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Site Waste Management Plan (SWMP)

The Former Stag Brewery, Mortlake

Reselton Properties Limited

February 2018

Quality information

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Revision History

Revision	Details	Updated By	Position	Name	Position
1	Update Figures, Plans and Waste Quantities	Nafey Bin Afan	Waste Consultant	Kat Lees	Associate Director

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1. Introduction

1.1 AECOM Infrastructure and Environment UK Limited ('AECOM') has been appointed by Reselton Properties Limited (hereby referred to as the 'Applicant') to prepare a Site Waste Management Plan (SWMP) (hereby referred to as Plan) in support of the hybrid planning application for The Former Stag Brewery, Mortlake Development (hereby referred to as the 'Proposed Development') located within the administrative boundary of London Borough of Richmond upon Thames (LBRuT).

1.2 The former Stag Brewery Site is bounded by Lower Richmond Road to the south, the river Thames and the Thames Bank to the north, Williams Lane to the east and Bulls Alley (off Mortlake High Street) to the west. The Site is bisected by Ship Lane. The Site currently comprises a mixture of large-scale industrial brewing structures, large areas of hardstanding and playing fields.

1.3 The redevelopment will provide residential units (including affordable units), a care village for the older population, complementary commercial uses, community facilities, a new secondary school alongside new open and green spaces throughout. Associated highway improvements are also proposed, which include work at Chalker's Corner junction.

1.4 The Hybrid Planning Application for the Proposed Development has been divided into three applications:

- Hybrid Application A - hybrid planning application for comprehensive mixed-use redevelopment of the former Stag Brewery site consisting of:
  - Land to the east of Ship Lane applied for in detail (referred to as 'Development Area 1' throughout); and
  - Land to the west of Ship Lane (excluding the school) applied for in outline detail (referred to as 'Development Area 2' throughout).
- Detailed Application B (School) - detailed planning application for the school (on land to the west of Ship Lane).
- Detailed Application C (Chalker's Corner) - detailed planning application for highways and landscape works at Chalker's Corner.

1.5 The Planning Application relates to:

Application A: Mixed Use

Hybrid application to include the demolition of existing buildings to allow for the comprehensive phased redevelopment of the site:

Planning permission is sought in detail for works to the east side of Ship Lane which comprise:

a) Demolition of existing buildings (except The Maltings and the façade of the Bottling Plant and former Hotel), walls, associated structures, site clearance and groundworks

b) Alterations and extensions to existing buildings and erection of buildings varying in height from 3 to 8 storeys plus a single storey basement

c) 443 residential apartments

d) Flexible use floorspace for:

i. Retail, financial and professional services, café/restaurant and drinking establishment uses

ii. Offices

iii. *Non-residential institutions and community use*

iv. *Boathouse*

e) *Hotel / public house with accommodation*

f) *Cinema*

g) *Gym*

h) *Offices*

i) *New pedestrian, vehicle and cycle accesses and internal routes, and associated highway works*

j) *Provision of on-site cycle, vehicle and service parking at surface and basement level*

k) *Provision of public open space, amenity and play space and landscaping*

l) *Flood defence and towpath works*

m) *Installation of plant and energy centres*

Planning permission is sought in outline with all matters reserved for works to the west of Ship Lane which comprise:

a) *The erection of a single storey basement and buildings varying in height from 3 to 7 storeys*

b) *Residential development of up to 224 units*

c) *Nursing and care home (up to 80 ensuite rooms) with associated communal and staff facilities*

d) *Up to 150 units of flexible use living accommodation for either assisted living or residential use*

e) *Provision of on-site cycle, vehicle and service parking*

f) *Provision of public open space, amenity and play space and landscaping*

g) *New pedestrian, vehicle and cycle accesses and internal routes, and associated highway works*

Application B: School

a) *The erection of a three storey building to provide a new secondary school with sixth form;*

b) *Sports pitch with floodlighting, external MUGA and play space; and*

c) *Associated external works including, landscaping, car and cycle parking, new access routes and associated works.*

Application C: Chalker's Corner

Reconfiguration of Chalker's Corner traffic junction, to include existing public highway and existing landscaped and informal parking area associated to Chertsey Court, to facilitate alterations to lane configuration, a new cycle lane, works to existing pedestrian and cycle crossing, soft landscaping and replacement boundary treatment to Chertsey Court.

1.6 The principal aim of this Plan is to demonstrate how the Proposed Development has taken into account sustainable methods for managing waste arisings during the Construction, Demolition and Excavation (CD&E) phases. This Plan has the following aims:

- To contribute towards achieving emerging, current and long-term government, Greater London Authority (GLA) and LBRuT targets for waste minimisation, recycling and re-use of CD&E waste arisings and materials;
- To assist the Principal Contract to comply with all applicable legal requirements for handling CD&E waste; and
- To enable the Principal Contractor, achieve high standards of waste management performance.

1.7 The CD&E period covered within this Plan is anticipated to commence in June 2019 and are scheduled for completion in September 2027.

1.8 Documents that will include information regarding the logistical arrangement on Site and details regarding the CD&E activities on Site will be submitted along with this Plan.

1.9 Due to the Hybrid nature of the planning application, this Plan will contain reference to the information available at the time of writing, which may be high level. However, this Plan will be updated, or form the basis of a revised SWMP at the post-planning stage as further information relating to CD&E phases (i.e. material quantities, methods, logistics etc.) of the Proposed Development becomes available and confirmed.

1.10 This Plan has been written by AECOM, using information provided by Squire and Partners (hereafter referred to as the 'Architects'), Gardiner and Theobald (hereafter referred to as the 'Quantity Surveyors') and the wider design team. This Plan should be read in conjunction with the Framework Construction Method Statement submitted in support of this Planning Application which provides context to the CD&E works for the Proposed Development.

Requirement for a SWMP

1.11 Whilst the Site Waste Management Plan (SWMP) Regulations (2008) (Ref. 1) were revoked as of December 2013 (Ref. 2), producing a SWMP or similar document, such as a Construction Resource Management Plan (CRMP) for new development is considered best practice. Furthermore, information pertaining to the recycling and disposing of waste arising from CD&E activities is requested within the LBRuT's Validation Checklist (Ref. 3).

1.12 This Plan has therefore been prepared in-line with applicable policy and guidance at a national (England), regional (London), district (West London Waste Authority (WLWA)) and local (LBRuT) scale. Additionally, all waste reduction measures and the management and storage of recyclable CD&E materials and waste have been considered in line with the requirements and standards set out in The Waste (England and Wales) Regulations 2011 (as amended) (Ref. 4).

