



## Northern Line Extension London Underground (TFL)

**Location:** London, United Kingdom

**Date:** 2016 - 2018

**Structure:** SCL Shafts, SCL Launch Tunnels, SCL Running Tunnels, SGI / Timber heading for Step Plate Junction and station cross passages

**Length:** 3km Bored Tunnels, 2 x 77m SCL Launch Tunnels, 2 x 20m SCL Stub Tunnels and approx. 300m SCL Running Tunnels

**Cross-Section:** SCL up to 40m<sup>2</sup>, SGI/Timber Headings for step plate junction varying

**Geology:** London Clay, Harwich Formation, Lambeth Group

**Cost:** £700M

**Client:** Laing O'Rourke Ferrovial (FLO) JV

**Owner:** London Underground (Transportation for London)



Figure 1. Battersea Power Station.

### TBM Tunneling Expertise Consulting Services:

This project entailed the construction of the expansion of the Northern Line with approx. 3 km of planned bored tunnels (5.2m internal diameter), along with the construction of two new London Underground stations - Nine Elms and Battersea. A Step Plate Junction was constructed using SGI / Timber Heading in order to connect to the Northern Line's existing loop tunnel at Kennington Station to the new extension. Further the existing Kennington Station was enlarged by 4 additional Cross-Passages with SGI lining and hand mining.

Gall Zeidler Consultants (GZ) provided pre-tender design services to a contractor JV and subsequently independent Category III check design services for all SCL structures, the Step Plate Junction and new Kennington Station cross passages.

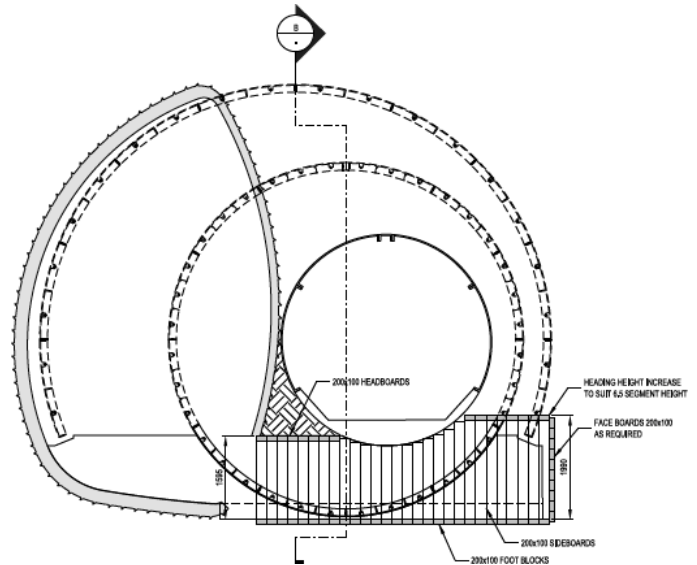


Figure 2. Step Plate Junction.