



Crossrail Environmental Statement

Volume 3

Outer route section impacts



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Crossrail Environmental Statement

Volume 3

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Crossrail Environmental Statement Volume 3

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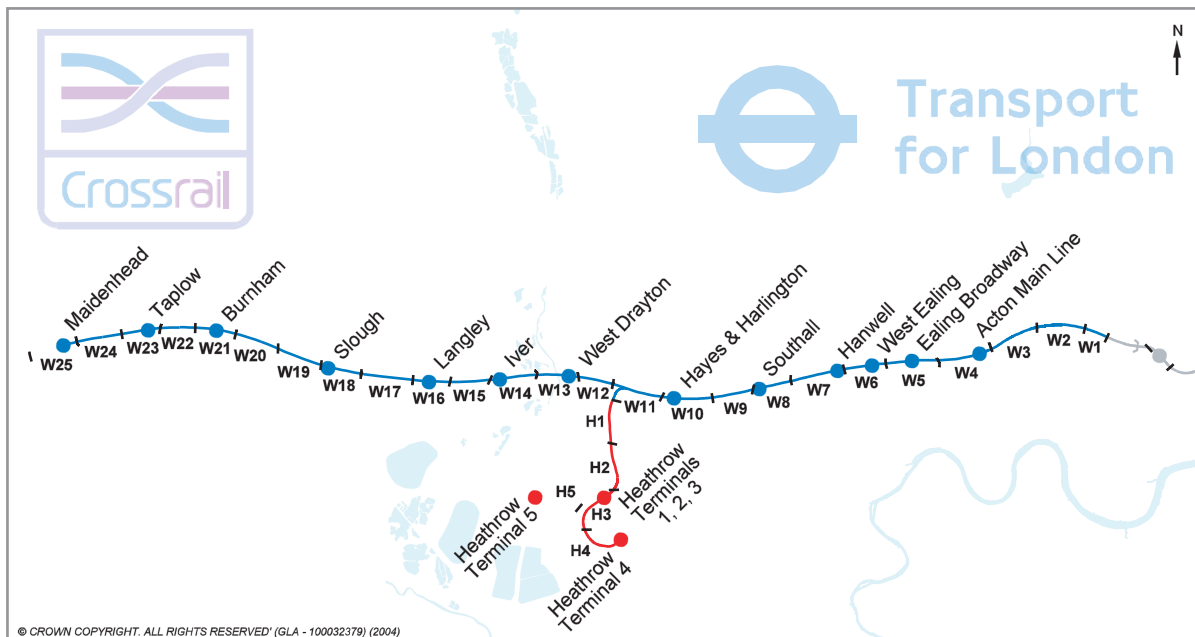
Baseline and environmental impacts for western route section

9 Baseline and Environmental Impacts for Western Route Section

9.1 Introduction

- 9.1.1 This chapter describes the western route section of Crossrail from Maidenhead station to Portobello Junction (Westbourne Park). Specifically the chapter describes the permanent and temporary works along the route section, the environmental baseline and the significant environmental impacts that will arise from the construction and operation of the scheme.
- 9.1.2 Many of the impacts that will potentially occur during construction will be similar to those associated with other rail projects. Experience gained from these projects has assisted in the identification of appropriate measures to mitigate or reduce impacts during Crossrail's construction. The measures that will be used are described in Appendix B1. Implementation of these measures has been assumed in the assessment.
- 9.1.3 Many of the impacts that will potentially occur during construction will be similar to those associated with other rail projects. Measures to mitigate these impacts will be implemented during Crossrail's construction in order to ensure significant impacts are avoided, wherever possible. These measures are described in Appendix B1.
- 9.1.4 The impacts reported in this chapter are residual impacts, ie the significant impacts that will remain after the application of generic or specific measures to reduce or control them.
- 9.1.5 The western route section has, for the purposes of assessment, been broken down into component route windows:
- the key baseline environmental features, such as ecological designations and listed buildings, within each of the route windows are shown in Maps W25(i) to W1(i) and H1-5(i) in Volume 4b of the ES.
 - the temporary and permanent land take requirements of the scheme, worksite locations, main physical components of the project and temporary and permanent impacts are shown in Maps W25(ii) to W1(ii) and H1-5(ii) in Volume 4b.
- 9.1.6 Supporting information on the assessment of potential impacts with respect to water resources, noise and air quality is provided in Volumes 6a and 6b. Supporting information on the assessment of traffic and transport impacts is provided in Volumes 8a and 8c.

9.2 Overview of Crossrail works in Western Route Section



Orientation Diagram of the Western Route Section

Permanent Works

- 9.2.1 The Crossrail service will use only the existing Great Western relief lines (in normal operations). Additional new track will however, be provided at some locations. For example, a new line will be constructed over about 1 km between Langley and West Drayton, which will link existing (but upgraded) freight lines to its east and west so providing increased track capacity.
- 9.2.2 Crossrail's major new structures or facilities include a new dive-under (rail underpass) at Acton (W4), a new flyover at Stockley in Hillingdon (W11), a freight loop from Langley to West Drayton (W14, W15, W16) and new or remodelled sidings at Maidenhead (W25), West Drayton (W13) and Old Oak Common depot (W3). Crossrail will require, at several places, changes to the permanent way, such as new track or track realignment. It will also require new or extended station platforms to accommodate Crossrail's 200 m long trains. At nine stations, improved facilities, including new or modified ticket halls, will be provided to accommodate the increased number of passengers from Crossrail.
- 9.2.3 Much of the Great Western Mainline (GWML) is not electrified: only the section between Paddington and the Stockley Road bridge in Hillingdon is electrified at present. The remainder of the route west of Stockley Road bridge will require the provision of new 25 kV AC overhead line equipment (OHLE), generally in the form of 6 m high gantries from which catenary wires and contact wires will be suspended. This in turn will require that some of the bridges on the route be raised or the track lowered beneath them. In some cases, bridges will be reconstructed completely. In other cases, bridge works will be more limited; for example, the raising of parapets (side walls) for public safety reasons.

Construction

- 9.2.4 Construction methods for each of the works are described in their route window; for example, with respect to construction of bridges, station buildings, stabling facilities and grade separated crossings. The construction works, where they take place on or near to the railway, may need to be undertaken during 'possessions', when the railway is closed to normal passenger and freight services. These possessions generally take place at night, at weekends or over public holidays. Where time periods for the works are given in this chapter, they may be subject to alteration to accommodate possession planning requirements (ie times to be negotiated with the train companies and Network Rail, when the works can be undertaken during temporary closure of the railway) and final commissioning, which may need to be completed for the corridor as a whole.
- 9.2.5 Methods for constructing OHLE and platform extensions are much the same wherever they are undertaken and so, for brevity, are described once here.
- 9.2.6 Construction of OHLE will require that ground bearing or piled foundations be installed using rail-mounted machinery or by hand. Masts (which will have a bolted base) and electrical equipment will be installed generally from the rail. Materials will be delivered by rail or road as appropriate.
- 9.2.7 Plant and equipment required for construction of OHLE will include a mini digger, piling rigs, concreting plant, diesel locomotives and wagons, generators, road/rail cranes and hand held plant.
- 9.2.8 Platform extensions, which will be undertaken at 13 stations, will involve:
- break out and removal of existing surfaces and ramps;
 - excavation and construction of foundations using piling where appropriate;
 - construction of platforms using crosswalls and pre-cast concrete planks;
 - fitting of reinforced concrete screed, copings and paving, fitting of tactile strips and levelling of the surface;
 - installation of lighting and drainage; and
 - adjustment of track alignments, if required.
- 9.2.9 Proprietary platform extension systems may be used which may vary the construction activities.
- 9.2.10 Subject to possession planning requirements and excluding final commissioning, platform extensions will generally take between one and three months to complete.
- 9.2.11 Enabling works will be required prior to the main construction works. These may take up to 12 months at each site, although at locations where only minor enabling works are required the durations of these works could be much shorter.

