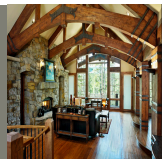
Structural Assessment Blog

Blog Date: 8/06/15

Beech Mountain, North Carolina

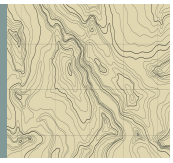
The Structure:



Although the views are magnificent atop beautiful Beech Mountain, they come at a risk. Like many residences that are built on this extreme slope, they are built using extremely high CMU (concrete masonry unit) foundation walls. Fill material is then piled up behind the foundation wall to provide a level grade for means of entrance into the home.

1

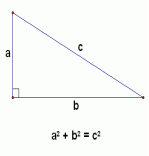
The Topography:



At an elevation of 5,506 feet, Beech Mountain is the highest town east of the Mississippi. Many homeowners choose to build their houses directly on the slope of the mountain in order to obtain the best view, however many structural concerns come into play that contractors sometimes neglect. If not careful, your house could end up at the bottom of the mountain.

2

The Problem:



The foundation wall (shown in the picture above) was under severe horizontal pressure from the weight of the back fill, which was being used for parking. The foundation walls were under reinforced and therefore did not have the strength to support such loads.

3

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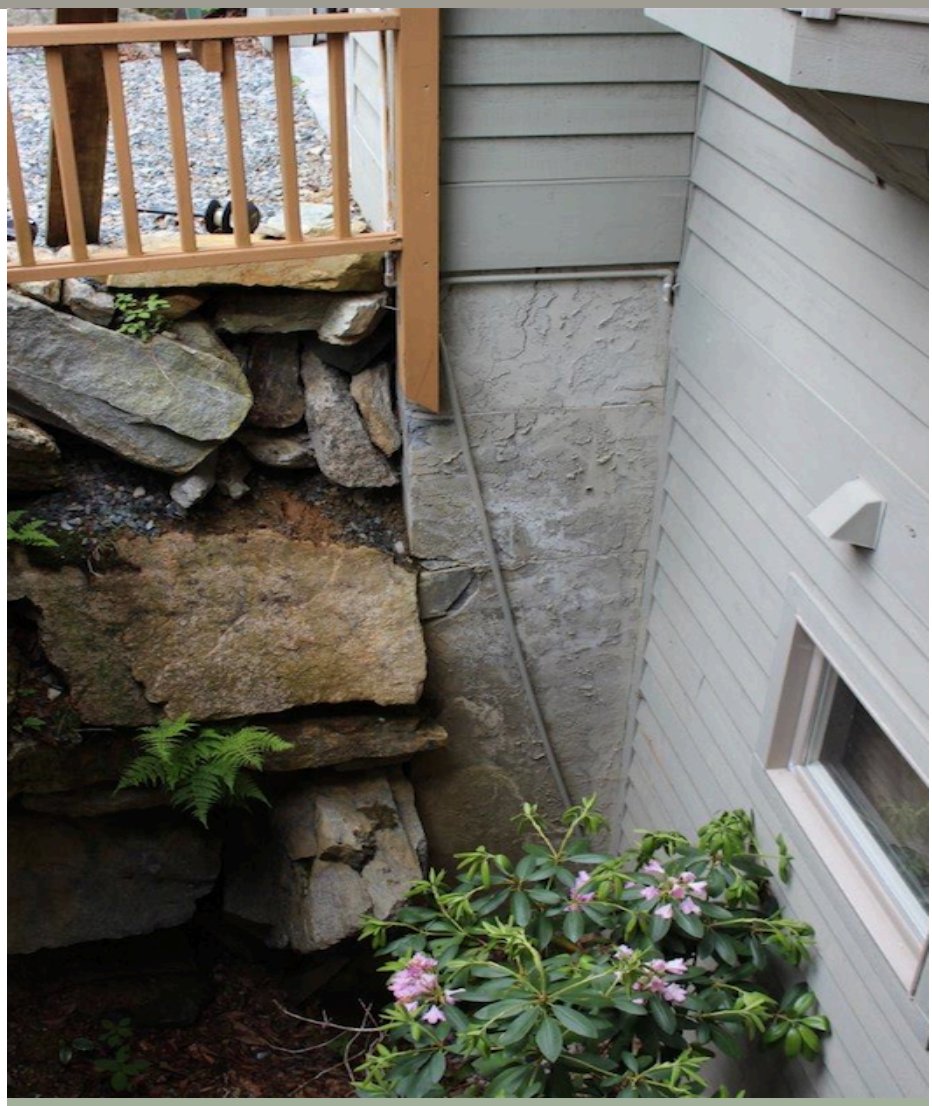

Lesson Learned:

"Fill is heavy, keep it steady"

-due to the extreme load exerted on the under reinforced (partially grouted) foundation wall, the wall had completely cracked all the way through and could have failed at any moment. If this structural issue had not of been found in time, the homeowner could have lost his home. When building on steep terrain such a Beech Mountain, especially when there is going to be horizontal force on the foundation walls such as backfill, make sure that the foundation walls are completely reinforced. This means that there is steel and grout in every cell of CMU block. In a perfect world there should be no lateral earth pressure against foundation walls, however this is not always possible especially in the mountains. A great way to prevent lateral earth pressure on the foundation walls is to reinforce the fill material using geogrid and leaving a slight gap between the back fill and the wall.