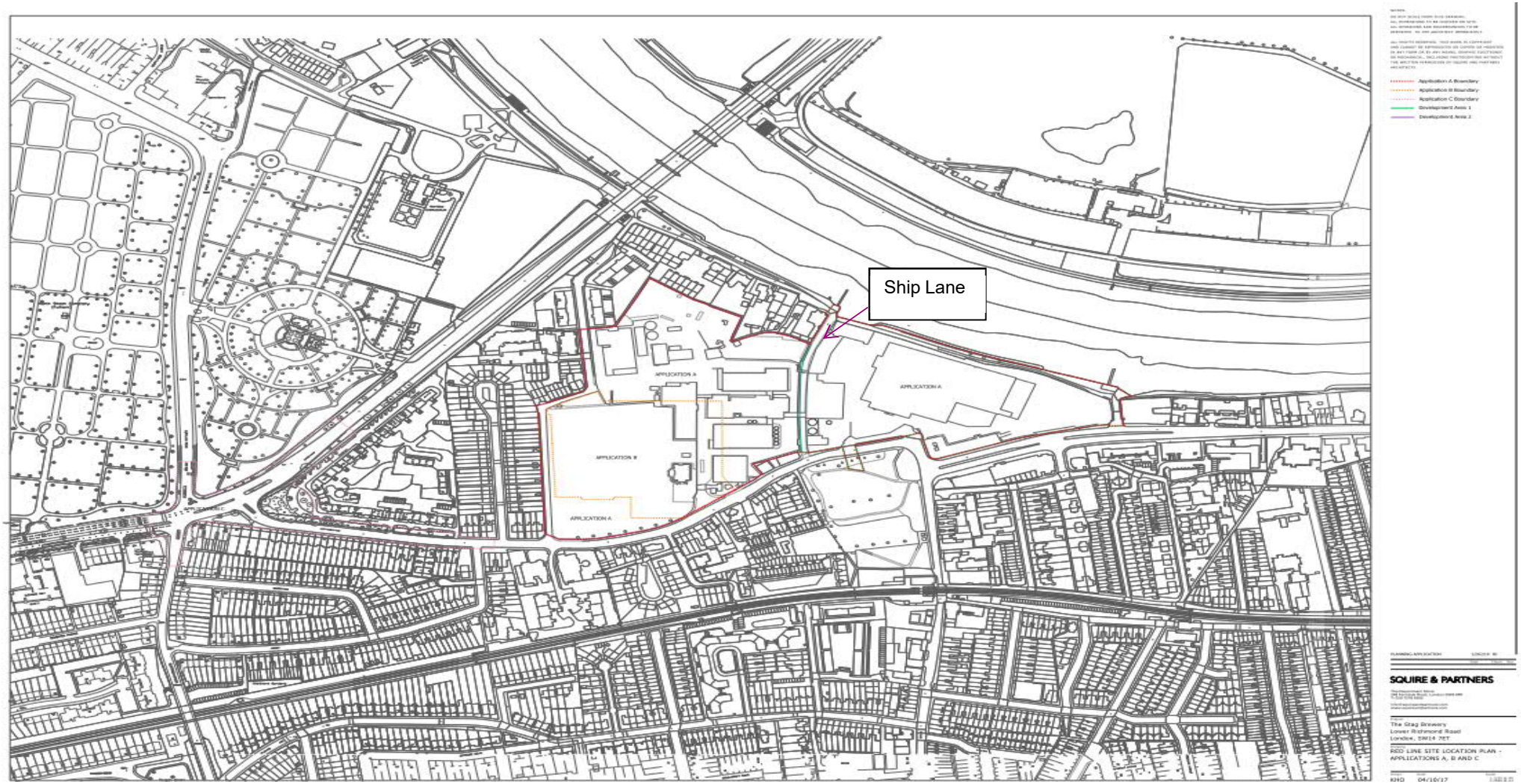
Site Context

1.13 The former Stag Brewery Site is bounded by Lower Richmond Road to the south, the river Thames and the Thames Bank to the north, Williams Lane to the east and Bulls Alley (off Mortlake High Street) to the west. The Site is bisected by Ship Lane. The Site currently comprises a mixture of large-scale industrial brewing structures, large areas of hardstanding and playing fields.

1.14 The Site extends to circa 8.6 hectares (ha) (21.2 acres) and is divided into two areas (Development Area 1 and Development Area 2) by Ship Lane, which runs north - south through the centre of the Site, as demonstrated in Figure 1.

1.15 The eastern portion (Development Area 1) of the Site measures approximately 3.57 ha, whilst the western portion (Development Area 2-excluding the school site) measures approximately 3.5 ha. The existing Site level is approximately 5 m to 6 m above ordnance datum (AOD), with the highest level to the west falling to the east.

Figure 1 Red Line Boundary



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1.16 The Site is currently occupied by several redundant buildings and structures, ranging between two to ten (plus) storeys, associated with the brewing process previously undertaken on Site. There is also a private playing field located in the south-west corner of the Site. The existing buildings on Site cover an area of approximately 393,322 square foot (sq. ft.)/36,541 square metre (sq.m) Gross Internal Area (GIA). The existing Site layout is demonstrated in Figure 2 and the areas of the existing buildings on Site are set out in Table 1.

Figure 2 Existing Site Layout

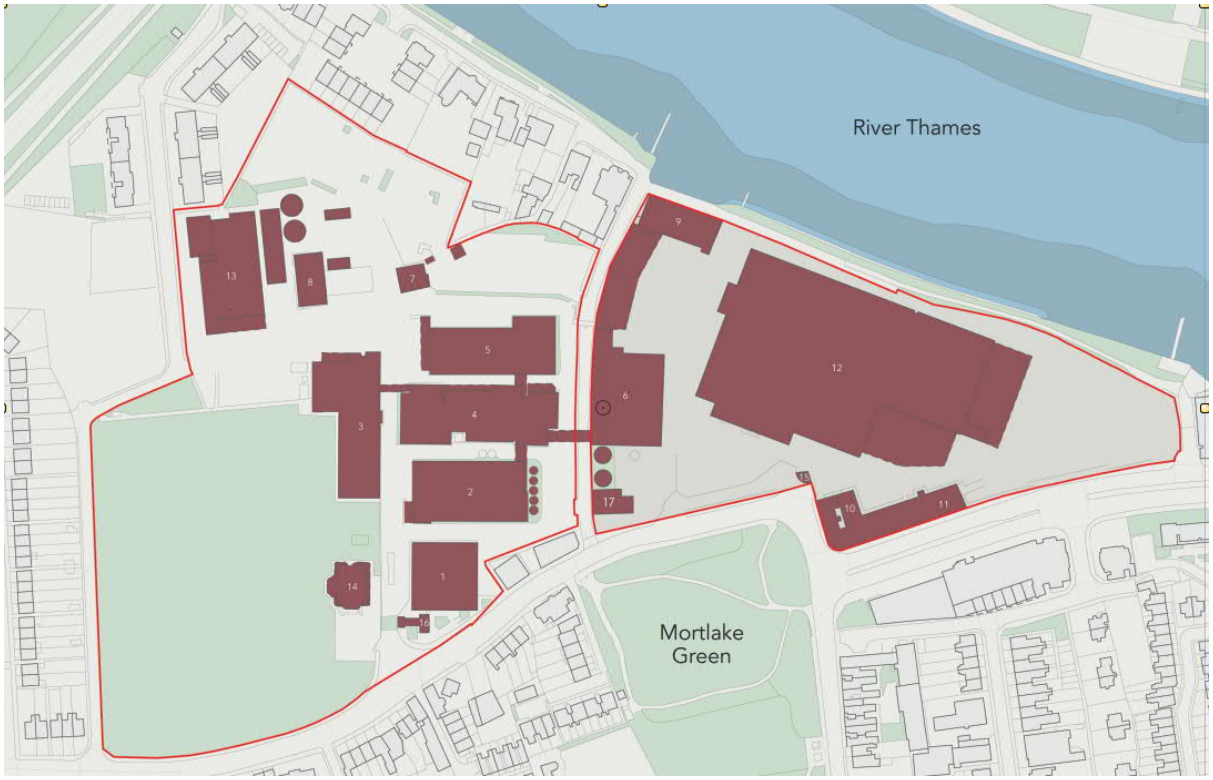

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Table 1 Existing Buildings on Site