9.3 The Route Windows

9.3.1 The scale of the works along the route varies, with relatively minor works taking place in some route windows and more substantial works in others. Table 9.1 summarises the main works (excluding enabling works) that will take place in the Western Section. Those route windows containing the more substantial works are highlighted with shading.

9.3.2 The level of detail that is reported in subsequent sections for route windows W25 to W1 is commensurate with the extent of works that is proposed in each of these route windows.

Table 9.1 Main elements of the scheme within the Western Route Section (route windows with major works are highlighted)

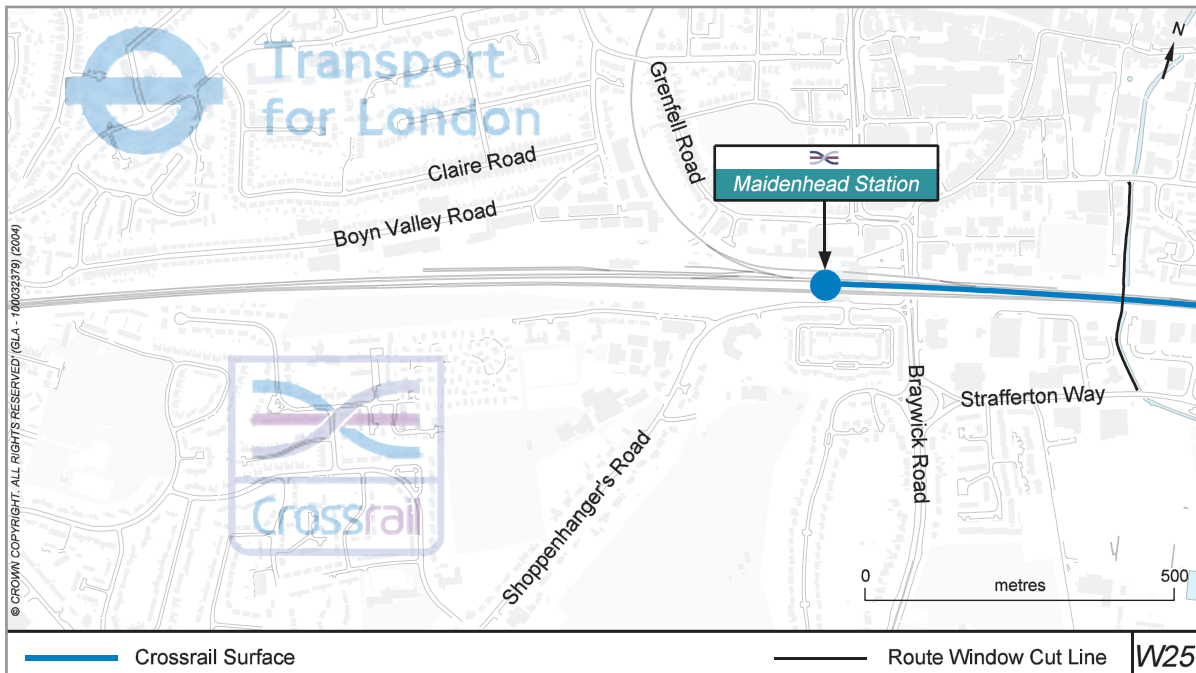
Route Window	Main project works	Local authority
W25: Maidenhead station Welbeck Road to York Stream	<ul style="list-style-type: none"> • Stabling and turnback facility • New ticket office • New bay platform and platform extensions • Extension to existing subway • Overhead line equipment 	Royal Borough of Windsor & Maidenhead
W24: Maidenhead railway bridge York Stream to Jubilee River bridge	<ul style="list-style-type: none"> • Overhead line equipment 	Royal Borough of Windsor & Maidenhead and District of South Bucks
W23: Taplow station Jubilee River bridge to Hitcham Road	<ul style="list-style-type: none"> • Platform extensions • Overhead line equipment • Footbridge works 	District of South Bucks
W24: Maidenhead railway bridge York Stream to Jubilee River bridge	<ul style="list-style-type: none"> • Overhead line equipment 	Royal Borough of Windsor & Maidenhead and District of South Bucks
W22: Lent Rise Hitcham Road to Clare Road	<ul style="list-style-type: none"> • Overhead line equipment 	District of South Bucks and Borough of Slough
W21: Burnham station Clare Road to Henley Road	<ul style="list-style-type: none"> • Platform extensions • Overhead line equipment 	Borough of Slough

Route Window	Main project works	Local authority
W20: Dover Road and Leigh Road bridges Henley Road to Yarmouth Road	<ul style="list-style-type: none"> • Overhead line equipment • Works to Dover Road bridge • Replacement of Leigh Road bridge 	Borough of Slough
W19: Stoke Poges Lane bridge Yarmouth Road to Grays Road	<ul style="list-style-type: none"> • Overhead line equipment • Works to Stoke Poges Lane road bridge and footbridge • Works to Farnham Road bridge including track lowering 	Borough of Slough
W18: Slough station Grays Road to Eastbridge	<ul style="list-style-type: none"> • Changes to the ticket hall, a new footbridge and provision of lift access • Platform extensions and a new bay platform • Overhead line equipment • Works to three road bridges • Construction of a new goods loop 	Borough of Slough
W17: Middlegreen Road, St Mary's Road and Trenches bridges Eastbridge to Darwin Road	<ul style="list-style-type: none"> • Overhead line equipment • Replacement of Middlegreen Road bridge, St Mary's Road (Church Lane) bridge, and Trenches footbridge 	Borough of Slough
W16: Langley station Darwin Road to Southwold Spur	<ul style="list-style-type: none"> • Overhead line equipment • Platform extension • Reinstatement and extension of track at Langley East Junction 	Borough of Slough
W15: Dog Kennel bridge Southwold Spur to Bathurst Walk	<ul style="list-style-type: none"> • Overhead line equipment • 1.2 km of new track on the north side of the line with associated embankment widening • Demolition of Dog Kennel bridge 	District of South Bucks and Borough of Slough

Route Window	Main project works	Local authority
W15: Dog Kennel bridge (Cont) Southwold Spur to Bathurst Walk	<ul style="list-style-type: none"> • Construction of new bridge span over road adjacent to existing Chequer bridge 	District of South Bucks and Borough of Slough
W14: Iver Station Bathurst Walk to River Colne	<ul style="list-style-type: none"> • Overhead line equipment • Replacement of ticket office • Platform extension and provision of new platform face • Track realignment • Demolition and replacement of Thorney Lane bridge including road realignment 	District of South Bucks
W13: West Drayton station and stabling River Colne to Roberts Close	<ul style="list-style-type: none"> • New stabling facility on the site of former West Drayton coal depot • Replacement of the ticket hall, and new overbridge and lifts • Platform extensions and track realignment • Overhead line equipment 	District of South Bucks and LB Hillingdon
W12: Horton Road and Old Stockley Road bridges Roberts Close to Stockley Road bridge	<ul style="list-style-type: none"> • Overhead line equipment • Replacement of existing Kingston Lane bridge and Old Stockley Road bridge with new footbridges and cycleways 	LB Hillingdon
W11: Stockley flyover Stockley Road bridge to Alpha Estate	<ul style="list-style-type: none"> • New viaduct along the north side of the railway and new transfer structures at either end, with associated trackworks • Overhead line equipment to the west 	LB Hillingdon
W10: Hayes & Harlington station Alpha Estate to Brent Road	<ul style="list-style-type: none"> • New track on north side of rail corridor and extension of Station Road bridge • New ticket hall, footbridge and lifts • New platform and platform extensions 	

