

6.2 Wimbledon

6.2.1 Station Planning Criteria

6.2.1.1 Objectives

The station at Wimbledon aims to serve the town centre and to combine with the existing station, which has mainline rail services, a terminus of the LU District line and Tramlink. The rail interchange is supplemented with the numerous bus routes that pass through the centre of Wimbledon, and can benefit from the taxi rank that lies to the west side of the existing station.

The Crossrail 2 anticipated passenger numbers suggest a single station entrance is adequate, providing minimum journey time routes to the town centre and to the rail services that use the existing station.

6.2.1.2 Location and Site Constraints

A station at Wimbledon is included in the existing 2008 Crossrail 2 alignment, and a swathe of safeguarded area lies to the west side of the LU District lines. It is the most southerly station of the Crossrail 2 study and lies just to the north of the portal.

The station lies in an area of low-rise predominantly private housing that surrounds the largely built-up town centre. The area has a number of heritage features, and of particular relevance are those embedded in the shopping centre to the east of the existing station. There are few evident worksites beyond those identified in the current Safeguarding.

The local authority has ambitions to enhance Wimbledon town centre. A new retail development is proposed on the eastern car park and it is understood that one of the mixed-use commercial buildings may be considering redevelopment.

Figure 6.1: Buildings Affected by the Proposed Crossrail 2 Station at Wimbledon



Source: Google

Figure 6.2: Listed Building to the front of Centre Court Shopping Centre



Source: Tony Meadows Associates

Figure 6.3: Centre Court Shopping Centre



Source: Google

Figure 6.4: Entrance to Wimbledon Station



Source: Tony Meadows Associates

6.2.1.3 Environmental Considerations

A desktop study has been undertaken to identify potential environmental and site constraints, a summary of which is listed below:

- There are no designated protected areas for nature within 500m of the proposed Wimbledon Station development.
- There are a number of listed buildings within 100m of the proposed development;
 - Wimbledon Town Hall – Grade II;
 - The Fire Station – Grade II;
 - Former WWI, Type G, RNAS seaplane shed (200m south) – Grade II.
- The development does not fall within a flood risk zone, water body or SPZ.
- There are a number of sensitive receptors in close proximity to the proposed development, including a number of commercial buildings and churches;
 - Queens Road Church (adjacent to a worksite);
 - St Marks Church (adjacent to a worksite);
 - Trinity United reformed (15m north-west);
 - Wimbledon High School (150m north-west).
- The following buildings may require demolition to make way for the proposed new development;
 - Speyhawk Centre Court Shopping Centre (excluding listed sections of the building)
 - Rotunda Point Apartments
 - Wimbledon Bridge House (Partial)
- Construction of the stations will almost certainly increase traffic and congestion in the area. The majority of construction lorry movements will arise from the transport of excavated material to disposal sites.

6.2.2 Station Layout

6.2.2.1 Station Alignment

The proximity of the portal to the south of the station places the platforms at a shallow depth below ground level and drives a broadly north-south platform alignment. The portal is to the east of the existing mainline tracks and as such makes the use of the existing safeguarded zone largely impractical.

The station proposal that informed the current safeguarding proposes a new station access directly beneath the existing, an arrangement that would call for the demolition of the existing station which would close or significantly reduce the capacity of the station for the period of construction.

It is proposed instead to provide a new Crossrail 2 ticket hall, separate from and adjacent to the existing station.

6.2.2.2 Preferred Station Layout

A station configuration that calls for the purchase and demolition of major buildings is the preferred arrangement. The demolition is required due to the shallow tunnelling and the assumption that each of the buildings is piled. The affected buildings are the shopping centre to the east of the existing station, the office section of the mixed-use property that is intended for redevelopment and possibly a row of low-rise flats that border the railway cutting to the north of the portal.

The principle of such major intervention has been discussed with the local authority and not dismissed, in that it may bring about their aspiration for the town centre redevelopment.

With the combination of poor ground conditions, high water table and shallow station depth, the station is currently assumed to be a box construction. This will call for additional property demolition and considerable construction planning and temporary works at the junction of Queens Road and Hartfield Road.

The new station entrance would lie at the east end of the existing station bridge, effectively expanding rather than duplicating the station. All interchange, including step free access, would be paid side. With the exception of the entrance, the upper levels of the station box would be available for use by the over-site development, and the station walls and internal columns could also be designed to support future capacities.

The ventilation and emergency access at the north end of the platforms would be within the station box. It is anticipated that the south end ventilation would be via the portal, minimising the permanent impacts at ground level.

The new station can be constructed separately from the existing, with no disruption to Network Rail services predicted.

