

Cofra



Soil improvement and foil structures



Building worldwide on our strength

Cofra



Soil improvement and foil structures

Our history

Founded by Mr Cortlever and Mr Fransen in 1923, Cofra is an experienced and proven partner in soil improvement techniques. Originally an Amsterdam based contractor with local operations, Cofra has evolved into an international specialist in soil improvement. Cofra has international offices and an extensive network of agents. Since 2006 Cofra has been a division of Royal Boskalis Westminster, a dredging conglomerate with international operations. This has further strengthened Cofra's position worldwide.

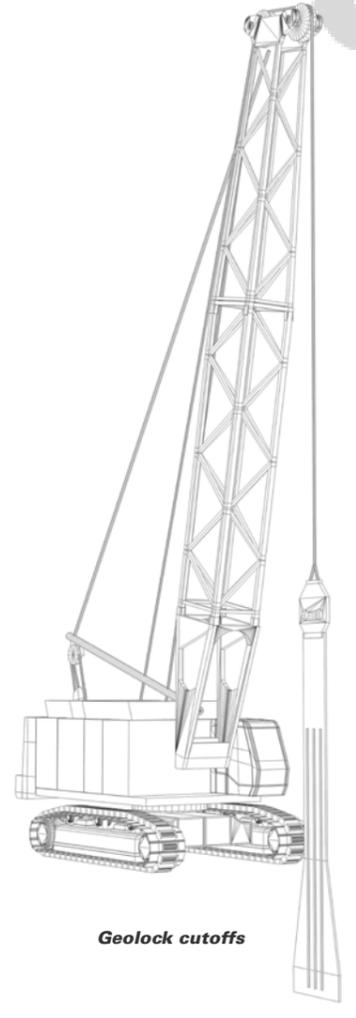
Our core values

Innovation, reliability and professionalism are Cofra's primary core values. Its proactive approach and advanced equipment designed in-house, among other things, have earned Cofra a leading position as a soil improvement specialist. Its core values have made Cofra a reliable international knowledge partner in civil engineering.

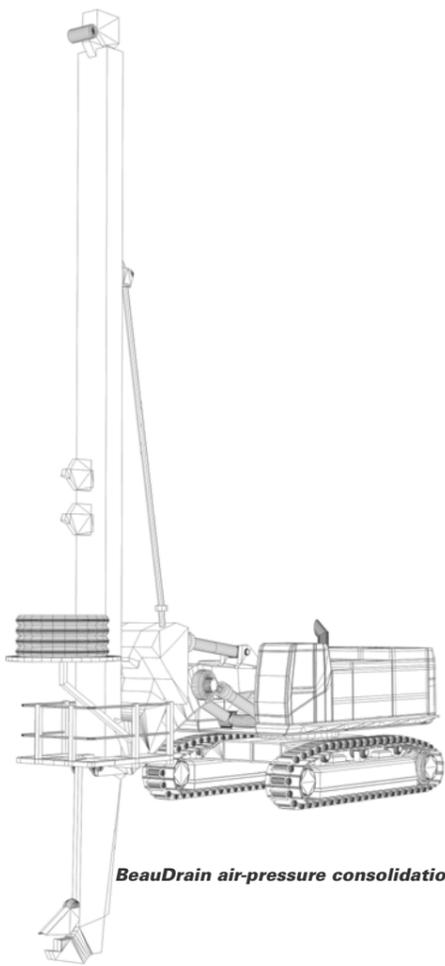
Our techniques

Cofra has a wide range of techniques for soil improvement. With state-of-the-art equipment and its own geotechnical engineering department, Cofra specialises in soil improvement techniques and environmentally-protective liner techniques. Cofra's consolidation and compacting techniques provide the solution for construction site preparation in international infrastructure projects and land reclamation projects.

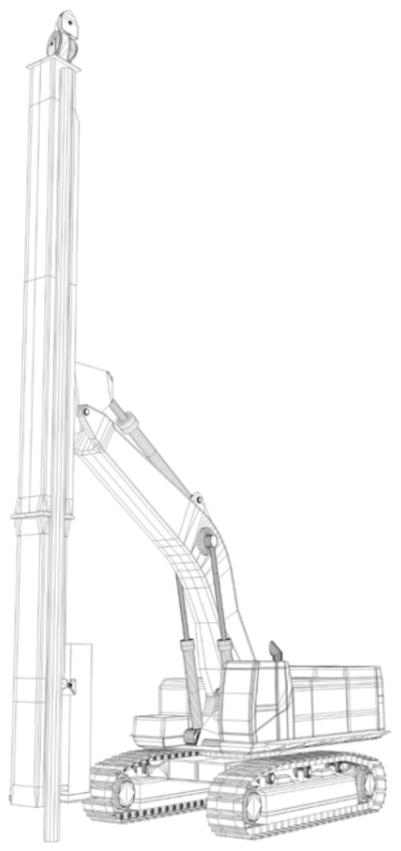
This brochure provides an overview of these installation techniques. A more comprehensive description of each of these techniques can be found in the separate product brochures.



