

6. Development Programme, Demolition, Alteration, Refurbishment and Construction

Introduction

- 6.1 This Chapter describes the anticipated programme of works and the key activities that would be undertaken on the Site during the demolition, refurbishment, alteration and construction works (hereafter referred to as the 'Works') necessary to facilitate the Development. This Chapter sets out how the Works would be carried out and the Applicant's intentions for managing environmental effects during the Works. Detailed consideration of likely significant environmental effects related to the Works are provided in each of the technical Chapters (**Chapters 7 to 19**) of this ES.
- 6.2 A summary of the likely significant environmental effects arising from the Site preparation and construction works are briefly set out, together with a summary of the relevant mitigation measures. A Framework Construction Management Statement (FCMS) has been prepared to support the Planning Applications. The FCMS provides an indicative strategy for the proposed demolition, construction methodology, construction logistics and associated assumptions for the Works. The FCMS is an initial plan and has been prepared in advance of the appointment of a Principal Contractor(s). Upon appointment, the Principal Contractor will outline the project Construction Method Statement and Construction Logistics Plan. Prior to the commencement of the main Works, the Principal Contractor will be required to register and comply with all of the requirements of the Considerate Contractors Scheme (CCS), ensuring that their project methodology is tailored to the specific requirements of the CCS Code of Practice and the requirements of the London Borough of Richmond upon Thames (LBRuT).
- 6.3 It is proposed that a detailed Construction Environmental Management Plan (CEMP) would also be prepared for the Development and secured through planning condition attached to the planning permission, based on the FCMS provided with the planning application. The CEMP would include details of relevant environmental management controls necessary for environmental protection during the Works, as detailed later in this Chapter, and would be implemented by the specific Project Environmental Manager (PEM) for the Development.
- 6.4 Planning for construction is necessarily broad at this stage and may be subject to modification. Specific activities may vary in frequency, depending upon the particular stage of works. However, it is considered that sufficient planning has taken place to enable the identification and assessment of all likely significant environment effects related to the Works. Where relevant, technical assessments have assumed a reasonable worst-case scenario where information is unknown at this stage (for example, the distance of construction plant to sensitive receptors).

Programme of Works

- 6.5 It is currently anticipated that the Works required to facilitate the Development would be carried out over a period of approximately 7 years. The Works are anticipated to commence in March 2023 and complete in November 2029. The programme is based on continuous working without gaps, with the completion of demolition and start of enabling works and construction overlapping across the phases. The exact overlap duration of construction activities will be decided during the procurement stage as these elements of work will likely be undertaken by different contractors.

6.6 **Table 6.1** sets out an indicative outline programme of key activities associated with the Works. The construction programme is graphically represented within **Figure 6.1**, with the overall proposed phasing sequencing illustrated in **Appendix 6.1**. **Figure 6.2** shows the overall proposed phasing plan as follows:

- Site-wide demolition clearance and basement construction;
- Phase 1 comprises Buildings 1, 2, 3, and 5 and 6 in the east of the Site (Development Area 1) and Buildings 18 and 19 on the west of the Site (Development Area 2);
- Phase 2 comprises Buildings 4, 7, and 8 on the east of the Site (Development Area 1) and Buildings 13, 14, 15, 16 and 17 in the west of the Site (Development Area 2);
- Phase 3 comprises Buildings 9, 10, 11 and 12 on the east of the Site (Development Area 1); and
- Phase 4 comprises Buildings 20 and 21 in the west of the Site (Development Area 2).

Table 6.1: Indicative Outline Programme of Key Site Preparation and Construction Activities

Key Stages of Work	Start	Finish	Approximate Duration (Weeks)
Site wide enabling works and services isolation	March 2023	May 2023	11
Site wide demolition and slab removal	March 2023	October 2023	30
School Construction	May 2023	January 2026	130
School completion and handover		January 2026	
S278 Works at Chalkers Corner	January 2025	January 2026	48
Phase 1 sheet piling works	June 2023	April 2024	40
Archaeological inspection period	March 2024 December 2024	April 2024 January 2025	4 4
Eastern basement and cores construction	January 2025	July 2026	72
Western basement and cores construction	April 2024	March 2025	46
Development Area 1 and 2, Phase 1			
<ul style="list-style-type: none"> • Basement construction • Building 1-3 construction • Building 5-6 construction / alteration • Building 18-19 construction 	March 2024	July 2027	166
Development Area 1 and 2, Phase 2			
<ul style="list-style-type: none"> • Basement construction • Building 4 Alteration / refurbishment • Building 7-8 construction • Building 13-17 construction 	January 2026	January 2029	146
Development Area 1 and 2, Phase 3			
<ul style="list-style-type: none"> • Building 9-12 construction 	September 2027	August 2029	94
Development Area 1 completion and handover	August 2029		

Development Area 2, Phase 4	May 2028	November 2029	75
• Building 20 – 21 construction			
Development Area 2 completion and handover	November 2029		

Description of the Works

- 6.7 The Works are anticipated to be undertaken in the following way:
- site enabling and demolition works will be undertaken Site wide in one phase;
 - archaeological trenches will be dug in line with basement excavations;
 - basement excavation will take place concurrent with the phasing of the building construction above using sheet piling to form basement boxes with temporary wall/bund construction. This will allow each basement area designated to the plot above to be developed independently;
 - construction of the School will be concurrent with the construction works of Phase 1, and will be completed and operational before commencement of construction works on Phases 2 to 4;
 - Chalkers Corner highways works would be undertaken prior to the completion of the school;
 - an entire Phase would be completed before any buildings within the Phase are occupied.
- 6.8 Vehicle movements will vary during construction activities across the Site. It is anticipated that the maximum number of trips will reach a peak of 260 daily trips to and from the Site during Q1 2027, and 276 daily trips to and from the Site during Q1 2028. For the purposes of the EIA, the peak construction year is therefore assumed to be 2028 (refer to **Chapters 8 to 10**).

Stag Brewery Component of the Site

- 6.9 Details of the retention and alteration works to retained structures is provided in **Chapter 5: The Proposed Development**.

Enabling Works

- 6.10 Prior to commencing enabling works, the boundary of the Site would be secured by the installation of solid 2.4 m high hoarding. Further hoarding would enclose work areas and buildings where access is to be provided to the contracting team and where external works are to take place adjacent to public areas. This would establish a safe working enclosure and exclusion zones for the general public. The hoardings would comply with the Health and Safety Executive (HSE) and LBRuT requirements. They would be well lit and maintained throughout the works to ensure public safety.
- 6.11 Full pavement width hoarding is anticipated to the road frontages with temporary pedestrian tunnels to maintain pedestrian access. The pedestrian access will be fully lit throughout, and on the highway side there will be baulk timbers that will be lit along their length. The area will be regularly maintained to ensure it is kept clean and maintained to acceptable standards. The Scaffold Tunnel will be constructed such that it is weatherproof from above as well as protected from the unlikely event of any falling material. Where the pedestrian tunnel extends beyond the pavement into the highway (if necessary) the levels will be locally adjusted to create a level walking surfaces.

- 6.12 Prior to demolition work, the following enabling works would be carried out to protect infrastructure, buildings and features that would be retained through the Works:
- protection of buildings or structures to be retained, as outlined in **Chapter 5: The Proposed Development**, including the Maltings, former Hotel and former Bottling buildings (façade retention), memorial plaques, northern and southern boundary structures;
 - protection of tree preservation order (TPO) protected trees; and
 - decommissioning of the existing services within the brewery and disconnection of services and utilities connected to the existing Site has already been undertaken. However, these utilities will be made safe, diverted and protected during the Works with the intention that many utilities and underground services may require upgrading at a later date to accommodate the Development.

Demolition

- 6.13 As outlined above Site-wide demolition would be undertaken, and is anticipated to be undertaken from March 2023 to October 2023. However, the following structures within the Site would be retained and therefore not demolished:
- Maltings;
 - (Former) Hotel (façades);
 - (Former) Bottling Building (façades);
 - railway tracks, paving and moorings along the towpath;
 - memorial plaques;
 - Sections of the boundary walls;
 - fence south of Watney's sports ground; and
 - the brewery gates.
- 6.14 Buildings due for demolition would be demolished by top-down de-construction method by means of mechanical plant and mobile craneage. Fully wrapped scaffolding would be utilised within the Site to provide protection during the demolition works. The wrap would protect adjacent roads, walkways and buildings from debris, falling materials and dust. It is assumed at this stage that no static cranes will be required during demolition works and that the use of mobile cranes will be utilised to carry out these works. Where mobile cranes are needed for specific operations their use and impact will be agreed with the appropriate parties a minimum of 28 days prior to the works being undertaken.
- 6.15 The memorial plaques and historic gates would be stored for protection in containers on the Site during the Works and re-instated post-construction (re-located within the Site).
- 6.16 A phased archaeological evaluation programme would be implemented, following demolition and Site clearance, moving across the Site behind the demolition (see **Chapter 14: Archaeology** for further details). In addition, further ground and geotechnical investigations would be undertaken to inform an appropriate remediation strategy for the Site (see **Chapter 11: Ground Conditions and Contamination** for further details). A suitably qualified Asbestos remediation company would be employed to survey, make notifications and remove all asbestos from the Site in accordance with good practice to a suitably registered waste facility in line with the Control of Asbestos

Regulations 2012¹. Where access was available, asbestos removal from buildings has been undertaken in 2019.

- 6.17 During the demolition stage, a minimum site set up consisting of 6 portable cabins is envisaged for Site accommodation. As construction works begin and progress, the site set up will be reconfigured into a stacked (not exceeding 3 cabins in height) accommodation area.

Site Preparation

- 6.18 Following Site-wide demolition works, Site preparation activities will be carried out at the commencement of work to each phase, which would include but not be limited to:
- installation of site accommodation and clear directional signage;
 - establish escape routes, emergency plans and contact details;
 - utility diversions, supplies and connections agreed with relevant statutory authorities;
 - installation of temporary power, lighting and water;
 - connection of welfare facilities to drainage system; and
 - temporary site and access track drainage including temporary surface water collection tank and potential oil separator to account for the increased temporary surface run-off within a cleared site area.
- 6.19 Since the proposed school would be implemented and operational before the surrounding development (Application A), it is proposed that the hard landscaped area to the north of the school and the road to the east of the school would be built simultaneously with the school in order to provide a route for vehicles to circulate in a single anti-clockwise direction around the school from and to Lower Richmond Road. This route would remain functioning until the completion of Application A, after which the route to the north would become a controlled access route only.

Substructure Works

- 6.20 Sub-structure works will commence after the completion of enabling and site preparation work. Sub-structure works would comprise of the following activities:
- deep excavations;
 - dewatering and disposal, using standard techniques such as sumps and pumps;
 - sheet piling to form a retaining wall and groundwater stop to the basement structure;
 - ground remediation and preparation of excavated surface;
 - construction of basement structure including foundations, columns and reinforced concrete slabs;
 - waterproofing of substructure system; and
 - backfilling as necessary.
- 6.21 As outlined in **Chapter 5: The Proposed Development** a single storey basement is proposed underneath the majority of detailed component of the Site, east of Ship Lane (Development Area 1). The bottom of the proposed basement slab within this east part of the Site would be set at 0.76m AOD with the basement Finished Floor Level (FFL) set at 1.76 m AOD. Building 1 (cinema)

in Development Area 1 has an additional basement level, creating a two-level basement extending down to -1.64m AOD.

- 6.22 A single storey basement is proposed west of Ship Lane, located in the north-east section of this part of the Site (Development Area 2). The maximum extent of the proposed basement within this west part of the Site (west of Ship Lane), would be set at 2.45m AOD.
- 6.23 It is anticipated that excavation for basements would be undertaken as follows:
- Eastern basement (Development Area 1): January 2025 to July 2026
 - Western Basement (Development Area 2): April 2024 to March 2025.
- 6.24 Sheet piling, using Continuous Flight Augur (CFA) piling, would be used to retain the external basement walls. Temporary walls/bunds will be constructed so that each basement area designated to the plot above can be developed independently.
- 6.25 The proposed foundation design for all buildings within the detailed element of the Site would comprise a 1m deep piled raft, with the exception of the proposed cinema area which would be founded in 1m deep local pile caps with 1m deep ground beams. Below the foundations, all buildings would have an expanse of piles (3 to 5 per column) that would be 600mm in diameter and extending down up to 25m in length. The new flood defence wall would be formed of a sheet pile wall with an in-situ reinforced concrete capping beam. The toe level of the sheet pile wall would be set at -1m AOD.
- 6.26 The sub-structure works will be phased progressively with the above superstructure works.

