Construction Skills Centre & Site Accommodation at Former Maria Fidelis School Site

Deliveries and Servicing Management Plan

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Work Package No.

stakeholder review required (SRR)

county/district/london borough council

lov

lul

nrl

tfl

utilties company

other ………………………………………………………………….

Purpose of SRR

Acceptance

Approval

No Objection

Consent

Disclaimer:

This report takes into account the particular instructions and requirements of the Project as defined in SDSC Contract for the provision of design services Euston dated 13 February 2018 including any amendments to it.   
It is not intended for and shall not be relied upon by any third party and SDSC shall have no responsibility or liability to any third party. Provided always that nothing in this disclaimer alters our SDSC’s rights, obligations and liabilities under our Contract for the Project.

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# Executive Summary

* + 1. The site is in the northern part of the former Maria Fidelis School and is adjacent to the HS2 Station worksite to the north.
    2. The development, which has been approved under planning permission ref 2021/3796/P and is currently under construction, will provide a Construction Skills Centre (CSC) and Site Accommodation for site operatives and management staff to facilitate the construction of HS2 Euston Station.
    3. The CSC will accommodate approximately 120 students and 30 staff members. The Site Accommodation will facilitate approximately 2,500 site operatives and management staff during the peak construction period. Due to shift work, it is expected that the peak number of staff during the day will be around 1,800.
    4. The development was granted planning permission subject to conditions and a Section 106 (S106) legal agreement (dated 10 December 2021). Clause 4.13 of the S106 agreement requires submission of a Service Management Plan on or prior to occupation of the development.
    5. The objective of this Deliveries and Servicing Management Plan (DSMP) is to employ several initiatives that will reduce the number of weekly delivery and servicing trips achieving:
* Fewer commercial vehicle visits during the working day;
* Improved safety for pedestrians and cyclists through reducing vehicle movements;
* Improved air quality through reduced vehicle emissions; and
* Reduced noise from commercial vehicles.   
  + 1. It is anticipated that the CSC and Site Accommodation will generate 19 vehicles per day.
    2. All goods arriving at the site will be delivered to the designated loading area on Cobourg Street during the early phases of operation. A private loading bay off Cobourg Street will be used during later operational phases. From these locations, deliveries will be transferred directly to the end user in a safe manner using the appropriate manual handling equipment using service corridors and goods lifts to reach the final delivery point.

# Introduction

* + 1. This report has been produced by the Mace Dragados Joint Venture (MDJV) on behalf of High Speed 2 (HS2) Ltd, to support the discharge of a S106 planning obligation in relation to the CSC and Site Accommodation which is currently under construction at the site of the former Maria Fidelis School.
    2. The development under construction will provide:
* a Construction Skills Centre (‘CSC’) on behalf of London Borough of Camden (‘LBC’), for which a similar scheme was previously granted planning permission under LBC application reference 2019/3091/P; and
* a Site Accommodation facility to accommodate approximately 2,500 site operatives and management staff, including office space, ancillary rooms, WCs, showers and changing rooms, and on-site catering. This is required as part of the High Speed Two (‘HS2’) railway project and will facilitate the construction of HS2 Euston Station.
  + 1. The CSC and Site Accommodation building is required for a temporary period of 10 years from occupation and will be removed following the construction of HS2 Euston Station.

## Site description

* + 1. The site is in the northern part of the former Maria Fidelis School in the LBC. The site is currently being utilised as a construction site for the CSC and Site Accommodation building. Prior to this the site was used as outdoor play space associated with the school.
    2. The land immediately to the south of the site is occupied by the five-storey former school building, which was constructed in the interwar period. Planning consent was granted (subject to completion of S106 agreement) in October 2020 for the mixed-use redevelopment of the former school building.
    3. The surrounding area is a mix of residential and commercial uses, with Euston Station located to the north-east. To the north of the site is the HS2 Euston Station construction site, which was formerly St. James’s Gardens.
    4. The site is accessed via North Gower Street to the west and via Cobourg Street to the east. Starcross Street is located to the south of the wider Maria Fidelis site and connects North Gower Street and Cobourg Street. Hampstead Road is located beyond North Gower Street to the west of the site. There are no Listed buildings on-site and the application site is not within a Conservation Area. The buildings on the eastern (no’s 190-204) and western (no’s 211-229) North Gower Street, located approximately 100 metres to the south of the site, are Grade II Listed. 108 Hampstead Road, located 20 metres to the north-east of the application site, is Locally Listed.

## Description of development

* + 1. Erection of a six-storey combined Construction Skills Centre (Class F1(a) – Education) and Site Accommodation (Class E(g)(i) – Offices) to facilitate the construction of HS2 Euston station, as meanwhile uses for a period of up to 10 years from occupation.
    2. The development will provide 1,378sqm of CSC floorspace and 5,670sqm of Site Accommodation floorspace. The overall site area is 0.24ha. The maximum height of the building will be 22.4m and the building will be 77m wide and 18m deep.
    3. The construction is utilising modular construction, using modern methods of construction and assembly on-site to the form described above.
    4. Vehicular access to the Site Accommodation will be delivered via a combination of the existing HS2 worksite to the north and Cobourg Street. Vehicular access arrangements for the Site Accommodation would change throughout the construction and operational period to accommodate wider HS2 works to the north of the site. Vehicular access for the Construction Skills Centre will remain as previously approved with infrequent servicing use of North Gower Street (consented under extant permission 2019/3091/P).
    5. Pedestrian access to the CSC will be via the Starcross Yard open space to the south of the building. As Starcross Yard will not be open 24/7, a gated out-of-hours access route to the CSC will be available adjacent to the open space. Pedestrian access to the Site Accommodation will only be from Hampstead Road and through the existing HS2 worksite to the north.
    6. For full details of pedestrian, cycle and vehicular access arrangements, refer to the submitted S106 Travel Plan (ref: 1CP01-MDS\_ARP-TM-REP-SS08\_SL23-990017).