6.2.2.3 Alternative Station Layouts

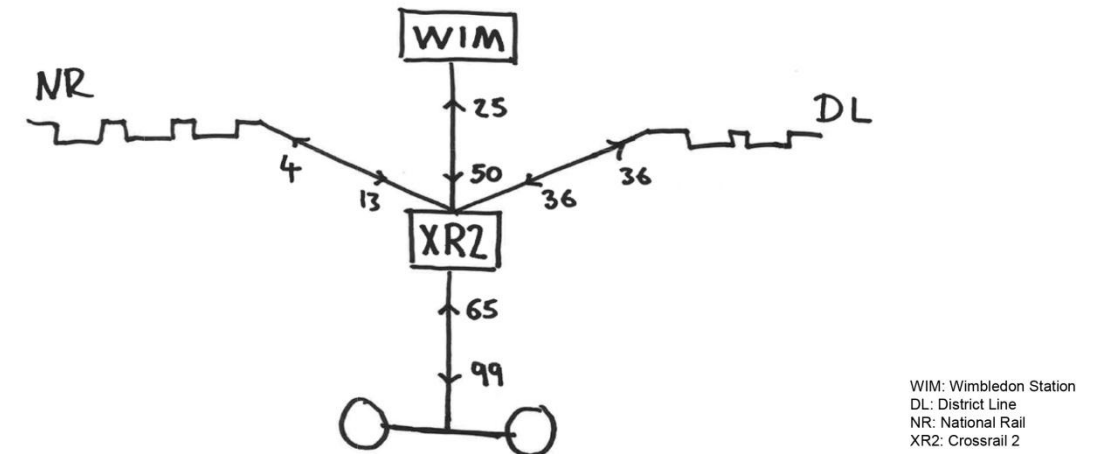
Numerous alternative station alignments have been considered, predominantly under the existing tracks but each call for less than ideal rail alignments between the portal and the southern end of the platforms. Those directly to the east of the existing station call for considerable land-take due to the scale of the buildings under which the running tunnels and platforms pass. An alignment to the west of the town centre has also been considered, but was felt not to achieve the core passenger objectives.

6.2.3 Further Validation

A fuller understanding of the existing buildings and ground conditions is critical to the validation of the preferred configuration.

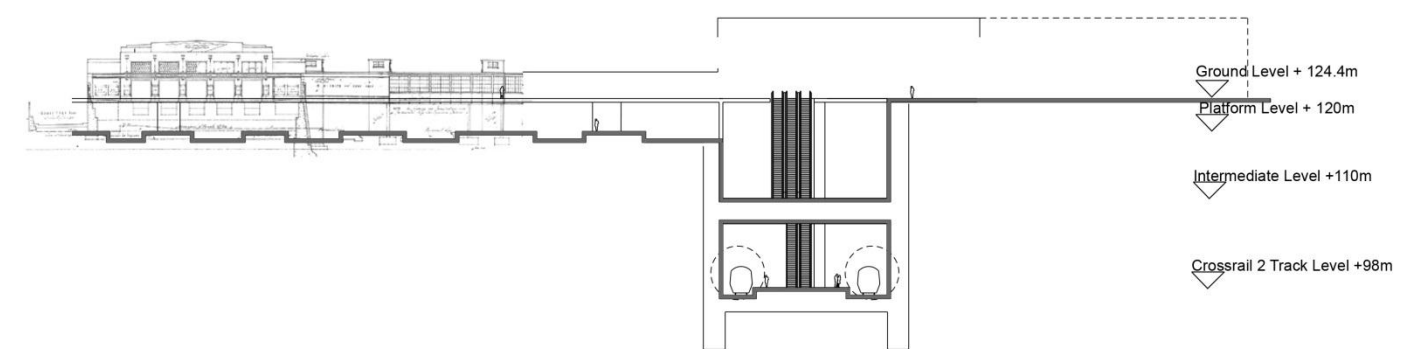
The substantial surface impacts of the proposal and the potential for future redevelopment will be an important consideration if the preferred configuration is pursued.

