

Construction Environmental Management Plan

Western Yards

Revision 03



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VERSION / APPROVAL / AMENDMENT RECORD

Version	Author	Amendments	Approved By	Date
1.0	Environmental	First Version	JD	06/02/2020
1.1	Design	Updated images	DR	22/04/2020
2.0	Environmental	Amendments to Noise, Dust and Vibration Monitoring	JD	16/06/2020
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INITIAL INFORMATION

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Planning Application Reference Number

12/AP/3940

Description and Duration of Development

Multiplex Construction Europe Ltd. (MPX) has been appointed as Principal Contractor for the Western Yards Building 3 and basement project (hereafter referred to as 'the Site' or 'the Project').

A plan showing the location of the Site and its sensitive receptors is presented below (Figure 1 and Table 1)

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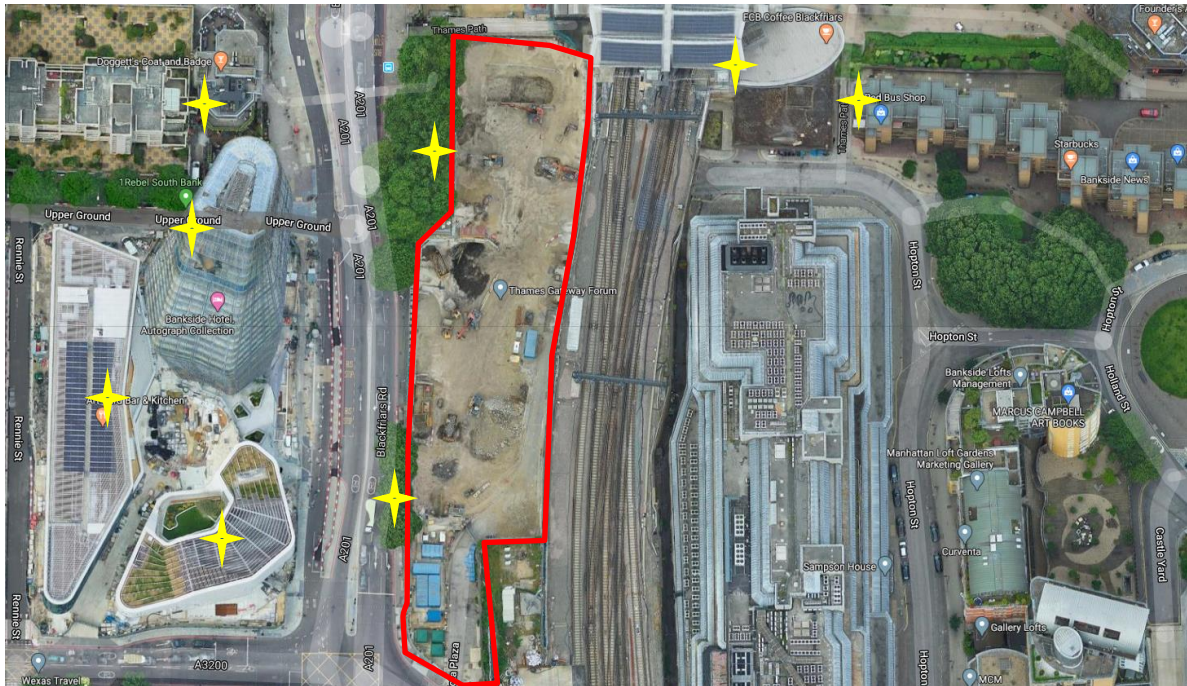


Figure 1 Plan demarking the location of Western Yards and any sensitive receptors

Receptors	Location	Type
One Blackfriars	Blackfriars Road	Residential Receptor
Rennie Court		Residential Receptor
Doggett's Coat and Badge		Commercial Receptor
Bankside Hotel		Commercial Receptor
Protected Trees		Environmental Receptor
Rennie Gardens		Environmental Receptor
Holiday Inn Express	Southwark Street	Commercial Receptor
SAMA Bankside	Hopton Street	Commercial Receptor
Hopton Street Residents to include Falcon Point		Residential Receptor
Blackfriars Station to include TfL		Commercial Receptor
River Thames	Thames Path	Environmental Receptor

Table 1 List of Sensitive Receptors

Western Yards is located in the London Borough of Southwark, within South East London, with its centre at approximate National Grid Reference 531684E and 180473N. The site is located on Blackfriars Road and is bounded by the River Thames and river walk to the North, Blackfriars Road to the West, Southwark Street to the South and the Network Rail viaduct into Blackfriars Station, to the East. The development will comprise of three buildings consisting of WY3 - a 20 storey commercial building, WY2 – 2 a 49 storey residential building and WY1 – a ground plus 12 storey residential building.

The development also comprises of a common basement level for all three buildings, with a lower ground floor, B1, B2 level and a car stacker shaft going down to B4 level. The basement levels in the

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main house the plant, car parking space, bicycle racks, back of house and staff areas. This document only considers the construction of Building 3 and basement area

The works will largely consist of:

- Basement perimeter Secant Wall, undertaken by the sub-structure contractor, appointed directly by the client.
- Piled foundations, undertaken by the sub-structure contractor, appointed directly by the client.
- New formed basement, undertaken by the sub-structure contractor, appointed directly by the client.
- Superstructure works of Building 3
- Installation of the external cladding (mammoth hoists, monorail & tower crane for the upper levels)
- MEP and Fit Out works of the commercial buildings (CAT A)

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CONSTRUCTION INFORMATION – SITE START UP

Site set up

The site is presently secured using solid hoarding system installed by the sub-structure contractor who has been appointed directly by the client and is the present Principal Contactor on site. The sub-structure contractor will be novated across to Multiplex (timing is presently being agreed with all parties).

When Multiplex take possession of the site as Principal Contractor in order to segregate people from moving plant and vehicles, pedestrian access to the project and offices will be provided via the east of the site from Hopton Street into a PPE free compound area.

The initial site offices and welfare arrangements will be situated on the Bankside East site grounds closest to the North Arches of the railway viaduct, this will allow site operatives to access Western Yards site through the southern (Arch No.2) of the northern arches, as per the below plan below. Please note if this pedestrian route is not possible through Arch No. 2 (presently UKPN works are ongoing in Arch No. 1, then a route would be required through arch No. 7, from MPX site office and Welfare as highlighted below in Figure 2.

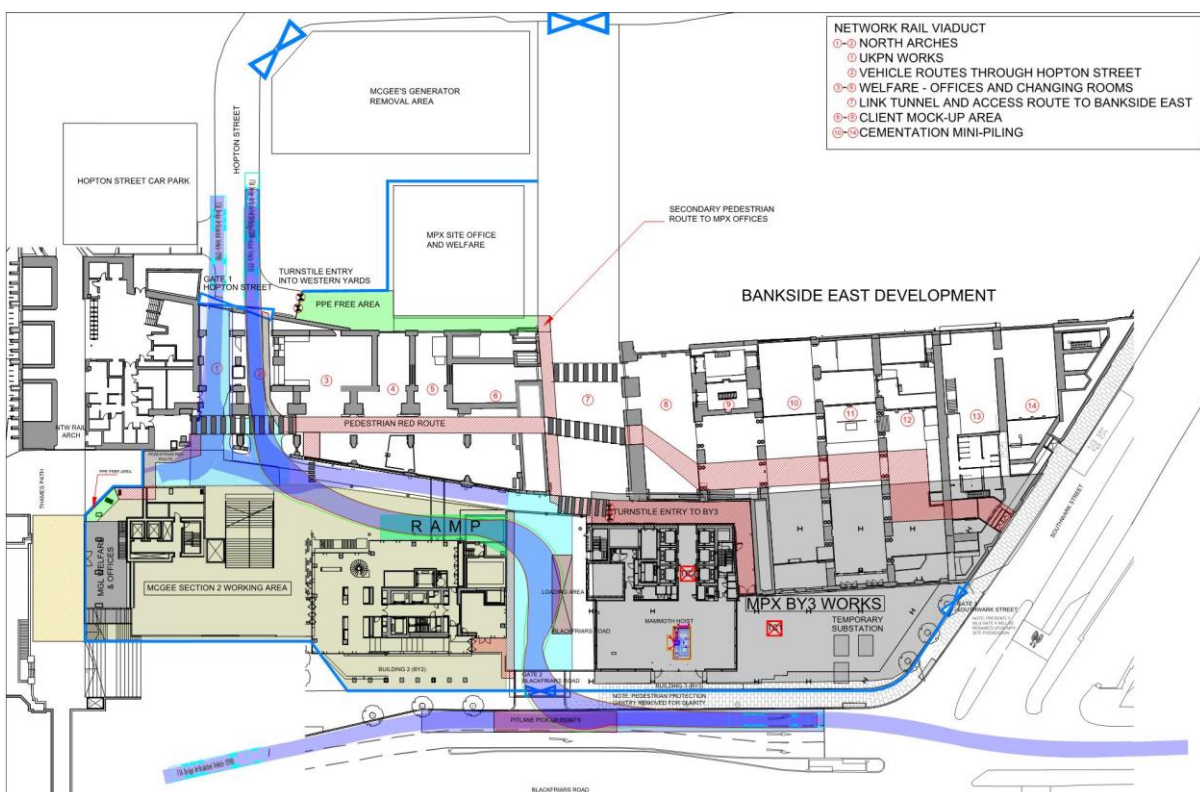


Figure 2 – Pedestrians Routes

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Pedestrian access to the site will be controlled via biometric scanners and full height turnstiles, and a series of CCTV cameras will be installed on site with an alarm system in place for the superstructure works. During the fit out stage of the project there will be on site security out of working hours.

PPE routes will be provided at all times around the site. These will be identified by appropriate signage and segregated from work areas and vehicle loading by suitable barriers. It is noted that the unloading area will be segregated and only those operatives involved in traffic management or unloading from vehicles are to access this area.

As part of Multiplex security strategy, a solid hoarding to the full perimeter, together with the overhead scaffold protection gantry will be installed on the pavement on Blackfriars Road, Southwark Street and Thames Pathway, lockable vehicle access and egress gates will also be installed, this will replace the present site hoarding which has been installed by the sub-structure contractor. There will be turnstiles installed at the entry to the welfare set up area on Bankside East and then when you enter site through to each building.

During the construction phase of the project, the security contractor will operate a biometric security system to permit access through the turnstiles, during the biometric registration, all Sub-Contract employees will be photographed and their details recorded in accordance with data protection requirements. The registration process will only be commenced upon the successful completion of the site induction, presentation of evidence of qualifications held and right to work/clearance documents. Under no circumstances will access be granted to the project prior to completion of the complete induction process. The security contractor and Multiplex will use the biometric system to monitor access and egress of all people undertaking project activities on site. The security contractor will process all information obtained from the security system in accordance with the requirements of the Data Protection Act. The information will be used to measure, record and report time in attendance as well as to provide the list of operatives on site at the point of any site evacuation. CCTV monitoring and guarding of the site shall be carried out 24 hours a day. CCTV imagery will be used for general security management and may be used as evidence to support investigations with the authorisation of Multiplex. The security infrastructure and positioning will change as the project progresses and updates will be advised at the logistics or construction management meetings.

Traffic Management Measures

The sites location presents a number of challenges to the construction of the project. Similarly, the constraint in the size of the site means that vehicle deliveries, movements and unloading need to be strictly controlled and managed.

Construction deliveries approaching site from North London direction will approach the site from Blackfriars bridge, onto Blackfriars Road and then either entering the site through the future pit lane or turning left into Southwark Street and then turning left into Hopton Street and following the road to the end and enter site at Gate 1 – Hopton Street and the North Arches of the Network Rail viaduct. On leaving the site vehicles will leave site via Gate 2 and turn left into the pit and left again

File Name: Appendix A - CEMP REV3.0_JC

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into Southwark Street, when leaving site from gate 2 into the pit lane is mandatory to turn left into Southwark Street, Transport for London have not permitted vehicles leaving the site or pit lane to head straight down Blackfriars Road. Gate 2 at present will be used for site exit only.

Delivery vehicles can also approach site from Stamford Street on to Southwark Street or approaching the site from easterly direction on Southwark Street, however this route will mean that vehicles will not be able to access the pit lane on Blackfriars Road directly, and will need approach site through Hopton Street and Gate 1. Gate 1 at present with UKPN works ongoing will operate a predominately a strict one way system through the southern of the northern arches.

It should also be noted vehicles could leave site through Gate 1 and Hopton Street, however this would be either reversing into site or performing turning manoeuvres on site. We would want to avoid or keep such vehicle manoeuvres to a minimum however the Multiplex Logistics team would assess this on a case by case basis. The above is detailed in Figure 3 below.

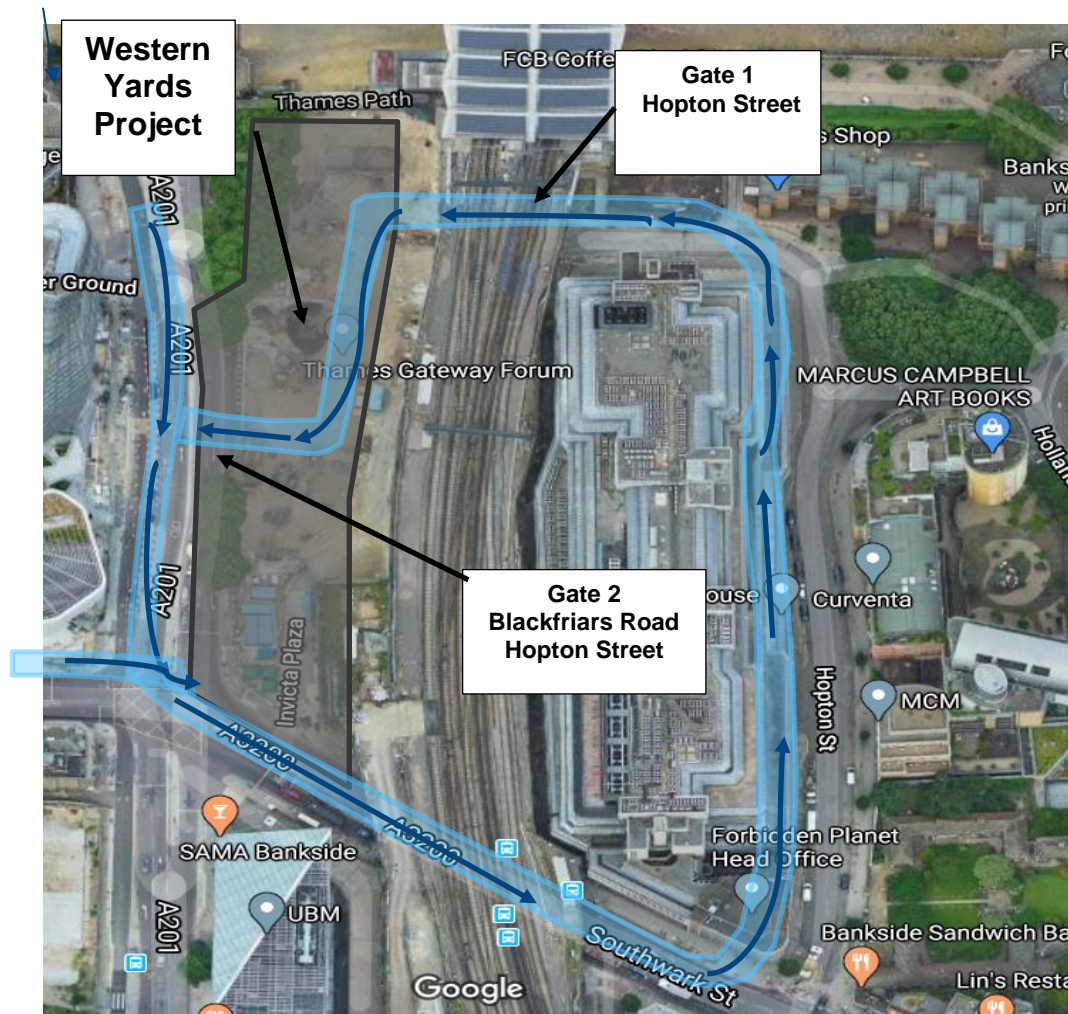


Figure 3 – Project Location and route direction

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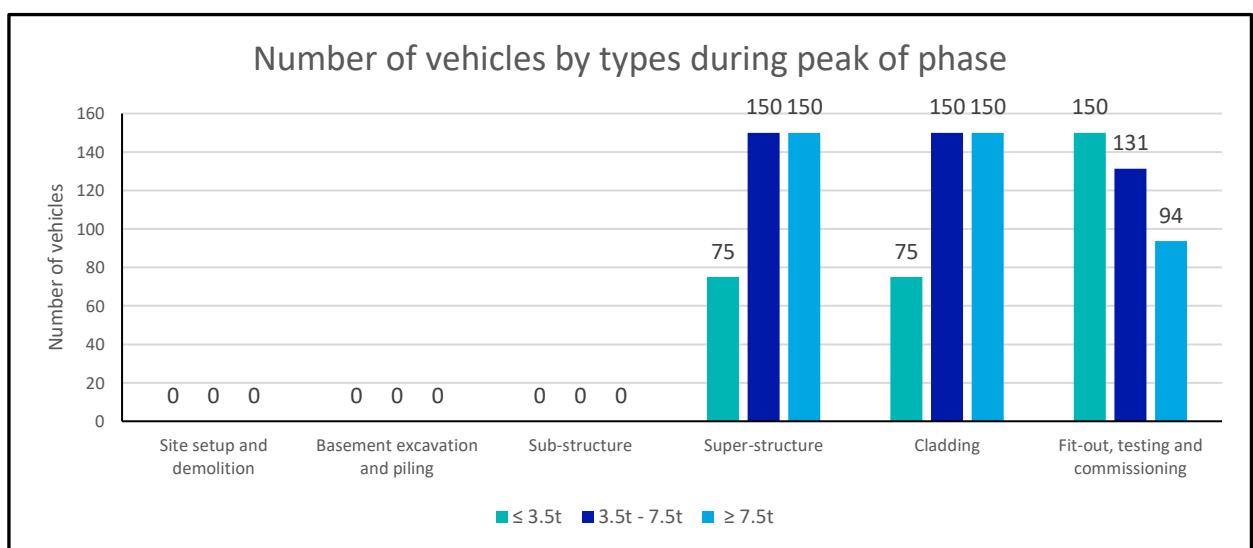
All access and egress points on site will be manned by a banksman or traffic marshal who will ensure that vehicles and pedestrians do not come into contact. All traffic marshals will undertake the Elite traffic marshal training. The pedestrian crossings on both Southwark Street and Blackfriars Road will be maintained at all times during construction.

