Deck permit guide

This handout is intended only as a guide and is based in part on the 2020 Minnesota Residential Code, St. Louis Park City ordinances, and good building practice. While every attempt has been made to insure the correctness of this handout, no guarantees are made to its accuracy or completeness. Responsibility for compliance with applicable codes and ordinances falls on the owner or contractor. For specific questions regarding code requirements, refer to the applicable codes or contact your local Building Department.

The following are examples of information that should be included on plans submitted for building permits for residential decks. They are examples only and should not be construed as being code compliant for every application. It is the responsibility of the homeowner or person preparing the plans to show in detail how they will build their deck. Some designs may require more detail than others.

Your deck plans should replicate exactly how you will build your deck. We will review your plans before we issue the building permit to identify code violations before you start work. The more detailed your plans, the more likely you avoid corrections in the field. When you receive your permit, you will also be given one set of plans stamped “Approved”. Once your plans are approved, you should not change your design without approval by the St. Louis Park Inspections Division. You should read through the approved plans to determine if the plan reviewer noted any corrections to your plan. If you have any questions regarding any of the corrections, you should contact us before proceeding.

Plans created at home centers are acceptable for plan review. These computer designs do not allow homeowners to duplicate conditions at their home.

The City of St. Louis Park recommends this handout on deck construction and to be reviewed prior to application for the permit and construction.

Checklist for deck plans

Site Plan

- ☐ Street address and/or legal description shown
- ☐ North arrow shown
- ☐ Plan drawn to useable scale and scale used shown
- ☐ Size of existing buildings shown
- ☐ All lot dimensions and pin locations shown
- ☐ Location and size of proposed deck shown
- ☐ Distance to all lot lines from existing buildings and proposed deck

Construction Plans

- ☐ Plans drawn to useable scale
- ☐ Scale indicated on plan
- ☐ Plan neat and legible

Elevation (This could be illustrated on section drawings)

- ☐ Show side and front view of deck in relation to grade and dwelling
- ☐ Include railing height and design

Framing Plan

- ☐ Floor joist size and spacing including species and grade
- ☐ Orientation of floor joists
- ☐ Cantilever of joists
- ☐ Bearing points for all joists
- ☐ Size and location of all beams including species and grade
- ☐ Cantilever of beams
- ☐ Size and location of ledger board including species and grade
- ☐ Size and location of all columns including species and grade
- ☐ Track all floor loads thru beams to columns to footings
- ☐ Location of stairs
- ☐ Changes in elevation of deck floors or landings
- ☐ Unusual framing issues such as cantilevers of the dwelling floor

Ledger Details

- ☐ Framing method and orientation of existing dwelling floor framing.
- ☐ Method of meeting lateral load connection requirements
- ☐ Spacing, location, and type of bolts or lags used to attach ledger

Footings (This information may be included on section or framing plans)

- ☐ Footing depth and design
- ☐ Footing width at base consistent with load for each footing location.

Section(s)

- ☐ Section view(s) from bottom of footing to top of guard to show railing details; floor framing orientation; joist/beam orientation and bearing; column locations; connections; footing design, size, and depth; and height of deck floor above grade.

Details

- ☐ Flashing at the ledger
- ☐ Joist bearing/hangers
- ☐ Ledger connection (Caution for dwelling floor cantilevers)
- ☐ Fasteners/connectors consistent with lumber and decking used
- ☐ Column/beam connection
- ☐ Column/footing connection
- ☐ Type of decking and orientation (Caution for 5/4 or composite decking for spans more than 16” o.c. or installed diagonally
- ☐ Research report required for decking other than wood
- ☐ Stair stringer connection
- ☐ Lateral bracing

