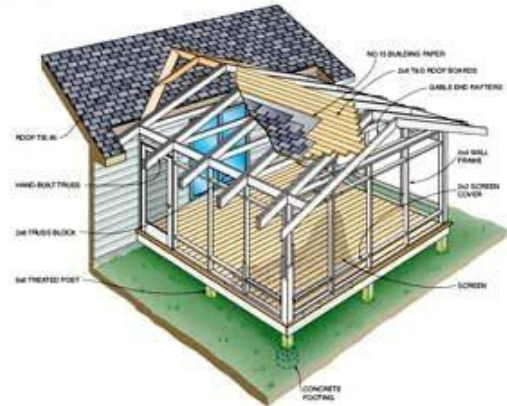




3-4 SEASON PORCHES
City of Grand Rapids
Building Safety Division
218-326-7601
www.grandrapidsmn.org



This handout is intended only as a guide and is based in part on the 2007 Minnesota State Building Code, Grand Rapids 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 Safety Division.

GENERAL CAUTIONS REGARDING PORCH CONSTRUCTION

If you are considering constructing an enclosed porch on your existing deck, please be aware that you will likely need to make significant alterations to the framing and supports of your deck in order to support the additional weight of a porch unless your deck was originally designed for that purpose. If you are constructing your porch from scratch, you can design your porch without those concerns.

It is common practice to use “concrete piers” or “post footings” to support enclosed porches. Be aware that these types of foundations are a significant compromise compared to continuous perimeter foundations. Pier foundations are more susceptible to independent movement that can result in shifting of the porch resulting in cracked or jammed windows and doors and cracked wall finishes. Also, piers are usually sized just large enough to support anticipated loads based on average soil conditions leaving little safety factor. If your home is located in an area with clay or unpredictable soils, you may wish to consult with a soils engineer to aid in designing your foundation.

Two problems can arise when you enclose a porch with a walkout basement sometimes with screening or a combination of walls and screening. First, if walls are securely placed under the perimeter of the porch and on top of a patio slab below, there is a risk frost will move the slab enough to place pressure on the porch above potentially causing damage. Second, if the construction is supported from the porch above, additional and unanticipated weight placed on the porch foundation may cause settlement. Again, if you anticipate these types of alterations in the future, plan your project accordingly.

PERMITS AND PLANS

A building permit is required to construct a porch. Two sets of plans must be included with permit application. Plans must include a site plan, cross sections, floor plans, and elevations. For more information on plans, see the handout on “Building Plans”.

THE ENERGY CODE

Screen porches need not meet Energy Code requirements. Three and four season porches may need to meet all or a portion of the Energy Code depending on how the porch is designed and built. Because of the number of variables presented by varying porch designs and the Energy Code, it is recommended that discuss your plans for enclosing with a Building Safety Division Staff member early in the design stage to avoid any surprises.

FOUNDATIONS

Porch designs must result in a framing system to transfer all loads to the ground. This includes roof dead loads, snow loads, wall loads, floor dead loads, and floor live loads. Your plans should include detailed information on the sizing of all framing members. If you need assistance determining the size of beams, columns, and footings, you may wish to consult with a structural engineer.

FRAMING

Because the weight of a porch is significantly greater than a deck, all framing members and connections will need to be larger and stronger. Columns and beams need to support roof as well as floor loads. The ledger board will almost always be insufficient to carry roof and wall loads in addition to floor loads. This means that the exterior wall of the home will need to be opened to allow beams to extend into the wall for support. Roof framing cannot be attached to fascia boards but must extend onto the top plate of the exterior wall. Because vaulted or cathedral ceilings are often desired in porches, roof framing systems must be designed with a beam at the ridge since no wall ties or ceiling joists will be available to prevent walls from bowing. See the handout on Basic Wood Framing for additional information.

SAFETY GLAZING

Porches often have many large windows. Windows adjacent to doors, including sliding patio doors and windows exceeding certain size limitations must have tempered or laminated glass. The Building Safety Division has a handout on safety glazing to help identify locations where protection is required. If you have any questions regarding safety glazing, contact the Building Safety Division.

GUARDS/GUARDRAILS

Screen porch floors that are more than 30 inches above grade must have guard rails not less than 36 inches in height meeting guard requirements. Insect screening **is not** an acceptable substitute. To avoid installation of a guard, you may wish to start the screening 36 inches off the floor and have a solid wall below the screening. Or, you may construct the wall with balusters as a guard in accordance with the building code. The Building Safety Division has a handout on Guards.

