A WOOD FOUNDATION… *HOW LONG CAN IT LAST?*

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A wood foundation in Iowa? You have to be kidding. Won't it leak? Won't it rot? Can it be strong enough? Is it safe? Does it have any advantages?

Wood seems like an unlikely material to build a foundation with until you look at all the things a foundation needs to do and address each one. Let's go through them.

Manage Water *(Won't it leak?)*
Even poured concrete foundations leak if you don't manage water. Water coming up from below needs to drain into a sump pit and be pumped away before it reaches footing height. Water from above is managed by proper grading away from the house. Gutters can catch water from the roof, or you can lay plastic sheeting covered with river rock on the sloped ground under the eaves, or both.

Water along the side walls isn't as much of a problem since gravity is pulling it straight down, not pushing it sideways. Nevertheless, walls are covered with a continuous later of plastic sheeting over a drainage plane of asphalt-saturated felt.

Wood foundations are set on a bed of washed rock under the footings and floor. The rock serves as a continuous layer to drain water away and keep the floor and foundation dry. If you also have a wood floor, spraying urethane foam insulation directly on the rock, between the joists, seals the entire floor from soil gasses, keeps the floor warm and locks the whole floor in place.

Finally, wood foundation walls are backfilled half way up with washed rock. Any water that makes it through the top is allowed to drain right down to below the footing. If you imagine it in cross section, the whole foundation and floor are enclosed in a basket of washed rock.

Come to think of it, *that's the way all foundations should be built*.

Free from decay *(Won't it rot?)*
The wood used for foundations is treated with salts that make it unusable as a food for termites, bacteria and fungi. The salts bind to the cellulose and there is a standard concentration of those salts (0.6 lbs. of salts per cu. ft. of wood) that is used for foundation grade treated lumber.

Structurally strong *(How do you make it strong enough?)*
We all know wood walls can hold up several stories of height, but over time, soil acts like a thick liquid, and can exert lateral loads (sideways pressure) on the walls. If foundation walls sit 4 ft or less in the ground, structural designs can be determined from code-approved tables. But foundations deeper than 4 ft in the ground need to be engineered to withstand the lateral loads.

You might think that specifying the size and spacing of the studs to keep them from buckling is all there is, but keeping the walls in place, at the top and the bottom, especially during backfill, is more important. How the walls are fastened to the basement and main floors determine how long the system will last. Lateral loads need to be calculated, the size, type and spacing of fasteners need to be specified and conscientiously installed.

I've seen several wood foundation failures, and every single one happened not because of wood rot, but because the builder thought the specs were excessive, and must have said "I don't need to do that!"

Healthy *(Is it safe?)*
You wouldn't want to drink the salts used to preserve wood; they're poisons. Even the new formulas without arsenic can be toxic. During the treatment process some excess salts remain soluble and don't combine with wood, and could potentially leach out of the wood if it gets soaked. But remember, wood foundations are designed to be kept dry, so there should be minimal risk of exposure to the salts.

Durable *(How long can a wood foundation last?)*
Centuries. Easily.

Are there any advantages?
Wood basements can feel warmer. Concrete absorbs a lot of radiant heat from your skin, and can make a basement feel cold, even if the air temperature is warm. Wood absorbs much less radiant energy. While there's no denying a concrete basement floor with in-floor radiant heat feels great, you often don't need the extra heat in a wood floor to feel comfortable.

Wood foundation materials take less energy to make. The heat needed to make anhydrous Portland cement takes a large amount of energy, and wood is a renewable resource.

Wood basements can be easily insulated and finished with no additional structures. Wiring can be run through the studs, and drywall can be fastened with no additional stud walls.

Wood foundations can cost less. The savings increase the farther out of the ground the foundation sits. Even a foundation 7 ft in the ground can be significantly less; saving funds which can be applied to a geothermal system, for example.