ARUP

Colt Data Centre Services

LON4, Hayes

Pre-Occupation Delivery & Servicing Management Plan

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1. Introduction

1.1 Background

Arup has been appointed by Colt Data Centre Solutions to provide a Delivery and Servicing Management Plan (DSMP) for the development of a data centre at Beaconsfield Road in Hayes, London Borough of Hillingdon (LBH).

This DSMP is provided in accordance with Condition 20 of planning permission 38421/APP/2021/4045: *"Prior to operation, or each development phase, the final comprehensive Delivery and Servicing Plan for the development, or each development phase, shall be submitted to and approved in writing by the Local Planning Authority. This should accord with the TfL Delivery and Servicing Plan Guidance. Thereafter the development shall be carried out and maintained in full accordance with the approved details."*

The site sits as part of Springfield Road Industrial Area, a wider commercial area bound to the north by Uxbridge Road, the west by Springfield Road, to the east by the Yeading Brook, and to the south by Beaconsfield Road. The area comprises of a mix of commercial operations with a number of retail developments and a hotel located predominantly in the northern part closer to Uxbridge Road and industrial, storage, and manufacturing operations across much of the central and southern areas.

The site is located within the Hayes Opportunity Area within the wider Heathrow/Elizabeth Line West Growth Corridor. The Hayes Opportunity Area is identified as being "nascent", the tier of Opportunity Areas considered most ready for intensification. Within the Opportunity Area, the site itself is included within the Springfield Road section of the wider Hayes Industrial Area Strategic Industrial Location (SIL). The Springfield Road site is specifically identified as being a "Strategic Area for Regeneration", a specific area which has been identified as having the greatest socio-economic need and where there is a particular focus on urban regeneration and renewal.

The site is located within an Air Quality Management Area (AQMA) which has been established across the entirety of the southern half of the LBH but is not within an Air Quality Focus Area.

1.2 Existing Operation

The eastern part of the site is occupied by a Data Centre, a co-location facility operated by Optimum Data Centres. The data centre itself was constructed in the 1980s as a warehouse with an element of office space constructed subsequently, before planning permission was granted in 2001 for the change of use to a data centre. It comprises a two-storey traditional steel framed warehouse unit with connected two story brick built office extension to the south and plant equipment located across and adjacent to the two buildings.

To the west of the Data Centre (and forming the central element of the site) are the Tudor Works, a terrace of 16 industrial units with two storey office extensions on both the northern and southern ends. The units are of a steel framed construction with profiled. The units are occupied for a range of storage and manufacturing operations.

To the west of the Tudor Works (and forming the very western part of the site) is the Veetec Motor Group facility which comprises a three-storey office building at the front of the site, an open yard used for car storage to its rear, and an industrial unit to the rear. The site is used for the receipt, repair, storage, and maintenance of vehicles.

Figure 1 illustrates the site location.

Figure 1 Site Plan

1.3 The development

The development of the site to deliver a data centre campus including: two data centre buildings; associated energy and electricity infrastructure, buildings, and plant; security gatehouse, systems and enclosures; works to the highway, car parking and cycle parking; hard and soft landscaping; as well as associated infrastructure, ancillary office use, and associated external works

The development will provide 39,359 m² Gross Internal Area (GIA) of data centre campus development, comprising:

Building 1:

- 2,873 m^2 GIA office use; and
- 18,494 m^2 GIA data centre/switchroom use.

- Building 2:
- 17,992 m^2 GIA data centre/switchroom use.

1.4 Area schedule

Table 1 shows the area schedule for the development. NIA is assumed to be 70% of GIA.

Data Centre - Area Schedule			
Land Use Class	**Use Class**	**GIA (m^2)**	**NIA (m^2)**
Building 1			
Office	E(c)	2,873	2,011
Data centre/switchroom	E(b)	18,494	12,946
Building 2			
Data centre/switchroom	E(b)	17,992	12,594
TOTAL	-	**39,359**	**27,551**

Table 1 Area schedule

1.5 Reference publications

The following planning policy and best practice guidance documents have been considered when developing this DSMP:

National policy documents:

- Revised National Planning Policy Framework, 2019;
- 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.

