	100	24	27	9	21	23	7	19	21
	120	26	30	10	23	26	8	20	23
	140	28	32	11	25	28	9	22	25
	160	30	34	12	26	30	10	24	27
60	20	12	14	6	12	14	6	12	14
	40	16	19	6	14	16	6	13	14
	60	20	23	7	17	20	6	16	18
	80	23	26	9	20	23	7	18	20
	100	26	29	10	22	25	8	20	23
	120	28	32	11	25	28	9	22	25
	140	31	35	12	27	30	10	24	27
	160	33	37	13	28	32	11	25	29
70	20	12	14	6	12	14	6	12	14
	40	18	20	6	15	17	6	14	15
	60	21	24	8	19	21	6	17	19
	80	25	28	9	21	24	8	19	22
	100	28	31	11	24	27	9	21	24
	120	30	34	12	26	30	10	24	27
	140	33	37	13	28	32	11	25	29
	160	35	40	15	30	34	12	27	31

The City of Watertown's Snow load value is 50 lbs. for figuring footing sizes in this chart.

R507.4 Deck posts.

For single-level wood-framed decks with beams sized in accordance with [Table R507.5](#), deck post size shall be in accordance with [Table R507.4](#).

TABLE R507.4 DECK POST HEIGHT^a

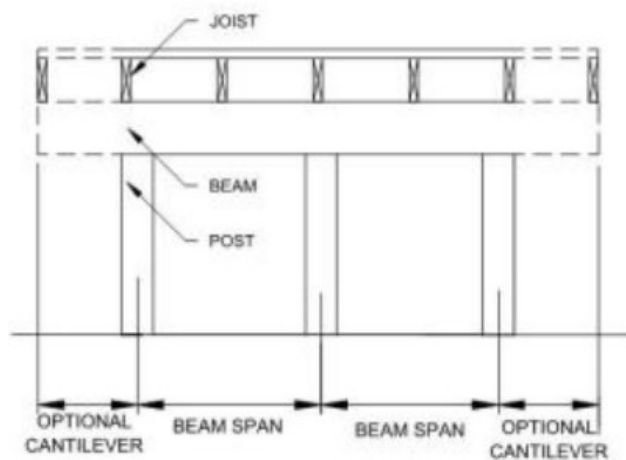
DECK POST SIZE	MAXIMUM HEIGHT ^{a, b} (feet-inches)
4 × 4	6-9 ^c
4 × 6	8
6 × 6	14
8 × 8	14

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

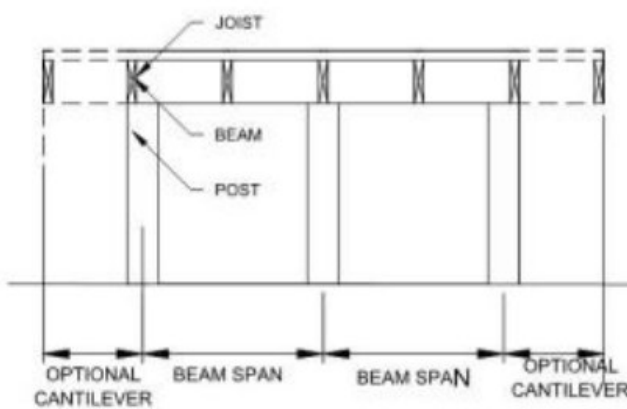
a. Measured to the underside of the beam.

b. Based on 40 psf live load.

c. The maximum permitted height is 8 feet for one-ply and two-ply beams. The maximum permitted height for three-ply beams on post cap is 6 feet 9 inches.



DROPPED BEAM



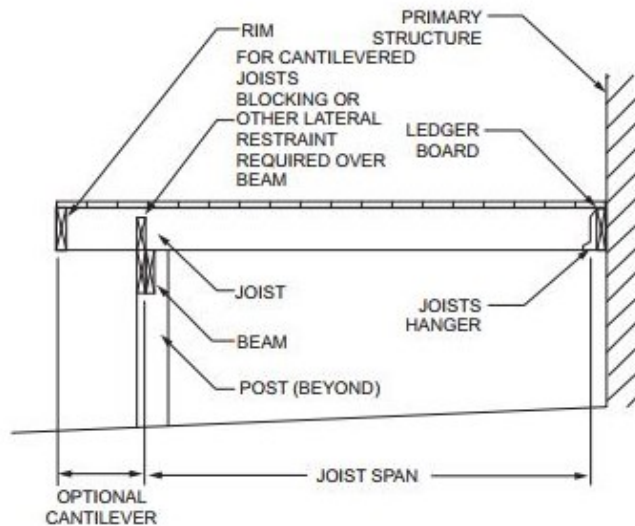
FLUSH BEAM

TABLE R507.5 DECK BEAM SPAN LENGTHS^{a, b, g} (feet - inches)

