

## **05 Demolition and Construction**



# 05 Demolition and Construction

## Preface – Update 2015

- This replacement November 2015 Environmental Statement (hereafter referred as the 'November 2015 Replacement ES' or 'this Replacement ES') takes into account the design changes to the Blossom Street project (refer *Chapter 4: Proposed Development*) that have occurred since the submission of the application in December 2014 ES and concludes if any changes to the likely significant effects occur as a result of those changes. This Replacement ES consolidates the environmental assessment of the design changes into a single ES, presenting commentary (under the heading 'Update 2015') for the design changes in the March 2015 ES Addendum (the 'March 2015 ES Addendum') by blue text, and the design changes arising from the current design changes by red text. Where relevant, text removed will be denoted by strike-through, e.g. effect, and updated tables and figures will be denoted by the suffix 'A' (e.g. Table 2.10A).
- This Replacement ES adopts the following terminology to describe the development descriptions and design changes:
  - Proposed Development: description of the development presented in the December 2014 ES;
  - Revised Scheme: description of the scheme incorporating the design changes to the Proposed Development in March 2015 (the design changes referred as the 'March 2015 amendments'), assessed within the March 2015 ES Addendum;
  - Amended Proposed Development: description of the development incorporating the current design changes to the Revised Scheme (the design changes referred as the 'November 2015 amendments'), to be assessed within the November 2015 Replacement ES.
- For clarification, since the preparation of the December 2014 ES, AECOM has merged with URS Infrastructure & Environment UK Limited (URS) to become a single environmental consultancy. Reference within the text to 'URS' in the November 2015 Replacement ES has now been replaced by AECOM Infrastructure & Environment UK Limited (hereafter referred to as 'AECOM').

## Introduction

- 5.1 This chapter of the ES describes the proposed programme of demolition and construction works and the key activities that will be undertaken prior to completion and occupation of the proposed Blossom Street development (the 'Proposed Development'). Likely significant environmental effects associated with the demolition and construction activities are identified and, where necessary, mitigation measures are outlined.
- 5.2 ~~URS Infrastructure & Environment UK Limited (URS)~~ AECOM has prepared this chapter in conjunction with BlueSky Building, and the Design and Consultant Team.
- 5.3 Planning for demolition and construction is necessarily broad at this stage and will be subject to modification during any future detailed construction planning. For this reason, the following assessment is based on reasonable assumptions in the demolition and construction programme and the collective experience of the Design and Consultant Team with similar projects.
- 5.4 Potential environmental effects identified within this chapter are discussed in more detail in each of the corresponding technical chapters of this ES (i.e. chapters 6 to 15).

## Consultation

- 5.5 The London Borough of Tower Hamlets (LBTH) has been consulted throughout the evolution of the Proposed Development. The scope of the demolition and construction assessment for the EIA was set out in the EIA Scoping Report submitted to LBTH on July 2014. The EIA Scoping Opinion identified a list of the information to be accounted for within the assessment. These have been addressed within this Chapter (refer below) or where topics have not been addressed, reasons are provided.
- 5.6 Relevant matters identified within the Scoping Opinion relating to the demolition and construction assessment include:

**Table 5.1 Matters raised within the Scoping Opinion**

Matter	Reference in this ES Chapter / Application Documentation
<b>London Borough of Tower Hamlets</b>	
The construction traffic assessment should consider both vehicles bringing material/ equipment to/ from the site, as well as construction staff i.e. the ES needs to consider how the workers will get to site	Refer 'Traffic Management - Access and Egress' section Refer <b>Chapter 8: Traffic and Transport</b>
Likely construction traffic routes should be established, so that receptors can be appropriately assessed.	Refer 'Traffic Management - Access and Egress' section Refer <b>Chapter 8: Traffic and Transport</b>
The EIA Scoping Report does not include water transport as a mode. The ES should set out whether there is the potential for construction material to be moved by water, and/ or for site users to utilise water transport to/ from the site. If water transport is not going to be utilised as a transport mode during either construction/ or operation, or the effects are not considered to be significant, this should be clearly set out in the ES.	Refer 'Traffic Management – Use of the River Thames' section
<b>Transport for London</b>	
A commitment to produce a construction management plan (CMP) and construction logistics plan (CLP) to minimise highway impact should be clearly set out.	Refer 'Potential Environmental Effects – Environmental Management Plan' section Refer <b>Chapter 8: Traffic and Transport</b>
<b>Network Rail</b>	
The applicant will need to ensure that the operational railway will not be adversely affected by the proposed development both during construction and after it is completed.	Refer 'Description of Works' section

## Programme of Works

- 5.7 Given the scale of the Proposed Development, the current expectation is that the demolition and construction works would take approximately 29 months.
- 5.8 Whilst details regarding future demolition and construction have not been finalised at this stage, it is possible to provide general information about the demolition and construction activities. The programme will include the following key stages:
- Enabling works;
  - Demolition;
  - Substructure and basement;
  - Superstructure (i.e. frame);
  - Envelope, roof, shell and core; and
  - Fit-out and external works.
- 5.9 The main activities to be undertaken and the approximate duration of the works are detailed in Table 5.2. The Outline Demolition and Construction Programme is presented in Figure 5.1A.
- 5.10 The indicative year of operation of the Proposed Development for the purpose of the technical assessments within the ES is 2017.

**Table 5.2 Indicative Demolition and Construction Activities and Approximate Duration**

Activity	Approximate Duration (months)
Enabling Works	3
Demolition	9
Substructure and Basement	10
Superstructure	10
Envelope, Roof, Shell and Core	11

# 05 Demolition and Construction

Activity	Approximate Duration (months)
Fit-out and External Works	12
<b>Total Duration</b>	<b>29*</b>

\* Some activities will overlap (refer to Figure 5.1A - Outline Demolition and Construction Programme)

## Programme of Work – Update 2015

### November 2015 Amendments

- 5.11** Accounting for the design changes to the Proposed Development, the Outline Demolition and Construction Programme has been amended, and an update to the programme is presented in Figure 5.1A.
- 5.12** It is still expected that the demolition and construction works would take approximately 29 months, and the indicative year of operation of the Amended Proposed Development for the purpose of the technical assessments within this November 2015 Replacement ES is 2019.

### Sequence of Construction

- 5.13** The demolition and construction works proposed to deliver the development of plots S1 / S1c, S1a, S1b, S2 and S3, will be in accord with the following works sequence, involving the following key stages and activities:
- Site set up and enabling works, including hoardings, traffic provisions, site accommodation and protective measures to ensure the safety of neighbours, pedestrians and operatives;
  - Demolition across the Site as a whole with areas of specific heritage interest isolated for further investigation;
  - On completion of sub-ground investigations (i.e. archaeological, ground contamination) and as demolition ends the substructures of the taller buildings i.e. S1 and S1c, will proceed;
  - As substructure operations move forward to S2 and finally S3, the construction of superstructure to S1 will proceed;
  - Building envelope construction to the larger proposed buildings will follow the superstructure works and finally the internal fit out of landlord spaces will be completed;
  - As the refurbishment of smaller, retained buildings is more labour intensive, this will be a slower process and will progress in parallel to the construction of the new buildings; and
  - Finally the external works, soft and hard landscaping, and fit out will be progressed to conclude construction operations.

## Sequence of Construction – Update 2015

### November 2015 Amendments

- 5.14** As substructure operations move forward to S2 and finally S3, the construction of superstructure to S1, including the refurbishment of the retained Blossom Street Warehouse, will proceed.

## Description of Works

### Enabling and Demolition Works

#### Enabling Works

- 5.15** At the start of the project the relevant enabling works to utilities will be carried out. This will involve the capping-off or removal of redundant utilities, diversions, new supplies and connections as agreed with the statutory authorities.
- 5.16** There are several buildings throughout the Site of architectural and heritage merit and these are to be retained (see Figure 5.2 for buildings to be retained). During the initial weeks of the works these buildings

will be made safe and stripped of internal finishes and services as applicable. Façade support systems will be designed and erected in agreement with the LBTH.

- 5.17** Pavement gantries, scaffolds and hoardings will be erected to afford protection to pedestrians and neighbouring properties during the works. Detailed positions will be established by the contractors and licences applied for. Headroom heights of 2.5m under the gantries will be targeted in accordance with the LBTH Code of Construction Practice (CoCP) (Ref. 5-1). Hoardings will be in full compliance with the LBTH CoCP and will be a minimum of 2.4m high.

## Enabling Works – Update 2015

### November 2015 Amendments

- 5.18** There are several buildings throughout the Site that are to be retained, such as the Blossom Street Warehouses, and these buildings will be made safe during the initial weeks of the works. Underpinning of existing structure, where neighbouring works are likely to excavate lower than the existing foundations, will be carried out to ensure the foundations are not undermined.

### Demolition

- 5.19** The remainder of the existing buildings are proposed to be demolished to the underside of the basement level. The current buildings on plots S1, S1a, S1b, S1c and S2 generally comprise warehouses of load bearing masonry construction with either timber or concrete floors. Where internal spans are large, cast iron columns and wrought iron beams have been used to support the internal spaces. The existing buildings on S3 comprise a single storey depot building and a four storey office block of modern construction comprising concrete frame and ribbed floors.
- 5.20** Demolition will be undertaken using mechanical plant appropriate to the various structures. Plant is likely to include track mounted long reach excavators with jaw attachments and mobile cranes. All such plant will operate within the hoarded boundary of the Site. The existing elevations will be completely enclosed in scaffold with appropriate sheeting whilst stripping of internal fitments, windows and metal cladding proceeds. In the larger buildings, areas of framework will be back propped to allow tracked excavators fitted with pneumatic breaking and munching heads to be lifted onto floors to cut and dismantle the frame. Concrete and reinforcement will be lowered to the ground in skips for segregating and removal from the Site. Where appropriate, ground based long reach machines will also be used.
- 5.21** Given the mixed nature of the buildings to be demolished and the likely phasing of the Proposed Development, opportunities to segregate and recycle demolition materials will be fully explored. If appropriate and agreeable to LBTH a small on-site crushing machine would be utilised to crush concrete and masonry in order to reduce the number of vehicles leaving the Site and to prepare material for re-use in piling mats and temporary hard-standings.

