Old Oak Common Interchange: A Supporting Submission to HS2

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Section 1.0 - Executive Summary

Rail demand in London has seen significant growth in the last decade. This growth has created capacity issues on both underground and overground rail services serving the capital. Parsons Brinckerhoff (PB) has developed an outline proposal for a major public transport interchange in West London in the area of the former Old Oak Common railway sidings to assist in relieving this congestion and maximizing the output from the existing railway.

The London Borough of Hammersmith and Fulham, which is the planning authority for the site, is highly supportive of the proposal and the interchange has the ability to meet the objectives of a diverse set of stakeholders from National to local level. Following Government proposals for a second High Speed Line in the UK (HS2), the team tasked with developing HS2 requested further information regarding the Old Oak Common interchange.This was with regards to best serve Heathrow. This report addresses the specific points requested by the HS2 team which are weighted toward the servicing of Heathrow airport and the ability of the Old Oak Common interchange to house an HS2 station. The report confirms that the interchange:

- Has the potential to link a significant number of railway destinations with minimal new infrastructure requirements;
- Provides a high degree of connectivity for Heathrow passengers without significant on-airport construction;
- Is consistent with the local planning authority's regeneration plans for the area and would act as a major enabler for regeneration over a 50 hectare site;
- Would cost in order of £750M to develop;
- Would deliver major benefits both locally and to UK PLC, including:
- Journey time savings to passengers accessing Heathrow by public transport;
- Congestion benefits to users of London Underground and a range of overground rail services;
- Increased rail revenue resulting from further mode shift to rail;
- Strengthening the case for Crossrail western services;
- Increased flexibility during maintenance and renewals; and
- Regeneration of a major opportunity area.
- Is constructable without major impacts on existing users;
- Is likely to generate potential funding as a result of associated major development opportunities;
- Has a high degree of synergy with the needs of Heathrow access and meeting the Government's sustainable transport agenda;
- Has the potential to add to the public transport surface access offer at all of the South East's major airports; and
- Would provide a focal point for future London Overground orbital rail services.

This report has been submitted to Government's HS2 team to assist in their considerations of serving Heathrow by a new high speed rail service between London and the North.

Section 2.0 - Old Oak Common Interchange Review

Introduction

In parallel to Government's investigation into the potential route for HS2 a number of 3rd parties have investigated the drivers for and benefits of hub railway stations in the quadrant described by the M3 and M40 motorways. The DfT has asked these 3rd parties to provide a commentary on their proposals, how they would operate with HS2 and how they would support access to Heathrow. What follows is the description of the option developed by PB for the site at Old Oak Common (the Parsons Brinckerhoff Option).

The following sections provide background to the rationale for investigating the Old Oak Common site as a potential interchange for 'classic' rail services serving the West of London and a review of how this site would serve both Heathrow and HS2.

Background

The historic link between the growth of the economy and transport demand has resulted in a sustained increase in rail passengers travelling on the radial routes into and out of London. This has placed a high degree of pressure on both regional commuter routes and the main strategic arteries serving London. Demand for travel on the London Underground routes that distribute passengers from the capital's main rail termini has also seen an apparent ever upward trend.

National and regional policy is moving to break the link between the economy, transport and emissions by more sustainable planning and investment policies, however this move will take a number of years to be fully realised. This creates a pressure to develop solutions to the issues of overcrowding and congestion that are straightforward to realize, scaleable, can maximize use of existing infrastructure and available capacity, meet the broadest range of objectives and offer high value for money.

Parsons Brinckerhoff has a long held view that 'through-traffic' crossing London puts an unnecessary pressure on the London Underground network and that this is something that could be addressed by the development of a series of transport hubs in inner and outer London. These have the potential to:

- Take the pressure off of major London termini by routeing trips onto other existing links;
- Allow more intensive use of existing and new orbital links such as the East London Line and West and North London Lines;
- Act as a major regeneration force creating housing and employment;
- Assist in promoting access to airports by public transport; and in the future
- Allow better use to be made of the western section of Crossrail.

PB believes that these benefits are best delivered in the 'Western sector' by the site where the West London Lines cross the Great Western Main Line. This is just East of the Old Oak Common sidings and the former Eurostar Depot at North Pole. This site offers a number of opportunities:

- Physically connecting the intersection of the Great Western Mainline and the West and London Lines (also giving access to the West Coast Mainline and North London Lines) by creation of a rail interchange;
- The opportunity to locate a Crossrail station on the site (with potential for this to form an alternative turnback point for those trains not continuing to Heathrow or Maidenhead);
- Long term potential as a site for a terminus or interchange station for High Speed 2 trains;
- The ability to stop Heathrow Express trains that along with Crossrail offer the opportunity for the site to create a major interchange serving Heathrow airport (it takes around 12 minutes to travel from the site to Heathrow Central Station and 17 minutes to Terminal 5);
- Linking rail to a significant density of bus routes in the area allowing good onward non rail public transport opportunities; and
- The realization of the significant regeneration potential offered by the Old Oak Common and Willesden Junction area.

The Site

The site of the proposed interchange station is at the crossing of the Great Western Main Line (GWML) and the West London Line (WLL) in the area of the former Old Oak Common carriage sidings. This is just East of the former Eurostar Depot at North Pole and is shown in the wider West London context in Figure 1. While the site of the station is described by the point where the GWML and WLL cross there is a larger area of opportunity for development bounded by the North London Line (to the West) and the West Coast Main Line (to the North). This wider area is typified by:

- Light industry;
- Warehousing;
- Car breakers;
- Waste recycling companies; and
- Old railway sidings (Old Oak Common).

There are some continuing and proposed further rail uses in the area:

- The Heathrow Express train care facility;
- First Great Western's HST maintenance facility;
- A proposed Crossrail depot; and
- A potential facility for IEP trains at the former Eurostar depot at North Pole.

In terms of the wider context of the site the development area is cut in half by the Grand Union Canal with the 'railway lands' to the South and the light industrial area to the North. To the West is the Park Royal industrial area. The remaining areas surrounding the site are typical of this part of London with urban mixed use development containing a high proportion of residential use. South of the GWML there are a number of large institutional uses (Hammersmith and Queen Charlotte hospitals and Wormwood Scrubs prison) and the large recreational space of Wormwood Scrubs itself. The site is just under 5 km by rail from Paddington and approximately 19 km by rail from Heathrow's Central Terminal Area railway station.

The Station

The station comprises a two level rail interchange with an associated bus and coach station. This interchange would also allow for taxi and private car pick-up and drop-off. At this stage the provision of long term car-parking has not been considered. Highway congestion in the West London quadrant is a key issue for a number of stakeholders and the ability of the site to absorb any degree of 'park and ride' activity would be a matter of planning with the relevant authorities and statutory consultees.

The rail station will be comprised of a 'low level' station on the Great Western Main Line and a 'high level' station on the West London Lines. Figures A.1 to A.5 in Appendix A show the station and bus interchange layout in plan. The low level station would be constructed with an upper level concourse above the GWML platforms, this concourse would be accessed via high quality vertical circulation. The GWML concourse would then link to a similar arrangement above the high level station on the WLL. The high level station would be linked to the bus and coach station. Figure A1 shows these arrangements in section.

The low level station has a pair of island platforms for HS2. These would share station arrangements with the low level station concourse, this could be segregated from the operations associated with non high speed operations if required by the service operators. Both the low and high level stations allow for through lines that by-pass the station and permit the running of non-stopping services and freight without impact on station operations.

It has been assumed that Crossrail stabling arrangements would remain as planned and the interchange arrangements allow for multiple access arrangements to the proposed depot. Those Crossrail trains terminating at the station (at their westernmost point of operation) would use the island platforms for boarding and alighting and would be turned around using either turnback facilities to the West of the station or by use of bi-directional working. This would be a matter for detailed planning and would depend on the requirements of the route.

It has been assumed that Heathrow Express trains would stop at the station to allow interchange with the wide range of other services available. Access to the HEX and Old Oak Common train care facilities would be unchanged unless the station development was able to bring about sufficient betterment to warrant change.

Road Links

The closest road link serving Old Oak Common is the A219 (Scrubs Lane) which runs North – South along the Eastern edge of the site and which connects to the A40 South of the site and the A406 North Circular North of Harlseden. If Old Oak Common was to become a major station on the HS2 route then it is a fair assumption that it would require access to the main Transport for London Road Network and the HA's motorway network beyond.

This would be necessary for both passenger and staff access as well as servicing of the site. In this case it has been assumed that a link would be taken from the A40 at North Acton (where there would be a new highway junction) into the Old Oak Common site. If at all possible this would be combined with the approach route of HS2 in order to create a single transport and utilities approach corridor for the site. Connection into the A40 would permit direct access into Central London as well as access to the North / South Circular and the M25.

While the proposed connection from North Acton would provide access to an HS2 station it should be made clear that one of the major attractions of the Old Oak site is the inherent connectivity of the site by public transport. The density of rail services in the area would make this location highly accessible by rail and so reduce the need for private vehicle access and so lessen any associated impacts on the existing highway network.

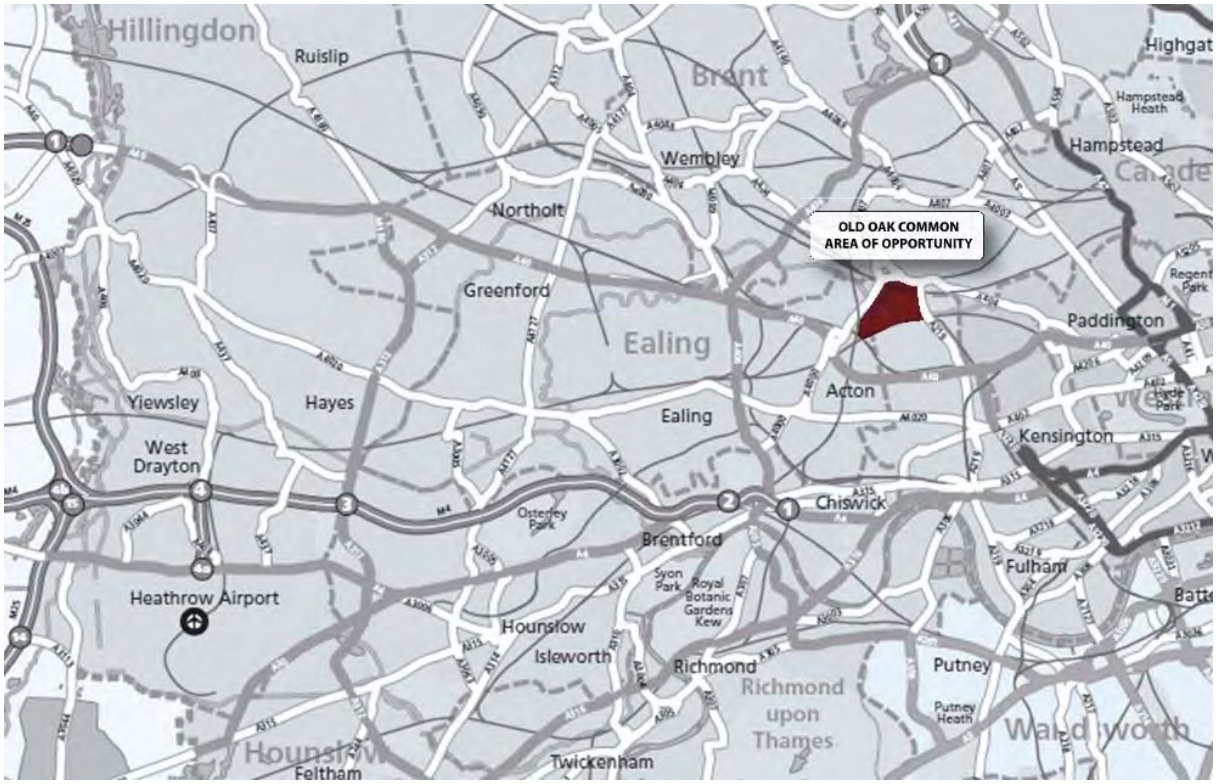


Figure 1 The Old Oak Common Interchange site in relation to West London and the Transport for London Road Network

Rail Connectivity and Services

The Old Oak Common area is cut through by four different heavy rail corridors. It can be argued that until now the communities surrounding these corridors have seen very little direct benefit. As described above the PB proposal is to construct an interchange station linking platforms on the GWML (the low level station) and the West London Lines (the high level station). Development of a hub on this site could create one of the best connected and most sustainable communities in the UK.

The total potential connectivity for the site is shown in schematic form in Figure 2, the existing, committed and future potential lines overlain on the local topography are shown in Figure 3 along with an outline of the hub's two station 'boxes'. The lines that would be connected by the hub if it were constructed are:

- The Great Western Main Line providing access to Central London, The West and Wales and Heathrow airport;
- The West London Line connecting to Clapham Junction and the Brighton Main Line providing access to Gatwick airport and the East London Line as well as Victoria and Waterloo Main line stations (in the future);
- The North London Line (via the West London Line) providing access to North London and Stratford; and
- The West Coast Main Line (via the West London Line) providing connections to Watford and the North West.

The hub also provides a logical terminus station for those Crossrail services that would otherwise be turned back at Westbourne Park. This would provide a high frequency link into Central London and add further relief to the Central Line and long term station pressures at Paddington.

Although not currently connected there is also a long term opportunity to create a link between the West London Line and the Chiltern and Midland Main Line routes to Aylesbury and Birmingham and Luton and beyond. This is the only wholly 'new' link proposed by the hub but provides further opportunity for offering longer term capacity relief for Marylebone and St Pancras stations and the Bakerloo Line. The wider area of opportunity is also served by the Bakerloo line at Willesden Junction which is currently a ten minute walk from the proposed station and which could be made more accessible by integration into the wider area Masterplan.

Providing connectivity to such a breadth of strategic and suburban routes (including London's orbital Overground Network) would provide:

- Significant onward distribution opportunities for an HS2 station;
- Revenue strengthening for Crossrail;
- Relief to London Underground Limited (LUL) services by the removal of through trips currently using the main London rail termini and London Underground;
- An opportunity to review the role of some major London termini by the redirecting of either intercity or suburban services to the hub; and
- Significant additional rail surface access opportunities for passengers from Heathrow. Also Gatwick, Luton and London City airports and Stansted (if the former cord between the North London Line and the West Anglia Main Line at Tottenham Hale was reinstated).