## Purpose of Report

* + 1. The objective of the DSMP outlined below is to employ several initiatives that have reduced the number of weekly delivery and servicing trips in similar developments around London thereby achieving:
* Fewer commercial vehicle visits during the working day;
* Improved safety for pedestrians and cyclists through reducing vehicle movements;
* Improved air quality through reduced vehicle emissions; and
* Reduced noise from commercial vehicles.
  + 1. All tenants within the development should be required to implement the following measures to reduce vehicle trips and the impact of servicing on the local environment:
* Use a booking-in service to control the flow of vehicles and for loading bay management;
* Consider the re-timing of deliveries;
* Provide a list of preferred suppliers and ensure that tenants only order through them to allow collective procurement; and
* Provide information to deliverers i.e. a delivery point assessment.
  + 1. Additional measures that would reduce the number of daily deliveries include:
* Deploy stock optimisation techniques, such as the bunching of orders so that they arrive at the same time every week;
* For office staff, companies should consider promoting the collection of personal deliveries on the way home from work, as opposed to having packages delivered to the development; and
* Consider the introduction of a nominated carrier scheme (a scheme whereby a single delivery company is selected by the purchaser to deliver all their goods from all their suppliers).

## Area Schedule

* + 1. Table 1 shows the area schedule for the development.

Table 1 Area Schedule

|  |  |  |
| --- | --- | --- |
| **Building** | **Land Use** | **GIA (m2)** |
| Construction Skills Centre | F1(a) – Education | 1,378 |
| Site Accommodation | E(g)(i) – Offices | 5,747 |
| Total |  | 7,125 |

* + 1. Typical conversions:

GIA => NIA = 0.85

## Reference Publications

* + 1. The following planning policy and best practice guidance documents have been considered when developing this DSMP:
* National policy documents:
* National Planning Policy Framework (NPPF), 2021;
* Designing for Deliveries, Freight Transport Association, 2016;
* The Waste (England and Wales) Regulations, 2011;
* DEFRA Government Review of Waste Policy in England, 2011; and
* BS5906 Waste Management in Buildings – Code of Practice, 2005.
  + 1. Regional policy documents:
* New London Plan, 2021;
* The Freight and Servicing Action Plan, 2019;
* The Mayor’s Transport Strategy, 2018;
* Delivering a road freight legacy, 2013;
* Fleet Operator Recognition Scheme (FORS); and
* TfL guidance for DDSMPs.
  + 1. 1.1.21 Key local policy:
* Camden Planning Guidance – Design March 2019; and
* Camden’s Environment Service technical guidance for recycling and waste.

## Report Structure

* + 1. This Deliveries Servicing Management Plan (DSMP hereafter) is divided into the following sections:
* Section Three – sets out initiatives to reduce delivery vehicles and emissions through smart procurement and vehicle reduction measures;
* Section Four – sets out the type, number, and nature of daily delivery vehicles;
* Section Five – sets out the delivery and servicing strategy for the movement of goods within the development; and
* Section Six – sets out the review mechanism for the DSMP
* Section Seven – sets out the waste management strategy.

# Procurement and Sustainability

## The Mayor’s Transport Strategy

* + 1. The Mayor’s Transport Strategy (MTS) sets out the Mayor’s transport strategy for London up to 2031 and the issues of freight and servicing is considered throughout.
    2. The MTS highlights the importance of the London Freight Plan, DSMPs, CLPs and FORS to encourage improved efficiency and provide a framework for incentivization and regulation.
    3. Proposal 99 states that the “the Mayor, through TfL and working with the London Boroughs, road freight operators and other stakeholders will:
* Adopt planning conditions that specify Delivery and Servicing Plans for major developments;
* Aim for 50% of HGVs and vans servicing London to be member of the FORS;
* Encourage, and where appropriate specify, improved freight movement efficiency through, for example greater consolidation, more off-peak freight movement and greater use of rail-based transport; and
* Support the freight industry and land requirements for locally focused consolidation and/or break-bulk facilities and access to waterways and railways.”
  + 1. Proposal 117 acknowledges the incorporation of DSMPs, CLPs and the FORS scheme:
    2. “The Mayor, through TfL and working with the London boroughs, and other stakeholders in the public and private sectors, will improve the efficiency and effectiveness of freight operations through the promotion of delivery and servicing plans, construction logistics plans, the FORS and other efficiency measures across London.”
    3. The MTS sets out the importance of the London freight information portal which “will help London’s public authorities (the GLA and boroughs, for example) and freight operators exchange information about:
* Improving operational efficiency;
* Encouraging better driver behaviour, the use of alternative fuels and the uptake of low carbon vehicles;
* Reducing freight administration costs; and
* Enhancing freight journey planning.

## Delivery Booking System

* + 1. Deliveries should be managed by the facilities management (FM) team using a delivery management system. All delivery and servicing vehicles are registered on the system before they can enter the building. This will ensure all servicing vehicles are scheduled and prioritised accordingly. A booking system allows the FM team to actively manage the arrivals to the site during the day and will have the following benefits:
* Online appointment scheduling for carriers and suppliers to book loading bay;
* Appointments over the web, and monitor the status in real time;
* The ability for the site FM team to accept requests, prioritise shipments and refuse requests;
* Automated appointment scheduling with unload service time calculations taking into consideration trailer type, loading bay restrictions, special equipment, and product handling unit types;
* Appointment audit trail and reporting;
* Historical data analysis and compliance tracking;
* Improved visibility to the inbound supply chain by tying purchase orders to inventory and shipment data; and
* Improved resource planning and task allocation for the site FM team.

When a vehicle arrives, the FM team should inspect the booking form or delivery note. The goods will be unloaded by the driver and inspected by the FM team before onward distribution to, or collection from, the commercial or office tenants. This process flow is summarised in Figure 1.

Figure 1 Goods in process flow

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## Re-timing of Deliveries

* + 1. Retiming of deliveries should be managed through the booking-in system. Operational hours for the Site Accommodation will be 24 hours. Operational hours for the CSC will be 8am – 7pm Monday to Friday. Out of hours cover (Monday – Friday) for delivery vehicles will be provided 7pm – 8am.
    2. When scheduling deliveries outside of normal business hours, suppliers and their delivery agents will be expected to conform to TfL’s Code of Practice for Quieter Deliveries. Suppliers and the FM team will ensure there is no impact on local residents.

## Delivery Point Assessment (DPA)

* + 1. To assist deliveries to the development, suppliers and their logistics providers should be given a DPA. This document provides drivers with clear instructions on where and how to access the development to avoid causing disruption to other road users and pedestrians. The content of these guidance notes will include the following:
* Provide the contact details for the FM team /security;
* Outline of the correct route to the delivery premises;
* Provision of a detailed parking map of the area, including restrictions;
* Risk rating for manoeuvring;
* Risk rating for loading;
* Advice to the driver about special restrictions (e.g. the need to turn off refrigeration units); and
* Health and safety risks to their employees and third parties.