# 05 Demolition and Construction

Figure 5.1A Outline Demolition and Construction Programme – Update 2015

Activity	Duration	Year 1		Year 2				Year 3				Year 4
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
<b>ENABLING WORKS</b>	12 Weeks											
<b>DEMOLITION</b>												
Demolition Site One	17 Weeks											
Demolition Site Two	13 Weeks											
Demolition Site Three	13 Weeks											
<b>SUBSTRUCTURE</b>												
Substructure Works (Sites S1a, S1b, S1c, S1 Warehouses)	30 Weeks											
Substructure Works (Site Two)	26 Weeks											
Substructure Works (Site Three)	21 Weeks											
<b>CONSTRUCTION</b>												
<b>S1</b>												
Frame	24 Weeks											
Envelope	30 Weeks											
Fitting Out	26 Weeks											
<b>S1c</b>												
Frame	21 Weeks											
Envelope	16 weeks											
Fitting Out	22 Weeks											
<b>S1a</b>												
Frame	16 Weeks											
Envelope	16 Weeks											
Fitting Out	19 Weeks											
<b>S1b</b>												
Frame	16 Weeks											
Envelope	16 Weeks											
Fitting Out	19 Weeks											
<b>S2</b>												
Frame	16 Weeks											
Envelope	24 Weeks											
Fitting Out	20 Weeks											
<b>S3</b>												
Frame	12 Weeks											
Envelope	15 Weeks											
Fitting Out	28 Weeks											

# 05 Demolition and Construction

**Table 5.3 Summary Of Buildings To Be Retained And Demolished By Plot**

Buildings to be demolished	Buildings to be retained
<b>S1 / S1c</b>	
2 Shoreditch High Street	Blossom Street warehouses (No 12 & 13 Blossom Street (Timber section of Blossom Street Warehouses) and No 14 & 15 Blossom Street (façade only) (concrete section of Blossom Street Warehouses) [ <b>Location 4</b> ]
3-10 Shoreditch High Street	1887 Blossom Street warehouse [ <b>Location 5</b> ]
20 Norton Folgate	
<b>S1a</b>	
13, 14 Norton Folgate	15 Norton Folgate [ <b>Location 2</b> ]
	16-19 Norton Folgate [ <b>Location 1</b> ]
<b>S1b</b>	
16-17 Blossom Street	5-11a Folgate Street [ <b>Location 3</b> ]
<b>S2</b>	
2 Elder Street	4 Elder Street [ <b>Location 7</b> ]
1927 warehouse (façade retained)	6 Elder Street [ <b>Location 7</b> ]
161 Commercial St (façade retained)	8 Elder Street [ <b>Location 7</b> ]
X Elder Street	1927 warehouse (façade only) [ <b>Location 6</b> ]
	161 Commercial Street (façade only) [ <b>Location 8</b> ]
<b>S3</b>	
10 Blossom Street – the depot site	
14-22 Elder Street	
11-16 Fleur de Lis Street	

\* Numbers in bold / brackets denote buildings within Figure 5.1 below

**Figure 5.2 Buildings To Be Retained During Demolition**



## Substructure and Basement

### Substructure and Basement Overview

- 5.22** The proposed substructure across the Site is comprised of raft and pile foundations with a single storey basement over the majority of the Site. The basement structures are predominantly required to house plant equipment and will not be accessible to building users apart from bicycle storage, changing rooms, showers and bin stores.
- 5.23** The design of the substructure works across the Site has accounted for the following constraints and issues, which are summarised below:
- Scheduled Ancient Monument;
  - London Underground (Central Line);
  - Network Rail cutting to the north;
  - Existing basements and possible obstructions;
  - Reuse of existing basements and foundations; and
  - Utilities.

# 05 Demolition and Construction

## *Scheduled Ancient Monument*

- 5.24** A number of areas on the Site have been acknowledged as having very high survival potential for remains of The Priory of St. Mary Spital, a Scheduled Ancient Monument dating from medieval times. Foundations and basements have been designed to avoid these areas.

## *London Underground (Central Line)*

- 5.25** The location, and type, of piling used on the Site has been restricted due to the presence of the London Underground Central Line, which passes directly under the Site. During the design of the Site, an exclusion zone of 6 metres above and 3 metres either side of the tunnels has been adopted.

## *Network Rail Cutting to the North*

- 5.26** On the northern boundary of the Site runs a Network Rail cutting. A large retaining wall, which is part of the cutting, is required to be protected at the various stages of demolition and construction. The design process has taken account of the requirement that the proposed new buildings will add no further load on the retaining wall, compared to the existing buildings.

## *Existing Basements and Possible Obstructions*

- 5.27** There is a long and intense history of development on the Site, which has resulted in the risk of basements and obstructions being discovered, especially from the late 19<sup>th</sup> Century when there were many terraced houses on the Site. Some of the existing buildings on-site have basements and consideration of whether the basement walls could be re-used as part of the strip footings (concrete support that sits under the foundation) within the new construction has been taken into account.

## *Reuse of Existing basements and Foundations*

- 5.28** Where existing basement walls and foundations have been incorporated into the design of the Proposed Development they will need to be checked to ensure there is appropriate capacity to enable their reuse.

## *Utilities*

- 5.29** Utilities in and around the Site have been taken into consideration and proposals will be put forward for any retention or diversion of these services, once they have been identified. Discussions and agreement with the relevant utility providers will be undertaken before works commence on-site.

## *Foundation and Retaining Wall Construction Considerations and Overview*

- 5.30** The option of utilising a ground bearing solution has been considered but this is dependent on the weight of the proposed buildings. There are several risks associated with this approach which include the variable nature of soil and the unknown strata across the Site.
- 5.31** Some existing foundations will be used and reinforced, principally when existing buildings / structures are being retained.
- 5.32** Small diameter mini piles may be necessary for locations where access is limited or minimal foundation works are preferred (e.g. within the Scheduled Ancient Monument).
- 5.33** The option of using small diameter CFA (Continuous Flight Auger) or bored piles could be utilised across the Site where the London Underground tunnel exclusion zone is not present, or further exclusion zones associated with the Scheduled Ancient Monument. Typical diameters for these piles are 450mm, 600mm, 750mm and 900mm. Both CFA and bored piles require the construction of pile caps and ground beams to transfer the vertical load into the piles.
- 5.34** To enable excavation and underpinning on the Site to be carried out, temporary propping of retaining walls will need to be undertaken. This will need to take place before demolition of the ground floor slab for areas where there are existing basements.
- 5.35** Bored piles will be constructed by piling rigs. Ramps for piling rig and lorry access will be constructed from demolition material and excavation arisings, and removed as piling completes.

- 5.36** Where existing facades or buildings are to be retained it may be possible to underpin the existing footings using concrete cast in-situ using a 'hit and miss approach'<sup>1</sup> which lowers the level of the footing and allows a deeper excavation and hence allows the basement slab to be formed.

## *Substructure and Basement Overview – By Site*

- 5.37** The following section presents an overview of the proposed substructure works for the development of each sub-site. This includes, where relevant, outline details encompassing the following works:

- Foundation Type;
- Retaining Wall.

### *S1*

- 5.38** A full basement under the entire footprint of the building and a new eleven storey (including plant) office block will be constructed.
- 5.39** The main challenges with S1 will be the extent of the basement and incorporating the existing perimeter walls where possible, as well as the Scheduled Ancient Monument to the south of the building.
- 5.40** A piled solution is considered the prudent option for the S1 foundations. 750mm diameter piles will be utilised to a depth of approximately 30 metres. Pile caps and ground beams will be used to suit the pile arrangements.
- 5.41** For the other perimeters of the building, a secant wall is proposed due to the proximity to highways and the Scheduled Ancient Monument.
- 5.42** The ground floor level on S1 is approximately 13.90 metres Above Ordnance Datum (AOD) with the basement slab at approximately 8.10 AOD, and 9.90 AOD on the eastern part of Building S1. A basement reinforced concrete slab is proposed.

## ***Substructure and Basement Overview – S1 – Update 2015***

### ***November 2015 Amendments***

- 5.43** A full basement under the entire footprint of the building will be constructed, which also incorporates part of the existing 12 & 13 Blossom Street Warehouse basement, which is proposed to be lowered to 9.90 AOD.
- 5.44** The main challenges with S1 will be the extent of the basement, incorporating both the existing perimeter walls where possible and the retained warehouse footings to the east, as well as the Scheduled Ancient Monument to the south of the building.
- 5.45** For the S1 new build foundations, a piled solution is considered the prudent option, whereas the existing Blossom Street Warehouse buildings to be retained sit on strip footings and these will be underpinned to provide structural support.

### *S1a*

- 5.46** Plot S1a is at the South West corner of the Site and comprises the retention of the existing buildings from 15 to 19 Norton Folgate, and the demolition of the properties at 13 and 14 Norton Folgate and replacement with a new office building. The existing basements are to be reused on this Site.
- 5.47** Underpinning of the new buildings may be required depending upon the capacity of existing masonry basement walls, ground, and the assumption that the existing building is also of concrete construction. The existing basement level is at 11.20 AOD and this level will be retained.
- 5.48** The reuse of existing foundations and basement walls is required, with mini piles supporting columns outside of the basement footprint. Temporary propping will also be required to the basement walls during construction. A 300mm suspended slab at the ground floor level with a capping beam to the masonry walls will provide restraint to the walls and prop soil forces.

<sup>1</sup> This is an underpinning method whereby mass concrete support is formed in alternate or sequential sections, so as not to wholly undermine the existing foundation support.

# 05 Demolition and Construction

## S1b

- 5.49** The existing basements are proposed to be reused for S1b. New buildings constructed on this part of the Site may require underpinning, depending upon the capacity of the existing masonry basement walls and the ground. The existing foundations and basement walls will be reused with ground beams and a ground floor slab will span any areas which have no basement. Mini piles will be used to support columns which sit adjacent to Scheduled Ancient Monument. The underside of the basement slab at 16 – 17 Blossom Street is expected to reach 10.30 AOD from a ground floor level of 14.00 AOD.
- 5.50** At the basement level a 500mm thick raft (a supporting foundation layer) will be used where required beneath the core walls or the new columns which do not sit on existing walls.

## S1c

- 5.51** The substructure of S1c will consist of a suspended reinforced concrete slab of 350mm thickness alongside a 1m thick piled supporting foundation layer under the core with ground beams and pile caps.
- 5.52** The extent of the basement for Building S1c has been determined in conjunction with the requirements for S1 to the south. It is proposed to have a combined basement that spans beneath Fleur De Lis Passage. It will therefore be excavated to the same level as S1. The existing basement under 1887 Warehouse will be lowered from 12.04m AOD to 11.64m AOD.
- 5.53** Due to the proximity of the Network Rail retaining wall and the number of storeys proposed a ground bearing solution is not suitable for S1c.

## S2

- 5.54** Plot S2 consists of a load bearing raft solution to account for the London Underground Central Line passing directly beneath the building.
- 5.55** The proposals for the substructure works at S2 include the following:
- A combination of secant piled embedded retaining wall, and underpinning of the existing concrete support sitting underneath the foundations;
  - A 1000mm deep supporting foundation layer at basement level transferring the building weight into the ground;
  - A 1500mm thickened piled strip beneath the core; and
  - 300mm retaining walls to stiffen the basement box and control any ground movement.
- 5.56** From a ground floor level of 15.10 AOD the basement sits at 11.10 AOD and the underside will therefore extend to a maximum of 10.50/10.20 AOD (localised deeper basement to underside of basement slab 9.40m AOD).

## S2 (Elder Street)

- 5.57** For the Elder Street section of S2, the existing basements will be retained as much as possible and existing footings will be reused where possible.

## S3

- 5.58** Plot S3 comprises the residential portion of the Proposed Development over 4-6 storeys. The building is bounded on three sides by highways and to the south by a Party Wall with other buildings outside of the Site (i.e. the Tune Hotel and a residential building converted to office).
- 5.59** Propping of the embedded retaining walls at ground level will be required during excavation. A 750mm thick ground bearing foundation layer will be utilised and a secant pile perimeter wall is proposed with 300mm thick reinforced concrete retaining walls. The ground level on S3 is at 14.65 AOD with the underside of the basement reaching a general depth of 11.35 AOD, although localised deeper basement at 9.85m AOD may be required.

## Works Involving Heritage Assets

- 5.60** The Proposed Development will involve works the road surface of Fleur de Lis Street to facilitate works to the utilities. The road surface of Fleur de Lis Street is statutorily listed (Grade II). It also sits above the Scheduled Ancient Monument of the Priory and Hospital of St Mary Spital. The works will be subject to a separate consent application, including:
- Listed Building Consent (works to the street surface); and
  - Scheduled Ancient Monument Consent (sub-ground works).
- 5.61** An outline summary of the proposed works to the heritage assets is presented below.

