OK Valley HOME INSPECTIONS

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PERMANENT WOOD FOUNDATIONS (PWF)

Permanent Wood Foundations (PWF) have been used in lieu of poured-in-place concrete or concrete block foundations since the 60's, shortly after the development of pressure treating wood became common. The material used has been treated with with special moisture inhibitors and pesticides to preserve the life of the wood and prohibit rot and pest damage.

THE PRO'S AND CON'S

Supporters of PWF suggest that it is more economical to construct than the traditional concrete foundation wall, and that it makes the job of finishing the inside basement significantly easier and less costly by allowing plumbing pipes, electrical, and mechanical to run through the wood foundation. Many say that the basement will be warmer and will seem "fresher and less damp", as there is less moisture leaching through the walls of a wood structure than there is through a concrete wall.

Opponents say that the primary issue with PWF is not with the immediate or physical concerns, but with long-term degradation caused by water and or pests. Others indicate that engineering issues are key including: (1) bulging and buckling along the length of the wall (due to improper backfilling or external soil pressure), (2) wall dampness due to barrier failure, (3) deterioration of exterior and interior wall material, (4) evidence of water leakage along the bottom of the wall, (5) physical damage to the moisture barrier on the exterior, (6) insect damage and, (7) improper grading and moisture control around the perimeter.

INSTALLATION

Standard practices suggest several steps during installation including: (1) proper footing drainage (some areas do NOT allow traditional weeping tile drainage systems), (2) the use of stainless steel or hot-dipped galvanized fasteners, (3) all end-cuts or linear cuts must be re-treated with a strong preservative and pesticide, (4) all joints in plywood must be completely moisture sealed in every direction, (5) installation of a 6 mil vapour barrier with adequate waterproof overlap at the top, sides and bottom, (6) proper exterior damp-proofing, etc. (7) The exterior grade must be drained and properly sloped to keep the soil as dry as possible and (8) backfilling properly with recommended gravel is very important. (9) Because the walls are not as thick as concrete walls, it is also suggested that vertical joist spacing should be 12 inches instead of 16 inches OC to handle horizontal pressure from exterior soil. Most of these issues are not visible once the home is completed.

It is especially important that the contractor installing PWF is current in his knowledge of PWF and diligent in his duty. One of the issues to consider is that **a concrete foundation wall has some tolerance for workmanship and quality problems, while a PWF has zero tolerance**. It wouldn't take much for the PWF to become vulnerable and begin to degrade when compared to concrete or stone.

Here are some points to think about if you are considering a PWF wall: (1) Historically, ships and vessels were made from wood - and when built properly, they were watertight. Presently, very few are still floating. (2) Castles, pyramids, temples and various wall structures have been around for millenniums. Very few historic wooden structures are currently standing. (3) Used pressure-treated railway ties are for sale to be

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used as landscaping features… but why did the rail companies replace them in the first place? (4) And the three little pigs... neither the straw house nor the wood houses survived.

HOW HAVE THESE STRUCTURES FARED OVER TIME?

Home Inspectors have found: (1) signs of deterioration of wood members, (2) evidence of insect damage, (3) physical damage due to exterior construction or mechanical damage, (4) holes drilled through the wall to the exterior by various trades and homeowners, (4) windows and doors added without proper consideration for moisture issues, (5) deflections at the top and mid-wall due to exterior soil pressure, and (6) termite damage in older pressure-treated posts (just how long can preservatives and pesticides last in the Okanagan?)

Realtors have reported poor resale value of the homes because of the small number of people that would buy a house with a wood foundation.

Fire Departments have issues associated with their staff while fighting a fire involving treated wood.

Lawyers have commenced legal action regarding the toxic nature of the preservative used. Any scraps from construction or removal must be contained in plastic bags and brought to an approved landfill in many areas. Arsenic was often used as a preservative which is why older playground equipment has been replaced with newer concept materials.

Environmentalists are concerned about the chemicals involved in preserving the wood and chemicals leaching it into the soil.

INSPECTION

Inspecting PWF is not easy. In the "best case scenario", only half of the wall will be visible, the rest is underground. Of the PWF's that I have inspected, most of surface of the interior walls was not visible either. Home inspectors will examine the wood surface for dampness or deterioration. Walls must be vertical and have little or no bulging. The interior floor and the area around the wall base should be perfectly dry. A vapour barrier should be visible on the outside wall where the foundation wall extends above grade - suggested minimum exposure is 8" as opposed to 6" with a concrete wall. Grading should be checked for proper slope away from the foundation wall. There should not be any wood in contact with soil, and even then, I always encourage the purchaser to retain the services of a economical and reputable pest control company anyway. If a driveway or large trees are located next to the PWF, the client should be cautioned about potential wall damage and deflection.

THE BOTTOM LINE

If the installation has been completed according to best practices guidelines and has met local codes and standards, PWF should not have any short-time issues - one manufacturer guarantees at least 75 years. That said, there is no maximum projected life expectancy for concrete. At the risk of offending the pressure-treated plywood manufacturers in North America, a permanent residence SHOULD have a permanent foundation… and wood is not permanent.