Regional policy documents:

- The London Plan, 2021;
- The Freight and Servicing Action Plan, 2019;
- The Mayor's Transport Strategy, 2018;
- Fleet Operator Recognition Scheme (FORS); and
- TfL guidance for DSMPs.

Key local policy:

- Hillingdon Local Plan 2012.

The following document has been used within this document:

- DCS20109-ARUP-DC-XX-XX-RP-C-00-052

1.6 DSMP objectives

This DSMP sets out to meet the following objectives:

- To identify the expected frequency and duration of delivery and servicing trips associated with the development and the size of the vehicles likely to be used;
- To identify the likely nature of the goods to be delivered;
- To demonstrate that goods and services can be delivered, and waste removed, in a safe and efficient manner with avoidance of vehicles arriving at the same time;
- To identify ways to reduce delivery numbers, employ out of hours deliveries and consolidate goods wherever possible;
- To ensure delivery activities do not hinder the flow of traffic on the public highway or obstruct pedestrian routes;
- To minimise vehicles waiting or parking at loading areas so that there is a continuous availability for approaching vehicles;
- To provide design guidance for accommodating service and delivery vehicles with suitable offloading areas; and
- To provide design guidance for waste storage and refuse collection vehicles.

On-going monitoring and review of the DSMP will be required to ensure that the listed objectives of this DSMP are achieved (further details in Section 6). If necessary, the DSMP will be reviewed and adapted to reflect continuous improvement of the delivery and servicing process.

1.7 Report structure

This report is divided into the following sections:

Section Two – sets out initiatives to reduce delivery vehicles and emissions through smart procurement and vehicle reduction measures;

Section Three – sets out the type, number and nature of daily delivery vehicles;

Section Four – sets out the delivery and servicing strategy for the movement of goods within the development;

Section Five – sets out the waste management strategy; and

Section Six – sets out a process for conducting an annual review of the DSMP.

2. Procurement and Sustainability

2.1 The Mayor's Transport Strategy

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.

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.

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."

Proposal 117 acknowledges the incorporation of DSMPs, CLPs and the FORS scheme:

"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."

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.

2.2 Overview

The objective of the servicing strategy 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.

All tenants within the development will 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, retime deliveries and for loading bay management;
- Provide a consolidated waste collection service; and
- Provide information to deliverers i.e. a delivery point assessment.

Additional measures that could be considered in order to 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;
- Provide a list of preferred suppliers and ensure that tenants only order through them to allow collective procurement; and
- For office staff, companies will consider promoting the collection of personal deliveries on the way home from work, as opposed to having packages delivered to the development.

The site has a specific focus on sustainability, with a strategy consisting of three focus areas:

Decarbonising our business:

- Climate change
- Biodiversity & land management
- Energy
- Waste
- Water
- Sustainable design and construction
- Building materials.

Connecting people:

- Customer engagement
- Community engagement
- Equity, diversity & inclusion
- Talent development and engagement
- Wellbeing, health & safety.

Safeguarding our company:

- Responsible supply chain management
- ESG Governance
- Business ethics and compliance
- Reporting & transparency
- Data privacy and security.

The development management will also aim to promote the use of sustainable and safe freight through the use of various schemes.

2.3 Proposed measures

2.3.1 Delivery booking system

Deliveries will 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 site. This will ensure all delivery and 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 access;
- Appointments over the web, and monitor the status;
- 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 at the site they will access via security gates and the driver will be directed to the service yard in the building they are visiting where goods will be unloaded by the driver and distribution to the tenants. This process flow is summarised in Figure 2.