Superstructures Works

- 6.27 The new buildings on Site will be constructed in steel sections. These sections would be delivered and constructed on site. Flatbed trailers would be used to move sections around the Site as required.
- 6.28 Ground-bearing slabs would be poured directly above the basement structures and tower cranes (estimated at a height of 40-45m) would be used to move all superstructure sections into place once a level platform is provided for operative to work on. All cranes will be suitably sized by the Principal Contractor to ensure that there will be no height clashes with the existing adjacent buildings. Due to the requirement of multiple cranes within a tight area, the crane strategy will be developed further by the Principal Contractor in agreement with LBRuT.
- 6.29 Once one level of columns is installed and formwork installed and propped as required, floor slabs would be poured using reinforced concrete slabs on profiled metal decking. Core construction methods would be utilised whereby reinforced concrete lift shafts are prioritised for construction early in the programme to provide the spine which the remainder of the buildings are constructed around.
- 6.30 Safety fans would be utilised on all structures once work has progressed beyond the first floor level. Like the Full Building (Body) Scaffolding, the safety fans would prevent objects falling and as such protecting the public, site operatives and adjacent property.
- 6.31 Completion of the roof would be undertaken by specialist roofing teams using the roof slab and a perimeter scaffold system. The roof would be completed when the roof slab has been cured to enable early weathering and commencement of internal works. Roof materials would be delivered in bulk and tower cranes used to place it at the workface.

Fit Out

- 6.32 Internal materials for the mechanical & electrical, fit out and equipment would be brought to Site using rigid delivery vehicles using a just in time approach to avoid excessive on-site storage and double-handling. The material would be distributed to each area of the Site using tower cranes and to each floor plate using hoists.
- 6.33 Fit-out of all newly constructed buildings would utilise a hoist and lift system. Given the specialist nature of the equipment required, the on-site sequence would be determined by the final design stage development. All hoists will be suitably sized by the Principal Contractor to ensure that they can accommodate plant/materials that cannot be placed at their end location by the tower crane.

Landscaping and External Works

- 6.34 External works would be phased to suit handover sequences. Any occupied areas would be provided with segregated walkways and routes if any external works are still being completed prior to completion of final access routes.
- 6.35 Local storage and stockpiles would be made available around the Site and it is anticipated that external / soft-engineering works would be undertaken in phases, determined by the wider construction programme.
- 6.36 External soft engineering works areas would be segregated from other users until the completion of work and integrated with the overall landscaping proposals. Drainage would be provided at this stage to prevent contamination and allow minimal impact to the existing drainage system.
- 6.37 Landscaping works would be undertaken in seasonally acceptable periods.

Chalkers Corner Highways Works

- 5.1 It is anticipated that the highways works at Chalkers Corners would be undertaken from January 2025 to January 2026. As noted in **Chapter 5: The Proposed Development**, works to Chalkers Corner and Lower Richmond Road include reconfiguration of Chalkers Corner traffic junction by introducing a new left-hand turn from Lower Richmond Road onto the A316, resulting in three lanes on Lower Richmond Road. This would involve moving the road by 4.2m closer to properties 137-171 to the south of Lower Richmond Road (refer to planning drawing 38262-5514-021) and the following changes to the road layout:
- relocation of stop lines on A205 closer to the junction;
 - introduction of advanced stop lanes on Mortlake Road and Clifford Avenue South; and
 - widening of the area between junctions by relocating the stop line by 2m.
- 5.2 It will also involve the reconfiguration of the informal parking area used by residents at this location on Lower Richmond Road, resulting in the loss of approximately 6 undesignated parking spaces.

Access

- 6.38 Access to the Works for both Development Area 1 and 2 would be via Ship Lane. This location has been selected as it allows for a separate entrance and exit whilst utilising existing infrastructure. For Development Area 1, additional access / egress at the corner of Bulls Alley and

Mortlake High Street would also be utilised. The gates to the Site would be designed not to encroach on to the footpaths or highway.

- 6.39 The final construction vehicle routes will be agreed and confirmed as part of the final Construction Logistics Plan (CLP) post determination of the planning application and once a Principal Contractor has been appointed. For the purposes of the EIA, it has been assumed that all construction HGVs would access the Site from the west via Chalkers Corner – Lower Richmond Road. As access from the east is constrained by 17 and 18 tonne weight restrictions along The Terrace (east of Mortlake High Street), it has been assumed that only LGV trips would access the Site from the east.

Employment

- 6.40 The number of jobs generated by the Site preparation and construction works is set out in **Chapter 7: Socio-Economics**. The Local Plan requires Local Employment Agreements (LEA) to be in place for large scale developments which would assist in ensuring that local residents have access to the employment opportunities arising from the Development. The measures to target local employment during Site preparation and construction would be secured through a Section 106 agreement.

Plant and Equipment

- 6.41 The types of plant that are likely to be used during the Works are identified in **Table 6.2**.

Table 6.2: Indicative Schedule and Plant and Equipment

Plant and Equipment	Site Preparation and Demolition	Enabling Works	Substructure	Superstructure	Cladding	Fit out	Public Realm & Landscaping
360° tracked excavator	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>
Concrete crusher and handheld compressor breakers	<input type="checkbox"/>	<input type="checkbox"/>					
Concrete ready-mix lorries	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>
Concrete splitters and concrete saws / Steel muncher machines	<input type="checkbox"/>						<input type="checkbox"/>
Cranes and hoists	<input type="checkbox"/>		<input type="checkbox"/>				
Cutters, drills and small tools	<input type="checkbox"/>		<input type="checkbox"/>				
Excavators and breakers	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>
Floodlights / telehandler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fork lift trucks	<input type="checkbox"/>		<input type="checkbox"/>				
Hydraulic benders and cutters	<input type="checkbox"/>		<input type="checkbox"/>				

Plant and Equipment	Site Preparation and Demolition	Enabling Works	Substructure	Superstructure	Cladding	Fit out	Public Realm & Landscaping
Lorries / vans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tarmac laying equipment	<input type="checkbox"/>						<input type="checkbox"/>
Scaffolding and hydraulic access platforms	<input type="checkbox"/>		<input type="checkbox"/>				
Temporary supports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Articulated flatbed trucks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Piling Rig			<input type="checkbox"/>				
Scissor Lift	<input type="checkbox"/>						
Site Dumper	<input type="checkbox"/>						<input type="checkbox"/>

6.42 All plant will carry spillkits in case of fuel or hydraulic leaks/spillages. Plant emissions will be controlled by implementing, but not limited to the following measures, where practical:

- using low emission plant fitted with catalytic converters, diesel particulate filters or use of non-combustion plant and electrical equipment where feasible;
- plant will be well maintained, with routine servicing to be completed in accordance with the manufacturer's recommendations and records maintained for the work undertaken;
- avoiding the use of diesel or petrol powered generators and using mains electricity or battery powered equipment;
- all plant and equipment to be used for the works will be properly maintained;
- engines of all mobile and fixed plant on site are not left running unnecessarily; and
- using ultra low sulphur fuels in plant.

