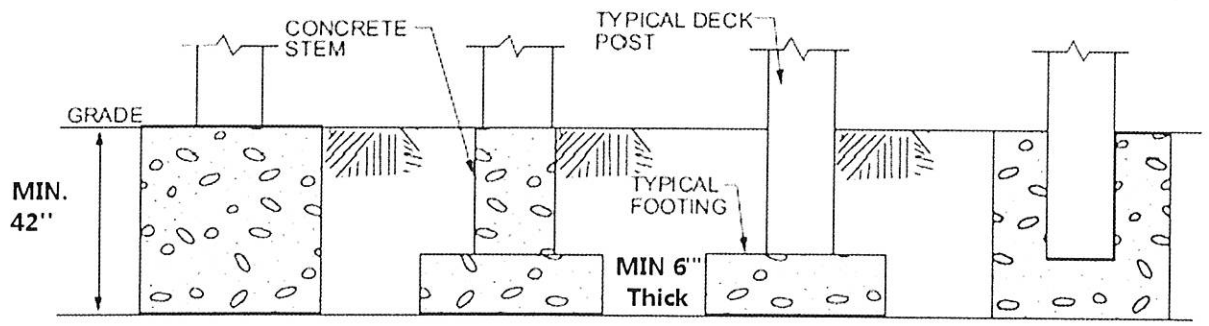
# Deck code requirements

1. Footings for decks are required to extend 42'' below grade unless the deck is not attached to another structure. Footings are required to be a minimum of 6'' thick and sized to transfer all imposed loads to the soil supporting the footing see figure 507.8.1.
2. Deck posts shall be connected to the footing to prevent lateral displacement with a manufacture post connector or be embedded in soil or concrete a minimum of 12''. 4x4 and 4x6 post may be use up to a post height of 8' 6x6 may be used up to a height of 14'
3. Beams shall be sized using table 507.6 of the Michigan residential code and be connected to the post in accordance with figure 507.7.1.
4. Joist shall be sized and spaced in accordance with table 507.5. Deck joist shall be permitted to cantilever not greater than one-fourth of the actual, adjacent joist span
5. Deck ledger connection must be done with in accordance with tables 507.2, 507.2.1, figures 507.2.1(1) and 507.2.1(2). Lag screws must extend beyond the inside face of the band joist of the attaching structure.
6. Corrosion resistant flashing is required over the attached ledger
7. Joist hangers are required for joists that are not supported on top of a beam or wall. Joist hanger depth shall be 60% of the depth of the joist.
8. Guards are required on decks that are 30'' or more above grade, guards shall not have openings that will permit the passage of a 4'' sphere. Guards must be capable of withstanding a concentrated load of 200 pounds at any point along the top or the rail.
9. The band joist may act as the beam if it is sized to meet the span requirements of table 507.6 and is connected to the post in accordance with figure 507.7.1 joist hangers will be required where joist connect to the side of a beam.
10. The maximum allowable joist spacing supporting decking shall be done in accordance with table 507.4 Decking shall be attached to the supporting member with not less than 2 8d nails or 2 #8 screws.

**Figure 507.8.1**



Manufacturer's connectors required

No connectors required

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

| SPECIES[a] | SIZE | SPACING OF DECK JOISTS WITH NO CANTILEVER[b] (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 | 6-8 | 6-8 | 6-8 |
| | 2 × 8 | 13-1 | 11-10 | 9-8 | 10-1 | 10-1 | 9-8 |
| | 2 × 10 | 16-2 | 14-0 | 11-5 | 14-6 | 14-0 | 11-5 |
| | 2 × 12 | 18-0 | 16-6 | 13-6 | 18-0 | 16-6 | 13-6 |
| Douglas fir-larch[d], hem-fir[d] spruce-pine-fir[d] | 2 × 6 | 9-6 | 8-8 | 7-2 | 6-3 | 6-3 | 6-3 |
| | 2 × 8 | 12-6 | 11-1 | 9-1 | 9-5 | 9-5 | 9-1 |
| | 2 × 10 | 15-8 | 13-7 | 11-1 | 13-7 | 13-7 | 11-1 |
| | 2 × 12 | 18-0 | 15-9 | 12-10 | 18-0 | 15-9 | 12-10 |
| Redwood, western cedars, ponderosa pine[e], red pine[e] | 2 × 6 | 8-10 | 8-0 | 7-0 | 5-7 | 5-7 | 5-7 |
| | 2 × 8 | 11-8 | 10-7 | 8-8 | 8-6 | 8-6 | 8-6 |
| | 2 × 10 | 14-11 | 13-0 | 10-7 | 12-3 | 12-3 | 10-7 |
| | 2 × 12 | 17-5 | 15-1 | 12-4 | 16-5 | 15-1 | 12-4 |

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. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360.

c. Ground snow load, 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 R507.6
DECK BEAM SPAN LENGTHS[a, b] (ft. - in.)

| SPECIES[c] | SIZE[d] | DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| Southern pine | 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 x 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.

a. Ground snow load, live load = 40 psf, dead load = 10 psf, L/A = 360 at main span, L/A = 180 at cantilever with a 220-pound point load applied at the end.

b. Beams supporting deck joists from one side only.