Route Window	Main project works	Local authority
W9: Southall West sidings Brent Road to Randolph Road	<ul style="list-style-type: none"> • None 	LB Hillingdon and LB Ealing
W8: Southall station Randolph Road to Lyndhurst Avenue	<ul style="list-style-type: none"> • New ticket hall, new overbridge and lifts • Extended platforms • Track works including new track 	LB Ealing
W7: Hanwell station Lyndhurst Avenue to Church Road	<ul style="list-style-type: none"> • Platform extensions 	LB Ealing
W6: West Ealing station Church Road to St Leonards Road	<ul style="list-style-type: none"> • Replacement of the ticket hall; new overbridge and lifts • New bay platform • Platform extensions 	LB Ealing
W5: Ealing Broadway station St Leonards Road to District & Piccadilly Line bridge	<ul style="list-style-type: none"> • Replacement of the ticket hall • Platform extensions 	LB Ealing
W4: Acton Main Line station and yard District & Piccadilly Line bridge to Western Avenue	<ul style="list-style-type: none"> • New rail underpass west of Acton Yard and remodelling of Acton Yard • New ticket hall • New footbridge • Platform extensions and new lifts 	LB Ealing
W3: Old Oak Common depot Western Avenue to Hythe Road	<ul style="list-style-type: none"> • Fifteen new stabling sidings • Carriage washing facility and crew accommodation 	LB Ealing and LB Hammersmith & Fulham
W2: Canal Way Hythe Road to Admiral Mews	<ul style="list-style-type: none"> • Changes to the track layout 	LB Hammersmith & Fulham and Royal Borough of Kensington & Chelsea
W1: Portobello Junction Admiral Mews to Edenham Way	<ul style="list-style-type: none"> • Remodelling of Paddington approaches trackwork 	Royal Borough of Kensington & Chelsea

9.4 Route Window W25: Maidenhead Station



Location plan of Maidenhead station

9.4.1 Within this route window the main Crossrail works will involve:

- construction of stabling and turnback facilities west of Maidenhead station;
- upgrading of Maidenhead station including a new ticket hall, lifts, a new platform for Marlow branch services and platform extensions, and an extension to the existing subway; and
- introduction of overhead line equipment.



Aerial view of Maidenhead station

9.4.2 This route window is located within the Royal Borough of Windsor and Maidenhead. Maidenhead station lies on the southeast edge of the town centre, within a wholly urban setting. Retail and office uses predominate in the town centre, which is itself adjoined by the residential area of Grenfell Park. To the south lies the mixed-use area of South Maidenhead, comprising housing, open space (Desborough Park and the Desborough school playing fields) and community facilities.

9.4.3 The proposed stabling site is located on an enlarged embankment that is adjoined to the north by the Boyn Valley Industrial Estate, beyond which lies the residential area of Boyn Hill. To the south lies the woodland belt of The Gullet and the residential area of Desborough.

9.4.4 The station and sidings site has potential for archaeological finds and its more recent history of railway use is likely to have left a legacy of contamination. The site is adjacent to a locally designated wildlife site. It overlies chalk that is known to contain good quality groundwater. The site's town centre location gives rise to moderate to high background noise.

Summary of Residual Impacts

9.4.5 The following significant adverse impacts will occur temporarily during construction phase:

- *Visual Amenity*: visual impacts at about 30 residential properties due to construction works and some loss of vegetation.
- *Groundwater*: sewer diversion by tunnelling in the Chalk poses significant risks to groundwater quality at a nearby abstraction.
- *Traffic and Transport*: temporary loss of public car parking and set-down and pick-up facilities at the station.
- *Construction Noise*: construction noise impacts will affect occupants at five residential properties and Desborough school. All five of these residential properties will be likely to qualify for noise insulation.

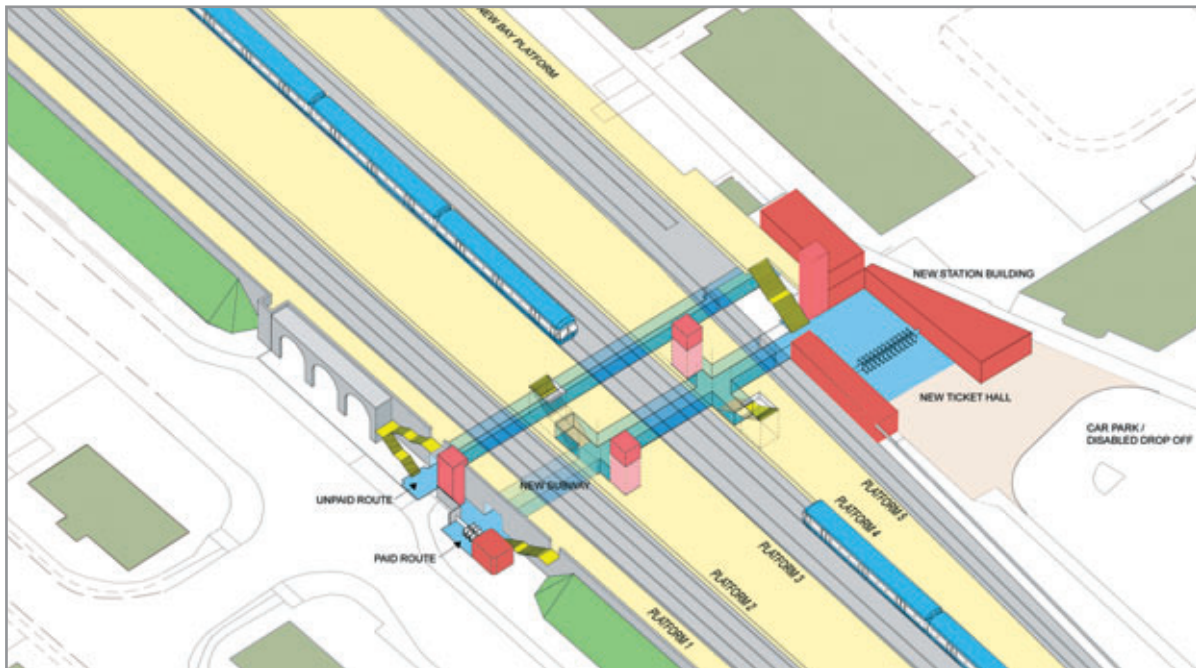
9.4.6 The only permanent impact is the loss of 110 car parking spaces at Maidenhead station.

Permanent Works

Turnback and Stabling Facility

9.4.7 Stabling facilities will be constructed about 350 m west of Maidenhead station on a site currently occupied by a car park and an industrial unit. They will comprise six 250 m long sidings with low height lighting. New staff accommodation buildings with associated car parking will be located at the west end of the site.

