



Tall Walls - Alignment Monitoring & Adjustments

The “art” of constructing tall Keystone walls requires constant attention to vertical and horizontal alignment due to the accumulation of minor construction and manufacturing variations when thousands of wall units are placed and backfilled. Taller walls magnify any construction and manufacturing variations and require much closer attention to alignment monitoring to achieve the same results as smaller walls.

The Problem

Wall units are initially set to an alignment determined by the contractor. The precision of setting the first course is proportional to the amount of time spent on this function. Subsequent courses are set and backfilled which begins to introduce error to the original wall alignment due to the minor variations caused by the setting, backfilling, and compaction process and slight dimensional variations of the units. If these small variations are not corrected as they begin to accumulate, the misalignment becomes increasingly noticeable to all involved and becomes a very difficult problem to correct at a later time without dismantling the wall structure.

Horizontal Alignment

Horizontal misalignment is usually obvious when sighting down a wall. The cause is not always apparent since the initial courses may not have been set to the proper alignment and grade, subsequent courses may have not been set properly or the units may not fit perfectly straight and level, and/or the wall alignment may have been disturbed during backfilling and compaction.

The initial correction for most horizontal alignment problems is to identify the cause so that further construction procedures can then be modified to correct the misalignment. Realignment can be accomplished by adjusting wall setback using different alignment pin hole locations or redrilling new pin holes to achieve the desired alignment. Small adjustments to horizontal alignment can be made with little structural or aesthetic concern when alignment problems are noted early. The key is to check alignment often and make "small" corrections as needed.

Vertical Alignment

Vertical misalignment is not as obvious as horizontal misalignment but contributes equally to the problems noted in taller walls. Every course of wall units should be checked for levelness with minor shimming done every course or two to insure that the units remain true to the design batter. Walls can tend to lean either forward and backward or both (results in horizontal misalignment as wall height changes) depending upon the tendencies of the wall facing units to get out of level due to fabrication or construction considerations. This problem gets greater with height when not corrected and a wall will continue to "roll" forward or backward.

Shimming should be limited to a maximum of 1/8" per course and spread over a number of courses to avoid structural or aesthetic concerns. Shimming materials should be somewhat flexible to compress slightly and distribute load evenly while avoiding hard materials which can create load concentration points. Geogrid or geotextile material can be folded to varying thicknesses and used for this purpose. Other common building materials such as roofing shingles and pieces of thick rubber or PVC liner material have been used for shimming with success.