## Vehicle Reduction Measures

* + 1. The development should also consider introducing policy-led interventions to avoid unnecessary vehicle movements.

## Personal Delivery Reduction

* + 1. At present, in London, it is estimated that almost 40% of all deliveries made to the workplace are personal[[1]](#footnote-2). This is having a significant impact on congestion, safety for vulnerable road users and air quality. Two ways this could be addressed by tenants would be to either ban or discourage employees receiving their online purchases at work. Firstly, a ban on employees receiving deliveries will significantly reduce the vehicles visiting the area and ease the pressure on post rooms and loading bays. However, based on our experience in this field some organisations are opposed to enforcing a total ban on their employees.
    2. An alternative option is to discourage employees and promote alternative ways to receive their online purchases. The building owner and tenants could choose to promote a click and collect scheme for their tenants (i.e. Doddle, collect +, Hub Box, Parcelly). This will allow employees to divert their personal deliveries to a specialised click and collect location.

## Collective Procurement

* + 1. Tenants within the development should have access to a preferred supplier scheme supervised by the FM team. Tenants should be encouraged to engage in collective procurement for consumables such as office supplies, milk, flowers, catering, and bread. Tenants will agree to purchase goods and services from a small, carefully selected choice of suppliers. Each tenant will have an account with the supplier, but their orders will be combined so that deliveries will arrive together, on a single vehicle.
    2. The development benefits from reducing the number of supplier vehicles on the street. Tenants benefit from volume discounts and reduced delivery costs. It has been shown that collective procurement by individual groups or businesses within a building, such as Transport for London’s (TfL) Palestra operating centre, reduced stationery deliveries from twice daily to only three deliveries a week.
    3. Tenants should be encouraged to order goods and materials to fully utilise their storage capability. This will result in less frequent deliveries throughout the week.

## Nominated Carrier Scheme (NCS)

A nominated carrier scheme (NCS) would involve tenants agreeing to the use of a single company for the delivery of certain types of goods. This is predominantly focussed on the collective procurement of non-perishable goods such as stationery. Additionally, nominating a shared courier, to be used by all tenants, is also a positive measure and would reduce the number of courier trips to the building each day. A visual representation is shown in Figure 2.

Figure 2 Nominated carrier scheme

|  |
| --- |
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## Accredited Operator Schemes

* + 1. Tenants should strive to work with suppliers that are aiming to raise the level of quality within fleet operations, and to demonstrate best practice in safety, efficiency, and environmental protection.

## Fleet Operators Recognition Scheme (FORS)

* + 1. FORS is a unique, industry-led, free membership (bronze, silver, gold) scheme to help van and lorry operators in the Capital become safer, more efficient, and more environmentally friendly.
    2. For bronze level membership several of requirements under the following headings need to be met:
* Drivers and vehicle management;
* Vehicle maintenance and fleet management;
* Transport operations; and
* Assessing the performance of company policies.
  + 1. For silver and gold level, members need to provide data to enable benchmarked values to be produced per million kilometres for each type of vehicle for:
* Fuel use;
* CO2 and emissions;
* Vehicle incidents; and
* Penalty Charge Notices and fines.

## Safe Urban Driving (SUD)

* + 1. SUD is essential training for all commercial drivers operating heavy goods vehicles (HGVs) regularly in the urban environment and where there are high volumes of vulnerable road users, such as cyclists and pedestrians.
    2. The course is aligned to meet the requirements of:
* Work Related Road Risk (WRRR);
* Fleet Operator Recognition Scheme (FORS); and
* Construction Logistics and Cyclist Safety (CLOCS).

## Alternative Fuelled Vehicles

* + 1. Logistics providers and courier companies are increasingly using electric vehicles and cycles for making last mile deliveries. For example, Clipper Logistics, UPS and Gnewt provide electric powered goods vehicles, courier vans and electric powered cycles.
    2. In terms of measures which could be implemented by management to encourage the use of alternatively fuelled vehicles, the following would be considered as part of the procurement strategy:
* Choosing partners that operate a supply chain including alternatively fuelled delivery vehicles;
* Choosing a courier company for outgoing mail that use alternatively fuelled vehicles;
* Using the procurement system within the development to encourage purchasing managers to buy from suppliers actively using alternatively fuelled vehicles in their supply chain; and
* Using the vehicle management system to offer optimum delivery (i.e. early morning) slots to operators with alternatively fuelled vehicles.

# Delivery and Servicing Vehicles

## Overview

* + 1. This section presents information for delivery and servicing activities:
* The size of delivery vehicles permitted within the loading bay;
* The number and frequency of delivery vehicles;
* The delivery and servicing strategy; and
* The nature of expected deliveries.

## Assumptions

* The Site Accommodation is inclusive of a canteen which sits 2,500 people over three sittings;
* The canteen is estimated to generate eight vehicle deliveries per day; and
* Site workers and deliveries to the building will not be using the open space to the south of the Site Accommodation building (except in emergency situations).

## Size of Servicing Vehicles

* + 1. As a mixed-use development within London, most of the servicing trips to the site will be made by 8m long vehicles. There will also be cycle courier deliveries throughout the day. Table 2 shows the likely service vehicle type including typical turnaround times.

Table 2 Size of servicing vehicles

|  |  |  |  |
| --- | --- | --- | --- |
| **Vehicle Type** | **Vehicle** | **Characteristics** | **Typical Turnaround Time (minutes)** |
| LGV – Light Goods Vehicle | Image result for plain white van | 3.5 Tonne, vehicle length 6m | 15 |
| MGV – Medium Goods Vehicle | Image result for plain white 7.5 truck | 7.5 Tonne, vehicle length 8m | 25 |
| HGV – Heavy Goods Vehicle | Image result for plain white 10m truck | 17 Tonne, vehicle length 10m | 30 |
| Service Engineer | Image result for plain white van | 3.5 Tonne, vehicle length 6m | 45 – Half day |
| Refuse Collection Vehicle | Image result for garbage truck png | 26 Tonne, vehicle length 10m | 15-20 |

## 

## Vehicle Generation

* + 1. The estimated daily delivery and servicing trips to the site were calculated using an Arup in-house vehicle generation tool developed to utilise Arup research. The generation tool applies a delivery and servicing vehicle trip rate for each of the proposed building uses to the relevant gross internal area (GIA) for that building. The trip rates, which are expressed as vehicles per 100m2 per day, have been derived from survey data at office, retail, residential and other facilities around London, as well as relevant design guidelines and local authority regulations. The surveys recorded vehicle arrival and departure times, vehicle type and size of goods vehicle use to make the delivery.
    2. The generation rates used to determine the daily number of delivery trips are shown below:
* 0.20 vehicles/100m²/day for office use; and
* 0.10 vehicles/100m²/day for CSC use.

