



**Cement Stabilized Mix using Crushed Aggregates–  
XCS®CSMCA**

**Executive Summary**

Cement Stabilized Mix using Crushed Aggregates (CSMCA) or Cement Stabilizer is a type of semi-hardened mix which has been developed through trials, in conjunction with Contractors projects requirement, to be compliant with the Technical Specifications.

Cement Stabilized Mix is a mixture of coarse aggregate (20mm & 10mm), fine aggregate (5mm & dune sand), cement and water (low amount). CSMCA is produced by introducing 5-7% by weight of water to all-in aggregate and cement of semi-hardened mix. Semi-hardened density average 2200kg/m<sup>3</sup> is the target but could vary based on project requirements.

**Description**

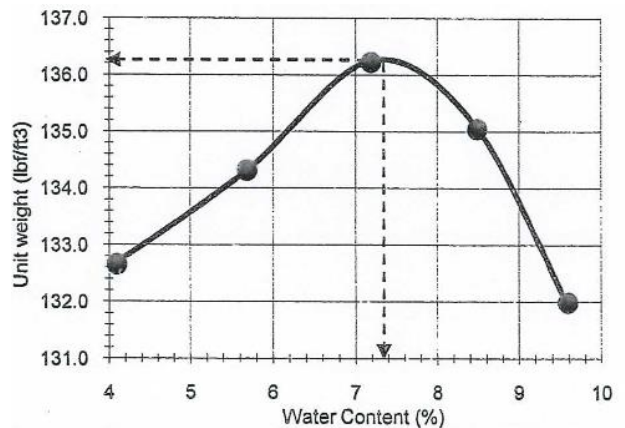
The controlled addition of water mixed to all-in aggregate and cement produces an unhardened or semi-hardened mixture. When a relatively small quantity of Portland cement is added to all-in aggregate mix the property of the dry materials is changed. At 5-7% moisture content percent by dry weight at the time of placing produces change in physical property to the degree required, such as for compaction.

As the water quantity increases a consistency similar to concrete is produced exhibiting a hardened mixture which makes it difficult to use as a stabilizer, so that optimum moisture content and determining the quantity of cement is vital.

Strict water control and minimum cement quantity is required to create this specialist stabilized material, which is suitable as a backfilling to box culverts, road side embankment filling, road shoulder backfilling, treated sub-grades, etc. It is transported and placed using dump-truck or other means of bulk transport.

**Technical Data**

- Optimum water content 5-7% by dry weight materials
- Cement content 48 kg/m<sup>3</sup>
- Maximum dry density (MDD) 2.1800 Mg/m<sup>3</sup> refer Fig 1
- CBR at 90% MDD 47% refer Fig 2



**Transportation & Placement**

Cement Stabilized Mix is placed by using dump-truck compacted to the required degree of compaction.

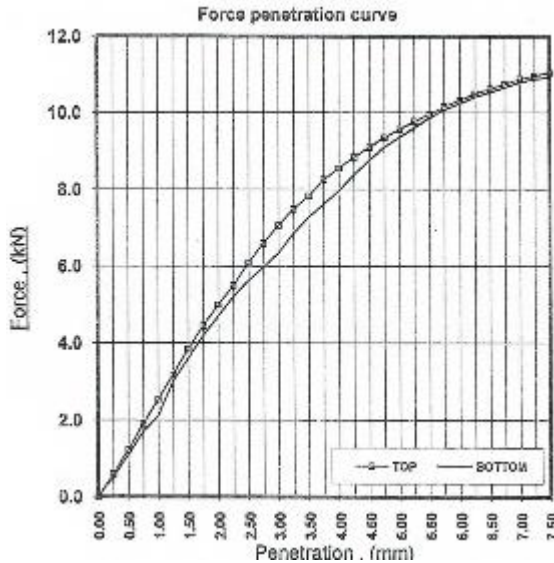




## Uses

- Backfilling in general
- Improved property compared with natural source without cement

Fig 2 CBR value



- Trench backfilling
- Treated sub-grade or sub-bases
- Highway fills (slope/embankment & road shoulder area)

## Benefits

- Easy to transport and place
- CSMCA is prepared in the batching plant maintaining the optimum moisture content and minimum cement
- Technical support by XCS all the times
- CSMCA is locally produced to enhance LEED MR-5 and Estidama SM-9 under 'Stewarding Materials' category to achieve Pearl Building Rating System
- Moisture content can be regulated to achieve the required degree of compaction
- AJES/STD-JV for Etihad Rail Network Stage 1 Shah-Habshan-Ruwais Contract C301 Earth Works & Major Structure Package 3,4 & 5
- Al Wasit/STD-JV for Etihad Rail Network Stage 1 Shah-Habshan-Ruwais Contract C301 Package 2

## General Precautions

Precaution shall be taken to maintain the optimum moisture & minimum cement quantity to achieve semi-hardened stabilized mix.

## Quality & Care

Cement Stabilized Mix has been developed by XCS Technical R&D Team to meet the special project requirements, and taking into account GCC weather. It is produced by XCS Abu Dhabi in our batching plants is designed under Integrated Management System (IMS) independently certified to confirm the requirements of quality ISO 9001, environmental ISO 14001 and occupational health & safety ISO 18001 standards.

## Performance Record

This product was used in various road & first railway projects such as: