

5.0 The Construction Works

5.1 Time Scales

Section 9 refers to the Osborne Summary Programme rev P
The overview timescales for works are as follows:

Procurement of contractor - main and final works	Jan 2015 –	May 2015
Design development:	Jan 2015 –	Mar 2017
Early Phase 1 works:	Feb 2015 –	Oct 2015
Enabling works including temporary ticket office	Mar 2017 –	Aug 2017
Start on site main works	Aug 2017	
Podium works	Apr 2017 –	Feb 2019
Block A	Sep 2017 –	Mar 2019
Block B	Nov 2017 –	Jul 2019
New station ticket office	Jun 2018 -	Apr 2019
Block C	Apr 2019 -	May 2020

5.2 Detailed Early Works

As noted above the early stage works were completed prior to the Rugby World Cup, in September 2015. This involved: site clearance and construction works and was carried out between February 2015 and March 2015.

Construction works were limited to the construction of a surface water manhole located within the existing station compound area.

All activities associated with the construction of the manhole were carried out in normal daytime working hours. Following the removal of Japanese knotweed (see NS 39 (ref.11/1443/DD10 & 11/1443/DD21) for a detailed method statement on JKW treatment and removal) the sequence of works was as follows:

- Set up temporary mobile site cabins
- Erect acoustically sheeted Heras fencing
- Mobilise plant and materials
- Identify any services present (the manhole was located to avoid services in the first instance)
- Level the ground in the construction area
- Temporary protection of services
- Archaeological Excavation trench AT1 and record (NS34 Archaeology ref. 11/1443/DD01)
- Excavation of manhole to a depth of 2m
- Placing of temporary shoring (hydraulic box unit)
- Installation of root barrier protection
- Construction of manhole in stages, including rocker pipes, to finished level
- Backfill around completed manhole
- Tag and Trace all cables
- Demobilise plant and equipment

The above works were generally carried out between the hours of 08:00am to 18:00pm, Monday to Friday, except where work was required to be done adjacent to the railway.

5.3 Detailed Mobilisation Stage

A major communications programme will be implemented to explain the main stage of the works prior to commencement. This will be done in the mobilisation stage.

The project mobilisation works for Solum will start on 20th March 2017 including some minor works that will be undertaken outside of the site boundary (to the south west of the station, beneath the London Rd bridge) to enable the works planned for the April possessions to be undertaken efficiently and to minimise risk of disruption to the railway. The nature of these works and when they will be undertaken will be subject to a section 61 application to be agreed with the authority.



Figure 10: Site Establishment with new Temporary Ticket Office

Prior to being able to construct the podium over the operational railway detailed approvals from Network Rail asset protection team to demonstrate the safety of the works during construction, in use and maintenance will be required to enable the works. Initially site accommodation including site welfare facilities and hoarding, will be erected to allow the use of the existing car park area (see figure 5).

One hundred and four covered bicycle stores for the TOC's customer's use will also be positioned adjacent to the new station entrance.

5.3.1 Temporary Ticket Office and Station Entrance

In order to commence the main works it is necessary to set up a temporary station ticket office and gate line for passengers to access the station and enable the existing building to be demolished. It has been agreed with South Western Railways to replicate, where possible, the existing ticket office facilities adjacent to the current event day access on platform 2, by using a temporary ticket office. The structure will be assembled from off-site fabricated elements. The temporary structure will be fitted out with two ticket windows, a small mess area, and toilet facilities for the staff, a store, and office and power supply room from the District Network Operator (DNO). Six ticket vending machines will also be relocated from

the original ticket office location.

Prior to the ticket office becoming operational cable and service routes will need to be relocated to allow a seamless switch over from the existing facility. Some of these trunking and service routes that will go from the existing platform buildings will need to be routed during ROTR, at night when works are in close proximity to the train lines.

Customer information and CCTV services will be relocated to serve this area prior to staff being moved from the existing ticket office. The fit out of the temporary office is planned to take place between July and August 2017.

A new gate line will be established within the temporary ticket office roofed area.

Public access to the temporary station will be by means of a temporary segregated safe access route (separating pedestrian from traffic, to ensure the safety of the public) down from London Road. . The route will be lit using the existing lighting columns supplemented where required temporarily by lighting on hoarding to ensure a minimum requirement of 50 lux and will be subject to changes as the works progress. For further details on the management of existing traffic and pedestrian movements please refer to planning application ref. 11/1443/DD19 to discharge planning condition NS27 – Traffic and Pedestrian Management. This application also includes details on the cycle parking to be provided for use by passengers at the temporary station.

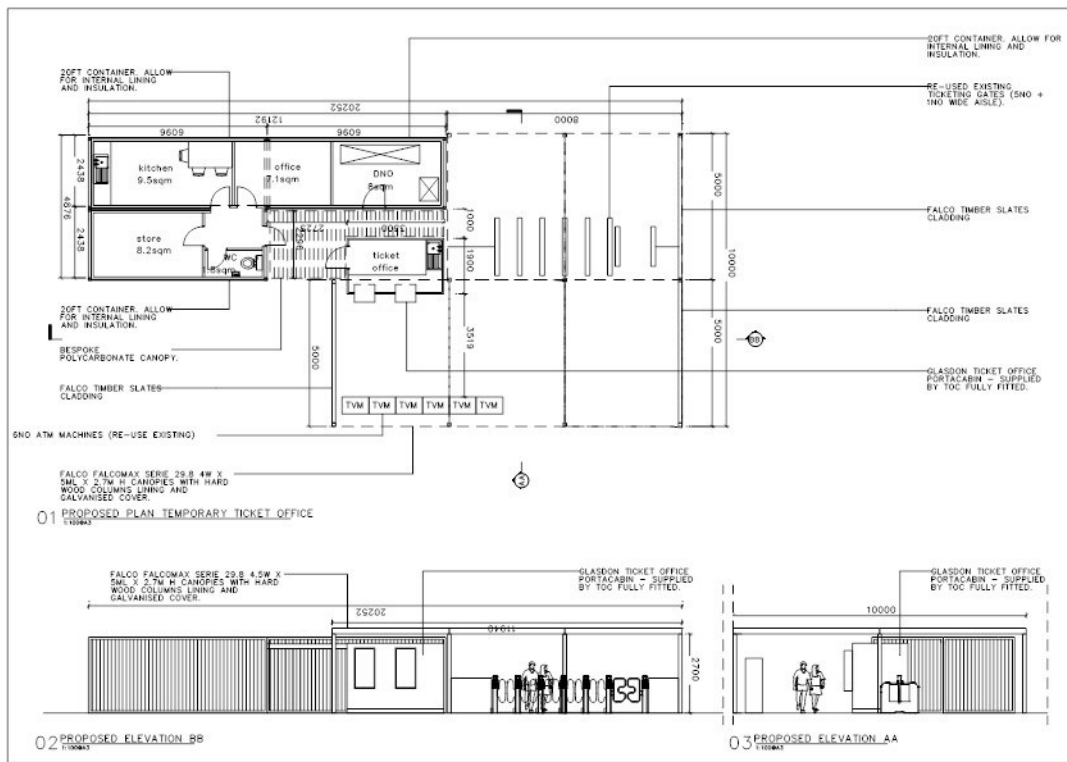


Figure 11: the Temporary Ticket Office

Directional signage will be provided (to a design and strategy agreed with Network Rail and the Train Operating Company) to direct passengers to and from and within the temporary station. Additional signage will be provided on event days to ensure

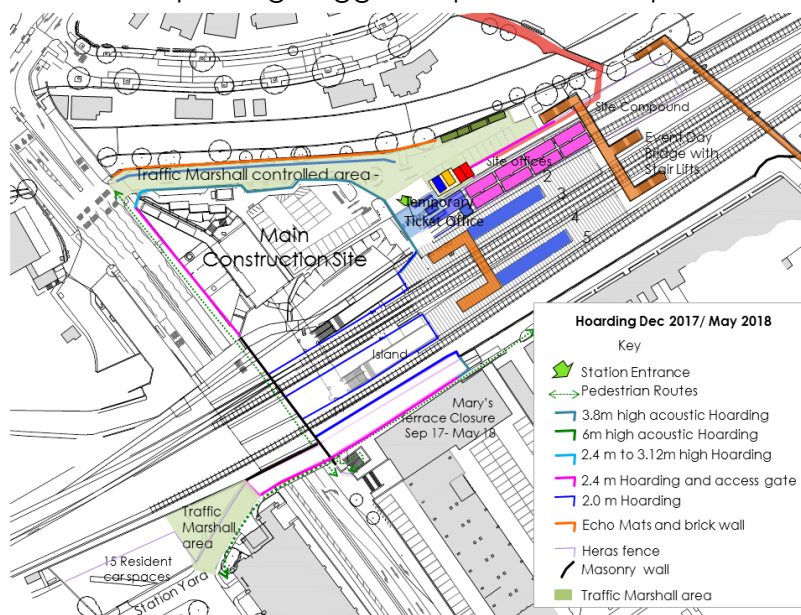
passengers access the correct queuing lanes (post event) relating to their direction of travel to and from the station.