A traffic management plan will be made available in the site cabins and on a noticeboard before entering site to ensure all operatives are aware of safe areas and walk ways.

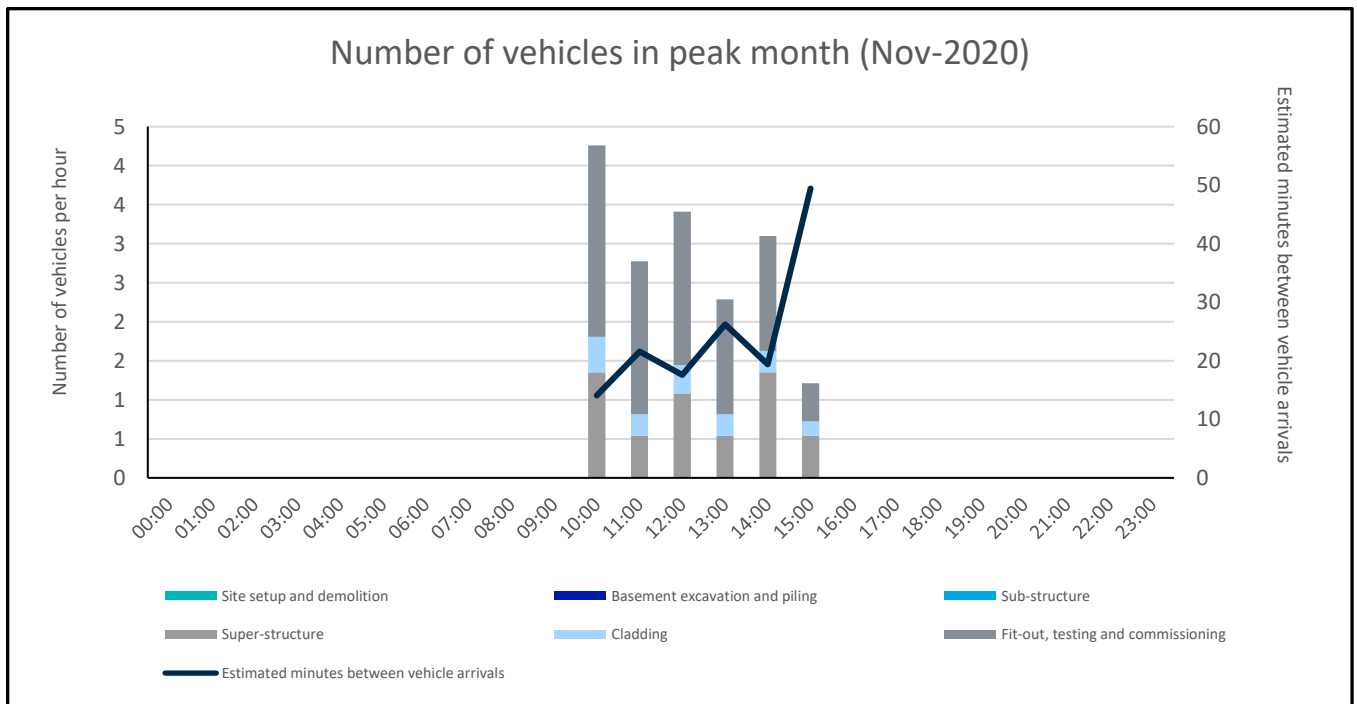
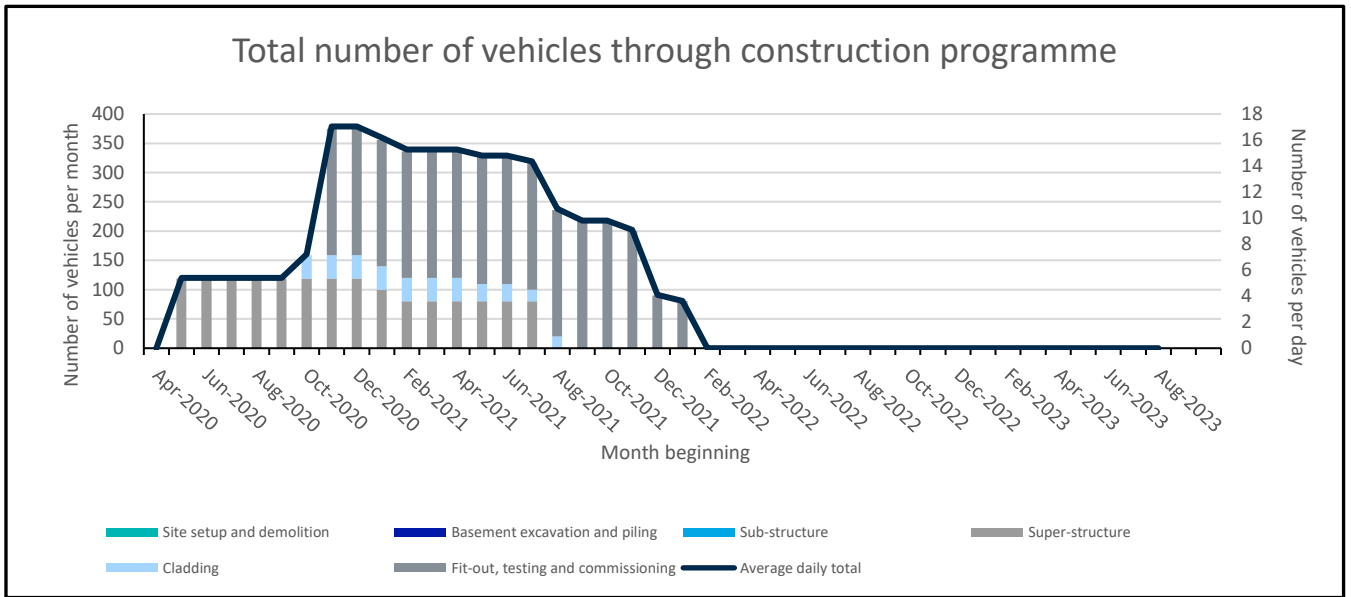
Early or late vehicles will be turned away to avoid congestion and will be required to make an alternative booking. A proportion of delivery slots will be left open to allow for those vehicles that arrived early/late. Un-booked or un-scheduled deliveries will be turned away and will be required to make a booking via the online booking system.

Each vehicle gate will be manned with security guards provided by the security contractor to control the vehicle movements and to segregate the pedestrian crossovers from people and vehicles. To prevent pedestrians from traversing the pavement during vehicle movements, retractable barriers will be pulled out ensuring segregation and protection.

An indicative outline of number vehicles and vehicle types to enter the project throughout the project is provided below in Graphs 1-3:



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Present Site Set up and Logistics

During the sub-structure works, prior to Multiplex taking possession of site, the main entry points for vehicles is either through Gate 2 on Blackfriars Road, and exiting via Gate 4, or via Gate 1 on Hopton Street (See below Figure 4).

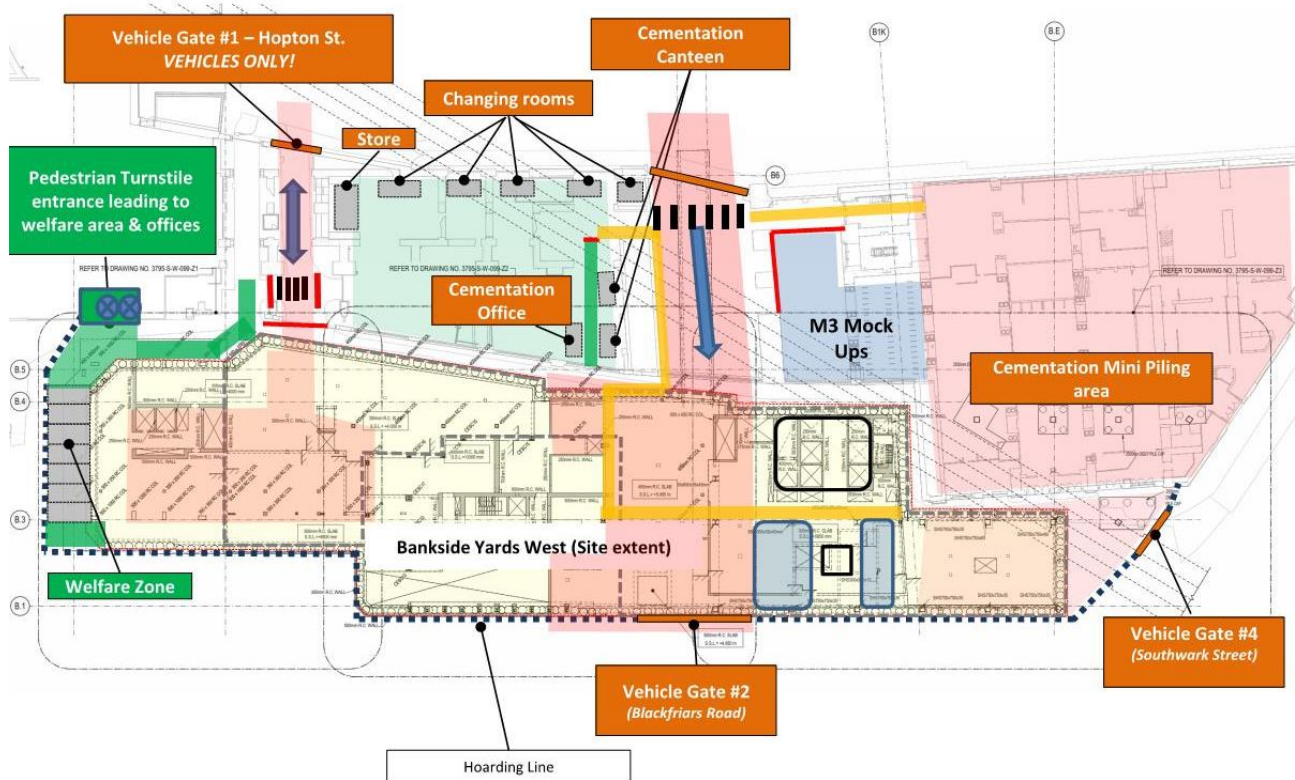


Figure 4 - Present Sub-Structure Logistics Plan

MPX Site possession: Phase 1 Set up and Logistics

Upon Multiplex taking possession for site and steelwork for WY3 commencing, the vehicle and pedestrian routes within the site confines are shown below in Figure 5, together with the installation of a pit lane on Blackfriars road, TC2 tower crane erected above the core for building 3.

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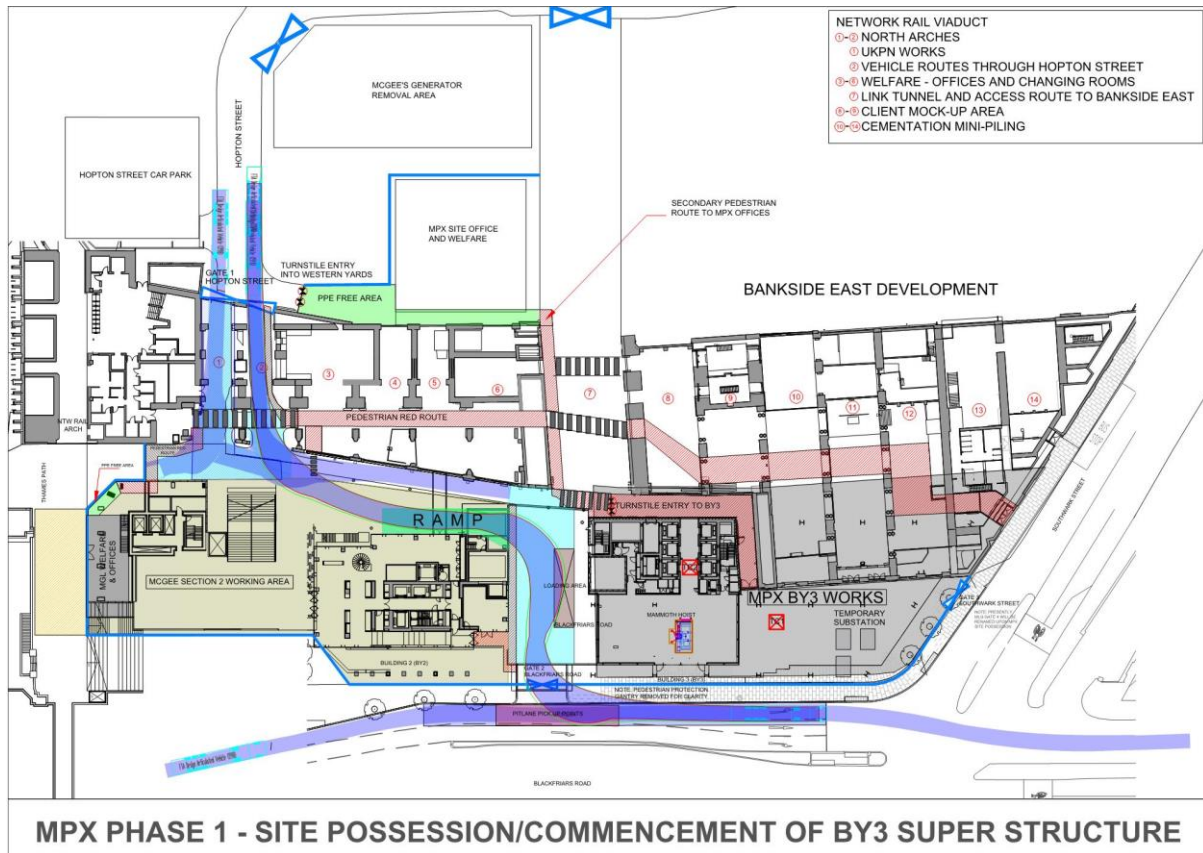


Figure 5 - Commencement of Building 3

Bankside East site will be for use as a storage area for materials, but also a vehicle holding area whilst other deliveries are being unloading, this would reduce impact on the neighboring streets around the site, but also assist in the overall logistics of the project (A site on Great Dover Street will be used as a back up holding area). In addition in the event of unexpected deliveries these would be directed to the vehicle holding points described above to prevent vehicles waiting on the road network until their allotted times arises.

Furthermore with UKPN works and potential road closure of Hopton Street required by generator removal works on Bankside East, access to site through this main route would not be possible, and in such circumstances we would need to access site through Bankside East as well. Please see below Figure 6.

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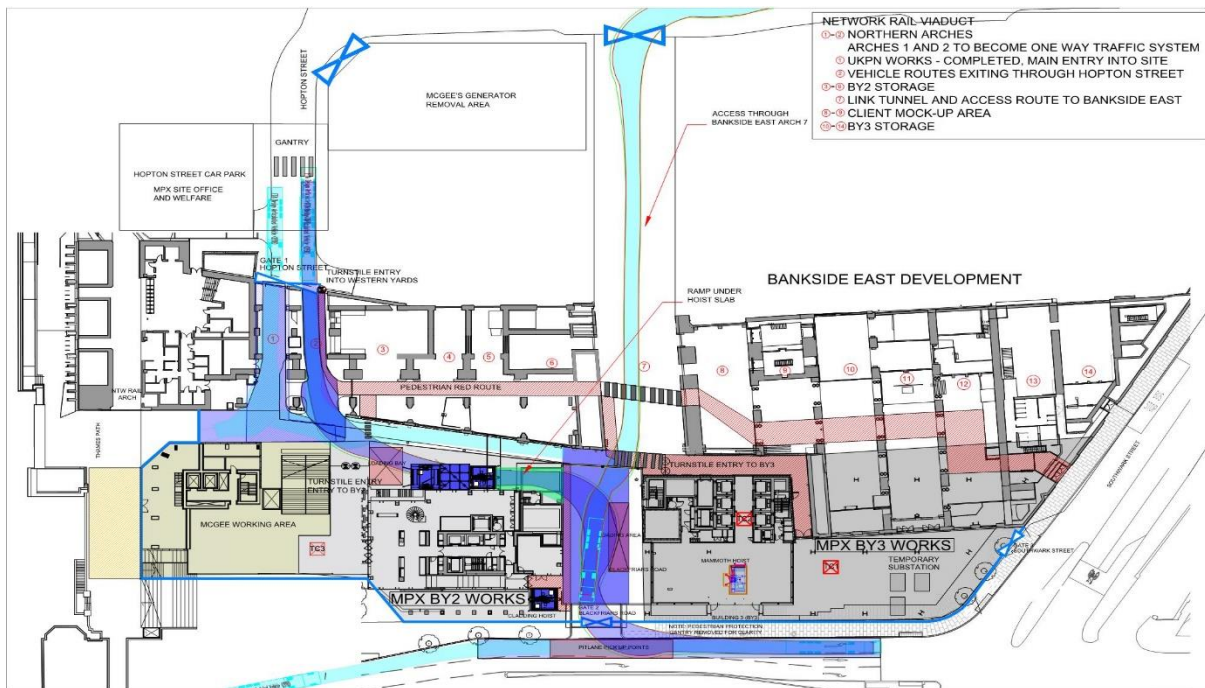


Figure 6 – Access through Bankside East through Arch 7

To assist in the vertical movement of materials, a pit lane will be formed along Blackfriars Road to allow deliveries to be unloaded directly from the road via Tower Cranes, the exact location of the pick-up points within the pit lane are being reviewed in line with the existing tress on Blackfriars Road.

