



ITA TUNNELLING
AWARDS 2017



UK Power Networks Ltd. Southwark to City of London Deep Cable Tunnel

Sean Martin

Operations Manager - Murphy



ITA TUNNELLING
AWARDS 2017



Stakeholders

Client – UK Power Networks Ltd.

Client's Representative – WSP

Contractor – J. Murphy & Sons Ltd.

Contractor's Designer – Aecom

Mining Labour Supplier – Fineturret

Precast Segmental Lining Supplier – FP McCann



ITA TUNNELLING
AWARDS 2017

Project Scope



Construction of a deep underground tunnel network & installation of 132,000V electricity power cables to connect substations in Southwark (South London) & City of London (North London) including:

- Construct 3km of 2.85m I.D. tunnel
- Construct 34m deep x 9m I.D. shaft (TBM Launch & Tunnel Operation)
- Construct 8.5m long x 6.2m I.D. Chamber using SCL technique (TBM Reception)
- Construct 60m long x 3.7m I.D. tunnel using SCL technique
- Installation of 27km of 132,000V and associated electricity power cables
- Installation of all permanent MEICA equipment





ITA TUNNELLING
AWARDS 2017



Project Challenges

Tunnel Horizon Ground Conditions

- Chalk – High Flint Content (<math><800\text{MPa}</math>), Fractured with high permeability (10^{-3}m/s)
- Thanet Sand – Permeability = 10^{-3}m/s , High abrasivity
- Lambeth Group – mixed and variable
- London Clay – well suited to Tunnelling

Limited Working Area at Main Site

- 20m x 70m Site Area
- Safe Systems of Working Methods - Site within a UK Power Networks and National Grid Operational Substation – significant working challenges to stringent procedures
- Stakeholder management - Site adjacent to a number of private residences

Tunnel Alignment

- Approx 15% of Drive length on 150m Radius Curves
- >40% of drive involves curves <math><250\text{m}</math> Radius



ITATUNNELLING
AWARDS 2017

PROJECT
OF THE YEAR
- UP TO €50 MILLION -

Health, Safety & Wellbeing

Zero Lost Time Injuries (LTI's) recorded during Tunnelling works

- 290,000 man-hours safely achieved

Infrastructure & river crossings

- London Underground Jubilee Line x 2 (1mm movement recorded)
- Network Rail infrastructure
- River Thames
- Achieved TBM face loss between 0.2% & 0.6%

Adjacent to Local Residents

- Restricted site hours
- Noise abatement measures
- Constant communication with neighbours
- Spoil removal & deliveries considerations





ITA TUNNELLING
AWARDS 2017

PROJECT
OF THE YEAR
- UP TO €50 MILLION -

Project Innovations & Value Engineering

Use of an Existing Lovat TBM

- Modified to manage horizontal alignment
- Consideration for face conditioning to aid spoil removal from small site

Deletion of an intermediate shaft

- Provided significant cost savings as shaft was deep & in challenging ground
- Made possible by confidence in TBM Cutting Tools
- Made possible by confidence in surveying accuracy

Redesign of TBM reception chamber

- Made possible by decision to Drive Tunnel from South to North





**ITA TUNNELLING
AWARDS 2017**



THANK YOU

Any Questions or feedback?



PARIS- 15 November 2017

Sean Martin – Operations Manager

