

# Supporting outdoor structures

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In this episode, we collected several different viewer questions about supporting outdoor structures so we could compare one to the other.

The first viewer lives in the mild climate of the lower mainland of British Columbia and wants to support a new deck by putting concrete pyramids over an existing asphalt driveway. In the first two photos above, you can see the two basic ways pyramid blocks are used as footings, either holding beams horizontally or supporting 4x4's vertically. If you live in an area subject to frost and you have clay soil, these pads tend to lift up in the winter and come back down in the spring or lift more each winter. They do not make a stable base when you combine freezing temperatures and clay soil. In the portions of BC that have very little frost, they could work. But there is still a problem on an asphalt pad, especially if the summers get hot. Their constant heavy pressure can cause them to sink into the asphalt. Generally, pyramid pads are not good for any permanent structures, because they move up and down so much, especially when they are structures attached to a house where the movement will be more obvious.

George, from Ontario, has freezing temperatures and clay soil and he is complaining that the support spikes used to hold up his deck are twisting and shifting each spring. You can see a support spike in the third photo. Support spikes are the easiest of all fence and deck products to install, unless you have a rocky soil, because you simply pound them into the ground. But support spikes have very poor sideways support and will continue to sink if your deck has activities on it, such as dancing, and they shift upwards with frost if you have a stop plate at ground level. I have never found any really good uses for these devices and have heard lots of complaints like George's.

In the fourth photo you see my favourite deck support. 3 inches of concrete is poured into the bottom of a hole reaching deep below the local frost level, and left to dry without a post. The 4x4 is then set on this dry concrete footing. The deck is built and the hole is filled in after the structure is finished. This makes a footing that will not allow the 4x4 to drop any deeper by pile-driving dancing parties on the deck, will not be subject to frost, and does not lock the 4x4 into a position that is always one inch off of what I need to line up the structure. If the 4x4 doesn't sit perfectly centred on the concrete; no problem. If the 4x4 twists as it dries; no problem, because the bottom twists, not the top. And you rarely need a Sono tube full of concrete anyway.

When you build a fence, corners are strong because they are supported by the fence stringers at a right angle to each other, so why pay for concrete? Long fences may need some concrete towards the centre post and gates may need concrete because of all the sideways forces on them. Very high decks may need concrete if there are horizontal forces on the deck, but most decks need no concrete except for footings.

If you are pouring Sono tubes full of concrete, what size tube should you use? There should be as much concrete on each side as the thickness of the post itself, hence 4x4's go into 10 inch Sono tubes, and 6x6's into 12 inch Sono tubes, or you use hardware that keeps the wood totally above the concrete.

The last photo is to answer a question from Blair in Trenton, Ontario, who has a sun porch that has been lifted 7 inches by frost. You can rent house jacks that can easily lift the weight of a deck or sun porch off of the supports, allowing you to remove any excess or repair rot. In Blair's case, he needs to

check out the landscaping to get standing water away from those posts to prevent future frost heaving

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