

Deep Soil Mixing (DSM) to strengthen soft soils in place

Rotating mixing tools blend cement or lime binder into soft soil to form stiffened columns, panels or blocks.

CAN BE CONSIDERED WHERE

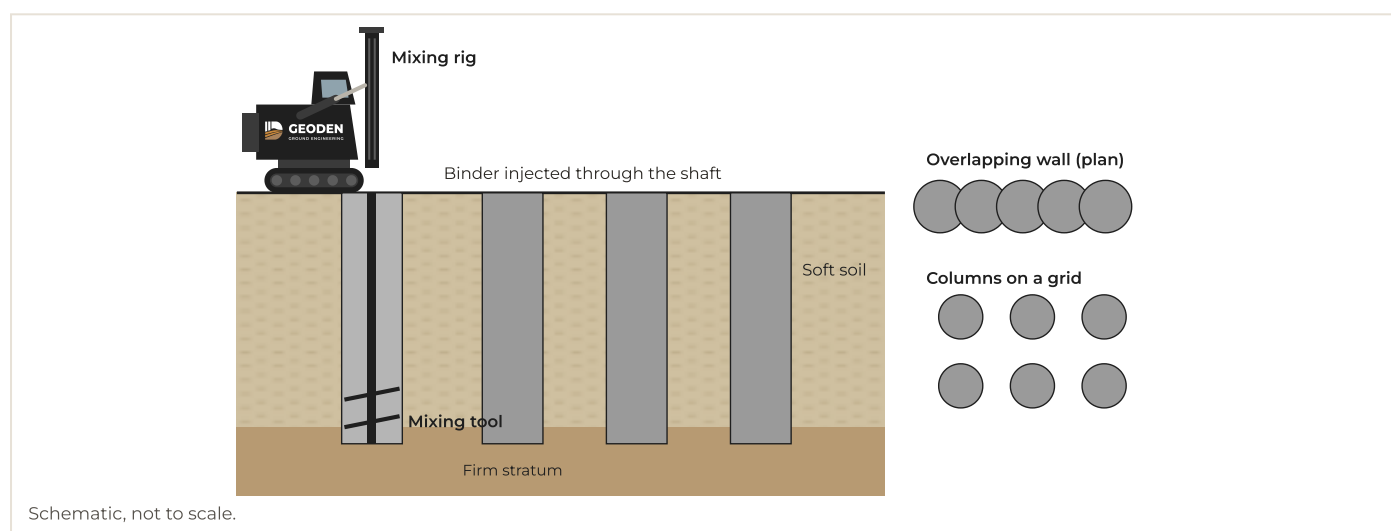
- Soft clays, silts and organic soils beneath embankments, tanks and slabs.
- Cut-off and retaining walls of overlapping columns or panels.
- Stabilisation and containment of contaminated ground.
- Liquefaction mitigation in loose saturated sands.

LIMITATIONS

- Strength achieved depends on soil type, binder and mixing energy; a laboratory mix design and field trial are needed.
- Organic and highly plastic soils need more binder and give lower strength.
- Obstructions, boulders and stiff layers limit penetration.

HOW IT WORKS

A rig with one or more hollow mixing shafts drills to the design depth. Binder is injected through the shafts while they rotate, during penetration, withdrawal or both, so the soil is broken up and blended with the binder.



DESIGN INPUTS

- Site investigation: soil types, moisture content, organic content, chemistry and groundwater.
- Laboratory mix design: binder type and dosage against target strength.
- Loads, settlement criteria and required strength.
- Column or panel layout, diameter and overlap.
- Spoil and surplus volume handling.

EXECUTION CONTROLS

- Binder dosage, injection rate and pressure recorded continuously.
- Penetration and withdrawal speed and mixing tool rotations per metre.
- Column position, depth and verticality.
- Wet samples taken at the agreed frequency.
- Spoil volume and condition observed.

VERIFICATION AND ACCEPTANCE

Design intent: What is required

Strength, uniformity, permeability and overlap criteria agreed with the consultant.

Production control: What was done

Automated mixing records for each column.

Acceptance: What was proven

Unconfined compressive strength tests on cores or wet samples, and load tests where specified.

DELIVERABLES

Method statement and risk assessment · Laboratory mix design report · Column layout plan · Trial report · Mixing records · Strength test results