**Olmsted County Planning Department**

# Residential Decks and Porches

This information only outlines general code requirements related to building a residential deck. For specific code requirements, please contact a design professional or the Olmsted County Planning Department at 507-328-7100.

A building permit is required to construct a deck if attached to a structure or more than 30” above grade. To obtain a permit, the following items must be submitted:

## REQUIREMENTS

a) A signed, completed building permit application form.
b) A copy of the Certificate of Survey or site plan drawn to scale, showing property lines, existing buildings and the proposed structure location with distances to property lines.
c) Two copies of building plans. All structural members must be sized and properly spaced to support all loads. The following pages may be used in designing your deck. If there is any overhead wires in the vicinity of your proposed deck, contact the state electrical inspector for required clearances. The following items must be included with the deck plans:
d) All dimensions drawn to scale
e) Size and depth of footings
f) Size and spacing of posts
g) Size of beams and headers
h) Stair location (if applicable)
i) Size, direction and spacing of joists
j) One elevation showing deck height and guard design
k) Size, direction and type of decking
l) Type and size of all materials used

## PERMIT PROCESS

Your application will be reviewed for code compliance and setback requirements. Permit fees will be calculated and you will be notified when the permit is ready to be picked up.

Before digging, call GOPHER STATE ONE CALL at (651) 454-0002 to locate utilities 48 hours in advance.

# REQUIRED INSPECTIONS

Please call 507-328-7100 a minimum of 24 hours in advance to schedule inspections. Inspections are scheduled Monday thru Friday, 8:00 am until 4:30 pm.

Footing - After holes are dug, loose dirt and water removed prior to pouring concrete

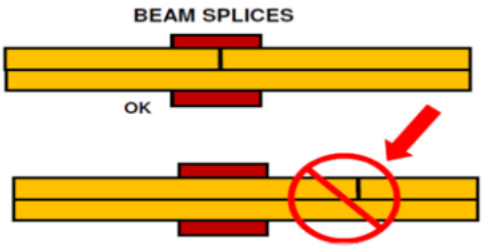
Framing - Only if the deck joists are lower than 5' above grade, inspect before deck boards are installed

Final - Final building inspection after work is complete

# BUILDING CODE REQUIREMENTS 2018 INTERNATIONAL RESIDENTIAL CODE & 2020 MINNESOTA STATE BUILDING CODE

m) The bottom of the footing must be 42" minimum below undisturbed soil, measured either vertically or horizontally.

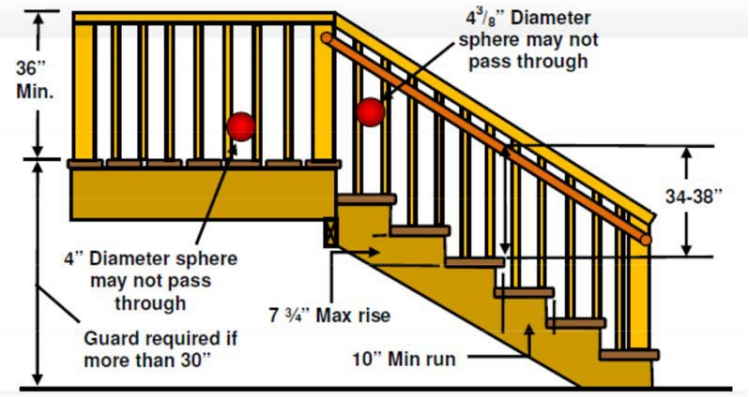
Beam splices must be directly over posts, minimum of 1½" bearing.




n) Joist hangers are required wherever joists do not have at least 1½" of bearing. (Exceptions: cantilevered ends.)

o) Galvanized connectors are required for footing to post, post to beam, and beam to joist connections.

p) Guards are required on all decks more than 30" above grade. Guards must be 36" minimum in height. Open guards must have intermediate rails or an ornamental pattern that a 4" sphere cannot pass through. Guards must be able to withstand 200 lbs. of applied pressure.

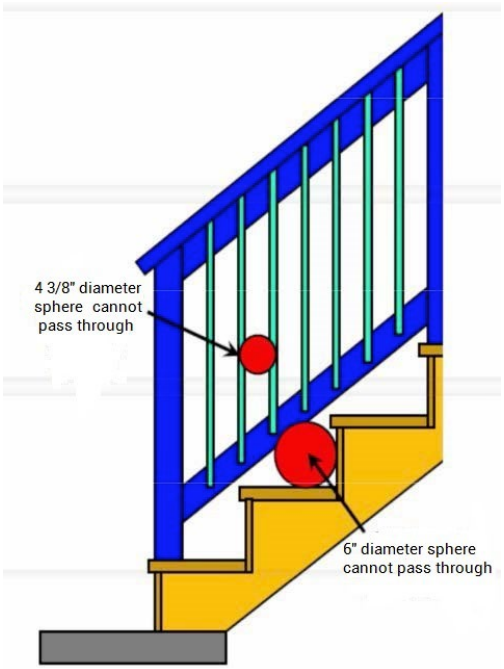



q) Stairways must be 36" between guards for the full length of the stairway.

r) 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. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36 inches (914 mm).