The pit lane will run the length of the present left slip lane nearest to the site boundary on Blackfriars Road. The pit lane design and operation will be agreed with Transport for London, and consists of physical separation via the use of low level barriers, retractable barriers and fencing, appropriately lit (Figure 7). The dedicated marshals will also be responsible for directing any traffic during lifting operations from the pit lane to prevent any risk of vehicles along Blackfriars. The footway for the gantry outside the development will be increased to a minimum of 2 meters in line with current COVID guidance (See Figure 7)

The pit lane will be controlled by dedicated traffic marshals from the logistics contractor who will also ensure any unauthorised vehicles, pedestrians and cyclists cannot gain access to the pit lane. The pit lane will only be operational from the hours of 10:00-16:00 and outside of these hours the associated barriers will be removed to allow the continuous movement of traffic on Blackfriars Road. The pit lane may also be used for abnormal loads (e.g. oversized façade panels) in the evening (19:00-23:00) subject to agreement from TfL and Southwark Borough Council.

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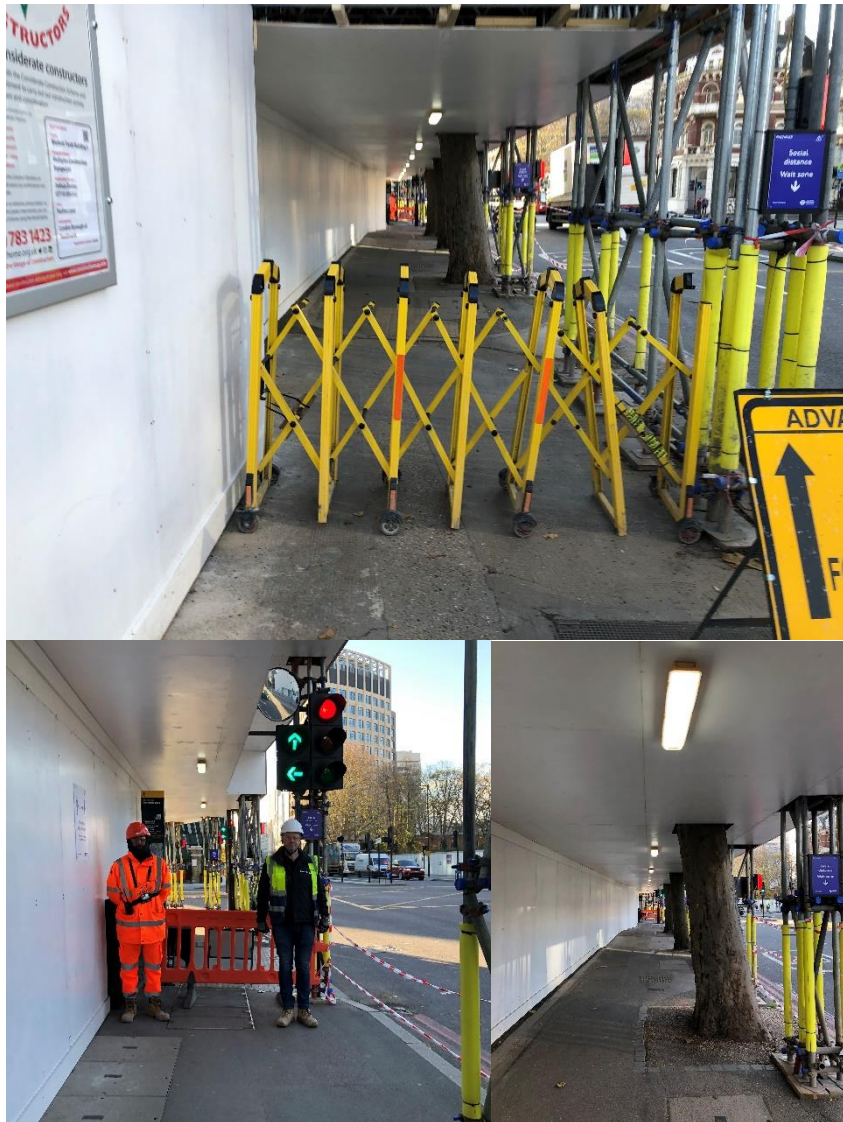


Figure 7 – Pit Lane on Blackfriars Road

All vehicle movements and materials deliveries to the site will be controlled by an online Delivery Management System (DMS). Subcontractors will need to receive the relevant training and use the system to book all vehicle movements to and from site as well all materials deliveries and collections. The system will be used as an overarching logistics management system to control and monitor numerous logistics activities. It manages and allocates project resources and capability to ensure that bookings are properly coordinated and supported with the necessary assets and resources. Please refer to the responsibilities flowchart for clarity on the DMS as below in Figure 8.

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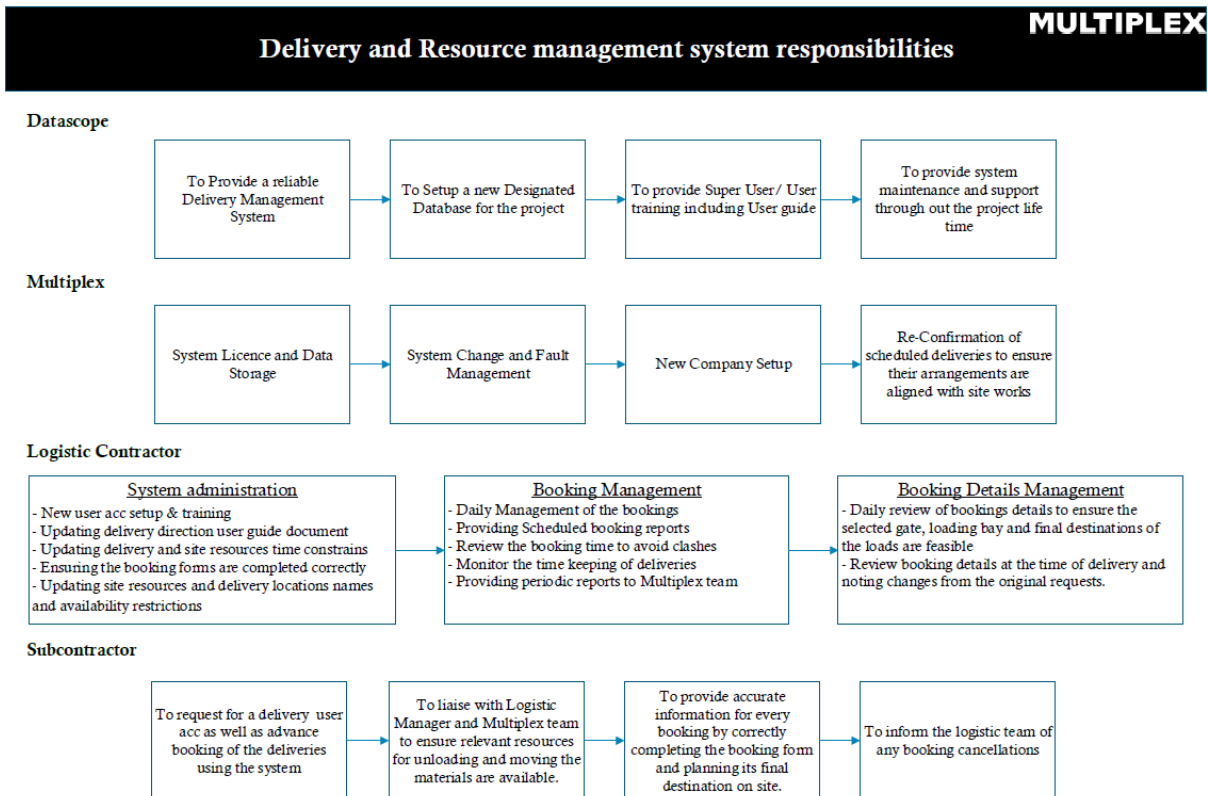


Figure 8 Delivery Management System (DMS)

Authorised users have the ability to:

- Make vehicle movement and materials delivery and collection bookings, including for the pit lane
- View the status of bookings and amend requirements
- Hoist and crane allocation schedules
- View the real-time progress of materials deliveries
- View inventory information on materials held on site
- Receive notifications on the arrival of vehicles/materials at site

DMS bookings will be reviewed constantly by the PLM and a schedule of deliveries will be issued daily to subcontractors for the following day’s vehicle movements and deliveries. Where conflicts of delivery time or resource are encountered, the PLM will de-conflict this in conjunction with the Multiplex project team to ensure that the project priority is applied. For this reason and to ensure the deliveries are coordinated, deliveries are required to be booked no later than 48 hours before the delivery takes place. FORS Silver and CLOCS registered are the minimum standard of vehicle equipment required for all vehicles accessing the pit lane and site.

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Multiplex will also liaise with our fit out contractors on the project, to see if an off-site consolidation would be required and benefit the project nearer the time. Multiplex will then seek this through our appointed logistics contractor which is close to site or within the M25 region. Bankside East will provide a local vehicle holding capacity, in addition to a site on Great Dover Street. In the event that vehicles arrive earlier than their allocated slot or are unable to access site for some other reason, the driver will be directed to hold at Bankside Yards East or to the site Great Dover Street until site access is available.

Due to the size and layout of the project, and particularly at the ground floor, site storage is strictly limited and controlled. For this reason, the use of the Bankside Yards East/Consolidation Centre will be vital to ensure the smooth running of the project. At each floor level, designated areas shall be identified on the slab highlighting storage areas. Items stored prior to the installation of the cladding shall require securing and or tethering to prevent the risk of lightweight materials being blown from the building by the wind. Further storage space for tools/materials will be allocated within the Network Arches, however this at Multiplex's discretion.

Tower Cranes

The first Multiplex Tower Crane TC2 will be installed by the sub-structure contractor's tower crane which is presently on site. TC2 tower crane will bear on a steel grillage which will be installed on top of the recently constructed concrete core for Building 3. This crane will remove the sub-structure contractor crane from site, and serve the erection of the steelwork for Building 3.

The second crane for Building 3 will be installed by TC2 and will be positioned within the footprint of building and such will be able to unload deliveries from the pit lane in Blackfriars Road.

All tower crane deliveries will be delivered as abnormal loads and will be booked in in advance via TfL and Metropolitan Police

The tower cranes will be 'zoned' to ensure that no lifting can take place outside of the designated lifting zones, so that no materials can be lifted over the public spaces outside of the site and in particular the Network Rail viaduct tracks, apart from the 'Pulse night club area of the viaduct. See Figure 9.

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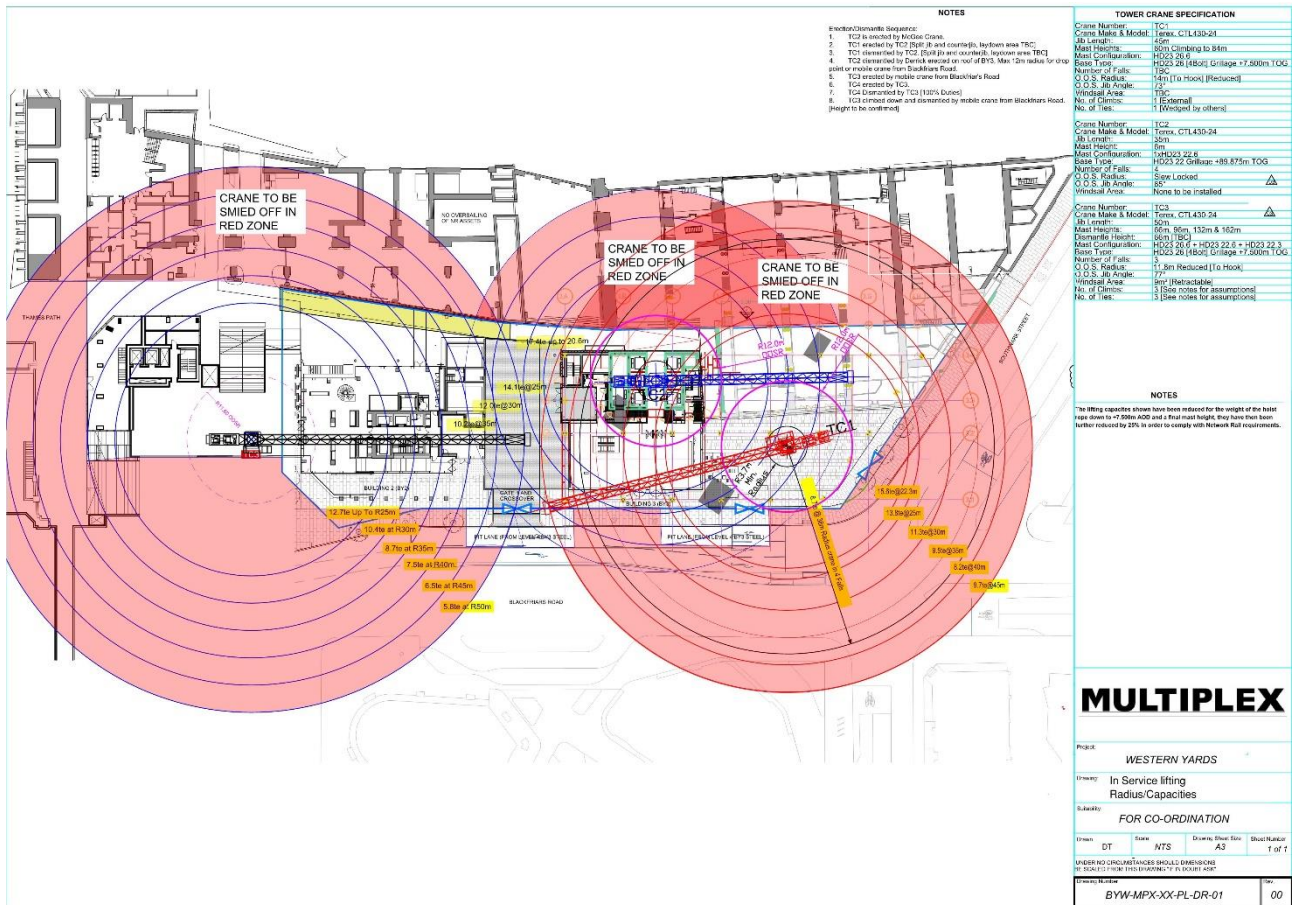


Figure 9 In Service Tower Crane Lifting Radius

Hoists

The means of vertical transport for people and a considerable volume of material shall be via the hoists located external to the building. The hoist provision has been selected to meet a number of variables including capacity, speed and maximum height and a range of machines have been selected to meet the project specific requirements, including both passenger and goods and goods-only machines.

A mammoth hoist used for operatives and material distribution will be utilised for Building 3 and will provide access to all floors, signage will be used to identify the floors served by each hoist to ensure the prompt flow of passengers and materials and minimise queuing.

It is noted that the intention is to operate hoists on the project until the end of the working day (1800); therefore, the means of mitigating excessive noise, particularly the opening and closing of landing gates and hoist doors will be detailed during procurement with the chosen manufacturer.

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Welfare

Multiplex is committed to the provision of class-leading welfare facilities that will place a high priority on the health and well-being of all personnel on site. Welfare and facilities management services will be provided by the logistics contractor. The logistics contractor will ensure that welfare standards are maintained throughout the project and ensure that services and facilities are managed effectively. A Welfare User Group will be established to ensure that facilities meet the expectations of the workforce and the Client throughout the project.

The initial site set up will be site cabins situated on the grounds of Bankside East, this will enable for the Multiplex team to mobilise on site together with the steelwork sub-contractor, and this set up will provide office space, drying rooms and an eating area. Initially this eating area facility will provide self-service cooking/heating facilities for the projected workforce of up to 100 work who wish to bring their own food and include means to store and prepare food, heat drinks and provide a sufficient number of tables and chairs for rest. This also provide office space for MPX site team and steelwork sub-contractor (Figure 10).



Figure 10 – Phase 1 Accommodation on Bankside East

Canteens, Offices, Toilets and Washrooms

The main canteen facilities will be established in the second phase of the accommodation set up and will serve hot food. The facility will also provide self-service heating facilities for the project workforce with sufficient number of eating space of tables and chairs. It is projected this facility will be able to cater for 450 people at any one time. Toilets and washrooms shall be provided in the site cabins on bankside east initially and then will be relocated to the second phase set up. Office

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accommodation shall be provided via the site cabins on bankside east and then then will be relocated to the second phase set up.

Potential For River Transport

River transport has been explored at the initial stages of the project but currently not a viable option. Multiplex will continue to explore opportunities to utilise the River for transport throughout construction.