### Works to Street Surface

- 5.62** For works to historic public spaces that affects their surfaces, a prescriptive approach would be inappropriate. Rather, when considering the works the focus will be on:
- The retention of historic material;
  - Its reuse in a fashion that is historically consistent; and
  - Quality in the design and implementation of work.
- 5.63** The street will continue to be used for vehicular traffic during the demolition and construction works, and as such, the following steps will be considered and the appropriate approach implemented:
- The lifting, removal and safe storage of granite setts and kerbs, along with bollards and other street furniture;
  - Laying of a temporary road surface to protect underlying historical features
  - The careful removal of mortar and street markings from recovered material, and the undertaking of any other necessary repairs (such as paint removal and redecoration of bollards, etc.);
  - The installation of a road bed to appropriate highways standards; and
  - The relaying of salvaged street surface materials along with new matching material and the reinstallation of street furniture to the new layout and design.
- 5.64** A suitably qualified heritage consultant will design the work required, subject to further discussion and agreement with English Heritage and LBTH, given the listed nature of the street surface, and work will be undertaken to detailed drawing layouts which make clear where material is to be used, and where falls and joints are created. The following mitigation measures will be adopted as part of the works to the heritage assets:
- Salvaged setts and kerbs will be re-used and re-laid to a carefully considered layout design that uses salvaged and new material in a sensible and well-detailed way;
  - Setts will be laid in a coherent and historically consistent pattern in keeping with similar historic surfaces. New matching setts will be required, and will be sourced to ensure visual consistency, and sized to create a harmonious appearance;
  - New material will be carefully incorporated into the reinstated streetscape, and placed in sections rather than used randomly within areas of reinstated salvaged material, in a manner that blends with salvaged material;
  - High quality workmanship will be employed, for example, joints will be a consistent and reasonable width, awkward cutting will be avoided, access covers will be properly integrated into the designed layout; and
  - Close supervision of contractors by the designer will be undertaken during the reinstatement of the road surface.

### Sub-Ground Works with Scheduled Ancient Monument

- 5.65** Areas of new substructure falling within the Scheduled Ancient Monument boundary (S1, S1a, S1b and S3) will be subject to detailed probing and archaeological investigation and agreement prior to proceeding with the works (see section on archaeological mitigation (under 'Potential Environmental Effects – Environmental Management Plan' below for further detail).

# 05 Demolition and Construction

## Construction Works

### Superstructure Construction Overview

- 5.66 Fixed tower cranes will be erected for vertical material movement, together with concrete pumps. The fixed tower cranes will enable the construction of the superstructure, as well as assist with the erection of formwork and concrete placing. Figure 5.3A shows the proposed location of the fixed tower cranes and span radius of the jibs.
- 5.67 Static or mobile concrete pumps will be used for placing concrete. Larger items of mechanical plant may be craned into position as basement construction proceeds for ease of access before the structures become closed in.
- 5.68 The cranes will have luffing jibs with computerised control of lifting arcs to prevent oversailing of the railway, public roads and neighbouring properties. Climbing formwork screens will be utilised to afford protection as the frame progresses. The areas highlighted pink on Figure 5.3A represent the areas controlled outside of tower crane oversailing (this will ensure compliance with section 14.5 of LBTH's CoCP).
- 5.69 The steel and timber structures will also be erected by tower crane where possible to limit the need for mobile cranes and road closures in the narrow streets around the Proposed Development.
- 5.70 As the new structural frames are erected the retained façades will be permanently tied to them and once the load transfer is complete the temporary façade support will be dismantled and removed from Site.

### Superstructure Construction Overview – Update 2015

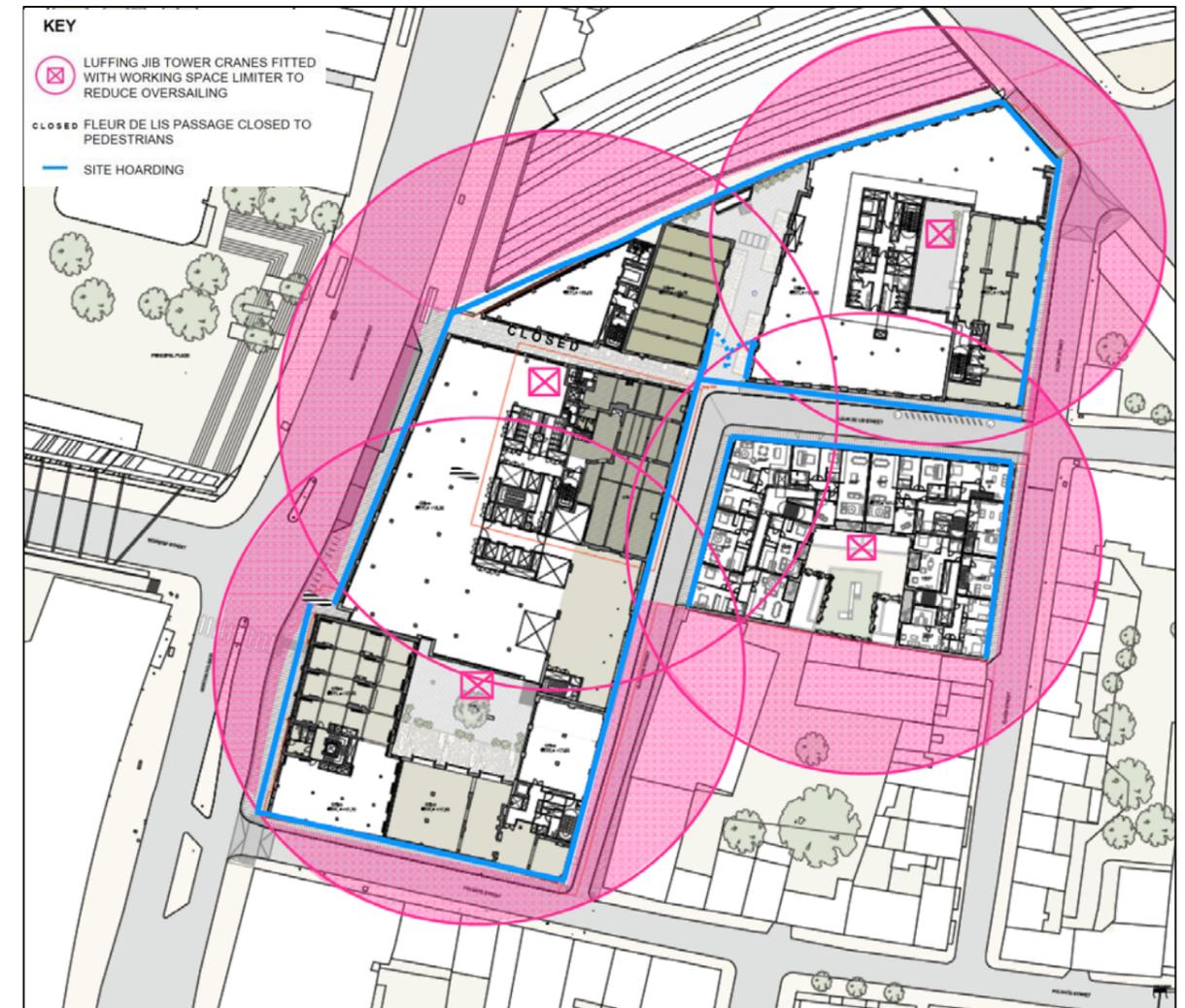
#### November 2015 Amendments

- 5.71 Figure 5.3A presents an update to account for amendments to the ground floor drawings, and shows the proposed location of the fixed tower cranes and span radius of the jibs. The proposed location of the tower crane located to the north of S1 has been relocated to account for the current design amendments involving the retention of Blossom Street warehouses (No 12 & 13 Blossom Street).

### Envelope, Roof, Shell and Core Overview

- 5.72 Cladding to the buildings will comprise a mixture of traditional masonry glass, aluminium and precast units. Precast units will be erected using the tower cranes. Where feasible, glass and aluminium walls will be of a unitised system, erected in storey height panels either by tower crane or using floor mounted mini cranes or monorails. Access to the external areas of the Proposed Development for these works will be achieved by a combination of mechanical wall-climber platforms and traditional scaffold.
- 5.73 Mechanical plant and roof materials will be placed by tower cranes, on completion of which these cranes will be dismantled and removed from the Site.
- 5.74 As the envelope completes and the tower cranes are removed, electric hoists will be positioned to handle operative movements and materials for the fit out of offices and residential units. Access will be arranged externally to the buildings using window openings or temporarily omitted cladding panels. Hoists will be removed once the permanent goods lifts are operable and available for builders' use.
- 5.75 Throughout the fitting out works, prefabricated components will be utilised, where practical, in order to limit the extent of site works and the number of delivery vehicles needed.
- 5.76 When the building envelopes are completed, the need for external access equipment will be reduced and so the external hard and soft landscaping can be completed, which will include the reinstatement of the listed road surfaces.

Figure 5.3A Location of Fixed Tower Cranes



Note: Radii of the tower cranes shown for illustrative purposes only

### Construction Overview – By Site

- 5.77 The following section presents an overview of the proposed construction works for the development of each sub-site. This includes, where relevant, outline details encompassing the following works:
- Superstructure Construction; and
  - Envelope, Roof, Shell and Core.
- S1
- 5.78 Construction of S1 will involve two different strategies involving the Blossom Street Warehouses - No 12 & 13 Blossom Street (Timber section of Blossom Street Warehouses) and No 14 & 15 Blossom Street (concrete section of Blossom Street Warehouses).

# 05 Demolition and Construction

- *No 12 & 13 Blossom Street (Timber section of Blossom Street Warehouses)* - proposals will now include more of the fabric of the No 12 & 13, Blossom Street. In particular, with regard to the timber floors and cast iron it will be sought to largely retain and reuse these. In order to give these buildings the long term future that we require of our investments we will need to make certain interventions. These interventions will include structural reinforcement and fire protection required by statutory safety standards and in order to provide for the requirements of modern occupiers both of which an attempt will be sought to achieve preserving where possible the existing structure. It is also proposed to re-set the floors at the first and second floors by raising the existing structure to tie in with levels elsewhere. The detail of the design will need sufficient time and expert input in order to be developed as we continue with detailed design post submission of planning. It is the intention to try and keep what can of the rear wall of the warehouse. One of the key features of this building is that it has been extended over time as the Site has evolved and as such there is not a clear rear wall along the extent of this warehouse.
- *No 14 & 15 Blossom Street (concrete section of Blossom Street Warehouses)* - The facade will be retained. The concrete structure will be replaced with a new timber and steel structure which is in the spirit of the adjacent timber warehouses.

**5.79** The structure's columns will be reinforced concrete, with square sections. The dimensions of each column will reduce at the upper levels of the structure. Core walls will be reinforced concrete, which will provide lateral stability to the structure. At the upper storey level, step backs (where the structure recesses) will be utilised, using concrete encased steel transfer beams.