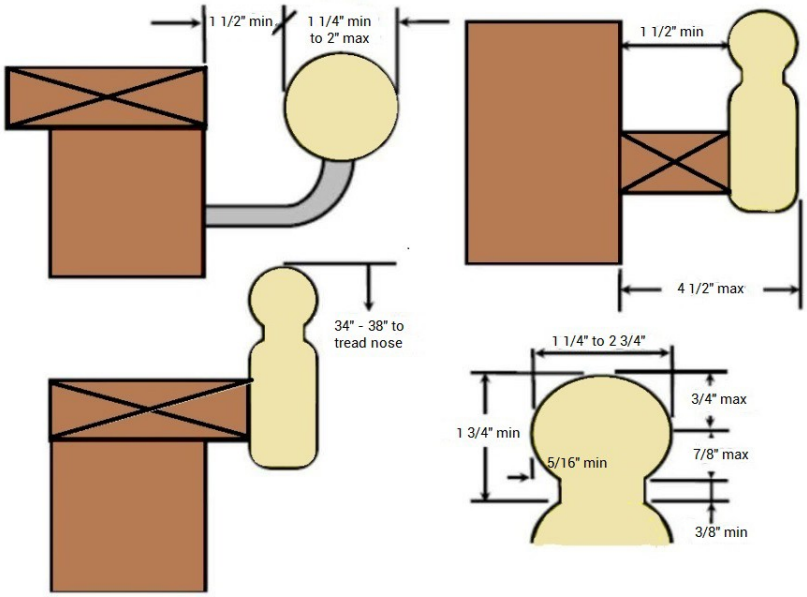
s) The maximum rise is 7 ¾", the minimum run is 10". Treads, risers and nosing's shall be consistent within 3/8". Open risers on stairs with a total rise greater than 30" is not permitted to allow the passage of a 4" diameter sphere. A nosing not less than ¾ inch or greater than 1 ¼" shall be provided on stairways. Spiral stairs are to comply with Section R311.7.10 and R311.7.10.1

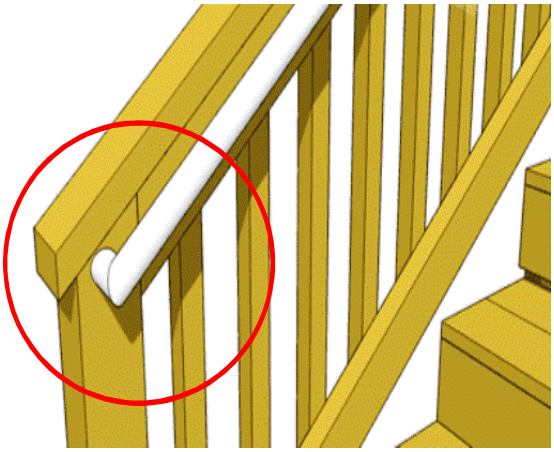
t) Stairways require a guard not less than 34” in height from the nose of the treads. Open guards shall have intermediate rails or an ornamental pattern such that a sphere 4 3/8” in diameter cannot pass through. The triangular openings formed by the riser, tread and bottom rail of guards shall be such that a sphere 6” in diameter cannot pass through.




u) Handrails are required on stairs with four or more risers.

v) Handrails must have a continuous graspable surface and be 34” to 38” above the tread nosing and run the full length of the stairs with ends returned. Handrails shall have a space of not less than 1½” between the handrail and the wall or guard. The handrails shall be not less than 1¼” or more than 2” in diameter.



w) Structural members of exterior decks must be cedar, redwood, treated wood or an approved composite material.

x) Hangers, connectors and fasteners used in conjunction with ACQ treated lumber are required to be ACQ compatible.

y) Special designs or engineering may be required for a 3-season porch or if spas/whirlpool tubs will be placed/located on decks.