CONSTRUCTION METHODOLOGY WESTERN YARDS BUILDING 3 (WY3)

Western Yards Building 3 (WY3) is a commercial building which will be situated to the south of the Western Yards development.

WY 3 Logistics

Multiplex’s lifting strategy is based around two tower cranes which will be primarily used for the offloading and erection of the steel frame, both having capacity to reach the pick point on Blackfriars Road. TC1 will have the capacity to lift from an additional pick point to the south inside the site hoarding for heavier Verindeel elements (Figure 11).

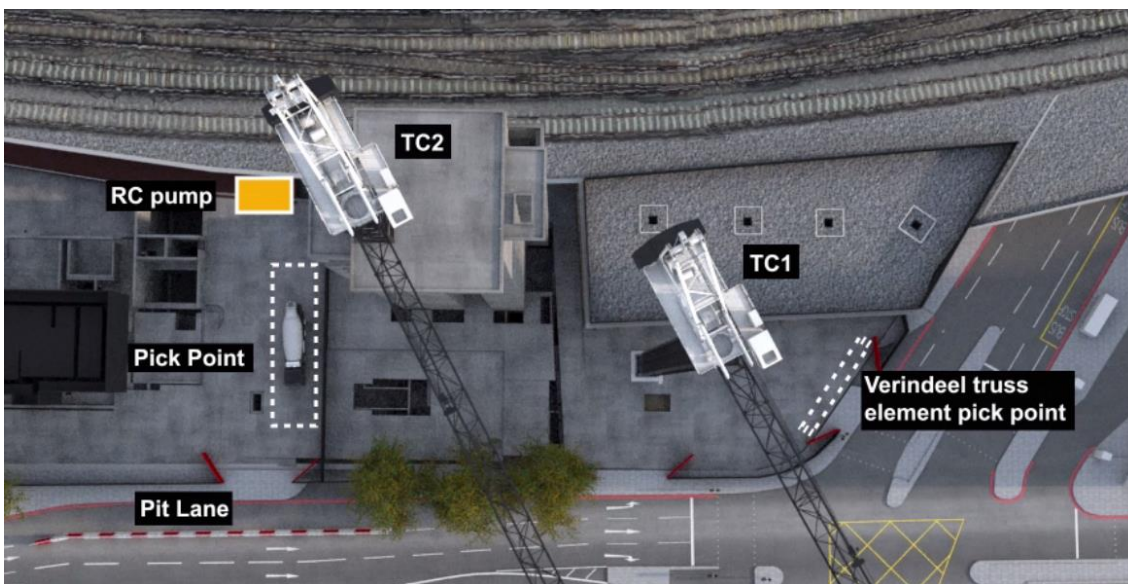


Figure 11 - Snapshot of the modelled logistical strategy

Additionally, the tower cranes will be used for loading the large façade panels to the floor plates via CantiDecks. Multiplex will continue to re-evaluate this with the specialist façade contractor to check the feasibility of loading out with pod lifters to avoid the constraints and set up times involved with CantiDecks. All other façade panels and materials will be distributed using the internal hoists until such times that the façade is complete. The façade panels will be further moved into their final installation positions using specialist lifting equipment as described within the façade section. Our

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hoisting strategy for WY3 is to mitigate the need for external hoists, not only will this allow simplified temporary weatherproofing it will segregate trade interfaces allowing for completion of architectural finishes of steelwork and following CAT A fit-out activities (Figure 12).

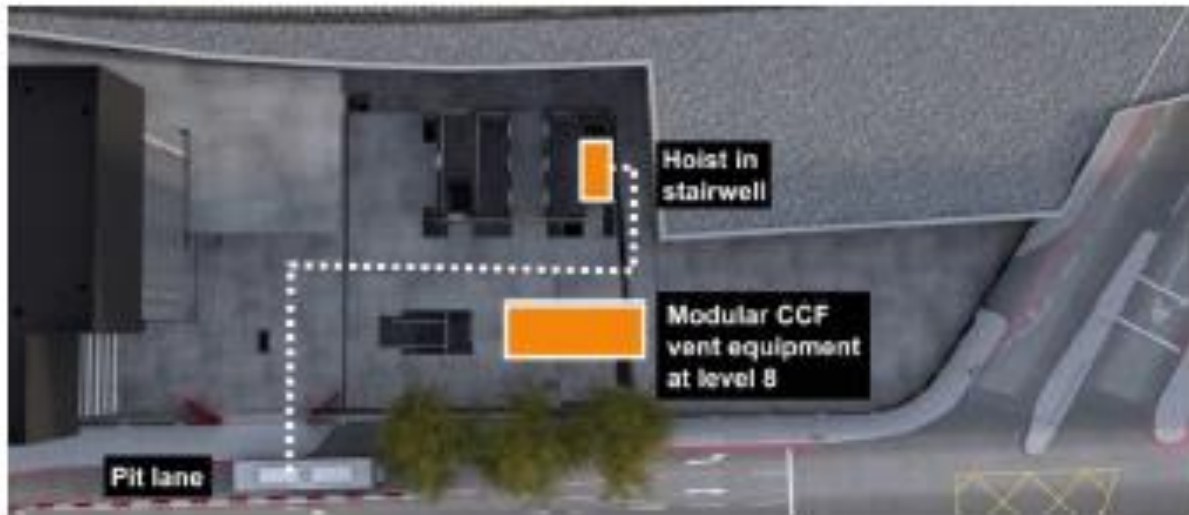


Figure 12 Hoist location

Once the façade is complete, a beneficial use goods lift and passenger lift will be used to complete the building. Upon completion of the South East façade panels, TC1 will be dismantled using TC2. Prior to the end of service of TC2, a derrick crane will be erected on the core and used to dismantle TC2. This is necessary due to the size of mobile cranes required not being feasible.

Additionally, the erected derrick crane will be able to progressively dismantle the tower crane. It will provide hold points should the weather conditions change, whereas mobile cranes would require reverting to back up dates causing further disruption to the local environment and the project.

Hoist 1 – located within the stairwell – will be decommissioned and removed following the handover of the beneficial use goods and passenger lift. The stair will then be installed, reducing the risk of damage from sustained use in a temporary scenario. Multiplex will construct a temporary staircase in a fire-rated enclosure adjacent to TC1 to minimise the impact on CAT A fit-out. This will provide two means of escape required during construction.

Beneficial use goods and passenger lifts will be installed within the core respectively.

WY3 Site at Stage 1 Handover

The site will be handed over as a complete ground floor slab over the extent of Building 3 with a molehole for the basement contractor (Figure 13).

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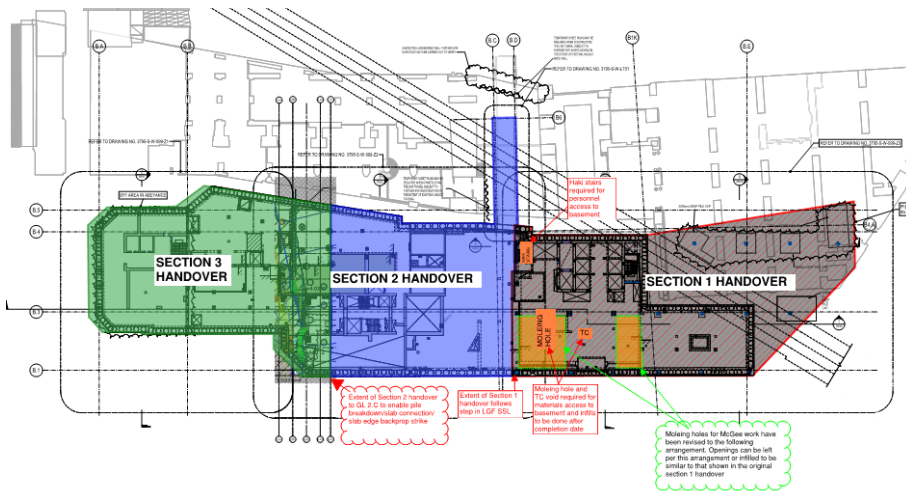


Figure 13 Plan showing the sectional handover area

All embedment plates and holding down bolts will be installed by McGee. To mitigate any risk associated with out of tolerance elements, we will survey these from day one. For the cast in plates, we will use a mobile elevating work platform to access up to Level 5 and then a cradle above (Figure 14). This will allow the steel contractor to fabricate the fin plates in advance and give surety on programme.



Figure 14 Image showing a cradle for fin plate install

WY3 Structures Steel Frame Construction

There are a number of columns in the first phase which neither tower crane will have the capacity to lift. To install these, we will use a mobile crane sat on the ground floor slab (Figure 15). The crane will need to be set up in two locations to get full coverage of the columns. A lane closure

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along Southwark Street will be required for a loading bay to unload the steel columns. The installation can occur without the need for traffic management orders.



Figure 15 Mobile crane approximate position for column installation

WY3 Columns Through the Viaduct

The viaduct penetrations that McGee is forming are not wide enough for the column to be installed through with the baseplate attached. A stub section will be trolled into location and installed within the viaduct. The column will then be lifted through the penetration and spliced to the stub.

WY3 Typical Steel Erection

Steel deliveries will either be brought to site along Blackfriars Road and unloaded from the pit lane or via Arch X onto the logistics slab. Both TC1 and TC2 have the capacity to pick up from the pit lane and logistics slab. TC2 will also be able to pick the heaviest elements from the southern elevation inside the site hoarding from lifting beds skated into position from the main off-loading position.

The tower crane strategy has been developed to optimise hook time for the frame construction. The construction methodology for other trades has been developed to minimise the need for tower crane hook time. This not only provides the most cost-effective strategy but provides the safest solution for National Rail asset protection.

At this stage, we envision that the frame will be erected in two halves, utilising the two tower cranes concurrently. The steel contractor will be responsible for ensuring the stability of the steel frame during the erection. The columns will be erected in two-storey heights to achieve the quickest cycle time. Figure 16 outlines the build sequence for Building 3.

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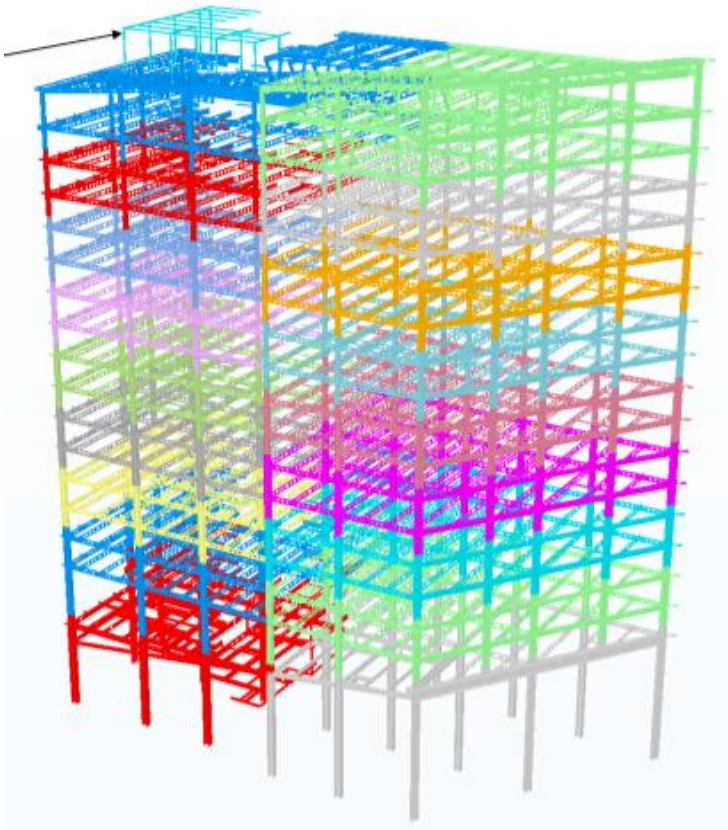


Figure 16 3D visualisation of the build sequence for Building 3

The hanging mezzanine slabs will be constructed as the structure is progressed so that the floor plates can be released for façade installation. The steel will be temporarily propped or will be lifted through the beams on the floor above and hung.

WY3 Vierendeel Frame Construction

The Vierendeel portal frame on the South Elevation controls the lateral displacements due to the eccentric core. The Vierendeel portal frame will be installed in two-storey heights along with the rest of the steelwork. We have investigated several methods of cruciform and goal post arrangements to deliver the structure. Upon final procurement, we will work with the design team to ensure the most effective method will align with architectural aspirations for the exposed steelwork.

Based on our experience, the above-ground splice connection will be large and will not provide a satisfactory architectural finish. In light of this, we have looked at the option to bolt the column to the baseplate (Figure 17).

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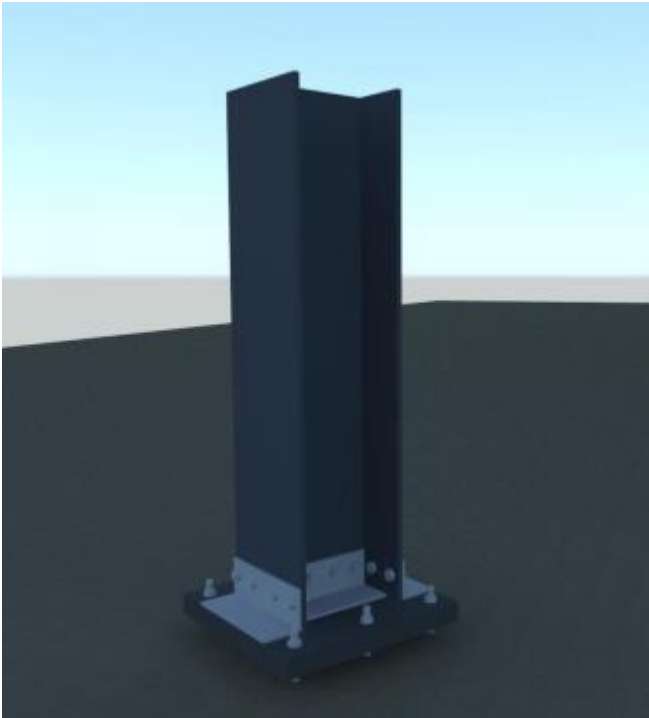


Figure 17 Column bolted to baseplate (indicative only)

WY3 Architectural Steel

All steel will be coated in intumescent and top coat offsite to ensure quality control. This will ensure that any areas which are inaccessible once erected are painted to the required specification. The finish of the top coat is dependent on the smoothness of the intumescent. This means that the top coat and intumescent will be applied by the same contractor so that the finish and DFT can be achieved.

WY3 Floor Slab Construction on Metal Deck

We will use safety netting for all decking installations and perimeter protection fans will climb with the structure at no more than four floors behind working levels. Alongside the loading out and fixing of metal decking, the mesh and loose bar reinforcement will be loaded out to pre-agreed points.

The floor plate will be poured in two sections to match the steel erection sequence (Figure 18). The concrete subcontractor will place concrete to each of the floors consecutively up the building. Concrete will be pumped from Eastern Yards to minimise the number of vehicles through the site and to mitigate issues with supply.

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Figure 18 An image showing concrete being pumped on metal decking

WY3 Edge Protection Strategy

Full height edge protection with mesh panels will be installed to the steel beams as the floor plates are erected, Figure 19.



Figure 19 Snapshot from our animation detailing steel frame progression

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WY3 Facade

The installation of the CCF façade system requires close coordination with a temporary and permanent dry air system. The permanent plant room has been housed on Level 20, therefore a temporary plant room will be provided within a container to allow connection of the dry air system to the façade when panels are delivered to site and installed.

Permanent pipework will be installed from the distribution riser limiting the commissioning required once the permanent plant room location is available. Following installation of the air supply infrastructure, panels will be delivered to site in accordance with the construction sequence, as all panels are required to remain horizontal during transportation two strategies are required for the 1.5m and 3m panels.

The larger panels will require abnormal loads and will need to be delivered between 7pm and 7am. Smaller panels will be distributed during normal working hours. Our strategy for vertical distribution ensures that the entire façade can be completed in sequence by relocating the external goods hoist into Stair 3 (Figure 20). This removes the need for a return visit for façade installation in a hoist location. The larger 3m panels which do not fit into the goods hoist will be distributed by the tower crane and CantiDecks following delivery.

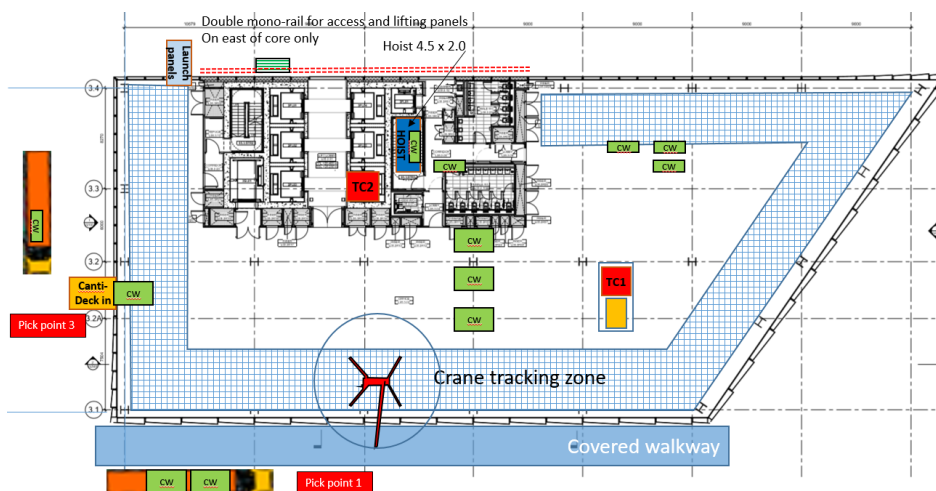


Figure 20 Logistical approach to façade unloading

The CCF units will be installed to all elevations up to and including Level 17 using a spider crane and launch table. The top floor will require the tower crane which will be available following completion of the superstructure (Figure 21).

