

RESIDENTIAL DECKS

CITY OF HUTCHINSON BUILDING DEPARTMENT

111 Hassan Street SE, Hutchinson, MN 55350

Phone: 320-234-4216 web site with forms www.ci.hutchinson.mn.us/bldg.htm

REQUIRED INFORMATION WHEN APPLYING FOR A DECK PERMIT:

1. A Building/Land Use permit is required to construct a deck.
2. Completing an application does not imply permission to construct.
3. A review of materials, dimensions and setbacks must be conducted by the Building and Zoning Departments prior to a permit being issued.
4. Please allow ample time for this review process, before planning to begin work.

TO APPLY FOR A PERMIT THE FOLLOWING ITEMS MUST BE SUBMITTED

1. A completed Building/Land use permit application.
2. Two (2) 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.
 - All dimensions of deck drawn to scale
 - Size and depth of footings
 - Size and spacing of posts
 - Size of beams and headers
 - Size, direction and spacing of floor joists
 - Size, direction and type of decking
 - Type and size of all materials used
 - Elevation showing approximate height of deck from grade
3. A copy of a Certificate of Survey or site plan drawn to scale showing property lines, existing building and the proposed structure location, complete with distances to property lines and other structures. Setbacks and locations of decks are regulated by zoning laws. Please verify specific regulations for your lot.

PICKING UP THE PERMIT

Your application will be reviewed for code compliance and set back requirements. You will be notified when the permit is ready to be picked up.

It is your responsibility to contact **GOPHER STATE ONE CALL** 48 hours prior to digging to locate utilities. **1-800-252-1166**

CALLING FOR INSPECTIONS 320-234-4216

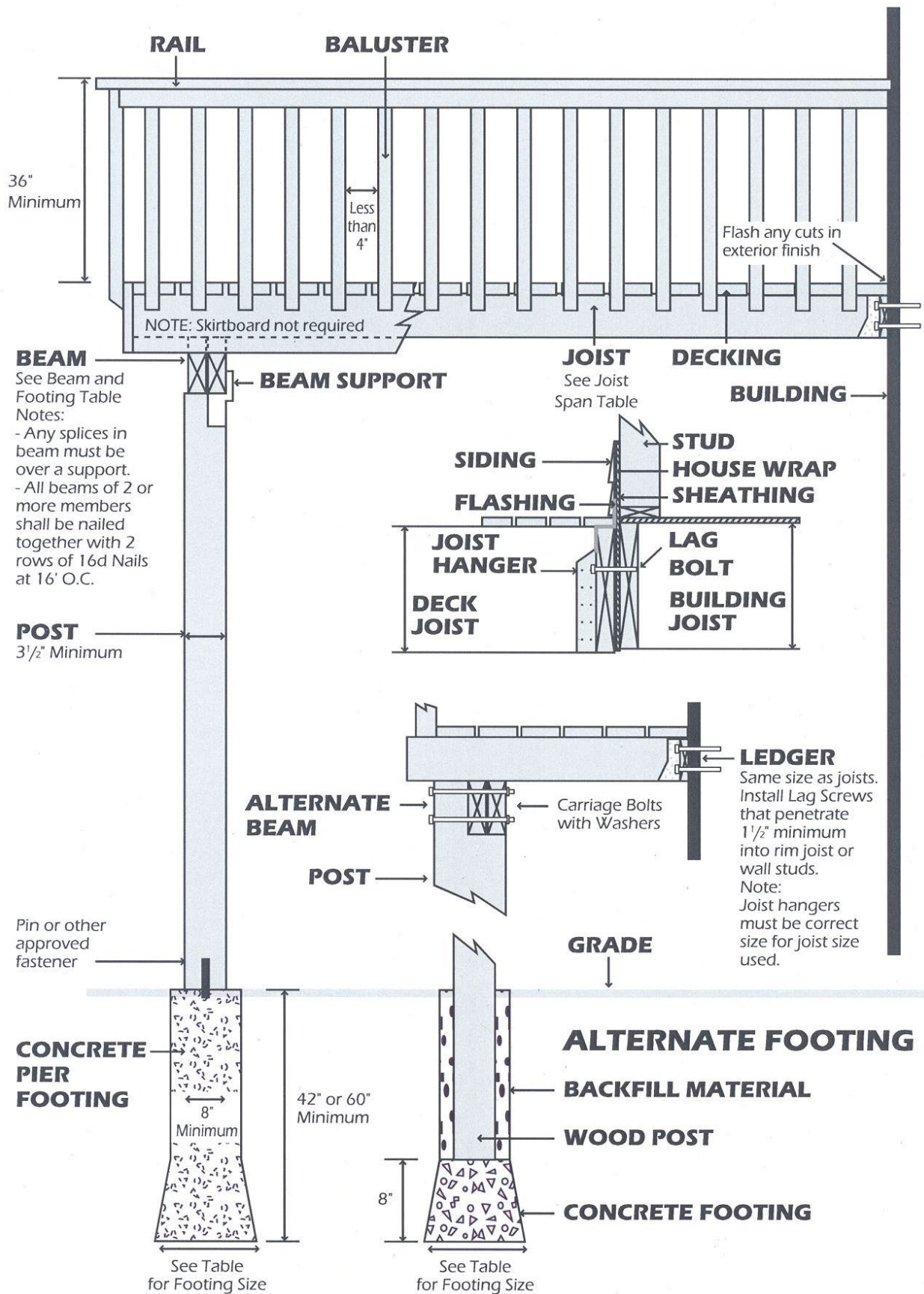
Please call at least 24 hours in advance for inspections. Be prepared to provide the address, permit number, and desired inspection time.