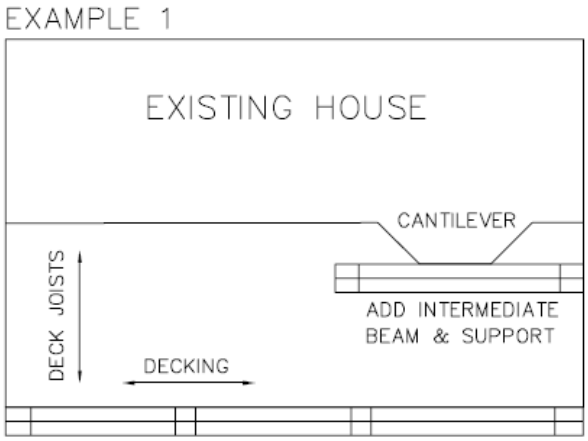
z) Revised plan review fees shall be incurred in the event an additional plan review becomes necessary due to revised building plans.

aa) Joist cantilevers shall be limited to one-fourth of the joist span or the maximum cantilever length specified in Table R507.6, whichever is less. Beam cantilevers are limited to the adjacent beam’s span divided by 4.

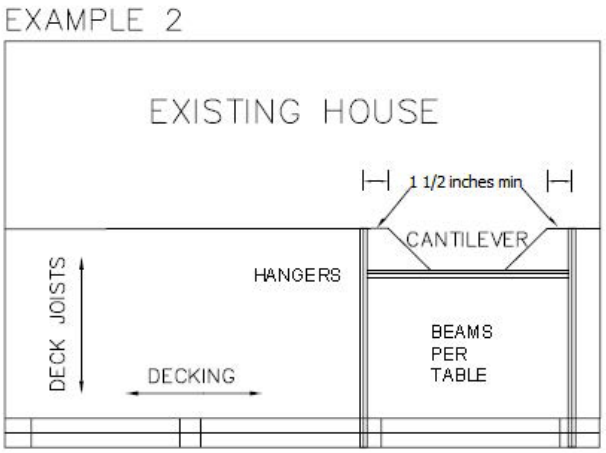
bb) Decks cannot bear on cantilevered floors. Additional framing will be required.

**Olmsted County Planning Department**

Example 1 - Add an intermediate beam, supports and footings. Size beam and footings.




Example 2 - Size beams per handout. Provide adequate hangers from all connections. Design center beam per chart. Also lag bolt to cantilever ledger board.




# DECK LEDGER REQUIREMENTS

## R507.1 Decks.

Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.5 acting on the cantilevered portion of the deck.

## R507.2 Deck ledger connection to band joist.

For decks supporting a total design load of 50 pounds per square foot (2394 Pa) [40 pounds per square foot (1915 Pa) live load plus 10 pounds per square foot (479 Pa) dead load], the connection between a deck ledger of pressure-preservative-treated Southern Pine, incised pressure-

preservative-treated Hem-Fir or approved decay-resistant species, and a 2-inch (51 mm) nominal lumber band joist bearing on a sill plate or wall plate shall be constructed with ₁/₂-inch (12.7 mm) lag screws or bolts with washers in accordance with Table R507.2. Lag screws, bolts and washers shall be hot-dipped galvanized or stainless steel.

## TABLE R507.9.1.3(1)

FASTENER SPACING FOR A SOUTHERN PINE OR HEM-FIR DECK LEDGER AND A 2-INCH-NOMINAL SOLID-SAWN SPRUCE-PINE-FIR BAND JOISTc, f, g (Deck live load = 40 psf, deck dead load = 10 psf)

| 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' |
|---|---|---|---|---|---|---|---|
| Connection details | On-center spacing of fasteners | | | | | | |
| $^1/_2$" diameter lag screw with $^1/_2$" maximum sheathing[b,c] | 30 | 23 | 18 | 15 | 13 | 11 | 10 |
| $^1/_2$" diameter bolt with $^1/_2$ " maximum sheathing[c] | 36 | 36 | 34 | 29 | 24 | 21 | 19 |
| $^1/_2$" diameter bolt with 1" maximum sheathing[d] | 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 R703.4 to prevent water from contacting the house band joist.
b) The tip of the lag screw shall fully extend beyond the inside face of the band joist.
c) Sheathing shall be wood structural panel or solid sawn lumber.
d) Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber, or foam sheathing. Upto 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.

Placement of lag screws or bolts in deck ledgers and band joists. The lag screws or bolts in deck ledgers and band joists shall be placed in accordance with Table R507.9.1.3 (2) and Figures R507.9.1.3 (1) and R507.9.1.3 (2).