The temporary ticket office will be operational until the new facility ticket concourse is available in April 2019. A segregated access route to the main construction site from the site office area will be created via a gantry over the temporary ticket office.

Once the new station facilities are complete and in use, these temporary arrangements will be removed to allow the construction of the final stage of the works in Block C.

5.3.2 Hoarding

The construction site will be secured by erecting a hoarding around the site boundary. The hoarding heights and indicative layout is shown in figure 12. Hoarding licences will be agreed with the Highways Authority where located on the public highway (on Mary's Terrace and on London Road). Where located on the public highway, adequate space will be allowed for pedestrians/wheelchair users/those pushing buggies or prams, etc to pass.



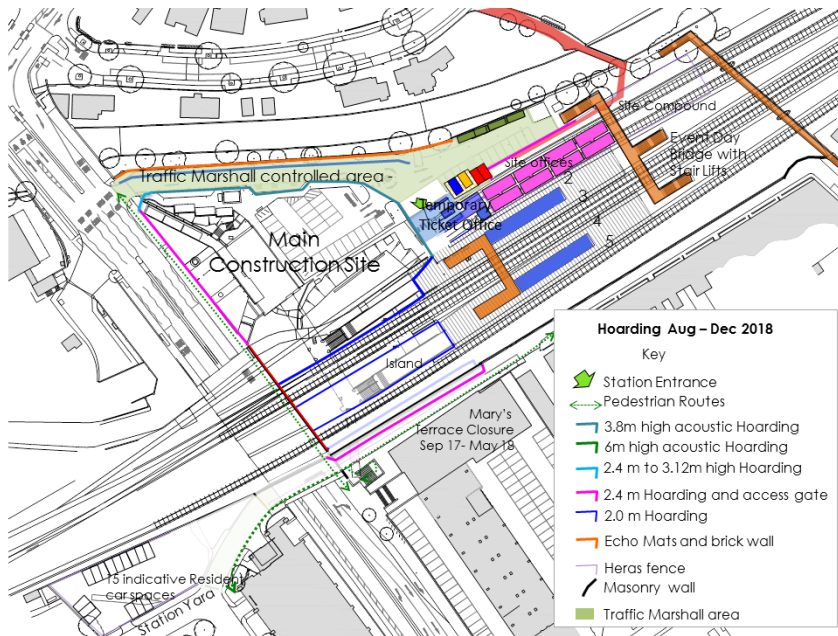
Hoarding on London Road pavement will be for specific purposes and for the shortest period. Hoarding is needed for safety reasons to segregate the construction works from the public. Hoarding will be installed along London Road (on the boundary with the public highway) from September 2017 and will tie into the existing brick wall on London Rd bridge.

Figure 12: Hoarding heights and locations Dec 2017 – April 2018

From May 2018 the hoarding line will need to be extended on to the pavement and across the London Rd bridge to protect the site from public access as the parapet is only 1.524 m high. Hoarding licences will be agreed with LBRUT in advance. Please refer to figure 12 and figure 12a which illustrate these two phases to hoarding alignment on London Rd.

All hoarding will be subject to a weekly inspection of its condition and will be repaired / replaced if required. Along with protecting the public from the construction works as these progress, the hoarding will also (particularly in some areas) perform an acoustic dampening function as detailed in the Noise and Vibration Management Plan (NVMP). refer to planning application ref. 11/1443/DD28 to discharge planning condition NS36. Acoustic screening 3.8m high will be erected along the access road from London Road down to the temporary ticket office.

As the fence is closer to potential noise sources and the angle between the source and the top of the acoustic fence will be higher it will improve the acoustic mitigation to residential properties in comparison with a fence on the riverside of the access road. The fence in this location will also not cause damage to the line of trees along the boundary.



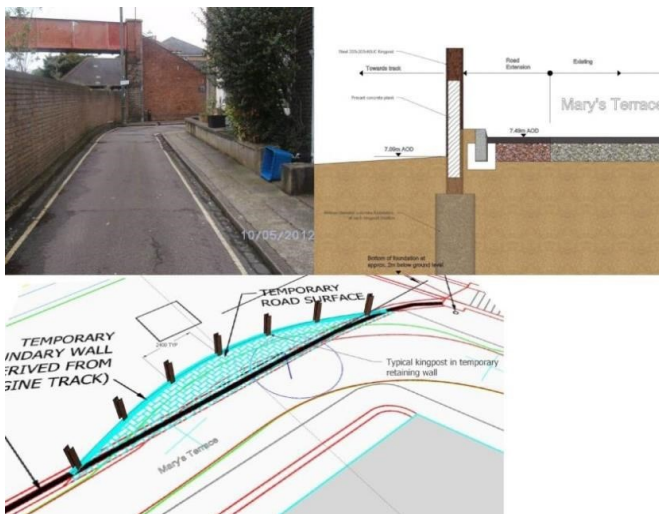
trees along the boundary.

This acoustic screening has been the subject of a detailed design, to comply with a noise assessment to mitigate impact to properties along the River Crane and wildlife. The design has been carried out by Anderson Acoustics, specialist noise consultants; whom also produced the NVMP.

Figure 12a: Hoarding heights and locations Aug – Dec 2018

The noise monitoring will commence prior to the possessions in June 2017. Anderson Acoustics will also produce Section 61 Applications on behalf of Osborne at six monthly intervals throughout the main construction works. An initial section 61 will be produced for the mobilisation works. The section 61's will include sound made at any time on the works including Rules of the route works and T3 possessions.

5.3.3 Road Widening to Mary's Terrace



Road widening to Mary's Terrace at the junction with Beauchamp Road is being done to allow emergency vehicles to access Mary's Terrace from the east as the road will be closed on the western side to through traffic.

Figure 13: Road widening Mary's Terrace /Beauchamp Road

Mary's Terrace has been closed to through traffic for a number of years and all vehicles except fire engines must enter the road from Beauchamp Road. The temporary road widening of Mary's Terrace at Beauchamp Road will allow emergency vehicles to access Mary's Terrace from the east.

A suspension of parking and the closure of Mary's Terrace, for emergency vehicular traffic from the east will be needed, adjacent to the new podium position near London Road Bridge. This will enable piling to take place on the site boundary to Mary's Terrace opposite the hotel, as well as the construction of a pile caps retaining element, columns to take the load of the edge of the new station concourse and the re-construction of the wall on the boundary.

The road widening to the Mary's Terrace and Beauchamp Road junction will be carried out in August and September 2017.. The widening works to Mary's Terrace will require short term closure of the road at the junction whilst the work is carried out, adjacent to the public footbridge and the footpath will remain open. Vehicular access for residents and construction vehicles during this operation will be via the barrier at the London Road end of Mary's Terrace. Details of access will be agreed with the local Highways Authority. Solum will have meetings with Mary's Terrace and Beauchamp Road residents a minimum of 4 weeks prior to the widening works commencing. Submissions to the local highway authority will occur and approvals obtained, prior to the works commencing.

Segregation for pedestrians using the footpath and residents vehicles will be by use of Heras style temporary fencing for this particular short-term activity.

These works, which have been approval in principle by the Highways Authority, will include localised removal of the Network Rail boundary wall, installation of a temporary retaining element to the extended carriageway and resurfacing of the road to the new alignment (see Figure 13). A new fence line will be erected to prevent access to the Network Rail land and a kerb will be provided to protect Network Rail LOC (location) boxes. Notification of these works will be made in accordance with planning condition DV42 prior to these works starting.

A full detailed design will be prepared by the specialist contractor and submitted to Network Rail, LBRuT and Highways Agency prior to commencement. A photographic condition survey of the carriageway, footpath and existing boundary wall will be undertaken and recorded with the Traffic Department. All these works will be undertaken in accordance with an approved Network Rail Works Package Plan (WPP) and Safe System of Work (SSOW).

Once work is completed and the junction reopened to enable emergency vehicles to enter Mary's Terrace from the east, Mary's Terrace will be closed to vehicles at the western end so that work can commence adjacent to London Road Bridge.

5.3.4 Slewing Cables and Diversions

A number of Network Rail cable routes and equipment has to be relocated to the underside of the London Road Bridge, carried out during night time at the end of March and in early April and weekend possessions in April 2017, using the possessions available. These works are all rail side and involve alterations to rail infrastructure only. Materials will need to be brought in to the island site between

tracks four and five from the west side of the London Road Bridge and from there to the re-sited Location cabinets under the London Road Bridge. Once material has been moved to the island site most of the works can be carried out during day time works. This work is inherently not noisy although will be subject to section 61 application. (See Figure 5 for platform locations)

5.3.5 Platform Canopy Amendment

The platform canopy in the location where the additional temporary footbridge needs to be positioned (see Figure 14 below) will be carefully removed to allow the construction of the temporary footbridge. Preparation for the footbridge footings will also be undertaken, within a fenced area that maintains a 2m clear platform each side. The extent of these works will be kept to a minimum through the use of counterweight supports to the bridge which will be the subject of a fully designed and checked temporary works design, but will include removal of platform surfacing and shallow concrete pad foundations between the new stairs and platform buildings. All these works will be undertaken in accordance with an approved Network Rail WPP and SSOW. Works within 2m of the platform edge will be carried out during a T3 possession in June 2017.