Building Name	Building No.	Max Height (m)*	Number of Storeys	Gross Internal Area (GIA) m^2
P.O.B (office)	1	16	4	2,221
Brewhouse	2	24	6	4,645
Process Building	3	26	8	3,705
Chip Cellar	4	28.5	6	2,923
Finishing Cellar	5	25	4	2,153
Power House	6	25	4	2,627
Powder Store	7	5	1	168
Effluent Treatment	8	8	2	330
Maltings	9	27.5	4	2,222
(Former) Hotel	10	11	4	3,085
(Former) Bottling Hall	11	13.5	1	70
Packaging	12	12	2	9.440
Stable Court	13	12	5	2,110
Sports Club	14	8	2	549
East Gatehouse	15	5	1	24
West Gatehouse	16	5	1	72
Building 17	17	5	1	196

** Where building heights have not been provided these have been calculated as 5 m for the ground floor and 3 m per storey above ground*

2. Legislation and Planning Policy

National Legislation

2.1 Waste legislation considered relevant to the Proposed Development during the DE&C phases is set out as follows:

- Clean Neighbourhoods and Environment Act 2005 (Ref. 5);
- Control of Pollution (Amendment) Act (COPA) 1989 (Ref. 6);
- The Controlled Waste (England and Wales) (Amendment) Regulations 2012 (Ref. 7);
- Environment Act 1995 (Ref. 8);
- The Environmental Permitting (England and Wales) Regulations 2016 (Ref. 9);
- Environmental Protection Act 1990 (EPA) (Ref. 10);
- The Waste (England and Wales) Regulations 2011 (as amended);
- The Waste (England and Wales) (Amendment) Regulations 2014 (Ref. 11);
- The Hazardous Waste (England and Wales) (Amendment) Regulations 2016 (Ref. 12);
- The Landfill Tax 1996 (Ref. 13), (Amendment) Regulations 2017 (Ref. 14);
- The List of Wastes (England) (Amendment) Regulations 2005 (Ref. 15);
- The Packaging (Essential Requirements) Regulations 2015 (Ref. 16);
- The Pollution Prevention and Control (Fees) (Miscellaneous Amendments) Regulations 2017(Ref. 17);
- The Producer Responsibility Obligations (Packaging Waste) (Amendment) Regulations 2017 (Ref. 18);
- The Waste Batteries and Accumulators (Amendment) Regulations 2015 (Ref. 19);
- The Waste Electrical and Electronic Equipment (WEEE) Regulations 2015 (Ref. 20); and
- The Waste Management (England and Wales) Regulations 2006 (Ref. 21).

National Planning Policy

National Planning Policy Framework (2012)

2.2 The National Planning Policy Framework (NPPF) (Ref. 22) outlines the Government's planning policies for England and how they are expected to be applied. The NPPF does not contain specific waste policies; instead, national waste planning policy is contained within the Planning Practice Guidance (Ref. 23), Waste Management Plan for England (2013) (Ref. 24), and the National Planning Policy for Waste (2014) (Ref. 25).

Planning Practice Guidance (2014)

2.3 Planning Practice Guidance (PPG) provides a web-based resource in support of the NPPF. There are two guidance documents that are relevant to waste, 'Design' (Ref. 26) and 'Waste' (Ref. 27). However, no specific policies or requirements are outlined pertaining directly to the management of CD&E waste management.

Waste Management Plan for England (2013)

2.4 The Waste Management Plan for England is a high-level document, which outlines the steps required to move towards a zero-waste economy, as part of the transition to a sustainable economy.

2.5 The Waste Management Plan fulfils the Waste Framework Directive (WFD) Article 28 mandatory requirements (Ref. 28), and other required content as set out in Schedule 1 to the Waste (England and Wales) Regulations 2011 as amended. The Waste Management Plan provides an analysis of current waste management practices in England and evaluates implementation of the objectives and provisions of the revised WFD.

National Planning Policy for Waste (2014)

2.6 The National Planning Policy for Waste provides the planning framework to enable Local Authorities to put forward, through local waste management plans, strategies that identify sites and areas suitable for new or enhanced facilities to meet the waste management needs of their areas. Information is also included concerning non-waste developments, including any development whose end function is not directly related to waste. Waste developments include: landfills; waste disposal; waste treatment; waste recycling plants; and Household Waste Recycling Centres (HWRCs).

2.7 The National Planning Policy for Waste states that when determining planning applications for non-waste developments, Local Authorities should ensure that:

- "*the likely impact of proposed, non-waste related developments on existing waste management facilities, and on-sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the Waste Hierarchy and/or the efficient operation of such facilities; and the handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal.*"

Regional Policy and Guidance

The London Plan, (2016) The Spatial Development Strategy for London Consolidated with Alterations Since 2011

2.8 The London Plan (Ref. 29) outlines the Mayor's commitment to making better use of waste and its management, in an attempt to reduce London's impact on climate change, such as exploiting opportunities to utilise energy from waste (EfW). The London Plan describes waste as a valuable resource, which can be exploited for London's environmental, economic and social benefit.

2.9 The London Plan contains four policies which are relevant to CD&E waste and are outlined in Table 2.

Table 2 The London Waste Management Policies

Policy	*Description*
Policy 5.3 Sustainable Design and Construction	States that the highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime. This should be achieved through a number of sustainable design principles, including minimising the generation of waste and maximising re-use and recycling.
Policy 5.16 Waste Net Self-sufficiency	States that the Mayor will work with various stakeholders and authorities to manage as much of London's waste within London as practicable, working towards managing the equivalent of 100% of London's waste within London by 2026, whilst also working towards zero biodegradable or recyclable waste sent to landfill. This should be achieved by a number of ways, including minimising waste, encouraging the reuse of materials, exceeding recycling/composting levels in local authority collected waste (LACW) and commercial and industrial waste, improving London's net self-sufficiency, through reducing the proportion of waste exported from the capital over time, and working with neighbouring regional and district authorities to co-ordinate strategic waste management across the greater south east of England.
Policy 5.18 Construction, Excavation and Demolition Waste	States that waste should be removed from construction sites, and materials should be brought to the site, by water or rail transport wherever that is practicable.
Policy 5.19 Hazardous Waste	States that there is a capacity gap for dealing with London's hazardous waste and identifies the need for hazardous waste treatment sites.

District (WLWA) Policy

West London Waste Plan 2014

2.10 The WLWA is a statutory waste disposal authority (WDA) comprised of the London Boroughs of Brent, Ealing, Harrow, Hillingdon, Hounslow and Richmond upon Thames. In 2014 the WLWA published the West London Waste Plan (WLWP), which provides a planning framework for the management of all waste produced in the six constituent boroughs. Policy WLWP 5 – Sustainable Site Waste Management (Ref. 31) sets out support for "*the use of local, reclaimed, renewable, recycled and low environmental impact materials in construction and estate management*." Policy WLWP 5 also states that these details should be considered and included within the sustainable design and construction statement and the Site Waste Management Plans. Furthermore, Policy WLWP 5 sets out the following targets:

- "*At least 10% of materials or products used in the construction and / or operation of the development are re-used or recycled and sourced from within 100km from the site, where available and appropriate; and*
- *Construction, demolition and excavation wastes are reused or recycled on site, where practicable and environmentally acceptable*."

Local Policy

LBRuT Core Strategy (2009)

2.11 The LBRuT's Core Strategy (Ref. 32) includes Policy CP6: Waste, which details objectives for sustainable waste management. Additionally, under Policy CP5: Sustainable Transport it is stated that where practicable, river transport will be encouraged and that this may be particularly appropriate for the transport of construction or waste materials, depending on the feasibility of access to the river.

LBRuT Development Management Plan (2011)

2.12 The LBRuT's Development Management Plan (Ref. 33) includes Policy DM SD 1: Sustainable Construction, which states that:

- "*All development in terms of materials, design, landscaping, standard of construction and operation should include measures capable of mitigating and adapting to climate change to meet future needs; and All new buildings should be built to a standard which minimises the consumption of resources during construction and thereafter in its occupation*."

