



**Note:** For gravity walls (Keystone, Verdura, crib wall, etc.), the Engineering Division is responsible for plan review and inspection. It may be necessary to consult with Engineering to determine the appropriate determination of h and s.

When a building footing is adjacent to a retaining wall, and the wall has not been designed to support the surcharge, it is necessary to consider whether or not the footing, as-built, is imposing a surcharge. If so, then the footing must be deepened, or the wall must be checked to see if it can support the surcharge.

Using the designations shown in the drawing, the following formula can be used to check this:

$$s = h - d \text{ (setback = height of retained earth - depth of footing)}$$

In most cases, the wall will already be in place and the footing setback from the wall will also be “fixed”, i.e., it would be very difficult to change the location. Therefore, the variation of this formula that would most often be used would be:

$$d = h - s$$

In this way, the required depth of the footing necessary for the “line of influence” to miss the stem of the wall can be determined.

There is a limit to how much a footing can be deepened to avoid the surcharge. At this time we are going to limit the total depth of footings to 42 inches (3 ½ feet). Past this, we will need to review each case to determine whether or not engineering evaluation is necessary.

The line of influence (dashed line in drawing) extends from the bottom corner of the footing at a 45° angle toward the wall. This is the path that the force from the load supported by the footing is assumed to take. The angle results in a “one to one” relationship between the setback (s) and (h - d), i.e., this is where the formula  $s = h - d$  is derived.

This same concept can be applied to other types of surcharges, driveways and parking spaces, for example.