

How Can This Happen?

Railway Tunnel penetrated by Piles.

BB – Extracts from RAIB report.

Summarised by :

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Balfour Beatty



Rail Accident Report



**Penetration and obstruction of a tunnel between
Old Street and Essex Road stations, London
8 March 2013**

Report 03/2014
February 2014

Balfour Beatty

Rail Accident Report



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What Happened?

1. A seven storey residential building commenced piled foundations on 6 March 2013, 13m above an undetected railway tunnel.
2. At **10:09 hrs on Friday 8 March 2013** Driver reported that water was flowing from the roof of the tunnel. (Old Street and Essex Road stations on the Northern City line.)
3. Inspection train deployed and 2 x 350mm dia Auger drills had come through the tunnel wall and had fallen onto the track.
4. The piling team were unaware that they had penetrated a tunnel.
5. Attempted to locate the missing sections of auger using metal bars.
6. No accidents or injuries.

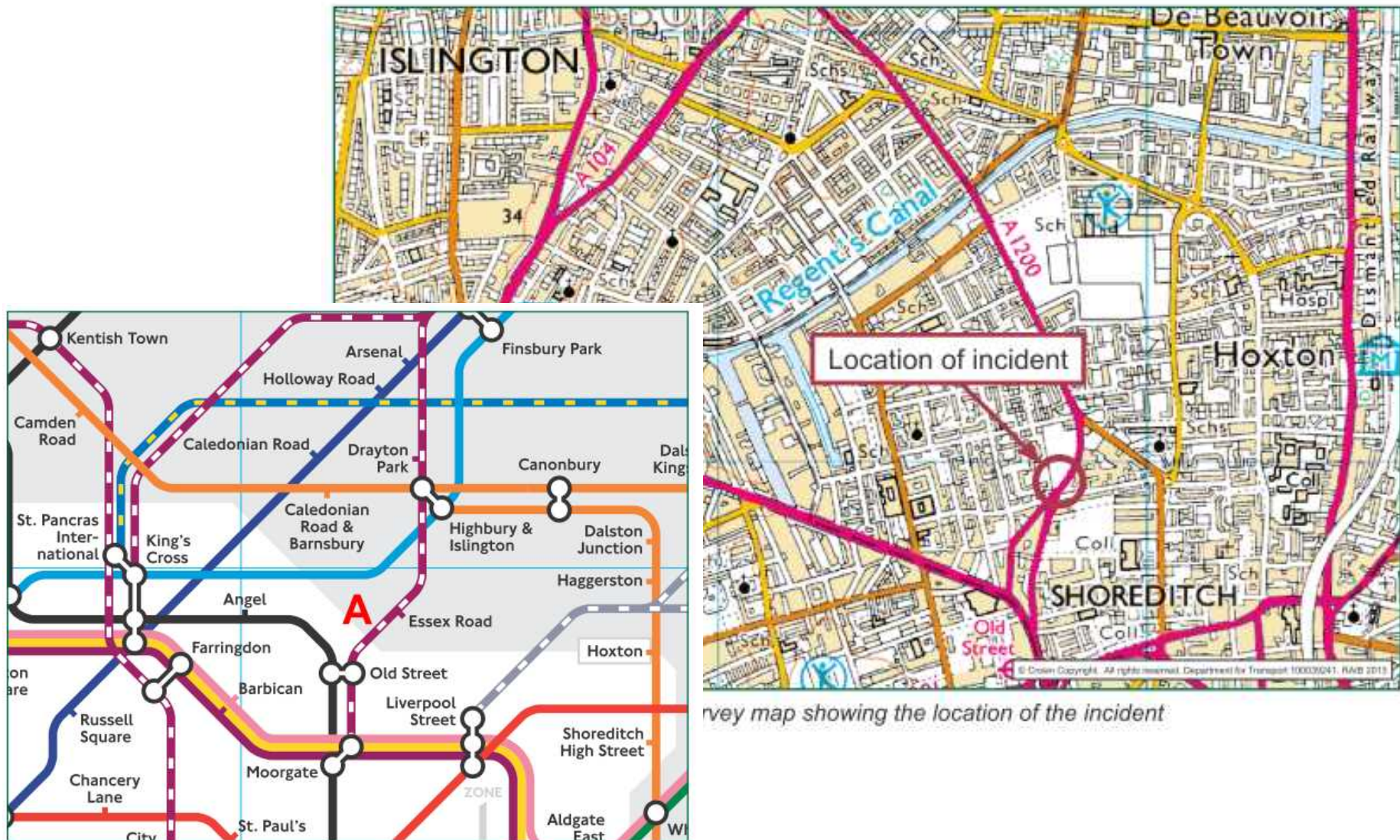


Figure 2: Extract from London Rail and Tube services map (Transport for London). The incident occurred at location marked 'A'.



