

Crawl Spaces

Where no floor system is provided at or near the base of the crawl space foundation wall, the wall shall be placed in a trench. The wall must be backfilled on the inside to resist lateral pressure. This inside backfill must be compacted and be at least $\frac{2}{5}$ of the exterior backfill height.

First Floors

Floors at the top of the foundation wall are required to provide resistance to lateral pressures on the foundation walls. Solid sawn wood joists, parallel chord wood floor trusses or I-joists may be used if adequate bracing and blocking is provided.

Framing straps are required in most instances to transfer lateral loads from the walls to the first floor joists.

Stairwell openings adjacent to foundation walls require special framing and increased nailing to provide lateral resistance. The size of the stairwell opening is limited when it is located near an exterior wall.

Support for Veneer

Masonry veneer exterior cladding may be supported on a PWF on top of the main foundation wall or on a knee wall attached to the exterior of the main foundation wall. CAN/CSA-S406 includes requirements for both these configurations.

**SEE CAN/CSA-S406 FOR
USEFUL TABLES AND
DIAGRAMS**

Support for Exterior Steps, Landings and Slabs

Adequate provisions must be made to account for the effect of additional loading when a driveway or garage slab is adjacent to a PWF. This may be done by selecting the size and spacing of the wall studs to suit, or by supporting the slab on a knee wall.

Exterior steps and landings may be supported on a PWF, but they shall not be hung so as to be cantilevered from the PWF.

Exterior Moisture Barrier

Except for knee walls or crawl spaces with trenched footings, the below-grade portion of the exterior face of a PWF enclosing habitable space must be protected by a 6 mil polyethylene moisture barrier. It must be applied to the plywood by embedment into vertical beads of sealant or into uniformly applied dampproofing. The moisture barrier must cover the entire surface of the wall below grade including a wood footing, but cannot extend over the granular drainage layer, under a wood footing, or obstruct the drainage passages in a concrete footing.

The moisture barrier must be protected at the upper edge and at corners. At the upper edge, 150 mm of the moisture barrier must be looped over a 12.5 mm thick by 300 mm deep cover plate of treated plywood. The top of the cover plate must extend at least 75 mm above grade at any point, and be embedded in sealant or dampproofing along its entire length.

Backfilling and Site Grading

PWFs must not be backfilled until the basement floor and the floor at the top of the foundation walls are fully installed, including subfloor sheathing and all fastenings.

Backfill must be placed in uniform 600 mm lifts and should not be mechanically compacted. Backfill must be free from deleterious debris, frozen clumps and boulders. Heavy equipment must be kept a safe distance away from the foundation during backfilling.

Native soils with medium or better drainage characteristics may be used as backfill material, except in locations where native soils have a high volume change potential or where soils are susceptible to frost heave. In these locations, backfill and drainage systems must be designed by a qualified engineer. Backfill must be placed so that the final grade away from the house is minimum 1 in 12.

The contents of this brochure are for information purposes only. Designers and builders should refer to *The Uniform Building and Accessibility Standards Regulations* for the purposes of interpretation and application of the law.

For more information contact:

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March 1996



Saskatchewan
Municipal
Government

Building
Standards

Preserved Wood Foundations



*“Promoting
construction of
safe buildings
through leadership
and guidance”*

Preserved Wood Foundations

The following requirements for preserved wood foundations (PWFs) are based on CAN/CSA-S406 “Construction of Preserved Wood Foundations” as required by the National Building Code (NBC) of Canada 1995, adopted and amended by *The Uniform Building and Accessibility Standards Regulations*.

The standard applies to all PWFs and gives specific details for buildings up to 2 storeys in building height with building areas less than 600 m².

The standard is based on specific design assumptions regarding installation procedures, soil type, clear spans for floors and roofs, dead and live loads, modification factors, deflections and backfill height. If any of the design conditions are different from or more severe than the assumptions, the PWF must be designed by a professional engineer or architect and installed in conformance with the standard.

In addition to the requirement for professional design described above, some local authorities in Saskatchewan require professional design for all foundations or professional designers’ certificates for PWFs.