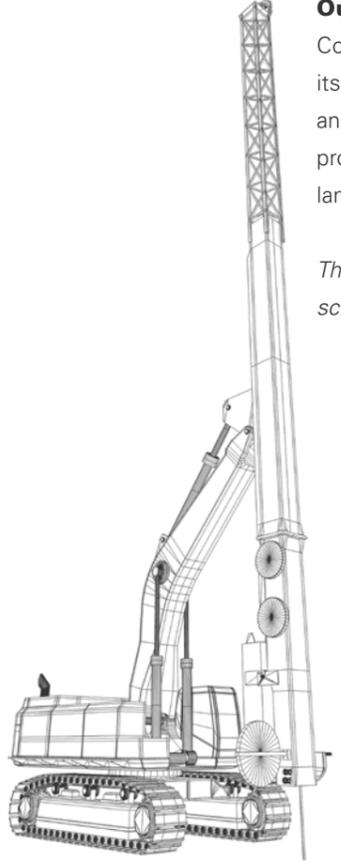
Geolock cutoffs



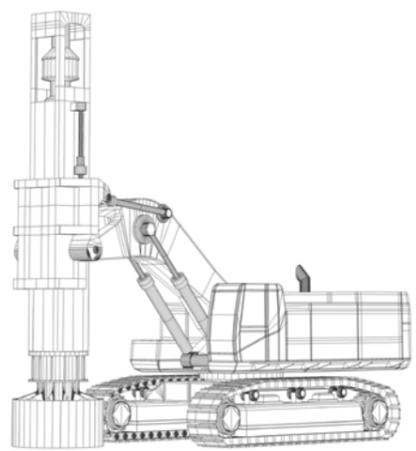
BeauDrain air-pressure consolidation



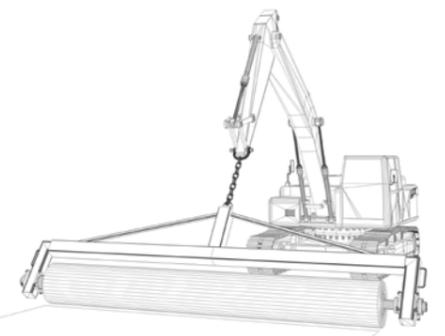
AuGeo embankment on piles



Mebradrain vertical drainage



CDC compaction



HDPE membrane seals





MebraDrain vertical drainage



Cofra uses vertical drainage to shorten a consolidation process from several decades to six months or less. It accelerates the consolidation process, allowing construction sites to be raised and developed more quickly. Over the past 40 years Cofra has installed millions of metres and continuously innovated its installation technique during this period. Cofra is a pioneer in installing vertical drains, and therefore can often be found working on the largest and most challenging projects. Cofra installs its vertical drainage systems using patented equipment developed in-house.

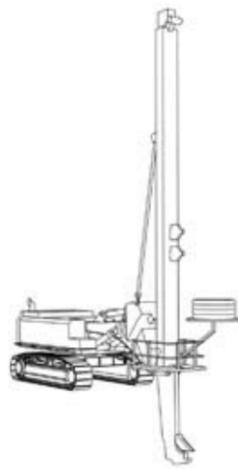
Applications of vertical drainage include:

- > Preparation of residential districts for construction
- > Installation of different types of infrastructure
- > Construction of dikes
- > Land reclamation projects

Advantages of MebraDrain vertical drainage:

- > Sophisticated equipment
- > Short consolidation periods
- > Quick installation
- > Installation to a drain depth of 65 m

BeauDrain air-pressure consolidation



When preparing a site for construction, designers often decide to apply standard vertical drainage with surcharge. But if the construction time or the time allowed for placement of the surcharge is very short and no time or money is available for (additional) surcharge, Cofra's settlement-accelerating technique known as BeauDrain often provides the solution. With the BeauDrain technique a pressure drop is imposed to the vertical drains through the connected horizontal drains. Through the creation of this underpressure a large part of the surcharge can be eliminated and the consolidation process can be even further accelerated.

Advantages of BeauDrain:

- > Short installation period
- > Clean work area after installation
- > Considerable reduction in the amount of horizontal deformation of embankments
- > No supply/removal and storage of sand and soil

Applications of BeauDrain include:

- > Expedited preparation of various sites for construction
- > Installation of different types of infrastructure
- > Construction of dikes
- > Expedited construction of embankments



BeauDrain-S air-pressure consolidation



Cofra developed the BeauDrain-S system in order to be able to apply vacuum drainage to surfaces and installation depths of any size. BeauDrain-S combines the standard BeauDrain system and vertical drainage. With this technique, sand layers are blinded off by a polythene hose and the drain is applied only in the compactable layer. This technique can be applied in specific soils anywhere in the world, on any surface and at any depth.

