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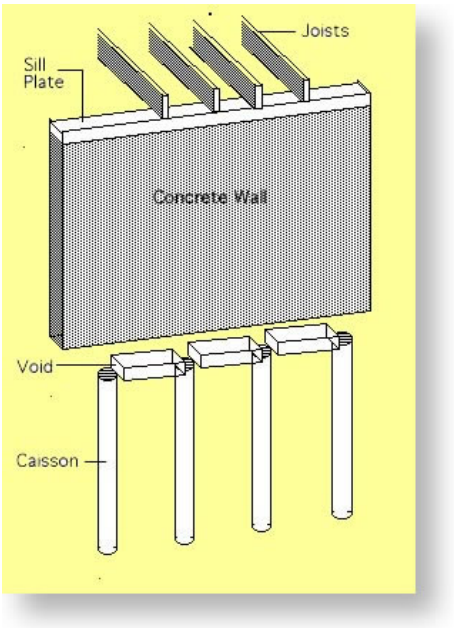
Caisson House Foundations For Expansive Soils

Caisson house foundations have been developed as one solution to building homes on **active or expansive soils**. When built on conventional foundations, homes **often sustain moderate to severe damage** when active soils, exposed to moisture, begin to expand, heaving upward, and, creating movement which the home is not designed to withstand.

So what is a "caisson house foundation?" In home construction, a caisson is a **reinforced concrete pile or post** that transfers the load (weight) of the home directly to bedrock!

How does this work? 10" to 12" holes are drilled through the bad soil down to **and into** the underlying bedrock. Reinforcing steel bars (rebars) are placed in the holes and the holes are filled with concrete.

This guy is drilling a hole for a caisson.



Forms are placed so that a concrete foundation wall can be poured (supported by the caissons). But before the foundation walls are poured, **"void material" is places between each caisson house foundation.**

Here's a sample of "Void Material." The exterior surface is waterproof so that it doesn't deteriorate when exposed to moisture.

This "void material" is actually a honey-combed cardboard about 4" tall and as wide as the foundation wall (usually 8").

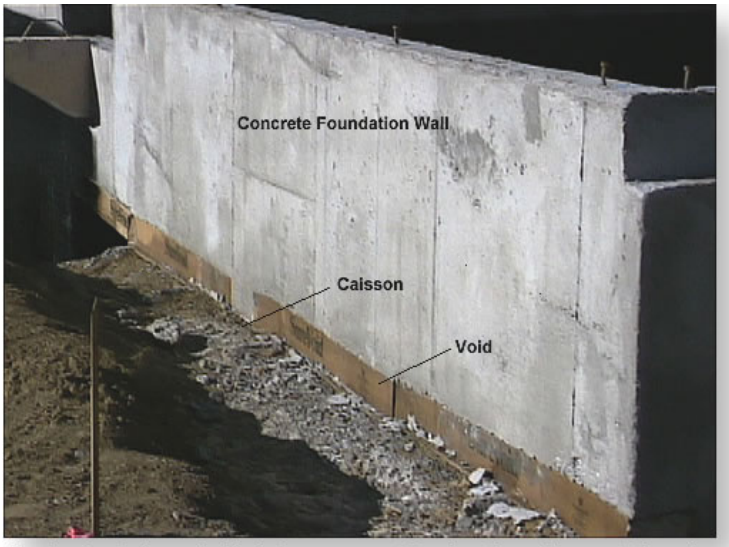
It comes in six foot lengths and is easily cut to fit between the caissons.

The purpose of the "void material" is to keep the concrete from coming into contact with the expansive soil when the walls are poured.

By not covering the caisson house foundations with the "void material," the concrete is allowed to flow down to the caissons.

You're looking at an outside corner of a foundation wall before the outside form has been set. See how the concrete will flow down to the caisson.

The result is that the home is supported by the caisson house foundations alone. If (when) the active soils are moistened (rain, snow, etc.), the heaving soil crushes the cardboard "void material," leaving the bottom of the foundation walls untouched and unmoved!



Here's a foundation wall with the forms removed. See how the void supports the wall, isolating it from the expansive soil, and how the caisson (can't really see it in this photo, but it's there!) supports the wall by the concrete that has flowed down between the void.

See how cardboard "collars" have been placed around the tops of these caissons so that they have a nice neat bearing surface. See the re-inforcing steel rebars sticking out the tops? The steel will be imbedded in the foundation walls.

Please note that the design and installation of one of these caisson based foundation systems is definitely not a do-it-yourself project.

The loads imposed on the foundation by the proposed home construction must be calculated by a competent engineer, who will design the system (location and size of the caissons, etc.).

Also the installation should be inspected by the engineer as well as any governing building inspections department.

As you can imagine, this system is far **more expensive** than digging an 18" wide trench in good red North Caroling dirt and pouring an 8" deep "spread" footing, or better still - digging a little trench around the perimeter and pouring a slab and footing all at one time as they might in Florida or Arizona.

So, if you have a choice, it may be best (or at least more economical) to **avoid lots with expansive soils**. How do you know? Talk to the folks at the building and zoning office.

See what a mess you have if you don't install the collars!

Here's some void material that has been

Talk to builders and foundation subcontractors in the area. They will know if there is an expansive soils problem in your area. If there is, get a soils engineer to bore test holes on the lot **before you commit to buying it.**

Here's some void material that has been delivered to the job site and is being stored under a basement window well.

For additional information on Footings,
see **Lesson Five** of our online course
Successful Home Contracting.

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