Figure 6.5: Predicted Passenger Numbers



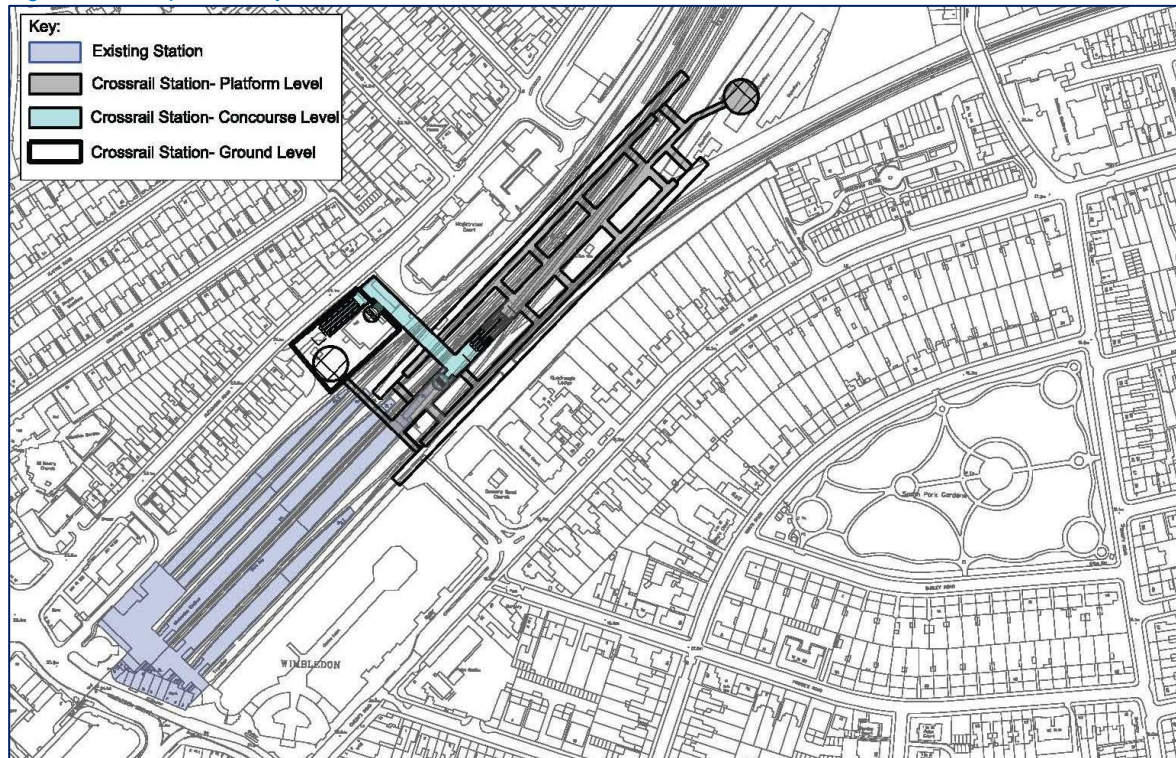
Source: Transport for London

Figure 6.6: Section Through Proposed Crossrail 2 Station at Wimbledon



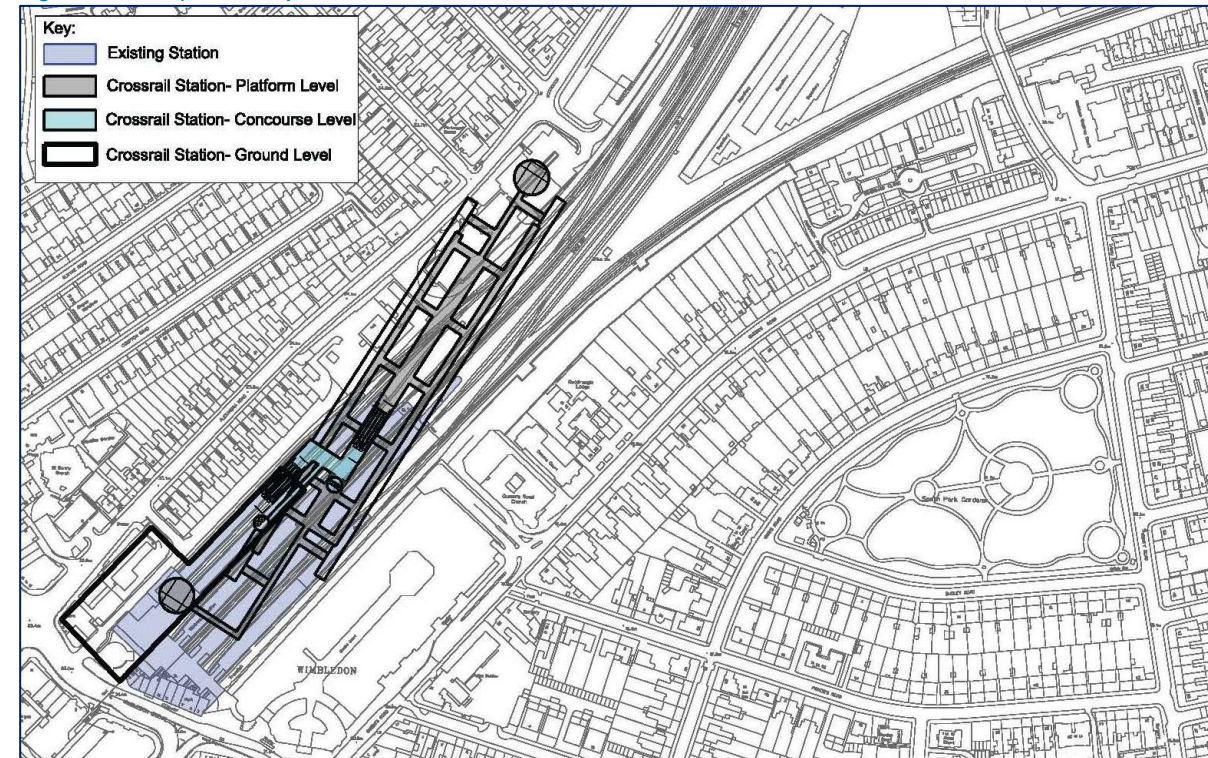
Source: Tony Meadows Associates