## Servicing Trips

* + 1. The anticipated number of delivery and servicing trips for the Proposed Development is shown in Table 3.

Table 3 Estimated deliveries and servicing trips

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Land Use** | **GIA (m2)** | **Average Daily Trip Rate per 100m2 GIA** | **Number of Daily Deliveries** | **Peak Hour** |
| Site Accommodation | 4,497 | 0.20 | 9 | 07:00 – 08:00 |
| Canteen | 1,250 | n/a | 8 |
| CSC | 1,378 | 0.10 | 2 |
| Total | 7,125 | - | 19 |

* + 1. The anticipated number of daily vehicles by vehicle type is shown in Table 4.

Table 4 Number of vehicles

|  |  |
| --- | --- |
| **Vehicle Type** | **Daily Deliveries** |
| Up to 4.6-ton Panel Van | 8 |
| 8m Rigid Vehicle | 8 |
| 10 metre Rigid Vehicle | 3 |
| Total | 19 |

* + 1. To manage the peak hour demand of three trips, the Site Accommodation will require a total of two loading bays, as follows:
* 1 No. 10m loading bay(s) sized at 10m x 3.5m
* 1 No. 6m loading bay(s) sized at 6m x 3.5m
  + 1. To manage the peak hour demand of one trip, the CSC will require a total of one loading bay, as follows:
* 1 No. 10m loading bay(s) sized at 10m x 3.5m
  + 1. A minimum 3m must be provided behind each loading bay for offloading and 4.5m clear headroom above vehicle manoeuvring and parking areas. In addition, sufficient space should be provided for circulation of goods and waste between the loading bay area and the building entrance(s).

## Typical Deliveries

* + 1. Some examples of typical deliveries, identified through survey data, are shown in Table 5.

Table 5 Typical deliveries

|  |  |  |
| --- | --- | --- |
| **Site Accommodation** | **Canteen** | **CSC** |
| Furniture | Furniture | Building Materials |
| Stationary | Fresh food | Oils |
| Cleaning products | Frozen food | Event material |

* + 1. These goods and materials are normally delivered in the following ways:
* Linen is wrapped in plastic and comes in bags, trolleys or roll containers;
* Frozen food deliveries are generally palletized, whereas fresh food is delivered in plastic/wooden crates; and
* Cans are often delivered on a pallet.
  + 1. Palletized goods and heavy or large crates are handled using a hand pallet truck. Roll cages are pushed. Examples of the types of containers which are used for general goods deliveries are shown in Table 6.

Table 6 Typical Goods Containers

|  |  |  |
| --- | --- | --- |
| **Roll Container** | **Pallet** | **Plastic or Wooden Crate** |
| A picture containing building, iron, metal, cage  Description automatically generated | A wooden pallet on a white background  Description automatically generated | A picture containing yellow, container, box, crate  Description automatically generated |
| Overall width: 7800mm  Overall length: 6800mm  Overall height: 1340mm  Capacity: 600kg | Width: 1200mm  Length: 800mm  Height: 166mm  Capacity: 1000kg | Overall width: 1000mm  Overall length: 1200mm  Overall height: 400mm |

# Internal Distribution

## Overview

* + 1. Vehicular access to the site will be for servicing and delivery vehicles only and the arrangements are as follows and as indicated in Figure 3.
    2. CSC – For all operational phases, vehicle access for servicing and deliveries will be on Starcross Street with infrequent use of North Gower Street, as per the previous consent.
    3. Site Accommodation:
* Phase 1 – Vehicles will access and egress the service yard via the Cobourg Street gate.
* Phase 2 – Vehicles will access the service yard via Hampstead Road and egress via the Cobourg Street gate. It is caveated that Phase 2 will be kept under review, as part of the wider logistics planning for the HS2 Euston Station scheme.

Figure 3 Proposed vehicle access

A blueprint of a building

Description automatically generated with medium confidence

* + 1. All deliveries to the Proposed Development will be delivered to a private loading bay. From these locations, deliveries will be transferred directly to the end user in a safe manner using the appropriate manual handling equipment using service corridors and goods lifts to reach the final delivery point.

## Loading Bays

* + 1. As per the above access requirements and site operational requirements, the scheme has provided two private loading bays for the Site Accommodation as shown in Figure 4 and parking space for the CSC off North Gower Street for occasional access in Figure 5. Day to day deliveries to the CSC will be made via Starcross Street and through the park.

Figure 4 Site Accommodation Loading bays

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Figure 5 CSC Off-road parking

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* + 1. All goods or courier deliveries will report to the dock manager who will inform the tenant. The deliverer will either be sent to the tenant’s floor via the goods lift or a tenant representative will make their way down to the loading bay to collect their delivery. The dock manager or the reception team will not be responsible for receiving or signing for tenant goods or materials. Once delivered and signed for, all goods must be taken to the final delivery point. There will be no provision for the temporary storage of goods within the service area.

## Vehicle Swept Path Analysis

* + 1. Swept path analysis (auto-tracking) has been undertaken to demonstrate vehicle paths in the loading bay, ensuring each vehicle can independently manoeuvre into their respective loading bay while other bays are occupied. This can be seen in **Appendix A**.

## Goods Receipt and Distribution

### Facilities Management (FM) Team

* + 1. In terms of the day-to-day management of incoming goods and consignments, it is proposed that the site logistics contractor be responsible for the following:
* Communication and liaison with each tenant;
* Assisting with the receipt, sorting, and moving of goods through the building to their destination;
* Monitoring misuse, unsafe or illegal use of the loading areas by the suppliers and taking action if necessary;
* Using the information provided by the booking-in system, collating delivery information into an overall delivery profile; and
* Reducing or consolidating the number of suppliers by identifying opportunities to share the same supplier base among the different tenants of the development.

