Trenchmix

Soil Mixing

Various U.K. Sites

Introduction

Over the last five years Bachy Soletanche have been working in partnership with equipment suppliers **Mastenbroek** to develop a new, patented technique, to provide an alternative and economical solution for ground improvement and for installing "cut-off" walls for flood waters and water born contamination.

The Trenchmix process involves the construction, below ground, of a trench comprising soil mixed with a binding agent. This can be for impermeable and semi-impermeable cut-off barriers or for ground improvement. The Trenchmix process minimises land take, reduces disturbance to property, people and wildlife and offers an ability to work safely, close to high voltage electric cables, waterways, roads and railway lines.

When used as a "cut off" barrier, this technique is faster than sheet piling, produces significantly less spoil than conventionally dug walls and has no issues with noise and vibration.

Ground Improvement for a roadway at Steppes, near Glasgow

Contamination "Cut-off" Barrier at Bletchley, near Milton Keynes by

Sustainability Innovations

- ✓ Minimal spoil and low resources input.
- ✓ Low headroom, low weight and compact rig.
- ✓ Low noise and vibration.
- ✓ Efficient mixing and optimised reagent use.
- ✓ Cost effective alternative to conventional water & contamination barrier plus ground improvement systems.

Trenchmix provides continuous impermeable and semi-impermeable walls for foundations or leachate cut-off applications at depths of 4-10m and 400mm thick providing a permeability better than 1X10-8m/s and compressive strengths greater than 0.5Mpa.

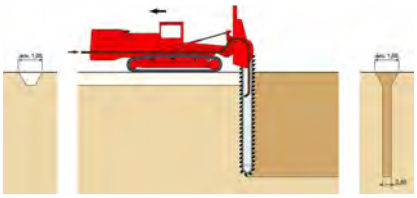
Contamination "Cut-off" Barrier

As an added advantage Active Barriers can be installed to treat contaminated groundwater.

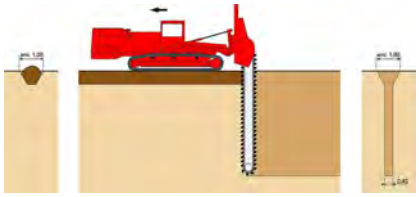
Trenchmix uses a Mastenbroek trencher which is similar in appearance to those used for land drainage, but the action of the chain is reversed to facilitate the mixing of slurry below ground and grout/water injection points have been added along the mixing boom. The trencher is highly manoeuvrable and capable of operating within a narrow corridor. The only raw material required is the cementitious grout, that can be mixed in the trench (dry method) or pumped from a small batch plant (wet method).

The process is controlled by a specifically designed quality control system that also provides comprehensive validation data, including treatment depth, mixing and incorporation index.

For the wet mix process the grout is injected at a controlled rate into the soil. For the dry mix process the binder is placed in the shallow pre-trench and water is added during mixing to achieve the required workability. Effective and thorough mixing of the soil/ binder/water mixture is ensured by the specially designed mixing teeth and the high energy mixing process. This delivers optimised mixing and binder dosage, to achieve the specified results.



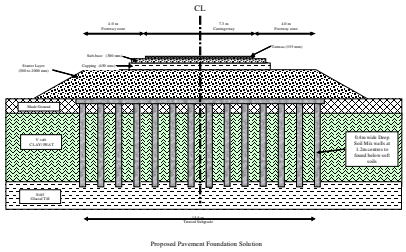
Wet Mix Process with Grout Binder



Dry Mix Process with Powder Binder

The mixed material sets within hours – though, as with all cementitious materials, it only develops full strength after a longer period of curing.

The fact that the material is



Ground Improvement Cross section

drawn to the surface during mixing, allows the operator to visually check that the material is being effectively mixed.

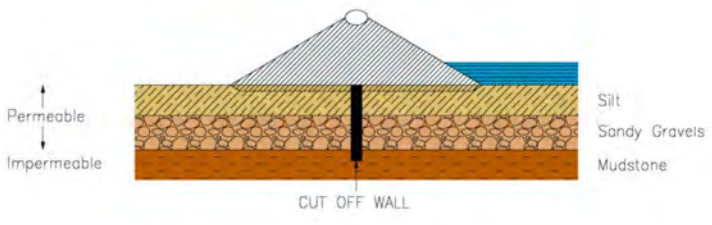
The design of the Trenchmix solution can be carried out by our in-house Engineers.

Significantly higher soil strengths

Trenchmix boom soil mixing by the dry process with powder

are achievable dependent on ground conditions and the slurry design, allowing use for road and building foundations as an alternative to Vibro Stone Columns and Driven Piles.

This process is applicable to both building structures and infrastructure embankments.



Cross Section of a Ground Water "Cut-off"