9.4.8 Some track slewing will be required adjacent to the stabling facility to accommodate two reversing sidings.



Visualisation of new layout of Maidenhead station

Maidenhead Station

- 9.4.9 A new 70 m long bay platform (platform six) will be constructed on the north side of the station and a new track will be provided to accommodate Marlow branch line trains. Island platform two/three will be extended westwards by 10 m to accommodate Crossrail trains.
- 9.4.10 The existing ticket hall will be demolished and replaced by a larger facility that will extend into the station forecourt area. The eastern subway will be extended southwards to platform one and new stair and lift access will be provided from it to all Crossrail platforms; passive provision will be made for a lift to platform one.
- 9.4.11 The western subway, which currently provides access to the platforms, will be changed to a subway linking the north side of the station with a new entrance on the south side.

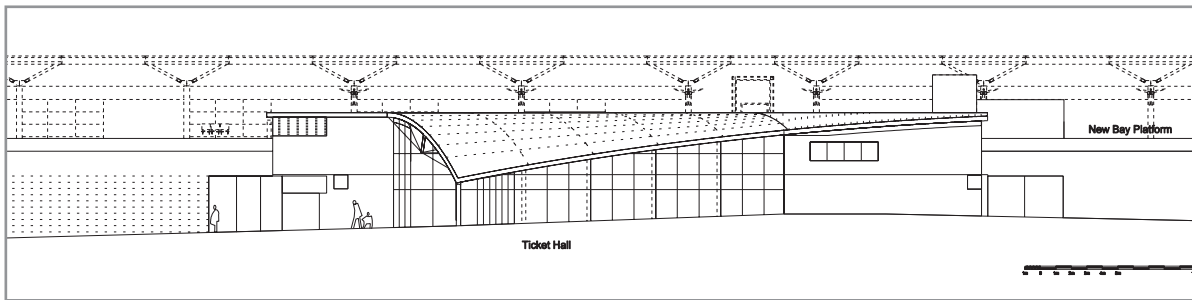


Figure 9.1 Proposed Maidenhead station elevation from north

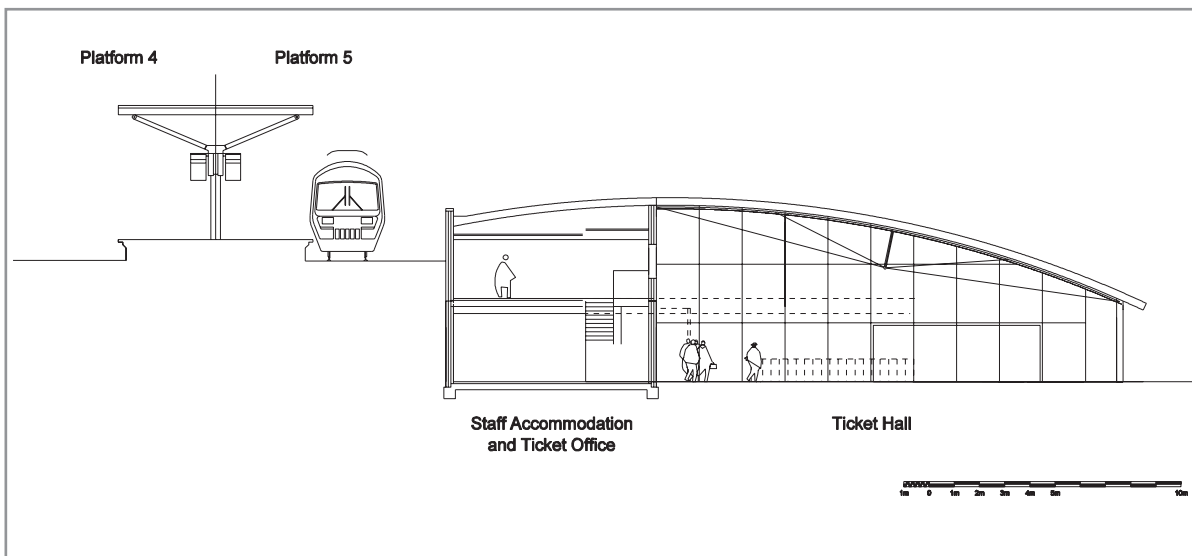


Figure 9.2 Proposed Maidenhead station section

Overhead Line Equipment

- 9.4.12 Overhead line equipment will be installed on the stabling and turnback sidings, on the tracks through platforms three, four and five and, east of Maidenhead East Junction, on all four running lines.

Construction – Stabling and Reversing Facilities

- 9.4.13 Subject to possession planning requirements and excluding final commissioning, the construction of Maidenhead stabling and reversing sidings will take about one year and three months to complete.
- 9.4.14 Enabling works will include the diversion of utilities and services. A key part of this will involve the diversion of a sewer in Maidenhead yard, which underlies the proposed location of new track. Reception and drive shafts will be located within the existing site boundaries. The work will involve the use of a small diameter tunnel boring machine and cranes in addition to the other equipment required for the stabling and reversing facilities. The sewer diversion will be undertaken from its own designated worksites.

9.4.15 The main works at the sidings will comprise:

- construction of new staff welfare facilities and provision of access and car parking;
- preparatory works for the formation of the stabling and reversing sidings including installation of drainage, followed by construction of the foundations (no deeper than 1 m) for the stabling platforms;
- construction of the stabling and reversing sidings and turnouts, including provision of ballast and followed by track laying, installation of OHLE, and installation of signalling;
- construction of the stabling platforms between each pair of stabling sidings;
- provision of lighting and fencing;
- construction of electrical track sectioning facilities; and
- reinstatement of the station car park.

9.4.16 Plant and equipment required at the sidings will include generators, compressors, excavators, a rail crane, a bulldozer, rail tampers and a tracked crane.

9.4.17 Works for the sidings will be carried out from the Maidenhead sidings worksite, which is mainly contained within the original goods yard north of the railway. Materials for trackworks will be delivered by rail. Materials for construction of buildings and the platforms will be transported by road, as will waste material from demolitions. Vehicles will access the site from Grenfell Road via the private road under the Marlow branch known as Silco Drive. The Maidenhead sidings worksite will be served by 24 lorries per day during the 15 week peak construction period and typically by 16 per day at other times.

Construction – Maidenhead Station

9.4.18 Subject to possession planning requirements and excluding final commissioning, the main works at Maidenhead station will take about two years and three months to complete.

9.4.19 Enabling works will include the diversion of utilities and services. The principal demolitions required at Maidenhead station will include the station building, platform ramps and canopies, a goods shed and a building in the works compounds, and the garden walls of the flats south of Shoppenhanger's Road. Demolition of the garden walls will be required to facilitate a temporary realignment of Shoppenhanger's Road.

9.4.20 The main stages of construction at Maidenhead station are described below. The first three stages will overlap.

- Construction of the subway extension involving the demolition and subsequent reconstruction of the sections of platforms one and two on the alignment of this subway. Construction of the new south station entrance will then be undertaken, including stairs and passive provision for a lift. This phase will take approximately one year.
- A temporary ticket office will be provided allowing the existing ticket office to be demolished. This will be followed by construction of the new station building. Further works will include the provision of new eastbound relief and reversible alignments and

removal of crossovers at Maidenhead East Junction. Construction of new lifts and the removal of the existing lifts will then be undertaken. These works will take approximately two years.