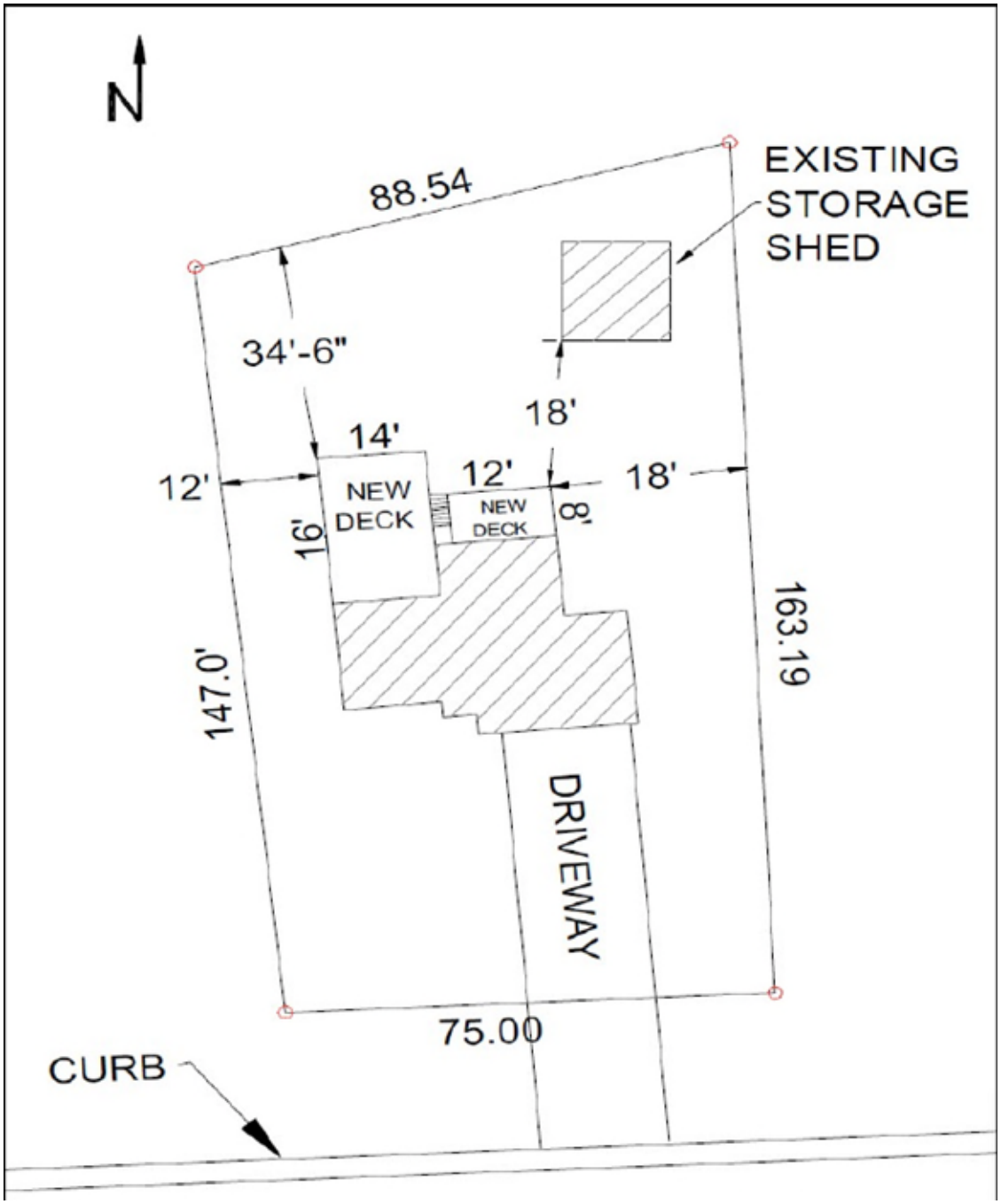
Stairs

- ☐ Width of stairs
- ☐ Rise/run w/tolerance shown
- ☐ Number and size of stringers
- ☐ Open riser design
- ☐ Type and size of tread consistent with stringer spacing (Caution for decking use)
- ☐ Connection method for treads to stringers
- ☐ Handrails shown for stairs with 4 or more risers
- ☐ Handrail height shown on plan
- ☐ Handrail profile detailed
- ☐ Landing at bottom of stair
- ☐ Show any doors or windows adjacent stairs and landings