1. Call for FOOTING INSPECTIONS after holes are dug and before pouring concrete. Remove loose dirt and water.
2. Call for FRAMING INSPECTION if under-floor framing will be concealed when complete.
3. Call for FINAL INSPECTION when deck is complete.

BUILDING & ZONING CODE REQUIREMENTS

- If hiring a contractor to work on your home, the contractor must be licensed through the state of Minnesota. You may contact the Hutchinson Building Department to verify if your contractor is licensed.
- The bottom of the footing must extend 42 inches minimum below finished grade to ensure minimum frost protection.
- Beam splices must be located over posts, with minimum 1½ inch of bearing.
- Deck ledger boards must be fastened to the structure according to the information included in this handout, and shall be designed for both vertical and lateral loads. Ledger must be flashed to prohibit moisture intrusion.
- Joist hangers are required wherever joists do not have 1½ inches of bearing.
- Many of the man made decking materials available have not been tested or approved, check with the manufacturer or Building Department to ensure the product you choose is approved.

- Guards
 1. Guards are required on all decks with any part of the walking surface located 30 inches or more above grade or lower surfaces.
 2. Guards must be 36 inches minimum in height.
 3. Guards must have intermediate rails or an ornamental pattern that does not allow passage of a 4-inch sphere.
- Stairs
 1. Stairs shall not be less than 36 inches in clear width.
 2. Stairs must have a maximum rise of 7-3/4 inches, and a minimum run of 10 inches.
 3. The dimension of the rise or run shall be consistent to within 3/8 of an inch. Open risers are permitted providing a 4-inch sphere cannot pass through.
 4. Stairs having landings shall have landings not less in width than the stairs it serves. All landings at top and bottom of stairs shall have a minimum of 36 inches measured in the direction of travel.
- Handrails
 1. Handrails are required on at least one side of stairs having four or more stair risers.
 2. Handrails shall not project more than 4-1/2 inches into the stairway.
 3. Handrails must have a continuous graspable surface, running the full length of the stairs with ends returning to or terminating at newel posts or other safe terminal. The required size of handrails is shown in the illustrations on the following pages.
- Wooden structural members of exterior decks must be cedar, redwood, treated wood, or other material approved for exterior exposure.
- If pier blocks are used in lieu footings, deck shall be designed to prevent lateral displacement and uplift. If pier blocks are used, the deck must not be fastened to any structure with frost depth footings.
- Special designs consideration may be required if a future 3 or 4 season porch, screen porch, spas or whirlpool tub will be placed on deck.
- All fasteners must be approved for exterior use.
- Positive connections are required at all joint locations.