Figure 6.7: Option 1 Layout



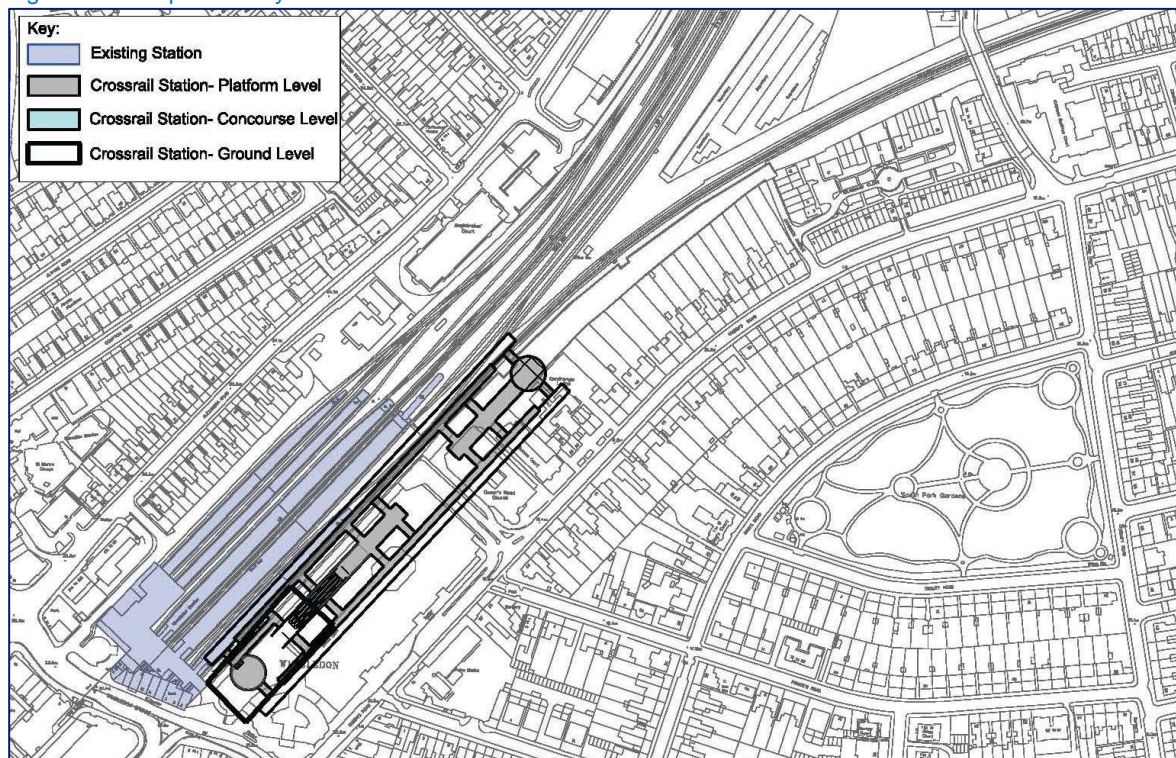
Source: Tony Meadows Associates

Figure 6.9: Option 2 Layout



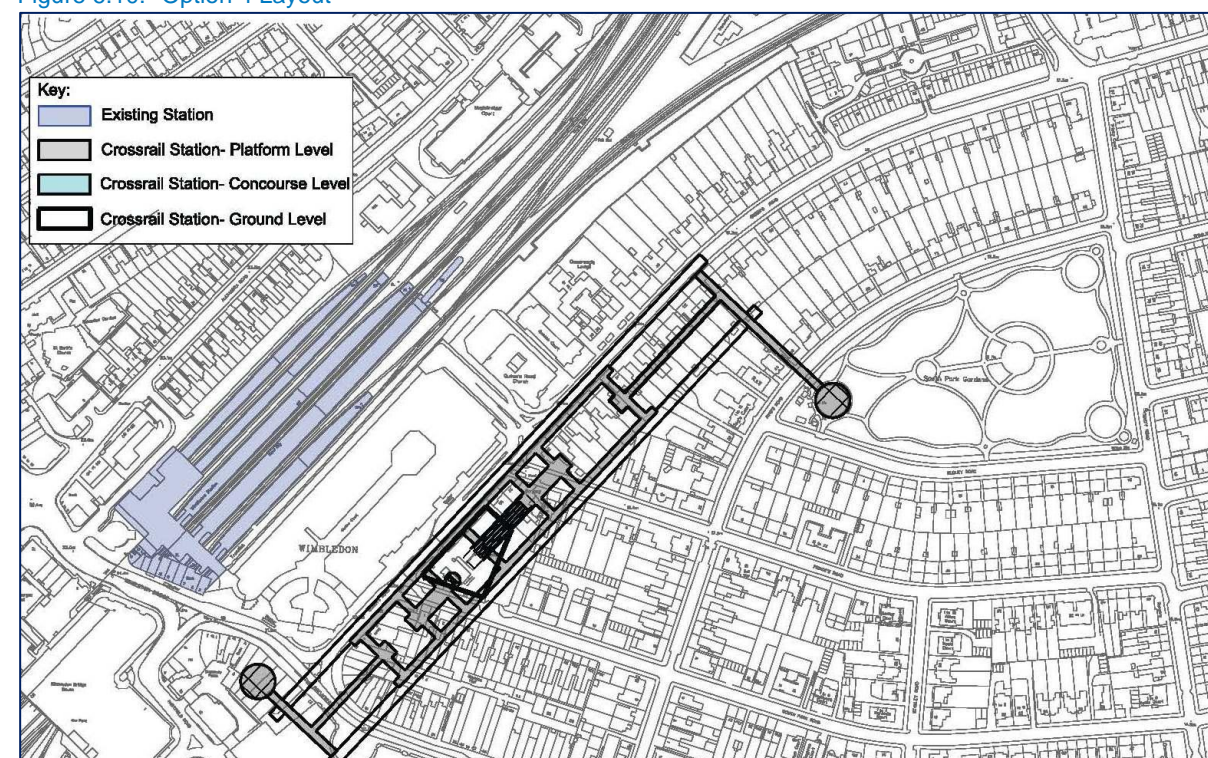
Source: Tony Meadows Associates

Figure 6.8: Option 3 Layout



Source: Tony Meadows Associates

Figure 6.10: Option 4 Layout



Source: Tony Meadows Associates

8. Portals

8.1 Introduction

The proposed Crossrail 2 route will surface at three locations, with portals Wimbledon, Alexandra Palace and Coppermill Junction.