Hours of Work

6.43 It is anticipated that the normal working hours for demolition and construction would be:

- 08:00 to 18:00 hours weekdays; and
- 08:00 to 13:00 hours Saturday.

6.44 The Site will be open from 07:00am to enable operative access to welfare.

6.45 Generally, working on Sundays or Bank Holidays would be limited to specific major events such as crane erection and dismantle and the delivery of large or heavy materials or plant, which due to their size would have to be transported outside of normal working hours. In all instances, times and dates for these would be previously agreed with LBRuT, and other relevant parties.

- 6.46 Night-time working would be restricted to exceptional circumstances and would also be subject to prior agreement.
- 6.47 Where practical and subject to appointment of the Principal Contractor, vehicle movements and deliveries will be reduced during weekday peak hours (8am-9.30am and 4.30pm-6pm).

Likely Significant Environmental Effects

- 6.48 Demolition, refurbishment and construction sites have the potential to cause temporary disturbance and nuisance to neighbouring occupants, highway users and other sensitive receptors. Detailed assessments of the likely significant environmental impacts resulting from the Works of the Development are described within the technical chapters of this ES (**Chapters 7 to Chapter 19** inclusive).

Construction Environmental Management Plan

- 6.49 The nature and magnitude of likely significant environmental effects associated with Site preparation and construction works are largely dependent on the implementation of effective management controls e.g. employment of dust suppression methods and use of properly maintained plant.
- 6.50 The Contractor would be required to prepare a Site-specific CEMP and for it to be approved under the planning permission. The preparation of a CEMP is an established method for managing environmental effects resulting from demolition and construction works and is consistent with methods generally adopted for major schemes in urban areas. The CEMP would be an operational manual for carrying out environmental controls and monitoring during works, and would include reference to essential standards for dealing with waste and materials, air quality and noise, as defined by the Mayor of London's Supplementary Planning Guidance on Sustainable Design and Construction published in May 2014². The CEMP would include guidelines on environmental controls to protect the environment in line with LBRuT's Sustainable Construction Checklist Guidance Document³ and would be discussed with LBRuT's Environmental Health Department prior to being submitted for approval by the Council, pursuant to a planning condition proposed for inclusion in the planning permission sought.
- 6.51 The CEMP would include the following key considerations:
- restrictions and targets for specific work activities in order to minimise environmental effects, including disruption and disturbance to local residents, workers and the general public;
 - details of the means by which appropriate environmental monitoring, record keeping and reporting would be managed to ensure the above targets are being met;
 - procedure(s) to deal with necessary 'abnormal' works that could result in deviation from the agreed procedures and targets (targets are essential components for effective environmental management); and
 - provision for a programme of regular environmental audits and reviews at key stages in the construction programme.
- 6.52 The CEMP would be secured by a suitably worded condition of the planning permission. The CEMP would place stringent contractual and procedural performance obligations upon trade Contractors. These would be maintained and reinforced by commitments detailed below and, where relevant, within **Chapters 7 to 19** inclusive. Such commitments would be enforced through

subsequent detailed agreements with, and consents provided by LBRuT. A clear management structure and description of the responsibilities and authority of a specific PEM would be included.

- 6.53 The PEM would have primary responsibility for liaising with LBRuT and other agencies on environmental matters. It is anticipated that regular meetings would take place to review progress and to agree necessary actions. Nevertheless, it is recognised that positive action and reaction by site operatives at the time of any environmental incident or breach of targets are essential components of effective environmental management.
- 6.54 The CEMP would address requirements in relation to environmental controls and would allow for, and include, the following:
- the appointment of an experienced PEM responsible for the preparation and implementation of the CEMP;
 - details of the phasing of the works, including information on construction works that may be carried out by trade Contractors;
 - procedure for construction activities, highlighting any operations likely to result in adverse environmental effects, with an indication of the mitigation measures to be employed;
 - reference to, and provision of a framework for compliance with all legislation that would be relevant;
 - emergency procedures that would be implemented on-Site;
 - prohibited or restricted operations;
 - control limits or target criteria for environmental issues, where practicable;
 - requirements for monitoring and record-keeping;
 - mechanisms for third parties to register complaints and the procedures for responding to complaints;
 - provisions for reporting, public liaison and prior notification, especially where dispensations would be required;
 - details of construction operations, highlighting the operations most likely to result in disturbance and / or working outside core working hours, together with an indication of the expected duration of each activity;
 - possible departures from target criteria, and details of how any adverse effects would be minimised, or potential complaints addressed;
 - details of proposed routes for HGVs travelling to and from the Site;
 - provisions for auditing by the PEM, LBRuT and other regulatory authorities where appropriate;
 - details of plant to be used;
 - details of all construction works involving interference with a public highway, including temporary carriageway / footpath closures, realignments and diversions; and
 - housekeeping procedures and environmental management controls.
- 6.55 Further detail on specific control measures for the different potential environmental issues are identified further below.

Waste Management and Minimisation

- 6.56 It is estimated that approximately 210,610 tonnes of waste would be generated as a result of the demolition of the existing buildings on Site. The anticipated breakdown of this total is detailed within **Table 6.3**.

Table 6.3: Indicative Quantities of Demolition Waste

Waste Stream	Estimated Quantity (tonnes)
Concrete	123,000
Masonry	22,775
Aggregates	21,410
Ferrous	26,550
Non-Ferrous	1,020
Timber	8,620
Glass	250
Plasterboard	5,700
Slates	990
Miscellaneous	295
Overall Total	210,610

Note: Quantities estimated by AECOM using the Waste and Resources Action Programme (WRAP) Net Waste Tool⁴ based on the approximate length, width, and height of existing buildings

- 6.57 It is estimated that site clearance activities will be carried out on an approximate Site area of 60,995m². Excavation activities to construct the basements are estimated to result in a total of approximately 101,059m³ (equating to 176,853 tonnes) of material being removed from the Site, although it is expected that 26,528m³ (46,424 tonnes) of this waste would be re-used on Site. Further excavation waste will arise from foundations, installation of services, drainage infrastructure and other excavations. It is not possible to quantify the arisings at this stage. The BRE SmartWaste waste benchmark calculator⁵ has been used to estimate types and amounts of construction waste. The calculator cannot be applied to mixed use projects collectively because of the variations between such projects. The BRE⁶ recommends applying the appropriate benchmarks to each area / use, then adding these together to give an overall forecast for the project. This approach has been followed, as shown in **Table 6.4**. These data should be used for guide purposes only. They will be refined as the project progresses.
- 6.58 The estimated construction waste arisings presented in **Table 6.4** below represent a worst-case scenario based on the maximum total flexible use area and the uses with the highest tonnes of waste per m². In summary, the estimated tonnage of construction waste from proposed uses with fixed areas is 22,631 tonnes. From the flexible uses a worst-case estimate of 619 tonnes is derived.

