
From: Brodrick, Claire [mailto:Claire.Brodrick@ffw.com]

Sent: Monday, January 13, 2014 11:11 AM

To: Thames Tunnel

Cc: Bowman, John

Subject: RE: 40954.00016: Application by Thames Water Utilities Limited for the Thames Tidway Tunnel ("the Application") National Grid Gas plc and National Grid Electricity Transmission plc - Unique Reference No: 10018671 [FFW-DOCS.FID2980047]

Dear Sirs

Please see the attached letter in respect of the Examining Authority's second written questions and requests for information, the original of which is following in the post.

Yours faithfully

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for Field Fisher Waterhouse LLP
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By Email (thamestunnel@infrastructure.gsi.gov.uk)
By Post

13 January 2014

Dear Sirs

**Application by Thames Water Utilities Limited for the Thames Tideway Tunnel ("the Application")
National Grid Gas plc and National Grid Electricity Transmission plc
Unique reference no: 10018671**

We act on behalf of our clients, National Grid Gas plc (NGG) and National Grid Electricity Transmission plc (NGET). We are writing in response to your letter of 19 December 2013.

Please find below our clients' response to Q32.1(a) of the Examining Authority's second written questions and requests for information. Whilst this question has been addressed to the Applicant, we note that the Examining Authority has invited Interested Parties to respond where relevant.

This section of the National Grid Cable Tunnel is due to be constructed in 2014 and commissioned in 2017. The Applicant has undertaken an assessment of impacts on the National Grid Cable Tunnel due to construction of the Thames Tideway Tunnel. Any disturbance to the integrity of National Grid Cable Tunnel will have an impact on the electricity circuits within the tunnel and a potentially significant impact on the electricity transmission network for London (which includes businesses, Crossrail, London Underground and supplies to distribution network operators such as LPN, who in turn supply millions of homes).

It is anticipated that the construction of the Thames Tideway Tunnel will result in an amount of movement (settlement) of the ground above the Thames Tideway Tunnel (as is common for all tunnels). Such settlement will affect the subsoil through which the National Grid Cable Tunnel will be located. This settlement must be closely monitored and controlled. If viewed in cross section, the settlement profile of the ground is usually a trough/bell shape, with the trough having a certain cross-sectional area. A parameter known as volume loss is defined as the trough area divided by the excavated cross-sectional area of the tunnel. Volume loss is a measurement of settlement performance during tunnelling that can be compared across tunnels of different sizes.

The Applicant's assessment identified made two major recommendations for reducing the impacts on the National Grid Cable Tunnel and thereby ensuring that NGET's apparatus is protected:

1. The installation of flexible packers in the lining of the National Grid Cable Tunnel to make it less sensitive to movement. These flexible packers will be installed by NGET's contractor when this section of National Grid Cable Tunnel is built.
2. The imposition of a contractual requirement of 0.85% volume loss on the construction of the Thames Tideway Tunnel in this area in order to protect the integrity of the National Grid Cable Tunnel.

Notwithstanding the above mitigation measures, the assessment anticipated that the construction of the Thames Tideway Tunnel will cause movements to the National Grid Cable Tunnel, although the assessment demonstrates that the movements predicted are acceptable given the mitigation. Any reduction of the clearance between the two tunnels to less than 6m would increase these movements further. In order to mitigate such an increase in movements, it may be necessary to impose a lower volume loss requirement which may not be feasible as the existing volume loss requirement is already very stringent.

A reduction in the clearance between the two tunnels will therefore have serious impacts on the integrity and serviceability of the National Grid Cable Tunnel and potentially the National Grid Electricity Transmission network.

We should be grateful if you would acknowledge receipt of this letter.

Yours faithfully

A handwritten signature in blue ink that reads "Field Fisher Waterhouse LLP". The signature is written in a cursive, flowing style.

Field Fisher Waterhouse LLP