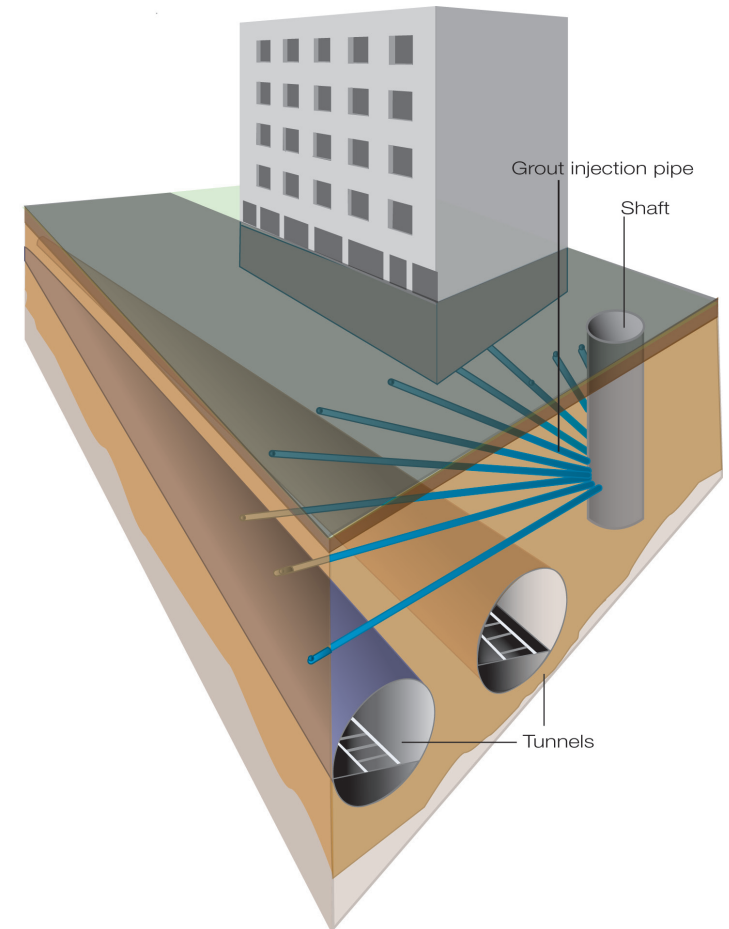


## Northern line extension

### Factsheet 7: Temporary shafts and ground treatment works



## 1. Introduction

This temporary shafts and ground treatment factsheet will explain:

- Why ground treatment is necessary
- What grout shafts are
- How grout shafts will be used on the construction of the Northern line extension

## 2. Why is ground treatment necessary?

Digging tunnels and shafts that will be required during the construction of the Northern line extension may cause small movements in the ground. This is called 'settlement'. In most cases you would not be able to see the effects of settlement, but sometimes there may be small cracks in plaster, and in a few cases doors or windows may stick. Settlement can, very rarely, affect the structure of a building.

Ground treatment works can minimise settlement and its impact on a property.

## 3. How will Transport for London minimise settlement?

We know a lot about how settlement works from projects such as the Heathrow Express railway, the Jubilee line extension, tunnels for the Docklands Light Railway, the Channel Tunnel Rail Link and the Thames Water Ring Main. We have also learned a lot about how best to minimise it.

Settlement will be minimised by the tunnelling and excavation techniques used to build the Northern line extension. For example, by using tunnelling machines that will exert a continuous pressure on the surrounding earth.

If necessary, we will also treat the ground so that it is less likely to move. The most effective means of doing this is by using 'compensation grouting'.

## 4. What is compensation grouting?

Compensation grouting is a well-established technique employed on tunnelling projects around the world to minimise settlement.

It works by injecting a cement-like grout into the ground to firm up the area where settlement is expected to occur. This is injected via small-diameter underground pipes which spread out from a central 'grout shaft'. This method can be employed very precisely and is an effective way of minimising settlement and damage to buildings.

## 5. What are grout shafts?

Grout shafts are holes in the ground from which grout can be pumped.

They will be operated from worksites of approximately 30-35m by 6m.

The worksites will be surrounded by hoardings to limit dust and noise. Much of the equipment that will be used will be located within the shafts, further limiting noise and dust.

## 6. Where and when will grout shafts be used on the Northern line extension?

Radcot Street and Harmsworth Street in Kennington have been identified as proposed locations for grout shafts. These will be at the point where the new tunnels for the Northern line extension will connect to the existing tunnels via junctions close to Kennington station.

## 7. Further information

For more information about the Northern line extension, visit [tfl.gov.uk/nle](https://tfl.gov.uk/nle)

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