

## **Foundation Maintenance Overview – drainage and watering**

It is a generally accepted fact that most of the soils in North Texas consist of expansive (plastic) clays. This means that when the clays are relatively dry (in the summer months) they shrink, and when they experience an increase in moisture content (typically in the winter/spring months) they expand. Many times, this expansion & shrinkage of the soil is significant and will cause a foundation to move up and down with the soils. Sometimes, this up/down movement of the foundation does not cause a significant problem with the structure; however, other times, the problems can be severe.

There are several things a property owner can do to reduce the potential for foundation movement when that movement is caused by seasonal factors. The two most common preventative measures homeowners can take are:

- Ensure that there are excellent drainage conditions around the foundation (to keep the soils from getting too wet).
- Watering the soils around the foundation before they get too dry.

### **Proper Drainage**

Water should not be allowed to pool around the foundation of a structure. In general, the ground surface around the foundation should be sloped such that the water moves rapidly away from the structure. There are several factors that impact the drainage conditions:

- Is the ground surface around the foundation properly sloped?
- Is there an existing french-drain system? If so, it is working properly?
- Do the rain gutter downspouts discharge their water well away from the foundation?
- Are the flower beds properly sloped for drainage? Are they bordered? If so, do the borders trap the water near the foundation?

### **Watering the Foundation**

In North Texas, our rainy season occurs during the winter/spring months while our summers are typically very dry. Even though some watering of the soils around a foundation is required during the winter months, a property owner should plan on “ramping up” his watering at the end of the spring rains but prior to the arrival of the summer drought. This is because during a typical summer in North Texas, the soils can, depending on environmental conditions, dry out to depths of 12 to 18 feet deep (they may not get bone dry but they do get drier). Therefore, it is important not allow this to occur.

At the end of the rainy season, the soil is usually at its peak moisture level, being moist several feet deep. The goal is to maintain the moisture content at a constant rate (and depth). If a property owner begins watering during the midst of the summer, and after the drought starts, the water typically only penetrates the soil a few inches which is not effective.

To emphasize, the moisture level should be maintained to depths of several feet which is very difficult if the watering is started during the middle of the summer. During the prolonged summer drought, it may be necessary to water the soil around the foundation on a daily basis. A word of caution though - do not

suddenly overwater dry expansive clays! The goal is to keep the soil near and under the foundation at a consistent moisture level (neither wet and/or muddy nor dry and cracked).

The typical method of adding water to the soils around the perimeter of a foundation is to use either an automatic irrigation system (some have zones that are specifically designed to water the soils adjacent to the foundation) or to install soaker hoses around the foundation. The soaker hose is usually placed 18" to 24" from the foundation. The hose should not be placed against the foundation.

### **Landscape Impacts**

To further complicate matters, trees, bushes, and shrubs can remove large amounts of water from the soils, everyday. So it is sometimes necessary to install a root barrier between a tree and the structure. It has been my experience that many times when a home is 20 years old (or older) and begins to have foundation movement for the first time, it is typically because the trees have matured and the root structure has extended to (or under) the foundation.

### **Miscellaneous Factors**

Other important factors in controlling the moisture around the perimeter of a foundation are to be aware of any dripping faucets, air conditioner condensate lines, misdirected water from rain gutters and downspouts, leaking swimming pools, sprinkler leaks, etc.

### **Summary**

To summarize, much of North Texas has highly expansive clays and when coupled with the wide swings between rainfall amounts and drought, the soils are prone to expand and contract significantly. When this occurs, foundation stability can be negatively impacted. Therefore, an effective foundation maintenance plan is important and includes more than one single aspect. The property owner needs to consider the soil conditions, drainage conditions, watering procedures, landscaping, and the other miscellaneous factors that contribute to the overall instability of the foundation. An experienced engineer who is familiar with the soil properties can be of assistance in conducting this evaluation and developing a plan of action.