## **Construction Overview – By Site – S1 – Update 2015**

### *November 2015 Amendments*

- 5.80** The amendments propose to retain No 12 & 13 Blossom Street and undertake repairs and alterations to allow the building to be reused as office space. No 12 & 13 Blossom Street will become a self-contained building, and will involve less external change in appearance than initially proposed. The appearance of the elevations, including the roofs, of No 12 & 13 Blossom Street will remain, in terms of height, width, and detail; largely as they are now. The internal amendments proposed involve inserting a new core to the rear of No 12 & 13 Blossom Street.

### *S1a*

#### 15 to 19 Norton Folgate

- 5.81** The existing timber floors are to be replaced with new timber floors and the existing roof will be removed and replaced by a roof with new steel to form a dormer roof profile at front and back. New steel beams will be installed internally to provide openings within the existing masonry walls.
- 5.82** It is proposed to link these properties at the upper levels, with the ground floor of 18 and 19 Norton Folgate forming the main entrance to S1 and the yard.

#### New buildings at 13 to 14 Norton Folgate

- 5.83** The new buildings at 13 to 14 Norton Folgate will use a timber joist floor, to match the existing floor construction, which is supported off a steel frame. Steel columns will be used at the perimeter and interior of the building, founded on the existing basement walls. The core walls will be constructed from reinforced concrete of 250mm thickness.
- 5.84** A step back from the surrounding façade at the top storey will be constructed by aligning columns through vertically. The existing facade and walls of 15 Norton Folgate will be retained.

### *S1b*

- 5.85** Plot S1b will include the refurbishment of the existing Water Poet Public House on the corner of Folgate and Blossom Street, the retention of the facade of 5-9 Folgate Street and the demolition and rebuilding of the Warehouse at 16-17 Blossom Street.

### 5-11a Folgate

- 5.86** The existing roof to 5-11a Folgate St is locally listed and the dormer arrangement to the Folgate St elevation is to be retained. It is proposed to remove the rear existing roof and use internal steel portal frames, sitting on the party walls and internal loadbearing walls or columns to support the new roof. Should the Folgate Street roof elevation require removal to allow structural work it will be dismantled and stored safely on site to be reinstated or reconstructed in its original configuration.
- 5.87** The existing timber floors are to be replaced with new timber floors.
- 5.88** The facade to the rear of 5-9 Folgate is to be demolished and rebuilt. The construction of the new facade is proposed to be an internal steel portal frame structure from which the cladding is supported.

### 16-17 Blossom Street

- 5.89** The floor plates for this building will consist of a thick flat slab and load bearing masonry piers will be constructed to support new floor plates at the perimeter and with square concrete columns installed internally. In order to provide lateral stability to the structure, thick reinforced core walls will be used.
- 5.90** A step back will again be constructed at the upper storeys, using a concrete transfer slab, with the upper floor being constructed from a steel frame with lightweight roof cladding. Risers will be located around the structural core to maximise the floor area.

### *S1c*

- 5.91** Plot S1c is located on the triangle of land bounded by Fleur De Lis Passage to the south, the Network Rail wall to the north, and the 1881 warehouse to the east. The design of S1c incorporates a link to the 1887 warehouse at the lower floor levels.
- 5.92** The structure of the Proposed Development on S1c will be comprised of:
- A post tensioned slab;
  - thick reinforced concrete core walls;
  - Columns at the perimeter to create a column free interior; and
  - Risers located around the core to maximise the floor area.

## **Construction Overview – By Site – S1c – Update 2015**

### *March 2015 ES Addendum*

- 5.93** In response to concerns raised by LBTH Highways with regards to the impact on the highway specifically access during maintenance, it was proposed to amend the Proposed Development to remove the bridge links between S1 and S1c buildings, resulting in S1 and S1c to be independent buildings.

### *S2*

- 5.94** Floor plates within S2 will have post tensioned flat slab construction.
- 5.95** Circular reinforced concrete columns will be utilised which decrease in diameter at the upper levels. Reinforced concrete core walls of 250mm thickness will be used to provide lateral stability.
- 5.96** As with other buildings, risers will be located around the structural core to maximise the floor area.
- 5.97** The facade of 161 Commercial Road facing onto the street, and also the 1927 Warehouse Facade facing onto the historic extension of Blossom Street (see Figure 5.4) are to be retained. Both facades will require underpinning and integration into the proposed foundation.
- 5.98** The facade of 161 Commercial Road is currently in a very poor state of repair, and therefore may require refurbishment prior to works commencing. It is proposed to erect the facade retention steelwork externally on the highway in this location.

# 05 Demolition and Construction

Figure 5.4 1927 Warehouse Façade to be retained



## No. 4 – 8 Elder Street

- 5.99** The existing buildings are being restored at the front with the existing stucco being removed to reveal the original brick piers at ground. The floor structure is being retained throughout. The buildings are being laterally connected by opening up the existing brick arches within the party walls.
- 5.100** The 'blind' rear elevation of No4 is being rebuilt with new window openings and aligned to the rear elevation of No6. No6 is largely retained with the ground extensions being removed. The party wall to No8 is being rebuilt but is currently exposed and creates a narrow end elevation on Fleur de Lis Street. All repairs will be done in reclaimed brickwork.
- 5.101** The roof is being retained with 2 new dormers to No6 on the front, in line with the rhythm and proportion of the façade and existing dormers. The rear roofs of No 4 and 6 are being lowered to tie in with the rear alterations and accommodate new roof lights.
- 5.102** The new floor infill is to be constructed from timber joists and supported with a stress skin panel. Core walls are to be 250mm thick and again constructed from reinforced concrete to provide lateral stability. The roof will be supported from the extended masonry party walls, with the new steel frame and steel cross beams supported from party wall.

S3

**5.103** The Proposed Development on S3 will be arranged around a central courtyard.

**5.104** The floor plates are proposed to consist of reinforced concrete flat slabs. All columns will be constructed from square reinforced concrete with 250mm thick reinforced concrete core walls providing lateral stability. A step back will be constructed at the upper storeys using concrete transfer beams, with the upper floor being constructed from a steel frame with lightweight roof cladding.

## Material Quantities

### Demolition

**5.105** Approximately 20,000 cubic metres (m<sup>3</sup>) of material is expected to be generated during the demolition of the existing building (largely consisting of concrete and steel). Wherever possible, materials will be recycled and re-used on-site.

### Excavation and Construction

**5.106** Approximately 21,000 m<sup>3</sup> of material is expected to be generated during the excavation of the single storey basement and building foundations.

**5.107** Estimates of key construction materials are listed below

- 15,300 m<sup>3</sup> of reinforced concrete;
- 18,400 square metres (m<sup>2</sup>) of façade cladding;
- 4,000 m<sup>2</sup> of high performance roofing membrane;
- 12,500 m<sup>3</sup> of internal walls and partitions; and
- 1,500 m<sup>2</sup> of external paving.

### Excavation and Construction – Update 2015

#### November 2015 Amendments

**5.108** The approximate volumes of material presented in the December 2014 ES represent the worst case scenario for assessment and it is not considered the design amendments relating to the March 2015 ES Addendum and this Replacement ES would result in significant changes in the volume of material generated.

### Landfill Capacity

**5.109** All contractors will be required to investigate opportunities to minimise and reduce waste generation in accordance with WRAP's 'Halving waste to Landfill' initiative (Ref. 5-2) the Waste Management Plan for England 2013 (Ref. 5-3) by:

- 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;
- Use of standard size components in design detailing to eliminate risk at source where possible to do so;
- Attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- Re-use of materials wherever feasible, e.g. re-use of excavated soil for landscaping. Concrete will be taken off site for crushing and re-use. The Government has set broad targets of the use of reclaimed aggregate, and in keeping with best practice, contractors will 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 will be colour coded and signposted to reduce risk of cross contamination and covered to prevent dust and debris blowing around the site, these will be cleared on a regular basis; and

# 05 Demolition and Construction

- Burning of wastes or unwanted materials will not be permitted on-site.
- 5.110** The Applicant will demonstrate best practice and standards through their own sustainability guidance for managing waste, which sets the following standard to be achieved:
- divert 100% of non-toxic demolition and strip-out waste from landfill; and
  - divert at least 98% of construction and fit-out waste from landfill.
- 5.111** The Code of Construction Practice (CoCP) for LBTH also provides best practice guidance for waste management. Using this guidance, the relevant contractors will be required to carry out works in such a way that, as far as is reasonably practicable, the amount of spoil and waste to be disposed of by landfill is minimised and that any waste arising from the site are transported and disposed of in accordance with relevant legislation including the following:
- The Environmental Permitting (England and Wales) (Amendment) Regulations 2013 (Ref. 5-4);
  - The Waste (England and Wales) (Amendment) Regulations 2012 (Ref. 5-5);
  - The Waste Management (England and Wales) (Amendment) Regulations 2006 (Ref. 5-6);
  - Clean Neighbourhoods and Environment Act 2005 (Ref. 5-7); and
  - Contractors will be encouraged to adopt the principals of The Site Waste Management Plans Regulations 2008 (repealed) as good working practice.
- 5.112** In addition, disposal sites and routes will be identified by the contractors in consultation with the LBTH and the Environment Agency (EA) and presented in a Site Waste Management Plan (SWMP). When assessing the most suitable option for landfill disposal, the mode of waste transportation and alternatives to reduce adverse environmental impacts, transport times and landfill capacity must be considered.
- 5.113** Where possible, the project will seek to maximise the reuse of suitable soils on-site, in order to minimise waste disposal.
- 5.114** Intrusive site investigation work will be undertaken to identify any significant areas of contamination (refer 'Environmental Management Plan – Potential Effects - Ground Conditions' section below). It is likely that the intrusive site investigation work will comprise soil chemical testing to further characterise soil material for disposal, including Waste Acceptance Criteria (WAC) analysis. The soil sampling and testing necessary for classification and disposal of waste soils will follow the methodology described in the following two EA publications: 'Framework for the Classification of Contaminated Soils in Hazardous Wastes 2004', (Ref. 5-8) and 'Waste Acceptance at Landfills: Guidance on waste acceptance procedures and criteria 2010 (Ref. 5-9). All soil sampling and testing will be undertaken in accordance with BS 10175: Investigation of Potentially Contaminated Sites: Code of Practice (Ref. 5-10).
- 5.115** In terms of landfill capacity within London, remaining void space has decreased significantly in recent years to 9.7 million m<sup>3</sup> in 2011 (Ref. 5-11). However, a large proportion of waste generated in London is also disposed of at landfill sites in the southeast and east of England where capacity levels are much higher. In 2008, southeast England had 106 million m<sup>3</sup> remaining across various landfill sites with a further 74 million m<sup>3</sup> in the east of England. With this in mind, and the fact that waste generated by the Proposed Development will be minimised and reused wherever feasible, there is not predicted to be any significant effect upon landfill capacity as a result of the demolition and construction waste volumes.

## Plant and Equipment

- 5.116** Consideration has been given to the types of plant that are likely to be used on-site during demolition and construction of the Proposed Development.
- 5.117** The plant and equipment associated with each key element of the demolition and construction process is set out in Table 5.4.

