

Framework Construction Environmental & Logistics Management Plan



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VERSION CONTROL

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This report dated 30 June 2021 has been prepared for The London Borough of Richmond Upon Thames (the "Client") in accordance with the terms and conditions of appointment dated 06 October 2020 (the "Appointment") between the Client and ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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1 INTRODUCTION

The purpose of this document is to set out the Framework Construction Management Plan ('FCMP') for the construction of the following description of development, hereafter known as the 'Proposed Development':

"Demolition of existing buildings and structures and redevelopment of the site comprising residential (Use Class C3), ground floor commercial/retail/cafe (Use Class E), and public house (Sui Generis), boathouse locker storage and floating pontoon with associated landscaping, restoration of Diamond Jubilee Gardens and other relevant works."

The Proposed Development lies within the administrative boundary of the London Borough of Richmond upon Thames ('LBRuT') and is located at 1, 1A, 1B and 1C King Street; 2-4 Water Lane; the site of the former swimming pool and associated buildings; the Embankment; the Diamond Jubilee Gardens, Twickenham ('the Site'), highlighted within the red line below.

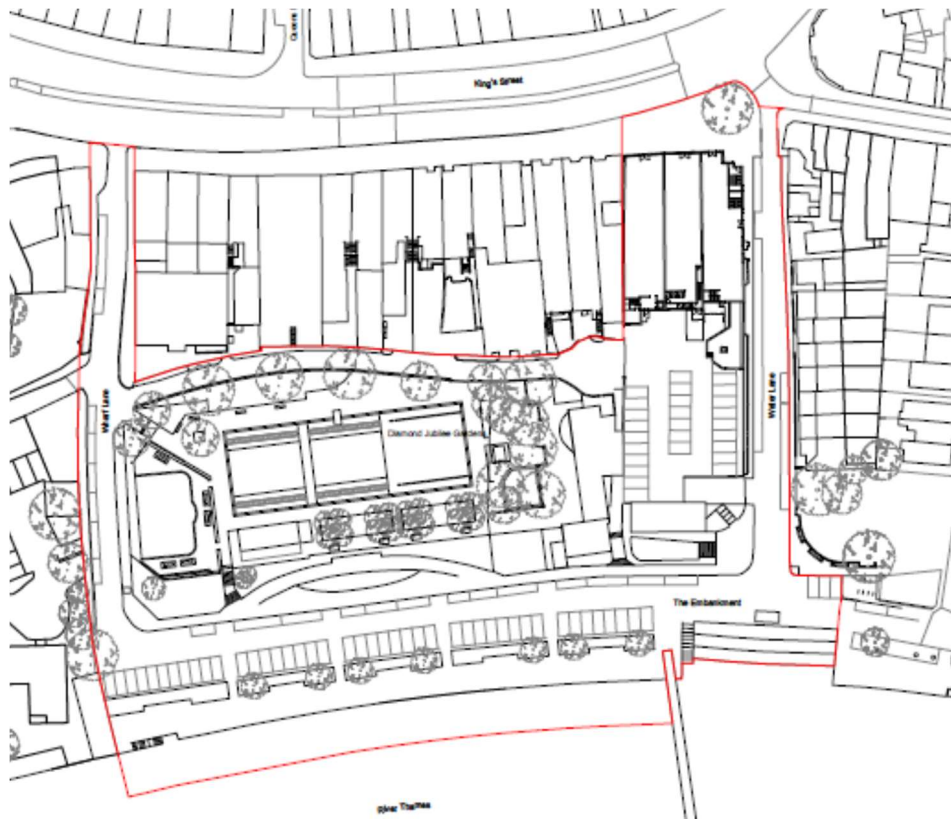


Diagram Existing Site Plan

The site is located within the busy Twickenham Town Centre and is bound by commercial units at the northern edge along King Street, residential uses to the east and west, and the Eel Pie Island to the south of the site across the footbridge.

Since 2010, the London Borough of Richmond upon Thames (LBRuT), 'the Applicant' has worked with multiple stakeholders to create a strategy for the future development of Twickenham town centre, making the best use of the opportunities presented by key sites to deliver high quality new buildings and public spaces and a more attractive and prosperous town centre.

Following a series of further consultations and the acquisition by LBRuT of a number of key properties, the potential was created for a new look Twickenham Town Centre taking forward some of the principles for Highways and the Street Scene set out in the Area Action Plan.

Twickenham Riverside is of strategic importance for the regeneration of Twickenham town centre and will encourage visitors and residents to enjoy the riverside.

Twickenham Riverside is a site of historic and economic importance. It is currently 1.34 hectares and was previously used as a lido which was closed in 1980. The Site is made up of three retail and one office unit, a public garden, a café, an unused car park and derelict buildings from its previous use, as well as a public highway and parking along the riverside.

The Proposed Development, which is illustrated in the diagram below is a mixed-use development comprising 45 new residential units, retail, office, food, and beverage space, alongside the provision of green space and increased public open space through the relocation and re-provision of public gardens.

A planning application is proposed by the end of July 2021.

