



## Residential Deck Checklist

Building permits may be submitted by the property owner if they occupy the primary building OR a licensed Residential Building Contractor (BC#) with a Qualified Builder (QB#) number from the Minnesota Department of Labor and Industry.

This checklist is intended for simple, rectangular decks. If your deck isn't simple, please submit full building plans.

Before you begin your application, familiarize yourself with [Section R507 of the Minnesota Residential Code](#). This section includes requirements for building your deck to code and includes important tables to reference.

## Required Permits

1. **Deck – 1 or 2 Family Dwelling**
2. **Shoreland/Floodplain** (if applicable)

## Required Documents

Provide the following documents in **PDF format** when applying for this permit on ePlace:

1. **Site Plan** – See [Site and Survey Packet](#) for more information
2. **Survey** – See [Site and Survey Packet](#) for more information
3. **Deck and Step Plans**
4. **Deck Sections**
5. **Engineered Drawings and Engineered Product Design Info** (if applicable)
  - a. Required when engineered wood products (i.e. laminated veneer lumber) are used. Typically provided by the supplier
6. **Helical Pier Special Inspection Form** (if applicable)
  - a. Required when helical piers are used to support the structure or deck. See the [Helical Pile Handout](#)
7. **Planning/Zoning Approval Documentation** (if applicable)
  - a. Required if a variance or similar Planning action was approved
8. **Other Special Approval** (if applicable)

