City of Urbandale
3600 86th Street
Urbandale, IA 50322-4057
Building Department (515) 278-3935
www.urbandale.org

Deck Plan Review and Inspection Schedule

Inspections

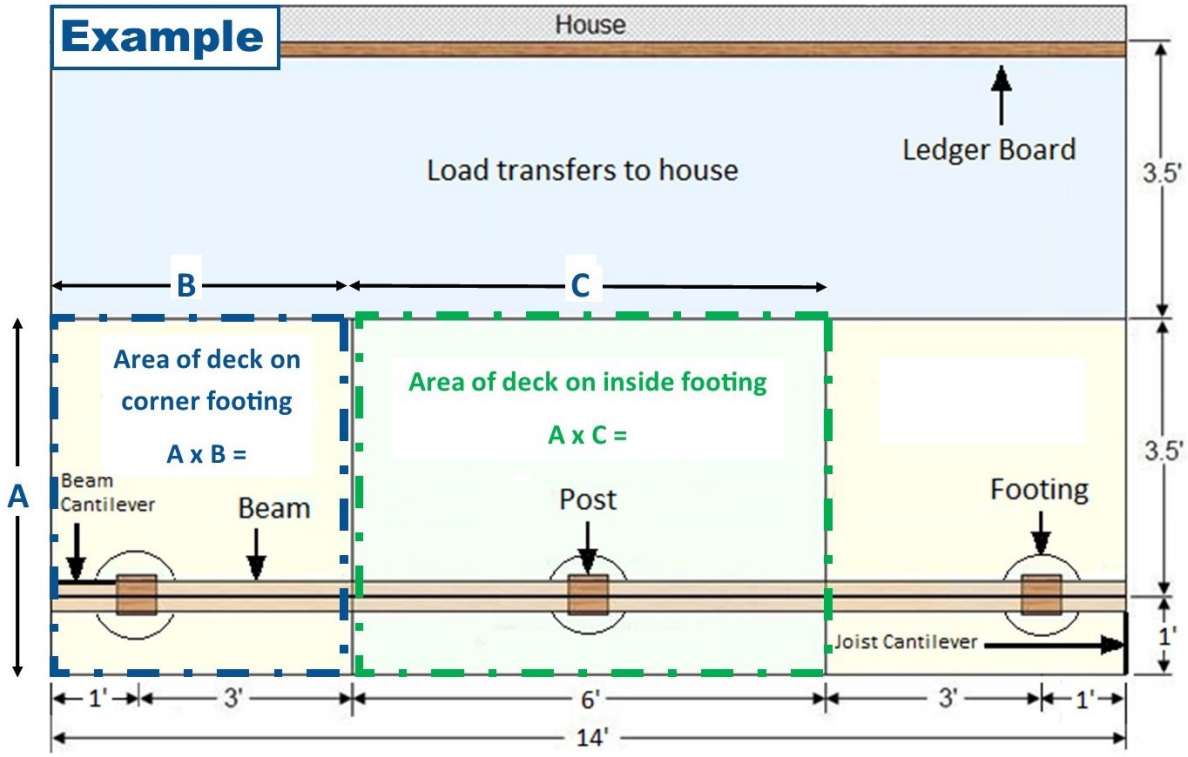
1. **Footings/Setback Inspection** before the footings are poured. Lot pins should be located at this time to verify set backs.
2. **Framing Inspection** before deck surface is installed if framing cannot be observed at final due to height
3. **Electrical Rough-in Inspection** – If applicable (separate electrical permit is required)
4. **Final Inspection**

Footings

- The footings must extend a **minimum 42" below grade**. The diameter of the footings must be sized to adequately support the imposed loads. See illustrations and table for determining your area and footing sizes. (R301 & 403.1.4.1)
- **Helical piers**- engineering and installation reports are required to be submitted to the city. Piers with loads larger than 3533 psf (equal to 18in. round) must review by structural engineer.