Figure 2: Future Potential Rail Connectivity of the Old Oak Common Site (Attached overleaf)

Figure 3: Future Rail Connectivity of the Old Oak Common Interchange (Attached overleaf)

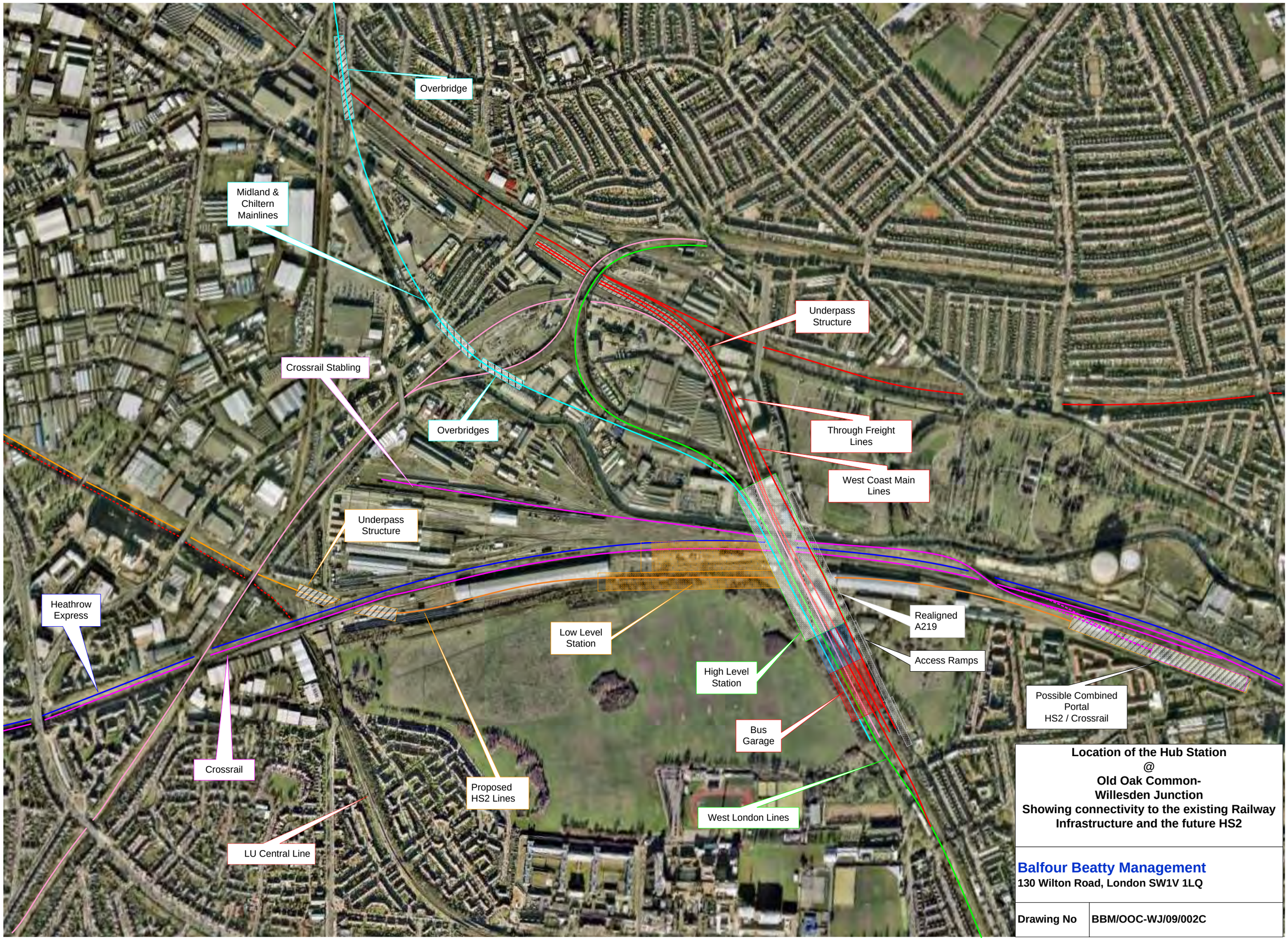


Figure 2 Future Potential Rail Connectivity of the Old Oak COmmon Site

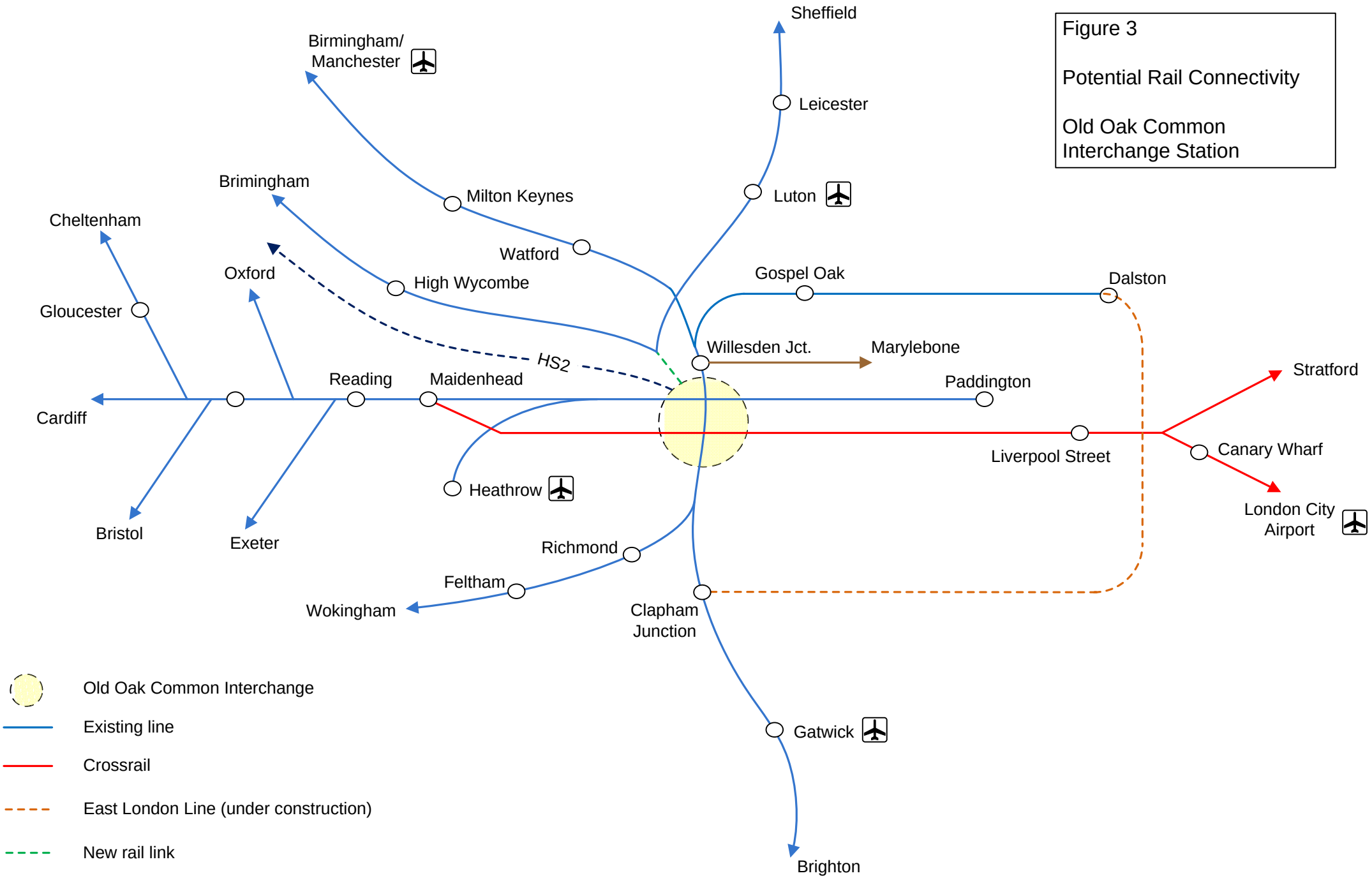


Figure 3
Potential Rail Connectivity
Old Oak Common Interchange Station
Sheffield
Birmingham/ Manchester
Leicester
Brimingham
Milton Keynes
Luton
Cheltenham
Watford
Oxford
High Wycombe
Gospel Oak
Dalston
Gloucester
HS2
Willesden Jct.
Marylebone
Reading
Maidenhead
Paddington
Stratford
Cardiff
Liverpool Street
Canary Wharf
Heathrow
London City Airport
Bristol
Exeter
Richmond
Feltham
Wokingham
Clapham Junction
Gatwick
Brighton
Old Oak Common Interchange
Existing line
Crossrail
East London Line (under construction)
New rail link
Bakerloo Line
High Speed 2

Serving Heathrow

The Parsons Brinckerhoff option would use the existing railway to serve Heathrow. It has been assumed that 8 trains per hour would operate between the airport and the hub (nominally the 4 Heathrow Express and 4 Crossrail trains currently planned for the future). This would provide for a high quality turn up and go rail service. There is a possibility that this could be further enhanced if the capacity constraints of the rail network in the Heathrow Central Terminal Area (CTA) could be removed.

A station at Old Oak Common would be approximately 12 minutes from the Central Terminal Area (serving the existing Terminals 1 and 3 and Terminal 2A which is under development). Terminal 5 would take approximately 17 minutes. Journey times to Terminal 4 would depend on how the terminal is served by rail in the future. A sixth terminal accompanying a potential third runway would be less than 10 minutes from an interchange at Old Oak Common. Work by ARUP has forecast that a Heathrow Hub further West on the GWML would be 45 minutes from Birmingham by High Speed 2. Using this assumption and allowing for time for interchange, a journey between Heathrow CTA and Birmingham via Old Oak Common would take a little over an hour and fifteen minutes.

It is a fact of life that serving Heathrow by rail is always likely to be a compromise irrespective of whether the rail service in question is a 'classic' or 'high speed' link or where the airport station is located. Terminal 5 is the only terminal that has rail fully factored into its planning and design. The result (at Terminal 5) is a transfer between the airport and railway that is virtually seamless. It is probable that a sixth terminal could achieve a similar linkage. With the exception of Terminal 4's heavy rail station there are real challenges to providing a seamless interchange for the rail and underground passenger at Heathrow.

To be successful the rail links to Heathrow need to deliver for the customer. These customer needs are well documented. They contain the usual cannon of: speed, reliability and predictability, ease of access and convenience. They also include needs that relate specifically to airport passengers. These requirements relate to the impediments of passenger baggage, passenger familiarity with using the railway and clear and intuitive wayfinding.

An Old Oak Common hub station can deliver to meet these needs. This would require:

- A fast and frequent service to the terminals – this could be achieved with an 8tph linkage to the CTA. Without changing how Terminal 4 is served this would require some interchange at the CTA. A different approach to serving Terminal 4 could create a high quality 8tph spine running from Old Oak via the CTA to Terminal 5 and potentially serving a new Terminal 6;

- The Old Oak station would be designed with high quality vertical circulation to permit easy transfer between classic and HS2 services and those serving Heathrow. The CTA station could use the existing subterranean network of travelators to access the current Terminal 3 and the future Terminal 2A. Alternatively the need to distribute rail passengers from the existing CTA station box could be incorporated into future masterplanning and development of the CTA. Either way, use of the existing rail network to access the CTA and other terminals is likely to be dramatically cheaper than constructing a new people mover system to connect to the West.

- Making a Heathrow Hub successful will require that passengers have a simple and stress free journey from the rail services feeding the hub and into the airport. Minimising walking distances and making the journey intuitive will be key requirements for success. Good design can ensure that passengers find movement between the train services at the hub easy. Making it easy for them to find their way onto the right train for the airport will require more than just good physical design. Passengers interchanging for the airport will need to feel that they have already arrived at Heathrow by use of familiar and obvious branding.

Short journey times between the interchange and the airport, good provision for vertical circulation, good connectivity between airport rail stations and terminals and making the interchange feel 'part of the airport' will ensure good connectivity between the airport and Old Oak Common.

Options for Associated Development

The London Borough of Hammersmith and Fulham has identified the area to the North of Old Oak Common as having significant regeneration potential. The borough's consultation document for the Core Strategy Options within the draft Local Development Framework includes regeneration of its most deprived parts as part of the framework's spatial vision. The Old Oak Common area is included as part of the borough's preferred option for delivering the vision. The extract shown in Figure 4 below outlines the opportunity in the area as captured in the Core strategy Options consultation document.

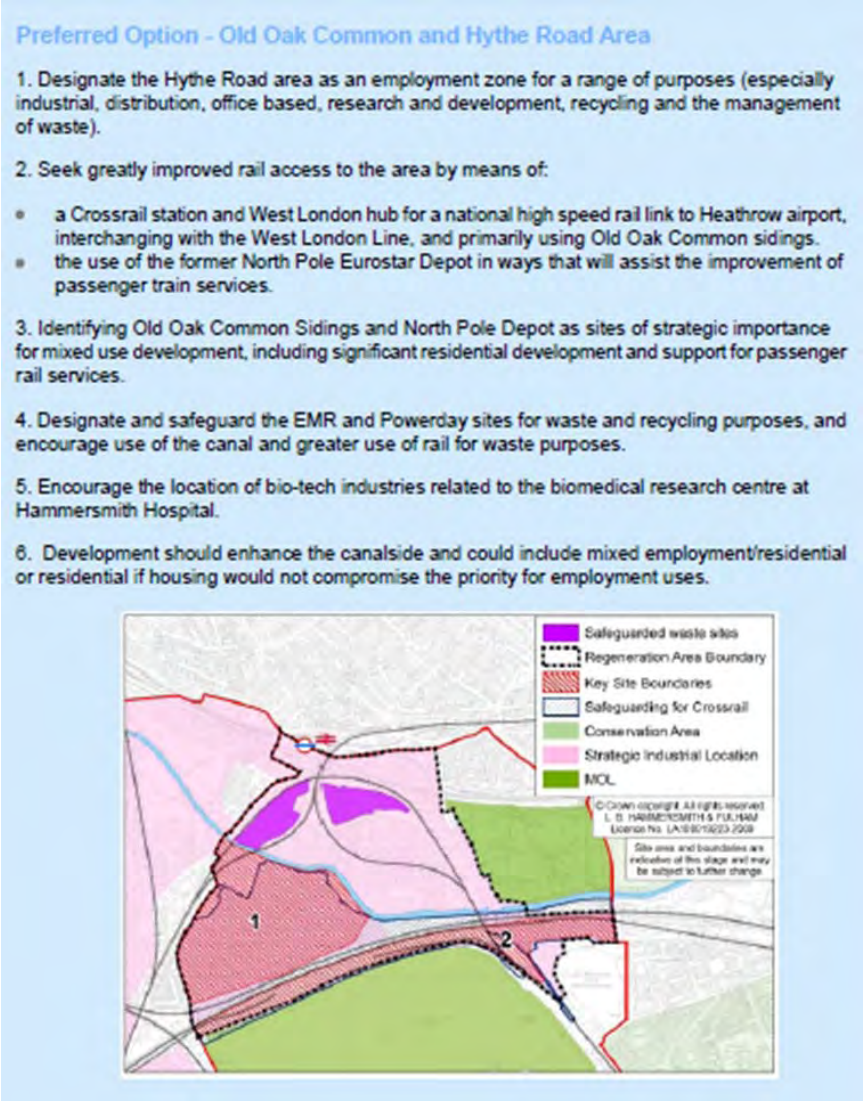


Figure 4 Extract from LBH&F Core Strategy Options Consultation Document

The borough has recently commissioned a study into the regeneration opportunities and benefits associated with the Old Oak site. At its greatest extent it is estimated that there will be in excess of 50 hectares of land available for redevelopment (including land over the railway). It is anticipated that the development will be mixed use containing housing, commercial office and retail space with some supporting institutional use (such as education).

