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- Home
- Being An Owner Builder
- Contracting Process
- The Parts Of Your Home
- Planning
- Funding Your Project
- Developing Your Budget
- Your Building Lot
- Plans and Specifications
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Expansive Soils - A Potentially BIG Home Building Problem

Most owner builders have never heard of "active" or "expansive" soils. Home building can be a challenge if these types of soils are present in the area where your new home is to be built - and especially if they are present on your lot.

So what do you need to know?

YOU NEED TO KNOW WHAT EXPANSIVE SOILS ARE, why they can create problems for a Home Building Fool like you, how to tell if you have any of these pesky soils on (or underlying) your lot, and what to do if it turns out that, in fact, you do.

Bentonite and other active or **expansive soils** are clay soils which are composed of very fine particles. The annoying property of these soils is that they easily absorb moisture (as in when it rains, or when you water your roses). When they absorb moisture, they "expand" or swell up. "Big deal," you say. What's a little swelling compared to a big heavy house?

Well, the fact is that when these soils begin to swell, they exert tremendous pressures on anything that opposes them . . . like your house's foundation for instance. Improperly constructed foundations, so exposed, can be lifted, cracked, and moved to such an extent that their load bearing job is compromised, and homes become almost unlivable.

Get the picture? This is nasty stuff!

A national warranty company insuring new homes in the Denver, Colorado area suffered claims losses in excess of one hundred million dollars during the housing boom of the early 1980's. **These losses were the result of damage resulting from Bentonite. And they could have been avoided** - if the builders and building officials had understood how to design and build homes on such soils.

OK, now you know that expansive soils can be big trouble. So how do you as a budding home builder avoid this problem?

First, avoid buying a home building lot that has expansive soils. Take a look at the map below from Geology.com. It shows the areas of the country where expansive soils are prevalent (red).

Click [here](#) for more details on how to use this map.

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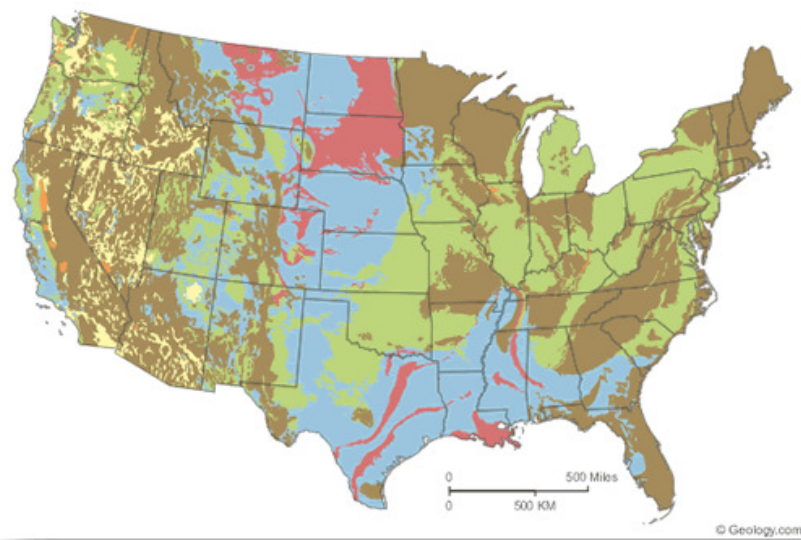
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Important Disclaimer

The map above is meant to show general trends in the geographic distribution of expansive soils. It is not meant to be used as a property evaluation tool. It is useful for learning areas where expansive soils underlie a significant portion of the land and where expansive soils might be a localized problem.

All construction projects should include a soil analysis to identify the types of soil present and determine their expansive properties. Local occurrences of expansive soils can be found in all of the soil categories shown on this map.

If you are in or near on of these areas, use extreme caution. Start with your local building department. The building official will know if there are expansive soils problems in your area. If the answer is yes, you will need to have your lot tested for expansive soils before you commit to the purchase.

These tests are done by taking samples at various places around the property and testing them in a laboratory to determine how much they expand when exposed to moisture. They are done by engineers certified in soils and structural foundations. You will find such specialists in every area where there are soils problems.

If expansive soils such as Bentonite show up on the soils report, **it is best to look for another lot.**

If you already own the lot, or if your heart is set on this particular lot, take heart. **All is not lost.** You can build your new home on a lot that has expansive soils if you have the footings and foundation properly designed.

The engineer who tested your lot will provided you with a soils report and a description of steps taken during the building of your home to prevent damage due to expansive soils. **Special foundation systems** (expensive) are often prescribed. Make sure that the construction of these elements scrupulously follows the design and specifications.

Be forewarned, however, that this path is significantly more expensive than more traditional foundations. How much more. That's impossible to say without the specifics of your lot and your design. **But for sure, it will be thousands more!**



In addition to avoiding structural damage, care must also be directed to non-structural elements which may come into contact with expansive soils - particularly basement slabs and any other "flat work" such as walks and drives. Floating floors are often designed in such



Worker prepares this structural basement slab which will never touch the expansive soils below. The concrete will be poured over the corrugated steel.

situations in which the floor is attached to the foundation walls and does not even touch the expansive soils below.

If you do build on expansive soils, care must still be paid to protecting your home from possible damage by making sure that the ground around the home is carefully graded so that water drains away from the home's foundation. Also, it is wise to avoid foundation planting that holds moisture close to the home's foundation.

See [this article](#) for more information on proper maintenance of homes where expansive soils are present. It was written for Colorado, but the tips are applicable to any location that had expansive soils.

Bottom line: Avoid expansive soils if at all possible. If you end up having to deal with expansive soils, make sure you have a design done by an expert, and that you follow the plan carefully.

For additional information on the Expansive Soils, see [Lesson Fourteen](#) of our online course ***Successful Home Contracting***.

[Return to the Home Building Answers' Home Page from Expansive Soils](#)

[Home](#) | [Owner Builder](#) | [Contracting Process](#) | [Parts of Home](#) | [Planning](#) | [Funding](#) | [Budget](#) | [Plans](#)
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