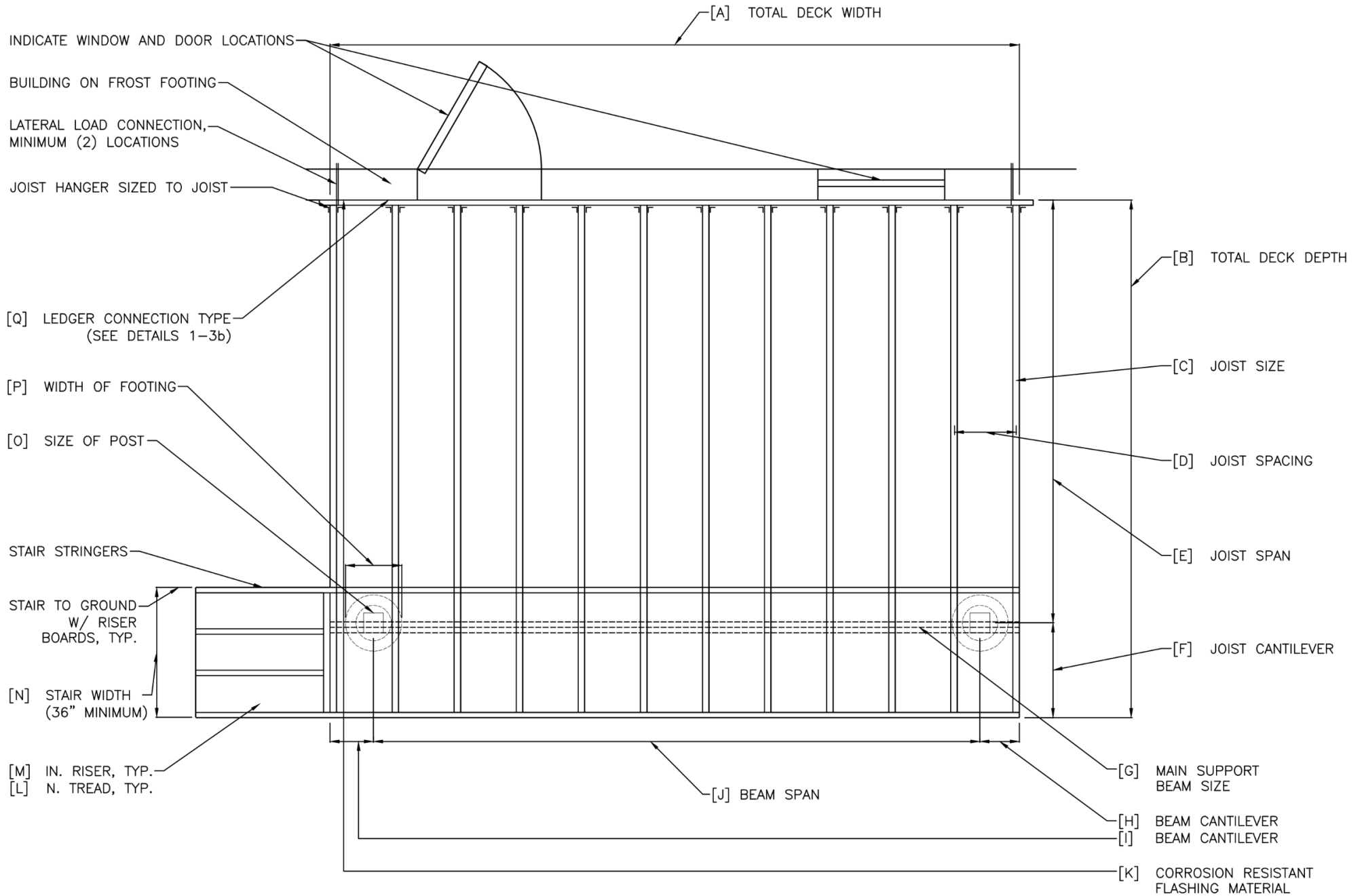
## Required Inspections

You must call for a scheduled appointment time (please try to schedule inspections a minimum of 24 hours in advance).

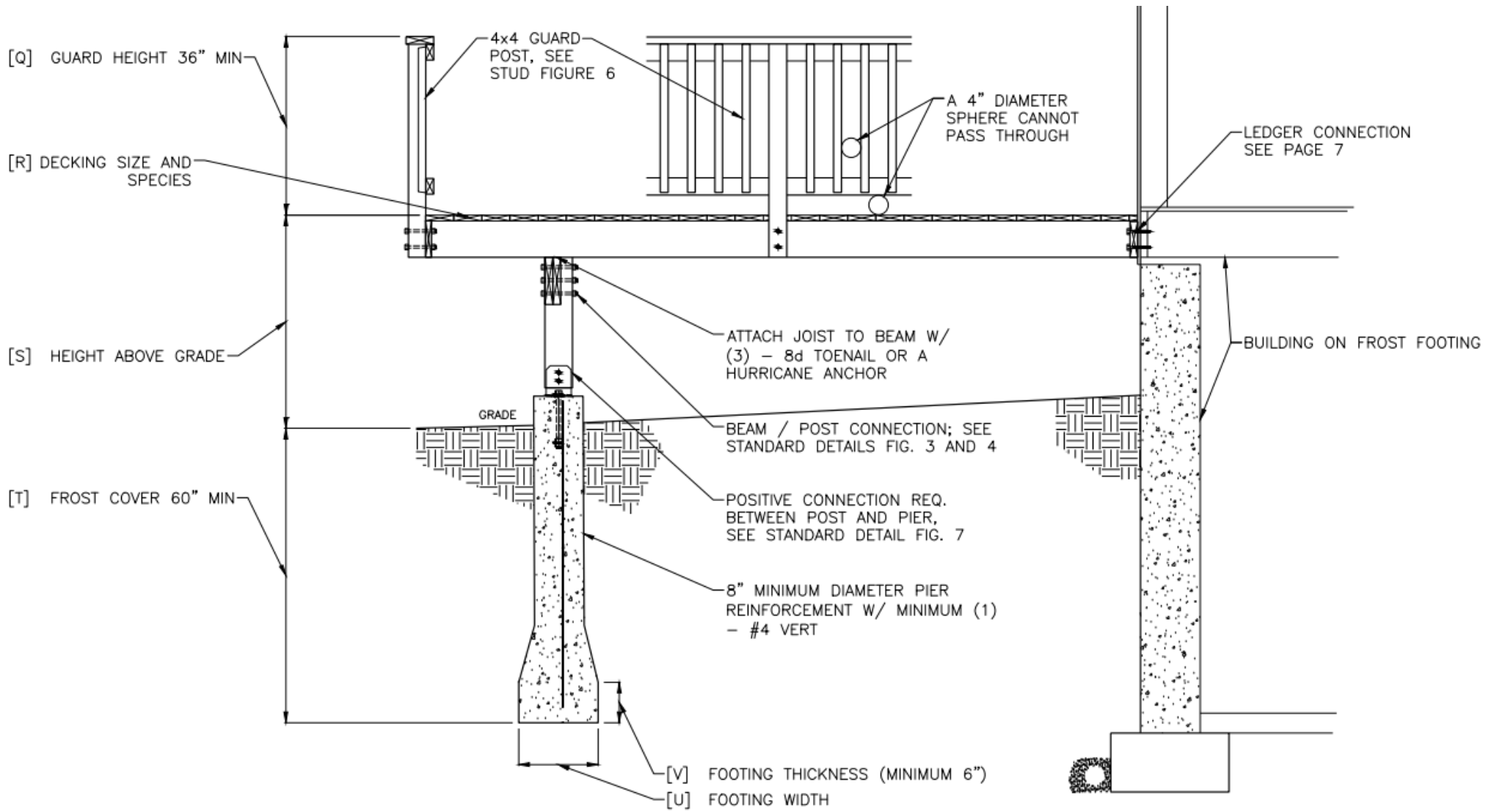
The approved plan must be on site for all inspections. Typically, 3 inspections are required:

1. **Footings** - These will be checked for proper diameter, depth, belled bottom, a flat surface at the base, and no water in the holes. The form (sonotube) and reinforcement must be in place. The post bases and anchor bolts (or approved equal) must be on-site.
2. **Framing** – If your deck surface is 4 feet or closer to the ground, you must pass a framing inspection before the decking material may be applied to the deck surface. Structural integrity and proper attachment of all connectors will be inspected.
3. **Final** – For decks that are 4 feet or greater off the ground, framing and final inspections may be completed together. A final inspection must be completed to be sure that the deck complies with the current Minnesota State Building Code.

**Figure 1: Deck Plan**



**Figure 2: Deck Section**



## Deck Plan Information:

- A. Total Deck Width: \_\_\_\_\_
- B. Total Deck Depth: \_\_\_\_\_
- C. Joist Size: \_\_\_\_\_
- D. Joist Spacing: \_\_\_\_\_
- E. Joist Span: \_\_\_\_\_
- F. Joist Cantilever: \_\_\_\_\_
- G. Main Support Beam Size: \_\_\_\_\_
- H. Beam Cantilever: (Right): \_\_\_\_\_

- I. Beam Cantilever (Left): \_\_\_\_\_
- J. Beam Span: \_\_\_\_\_
- K. Corrosion Resistant Flashing Material:  
\_\_\_\_\_
- O. Size of Post: \_\_\_\_\_
- P. Width of Footing: \_\_\_\_\_
- Q. Ledger Connection Type: \_\_\_\_\_

## Stairs (if applicable):

- L. Riser: \_\_\_\_\_
- M. Tread: \_\_\_\_\_

- N. Stair Width: \_\_\_\_\_

## Deck Section Information:

- Q. Guard Rail Height (36 inch minimum):  
\_\_\_\_\_
- R. Decking Size and Species: \_\_\_\_\_
- S. Height Above Grade: \_\_\_\_\_
- T. Frost Cover (60 inch minimum): \_\_\_\_\_

- U. Footing Width: \_\_\_\_\_
- V. Footing Thickness: \_\_\_\_\_

**Beam to Post Connection Option** (see Figures 3 and 4): **Option A** or **Option B**

If not using a concrete or helical pier, describe the footing system: \_\_\_\_\_  
\_\_\_\_\_

## Notes:

If using helical piers, submit the [Helical Pile Specification and Installer Designation Form](#).