LBRuT Final Draft of Local Plan (Publication Version-2018)

2.13 The LBRuT's Final Draft of Local Plan (Publication Version) (Ref. 34) includes Policy LP 45: Parking and Servicing: Freight and Servicing, which states that:

- "*New major development which involves freight movements and has servicing needs will be required to demonstrate through the submission of a Delivery and Servicing Plan and Construction and Logistic Plan that it creates no severe impacts on the efficient and safe operation of the road network and no material harm to the living conditions of nearby residents*."

3. The Proposed Development

3.1 The Proposed Development will constitute a Gross External Area (GEA) of 168,847 m^2 as set out in Table 3.

Table 3 Area Schedule for the Proposed Development

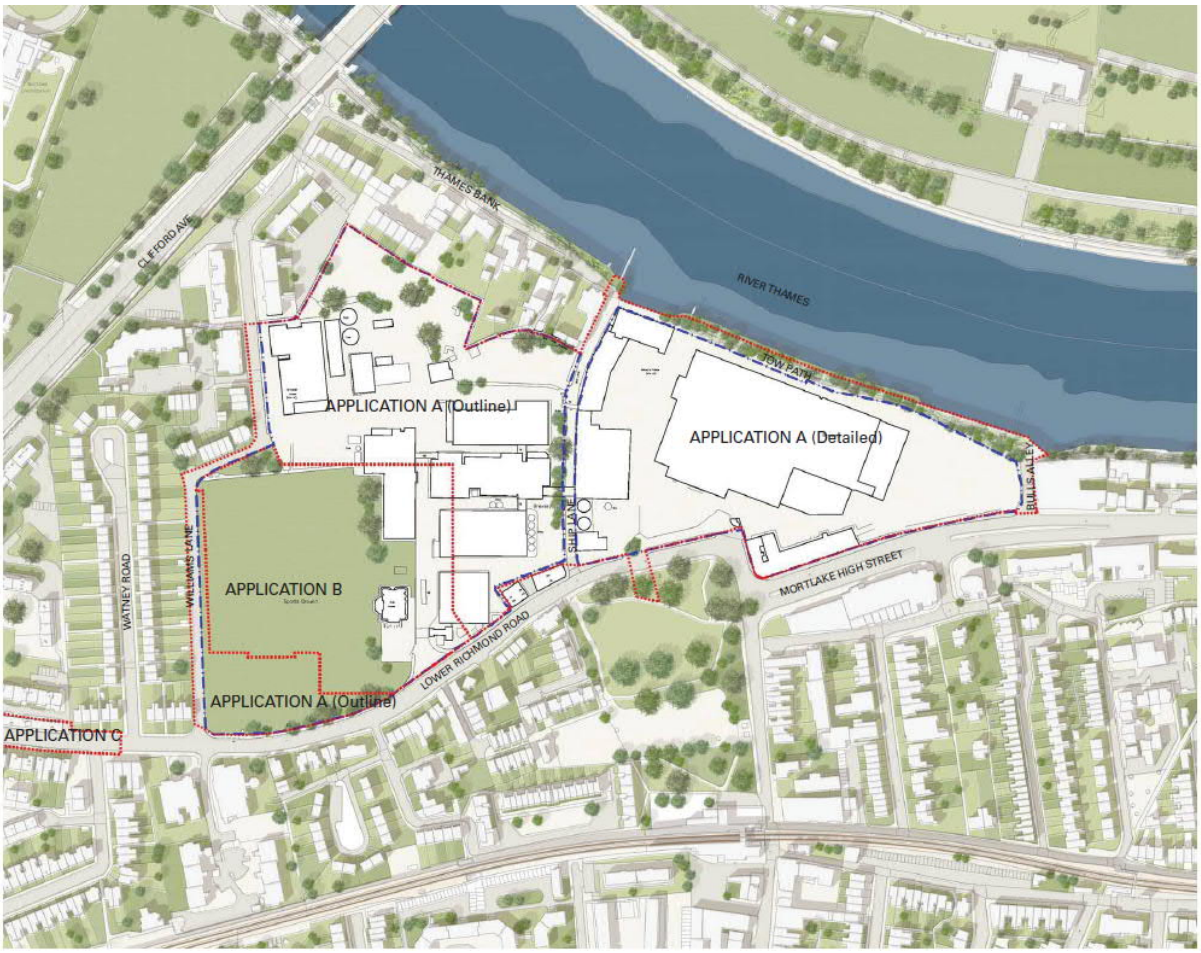
Application	*Total Area GEA(m^2)*
Application A –Detailed and Outline	157,417 m^2
Application B- School	11,430 m^2
Overall Total	***168,847 m^2***

3.2 Table 4 provides the Site Areas based on the applications.

Table 4 Red Line Site Areas for all Application

Application	*Total Area (m^2)*
Application A –Detailed and Outline	92,454.3 m^2
Application B- School	21,797.5 m^2
Application C – Chalker's Corner	15,163.2 m^2
Overall Total	***129,415 m^2***

Figure 3 Current Plots and Application Diagram



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4. Demolition, Excavation and Construction Waste

Methodology

Construction Waste

4.1 Initial estimates of the quantities of material likely to be required during the construction phase have been calculated based on the total Gross External Area (GEA) of each land use class within the Proposed Development. It should be noted that the quantities of materials required during the construction phase will be refined and confirmed at the detailed design stage post-planning. The quantities and materials of construction waste and materials have been estimated based on Building Research Establishment (BRE) Smartwaste (Ref. 37) and Waste and Resource Action Plan (WRAP) data (Ref. 38). The quantities of materials required during the construction phase will be refined and confirmed at the detailed design stage post-planning.

4.2 It is difficult to calculate the precise waste quantities arising from these construction materials. In a best-case scenario, all construction materials would be utilised; however due to over ordering of materials and poor storage of these materials (amongst some of the most common reasons for construction material wastage), this is not often the case. The estimated waste arising from the construction and refurbishment of the Proposed Development is dependent upon several factors, including construction methodologies, and the nature of the materials used. However, BRE Benchmark Data (Ref. 37) provides an estimation of the tonnes of construction waste per 100 m^2 of materials used, as demonstrated in Table 5.

Table 5 Average Tonnes per m^2 of New Build Developments – Taken from BRE Benchmark Data

Land Use Class	*Average Tonnes per m^2*
Residential*	16.8
Education	23.3

** In order to provide a reasonable worst-case ancillary land uses such as car parking, amenity, and plant and storage space have been calculated using the same assumption as residential land use classes.*

4.3 As well as the total quantity of construction waste material varying dependent on several factors, so does the composition of the construction waste stream. Studies conducted by WRAP (Ref. 39) have determined that the composition of construction waste arisings can vary widely, as demonstrated within Table 6.

Table 6 Indicative Construction Waste Stream Composition

Material	*Composition of Construction Waste Stream (%)*
Packaging (incl. wood pallets, cable drums, cases)	25 – 35
Plasterboard	5 – 36
Rubble – broken bricks, blocks, tiles etc.	25 – 40
Timber - (excludes pallets)	15 – 25
Cement and plaster	10 – 17
Insulation – rock wool and fibre glass	6 – 15
Metal	3 – 9
Dry concrete products – blocks, slabs etc.	2 – 12
Plastic products (excludes packaging)	1 – 11
Ceramic material	1 – 8

Demolition Waste

4.4 Demolition waste was calculated using the online Waste and Resources Action Programme (WRAP) Demolition Quantities Estimator (DQE) online tool (Ref. 35). Based on the external dimensions of the existing buildings to be demolished, the tool provided a breakdown per material of the likely tonnes of waste to be generated. The waste was broken down into the following materials:

- Concrete;
- Masonry;
- Aggregates;
- Ferrous;
- Non-ferrous;
- Timber;
- Glass;
- Plasterboard;
- Slates; and
- Miscellaneous.