Applications of BeauDrain-S include:

- > Accelerated preparation of various sites for construction
- > Installation of different types of infrastructure
- > Construction of dikes
- > Expedited construction of embankments

Advantages of BeauDrain-S:

- > A very short installation period
- > Very large working depths possible
- > Suitable for installation through thick sand layers
- > High degree of flexibility in configuration



AuGeo embankment on piles



If the construction or renovation of infrastructure must be completed quickly and meet strict conditions, Cofra provides the solution with Au-Geo. This piled embankment system allows embankments to be completed free of settlement within a very short time. This technique is also highly suitable for projects in which environmental impact (as in the case of existing buildings or infrastructure that cannot be exposed to vibration and settlement damage) is normative for execution.

Applications of AuGeo include:

- > Construction and widening of embankments
- > Construction and widening of various types of infrastructure
- > Foundation of roads in urban development areas
- > Foundation of industrial flooring systems

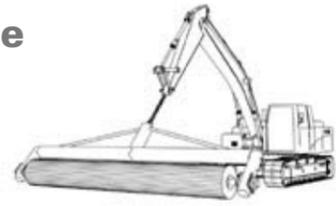
Advantages of AuGeo:

- > Quick, vibration-free and low-noise installation
- > No settlement period and no risk of instability
- > No impact on the surrounding area
- > Guaranteed pile diameter in peat soil





HDPE membrane seals



Cofra specialises in the incorporation and application of HDPE synthetic liner. Cofra is the Netherlands' largest installer of HDPE liner at waste disposal sites and in civil engineering projects. Furthermore, Cofra was the first contractor to be certified for the incorporation of synthetic liner according to the KIWA BRL K537 standard. For more than 25 years, installation crews have carried out all types of work according to the highest quality standards.

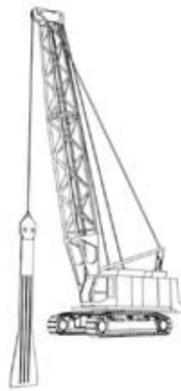
Applications of the HDPE technique include:

- > Waste disposal sites, bottom sealing and end covering
- > Waste incineration plant mounds
- > Water basins
- > Soil protection

Advantages of Cofra as a HDPE installer and mover:

- > High quality
- > 25 years of experience
- > Significant installation capacity
- > Daily on-site quality inspections

Geolock cutoffs



Geolock is a waterproof barrier consisting of a patented locking structure of extruded synthetic material with an HDPE 2.0 mm membrane welded to it. Geolock is used for the isolation of contaminated soil and for the waterproofing of dikes and dams. Cofra has many years of worldwide experience in the installation of Geolock screens. Geolock provides the best waterproof solution for blocking any horizontal underground flow of contaminated or uncontaminated groundwater.

Applications of Geolock include:

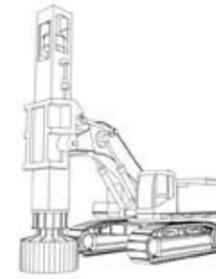
- > Vertical isolation of contaminated soil
- > Water-retaining structure in civil engineering
- > Gas-retaining screen in case of low groundwater levels
- > Reduction of tree root growth

Advantages of Geolock:

- > Fully waterproof and/or gastight
- > Flexible, crack-resistant material
- > Suitable for installation in any type of soil
- > Chemically resistant and a long life span



CDC compaction



Due to expansions in the dredging sector, reclamation projects nowadays are executed much faster than 10 years ago. This has reduced the amount of time available for compacting sand in thin layers, which means that compacting must be done in thicker layers. Few compacting techniques are available for these thicknesses. With the development of the CDC technique, Cofra has provided this niche market with a promising technique that compacts the subsoil in a homogeneous and highly accurate manner.

Applications of the CDC technique include:

- > Land reclamation projects
- > Tank terminals
- > Major infrastructure projects in granular soils
- > Compacting of embankments

Advantages of CDC:

- > Cost-effective
- > Compaction impact down to depths of up to 9 metres
- > Real-time GPS monitoring
- > Flexibility



Cofra: Building Worldwide on Innovation



Building Worldwide on our Strength has been Cofra's appropriate motto for many years. Speaking of Cofra's power quickly brings us to the topic of innovation. Innovation is one of Cofra's core values, it's in the company's DNA. All techniques used in soil improvement and environmental protection projects have been developed (and/or improved) in-house, by Cofra and its partners. New techniques result from the need for solutions to various problems, for the most part geotechnical problems in international projects. For Cofra, as experienced specialist in civil engineering, these problems are seen as challenges to provide the best solutions for each situation. For example, the recently improved CDC compacting technique has been a resounding success. With Cofra, you can always count on an innovative and pragmatic approach that sets the tone in its market segment.

This brochure has provided you with an overview of current operational techniques. Nonetheless, Cofra never sits still. New ideas are already being developed.

Cofra builds worldwide on Innovation!



Cofra

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