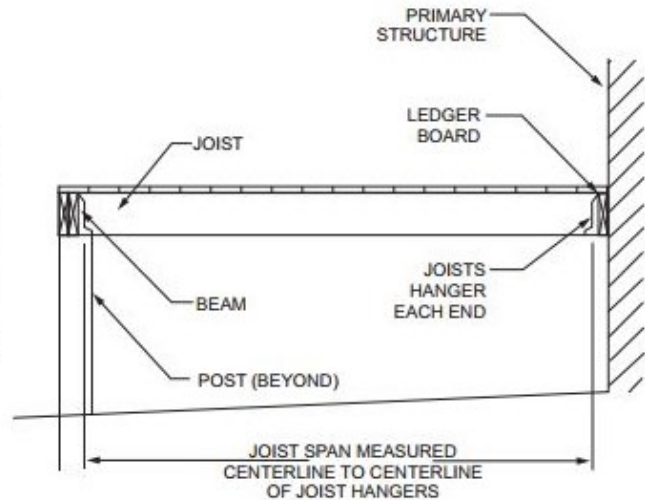
SPECIES ^c	SIZE ^d	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	1 – 2 × 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1 – 2 × 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5
	1 – 2 × 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1 – 2 × 12	8-3	7-1	6-4	5-10	5-5	5-0	4-9
	2 – 2 × 6	6-11	5-11	5-4	4-10	4-6	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
Douglas fir-larch ^e , hem-fir ^e , spruce-pine-fir ^e , redwood, western cedars, ponderosa pine ^f , red pine ^f	3 × 6 or 2 – 2 × 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 × 8 or 2 – 2 × 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 × 10 or 2 – 2 × 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 × 12 or 2 – 2 × 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 × 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 × 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 × 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 × 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 – 2 × 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 – 2 × 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3 – 2 × 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 – 2 × 12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- Live load = 40 psf, dead load = 10 psf, $L/\Delta = 380$ at main span, $L/\Delta = 180$ at cantilever with a 220-pound point load applied at the end.
- Beams supporting deck joists from one side only.
- No. 2 grade, wet service factor.
- Beam depth shall be greater than or equal to depth of joists with a flush beam condition.
- Includes incising factor.
- Northern species. Incising factor not included.
- Beam cantilevers are limited to the adjacent beam's span divided by 4.



CANTILEVERED JOISTS WITH DROPPED BEAM



JOISTS WITH FLUSH BEAM

TABLE R507.6 DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)

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 x 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 x 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 x 10	16-2	14-0	11-5	3-4	3-6	2-10
	2 x 12	18-0	16-6	13-6	4-6	4-2	3-4
Douglas fir-larch ^d , hem-fir ^d , spruce-pine-fir ^d	2 x 6	9-6	8-8	7-2	1-2	1-3	1-5
	2 x 8	12-6	11-1	9-1	1-11	2-1	2-3
	2 x 10	15-8	13-7	11-1	3-1	3-5	2-9
	2 x 12	18-0	15-9	12-10	4-6	3-11	3-3
Redwood, western cedars, ponderosa pine ^e , red pine ^e	2 x 6	8-10	8-0	7-0	1-0	1-1	1-2
	2 x 8	11-8	10-7	8-8	1-8	1-10	2-0
	2 x 10	14-11	13-0	10-7	2-8	2-10	2-8
	2 x 12	17-5	15-1	12-4	3-10	3-9	3-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

a. No. 2 grade with wet service factor.

b. Live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$.

c. Live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever with a 220-pound point load applied to end.

d. Includes incising factor.

e. Northern species with no incising factor.

f. Cantilevered spans not exceeding the nominal depth of the joist are permitted.



CITY OF
WATERTOWN

PUBLIC WORKS - COMMUNITY
DEVELOPMENT

P: (605) 882-6201
23 Second St NE
www.watertownsd.us