Decks over 6 feet from grade require angle bracing.

Guards are required for decks with surfaces located more than 30 inches above the grade.

Decks cannot be attached to brick veneer.

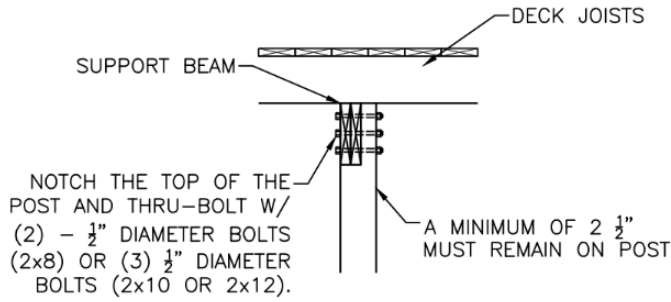
Fasteners for pressure preservative wood shall be hot dipped zinc coated galvanized steel (HDG), stainless steel, silicon bronze, or copper.

All lumber shall be a naturally durable species (such as redwood or western cedar) or be pressure treated with an approved process and preservative in accordance with American Wood Protection Association Standards. All lumber in contact with the ground shall be approved preservative treated wood suitable for ground contact.

## Standard Details

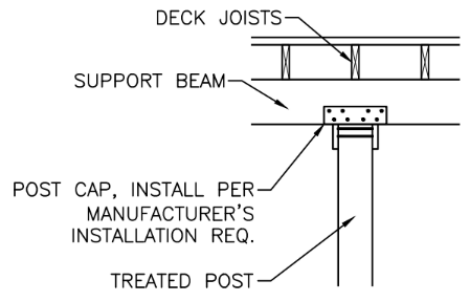
Build your deck to the following figures. More details can be found in the relevant sections under Residential Deck Information.