Table 6.4: Estimated Construction Waste Types and Arisings

Waste product	Waste benchmark calculator estimations (tonnes)												
								Flexible uses					
	Residential	Car park	Hotel	School	Cinema	Office	Retail	Financial and professional services	Café/restaurants	Drinking establishments	Office	Community use	Boathouse
Bricks	1,248.30	47.56	9.06	129.15	8.24	29.91	4.51	0.65	12.32	9.24	14.47	10.86	1.95
Tiles and ceramics	89.26	19.03	0.30	9.56	0.27	0.44	0.56	0.00	0.41	0.31	0.21	0.04	0.06
Concrete	1,689.17	430.15	14.51	82.22	13.20	114.11	29.90	13.28	19.73	14.80	55.21	12.21	3.12
Inert	4,865.93	292.76	75.99	267.78	69.14	57.22	104.01	10.53	103.32	77.49	27.69	43.41	16.36
Insulation materials (non hazardous)	85.96	1.17	0.73	11.17	0.66	4.38	0.71	0.01	0.99	0.74	2.12	1.93	0.16
Metals	237.32	264.72	3.33	34.37	3.03	10.19	7.61	0.60	4.53	3.40	4.93	3.17	0.72
Packaging materials	470.58	50.21	3.56	47.37	3.24	9.39	3.07	0.40	4.84	3.63	4.54	3.69	0.77
Plasterboard / Gypsum	591.75	3.67	5.78	57.95	5.26	20.35	4.08	0.31	7.87	5.90	9.85	5.18	1.25
Binders	21.59	4.74	0.21	1.04	0.19	0.22	0.22	0.00	0.28	0.21	0.11	0.03	0.04
Plastic (excluding packaging waste)	317.03	46.44	1.34	13.53	1.22	4.55	2.83	0.28	1.83	1.37	2.20	2.75	0.29
Timber	1,434.73	385.30	14.21	92.31	12.93	40.28	13.27	1.78	19.32	14.49	19.49	11.27	3.06

Waste product	Waste benchmark calculator estimations (tonnes)												
								Flexible uses					
	Residential	Car park	Hotel	School	Cinema	Office	Retail	Financial and professional services	Café/ restaurants	Drinking establishments	Office	Community use	Boathouse
Floor coverings (soft)	9.33	0.02	0.18	2.53	0.16	0.18	0.11	0.00	0.24	0.18	0.09	0.02	0.04
Electrical and electronic equipment (non hazardous)	6.39	0.02	0.17	0.61	0.15	0.04	0.02	0.00	0.23	0.17	0.02	0.03	0.04
Bulky waste / furniture	1.90	0.01	0.70	0.07	0.64	4.19	0.07	0.00	0.95	0.71	2.03	0.04	0.15
Canteen / office / adhoc waste	176.75	514.07	2.34	29.95	2.13	4.69	5.71	0.27	3.18	2.39	2.27	8.66	0.50
Liquids	8.97	154.36	0.29	0.49	0.26	7.33	0.56	0.00	0.39	0.29	3.55	0.00	0.06
Oils	2.67	17.03	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.00
Bituminous mixtures (non hazardous e.g. asphalt)	98.09	25.21	3.78	73.42	3.44	3.04	5.44	0.75	5.14	3.86	1.47	0.00	0.81
Hazardous waste*	102.93	21.07	1.58	24.51	1.43	0.47	1.67	0.00	2.14	1.61	0.23	0.73	0.34
Other waste	451.18	791.13	18.90	54.59	17.20	11.47	7.46	1.40	25.70	19.27	5.55	2.23	4.07
Mixed construction and	4,827.68	562.98	93.78	369.70	85.33	158.41	86.17	5.08	127.51	95.64	76.64	53.02	20.19

Waste product	Waste benchmark calculator estimations (tonnes)												
	Residential	Car park	Hotel	School	Cinema	Office	Flexible uses						
							Retail	Financial and professional services	Café/ restaurants	Drinking establishments	Office	Community use	Boathouse
/ or demolition waste													
Total estimated construction waste arisings (tonnes)	16,738	3,632	251	1,302	228	481	278	35	341	256	233	159	54
Maximum area (m ²)*							2,200	220	2,400	1,800	2,200	1,300	380
Estimated construction waste arisings (tonnes/ m ²)							0.126	0.161	0.142	0.142	0.106	0.123	0.142
Assumed areas for worst-case flexible use waste production (m ²) (totalling 4,839m ²)							0	220	439	1,800	2,000	0	380
Total worst-case construction waste arisings for the flexible uses (tonnes)							0	35	62	256	212	0	54
Total estimated construction waste arisings for fixed uses (tonnes)						22,631	Total estimated construction waste arisings for flexible uses (tonnes)**						619

*These areas were inputted into SmartWaste. Note that the flexible use areas are the maximum potential floorspace for each use. Only 4,839m² of flexible use space in total will be realised.

**To estimate the worst-case tonnage of construction waste from the flexible use areas, the uses were ranked in terms of their relative waste production (tonnes / m²). A minimum office floorspace of 2,000m² was assumed in line with the minimum caps presented in the Planning Application, then additional areas were added to reach the total area of 4,839m² starting with the areas for the uses with the highest tonnes of waste per m².

- 6.59 Detailed information on the likely waste management measures and procedures to be implemented on Site during the Works would be provided at subsequent stages by the Principal Contractor, once details and methods associated with the demolition, excavation and construction phases are known.
- 6.60 Where it is necessary to transport waste to and from the Site, transportation would comply with The Waste (England and Wales) Regulations 2011 (as amended)⁷ including:
- transporting waste via registered carriers;
 - disposal to appropriately licensed sites; and
 - maintenance of appropriate waste transfer documentation.
- 6.61 Additionally, all waste arisings would be managed in accordance with the 'proximity principle' (i.e. managing waste as close to its origin of source as possible).
- 6.62 All relevant contractors would be required to investigate opportunities to minimise and reduce waste generation through:
- 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;
 - use of standard size components in design detailing to eliminate risk at source where possible to do so;
 - the pre-assembly and pre-fabrication of elements wherever practicable to minimise waste generation on-Site;
 - attention to material quantity requirements to avoid over-ordering and generation of waste materials;
 - re-use of materials wherever feasible, e.g. the Government has set broad targets for the use of reclaimed aggregate, and in keeping with best practice, contractors would be required to maximise the proportion of materials recycled;
 - 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);
 - skips would be colour coded and signposted to reduce risk of cross contamination and covered to prevent dust and debris blowing around the Site, these would be cleared on a regular basis; and
 - burning of wastes or unwanted materials would not be permitted on-Site.

