Chembase Treatment System (CTS)

Application and treatment of embankment sub-base layers

Product: Chembase® C-SSSB1 | Research and development

“It costs you nothing to find out how much you can save.”

What is an embankment?

A flood defence

An artificial ridge of soil or rock built beside a river to stop it flooding at times of high water.

Set back from the river

This allows flood storage on the floodplain and reduces the risk of undermining by bank erosion.

Built from cut material

Embankments are often constructed using material obtained from a cutting.

Compacted and waterproofed

The fill must be compacted and non-porous to give support and a stable, level surface.

Soils and fill used in embankments

Laterite soil

Iron-rich tropical soil.

Moorum (red soil)

Red, gravelly soil.

Desert sands

Fine granular sand.

Alluvial soil

Soil deposited by rivers.

Clay

Including black cotton soil.

Gravel

Coarse material with little or no fines contributing to cohesion.

Embankment dams come in two principal types, earth dams and rock-fill dams, depending on the predominant fill material.

CBR explained in plain numbers

2%

Typical CBR value of clay

10%

CBR value of some sands

80–100%

CBR of a high-quality base layer (100% is the maximum)

CTS research and development on embankment base layers shows increased strength, including a higher CBR, along with water resistance and a longer life.

The CBR test is carried out on soils with a maximum particle size of 20 mm. Larger material is assessed with plate bearing tests.

Set-back embankments: benefits and risks

Benefits

Flooding is contained
Flooding is limited to a known area of land.

Less risk elsewhere
The risk of flooding in other areas is reduced.

Relatively low cost
Construction and maintenance costs are relatively low.

Durable
Flood banks last, compared with frequent in-stream engineering work.

Points to manage

Failure under extremes
Under extreme conditions embankments may fail and cause bigger problems, as in New Orleans.

Dredging impacts
Dredging harms marine organisms through entrainment, habitat loss, noise and sedimentation.

Fill quality matters
Granular soils (sand, gravel) are highly desirable; finer silts and clays are less so.

One product, supplied in two parts

PART A

Polymer-Stabiliser

+

PART B

Activator

Chembase®
C-SSSB1

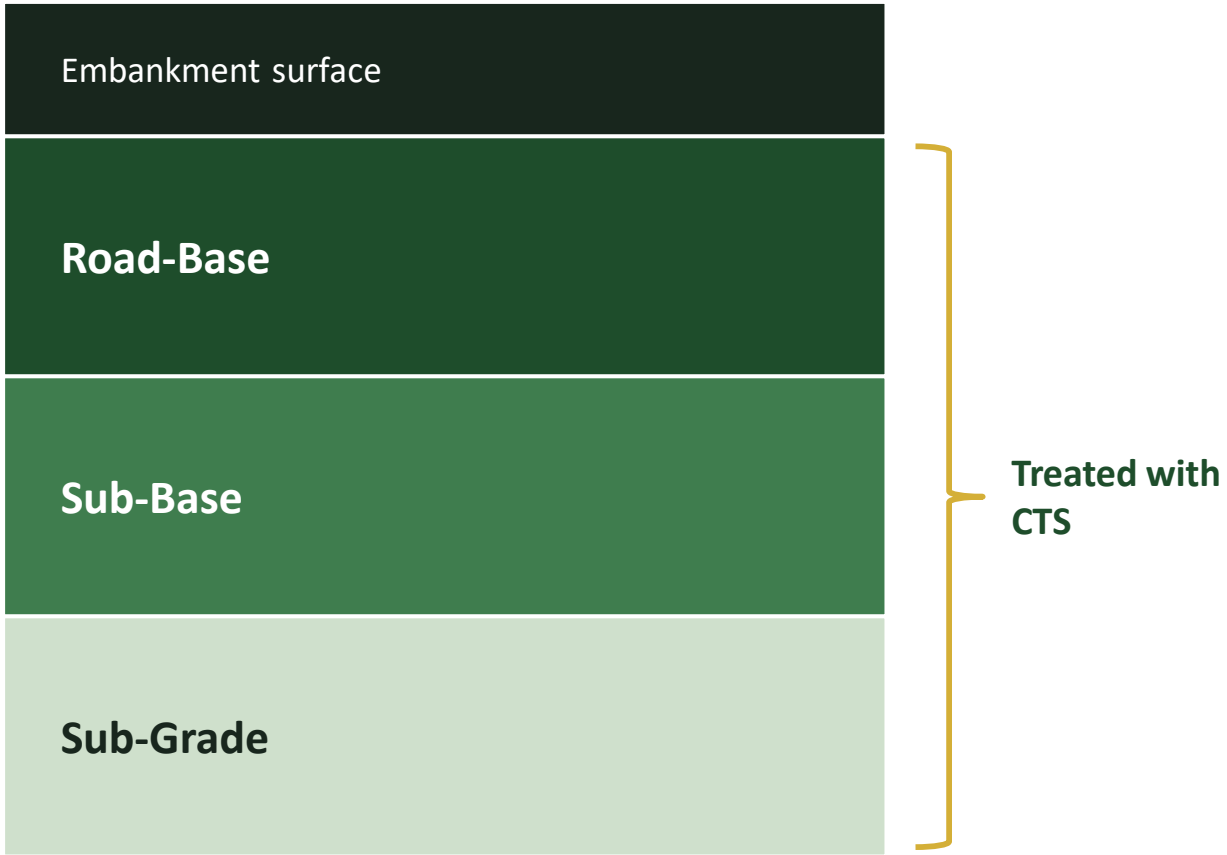
Five characteristics
combined in one product

