

Abutments with

Fortrac[®]

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R E P O R T



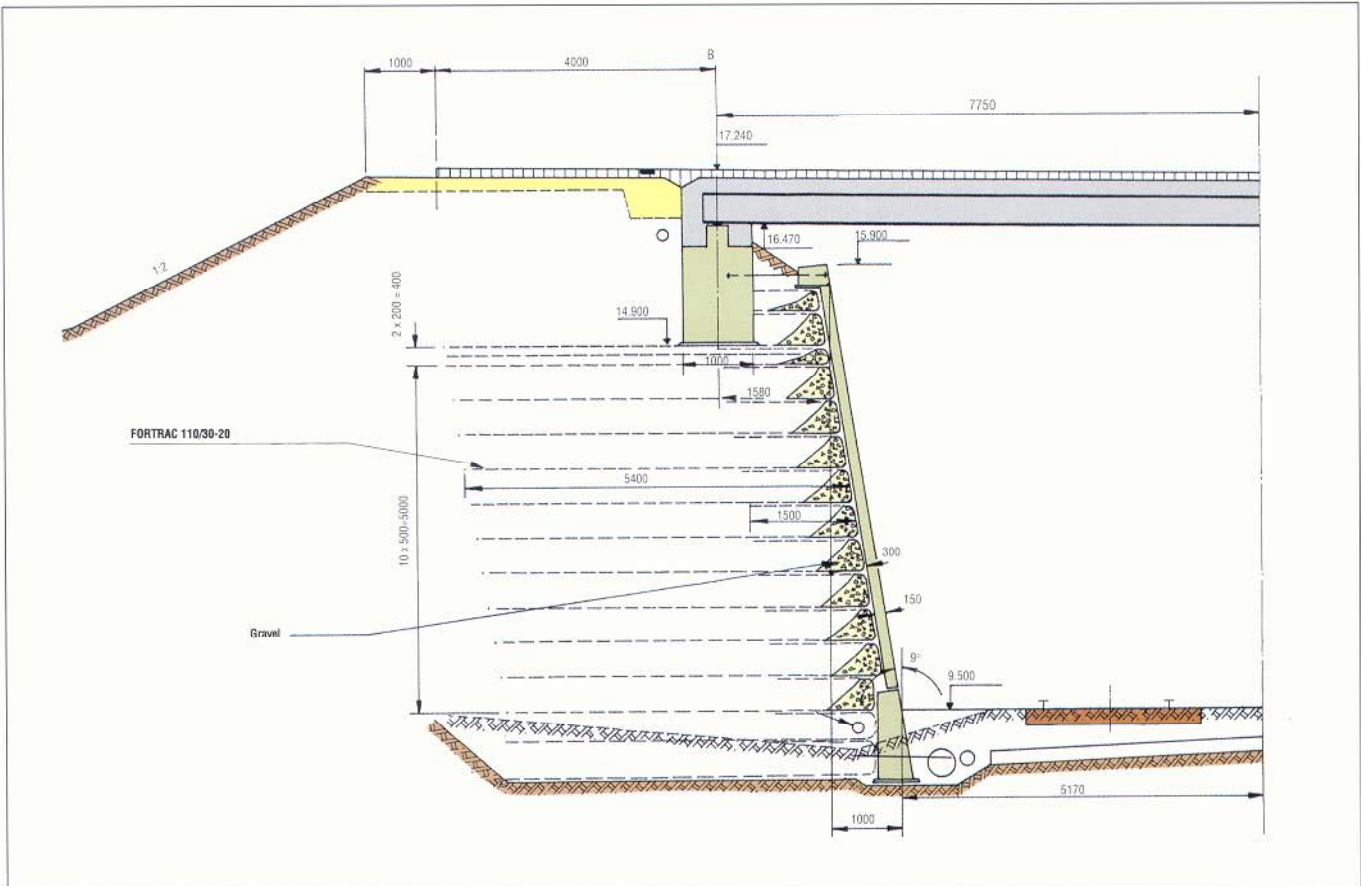
Road Bridge at Ullerslev / Funen

Danish State Railways (DSB) opted for reinforced soil abutments, when the road bridge was built over the Nyborg-Fredericia main railway line on the island of Funen. Due to the subsoil for this bridge at Ullerslev being glacial clay, considerable settlements of the abutment had to be accommodated. The conventional pile foundation was ruled out for financial reasons, and instead, the DSB chose a flexible supporting structure of earth and geogrids.

The road bridge, with a span of 15.5 m, consists of an 11 m wide steel structure resting on 8 m high abutments. Each abutment has to carry 2000 kN of dead weight and 1700 kN of traffic loading.

A gravel-sand compacted to a Proctor density of 100% was employed as fill material for the abutments. The soil was reinforced with a **Fortrac[®] geogrid 110/30-20** at a spacing of 50 cm for each layer, which enabled the construction of an abutment with a frontal inclination of 81°, almost vertical.

Fortrac[®] 110/30-20 is a flexible geogrid made by HUESKER Synthetic, having a short term tensile strength of 110 kN/m in the longitudinal direction



Fortrac® is manufactured from high modulus polyester in a range of strengths. It carries a "British Board of Agrément" Certificate, in which the design principles are detailed.

The contractor, Jørgensen & Søn A/S of Odense/Denmark, built the abutments between December, 1991 and January, 1992. The bridge itself was erected in August, 1992.

Since December 1991 the deformations of the abutment facings have been measured in 40 measuring points. The results show that almost all of the abutment deformations are caused by the subsoil. Up to the summer of 1993 the settlements amounted to max. 40-50 mm, of which approx. 10 mm occurred after the erection of the bridge superstructure. The reinforced soil abutments had themselves only settled approx. 2 mm.

DSB's reaction to this project, in both technical and

financial aspects, was positive. Once again the reinforced soil approach has proved itself!