**Figure 3: Beam/Post Connection Option A**



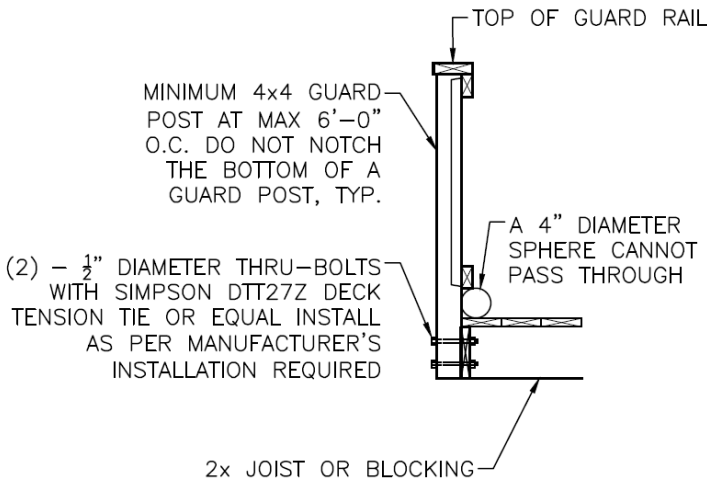
OPTION A: NOTCHED POST

**Figure 4: Beam/Post Connection Option B**

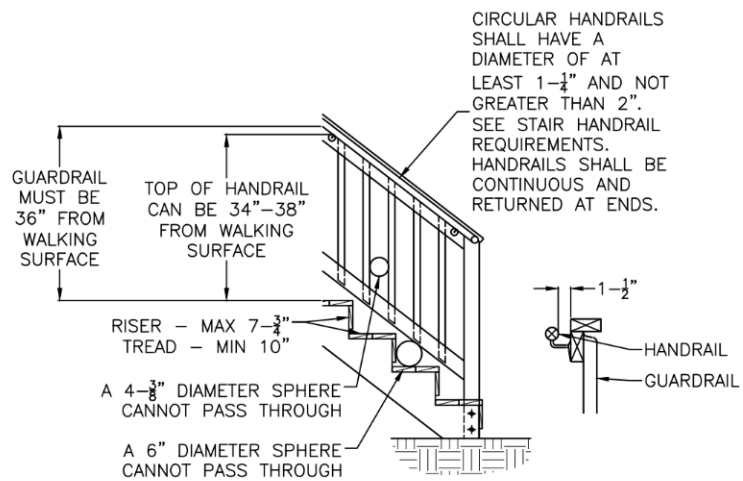


OPTION B: POST CAP

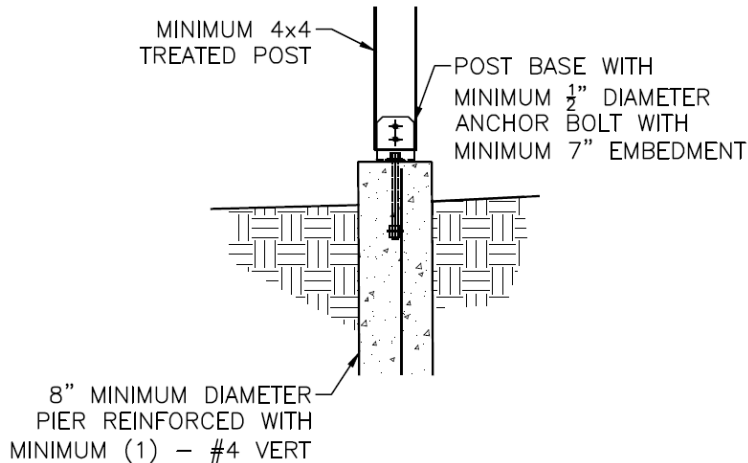
**Figure 5: Guard Post Connection**



**Figure 6: Stair/Handrails**



**Figure 7: Post/Pier Connection**



# Residential Deck Information

## Minnesota Residential Code

Decks must be built according to the Minnesota Residential Code (MSRC) with most requirements found in Section R507: Exterior Decks. Code sections and subparts in this document are indicated in parenthesis. For example: Chapter 5 Section R507.2 Materials would be referenced as (R507.2).

## Building Permits

A permit is required if the deck is attached to the dwelling or is 30 inches (or more) above grade. Cost of the permit is based upon the size of the deck. Please be aware that if you later decide to make changes to your plan, these changes must also be approved.

## Setbacks

Always site specific. Check with Construction Services (218-730-5240) and Planning (218-730-5580) for your project.

## Structural Details

Header beams and joists that frame into beams shall be supported by approved framing anchors such as joist hangers. **Beams supporting deck joists shall not be supported on deck ledgers or band joists.** A 3-inch beam pocket, rated beam holder, or a post supporting the end of the beam is compliant. Posts shall be attached to concrete piers with a post base and anchor bolt (or approved equal). Installation of these framing anchors shall be in accordance with the manufacturer's installation instructions; typically, special nails are required. Note: Decks must be positively anchored to the primary structure or be self-supporting.

## Height Above Grade

For decks greater than 14 feet above grade, a complete design of the framing, connections, and foundation by a Minnesota licensed structural engineer is required. For decks greater than 6 feet above grade, corner bracing shall be required connecting the beam to the posts.

## Multi-Level Decks

If the area of any level of a multi-level deck exceeds 120 square feet or if the vertical distance between the top of the floor of the lower level and the bottom of the joist of the upper level exceeds 10 feet, design must be by a Minnesota licensed engineer. If proposed deck does not require an engineer, footings must be sized to carry the load from all levels. Design for 40-pound live load plus 10-pound dead load, assuming 1500 pounds per square foot soil bearing capacity.

## Loads

All decks shall be designed to support a live load (people, furniture, grills, etc.) of 40 pounds per square foot, and a dead load (wood, decking, etc.) of actual weight of materials (R301.4, R301.5).