The site's proximity to Heathrow, the connectivity offered by Crossrail to London's financial and commercial centers and the potential for direct rail links to a wide variety of regional centers are likely to make the site extremely attractive as a location for company headquarters and other commercial developments. As the price of carbon grows so the attractiveness of 'super connected' sites such as Old Oak is likely to increase.

Options for Phasing

There is scope for incremental development of the Old Oak scheme. The heart of the scheme is the interchange station between the Great Western and West London lines. This this would allow:

- The stopping of Great Western services to allow improved access to Heathrow from the West;
- Creation of a Crossrail station;
- Access between Heathrow and the West Coast Main Line; and
- Access to the West Coast Main Line and North London Lines and provision for access to the East London Line and Brighton Main Lines via Clapham Junction.

This could be created in advance of a High Speed 2 station and would provide significantly improved rail connectivity to Heathrow. In addition to the later addition of an HS2 station the connectivity to the Midland Main Line and West Coast Main Lines could also be phased. The feasibility work undertaken to date has examined how a new underpass between the existing West London Lines and the West Coast Mainline could be constructed in order to facilitate the re-routeing of intercity or suburban services to the Old Oak interchange from Euston or the introduction of new services.

This underpass would also allow for the separation of freight and passenger services by the construction of a dedicated freight line between the two routes. This enhancement could potentially be delivered after the interchange station had been constructed if only limited access to the West Coast Main Line was required. Similarly the link to the Midland Main Line and Chiltern Lines could be delivered following the interchange station.

It is important to note that it has been assumed at this stage that the core interchange station requires full development of the low level and high level station floor plates in the first phase of construction. The ability to take a phased approach to constructing the interchange station would require a full value engineering approach which is not appropriate at this stage of scheme development.

Costs, Revenues and Funding Options

Parsons Brinckerhoff has carried out a costing exercise for the interchange station based on the design provided in Appendix A. The total estimated cost for the station is £750M. This cost includes:

- The HS2 station less fit out costs;
- The low and high level stations less fit out costs;
- The bus and coach interchange less fit out costs;
- Construction of through and freight lines; and
- Realignment of the A219.

This cost does not include the construction of a new link from the A40 at North Acton or land acquisition costs.

The railway lands incorporating the Crossrail, HEX and First Great Western depot areas and the nearby through railway lines are included within the local authority's preferred option for regeneration within the borough. This raises the potential for property development above these areas which could be pursued in Network Rail's own right or via the leasing of air rights above the station and surrounding area to third parties. The funding for the scheme could be raised via a Design Build Finance Operate and Transfer arrangement which could form part of a franchise (as has been pioneered through the Chiltern franchise). Other alternatives such as a fully developer led package (as is happening with Southend Airport station) or a PFI with payback via a combination of an availability contract and station access charges are other alternatives that could be investigated.

Sources and Description of Benefits

Development of a hub at Old Oak Common would provide potential for benefits to:

- Passengers and employees travelling to Heathrow:
- Those making long distance journeys and who currently cross London;
- London Underground passengers and
- Passengers using terminating services into London from the North and West.

These benefits would take the following forms:

- Journey time savings for passengers and employees travelling to Heathrow;
- Journey time savings for passengers currently transiting London via underground services and who would be able to reduce both time spent interchanging between services and total on-board journey time;
- Reduction in the congestion indices at major termini and their approaches resulting in improved reliability;
- Increased train revenue achieved from mode shift towards rail from competing modes and improvement in the accessibility to and use of Crossrail;
- Decreased costs in terms of reduced 'Killed and Seriously Injured' realised by mode shift;

- Crowding benefits resulting from transfer from London Underground to overground services; and
- Reduced costs through the provision of new diversion routes during maintenance, resulting in better service provision during blockades and weekend possession and a reduction in more costly short term possessions.

Journey Time Savings

Understanding the full extent of journey time savings offered by providing an interchange opportunity at Old Oak Common with a link to Heathrow will require a significant timetabling and modeling exercise. This will also need to take account of the opportunities for structural change that the interchange offers with regards to changes in the way that suburban and inter city services relate to the major London termini. The potential impact of electrification and signaling changes on routes such as Great Western and the Midland Mainline also need to be understood.

At this stage of development the current timetable has been used to gauge the journey time savings that could be provided by the interchange. The analysis undertaken has concentrated on trips to and from Heathrow, although it is fair to say that similar benefits would accrue to journeys between major transport nodes in the South East and wider afield that benefit from the additional connectivity offered by the interchange.

Our analysis shows the following journey time benefits for typical trips to the airport

Journey	Current Rail Travel Time hrs:mins	Travel Time With Old Oak (Saving)
Brighton - Heathrow	2:00	1:40 (20 mins)
Luton - Heathrow	1:35	1:10 (25 mins)
Sheffield - Heathrow	3:15	2:50 (25 mins)
Milton Keynes - Heathrow	1:40	1:20 (20 mins)
Aylesbury - Heathrow	1:30	1:15 (15 mins)

Notes:

1. All of these journeys include the removal of an intervening London Underground journey leg (some with an additional interchange between underground lines) and a walk leg between mainline rail platform and London Underground;
2. Current travel time has been based on an average of existing off-peak journey times as published by 'National Rail Enquiries';
3. Journey times assume the Heathrow Central Terminal Area station as the ultimate destination;
4. Travel times with Old Oak are based on nearest current equivalent trip or routeing; and
5. Interchange times at Old Oak have assumed a regular 8 minute frequency service to Heathrow, average interchange times for Heathrow services at Old Oak have been assumed as10 minutes.

Benefits from Mode Shift

The Old Oak proposal has not been subject to testing within Heathrow Airport Limited's Heathrow Surface Access Model suite for passengers and employees or any alternative model. It is understood that the proposal will be included as an option for testing as part of the airport's forthcoming masterplanning exercise for a three runway airport. The proposed station has also not been assessed as part of an exercise to gauge the impact of High Speed Rail on interlining air passenger trips at Heathrow. The potential for these impacts is documented in Network Rail's New Lines Programme: Strategic Business Case, particularly paragraph 7.45 which notes that in their forecasts a new High Speed Station located at the airport reduces the demand for interlining trips by 22%.

Prior to conducting a full modelling exercise the scope for mode shift can be inferred from the effects of previous rail developments and planned interventions at Heathrow.

The Heathrow Express service between Heathrow and Paddington currently carries around 12 per cent of the airport's non-transfer passengers. These passengers are made up of some mode transfers from taxi, private car and private hire car and some abstraction from rail services offered by London Underground. The pure long-term mode shift effect is probably in the order of 5-7%. The proposed Airtrack rail service from Heathrow Terminal 5 to London Waterloo is understood to forecast a 2-3% mode shift to rail.

These impacts are on routes with very concentrated demand to centres of attraction in London. The Old Oak interchange will serve a very large catchment area and is likely to achieve a good market penetration into this catchment providing the specific needs of air passengers can be met. It is important to realize that the absolute numbers of passengers in the element of the catchment area outside London is relatively small compared to the markets being targeted by HEX and Airtrack. Without modelling it is perhaps best to say at this stage that the Old Oak Interchange could result in a 3-5 % shift towards rail.

If these trips are assumed to switch from park and fly this would equate to an upper bound reduction of around 4.4 million road trips per annum (taken as 5 per cent of 44 million non transfer passengers per annum using the airport, with each passenger assumed to have an inward and outward surface access leg). This can be considered a highly conservative estimate as a proportion of these trips would come from so called 'kiss and fly trips' where passengers are escorted to the airport either in a private or hire vehicle. These trips result in four surface access trips per passenger with an inward and outward surface access leg.

Regional Economic Benefits

The regeneration of the area surrounding the interchange is likely to result in increased tax receipts as a result in the increase in the underlying transaction values in the area. A significant level of benefit is likely to accrue to 'wider economic benefits'.

Development of an interchange at Old Oak Common is expected to deliver both:

- Agglomeration benefits as a result of reducing travel time between service providers and their customers and the concentration of employment opportunities and housing in the area; and
- Economic benefits of increased employment and productivity resulting from reduced travel to work times and an increased number of employment opportunities.

Development and Regeneration Potential

As discussed under the 'options for associated development' and 'funding' sections above, the site has a high potential for:

- Assisting in the regeneration of a proposed area of strategic importance within the London borough of Hammersmith and Fulham Local Development Framework;
- Assist in sustaining and supporting development within the existing Park Royal Opportunity Area;
- Providing opportunity for the development of highly sustainable territory headquarters buildings over and around the proposed station;
- Assist in meeting the local borough's housing targets;
- Establishing a new gateway into the West of London; and
- Strengthening the Crossrail business case.

Construction Benefits

The construction areas and phasing for the station works and the links to the West Coast Main Line and the Midland Main Line are shown in Appendices B, C and D. These show how the station elements of the interchange and its associated linkages are able to be delivered with minimal impacts on existing rail services. These also show how highway access on the A219 would be maintained throughout the construction process.

The new stations (HS2, Low and High level) are deliverable by a staged approach that construct diversionary routes for the existing GWML and WLL via preliminary works and an eventual track slew into and through the new stations. This will minimize impacts on existing scheduled services on these routes. It is also worth noting that by maximizing use of the existing rail route into Heathrow, there are benefits at the airport of reduced disruption as a result of minimizing the potential for construction impact on the terminals.

Fit with Heathrow Airport Development

An interchange at Old Oak Common would achieve 'fit' with Heathrow airport development by offering flexibility and economy. Key features are:

- The Old Oak Common interchange makes maximum use of the existing railway infrastructure serving Heathrow and will not therefore impose a further degree of constraint on the airport's development by introducing further fixed links in the airport;
- Use of existing infrastructure minimizes the cost of new infrastructure in the airport;
- The physical extent of the route coverage offered by a single interchange at Old Oak Common would increase the accessibility to the UK's only true 'hub' airport and allow Heathrow's further market development; and
- The interchange's connectivity to routes in the 'greater South East' (including London) would withstand structural changes in Heathrow's catchment area (which is presently dominated by West London).

In terms of the airport's specific needs with regards to its developing surface access strategy, this is likely to be dominated by the need to deliver for the passenger but in an affordable manner. It is worth bearing in mind that this affordability has to be agreed with the airport's airlines and its regulator, the CAA, who will be asked to fund (and agree funding of) any new infrastructure in support of the surface access strategy. The inherent flexibility and economy that make the proposal fit with the airport's future development also make it an affordable option for any future surface access strategy.

In terms of delivering for the passenger, the interchange would be designed to meet the demands of air passengers, particularly their very specific accessibility requirements such as vertical circulation needs. This accessibility provision would include a suitably frequent service between the airport and the interchange in order to minimize delay in transferring to and from the airport. All of this would be packaged in a way to 'bring the airport to the interchange' and so aid intuitive wayfinding for passengers who are new to the airport or who have other wider accessibility requirements.

It is important to note that a significant part of the Old Oak offer is its ability to score well against the objectives of a broad spectrum of stakeholders. Delivering sustainable access opportunities for Heathrow is one such objective, however its delivering sustainable regeneration in a way that is consistent with Government's carbon agenda for transport is equally important. This ability to score well across numerous stakeholder objectives means that whilst the interchange would support the surface access strategy at Heathrow its viability is not unduly impacted if the development agenda at Heathrow changes.

Appendix A - Old Oak Common Hub Station Plans

Please find attached overleaf the following drawings:

- OOC-WJ-Revised Final 01 (1): Appendix A Dwg A.1
- OOC-WJ-Revised Final 02 (1): Appendix A Dwg A.2
- OOC-WJ-Revised Final 03 (1): Appendix A Dwg A.3
- OOC-WJ-Revised Final 04 (1): Appendix A Dwg A.4

Grand Union Canal

To Crossrail Depot

Through Lines

To Heathrow, West Country

Existing North
Pole Shed

Possible HS2 Lines

Escalators and Lifts
to concourse ares

Freight Lines

A129
Dual
Carriageway

Bus & Coach Station

A

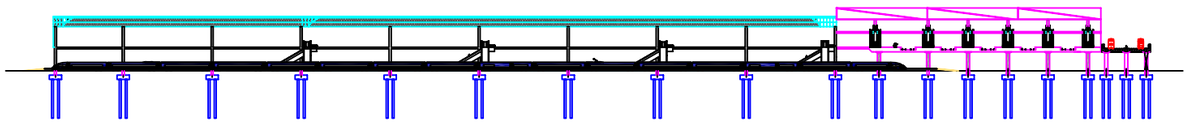
B

B

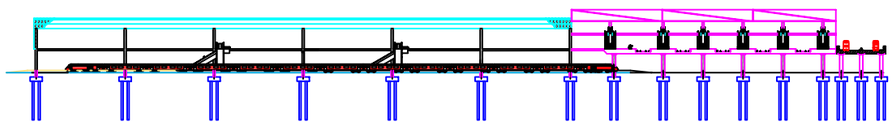
C

C

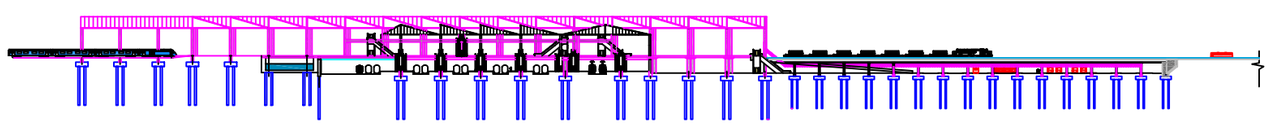
Section C-C



Section B-B



Section
A-A



Notes

KEY

DISCLAIMER
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IT IS PROVIDED FOR INFORMATION ONLY FROM RECORDS PROVIDED BY THE UTILITY COMPANIES ON THE APPROXIMATE POSITION OF MAINS AND OTHER APPARATUS.
THERE IS NO CONTRACT AND NO WARRANTY IS IMPLIED AS TO THE ACCURACY OF THIS PLAN.