Guards

- ☐ Guard height and opening dimensions
- ☐ Guard design/materials
- ☐ Guard attachment

WARNING: THIS IS AN ILLUSTRATION ONLY. IT IS INTENDED TO SHOW SOME OF THE INFORMATION THAT SHOULD BE INCLUDED ON YOUR DECK PLANS. IT IS NOT INTENDED TO SHOW COMPLIANCE WITH ANY CODES THAT MAY APPLY. CHANGES IN THE HEIGHT AND SIZE OF A DECK WILL CAUSE VARIATIONS IN CODE REQUIREMENTS.

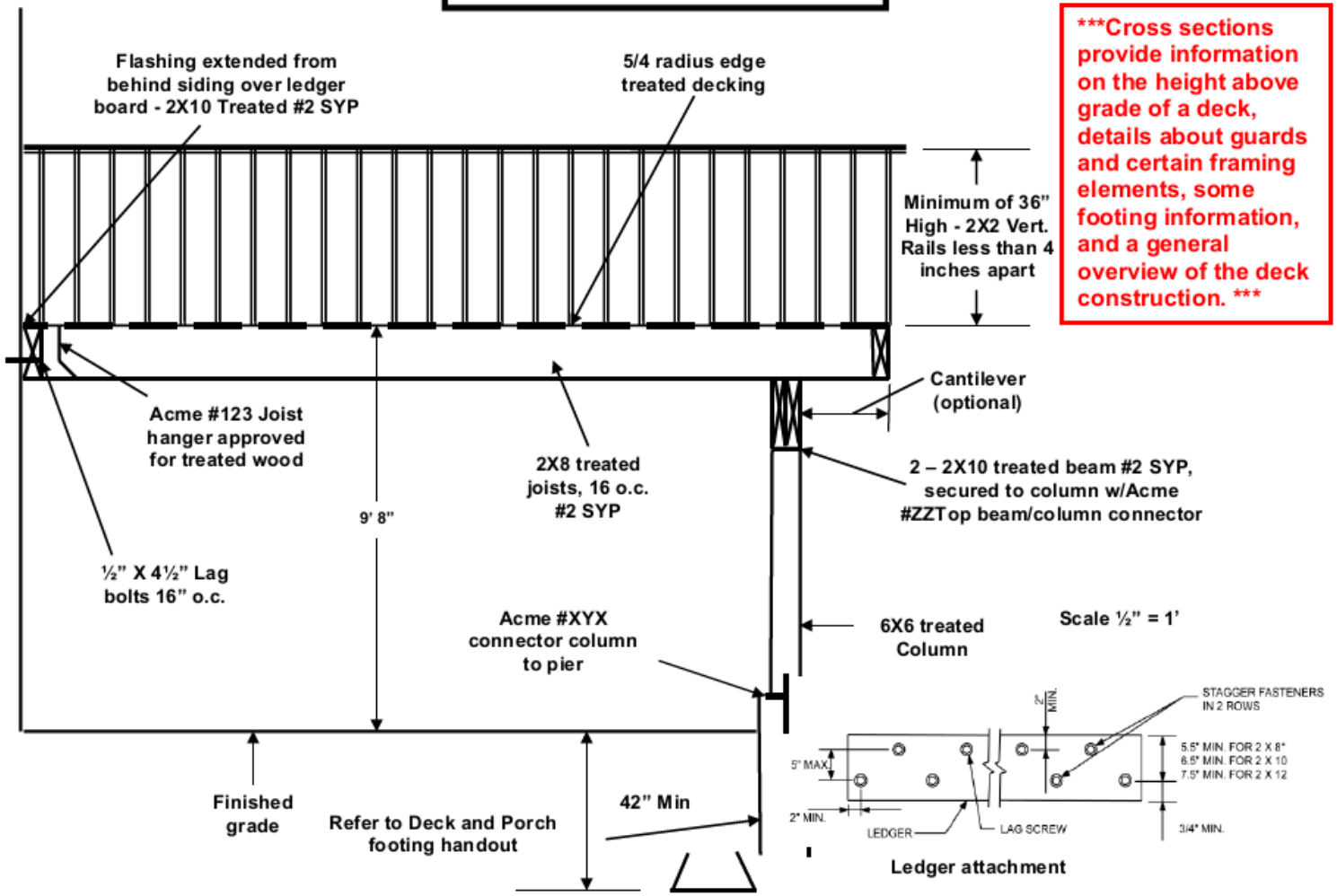


** Notch 4x4 railing post on exterior do not meet 200 lb. lateral

TYPICAL DECK CROSS SECTION

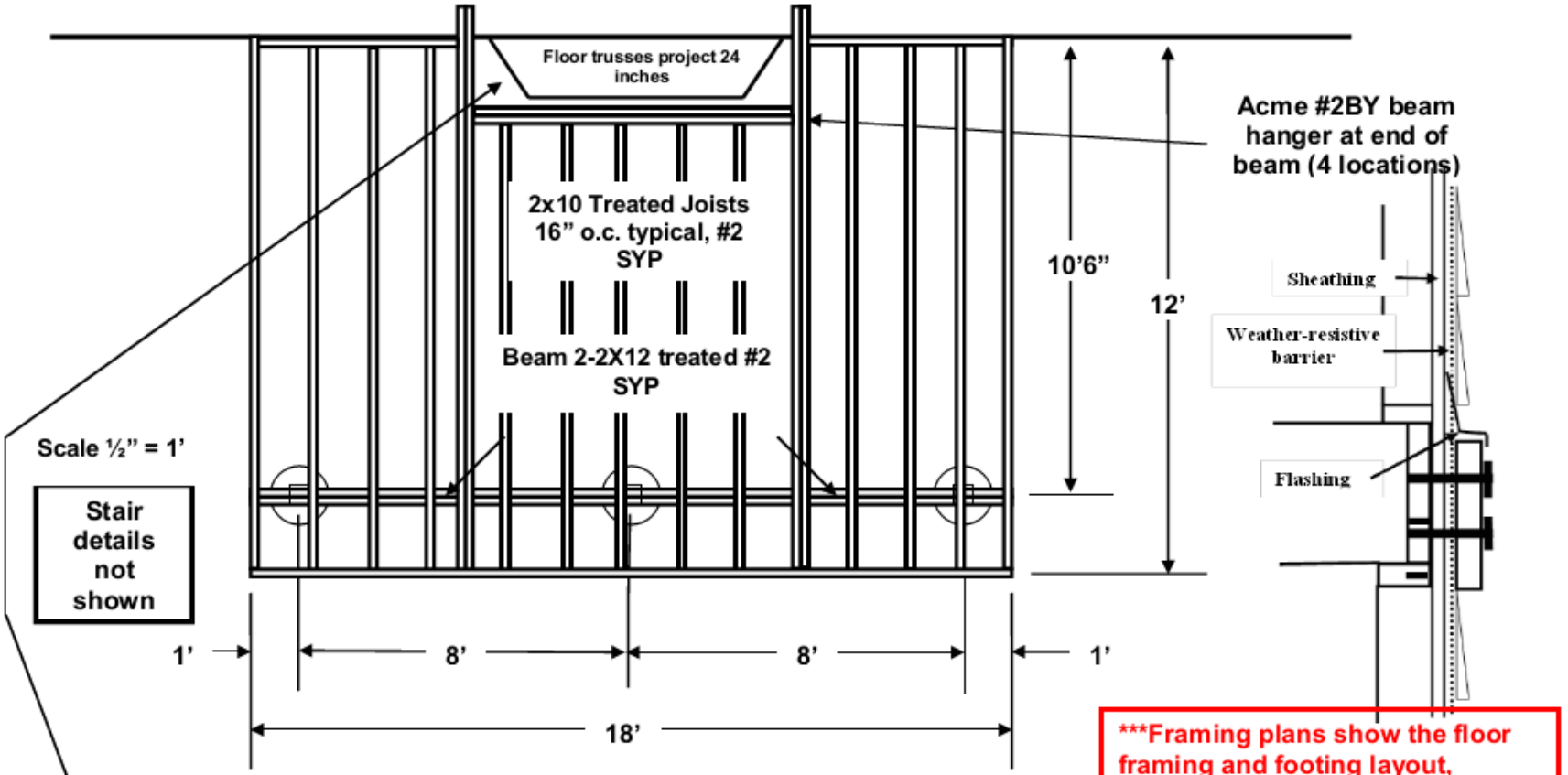
Note: All fasteners and connectors will be compatible with materials used.