Footing Size Table — Based on 2,000 psf

Area of Deck (Sq. Ft.)	Diameter of a Round Footing (inches)	Footing Minimum Thickness (inches)	Area of Deck (Sq. Ft.)	Diameter of a Round Footing (inches)	Footing Minimum Thickness (inches)
14	8"	6"	87	20"	8"
21	10"	6"	105	22"	10"
31	12"	6"	125	24"	10"
42	14"	6"	147	26"	10"
55	16"	8"	171	28"	12"
70	18"	8"	196	30"	12"



Design

- For covered decks please refer to the ***Seasonal Rooms and Cover Decks Handout***
- The design will be structurally reviewed by the Building Department (R106.1) so the deck plan should include; Dimensions of deck should include length x width and height above grade and structural details as noted.

  a)Joist size & spacing

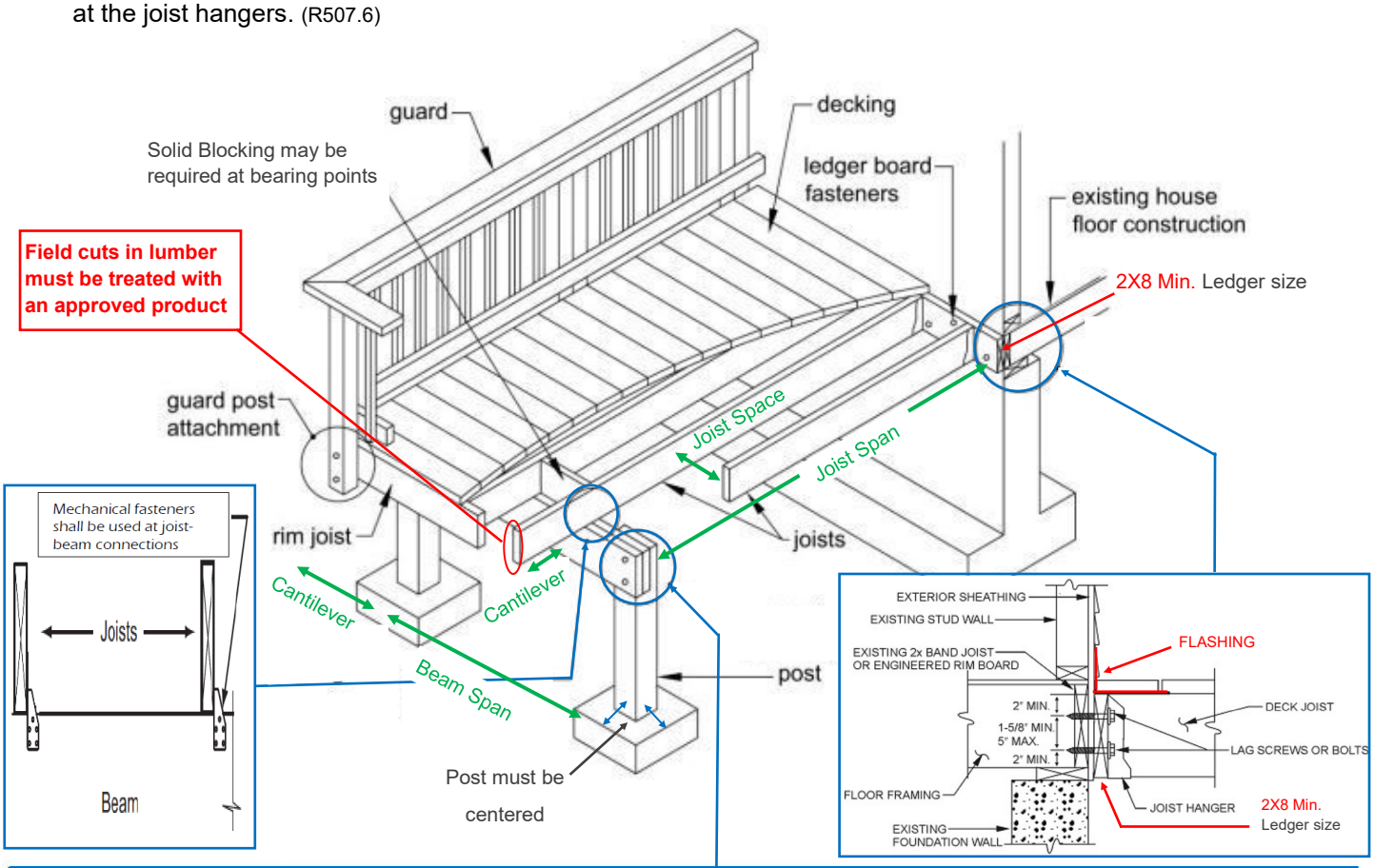
  b)Beam size & location

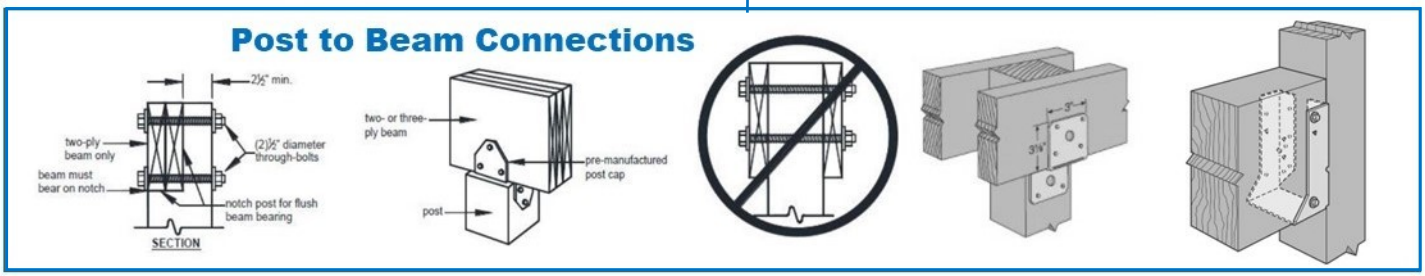
  c)Support columns & location

  d)Footing sizes & location

  (please see next page for design tables)

- All loads such as beams are required to transfer to the center of (or) in the footing and be supported by framing members placed directly underneath them. (R301.1 & R507.4)
- Wood deck materials must be a species with natural resistance to decay such as cedar, redwood or treated wood. Due to the corrosive nature of some framing, the materials hangers and fasteners must be coated to be compatible with the framing materials. (R317.1& R317.3.1)