## TABLE 507.9.1.3 (2) PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

| MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS | | | | |
|---|---|---|---|---|
| | 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 inaccordance with Figure R507.9.1.3 (1)

b) Maximum 5 inches.
c) For engineered rim joists, the manufacturer's recommendations shall govern.
d) The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.9.1.3 (1)

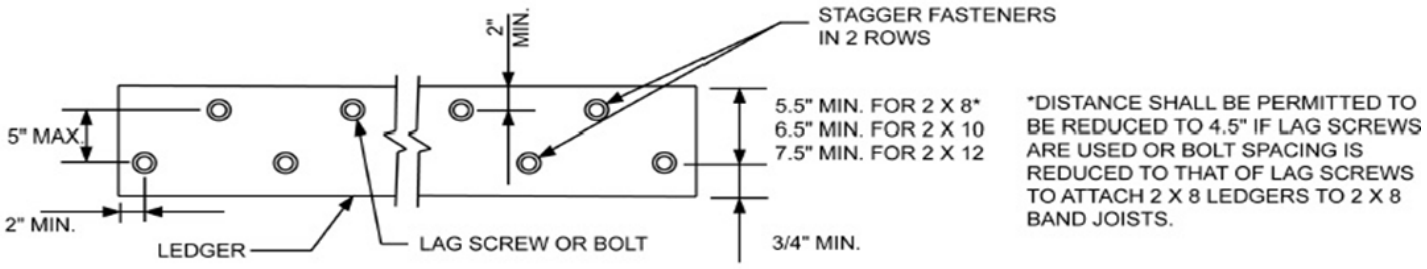
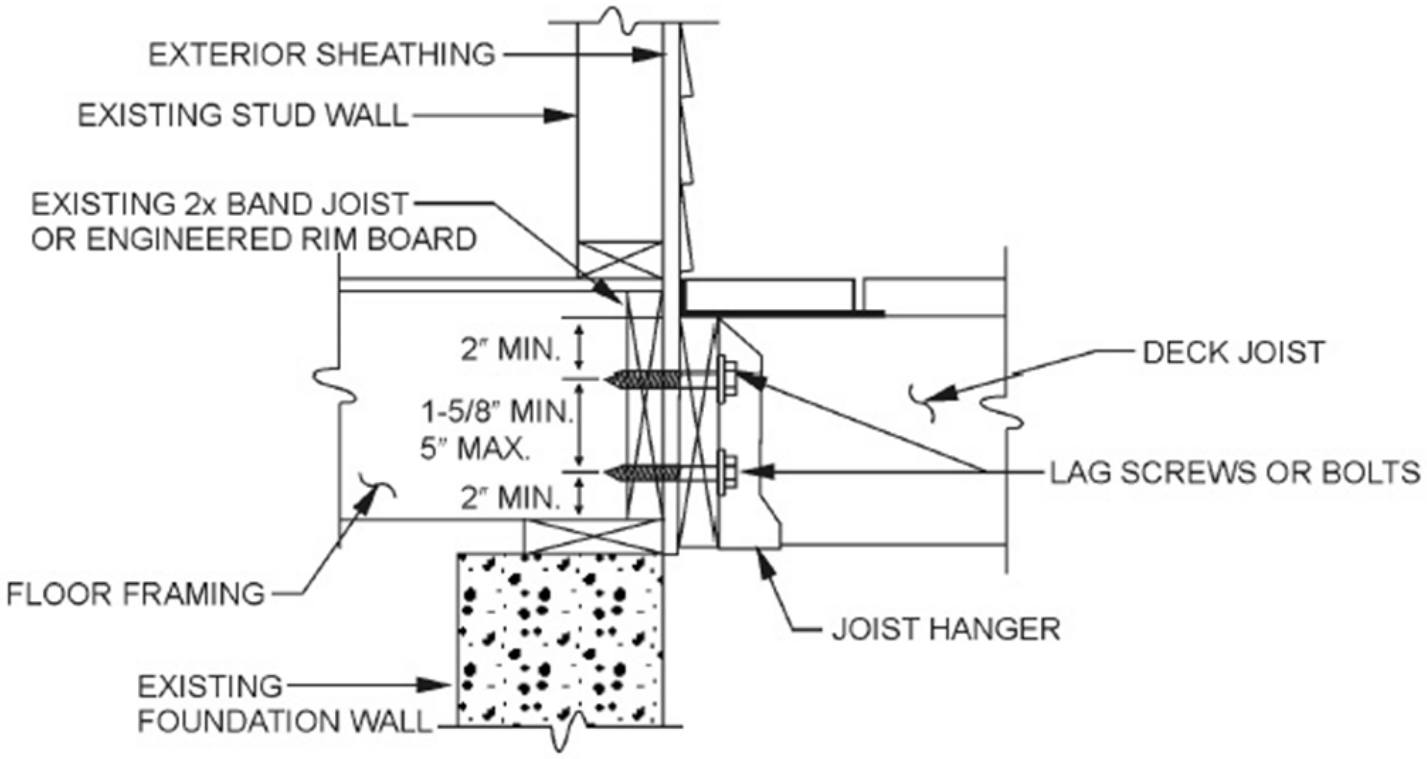