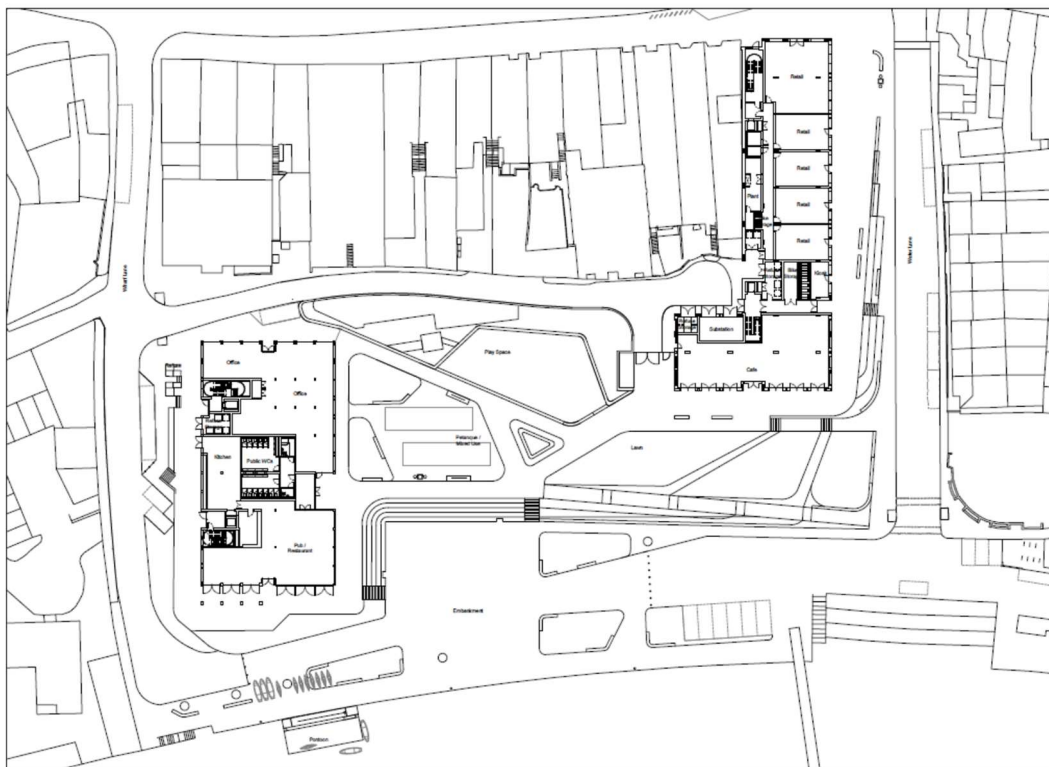


Diagram Proposed Site Plan

2 CONSTRUCTION MANAGEMENT PLAN

2.1 Introduction

This FCMP has been prepared on the basis of the current RIBA Stage 3 design and provides an indicative, high-level approach to the construction and management of the Proposed Development at the time of writing.

This plan describes the intentions for managing and supporting the project and the particular approach that will be taken for certain key aspects. However certain areas of operation will be the subject of specialist considerations and the approach set out in this document may be subject to change once a Principal Contractor is appointed.

More specific and detailed method statements relating to these operations will be developed and approved as the project proceeds. These additional key method statements will comply with the requirements of the relevant regulatory bodies and be prepared by the Principal Contractor and specialist sub-contractors involved in the project.

A design and build procurement route have been selected for Twickenham Riverside and a single stage tender process based upon RIBA Stage 4 information is currently considered the most appropriate. This should provide significant benefit to LBRuT with regard to quality of the scheme cost certainty.

Certain elements of the Proposed Development are also considered technically complex, and the above approach will enable early Contractor engagement and the utilisation of their expertise in finalising the design, discharging planning conditions and in the organisation, control, and construction of the works to the Employer's Requirements.

Once a Principal Contractor is appointed to deliver the construction of Twickenham Riverside a more detailed Construction Management Plan will be progressively developed with the benefit of their construction expertise and a detailed review of every aspect of the proposed approach will be undertaken including:

- Design and Construction.
- Buildability, sequencing, and construction risk.
- Innovation.
- Packaging of the works and the selection of specialist contractors.
- Detailed construction strategy and programme including 24-hour emergency contact
- Development of the cost plan
- Development of the method of construction.
- Site layout and phasing plans for the construction phase.
- Preliminaries for specialist and trade contractor bid documents.

In advance of starting the Proposed Development on site a detailed Construction Phase Health and Safety Plan will also be prepared in accordance with the Construction (Design and Management) Regulations 2015. This plan will be progressively refined and developed as trade package contractors and specialists are appointed, and more specific and detailed methods, techniques and requirements are established.

2.2 Land Ownership

The Site is registered on the Brownfield site register as Twickenham Riverside (former pool site) and south of King Street Local Plan.

LBRuT owns the freehold of the Site with the exception of the riverside Embankment, which is maintained by LBRuT but owned by the Port of London Authority (PLA). The PLA have agreed and signed Heads of Terms with LBRuT for the sale of this land.

1, 1a, 1b and 1c King Street are leased and notice to quit served notifying the tenants that they need to leave the rented premises.

LBRuT granted a 125-year lease to a Charitable Trust (Twickenham Riverside Trust) for the Diamond Jubilee Gardens in the centre of the Proposed Development which is being re-provided and substantially improved. Heads of Terms have been drafted and negotiations with the Trust are ongoing.

2.3 Site Constraints

A large part of the Site has been vacant for 40 years due to its complexity and constraints including significant flood storage requirements limiting the developable footprint, access for transport and vehicles delivering to Eel Pie Island which is only accessed by a single footbridge within the Site. Additionally, the re-provision of the public gardens which must be above the flood line and the disconnection, demolition, temporary and permanent replacement of an existing sub-station, and the diversion of utilities including high and low voltage electricity supply. A high-level summary of the principal known site constraints has been provided below;

Flood defence and storage

Given the riverside location the lower levels of the site, along the river is regularly flooded. The south of the site is located in Flood Zone 3 and is considered functional flood plain, LBRuT have engaged extensively with the Environment Agency (EA) on the associated requirements alongside the open space requirements (below) and these have dictated the buildable area of the site.

There are a number of resulting constraints on the site, relating to the safety of the development itself and the impact on the rest of the local area.

In order to ensure that the development of the site does not negatively impact off-site flood risk the EA has required that the new scheme re-provides flood storage on a like for like basis, as the current site, at every 200mm level, having a huge impact on the buildable space nearer the river as the overall volume of developed land cannot be increased from the current condition.

In line with National Planning Policy Framework all proposed development that is not water compatible must not be located within Flood Zone 3, this is achieved by the provision of a flood defence wall set to suit the local flood level (1/100 + climate change). All new structure is set such that the ground floor is located above this level. The flood defence line comprises a mix of RC cantilever retaining walls and engineered landscaping. This asset will need to be managed with the EA and their input / comments have been sought throughout the design process.

The EA requires that all buildings be set back from the flood defence for safety as well to allow for access and maintenance to the wall. This buffer was initially proposed at 16m but was reduced through negotiation to 4m, although further agreement is required around the landscaped defences.

Reprovision of the Diamond Jubilee Gardens

On the Site is a Gardens that is leased to the Twickenham Riverside Trust (the Trust). The Applicant has reached an agreement with the Trust to include the Gardens in the Proposed Development, providing that the land is re-provided at the same, or larger, size and that a certain amount must be delivered above the floodplain.

LBRuT is negotiating with the Trust the Heads of Terms for the surrender of their lease and the grant of a new one. The fact that the Trust have made it a condition that a certain amount of open space needs to be re-provided above the floodplain has again impacted on the buildable area of the Site, as it needs to be carefully balanced with the EA's requirements.

Utility diversion

There are currently a number of utilities running across the Site which will need to be either diverted or re-provided for the Proposed Development. These include telecoms cables, water, gas, and electricity supplies, including to the existing Eel Pie Island. In addition to the diversion of these utilities, an existing sub-station on the Site needs to be removed, temporarily replaced elsewhere on-site, and then the temporary sub-station removed once a permanent new sub-station is created.

River Wall

The South boundary of the site is formed by the existing historical river wall. No record information is available on this asset.