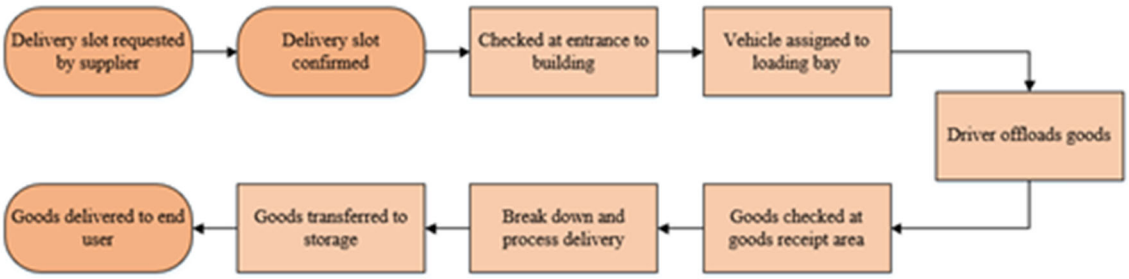


Figure 2 Goods in process flow

2.3.2 Delivery Point Assessment (DPA)

To assist deliveries to the development, suppliers and their logistics providers will 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.

2.3.3 Waste collection consolidation

To consolidate waste collections into as few vehicles as possible, the development will provide a communal waste room in each building and waste collections will be arranged by the on-site FM team.

2.4 Additional measures to be considered

2.4.1 Personal delivery reduction

At present, in London, it is estimated that almost 40% of all deliveries made to the workplace are personal[1]. 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.

An alternative option is to discourage employees and promote alternative ways to receive their online purchases. The building owner and customers 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.

2.4.2 Preferred supplier

Customers within the development will have access to a preferred supplier scheme supervised by the FM team. Customers will 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.

The development benefits from reducing the number of supplier vehicles on the street. Customers 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.

Customers will be encouraged to order goods and materials to fully utilise their storage capability. This will result in less frequent deliveries throughout the week.

2.5 Safe & sustainable freight

Customers 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.

2.5.1 Fleet Operators Recognition Scheme (FORS)

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.

For bronze level membership a number 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.

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;

[1] This figure is based on a large-scale survey of 1,200 offices conducted by TfL in 2016

- Vehicle incidents; and
- Penalty Charge Notices and fines.

2.5.2 Safe Urban Driving (SUD)

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.

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).

2.6 Alternative fuelled vehicles

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.

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 retail and procurement strategy:

- Choosing retail 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 retail operators with alternatively fuelled vehicles.

3. Delivery and Servicing Vehicles

3.1 Overview

This section presents the information for delivery and servicing as follows:

- The size of delivery vehicles permitted within the loading bays;
- The number and frequency of delivery vehicles;
- The delivery and servicing strategy; and
- The nature of expected deliveries.

3.2 Assumptions

Key assumptions used to calculate the servicing requirements for the project are:

- Office deliveries are calculated by the application of a trip rate of 0.20 trips per 100 m^2 GIA to the total office floor area; and
- Deliveries and servicing trips to the data centre itself are calculated by the application of a trip rate of 0.05 trips per 100m^2 GIA to the total data centre and switchroom floor area.

3.3 Size of servicing vehicles

The delivery and servicing trips to the site will be made by a variety of vehicles. Table 2 shows the likely service vehicle type including typical turnaround times.

Table 2 Size of servicing vehicles

Vehicle type	Vehicle	Characteristics	Turnaround time (mins)
Cycle couriers		1T, vehicle length 2m	15
Motorcycle couriers		1T, vehicle length 1.5m	15
A1 Cars		1.5T, vehicle length 5m	15
A2 &B Small Transit Van		2T, vehicle length 5m	15
C Transit Van / Light Goods Vehicle (LGV)		3.5 T, vehicle length 6m	15
D / Medium Goods Vehicle (MGV)		7.5 T – 17T, vehicle length 8m	25

Vehicle type	Vehicle	Characteristics	Turnaround time (mins)
E1 / Heavy Goods Vehicle (HGV)		17 T, vehicle length 10m	30
F1 & F2 Articulated vehicle		44 T, vehicle length 16.5m	30-60
C Transit Van / Service engineer		3.5 T, vehicle length 6m	45 – half day
Refuse collection vehicle		26 T, vehicle length 10m	15-20

3.4 Vehicle generation

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 building uses to the relevant gross internal area (GIA) for that building. The trip rates, which are expressed as vehicles per 100m^2 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.