- Beam to post connections for decks must be secured by a “notched to beam” or “beam over post” with a manufactured post to beam connector or a “sandwiched beam” only with approved bracket . (R507.5)
- Each joist must bear on a minimum of 1 ½” of wood or be supported by the use of a joist hanger. The manufacturer’s directions for all hardware must be followed which may include the use of nails or listed screws at the joist hangers. (R507.6)





Design Details

Decking Materials Span T. R507.7		
Material	Max Joist Spacing	
	Perpendicular	Diagonal
5/4 decking	16”	12”
2” nominal decking	24”	16”
Composite decking	Follow Manufactures Specs	

Deck Post Height T. R507.4	
Deck Post Size	**Max. Height (Feet - Inches)**
4 x 4	8’ - 0” *
4 x 6	8’ - 0”
6 x 6	14’ - 0”
(*) 4x4 post with a 3 ply beam 6’ - 9” max post height	

Joist Spans Table T. R507.6			
Joist Size *Southern Pine*	**Joist Spacing**	**Allowable Joist Span (feet-inches)**	**Max. Cantilever***
2 x 6	12” o.c.	9’-11”	1’-3”
	16” o.c.	9’-0”	1’-4”
	24” o.c.	7’-7”	1’-6”
2 x 8	12” o.c.	13’-1”	2’-1”
	16” o.c.	11’-10”	2’-3”
	24” o.c.	9’-8”	2’-5”
2 x 10	12” o.c.	16’-2”	3’-4”
	16” o.c.	14’-0”	3’-6”
	24” o.c.	11’-5”	2’-10”
2 x 12	12” o.c.	18’-0”	4’-6”
	16” o.c.	16’-6”	4’-2”
	24” o.c.	13’-6”	3’-4”
* Max Cantilever 1/4 joist span or table value, whichever is less			