Figure 5: Penetration of tunnel lining and debris on track



Figure 6: Auger sections and debris on the track (photograph courtesy of Network Rail)

History

1. The site was vacant since the 1970s.
2. Developer engaged an Architect, Engineer and Land Searches.
3. GI Bore holes done in November 2011 – possible obstructions
4. Planned bore hole depth of 20m, one refused at 14m.
5. The Structural Engineer's research – no tunnels or sewers.
6. Planning permission was granted for the scheme in March 2012.
7. Principal Contractor passed responsibility onto Piling Contractor.
8. Unknown to the designers, 19 of the planned 39 piles would clash.
9. The longest piles would have extended over 9 metres below rail level

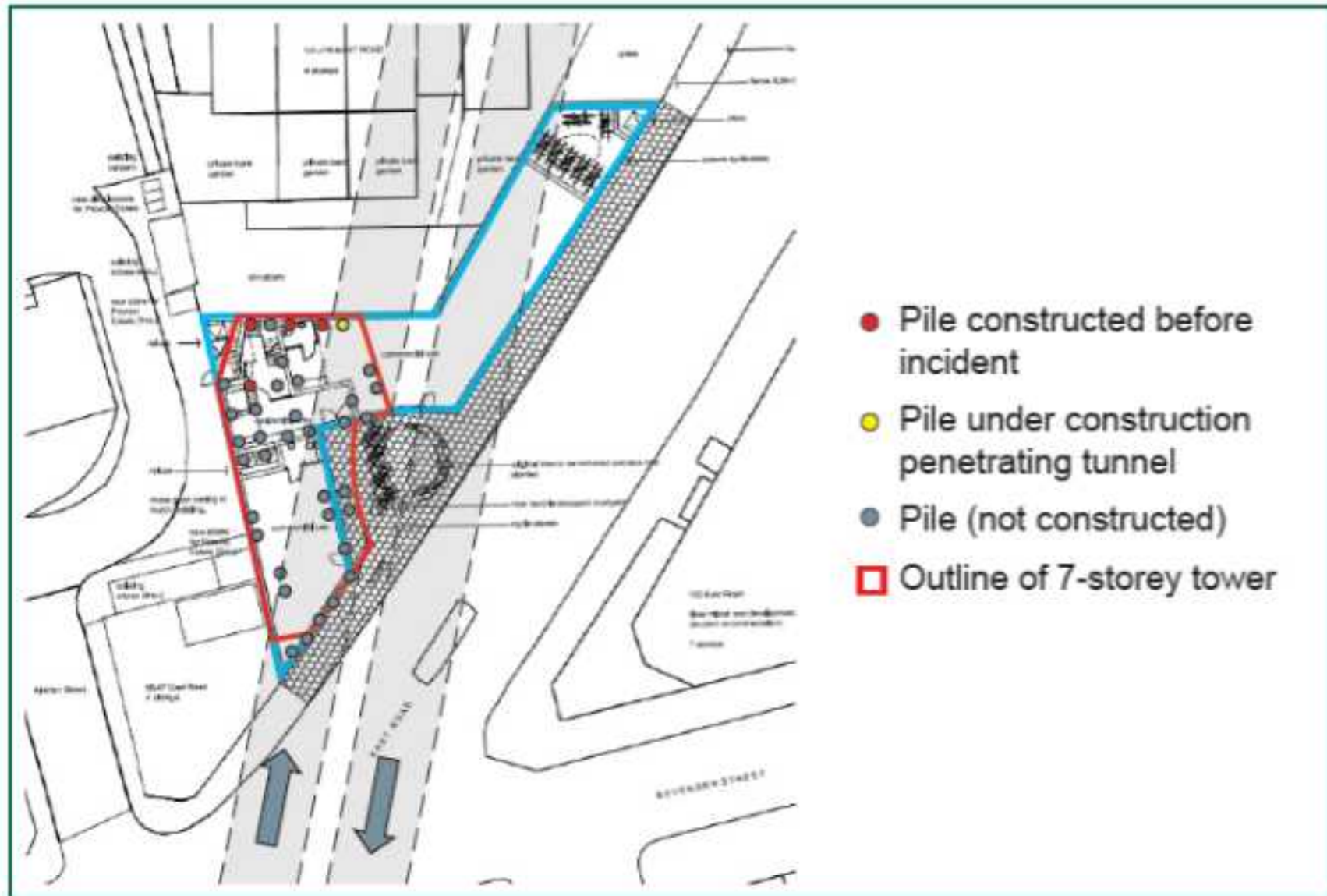


Figure 10: Extract from 2011 planning application enhanced to show location of piles and tunnels