### Pre-Delivery Process

* + 1. Commercial tenants should use a pre-booked delivery system. This will ensure an even arrival profile of service vehicles to optimise the use of the loading facilities.
    2. When booking a delivery slot, the logistics provider will allocate a slot for the delivery to be completed. Slots will be timed according to the size of the vehicle. If a driver misses their slot, they will be instructed to leave the area and re-book an alternative delivery slot.
    3. It is anticipated that not every delivery can be booked in advance. Deliveries arriving without a booking-in slot will be processed at the discretion of the site FM team.
    4. There will be a procedure for periodic reviews between the site FM team and the tenants to ensure the system utilised is operating to the benefit of all concerned. It will also be able to respond to any unexpected issues that may arise that are beyond the control of the team.

## Delivery Receipt and Distribution Process

### Overview

* + 1. The Site Accommodation service yard will be open 24 hours a day seven days a week to cover engineering hour works in live stations and tunnelling shift patterns.
    2. For the Site Accommodation, delivery vehicles will be able to pull into the service yard and manoeuvre with it to exit. Swept path analysis of the vehicle manoeuvres is shown in **Appendix A**. The dockmaster will assist with indicating the correct bay to the driver and co-ordinating the delivery receipt process.
    3. The CSC service yard will be open 11 hours a day Monday to Friday.
    4. For the CSC, day to day deliveries will be made via Starcross Street and the delivery of construction materials and skips will be made by vehicles that will be able to pull into the service yard from North Gower Street and reverse within the service yard into their parking location. Swept path analysis of this vehicle manoeuvres is shown in **Appendix A.** The dockmaster will assist with indicating the correct bay to the driver and co-ordinating the delivery receipt process.
    5. Tenants should be aware of the bookings their suppliers have made in the delivery booking system and should be ready to receive their deliveries. The dockmaster will inform the tenant when their delivery has arrived, and the FM team will co-ordinate the route through the building.

### Site Accommodation Deliveries

* + 1. The driver will be responsible for the unloading/loading and distribution of goods from the vehicle. Goods are moved to the site stores by the FM team, the recipient signs for the goods and the driver returns to the vehicle and leaves the service area.
    2. Where fresh food goods are delivered, a representative may be required to inspect the goods before taking ownership from the logistics provider. The canteen representative will inspect the goods. Once received, the restaurant staff or driver will complete the movement of goods between the service yard and the kitchen.
    3. From the loading bays, goods will be manually transported into the site at ground floor level through the external servicing route to the Station Accommodation core and transported vertically using the appropriate goods lifts before onward distribution to the relevant accommodation area.

### CSC Deliveries

* + 1. It is anticipated that the workspace and college use will generate very few servicing and delivery trips. There will be two main points for deliveries, as follows:
* Day to day deliveries for the CSC will be undertaken on-street from Starcross Street; and
* There will be very occasional deliveries of building materials and skips, which will access the site via the north-west corner of the site approaching along North Gower Street. These vehicles will be larger including a flatbed truck and skip lorry. Exceptional deliveries to the CSC will access the site at the existing access to be realigned at the northern end of North Gower Street. These vehicles will head northbound along North Gower Street to reach this access, via the pedestrianised section. The existing arrangement on North Gower Street will be maintained with occasional large vehicle and emergency access from this route only. Vehicles will approach from the south along the carriageway to the car park then cross into the pedestrianised area and turn into the realigned access at the north-western corner of the site.
  + 1. The driver will be responsible for the unloading and loading of goods from the vehicle. CSC staff will be expected to receive the goods and distribute them internally. This will ensure that the delivery or collection is completion in an efficient and timely manner and the driver can leave the service yard as quickly as possible.
    2. From the loading bays, goods will be manually transported into the site at ground floor level through the internal servicing corridors.

# Review mechanism

* + 1. The success of this DSMP as detailed above will be closely monitored by the MDJV logistics and FM teams.
    2. Feedback will be provided monthly and as and when required where immediate action is required, and will be dealt with in accordance with this strategy.
    3. A formal review of the DSMP will be undertaken every six months.
    4. Any changes or deviations to the agreed DSMP will be made by submission of a revised document to the LBC Planning Obligations team.

# Waste Storage and Servicing

## Overview

* + 1. A Waste Management Plan (WMP) presented in **Appendix B** has been prepared using the following guidance documents:
* Camden Planning Guidance, March 2019;
* Camden’s Environment Service technical guidance for recycling and waste; and
* BS 5906:2005 Waste management in buildings – a code of practice.
  + 1. It is intended that the WMP be updated and agreed with LBC prior to occupation.
    2. The area schedule applied to calculate the waste generation for the development are shown in **Appendix B**. To comply with industry best practice, two-day waste storage has been provided for waste generated by the commercial land uses. Waste generated within the development is split between dry mixed recyclables, residual waste streams and food waste. Other waste streams will be generated on an ad-hoc basis.

## Waste Storage Requirements

* + 1. General requirements for waste storage shall be as follows, with further details to be set out in the WMP in **Appendix B**:
* The enclosure or chamber should be large enough to allow clearance of 150 mm between each bin and the walls, on each side;
* There should be space in front of the bins to allow residents to easily access the bins when depositing waste;
* If multiple bins are used, then there should be sufficient space to rotate the bins in between collections;
* The walls should be made from an impervious, non-combustible material that ideally has a fire resistance of one hour when tested to BS 476-21;
* If a gate or door is added to the enclosure or chamber it should be metal, hardwood or softwood clad with metal;
* Ideally it should have a fire resistance of 30 minutes when tested to BS 476-22. The door frame should allow clearance of 150 mm either side of the bin, when it is being pulled out for collection;
* The door frame should be rebated into the reveals of the opening. There should be a latch or clasp to hold the door open while the collection process takes place;
* Arrangements should be made for the cleansing of the bin stores with water and disinfectant. A hose union tap should be installed for the water supply. Drainage should be by means of trapped gully connected to the foul sewer. The floor of the bin store area should have a suitable fall (no greater than 1:20) towards the drainage points;
* If the chambers are inside the building, they should have a light. The lighting should be a sealed bulkhead fitting (housings rated to IP65 in BS EN 60529:1992); and
* Internal bin chambers should have appropriate passive ventilators to allow air flow and prevent unpleasant odours. The ventilation must be fly, and vermin proofed and near to either the roof or floor, but away from the windows of dwellings.

