

DECKS

- This handout is intended only as a guide. It shall not be considered a complete set of requirements.
- Materials and installation must comply with the current Minnesota State Building Code and the manufacturers' installation specifications for each product.
- A building permit is required for any deck/platform that is attached to a structure or is 30" or more above grade. A deck/platform that is less than 30" above grade, is not attached to a structure with frost footings, and is not part of an accessible route, does not require a building permit. Landings must be attached to structures or be engineered to resist both lateral and vertical forces. **Most municipalities require a zoning review. Please check with your municipality regarding requirements.**

BUILDING Permit Submittal shall include:

- Building Permit Application**, completed in its entirety, including signature and valuation.
- SUPPLEMENTAL WORKSHEET FOR DECKS** (included in this handout).
- One set of plans** (drawn to scale) showing the proposed design, and including:
 - Deck materials, including fasteners, connectors, and lumber type/material size.
 - Deck height.
 - Footing depths, sizes, and locations.
 - Joist, beam, decking sizes and locations. Lumber type.
 - Post spacing.
 - All window locations adjacent to deck.
 - Stair and landing location and size/height.
- A site plan** (or **Certificate of Survey** if required by municipality) drawn to scale and dimensioned, identifying proposed deck dimensions with measurements from the adjacent lot lines; as well as all lot lines, setbacks, easements, adjacent street names, and all structures on the property. **Check with your municipality to determine setback requirements for the property.**
- Additional information may be required by the plan reviewer.

PERMIT CARD AND APPROVED PLANS (throughout the project) shall be:

POSTED prior to start of work - **VISIBLE** from street or driveway - **ACCESSIBLE** to the inspector.

INSPECTION REQUIREMENTS:

Inspections **MUST** be scheduled during office hours **AT LEAST** one business day prior to inspection. If a specific date and time is required, additional notice may be needed. Failure to cancel a scheduled inspection may result in a reinspection fee.

- **Office Hours:** Monday - Friday • 8:00 a.m. - 4:30 p.m.
- **Phone:** (952) 442-7520 or (888) 446-1801

Inspections: (Refer to your permit card regarding project-specific inspections)

- **Footings:** After holes are dug, but **PRIOR TO POURING CONCRETE.**
- **Framing:** Before decking is installed (if deck is less than 4 feet above grade).
- **Final:** After deck is complete with stairs, handrails, and guardrails installed.

NOTICE: Construction or work for which a permit is required shall be subject to inspection by the Building Official, and such **construction or work shall remain accessible and exposed for inspection purposes until approved.** It is the responsibility of the permit applicant to be in attendance on site and provide access to the Building Official for all required inspections. If work is concealed and/or work is not complete at time of inspection, an additional inspection is required and a **reinspection fee may apply.**

Note: The State of Minnesota requires all residential building contractors, remodelers, roofers, plumbers, and electricians to obtain a state license, unless they qualify for a specific exemption. Any person claiming an exemption must provide a copy of a Certificate of Exemption from the Department of Labor & Industry to the Municipality before a permit will be issued.

Note: To determine contractor requirements, or to check the licensing status of a contractor, please call the Minnesota Department of Labor & Industry at 651-284-5065 or toll free 1-800-342-5354.

Note: For specific code requirements, contact the Building Inspection Department at 952-442-7520 or 888-446-1801 or e-mail: info@mnspect.com.

PROJECT CHECKLIST:

The following is a guideline to assist in compliance with the requirements of the MN State Building Code.

