

Case Study 1 – new cable tunnel

Elstree - St. John's Wood, London Project completed November 2005

As part of National Grid's obligations to be able to meet the growing demand for electricity in Central London, it was necessary to construct a new 400 kV substation, alongside an existing 275 kV substation at St. John's Wood. Simply interconnecting these substations did not allow National Grid to transfer the increased levels of power to the EDF distribution network. To achieve this, a new 400 kV transmission circuit was required between the new St. John's Wood substation and Elstree substation.

A new overhead transmission line was considered unsuitable due to the urban nature of the area between Central and Outer London. Burying the cable directly in the highway was ruled out on the grounds of significant disruption to the public and the fact that the highway was already congested with other buried services. Factors such as the need to protect a very expensive asset from third party damage, and having the facility to install a second circuit with relative ease in the future, alongside the unsuitability of other options, justified the construction of a cable tunnel.

Therefore the new 400 kV transmission circuit was achieved by constructing a deep bore cable tunnel between St. John's Wood and Elstree. Tunnel construction took place from April 2001 to March 2004. This tunnel presently only contains one 400 kV cable circuit, but has the facility to have a second installed in the future.

Facts and figures

Tunnel length: 20km

Tunnel diameter (internal): 3m

Tunnel depth (average): 25m

Components: 7 shafts and headhouses (2 end shafts inside our substations at St. John's Wood and Elstree, the other 5 at intermediate locations).

Tunnel construction costs: £70m

Cable type: 1 circuit of 2500 sq. mm XLPE cable

Cable supply and installation costs: £45m. Please note this is for one 400 kV cable circuit, one cable per phase.



Aerial views: Elstree (left) and St John's Wood (right).

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