

THE CONSTRUCTION INDUSTRY DILEMMA

The civil construction industry is controlled by the earthwork elements of construction. Earthwork is rarely the largest construction item, but the earthen fills component is the only area of construction where the contractor does not have full control over cost, schedule, performance and results. The fills are also the only elements of infrastructure constructed with assumptions, trial and error exercises, and inadvertent engineering compromise. The fills are critical because these elements are foundations to our infrastructure. The [fill elements pose the most critical component of ground risk today](#), and persist as the primary source of the [greatest problem in infrastructure](#): differential subgrade movement now amounting to \$19 B in annual US property damage and escalating by \$0.35 B each year. These collective conditions cause a vicious cycle in the construction industry, in constant search for solutions. The earthwork is the only component of civil construction that dictates 1) construction contract structures, 2) construction liabilities and warranties, 3) liability separation of projects from contractors, and 4) creation of the “smart compactor” industry attempting to solve the problems.

These conditions all start with problems in compaction control. These conditions all end with solution to the compaction control problems. Earthen fills are constructed by compaction. Compaction is done with compaction equipment referred to as compactors or rollers. All compactors and operators work well. The problem is contractors are continuously forced to “meet” process control specs that conflict with the performance of the compactors used in construction -- a mechanical impossibility. This condition causes the following outcomes:

- adverse compaction
- dysfunctional process controls
- forced compromise with trial and error exercises
- inefficient construction / lower production
- deficient construction
- no direct verification of design requirements
- subgrade problems below foundations and pavements
- no control before, during or after fill construction

This in turn has developed a vicious cycle over the years, which is now controlling the industry. The graphic below illustrates the construction industry cycle controlled by the earthwork component. ESOL solves all of these problems and breaks the cycle. ESOL does this without changing any of the process control methods we use today.

CONSTRUCTION INDUSTRY CYCLE – DICTATED BY THE EARTHWORK COMPONENT