- The home address must be visible from the street.
- BEFORE YOU DIG, contact Gopher State One Call to locate buried utilities: (651) 454-0002 or (800) 252-1166. www.gopherstateonecall.org.
- The minimum live load for an exterior deck is 40 pounds per square foot.
- Refer to Figure R507.9.1.3(1) & Tables R507.9.1.3(1) & R507.9.1.3(2) in the MN State Residential Code for ledger and band joist fastener requirements.
- See Figure R507.9.2(1) & R507.9.2(2) in the MN State Residential Code for deck attachment for lateral loads.
- A minimum of 36" clear space is required above emergency escape and rescue openings.
- Decks shall not be hung from the cantilever of a house unless joists/trusses are designed/engineered to carry additional deck loads, and documentation to that effect is provided with plan submittal.
- Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed to resist both vertical and lateral loads.
- All connections between deck and dwelling shall be weatherproof. Any cuts in exterior finish shall be flashed.
- Frost footings are required for any deck attached to a structure that has frost footings. Frost footings are required for all detached decks unless:
 - o The joists bear directly on a precast concrete pier block at grade without support by beams or posts.
 - o The area of the deck does not exceed 200 SF.
 - o The walking surface is not more than 20" above grade at any point within 36" measured horizontally from the edge.
 - o Footings shall be designed to support the structure. The minimum depth to the base of the footing is 42" in Zone 1.
- Cantilevers (overhanging joists and beams) – Refer to Table R507.6 and Table R507.5 (footnote g) for joist and beam cantilever requirements. Cantilevers greater than that listed in the tables will require engineering to be provided.
- All joist to beam, beam to post, and post to footing connections must have a positive connection to resist lateral displacement.
- All exposed wood used in the construction of decks is required to be a type with natural resistance to decay (redwood, cedar, etc.) or approved treated wood. This includes posts, beams, joists, decking and railings. If wood is to be used below or in contact with grade, it must be approved for ground contact.
- Field-cut ends, notches, and drilled holes of preservative-treated wood shall be treated in the field in accordance with AWP A M4.
- All fasteners (nails, bolts, screws, hangers, etc.) must meet the requirements set forth in Table R507.2.3.
- All (round) joist hanger holes must be filled with nails/screws approved for joist hanger structural connections.
- Composite decking shall comply with Section R507.2.2 and ASTM D7032.
- If decking is installed **perpendicular** to the joists, joist spacing of 24" on center requires 2" minimum (nominal) decking, and joist spacing of 16" on center requires 5/4" minimum decking. For **diagonally** installed decking, joist spacing of 16" on center requires 2" minimum (nominal) decking, and joist spacing of 12" on center requires 5/4" minimum decking. Decking may not be installed diagonally if joist spacing is greater than 16" on center. Maximum angle of 45 degrees from perpendicular for wood deck boards. **Composite** decking shall be installed according to the manufacturer's instructions as well as R507.2.2 and ASTM D7032.
- Guards are required on all decks more than 30" above grade or floor below. Guardrails must be 36" minimum in height. Open guardrails must have intermediate rails or an ornamental pattern that a 4" sphere cannot pass through. The top section of guardrails must be built to withstand 200 lbs. of load applied from any direction. Spindles and/or ornamental fill must withstand 50 lbs. of applied force. (Table R301.5)

Stair Exception: Guardrails on stairs must be 34" minimum in height measured vertically from a line connecting the nosing. Open guardrails on stairs must have intermediate rails or an ornamental pattern that a 4-3/8" sphere cannot pass through. The triangular opening formed by the riser, tread, and bottom element of a guardrail must be sized so that a 6" sphere cannot pass through.

- Stairways must be a minimum width of 36" above the handrail. Maximum riser height is 7-3/4". Tread depth is measured excluding nosing. Minimum tread depth is 10". The largest tread depth or riser height shall not exceed the smallest by more than 3/8". Open risers are permitted, provided that the opening between treads does not permit the passage of a 4" sphere, or the riser is less than 30" above grade. Nosing not less than 3/4" and not more than 1-1/4" shall be provided with solid risers (unless the tread depth is 11" or greater).
- Exterior landings, decks, balconies, and stairs shall be positively anchored to the primary structure. Attachment shall not be accomplished by use of toenails or nails subject to withdrawal.
- Lighting must be provided to illuminate the stairway and shall have a light source located at the top landing of the stairway.
- Handrails are required on at least one side of any stairway with 4 or more risers. The handrail must be placed so that the top of the handrail is between 34" and 38" measured above the plane of the tread nosing. Handrails must be continuous for the entire length of the stairs, and shall include ALL risers. Handrails shall return at the ends or terminate into a newel post. The handgrip must have a smooth surface with no sharp corners, and must meet the requirements for a Type 1 or Type 2 handrail as set forth in MRC Section R311.7.8.5. Please contact the inspections office for specific design details if you are using a 2x material placed on end.
- Landings are required at the top and bottom of each stairway. Minimum size of a landing shall be 3' in the direction of travel, by the width of the stair served.