5.3.6 Temporary Footbridge

Twickenham station has two footbridges between different platforms (platform 3 and 4/5) to cope with the logistics of event day planning. The main footbridge is in the location of the construction site so requires a temporary footbridge to be erected prior to the existing one being removed. The new temporary footbridge will be erected in a T3 possession in June 2017 (see figure 5 for location of footbridge and the platforms which it links).

South Western Railways have requested two new stair lifts to be available on the existing event day bridge prior to the existing stair lift being de-commissioned. The bridge will be fitted with two new stair lifts to enable passengers to get from the temporary ticket office to platforms four and five.



Figure 14: Mary's Terrace Enabling – Existing Footbridge

The temporary footbridge will be constructed from scaffold. Once this is erected, the scaffold structure will replace the existing bridge that will be

demolished to allow the new podium to be constructed. The temporary footbridge will be installed and made fit for use prior to the demolition of the existing structure; the latter will remain fully operational whilst this takes place. The parts of the bridge that are below the hoarding surrounding the bridge towers can be worked on during the day time. Works above the hoarded area that could potentially fall near the track will need to be constructed in railway possessions on 17th and 18th June 2017.

Tower and bridge scaffold elements will be delivered during normal hours into the existing station car park (cordoned off) ready for assembly in night works. As much of the bridge as possible will be assembled into manageable sections during day time. These will be lifted, erected and secured in position during the T3 possession in June 2017.

Decking and cladding will then be incorporated into the bridge design. The flanking balustrade to the sides of the bridge will have solid sides up to a height of 1.8m above the nosing to the stairs to prevent the possibilities of overlook. Cabling, lighting and CCTV will be installed within the bridge, completed once the bridge has been constructed and handed over by the bridge erector. The bridge will include coated handrails. Lighting, way-finding signage and customer information boards will be installed in accordance with Network Rail standards. The walkway flooring will be of a low maintenance anti slip finish with minimal joints to Network Rail standards. In accordance with Network Rail standards the handrails and stair nosings will be of contrasting colours, details to be agreed with SWR/Network Rail.

The bridge will be designed, approved, located and constructed in accordance with all Network Rail standards. Its capacity and accessibility has been checked using computerised specialist pedestrian modelling software demonstrating that sufficient capacity is provided to access the central platforms. The bridge will remain in use during the main construction period up until the time the new station entrance from London Road is ready to open.

5.3.7 Other Mobilisation Works

During one of the possessions in June 2017 and before demolition and piling work is carried out adjacent to the London Road Bridge, a structural condition survey will also be carried out using mobile access equipment by a Network Rail qualified Structural Inspector or Engineer. All these works will be undertaken in accordance with an approved Network Rail WPP and SSOW.

As previously noted, the Mary's Terrace roadway between the garages and London Road Bridge, will be closed to through vehicular traffic, from the beginning of September 2017 until the end of June 2018 and parking will be suspended from September 2017 until the start of July 2019 in agreement with the Highways Authority. Although the parking suspension will remain in place until August 2019, it is the intent that the complete road closure will cease from June 2018, with the hoarding realigned to allow through traffic (for cars only) so that residents of Mary's Terrace and Beauchamp Rd (only) will be able to drive directly through to the car park at station yard. These road closures will be appropriately sign posted to ensure road users are aware of the traffic restrictions at Mary's Terrace in advance of entering this road. Specifically, signage will be erected at the junction of Beauchamp Road and

Amyand Park Road warning drivers and cyclists of the road closure and parking suspension ahead on Mary's Terrace. This will be agreed via the traffic management order for the road closure. Alternative parking for residents (of Mary's Terrace and Beauchamp Rd) will be provided on Network Rail land off Station Yard although it has been agreed that additional residents parking will be secured (by the highways authority) on other local roads (including Amyand Park Road, Beauchamp Road and Cheltenham Avenue) by converting current pay and display bays and yellow lined bays for the duration of the parking suspension on Mary's Terrace. Hoardings against the footpath and across the carriage way and any acoustic screening identified from the Section 61 assessments will be erected during daytime hours to segregate the work site from the public. The 1.2m wide pedestrian route along the footpath and to the London Road stairs will be retained (and will be provided with lighting to highways standards), whilst this closure is in place. There will be appropriate signage applied to the hoarding at each end to request that cyclists dismount and walk with their bikes through this pedestrian route in order to mitigate against conflict with pedestrians.

5.4 Detailed Main Construction Works

The main works consist of the construction of the construction of Blocks A&B, the over rail podium, the new station concourse and the creation of six retail units.

5.4.1 Demolition of Existing Ticket Hall

Once the TTO is operational and pedestrians are diverted to enter and exit the station via the Temporary Ticket Office, the existing gantry footbridge can be blocked off where it goes down to platform 2/3. The asbestos surveys can commence to the ticket hall and the soft strip out of the existing ticket hall can commence. Ticket machines will have been relocated to their new position. Demolition will occur during the daytime, Monday to Friday. Demolition materials will be segregated with inert hazardous and hazardous materials being separately disposed of to appropriate registered disposal sites.



Figure 15: Demolition of the Existing Ticket Hall

5.4.2 Contiguous Piling

Once the existing ticket hall has been demolished using hydraulic demolition equipment during the daytime, contiguous piling will start to the junction with London Road. A Continuous Flight Auger (CFA) rig will be used. A piling mat will be created adjacent to the slope to the north of the old ticket hall to allow the piling rig to work on a level surface adjacent to the slope. There is a possibility that the pile arisings adjacent to the slope where the bicycle racks currently are, will need to be removed from the site as contaminated waste as they may contain roots of Japanese knotweed. Each pile will produce about seven cubic metres of material that will bulk up to about eleven cubic metres. A 360degree excavator will load the arisings into bulk containers for removal from site. The contiguous pile retaining wall will be constructed using 600mm diameter piles along London Road. This wall will be linked to the existing bridge abutment. This work needs to be carried out prior to the area reduced dig so that the highway support can be maintained.



Figure 16: Contiguous Piling and Mary's Terrace Road Closure

The reduced dig will commence once the existing ticket hall has been demolished, in accordance with an approval in principal from the Highways Authority, which will be progressed prior to the main works starting. Raking temporary support members will be installed in trenches perpendicular to the contiguous piled wall to support the top of the ground beam to the top of the wall.

5.4.3 Reduced Dig and Demolition of Retaining Walls

All construction access to the construction site on Mary's Terrace will be via the Station Yard / Railway Approach entrance to Mary's Terrace under the control of a trained Traffic Marshall. The hoarded area will be gated at the western side of London Road bridge to provide security. The eastern end of the Mary's Terrace construction area will have an acoustic hoarding 6m high. Slew restrictors will be fitted to the excavator to prevent over-sailing of the Network Rail boundary or the pedestrian areas open to the public unless under the control of the Traffic Marshall, who will also be a trained banksman.

There is a one metre difference in height between Mary's Terrace and Track Five

with Mary's Terrace being higher. To facilitate piling the existing retaining wall will need to be removed and the level of part of Mary's Terrace will need to be reduced to take the loading from the reduced height piling rig. Once hoardings are in place trackside and roadside the works to enable the piling will be instigated. These works will be undertaken between 8am and 6pm Monday to Friday and Saturday 8am to 1pm unless there is a Twickenham Event, using excavators fitted with breaker and munch attachments and diamond bladed saws.

Piling near to fibre optic cables is only possible due to the test moving of the fibre cables that are immediately the other side of the retaining wall. Fibre optic cables are currently about three metres from the track along the length of Mary's Terrace.



Figure 17: Reduced Dig and Demolition of retaining walls

At the same time the original station forecourt will start to be reduced in level. Temporary props will be required to support the top of the contiguous wall. Hydraulic crushers and diamond saws will be used to demolish the 4.8m high concrete retaining structures. This work will be undertaken between 8am and 6pm Monday to Friday and Saturday 8am to 1pm unless there is a Twickenham event. Until tests have been carried out on the concrete of the wall, Osborne are unable to precisely determine how many days it will take to remove all of the original retaining elements supporting the station concourse. Methods that keep vibration



to a minimum will be used, to minimise damage to the existing bridge abutment and reduce noise and vibration impact to local residents. This will involve the installation of a contiguous piled wall with raking diagonal shores to stop any significant movement in the footway. These temporary works will be agreed with Highways (via an application to be made to the agreed timescales in advance of the works commencing) to a specification previously agreed with the project's Structural Engineer.

Figure 18: conveyor belt in enclosed area to sort ACMs

The site has asbestos containing materials (ACM)s in some locations, the roof to the existing pedestrian gantry over the tracks is made of asbestos cement and waste off cuts have been found at ground level within the top soil. Also early troughing routes through the site from Moor Mead Park were contained in above ground circular ACM ducts. Historically the troughing route was been replaced through the site but the original material was scattered at the then ground level and is buried in the ground.