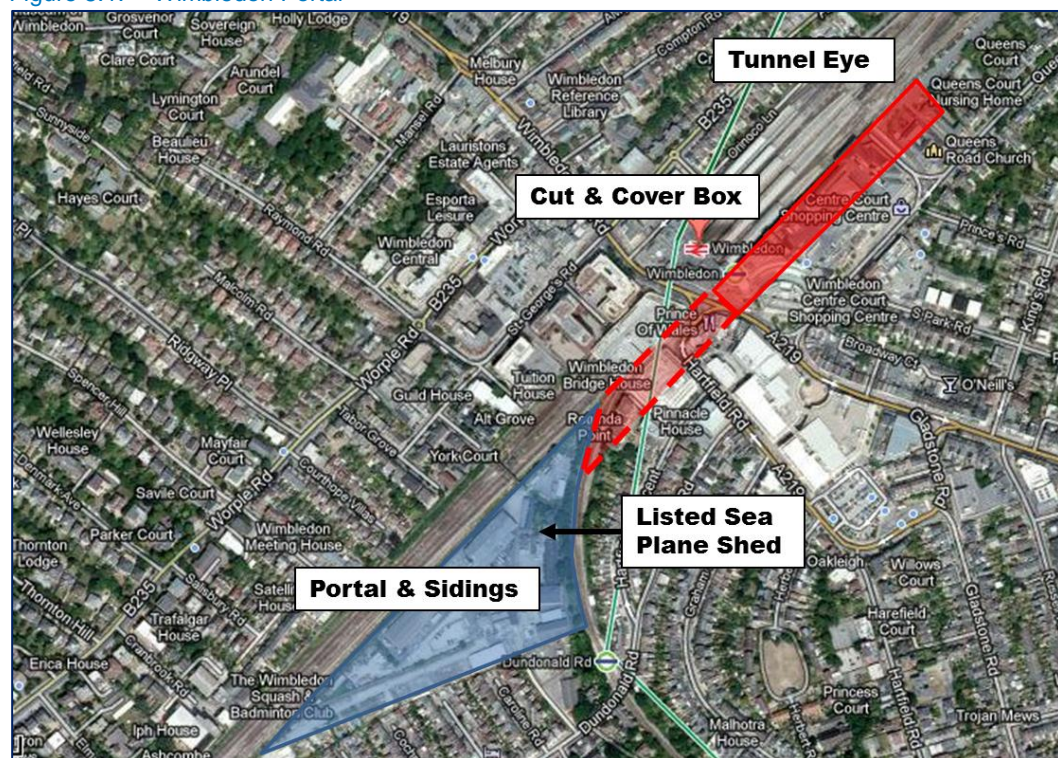
8.2 Wimbledon

8.2.1 Location and Site Constraints

The portal at Wimbledon will be located in the area of disused rail land to the south of the existing mainline overground station. This area surrounding the proposed location for the portal is varied, with low rise residential housing to the south and tall residential and commercial buildings to the north.

The tall buildings on the north eastern side of the existing rail corridor are supported on deep foundation limiting the alignment opportunities without significant works to the existing high street environment. The disused railway land to the south east of the station provides significant worksite opportunities, however, it houses an existing Listed Sea Plane Shed that will need to be demolished or relocated to make way for the new portal. The existing Tramlink line from Wimbledon to Croydon crosses the proposed Crossrail 2 alignment, limiting opportunities for a tunnel eye in this location. The tall buildings on the north western side of the existing rail corridor appear much newer than the buildings to the east and are almost certainly likely to be supported on deep foundations. This coupled with the line of residential housing adjacent to the railway boundary, limits the opportunities for a portal in this location.

Figure 8.1: Wimbledon Portal



Source: Google

8.2.2 Environmental Considerations

A desktop study has been undertaken to identify potential environmental and site constraints, a summary of which is listed below:

- There are no designated protected areas for nature within 500m of the proposed location of the portal;
- There are a number of listed buildings in close proximity to the Wimbledon portal, including;
 - Wimbledon Town Hall (50m north east) – Grade II
 - Fire Station (100m north east) – Grade II
 - Former WWI, Type G, RNAS seaplane shed (200m south) – Grade II
 - Horse Trough/Drinking Fountain South Park Gardens (400m north east) – Grade II
- The site is located within 1000m of the River Wandle; however, given the distance from the river to the proposed portal location, direct impacts to the watercourse are unlikely. The area is not at risk from flooding.
- The site is located within 1000m of a groundwater source protection zone. The use of that water is unknown but likely to be for public consumption. As such, discharge of liquids on site may have to be monitored and consents may be required.
- The London Borough of Merton has 20 areas designated as Archaeology Priority Zones (APZs). The closest APZs have been listed below;
 - Wandle Valley Alluvium (700-800m east);
 - Wandle/Colliers Wood (800m east of the development); and
 - Wimbledon Common (approximately 1000m west / north west).
- There are a number of sensitive receptors in close proximity to the proposed development, including a number of commercial and residential buildings and recreational areas;
 - The Dundonald Recreational Ground (250m south west)
 - The Wimbledon Squash and Badminton Club (300m south west)
 - South Park Gardens (400m north east)
 - Centre Court Shopping Centre (10m east)
 - Residential areas – surrounding the portal location (>20m north and south)
 - Dundonald Primary School (150m south)
 - University of the Arts – Wimbledon School of Arts (600m south east)
 - Wimbledon High School (250m north west)
- Demolitions to a number of buildings are necessary as part of the development;
- The portal location is in a built up area, characterised by residential and commercial buildings. The surrounding transport network (roads) is often heavily congested – the use of HGV / vans pose a challenge to the road network.

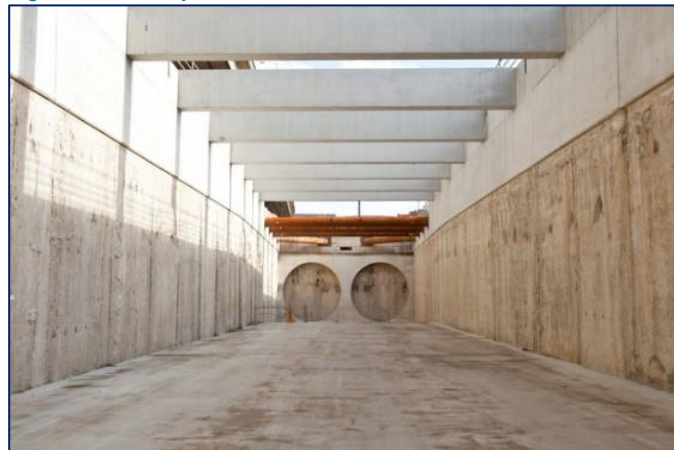
8.2.3 Preferred Layout

The new station is located to the east of the existing mainline station on the site of the existing Wimbledon Centre Court Shopping Centre, which results in a south-west to north-east alignment that runs parallel to the existing rail corridor. Due to the high concentration of tall buildings and difficult site constraints, the portal at Wimbledon will be separated by the new station, with the tunnel eye located to the north adjacent to the existing Queens Road car park, and the portal and grade separated junction located in the triangular area of disused railway land to the south. This results in a cut and cover structure from the tunnel eye and the tunnel portal to the south. The vertical rail alignment at the station location is 26m below ground level, providing a minimum cover of one tunnel diameter at the tunnel eye.