A condition survey was undertaken by Ramboll that confirmed the asset to be in reasonable condition and suitable for its current use, however due to the lack of available information loading within the zone immediately to the rear of the wall must be maintained within the current anticipated usage to avoid potentially overloading the wall. Similarly, no alterations should be made to the wall without additional investigative works.

Existing Trees

There are a number of existing trees which are to be retained in situ and other trees which are to be relocated and retained elsewhere within the scheme. These must be protected in accordance with the Tree Protection Plan (TPP). Those trees to be relocated must be protected in accordance with the TPP until such time as they are relocated; at which point new protective fencing must be installed immediately for the remainder of the construction period to ensure that all trees to be retained post-development are appropriately protected.

Existing Service Access

Through the construction period, service and emergency vehicle access needs to be maintained for the businesses and residents on Eel Pie Island, Water Lane and to the rear end of 5-57 King's Street.

Furthermore, the loading/unloading for Church Street, which has been recently pedestrianised currently take place at the top end of Water Lane and will need to either be retained or re-provided in a new loading bay along King's Street fronting 1-5 retail units.

Change in level

There is a large change in level of approximately 3.5m from the top of the site at King Street to the bottom of the site at the river. As a result, there are a number of areas of steep banking and retaining walls, partially acting as the current flood defence wall.

2.4 Programme and Sequencing

It is currently anticipated that that the Twickenham Riverside Project will be carried out in one single phase. Diamond Jubilee Gardens will be closed for the duration of the Proposed Development for the purposes of re-providing the new gardens and maintaining health and safety across the site.

The Site has however been divided in to 4 zones (with some overlap) and work is likely to be progressed concurrently across all zones for the duration of the Project:

1. Embankment and Lower Wharf Lane
2. Wharf Lane Building
3. Diamond Jubilee Gardens
4. Water Lane Building



Diagram Showing Proposed Construction Zones

We have included within the appendices a high-level indicative programme showing the possible sequencing of the construction works. It is currently anticipated that construction will commence on site in the spring / summer of 2022 with an estimated duration of 25-30 months.

A more detailed plan for the delivery and sequencing of the construction works will be developed once a principal Contractor has been appointed but this will include:

1. Contractor appointment and mobilisation
2. Suspend street parking and adapt access and service roads
3. Contractor's site set up and site surveys / investigations
4. Demolition and site clearance
5. Diversion and removal of utilities and services

6. Temporary relocation of sub station
7. Temporary shoring and sheet piling
8. Excavation and reduction in levels
9. Removal of below ground obstructions including Lido and flood defence wall
10. Piling and basement construction
11. Construction of flood defence wall
12. Back fill and levelling
13. Superstructure and External Works
14. Landscaping including Diamond Jubilee Gardens
15. Works to Embankment
16. Handover and completion
17. Fit Out

The following documents have also been included within the Appendices:

- Indicative Access and Servicing Plan
- Indicative Crane Strategy
- High-level Structural Constraints
- High-level Utilities Diversions

This FCMP describes the intentions for managing the Proposed Development and the particular approach that will be taken for certain key aspects. However certain areas of operation will be the subject of specialist considerations and the approach set out in this document may be subject to change once a Principal Contractor is appointed.

The Project will follow the principals and approach set out in this FCMP and the site set up and construction zones will be tailored to suit the selected construction sequencing by the Principal Contractor.

2.5 Pre-start Investigations

A range of pre-start site surveys and appraisals have been carried out by the consultant team and specialists which have and will continue to inform the design and construction of the Twickenham Riverside Project. These include but are not limited to the following;

- Existing site, buildings, and river wall (including valuation, measured surveys, structural surveys, structural investigations, condition surveys, and demolition surveys).
- Geological and geotechnical.
- Daylight, sunlight, and overshadowing.
- Topographical surveys.
- Below ground services.
- Contamination.
- BREEAM Assessment.

- Energy assessment and sustainability statement.
- Arboricultural / Ecological survey.
- Archaeological.
- Townscape and heritage.
- Waste management strategy.
- Traffic and transport.
- Delivery and servicing plan.
- Flood risk.
- Air quality.
- Acoustic.
- Photographic.
- Historic use.
- Structural surveys (including retained structures, underground structures, and obstructions).
- Unexploded bomb survey.
- Asbestos and other hazardous materials surveys and registers.
- Fire strategy
- Electrical infrastructure and capacity.
- Gas network infrastructure and capacity.
- Foul sewers and drains infrastructure and capacity.
- Existing water supply infrastructure and capacity.

Notification of the project commencement will be issued to all Statutory Authorities, advising them of the construction works and programme.

Pre-commencement newsletters will be delivered to all neighbouring addresses introducing the site team and outlining upcoming activities and relevant points of contact etc. This will continue on a quarterly basis, or as required, throughout the construction works.

At the commencement of the contract, the contractor will start the enabling and logistics activities that are detailed below.

3 Enabling and Logistics Activities

3.1 Security and Site Establishment

A secure site and compound will be established during the early stages of the project enclosed with a 2.4m high timber hoarding along the site boundary which will be inspected weekly, maintained, and adapted during the contract to suit the sequencing of the construction works.

Details where security hoardings (including decorative displays and facilities for public viewing) will be installed, and the maintenance of such will be developed by the successful Contractor taking in to account the proposed sequencing of the project and to align with construction traffic routes

Any existing fence to adjacent properties will be thoroughly examined to ensure that it conforms to HSG 151 and if not will be secured accordingly.

The contractor will be encouraged to apply appropriate CCTV and temporary lighting to the site boundaries to provide reassurance and security to public around the site. Typically for construction sites of this size biometric turnstiles are utilised to monitor and restrict site access and to prevent trespass.

The precise site set up and location of the Principal Contractors site compound and storage will be confirmed once a Principal Contractor has been appointed but one possible location would be the Embankment, subject to the constraints referred to above.

Site office and welfare facilities will comprise site management offices, meeting rooms, induction room, canteens, and welfare facilities. These will be erected on hard standings within the contractor's working area and segregated from construction traffic by pedestrian barriers.

3.2 Considerate Constructors Scheme

The successful contractor will be required to sign up to the Considerate Constructors Scheme and comply with the Code of Considerate Practice and site scoring associated with this registration.

Constructors should ensure sites appear professional and well managed

- Ensuring that the external appearance of sites enhances the image of the industry.
- Being organised, clean and tidy.
- Enhancing the appearance of facilities, stored materials, vehicles, and plant.
- Raising the image of the workforce by their appearance.

Constructors should give utmost consideration to their impact on neighbours and the public

- Informing, respecting, and showing courtesy to those affected by the work.
- Minimising the impact of deliveries, parking, and work on the public highway.
- Contributing to and supporting the local community and economy.
- Working to create a positive and enduring impression and promoting the Code.