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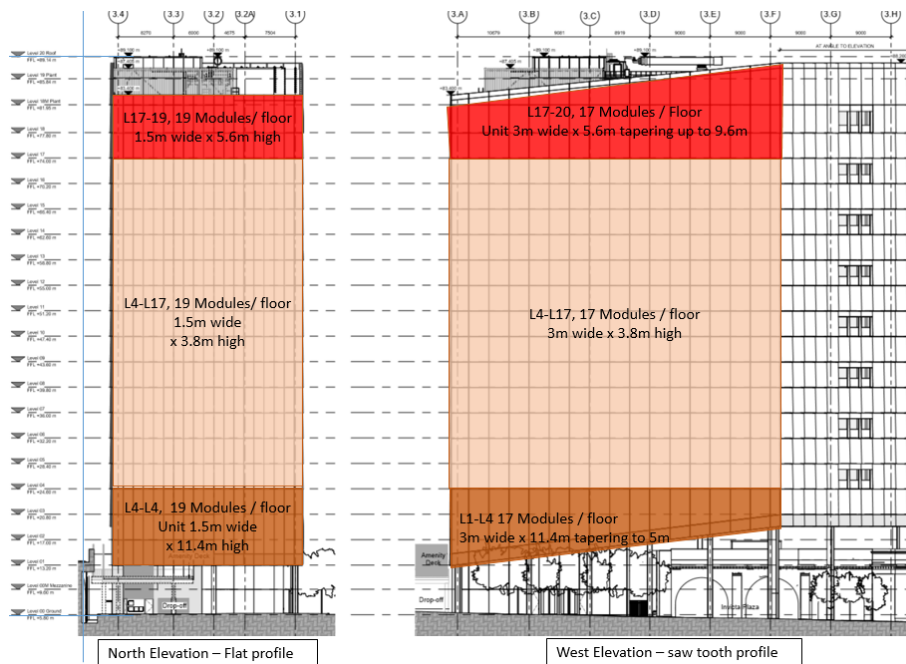


Figure 21 Breakdown of installation techniques minimising use of tower cranes

The East Core wall will be accessed via a double monorail system which will provide a lifting point for the panels and access for operatives to install brackets and gaskets via a temporary cradle (Figure 22).



Figure 22 Double monorail installation technique

Immediately following installation, Multiplex will complete the post-installation checks of the façade units which will include visual inspections of the glass and the cavities and demonstration of the blind operation.

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WY3 MEP

In this section, we have outlined the MEP for WY3 and the basement completion due to the intrinsic link of handover and full basement system installation requirements.

WY3 Basement

The Multiplex M&E team members has been involved in the tender throughout the process and have identified by way of reviewing the design, as currently prepared, that the primary plant for the buildings are locations in the basement levels.

Multiplex will co-ordinate the logistics requirements, utilising the ground floor slab where plant, equipment and pre-fabrication modules will be offloaded in preparation to be lifted into position throughout the various basement levels. This detailed plant movement sequence of works will be managed by the subcontractors in collaboration with the Multiplex team (Figure 23).

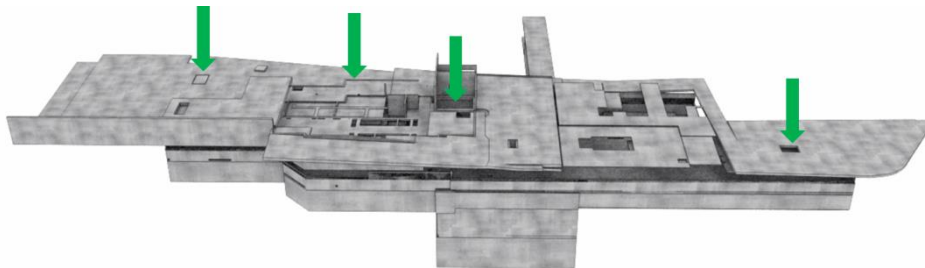


Figure 23 Basement MEP access opportunities utilising plant replacement plans, and temporary openings in car stacker location. Final plant sizing and equipment choice will dictate final arrangements

We also recognised that all these basement distribution areas are heavily serviced with multi-layered M&E services as well as the large plant. We will review each of these areas with the team to ensure that the build sequence reflects the proposed pre-fabrication strategy and that each area derives the maximum benefit in respect of time, cost and programme.

WY3 Risers

Multiplex will look to manufacture riser modules to a minimum of two stories in height, which would be dropped by the Tower Cranes directly from the delivery vehicles through the core. This method has been used on several projects in the past with great success. These elements of installation could be undertaken out of hours to minimise the impact on the crane time required by other activities.

WY3 Tenant Cat A Areas

The current design intent of running all services through holes in structural steelwork does create limitations to pre-fabrication as modularising distribution necessitates more joints, increasing not only cost but risk of component failure too. As such Multiplex will develop the CAT A design cognisant of logistic demands on hoisting and material distribution. By undertaking interfacing works offsite, packaging and waste is minimised and deliveries to site are reduced.

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WY3 Roof

The strategy of de-coupling Building 3 from the basement located water cooled chillers allows the building to operate relatively independently. However, with cooling now provided exclusively from the air cooled chillers mounted on the roof of Building 3 the criticality is to connect the roof plant to the vertical distribution at the earliest point in time to facilitate testing and commissioning works.

WY3 Vertical Transportation

Multiplex have reviewed the programme requirements (for design, procurement, manufacture), and obtained power supplies for testing, commissioning and beneficial use, which have also been coordinated with our temporary electrical installation requirements. As Building 3 will be constructed we have allowed for drill and fix of shaft bracketry. From reviews with our contractors, our focus will be to procure and install the escalators as early as practically possible and protecting these until commissioning can commence. A 94 space car stacking system with two transit lifts is planned within the basement.

WY3 Beneficial Use of Lifts

We have included to use the permanent lifts for Builders Beneficial Use (BBU) during the installation works and up to Practical Completion (PC). We will carry out the necessary BBU/Caretaker maintenance during this period.

WY3 Fit-out

We have developed a detailed CAT A fit-out process that we have developed from extensive experience in high-end commercial projects across London. Our supply chain has brought into our sequence segregation allowing us to maximise delivery efficiency. For WY3, we have developed the sequence to take cognisance of the specific details of the unique CAT A fit-out. This includes the following:

- Modular approach to bathrooms.
- Delivering CAT A for the most effective CAT B follow-on works.
- Post steel installation paint finishes and slice detailing
- Unique hung ceiling detailing and installation
- Reception fit-out requirements and coordination with earliest CAT B access

WY3 Toilet and Changing Room Fit-out

Multiplex have adopted the 'white box' (turnkey) strategy for the specialist areas, whereby the general fit-out trades will form the rooms and install basic MEP services prior to handing them over to the specialist fit-out trades to undertake their detailed works. This approach will be used at Western Yards WY3 for the toilets and changing room areas. The main MEP subcontract will install the first fix services, waste and air systems. When this stage has been reached and verified, the

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white box can then be signed over to the specialist trade to complete the fit-out on a rolling programme throughout the building.

WY3 Reception and Lift Lobby Fit-out

Multiplex have developed a highly-integrated delivery strategy for the reception area. The reception is a fundamental part of the vision for Western Yards WY3. High-level services will commence while the envelope façade is being completed along with secondary steel work, and the first fix support systems for both stone and timber cladding.

Internal cladding will then commence to the cores, while the underfloor services are laid throughout. Once inspection and handover processes have completed, the ceiling will be constructed in sequence, along with the installation of speed gate bases, signs, and entrance escalators and the like. Second fix services installation will begin when the raised floor sequencing is complete.

Once the raised flooring is complete the stone and timber cladding will commence, shortly followed by the stone flooring. As the floor is grouted, inspected and signed off it will be adequately protected to allow work to begin on decorations and third fix services to the ceiling. Final installations will include the speed-lanes, placing the two reception desks into position and commissioning the systems.

WY3 CAT A – Fit-out

Multiplex have developed a highly integrated delivery strategy for commercial developments. The strategy separates the fit-out into 12 stages and identifies QA (quality assurance) hold points at several key points to ensure quality is built-in as works progress.

Each stage identifies a specific operation for a particular trade and ensures the floor space does not progress to the next stage until the previous stage has been fully completed.

WY3 First Fix Activities

The initial setting out and first fix of partition head tracks will allow the accurate installation of high level services. Ductwork, fan coil units, cable trays and wiring will be installed at this stage ready for the dry lining wall partitions to be erected (Figure 24).

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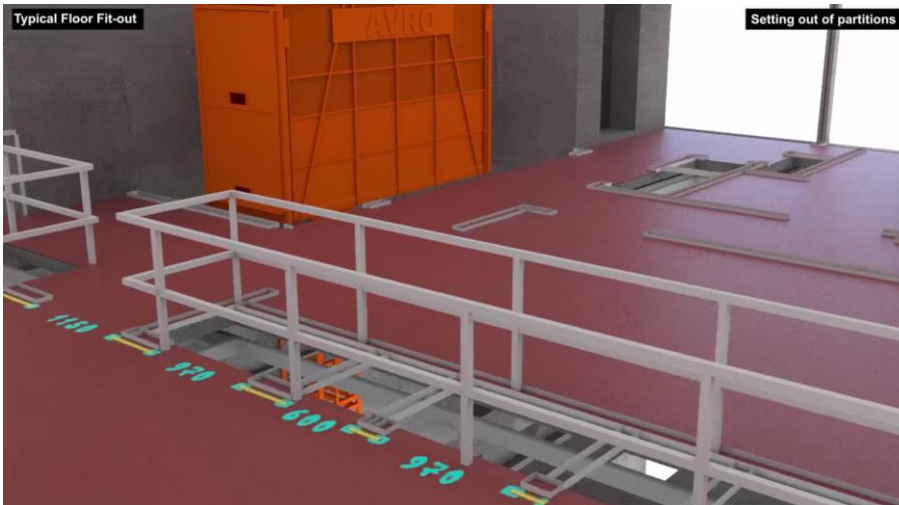


Figure 24 Our ‘model-first’ approach allows us to virtually plan, set-out and coordinate our logistics to enable optimum approach to be developed as site conditions evolve.

Following this, demise walls will be installed and fire stopped, followed by the cores internal partitions and ceiling framing. Materials will be delivered to the point of use on a just-in-time basis to avoid overloading the floors and restricting free movement of trades.

After the partition framing, the walls will be boarded on one side. The first fix MEP will then be installed into the walls. Prior to closing up the walls and ceilings, a full inspection will be carried out in accordance with our inspection procedures to ensure that all components are properly installed in the correct locations and that all fire stopping, insulation and seals are in place.

Upon satisfactory sign-off by the preceding trades, the floor will be offered to the partition contractor to complete the boarding of the walls and ceilings margin and grid. The partition contractor will then tape and joint or skim the surfaces and offer the floor for inspection and sign-off.

WY3 Second Fix Activities

Once the partitions have been jointed, a mist coat will be applied to all partitions, the mechanical and electrical contractor will then follow as the proceeding trade to fit their second fix installation.

Upon sign-off from the MEP contractor, the ceiling tiles will be laid within the metal grid. The raised flooring contractor will then take control of the floor space for their installation following void closures sign-off from the MEP contractor.

WY3 Third Fix Activities

Once the raised floor has been completed, the remaining ceiling tiles will be placed to allow for power on and final decorations and joinery to the cores. Commissioning will follow and a builder’s clean sequence will be carried out throughout the building.

WY3 CAT A – Multiplex Fit-out Sequence Model

Our typical 12 stage fit-out approach to CAT A fit-out is indicated in the following list:

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File Name: Appendix A - CEMP REV3.0_JC



- Stage 1: Dust Sealer and Control Points
- Stage 2: High Level MEP Services/Riser Services
- Stage 3: Dry lining First Fix/Part Wall Closures
- Stage 4: M&E Services – First Fix Walls
- Stage 5: Dry Lining Second Fix Works (Walls)
- Stage 6: Ceiling Margins and Plasterboard Ceilings
- Stage 7: Ceilings Grid Install
- Stage 8: Painting and Decoration
- Stage 9: Install Ceiling Tiles, Third Fix Services
- Stage 10: Raised Access Flooring
- Stage 11: M&E Commissioning
- Stage 12: Soft Finishes and Builders Clean

SUSTAINABILITY & ENVIRONMENTAL MANAGEMENT

MPX, and specifically the Project, are looking to improve on new and emerging issues, and making the areas we work more sustainable. We will employ best practice on our project in areas of the following:

- Consumption of resources, focusing on greater efficiency in use of resources such as water and energy
- Natural resource protection, through sustainability procurement of materials and designing out waste
- Climate change and energy, in reducing energy use and CO₂ on our project, as well as recording embodied carbon of our project

MPX will directly employ personnel to manage the various construction packages and ancillary services such as health and safety, sustainability and quality management. The key MPX contacts in terms of environmental and sustainability management of the Project are given below in Table 3:

Position	Name	Responsibility	Contact Details
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File Name: Appendix A - CEMP REV3.0_JC



Project Director	Matt Price	Ultimate Project responsibility for delivery of environmental compliance. The Sustainability Manager reports in to the Project Director.	Matt.Price@multiplex.global
Project Manager	Marvin Dyke	Supports the Project Directors and the delivery of environmental compliance.	Marvin.Dyke@multiplex.global
Sustainability Manager	Joshua Davies	Implementation of the environmental controls set out within this CEMP	Joshua.Davies@multiplex.global
Social Value & Community Manager	Amy Dawson	Implementation of S106 and community outreach programme and supporting the Project in addressing complaints and community matters.	Amy.Dawson@multiplex.global 07715629701
Construction Manager	Mostyn Higgs	Responsibility for Site Management and coordination of works and logistics in accordance with the content of this CEMP.	Mostyn.Higgs@multiplex.global
Design Manager	David Ray	Responsibility for ensuring sustainable design functions are incorporated into the Project, including for BREEAM 2014 Excellent and Code for Sustainable Homs Level 4 purposes.	David.Ray@multiplex.global
Commercial Manager	Jamie Godden	Responsible for ensuring strong and compliant environmental management standards are undertaken by the subcontractors that they manage.	Jamie.Godden@multiplex.global
Health & Safety Manager	Carl Beisser	Responsible for health and safety on the project including elements of COSHH management.	Carl.Beisser@multiplex.global

Table 3 Roles and Responsibilities

Audits and Inspections

MPX Sustainability Manager will conduct site inspections, checking the following items: waste, hazardous substances/ chemicals, storage of materials, delivery of materials, housekeeping, land and ecology, site drainage of rainwater, discharge, dust, noise, vibration, light pollution, emission to air and signage. Findings summarised in an inspection report will be passed to the subcontractors, where root cause analysis and corrective actions of the NCRs will be requested to be completed by themselves.

MPX conduct biannual internal audits as part of our internal management system and our ISO 14001 procedures.

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Training and Communication

All Multiplex Managers will attend a project specific Environmental Responsibilities Training and an Environmental Good Practice on Site training by CIRIA. In addition, subcontractors will be requested to attend and provide certificates of either CIRIA's Environmental Good Practice (EGP) training or CITB's Site Environmental Awareness Training Scheme (SEATS).

As part of the environmental training for the workforce, environmental Toolbox talks will be conducted on a monthly basis by all subcontractors.

All Environmental items will be communicated and discussed at the monthly Environmental Health and Safety meeting where MPX managers and contractors supervisors and managers will attend.

Identified Receptors

Early engagement with Southwark Council is key to allow Multiplex to identify and engage with the site specific receptors, based on the land-use as well as the environmental setting of the site.

The following neighbours have been identified to date:

- Hopton Street Residents to include Falcon Point
- One Blackfriars Residents
- Rennie Court Residents
- Southbank Tower Residents
- Bankside Hotel, Upper Ground
- The Mad Hatter Hotel, Stamford Street
- Holiday Inn Express, Southwark Street
- Christ Church, Southwark
- Doggett's Coat & Badge, Blackfriars Road
- SAMA Bankside

Consultation Proposal During Works

Multiplex will have a dedicated and experienced Social Value and Community Manager (SVCMM) who will be based on site and this person will be the main point of contact for members of the local community and key stakeholders.

Prior to any works taking place, a written notification shall be sent to surrounding residents with relevant contact details of the SVCMM Manager and brief summary of works, start date and outlining how notifications will be distributed throughout the build process.

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The SVCM will share contact details with all relevant parties as well as arrange for a 24/7 emergency contact number to be implemented for any out of hours concerns or queries. The SVCM will be responsible for attending community engagement meetings to provide updates to local residents, local businesses and other key stakeholders regarding the development and will also be the main point of contact for any complaints or concerns regarding the site. The SVCM will actively work with the local community, the project team and the supply chain to ensure that all potential disruption is minimised as much as possible and that the team are aware of any community concerns etc. It will be the responsibility of the SVCM to implement and execute Multiplex’s Social Value and Community Engagement Strategy which includes a robust Neighbourhood Liaison Strategy, documenting the methodology of how the SVCM will engage with the local community and members of the public.