Excavation Waste

4.5 Initial estimates of the quantities of material likely to be generated from the excavation of the Site have been provided by the Quantity Surveyors. The calculation of waste materials associated with excavation activities have been based on the approximate size of the basement. Land clearance (removal of the current hard standing) was also considered.

4.6 Appropriate bulking factor based on the Site geology (i.e. in this case a mixture of clay, gravel, spoil and chalk) has been used to provide an estimation of the excavation quantities. Considering a worst case scenario, an average of **1.75 tonnes** of excavated material per cubic metre of material removed was assumed for the excavated material (as London Clay (High Permeability Index (PI)) has a bulking factor of 1.4 with a conversion factor of 1.25 tonnes per cubic metre i.e. 1.75 tonnes per cubic metre (Ref. 36).

Anticipated Construction Waste: Quantities and Materials

4.7 Quantities of waste arising during the construction phase (broken down by construction material) have been estimated and are detailed within Table 7. Other waste types such as doors, frames, partitioning, fixtures and fittings etc. may also be generated, but quantities are not available at this stage.

4.8 Based on the assumption set out in Table 6 the total quantity of waste anticipated to be generated from the construction of the Proposed Development is approximately **29,109** tonnes (based on a GEA of 168,847 m^2). The precise composition and volume of this waste is likely to be dependent on a number of factors and will be further informed by the Principal Contractor, based on their experience on similar developments. At this stage, the estimates are high level, based on generic benchmark values. Table 7 provides the anticipated quantities/composition of waste materials like to arise.

Table 7 Anticipated Quantities of Waste Materials likely to Arise during the Construction of the Proposed Development

Material	*Composition of Construction Waste Stream (%)*	*Approximate Quantity of Total Tonnes of Waste Anticipated to Arise during Construction*
Packaging (incl. wood pallets, cable drums, cases)	25 – 35	7,278 - 10,188
Plasterboard	5 – 36	1,456 - 10,480
Rubble – broken bricks, blocks, tiles etc.	25 – 40	7,278 - 11,644
Timber - (excludes pallets)	15 – 25	4,367 - 7,278
Cement and plaster	10 – 17	2,911 - 4,949
Insulation – rock wool and fibreglass	6 – 15	1,747 - 4,367
Metal	3 – 9	874 - 2,620
Dry concrete products – blocks, slabs etc.	2 – 12	582-3,493
Plastic products (excludes packaging)	1 – 11	291 - 3,202
Ceramic material	1 – 8	291 - 2,329

Quantities of Demolition Waste Generated

4.9 Using the online WRAP Demolition Quantities Estimator tool, it is estimated that approximately **210,610 tonnes** of waste will be generated as a result of the demolition of the existing buildings on Site. The anticipated breakdown of this total is detailed within Table 8.

Table 8 Anticipated Quantities of Demolition Waste

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

Note: Quantities estimated using the WRAP Net Waste Tool based on the approximate length, width, and height of existing buildings.

4.10 In addition to the anticipated demolition waste quantities detailed within Table 8, waste materials are also expected to be produced by site clearance and excavation activities. Waste materials associated with excavation activities will arise through two main processes; bulk digging and piling. Excavation waste will predominantly comprise of topsoil, rubble, tarmac (from former hardstanding), gravel, clay and limited amounts of vegetation.

4.11 In addition, activities undertaken at Chalker Corner will result in approximately **298 tonnes** of waste generation (based on an assumed pavement depth of 0.13 m and 2.2 tonnes/m^3 conversion factor)

Anticipated Site Clearance and Excavation Waste: Quantities and Materials

4.12 Waste materials associated with excavation activities will arise through two main processes; bulk digging and piling. Excavation waste will predominantly comprise of topsoil, rubble, tarmac (from former hardstanding), gravel, clay and limited amounts of vegetation.

4.13 It is estimated that site clearance activities will be carried out on an approximate Site area of 60,995 m^2.

4.14 To provide an estimated tonnage for this material a conversion factor of 1.25 tonnes per m^3 has been applied to these quantities, based on a WRAP study conducted in 2014. Considering a worst-case scenario, approximately **38,881 tonnes** of material is like to arise as a result of site clearance activities.

4.15 In order to create a consistent Site level (i.e. to increase the ground floor levels to areas not above 0.55 m above the basement level), it is estimated that excavation activities will result in a total of approximately

163,652 m^3 of material to be removed from the Site. It is envisaged that of this total volume approximately **26,528 m^3** will be re-used on Site (for Site levelling purpose).

4.16 The solid geology at the Site is London Clay, which is estimated to be approximately 73 m thick. Beneath this is expected to be Lambeth Group (mottled clay with sand and pebble beds), and possibly Thanet Sand Formation (fine grained sand) and then Chalk bedrock.

4.17 As per a geological study carried out by the Transport Department (Ref. 36), London Clay has a bulking factor of 1.4 with a conversion factor of 1.25 tonnes per cubic metre(Ref. 40) i.e. 1.75 tonnes per cubic metre. Using the conversion factors, it can be estimated that **286,391 tonnes** of excavation waste is likely to be generated from the excavation of the foundation and basement, of this it is anticipated that **46,424 tonnes** will be reused on Site.

5. Site Waste Management

5.1 The Site Waste Management element of this SWMP details the likely waste management measures and procedures to be implemented on Site during the CD&E phases. Detailed information will be provided at subsequent stages by the Principal Contractor, once details and methods associated with the CD&E phases are known.

5.2 Where it is necessary to transport waste to and from the Site, transportation will comply with The Waste (England and Wales) Regulations 2011 (as amended) including: transporting waste via registered carriers, disposal to appropriately licensed sites and maintenance of appropriate waste transfer documentation.

5.3 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 (Ref. 41) through:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- Use of standard size components in design detailing to eliminate risk at source where possible to do so;
- The pre-assembly and pre-fabrication of elements wherever practicable to minimise waste generation on-Site;
- Attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- Re-use of materials wherever feasible, e.g. the Government has set broad targets for the use of reclaimed aggregate, and in keeping with best practice, contractors 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
- Burning of wastes or unwanted materials will not be permitted on-site.

5.4 The disposal of all waste or other materials removed from the Site will be undertaken in accordance with the requirements of the Environment Agency and applicable legal requirements. Any waste effluent will be tested and where necessary, disposed of at an appropriately licensed facility by a licensed specialist contractor.

5.5 The risk of infestation by pests or vermin on Site 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, LBRuT's environmental health officer will be consulted about the action to be taken.

5.6 An appropriate person (i.e. the Principal Contractor) will be responsible for confirming the exact details of on-Site waste management practices, in agreement with LBRuT. Further list of management measures which could be employed on the Site are detailed within Table 9.