## Access for Collections

* Collectors should not have to move a bulk bin more than 10 metres from the point of storage to the collection vehicle;
* The gradient of any path that the bulk bins must be moved on should ideally be no more than 1:20, with a width of at least 2 metres, and the surface should be smooth;
* The transfer route should be well lit and clear of debris and vegetation;
* If the storage area is raised above the area where the collection vehicle parks, then a dropped kerb is needed to safely move the bin to level of the collection vehicle; and
* The roadway the vehicle parks on should be able to accommodate the weight and size of a 26-tonne vehicle.

## Waste Collection

* + 1. Waste bins will be collected from the service area and waste collections will be undertaken by the nominated waste contractor. Collections are usually out of hours between, 06:00 and 07:00.

## Waste Mitigation

* + 1. Tenants of the development will be encouraged to reduce, re-use and recycle waste materials where possible to reduce waste to incineration.
    2. The FM team and any other on-site staff handling, and segregating waste will need full training on the correct residual and recycling compositions using up to date LBC guidance.

## Litter Picking

* + 1. Litter picking will be conducted by the FM team throughout the day to allow for both a safe and clean environment within the site and its immediate environs.

Appendix A: Swept Path Analysis

Site Accommodation: Swept Path Analysis – 10m Vehicle IN/OUT Phase 1

Diagram, engineering drawing

Description automatically generated

Site Accommodation: Swept Path Analysis – 6m Vehicle IN/OUT Phase 1

Diagram, engineering drawing

Description automatically generated

Site Accommodation: Swept Path Analysis – 10m Vehicle IN Phase 2

Diagram, engineering drawing

Description automatically generated

Site Accommodation: Swept Path Analysis – 6m Vehicle OUT Phase 2

Diagram, engineering drawing

Description automatically generated

CSC: Swept Path Analysis – Skip Vehicle IN

A blueprint of a building

Description automatically generated with low confidence

CSC: Swept Path Analysis – Skip Vehicle OUT

A picture containing text, diagram, plan, map

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CSC: Swept Path Analysis – Hiab IN

A blueprint of a building

Description automatically generated with low confidence

CSC: Swept Path Analysis – Hiab OUT

A picture containing text, diagram, plan, screenshot

Description automatically generated

Appendix B: Waste Management Plan

Overview

* + 1. This document sets out the Waste Management Plan (WMP) for the development.
    2. The Principal Environment Services Officer, LBC, will offer advice for the final submission and arrangement for this waste strategy.
    3. The final WMP will include the following key elements:
* Details of the responsible contact person, how a copy can be obtained and the teams / personnel to whom a copy of the WMP must be provided to;
* The segregation of waste streams and how to dispose of them;
* Expected waste generation and storage requirements;
* Collection points and frequency;
* The various responsibilities of FM team and future occupants;
* Programme of document monitoring and review; and
* Documentation of any amendments.

Waste Segregation

* + 1. Since January 2015, UK regulations require the separate collection of paper, plastic, metals & glass for recycling from all waste producers including commercial waste.
    2. There is often confusion for people around what is and isn’t recyclable, the items that are recyclable should carry obvious visual clues about which bin they should be placed into. This could be via labels on the packaging itself or signage on and adjacent to the bins carrying photos of each container type and an indication of which bin it should be placed into. Some examples of how this can be achieved is shown in Figure 6.

Figure 6 Waste labels and posters

|  |
| --- |
|  |

* + 1. If it is not technically, environmentally and economically practicable to segregate all waste streams, it is proposed to provide co-mingled recyclable storage for waste streams shown in Figure 7. For waste across the site, waste will be segregated by hand at the source of production.

Figure 7 Co-mingled recyclables

|  |
| --- |
| https://www.newham.gov.uk/Style%20Library/Newham/Environment%20and%20planning/Recyclable_materials.JPG |

Waste Generation and storage

* + 1. Guidance in the following documents has been applied when defining the WMP:
       - Camden Planning Guidance, March 2019;
       - Camden’s Environment Service technical guidance for recycling and waste; and
       - BS 5906:2005 Waste management in buildings – a code of practice.
    2. Two-day waste generation for commercial use has been calculated to comply with best practice and allow for contingency.
    3. Residential waste has been calculated in weekly volumes.
    4. The equipment required can be seen in the example equipment specifications.

Commercial Waste Generation

* + 1. Based on the area schedule in section 0 of the DSMP, the estimated two-day waste generation is 25.38m³ as shown in Table 7.

Table 7 Two-day waste generation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Proposed Development - Two Day Waste Generation (m³) | | | | |
| **Waste Stream** | **Site Accommodation** | **Canteen** | **CSC** | **Total (m³)** |
| Residual | 1.27 | 10.00 | 0.47 | 11.74 |
| Paper | 4.14 | 0.00 | 1.52 | 5.66 |
| Cardboard | 0.45 | 0.83 | 0.23 | 1.51 |
| Plastic | 0.38 | 0.50 | 0.12 | 1.00 |
| Aluminium | 0.13 | 0.50 | 0.00 | 0.63 |
| Glass | 0.00 | 0.83 | 0.00 | 0.83 |
| Food Waste | 0.00 | 4.00 | 0.00 | 4.00 |
| **Total** | **6.37** | **16.67** | **2.34** | **25.38** |

Commercial Waste Storage

* + 1. The Proposed Development requires a two waste stores, a waste store for the site accommodation (including the canteen) and for the CSC, sized at 54.95m2 and 13.65m2 respectively. Waste stores have been sized to accommodate two days’ storage of commercial waste. The equipment required is shown in Table 8 and Table 9.