Due to the potential quantities, the ground material requires to be sorted to remove the physical pieces of asbestos. A typical set up will be to use an enclosed sorting station fed via a conveyor belt. The specialist removal company will provide all necessary documentation; CDM information, Mobile Treatment Permits, HSE Notification for NNLW, ALO etc.

5.4.4 Piling Works

Continuous Flight Auger (CFA) piling will occur in the area of block A once the pile mat is in place. The pile mat will need to be rolled which does create low frequency vibration whilst it is being compacted. For the main construction stage conventional CFA piles of 600mm diameter of about 25m length will be installed using standard piling rigs and techniques, as these are located outside of the Network Rail zone.

Additional piles will be installed in the area between block A & B to support the future tower crane to be used during the main works.



Figure 19: Works to Block A Piling and Mary's Terrace

The Piles to Mary's Terrace will be constructed using a special reduced height, piling rig which cannot topple over on to the railway. Piling will occur during daytime. Pile arisings will be removed using a 360 degree excavator, with the material being directly deposited into a lorry.

5.4.5 Footbridge Removal

With the temporary footbridge being operational the old footbridge can be prepared for removal. The bridge will be fully scaffolded to will allow the bridge to be safely demolished without any of debris falling on to the track. The existing

station footbridge, stairs to the platforms and out of hours gantry adjacent to London Road is to be dismantled during August 2017 and removed from site during the T3 possessions of the railway lines in September 2017. This can only be removed once the new temporary footbridge is completed and is fit to be used by passengers.

The bridge roofing and some cladding panels are known to contain asbestos and therefore prior to any demolition a detailed survey will be carried out by a competent independent consultant, to confirm the extent and grade of the asbestos.

Should further asbestos be identified, this will be advised to the demolition contractor and, if identified as notifiable, to the HSE in accordance with the Control of Asbestos Regulations 2012.

The appointed demolition contractor will be a member of the National Federation of Demolition contractors, fully licensed and insured for asbestos removal and demolition. A detailed method statement for the controlled removal of the asbestos and the bridge will be prepared by the specialist and approved by Network Rail, prior to commencement. A copy will be made available to the Local Authority on request.

In preparation for the removal of the bridge it will also be necessary to soft strip the interior, including any non-essential services, and the advertising boards. This will be carried out during station closure hours.

Once the bridge is closed to passengers, the appointed mechanical and electrical contractor will disconnect all power and communications links to the bridge, stairs and canopies, ready for demolition.

The main spans of the existing bridge are made up of four separate deck structures bolted together, plus the fifth span for the out of hours gantry. The bridge will be disassembled and lifted off site in these five spans. The concrete steps to the platform stairs will be sufficiently removed to allow disconnection from the bridge spans by cutting. The railway track and services beneath the footbridge will be protected from debris using polythene and sleepers, which will also provide access for the mobile access equipment and plant.

The roofing, cladding and windows will first be removed in sufficient quantities to gain access to the bolted connections and reduce the weight of the bridge for lifting; this will be carried out using scaffold access from track level. The sheeting and any affected insulation will be double bagged and secured on the floor of each deck for subsequent removal. The bridge deck itself is formed of surfaced precast planks. Surfacing will be cut and the planks will be removed using lifters working from one end to a lifting position, to reduce the weight of the bridge spans to be lifted from the car park.

The out of hours gantry will be stripped of planks manually and temporary scaffold trestle supports erected beneath it. It will be broken into three or four sections and lifted off during specific T3 possessions. Mary's Terrace will already be closed to vehicles, but it will also be necessary to close the public footpath and staircase to London Road for the weekend whilst this gantry is removed. The entrance to the staircase and gantry will be fenced off and a working area created at London Road to prevent public access whilst the demolition progresses.

All the remaining asbestos sheeting will be double bagged and removed by the licenced contractor to a waste disposal centre licensed to take this hazardous material. Details of this will be included in the Site Waste Management Plan for the project.

The piers supporting the main spans and staircases will then be removed using a long reach 360 degree excavator with a hydraulic, munching attachment. The material will be loaded directly into wagons where reach allows or by dumper to a stockpile area.

Finally, the redundant foundation pads and platform walkways will be removed using the excavator and muncher. These works will be carried out behind the track hoardings and in normal hours, with waste removal across the Tracks 3 and 4 in ROTR possessions.

5.4.6 Pile Caps and Columns

As piling continues in the area under block B, the areas under block A will have the piles tested for integrity. Piles will be cut down and reinforcing for pile caps and shuttering will be installed. The first tower crane will be erected once the piled base has reached its working load. The pile cap on Mary's Terrace will be substantially out of the ground so that it can act as a retaining wall to the road. Having a raised pile cap will also enable the pile cap construction to avoid steel sheet piling, preventing movement of the rail tracks. Omitting this work will also reduce potential noise to local residents.



Figure 20: Block A pile caps piling – Tower crane and Mary's Terrace pile caps

Piling works will start to commence to the island site between Track 4 and 5. This will be accessed from the Main Site for equipment. Access will occur at night for the piling rig, which will operate during the day.

A temporary materials bridge/gantry will be constructed to the west of the London Rd bridge, over the railway to link the island site to a condoned off area of Station Yard car park. The availability of 15 residents parking spaces and access to will be maintained (except for 1 day of line painting in December 2017 when 9 spaces will

be available). The gantry will be used to remove piling arisings and other excavated materials from, and to supply concrete to the island site. It will be operational during normal hours and from December 2017 to June 2018. The use of the gantry will reduce the reliance on access to the railway during RotR possessions, reducing the risk of noisy works at night disrupting local residents at night.

The piling adjacent to the track next to Track 3 will have the both the piling and arising removal done during daytime. Removal of the pile arising will be dependant upon the quantity of water in the material it may need to be put in a bunded area to dry out using a 360 degree digger. When the material is sufficiently dry it will be deposited into waste removal container for subsequent removal when full.

The elevation along Mary's Terrace opposite the hotel will require a retaining wall to support the carriageway. The existing retaining wall will be removed prior to the piles being installed along the line of the retaining boundary wall. The continuous pile cap design, approved in principal by the Highways Authority, has been partially raised out of the ground to act as the retaining wall. The large wall columns are then cast above the pile caps and are clad in brickwork. The brickwork will require a full masonry scaffold and the suspension of parking until this elevation is complete. Mary's Terrace will not be used for access to the island site, as this would prolong the through route closure of Mary's Terrace.

5.4.7 Trackside Pile Cap Foundations and Drainage

The raft pile caps are reinforced cast in-situ concrete elements designed to spread the loads to the piles and to resist possible impact from trains in accordance with Network Rail standards, where they are within 4.5m of the track.

The raft pile caps have been intentionally raised to limit excavation depth next to the rail tracks to minimise the risk of undermining them. The cut off level of the piles will be approximately 300mm below ground level. Outside of the Network Rail zone of influence the pile caps will be deeper, typically 1200mm deep.



Figure 21: Block A Frame and Island Pile Caps

Once completed, the pile mat will be removed using a 360 degree excavator to

the required level and any redundant fill materials stockpiled locally or removed from site.

The piling mat finished level will be constructed as close as practicable to top of pile level to minimise the length of piles to be cut down for pile cap construction.

Piles will be broken down in accordance with the Code of Practice from the Federation of Piling Specialists using a low vibration technique such as the Elliot system, which mitigates risk to operatives.

All below ground drainage and pile cap construction will take place within the hoarded site areas. The surface water drainage from the raft is to be connected into new manhole SW06 which outfalls into the River Crane. The formation will be blinded with concrete to give a clean surface to enable the pile caps to be constructed.

Reinforcement cages will be pre-fabricated and delivered to site and timber shutters erected to approved temporary works designs, with dowel tubes and starter bars to receive the vertical walls and columns. Pile caps will be poured using ready mix concrete and mobile concrete pumps, connected to the static pumping main to serve the island areas. A crossing from the main construction site will be erected each night to span the third rail, so alteration will not be required.



The foundations have been designed to minimise the depth of excavation required against the operational railway lines. Some excavation will be required to prepare for the pile caps to be constructed, as well as for the bored piling, to remove obstructions, install drainage and other services. The overall duration of these activities is dictated by the restricted access and work area in the Island; the works in Mary's Terrace and the Car park will progress concurrently. By erecting the hoardings the piling, drainage and foundations can progress within normal working hours, with only deliveries and waste removal from the island, taking place during ROTR, using the track crossing as previously described.

In accordance with planning condition DV 42 (ref. 11/1443/DD09) the following section details the intended method of constructing the foundations, including the method and equipment to be used for piling.

Figure 22; Klemm KR 709 Restricted Height Type Piling Rig

To ensure that the foundation construction minimises disruption to neighbours, an auger boring piling technique has been selected. This complies with the requirements of Network Rail train impact requirements, design loading requirements and is suitable for confined working areas. This is in accordance with good practice that states the types of piling operations that are more suitable for sensitive development in terms of noise and vibration impact.