## Nails, Screws, and All Connection Hardware (R507.2.3)

Fasteners for pressure-preservative wood shall be hot dipped zinc coated galvanized steel (HDG), stainless steel, silicon bronze or copper. Ask your materials supplier for an approved fastener (R317.3.1). Screws cannot be used to attach joist hangers unless specifically approved for such application.

## Flashing (R703.4 and R507.2.4)

Needed where exterior porches, decks, or stairs attach to a wall or floor assembly of wood frame construction. Flashing material to be compatible with substrate of structure.

## Footings (R507.3)

Footings are required for any deck attached to a dwelling or to any other structure that has frost footings. The minimum depth to the bottom of the footings is 60 inches. The footing bottom diameter (or height/width of square footings) shall be based upon [Table R507.3.1](#). If the materials used for posts are not rated for ground contact, the concrete piers must protrude above grade a minimum of 6 inches. Minimum thickness of footing pad is 8 inches, but a thicker pad is required for larger footings. Reinforce concrete piers with a minimum of (1) - #4 vertical. See [Table R507.3.1](#) for footing requirements.

## Posts (R507.4)

Posts must be centered on the concrete piers without overhanging portions and attached with a mechanical fastener (post base) and anchor bolt (or approved equal) (Figure 3 and 4). Beams must be positively connected to the top of the posts. Options include a mechanical fastener or notch the top of the post leaving 2 ½ inches for double beam of post material and thru-bolt the beam with a minimum of (2) – ½ inch diameter bolts (two 2x8) or (3) – ½ inch diameter bolts (two 2x10 or greater) (see Figure 3 and 4). Splices in beams must be centered over a post. Each joist must be connected to the beam with the proper fastening method using nails, joist hangers or hurricane clips. Beam members shall be nailed or screwed together. Attach with a minimum of (2) – rows 10d common nails or (2) – rows #10 screws at 16 inches on center from each side, stagger. Split beam attachment to the side of posts is not allowed.

## Beams and Joists (R507.5, R507.6, and R507.7)

See [Table R507.5](#) for beam size. See [Table R507.6](#) for minimum joist size and spacing requirements. Ask your lumber supplier about species and grade.

The maximum joist spacing will depend on your decking. See R507.7

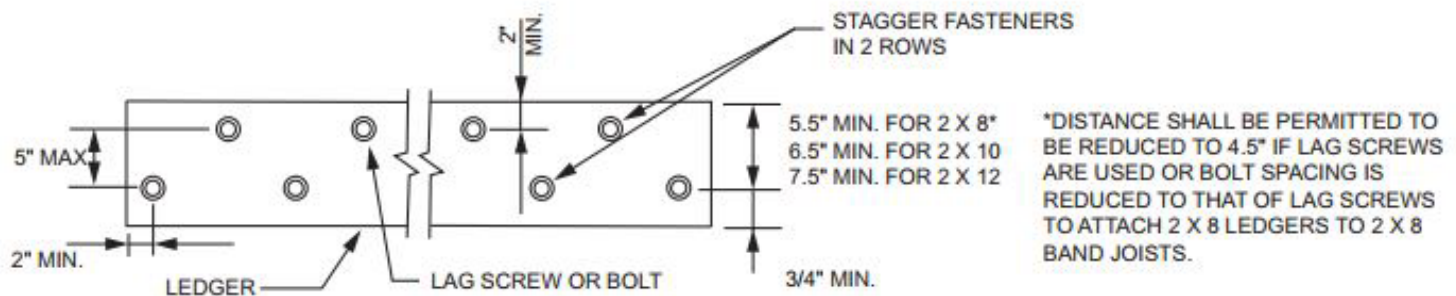
## Cantilevers (R507.5 and R507.6)

Cantilevers are addressed in [Table R507.5](#) for beams and [Table R507.6](#) for joists.

Decks shall not be supported by cantilevers extending from the primary structure or from another deck unless the structure is analyzed and approved by a licensed professional engineer.