DATE	DRBN	CHKD	APPD	ISSUE	
04/08/2009	CN			B	SECOND ISSUE
09/05/2008	CN			A	FIRST ISSUE

Old Oak-Willesden Junction
Hub Station

PLAN AT PLATFORM LEVEL
GW, HEX INCLUDING
FUTURE HS2 & CROSSRAIL LINES

Balfour Beatty
Management
Balfour Beatty Management Limited
Stockley House
130 Wilton Road
London
SW1V 1LQ
Tel 020 7963 4201
Fax 020 7963 4299
A Balfour Beatty Company

SCALE	NTS	MASTER SIZE	A0
DRAWING NO.	00-WJ-HSt- 01	ISSUE	A

Escalators and Lifts
to concourse ares

Lower
Concourse

Escalators and Lifts
to Upper concourse areas

Notes

KEY

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DATE	DRWN	CHKD	APPD	ISSUE	
04/08/2009	CH			B	SECOND ISSUE
09/05/2008	CH			A	FIRST ISSUE

Old Oak - Willesden Junction
Hub Station
Plan @ Lower Concourse Level
GWR, HEX, CROSSRAIL, HS2
PLATFORM LEVEL
WLL, NLL, WCML

Balfour Beatty
Management
Balfour Beatty Management Limited
Stockley House
130 Wilton Road
London
SW1V 1LQ
Tel 020 7963 4201
Fax 020 7963 4299
A Balfour Beatty Company

SCALE	NTS	MASTER SIZE	A0
DRAWING NO.	00-WJ-HSt - 02	ISSUE	A

Escalators and Lifts
to concourse ares

Lower
Concourse

Escalators and Lifts
to concourse areas

Upper
Concourse

Notes

KEY

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DATE	DRSN	CHKD	APPD	ISSUE	
04/08/2009	CH			B	SECOND ISSUE
09/05/2008	CH			A	FIRST ISSUE

Old Oak - Willesden Junction
Hub Station

Plan @ Upper Concourse Level
WCML, NLL, WLL, MML, Chiltern

Balfour Beatty
Management
Balfour Beatty Management Limited
Stockley House
130 Wilton Road
London
SW1V 1LQ
Tel 020 7963 4201
Fax 020 7963 4299
A Balfour Beatty Company

SCALE	NTS	MASTER SIZE	A0
DRAWING NO.	00-WJ-HSt - 03	ISSUE	A

Possible HS2 Lines

Lower Station Roof
Canopy Outline

Upper Station Roof
Canopy Outline

Notes

KEY

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DATE	DRWN	CHKD	APPD	ISSUE	
04/06/2009	CN			B	SECOND ISSUE
09/05/2008	CN			A	FIRST ISSUE

Old Oak-Willesden Junction
Hub Station

Roof Structures to Hub Station

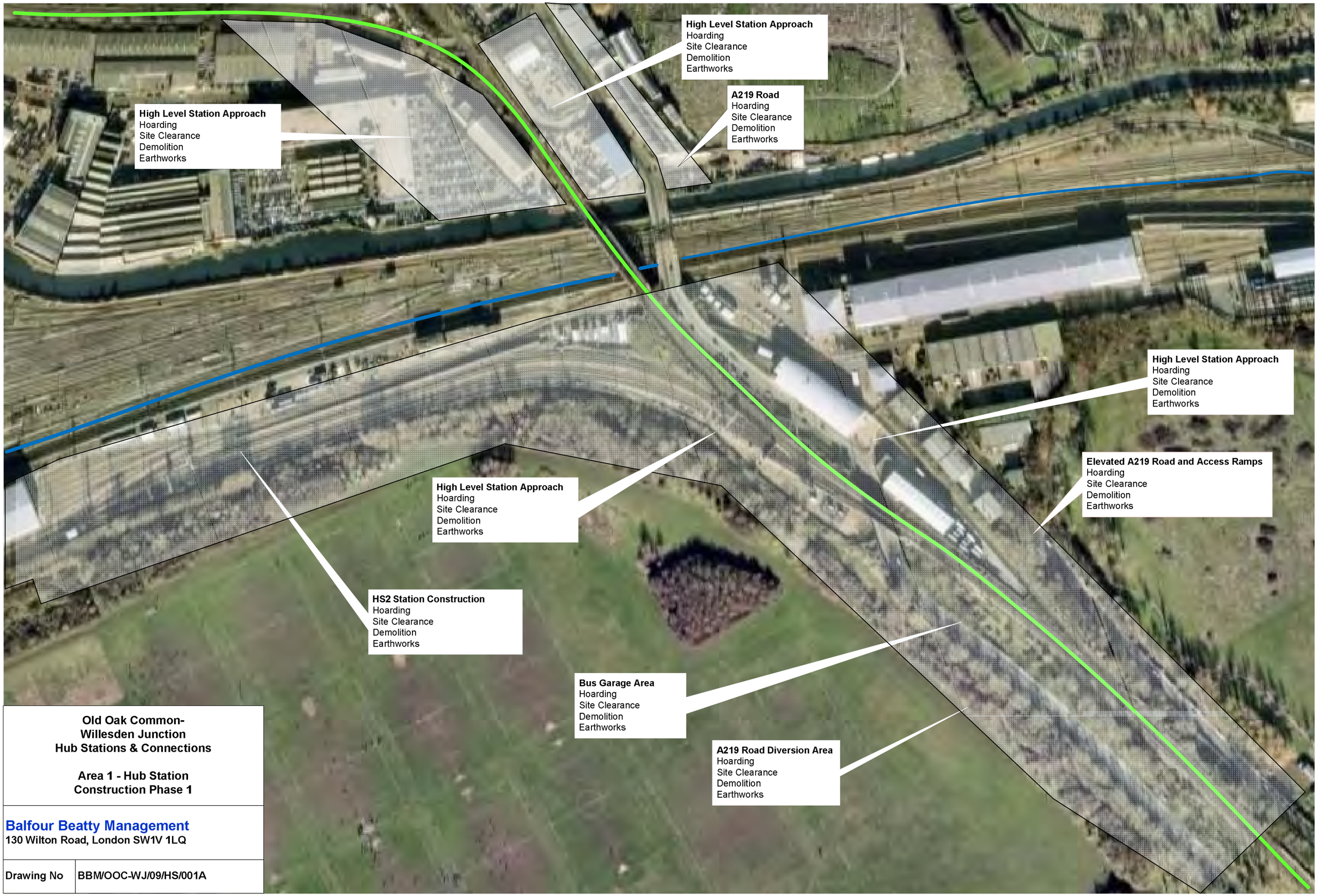
Balfour Beatty
Management
Balfour Beatty Management Limited
Stockley House
130 Wilton Road
London
SW1V 1LQ
Tel 020 7963 4201
Fax 020 7963 4299
A Balfour Beatty Company

SCALE	NTS	MASTER SIZE	A0
DRAWING NO.	00-WJ-HSt - 04	ISSUE	A

Appendix B - Hub Station Construction Phase Drawings
OOC-WJ-Area 1-HS

Please find attached overleaf the following drawings:

- Appendix B Dwg B.1
- Appendix B Dwg B.2
- Appendix B Dwg B.3
- Appendix B Dwg B.4
- Appendix B Dwg B.5
- Appendix B Dwg B.6
- Appendix B Dwg B.7