The piles for the Island and Mary's terrace will be installed using low centre of gravity rigs, with reduced height masts i.e. the Klemm KR 709, which will give greater efficiency in these areas. Figure 22 shows an image of the piling rig to be used on the rail podium works.

These rigs and their set ups will be in full compliance with Network Rail's Code of Practice for piling adjacent to the running line. The auger head on these rigs is short, mitigating the risk of retained materials dispersing as it is withdrawn from the bore. Preparation for the piling rigs and the associated piling mat will require an excavation, filling and a compaction process to form a firm level working platform. This will involve the use of 360 degree excavators fitted with slew restrictors to prevent encroachment within 3m of the nearest rail, in compliance with Network Rail standards. The piling mat will be designed, checked and approved by Network Rail prior to commencement; fill materials will then be placed in and compacted in layers in accordance with this design. Once a sufficient area of piling mat is completed the piling rigs and associated equipment will be delivered to the work sites.

The existing ground conditions of the site indicates made ground over Kempton Park gravels and London clay; the Kempton Park gravel is classified by the Environment Agency as a principle aquifer. These ground conditions and applied loads for railway impact lead to the selection of traditional rotary bored cast in-situ non displacement piles of 600mm diameter into the London clay to depths of about 25m. Due to the ground conditions, temporary casings will be required through the gravels and made ground and in the zone of influence for the London Road bridge abutment. The pile reinforcement will be de-bonded in the cut off zone to enable passive breakdown to finished level.



Figure 23: Concrete Frame: Pile Caps to Island

Throughout the piling operations the railway tracks will be monitored daily for movements in accordance with a plan to be agreed with Network Rail. Vibration monitoring at sensitive neighbouring receptors, including London Road Bridge, Mary's Terrace and the Travelodge will also be carried out throughout the piling as agreed in the Noise Vibration Management Plan (NVMP). As stated within the NVMP, all monitoring will be carried out in accordance with Informatives NI 13, 16, 17, 18, 19, 20 and 21.

The Demolition Construction Method Statement also details the projects noise and dust strategy in respect of piling and transportation of materials throughout the works.

An attendant 360 degree excavator will remove spoil and lift in reinforcement cages for the piles. Ready mixed concrete will be delivered to the piling operations by the road directly to the main construction site and Mary's Terrace. Concrete will be pumped to the island site using a static concrete pump from the main construction site using a static pipe that will be installed over track 3 & 4 in a dual walled pipe system. Construction work to Mary's Terrace will occur between 8 am and 6pm Mon to Fri and Sat 8am till 1pm. Removal of equipment & bagged up spoil from the island site will occur from the west side of London road during ROTR.

Once concrete has cured to a pile, the temporary casings will be extracted using a proprietary rig attachment, unbolted and reused or removed from site.



Figure 24: The First level of Post Tensioned Concrete Frame

The concrete frame in area A will be brought up to podium level enabling the temporary restraint to the contiguous piled wall to be removed. The face of the retaining wall will now be faced up to provide a waterproof structure.

5.4.8 Columns Adjacent to the Tracks

The vertical elements of the podium raft will be cast in-situ wall panels and columns, connected to the pile capping beam with continuity reinforcement, which minimises the risk to the operational railway. There are 35 columns forming the vertical elements of the raft. Each column is 800mm thick by 3.2m long to withstand potential horizontal forces, should there ever be a train derailment.

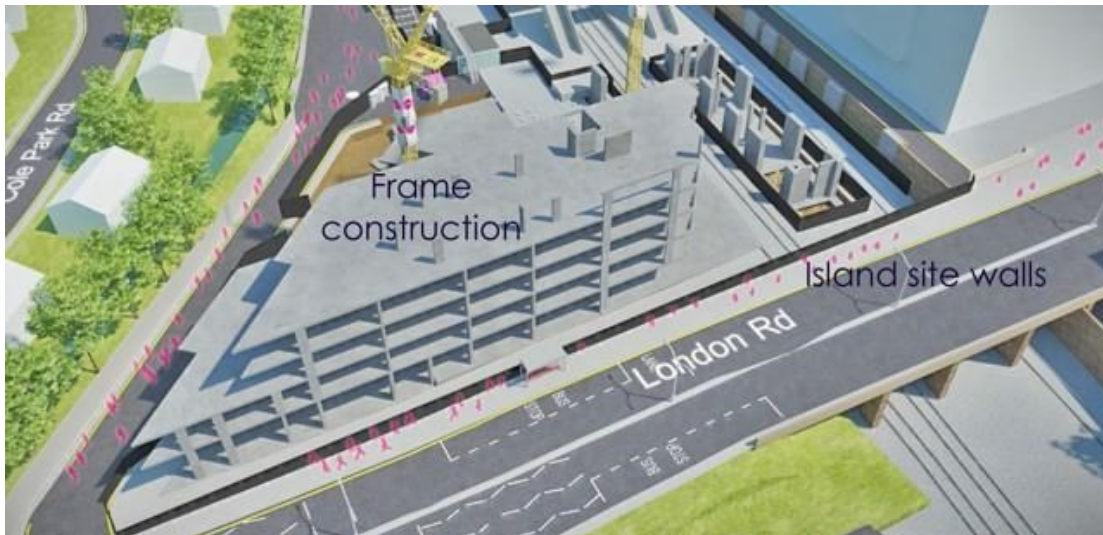


Figure 25: Completion of the Columns to the Island Site

All column shuttering and reinforcement constituents will be lifted into position in all three areas from the tower crane in the main construction area. For this reason, and in accordance to Network Rail standards for operating cranes adjacent to the railway, all the materials will be lifted in during ROTR weeknight normal possessions, with concrete being placed by static line pumps during the day.

A lifting schedule will be submitted to Network Rail, detailing each individual lift for load and crane radius. Shuttering will be subject to temporary works design and Network Rail approval. Columns to Mary's Terrace will be installed first, followed by the Island and the car park.

5.4.9 Precast Deck Beams

The deck is formed from precast beams and planks. Perimeter L shaped beams are first lifted into position between the wall columns and an in-situ concrete infill poured to join them into a frame and secure them to the top of each wall column. Firstly a movement joint is formed at the London Road Bridge parapet to separate the two structures and allow them to move independently, in accordance with a detail approved in principal by the Highways Authority. The deck is then formed from precast concrete bridge beams spanning across the tracks onto the perimeter beams, working towards the junction with the London Road Bridge and from Mary's Terrace towards the car park. Hollow core precast planks are also to be installed to the open end of the raft, which will form the future maintenance platform for block B.

All the precast beams are to be lifted into position in a similar manner using the crane sited in the station car park in pre- booked possessions of the rail in April and June 2018. As they are positioned, the horizontal gaps between the bridge beams

will be sealed with a GRP and mastic filler joint ready for the overlying concrete deck.

Once the podium structure has been completed a facing brickwork skin is to be constructed to the boundary from a scaffold erected in an area of closed carriageway to Mary's Terrace. The existing wall will be made good up to this new brickwork level and the carriageway reinstated to the original levels.

The pedestrian segregation hoardings will be removed to enable the carriageway to be reopened to public vehicles. Parking will still need to be restricted adjacent to the Travelodge Hotel to enable a masonry scaffold and protective fan to be constructed whilst the brickwork is completed on this elevation.

Mary's Terrace will also need to be closed for a short period of time whilst the wall at the other end of Mary's Terrace at its junction with Beauchamp Road is reinstated. A temporary fence will be erected trackside in a night-time possession to enable this work to be undertaken in daytime hours. This closure will be for a short period only and only once the parking spaces on Mary's Terrace are available once more. Access to these spaces will be made available from the Station Yard end of Mary's Terrace whilst this short term closure is in place.



Figure 26: Deck Slab in Position

Installation of soffit lighting, cabling and other services beneath the deck, required for railway operations, will be installed behind the beam installation using mobile access platforms from track level, again in night-time and weekend possessions.

5.4.10 Concrete Deck Slab

Once all the precast concrete beams have been secured in position and the infill strips checked, the deck will be prepared for using a concrete pump situated in the car park during normal working hours. Once the concrete deck has cured, a waterproofing membrane will be applied across the surface ready for construction of Block B. Services and the external finishes will be completed whilst the station is being fitted out. (See Figure 26 above)

5.4.11 Post Tensioned Frames

The post tensioned concrete frame will continue to be erected for Block A & B. The large span trussed steels over the concourse will be erected as individual sticks. Scaffold will start to be erected to block A to facilitate the construction of the cladding that due to its complexity can't be erected as off site elements. Structural steel framing will be erected first and clad with cementitious boarding. The scaffold will be tightly protected with Monarflex acting as a screen to prevent any materials from being blown or falling from the works. Brickwork, render and metal cladding will be installed under the sheeting and will not be visible until the scaffold is removed revealing the nearly completed facades. The fit out of residential units will progress on floor levels that are weather-tight. The station fit out will also commence when the station shell is completely watertight.