**FIGURE R507.9.1.3 (1) PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS**



# TABLE 507.5 DECK BEAMSPAN LENGTHS (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 x 6 | 4-11 | 4-0 | 3-7 | 3-3 | 3-0 | 2-10 | 2-8 |
| | 1 – 2 x 8 | 5-11 | 5-1 | 4-7 | 4-2 | 2-10 | 3-7 | 3-5 |
| | 1 – 2 x 10 | 7-0 | 6-0 | 5-5 | 4-11 | 4-7 | 4-3 | 4-0 |
| | 1 – 2 x 12 | 8-3 | 7-1 | 6-4 | 5-10 | 5-5 | 5-0 | 4-9 |
| | 2 – 2 x 6 | 6-11 | 5-11 | 5-4 | 4-10 | 4-6 | 4-3 | 4-0 |
| | 2 – 2 x 8 | 8-9 | 7-7 | 6-9 | 6-2 | 5-9 | 5-4 | 5-0 |
| | 2 – 2 x 10 | 10-4 | 9-0 | 8-0 | 7-4 | 6-9 | 6-4 | 6-0 |
| | 2 – 2 x 12 | 12-2 | 10-7 | 9-5 | 8-7 | 8-0 | 7-6 | 7-0 |
| | 3 – 2 x 6 | 8-2 | 7-5 | 6-8 | 6-1 | 5-8 | 5-3 | 5-0 |
| | 3 – 2 x 8 | 10-10 | 9-6 | 8-6 | 7-9 | 7-2 | 6-8 | 6-4 |
| | 3 – 2 x 10 | 13-0 | 11-3 | 10-0 | 9-2 | 8-6 | 7-11 | 7-6 |
| | 3 – 2 x 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 x 6 or 2 – 2 x 6 | 5-5 | 4-8 | 4-2 | 3-10 | 3-6 | 3-1 | 2-9 |
| | 3 x 8 or 2 – 2 x 8 | 6-10 | 5-11 | 5-4 | 4-10 | 4-6 | 4-1 | 3-8 |
| | 3 x 10 or 2 – 2 x 10 | 8-4 | 7-3 | 6-6 | 5-11 | 5-6 | 5-1 | 4-8 |
| | 3 x 12 or 2 – 2 x 12 | 9-8 | 8-5 | 7-6 | 6-10 | 6-4 | 5-11 | 5-7 |
| | 4 x 6 | 6-5 | 5-6 | 4-11 | 4-6 | 4-2 | 3-11 | 3-8 |
| | 4 x 8 | 8-5 | 7-3 | 6-6 | 5-11 | 5-6 | 5-2 | 4-10 |
| | 4 x 10 | 9-11 | 8-7 | 7-8 | 7-0 | 6-6 | 6-1 | 5-8 |
| | 4 x 12 | 11-5 | 9-11 | 8-10 | 8-1 | 7-6 | 7-0 | 6-7 |
| | 3 – 2 x 6 | 7-4 | 6-8 | 6-0 | 5-6 | 5-1 | 4-9 | 4-6 |
| | 3 – 2 x 8 | 9-8 | 8-6 | 7-7 | 6-11 | 6-5 | 6-0 | 5-8 |
| | 3 – 2 x 10 | 12-0 | 10-5 | 9-4 | 8-6 | 7-10 | 7-4 | 6-11 |
| | 3 – 2 x 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) Live load = 40 psf, dead load = 10 psf, L/Δ =360 at main span, L/Δ = 180 at cantilever with a 220-poundpoint 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.
g) Beam cantilevers are limited to the adjacent beam's span divided by 4.

# TABLE R507.3.1 MINIMUM FOOTING SIZE FOR DECKS

| LIVE LOAD[b] (psf) | TRIBUTARY AREA (sq. ft.) | LOAD BEARING VALUE OF SOILS[a,c,d] (psf) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1500[c] | | | 2000[c] | | |
| | | 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 |
| | 40 | 14 | 16 | 6 | 12 | 14 | 6 |
| | 60 | 17 | 19 | 6 | 15 | 17 | 6 |
| | 80 | 20 | 22 | 7 | 17 | 19 | 6 |
| | 100 | 22 | 25 | 8 | 19 | 21 | 6 |
| | 120 | 24 | 27 | 9 | 21 | 23 | 7 |
| | 140 | 26 | 29 | 10 | 22 | 25 | 8 |
| | 160 | 28 | 31 | 11 | 24 | 27 | 9 |

| LIVE LOAD[b] (psf) | TRIBUTARY AREA (sq. ft.) | LOAD BEARING VALUE OF SOILS[a,c,d] (psf) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2500[c] | | | ≥3000[c] | | |
| | | 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 |
| | 40 | 12 | 14 | 6 | 12 | 14 | 6 |
| | 60 | 13 | 15 | 6 | 12 | 14 | 6 |
| | 80 | 15 | 17 | 6 | 14 | 16 | 6 |
| | 100 | 17 | 19 | 6 | 15 | 17 | 6 |
| | 120 | 19 | 21 | 6 | 17 | 19 | 6 |
| | 140 | 20 | 23 | 7 | 18 | 21 | 6 |
| | 160 | 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.