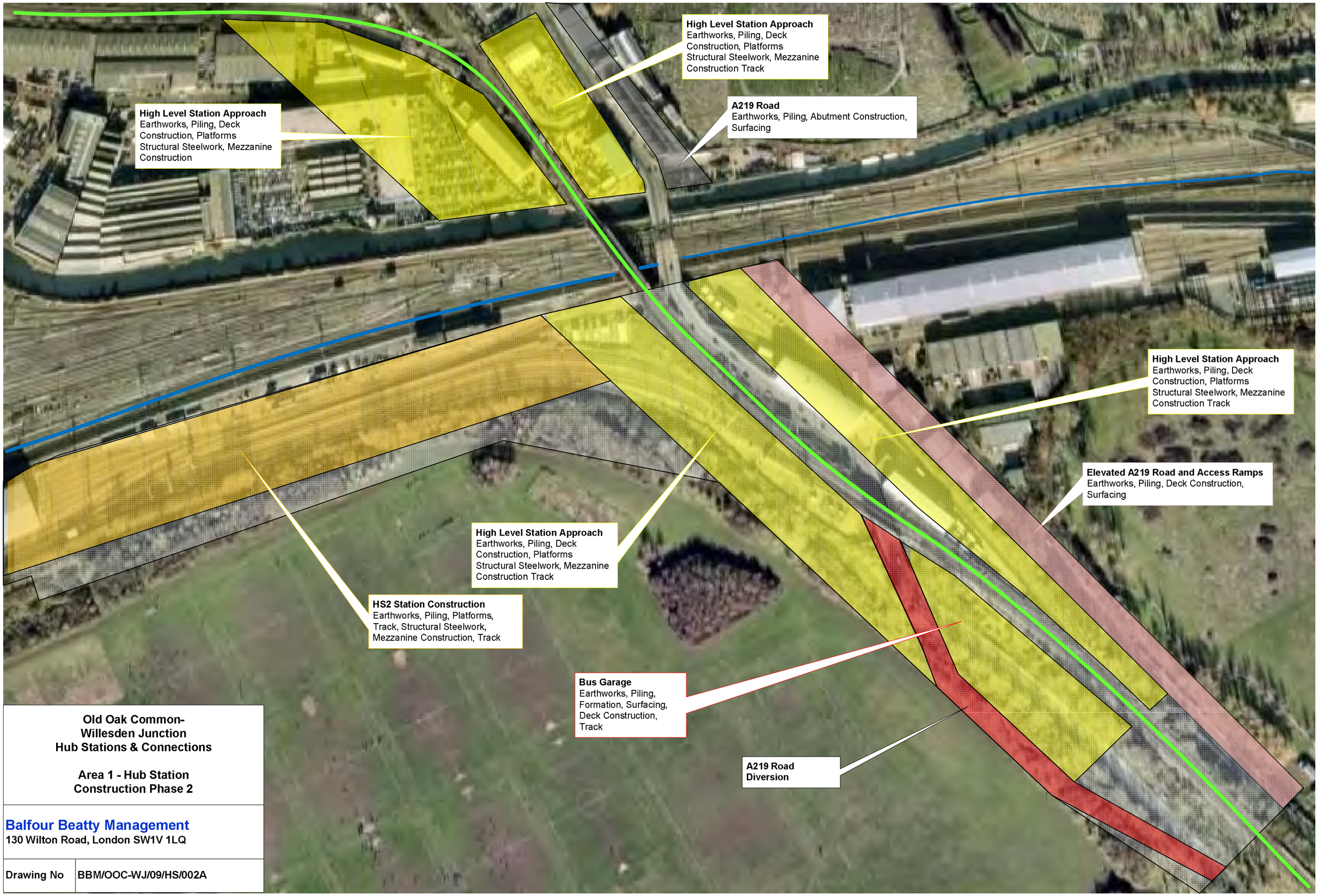


Old Oak Common-
Willesden Junction
Hub Stations & Connections

Area 1 - Hub Station
Construction Phase 1

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/HS/001A

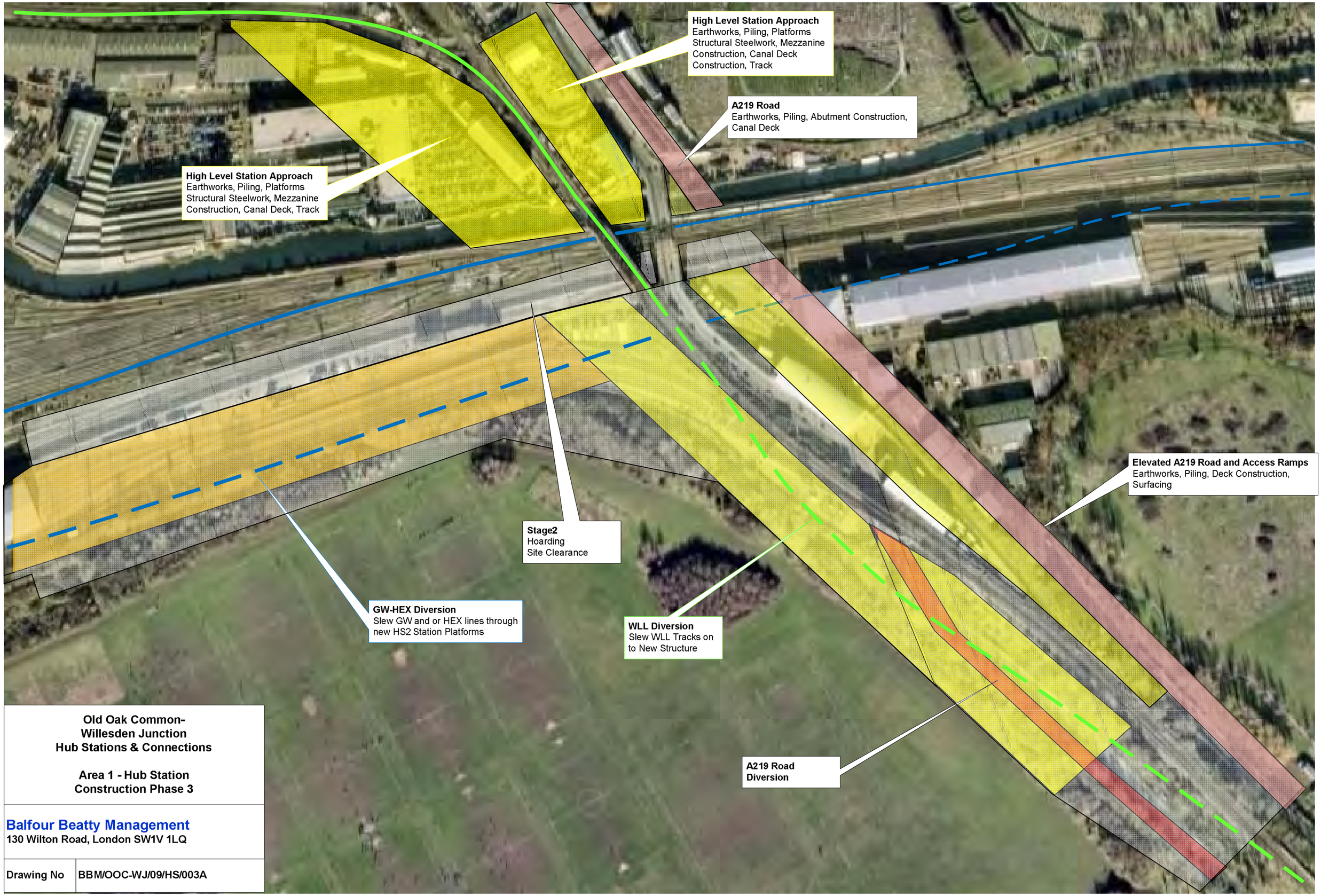


Old Oak Common-
Willesden Junction
Hub Stations & Connections

Area 1 - Hub Station
Construction Phase 2

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/HS/002A

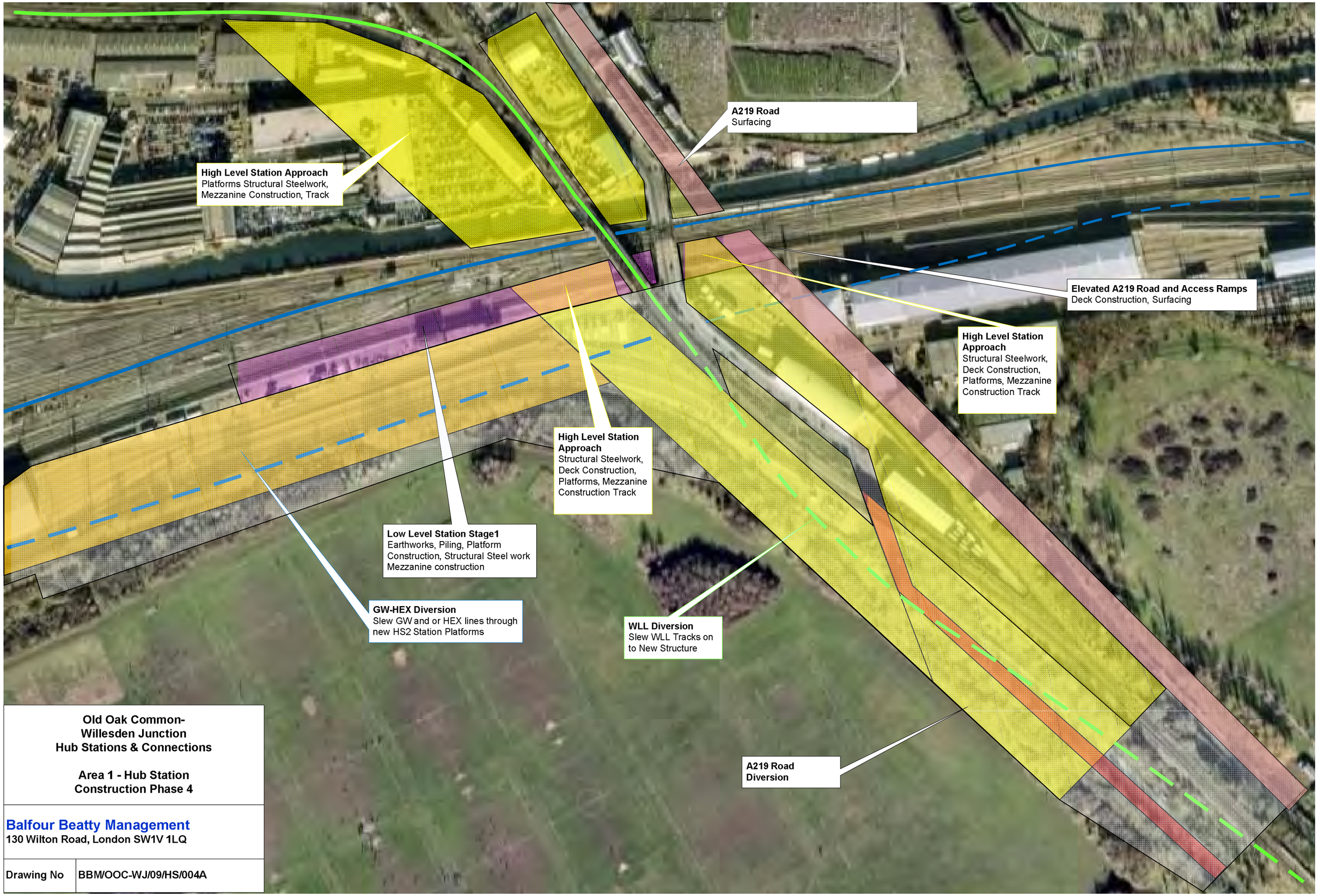


Old Oak Common-
Willesden Junction
Hub Stations & Connections

Area 1 - Hub Station
Construction Phase 3

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/HS/003A

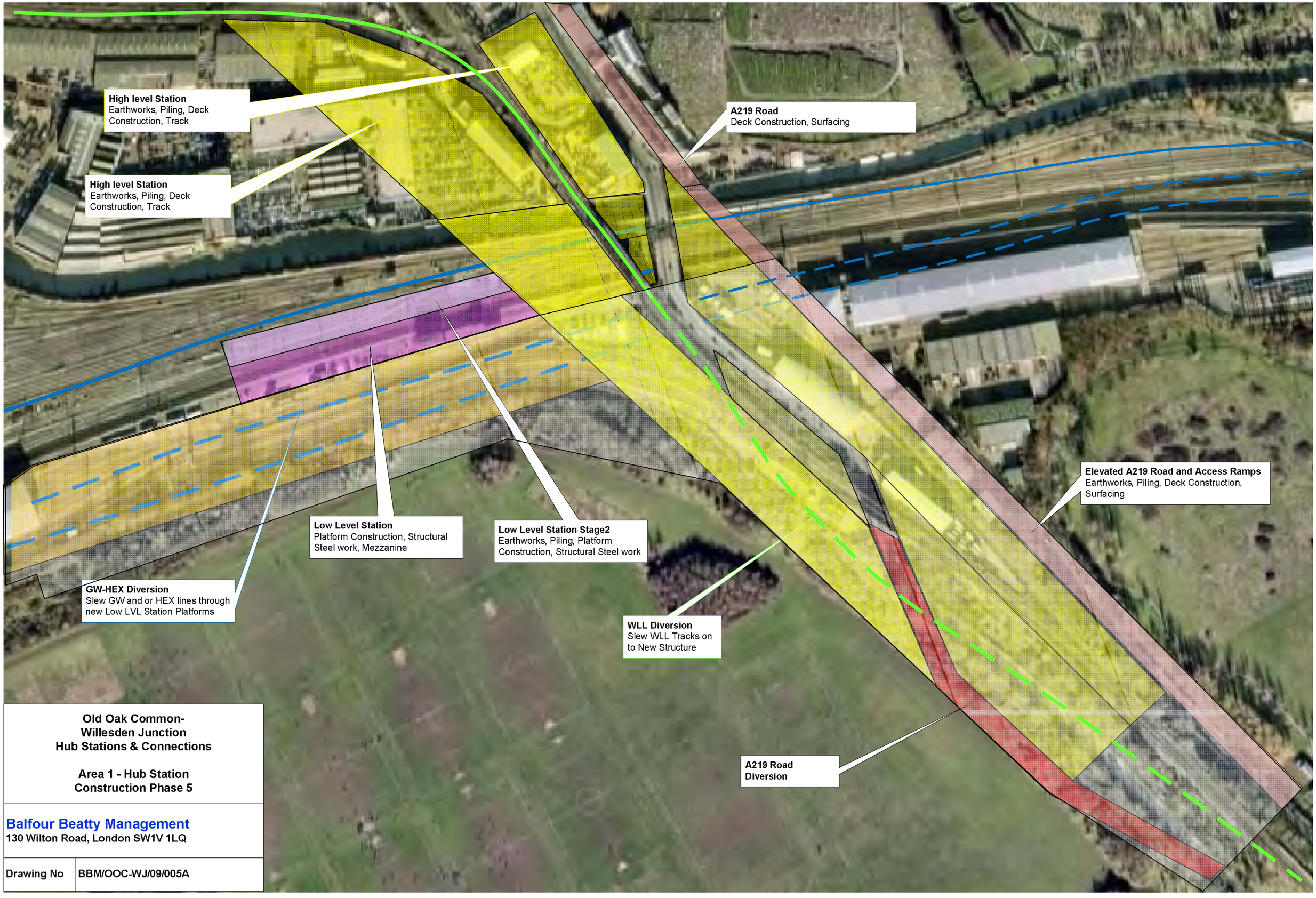


Old Oak Common-
Willesden Junction
Hub Stations & Connections

Area 1 - Hub Station
Construction Phase 4

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/HS/004A