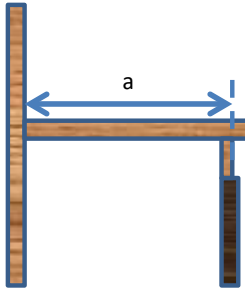


Joist Span

Based on No. 2 stress grade and wet service conditions.

(Design Load = 40 psf live load, 10 psf dead load)

| | Ponderosa Pine | | | Southern Pine | | | Western Cedar | | |
|----------|----------------|---------|---------|---------------|----------|---------|---------------|---------|---------|
| | 12" OC | 16" OC | 24" OC | 12" OC | 16" OC | 24" OC | 12" OC | 16" OC | 24" OC |
| 2" x 6" | 8' -10" | 8' -0" | 6' -10" | 9' -11" | 9' -0" | 7' -7" | 8' -10" | 8' -0" | 6' -10" |
| 2" x 8" | 11' -8" | 10' -7" | 8' -8" | 13' -1" | 11' -10" | 9' -8" | 11' -8" | 10' -7" | 8' -8" |
| 2" x 10" | 14' -11" | 13' -0" | 10' -7" | 16' -2" | 14' -0" | 11' -5" | 14' -11" | 13' -0" | 10' -7" |
| 2" x 12" | 17' -5" | 15' -1" | 12' -4" | 18' -0" | 16' -6" | 13' -6" | 17' -5" | 15' -1" | 12' -4" |

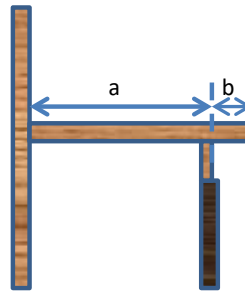


Refer to tables for joist, beam, and footing size requirements

Example: a = 12'; Post Spacing = 8'

Use the Joist Span table to find the acceptable joist sizes for a 12' span, 2 x 8s at 12" O.C., 2 x 10s at 16" O.C., or 2 x 12s at 24" O.C.

Use the Beam and Footing Sizes table and find the 8' post spacing column. With a 12' deck span, the beam may be either two 2 x 8s or two 2 x 10s, depending on wood used. Depending on the type of soil, the footing diameter at the base must be a minimum of 12", 19" or 9" for the corner post and 17", 14", or 12" for all intermediate posts.

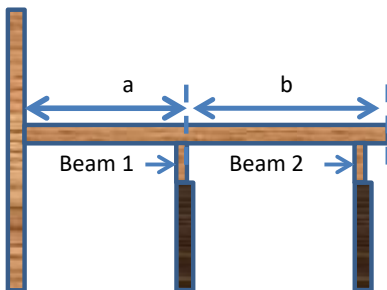


Use "a" to determine joist size and "a" + "2b" to determine beam and footing sizes. The length of "b" is restricted by both the length of "a" and the size of the joists.

Example: a = 8', b = 2', Post Spacing = 10'

Refer to the Joist Span table. For an 8' joist span, either 2 x 8s at 24" O.C. or 2 x 6s at 16" O.C. are acceptable.

For sizing the beam, use a joist length of 12' (8' + 4') and a post spacing of 10'. The Beam and Footing Sizes table indicates that the beam may be either two 2 x 10s or two 2 x 12s, depending on wood used. Depending on the type of soil, the footing diameter at the base must be a minimum of 15", 12", or 11" for the corner post and 20", 17", or 15" for all intermediate posts. Note that because of the 2' cantilever, all footing sizes were increased by 1" as required by footnote 2 at the end of the table.



Use "s" or "b", whichever is greater, to determine joist size. Use "a" + "b" to determine the size of Beam 1 and the post footing size for the posts supporting Beam 1. Use joist length "b" to determine both the size of Beam 2 and the post footing size for the posts supporting Beam 2.

Example: a = 6', b = 7', Post Spacing 9"

Joist size is determined by using the longest span joist (7'). The Joist Span table indicates that 2x 6s at 24" O.C. would be adequate for this span.