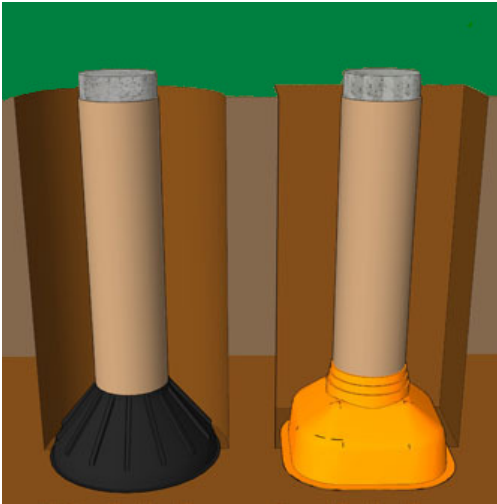
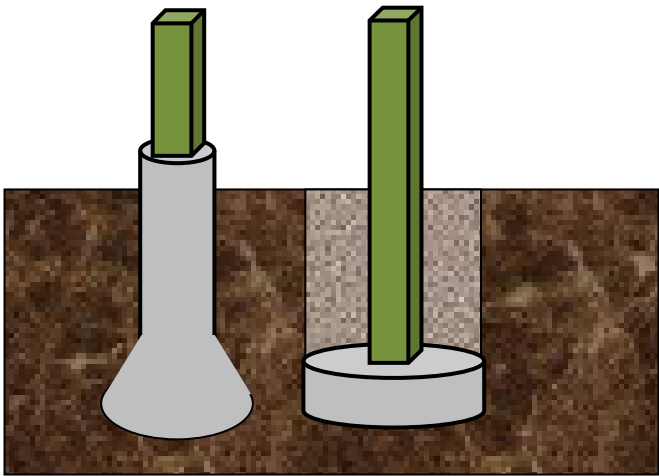
SIZING PIER FOOTINGS

Because there are so many variables in how porches can be framed, there is no simple illustration that can be provided to simplify sizing of footings. Following is one example of how loads transfer to the footing. The total area of the roof (including overhangs) and floor supported by a member must be used in sizing that member. Footing sizes are based on all accumulated loads. The following are several methods of constructing pier footings followed by a load path diagram. The following design loads are used:

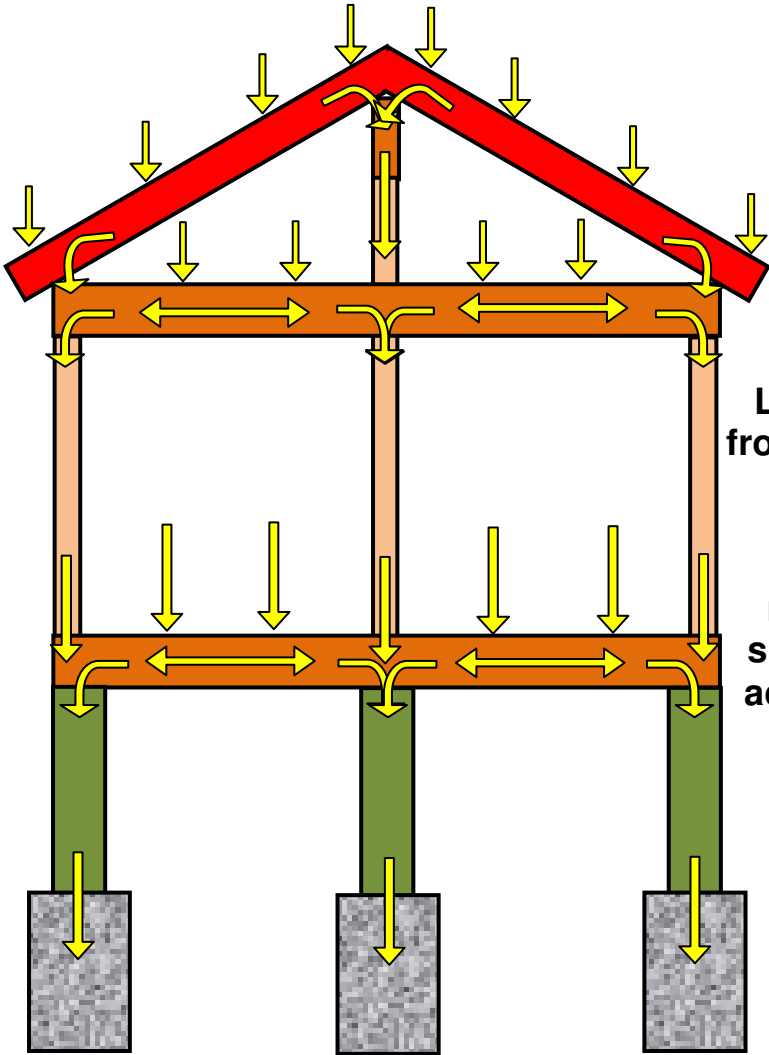
- Roof loads – 60 psf
- Floor loads – 50 psf
- Wall loads – 64-88 plf (wall loads can vary depending on construction of the wall)
- Soil bearing – 2000 psf

OTHER HANDOUTS

The Building Safety Division has a number of other handouts on fasteners, wood framing, stairs, and a host of other topics not covered in this handout.



**SIZING MEMBERS TO
ACCOMDATE LOADS**



Loads accumulate from the roof through all supporting members to the ground. Each member must be sized to support all accumulated loads.

TYPICAL FRAMING LAYOUT