Constructors should protect and enhance the environment

- Identifying, managing, and promoting environmental issues.
- Seeking sustainable solutions, and minimising waste, the carbon footprint, and resources.
- Minimising the impact of vibration, and air, light, and noise pollution.
- Protecting the ecology, the landscape, wildlife, vegetation, and water courses.

Constructors should attain the highest levels of occupational health and safety performance by:

- Demonstrating positive practices and approaches which care for the safety of the public, visitors, and the workforce during construction activity.
- Minimising security risks to neighbours.

- Having initiatives for continuous improvements for occupational health and safety.
- Embedding the right attitudes and behaviours that enhance occupational health and safety performance.

Constructors should provide a supportive and caring working environment

- Providing a workplace where everyone is respected, treated fairly, encouraged, and supported.
- Identifying personal development needs and promoting training.
- Caring for the health and wellbeing of the workforce.
- Providing and maintaining high standards of welfare.

3.3 General Access Strategy

This access strategy is intended to demonstrate one possible way of feasibly providing access to the construction site while maintaining safe access for local Stakeholders. The Principal Contractor, once appointed, will establish a general access strategy in detail and submit this for review to the local Highways Authority prior the commencement of main works on site.

The illustrative access strategy takes in to account the following constraints:

- Church Street which has recently been pedestrianised and requires a loading facility in the proximity of its junction with Water Lane to be maintained/ re-provided through the period of construction.
- Water Lane residential properties to the east of the proposed development site which will require access to be maintained and will need to be consulted on construction related parking suspensions.
- Eel Pie Island residents and businesses which will require approximately 6 parking/loading spaces to be maintained in close proximity of the bridge for the duration of the construction works. Furthermore, Eel Pie Island relies on access for articulated vehicles and waste removal trucks and as access to be maintained to fire hydrants in proximity of the bridge in case of an emergency.
- 35-57 King's Street properties which require access to the private car park via Wharf Lane.
- 5-33 King's Street properties which require access to the rear of their properties (Service Road) for waste removal, vehicle parking and back of house emergency exits.

Whilst temporary suspension of these access and parking requirements may be required this will be discussed and agreed with the interested Stakeholders during all stages of the construction works.

Other aspects of the access strategy may include:

- Site working times will need to consider the proximity of residential properties and leisure visitors of the riverside area, indicatively the working could be restricted as follows:
 - 07:30- 18:00 Monday – Friday
 - 08:00-13:00 Saturday (no noisy works)
 - Sundays and Bank Holidays No works on site.
- All deliveries will be routed to site along an agreed preferred access route selected to minimise disruption to local residents and surrounding areas. The deliveries access could change from to suit different stages of the Project.

- During some stages of the Proposed Development, parking along Water Lane, Wharf Lane and the Embankment will be suspended. Parking suspensions will be discussed and agreed with the local Highway Authority.
- At the pedestrian access to the site compound, a combination of turnstile and signing in/out procedures (visitors) will be established. These will be operated in conjunction with site safety, environmental and quality inductions for all personnel visiting and working on the Project.
- There will be no parking available onsite, and all operatives and visitors will be encouraged to take public transport.
- An appropriate holding area will be formed within the construction site / off-site where vehicles can pause, turn off their engines until required to unload/load.
- No waiting will be permitted on the roads adjacent to the site. The Gateman will be posted at the site entrance to ensure that construction vehicles do not obstruct pavements or queue on the roads adjacent to the site.
- The site access will be kept clean to avoid debris and other materials being deposited on the surrounding streets and footpaths.
- A 5mph speed limit will be enforced for construction traffic on immediate public roads and on the site.
- Safety signs will be placed around the site and along all pedestrian routes.
- Adequate signage will be displayed directing traffic to/from site and traffic movements into/out of site will be controlled by a trained Traffic Marshall/Banksman adjacent to the existing main entrance gate.
- Multiple deliveries or abnormal loads will necessitate holding vehicles in designated zones away from site to avoid vehicle congestion at the site entrance.
- All deliveries including plant will be within the site boundary.
- Deliveries will be strictly controlled to delivery time restrictions described above.
- A Banksman will be employed to receive and manage deliveries arriving and all large deliveries will be required to book in advance to avoid multiple, unexpected arrivals on site.
- Significant large deliveries, e.g., steelwork lorries/cranes etc. will be pre-empted and notified to neighbours, where possible, via monthly update newsletters.
- The Banksman will provide safe temporary road crossing points if footways are closed.
- To ensure the safety of pedestrians and cyclists, the contractor will comply with CLOCS (Construction, Logistics and Community Safety) requirements.
- Due to the location of the site in central Twickenham, which has significant road closures on event days at Twickenham Rugby Stadium, no work will be undertaken on match days.

Prior to the commencement of works on site the appointment Principal Contractor will submit details of the following to the local authority:

- The size, number, routing, and manoeuvring tracking of construction vehicles to and from the site, and holding areas for these on/off site;

- Site layout plan showing manoeuvring tracks for vehicles accessing the site to allow these to turn and exit in forward gear;
- Details and location of parking for site operatives and visitor vehicles (including measures taken to ensure satisfactory access and movement for existing occupiers of neighbouring properties during construction);
- Details of any necessary suspension of pavement, footpaths, road space, bus stops and/or parking bays;
- Details of any highway licences and traffic orders that may be required (such as for licences for any structures / materials on the highway or pavement, or suspensions to allow the routing of construction vehicles to the site)

3.4 Wheel Washing Facilities

Where required a washing area will be provided to prevent deposit of materials on to the public highway. These facilities will be implemented and employed as required and will comprise a temporary concrete hard surface with drainage to a collection tank ensuring that dirty water from wheel washing does not discharge into the existing drainage system. Any necessary wheel washing will be via a handheld pressure jet washer utilising recycled water from the collection tank and a vibro-type platform wheel wash to dislodge and collect loose mud and debris.

3.5 Site Management

The site management for the Proposed Development will comprise a site-based construction manager who will lead the site team and administer the contract. In addition, a senior building manager will support the construction manager and be responsible for the overall construction works on Site. The site-based team will also consist of a lead and assistant project surveyor managing the commercial aspects of the Proposed Development.

The Site team will be supported and assisted by staff including environmental, planning, temporary works, health, and safety managers.

3.6 Signage

A main construction signboard and its content will be discussed, and its position agreed with the Local Authority.