A simplified range

- Five different chemistry characteristics are now combined into a single Chembase product.
- The application and treatment methods stay the same.
- The same characteristics, benefits and advantages are retained.

Naming: CTS stands for Chembase Treatment System. Chembase is also known as Chembase International and Chembase International Group.

Where CTS works: the base layers



Indicative cross-section

CTS modifies the properties of the existing soil to improve performance and durability.

- **Greater strength**
- **Higher load-bearing capacity**
- **Resistance to moisture-related issues**

Chembase and conventional road construction work together.

From stabilised layers to lower costs

1. **Stabilised base layers**
   CTS stabilises the road-base, sub-base and sub-grade.

2. **Less water, fewer potholes**
   Water leakage and potholes are reduced in the treated area.

3. **Less maintenance**
   The treated area needs less ongoing repair.

4. **Lower cost, longer life**
   Reduced costs and greater longevity for the treated area.

Performance benefits of treated layers

CBR increase

Raises the California Bearing Ratio (CBR), a standard measure of soil strength.

Water resistance

Treated layers resist water, limiting moisture-related damage.

Liquefaction resistant

Treated soil resists liquefaction, the loss of strength in saturated ground.

Freezing-condition tolerance

Tolerates freezing conditions.

Oil and petroleum barrier

Prevents oil and petroleum penetrating the treated soil.

Longevity

A long service life for the treated area.

Practical and environmental benefits

On site

Workable in any weather
Application is not held up by conditions.

Stable once diluted
The diluted product will not oxidise.

Re-compactable
Treated soil can be re-compacted (20 years).

Savings
Less maintenance and reduced costs.

Safety and sustainability

Safe to use
Product-safe and environmentally safe.

Waste plastic and glass
Shredded plastic or stained glass added to treated soil increases CBR.

Ash waste
Ash added to treated soil increases CBR.

Saltwater
Saltwater can replace fresh water, and increases CBR.

Brick pavements
Can be used in brick pavement manufacturing.

It costs you nothing to find out how much you can save

Talk to Chembase about treating your road-base, sub-base and sub-grade layers.

INDEPENDENT UNIVERSITY REPORTS

Reports from The University of Sydney and UNSW (University of New South Wales) are available at www.chembase.com.au

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