3.5 Servicing trips

The anticipated number of delivery and servicing trips is shown in Table 3.

Table 3 Estimated delivery and servicing trips

Estimated Daily Delivery and Servicing Trips				
Land Use	**GIA (m^2)**	**Trip Rate per 100 m^2 GIA**	**Daily Deliveries**	**Peak Hour (0700-0800)**
Building 1				
Office	2,873	0.20	6	2
Data centre	18,494	0.05	10	
Building 2				
Data centre	17,992	0.05	9	1
Total	**39,359**	**-**	**25**	**3**

The development has provided a total of four loading bays, as follows:

- 2 No. 16.5m loading bay sized at 16.5m x 4m in Building 1; and
- 2 No. 16.5m loading bay sized at 16.5m x 4m in Building 2.

This provision is more than sufficient to accommodate the above number of deliveries.

3.6 Typical deliveries

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 4.

Roll Container	Pallet	Plastic or Wooden Crate
		
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

Table 4 Typical Goods Containers

4. Internal Distribution

4.1 Loading bays

The scheme has provided four loading bays across two buildings, as shown in Figure 3.

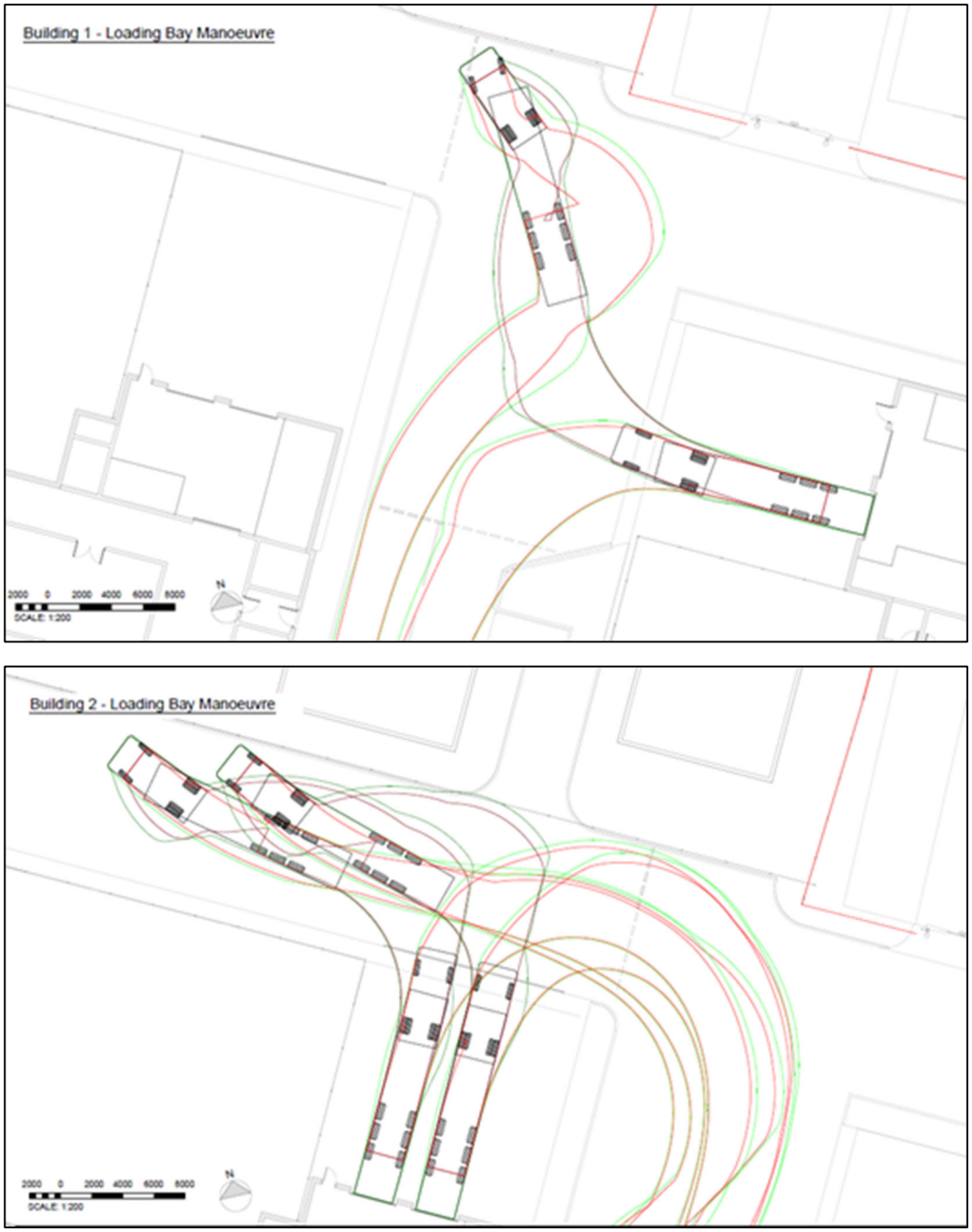


Figure 3 Building One and Building Two loading bays

Vehicles will be required to enter the internal service yard in forward gear and exit in forward gear. The service yards are accessed from an internal service road which is accessed from Beaconsfield Road.

4.2 Swept path analysis

Swept path analysis has been undertaken to demonstrate vehicle paths in the service yard, ensuring each vehicle can independently manoeuvre into their respective loading bay while other bays are occupied. This can be seen in **Appendix A**.

4.3 Goods receipt and distribution

4.3.1 Pre-delivery process

Servicing and delivery vehicles will be able to access the internal service yard at the development for 24 hours a day.

