

Jet Grouting for soil columns, cut-off walls and underpinning

High-velocity jets of grout cut and mix the soil in place, forming hardened columns of soilcrete.

CAN BE CONSIDERED WHERE

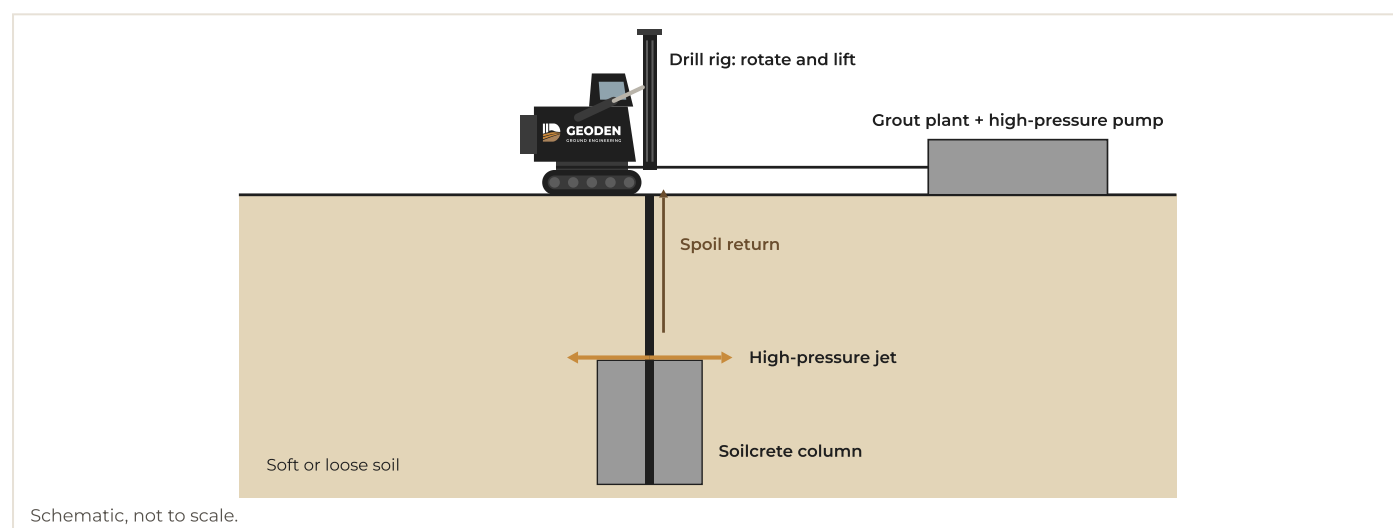
- Underpinning and protecting existing foundations.
- Groundwater cut-offs and base plugs for excavations.
- Strengthening soft or loose soils where access is restricted.
- Tunnel and shaft support, and treatment around obstructions.

LIMITATIONS

- Column diameter and strength vary with soil type and must be proven on a trial.
- Spoil (returned slurry) is produced in large volumes and must be handled and disposed of.
- High pressures can cause ground heave near structures; monitoring is needed.

HOW IT WORKS

A small-diameter hole is drilled to the base of the treatment. Grout is then pumped at high pressure through nozzles near the bottom of the rod, which is rotated and lifted at a controlled rate. The jet cuts a cylinder of soil and mixes it with grout.



DESIGN INPUTS

- Site investigation: soil types, grading, strength and groundwater.
- Purpose: cut-off, underpinning, bearing or retention.
- Required column diameter, strength, permeability and overlap.
- Existing structures and services nearby.
- Spoil handling and disposal route.

EXECUTION CONTROLS

- Jetting pressure, flow, rotation and lift speed recorded continuously.
- Grout mix, density and quantity per column.
- Hole position, depth and inclination.
- Spoil return observed for consistency.
- Heave and movement of nearby structures monitored.

VERIFICATION AND ACCEPTANCE

Design intent: What is required

Column diameter, strength, overlap and permeability criteria agreed with the consultant.

Production control: What was done

Automated jetting records for each column.

Acceptance: What was proven

Coring, unconfined compressive strength tests and, for cut-offs, permeability or pumping tests.

DELIVERABLES

Method statement and risk assessment · Column layout plan · Trial column report · Jetting records · Core and laboratory test results · Monitoring records