- Widening of the embankment followed by construction of the new bay platform six with provision of stair access to the new ticket hall and laying of the new track.
- Alterations to platforms four/five and their tracks will begin on completion of the new bay platform six. Works will include demolition and replacement of the existing waiting room and various track works. These works will take approximately six months to complete.
- Construction of the extensions to platforms two and three will commence midway through the construction of the new bay platform (platform six). These works will take approximately three months to complete.



The waiting room at Maidenhead station will be replaced

9.4.21 Construction plant and equipment at the station will include piling rigs, excavators, generators, compressors, a bulldozer, mobile cranes and a lorry-mounted concrete pump.

9.4.22 Works at the station will be carried out from four main worksites:

- Northern platform worksite - located to the immediate north of the GWML and extending along Grenfell Walk. This worksite will be served by 30 lorries per day during the four week peak construction period and typically by four per day at other times.
- Northern station car park worksite - located within the car park off Braywick Road to the north. This worksite will be served by 20 lorries per day during the seven week peak construction period and typically by four per day at other times.

- Southern station car park worksite - located in the eastern corner of the car park to the south of the GWML. The site is bounded by Shoppenhanger's Road to the south and the GWML to the north. This worksite will be served by 15 lorries per day during the four week peak construction period and typically by four per day at other times.
- Shoppenhanger's Road worksite - located off Shoppenhanger's Road to the south. This worksite will be served by 15 lorries per day during the four week peak construction period and typically by four per day at other times.

- 9.4.23 Materials required for the construction of buildings and platforms, and all waste materials from demolitions, will be transported by road. Materials for the trackworks will be delivered by rail.
- 9.4.24 Vehicle access to the worksites will be off Grenfell Road and Braywick Road to the north of the tracks and via Shoppenhanger's Road to the south of the tracks.

Impacts on Landscape/Townscape and Built Heritage

Baseline

- 9.4.25 The area is generally of medium townscape quality and sensitivity. The residential and open areas are of higher quality and sensitivity than the business and industrial sites. Grenfell Park, The Gullet, Desborough Park and the school playing fields are designated as 'important urban open space'.

Mitigation and Residual Impacts

- 9.4.26 No listed buildings will be affected directly by the construction or operation of the scheme in this route window. No significant landscape or built heritage impacts will result from the construction, permanent works or operation of Crossrail.

Impacts on Visual Amenity

Baseline

- 9.4.27 Visibility is determined by a combination of terrain, buildings and vegetation. Views extend northwards to adjacent residential and industrial properties and to the medium-rise buildings in the town centre. Views southwards extend to the southern side of the railway corridor and The Gullet, and to adjacent properties. The most sensitive receptors comprise occupants of residential properties; users of open space are of medium sensitivity.

Mitigation and Temporary Residual Impacts

- 9.4.28 The construction works will have a significant impact on the visual amenity of about five residential properties on Ludlow Road and 25 residential properties along the Shoppenhanger's Road frontage of the Courtlands Estate. This reflects the proximity, likely duration and prominence of the works, which will involve some loss of vegetation from the railway embankment.

Mitigation and Permanent Residual Impacts

- 9.4.29 The introduction of OHLE and new signalling may result in visual impacts at some properties, although, since these will be due principally to gantry structures, the location of which is not yet confirmed, the number and identity of affected properties cannot be determined at this stage. No other significant visual impacts will result from the permanent works or operation of Crossrail in this route window.

Impacts on Archaeology

Baseline

- 9.4.30 At both Maidenhead stabling site and Maidenhead station there is a moderate potential for remains of Neolithic and Early Bronze Age settlement, Iron Age and Roman activity, and Saxon to post-medieval field systems. There is a low potential for Bronze Age field-systems, and, at the stabling site, for Palaeolithic and Mesolithic artefacts. At Maidenhead station there is also a moderate potential for remains of the original 19th Century railway station; these would be of moderate importance. Palaeolithic artefacts within their original locations would be of high importance; reworked redeposited artefacts would be of low importance. Other remains would be of moderate importance.

Mitigation and Residual Impacts

- 9.4.31 At the stabling site, away from the embankment, new sidings, platforms, a construction compound and site clearance, would partially or completely remove potential archaeological remains.
- 9.4.32 Two shafts for sewer diversion would completely remove potential archaeological remains, and works within the two associated utilities worksites would partially remove them.
- 9.4.33 At the station, demolition and replacement of the ticket hall and provision of the new entrance building, together with subway alterations, embankment re-profiling, platform works and construction sites, would partially or completely remove potential archaeological remains.
- 9.4.34 At all sites, preservation by record would be the most appropriate form of mitigation for archaeological remains of these types in these locations. With this mitigation, no significant impacts will occur.

Impacts on Ecology

Baseline

- 9.4.35 The non-statutory wildlife heritage site, The Gullet is located adjacent to the proposed works, but separated from works by the railway. The York Stream Wildlife Heritage Site lies adjacent to proposed minor works associated with the OHLE.

- 9.4.36 Most of the affected areas comprise hard standing; semi-natural vegetation affected includes typical railway lineside scrub, grassland and wasteland vegetation types that are common both nationally and locally. However, there will be temporary and permanent losses of secondary lineside woodland, including habitat for nesting birds, to construction of the bay platform.
- 9.4.37 Surveys undertaken for Crossrail identified slow worm in the vicinity of Maidenhead station. Maidenhead station was identified as having moderate bat roost potential. Possible bat droppings were identified during a subsequent survey. In addition trees in three work areas at the station and brick buildings at Maidenhead sidings were identified as having a moderate bat roost potential.

Mitigation and Residual Impacts

- 9.4.38 In the event that slow worms are found on site during pre-construction, it will be necessary to relocate these reptiles to an alternative site before works commence, as they are statutorily protected against killing. This will prevent significant impacts.
- 9.4.39 Of the many bat emergence surveys undertaken elsewhere on the Crossrail route none has identified roosting bats in similar locations and it is therefore statistically unlikely that roosting bats are present here. In order to establish the prevailing conditions prior to construction, surveys will be undertaken at these worksites and if roosting bats are found, routine mitigation, as set out in Appendix B1, will prevent significant impacts.

Impacts on Water Resources

Baseline

- 9.4.40 The geology to the east of Maidenhead station comprises superficial deposits of Alluvium and River Terrace Gravels, overlying Chalk. At the Maidenhead station the superficial deposits are absent and the Chalk outcrops. Good quality groundwater is contained within the Chalk and is abstracted for public water supply. There is one Chalk groundwater abstraction licensed for spray irrigation; the 400 day Time to Travel Zone (TTZ) for this lies 50 m from the route alignment. The route window falls within the outer source protection zone for a public water supply abstraction located 770 m to the north of Maidenhead station.
- 9.4.41 Maidenhead Ditch and the Thames floodplain cross the route alignment in the eastern part of the route window.

Mitigation and Temporary Residual Impacts

- 9.4.42 Construction of the sewer diversion by microtunnelling in the Chalk within the 400 day TTZ poses significant risks to water quality at the abstraction since some turbidity increases in groundwater are predicted and bentonite fluids or face conditioning fluids could also be required. In the absence of detailed site investigation on ground and groundwater conditions, no particular mitigation measures have been identified. However, impacts on groundwater may be controlled through: a combination of careful selection of appropriate machines, tunnelling methods and fluids; close monitoring of fluid loss to formation; and possibly scavenging. However, the residual impact has been assessed to be significant and a temporary supply from an alternative source may also be needed as compensation to the owner.