**Table 5.4 Estimated Plant Type and Equipment during Demolition and Construction**

Plant	Stage				
	Demolition	Substructure and Basement	Super-Structure	Envelope, Roof, Shell and Core	Fit Out and External Works
Concrete Crusher	✓				
360° Excavators	✓	✓			✓
Compressor & Air Tools	✓	✓	✓		
Tower Cranes		✓	✓	✓	
Mobile Cranes	✓	✓	✓	✓	✓
Piling Rigs		✓			
Concrete Pumps		✓	✓		
Wall-climber Platforms			✓	✓	
Goods/ Passenger Hoists			✓	✓	✓
Mechanical road sweeper	✓	✓	✓	✓	✓
Tipper Lorry	✓	✓	✓	✓	✓
Ready Mixed Concrete Lorry		✓	✓		✓
Climbing Screens			✓		
Pavement Gantries	✓	✓	✓	✓	
Low Loader	✓	✓	✓		✓
Articulated Lorry	✓	✓	✓	✓	✓
Large Rigid Lorry	✓	✓	✓	✓	✓

## Hours of Work

- 5.118** It is anticipated that the core working hours for demolition and construction will be as follows:
- 08:00 – 18:00 hours weekdays;
  - 08:00 – 13:00 hours Saturday; and
  - No working normally undertaken on Sundays or Bank Holidays.
- 5.119** It is recognised that approval from the LBTH is required for any works that need to be undertaken outside these permitted hours.

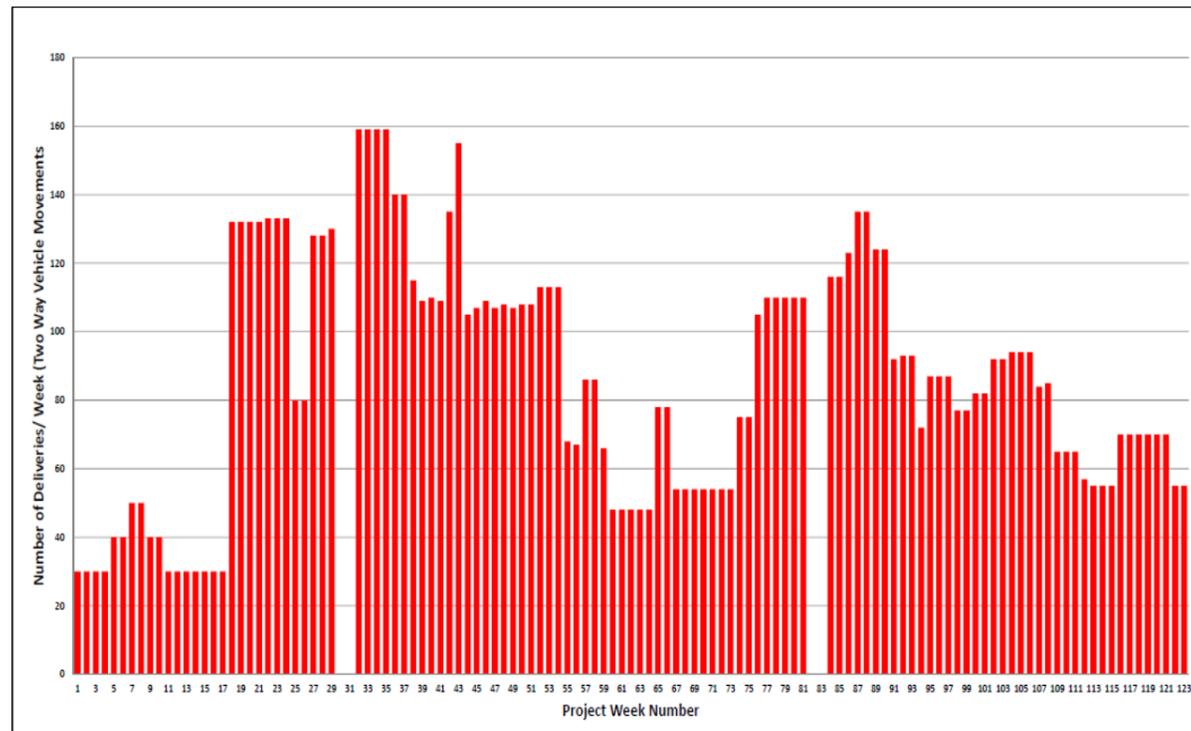
## Traffic Management

### Demolition and Construction Vehicle Movements

- 5.120** Figure 5.5 summarises the estimated number of construction vehicle trips to be generated during the demolition and construction phases. This captures all vehicle trips, including HGV's, and has been calculated based on volumes of demolition/excavated waste material, together with imported concrete, piling materials and arisings, and cladding.

# 05 Demolition and Construction

**Figure 5.5 Estimated Demolition and Construction Vehicle Movements (Two-Way, per Week)**



- 5.121 Construction vehicle traffic generation will be at its peak between weeks 32 to 36 of the indicative construction programme where 159 two way vehicle movements will occur to/from the Site. This equates to 80 vehicles arriving at the Site per week (peak).
- 5.122 It is assumed that construction traffic for the Site will be evenly spread across the ten hour working day and that construction activity will occur for 5.5 days per week. This equates to 29 two way vehicle movements a day, which on average assumes three two way vehicles movements per hour. This equates to an average of 15 vehicles per day during the peak period of construction.
- 5.123 Where possible, off-site consolidation will be used to reduce the number of deliveries to the Site.

### **Demolition and Construction Vehicle Movements – Update 2015**

#### *November 2015 Amendments*

- 5.124 The approximate volumes of material presented in the December 2014 ES is considered to represent the worst case scenario for assessment and it is not considered the design amendments relating to the March 2015 ES Addendum and this Replacement ES would result in significant changes in the volume of material generated. It is therefore considered that, based on volumes of demolition/excavated waste material, together with imported concrete, piling materials and arising's, and cladding, the corresponding vehicle movements are also unlikely to change significantly.

#### **Use of the River Thames**

- 5.125 Consideration has been given to the potential use of the River Thames as a potential route for construction materials and waste, thereby reducing the construction traffic and its effects on the highway network.

- 5.126 The Site is not located close to the River Thames (the River Thames lies approximately 1.7km south of the Site) and would require construction materials and waste to still be transferred by road between the Site and any associated wharf identified as the loading/unloading point.
- 5.127 The transfer of goods between river transport and construction vehicles at both the source and destination Wharf, and then again at the Site, significantly increases the handling of materials and the potential for damage and waste. For the above reasons, the assessment undertaken of construction related activities undertaken assumes that all goods are be moved by road.

#### **Access and Egress**

##### *Construction Traffic Routes*

- 5.128 Construction vehicles will be required to access the Site using specific routes. These routes will be selected to avoid minor / residential roads and to use distributor roads for the bulk of their journey through London.
- 5.129 The anticipated routes are shown in Figure 5.6:
  - North West – vehicles from the M1/A1 will be instructed to approach the site via A102, A501 and Commercial Street / Shoreditch High Street; and
  - South East – vehicles from the A11 / A12 / A13 will be instructed to approach the site via A11 and the A13 via Commercial Street.
- 5.130 It is likely that the total construction traffic vehicle movements approaching the Site along these key routes would be split in approximately the following way:
  - 55 per cent using the M1/A1 (pink route);
  - 22.5 per cent using the A11/12 (blue route); and
  - 22.5 per cent using the A13 (green route).
- 5.131 Final access routes to and from the Site will be agreed with LBTH / highway authority prior to the commencement of the demolition and construction works, after detailed specifications are produced and packages of work are procured.
- 5.132 It will be a requirement that suppliers, contractors and subcontractors submit their individual delivery plan to confirm intended delivery routes to and from the Site. The Principal Contractor will be required to maintain an updated plan of lorry movements. To ensure all parties adhere to agreed traffic routes, checks will be carried out to enforce the policy. Vehicles will be monitored exiting the Site to ensure that they follow the designated routes. Trade contractors and suppliers that do not comply will be banned from delivering / collecting from the Site.
- 5.133 A vehicle booking and management system will be used to minimise peaks and increase opportunities for consolidated deliveries. As necessary peak hour restrictions will be applied and enforced.
- 5.134 Consideration will also be given to the use of a 'Construction Consolidation Centre' to reduce the number of vehicles to the Site.
- 5.135 The Principal Contractor will also be responsible for proposing detailed temporary traffic measures and signage.
- 5.136 The Principal Contractor will adhere to the 'Construction Logistics and Cycle Safety' (CLOCS) Standard (Ref. 5-12) for construction logistics operators and clients.

##### *Construction Traffic Access*

- 5.137 The construction site access points will be designed to accommodate the movement of all expected construction vehicle types and will take into account the need to ensure the safety of all highway users, particularly pedestrians and cyclists.
- 5.138 Figure 5.7 below presents the indicative delivery and loading points for the Site during the construction phase. Final access routes to and from the Site will be agreed with LBTH / highway authority prior to the commencement of the demolition and construction works.

# 05 Demolition and Construction

## Car Parking and Travel to Site

- 5.139 There will be no on-site parking provided for construction worker vehicles. Site parking will only be made available temporarily to those construction personnel who need to carry heavy equipment or materials to the Site.
- 5.140 The roads in LBTH are within a Controlled Parking Zone and the only legal on-street parking is for permit holders or in pay-and-display bays. Strict parking controls and enforcement will ensure on-street parking by construction workers is prevented.
- 5.141 The Site is located in an area with excellent accessibility to public transport. As a result it is anticipated that the majority of construction workers will travel to the Site by public transport and will be given detailed information on travel options.