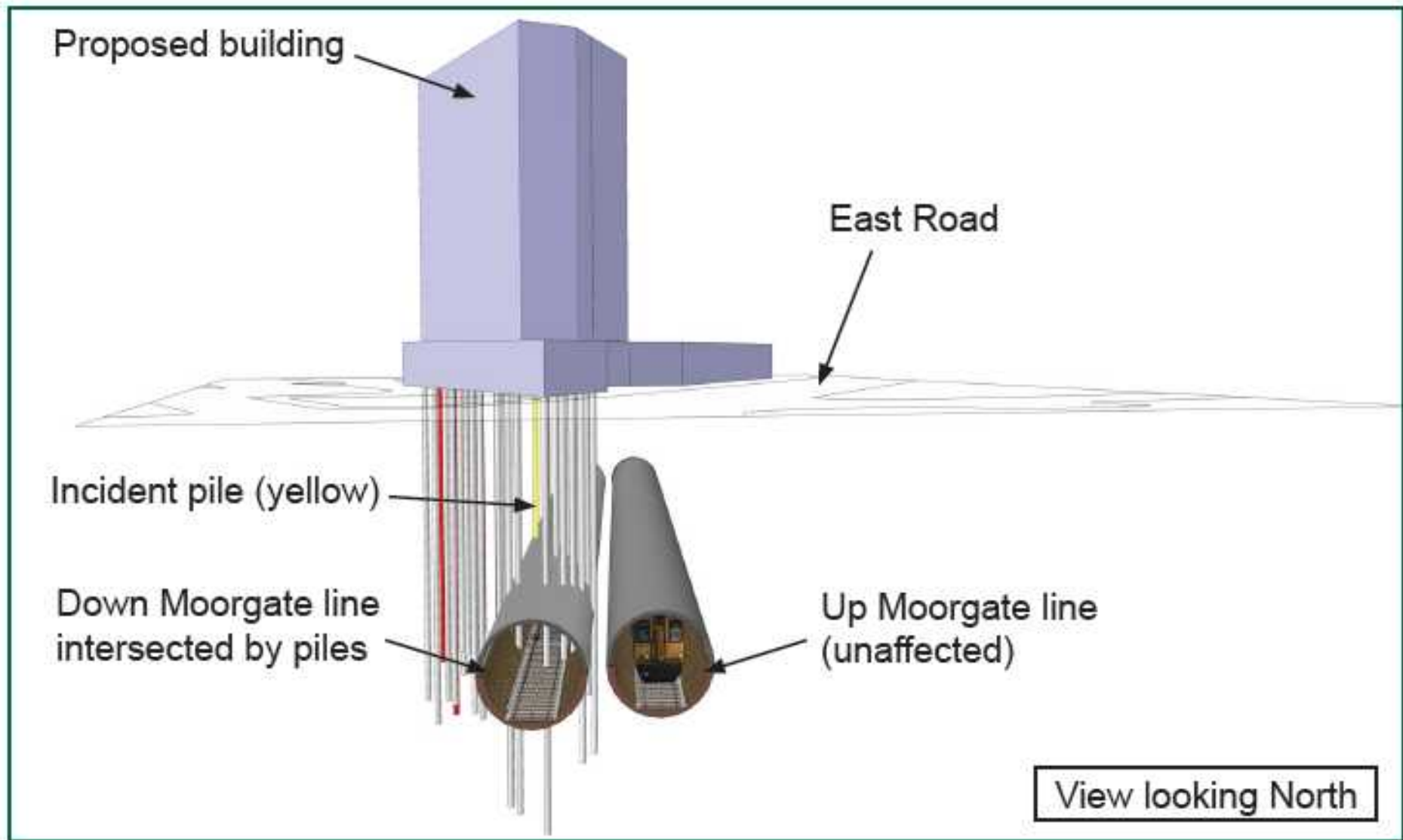


Figure 11: Scale diagram showing proposed foundation layout and extent of interaction with railway tunnel

How did this happen?

