

## The Lighthouse, London Docklands

### Our Services

- Desk Study
- Site Investigation
- Finite Element Analysis
- Design Advice
- Monitoring



### Assessment of Tunnel Movements

This multi-storey residential development straddles the northbound Blackwall Tunnel. Excavation of the basement and installation of piled foundations altered the vertical stresses acting on the 100 year-old tunnel and the project had to ensure that no damage resulted to this important transport artery.

The design of all aspects of the basement construction from excavation and temporary support measures to the build of the foundations had to consider the potential impact on the tunnel and had to meet the approval of Transport for London (TfL) who operates the tunnel.

Sophisticated finite element analyses of the interaction between the new structure, the ground and the tunnel were undertaken to assess the impact of the development on the tunnel.

**CGL** worked closely with Laing-O'Rourke and the structural engineer Walsh Associates to ensure that effective and efficient design solutions were employed.

Distortions of the tunnel were monitored throughout the works using strain gauges attached to the tunnel linings. These were read remotely using wireless technology to provide real time data on tunnel behavior.

The deflections observed during construction were well within the targets agreed with TfL based on the computer predictions.

Client: St James Homes  
Contractor: Laing O'Rourke