Figure 5.6 Traffic Approaches

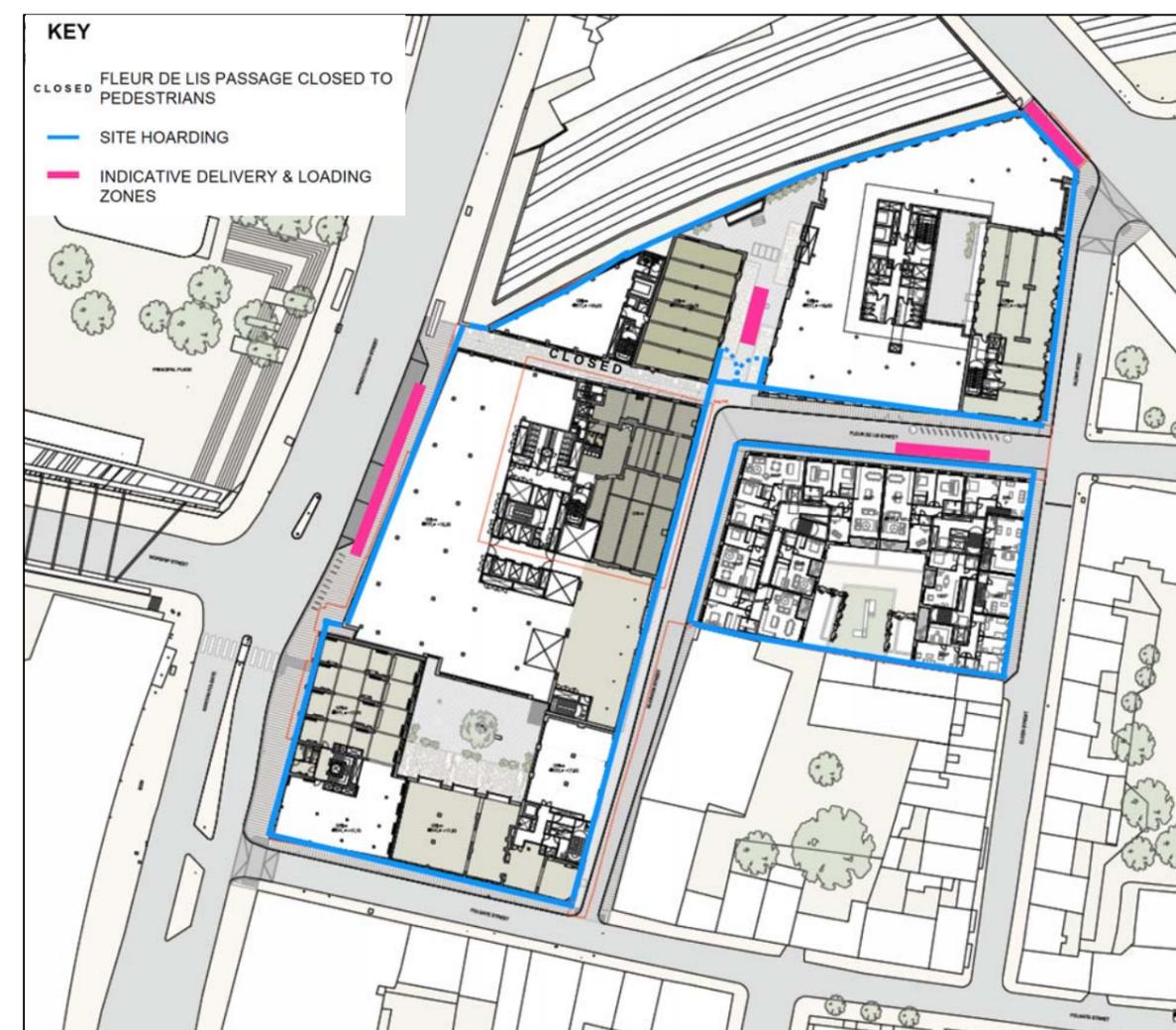


## Car Parking and Travel to Site – Update 2015

### November 2015 Amendments

- 5.142 Figure 5.7A presents an update to account for amendments to the ground floor drawing. No other changes are presented.

Figure 5.7A Indicative Vehicle Delivery and Loading Plan



## Potential Environmental Effects

- 5.143 A review has been undertaken of the potential sources of effects associated with demolition and construction works, prior to the incorporation of any identified mitigation measures. The results of this are presented within Table 5.5.
- 5.144 Each of the potential environmental effects outlined below in Table 5.5 discussed in more detail either within this ES Chapter or in each of the corresponding technical chapters of this ES (i.e. chapters 6 to 15).

# 05 Demolition and Construction

**Table 5.5 Potential Effects during Demolition and Construction**

Issue	Potential Effects
Noise	Increased road noise levels from vehicles and demolition and construction activities, plant and power tools, e.g. from the use of air compressors and diamond cutters on-site. - Refer 'Environmental Management Plan – Management of Effects from Noise, Vibration and Air Quality' section below - Refer <b>Chapter 10: Noise and Vibration</b>
Vibration	Effect to neighbouring properties from increased vibration levels from vehicles, and activities (e.g. piling) plant during demolition and construction works. - Refer 'Environmental Management Plan – Management of Effects from Noise, Vibration and Air Quality' section below - Refer <b>Chapter 10: Noise and Vibration</b>
Dust/air quality	Wind borne dust arising from ground surfaces, stockpiles, vehicles, work faces and cutting and grinding of materials. Exhaust emissions from vehicles and plant. - Refer 'Environmental Management Plan – Management of Effects from Noise, Vibration and Air Quality' section below - Refer <b>Chapter 9: Air Quality</b>
Storage of fuels and materials	Accidental spills, discharges to drains/storm-water systems, ground contamination. - Refer 'Environmental Management Plan – Ground Contamination; Waste Management; Protection of Water Resources' sections below - Refer <b>Chapter 13: Water Resources, Drainage and FRA</b>
Hazardous materials and contaminated land	Exposure of workforce to deleterious/hazardous materials and contaminated land. Disturbance of source contaminants and creation of migratory path to groundwater receptor. - Refer 'Environmental Management Plan –Ground Contamination' section below - Refer <b>Chapter 13: Water Resources, Drainage and FRA</b>
Waste	Diverse waste generation and disposal associated with the works. - Refer 'Material Quantities – Landfill Capacity' above, and 'Environmental Management Plan – Waste Management' below - Refer <b>Chapter 6: Waste and Recycling</b>
Water	Increased sediment deposition to storm-water systems. Potential contaminated storm water run-off - Refer 'Environmental Management Plan – Protection of Water Resources' section below - Refer <b>Chapter 13: Water Resources, Drainage and FRA</b>
Water usage	Consumption and depletion of natural resource / resource availability. - Refer 'Environmental Management Plan – Energy and Water Usage' section below - Refer <b>Chapter 13: Water Resources, Drainage and FRA</b>
Archaeology	Effects to sub-surface archaeological deposits. - Refer 'Environmental Management Plan – Archaeology' section below - Refer <b>Chapter 14: Archaeology</b>
Ecology	Disturbance to potential nesting birds within waste ground, rubble and tall structures with ledges and crevices, such as cranes. - Refer 'Environmental Management Plan – Ecology' section below
Energy usage	Indirect effects associated with energy. Generation of CO <sub>2</sub> and NO <sub>x</sub> emissions. Consumption of natural resources. - Refer 'Environmental Management Plan – Energy and Water Usage' section below - Refer <b>Chapter 9: Air Quality</b>

Issue	Potential Effects
Traffic	Increased congestion to existing highway and roads due to site related traffic and road diversions and highway works. Increased HGV vehicle movements. Transfer of mud and material from vehicles onto the public highway. Disruption due to abnormal and/or hazardous loads. Exhaust emissions. - Refer 'Traffic Management' section above - Refer <b>Chapter 8: Traffic and Transport</b> - Refer <b>Chapter 9: Air Quality</b>
Pedestrian access	Restrictions on pedestrian access to walkways, footpaths and roads. - Refer <b>Chapter 8: Traffic and Transport</b>
Light	Light spillage from construction lighting. - Refer <b>Chapter 11: Daylight, Sunlight, Overshadow, Solar Glare and Light Pollution</b>
Views	Views affected and/or impeded by construction equipment, particularly cranes. - Refer <b>ES Volume II: Townscape and Visual Impact Assessment</b>

## Environmental Management Plan

**5.145** The Applicant will develop and implement a Demolition and Construction Environmental Management Plan (DCEMP) through which mitigation and compliance with the LBTH's CoCP (Ref. 5-1), the Greater London Authority's (GLA) 'Sustainable Design and Construction Supplementary Planning Guidance (SPG)' (Ref. 5-13) and the GLA's 'The Control of Dust and Emissions During Construction and Demolition SPG' (Ref. 5-14). The DCEMP will also refer to industry standards, best practice and guidance, such as the 'Considerate Constructors Scheme' (Ref. 5-15) and Environment Agency 'Pollution Prevention Guidance' (PPG) notes (i.e. PPG13: Vehicle Washing and Cleaning (Ref. 5-16); PPG22: Dealing With Spills (Ref. 5-17)).

**5.146** The DCEMP will include roles and responsibilities, detail on control measures and activities to be undertaken to minimise environmental effects, and monitoring and record-keeping requirements.

**5.147** A commitment will be made to periodically review the EMP and undertake regular environmental audits of its implementation during the demolition and construction phases.

**5.148** The DCEMP will comprise the following matters to minimise the environmental effects of the construction of the Proposed Development on the surrounding area:

- Demolition and Construction Method Statement (DCMS);
- Considerate Constructors Scheme;
- Neighbour and public relations;
- Management of trade contractors;
- Management of effects from noise, vibration and air quality;
- Waste management;
- Ground conditions;
- Protection of water resources;
- Archaeology;
- Ecology; and
- Energy and water usage.

## Demolition and Construction Method Statement

**5.149** A Demolition and Construction Method Statement (DCMS) will sit within the DCEMP. The DCMS will outline the different activities and procedures to be undertaken in order to complete the various demolition and construction works.

**5.150** The DCMS will include the following main items:

- The demolition and construction programme;

# 05 Demolition and Construction

- A broad plan of the demolition and construction works, highlighting the various stages and their context within the project, including a full schedule of materials and manpower resources, as well as plant and equipment schedules;
- Details of proposed routes for HGVs;
- Detailed site layout arrangements (including requirements for temporary works), plans for storage, accommodation, vehicular movements, delivery and site access and egress;
- Prohibited or restricted operations (locations, hours, etc.);
- Details of operations that are likely to result in disturbance, with an indication of the expected duration of each phase with key dates, including a procedure for prior notification of the LBTH and relevant statutory and non-statutory (including neighbours) parties so that local arrangements can be agreed;
- Site working hours;
- A procedure to ensure communication is maintained with the LBTH and the local community to provide information on any operations likely to cause disturbance (e.g. through meetings and newsletters);
- Provisions for affected parties to register complaints and the procedures for responding to complaints; and
- Provisions for reporting to the Applicant and the LBTH.

## *Considerate Constructors Scheme*

**5.151** The Site will be registered with the 'Considerate Constructor's Scheme'. This scheme ensures that contractors carry out their operations in a safe and considerate manner with due regard to passing pedestrians and road users. The Applicant will also require all contractors to target achieving 35 points or more to put them in the top 10%. In addition, the Applicant will target the Considerate Constructors Scheme score of 40 for this project in order to achieve the BREEAM target.

## *Neighbour and Public Relations*

**5.152** A key aspect of the successful management of the project will be the maintenance of good relations with site neighbours and the general public. The project team is already engaged in consultation with a broad range of stakeholders and this will continue through the various phases of the project. For further details, refer to the 'Statement of Community Involvement', accompanying this Application.

**5.153** The Principal Contractor will, prior to works being undertaken on-site, consult with LBTH, TfL, and contractors / developers of other construction schemes in the local area, on the programme as well as to discuss potential clashes and the local impacts of the construction, to ensure that works are planned so as not to cause unnecessary disruption and to mitigate the impact, if necessary.

**5.154** During the works period, a single point of contact will be established, with a senior member of the project staff nominated for the role. Outside normal working hours, site security will act as the main point of contact via a dedicated phone number. Security will alert the Construction or Logistics Manager if necessary (available 24 hours). Any complaints will be logged, fully investigated and reported to the relevant department within the LBTH as soon as possible. The complainant will be informed as to what action has been taken.

**5.155** Contact with neighbours and the general public throughout the demolition and construction period will be pro-actively maintained, with regular update meetings on a quarterly basis and the issuing of a brief news sheet on progress.

## *Management of Trade Contractors*

**5.156** Individual contractor contracts will incorporate relevant requirements in respect of environmental control, based largely on the standard of 'good working practice' as outlined within the DCEMP, as well as statutory requirements.

**5.157** All trade contractors will be required to demonstrate how they will adhere to procedures set out within the DCEMP satisfying regulations and best practices regarding environmental control. It will require individual trade contracts to incorporate requirements for environmental control, based on good working practice, such as careful programming, resource conservation, adhering to health and safety regulations and quality

procedures. In this way those involved with the demolition and construction phase will be committed to adopt the agreed best practice and environmentally sound methods.

## *Management of Effects from Noise, Vibration and Air Quality*

**5.158** The potential for demolition and construction related noise, vibration and air quality effects have been duly taken into consideration as detailed within **Chapter 9: Air Quality** and **Chapter 10: Noise and Vibration** of this ES. A full assessment of activities with the potential to generate high levels of noise, vibration or dust has been undertaken and mitigation strategies and measures confirmed.