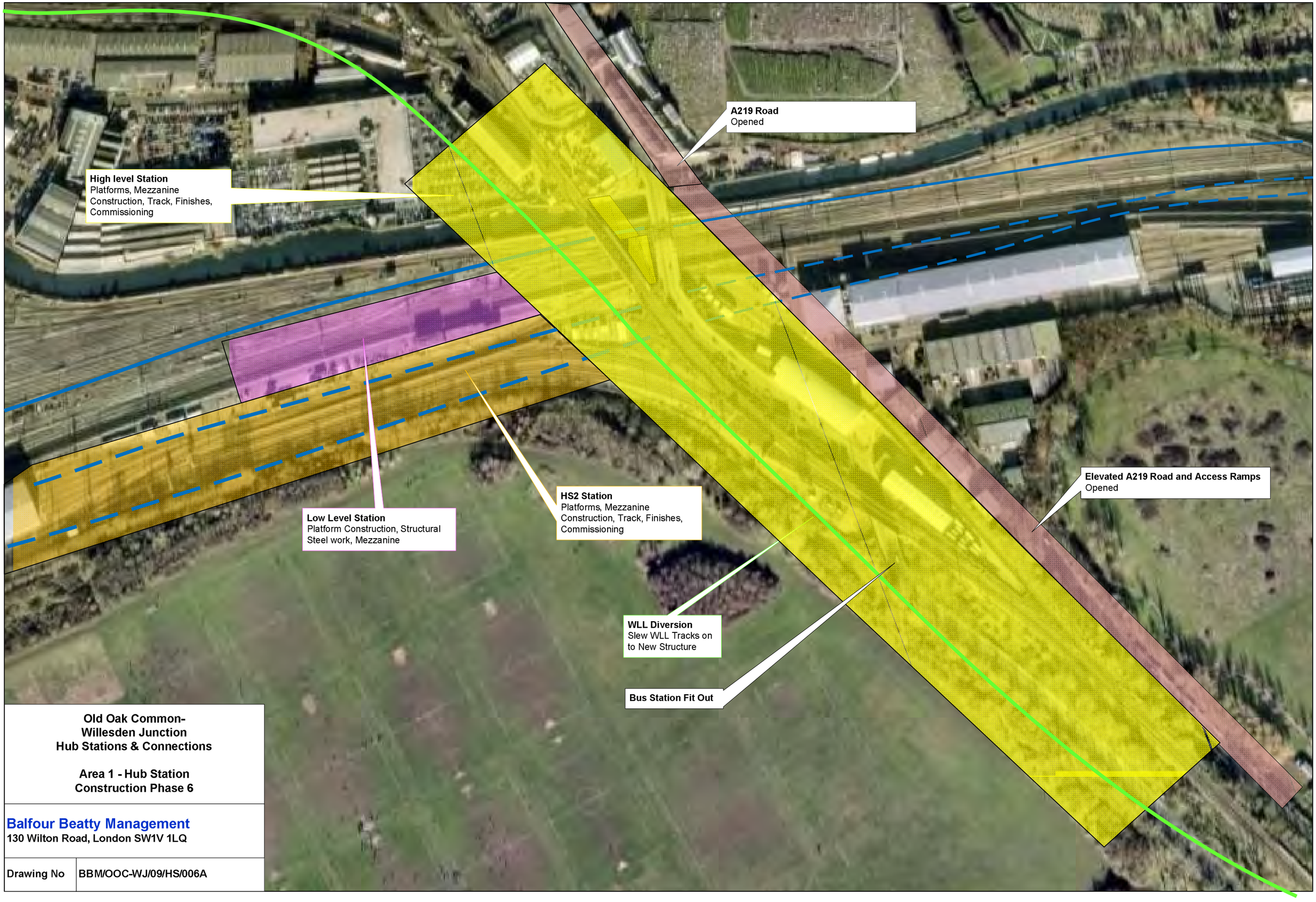


Old Oak Common-
Willesden Junction
Hub Stations & Connections

Area 1 - Hub Station
Construction Phase 5

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/005A

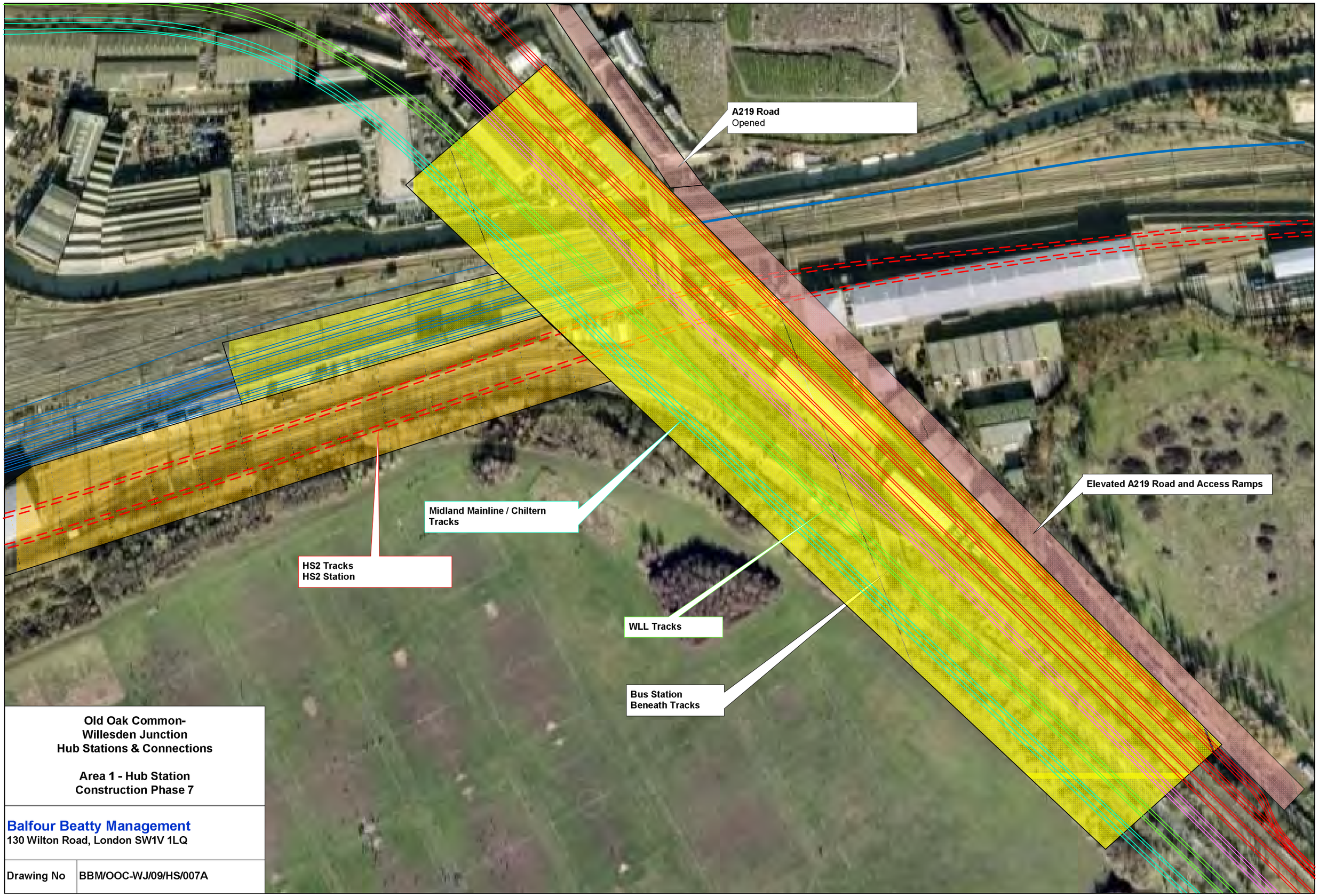


Old Oak Common-
Willesden Junction
Hub Stations & Connections

Area 1 - Hub Station
Construction Phase 6

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/HS/006A



Old Oak Common-
Willesden Junction
Hub Stations & Connections

Area 1 - Hub Station
Construction Phase 7

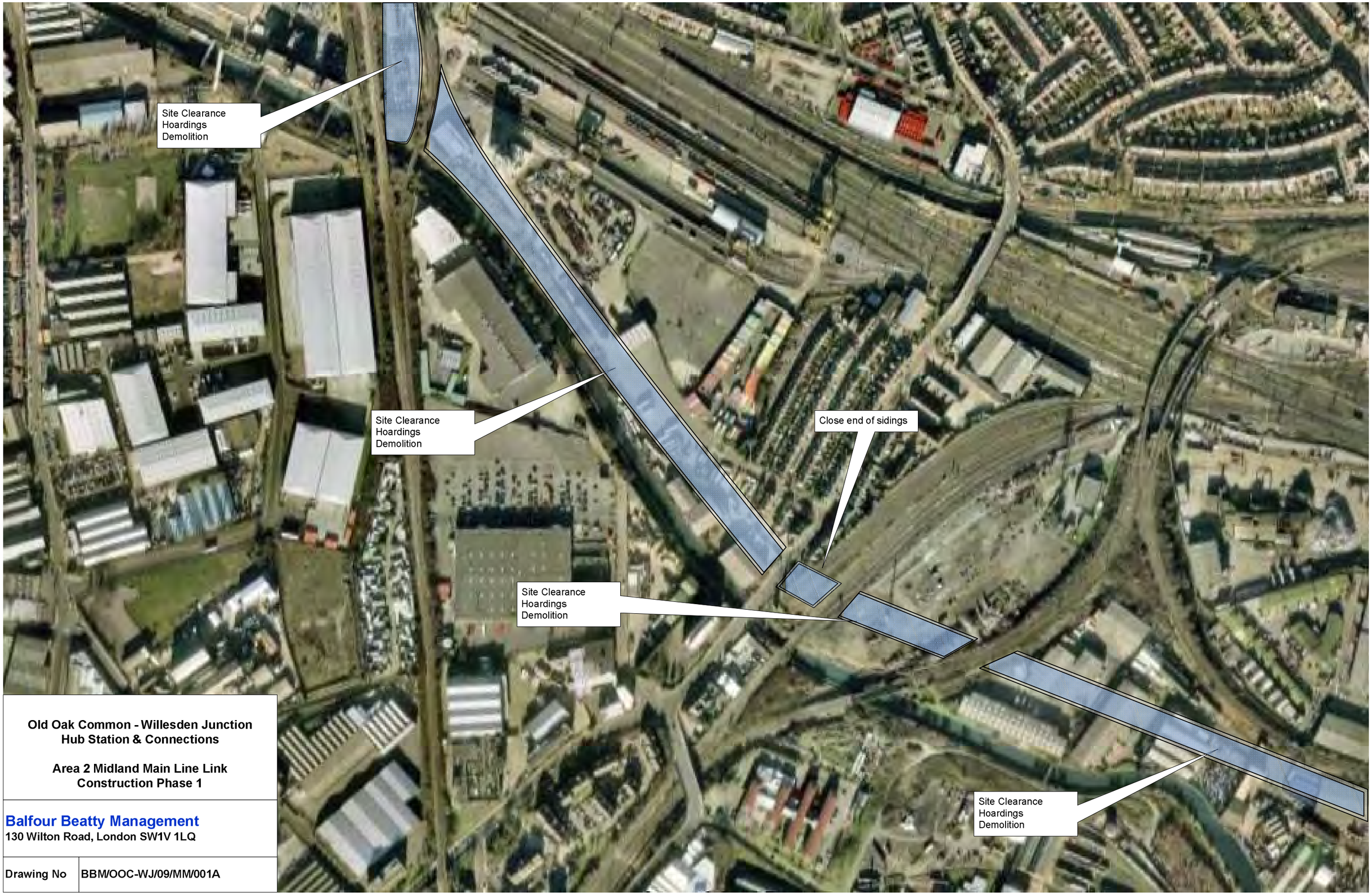
Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/HS/007A

Appendix C - Midland Mainline Construction Phase Drawings

OOC-WJ-Area 2-MM

- Appendix C Dwg C.1
- Appendix C Dwg C.2
- Appendix C Dwg C.3
- Appendix C Dwg C.4