Table 8 Site Accommodation waste storage equipment

|  |  |  |  |
| --- | --- | --- | --- |
| Site Accommodation – Waste Storage Equipment | | | |
| **Waste Type** | **Compacted Waste (m³)** | **Waste Container** | **Number Required** |
| - | - | Baler | 1 |
| - | - | Bin Compactor | 1 |
| - | - | Roll Cages | 3 |
| Residual | 3.91 | 1,100 litre bin | 4 |
| Paper | 2.83 | 100 kg bale | 3 |
| Cardboard | 0.38 | 100 kg bale | 2 |
| Plastic | 0.33 | 100 kg bale | 1 |
| Aluminium | 0.63 | 660 litre bin | 1 |
| Glass | 0.83 | 240 litre bin | 4 |
| Food Waste | 4.00 | 240 litre bin | 17 |
| **Total** | **12.92** | **-** | **37** |

* + 1. Storing the waste for the site accommodation will require the provision of:
* 1 No. Twin baler for recyclables;
* 1 No. 1,100 litre Eurobins compactor;
* 3 No. Roll cages for the temporary storage of cardboard;
* 4 No. 1,100 litre Eurobins for the storage of residual waste;
* 3 No. 100kg Bales for the storage of paper (double stacked);
* 2 No. 100kg Bales for the storage of cardboard (double stacked);
* 1 No. 100kg Bales for the storage of plastic;
* 1 No. 660 litre wheelie bin for the storage of aluminium;
* 4 No. 240 litre wheelie bin for the storage of glass; and
* 17 No. 240 litre wheelie bin for the storage of food waste.
  + 1. A blueprint of a building

       Description automatically generatedThe abovementioned waste segregation strategy ensures the highest quality of recycled materials, however the internal strategy for the different building functions will be developed and designed later, prior to occupation.
    2. Figure 8 shows the indicative waste room layout for the Site Accommodation

Figure Site Accommodation indicative waste room layout (to scale)

Table 9 CSC waste storage equipment

|  |  |  |  |
| --- | --- | --- | --- |
| CSC – Waste Storage Equipment | | | |
| **Waste Type** | **Compacted Waste (m³)** | **Waste Container** | **Number Required** |
| Residual | 0.47 | 1,100 litre bin | 1 |
| Paper | 1.52 | 1,100 litre bin | 2 |
| Cardboard | 0.23 | 360 litre bin | 1 |
| Plastic | 0.12 | 240 litre bin | 1 |
| Aluminium | 0.00 | n/a | 0 |
| Glass | 0.00 | n/a | 0 |
| Food Waste | 0.00 | n/a | 0 |
| **Total** | **2.34** | **-** | **5.00** |

* + 1. Storing the waste for the CSC will require the provision of:
* 1 No. 1,100 litre Eurobins for the storage of residual waste;
* 2 No. 1,100 litre Eurobins for the storage of paper;
* 1 No. 360 litre wheelie bin for the storage of cardboard;
* 1 No. 240 litre wheelie bin for the storage of plastic.
  + 1. As below, the CSC will also require storage for hazardous materials.
    2. The abovementioned waste segregation strategy ensures the highest quality of recycled materials, however the internal strategy for the different building functions will be developed and designed at a later date, prior to occupation.
    3. Figure 9 shows the indicative layout for the CSC waste room.

A blueprint of a building

Description automatically generated

Figure CSC indicative waste room layout (to scale)

Waste Storage

* + 1. Waste stores been provided in the service area. An indicative location of the waste stores is shown in Figure 10, correct at the time of writing.
    2. The waste stores have over 3m clear headroom for compaction equipment and the FM team will be responsible for the wash-down and cleaning of the waste store (and loading bay), providing spill kits where necessary. .

Figure 10 Commercial waste stores for Site Accommodation and CSC

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|  |

Internal waste transfer

* + 1. Waste stored within the building will be stored in discrete locations across the building – bins will be located against columns or within kitchenette’s. No waste will be temporarily stored in stairwells or communal corridors and that locations will be checked against the fire plan for access and egress.

General waste

* + 1. Non-recoverable waste streams will be colour coded and clearly labelled to help waste producers and the FM team responsible for transferring the waste to the waste room to ensure that they place waste in the correct storage units.

Dry recyclables

* + 1. Dry recyclables will be segregated from other waste in office, workshop, and communal areas. Bins and bags will be colour coded and clearly labelled to help waste producers and the FM team responsible for transferring the waste to the waste room to ensure all recyclable waste is placed in the correct waste storage units.

Bulky/Hazardous Waste

* + 1. The bulky/Hazardous waste store assumed to contain 2 x COSHH Cabinets, Drum store and fluorescent lighting tubing and, small area for bulk waste storage, is to be sized at 20m2. Hazardous and non-hazardous waste must be stored separately.
    2. For non-hazardous bulky waste (furniture, WEEE), there is an opportunity the occupier should explore to utilise the Construction Skills Centre workshops to repair on-site to minimise waste disposal.
    3. It is assumed that the following wastes, which are classified as hazardous, will be produced on site:
* Electrical equipment with potentially harmful components such as cathode ray tubes, e.g. computer monitors and televisions;
* Fluorescent light tubes and energy-saving light bulbs;
* Gas canisters (empty);
* Oils and oily rags (except edible oils), e.g. engine oil; and
* Solvents, e.g. aerosols.  
  + 1. A specific request should be sent to the FM team for the collection of hazardous waste. Upon collection, the marshals will take it to the general waste store prior to collection by a waste contractor.
    2. Waste streams such as florescent tubes, batteries, asbestos and chemicals will be required to be collected by a licensed specialist contractor as they are designated as hazardous waste. The FM team will be required to register the site for a Hazardous Waste Licence to permit this waste to be collected safely and reprocessed.

Specialist waste stream disposal

Waste Electrical and Electronic Equipment (WEEE)

* + 1. WEEE and other specialist waste are to be stored, alongside bulky waste, in an allocated area within the waste room.

Confidential Paper Waste

* + 1. Confidential waste must be collected in secure bins located around the buildings. To be fully compliant with the Data Protection Act, a written contract with a certified confidential waste company is required. This waste stream will be collected in situ by a specialist contractor and shredded and disposed of off-site.

Construction and Demolition Materials

* + 1. Construction and demolition waste is excluded and managed under the Construction Management Plan (CMP) or by the contractors.

Oil

* + 1. Waste oils will have contracts with a waste oil removal provider and will not be dispensed in the drains.

Batteries

* + 1. Batteries will be collected in pots (separate for lithium and alkaline types) located by the photocopiers, which will be periodically collected by the FM team for storage in the general waste store prior to collection by a waste contractor.
    2. The terminals of lithium batteries will require covering with an insulating, non-conductive material e.g. using electrical tape, to prevent the risk of fire. The FM team will ensure this is completed, though staff disposing of the batteries will be expected to complete this where possible.

Photocopier Cartridges

* + 1. Photocopier and printer cartridges will be collected in boxes located by the photocopiers, which will be periodically collected by the FM team for storage prior to collection by a waste contractor.