A pre-booked delivery system will be used. This will ensure an even arrival profile of service vehicles to optimise the use of the loading facilities.

When booking a delivery slot, the logistics provider will be allocated a slot for their delivery to be completed. Slots will be timed according to the size of the vehicle, with 6-metre-long vehicles (3.6/4.5T transit and box vans) being allocated 15 minutes, 8-metre-long vehicles (7.5T box vans) being allocated 20 minutes and 10-metre long and 16.5 metre long vehicles being allocated 60 minutes. For heavy and large deliveries an agreement must be reached in advance for the delivery and storage of any equipment requiring special handling or storage. However, 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 security and building FM team.

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.

4.3.2 Delivery receipt and distribution process

The service yard doors will be open 24 hours a day. Delivery vehicles will be able to reverse into their allocated loading bay in the service yard from the internal service road. A dockmaster will assist with indicating the correct bay to use and co-ordinating the delivery receipt process.

Tenants should be aware of the bookings their suppliers have made. The dockmaster will inform the tenant when their delivery has arrived, and the tenant will decide how they plan to receive the delivery.

Tenants can either collect the delivery from the loading bay or request for the driver to bring it to their unit directly.

The driver will be responsible for the unloading/loading of goods from the vehicle and transferring to the tenant space. Deliveries will be taken directly into the data centre and office spaces at ground floor level from the service yards.