Traffic and Access Management

- 6.63 As set out previously and in **Chapter 8: Transport and Access**, access to the Works on the Site would utilise the existing road infrastructure. The use of the river for construction logistics was considered by the Applicant, however, at this stage significant constraints have been identified in respect of river use, as discussed in **Chapter 4: Alternatives and Design Evolution**. On this basis river transport of construction materials is currently discounted. The FCMS submitted for

planning provides an indicative strategy for construction logistics. A Construction Logistics Plan would be prepared upon appointment of the Principal Contractor. Recognition is given to traffic and pedestrian management, as well as the segregation of construction activities. The use of just-in-time deliveries would look to minimise material delivery waiting times and reduce congestion and pollution on local highways. The segregation of construction traffic and public vehicles would be maintained wherever possible and deliveries would be aimed for times avoiding traffic rush-hours.

- 6.64 Whilst on-Site, construction traffic would utilise custom-built temporary haul roads throughout all phases. These roads would be constructed with a temporary asphalt / concrete surface to avoid the Site becoming waterlogged. A wheel-wash facility would be identified for use at all exit points from the Site at the designated loading areas and manned power-wash stations would be identified for exit points where wheel-wash facilities do not provide suitable means of cleaning.
- 6.65 Clear directional signage and consistent drop-off / pick-up areas are recommended to be maintained. This would provide continuity regardless of which haulage contractor is involved during the Works at any given time. The Principal Contractor would also need to implement a strong Site induction targeting specific areas of Site access and deliveries.
- 6.66 There will be no on-site parking provided for operatives working on the Site. All Contractors and Sub-Contractors on site will be advised through their contract documentation that no parking is available on Site and that Site personnel and visitors should use public transport. Controlled Parking Zones (CPZs) are in place across most of the surrounding area and construction workers would therefore not be permitted to park in these areas.
- 6.67 The Principal Contractor(s) will be required to operate both the Fleet Operator Recognition Scheme (FORS) and Construction Logistics and Cyclist Safety (CLOCS) safety Schemes whilst working on the Site.

Control of Noise and Vibration

- 6.68 During the Works, measures to reduce noise and vibration levels would be implemented (refer to **Chapter 9: Noise and Vibration**). This would be achieved by:
- use of hoarding to the required height and density appropriate to the noise sensitivity of the Site;
 - Demolition works to have consideration to Demolition Code of Practice BS6187⁸ (2011);
 - Using low impact techniques where possible (demolition munchers);
 - Off-site prefabrication or preparation of building elements where possible to reduce on-site works;
 - Changing, where possible, methods and processes to keep noise and vibration levels low as reasonably practicable (e.g. dismantling rather than traditional demolition works where adjoining or immediately adjacent to buildings);
 - Removal of obstructions at piling locations (old basements/foundation) prior to piling to reduce generated vibration levels, although coring through existing piles at urban locations is an accepted approach but may give rise to higher vibration levels;
 - Use of broad-band audible alarms wherever practicable including reversing alarms and other equipment such as mobile elevated work platforms;

- use of modern, quiet and well maintained machinery such as electric powered plant, where possible and hoists should use the Variable Frequency Converter drive system;
- vehicles and mechanical plant used for the works would be fitted with exhaust silencers, which would be maintained in good and efficient working order and operated in such a manner as to minimise noise emissions in accordance with the relevant EU / UK noise limits applicable to that equipment or no noisier than would be expected based the noise levels quoted in BS 5228. Plant should be properly maintained and operated in accordance with manufacturers' recommendations. Electrically powered plant would be preferred, where practicable, to mechanically powered alternatives;
- establish noise and vibration target levels (a Section 61 agreement under the Control of Pollution Act 1974⁹ (COPA)) to reduce noise and vibration to a minimum in accordance with best practicable means, as defined in Section 72 of COPA;
- where required, monitoring of noise and vibration levels;
- positioning plant as far away from residential property as physically possible;
- works would be limited to the specified hours and would be subject to agreement with LBRuT and hours worked on noisy operations would be limited; and
- liaison with the occupants of adjacent properties most likely to be affected by noise or vibration from activities on the Application Site should also take place. The occupants should be informed of the nature of the works, proposed hours of work and anticipated duration prior to the commencement of activities.
- implementation of a Construction and Logistics Plan (CLP) to pre-plan and manage traffic associated with the Works to minimise disturbance to sensitive receptors.

Control of Dust

6.69 As set out in **Chapter 10: Air Quality**, to minimise the release of dust and air pollution during the Works, the following would be undertaken:

- develop and implement a stakeholder communications plan, including community engagement before demolition and construction works commence on the Site;
- record all dust and air quality complaints, identify causes, take appropriate measures to reduce emissions in a timely manner, and record the measures taken, make the log available to the local authority;
- hold regular liaison meetings with other high-risk construction sites within 500 m of the Site boundary to ensure plans are coordinated and emissions minimised;
- plan the Site layout so that machinery and dust causing activities are located away from receptors, as far as possible;
- erect barriers around dusty activities that are at least as high as any stockpiles;
- fully enclose specific operations where there is a high potential for dust production and the area is active for an extensive period;
- avoid Site runoff of water or mud;
- keep hoarding, barriers and scaffolding clean using wet methods;

- remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used on the Site;
- cover, seed or fence stockpiles to prevent wind whipping, where practicable;
- ensure all vehicles switch off engines when stationary – no idling vehicles;
- avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment, where practicable;
- impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas;
- produce a Construction Traffic Management Plan to manage the sustainable delivery of goods and materials and that supports and encourages sustainable travel;
- use cutting, grinding or sawing equipment fitted, or in conjunction, with suitable dust suppression techniques such as water sprays or local extraction;
- ensure adequate water supply on the Site for effective dust/particulate matter suppression / mitigation, using non-potable water, where possible and appropriate;
- used enclosed chutes and conveyors and covered skips;
- minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;
- ensure equipment is readily available on the Site to clean any dry spillages. Clean up spillages as soon as reasonably practicable after the event using wet cleaning methods;
- use water -assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site;
- avoid dry sweeping of large areas;
- ensure vehicles entering and leaving the Site are covered to prevent escape of materials during transport;
- inspect on-Site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- record all inspections of haul routes and any subsequent action in a Site log book;
- implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable);
- ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever possible; and
- access gates to be located at least 10 m from sensitive receptors, where possible.