Beam Sizing Table T. R507.6 Material - Southern Pine							
Beam Size	Deck Joist Span Less than or Equal to: (feet)						
	6	**8**	**10**	**12**	**14**	**16**	**18**
Beams Spans (Feet - Inches)							
(1) 2x6	4’- 11”	4’- 0”	3’- 7”	3’- 3”	3’- 0”	2’ - 10”	2’ - 8”
(1) 2x8	5’ - 11”	5’ - 1”	4’ - 7”	4’ - 2”	2’ - 10”	3’ - 7”	3’ - 5”
(1) 2x10	7’ - 0”	6’ - 0”	5’ - 5”	4’ - 11”	4’ - 7”	4’ - 3”	4’ - 0”
(1) 2x12	8’ - 3”	7’ - 1”	6’ - 4”	5’ - 10”	5’ - 5”	5’ - 0”	4’ - 9”
(2) 2x6	6’ - 11”	5’ - 11”	5’ - 4”	4’ -10”	4’ - 6”	4’ - 3”	4’ - 0”
(2) 2x8	8’ - 9”	7’ - 7”	6’ - 9”	6’ - 2”	5’ - 9”	5’ - 4”	5’ - 0”
(2) 2x10	10’ - 4”	9’ - 0”	8’ - 0”	7’ - 4”	6’ - 9”	6’ - 4”	6’ - 0”
(2) 2x12	12’ - 2”	10’ - 7”	9’ - 5”	8’ - 7”	8’ - 0”	7’ - 6”	7’ - 0”
(3) 2x6	8’ - 2”	7’ - 5”	6’ - 8”	6’ - 1”	5’ - 8”	5’ - 3”	5’ - 0”
(3) 2x8	10’ - 10”	9’ - 6”	8’ - 6”	7’ - 9”	7’ - 2”	6’ - 8”	6’ - 4”
(3) 2x10	13’ - 0”	11’ - 3”	10’ - 0”	9’ - 2”	8’ - 6”	7’ - 11”	7’ - 6”
(3) 2x12	15’ - 0”	13’ - 3”	11’ - 10”	10’ - 9”	10’ - 0”	9’ - 4”	8’ - 10”
Beams may cantilever up to 1/4 of the adjacent beam span							

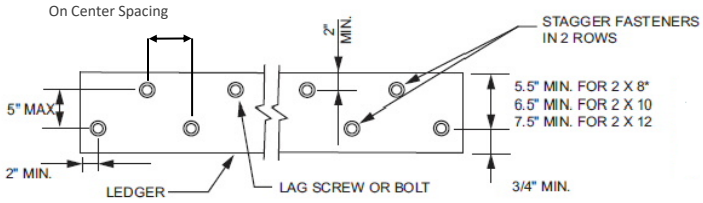
Stairs, handrails and guards

- If stairs are planned or deck floor surface is 30in. or more above grade see separate ***Stair, Handrail and Guard Handout***. (R311 & R312)