The following will be undertaken as part of the liaison and consultation strategy:

- The site will be registered with the Considerate Constructors Scheme with a minimum score target of 40/50.
- Development and Implementation of a Neighbourhood Liaison Strategy
- Introductions to local stakeholders by the dedicated SVCM
- Briefings / Community Engagement Updates on the development
- Regular communication (weekly/bi-weekly/monthly – stakeholder’s discretion) which will include face to face meetings, phone calls and email correspondence
- Community Notice Board on the hoarding which will identify key personnel, contacts, website, phone numbers and who to contact regarding a complaint
- Issue of regular (monthly) newsletters via approved communications partner (if required) as per the current arrangement the demolition contractor has been using.
- A detailed complaints/comments/compliments register will be set up and updated by the SVCM
- A detailed neighbourly contact tracker will be kept by the SVCM documenting all engagement with the local community and members of the public

Complaints Investigation Procedure

All complaints will be acknowledged, followed up and closed out, and the status will be monitored, reviewed and regularly reported to the Project Directors.

The Social Value & Community Manager will manage, make suitable arrangements and record the receipt of complaints with as much relevant information as possible, in the project’s Complaints and Compliments Register. Investigations into complaints shall be conducted promptly and, where necessary, technical, commercial or legal advice sought from an authorised source.

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Corrective actions or action plans arising from an investigation will be delegated to any relevant parties to address and close out the complaint. Contact with the originator of the complaint will be maintained until the matter is addressed.

Working Hours

The standard working hours for all construction activities will be from:

- 08.00 – 18.00 Monday to Friday; and
- 09.00 – 14.00 Saturdays

Excessively noisy works to take place on a 2 hours on/off basis:

- ON - Monday to Friday 08:00 - 10:00, 12:00 - 14:00 & 16:00 - 18:00
- ON - Saturdays 11:00 - 13:00 only

Any works on Sundays or Bank Holidays will be subject to reasonable notice to both the Council and the local residents and businesses. Any change to working hours will be agreed in advance with Southwark Borough Council's Environmental Protection Team ([Short term section 61 Out of Hours \(OOH\)](#)) and would include the following:

- Details of reasons why works cannot be undertaken during normal working hours
- Location
- Proposed days and hours of work (for works that will last less than 8 weeks)
- Equipment to be used
- Noise mitigation to be employed
- Details of proposed public relations (i.e. letter drop to surrounding residents and businesses)
- Applications will be submitted a minimum of 7 days before works are planned to commence, to permit processing.

Noise and Vibration

The guidance contained in BS5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise presents an overview of the legislative background to the control of noise and gives recommendations for basic methods of noise control including procedures for the establishment of effective liaison between developers, site operators and local authorities. This part of BS 5228 also provides guidance concerning methods of predicting and measuring noise and assessing its impact on receptors. As such Multiplex will aspire to noise action levels set out in BS5228-1:2009. The levels are shown in the Table 4 below:

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Type of Value	Noise level at Site Boundary	Action to be taken
Amber (Trigger)	75 dB(A) L_{eq} 15 minutes (short term) Or 70 dB(A) L_{eq} (10 h) Monday to Friday working day (08:00-18:00) or Saturday (09:00-14:00)	In the event of an exceedance of a Trigger Value an inspection will be undertaken to ensure that Best Practicable Means (BPM) is in place.
Red (Action)	80 dB(A) L_{eq} 15 minutes (short term) Or 75 dB(A) L_{eq} (10 h) Monday to Friday working day (08:00-18:00) or Saturday (09:00-14:00)	In the event of an exceedance of an Action Value an inspection will be undertaken to ensure that Best Practicable Means (BPM) is in place. Where BPM is not present these works will be required to stop until BPM is in place.

Table 4 Noise Action Levels

The action levels listed will be agreed with London Borough of Southwark and are also listed in our Section 61 agreement. The noise units will be real time and will run continuously – if any action levels are breached then an alerts email/text shall be sent out to site management, then works will stop and an investigation shall take place to find out the cause and to ensure Best Practicable Means (BPM) is in place. Where BPM is not present these works will be required to stop until BPM is in place.

The guidance contained in BS5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration presents an overview of the legislative background to the control of vibration and gives recommendations for basic methods of vibration control including procedures for the establishment of effective liaison between developers, site operators and local authorities. This part of BS 5228 also provides guidance concerning methods of predicting and measuring vibration and assessing its impact on those exposed to it. Guidance given in BS 5228-2 2009 will be used to assess the likely impact of vibration on building occupants and is shown below in Table 5:

Vibration Level (PPV)	Effect
0.14mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3mm/3	Vibration might be just perceptible in residential developments.

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1.0mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10.0mm/s	Vibration is likely to be intolerable for any more than a brief exposure to this level.

Table 5 Vibration Action Levels

Vibration levels will try to be kept to the following levels when measured at nearby commercial receptors, commercial listed buildings and at nearby residential receptors:

- Amber trigger level of 1mm/s
- Red trigger level of 3mm/s

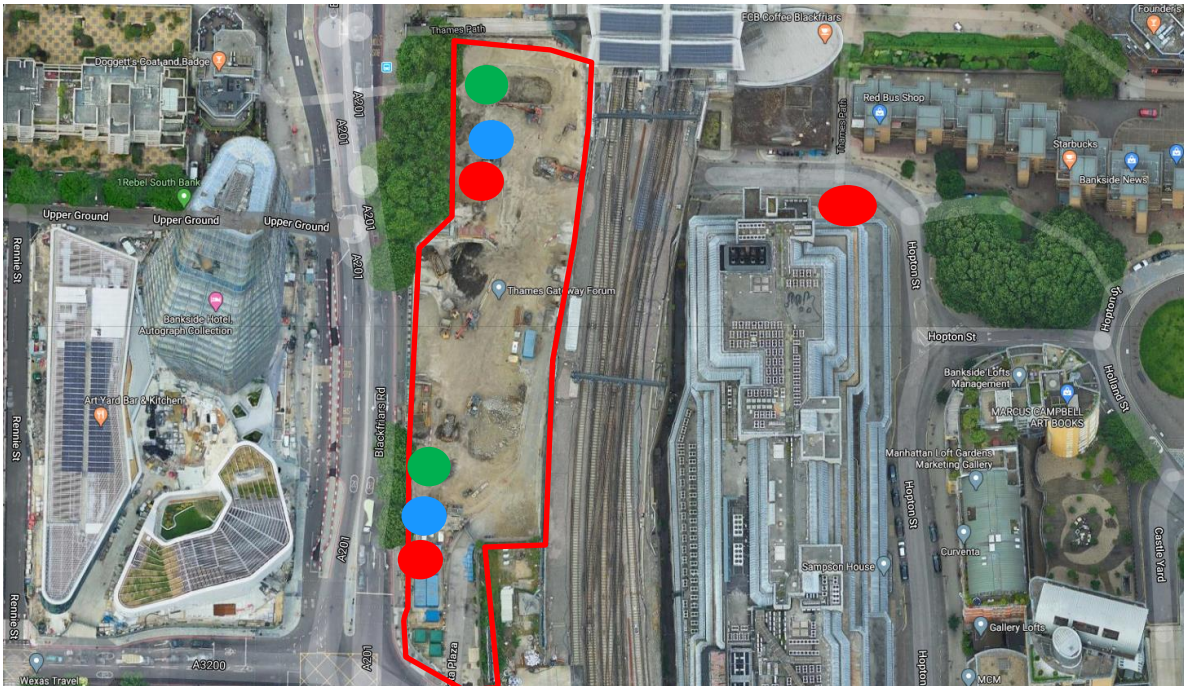
If levels are consistently recorded above the stated values, the local council shall be informed and further measures shall be taken to reduce vibration levels at the stated receptor. The vibration monitoring equipment that has been installed will send out email alerts if the agreed action level is exceeded

Due to the specialist technical nature of acoustic and vibration monitoring works MPX will appoint a specialist acoustic consultant to conduct combined noise and vibration monitoring works at the Site. The specialist acoustic consultant will install combined noise and vibration monitoring stations to conduct monitoring works during the construction phase of the Project. The stations will continuously monitor noise from the Site and will send automatic alerts to the site team if the designated thresholds are approached and/or exceeded. All noise monitoring equipment will be fully calibrated prior to use on site by the suitably qualified consultant. The Consultant will be instructed to produce weekly noise reports and provide technical advice as required.

The proposed location of the noise and vibration monitoring equipment for the Project is shown below in Figure 25 and is based on an enhanced current set compared to that utilised by the demolition and groundworks contractor on site to date and based on feedback from Southwark Borough Council Environmental Protection Team. The enhanced set up includes the following additions/amendments:

- The set of 3 monitors in the South West part of the site will be moved further south.
- An additional dust monitor will be installed for the northern part of site.
- The noise and vibration will be moved from the North East boundary to the North West boundary.
- An additional noise monitor on North East elevation of the Eastern Yards development where welfare facilities and storage for Western Yards will be situated.

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- Semi Permanent Dust Station – Site Boundary
- Semi Permanent Vibration Station – Site Boundary
- Semi Permanent Noise Station – Site Boundary

Figure 25 NDV Monitor Locations

The Best Practicable Means (BPM), as defined in Section 72 of the Control of Pollution Act 1974, shall be employed at all times to reduce noise (including vibration) to a minimum, with reference to the general principles contained in British Standard BS5228: 2009 ‘Noise and Vibration Control on Construction and Open Sites’.

Noise attenuation screening to be used if deemed appropriate. Any mobile screens shall have sufficient mass so as to be able to resist the passage of sound across the barrier and to be free of significant holes or gaps between or under any acoustic panels or board materials as far as reasonably practical.

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On-site, good practice procedures will be followed in order to mitigate noise and vibration impacts. Control measures to be adopted will be reviewed and carried out depending on the activities on site. Such measures include, but are not limited to:

- Where reasonably practicable, plant and/or methods of work causing significant levels of noise and/or vibration at sensitive premises will be replaced by other less intrusive plant and/or methods of working
- Arrange and connect to the mains electricity supply as early as possible to minimise generator use
- Concrete to be poured without the use of a concrete pump wherever practicable
- Ensure maintenance of plant and vehicles as per manufacturer's instructions
- Plant/equipment location on site to be considered in relation to neighbours
- Use of non/low impact construction techniques to be employed wherever practicable
- Vehicles are not to sound horns upon arrival/departure
- Use of mufflers/acoustic barriers/blankets where reasonably practicable
- Use of tight fitting, sealed acoustic enclosures on noisy equipment where reasonably practicable
- Use of silencers on generators where reasonably practicable
- Minimise the intensity of causal works where practicably possible
- Equipment likely to cause significant vibration will be moved as far away from sensitive receptors as practicably possible
- Scaffold with monarflex sheeting on external elevations of tall buildings
- Installation of site hoarding
- Co-ordination of deliveries to minimise waiting times and instruct drivers that engines are to be turned off while waiting
- Vehicles are to be scheduled to have full loads (where possible). This may include the consolidation of orders to minimise the quantity of deliveries to site
- Coordination with affected parties to arrange specific working arrangements and newsletters to be distributed in good time to notify of significant works
- Neighbourhood nuisance to be an agenda item at monthly subcontractor Environmental and Health and Safety and weekly MPX team meetings.

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Dust and Air Quality

The majority of air quality legislation in Europe and the UK is derived from health-based evidence provided by the World Health Organization (WHO). The European Union (EU) has adopted an Air Quality Directive (2008/50/EC – the “Air Quality Directive”) that sets standards for a variety of pollutants that are considered harmful to health and the environment. This document has been transposed into English law through the Air Quality Standards Regulations 2010 (“the 2010 Regulations”).

“The Control of Dust and Emissions during Construction and Demolition – Supplementary Planning Guidance (SPG), 2014” has arisen from “The London Plan 2011” to reduce emissions of dust (Particulate Matter (PM)10 and PM2.5) from construction and demolition activities in London. The SPG replaces “The Control of Dust and Emissions from Demolition and Construction Best Practice Guidance” published in 2006. The latest SPG provides guidance on the implementation of all relevant policies in the London Plan and Mayor’s Air Quality Strategy to all parties involved in any aspect of the demolition and construction process and identifies good practice for mitigating and managing air quality impacts.

In the absence of any other national control limit, Southwark Borough Council’s recommended site action levels are adopted, these are in Table 6 below:

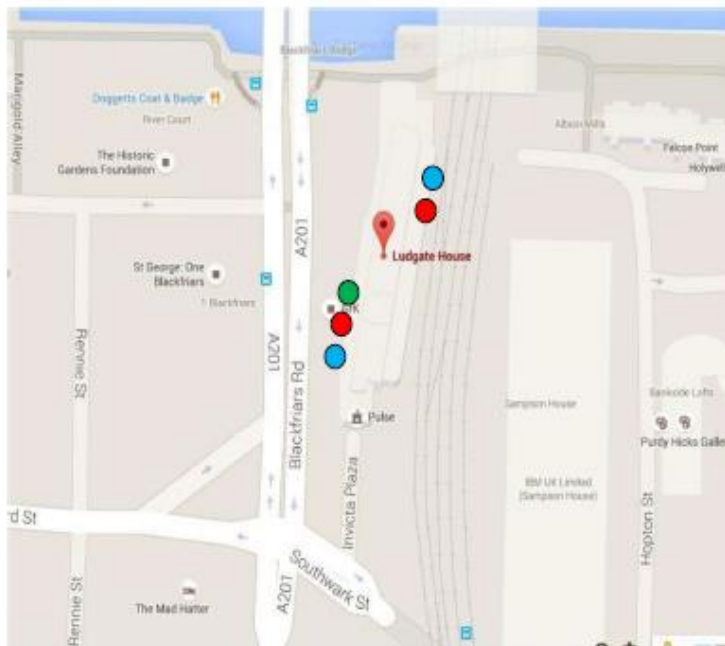
Type of Value	PM10 concentrations at Site Boundary	Action to be taken
Amber (Trigger)	150µg/m ³ 1 hour	In the event of an exceedance of a Trigger Value an inspection will be undertaken to ensure that Best Practicable Means (BPM) is in place.
Red (Action)	190µg/m ³ 1 hour	It the event of an exceedance of an Action Value an inspection will be undertaken to ensure that Best Practicable Means (BPM) is in place. Where BPM is not present these works will be required to stop until BPM is in place.

Table 6 Dust Action Levels

Due to the specialist technical nature of dust monitoring works MPX has opted to appoint a specialist consultant to conduct these works at the Site. The consultant will use automated particulate monitoring stations to conduct monitoring works during the construction phase of the Project. The stations will continuously monitor dust pollution from the Site and will send automatic alerts to the site team if the designated thresholds are exceeded. The Consultant will be commissioned to produce weekly dust reports and provide technical advice when needed.

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The proposed location of the dust monitoring equipment for the Project shown below and is based on the current set up that has been utilised by the demolition and groundworks contractor on site to date Figure 26:



- Semi Permanent Dust Station – Site Boundary
- Semi Permanent Vibration Station – Site Boundary
- Semi Permanent Noise Station – Site Boundary

Figure 26 NDV Monitor Locations

In addition, the Construction and Sustainability Managers will include visual dust monitoring as part of their weekly site inspections and report on any incidents for investigation. Subcontractors are also required to report dusty events/works.

The list of control measures which will be installed on Site to control dust are as follows:

- Locate machinery and dust generating activities away from off-site sensitive receptors.
- Personnel shall be trained in best practice for dust control by Environmental Toolbox Talks

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- Erection of hoarding around the site perimeter to ensure dust/fumes do not escape the perimeter
- Hoardings, fencing, barriers and scaffolding will be regularly cleaned using wet methods to prevent resuspension of particulate matter.
- Use of monarflex on scaffolding
- The location of stockpiles of soil and other potentially dusty materials away from dust-sensitive properties, taking into account prevailing wind
- General housekeeping measures including damping down and sweeping/hovering up of dusty materials
- Regular checks for soiling due to dust of buildings of the site boundary will be carried out with cleaning, using wet methods, carried out where and when visible dust deposition can be seen to be occurring. Cleaning will take place daily or as required.
- No burning of any materials on Site
- Use of dust collection bags and dust suppression fixings on equipment
- Erection of windbreak netting around dusty material stockpiles and vehicle loading/unloading areas, exposed excavation and material handling operations
- Controlled damping down of the site (including exposed soil and stockpiles, at work faces, loading operations and site access roads) to suppress dust
- Control and containment of all rainfall runoff containing sediment from Site
- Loading of material into lorries/skips within designated bays/areas
- Removal of materials from site on a timely basis and in covered/sheeted trucks
- The site will be bunded to prevent runoff. Runoff and mud will be contained and managed as it can lead to re-suspended dust on haul routes and highways when it dries and pollutes local waterways and sewers when washed off.
- Hard surface all major haul routes, inspect and repair them regularly and keep clean from debris at all times.
- Fixed wheel and/or vehicle washing on leaving site e.g. drive through, under hand held jet washers.
- Hard surfacing and effective wet cleaning of haul routes.
- Enforced a 5mph speed limit on site.
- Regular inspection of local highways and site boundaries for dust deposits
- Cleaning of local highways and site boundaries for dust deposits.

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- No idling allowed on site
- Plant and equipment will be maintained as appropriate
- Off-site fabrication to avoid cutting materials on site, where possible.
- All Light Goods Vehicles & Heavy Duty Vehicles servicing the site must meet emission criteria EURO 6
- Renewable, mains or battery powered plant items will be used wherever feasible.