Control of Lighting

- 6.70 The CEMP would recommend that the use of portable external lighting be used in such a way so as to avoid the spill of light into neighbouring properties and into the night sky. Furthermore, lighting used during the Works would accord with the Institution of Lighting Professionals (ILP) Guidance so as not to cause a nuisance to nearby receptor (refer to **Chapter 18: Daylight, Sunlight, Overshadowing and Light Pollution**).

Townscape and Visual

- 6.71 Specific to the issues of townscape and visual impact, good site management, maintenance and housekeeping and careful siting of construction machinery would be implemented through the use of the CEMP to minimise visual intrusion the Works (refer to **Chapter 16: Townscape and Visual Effects**). This would ensure that temporary deterioration of townscape character and visual intrusion would be minimised as far as practicable. The use of attractive hoardings and the maintenance of a clean, safe pedestrian environment along the street frontages of the Site would aid in screening views of much of the ground level construction works from the adjoining townscape in and around the Site.

Ground Contamination

- 6.72 As detailed in **Chapter 11: Ground Conditions and Contamination**, following further detailed ground investigation, a Remediation Strategy would be produced. This would be agreed with the EA and LBRuT. The Remediation Strategy would outline the measures necessary to break potential pollutant linkages at the Site. The purpose of the Remediation Strategy would be to ensure the Site would be 'suitable for the end use' (i.e. the completed and operational Development) and that no unacceptable contamination risk would remain. Remedial measures may include, but would not be limited to, the following:
- removal of contaminated material;
 - treatment of soil prior to reuse or disposal;
 - appropriate reuse of material beneath paved areas or cover systems;
 - importation of clean soils for areas of soft landscaping;
 - the use of ground gas / vapour membranes in basements; and
 - appropriately designed buried concrete and service pipes.
- 6.73 Following the completion of any remedial works required, a Verification Report would be produced. This would detail the results of testing, audits, as-built plans and duty of care documents to demonstrate identified linkages have been broken.
- 6.74 In addition to the remedial works, precautions would be taken to minimise the exposure of Site workers and the public to potentially harmful substances. Such protective measures would include:
- monitoring and preventive measures to control dust, which could include water spraying in dry weather and wheel washing facilities for vehicles leaving the Works;
 - handling and storage of any potential hazardous liquids / materials not only in accordance with relevant legislation, but also in line with best practice including EA pollution prevention guidance. Storage tank and container facilities would be appropriately bunded with designated areas and located away from surface water drains. All drums and barrels would be fitted with flow control taps and would be properly labelled;
 - stockpiling of contaminated materials would be avoided, wherever possible. Stockpiles would be located on areas of hardstanding or on plastic sheeting to prevent mobile contaminants infiltrating into the underlying ground and located away from the Thames and drains;
 - procedures for the management of construction materials, spillage response, use of best practice construction methods and monitoring.

- surface drainage would pass via settlement and oil interceptor facilities, within the proposed basements and where required, and discharge arrangements would be agreed with the EA and Thames Water; and
- the provision of adequate drainage to manage surface water run-off and minimise contaminated water reaching the groundwater.

6.75 Post-demolition of the buildings on-Site, work should be carried out to locate and decommission the historic abstraction wells in-line with best practices and EA guidance, to prevent them acting as preferential pathways to the Principal Aquifer in the Chalk Formation.

Unexploded Ordnance

- 6.76 Prior to commencement of the Works, a detailed desk-based Unexploded Ordnance (UXO) assessment would be undertaken to identify and classify the actual on-Site risk posed by UXO. The desk-based UXO assessment would include recommendations for mitigation to be undertaken during the Works. Dependent on the Site's actual UXO classification, mitigation may include:
- safety and awareness training to all construction staff;
 - UXO safety testing and appropriate clearance certification for each ground penetration; and / or
 - UXO safety procedures where UXO is discovered.

Protection of Water Resources and Site Drainage

- 6.77 The construction of the basement within the east part of the Site (east of Ship Lane) would involve excavation to below likely groundwater levels. Appropriate dewatering and disposal, using standard techniques such as sumps and pumps would likely be required.
- 6.78 Temporary measures to control surface water runoff from the Site during the Works would be provided. Such measures would include the provision of adequate drainage to manage surface water run-off. Construction of the drainage system should be designed and managed to comply with BS 6031:2009 'The British Standard Code of Practice for Earthworks'¹⁰, which details methods that should be considered for the general control of drainage on construction sites. Discharge rates and volumes of water discharged would be agreed with the EA and Thames Water. Where appropriate, cut-off drainage would be provided around the Site during the Works when there is no on-Site drainage network in place.
- 6.79 The existing northern boundary wall would be lowered in certain areas, however, this would be undertaken after the new flood defence wall has been built, and would still be above the statutory flood defence level. Temporary defences would also provide the required level of protection until any replacements are in place and the Works would be undertaken when there is no practical risk of tidal flooding. All such work would be undertaken in conjunction with the EA to ensure necessary approvals for design and constructional sequence through Environmental Permits.
- 12.1 To reduce the water demand of the Development during the Works, all relevant contractors would be required to investigate opportunities to minimise and reduce the use of water in accordance with the CEMP. These would include:
- selection and specification of equipment;

- implementation of staff-based initiatives such as turning off taps, plant and equipment when not in use;
 - use of recycling water systems in functions such as wheel washes and toilets;
 - rainwater harvesting system for equipment and vehicle washing; and
 - where possible, water from excavation would be used for dust suppression during construction.
- 6.80 Water consumption throughout the Works would be monitored, either through sub-metering or utility bills to allow a comparison against best practice benchmarks.
- 6.81 Easements would be provided to ensure existing drainage infrastructure is not impacted upon. The CEMP would set out measures to ensure that the existing sewers are adequately protected and / or diverted in line with best practice. Requirement for asset protection measures during the Works would be confirmed with Thames Water during the future design stages. The adoption of appropriate piling methods, which would be detailed in the CEMP, would ensure vibration levels are kept to a minimum and would not affect existing below ground infrastructure.