At the southern end, the portal structure crosses under the existing Tramlink line that runs between Wimbledon and Croydon. The current proposal is to temporarily terminate the line at Dundonald Road, whilst the tunnel portal is constructed. The Tramlink station would be reinstated after construction, with the opportunity to incorporate it into a new multi-level Crossrail 2 station. This design is still under development and further details will be provided in the following revision to this document. If temporary closure of the Tramlink Wimbledon station is deemed unacceptable, there may be an opportunity to jack a box or tunnel under the existing line during a long weekend possession.

The portal structure to the south of the Tramlink line will comprise a 10m deep retained cutting, similar to the one used on Crossrail Line 1 at Royal Oak (See Figure 8.2), with contiguous piled / diaphragm walls and reinforced concrete floor slabs. There may be a need to cover the portal where the Crossrail 2 sidings pass under the realigned National Rail St Hellier line, although more detailed information regarding the proposed realignment is required prior to formalisation of the portal layout.

Figure 8.2: Royal Oak Portal



Source: Crossrail Line 1

Figure 8.3: Royal Oak Portal



Source: Crossrail Line 1

The portal structure at Wimbledon, will house a new grade separated junction, which is required to connect the Crossrail 2 alignment into the existing mainline rail corridor. Network Rail are currently developing a fifth tracking scheme that will add an additional track to the western side of the existing corridor and reconfigure the current alignment. The Crossrail 2 alignment takes account of this scheme, with connection into the Up Slow Relief line on the east via a 200m long dive under and the Down Slow line via a retained cutting / box on the west.

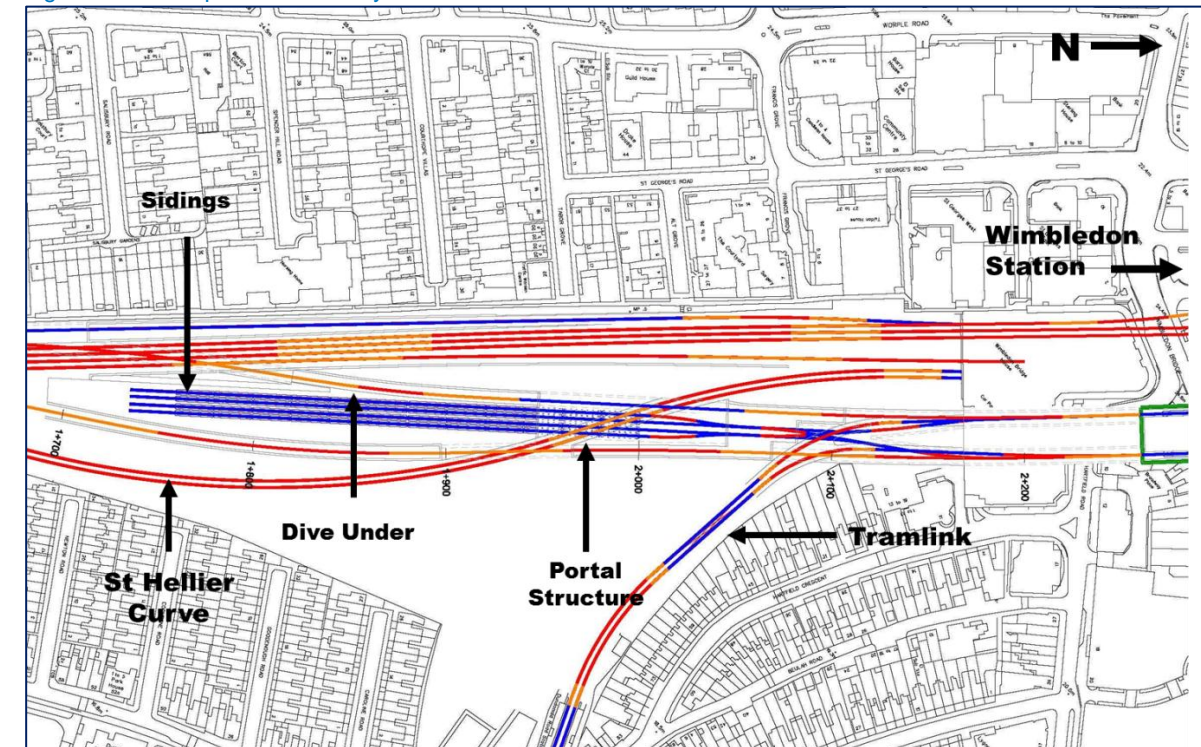
It is envisaged that the dive under would comprise a jacked box tunnelling arrangement. Jacked box tunnelling is typically used for constructing shallow rectangular tunnels beneath critical facilities such as operating railways, major highways and airport runways without disruption of the services provided by those surface facilities or having to relocate them temporarily to accommodate open excavations for cut and cover construction. This technique was originally developed from pipe jacking technology and can be used in soft ground at shallow depths and for relatively short lengths of tunnel, where TBM mining is not economical and cut-and-cover methods are too disruptive to overlying surface activities.