Table 9 Recommended On-Site Waste Management Measures (Summary)

Waste Management Measure	*Waste Stream*	*Description*
Audit Trail: Transportation and Disposal	All waste streams	The Principal Contractor will dispose of all waste or other materials removed from the Site in accordance with the requirements of the Environment Agency (EA), Control of Pollution Act, 1974 (COPA), Environment Act, 1995, Hazardous Waste (Amendment) Regulations, 2016 and The Waste (England and Wales) Regulations 2011 (as amended). The Principal Contractor will provide evidence that all waste has been deposited or transferred to the correct place and by appropriately licensed contractors (i.e. an audit trail). Waste Transfer Notes will be used to document waste production within the confines of the Site and movement to external facilities. These notes will detail the type of waste, waste volume, waste classification, contractor and ultimate disposal route. Records will be updated documenting that all waste transferred or disposed has been correctly processed with evidence of signed waste transfer notes that will be kept on-site for inspection whenever requested.
Waste Disposal	All Waste Streams	The Principal Contractor will monitor the disposal of all waste or other materials removed from the Site in accordance with the requirements of the EA, Control of Pollution Act, 1974 (COPA), Environment Act, 1995, Hazardous Waste (Amendment) Regulations, 2016 and The Waste (England and Wales) Regulations 2011 (as amended).
Concrete Crushing and Reuse	Concrete and Brick	In keeping with guidelines set out by the Government for the reclaiming of aggregates, deconstructed concrete (if appropriate) will be taken off-site for crushing and reuse. Where practicable, all concrete and brick elements will pass through crushing machines and the residual material recycled for use on Site in line with best practice. In particular, this material could be used as pile matt material for other developments. Any crushed material not utilised on the Site will be segregated for removal off site. This material will be recycled where possible. A 95% recycling target could be aimed for during the demolition, excavation and construction phases in order to work towards the London Plan's 2020.
Appropriate Concrete Storage used to Minimise Dust and Reduce Vehicle Movement	Concrete	Any processed concrete material shall be stockpiled and any dust generated shall be controlled with covers or dampened with water.
Surface Drainage, Ground Waste Seepage and Dewatering of the Site	Liquid Waste	All surface drainage and dewatering of the Site will pass through a settlement tank prior to entering the foul water sewer. Discharge arrangements into the foul water sewer will be agreed with Thames Water Utilities Limited (TWUL). Discharge arrangements into the foul water sewer will be agreed with LBRuT and TWUL.
Liquid Disposal	Liquid Waste	The Principal Contractor will check that any water, which may have come into contact with contaminated materials, will be disposed of in accordance with the Water Resources Act 1991, and to the satisfaction of the EA or TWUL.

Waste Management Measure	*Waste Stream*	*Description*
Wheel Washers, Mechanical Road Sweeper/Cleaner and Rainwater Harvesting Systems	Liquid Waste	The use of recycling water systems such as wheel washers and rainwater harvesting systems for use in equipment and vehicle washing will be investigated in order to maximise reuse and reduce energy consumption. To minimise Site generated matter on roads and footpaths, the contractor could take measures to include the provision of suitable facilities at the Site gates. This could include the use of a mechanical road sweeper/cleaner. Collected debris would then be disposed of as controlled waste in accordance with The Waste (England and Wales) Regulations 2011 (as amended) at a licensed waste disposal facility.
Storage	All Waste Streams	The storage of potentially polluting plant and materials will be limited as far as possible. For example, plant could be re-fuelled from visiting fuel trucks rather than from on-site fuel bowsers. All spoil will also be stored on impermeable surfaced areas, with bunding, to the satisfaction of the EA in order to prevent potential contaminated material coming into contact with flora or fauna. The bunded areas will also prevent contact with water, which would allow contaminants to seep out into surrounding watercourses, or leach to groundwater, and have damaging effects on both humans and wildlife.
Pre-assembly and Pre-fabrication of elements	Construction Materials	Throughout the design and construction phases of the Proposed Development, emphasis will be on pre-assembly and pre-fabrication of elements wherever practicable to minimise on-site waste and packaging and improve quality.
Prevention of On-Site Waste Burning	All Waste Streams	Burning of waste or unwanted materials will not be permitted on-site.
Sealing of Containers	All Hazardous Materials	All hazardous materials including chemicals, cleaning agents, solvents and solvent containing products will be properly sealed in containers (of 110% volume of materials stored) at the end of each day prior to storage in appropriately protected and bunded storage areas.
Use of Personal Protective Equipment	N/A	All demolition, excavation and construction workers will be required to use full Personal Protective Equipment (PPE) whilst performing activities on-site.
Testing Prior to Disposal of Waste Effluent	Waste Effluent	Any waste effluent will be tested and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor.
Segregation of Wastes	All Waste Streams	Waste segregation strategies will be developed and implemented in-line with the overall logistics plan for the Site. Substances hazardous to health (COSHH), gypsum / plasterboard and liquid waste will be segregated.
Storage of Construction Materials	Construction Waste	All construction materials will be stored in suitable containers and appropriately maintained. Material consolidation, and the use of specialist logistical contractors, will be incorporated into the Proposed Development so as to achieve the desired waste management goals.
Classification and Management of Potentially Contaminated Materials	All Hazardous Materials	Should any potentially contaminated materials be identified during the demolition, excavation and construction phase, work in the area will temporarily cease. The affected area will then undergo a subsequent assessment and an appropriate strategy for treatment and management of the material will be agreed with LBRuT. Site-specific chemical tests will be conducted to ascertain the composition of the potential contamination and evaluate the material against Technical Guide (WM3). In this way, materials can be classified as inert, non-hazardous or hazardous and disposed of in accordance with relevant legislation or processed for off-site treatment prior to final disposal. Wherever possible, materials will be recycled and re-used (either on-site or elsewhere).

Waste Management Measure	Waste Stream	Description
Clearing of Asbestos Containing Materials	Asbestos	Any asbestos containing materials will be appropriately removed and disposed of prior to the start of demolition by a suitably qualified contractor, in accordance with the Control of Asbestos Regulations 2012.
Just in Time Deliveries	Construction Waste	The Principal Contractor could implement a just in time delivery system in order to try to avoid the over-ordering of materials. This will prevent surplus material from damage from the elements.
Standard Sized Materials	Construction Waste	The Principal Contractor could implement the use of standard sizes for most items ordered in order to avoid cutting on site; materials are to be ordered to size in order to allow for minimum waste production.
Take Back Scheme	All Waste Streams	The Principal Contactor could set up a take-back scheme arrangement scheme with suppliers in order to allow for all packets and packaging to not be broken up and skipped.
Staff Training	N/A	All staff on site will be appropriately trained on how to minimise and waste.

5.7 In general, and in accordance with the principles of the Waste Management Plan for England, a principal aim during construction will be to reduce the amount of waste generated and exported from the Site. This approach complies with the waste hierarchy, whereby the intention is first to minimise waste generation, then to treat at source or compact and, finally, to dispose of off-Site as necessary.

5.8 Should these methods be employed by the Principal Contractor prior to the commencement of CD&E phases, it is anticipated that at least 70% of non-demolition (Excavation and Construction) waste and 80% of demolition waste will be diverted from landfill, in line with Building Research Establishment (BRE) Environmental Assessment Method (BREEAM) target Wst 01 – Construction Waste (Ref. 42).

Waste Carriers

5.9 All waste generated on the project shall be dealt with in accordance with legal requirements. The proposed waste carrier for each waste stream will be recorded in the registration table, with Waste Carriers Licence details appended to the final post-planning SWMP. An example table for demonstrating waste carrier registration is available in Appendix B of this Plan.

5.10 The Principal Contractor will ensure that the following is collected for all waste contractors:

- Contractors name;
- Date(s) of waste removal;
- Type(s) of waste removed (i.e. non-hazardous waste, hazardous waste, inert (specify);
- Method of treatment, recovery or disposal (i.e. reuse, recycling, incineration, landfill etc.);
- Volume or weight of waste removed; and
- Costs associated with waste removal, transport and treatment, including Landfill Tax charges where applicable.