Fluorescent Tubes and Light Bulbs

* + 1. A specific request should be sent to the FM team for the collection of fluorescent tubes and light bulb waste. Upon collection, the FM team will take it to the general waste store prior to collection by a waste contractor. This waste will then be stored in the same area of the waste room as the WEE and bulky waste.
    2. Waste streams such as florescent tubes and batteries will be required to be collected by a licensed specialist contractor as they are designated as hazardous waste. The FM team will be required to register the site for a Hazardous Waste Licence to permit this waste to be collected safely and reprocessed.

Landscape Maintenance Waste

* + 1. Any maintenance on lawns, hedges, trees, and flower beds within the site boundaries will be carried out specialist contractors who will be responsible for disposing of the waste as part of the contracted.

**Internal Waste Transfer**

* + 1. The FM team will be responsible for communicating with the tenants on the requirements for transferring waste and recycling to the storage facility, including the requirements for bulky and non-standard waste. The waste store and individual zones within the store shall always be labelled clearly.
    2. The office, workshop and communal areas will be provided with waste and recycling stations on each floor for segregating waste. Tenants must be aware of and follow their responsibilities under the waste duty of care: Code of Practice (2016)[[2]](#footnote-3) . The FM team will empty the bins on each floor and transfer waste to the waste store in trolleys or roll cages via the goods lift.
    3. The FM team will be responsible for the collection of all residual, recyclable and specialist waste streams from the development.

Litter Management

General Public Waste

* + 1. Waste will be collected from any public litter bins within the site by the FM team. The FM team will check all bins within the vicinity every at discrete periods over the day to be emptied as necessary within that time.
    2. Litterbins should be located in relation to pedestrian flows and consideration taken to the prevailing wind direction
    3. Public areas such as seating, pathways and green space will be monitored throughout the day and cleaned by the FM team.

Litter Picking

* + 1. Litter picking will be conducted by the FM team throughout the day to allow for both a safe and clean environment.

External/Surrounding Areas

* + 1. The cleaning of external areas within the Proposed Development will follow the programme set out in Table 10.

Table 10 Cleaning schedule

|  |  |
| --- | --- |
| Action | Frequency |
| Clear debris, litter from entrances and public areas | Daily |
| Empty waste bins | Daily |
| Clear leaves from all entrances and fire exits | Weekly |
| Clean and wash down external signs | Weekly |

Waste Collection

* + 1. Waste bins will be collected from directly from the waste store and waste collections will be undertaken by the nominated waste carrier. Collections are usually out of hours typically between, 06:00 and 07:00. Where the distance between the waste store and the waste collection point is more than 10m the marshals will manage waste collections and rotate any full and empty containers. There will be a smooth transfer for the presentation, tipping, and the bins will be removed immediately and transferred back to the storage room.
    2. As it is proposed to present full waste bins, issues associated with fly tipping will be minimised as members of the public will not have general access to the waste bins.
    3. In the event of a missed collection, full waste bins will be returned to the waste store. Storage has been provided to accommodate two days’ waste generation, therefore, missing a single waste collection will not have a detrimental impact on waste storage.

Waste Reduction Interventions

* + 1. This section presents initiatives to encourage environmental thinking to reuse, recycle and reduce waste through the building’s supply chain.
    2. When considering waste reduction methods, the waste hierarchy pyramid provides a useful guide to the order in which waste reduction measures should be considered, from most effective to the least effective as shown in Figure 11.

Figure 11 Waste hierarchy

|  |
| --- |
| Image result for waste prevention pyramid |

* + 1. Preventing the generation of waste is considered the most effective way of improving recycling rates, followed by reuse of materials, and then moving into recycling, recover and, eventually, disposal in landfill.

Material re-use

* + 1. For the CSC it is expected that courses will reuse material within the college e.g. wood reused for joinery courses.
    2. For site accommodation this will not be possible, the loading/ unloading area is within a live construction site.

Packaging

* + 1. The building management team should endeavour to collaborate with suppliers that display green initiatives when packing items including:
* Downsizing packaging;
* Using “green” packaging materials;
* Promoting recycling and reuse programs;
* Cooperating with vendor to standardise packaging;
* Encouraging and adopting returnable packaging methods including a deposit return scheme for recyclable waste generated in the canteen;
* Minimising material uses and time to unpack;
* Using a recyclable pallet system; and
* Saving energy in warehouses throughout the supply chain.

Supply Chain

* + 1. The building management should provide a purchasing strategy that encourages green logistics, including:
* Using alternative fuelled vehicles;
* Grouping orders together, rather than in smaller batches;
* Collaborating with other tenants to consolidate loads; and
* Optimising reverse logistics to collect used products and packaging from customers for recycling, returning packaging and products to suppliers for reuse, and requiring suppliers to collect their packaging materials.

Behaviour Change

* + 1. People often attach a low priority to pro-environmental behaviour. To encourage such behaviour and drive environmental performance, the tenant should address both the physical and the psychological environment. The goal should be to create an environment that guides decision making, and helps people act out those decisions. Some examples on how this could be achieved are as follows:
* Collect data to understand users’ experience of waste infrastructure and its effect on their behaviour;
* Reduce the amount of packaging, and increase the percentage of recyclable packaging;
* Redesign signage to make bins for different streams distinct;
* Update labelling to be uniform;
* Locate bins for different streams where they are most needed (e.g. on walking routes); and
* Remove bins not consistent with design.

Example Equipment Specification

1,100 Litre Eurobin

Length: 1.37m

Width: 1.11m

Height: 1.38m

|  |
| --- |
| A picture containing sketch, drawing, diagram, technical drawing  Description automatically generated |

240 Litre Wheelie Bin

Length: 0.72m

Width: 0.55m

Height: 1.15m

|  |
| --- |
| A drawing of a recycle bin  Description automatically generated with low confidence |

Waste Management Plan Review

* + 1. The success of the strategy as detailed above will be closely monitored by the FM team.
    2. Feedback should be provided monthly and as and when required where immediate action is required and dealt with in accordance with this strategy.
    3. The strategy will be updated and amended as appropriate to ensure the development is within the perimeters of what is deemed necessary to maintain a clean and safe environment all year round.
    4. Any changes or deviations to the agreed WMP will be made by submission of a revised document to the LBC Planning Obligations team. Amendments will be shown in an appendix to the WMP, under version control.

1. Reducing personal deliveries to your business. TfL (2016) [↑](#footnote-ref-2)
2. <https://www.gov.uk/government/publications/waste-duty-of-care-code-of-practice/waste-duty-of-care-code-of-practice> [↑](#footnote-ref-3)