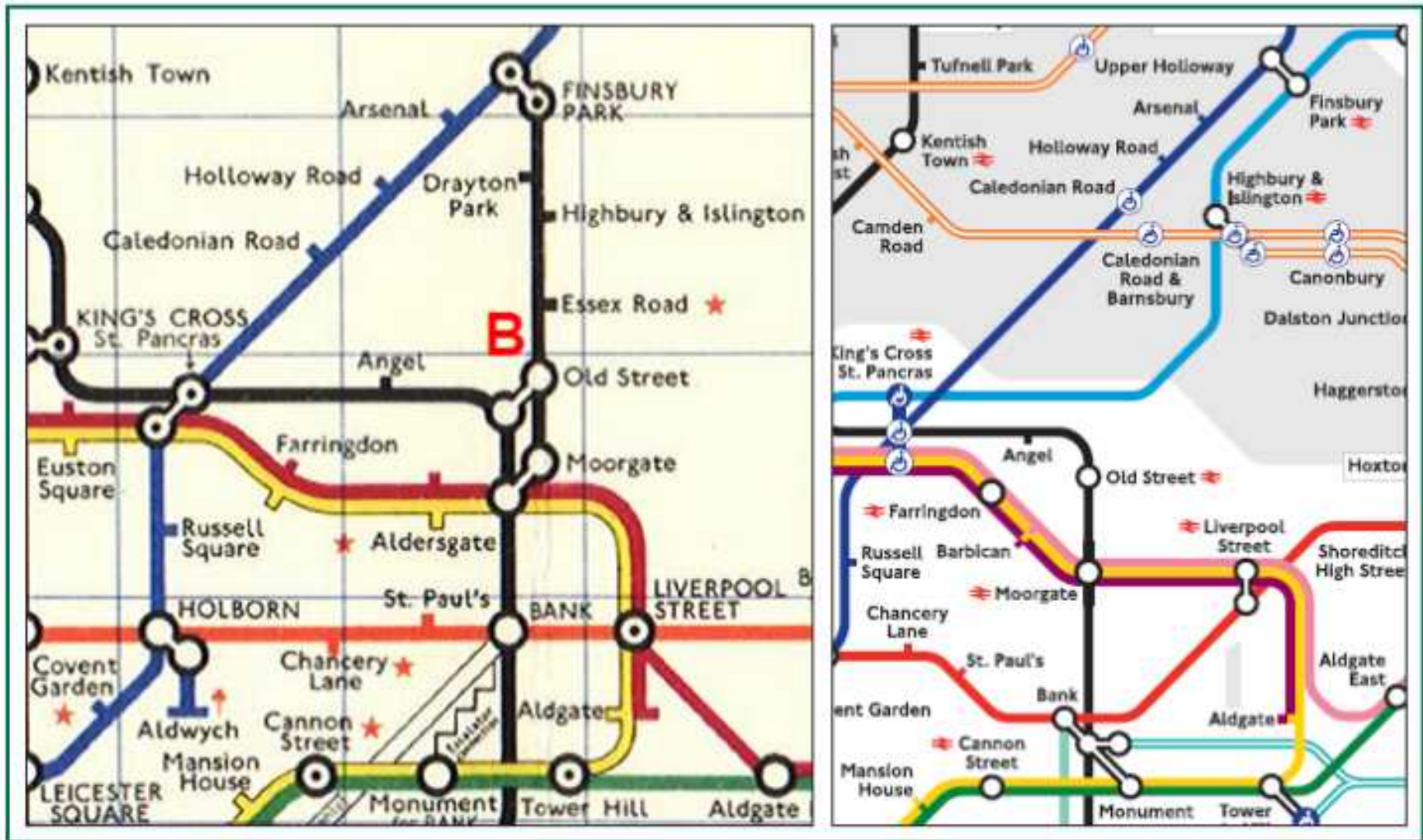
1. In 1967 London Borough of Hackney, intended to issue a covenant.
2. This did not happen and did arise clearly on the land searches.
3. Ordnance Survey do not plot London Underground network.
4. LU originally owned the route and showed it on a 1964 map.
5. LU were not consulted nor a listed of Statutory Authorities.
6. LU transferred the ownership to Network Rail.
7. LU removed the tunnel from their transport map.
8. NR had no protection measures in place and rely upon being informed.
9. NR were not consulted nor a listed of Statutory Authorities.

