

## SOIL MIXING

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Soil mixing is an insitu mechanical technique whereby soils are improved by adding a reagent through a mixing tool which incorporates the reagent into the soil with mechanical agitation. Soil mixing can be used to improve soft soils. These soils are most often cohesive soils with high moisture contents. Improvement can be achieved for increasing the bearing capacity of the soils to carry loads such as earth fills or structures. Shear strength can also be improved for reducing lateral loads that soft soil applies to underground structures such as sheet pile walls. Additionally, soil mixing can be used to remediate soils contaminated by toxins or hydrocarbons.

The tools used to mix soils vary in diameter from 24 inches up to 8 feet in diameter. The size of the tool which is used will vary according to the shear strength of the untreated soil as well as the purpose of the treatment. For large area treatments, larger tools will be more desirable. In some instances where a soil mixed column is being utilized to create an insertion point for a structural member such as an H-beam or pre-cast pile, a smaller diameter of 24 to 36 inches is more desirable.

Mix tools are typically mounted on large drills capable of turning the tool at the desired rpm in the untreated soil. The drills are usually track drills capable of trafficking in soft, uneven terrain. Soil mixing can also be performed by mounting the tool on a crane with a Kelly-bar attachment. The size of the equipment will vary according to the size of the tool and the application.

The reagent used to mix with the soil will typically be a pozzolan such as cement, lime, fly ash, or kiln dust. These materials are first mixed into a pumpable slurry and then pumped to the mixing operation, through the mix tool and into the soil. The materials are typically tested in advance to determine the strength gain possible by adding the materials into the soil at specific rates. Naturally, strengths will vary according to the amount of material added to the soil, however, it is possible to increase the strength of treated material by up to 100%.

Soil mixing can be used in a variety of configurations. Soil mixing has been used successfully as walled excavation support. Soil mixing has also been used to support loads over large areas by improving the soil mass where the loads will be bearing. The soil mixed columns will act to transfer the load as well as to reinforce the soil mass. Soil mixing can be used to reduce the lateral load behind sheet pile walls by improving the soils ability to support its own weight. Additionally, soil mixing can be used to improve an entire block of soil that has been contaminated by fixating the pollutants through stabilization.

If you have any questions, please contact [Dr. C.Vipulanandan](#)

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