Figure 27: Erection of Steels to New Ticket Concourse

5.4.12 Completion of Station Works

A fixed bed lorry turning area will be created under the podium slab such that after vehicle have been unloaded, they can turn around before driving out of the site back onto London Road. Larger vehicles will be turned round using banksman support on the access road.

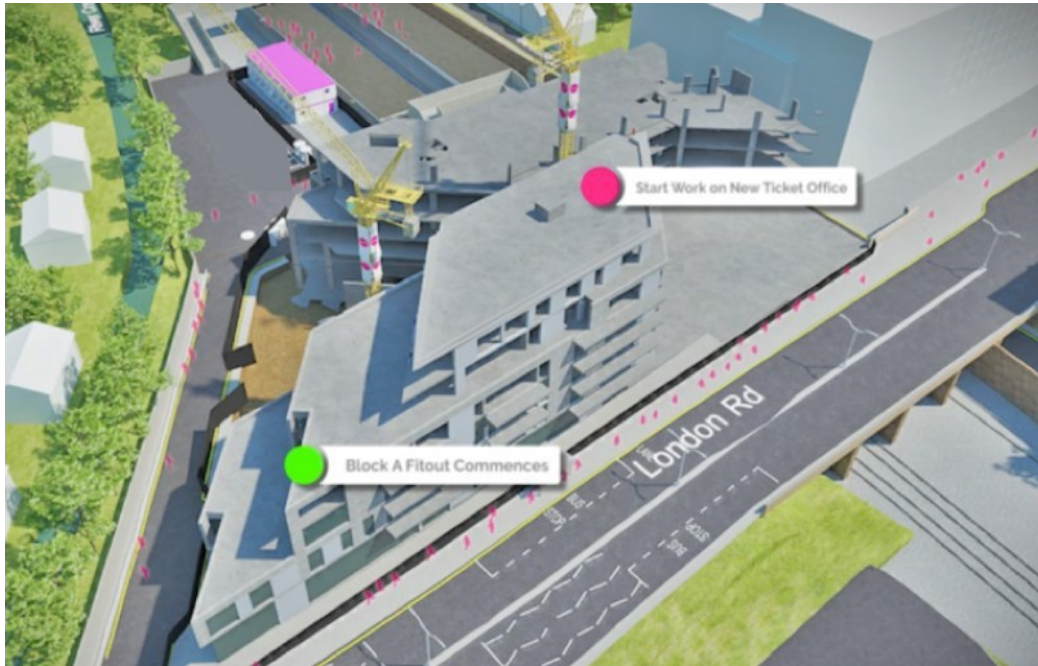


Figure 28: Start of the Station Fit Out



Figure 29: Public Realm and Station Handover

During the construction and fit out of the new station buildings an open liaison will be maintained at all times with the train operating company (TOC) to keep both the station staff and station users informed of the scope and progress of the works and advised of any changes to the current station provision including the changes during the construction of the temporary station and with regards to when bus replacement services will operate (the collection and drop off point will be at the bus stop A on London Road). Posters and signs will be drawn up in tandem with the

TOC to ensure that the correct level of information is portrayed to the station users throughout the project. The TOC may also provide notice of changes at the station via their website. This will be co-ordinated by Solum. For all areas of interface i.e. site entrances and the area at the west end of Mary's Terrace; access and egress points will be managed to ensure the minimum of disruption and safe movement of vehicles.

Materials unloaded by forklift can be transported around and, if necessary, put into storage under the podium slab.



Figure 30; Completion of Block A

This will include the provision of highways trained Traffic Marshalls and Gatemen to assist with vehicle movements. Clear signage will also be posted and maintained throughout the project to highlight potential conflict areas. Hoardings will be used to display further directions and diversions and to present relevant project information to allow members of the public to gain an understanding of the works that are being undertaken. Advance notices will also be displayed to ensure early notification of any planned changes to the pedestrian routes or hoarding lines and works that may affect the highway.

Following the completion of the fit out and commissioning of the new station building, the temporary footbridge at the west end of the platforms, to the north east of the new station concourse, will be removed and new station facilities opened to the public.

5.5 Final Stage Works - Block C

The final stages of work consist of:

- Relocation of the acoustic hoarding around the construction site
- Removal of temporary ticketing office facilities
- Erection of Tower crane for block C

- Temporary works associated with above
- Completion of pad foundation Substructure for block C.
- Installation of new service connections
- Superstructure construction block C, this will now be an in-situ concrete frame.
- Removal of temporary footbridge across the railway tracks
- Re-location of the existing bus stop to its agreed position
- Fit out of block C residential units
- Hard and soft landscaping to the public realm around block C and the access road
- M & E services associated with all the above

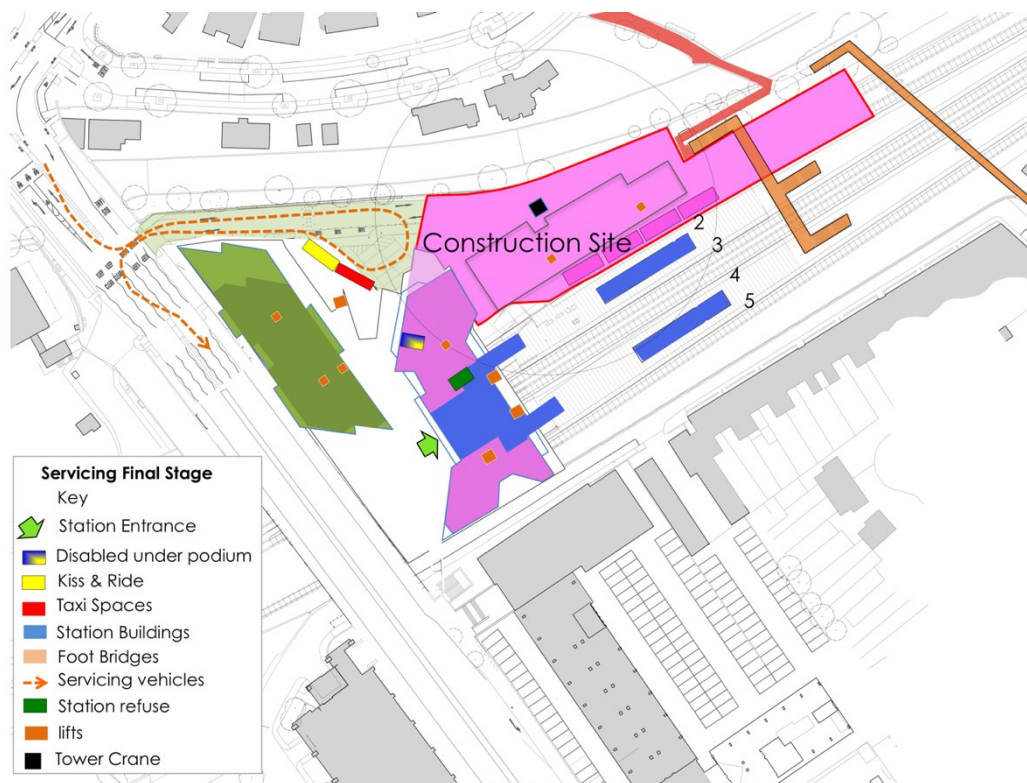


Figure 31: Final Stage Construction Site Layout

Figure 31 depicts the work areas noted above. There will be an overlap between block B completion and block C start. Once the new permanent ticket office is operational, the demolition of the temporary facility will commence. This will effectively release the remaining footprint area for the construction of block C. This block will have pad foundations. Method statements and works package plans will be developed for each element of the works to ensure the safety of the general public, railway passengers and staff.

Following completion of the groundworks and piling, and in order to complete the development a luffing jib tower crane will be in place for the erection of the in- situ frame. It will be used to lift the formwork, reinforcement and concrete in place to allow the structure to be completed and then used to assist with the cladding installation. The crane will be removed as soon as these activities are finished.

The piled base for the block C tower crane will be installed at the same time as the piling for Block B. These temporary piles will be cut flush with the surface of the tarmac ready for when this area becomes a construction site. Whilst the piling is taking place for these temporary works the area will be protected with hoarding.

All cranes used on the project will be provided with a luffing jib, and will be programmed such that they cannot lift over the railway line or adjacent properties or highways. They will also be appropriately rigged such that their lifting capacities are within the requirements of Network Rail.

For the installation of the cladding, external scaffolding will be erected to give access to all facades and the cranes will be used to lift the cladding materials to each level of scaffold. Consideration will be given to have panels pre-manufactured off site and brought as whole units and lifted into place as they are delivered. Haki staircases will be included within the scaffold to give external access to all levels.

As the cladding is installed and the building weathered, the internal fit out will commence with the installation of the services and partitions to allow the flats to be formed. External hoists will be provided on each block to allow for the vertical movement of materials up through the building to each floor. The staircases will be installed as the building structure is completed to give access for the workforce.