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

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

| SPECIES[a] | SIZE | ALLOWANCE JOIST SPAN[b] SPACING OF DECK JOISTS (Inches) | | | MAXIMUM CANTILEVER[c,f] SPACING OF DECK JOISTS W/ 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, pondersa 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.

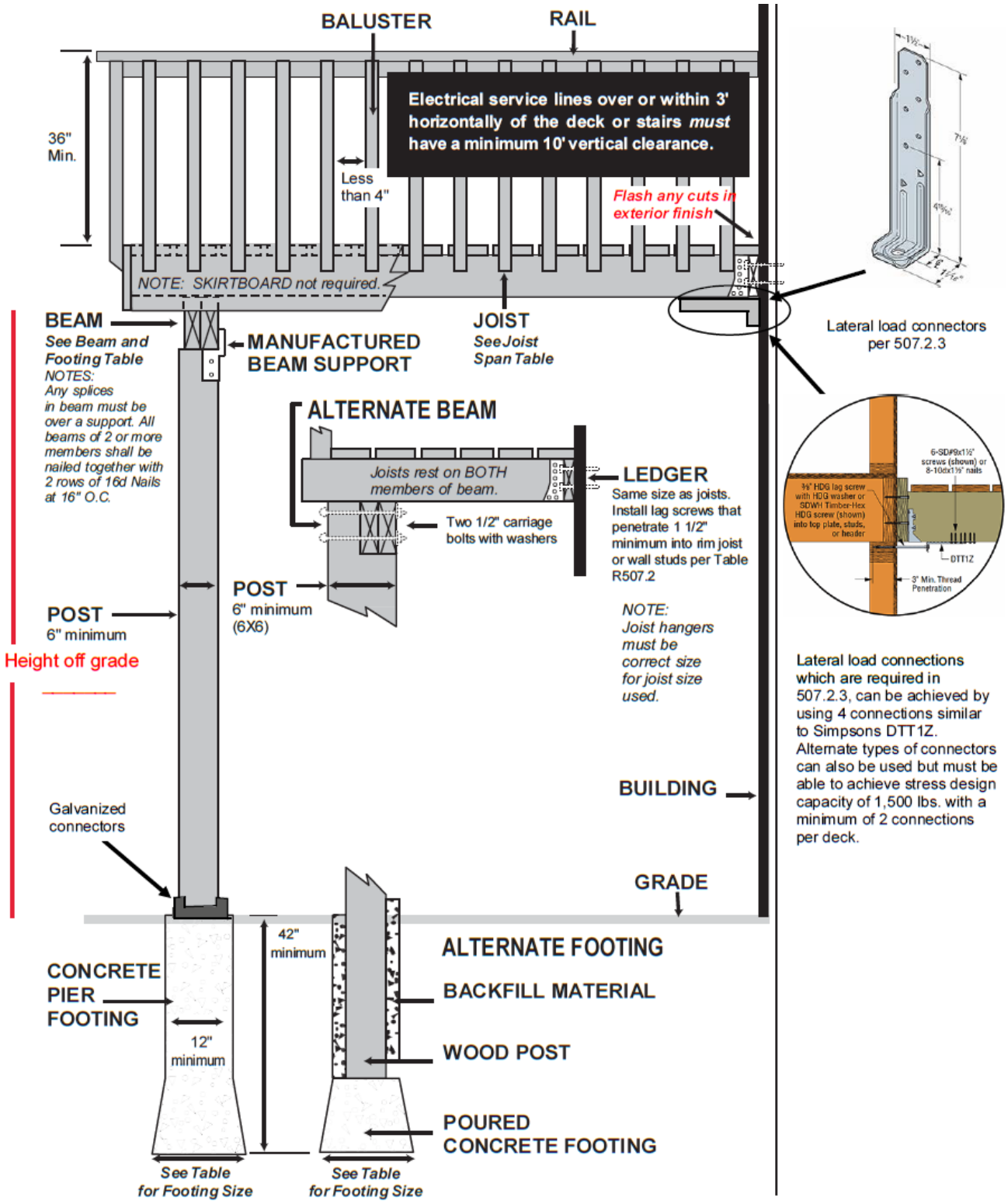
a) No. 2 grade with wet service factor.
b) Live load = 40 psf, dead load = 10 psf, L/Δ = 360.
c) Live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with 220-poundpoint load applied to end.
d) Includes incising factor.
e) Northern species with no incising factor.
f) Cantilevered spans not exceeding the nominal depth of the joist are permitted.