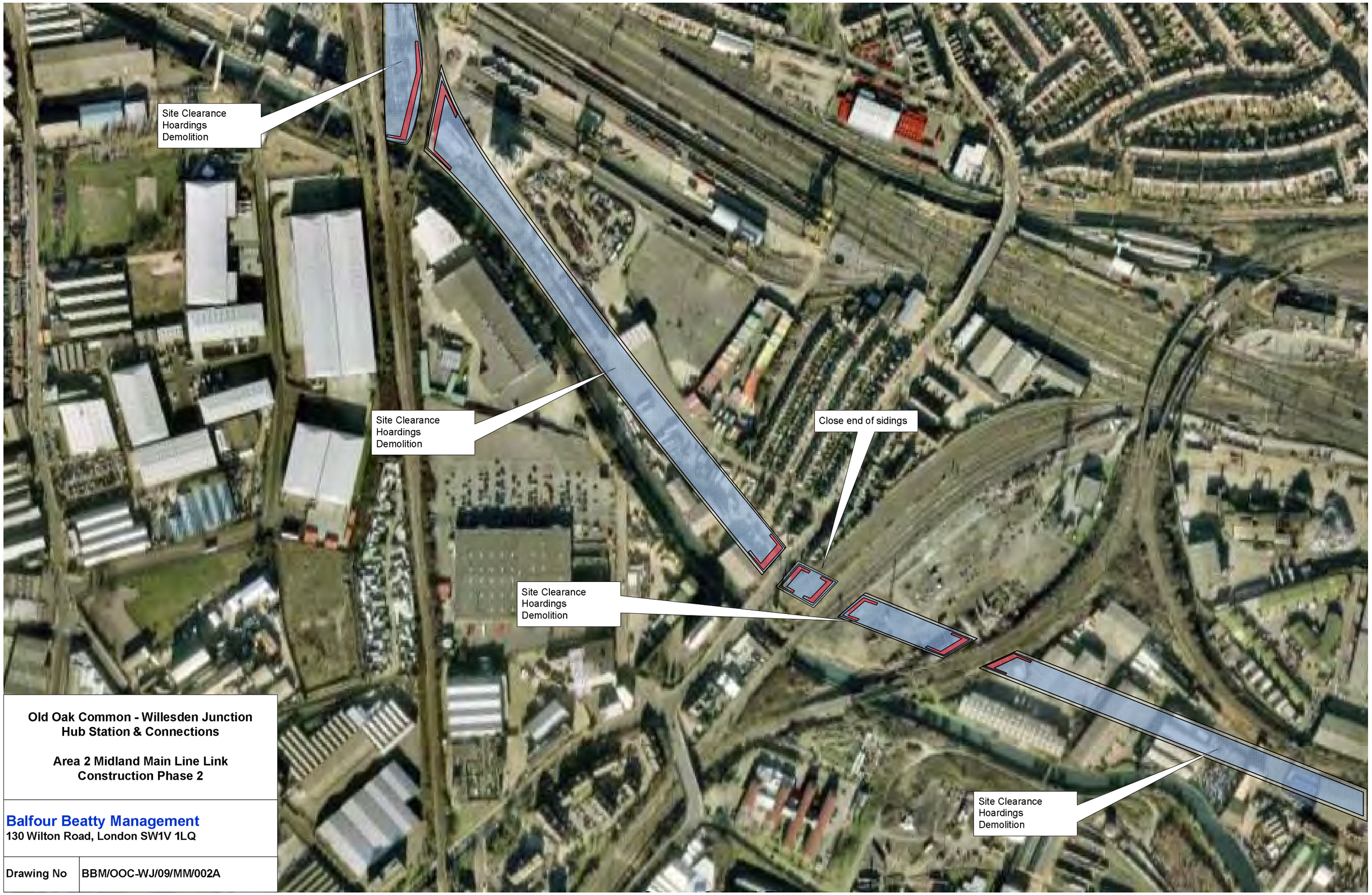


Old Oak Common - Willesden Junction Hub Station & Connections

Area 2 Midland Main Line Link Construction Phase 1

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/MM/001A

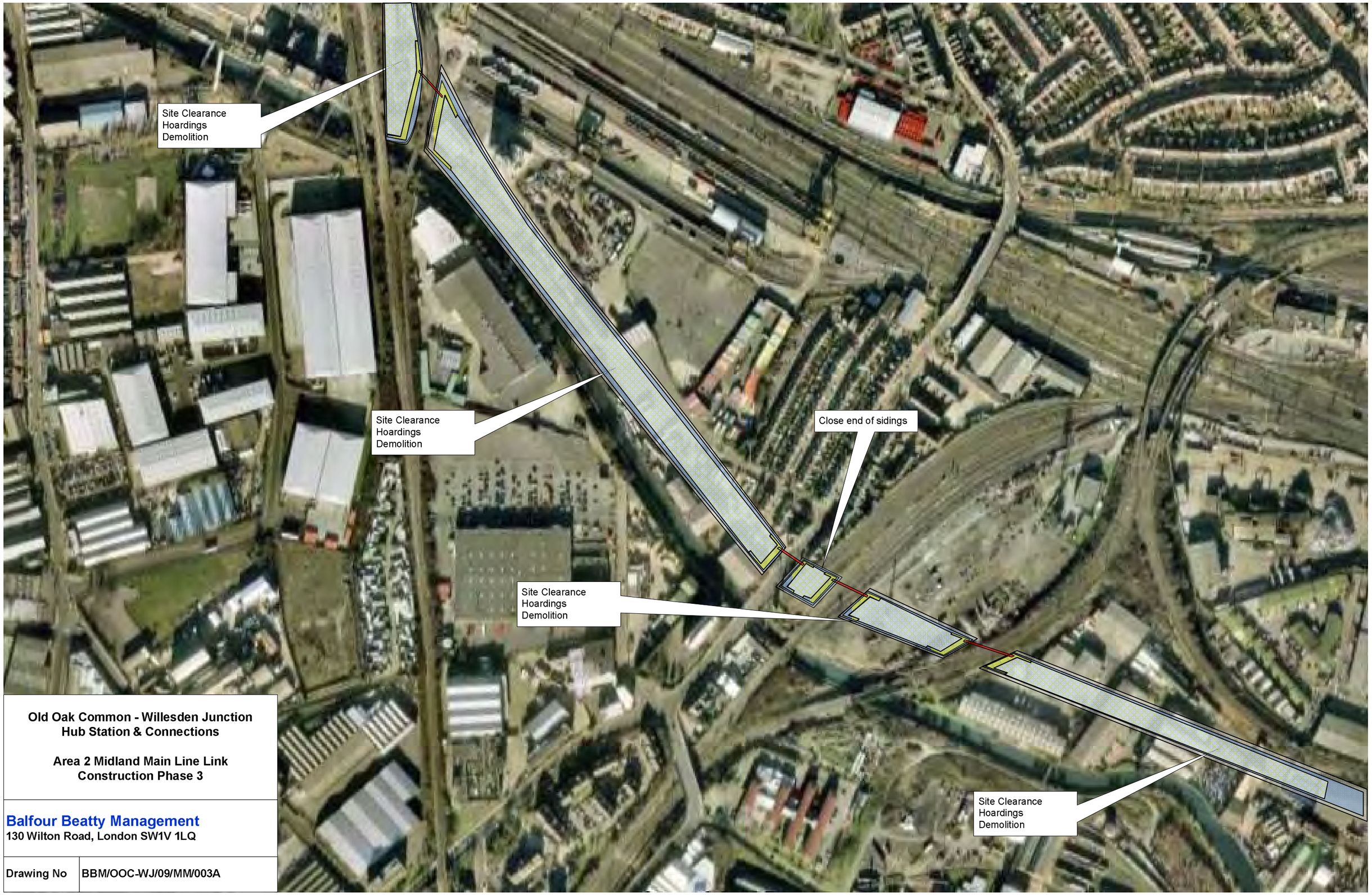


Old Oak Common - Willesden Junction
Hub Station & Connections

Area 2 Midland Main Line Link
Construction Phase 2

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/MM/002A

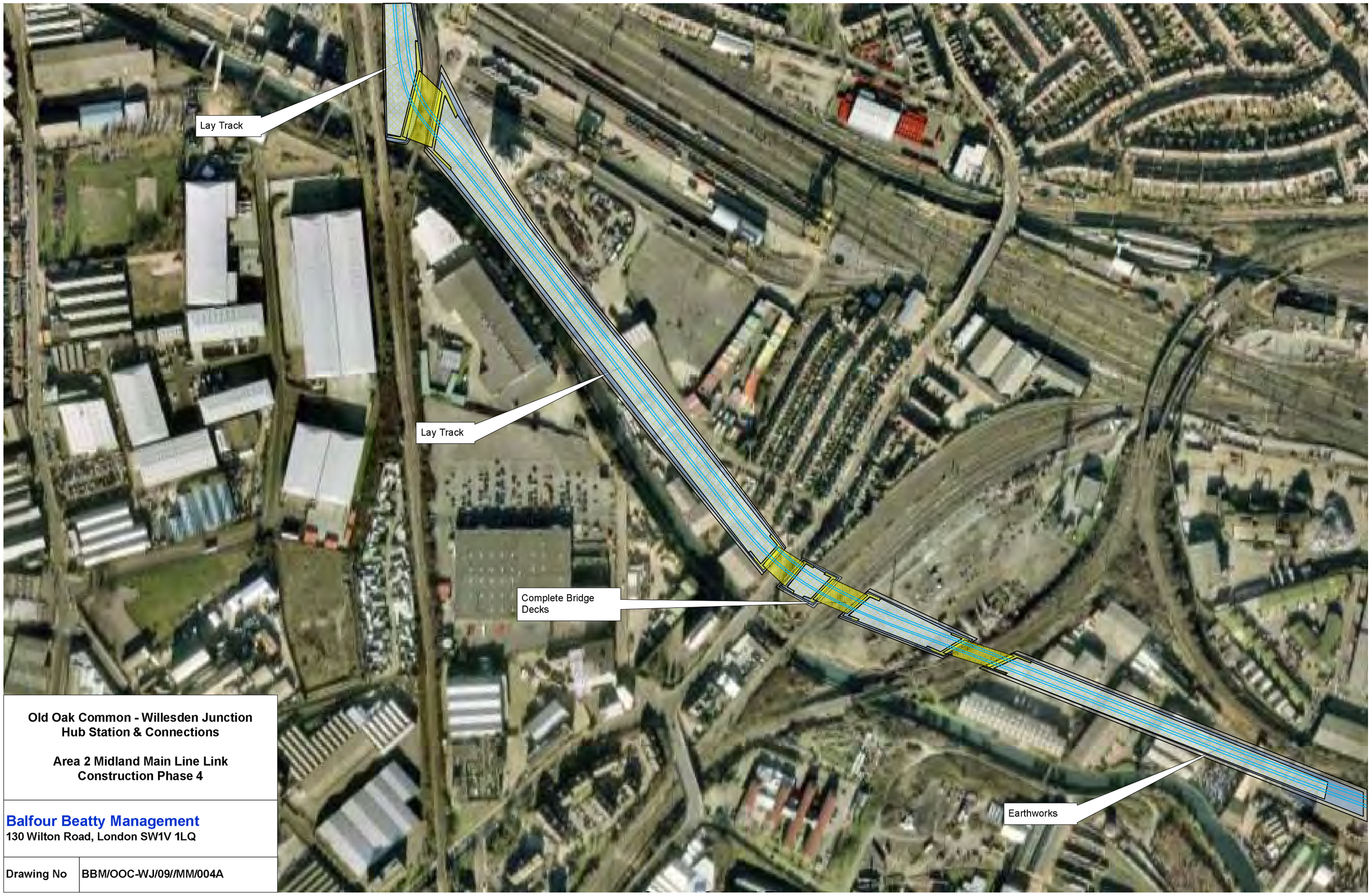


Old Oak Common - Willesden Junction
Hub Station & Connections

Area 2 Midland Main Line Link
Construction Phase 3

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/MM/003A



Old Oak Common - Willesden Junction Hub Station & Connections

Area 2 Midland Main Line Link Construction Phase 4

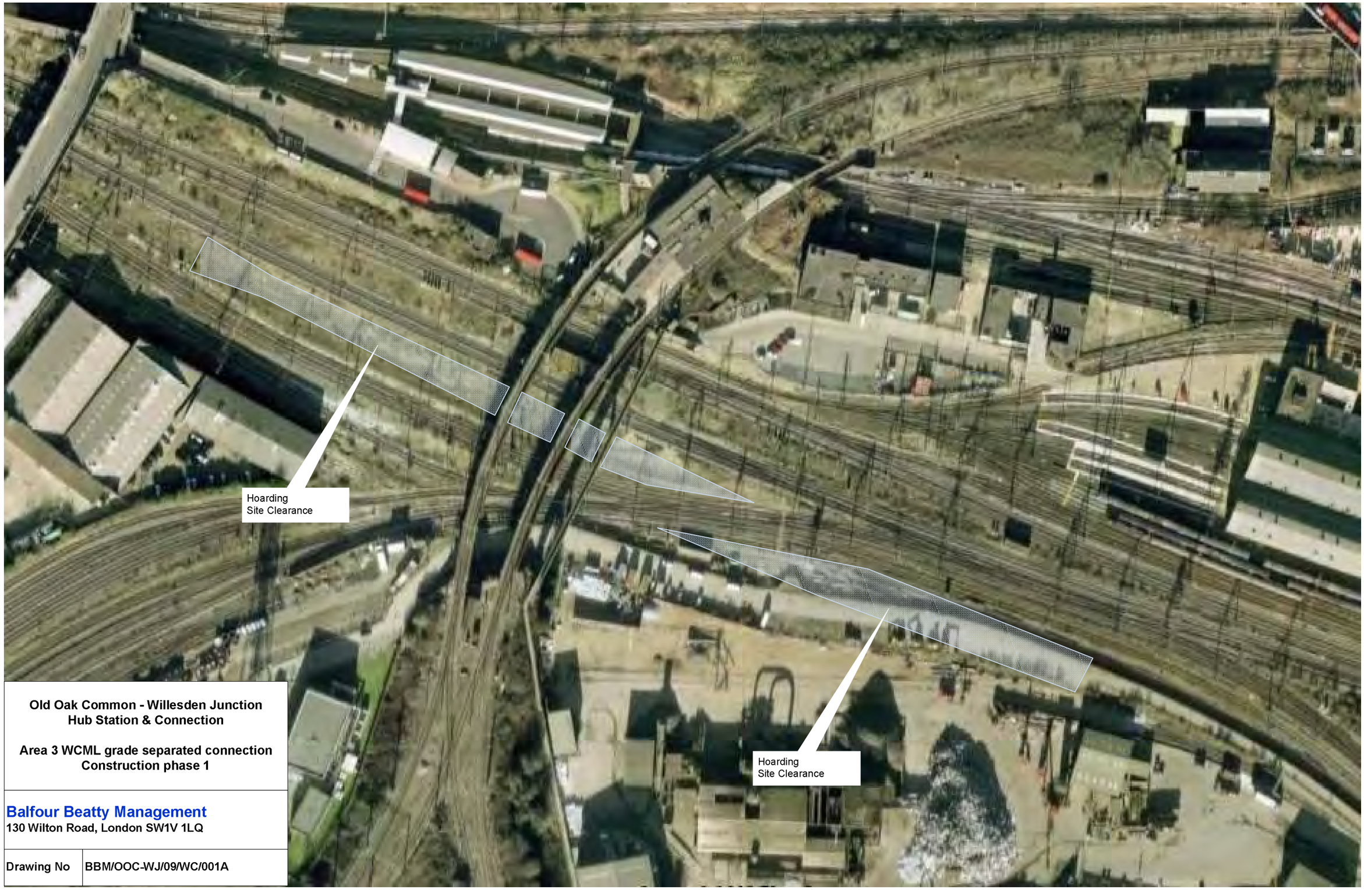
Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09//MM/004A

Appendix D - West Coast Mainline Construction Phase Drawings

OOC - WJ-Area 3-WCML

- Appendix D Dwg D.1
- Appendix D Dwg D.2
- Appendix D Dwg D.3
- Appendix D Dwg D.4
- Appendix D Dwg D.5
- Appendix D Dwg D.6

