



### Elements

Peaty, clayey and sometimes even silty soils are characterized by a high-water content, very low permeability and a low strength. When loads are applied to these soils, excess pore water pressure develops as the soil cannot adjust to the new load due to the very low permeability and slow dissipation of the excess pore water.

Constructing an embankment with no time available for the dissipation of the excess pore water pressure by means of our consolidation techniques, so called elements are often used as ground improvement solution. All element solutions have their own characteristics, but the main principle is load transfer down to the bearing strata. In case of GEC, DR and CSC technique combined with limiting the development of excess pore pressures and thus also reducing the residual settlements after construction.

Stone columns and GEC's can also be used to mitigate liquefaction.

### Solutions

- Geotextile Encased Columns (GEC)
- Cofra Stone Columns (CSC)
- Dynamic Replacement (DR)
- Piled embankment (AuGeo)





## Cofra

Cofra is an innovative contractor specializing in ground improvement techniques and membrane constructions. Innovation, professionalism and customer focus are embedded in our DNA. Thanks to our high level of experience and expertise we can provide in house the entire process from design to implementation. All based on the Cofra 'Way of working' in which quality and safety are key values. Cofra, as well as sister company Geotechnics, joined in 2006 Royal Boskalis Westminster, leading dredging and marine experts. Cofra's markets are infrastructure, dredging, mining, construction, waste management, flood protection, environmental and warehousing.

For further information about the consolidation segment and other Cofra techniques see our website

[www.cofra.com](http://www.cofra.com)

SEGMENT	CONSOLIDATION	COMPACTION	ELEMENTS	BARRIERS
<b>PURPOSE</b>	<ul style="list-style-type: none"> <li>- Accelerate settlement</li> <li>- Increase strength of subsoil</li> <li>- Reduce residual settlement</li> </ul>	<ul style="list-style-type: none"> <li>- Increase density</li> <li>- Increase bearing capacity</li> <li>- Increase safety against liquefaction</li> </ul>	<ul style="list-style-type: none"> <li>- Transfer load to bearing strata</li> <li>- Increase bearing capacity</li> <li>- Increase safety against liquefaction</li> <li>- Reduce residual settlements</li> </ul>	<ul style="list-style-type: none"> <li>- Obstruct waterflow</li> <li>- Obstruct sediment erosion</li> <li>- Non-structural elements</li> <li>- Prevent spreading pollution</li> </ul>
<b>ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Prefabricated Vertical Drains (PVD)</li> <li>- Vacuum Consolidation (BeauDrain)</li> </ul>	<ul style="list-style-type: none"> <li>- Cofra high impact Roller Compaction (CRC)</li> <li>- Cofra Dynamic Compaction (CDC)</li> <li>- Dynamic Compaction (DC)</li> <li>- Cofra Vibro Compaction (CVC)</li> </ul>	<ul style="list-style-type: none"> <li>- Geotextile Encased Columns (GEC)</li> <li>- Cofra Stone Columns (CSC)</li> <li>- Dynamic Replacement (DR)</li> <li>- Concrete columns (AuGeo)</li> </ul>	<ul style="list-style-type: none"> <li>- HDPE vertical barrier (up to 30m depth) (Geolock)</li> <li>- Vertical Sand Barrier (anti piping) (VZG)</li> <li>- Trenched MIP walls</li> <li>- Trenched liner barrier (up to 5m depth)</li> <li>- Liners</li> </ul>
<b>MARKETS</b>	<ul style="list-style-type: none"> <li>- Infra (roads, railroads, airports, ports)</li> <li>- Dredging (Reclamations, breakwaters)</li> <li>- Mining (Tailing ponds)</li> <li>- Construction (Housing and industrial estates)</li> </ul>	<ul style="list-style-type: none"> <li>- Infra (roads, railroads, airports, ports)</li> <li>- Dredging (Reclamations, breakwaters)</li> <li>- Mining (roads, remediation)</li> <li>- Construction (Housing and industrial estates)</li> </ul>	<ul style="list-style-type: none"> <li>- Infra (roads, railroads, airports, ports)</li> <li>- Dredging (Reclamations, breakwaters)</li> <li>- Construction (Housing and industrial estates)</li> </ul>	<ul style="list-style-type: none"> <li>- Waste management (landfills)</li> <li>- Mining (Tailing ponds)</li> <li>- Infra (Aqueducts)</li> <li>- Flood protection (anti piping)</li> <li>- Environmental</li> </ul>