This brochure will only highlight some requirements of the standard. Anyone undertaking to build a PWF should obtain a copy of CAN/CSA-S406 from the Canadian Standards Association, 178 Rexdale Boulevard, Rexdale (Toronto), Ontario M9W 1R3.

Materials

All lumber and plywood used in a PWF, except in limited locations, must be treated with preservative. It will be identified as such by a certification mark stamped on the material, stating conformance with CSA Standard 0322.

Treated lumber shall not be cut lengthwise or notched. Foundation wall studs, structural blocking and floor joists shall not be cut, notched or bored to accommodate electrical or mechanical utilities or for any other reason. Foundation wall studs may be cut to length and installed with their treated end down. Where it is necessary to field cut treated lumber, the cuts, holes or injuries must be treated with two applications of a copper naphthanate preservative solution containing a minimum of 2% copper metal and prepared with a solvent conforming to CSA Standard CAN/CSA-080.201.

Nails for fastening treated material shall be hot-dipped galvanized or stainless steel. Staples shall be stainless steel with a minimum diameter or thickness of 1.6 mm and a 9.5 mm crown. Framing anchors and straps shall be galvanized.

Moisture and vapour barriers must be at least 0.15 mm (6 mil) thickness.

Granular material for use in the granular drainage layer must be clean crushed stone or clean gravel that passes through a 40 mm sieve with not more than 10% of fine material. A manufactured drainage layer shall be a durable board or mat with comparable permeability.

Site Preparation and Footings

All topsoil and vegetable matter that would be under the building must be removed. The bottom of the excavation must be free of all organic material and standing water. The depth of the foundation is governed by Section 9.12 of the NBC 1995. The foundation excavation must drain toward the sump location.

A continuous granular drainage layer is required under all preserved wood footings and under floors of PWFs. This layer must be at least 125 mm thick and extend beyond the footing plate by at least 300 mm. This layer must drain to a sump which must be provided with drainage outside the building.

Perimeter drainage tile (“weeping tile”) cannot be used with PWFs. Wood footings must be placed on a continuous granular drainage layer. Concrete footings on undisturbed soil will require drainage passages through the footing — from the drainage layer outside the footing into the drainage layer under the floor (Figure 1).

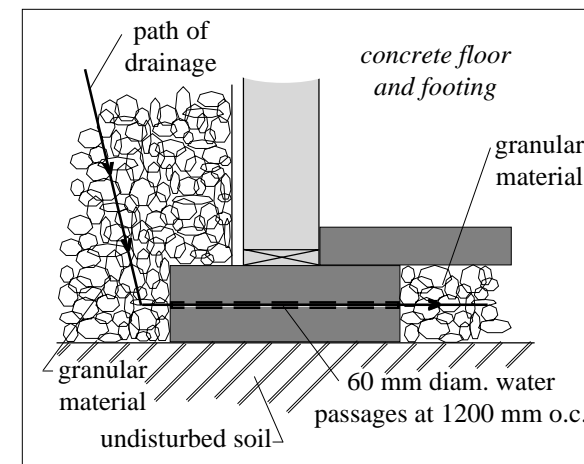


Figure 1

Exterior Walls

Wall stud sizes are dependent on the number of storeys supported and the height of backfill. The higher the backfill against the PWF, the stronger the walls must be to resist lateral pressure. Tables relating backfill height and number of storeys to the required size of the studs are included in CAN/CSA-S406.

When the backfill height is greater than 1200 mm, special framing and fastening requirements must be followed for wall openings (windows). When the backfill height is not uniform on all sides of the building, special nailing precautions must be taken to prevent lateral deflections.

The required thickness of plywood sheathing depends on whether the face grain of the plywood is perpendicular to the studs, the stud spacing, and the backfill height.

Framing straps are required in most instances to transfer lateral loads from the walls to the first floor joists. **PWFs must not be backfilled until the basement floor and the floor at the top of the foundation walls are fully installed, including subfloor sheathing and all fastenings.**

Basement Floors

Concrete floors, wood sleeper floors and suspended wood floors can all be used with PWFs. Requirements particular to each must be met to provide lateral stability. All floors must use polyethylene ground cover for radon control.