- 9.4.43 The site is located partly on the outcrop Chalk, which makes it highly sensitive to groundwater pollution. The historical uses of the station indicate that ground contamination may potentially exist (see Impacts from Contaminated Land, below). Good site practice measures, as set out in Appendix B1, will be implemented to ensure that no significant impacts on groundwater resources will occur with respect to the liberation of contaminants.
- 9.4.44 Similarly, measures will be implemented to protect surface waters from pollution via run-off or existing drainage pipes or storm water sewers. No significant adverse impacts will, therefore, occur.

Mitigation and Permanent Residual Impacts

- 9.4.45 No permanent impacts on groundwater will occur. The sidings will be designed to ensure that risks to surface water features from contamination by railway operations and activities will be controlled, for example by installing oil interceptors and by using appropriate protective measures when handling materials. The Crossrail trains will be electrically powered rather than diesel and the potential for pollution is low. No permanent impacts will, therefore, occur.

Traffic and Transport Impacts

Baseline

- 9.4.46 Maidenhead station is located south of the town centre. The A308, the main route to the M4 Motorway, is a dual carriageway east of the station. The station is accessed from the A308 either via Station Approach or via Shoppenhanger's Road. The main station entrance, on its north side, is off Station Approach. Station Approach can only be accessed from the northbound carriageway of the A308. Shoppenhanger's Road can be accessed from both the northbound lane and the southbound lane, via a right turning lane. The A308/Shoppenhanger's Road junction is traffic signal controlled with pedestrian crossing facilities. The secondary station entrance on Shoppenhanger's Road has connections to the main ticket hall and platforms.
- 9.4.47 Maidenhead station serves a large catchment area and has regular services to London Paddington, Reading, Marlow and the west of England, operated by First Great Western Link.
- 9.4.48 The A308 is a bus route and the station is served by several bus routes as well as by minibus services. There are set-down and pick-up spaces and taxi ranks on Station Approach and on Shoppenhanger's Road. The station also has good provision for cycle parking.
- 9.4.49 There are three separate station car parks on Station Approach, Shoppenhanger's Road and Silco Drive (northwest of the station) providing a total of some 350 spaces.

Mitigation and Temporary Residual Impacts

- 9.4.50 Five worksites are proposed for the platform extension and station redevelopment works.
- The Northern Station Car Park worksite will occupy the whole of the Station Approach area to the north of the railway for the duration of the station construction works, approximately two years and three months. It will be accessed from the northbound carriageway of Braywick Road via a separate entry and exit in the Station Approach area.
 - The Northern Platform worksite will be accessed via an existing footway/cycleway from Grenfell Road, which will be closed to the public. The length of the diversion route via Grenfell Road and Braywick Road will not cause a significant impact for pedestrians and cyclists. An access route to the station entrance for pedestrians will be maintained through the northern station car park worksite.
 - The small Shoppenhanger's Road worksite will be used to improve passenger access to the station ticket hall and will occupy part of the carriageway. Shoppenhanger's Road will be temporarily realigned to provide space for subway works. The taxi rank, bus layover space and bus stop will be temporarily relocated.
 - The Southern Station Car Park worksite will occupy part of the car park to the south of the railway accessed from Shoppenhanger's Road.
- 9.4.51 The Maidenhead sidings worksite will occupy part of the public car park to the west of the station, immediately beyond the Marlow Branch line. It will be accessed from Grenfell Road via Silco Drive.
- 9.4.52 Some 200 car parking spaces will be lost for worksite space. This will be phased to minimise the number lost at any one time but will represent a significant impact. The occupation of the Station Approach area by the Northern Station Car Park worksite will result in the temporary loss of car parking, set-down and pick-up spaces, a taxi rank, parking for the mobility impaired, motorcycle parking and cycle parking. There will be alternative provision for taxis, cycles, motorcycles and the mobility impaired in the immediate vicinity of the station. However, it is unlikely that provision for set down and pick up will be made, therefore, constituting a significant temporary impact.
- 9.4.53 Lorries will route from the M4 and A4 to all five worksites via the A308 Braywick Road/Grenfell Place. The use of this access route by construction traffic will not give rise to any significant impacts for road users, pedestrians or cyclists.

Mitigation and Permanent Residual Impacts

- 9.4.54 No major changes in passenger numbers are predicted at Maidenhead station following commencement of Crossrail.
- 9.4.55 There will be a permanent loss of 66 spaces from the northern station car park and 48 spaces from the Silco Drive car park; this will be a significant adverse impact.
- 9.4.56 No significant traffic and transport impacts will result from the operation of the stabling facilities.

Noise and Vibration Impacts

Baseline

- 9.4.57 Baseline noise levels around Maidenhead station are moderate to high, and are dominated by a combination of road traffic and trains. Table 9.2 shows the baseline noise levels that have been recorded at representative noise-sensitive receptors within this route window.

Table 9.2 Baseline Noise Measurements in Route Window W25

Reference	Receptor	Baseline Noise Level	
		Daytime ($L_{Aeq, 12 \text{ hour}}$)	Night-time ($L_{Aeq, 8 \text{ hour}}$)
WM01	51 Brownfield Gardens	62	50
WM02 ¹	189/191 Boyn Valley Road	63	
WM03	Brockton Court	65	56
WM04	Berkshire Lodge	70	63
WM05 ¹	1-6 Hampshire Lodge	68	

¹ Short-term monitoring location ($L_{Aeq, 3 \text{ hour}}$)

Mitigation and Temporary Residual Impacts

- 9.4.58 *Noise from Surface Construction Activity:* The mitigation measures set out in Appendix B1 will be employed to reduce construction noise impacts. 3.6 m high hoarding will also be provided around the worksites where appropriate. The application of these measures will ensure that no significant adverse construction noise impacts occur.
- 9.4.59 Works for the sewer diversion in Maidenhead Yard will potentially give rise to significant noise impacts at dwellings on the north side of Ludlow Road, as well as at Desborough school. In addition to the mitigation measures set out in Appendix B1, provision of a 5 m high hoarding around the site during the sinking of the caisson and of an enclosure for plant, including generators will help to reduce the impact. However, significant noise impacts from the sinking of the caisson will affect a small part of the school and five dwellings on the south side of Ludlow Road for up to eight weeks of the 26 week construction period. Provision of noise insulation will mitigate impacts at these properties.
- 9.4.60 *Vibration from Above-ground Construction Activity:* The application of mitigation measures, as described in Appendix B1, will ensure that no significant vibration impacts arise from above-ground construction activity.
- 9.4.61 *Noise from Construction Road Traffic:* Increases in roadside noise levels resulting from Crossrail construction traffic, at less than 1 dB(A), will not cause a significant impact.

Mitigation and Permanent Residual Impacts

- 9.4.62 *Noise from the Operational Railway:* The changes to the railway infrastructure and services will not be sufficient to give rise to significant increases in noise levels within this route window. No significant operational railway noise impacts will, therefore, occur.
- 9.4.63 *Noise from Operational Road Traffic:* Changes in roadside noise levels arising from traffic flows once Crossrail is operational will be less than 1 dB(A). This will not be sufficient to give rise to a significant impact.

Impacts on Air Quality*Baseline*

- 9.4.64 This route window is within the Royal Borough of Windsor and Maidenhead. Air quality is deemed relatively good within the Royal Borough and the local authority has not declared any AQMAs.