The main delivery area will be off the mini roundabout at the bottom of the slope for the car park access road. Deliveries will need to reverse in to the more constrained site area from the access route at the bottom of the ramp for either off-loading by tower crane or by forklift. This will enable delivery vehicles to leave the site in forward gear. A Traffic Marshall will continue to be employed to ensure the safe operation of deliveries. As the entrance to the station will have been relocated to its final position there will be reduced traffic entering this area.

Relocation of the temporary bus stop to its final location, hard landscaping and soft landscaping works will be phased accordingly with the completion of the building works.

This Demolition and Construction Method Statement will be reviewed every six months and updated if necessary in conjunction with the Section 61.

6. Sustainable Management Systems

6.1 Waste Management:

6.1.1 Construction Waste Arrangements.

For full details of the schemes waste management proposals please refer to the approved planning application ref. 11/1443/DD09, submitted to discharge planning condition NS28. This includes details on the plans recycling construction waste materials produced by the project. For clarity, there will be no bonfires or burning of waste on site.

6.2 Noise and Vibration Management

The project's noise and vibration strategy is detailed in the Noise and Vibration Management plan prepared by the projects specialist consultant.

The NS36 (ref. 11/1443/DD28) River Crane protection document, describes positioning of plant, equipment and cabins, the proposed acoustic screening measures and tree protection to River Crane. The above documentation and this DCMS complies with the requirements of informatives NI13, NI16 NI17, NI18, NI19, NI20 and NI21. With reference to IE06 Details of piling-EHO consultation, please refer to Section 5.4.4, 5.4.6 and 5.4.7 Excavation and Piling of this document and the Noise & Vibration Management Plan. For mitigation measures please refer to Section 5.2 of NS50 (ref. 11/1443/DD25) Construction Logistics Plan.

6.3 Dust Management

Osborne will produce a detailed Dust management plan in conjunction with their logistics company who will be used on the project. The Dust management plan will be in accordance with the London Plan. The plan will be produced and submitted to the council's EHO in July 2017.

6.4 Water Pollution Prevention

The site is immediately adjacent to the River Crane and the flood plane is an aquifer made up of river gravels. The river is canalised with concrete walls and base and water level at about 6-6.5m Ordinance Datum and the water table in the aquifer is at about 3-4m Ordinance Datum. As such water and ground pollution prevention will be a major aspect and consideration of the demolition and construction methodology.

Each area of the site and the main compound has existing Network Rail surface water and foul water drainage system. The surface water discharges through a network of drains running into the River Crane outfall to the north-east of the site. Foul water from the station platforms goes to the south-west of the site, to a heading in Mary's Terrace under the London Road Bridge.

Foul water from the existing ticket hall and café goes north-west into a heading in London Road.

It will be necessary to control discharge of water from site activities and surface water runoff, as well as to provide temporary diversions of water during the demolition and alterations to existing station facilities.

Osborne will take all reasonably practicable means to prevent pollution to watercourses and will follow the industry best practice and EA Guidance:

- Pollution Prevention Guidance 1 – General Guide to the prevention of pollution
- Pollution Prevention Guidance 5 – Works in, near or liable to effect watercourses
- Pollution Prevention Guidance 6 – Working at demolition and construction sites.
- CIRIA C692 - Environmental Good Practice on Site 2010. (A copy of PPG 6 will be kept on site at all times for reference)

6.5 Environmental Management Plan

An Environmental Management Plan will be developed for the project that identifies all environmental aspects and impacts and the control measures to mitigate the risks. Each task will be assessed and specific control and mitigation risks associated with that activity will be detailed. The Site Manager will be responsible for ensuring compliance with method statements and that all the measures are

being implemented effectively. Weekly monitoring will be undertaken and records kept of the results. Osborne will take the following measures to mitigate water pollution on the project:

- Existing drainage has been identified, marked up plans and displayed on site
- Fuel storage will be sited as far from receptors as practicable and in bunded tanks
- No construction activities will take place on the bank of the River Crane except acoustic and tree protection, Japanese knotweed treatment and landscaping works in accordance with approved plans.
- No storage of plant, cabins or materials within 4m of the River Crane. Wherever possible this will be extended to 10m.
- Osborne will both define and confine storage and delivery areas as far away from receptors as possible
- Any tanks or drums stored in suitable containers or bunded areas – condition regularly checked by Site Management
- Drip trays will be fitted to or used with all plant and equipment
- Covering of any open drainage grates that are within the working zone
- Hard surfacing and existing gully pots to car park to be retained and maintained as long as practicable during construction.
- Eliminate mud leaving site by road sweeping and mobile jet wash (for wheel washing) with grey water recovery system on hard standing (at appropriate locations within the site) when conditions require it.
- Sumps, and cut off trenches for excavations
- Silt traps and sumps will be used
- Designated concrete washout areas will be identified and silt traps used.
- Discharge licences for site establishment and temporary site drainage will be obtained
- Spill kits will be available at appropriate positions on site
- Emergency response plan will be prepared in the event of a spillage
- Fully secured boundary with daily inspections by a nominated boundary monitor
- Control of deliveries to and from site by the Gatemen and Traffic Marshalls
- Cover waste receptacles
- Coupled joints on all hoses and the temporary concrete pumping main to be fully encased in an outer sleeve.
- Sleeves will be used for the bored piles through Kempton gravels.
- Osborne will construct the attenuation tanks early in the works prior to the route over the attenuation tanks becoming the sole vehicular route into the under-croft space.
- Toolbox talks will be given to raise awareness of the plans to prevent pollution

Osborne will follow their sustainability policy on this project. Specific aspects relate to: -

- Minimise the environmental impact of its operations on the environment
- Prevent pollution of the environment.
- Reducing the consumption of energy
- Reducing the consumption of water
- Minimise waste production wherever

- Maximise the percentage of waste sent for recycling wherever technically and commercially practicable
- Maximise the use of recycled and sustainable materials wherever technically and commercially practicable. Including to only use Timber from FSC accredited sources.
- Increase environmental awareness of all Osborne staff
- Implement and maintain operating procedures for each business unit, which give information and guidance on achieving the above

6.6 Japanese Knotweed and Ecology Protection

An ecology report was carried out at Twickenham by Wardell Armstrong, which identified the existing ecological aspects and likely impacts on the construction of the new development, during and post construction. This was carried out in July 2010. This initial report has now been supplemented by the submission of a suite of planning condition documentation detailing the projects approach to ecology protection and treatment of Japanese knotweed.

The following sections outline the ecological impacts and protective measures that will be put in place during construction, particularly the main construction stage and how these will be monitored and reviewed. Should additional or different measures be required for the final stage these will be included in later updates of this document.

