

## **General Guidelines for Constructing New Slab Foundations in North Texas**

The following comments / questions are for general information only and do not replace the need to retain a competent engineer to design/evaluate the specific foundation in question. There are exceptions to every “rule of thumb” and to the comments made in this website. That is why every foundation should be considered “unique” and evaluated as such by an experienced P.E. (“Professional Engineer”).

### **Building a New Home on Expansive Clay Soils**

- If you are going to build a new home, be sure that a geotechnical engineer is retained to conduct a site specific soils study (the soil borings should be where your home is going to be located). Get a copy of the soils report (and the resultant foundation drawings).
- If you are considering building a new residence with a slab foundation on expansive clays, note if trees will need to be cut down to construct the foundation. If so, ensure that both the geotechnical engineer & the foundation design engineer are aware of this.
- Also, note if the builder is getting ready to install the foundation and the soil appears dry (typically, in North Texas, this occurs during the dry summer months). Building a slab on dry expansive clays can lead to foundation upheaval. Upheaval can be a very difficult (even impossible) problem to solve. So if the soils are dry expansive clay soils, they may need to be pre-treated with either water injection or injected with a chemical such as Potassium Chloride. Your geotechnical engineer can give guidance in this matter.
- Tell the builder that you want your slab to be designed so that it is rigid. Among other things, this requires close spacing of the grade beams. Having a rigid slab foundation does not mean that it will never move, but if it moves, it will move much like picking a table up by its edge, i.e., the slab will be out of level but it will be even. Most slabs are too limber and they move “a little here and a little there” which causes distress in the sheetrock, brick, doors, etc.
- Discuss with your builder about the possibility (and expense) of building a slab-on-piers foundation. This is a slab that is built over drilled concrete piers. If this is done correctly, the slab should not experience vertical settlement.

The piers need to be installed into a stable bearing stratum and need to be designed by a qualified engineer. I have seen some of these types of foundations fail because: the builder did not drill the pier shafts to the proper depth and/or did not clean out the pier shaft after drilling (leaving loose dirt in the bottom of the pier and then pouring the concrete into the shaft). However, the most common reason for failure has been that the slab was installed over the piers but on dry expansive clay. So, when the rains/homeowner irrigation rehydrated the clay, the clay expanded and pushed the slab up off the piers. This can be a big problem.

- Building a slab foundation on a steep incline requires special attention and it may be necessary to consider installing drilled concrete piers prior to installing the slab (and/or a retaining wall). This includes building over fill material (dirt used to level the lot prior to installing the slab).
- It is important to review the drainage conditions and ensure that excess surface water runs rapidly away from the foundation. A very common problem is that the top of the slab is, many times, constructed too close to the ground surface so it is very difficult to have excellent drainage around the foundation. The Texas Chapter of the ASCE recommended minimum guidelines for site drainage around a foundation: “For adjacent ground exposed or vegetative areas, provide adequate drainage away from the foundation (minimum five percent slope in the first ten feet and minimum two percent slope elsewhere). The bottom of any drainage swale should not be located within four feet of the foundation. Pervious planting beds should slope away from the foundation at least two inches per foot. Planting bed edging shall allow water to drain out of the beds.”

Note that it is also important to have excellent drainage conditions in flower beds.

- The installation of rain gutters (oversized) will greatly aid in controlling excessive water; especially if the downspouts are installed into buried drain pipes and arranged such that the water is deposited 15 to 20 feet away from the foundation AND in an area where the water will drain away from the house.
- Ask for a copy of all documents, reports and drawings concerning the foundation. For example, this might include foundation construction plans, site specific soil reports, as-built slab elevations taken soon after construction. The builder may not want to give you these documents, but it does not hurt to ask.