## Deck Ledger and Attachment (R507.9)

Figure 8: Placement of Lag Screws and Bolts in Ledgers



Ledger to be a minimum of 2 X 8 nominal lumber. Deck Ledger shall not support concentrated loads from beams and girders. If ledger is to be attached to a portion of the building on posts, engineering is needed or deck to be self-supporting. Deck Ledgers must meet the following requirements:

- Ledgers shall be flashed in accordance with R703.4 to prevent water from contacting the house band joist.
- The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- Sheathing shall be wood structural panel or solid sawn lumber.

- Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber, or foam sheathing. Up to ½ inch thickness of stacked washers shall be permitted to substitute for up to ½ inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

Ledger attachment requirements can be found in R507.9.1.3.

### **Lag Screws**

Lag screws shall have a minimum diameter of ½ inch. Lag screws may be used only when the field conditions conform to those shown in Figure 8. Rated ledger screws may be substituted. Have product rating available for your inspector.

### **Thru-Bolts**

Thru-bolts shall have a diameter of ½ inch. Pilot holes for thru-bolts shall be 17/32 inch to 9/16 inch in diameter. Thru-bolts require washers at the bolt head and nut.

### **Deck Lateral Load Connection (R507.9.2)**

The building code requires that decks be designed for both vertical and lateral loads. A minimum of two lateral load connections are required for each deck. The intention of the lateral load connection is to tie the deck and ledger into the floor system of the house. The most likely failure point of a deck is the ledger pulling away from the house. Figures R507.9.2(1) and (2) are two POSSIBLE options for complying with the lateral load connection requirement. Coordinate the lateral load connection requirement with your inspector. Complying with the lateral load connection requirement will be on a case-by-case basis dependent on the type of and direction of floor framing the deck will be attached to. Where a ledger is expansion anchored to a concrete wall, a deck lateral load connection is only required to connect to the ledger expansion anchors.

### **Stairs (R311.7 and R303.8)**

Minimum width is 36 inches. Maximum riser height is 7¼ inches. Minimum tread depth is 10 inches. Treads with a depth of less than 11 inches must have compliant nosing. Largest tread depth or riser height shall not exceed the smallest by more than 3/8 inch across the run of the stairs. Treads shall be level with a slope no greater than 2%. Lighting capable of illuminating the treads and landings is required, shall be in the immediate vicinity of the top landing (R303.8). There shall be a landing at the top and bottom of stairs. Landings must be as wide as the stairs they serve, have a minimum length of 36 inches in direction of travel and have a slope no steeper than one-unit vertical in 48 inches horizontal (2% slope). (R311.7.7) See Figure 6.

### **Handrails (R311.7.8)**

Stairways having 4 or more risers shall have at least 1 handrail. The top of the handrail shall not be less than 34 inches or more than 38 inches above the nosing of the treads (to the top of the gripping surface). Handrails shall be continuous for the full length of the stairs and shall protrude from the adjoining surface by at least 1½ inches, but no more than 4½ inches, and the ends shall be returned or terminated into posts. Handrails with a circular cross section shall have an outside diameter of not less than 1¼ inches or more than 2 inches. Other handrails may be acceptable. See the specific code language to be sure your handrail does comply. See Figure E.

### **Guardrails (R312.1)**

A guardrail is required on all decks or any portion of a deck more than 30 inches above grade or above a lower deck. Deck guardrails must be a minimum of 36 inches high. Open guardrails on decks must have intermediate rails (balusters) or an ornamental pattern that a 4-inch sphere cannot pass through. Guardrails on stairs cannot have an opening between balusters that a 4 and 3/8-inch sphere can pass through. See Figure 5. Guardrail connections must not be notched.

### **Overhead Wires**

All overhead wires (i.e. power lines) must have a minimum clearance of 10 feet from the deck floor.

### **Gas Meters**

Gas meters cannot be located above or below a new deck. Contact City of Duluth Engineering for meter relocation.