***Cross sections provide information on the height above grade of a deck, details about guards and certain framing elements, some footing information, and a general overview of the deck construction. ***



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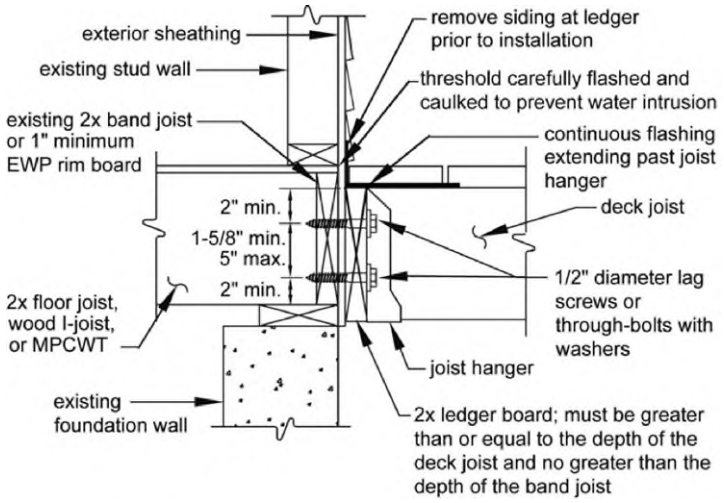
TYPICAL DECK FLOOR FRAMING PLAN, BEAM LOCATION, AND FOOTING LAYOUT

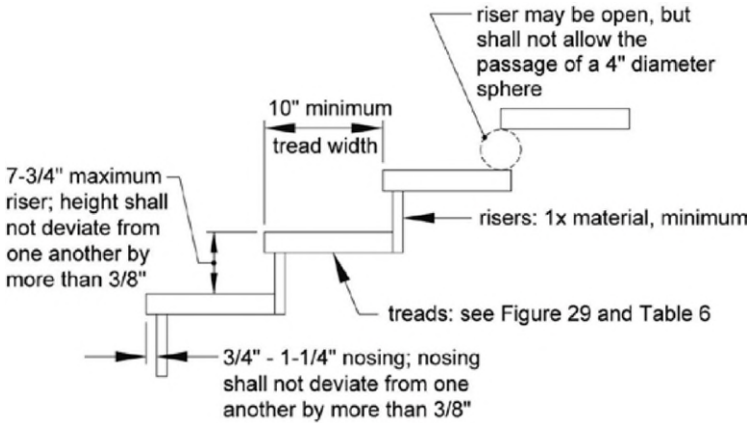


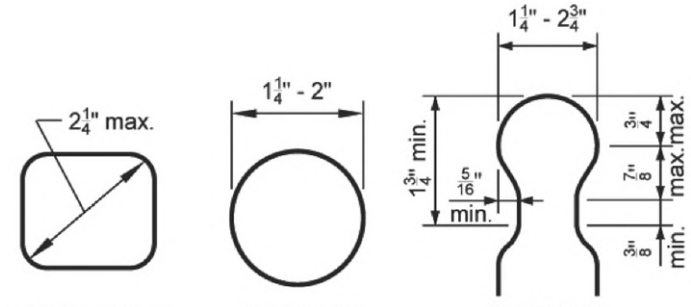
Note about House cantilevers: Occasionally home designs include a cantilever of the floor system at the patio door. Decks may not be attached to the cantilevered joists unless the house floor framing is engineered for the deck loads.