Mitigation and Temporary Residual Impacts

- 9.4.65 Dust will be generated by construction activity, including the movement of materials. There is a medium risk of dust nuisance during construction at Maidenhead station. With the application of measures, as set out in Appendix B1, no significant impacts due to dust will occur.
- 9.4.66 The construction traffic generated by Crossrail will not be sufficient to cause significant impacts from air pollution for a number of reasons, as summarised below.
- 9.4.67 In 2007, when construction is due to start, the ambient background NO₂ concentration in this route window is not predicted to breach the National Air Quality Objective of 40 µg/m³ on any of the roads assessed. Increases in NO₂ roadside concentrations due to construction traffic are forecast to be less than 1 µg/m³. This increase also only arises during the construction period and is not permanent. As a result the construction of Crossrail is not likely to prejudice the strategy adopted by the local authority to meet the National Air Quality Objective in its Local Air Quality Action Plan.
- 9.4.68 In 2007, ambient background PM₁₀ concentrations in the route window will be less than 70% of the Air Quality Objective Value of 40 µg/m³. A provisional Air Quality Objective Value of 23 µg/m³ is proposed for 2010. The ambient background concentration for PM₁₀ in the route window is forecast to be 20 µg/m³ in 2010. Increases in PM₁₀ roadside concentrations due to Crossrail's construction traffic are forecast to be less than 1 µg/m³. This increase also only arises during the construction period and is not permanent. As a result the construction of Crossrail is not likely to result in a breach of either the 2007 objective or the provisional 2010 objective.

Mitigation and Permanent Residual Impacts

- 9.4.69 None of the links within the route window is expected to experience an increase in traffic flow in 2016 compared to the 2016 baseline. Ground level concentrations within this route window will not increase significantly as a result of Crossrail's operation, therefore, no significant impacts will occur.

Impacts from Contaminated Land

Baseline

- 9.4.70 Significant ground-breaking will be required during the construction works at Maidenhead station and stabling sidings. The station and its former sidings have been identified as having a medium potential for contamination owing to the area's 125-year history of railway use. This historical contamination is likely to have left a legacy of both organic and inorganic substances that may have impinged on soil and/or groundwater quality.

Mitigation and Residual Impacts

- 9.4.71 Contamination will present a risk to people working on the site, as well as to surface waters and groundwater. However, with the application of the measures set out in Appendix B1, relating to the handling, treatment and ongoing management of contaminated soil and groundwater, no significant impacts will occur either during construction or in the long term.

Community Impacts

- 9.4.72 There will be no significant temporary or permanent community impacts in this location.

Socio-Economic Impacts

Baseline

- 9.4.73 Located within 1 km of Maidenhead station, there are approximately 10,000 jobs and around 390,000 m² of commercial floor space, of which almost half is dedicated to offices.

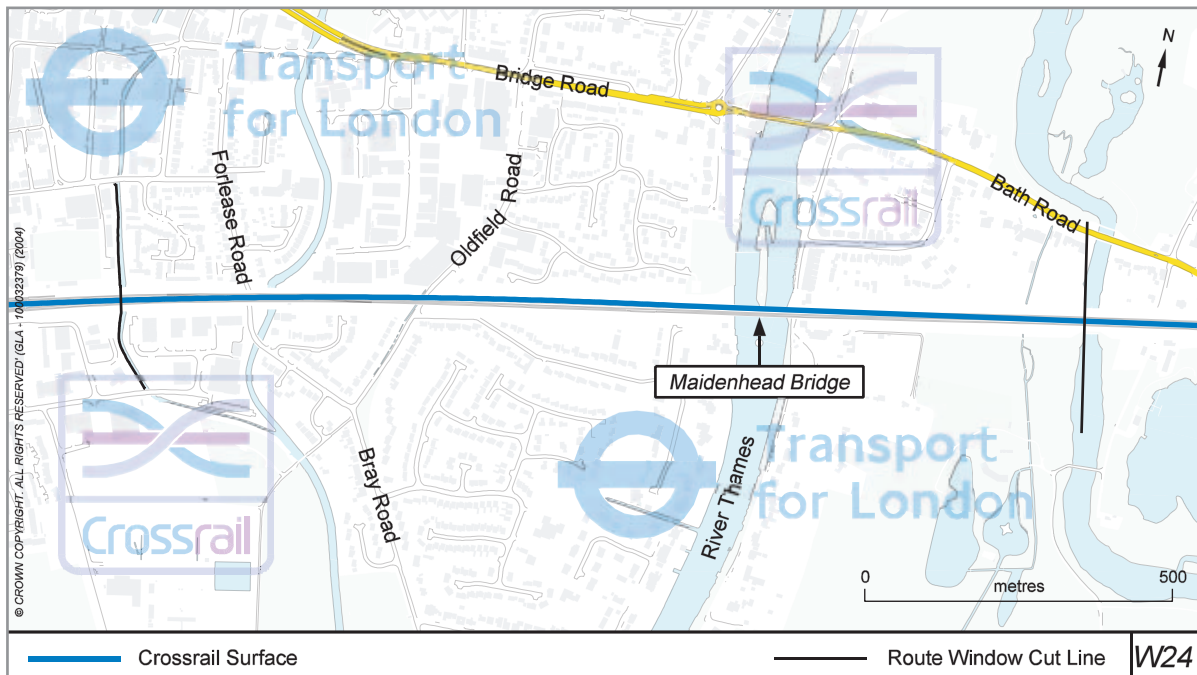
Mitigation and Residual Impacts

- 9.4.74 Construction work will displace retail and commercial units from the station building and into the former railway yard. The displacement of about 30 jobs that will result from this will be disruptive for the people affected, but, in relation to total employment in this area, will not be significant.
- 9.4.75 Although a number of jobs will be displaced at the sidings, some 30 to 40 jobs will be created for train crew and servicing staff to enable trains to operate from the stabling sidings. Overall there will be no significant impacts.

Design Options

- 9.4.76 An option to undertake eastward platform extensions at Maidenhead station was considered. This was rejected because the worksite would be a significant distance from the works. It would also have compromised track safety clearances and signal sightings.

9.5 Route Window W24: Maidenhead Railway Bridge



Location of Maidenhead Railway bridge

Overview of Route Window W24

- 9.5.1 The permanent works will comprise the introduction of overhead line equipment. This will generally employ portal frames, although masts with cantilevers will be used over Maidenhead railway bridge. Some utility diversions on the railway bridge will be required to enable installation of OHLE.
- 9.5.2 The methodology for installing OHLE is described above, in Section 9.2. Works will be undertaken using rail-mounted equipment. The majority of materials will be taken to and from the site by rail. Plant and equipment required at the worksite will include a mini digger, concreting plant, rail-mounted piling rig, diesel locomotive and wagons, generators and road/rail cranes and hand held plant.



Maidenhead railway bridge

9.5.3 This route window is located within the Royal Borough of Windsor & Maidenhead and the District of South Buckinghamshire. The route runs across the Thames floodplain on an embankment, with Brunel's Grade II* listed railway bridge carrying the line across the river itself. The embankment is densely vegetated. To the west of the river, the area is mainly built-up, comprising a mix of residential and business areas. To the east of the river, the area between the railway and Bath Road is built-up, mainly with housing. The areas to the north of Bath Road and to the south of the railway are predominantly open and rural, although housing extends along River Road. Maidenhead railway bridge is located within a conservation area.