**5.159** The mitigation measures will be reviewed at the detailed demolition and construction planning stage to ensure that the mitigation measures and management controls and/or procedures to be adopted as part of the DCEMP are sufficient to meet the commitments made throughout the assessments. A summary of the key mitigation measures is provided below.

## *Noise and Vibration*

**5.160** Construction noise and vibration will be controlled through the implementation of a series of measures, including (but not limited to):

- Use of acoustic hoarding. Erecting hoarding around the entire perimeter of the site will assist in the screening of low-level sources;
- Hydraulic construction to be used in preference to effect techniques where practical;
- All plant and equipment to be used for the works will be properly maintained, silenced where appropriate, and operated to prevent excessive noise and switched off when not in use and where practicable;
- Plant will be certified to meet relevant current legislation and Noise and Vibration Control on Construction and Open Sites (BS 5228 2009+A1:2014) Standards (Ref. 5-18);
- All trade contractors will be required to demonstrate familiarisation with current noise legislation and British Standards (BS) such as BS 5228 2009+A1:2014 which will form a prerequisite of their appointment;
- Threshold vibration limits will be set and monitoring equipment established at locations outside the Site which are deemed sensitive, such as nearby office areas and residential accommodation;
- Loading and unloading of vehicles, dismantling of equipment such as scaffolding or moving equipment or materials around the Site will be conducted in such a manner as to minimise noise generation and, where practical, will be conducted away from noise sensitive areas;
- Deviation from approved method statements will be permitted only with prior approval from Principal Contractor. This will be facilitated by formal review before any deviation is undertaken;
- Complaints about noise, or incidents where action levels are exceeded will be reported to the Principal Contractor and immediately investigated; and
- A Travel Plan will be designed for construction workers.

## *Air Quality*

**5.161** Demolition and construction dust is expected to only represent a nuisance to exposed human receptors in immediate proximity to the Site. Construction dust will be controlled through the implementation of a series of measures, including (but not limited to):

- Erect solid barriers to Site boundary;
- Site layout will be planned – machinery and dust causing activities should be located away from sensitive receptors where possible;
- A trained and responsible manager will be present on site during working times to maintain a logbook and carry out site inspections;
- Hard surface site haul routes;
- Real-time dust monitors will be put in place across the Site;
- Effective vehicle cleaning and specific fixed wheel washing on leaving the Site and the damping down/cleaning of haul routes will be undertaken;

# 05 Demolition and Construction

- Loads entering and leaving the Site will be covered;
- Movement of construction traffic around the Site will be minimised;
- Appropriate speed limit around the Site will be enforced;
- Water will be used as a dust suppressant; and
- Chutes and skips will be enclosed/covered.

**5.162** Emissions from construction traffic will be minimised through:

- The use (where appropriate) of catalytic converters;
- The regular maintenance of vehicle engines; and
- Vehicles will comply with emission standards for on-road vehicles and the requirements of the Low Emission Zone.

## *Waste Management*

**5.163** The disposal of all waste or other materials removed from the Site will be in accordance with the requirements of the Environment Agency (EA), Control of Pollution Act 1974 (COPA) (Ref. 5-19), Environmental Protection Act 1990 (Ref. 5-20), Environment Act 1995 (Ref. 5-21), Hazardous Waste Regulations 2005 (Ref. 5-22), NOC Waste Regulations 2009 (Ref. 5-23) and the Environmental Permit Regulations 2010 (Ref. 5-24).

**5.164** Any waste effluent will be tested and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor/s.

**5.165** In general and in accordance with the principles of the UK Government's 'Waste Strategy 2000' (Ref. 5-25) a principal aim during demolition and construction will be to reduce the amount of waste generated and exported from site. This approach complies with the waste hierarchy where by the intention is first to minimize, then to treat at source or compact and, finally, to dispose of off-site as necessary.

**5.166** The Applicant will be required to produce a construction Site Waste Management Plan (SWMP) which will contain:

- Classification of all wastes;
- Performance measures and target setting against estimated waste forecasts;
- Measures to minimise waste generation;
- Opportunities for reuse and recycling;
- Provision for the segregation of waste streams on site that are clearly labelled;
- Recording of proposed carriers and licences for disposal sites;
- An audit trail encompassing waste disposal activities and waste consignment notes;
- Measures to avoid fly tipping by others on land being used for construction;
- Measures to provide adequate training and awareness through toolbox talks; and
- Considerable alternatives means of removing waste other than by road.

**5.167** As previously described earlier in this chapter, all relevant contractors will be required to investigate opportunities to minimise and reduce waste generation in line with WRAP's 'Halving waste to Landfill' initiative.

**5.168** Risk of infestation by pests or vermin will be minimised by making adequate arrangements for the disposal of food and other material that may attract pests. Where there is a local infestation then the local environmental officer will be consulted about the action to be taken.

## *Ground Conditions*

**5.169** Construction works will be carried out in such a way as to prevent, contain or limit, as far as reasonably practicable, any adverse impacts arising from the presence of contaminated land or material.

**5.170** The Preliminary Contamination Assessment (PCA) report (Ref. 5-26) (refer **ES Volume III: Appendix A**) prepared provided an initial assessment of the historic activities undertaken at the Site and identified the potential contamination risks and issues.

**5.171** The PCA concluded that there is potential for localised areas of contamination, but that based on the available information it is anticipated that the Site should not be constrained by issues relating to

contaminated land, subject to the adoption of appropriate mitigation measures. For example, the PCA identified that the existing buildings are likely to contain asbestos in some form and therefore an asbestos survey will be carried out before works commence to determine the risk and locations.

**5.172** Appropriate mitigation proposed includes undertaking a Phase 2 Site Investigation and subsequent stages of investigation and site remediation (if required), to be made in the form of planning conditions. This would include a written programme of ground investigation for the presence of soil and groundwater contamination and landfill gas, and following agreement on the written programme, an investigation shall be carried out in accordance with the approved programme and the results and a written scheme of remediation measures (if necessary) shall be submitted to and approved by the local planning authority.

**5.173** The ground investigations will be undertaken prior to the commencement of works on-site and will further inform the Foundation / Piling Works / Hydrological Risk Assessment, which will confirm the appropriate piling methods and foundation design to mitigate risk.

**5.174** The Phase 2 investigations would include a risk assessment of the contamination at the Site, which would be undertaken by comparing measured levels of soil contamination with generic assessment criteria established through industry guidance and best practice (i.e. UK Soil Guideline Values (Ref. 5-27)).

**5.175** Should significant areas of contamination be identified during the further site survey/investigation work, a Remedial Strategy (including options appraisal) for the remediation of soils on-site, or their appropriate removal; off-site treatment (where practicable); and/or disposal off-site will be agreed as appropriate in advance of any remediation work. The remediation framework will identify remediation requirements for protection of human health and controlled waters as well as identifying any areas that require remediation to be undertaken.

**5.176** Should a Remedial Strategy be implemented, a verification process (verification plans and reporting to the local authority and the EA) will be undertaken to confirm that the strategy has remediated the soils to a level acceptable for the intended end use of the Site (based on Site specific criteria). If found existing at the site, soil with contaminant concentrations exceeding EA agreed remedial targets would be excavated, separated, stockpiled and removed off site, via an approved waste contractor under the Duty of Care Regulations (Ref. 5-28).

**5.177** Any contaminated soil would be disposed of off-site at a landfill appropriate to the level of contamination present and the waste classification determined from chemical analysis or Waste Acceptance Criteria testing as necessary, to ensure compliance with the Landfill Regulations (Ref. 5-29).

**5.178** Key information on excavated and fill materials, which fall within the Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Code of Practice (version 2) (Ref. 5-30), will be registered with the CL:AIRE Register of Materials (Ref. 5-31) with the intention of linking up with other project partners and services providers to make the process quicker and easier to find 'homes' for reuse of the soil or fill materials.

**5.179** Should soil for off-site disposal be classified as hazardous waste, the Hazardous Waste Regulations 2005 (amended 2009) will be adhered to.

**5.180** The removal of contaminated soils associated with the preparatory ground works, basement and foundation excavations of the Proposed Development would result in **moderate beneficial** residual effects to the local environment, through reducing the net contaminant loading at the Site and surrounding area.

**5.181** With regard to potential risk of asbestos, in order to comply with statutory requirements, control risks to construction workers and to neighbours/general public during development, it will be necessary to inspect the existing structures prior to any refurbishment or demolition works for the possible presence of materials containing asbestos and also to control dust arising from the development works. A Type III asbestos survey will be undertaken prior to the demolition of the existing buildings to ascertain the extent.

**5.182** Advanced building surveys, including surveys on materials containing asbestos, will be carried out as part of the pre-demolition process. As necessary, asbestos will be appropriately removed and disposed of prior to the start of demolition or removed from building fabric in concurrence with demolition, as appropriate. The asbestos will be removed by a suitably qualified contractor and in accordance with the Hazardous Waste Regulations 2005 (as amended) and the Control of Asbestos Regulations 2012 (Ref. 5-32).

# 05 Demolition and Construction

**5.183** A number of additional mitigation measures are proposed to be adopted to avoid or reduce potential effects to human health (i.e. construction workers and to neighbours/general public) and the environment throughout the site preparation, demolition and construction works. Below is a summary of the measures proposed:

- Appropriate use of Personal Protective Equipment (PPE) and implementation and adherence to Health & Safety Protocols, Plans and Procedures. Demolition and construction workers will remain vigilant of ground conditions at all times and will report to the Principal Contractor, any suspect areas of potential contamination.
- During both the demolition and construction stages of work, the contractor/s will employ dust suppression measures when necessary to prevent the potential mobilisation of contaminated dust particles and their migration off site. Stockpiles and material handling areas will be kept as clean as practicable to avoid nuisance from dust. Dusty materials will be dampened down using water sprays in dry weather.
- All vehicles entering and leaving the site during the demolition and construction period will pass through a wheel washing facility. Vehicles used to transport materials and aggregates will be enclosed or covered in a tarpaulin. Access roads will be regularly cleaned and damped down with water and vehicle movements will be kept to a minimum and vehicle speeds within the site will be limited.
- Dust generating equipment e.g. mobile crushing and screening equipment will be located to minimise potential nuisance effects to receptors, as far as practicable.
- Any waste effluent will be tested and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor/s.
- The appropriate utility company will be consulted on the potential requirement for an oil interceptor at the point where site surface water runoff enters the sewerage network.
- Oils and hydrocarbons will be stored in designated locations with specific measures to prevent leakage and release of their contents, include the siting of storage area away from surface water drains, on an impermeable base with an impermeable bund that has no outflow and is of adequate capacity to contain 110% of the contents.
- A spillage Emergency Response Plan (ERP) will be produced, which site staff will be required to have read and understood. On-site provisions will be made to contain a serious spill or leak through the use of booms, bunding and absorbent material.
- After removal of any fuel tanks, samples of soil and groundwater (if present) will be taken from beneath the tanks' location to check for possible contamination. Where contamination is found, the ground will be selectively excavated for disposal off-site or remediated.
- Appropriate handling and disposal of pile arisings, concrete, pastes and/or grouts during the laying of foundations.
- Screening for unexploded ordnance (UXO), in areas not covered in any previous munitions clearance surveys, will be undertaken by the contractor/s. An Explosive Ordnance Threat Assessment (EOTA) will be implemented prior to demolition and construction works being started. This may include additional mitigation measures such as site attendance of a specialist UXO subcontractor and a geophysical survey. A watching brief for UXO will be maintained during excavation works.
- An assessment for the potential for ground gas and volatile vapours will be completed during the further intrusive site investigation work. If necessary, gas and vapour monitoring of confined spaces, together with appropriate supervision and Confined Space Entry (CSE) training for site personnel will be adopted.

