



# QUANTUM

## GROUND STABILISATION

Quantum Ground Stabilisation System

Presented by:

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## Quantum Ground Stabilisation System

The Quantum Ground Stabilisation (QGS) System is a two part system that beneficiates the load bearing capacity of natural gravels and soils for road making purposes:

- One part lubricates the particles enabling greater compaction
- The other, a powder, fills capillary voids mitigating against soil moisture movement
- The nett result is significantly improved shear strength of the natural material

The QGS System is not a cementing agent:

- Is therefore not prone to the shrinkage problems associated with cement
- It can be reworked in service without loss of integrity
- For repair use, treated material can be stockpiled for unlimited time prior to compaction

The QGS System improves the bearing capacity of natural gravels and soils by:

- Enhancing compaction through reduction in the capillaries between soil particles
- Mitigating soil moisture increase thus maintaining the integrity of the natural cohesion and inter-particle friction

The QGS System demonstrates these benefits through:

- Increased unconfined compressive strength
- Improved shear strength
- Virtual elimination of permeability to ground water and rainfall

The QGS System is a chemical substance which breaks up the adhering water film leading to an irreversible agglomeration of fines thus substantially reducing the capillary rise of water and allowing better compaction of the treated soil and increases required density under traffic.

In comparison with untreated soil, QGS has the following characteristics:

- Better compactibility through changing the water characteristic in the soil
- Strong reduction of water absorption through reducing the capillary activity
- Reduced water permeability
- The Proctor Density Optimum Moisture Content of treated soil is lower and the density is higher
- Malleability reduced, shrink and swell behaviour

QGS inorganic powder prevents the treated soil from water ingress by closing the capillary. Water absorption is drastically reduced, preventing swelling of the soil.



Advantages of QGS System in relation to cement and lime stabilization:

- Mixed soil can be stored for unlimited time and remain fully effective
- Environmentally safe and compatible
- Easy to apply in the field, no curing time, use as soon as dressed and rolled
- Large tolerance in soil varieties for treatment
- Given correct material ratios, suitable application is made easier due to the constant rate of application per cubic metre

The QGS System works the same with any type of soil as it activates the cohesive forces of the soil and substantially and lastingly reduces the influence of water. The QGS System modifies the soil permanently and thus is used in-situ or in a factory premixing procedure.

The bearing values of the treated soil allow for a notably higher bridge function in the bearing layers and thus a risk free reduction of the wearing course where applied, which may reduce the cover from 60 mm to 20 – 25 mm.

Suitability of Natural Materials:

- Generally, 33% gravel, 33% sand and silt, 33% clay
- Free from deleterious substances
- Free from excess organic matter
- Free from high concentrations of sulphate ions

Grading:

TMR type 2.5 gravel

Atterberg Limits:

LLL < 25

LPL < 18

PI < 10

California Bearing Ratio:

SES 2016 - 2.5 aggregate

TriLab 2021 - 2.3 aggregate