Site signage will be provided within the boundaries of the Site as necessary to advise operatives/visitors and delivery staff of safety requirements within the confines of the site and where to report on arrival. The signs will not be illuminated within the Site boundary and will not face the residents of Water Lane. Such signage will include:

- Accommodation / access requirements Speed limits
- Overhead / underground services
- Safety helmet and footwear requirement
- Noise
- Danger construction site, etc.
- Emergency contact details and 24-hour reporting hotline

The contractor's banner and Considerate Constructors Scheme banner will be incorporated into the hoarding surrounding the site.

3.7 Movement and Hoisting of Materials

All vehicle movements and deliveries will be subject to the control of the contractor.

All vehicle movements will ensure entry and exit from the site in forward gear to prevent risk to pedestrians outside of the site. Notwithstanding this a banksman will direct and supervise all traffic movement on to and exiting the site.

The storage of materials on site will be kept to an absolute minimum and therefore delivery scheduling will be carried out to ensure supply is on a 'just in time' basis only.

The use of off-site consolidation centres or storage will be discussed with the Contractor

All concrete and screed deliveries will be proposed as 'ready mixed' and will be delivered to site in appropriate vehicles. Concrete and screed placement techniques will be changed and adapted to suit the location and suitability of the equipment for its placement.

It is anticipated a number of areas will be designated for unloading and distribution across the site by static tower crane. An indicative crane strategy has been included within the Appendices to be finalised upon the appointment of a Principal Contractor.

3.8 Storage and Handling

Various holding areas within the Site boundary will be setup for all plant and materials delivered to Site to be stored in a neat and safe fashion. Some materials will be stored on upper floor within the building footprint ready for the finishing trades, once the envelope is weather tight. More vulnerable materials/equipment will be stored in the secure container or programmed on to site to be incorporated directly into the construction.

Details and location where plant and materials will be loaded and unloaded will be discussed with the Contractor and incorporated into the Construction Management Plan prior to commencement of the works and may flex depending on the phase of works being undertaken.

Details and location where plant and materials used in constructing the development will be stored, and likewise be incorporated into the Construction Management Plan.

3.9 Waste Management

A waste removal strategy will be developed by the Principal Contractor during the pre-commencement period. This strategy will be incorporated into all trade contractor orders.

Segregated rubbish skips will be provided within the contractor's site area which will be removed and replaced on a regular basis. All trade contractors will be required to transport and deposit their rubbish within this provision.

Through the design process the volume of waste to be disposed is reduced as much as possible and either on or off-site segregation (depending on space and the chosen disposal company) enables as much as possible to be recycled.

Packaging, whilst used where necessary, will also be kept to a minimum.

Details of a scheme for recycling/disposing of waste resulting from demolition and construction works (including excavation, location and emptying of skips) will be developed with the successful Contractor;

3.10 Scaffolding

Conventional and system scaffolding, where required, will be independent with boarded lifts to suit the nature, location, and type of operation.

All scaffolding will be securely tied to the structure and will include suitable ladder access.

Scaffolding will be provided, erected, and maintained in accordance with all current statutory regulations. In addition, brick guards will be provided on all 'live' lifts.

Suitable guard railing will be utilised to prevent falling from unprotected edges of the excavations, upper floors, and staircases as applicable.

No person other than a certified competent scaffolder will be permitted to erect, alter, adapt, or dismantle any conventional scaffolding.

No access to the scaffolding will be allowed from outside of the site hoarding area to prevent trespass and danger to the public.

3.11 Temporary Services

A power supply will be provided using existing supplies from site-based transformer / sub-station. A 110v power distribution system will be utilised throughout the building site together with three-phase supplies for static cranes.

Safety & emergency florescent lighting will be used; all lighting will be controlled via time clocks to ensure they are not left on outside of the permitted working hours. Any flood lighting used on site will be pointed into the site to minimise light pollution outside of the site boundary.

Water will be provided direct from the mains system for use in the welfare facilities.

Temporary drainage will be connected to the existing foul drains until the new foul connection to the mains has been installed and commissioned.

Telephone lines and an electronic data transfer line will be provided to the site offices.

3.12 Hours of Work

The intended working hours are:

- 07:30 -18:00 Monday to Friday
- 08:00 -13:00 Saturday
- No working on Sundays and bank holidays or on match days.

Subject to obtaining planning permission, the working hours during construction of the Proposed Development will formalised by condition.

In the unlikely event that extended hours are required, the contractor will advise and agree these in advance with the local planning authority.

3.13 Air Quality and Dust Management Strategy

Best practice will be employed in respect of dust and debris control from the construction activities. The principles outlined in Mayor of London's SPG 'The control of dust and emissions from construction and demolition' will be applied.

On the basis that best practice measures are to be adopted at all times along with the mitigation's measures identified, a visual assessment is considered appropriate for the Site. During the piling and early groundwork's operation, dust, noise, and vibration monitoring will take place.

A record of the results of the daily visual inspection will be kept along with meteorological conditions including the prevailing wind direction across the site, wind speed, air temperature and the incidence of precipitation.

Mitigation Measures

The following mitigation measures may be employed during the Proposed Development to ensure that the impact of on-site activities is minimised. Mitigation measures will however be reviewed by the Principal Contractor once appointed and advised.

Site Planning

- The name and contact details of the person accountable for air quality and dust issues (i.e., the environment manager/engineer or site manager) will be displayed on the Site boundary;

- The head or regional office contact information will be displayed on the Site boundary;
- Solid barriers to Site boundary will be erected;
- No bonfires are permitted;
- Plan site layout – machinery and dust causing activities away from sensitive receptors;
- All site personnel are to be fully trained;
- Hard surface haul routes will be utilised where practical.
- Site fencing, barriers and scaffolding will be kept clean using wet methods;
- Bag and remove biological debris or damp down such material before demolition;
- An adequate water supply will be available on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Enclosed chutes and conveyors and covered skips will be utilised;
- Drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised and fine water sprays on such equipment will be used wherever appropriate.

Construction Traffic

- All vehicles to switch off engines;
- Site speed limit of 5mph will be enforced;
- Effective cleaning and wheel washing on leaving Site;
- All loads entering the site are to be covered;
- No run-off of site water or mud;
- All plant on Site to regularly maintained and appropriate filters in place;
- Regulate movement of construction traffic on Site;
- Ensure that onsite haul routes are effectively maintained and kept clean.