**5.184** Health and Safety procedures appropriate to the contamination status of the site will be implemented during demolition and construction and so will mitigate the potential impact of land contamination to all relevant receptors identified throughout this impact assessment.

**5.185** The mitigation measures discussed above will be managed through a Demolition and Construction Environmental Management Plan (DCEMP); Site Waste Management Plan (SWMP); Emergency Response Plan (ERP); and Health and Safety Plans (H&SP). These plans will all be completed by the Principal Contractor/s and sub-contractors prior to demolition and construction activities and agreed with the LBTH.

The mitigation measures implemented will be reviewed regularly to best suit the practices being undertaken across the Site.

## *Water Resources*

**5.186** Environment Agency Maps show that there are no major surface water courses located within 1km radius of the Site. The nearest surface water feature to the Site is the River Thames, which is located approximately 1.7 km South of the Site.

**5.187** The assessment of potential effects of the Proposed Development on water resources is presented within **Chapter 13: Water Resources, Drainage and Flood Risk** of this ES. A number of demolition and construction mitigation measures have been proposed and can be found in more detail within this chapter.

**5.188** In summary, surface drainage, ground water seepage, and any dewatering will pass via settlement tank facilities to the foul water sewer. Discharge arrangements into the foul water sewer will be agreed with Thames Water Utilities Limited (TWUL). All existing utilities will be identified and marked before works commence, with the use of signs to warn of their presence. Damage to existing infrastructure would be immediately repaired, and an ERP will be produced to contain leaks and spills.

**5.189** All liquids and solids of a potentially hazardous nature (e.g. diesel fuel, oils and solvents) will be stored on surfaced areas, with bunding, in accordance with the EA's requirements.

**5.190** The Principal Contractor will ensure that any water that may have come into contact with contaminated materials, will be disposed of in accordance with the Water Resources Act (1991) (Ref. 5-33) and other relevant legislation, and to the satisfaction of the EA and/or TWUL.

**5.191** All relevant contractor will be required to investigate opportunities to minimise and reduce the use of water, such as:

- Implementation of staff based initiatives such as turning off taps when not in use, both on site and within site offices;
- Use of recycling water systems such as wheel washes; and
- Use of a rainwater harvesting system, for use in equipment and vehicle washing, will also be investigated.

**5.192** The water consumption of the project will be monitored, either through sub-metering or reading of utility bills, to allow comparison against best practice benchmarks and improvements to be made.

## *Archaeology*

**5.193** Based on the results and conclusions of the archaeological impact assessment (**Chapter 14: Archaeology**), a phased programme of archaeological investigation will be undertaken across the Site and measures to be implemented to protect sub-surface archaeological deposits, including the Scheduled Ancient Monument, during excavation and construction works.

**5.194** A programme of phased archaeological investigation and recording will be undertaken. The following is a summary of the mitigation measures proposed for each area:

### *S1, S1a, S1b*

**5.195** As archaeological evaluations have already been undertaken, it is recommended that the most appropriate investigation strategy would entail targeted archaeological excavation prior to development. This might be combined with a watching brief during ground works for remains of lesser significance.

### *S2*

**5.196** Further investigation is required prior to the determination of planning application, in order to clarify the nature, survival and significance of any archaeological assets that may be affected. It is recommended that the most appropriate investigation strategy is likely to entail archaeological evaluation trenches/pits. A preliminary investigation including the archaeological monitoring of geotechnical pits dug for engineering purposes could also be undertaken.

# 05 Demolition and Construction

S3

- 5.197** It is recommended that the most appropriate investigation strategy is likely to entail archaeological evaluation trenches/pits. A preliminary investigation could also include the archaeological monitoring of geotechnical pits dug for engineering purposes.
- 5.198** The results of evaluations in both S2 and S3 would enable an appropriate final mitigation strategy, as part of an archaeological condition to the planning consent, to be drawn up. This would comprise the preservation in situ of remains of very high (national) significance and/or preservation by record through an archaeological intervention to a level appropriate to the asset's significance. A watching brief during ground works for remains of lesser significance may also be required.
- 5.199** Under the provisions of the Ancient Monuments and Archaeological Areas Act 1979 (as amended), scheduled monument consent (SMC) must be obtained for plots S1, S1a, S1b and S3, separately from any planning permissions, before any works take place which affect the scheduled area.
- 5.200** If Scheduled Monument Consent is granted, a condition of archaeological mitigation is likely to be applied, drawn up by the Inspector of Ancient Monuments, together with the LBTH and its archaeological advisors. Any archaeological work would need to be undertaken in consultation with the local authority's archaeological advisor and English Heritage with regards to SMC for plots S1, S1a, S1b and S3, in accordance with an approved archaeological Written Scheme of Investigation (WSI).

## Ecology

- 5.201** An extended Phase 1 habitat survey was undertaken in 6<sup>th</sup> September 2013 (refer **ES Volume III: Appendix A**) to identify, characterise and map the habitats within the Site. The Site was found to be generally of negligible ecological value.
- 5.202** The Site and its immediate surrounds have a limited potential for most protected species, due to the lack of suitable habitat, and the Site's poor connectivity to suitable natural or semi-natural habitats in the wider landscape. It is considered unlikely that the Proposed Development would have any effects upon statutory designated sites.
- 5.203** If any ecological issues are identified during the course of project activities, consultation with the relevant statutory and advisory bodies such as Natural England (NE) and the EA will be undertaken.

## Energy

- 5.204** All relevant contractors will be required to investigate opportunities to minimise and reduce the use of energy and water, such as:
- Use of alternatives to diesel / petrol powered equipment where possible;
  - The incorporation of sources of renewable energy, to offset the use of main utilities, will be considered;
  - Selection and specification of energy efficient plant and equipment wherever viable; and
  - Implementation of staff based initiatives such as turning off plant and equipment when not in use, both on-site and within site offices..
- 5.205** The energy consumption of the project will be monitored, either through sub-metering or reading of utility bills, to allow comparison against best practice benchmarks and improvements to be made.

## Cumulative Effect

- 5.206** It is considered that the demolition and construction phase will have the greatest potential to contribute to cumulative effect interactions. During the demolition and construction phase, potential effects exist for the sensitive receptors (identified within **Chapter 2: EIA Methodology** of this ES).
- 5.207** The receptors considered to be most sensitive to cumulative effects during the demolition and construction phase are pedestrians on the surrounding, residents at neighbouring sites and visitors and employees of neighbouring commercial premises. The criteria for identifying those receptors that are considered to be potentially sensitive include the nature of the receptor, proximity to the works, and extent of exposure to

effects and effect interactions. Key potential effect interactions are largely related to traffic, air quality and noise.

- 5.208** It is not unusual for construction to take place on more than one site in proximity to each other; however, in this instance there will likely be several cumulative schemes (as defined within **Chapter 2: EIA Methodology** of this ES), that may be under construction at the same time as the Proposed Development.
- 5.209** The Principal Contractor will meet with neighbouring developers of other construction schemes and LBTH prior to works being undertaken on-site to discuss potential clashes and to mitigate the impact, if necessary. The Principal Contractor will consult in relation to the programme and potential for local impacts during the construction phase to ensure that works are planned so as not to cause unnecessary disruption..
- 5.210** Each technical chapter of this ES includes a summary of cumulative effects from sources such as other construction sites (cumulative schemes are defined within **Chapter 2: EIA Methodology** of this ES) and **Chapter 16: Effect Interactions** presents a summary of the combined impact of different types of effects (e.g. noise, air and traffic) upon a single receptor.

## References

- Ref. 5-1 London Borough of Tower Hamlets, (2006); The Code of Construction Practice.
- Ref. 5-2 Waste Resources Action Programme (WRAP), (2013); Halving Waste to Landfill. Accessed at: <http://www.wrap.org.uk/content/what-halving-waste-landfill>
- Ref. 5-3 Department for Environment, Food and Rural Affairs (DEFRA), (2013); The Waste Management Plan for England 2013.
- Ref. 5-4 Her Majesty's Stationary Office (HMSO), (2013). The Environmental Permitting (England and Wales) (Amendment) Regulations.
- Ref. 5-5 HMSO, (2012); The Waste (England and Wales) (Amendment) Regulations.
- Ref. 5-6 HMSO, (2006); The Waste Management (England and Wales) Regulations.
- Ref. 5-7 HMSO, (2005); Clean Neighbourhoods and Environment Act 2005.
- Ref. 5-8 Environment Agency (EA), (2004); Framework for the Classification of Contaminated Soils in Hazardous Wastes.
- Ref. 5-9 EA, (2010); Waste Acceptance at Landfills: Guidance on waste acceptance procedures and criteria.
- Ref. 5-10 British Standards Institution (BSI), (2011); BS 10175:2011 Investigation of Potentially Contaminated Sites: Code of Practice
- Ref. 5-11 EA, (2011); London State of the Environment Report.
- Ref. 5-12 Construction Logistics and Cycle Safety, (2014); Standard for Construction Logistics.
- Ref. 5-13 Greater London Authority (GLA), (2014); Sustainable Design and Construction Supplementary Planning Guidance (SPG).
- Ref. 5-14 GLA, (2014); The Control of Dust and Emissions during Demolition and Construction SPG
- Ref. 5-15 Considerate Contractors Scheme, (2013); Code of Considerate Practice.
- Ref. 5-16 EA, (2007); Vehicle Washing and Cleaning: Pollution Prevention Guidelines (PPG) 13
- Ref. 5-17 EA, (2011); Dealing with Spills: PPG 22
- Ref. 5-18 British Standard Institute (BSI), (2009); BS 5228 2009+A1:2014 – Noise and Vibration Control on Construction and Open Sites.
- Ref. 5-19 HMSO, (1974); Control of Pollution Act. Part III. Chapter 40
- Ref. 5-20 HMSO, (1990); Environmental Protection Act.
- Ref. 5-21 HMSO, (1995); Environment Act.
- Ref. 5-22 HMSO, (2005); Hazardous Waste (England and Wales) Regulations 2005 (Amended 2009).
- Ref. 5-23 NOC, (2009); Waste Regulations.
- Ref. 5-24 HMSO, (2010); Environmental Permit Regulations.
- Ref. 5-25 DEFRA, (2000); National Waste Strategy (for England and Wales).

# 05 Demolition and Construction

- Ref. 5-26 AKT-II, (2014); Preliminary Contamination Assessment Report.
- Ref. 5-27 EA, (2009); Land Contamination: Soil Guideline Values (SGVs).
- Ref. 5-28 HMSO, (2003); The Environmental Protection (Duty of Care) (England) (Amendment) Regulations.
- Ref. 5-29 HMSO, (2005); The Landfill (England and Wales) (Amendment) Regulations 2005.
- Ref. 5-30 Contaminated Land: Applications in Real Environments (CL:AIRE), (2001); Definition of Waste: Code of Practice (Version 2).
- Ref. 5-31 CL:AIRE, (2013); Code of Practice and Cluster Register of Materials and Sites.
- Ref. 5-32 HMSO, (2012); The Control of Asbestos Regulations.
- Ref. 5-33 HMSO, (1991); Water Resources Act.