Protection of Ecological and Arboricultural Resources

- 6.82 As set out in **Chapter 13: Ecology**, the CEMP would ensure appropriate environmental controls to protect the River Thames and commuting and foraging bats from dust, noise, vibration, surface water run-off and lighting. Such protective measures would include:
- the use of environmental screens, water jet suppression, dust monitoring devices and other best working practices to minimise noise and dust;
 - no waste materials, including silt laden drainage and spillages, hazardous / contaminated materials, chemicals or fuels shall be allowed to enter the River Thames through measures such as the use of appropriately tanked and bunded storage areas;
 - all construction lighting would be positioned towards the centre of the Site to avoid light spill on to the adjacent River Thames. In addition, the main hours of the Works would be undertaken during typical working hours minimising the requirement for additional lighting during the night; and
 - The appropriate and legal removal of the Himalayan balsam recorded on the bank of the River Thames and other invasive plant species on Site as listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).
- 6.83 In order to avoid the contravention of legislation and as a requirement of the CEMP, a Natural England European Protected Species (EPS) Licence would be submitted to and approved by Natural England prior to any works which could impact on the bat roost at the Maltings building. Updated surveys (between May and August) will be undertaken at the Maltings to inform the licence application as only a single survey could be undertaken in October 2021 in support of this licence application. As part of the licence a Method Statement would set out the sensitive working methodologies required that will be overseen by an Ecological Clerk of Works (licence holder or accredited agent) to allow for roost destruction.
- 6.84 A series of monitoring visits (including surveys at both ground level and at height subject to Health and Safety considerations) will also be undertaken until it can be confirmed that the roosting peregrine (as identified during the Protected Species Surveys) is absent from the building. Works

will then be undertaken at the building to block access point previously utilised. Monitoring will continue prior to the commencement of the refurbishments works commencing at the Maltings to ensure the bird does not return to the roost site.

- 6.85 It is recommended that any retained semi-mature or mature trees situated within and around the boundaries of the Site (including those with a TPO) should be safeguarded during the Works following arboricultural best practice (BS 5837:2012: 'Trees in Relation to Design, Demolition and Construction')¹¹. Construction activities, materials storage or changes in level should generally be avoided within the root protection area of a tree to be retained. Contaminated soils will be removed as required in all areas apart from the Root Protection Areas of retained trees. Soil levels will be maintained (with the potential for a minor increase, as approved on a tree-by-tree basis by an Arboriculturist). In line with the Arboricultural Survey and Impact Assessment (AIA) submitted with the Planning Applications, the following tree protection principles will be adopted:
- select site access routes and construction plant that can safely access the Site given the physical constraints imposed by the height of the existing retained tree canopies;
 - systems to suppress dust, hydrocarbons, cementitious and other phytotoxic elements should be employed to prevent damage to the adjacent trees;
 - no materials/plant to be stored within the canopy spread of trees;
 - in order to minimise damage to shallow tree roots, it is recommended that the depth of any excavation work within the canopy spread and / or Root protection Area (RPA) of these trees (whichever is the greater, referred to as the Construction Working Area (CWA)) is minimised;
 - where any existing surface within the CWA is removed, this area should be protected from excessive compaction from people/plant;
 - consideration should be given to the use of permeable paving / surfacing systems within the root protection area of retained trees in order to assist with the long-term passive infiltration of air and water into the root-zone; and
 - where new underground services cannot be routed outside the CWA, excavation for these should be undertaken by hand or air-spade to prevent damage to retained tree roots.
- 6.86 Refer to the AIA submitted in support of the Planning Applications for full details on tree protection measures to be undertaken during the Works. The tree protection measures recommended above, and provided in full in the AIA, should be managed through an Arboricultural Method Statement (MS), conditioned as part of planning approval, that is bespoke to the Site / each application and activities concerned, including detailed construction proposals and final position of fencing / construction working areas as agreed with the Main Contractor.

Protection of Built Heritage and Archaeological Resources

- 6.87 As described in **Chapter 14: Archaeology**, A phased archaeological evaluation programme would be undertaken following demolition and Site clearance, moving across the Site behind the demolition. Implementation of further excavation work would be dependent upon the results of the evaluation programme.
- 6.88 As set out in **Chapter 15: Built Heritage**, a programme of archaeological building recording would be carried out prior to the demolition of historic fabric associated with the heritage assets.

- 6.89 Easements around the Buildings of Townscape Merit (BTMs) within the Site (i.e. the Maltings, façade of the former Hotel and façade of the former Bottling Building) would form a specified distance from the edge of the retained buildings / façades and structures where no demolition or slab removal works would take place. This would prevent ground loading or any ground disturbance which may cause foundations to move. In addition, and where required, all diesel and oil filling for plant and machinery would be located at the further cleared distance, in excess of the easement from the BTMs. The Site Manager would undertake dilapidation photographs of the retained buildings and structures and assess whether any additional protection is required such as boarding of windows or the erection of a physical barrier around them. Necessary protective measures would be identified through consultation with the relevant parties and review and sign off on a pre-construction condition survey of adjacent historic assets.
- 6.90 Further mitigation measures to protect historic assets during the Works would include:
- arrangement of delivery locations and times to limit disruption and possible damage to neighbouring historic structure;
 - use of excavation and demolition methods that produce low vibration levels and participation in a monitoring programme to ensure vibration levels are within established thresholds;
 - ensuring surface water runoff is not directed towards any historic assets; and
 - directing debris chutes away from historic assets.

References

- 1 Control of Asbestos Regulations 2012.
- 2 Mayor of London (2014); 'Supplementary Planning Guidance: Sustainable Design and Construction'.
- 3 London Borough of Richmond upon Thames (2020); 'Sustainable Construction Checklist Guidance Document'.
- 4 Waste and Resources Action Programme (WRAP); 'Demolition Quantities Estimator (DQE) as part of the Net Waste Tool'. URL: nwtool.wrap.org.uk.
- 5 Building Research Establishment (BRE) Limited (2021) SmartWaste software tool. URL: [SmartWaste Environmental Management Software | SmartSite \(bresmartsite.com\)](http://SmartWasteEnvironmentalManagementSoftware.com).
- 6 (see reference above)
- 7 The Waste (England and Wales) Regulations 2011 (as amended).
- 8 BSI (2011) BS6187:2011 Code of practice for full and partial demolition. BSI.

- 10 British Standards (2009): BS 6031:2009 'The British Standard Code of Practice for Earthworks', December 2009.
- 11 British Standards (2012); BS 5837:2012: Trees in relation to design, demolition and construction. Recommendations.