Site Activities

- Minimise dust generating activities;
- Use water as dust suppressant where applicable;
- Enclose stockpiles or keep securely sheeted;
- Re-vegetate earthworks and exposed areas as early as possible during the construction process;
- Effective water suppression will be used during demolition operations;

- Ensure that any concrete crushers are licenced and comply with current regulations;
- Materials that have a potential to produce dust will be removed from Site as soon as possible, unless being re-used on Site. If being re-used on Site, cover as detailed below;
- Buildings will be soft stripped inside before demolition;
- Equipment should be readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods;
- Sand and other aggregates should be stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Site Recording

- All dust and air quality complaints will be recorded, cause identified, and appropriate measures taken to reduce emissions in a timely manner. Measures taken will be recorded;
- The complaints log will be made available to the local authority when asked;
- Any exceptional incidents will be recorded which cause dust and/or air emissions, either on- or off- site and the action taken to resolve the situation recorded in the logbook;
- Regular site inspections will be undertaken to monitor compliance with the DMP, record inspection results and make inspection log available to LBR when asked;
- Site inspections will be increased in frequency by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged periods of dry or windy conditions;
- Daily on-site and off-site inspection will be undertaken, where receptors area nearby, to monitor, record inspection results and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window-sills within 100 m of the site boundary;
- All inspections of haul routes and any subsequent action will be recorded in a site logbook.

3.14 Noise & Vibration Control

Noise and vibration from construction operations have the potential to disrupt and cause annoyance to the adjacent neighbourhood. It is therefore vital on a construction project of this size and duration to minimise any such disruption. Through careful planning, activities likely to cause concern can be identified to allow for suitable mitigation to be applied.

The average sound pressure levels will be monitored to determine whether the BS 5228 threshold value of 75dB $L_{Aeq,T}$ could be exceeded at nearby residential receptors during the permitted working hours.

Proposals for monitoring noise & vibration and procedures to be put in place, where agreed noise levels are exceeded.

It is proposed that noise & vibration monitoring is carried out on site once operations are underway to ensure that the agreed levels are not exceeded. These will be regularly monitored by the site management team at set locations near sensitive receptors and records maintained. In the event that levels are exceeded, the following procedures will be put in place by the site management team:

1. Quickly assess the seriousness of the problem.
2. Contact the complainant and consider their views and advise how we propose to the situation.
3. Cease the activity causing the problem until preventative measures have been taken to control the situation.
4. Continue to take noise readings of the incident to demonstrate the effects of the improvements made.

Building / area of work	Method	Mitigation
Groundworks	Moving Materials, pouring concrete, piling, CFA piling. Breaking out tarmac.	Monitor using noise and vibration equipment. Stop immediately if agreed levels are exceeded.
Superstructure	Cutting steel, pouring concrete.	Monitor using handheld noise meter. Stop immediately if agreed levels are exceeded
Landscape	Materials delivery, spreading of materials.	Monitor using handheld noise meter. Stop immediately if agreed levels are exceeded

Table 1 Summary of Noise and Vibration Works

Mitigation Measures

The following mitigation measures, as suggested in BS 5228, will be employed to lessen the noise and vibration impacts during the demolition and construction phase.

Community Relations

The establishment and maintenance of good community relations will be a priority (see section 2.18 below). This will include informing local residents on progress of the works by way of leaflet drops and/or public meetings and ensuring measures are put in place to minimise noise impacts. A telephone "hot line" and agreed procedure for the contractor to investigate and report on complaints will be set up.

The Council shall be given 28 days' notice of times and dates of crane rigging and de-rigging by the contractor.

Training of Employees

Operatives will be trained to employ appropriate techniques to keep site noise to a minimum and should be effectively supervised to ensure that best working practice in respect of noise reduction is followed.

Execution of Works

Practicable measures to manage construction noise and vibration impacts which will be undertaken during these works include the following:

- The hours of working should be planned, and account should be taken of the effects of noise upon persons in areas surrounding site operations and upon persons working on site, considering the nature of land use in the areas concerned, the duration of work and the likely consequence of any lengthening of work periods.
- On-site noise & vibration levels will be monitored regularly, particularly if changes in machinery or project designs are introduced, by a suitably qualified person appointed specifically for the purpose. A method of noise and vibration measurement should be agreed prior to commencement of site works.

On those parts of a site where high levels of noise are likely to be a hazard to persons working on the site, prominent warning notices should be displayed and, where necessary, ear protectors should be provided.

Timing of works

In accordance with the requirements of the Richmond Upon Thames Construction Code of Practice, it is proposed that the scheduling of any construction works at the site be within daytime hours. The following hours of construction working are proposed;

- a.) Monday to Friday 08:00 – 18:00
- b.) Saturday 08:00 – 13:00
- c.) Sundays and Bank Holidays: No noisy activities on site

Noisy works outside of these hours subject to written confirmation with the Council

Control of Noise at Source

Noise from existing plant and equipment can sometimes be reduced by modification or by the application of improved sound reduction methods after consultation with the manufacturer.

Care should be taken to locate equipment away from noise-sensitive areas. Machines and plant should not be left running unnecessarily, as this can be noisy and waste energy. Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Acoustic covers to engines should be kept closed when the engines are in use and idling. Materials should be lowered whenever practicable and should not be dropped. Regular and effective maintenance by trained personnel is essential and will do much to reduce noise from machinery. Increases in plant noise are often indicative of future mechanical failure.

Controlling the Spread of Noise

If noisy processes can be avoided, then the amount of noise reaching the neighbourhood should be limited. Alternative ways of doing this are either to increase the distance between the noise source and the listener or to introduce noise reduction screens.

Increasing distance is often the most effective method of controlling noise. However, this may not be possible when work takes place on a restricted site.

An approved strategy and details will be approved by the planning authority. Where possible / practical material stockpiles can be strategically placed to provide an additional barrier.

Noise Monitoring

Noise monitoring during the construction phase will be undertaken in accordance with the guidance presented in Annex G of BS 5228-1:2009 which states that the following information will be recorded:

- a) the measured values of L_{Aeq} and, where appropriate, $L_{pA(max)}$ or L_{A01} , together with details of the appropriate time periods;
- b) details of the instrumentation and measurement methods used, including details of any sampling techniques, position of microphone(s) in relation to the site and system calibration data;
- c) any factors that might have adversely affected the reliability or accuracy of the measurements;
- d) plans of the site and neighbourhood showing the position of plant, associated buildings and notes of site activities during monitoring period(s);
- e) notes on weather conditions, including where relevant, wind speed/direction, temperature, presence of precipitation, etc.;
- f) time, date, and name of person carrying out the measurement.

Possible construction noise monitoring locations are shown on the diagram below. It is proposed that noise levels will be routinely monitored and reported at these locations for 4 hours during construction activities on a monthly basis, but this will be agreed once a Principal Contractor has been appointed.

Additional measurements will be undertaken to establish whether specific equipment or practices will be capable of achieving the Noise Emission Limits as set out below or in light of any complaints.