For Beam 1 and footings, use a joist length of 13' (6' + 7') and a post spacing of 9'. The Beam and Footing Sizes table indicates that the beam may be two 2 x 10s or two 2 x 12s, depending on the wood used. Depending on the type of soil, the footing diameters for Beam 1 posts shall be 13", 11", or 9" for the corner (outside) post and 19", 15", or 13" for all intermediate posts. For Beam 2 and footings use a joist length of 7' and post spacing of 9'. The beam may be two 2x 8s or two 2 x 10s, depending on wood used. Depending on the type of soil, the footing diameters for Beam 2 shall be 10", 8", or 7" for the corner posts, and 14", 11" or 10" for all intermediate posts.

MINIMUM FOOTING SIZE FOR DECKS

| LIVE LOAD ^b (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 |
| Center Post Tributary Area = (1/2 Joist span + Joist overhang of beam) x (Distance between posts) ** Center Post Tributary Area shall be multiplied by 1.25 at center posts with beams not spliced (continuous)** Corner Post Tributary Area = (1/2 Joist span + Joist overhang of beam) x (1/2 Distance between posts + Distance beam cantilevers past post) | | | | | | | | | | | | | |

^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 a 6 x 6 post.

^d If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.

^e Area, in square feet, of deck surface supported by post and footings.

DECK BEAM SPAN LENGTHS (feet - inches)

| Species | SIZE | 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 | 3-10 | 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 - 2x 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 |

DECK POST HEIGHT^a

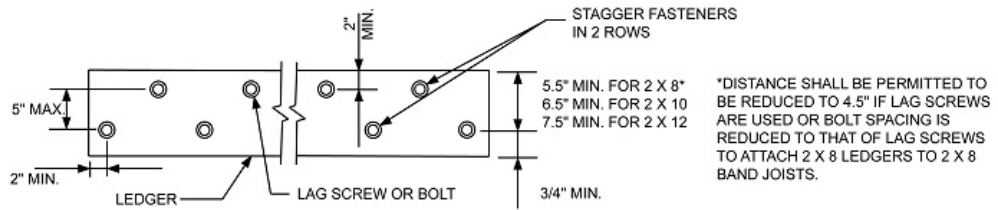
| DECK POST SIZE | MAXIMUM HEIGHT (feet-inches) ^{a, b} |
|----------------|---|
| 4 x 4 | 6-9 ^c |
| 4 x 6 | 8 |
| 6 x 6 | 14 |
| 8 x 8 | 14 |

^a Measured to underside of beam

^b Based on 40 psf live load

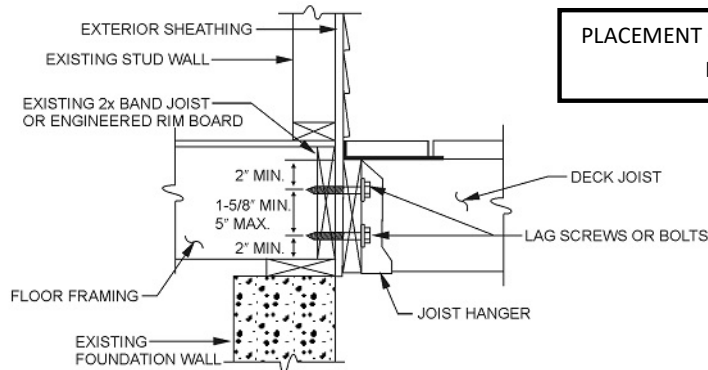
^c Maximum permitted height is 8 feet for on-ply and two-ply beams. The maximum permitted height for three-ply beams on past cap is 6 feet 9 inches.

PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS

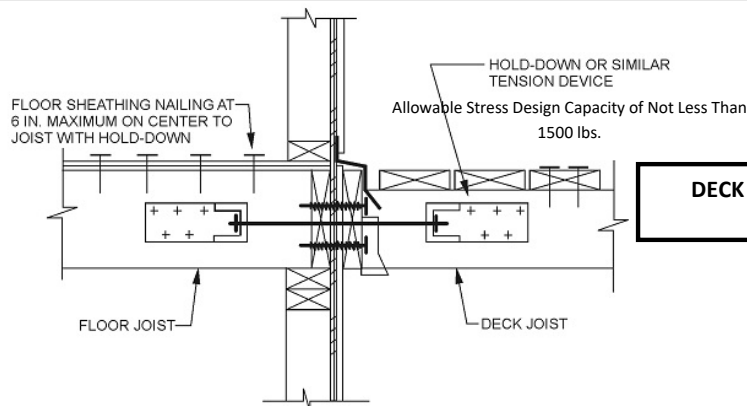


| JOIST SPAN | 6' and less | 6'1" to 8' | 8'1" to 10' | 10'1" to 12' | 12'1" to 14' | 14'1" to 16' | 16'1" to 18' |
|---|--|------------|-------------|--------------|--------------|--------------|--------------|
| Connection details | On-center spacing of fasteners ^{d, e} | | | | | | |
| ¹ / ₂ inch diameter lag screw with ¹⁵ / ₃₂ inch maximum sheathing ^a | 30 | 23 | 18 | 15 | 13 | 11 | 10 |
| ¹ / ₂ inch diameter bolt with ¹⁵ / ₃₂ inch maximum sheathing | 36 | 36 | 34 | 29 | 24 | 21 | 19 |
| ¹ / ₂ inch diameter bolt with ¹⁵ / ₃₂ inch maximum sheathing and ¹ / ₂ inch stacked washers ^{b, h} | 36 | 36 | 29 | 24 | 21 | 18 | 16 |

PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS

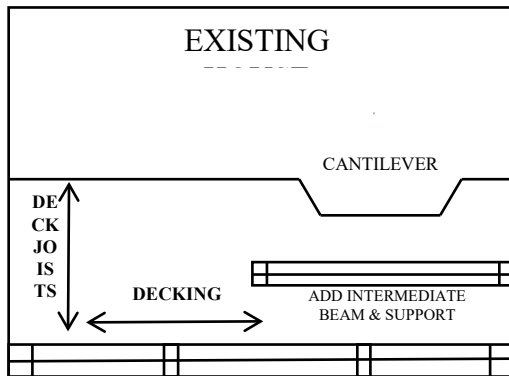


DECK ATTACHMENT FOR LATERAL LOADS

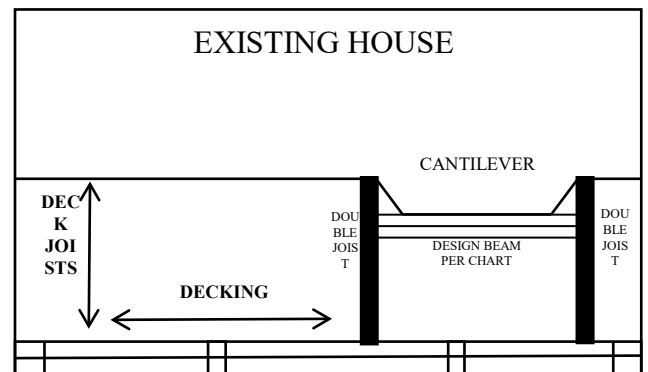


CANTILEVER REINFORCEMENT GUIDELINES

EXAMPLE 1



EXAMPLE 2



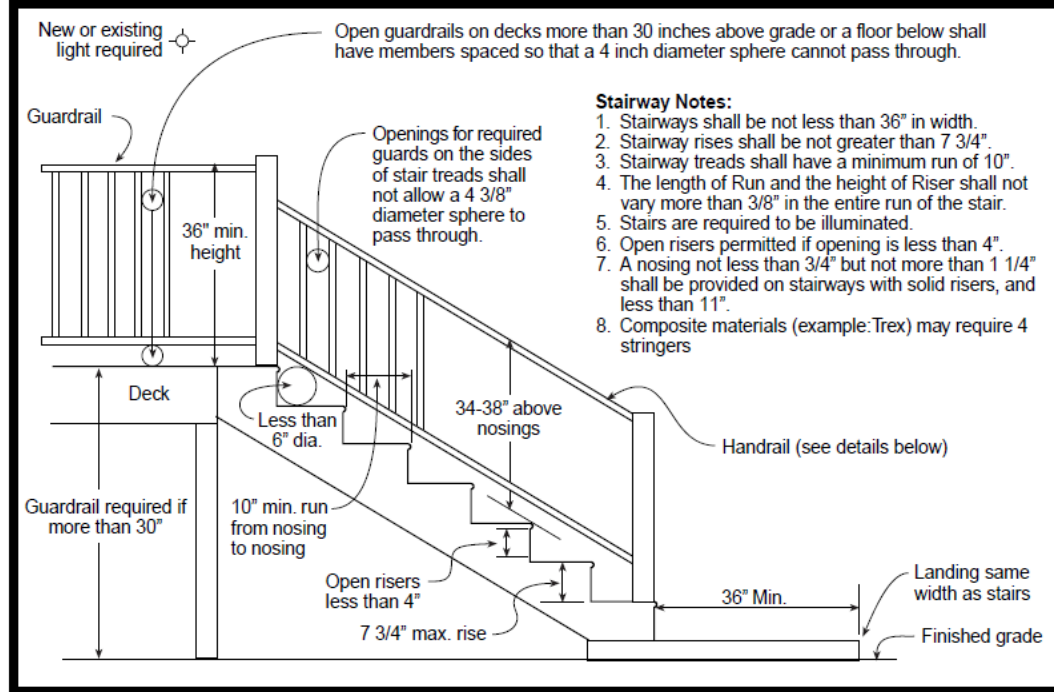
MANY HOUSE DESIGNS HAVE CANTILEVERED (EXTENSIONS) FROM THE MAIN STRUCTURE AND WHICH TYPICALLY CONTAIN PATIO DOORS FOR FUTURE DECK ADDITIONS. THE REINFORCEMENT SELECTED WILL BE BASED ON THE TYPE OF FLOOR FRAMING MEMBER PRESENTLY IN THE HOUSE. WE HAVE DIAGRAMMED TWO POSSIBLE SOLUTIONS FOR PROVIDING SUCH REINFORCEMENT.

EXAMPE #1: ADD AN INTERMEDIATE BEAM, SUPPORTS, AND FOOTINGS. SIZE BEAM AND FOOTINGS ACCORDING TO THE DECK HANDOUT.

EXAMPLE #2: ADD DOUBLE JOIST OUTSIDE OF CANTILEVER. PROVIDE ADEQUATE HANGERS FOR ALL CONNECTIONS. DESIGN CENTER BEAM PER CHART. ALSO LAG BOLT BEAM TO CANTILEVER LEDGER BOARD.

Single Family Residential Uncovered Decks and Porches

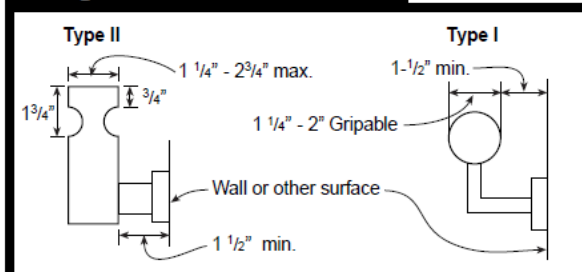
Stair & Handrail Specifications



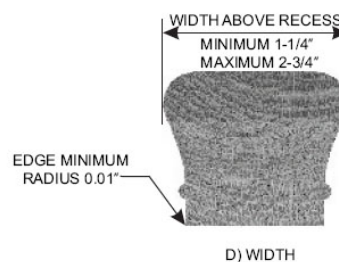
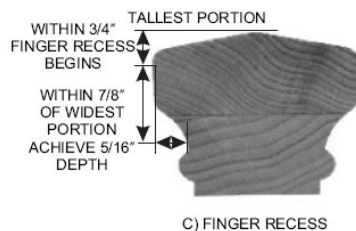
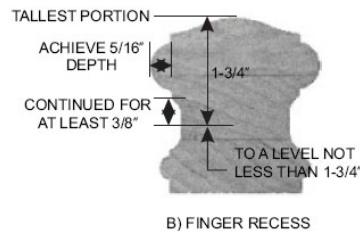
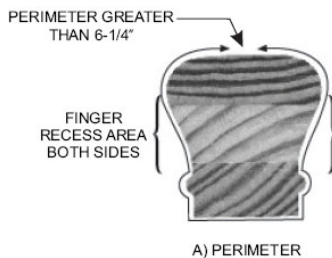
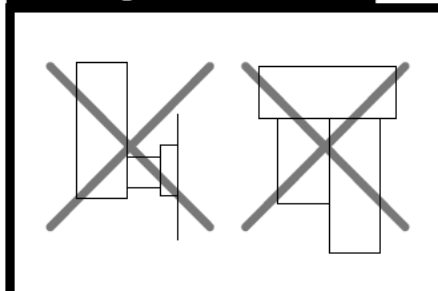
Handrail Notes:

1. Handrails shall be continuous on at least one side of stairs with 4 or more risers.
2. Top of the handrails shall be placed not less than 34 inches nor more than 38 inches above stair nosings.
3. The handgrip portion of handrails shall be not less than 1-1/4 inches nor more than 2 1/4 inches in cross section for non circular handrail
4. Handrails shall be placed not less than 1-1/2 inches from any wall or other surface.
5. Handrails to be returned to wall, post or safety terminal (per 311.5.6.2 IRC)

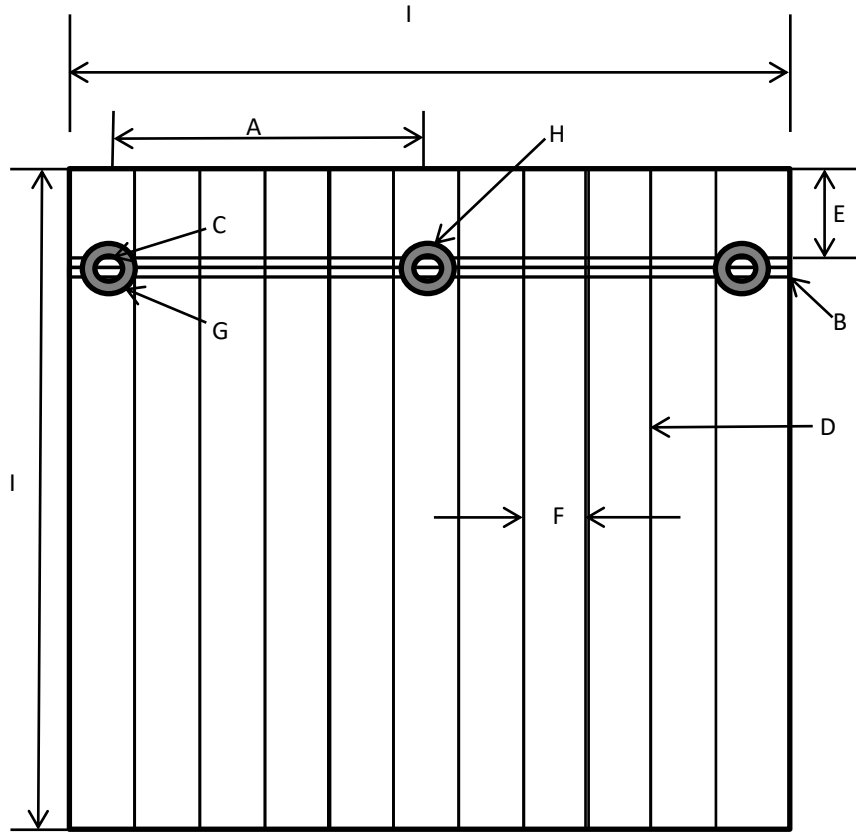
Acceptable Handrail Details



Unacceptable Handrails



SAMPLE DECK PLAN



EXISTING HOUSE

FILL IN THE BLANKS:

A. SPACING IN BETWEEN POSTS

B. BEAM SIZE (2 – 2 X 10, ETC.)

C. POST SIZE (4 X 4; 6 X 6; ETC.)

D. JOIST LENGTH AND SIZE

E. JOIST OVERHANG

F. SPACING BETWEEN JOISTS
(12", 16", OR 24" O.C.)

G. CORNER FOOTING SIZE

H. INTERMEDIATE FOOTING SIZE

I. OVERALL DECK SIZE

J. TYPE OF MATERIAL
(CEDAR, TREATED, ETC.)

K. HEIGHT ABOVE GROUND

L. TYPE OF DECKING
(5/4" X 6", 2" X 6", ETC.)

SPECIAL NOTE:

A COMPLETE AND DETAILED DECK PLAN WILL RESULT
IN A COMPLETE AND DETAILED PLAN REVIEW.