# TABLE R507.7 MAXIMUM JOIST SPACING FOR DECKING

| DECING MATERIAL TYPE AND NOMINAL SIZE | MAXIMUM ON-CENTER JOIST SPACING | |
|---|---|---|
| | Decking perpendicular to joist | Decking diagonal to joist[a] |
| 1 ¼ - 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.

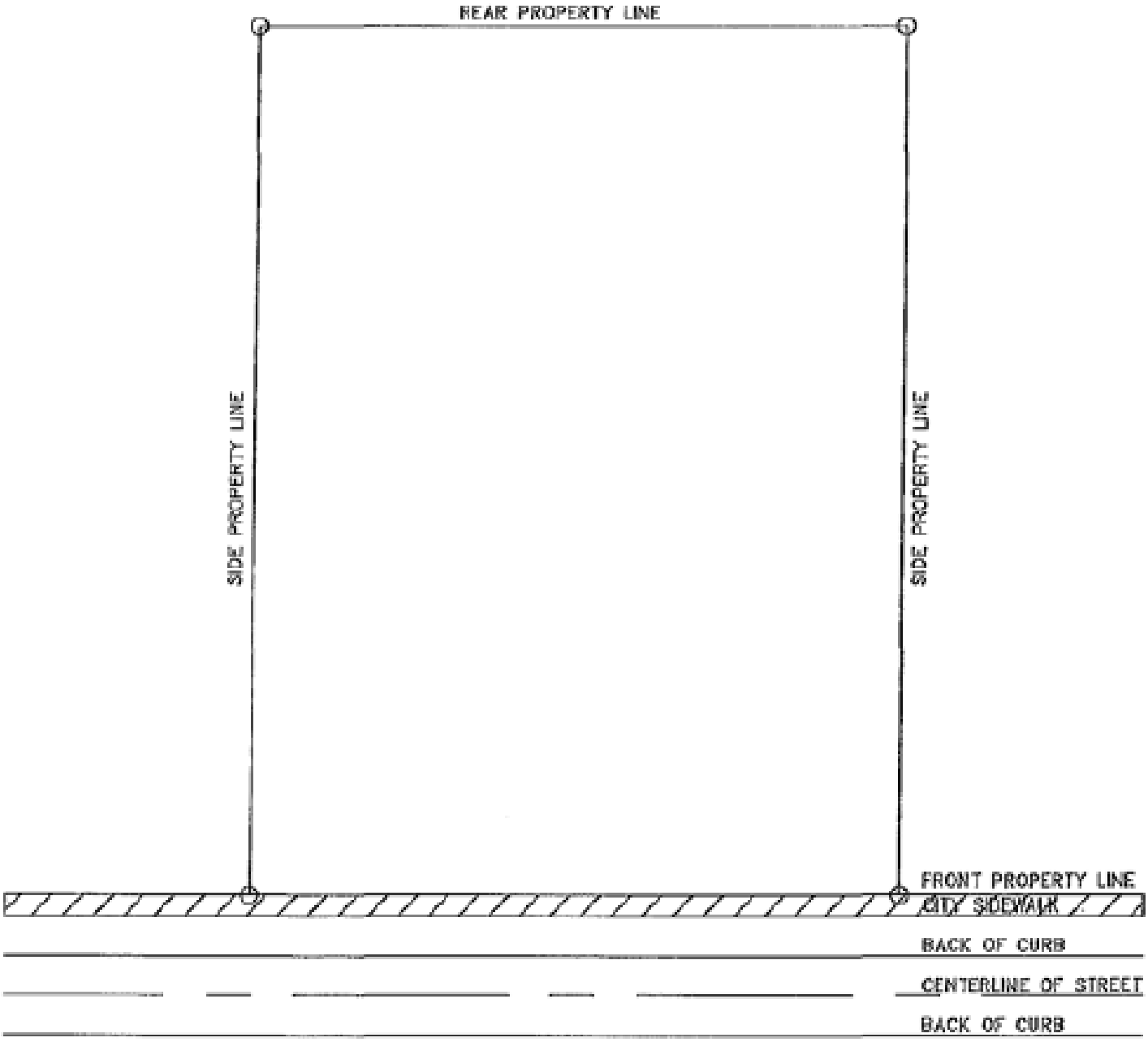
a) Maximum angle of 45 degrees from perpendicular for wood deck boards.