Ledger

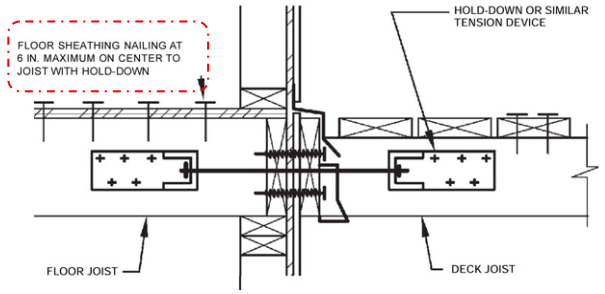
- If the deck is attached to the house, the ledger board must be securely attached with lags, through bolts or other approved fasteners to the house, and diagonal bracing to prevent racking is needed. Connection fasteners must be positioned to minimize damage to the rim joist and must be staggered. Siding must be removed behind the ledger and flashing installed. (R507.9 & R703.4)
- The deck ledger may not support concentrated loads from a beam or girder, "double joist hanger" (R507.9.1.1)
- Ledger boards cannot be attached to a cantilevered floor system unless a design from a registered design professional has been approved. (R507.9.1.2)
- Lateral restraint connections shall be transferred to the ground or the attached structure with bracing, minimum 12in. post embedment, or mechanical connections. *See below for examples of options for* ***Bracing and Lateral Tension Devices*** (R507.4.1 & R.507.9.2)

Connection Detail	JOIST SPAN						
	Up to 6'	6'-8'	8'-10'	10'-12'	12'-14'	14'-16'	16'-18'
	On-center spacing of fastners						
1/2" dia lag screw 1/2" max sheathing	30	23	18	15	13	11	10

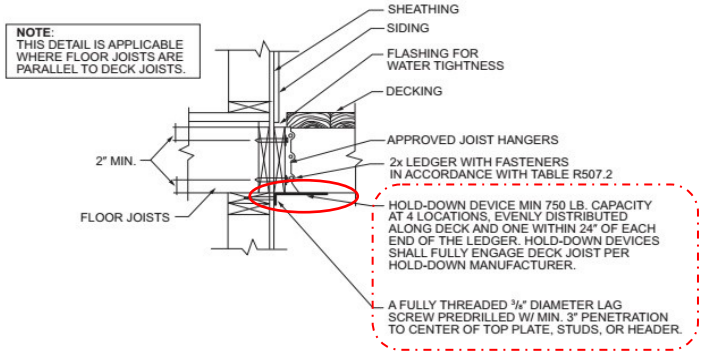


Bracing and Lateral Tension Devices (R.507.9.2)

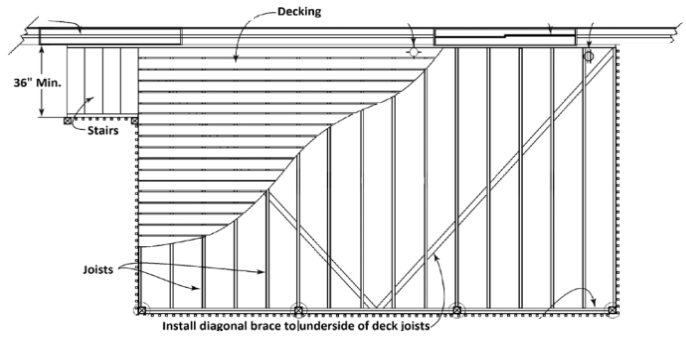
Example 1 - within 24in. of ends of deck, minimum (2)



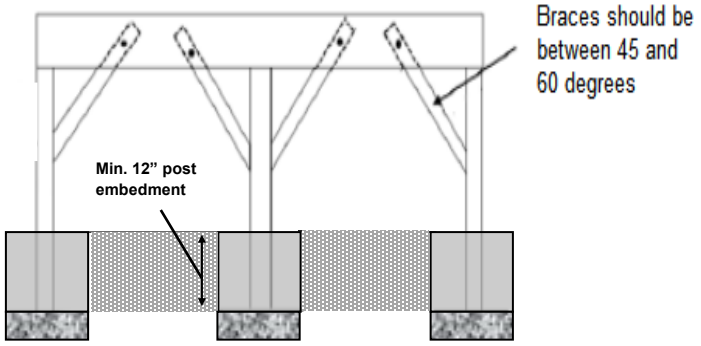
Example 2 – installed minimum (4) locations



Example 3 - installed diagonal bracing



Example 4 - bracing with post embedment into footing



Zoning

- Decks normally must be the same distance from the property lines (called "setback") that the house is required to be. For specific setback requirements for your property please contact the Zoning Administrator at (515) 278-3935.