Barrington Road Ventilation Shaft
Channel Tunnel Rail Link

Location: Ilford, United Kingdom

Date: 2002 – 2003

Structure: Ventilation Shaft

Depth: 125 feet (38) meters

Cross-Section: 36 x 40 feet (11 x 12 meters)

Geology: Made Ground, Alluvium and Terrace Gravel Deposits, London Clay, Harwich Formation, and Reading

Cost: Approximately US $1 Million

Client: Costain Skanska Bachy JV

Owner: Channel Tunnel Rail Link (CTRL)

Ventilation Shaft Design Independent Check Services:

As part of the Channel Tunnel Rail Link (also known as HS1), the Contract 250, the Barrington Road Ventilation shaft was built using a steel sheet cofferdam as primary support for the upper part excavated in the young terrace/flood plain deposits. SCL (sprayed concrete lining) was used as primary support for the deeper sections in London Clay. The lower part of the shaft has two 'shaft eyes' with sprayed concrete ring beams for lining strengthening in preparation for the TBM break-in and subsequent connection to the TBM tunnels. The shaft served for TBM retrieval during the construction.

Gall Zeidler Consultants (GZ) provided independent design check services for the Barrington Road Ventilation Shaft. This included an assessment of ground conditions, intermediate construction stages, the final stage of the structure in relation to ground deformation, the structural integrity of the upper sheet piled wall, and the sprayed concrete lining. The shaft was designed to retrieve two Tunnel Boring Machines (TBMs) and to form a permanent ventilation shaft.

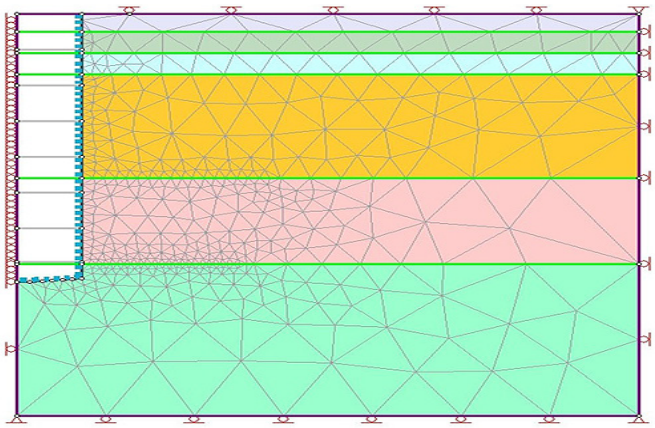

Figure 1. Finite Element Model (FEM) mesh for soil-structure interaction analysis.

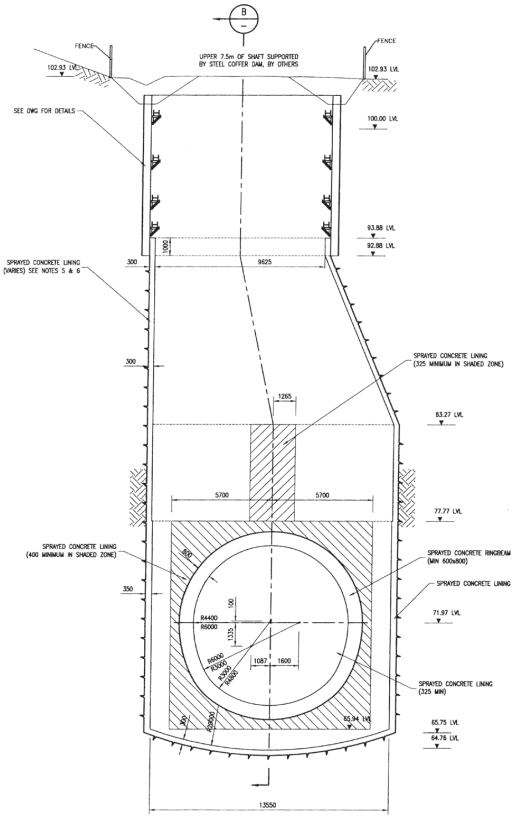

Figure 2. Shaft longitudinal section with shotcrete collar structure for TBM break-in.