Non Road Mobile Machinery (NRMM)

In July 2014 the Greater London Authority (GLA) released a Supplementary Planning Guidance 'The Control of Dust and Emissions from Construction and Demolition'. This document provides information outlining the new engine emission standards for NRMM in London under Chapter 7 'Cleaner Construction Machinery for London: A Low Emission Zone (LEZ) for Non-Road Mobile Machinery'.

To comply with the GLA's NRMM LEZ policy there is a requirement for construction projects to keep an inventory of all NRMM used on site. This inventory should be kept on site stating the emission limits for all equipment (Stage IV to be achieved for all plant over 37kW from 1st September 2020). All machinery will be regularly serviced and service logs kept on site for inspection. This documentation will be made available to local authority officers as required.

The NRMM register (<http://nrmm.london/nrmm/about/what-nrmm-register>) is an online inventory and details of all NRMM with a net power between 37kW and 560kW will be recorded as it is delivered to the site with an indication of the proposed duration of use no matter how short or long this may be.

This will apply to both variable and constant speed engines for both NO_x and PM. These standards are based upon engine emissions standards set in EU Directive 97/68/EC and its subsequent amendments.

MPX will maintain records of all relevant NRMM on site and conducting weekly inspections to ensure all relevant plant and equipment on site is compliant. MPX Sustainability Manager will update and maintain the online register and internal records.

The following flow chart (Figure 27) outlining the method used and the steps taken to ensure that all NRMM on site are compliant and registered will be implemented:

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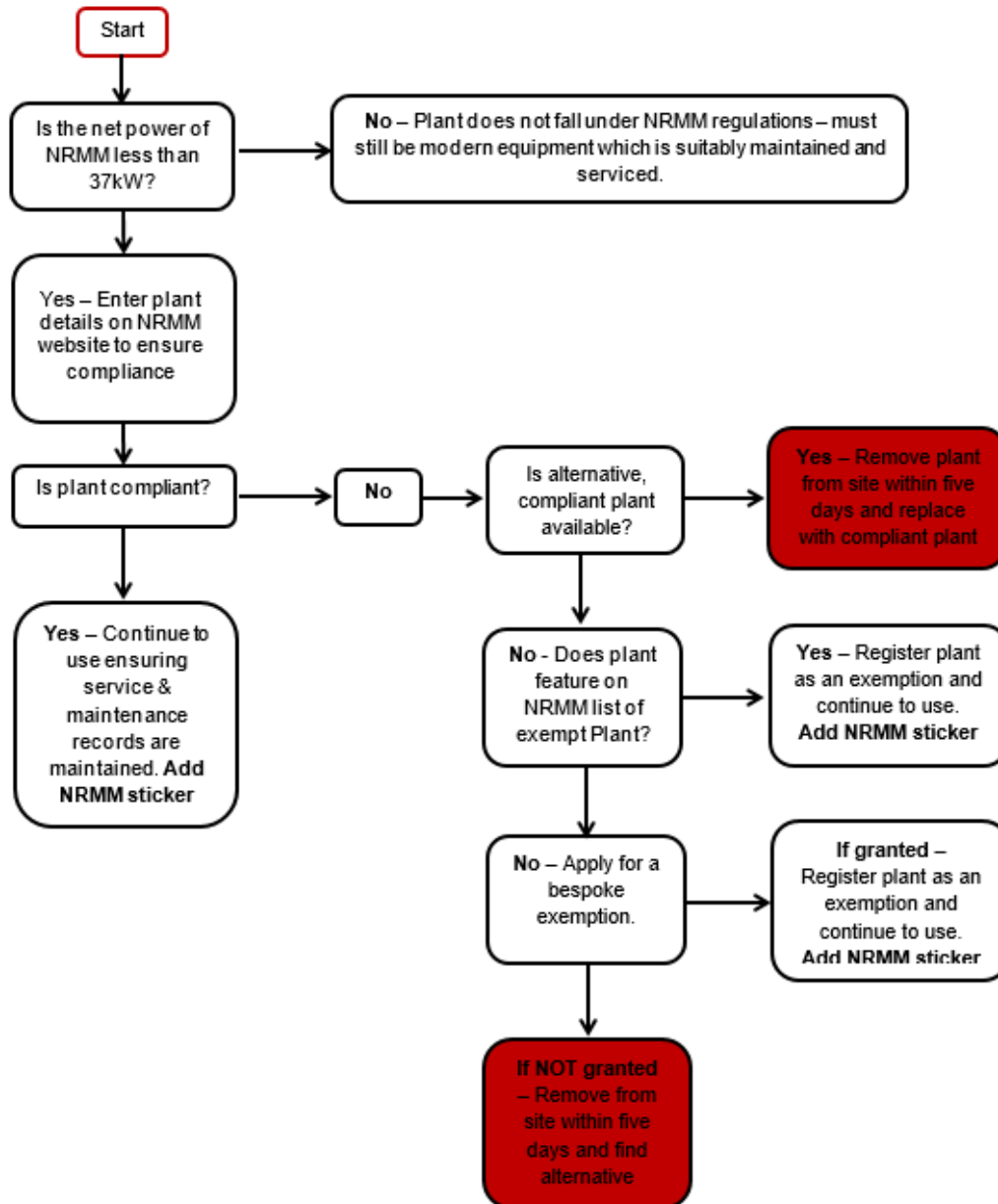


Figure 27 NRMM Registration Flowchart

Waste Management

Excavation Waste

Waste arising from site earthworks is expected to comprise vegetation, topsoil, rubble, tarmac from former hard standings, gravel and clay material. Wherever feasible excavated material will be reused

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which will be completed in accordance with the Code of Practice. Excavation material can be used will be removed from site by a licenced carrier and sent for re-use at another development site.

Construction and Demolition Waste

All waste arising from the site will be managed in accordance with the waste management hierarchy. Our innovative design out waste procedure undertaken with our Design Team and Sub-Contractors eliminates and reduces waste from site. Waste will be separated into key waste groups, with suitable areas provided within the Site for the separation of materials for re-use, recycling (e.g. timber, metals, packaging, hard-core, etc.), or if necessary (due to space constrictions) arranging for this segregation to instead be undertaken off-site by a suitable waste contractor and sent for energy from recovery.

A Site Waste Management Plan (SWMP) will be produced and will include identification of the type and quantity of waste expected to be generated, as well as opportunities to reduce, re-use and recycle waste materials where feasible. The SWMP will also focus on the management of waste in accordance with the “proximity principle” (i.e. managing waste as close to its origin of source as possible). The SWMP will be prepared prior to the commencement of any on-site works. MPX’s Sustainability Manager will be responsible for producing the SWMP, implementing and updating the SWMP throughout the Development process.

Waste Reduction

A principal aim during construction will be to reduce the amount of waste generated as a result of activities on-site.



Figure 28 Waste Hierarchy

This approach complies with the waste hierarchy (Figure 28) and will feed directly into the SWMP; waste reduction methods adopted on this project, include but are not limited to:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme
- Implementation of a “just-in-time” material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste

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- Attention to material quantity requirements to avoid over-ordering and generation of waste materials
- Pre-assembly and pre-fabrication of construction materials will be prioritised wherever practicable to minimise on-site generation of waste and packaging and reduce the number of delivery and collection vehicles to and from the Site (for instance all bathrooms for Building 2 will be manufactured offsite)
- Segregation of waste at source where practical
- Re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).

Design-out-Waste and Management process

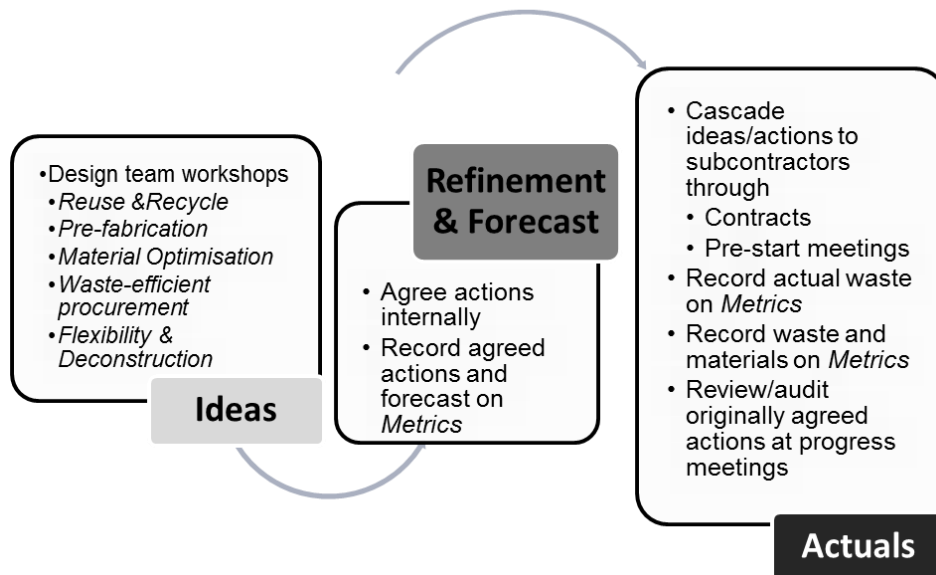


Figure 29 Design-out-Waste and Management process

MPX Design team will make every effort to design-out-waste according to WRAP’s published Design out waste: A design team guide for buildings. Ideas will be submitted, reviewed and refined as shown in Figure 29 above. The ideas agreed will be recorded on the SWMP and will be implemented to prevent or minimise waste.

Waste Documentation

As part of the SWMP, MPX will provide proof that all site waste has been deposited or transferred to the correct place and by appropriately licensed contractors (i.e. an audit trail). A fully completed (Waste Transfer Note) WTN will accompany the waste upon transfer from the producer to the carrier and from the carrier to the end point. The WTN will detail the type of waste, waste volume, waste classification, contractor and the name, address and registration of disposer (facility). Records will

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be updated regularly ensuring that all waste leaving our site has been correctly processed with evidence of signed waste transfer notes that will be kept on-site for inspection for a minimum of 2 years or 3 years (hazardous/special) and made available for inspection upon request.

Contaminated Materials and Hazardous Substances

Potential Sources of Contamination

Potential sources of contamination have been identified as:

- Contaminated made ground and/ or natural soils (including any surface waste materials) from either current or historical operations
- Contaminated groundwater within the secondary aquifers
- Asbestos in the ground

Further potential sources of contamination during construction works are include the hazardous substances and materials brought to Site. Such expected materials, but not inclusive, are:

- Diesel fuel
- Paints, solvents and other chemicals
- Cement slurry
- Cleaning products.

If any known sources of contamination are found, MPX will notify Southwark Borough Council, if applicable any remediation will be approved by the [Southwark Borough Council, prior to being undertaken.

Identified Receptors

Early engagement with Southwark Borough Council has allowed MPX to discuss the proposed works to identify the Site specific receptors, based on the land-use as well as the environmental setting of the Site. The identified receptors include:

- Current residents and workers in neighbouring properties (human health receptor)
- Construction personnel (human health receptor)
- Future Site users (human health receptor)
- Undifferentiated and Secondary Aquifers
- The Principal Aquifer
- Surface water features

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- Land Stability.

Potential Pathways

Human health exposure pathways are dependent on the proposed end-use of the Site (in this case residential and commercial). The human health exposure pathways that are considered viable based on UK guidance (CLEA) are listed below:

- Inhalation, ingestion and dermal contact with contaminated soils and groundwater
- Direct ingestion of soil and dust
- Dermal contact with soil and dust
- Ingestion of groundwater
- Inhalation of dust
- Inhalation of vapours (from soils and groundwater).

Construction Phase Mitigation Measures

The following mitigation measures will be carried out during the construction:

- Ensure all vehicles are well maintained to prevent accidental pollution from leaks
- For the disposal of any contaminated soil off-site, the waste classification will be determined from a chemical analysis or Waste Acceptance Criteria testing as necessary, and MPX will follow the specialist's remediation recommendations/conditions.

Emergency Procedures

A Pollution Response Plan (PRP) will be prepared prior to construction activities starting onsite and will be reviewed and updated regularly. The PRP will be an up-to-date document containing information on the location of hazardous substances on site, the location of spill response equipment, the location of sensitive receptors (i.e. live drainage systems and watercourses) and the Spill Response Flow Chart (SRFC).

Should a spill occur, the site should follow the procedures as set out in the SRFC. This will follow the 'Stop-Contain-Notify' procedure by first stopping the spill, then the use of spill kits and other appropriate methods. Any drainage systems should also be isolated to reduce the potential for off-site impacts. Key contacts within MPX will be contacted, together with the Environmental Agency, if required.

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Water Resources

The project has a plan in place for managing water consumption and preventing pollution. The Project will set a target for the use of water and monitor performance against the set target. This will be cascaded to all on-site sub-contractors and will be used when reviewing and approving method statements for site activities.

To prevent water pollution MPX team will ensure that:

- Generators and COSHH storage areas will be situated away from active surface water drainage systems and the northern perimeter (adjacent to the River Thames), they will also be provided with spill kits, appropriate bunding and signage
- All COSHH and fuel stores will comply with the Control of Pollution (Oil Storage Regulations) 2001 and wherever possible will be sited on areas of hardstanding
- The local drainage system will be clearly demarked on-Site
- Plant and equipment will be located away from surface water drainage systems and the northern perimeter (adjacent to the River Thames), wherever practicable
- If required, concrete and road sweeper washout and dewatering systems will be designed, installed and located to protect the Site and its ecological receptors. These will incorporate sedimentation tanks to remove the suspended solids from the washout waters prior to discharge
- The appropriate trade effluent license will be obtained, from Thames Water, where required.
- The project specific Site & Drainage plan will be prepared, showing the locations of the drainage system, any on-site treatment facilities for trade effluent or domestic sewage, COSHH storage areas, pollution prevention equipment and materials and any watercourse (River Thames) located within or near the site

Lighting

The site boundary will be provided with illumination sufficient to protect the safety of passing public, including the physically disabled. In particular, precautions will be taken to avoid strong shadows being cast on the surrounding footpaths and roads. Hoardings erected resulting in poorly lit walkways will also have bulkhead lights fitted.

Light sources used to assist construction works can cause light pollution, disturbing neighbouring properties and also adversely affect biodiversity. The following mitigation measures will be employed during the construction to prevent nuisance from artificial lighting:

- Lighting areas only when required
- Use timers to turn general lighting off when it is not in use

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- Direct light away from sensitive receptors
- LED lighting
- Lighting screens

Archaeology and Built Heritage

The enabling works contractor scope includes groundworks and; therefore we are not expecting any archaeological find during our contractual works. In the event of any archaeological remains being found on site, the Project Team will stop all works in the area and contact MOLA before proceeding.

The Rennie Gardens, also known as Blackfriars Gardens, is located to the northwest of the Site. The boundary between the adjoining land and the Site is at the external face of the projecting portion of the boundary wall and railings that form part of the site. Signage to the west of the Rennie Garden noted that the area is preserved under an Act of Parliament dated 1862 for the use of the public forever to commemorate John Rennie, the Engineer and Architect of several bridges spanning the Thames, it is owned by the City of London Corporation (the 'City') under the name of the Bridge House Trust (Charity). Multiplex will prevent damage to the listed structures within in Rennie Gardens during the course of development.

Ecology

The project will consult with a qualified Ecologist and ensure a survey is undertaken to identify any ecological features and ensure the necessary ecology protection measures are put into place on site, if applicable. The Project will ensure that a protocol is in place to ensure the relevant measures are maintained, and any biodiversity.

Any disturbance to such areas or species will be minimised. In the event of any discovery of protected species, all works will cease immediately and we shall inform the client. All appropriate licences or consents will be obtained prior to commencing works.

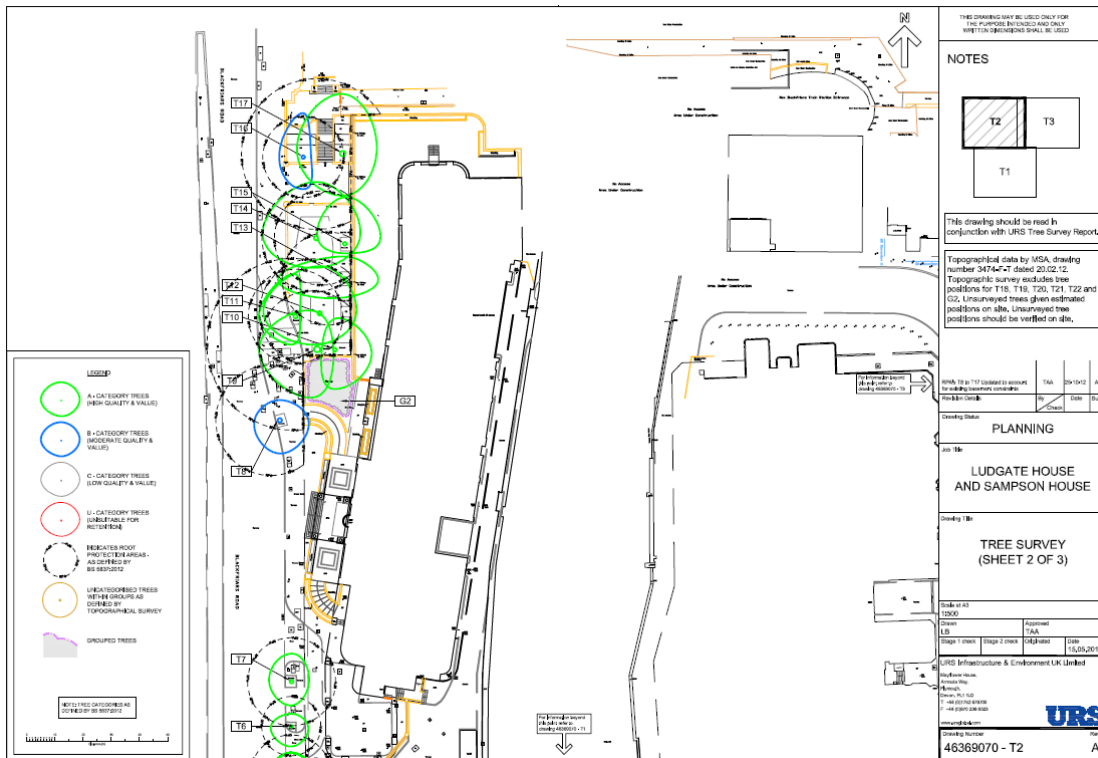
Subcontractors will receive environmental toolbox talks to ensure their awareness of the ecological requirements on site and potential presence of wildlife and the requirement to avoid its disturbance. This item will be included in inspections conducted by the Sustainability Manager.

