60,000 Ringtrac® reinforced sand-columns make it possible: 140 ha of new land for the production of the new Airbus A 380 in Hamburg, Germany

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The solution

Approximately 60,000 geotextile encased sand columns (GEC) with lengths varying between 4 and 14 m were installed at Mühlenberger Loch in Hamburg as a foundation system for a 2.4 km long dike. The new dike encloses a polder creating 140 ha of new land for the extension of the existing DASA Airbus plant (EADS) in Hamburg-Finkenwerder, required for the production of the new Airbus A 380. This enclosed area required to be raised up to 3m above sea level.

The main problem faced was construction in very soft soil (c_u between 0.4 and 10 kN/m²) with thicknesses between 8 and 14 m. The area concerned is also located in a tidal zone, with soil movement into the Elbe river not being permitted.

The original design solution for solving the stability problem asked for a 2.5 km long sheet wall to a depth of 40 m.

The GEC, alternative solution, saved 35,000 tonnes of sheet piling, 15 ha of reclamation area, 1.1 million m³ of sand filling, 8 million litres of fuel consumption and more than 1 year of construction time.

The **Ringtrac®** geotextile casing with a diameter of 800 mm provides radial support to the sand column in the soft layers. The distance between the columns centres is generally between 1.7 and 2.4 m. Over the GEC a horizontal bearing and equalising reinforcement is installed (**Comtrac®**) before construction of the dike is undertaken.

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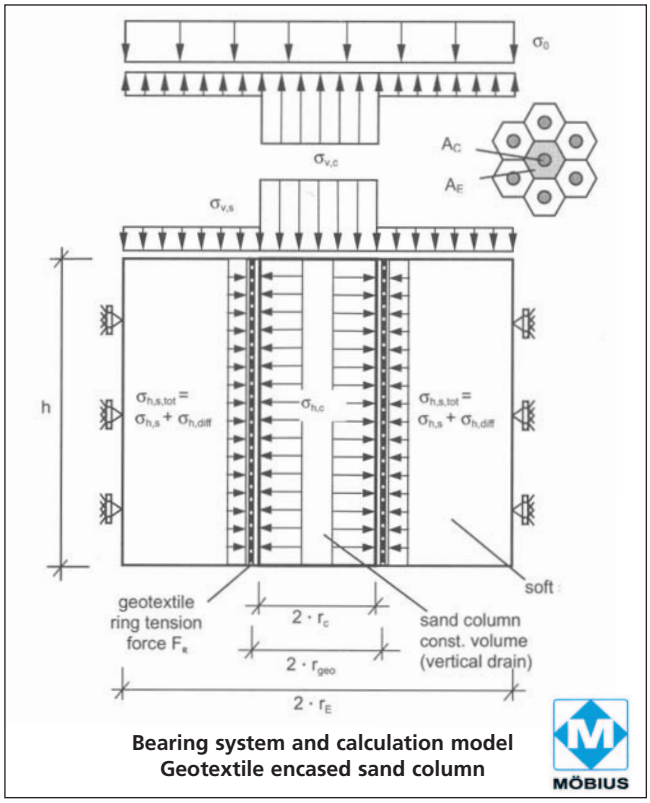

Bearing system and calculation model Geotextile encased sand column

Over the enclosed area both **Fortrac®** geogrids and **Stabilenka®** geotextiles were used as horizontal reinforcement.

The advantages

The advantages of the system are:

- major savings in steel, sand transport, reclamation area;
- shorter construction times;
- extensive reduction in settlements;
- substantial cost savings;
- can be used in soils with c_u < 15 kN/m²

Location:	Elbe river in Hamburg, Mühlenberger Loch
Client:	DASA Production Plant EADS Hamburg-Finkenwerder
Design:	Kempfert + Partner Geotechnik
Contractor:	Josef Möbius Bau Aktiengesellschaft „ARGE Mittelstand“
Year of construction:	2001 - 2003
Products:	**Ringtrac®** 100/400 60,000 columns **Fortrac®** R175/30-30 **Stabilenka®** 175/45 **Comtrac®** 1000/100A15 **Comtrac®** 500/100A15

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