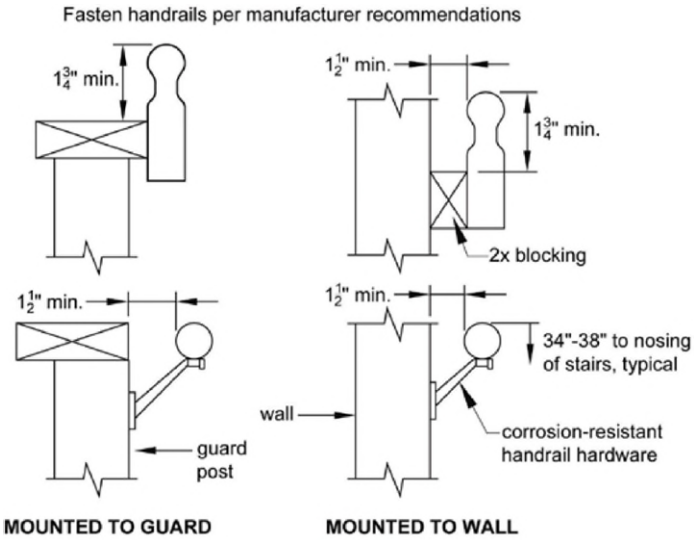
***Framing plans show the floor framing and footing layout, enable checks on spans and sizing of beams and joists, validation of footing sizes, and the ledger design. ***

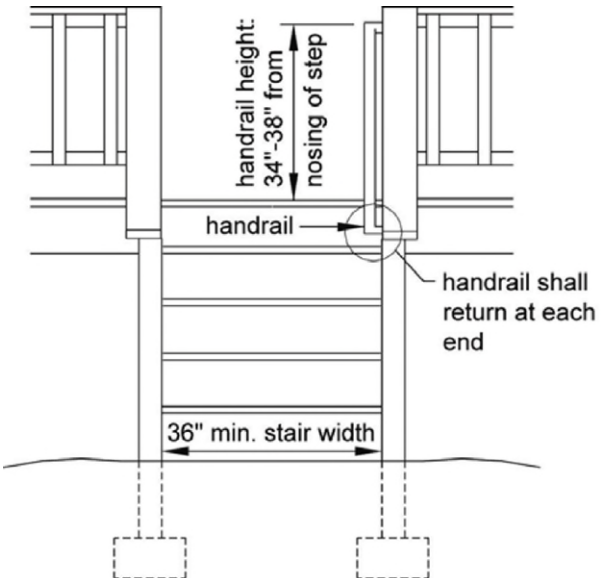
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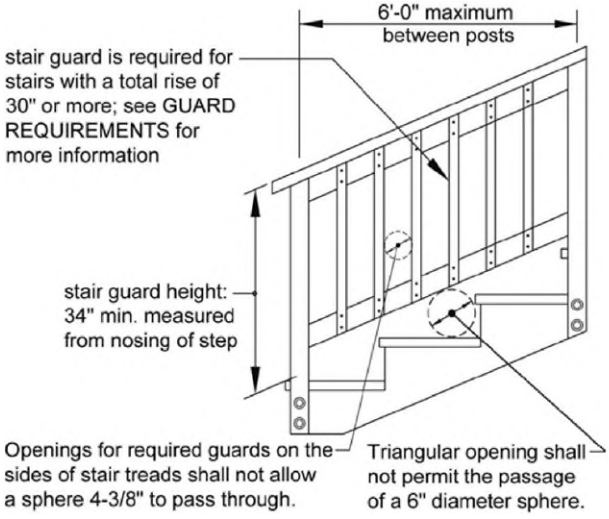






Handrails shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals.