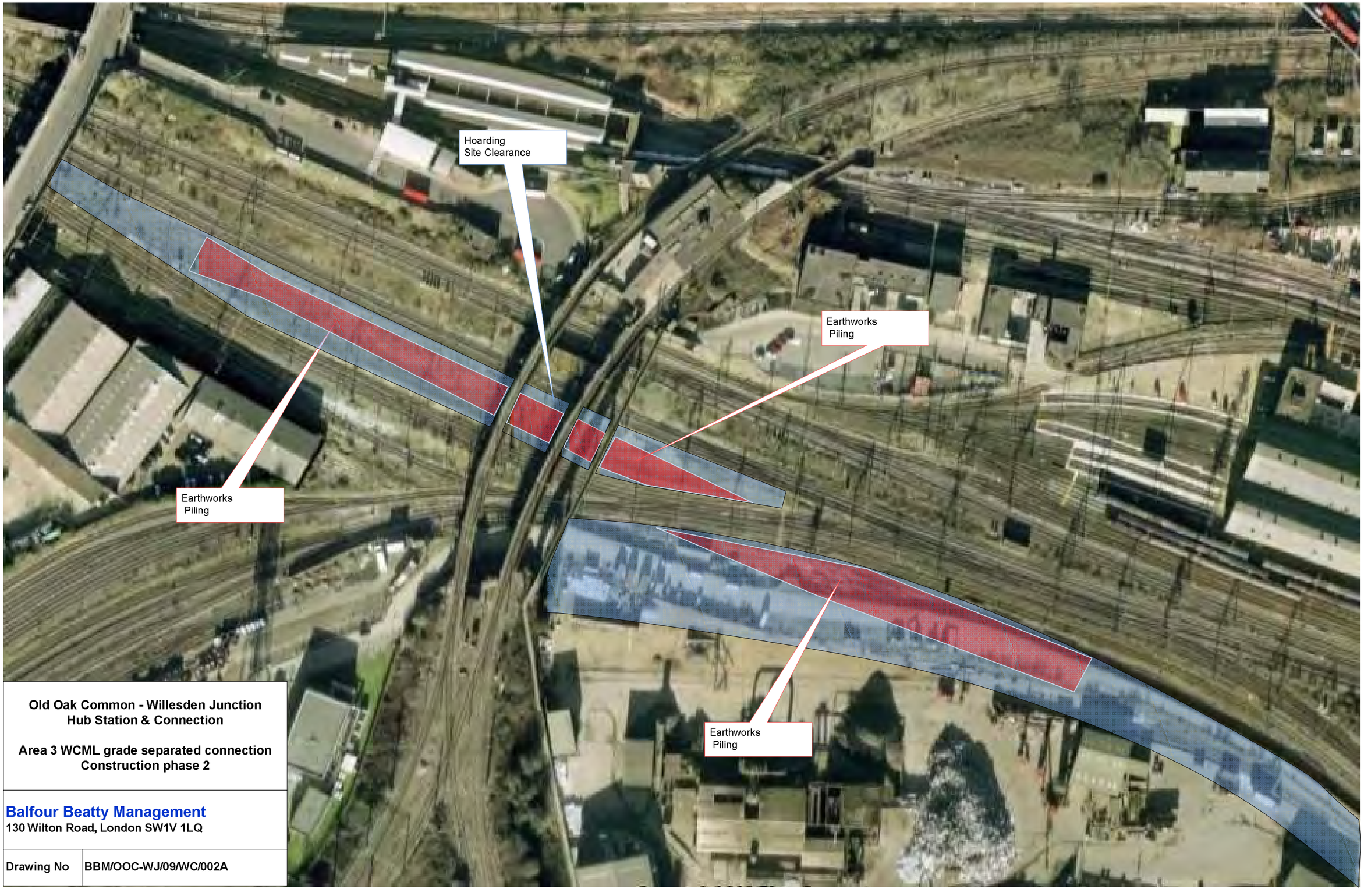


Old Oak Common - Willesden Junction
Hub Station & Connection

Area 3 WCML grade separated connection
Construction phase 1

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/WC/001A

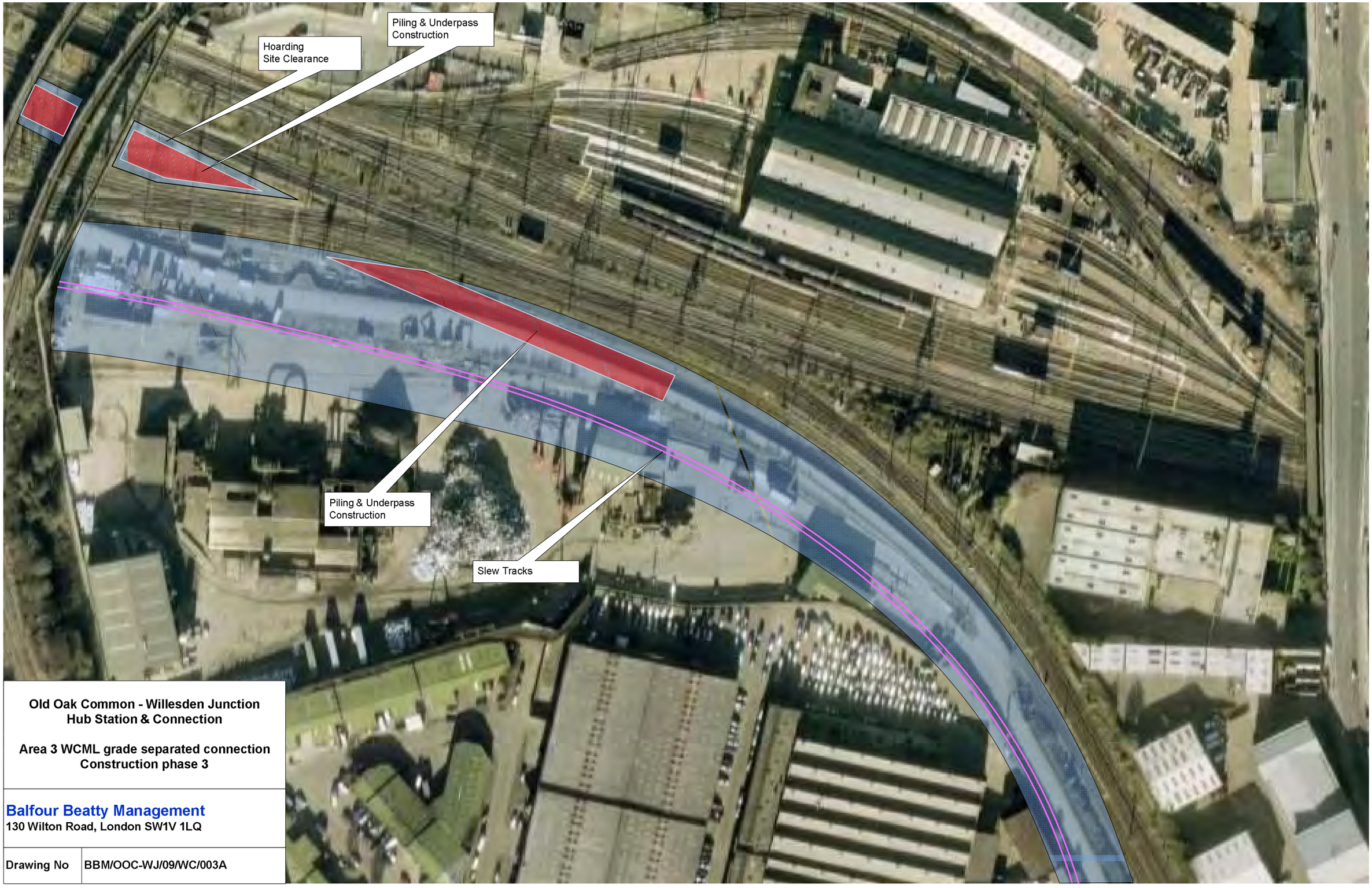


Old Oak Common - Willesden Junction
Hub Station & Connection

Area 3 WCML grade separated connection
Construction phase 2

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/WC/002A

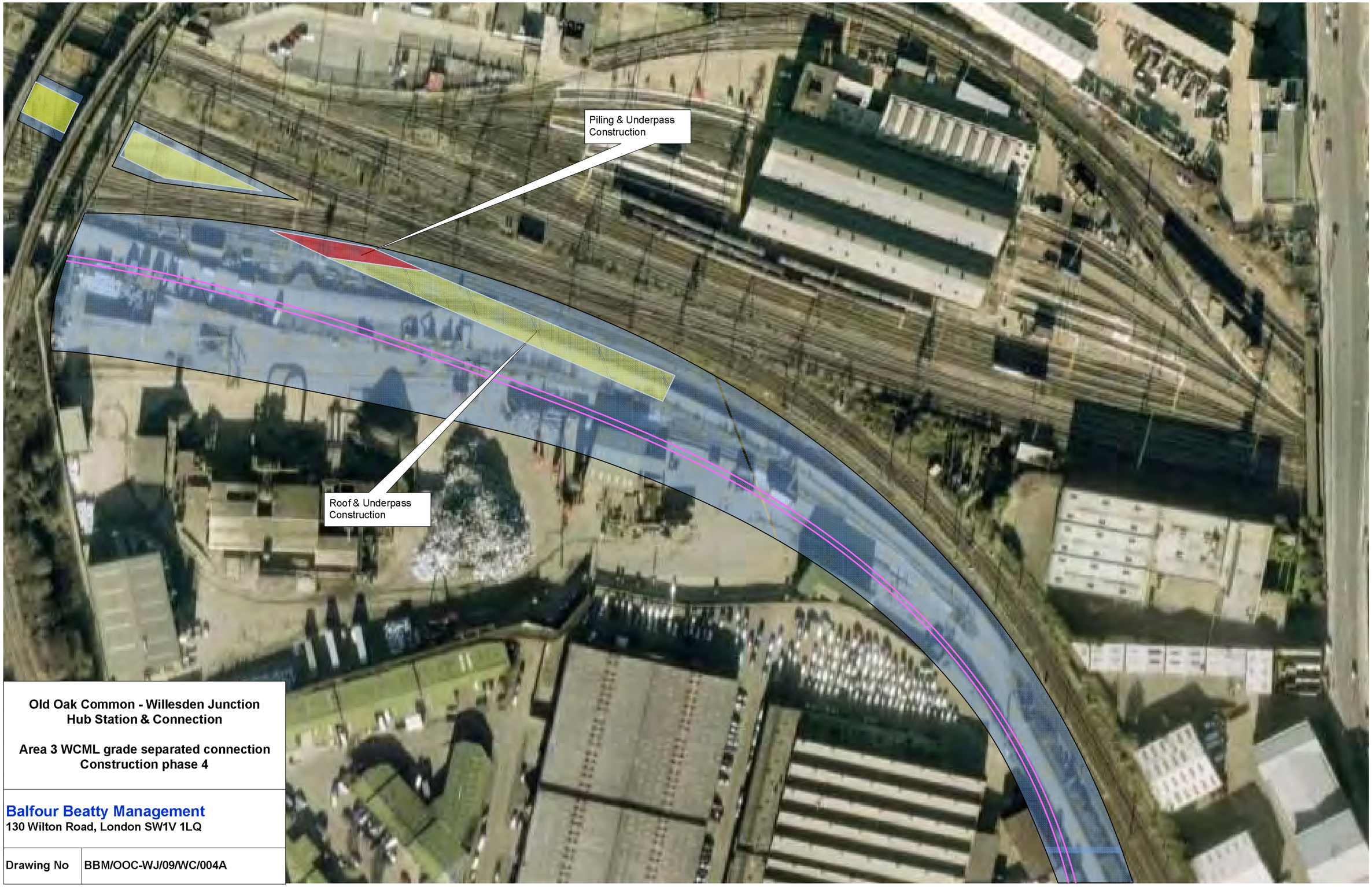


Old Oak Common - Willesden Junction
Hub Station & Connection

Area 3 WCML grade separated connection
Construction phase 3

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/WC/003A

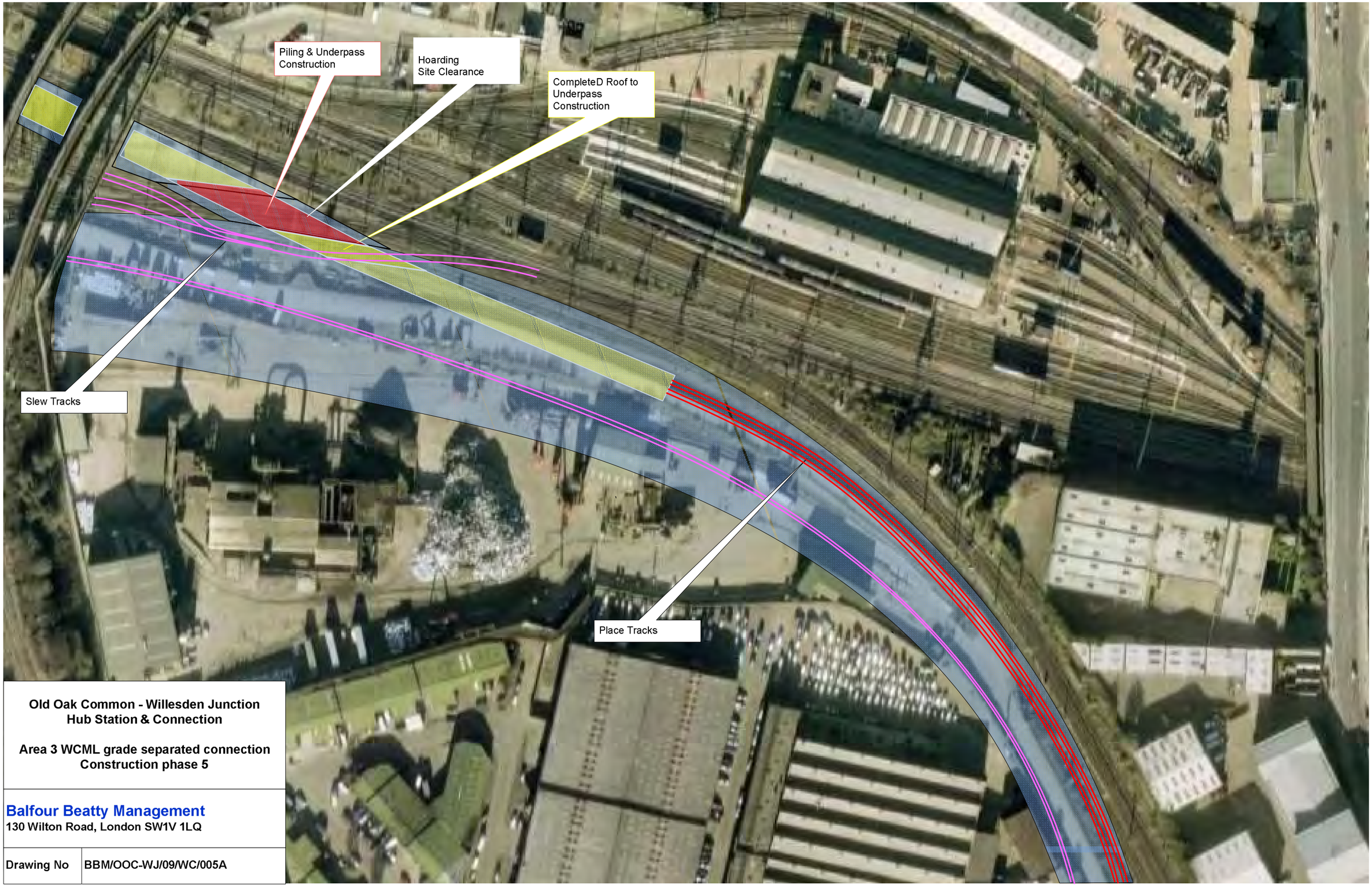


Old Oak Common - Willesden Junction
Hub Station & Connection

Area 3 WCML grade separated connection
Construction phase 4

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/WC/004A

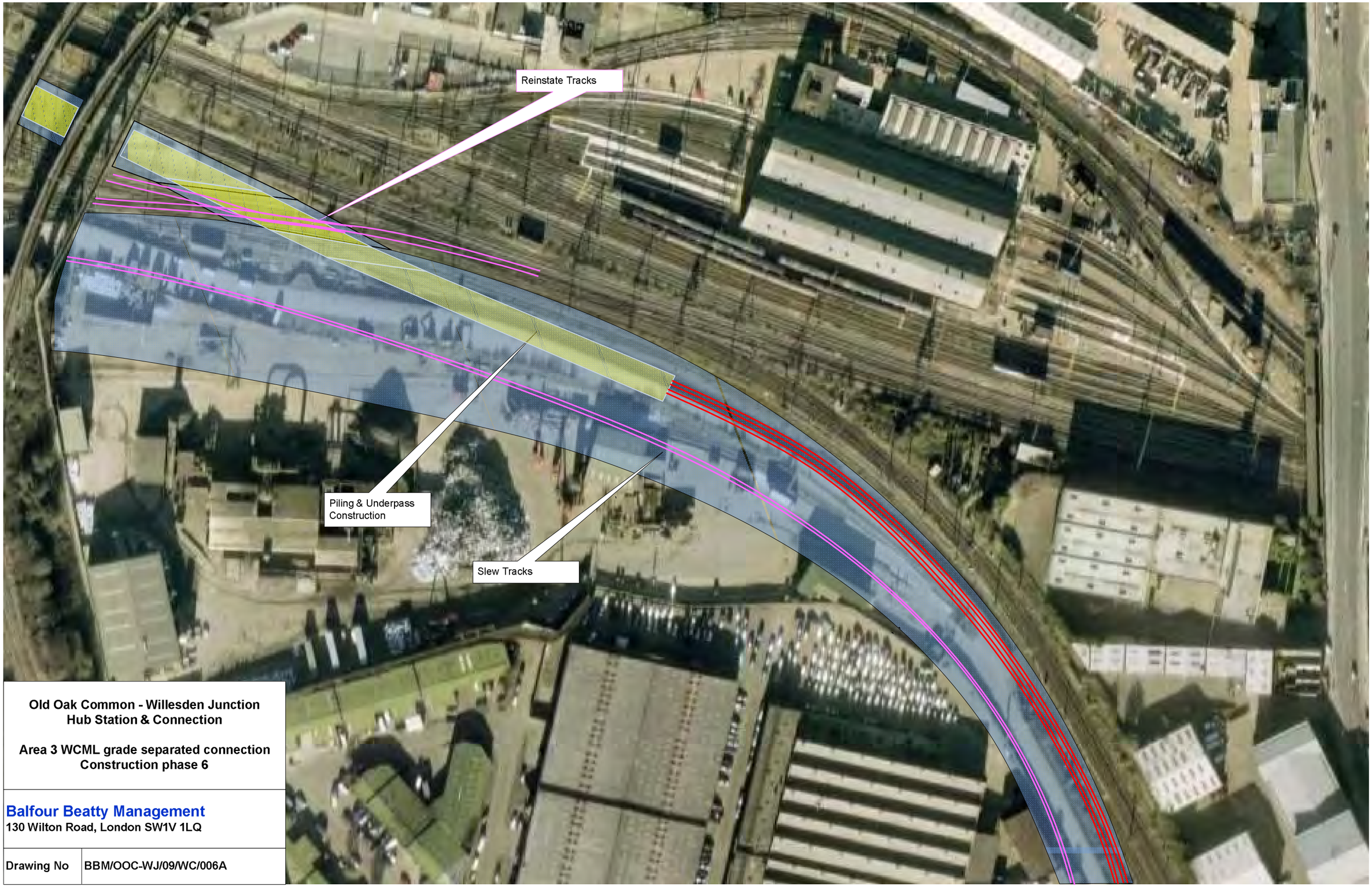


Old Oak Common - Willesden Junction Hub Station & Connection

Area 3 WCML grade separated connection Construction phase 5

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/WC/005A

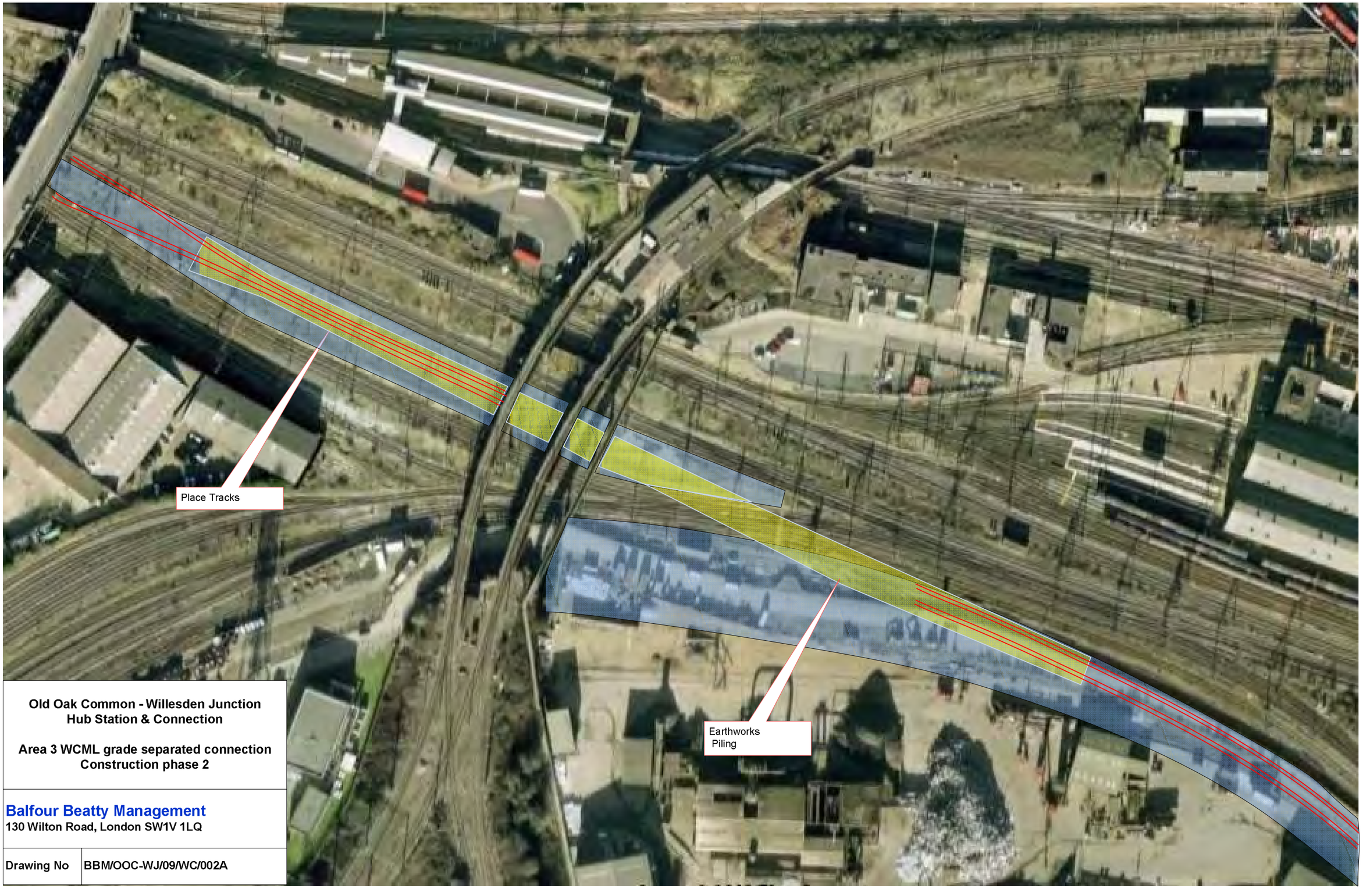


Old Oak Common - Willesden Junction Hub Station & Connection

Area 3 WCML grade separated connection Construction phase 6

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/WC/006A



Old Oak Common - Willesden Junction
Hub Station & Connection

Area 3 WCML grade separated connection
Construction phase 2

Balfour Beatty Management
130 Wilton Road, London SW1V 1LQ

Drawing No	BBM/OOC-WJ/09/WC/002A