Waste Documentation

5.11 All waste documentation will be retained at the main Site compound, and following completion of the project at the Principal Contractor's Head office. This includes:

- Post-planning SWMP (2 years after end of project);

- Waste transfer documentation (2 years for WTNs and 3 years for hazardous waste consignment notes);
- Copies of any exemptions or permits; and
- Copies of waste carrier and disposal site licences.

Waste Transfer Note (All Waste) (Excluding Hazardous Waste)

5.12 All movements of waste from Site must be accompanied by a Waste Transfer Note (WTN), which will detail specific information. The Principal Contractor's Waste Champion or other competent person will check that each WTN contains the following:

- The name of the person receiving the waste and what they are authorised to do with that waste as a Registered Waste Carrier can only transport waste;
- Type of waste produced;
- The 2007 Standard Industrial Classification (SIC) code (2003 SIC if hazardous waste);
- The six-digit European Waste Catalogue (EWC) number;
- Address of the producing site and details of the waste producer;
- Waste carrier's details including WCL No;
- Quantity of waste;
- How it is contained (e.g. 8 yard skip);
- Address of the receiving site (e.g. landfill) and the Environmental Permit or Exemption Number associated with the receiving site;
- The date to which the WTN applies;
- If the material is non-hazardous waste and it is destined for disposal directly to landfill, pre-treatment must have been applied and a declaration detailing treatment applied appended to the WTN; and
- A declaration that the waste has been treated in line with the requirements of the waste hierarchy.

5.13 The Site representative signing the WTN shall place all WTNs in the Site Waste Management File and kept for a minimum period of three years.

5.14 By signing a WTN the Site representative is confirming that all the details are correct and that the material is to be sent by a licensed waste carrier to a suitably licensed receiving site, permitted to receive that type of waste. The signature is binding of this fact and completes the WTN as a legal document, which must be retained for a minimum of two years (three years if it is hazardous waste).

5.15 The waste champion or other competent person signing the WTN shall additionally ensure that the Waste Carrier is using a suitable vehicle with adequate, covered containment for the waste.

Waste Consignment Note (Hazardous Waste)

5.16 A Hazardous Waste Consignment Note shall be completed for every movement of hazardous waste. Prior to signing, the Waste Champion or other competent person shall ensure that the Hazardous Waste Consignment Note includes:

- Hazardous Waste Premises Code (for sites in England and Wales only);
- Consignment note code;
- SIC Code;
- Name and address of site from which waste is being moved;
- Date of removal;
- Type of waste produced, including the quantity and the EWC code;

- The name of the person who is receiving the waste and what they are authorised to do with that waste e.g. a Registered Waste Carrier can only transport waste; and
- A final disposal site that is authorised to accept the waste.

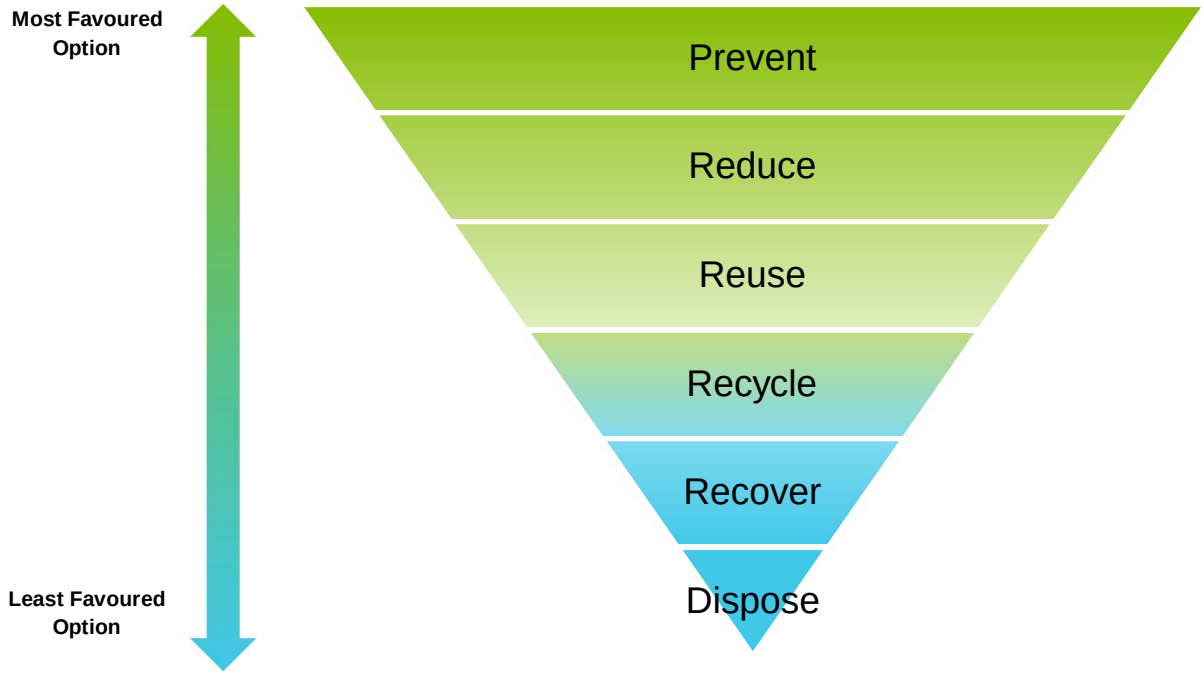
Waste Management Routes

Introduction

5.17 The waste hierarchy is a concept that encourages the management and reduction of waste material. The aim is to recover the maximum value from projects by reducing financial losses through material loss during construction. The waste hierarchy is a complex process influenced by the optimal management of any given product / waste. A basic representation of the waste hierarchy is provided in Figure 4 and the hierarchy will be considered as a guide to encourage the prevention of waste, followed by reuse and the recycling.

5.18 When determining the most suitable option for waste disposal, the mode of waste transportation and alternatives to reduce adverse environmental effects, transport times and waste capacity must be considered in line with the Best Practicable Environmental Option (BPEO).

Figure 4 Waste Hierarchy



5.19 All waste management options at the Site will consider the Site's location, natural environment, and available infrastructure. The options presented below are required to produce waste reduction mechanisms.

Preparing for Reuse

5.20 The aim is to provide design features on the development to use materials in their current state and form. This can occur either on Site or off Site.

5.21 For example, soil materials excavated on Site could be stockpiled and reused on Site as part of the landscaping strategy.

Recycle

5.22 The aim is to re-use materials won on Site by recycling them into an alternative form that can be used for any construction purposes (for example crushing concrete or other inert wastes for road construction material or sending green waste for composting). By recycling on Site as far as practicable, carbon emissions, and other adverse environmental effects, are reduced from taking materials away from the Proposed Development.

Recover

5.23 This generally aims to recover energy from material which cannot be otherwise reused or recycled. It is expected that this will include any waste materials such as hazardous liquids or solids that are suitable to be sent to EfW plants (i.e. in line with the relevant guidance and associated policies). Other waste recovery activities include using crushed concrete and bricks to create a development platform (for example a piling matt) for a building in place of primary aggregate (a deposit for recovery permit is required).

Disposal

5.24 The least preferred option is where the waste stream would be subject to a final disposal route such as landfill. Some waste streams will inevitably end up with such a solution.

5.25 The placing of waste disposal contracts will, where possible, consider the implications of long-distance travel in terms of health and safety risk, commercial terms, and increased emissions from vehicles. Wherever possible, contracts are to be awarded as locally as possible.

5.26 All hazardous and non-hazardous wastes must be pre-treated prior to disposal to landfill. The methods of pre-treatment will enable the waste to meet the 'three-point test':

- It must be a physical, thermal, chemical or biological process including sorting;
- It must change the characteristics of the waste;
- It must do so in order to:
  - reduce its volume, or
  - reduce its hazardous nature, or
  - facilitate its handling, or
  - enhance its recovery.