Landings for stairways: 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. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36”.

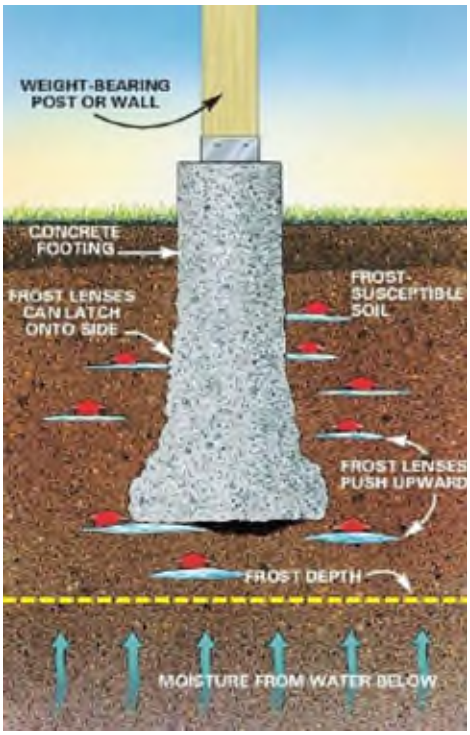


Frost heave
deck & porch

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Decks and porches constructed on concrete pier footings can experience movement when certain conditions exist even though the footings were installed in accordance with the Minnesota State Building Code.

Pier footings will heave if soil moisture conditions and freezing temperatures occur in the right combination to exert force on either the bottom or sides of a concrete pier.



Homeowners should be aware that pier foundations are a compromise from the traditional continuous spread foundation used as the primary support for the dwelling. Pier footings:

- Are typically loaded to their design maximum leaving little room for error if soil bearing conditions are not carefully considered.
- Allow independent movement of individual footings since they have no structural connection between them.
- Are susceptible to “soft spots” in the soils that may be bridged by continuous strip foundations.
- Are isolated far from the dwelling which permits frost to surround the pier and deeply penetrate adjacent soils increasing the likelihood of frost heave.
- Place tension loads on the concrete in the pier when certain frost actions occur, a condition that exploits an inherent weakness in concrete.

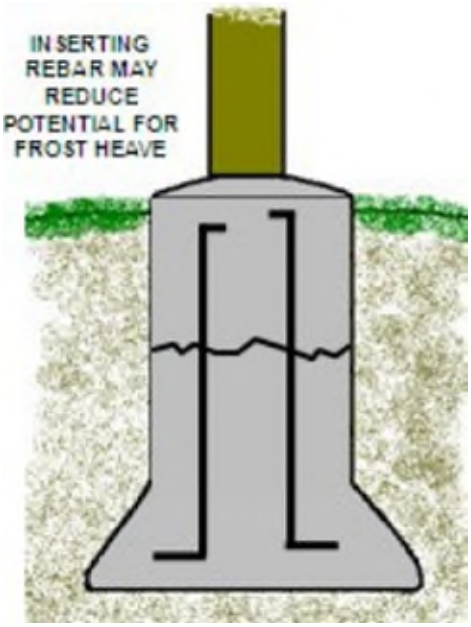
A code change that requires all footings to be poured with concrete having a 5000 psi compressive strength may provide some benefits from shearing of piers but it is too early to tell at this time.

The Minnesota State Building Code requires dwelling additions to be constructed on foundations that extend at least 42 inches below finished grade as protection against frost action. The code is by definition a ***minimum*** standard. As such, it should be expected that certain extreme conditions may occur from time to time that will negatively impact certain building components.