We will comply with statutory requirements in respect of the preservation of nature conservation areas and protected species. There are no sensitivities on site, however on the site boundary are a range of trees, as per the below two figures (Figure 30 and Figure 31).

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Figure 30 Trees with vicinity of Western Yards (Part 1)



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Figure 31 Trees with vicinity of Western Yards (Part 2)

Prior to the commencement of any construction operations on site, tree protection measures will be employed to protect all existing trees identified as being retained on site. Within this area no construction activities will take place without protection. The trees highlighted in the above figures can then be broken down into the following types:

Trees to be Removed

Trees to be removed include T16 and T17 London Planes adjacent to the Thames River Walk, and to the south-east of Blackfriars Bridge. These trees are of medium/high quality and amenity value to the public realm and are growing within two, steep planting beds flanking the existing stepped access to the Thames River Walk. As part of the development, improved pedestrian access is proposed including replacing the existing steps and widening of the pedestrian walkway bounding the riverside. The works will necessitate re-grading of the rooting area within which the existing trees are growing and therefore these trees will be removed and replaced with a new semi-mature London Plane.

Trees T1 to T4 bounding Blackfriars Road comprising 1No. medium value and 3No. low value trees will also be removed to permit, the construction of the adjacent development block and permit improved public realm and pedestrian circulation. 4No. new semi-mature London Plane trees are proposed within the adjacent footway at the junction of Blackfriars Road and Southwark Street.

Trees to be Retained (But Impacted by Construction Operations)

Trees T5 to T15 are proposed for retention and are in close proximity to the Site with the existing basement areas closer still. These trees have historically been managed by means of pollarding. The following will be considered prior to construction in order to minimise any detrimental impact upon the existing trees above. The extent and duration of any negative impacts will, however, be significantly reduced and managed by the adoption of appropriate site specific working methods in accordance with good arboricultural practice as outlined by the URS Baseline Tree Survey 02 (Final). This will include but is not limited to the following:

- No materials or soil should be stored against the trunks;
- No flames should be allowed within 5m of the outer branches of the tree’s crown;
- No change in soil level should be permitted within 2m of the trunks without the express approval of the Council.

Where sufficient working space permits, a protective around the trees will be established. The following standards will be applied:

- Trees should be fenced off until all development work is completed. Protection in accordance with BS 5837:2012 should consist of scaffold poles to which is attached

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chestnut paling fencing (1.2m high) erected at the crown perimeter of each tree. Where the concentration of construction activity is particularly intense, hoarding of at least 2.4m high should be erected, comprising of a scaffolding framework supporting minimum 20mm exterior grade ply or other robust man-made boards.

- Trenches for underground services should be located outside the branch spread of trees and roots over 5cm diameter should be retained; but if they have to be severed they should be cut using a sharp tool.

Where working space is restricted, the following standards will be applied:

- Tree trunks should be directly protected from mechanical damage using an inner ring of matting/material and an outer ring of chestnut paling fencing.
- The lower branches should be selectively removed in an approved manner in accordance with BS 3998 to reduce mechanical damage by construction plant.
- Service trenches should be as far as reasonably practicable from the tree and must be hand-dug if within the crown zone and/or within 2m of the trunk of a tree to be retained; roots of a diameter of over 2.5cm should be retained but if they have to be severed, they should be cut using a sharp tool. Trenches should be back-filled with excavated soil except for street trees for which an inert granular material and top soil mix may be preferred to aid aeration and reduce compaction.

Proposed Tree Planting

New tree planting has been incorporated into the development and includes both replacement planting (for the loss of trees T16, T17 and T1 - T4) and substantial new plantings along Hopton Street and the adjacent garden and public square spaces. In excess of 60 new trees are proposed at semimature sizes that will provide a significant contribution to the amenity of the area and wider environmental benefits.

Pest Control & Good Housekeeping

MPX will ensure that all areas on site are kept as clear and tidy as possible. Accumulations of surplus or damaged building materials can act as harbourage for pests, and shall be removed and disposed of promptly and safely.

MPX will take appropriate measures to limit infestations from pests such as insects, birds, and rats/mice, such as:

- Preventing access to the site, from drainage
- Ensure housekeeping is maintained to a high standard, to prevent rubbish

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- Ensuring that any waste is removed at frequent intervals during standard working hours and the site is kept clean and tidy. Food waste and cigarette litter shall be cleaned up and removed daily.
- Limit the potential for food and water sources

Food debris also encourages pests to become established. Staff site facilities including canteens, accommodation and sanitary provision will be maintained in a clean and hygienic manner and in accordance with relevant regulations and codes of practice. All food waste will be stored safely in suitably located, pest resistant, closable containers and removed frequently.

Considerate Constructors Scheme

Multiplex will register the project to Considerate Contractors Scheme. We will assign a senior manager to lead our focus on the Considerate Construction Scheme in following sectors

Care about Appearance

- Best practice of site hoarding and condition of access roadways
- Controlling site labour and their appearance to the community

Respect the Community

- Being aware of how our work can affect our neighbours
- Controlling our deliveries
- What Community Engagement we are undertaking

Protect the Environment

- Managing all Environmental issues
- Minimising effect of vibration, noise, dust and light

Secure everyone's Safety

- Consistent safety agenda throughout the project
- Create initiatives that raise awareness and involvement in working safely

Valuing the Workforce

- Deliver first class welfare that cater for all sections of society
- Consider all personnel health and wellbeing

Cumulative Impacts

A list of the existing, or anticipated construction sites, in the vicinity of the site will be maintained for consideration within the traffic management plan, in order to minimise the cumulative impacts.

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APPENDIX A – TRANSPORT FOR LONDON MEMORADUM OF UNDERSTANDING (MOU)

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Memorandum of Understanding Template

Between
Transport for London (TfL)
and
.....Multiplex Construction Europe Limited (MPX).....

Purpose

This Memorandum of Understanding (MOU) sets out the terms and understanding between **Transport for London (TfL)** and **.....MPX.....** for the management of construction vehicles exiting the Western Yards site onto Blackfriars Road. The purpose of the agreement is to ensure that all road users’ safety is considered whilst construction vehicles exit the development site on Blackfriars Road. This is a safety measure designed to reduce the risk of a vehicle / cycle collision.

Background

TfL and **.....MPX.....** have worked closely to coordinate a joint approach to the management of construction vehicle egress from the development site onto Blackfriars Road. The arrangement described in this MOU seeks to provide this form of egress in a safe and managed manner.

Managing vehicles across the cycle track

Description

The egress of vehicles from Gate 2 of the Western Yards site onto Blackfriars Road is to be marshalled by site staff coordinating movements with the timings of the traffic signals at Blackfriars Bridge (South Bound) and Blackfriars Road/ Southwark Street junction. This approach is intended to reduce the risk of conflicts between construction traffic and general traffic / cyclists.

Operation

Banksmen should be in place with physical barriers and signage to enforce Southbound traffic including pedestrians – as shown in Appendix A.

Terms of use

Duration of use

The arrangement may be used for the duration of the **Western Yards** construction works where vehicles are required to exit onto Blackfriars Road and vehicles utilizing the off peak pit lane. (See appendix C)

Use of the egress arrangement

The egress point on to Blackfriars Road and pit lane may only be used when it is supported by the presence of banksmen manning physical barriers and correct signs to prevent pedestrians from encountering a vehicle (appendix A).

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The operation of the egress arrangement must be carried out as per the arrangement set out in Appendix D and all banksmen must undertake site training.

Timing of use

The hours of operation for vehicle deliveries would be:

08:00-18:00 Monday to Friday

09:00-14:00 Saturday

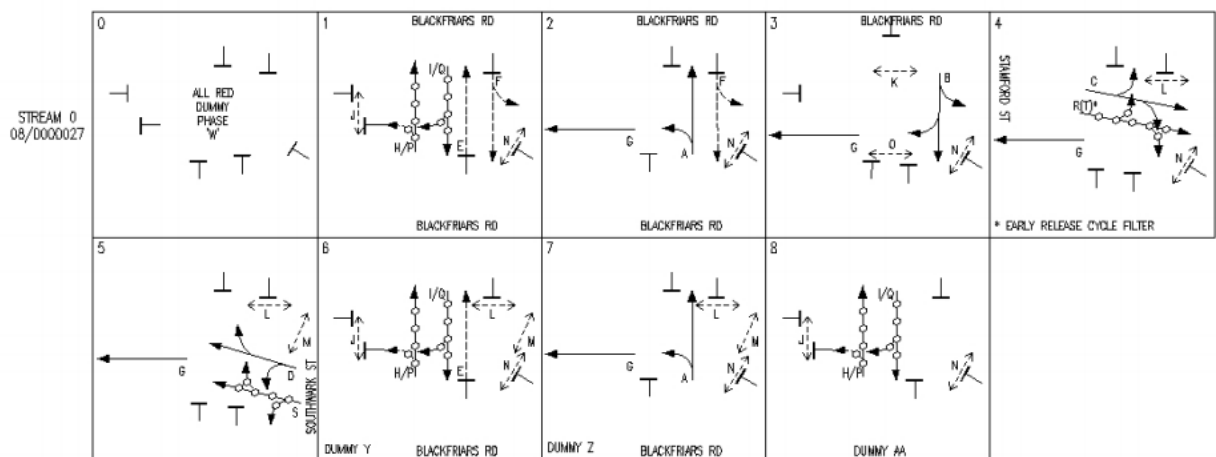
Pit Lane

10:00-16:00 Monday to Friday

19:30-23:30 Monday to Friday

Details of Signal Arrangement

The method of control at Blackfriars Road/ Southwark Street works as follows and the exit procedure takes place during stages 1 - 3 when southbound traffic (B) is on a full green and all other traffic is held at red:



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The egress arrangement will work with the signal phasing as follows:
TBC

Reporting

TfL will monitor the effectiveness of this arrangement on an ongoing basis and report any required changes to MPX via *appointed person*.

email: marvin.dyke@multiplex.global

Mob:07834 150078

Duration

This MOU is at-will and may be modified by mutual consent of representatives from TfL and **MPX**. This MOU shall become effective upon signature by the representatives from TfL and **MPX** and will remain in effect until modified or terminated by any one of the partners by mutual consent. In the absence of mutual agreement by the representatives from TfL and **MPX** this MOU shall end on 30 June 2022

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Construction Environmental Management Plan

MULTIPLEX

Contact Information

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NAME Marvin Dyke
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_____ Date:
(signature)

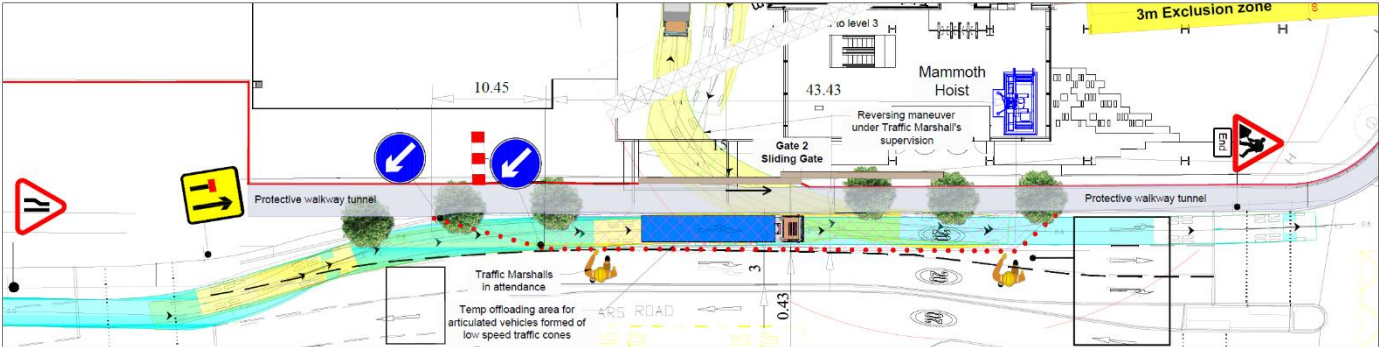
Name, Transport for London, position

_____ Date:
(signature)

appointed person , MPX Position

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Appendix A: Location plan showing banksmen and physical barriers



Pit Lane Set Up Proposal - Phase 1

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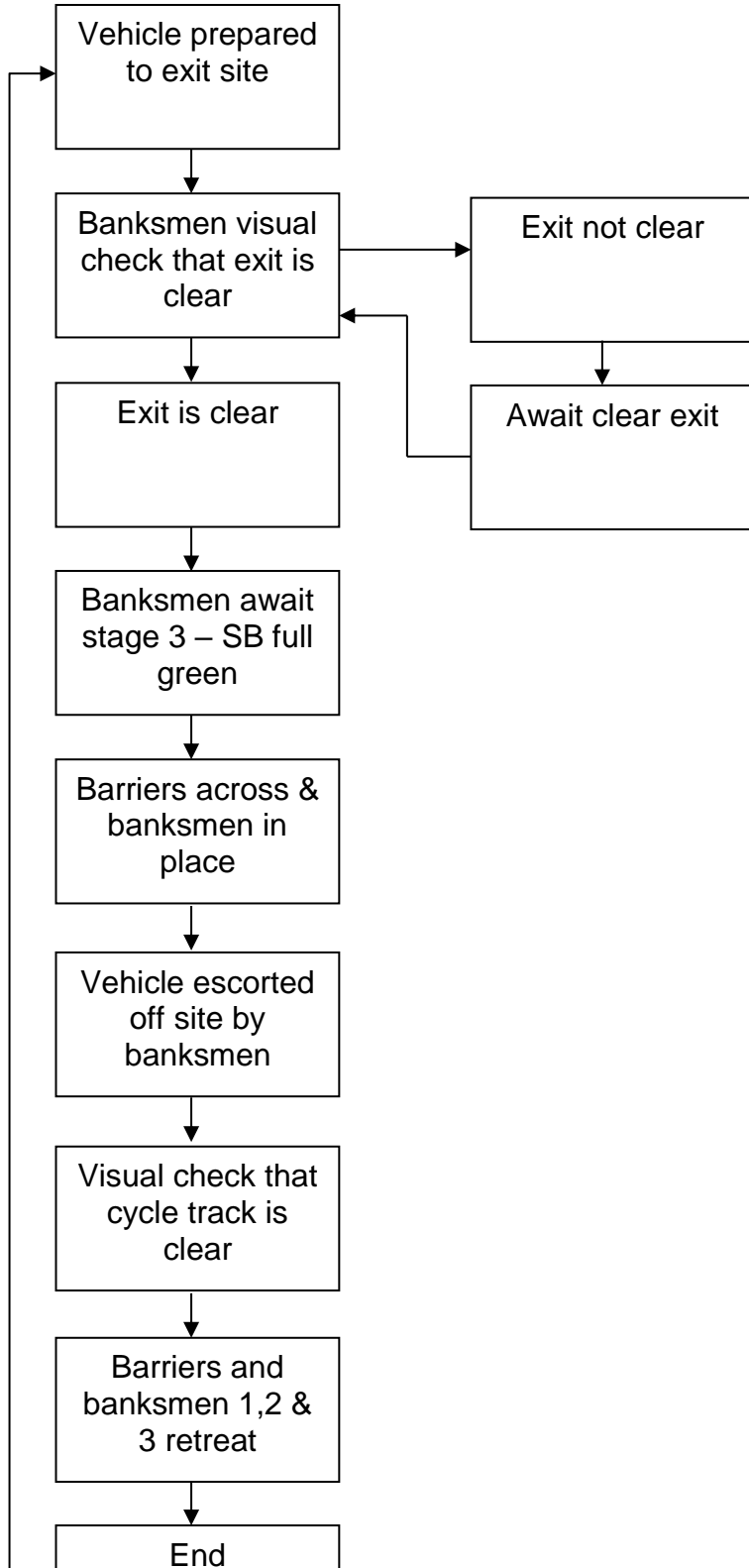
Figure 2 – Plan of MPX Construction Area and Vehicle Access Route

For the last 8 months the Western Yards Construction site has been accessed via Hopton street which has caused disturbance with vehicles waiting additionally there has been issues identified with vehicles turning onto Blackfriars road due to the reduced turning circle.

In order to mitigate this a pit lane is proposed so that wide loads and long vehicles can be off loaded via a pit lane during off peak hours from Blackfriars road. This will also create additional capacity entering site from Hopton street with a strict one way system allowing vehicle to be held within the site boundary.

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Appendix D: Indicative operation and management of signal phased egress



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Example- ensure correct signs used eg 'stop works'

Appendix E: site ops



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