

## London Cable Replacement Tunnels National Grid

**Location:** London, United Kingdom

**Date:** 2011 – Present

**Structure:** Temporary TBM Launch and Reception Adits; Diversion Chambers

**Length:** TBM Launch and Reception Adits: 33 to 197 feet (10 to 60 meters); Transition Tunnels: 21 to 36 feet (6.3 to 10.9 meters); Junction Tunnels: 36 to 66 feet (10.9 to 20.2 meters); Diversion Chambers: 15 to 35 feet (4.5 to 10.6 meters)

**Cross-Section:** TBM Launch and Reception Adits: 194 to 291 square feet (18 to 27 square meters); Junction Tunnels: 538 to 646 square feet (50 to 60 square meters); Diversion Chambers: 388 to 517 square feet (36 to 48 square meters)

**Geology:** London Clay, Lambeth Group; Groundwater table is approximately 6.6 to 14.6 feet (2 to 5 meters) below surface

**Cost:** Approximately US \$351 Million

**Client:** Costain Ltd

**Owner:** National Grid

St. Pancras Chamber. During the construction of the chambers, GZ is scheduled to have design representation, which will provide quality assurance and quality control for the Contractor.

The adit has a diameter of approximately 16 feet (4.8 meters) and is located approximately 80 feet (24 meters) below ground level in London Clay. The groundwater table elevation varies from site to site, but ranges from approximately 6.6 feet (2 meters) to 16.4 feet (5 meters) below ground surface. The adits and chambers will be constructed using Sprayed Concrete Lining / Sequential Excavation Method (SCL / SEM). The permanent linings of the structures include both sprayed concrete and cast-in-place methods.

The consulting and design services include 2D and 3D Finite Element Models (FEM) to determine requirements for the sprayed concrete lining and cast-in-place elements during all construction stages in accordance with the project specifications and Eurocode.

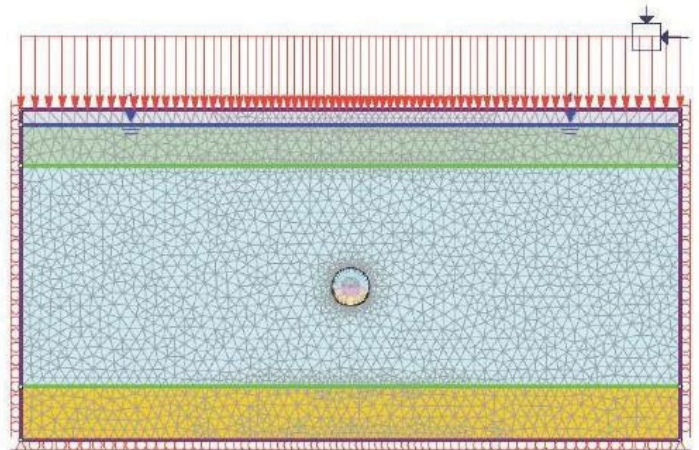


Figure 1. Finite Element Model (FEM).

### Engineering Consulting and Design Services:

National Grid is currently undertaking a major cable replacement program in the London area to serve the increasing energy demand for the city. Part of that investment is the installation of high-voltage underground cables in a series of tunnels to be built between Hackney and Willesden.

Gall Zeidler Consultants (GZ) has been contracted to carry out a Category 3 Check of the design for the excavation and primary lining of the tunnel adit at the Willesden Shaft. Additionally, GZ was responsible for the temporary designs of the Islington Shaft Launch Adit, the St. Pancras Shaft Launch Adit, and the temporary and permanent designs of the Wandsworth Adits, St. Johns Woods Adits, the Finsbury Park Chambers, the Islington Chamber, and the