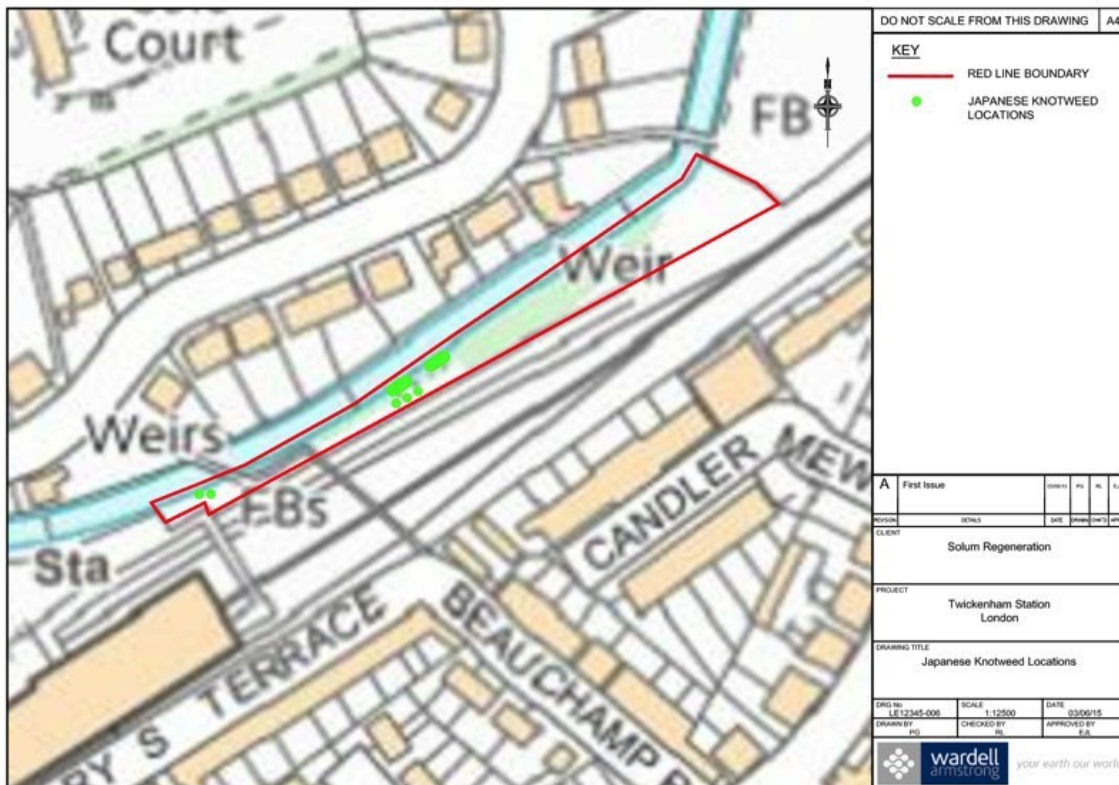
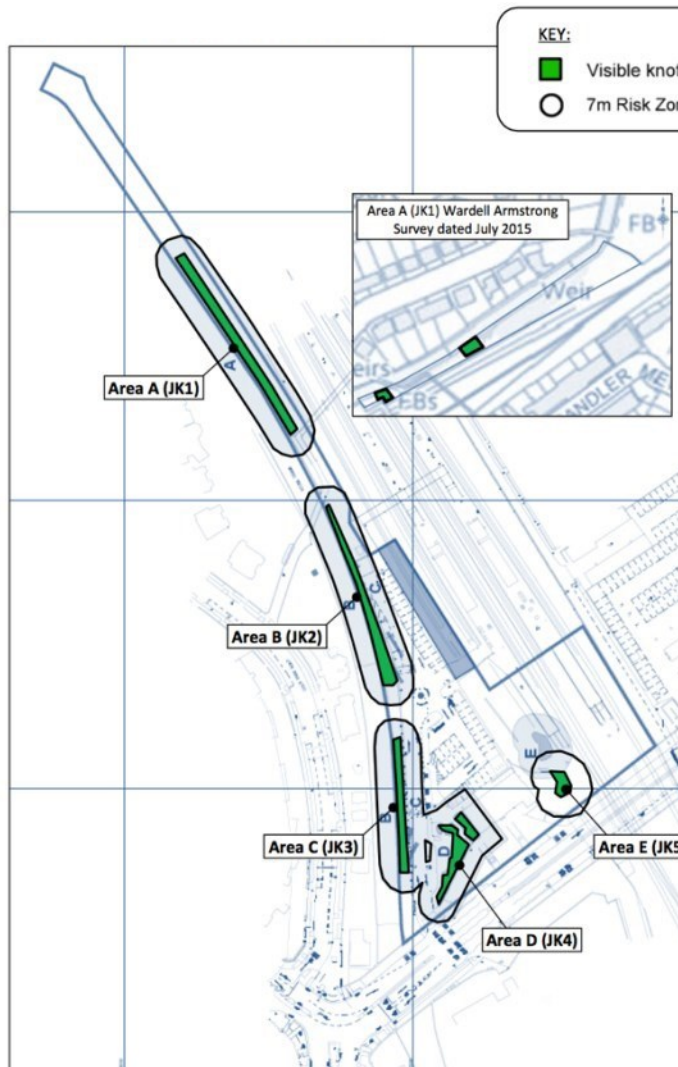


Figure 32: Japanese Knotweed Surveyed July 2015

6.6.1 Japanese Knotweed

To ensure compliance with planning condition NS39 (ref.11/1443/DD10 & 11/1443/DD21) a site inspection and report was commissioned by Solum

Regeneration in July 2014. This was further to an initial report that identified five areas of Japanese knotweed on the scheme: Initial treatment has now been carried out and a further addenda report has been produced in July 2015 identifying Japanese knotweed.



A) Along the riverbank east of the site, beyond the car park in the area to be used for the riverside walk and play area.

B) Two areas along the bank of the River Crane, behind the boundary wall of the car park

C) Potential rhizome extent car park side of this boundary wall

D) Adjacent to the station building and cycle racks

E) At track level between the underpass and the station building, near the existing footbridge.

Figure 33 showing the location of the above referenced areas

6.6.2 Tree Protection

With reference to planning conditions NS40, NS61, NS75, LT03, LT15, and U46976 (ref. 11/1443/DD11 and 11/1443/DD22) qualified arboriculturalists and landscape architects have been employed by Solum to develop the design, to discharge planning conditions, to produce and agree a scheme for tree and root protection and to monitor compliance and effectiveness of works on site in accordance with Section 7 of BS 5837:2005 Trees in Relation to Construction – the Tree Protection Plan.

The Wardell Armstrong arboricultural reports submitted by Solum addresses the above.

All site works will be carried out in strict adherence with the above report. The protection of branches, roots protection, soil compaction and fencing protection are clearly defined and the appointed contractor will comply with the report's

recommendations.

Monitoring for compliance with the report during construction will be carried out as detailed in LT15 (ref. 11/1443/DD11 and 11/1443/DD22) and Section 3 of the arboricultural report.

6.6.3 Other Ecology

Ecology surveys, including the Bat survey, have been carried out by Wardell Armstrong. With reference to NS 42 (ref. 11/1443/DD10 and 11/1443/DD21) an updated Bat Survey was carried out in June 2014 and May 2015. The published final reports provide an assessment of the bat assemblage on site. The reports take cognisance of NI 11, Bat Habitats.

The recommendations of the above reports will be strictly adhered to by Osborne during the construction phase.

The species of flora and fauna that needs to be protected is confined to the river bank and riverside walk areas, these will have limited landscape works in the construction of the play area and riverside walk. This will be carried out during the main phase of the project, to comply with planning conditions.

Osborne have an environmental management system certificated to ISO 14,001 and an environmental management plan will be prepared for the project, which includes aspects, impacts and mitigation measures specific for the scheme.

6.7 Communication Strategy

Osborne will communicate and liaise directly with the necessary departments at LBRuT and other parties with regard to the construction works and statutory requirements for the project. The Project Manager will be responsible for ensuring compliance with planning and statutory requirements for all aspects and phases of construction and for updating this method statement to reflect these.

A Community Liaison Officer (CLO) will be appointed for the project, who is not employed by the Contractor, and a community liaison strategy has been submitted by Solum Regeneration to the LBRuT for approval (Reference Section 106, Part 10). Details on the CLO and how they can be contacted are available via the project website (see below).

Osborne will register and manage the site under the Considerate Constructors Scheme, best practice code and standards. Osborne will exceed the standard set by the scheme, wherever practicable

Osborne will nominate a member of the permanent site staff to act as primary contact for community liaison issues and will comply with the requirements of the community liaison plan and this key contact will be communicated to local residents. A log will be maintained on site of any issues raised and actions taken.

The project manager will produce monthly progress reports on the project that will be incorporated into the reports from the CLO and will take part in monitoring group discussions and meetings.

Letter drops to update local residents and organisations on the construction progress, planned works and advance notifications of out of hours working or special activities (possessions, changes to parking arrangements and road closures etc.) will be issued at regular and appropriate intervals, at key milestones and in

advance of works which may be disruptive to residents (including any prompt consultation on any last minute changes to the programme). Communications will also be channelled through Solum's website . www.twickenhamforward.com which allows local residents and passengers to sign up for updates about the scheme.

7.0 Cumulative Impacts

The impact of the newly opened residential scheme over London Road (Brewery Wharf) should not need to be reviewed.

From the information received all works on the Brewery Wharf site will be completed prior to spring 2017. It is therefore considered that any cumulative impacts of the projects will not occur.

At this juncture it is also proposed to carry out a similar review with LBRuT if any other new developments emerge within close proximity of the redevelopment that may need to be considered.

8.0 Documents Referred To

Appendices

Solum Twickenham Summary Programme PV9 revision 5

Solum Twickenham Swept Path Diagrams V3

Demolition Construction Logistics Planning Images V10

Below are the condition documents referred to within the DCMS and their relevant Council planning reference numbers. Some of the conditions were partially discharged in two phases – hence the two references:

- NS23 – Service management plan (planning application ref. 11/1443/DD25)
- NS24 – Car park management plan (planning application ref. 11/1443/DD09)
- NS25 – Taxi Parking Management (planning application ref. 11/1443/DD25)
- NS26 – Emergency procedure plan (planning application ref. 11/1443/DD25)
- NS27 – Traffic and Pedestrian Management (planning application ref. 11/1443/DD19)
- NS28 – Site Waste Management Plan (planning application ref. 11/1443/DD09)
- NS34 Archaeology (planning application ref. 11/1443/DD01)
- NS36 – River Crane Protection (planning application ref. 11/1443/DD28)
- NS39 – Japanese Knotweed (planning application ref. 11/1443/DD10 and 11/1443/DD21)
- NS40, NS61, NS75, LT03, LT15, and U46976 - Tree Protection (planning application ref. 11/1443/DD11 and 11/1443/DD22)
- NS 42 – Bat Survey (planning application ref. 11/1443/DD10 and 11/1443/DD21)
- NS47 – Details of temporary bridge (planning application ref. 11/1443/DD26)
- NS48 – Details of disabled access (planning application ref. 11/1443/DD25)
- NS53 – Diagonal Gantry Making Good (planning application ref. 11/1443/DD26)
- NS50 – Construction Logistics Plan (planning application ref. 11/1443/DD25)
- DV42 – Details of foundations (planning application ref. 11/1443/DD09)