

Childress Engineering Services, Inc.

FOUNDATION MAINTENANCE

The condition of the drainage about the home can have a large impact on the long-term performance of the structure. If conditions develop where water can stand in areas adjacent to the foundation, it is very likely that this will produce long-term foundation movement. Also, if the soils are allowed to become excessively dry, this can produce foundation settlement. It is imperative that a homeowner monitors the conditions of the soils and the drainage in order to minimize the impact of these conditions on the structure.

Expansive soils can act much like a sponge. As they absorb moisture they swell, and as they lose water they shrink. Soils tend to dry out (and shrink) during the summer and to absorb moisture (and swell) during the winter. As the soil under a house shrinks and swells with the seasons, the house will move up and down. As long as the movement is not great enough to damage the house, most people do not consider the movement to be a problem. If the up and down movement of a house always returns the house to its original level position, then damage may appear and disappear on a regular basis as the seasons change.

If a homeowner wishes to minimize seasonal damage, the first step should be to follow a controlled watering program. By keeping the moisture content of the soil under the house constant, foundation movement can often be controlled to an acceptable amount.

The drainage about the structure should slope down and away from the foundation so that no water will stand within 4 feet of the foundation 4 hours after a rain. This condition should include the flowerbeds, which should be sloped to drain away from the home. Also, flowerbed edging should not be installed so that water is trapped adjacent to the foundation and allowed to pond. Soils placed adjacent to the foundation should be native clays, which will adhere to the existing soils and not readily be washed away as occurs with sandy type topsoils.

If gutter and downspout systems are utilized, they should drain past the flowerbeds and onto splash blocks or other suitable surfaces to preclude flooding the areas adjacent to the foundation. The downspouts should have extensions if necessary to direct the water beyond the flowerbeds and directly into well-drained areas.

After good drainage is provided about the home, a band of soil about the structure approximately 4 to 5 feet wide should be maintained at a consistent moisture content level year round. The band of soil can be watered by any method selected by the homeowner from sprinkler systems to soaker hoses.

Childress Engineering Services, Inc.

Page 2

Obviously, it is necessary to water more during hot, dry weather and less during cold, damp weather. The amount of water required to keep a foundation stable during the summer can be surprisingly large. A single large tree can remove as much as 100 gallons of water from the soil each day. Shrubs and other plants can also remove large quantities of water. During persistent hot dry weather, it may be necessary to water a foundation daily. Watering should supply enough water to keep the moisture content in the soil under the foundation as constant as possible.

The watering should start approximately a foot or so away from the perimeter of the home. This will allow the soils adjacent to the foundation to draw moisture from the area being watered and will preclude flooding the joint between the perimeter concrete grade beam and the soil. This joint is the point that should be monitored by the homeowner to determine the moisture content of the soils.

When the soils become damp they will swell and close the joint at the perimeter of the home. As long as the joint between the foundation and the soils remains tight and the soils are slightly damp to the touch, the watering patterns are sufficient. If the watering becomes excessive the soils will become wet and soupy. This indicates that the watering should be decreased.

If the joint begins to open and the soils feel dry, then the watering patterns should be increased. It must be pointed out that the watering of the soils about the home should be continued during the dry periods that frequently occur in the winter months.

As mentioned above, trees and certain types of large shrubs can have a significant impact on the moisture content of the soils supporting the foundation. When large shrubs or trees grow in proximity to a foundation, the root systems will seek out the naturally damper soils located beneath the structure. These soils will be damper due to the interruption of the sun drying and evaporation processes by the placement of the foundation. The soils may then give up moisture to the roots and subsequently experience a loss of soil volume. This loss of volume will produce a concurrent downward differential movement of the foundation, which depends upon the soils for support.

For this reason, trees should be planted a minimum distance away from the home equal to the drip line of the branches of the mature tree, or 10 feet, whichever is greater. Existing trees that are closer than this to the foundation should be equipped with a specific watering system to minimize their need to seek water from the soils near the foundation. In addition, the branches of trees and large shrubs can be regularly trimmed back to minimize their need for moisture from the soil.

By monitoring the drainage and watering of the soils about the home, the future impact of the seasonal moisture cycles can be minimized. This will significantly reduce the number and frequency of cosmetic defects that tend to occur about the home.