The proposed station layout at Wimbledon and the requirement to tie into the outer Network Rail tracks mean that the northbound alignment is located on the western side of the station and the southbound alignment on the eastern side of the station. The northbound and southbound tracks at Wimbledon station are positioned at a level of 118m to match existing track levels. From Wimbledon station, the northbound track dives into a retained cutting before crossing the existing railway corridor in a covered box to the north of the station. The cover at this location is limited by the proximity of the portal relative to Wimbledon station and the requirement to tie into the existing station levels. The northbound vertical alignment results in negligible cover between the top of the roof of the covered box and the existing tracks above. The northbound alignment enters the tunnel eye on the Gap Road site with a rail level of 105m. This provides an approximate cover of 12m. From Wimbledon station, the southbound track dives into a retained cutting that runs parallel to the existing railway corridor. The alignment enters the tunnel eye on the Gap Road site with a rail level of 105m. This provides an approximate cover of 12m.

The proposed new alignment and station layout will impact upon the existing station and will require detailed staging to ensure that existing services are not unacceptably affected. The LU District Line will be terminated at Wimbledon Park for the duration of the works to enable construction of the proposed new station, alignment and portal. Prior discussions with LU indicate that this would be an acceptable approach for the duration of the works.

The main portal structure can be constructed from either diaphragm or bored piled walls with a reinforced concrete roof, making provision for an over site development or stabling sidings as indicated in Figure 7.3 and Figure 7.4. Details of the proposed structure can be found on drawings MMD-307346-C-DR-SB-XX-1001, 1002, 1003 and 1074 and should be read in conjunction with the following text.

It is envisaged that the dive under would comprise a jacked box tunnelling arrangement or a phased cut and cover box. Jacked box tunnelling is typically used for constructing shallow rectangular tunnels beneath critical facilities such as operating railways, major highways and airport runways minimising disruption compared to 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 jack box arrangement is unlikely to require any track slews; however, the length of box, limited working area and high water table is likely to make this form of construction undesirable. A phased cut and cover solution would require a series of track slews to allow sufficient space for installation. This phasing will need to align with the station works which is also likely to result in significant changes to the current platform and track alignments. The TBM's for boring the southern running tunnels will be launched from the Gap Road site, with spoil removed via rail connection minimising the number of lorry movements.

7.1.4 Alternative Layouts

A number of alternative portal locations were considered, including twin single portals either side of the existing main line rail corridor to the south of Wimbledon Station and possible sites further south such as Raynes Park. The twin single portals were ruled out due to the limited space available to the west and the poor station arrangement that would result. Sites further south of Wimbledon were also ruled out due to the additional requirement for tunnelling and the requirement to connect into Network Rail five / six tracking scheme.

7.1.4.1 Dundonald Road Portal

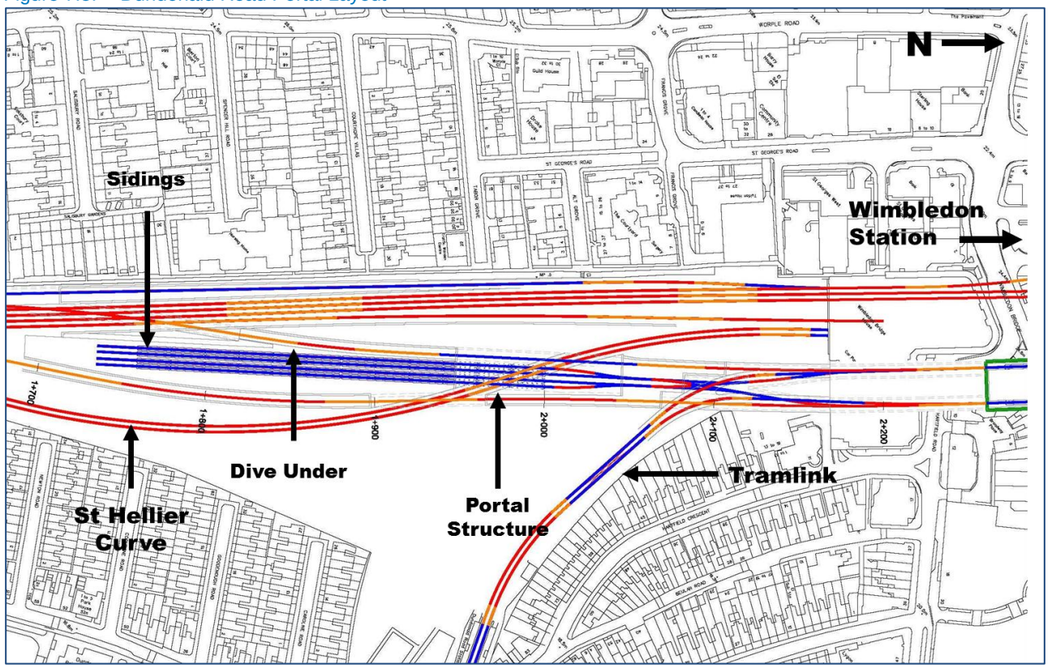
The site adjacent to Dundonald Road is considered a favourable location if the 2012 base case scheme was preferred due to its close proximity to Wimbledon Station and its location in relation to the proposed station layout. The preferred station layout is located to the east of the existing station on the site of the Centre Court Shopping Centre. Due to a 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 junctions of Queens Road and Hartfield Road with the Broadway. The tunnel eye is located in the station box at its eastern end, with an approximate rail level of 110m. This provides a cover of 3m. The portal site at Dundonald Road does not support a western or central alignment.

Network Rail are currently developing a fifth and six tracking scheme that will add an additional track to the western side of the existing corridor. This will result in slow lines either side of the railway corridor that Crossrail 2 will need to connect into. Connection of the northbound line to the western side will be via a grade separated junction with a 200m long dive under beneath the existing railway corridor. Connection of the southbound line to the eastern side will be via a grade separated junction within a retained cutting. Provision for additional stabling has been allowed for on the eastern side. These sidings and crossovers will be housed in a retained cutting at an approximate level of 110m.

The proposed new alignment and station layout will impact upon the existing Tramlink line and will require extensive land acquisition and road closure to facilitate the works. The Tramlink Line will be terminated at Wimbledon Park for the duration of the works to enable construction of the proposed new station, alignment and portal. Prior discussions with LU indicate that this would be an acceptable approach for the duration of the works although this is also to be discussed with Tramlink.

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 minimising disruption compared to 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.

Figure 7.5: Dundonald Road Portal Layout



Source: Mott MacDonald