In summary:

No Tunnel was known to exist.

Inadequate Consultation – resulted in no mapped evidence.

Inadequate further investigation of obstruction



Figures 18 and 19: Extracts from London Underground maps from 1964 and 2013. The Northern City line is shown running between Moorgate and Finsbury Park on the 1964 map (position 'B').

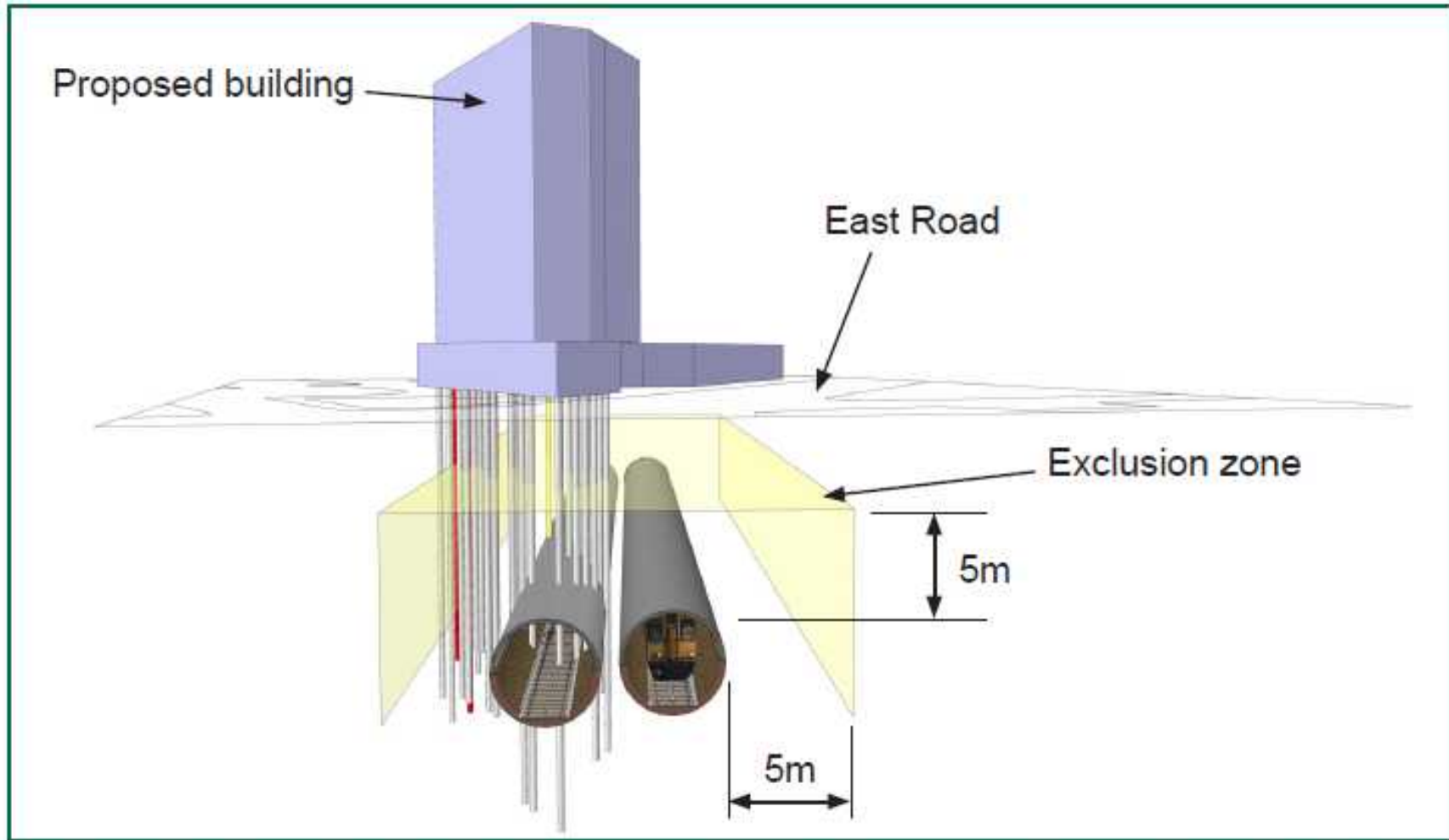


Figure 20: Scale diagram showing Network Rail's generic piling exclusion zone. Most of the proposed piles are located within this zone.