Diagram Showing indicative Construction Noise Monitoring Locations

Vibration Monitoring

Vibration monitoring will be undertaken during the construction phase; monitoring will record ppv, maximum displacement, VDV and acceleration. Measurement will generally be undertaken in accordance with the procedure described in BS ISO 4866:2010: Guidelines for the measurement of vibrations and evaluation of their effects on structures.

Baseline monitoring to be undertaken immediately (minimum 2 days) prior to works starting on site to establish appropriate monitoring trigger levels for vibration and displacement. Works will stop and alternative methods employed if vibration exceeds the established thresholds.

Records of the monitoring will be consistent with the requirements of BS7385:1990 and will include:

- Description of the vibration source
- Type and condition of the building
- Purpose of the measurement
- Reference to BS7385
- Position of transducer and manner of coupling type and make of transducer
- Frequency range and linearity
- Assessment of the sources of error
- PPV recorded and associated frequency

The piling method used for the Proposed Development is likely to comprise continuous flight auger (CFA) piling, but this will be reviewed by the Principal Contractor once appointed. Method Statements and noise levels/vibrations would typically be provided by the specialist piling contractor to suit the equipment they propose using.

3.15 Safety

Full recognition and regard will be taken in the management and execution of the project of the Construction (Design and Management) Regulations 2015.

All trade contractors are obliged to provide safety policies, plans and method statements and will be interviewed prior to order placement on all aspects of safety, health, and welfare.

All sites are subject to independent site safety checks, inspection and reports by our independent site safety inspectors and advisors.

Employer's direct contractors will be required to accord and be subject to the same safety procedures and requirements as the contractors' own trade contractors and operatives, as outlined above.

Safety inspections will also include the works of the employer's direct contractors if appropriate.

The Contractor will be required to comply with the Joint Code of Practice for the Prevention of Fire on Construction Sites. The code describes '...a series of simple precautions and safe working practices (to) ensure that adequate detection and prevention measures are incorporated during the design and planning stages and that work on a site is undertaken to the highest standard of fire safety.'

The code is accompanied by the Construction Site Fire Prevention Checklist, which is in the form of a series of questions, responses to which can be used to create a record of compliance with the code.

With regard to road safety measures, where possible the contractor will seek to use contractors who are registered on the FORS (Fleet Operator Recognition Scheme) system. In addition, where possible contractor vehicles will include sidebars, blind spot mirrors and detection equipment.

3.16 Environmental and Biodiversity

Ecology, bat and arboricultural surveys have been undertaken and any findings fed into the design process. Any further actions required during the construction works will be implemented and monitored. Post planting aftercare and provision for watering will need to be included to demonstrate that the trees and other planting stays healthy.

The protection of trees and tree roots will be taken into consideration. A Tree Protection Plan and method statement will be produced and will be followed to manage the trees within the construction area. The Arboricultural Method Statement will include management of the trees to be relocated as directed by the specialist Arboricultural contractor who will relocate the trees.

The table below shows all surveys carried out to ensure the protection of ecological features:

Survey	By Whom	Date
Phase 1 ecology habitat survey	BSG Ecology	July 2020
Bat emergence and re-entry surveys	BSG Ecology	September 2020*
Arboricultural Method Statement	Thomson Environmental Consultants	June 2021

**First survey 1st September after delay due to poor weather in August*

Table 2 Summary Surveys

The Construction Management Statement will be written in conjunction with the Arboricultural Method Statement, and in accordance with British Standard BS5837:2012 'Trees in relation to design, demolition and construction – recommendations', in particular section 5.5, 6.1, 6.2, 6.3 and 7;

Ecological Impact Assessment (EclA) (non-EIA) makes the following recommendations to be addressed during construction:

- To reduce any impacts of lighting on bats as a result of the proposed development, it is recommended that lighting along the River Thames corridor is sensitive to the continued (and potentially improved) use of the Site by bats. It is recommended that an ecologist reviews any lighting proposals for the scheme (including construction lighting) and that this is devised with reference to industry guidance on bats and lighting from BCT & ILP, 2018).
- The existing insect hotels present within the Site should be protected until their relocation and once installed in their new locations.
- Protection of trees to be retained (covered above)
- Implementation of appropriate measures such as Environment Agency best practice measures for working by water to avoid impacts on the River Thames (also the River Thames and Tidal Tributaries Site of Metropolitan Importance).
- Any removal of suitable nesting bird habitat (e.g., plantation woodland, hedgerow, and buildings) should be undertaken outside of the nesting bird season (March to August inclusive). If this is not possible, small areas of habitat can be subject to a pre-clearance check by an ecologist, noting that any active nests would need to be left in-situ with an appropriate buffer until they are no longer in use.

3.17 Community Engagement / Considerate Constructors Scheme

A multi-level approach to planning a community engagement will consider a range of long term and short-term engagements as befitting the location. Some ideas of what Community Engagement may involve are:

- Newsletters.
- Coffee mornings / open evenings.
- Open site.
- Supervised school visits.
- "Open door" policy.
- Construction Ambassador Scheme.

- Charity events.

A community liaison manager will be appointed on site who will make sure the lines of communications are kept open and there is constant dialogue. The site's 24hr emergency number will be displayed on the site hoarding and distributed to the local neighbours.

Wherever possible, consideration will be given to pre-fabrication of components off site prior to delivery to minimise potential disturbance caused by construction traffic.

The working site will be kept clean and in good order at all times. Surplus materials and rubbish will not be allowed to accumulate on the site or spill over into the surroundings.

Respectable and safe standards of dress will be maintained at all times. Lewd or derogatory behaviour and language will not be tolerated under threat of severe disciplinary action.

A banksman / logistics manager will be employed who will manage all deliveries to site.

A detailed traffic management plan will be implemented and issued to all sub-contractors and managed by our Banksman / Logistics Manager, whose duties will include:

- Giving priority to local residents & traffic.
- Managing / collating the delivery booking in process.
- Approved deliveries to site will contact the logistics manager in advance of their arrival to allow the site to prepare the delivery area and advise the driver of any issues.
- Ensuring vehicle engines are switched off while parking.
- Banking & reversing vehicles where necessary.
- Ensuring vehicle wheels are clean prior to leaving the construction area during groundworks phase.
- Ensuring vehicles are only using designated routes and not causing nuisance parking.

The contractor will register with the Considerate Constructors Scheme, which is a voluntary scheme in which construction sites agree to abide by the Code of Considerate Practice, designed to encourage best practice beyond statutory requirements.

Local Spend

Where possible, local contractors will be selected, enhancing the value of 'local pound' expenditure. Locating and engaging services locally is a key part of the commitment required from labour trades on site, but this extends beyond the immediate site boundaries into the community and local business structure.