BALUSTER
RAIL
36" Min.
Less than 4"
Electrical service lines over or within 3' horizontally of the deck or stairs must have a minimum 10' vertical clearance.
Flash any cuts in exterior finish
NOTE: SKIRTBOARD not required.
BEAM
See Beam and Footing Table
NOTES:
Any splices in beam must be over a support. All beams of 2 or more members shall be nailed together with 2 rows of 16d Nails at 16" O.C.
MANUFACTURED BEAM SUPPORT
JOIST
See Joist Span Table
ALTERNATE BEAM
Joists rest on BOTH members of beam.
Two 1/2" carriage bolts with washers
LEDGER
Same size as joists. Install lag screws that penetrate 1 1/2" minimum into rim joist or wall studs per Table R507.2
NOTE: Joist hangers must be correct size for joist size used.
POST
6" minimum
(6X6)
POST
6" minimum
Height off grade
BUILDING
Galvanized connectors
GRADE
42" minimum
CONCRETE PIER FOOTING
12" minimum
ALTERNATE FOOTING
BACKFILL MATERIAL
WOOD POST
POURED CONCRETE FOOTING
See Table for Footing Size
See Table for Footing Size
Lateral load connectors per 507.2.3
6-SDWH9x1½" screws (shown) or 8-10dx1½" nails
¾" HDG lag screw with HDG washer or SDWH Timber-Hex HDG screw (shown) into top plate, studs, or header
DTT1Z
3" Min. Thread Penetration
Lateral load connections which are required in 507.2.3, can be achieved by using 4 connections similar to Simpsons DTT1Z. Alternate types of connectors can also be used but must be able to achieve stress design capacity of 1,500 lbs. with a minimum of 2 connections per deck.

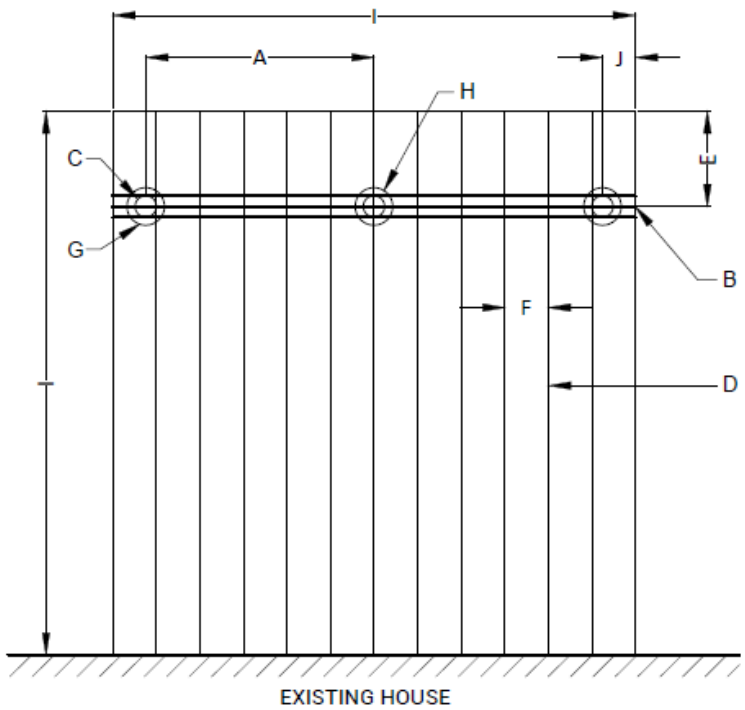
## Site Plan

Address:_____

For new buildings and abuilding additions, the site plan must include any existing structures or proposed construction, street(s), and distances from other structures, property lines, public streets, easements, septic tanks, drainfields, and wells.



# Simple Deck Plan




FILL IN THE BLANKS

A. SPACING IN BETWEEN POSTS: _____

B. BEAM SIZE (2 - 2x10, ETC.): _____

C. POST SIZE (6x6, ETC.): _____

D. JOIST LENGTH AND SIZE: _____

E. JOIST OVERHANG _____

F. SPACING BETWEEN JOISTS (16", 24" O.C.): _____

G. CORNER FOOTING SIZE: _____

H. INTERMEDIATE FOOTING SIZE: _____

I. OVERALL DECK SIZE: _____

J. BEAM OVERHANG: _____

K. LEDGER SIZE _____

TYPE OF RAILING OR GUARD

MATERIAL (CEDAR, TREATED, ETC) _____

HEIGHT ABOVE GROUND: _____

TYPE OF DECKING: _____

SPECIAL NOTE:
A COMPLETE AND DETAILED DECK PLAN WILL RESULT IN A COMPLETE AN DETAILED PLAN REVIEW.

NOT TO SCALE