

Green Park Station London Underground Ltd.

Location: London, United Kingdom

Date: 2008 – 2009

Structure: Shaft and Tunnel Stub

Length: Tunnel Stub – 15.0 feet (4.6 meters)

Cross-Section: Oval Shaft Diameter 29.9 / 31.5 high (9.1 / 9.6 meters) Axis Length – 91.0 feet (27.7 meters) Depth

Tunnel Stub – 28.5 feet (8.7 meters) Width, 42 feet (12.8 meters) Height

Geology: Man-Placed Fill, London Clay; Groundwater Table Approximately 9 – 12 feet (3 – 4 meters) Below Surface

Cost: Approximately US \$30 Million

Client: Donaldson Associates

Owner: London Underground Ltd. (LUL)

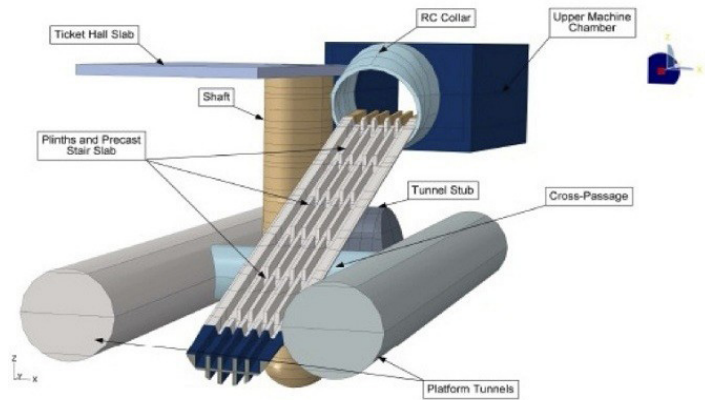


Figure 1. Three-dimensional (3D) Finite Element Model of shaft and tunnel stub with existing structures.

Modeling and Design Services for lift shaft and lift lobby tunnel stub using SCL / NATM:

The Step-Free Access (SFA) project's main goal is to provide step-free access from street level to all operational platforms via the ticket hall and between platforms for interchange purposes.

Gall Zeidler Consultants (GZ) provided design and computer modeling services for a shaft and tunnel stub to be constructed using Sprayed Concrete Lining / New Austrian Tunneling Method (SCL / NATM). These structures serve as an elevator shaft and the elevator lobby, respectively.

The shaft and tunnel stub was constructed entirely in London Clay. The initial shaft and tunnel stub support consists of a reinforced shotcrete lining. Excavation followed the principles of SCL / NATM. A PVC membrane-based waterproofing system as well as shotcrete and cast-in-place concrete linings were installed for permanent support.



Figure 2. Preparations for installation of opening frame for connection into existing platform tunnel 3.