SUPPLEMENTAL WORKSHEET FOR DECKS

(This sheet **MUST** be included with your permit submittal)

The following information is required to be included with a Deck permit application:

1. Footing Diameter: _____ Depth: _____
2. Size of posts: _____
3. Size of beams: _____ Number of plies: _____
4. Cantilever on beams: _____
5. Size of joists: _____ Spacing: _____
6. Cantilever on joists: _____
7. Species of lumber (please check one): Southern Yellow Pine Ponderosa Pine
 Spruce Pine Fir Hemlock Fir Douglas Fir Cedar Composite Unknown
8. Dimensions of floor boards: _____ Type: _____
If using composite decking materials please indicate the manufacturer. _____
9. Height of deck from ground: _____
10. Height of guardrail: _____
11. Spacing of spindles: _____
12. Height of handrail: _____
13. Dimensions of deck: _____
14. Distance to property lines (also identify on site plan):
 - a. Side 1: _____
 - b. Side 2: _____
 - c. Rear: _____
 - d. Other: _____

**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.

- Measured to the underside of the beam.
- Based on 40 psf live load.
- 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.

**TABLE R507.3.1
MINIMUM FOOTING SIZE FOR DECKS**

LIVE LOAD ^a (psf)	TRIBUTARY AREA (sq. ft.)	LOAD BEARING VALUE OF SOILS ^{a, c, d} (psf)											
		1500 ^e			2000 ^e			2500 ^e			≥ 3000 ^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)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)
40	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	14	16	6	12	14	6	12	14	6	12	14	6
	60	17	19	6	15	17	6	13	15	6	12	14	6
	80	20	22	7	17	19	6	15	17	6	14	16	6
	100	22	25	8	19	21	6	17	19	6	15	17	6
	120	24	27	9	21	23	7	19	21	6	17	19	6
	140	26	29	10	22	25	8	20	23	7	18	21	6
160	28	31	11	24	27	9	21	24	8	20	22	7	

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m², 1 pound per square foot = 0.0479 kPa.

- Interpolation permitted, extrapolation not permitted.
- Live load = 40 psf, dead load = 10 psf.
- Assumes minimum square footing to be 12 inches x 12 inches x 6 inches for 6 x 6 post.
- If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.
- Area, in square feet, of deck surface supported by post and footings.

**FIGURE R507.5
TYPICAL DECK JOIST SPANS**

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

SPECIES ^d	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	

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/Δ = 360 at main span, L/Δ = 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.

**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 × 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
Douglas fir-larch ^d , hem-fir ^d , spruce-pine-fir ^d ,	2 × 6	9-6	8-8	7-2	1-2	1-3	1-5
	2 × 8	12-6	11-1	9-1	1-11	2-1	2-3
	2 × 10	15-8	13-7	11-1	3-1	3-5	2-9
	2 × 12	18-0	15-9	12-10	4-6	3-11	3-3
Redwood, western cedars, ponderosa pine ^e , red pine ^e	2 × 6	8-10	8-0	7-0	1-0	1-1	1-2
	2 × 8	11-8	10-7	8-8	1-8	1-10	2-0
	2 × 10	14-11	13-0	10-7	2-8	2-10	2-8
	2 × 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/Δ = 360.

c. Live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 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.

**TABLE R507.7
MAXIMUM JOIST SPACING FOR DECKING**

DECKING MATERIAL TYPE AND NOMINAL SIZE	MAXIMUM ON-CENTER JOIST SPACING	
	Decking perpendicular to joist	Decking diagonal to joist ^a
1 1/4-inch-thick wood	16 inches	12 inches
2-inch-thick wood	24 inches	16 inches
Plastic composite	In accordance with Section R507.2	In accordance with Section R507.2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.01745 rad.

a. Maximum angle of 45 degrees from perpendicular for wood deck boards.