5.27 Source segregation can be seen as a pre-treatment option and as such can be applied to waste generation on Site including general waste and arisings and will take place on the project.

5.28 A declaration stating the pre-treatment method applied to the waste will be appended to any WTN for non-hazardous waste being disposed of to landfill and will accompany the WTN.

5.29 In terms of landfill capacity within London, remaining void space has decreased significantly in recent years to 5.9 million m^3 in 2016 (Ref. 43). 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.

Fly-Tipping

5.30 Fly-tipping of waste on or adjacent to ongoing construction projects can be a significant issue.

5.31 Should waste be fly-tipped on the Site, the Principal Contractor has a Duty of Care to ensure it is dealt with safely and disposed of correctly, even though not the producer of the waste. Any instance of fly-tipping will be reported to the LBRuT.

Reporting, Monitoring and Auditing

5.32 The Principal contractor may appoint a Waste Champion for the Site. The Waste Champion in conjunction with the Site Manager will be responsible for the formal recording of waste movements lies with the Waste Champion or Project Manager.

5.33 A log should be maintained of all materials that come on to Site, and details obtained from the waste disposal company of the exact amount of waste materials removed from Site. Details would also be provided outlining the recovery / disposal actions for the specific waste streams.

5.34 Waste receptacles should be monitored by the Principal Contractor so that contamination has not occurred; results should then be recorded and monitored for change with time.

5.35 The Principal Contractor should continually review the type of surplus materials being produced and change the Site set up to maximise reuse or recycling and the use of landfill seen as the last option.

5.36 ‘Spot checks’ may be made in relation to the completeness of any WTNs and any Hazardous Waste Consignment notes by the Client or their representatives.

5.37 If any problems are identified during the lifetime of the project in relation to exceeding the expected SWMP waste stream volumes, failure to meet stated targets or issues relating to cost effective and legal transfer of waste materials then they should be escalated to the Contracts Manager for further discussion on the best solution. This may trigger a review of the SWMP.

Review of the Post-Planning SWMP – Monitoring Records

5.38 The post-planning SWMP should be reviewed at least once every six months during the lifetime of this project by the Principal Contractor so that targets are being achieved and that realistic solutions are provided for unplanned events or abnormal wastes. The SWMP will also be reviewed if there is any significant change in the project. These reviews will involve the completion and submission of a monitoring report to the Client (or their representative) in an agreed format.

Additional Duty of Care Checks

5.39 Additional checks to confirm that waste is being appropriately managed, and to demonstrate that all reasonable measures have been taken to comply with waste hierarchy should be undertaken. For example, loads could occasionally be followed by the Principal Contractor to confirm that the waste is disposed of at the stated place of disposal, with any irregularities investigated immediately, and reported as an environmental incident. Action may involve termination of contract and / or notification to the Environment Agency.

Site Inspections

5.40 The Site Manager or nominated deputy should undertake a daily inspection of the construction areas including all areas used for waste management. Any issues would then be recorded in the daily log along with any corrective taken.

Closure Reporting

5.41 Within 3 months of the completion of works under a contract a Waste Management Closure Report should be submitted to the Client (or their representative) to demonstrate the effective implementation, management and monitoring of construction waste during the construction lifetime of the Proposed Development.

Potential Asbestos Containing Materials

5.42 A Management Survey of Asbestos Containing Materials (ACMs) was undertaken in August 2017. This survey considered all the buildings located on Site, as listed in Table 1, as well as smaller outbuildings and sheds. The surveys were conducted as pre-demolition surveys and found that ACMs were present in all but two of the buildings surveyed, although core sampling of concrete floors, walls, or structural columns was not undertaken. Therefore, further surveys will be conducted, with any confirmed ACMs removed by appropriately trained persons prior to the commencement of any CD&E works.

6. Post-Planning Reports

6.1 Whilst this Plan provides outline details of Site waste management and construction logistics likely to be implemented on Site during the CD&E phases, further detailed reports will be required at the post-planning stage, once further details of the CD&E methodology; programme and material quantities are known. This Plan is high level and once final details of the CD&E programme, phasing and strategy are confirmed post-planning, a full SWMP, Construction Environmental Management Plan (CEMP) or similar will be produced. The post-planning report will include roles and responsibilities, detail on control measures and activities to be undertaken to minimise environmental impact and monitoring and record-keeping requirements. A commitment would also be included to periodically review the post-planning report and undertake regular environmental audits of its implementation during the CD&E phases of the Proposed Development. An example of a method of recording any changes or alterations to the post-planning report is provided in Appendix A of this Plan.

7. Summary

7.1 Due consideration has been given to the management of waste arisings, logistics and proposed methods during the CD&E phases of the Proposed Development. Furthermore, this Plan and advised post-planning reports have the following aims:

- To contribute towards achieving current and long-term government, GLA and LBRuT targets for waste minimisation, recycling and re-use;
- To provide indicative information pertaining to the likely CD&E methods and management likely to be employed on-site. However, this information is indicative only at this stage and further information will be provided at the detailed design stage post-planning; and
- To assist the Principal Contractor to achieve high standards of waste management performance.

7.2 It is anticipated that CD&E activities associated with the Proposed Development will result in the generation of approximately **565,289 tonnes** of waste. Of this total, it is anticipated that approximately **29,109 tonnes** of waste is anticipated to arise during the construction activities, **210,908 tonnes** will arise from demolition of the existing buildings on Site (this also includes from waste arising from Chalker's Corner), and approximately **286,391 tonnes** will arise from the excavation activities with an additional approximate **38,881 tonnes** arising from site clearance activities, however, approximately **46,424 tonnes** of the excavated waste is anticipated to be reused on Site for site levelling purpose, resulting in approximately **239,967 tonnes** of excavated waste to be taken of site.

7.3 These waste quantities have been calculated prior to the implementation of any on-Site management measures. Therefore, details of the CD&E programme currently available is high level and is subject to change. However, it is assumed that through following the Site waste management guidance detailed within this Plan approximately **70%** of non-demolition waste and **80%** of demolition waste is anticipated to be diverted from landfill.

7.4 It is recommended that the information contained within this Plan is used as the basis to inform a further post-planning report, once a Principal Contractor has been appointed, and further information concerning the CD&E programme and methods are known. Through following this approach, CD&E waste arisings can be managed in line with applicable legislation and policy at a national, regional and local scale.

8. References

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Appendix A Example Recording Template

Site Waste Management Tracker			
Project Name		*Project Phase*	
Project Location		*Responsible Person*	
Client		*Name of Person Filling in*	
Principal Contractor		*Description of the Phase*	
		Reason for deviation from the Plan	

Summary of Waste Removal				
	Waste Description	*Planned Quantity (m^3) to be removed*	*Actual Quantity (m^3) removed*	*Reasons for Deviation*
Inert				
Non-Hazardous				
Hazardous				

Day wise Waste Removal									
	Date of removal	*Waste Description*	*Qty. reused on site (m^3)*	*Qty. reused off site (m^3)*	*Qty. Recycled on-site (m^3)*	*Qty. recycled off site (m^3)*	*Qty. sent to Landfill/other special or exempt site (m^3)*	*Destination of Waste Materials*	*Carrier Details, Registration number, licence details*
Inert									
Non-Hazardous									
Hazardous									

Appendix B Example Record of Waste Carrier Details

Waste type(s)	*Waste Carrier Name*	*Contact Details*	*Date checked with EA (dd/mm/yyyy)*	*Registration Number*	*Expiry Date (dd/mm/yyyy)*