While frost penetrating below the footing could occur, it may not be the most likely reason why piers heave. It is possible that freezing ground places pressure on the upper portion of the pier lifting it out of the ground. Water expands about 9% in volume when it freezes. If the soils around the pier retain water late into the fall, freezing temperatures can wreak havoc with the pier. Water channeled to the location of deck and porch piers via sump pump hoses, downspouts, or poor drainage are often the reason for the saturated conditions. Overwatering lawns or adjacent plantings in late fall can also be the cause. Obviously, the homeowner has some control over these conditions. But in some cases, nature takes its course and things occur beyond the control of the homeowner. What can you do to control this problem? If you are building a new deck or porch, you may wish to consider the following:



- Consider digging the footing deeper than the 42 inch minimum requirement.
- Use a cardboard form for the upper three feet of the pier.
- Wrap cardboard forms with several layers of heavy plastic to reduce adherence of soils to the form.
- Over-excavate the lower portion of the pier creating a “bell” to resist the pier from being lifted. Rebar should be installed to resist a fracture of the pier.
- Overbore piers and backfill the space between the form and the soil with a coarse granular material such as pea rock
- Take special precautions if you are near a wetland where problems predominate (consult a soils engineer).

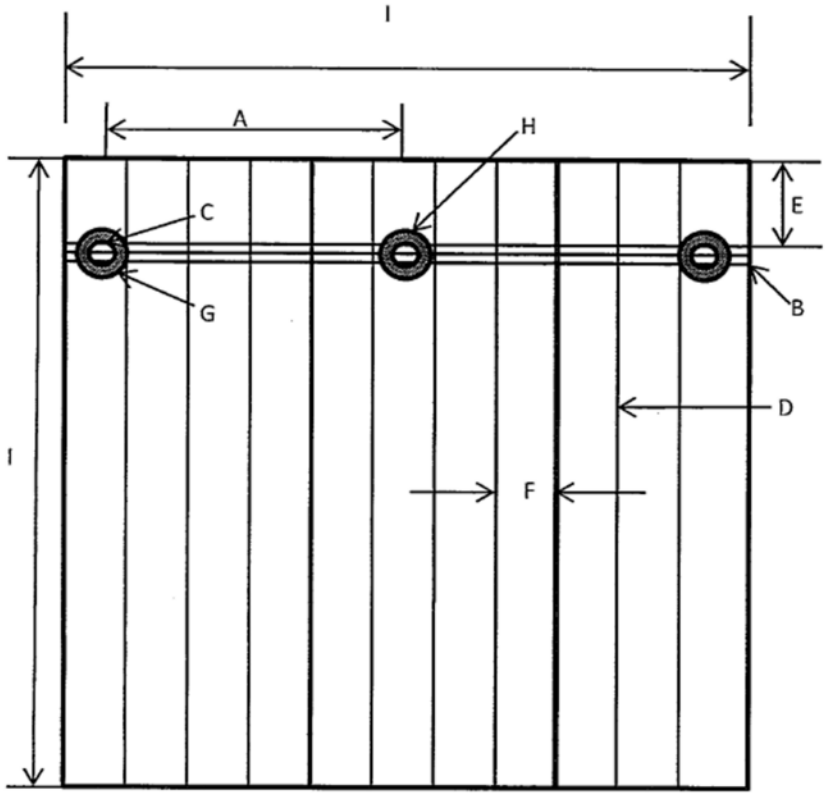


Precautions to take or steps that may reduce current problems include:

- Do not allow downspouts and sump pump hoses to drain near piers.
- Avoid heavy fall watering of surrounding soils.
- Consider installation of drain tile where soil moisture content is always high.
- Install subsoil insulation to trap heat around the pier.

There are no guaranteed methods to prevent piers from heaving. Problems can show up 5, 10, or even 20 years after the structure was built. But you can take steps to minimize the potential for problems by taking certain precautions. And remember, the Minnesota State Building Code is only a ***minimum*** co

SAMPLE DECK PLAN



EXISTING HOUSE

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

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.) _____