Mitigation and Temporary Residual Impacts

9.5.4 No temporary significant residual environmental impacts will occur in this route window.

Mitigation and Permanent Residual Impacts

9.5.5 No significant impacts will occur with respect to visual amenity, archaeology, ecology, water resources, traffic and transport, noise and vibration, air quality, contaminated land, community and socio-economics.

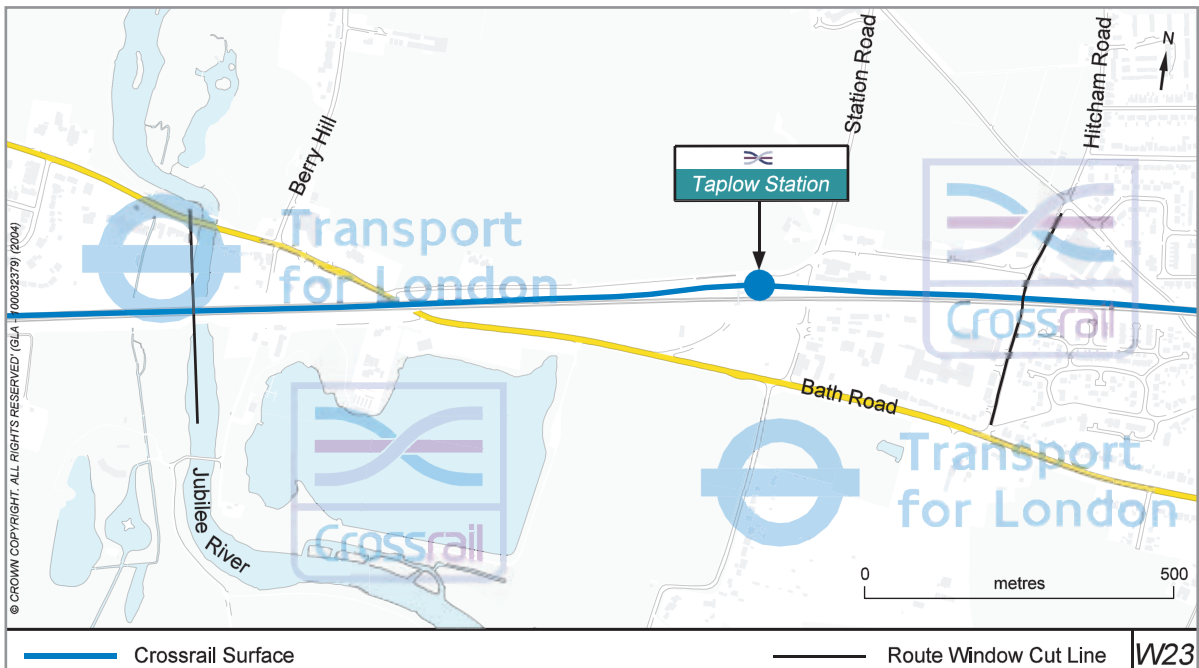
9.5.6 The OHLE requires that supporting posts be founded on the bridge structure. These will be positioned so as not to disrupt the symmetry of the bridge. Three sets of masts will be fixed at the bridge supports and a further two sets will be fixed at the far ends of the bridge. The masts will be fixed such that they may be removed in the future without damaging the bridge as it stands today.

- 9.5.7 Given the historical significance of the railway bridge, any physical impact will be deemed a significant impact. The impact will be mitigated by employing a fixing mechanism that avoids damaging the cornice by offsetting the mast from the bridge. The utility diversions on the bridge will not affect its superstructure. Overall, no significant impacts on this listed structure will occur.
- 9.5.8 It is proposed that the OHLE over Maidenhead railway bridge will use masts with wires suspended from cantilevers, since these will be visually lighter structures than the gantries to be used along other parts of the route. The masts will however, have a significant adverse landscape impact: they will affect important views along the river and the character of the river corridor; they will affect the setting of the Riverside Conservation Area; and they will affect the setting of the listed railway bridge and the setting of the adjacent Grade I listed road bridge.



View looking north along the River Thames

9.6 Route Window W23: Taplow Station



Location of Taplow station

Overview of Route Window W23

- 9.6.1 Crossrail will require the introduction of overhead line equipment throughout the alignment in this route window. At Taplow station, the safety implications of this electrification will require that the parapets of the station footbridge be modified. The methodologies for installing OHLE and for constructing platform extensions are described above, in Section 9.2.
- 9.6.2 Platforms at Taplow station will be extended westwards by about 26 m to accommodate Crossrail trains. Platform extensions and footbridge works will take about four months to complete.
- 9.6.3 The works will be undertaken from two worksites located respectively to the north of the railway, just off Approach Road, and to the south of the railway, in the western corner of the current car park. Transport of materials to and from the sites will be by road. Only about two lorries will serve each worksite on a typical day. Plant and equipment required at the worksite will include a piling rig, crawler, excavators, mobile cranes, compressors, lighting rigs and generators.



Taplow station

- 9.6.4 This route window is located within the District of South Buckinghamshire. The route runs across the Thames floodplain on an embankment, much of it well vegetated, returning to ground level at Taplow station. The surrounding area comprises countryside and urban fringe uses. Taplow station lies on the western edge of the built-up area of Burnham. Commercial and light industrial premises lie immediately to its east. Beyond Approach Road and Institute Road to the north, is located recreational space, a few residential properties and countryside. The area to the south, beyond Bath Road, is also mainly rural, but includes some residential properties. This rural area extends westwards, forming a wedge of rural land that separates Burnham and Maidenhead.
- 9.6.5 The main environmental features of note are a new flood relief channel and Taplow Lake, which are located on the Thames floodplain. Locally designated areas of landscape importance are situated to the north and south. Historic and archaeological remains are likely to survive in the area.

Mitigation and Temporary Residual Impacts

- 9.6.6 No temporary significant impacts will occur with respect to landscape/ townscape and built heritage, visual amenity, archaeology, ecology, water resources, traffic and transport, noise and vibration, air quality, contaminated land, community and socio-economics.
- 9.6.7 Station Approach Road Worksite North will occupy part of the car park on Approach Road resulting in the loss of some 10 parking spaces and an area of private land. The Station Footbridge Worksite South will use a small area of the southern car park with the loss of approximately five parking spaces. No temporary significant impacts will occur.

- 9.6.8 Land affected by the works may be contaminated. The application of relevant measures, as set out in Appendix B1, will ensure that no significant impacts will occur during construction or in the long term.

Mitigation and Permanent Residual Impacts

- 9.6.9 No significant impacts will occur with respect to landscape/townscape and built heritage, visual amenity, archaeology, ecology, water resources, noise and vibration, air quality, contaminated land, community and socio-economics.
- 9.6.10 Taplow station is located within an archaeologically productive area with a potential for, amongst other things, prehistoric, Roman, medieval and post-medieval remains, as well as for 19th Century infrastructure from Brunel's Great Western Railway. Works at the station would remove any such remains within their footprints. Preservation of these remains by record would, however, mitigate this potentially significant impact; no significant impacts will, therefore, occur.
- 9.6.11 Rail passengers at this station are forecast to experience significantly quicker journeys to and from the West End, the City and Docklands as a result of Crossrail. A small increase in passengers using the station is forecast with Crossrail in operation. No significant adverse residual traffic and transport impacts are expected.