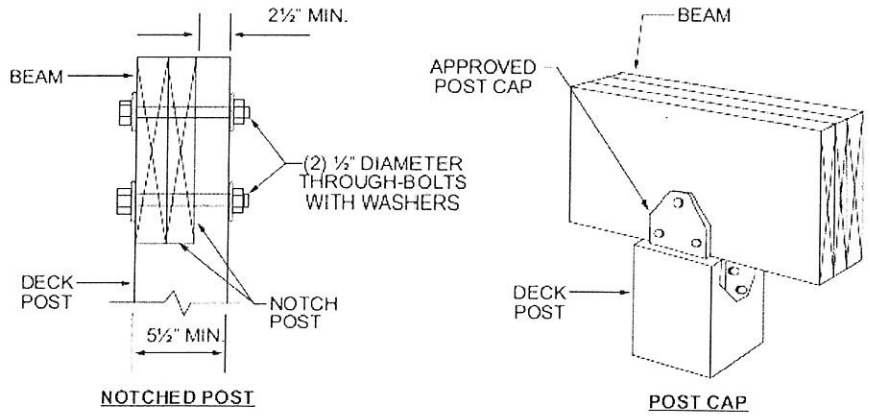
c. No. 2 grade, wet service factor.

d. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.

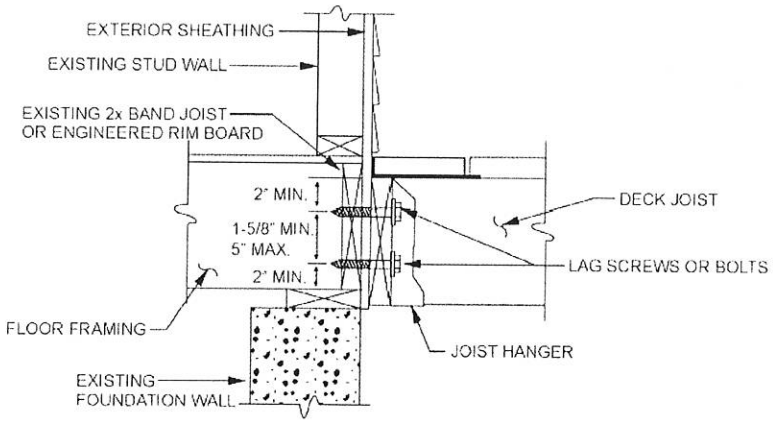
e. Includes incising factor.

f. Northern species. Incising factor not included.

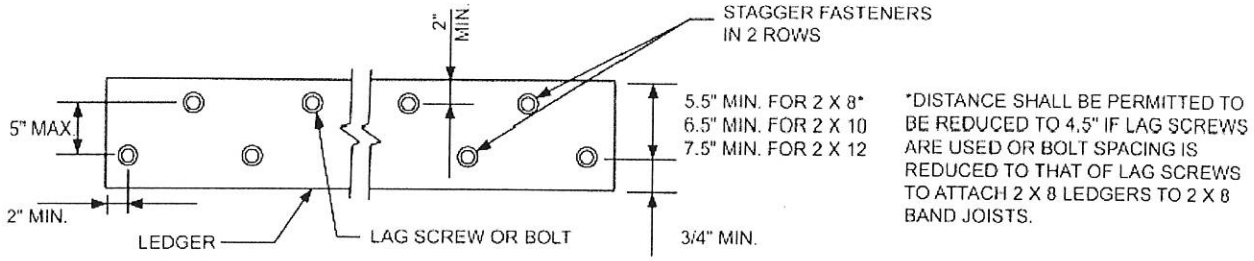
## Figure 507.7.1



## Figure 507.2.1(2)




## Figure 507.2.1(1)




### TABLE 507.2.1
### PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

| | TOP EDGE | BOTTOM EDGE | ENDS | ROW SPACING |
|---|---|---|---|---|
| Ledger[a] | 2 inches[d] | 3/4 inch | 2 inches[b] | 1 5/8 inches[b] |
| Band Joist[c] | 3/4 inch | 2 inches | 2 inches[b] | 1 5/8 inches[b] |

For SI: 1 inch = 25.4 mm.

a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.2.1(1). b. Maximum 5 inches.

c. For engineered rim joists, the manufacturer's recommendations shall govern.

a. The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.2.1(1).

### 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.

a. Ledgers shall be flashed in accordance with Section R703.8 to prevent water from contacting the house band joist.

b. Snow load shall not be assumed to act concurrently with live load.

c. The tip of the lag screw shall fully extend beyond the inside face of the band joist.

d. 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 1/2-inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing

**TABLE R507.4**
**MAXIMUM JOIST SPACING**

| MATERIAL TYPE AND NOMINAL SIZE | MAXIMUM ON-CENTER JOIST SPACING | |
|---|---|---|
| | Perpendicular to joist | 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 R507.3 | In accordance with Section R507.3 |

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