



CROSSRAIL INFORMATION PAPER

D11 – 24-HOUR WORKING

This paper sets out the proposals for 24-hour working during Crossrail construction.

It will be of particular relevance to those in the vicinity of the proposed Crossrail tunnel works and worksites.

This is not intended to replace or alter the text of the paper itself and it is important that you read the paper in order to have a full understanding of the subject. If you have any queries about this paper, please contact either your regular Petition Negotiator at CLRL or the Crossrail helpdesk, who will be able to direct your query to the relevant person at CLRL. The helpdesk can be reached at:

Crossrail
FREEPOST
NAT6945
London
SW1H 0BR

Email: helpdesk@crossrail.co.uk
Telephone: 0845 602 3813

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1. Introduction

1.1 For some of the major works to construct Crossrail, planning has been based on the assumption that work will be carried out on a continuous 24-hour cycle 7 days a week.

1.2 These works include construction of the Crossrail running tunnels and underground stations for which two construction techniques are proposed:

- Construction of running tunnels using tunnel boring machines (TBMs) with linings erected immediately behind the TBM cutter head.
- Construction of underground stations using sprayed concrete lining (SCL) techniques.

1.3 Other major construction works that may include some 24-hour working are:

- Basement boxes at shafts and stations, and portal structures.
- Shafts and adits constructed using precast linings or sprayed concrete lining (SCL).

1.4 Some works that interface with Network Rail or London Underground infrastructure will need to be carried out outside normal railway operational hours to ensure continued operation of rail services.

1.5 Tunnel fit out activities may require 24-hour working including construction of the track bed, cable laying and general materials delivery by train and installation.

1.6 Some utility diversions will not be able to be carried out during normal working hours.

2. Rationale for 24-hour tunnel working

Primary considerations

2.1 *Limiting settlement*

Appropriate control of the tunnelling process requires continuous working during TBM or SCL works. This gives the best opportunity to control the ground and prevent the build up of water behind the tunnel face, minimising the potential for settlement of adjacent structures.

2.2 *Safety*

By working continuously during TBM and SCL works, the risk of tunnel face instability is significantly decreased, minimising risks to the tunnelling workforce from ground collapse and build up of water behind the tunnel face leading to inundation.

Secondary considerations

2.3 *Programme*

Construction of the Crossrail running tunnels and underground stations is planned to be carried out over a period of approximately six years. Changing from 24-hour working would significantly increase the duration of construction,

delaying the benefits of the Crossrail scheme and prolonging the effects of construction.

2.4 *Limitation of cost*

By carrying out some of the major works 24-hours a day, costs are limited by using construction plant to greatest efficiency, minimising standing time thus reducing overall construction costs.

2.5 Other recently constructed tunnelling projects in London have utilised 24-hour working. These include:

- the Channel Tunnel Rail Link;
- the tunnels for Terminal 5 (T5) at Heathrow Airport;
- the Jubilee Line Extension to the London Underground; and
- the DLR extension to Lewisham and Bank.

3. Tunnelling support works

3.1 The Crossrail works planned to be carried out on a 24-hour basis will involve some 24 hour support operations within the worksites including:

- Delivery of materials, consumables and plant to the tunnel face from the drive portal or access shaft and for tunnel fit out by train from tunnel logistics sites at Aldersbrook and Old Oak Common
- Removal of excavated material from the tunnel face to the drive portal, access shaft or material stockpile
- Operation of key plant on the surface needed in support of underground construction (e.g. fans, compressors, generators, batching plant)
- Maintenance of key plant necessary for the safety of the works (underground or on the surface)
- Surface support to the underground work, including welfare facilities, cramage, workshops and stores
- Transportation, storage and removal of excavated material by conveyor, barge and rail.

3.2 Deliveries to site and removal of excavated material from station and shaft sites will be limited to normal working hours and one hour start up and shut down periods either side of the normal working hours, unless otherwise agreed with the local authority or under exceptional circumstances for special or abnormal deliveries; e.g. delivery of the TBMs. Normal or core working hours will be set out in the Crossrail Construction Code (see Information Paper D1, Crossrail Construction Code). Removal of excavated material and delivery of fit out materials by train will be subject to availability of train paths and will necessitate outside of normal hours operation.

4. Other works

4.1 Certain railway or utility works will need to be undertaken outside normal working hours:

- works requiring temporary possession of roads and railways for safety or operational requirements, to limit disruption to the travelling public; and
- works in connection with utilities when demand is low.

This will include Saturday afternoon, night-time, Sunday and/or bank holiday working from time to time. On occasion longer term possessions (in excess of one week) will be required for more major works.

4.2 In order to safeguard the works it will be necessary for certain items of plant and equipment to be kept running 24-hours per day, which would include pumps and generators. Any such equipment will be shielded in order to provide appropriate noise attenuation. Staff may be required to collect data and samples outside normal working hours at times.

5. Conclusion

5.1 24-hour working is required for tunnelling works including tunnel fit out. All recent tunnelling projects in London have adopted 24-hour working and it will be essential for the construction of Crossrail.

5.2 Planning of Crossrail works has assumed 24-hour working for construction and fit out of the running tunnels and underground stations and continuous working could be required for basements at shafts and stations, and for tunnel portals, shafts and adits.

5.3 24 hour working is deemed essential for tunnelling works to ensure safety, minimise environmental impact, ensure efficiency and minimise construction duration and cost.

5.4 Other works will need to be completed outside the normal working day for safety or operational reasons.