The portal will also house four turn back sidings providing stabling and turn back facilities for the Crossrail 2 route.

The advantage of this layout is the provision of a single portal face on eastern side of the existing rail corridor, with the majority of the construction works undertaken within the disused land to the south of Wimbledon. The solution also allows for a deeper station making tunnelling easier and more efficient due to the increased cover.

The disadvantage of this layout is the need for a 200m long shallow dive under beneath the existing rail corridor. This will be difficult and costly to construct, however, it removes the risk of constructing a tunnel portal on the western side of the rail corridor where space is very constrained. It also removes the need for potential land take in this area.

Figure 8.4: Proposed Portal Layout at Wimbledon

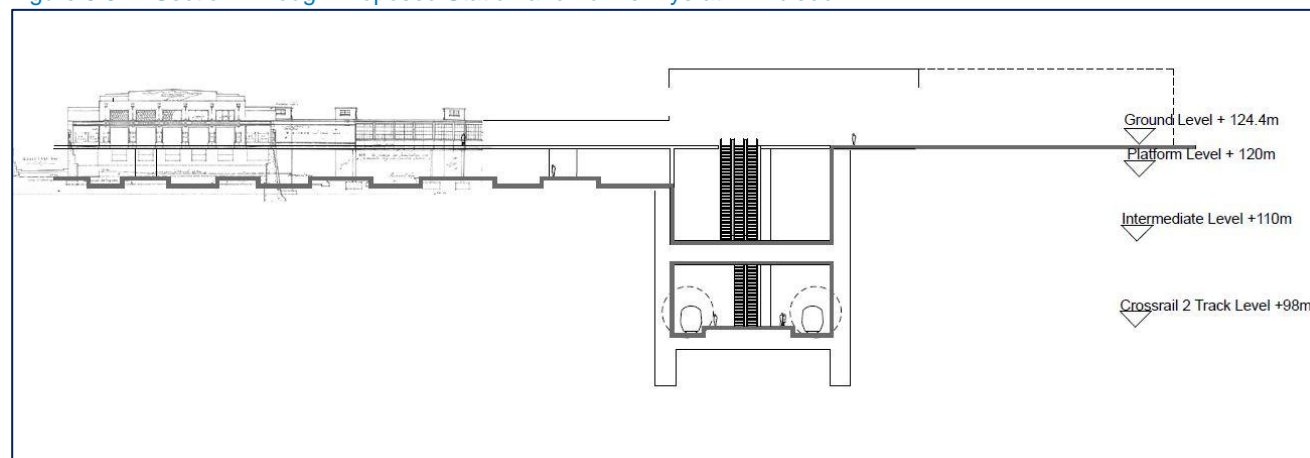


Source: Mott MacDonald

8.2.4

8.2.5

Figure 8.5: Section Through Proposed Station and Tunnel Eye at Wimbledon



Source: Tony Meadows Associates

8.2.6 Alternative Layouts

Twin single portals either side of the existing mainline rail corridor were considered, however these were ruled out due to the limited space available to the west and the poor station arrangement that would result.

Alternative station alignments were also considered, including a central alignment located directly under the existing station, an alignment to the west of the existing station and an alignment to the east of the station.

The central alignment was ruled out due to difficulties in locating the tunnel eye and portals, the western alignment due to limited worksite availability and the eastern alignment due to poor interchange links.

8.2.7 Further Validation

Alternative portal and depot locations exist further south, with Raynes Park suggested as a possibility. However, this would add an additional 1400m of tunnelling to the scheme and may not be possible due to the limited worksite areas and difficulties in connecting to the mainline rail corridor. There may be some benefit in reviewing this under a separate study if the portal at Wimbledon was deemed undesirable.