Reasonable commercial endeavours will ensure that some of the construction jobs in relation to the project are filled by residents of the London Boroughs of Richmond upon Thames, Hounslow, Kingston upon Thames, Wandsworth, Elmbridge, and Spelthorne District Councils. Local training providers will be engaged with the focus to put forward local candidates.

4 CONSTRUCTION METHODOLOGY

This section summarises the construction methods and materials to be used in order to complete this Proposed Development and outlines where further safety or method statements will be required.

The principals and approach set out in the Construction Management Plan will be followed but the final sequencing of the works and certain areas of operation will be the subject of specialist considerations and the approach set out in this document may be subject to change once a Principal Contractor is appointed.

More specific and detailed method statements relating to these operations will be developed and approved as the project proceeds and once a Principal Contractor is appointed a detailed more detailed Construction Management Plan will be progressively developed with the benefit of their construction expertise and a detailed review of every aspect of the proposed approach will be undertaken.

4.1 Enabling Infrastructure Relocation Works

Prior to the commencement of the main building works but after the initial demolition project has been completed, a new electrical substation will be installed by UK Power Networks (UKPN). The new substation will serve the properties connected to the existing substation located on the Site. Following energization and reconnections of the new substation, the existing substation will be decommissioned and removed.

4.2 Main Construction

Initial Site Setup

Initial construction activities commence with the erection of site safety hoarding and the establishment of the Site compound and offices.

A site sweep will be undertaken to ensure that any obvious hazards such as discarded drug paraphernalia, fly tipping or hazardous materials deposited on the site have been isolated and removed. The location of significant buried services will be identified with appropriate non-penetrative markers.

A full dilapidation survey of the surrounding infrastructure will be completed prior to any construction works being undertaken, any damaged caused as a direct result of the construction process will be repaired as required.

Ground Remediation and Reduced Level Dig

Following the establishment of the site, vegetation, topsoil and remaining above ground structures will be removed.

Ground levels will be reduced as required for the piling mat, including any remediation / removal of below ground obstructions / recycling of earthworks. Excavated edges will typically be battered to a stable slope, with sheet-piling used locally to protect trees or similar, close to the excavations. Earthmoving plant and equipment will be utilised which corresponds with the quantity of soil to be relocated, the quantity of soil to be removed from site and the timescale within which the operation requires completion.

The environmental impact of the works will be monitored and reviewed, and any special procedures or control measures taken to protect the environment including any risk of pollution to the River Thames.

Substructure

The sub-structure is generally proposed as a piled system, based on bored, not driven piles. A piling mat will be installed at the reduced level, and piling will be undertaken for both buildings as per the design proposals. The basement at Wharf Lane will be constructed using a bottom-up methodology, with the retaining walls and the lower ground floor raft slab installed, in combination with the underfloor

services, followed by the supporting columns and the ground floor slab prior to backfilling around the basement.

Water Lane will have a suspended ground floor slab spanning between ground beams and pile caps.

Similarly, the proposed RC flood defence wall will be constructed in sequence with the reduced level dig and the area behind will be backfilled once the wall is complete.

Superstructure

At this stage of the design, it has been assumed that the structure will be a concrete frame erected by a specialist subcontractor using a mobile / static crane.

A detailed method statement for concrete frame erection will be produced by the works contractor prior to commencement. Edge protection will be cast into the construction as the works progress.

Envelope

The external walls will be installed from either fixed independent scaffold and/or mobile elevating platforms depending on special constraints. This is likely to be undertaken concurrently with the roofing works and include the integration of bird and bat boxes as specified during the wall build-up.

The windows will be installed as soon as possible once the external walling has been erected. This will create a weather tight environment within the building for the installation of internal services and finishing works.

Internal Work

The internal partitions will initially be erected on the upper floors, followed by the lower floors once the high-level services within the ceiling void have been installed. Generally, only one side of the partition will be boarded at this stage. This will allow internal fixings and services to be installed before they are enclosed on the plasterboard on other side.

Internal carcass and first fixing by the finishing trades will commence once a weather tight environment has been achieved within the new building. Where necessary temporary weathering will be provided to window openings in prevent the ingress of wind and rain into the working area.

The skim plastering of plasterboard on internal walls and partitions will be undertaken progressively as boarding on each floor is completed.

The second fixing by other trades will follow after a suitable period of drying out.

Suspended ceilings, where designed, are to be installed once the high-level internal service pipework and trunking has been completed and tested.

The wall and ceiling finishes will be completed before floor finishes are laid.

Mechanical / Electrical Services

A detailed fabrication, delivery and installation schedule will be prepared by the mechanical and electrical contractor to ensure compliance with the overall contract programme. Builder's work required for the new services will be defined at this stage for inclusion on the structural engineer's construction drawings.

The high-level conduits and pipework above ceiling level will be installed from lightweight mobile towers, prior to construction of the internal walls and partitions.

Installation of light fittings, smoke detectors and fire alarm systems will be co-ordinated with the ceiling works and set out in accordance with the architect's reflected ceiling plans. Key dates for power and water supplies to be available within the building will be identified on the programme.

Testing and commissioning of specialist systems will be carried out by the specialist system supplier/installer and all test certificates will be issued.

On completion of the commissioning activities the complete system will be offered for demonstration and witness testing to the client.

Fitting Out / Handover

Temporary protection to floor and wall finishes will be removed once the installation of all fixtures and fittings has been completed.

Snagging, cleaning, and inspection will be undertaken room-by-room and once completed each room will be secured in advance of the final handover.

External Works

These works will be carried out as an on-going activity throughout the construction period, upon sufficient completion of the main building envelope. Initial works will include establishing formation level, mains drainage, mains services and base course to surface finishes, with soft and hard landscaping to all areas carried out towards the latter end of the construction period in one operation. The installation of street furniture, cycle racks and external lighting is likely to follow the completion of the hard landscaping works.

There are a number of existing features within the site which are to be carefully removed, stored, and then either re-located within the new landscape or re-located off-site to locations to be agreed with London Borough of Richmond upon Thames. For example, artwork within the gardens and memorial plaques to existing trees and benches. These existing features and their proposed re-location will be included in the landscape drawings.

There is also one existing Black Poplar and twelve pleached London Plane trees which are to be carefully lifted and re-planted within the new layout of the gardens. The logistics of moving these trees is to be co-ordinated with the construction phasing of the project in order to minimise the risk of damage to these trees.

Appendix A – Existing Plan

Appendix B – Proposed Plan

Appendix C – Indicative Construction Zones

Appendix D – Indicative Construction Programme

Appendix E – Indicative Access and Servicing plan

Appendix F – Indicative Crane Strategy

Appendix G – High-level Structural Constraints

Appendix H – High-level Utilities Diversions

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