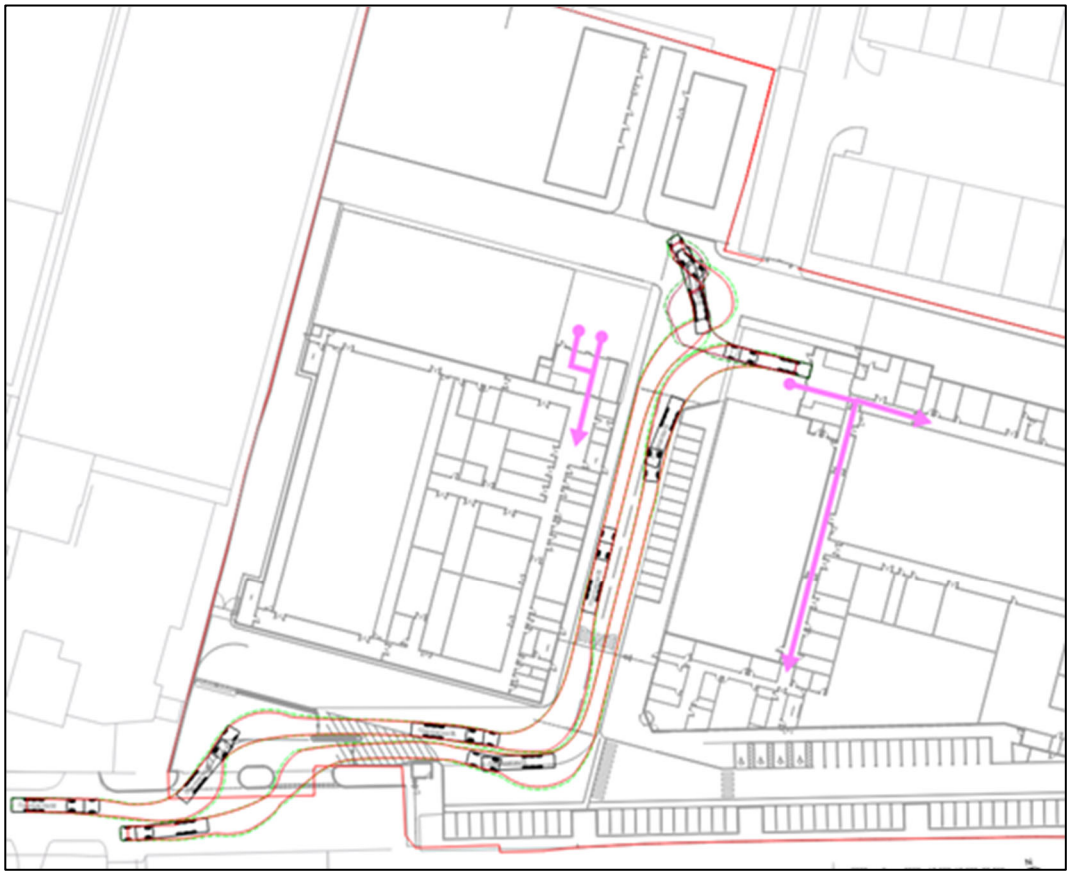


Figure 4 Ground floor distribution routes

5. Waste Management

5.1 Overview

This section sets out the Waste Management Plan (WMP) for the development.

This WMP will include the following key elements:

- Details of the person responsible for this WMP;
- 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.

5.2 Assumptions

Guidance in the following documents has been applied when defining the WMP:

- BS 5906:2005 Waste management in buildings – a code of practice.

This assessment has been based on a number of key assumptions:

- The office space generates 50 litres of waste for every employee per week;
- One employee per 10m² of floor area
- The data centre generates 5 litres of waste per m² of floor area per week;
- A twin cardboard baler will require a clear headroom of 2.2m;
- A 1,100 litre eurobin compactor will require a clear headroom of 2.1m; and
- Waste is collected every day but storage space is provided for two-days' worth of waste.

5.3 Commercial waste generation & storage

5.3.1 Building one

Based on the area schedule in Table 1 of the DSMP, the estimated two-day waste generation for building one is 29.91m³ as shown in Table 5.

Building 1: Data Centre - Weekly Waste Generation (m³)			
Waste Stream	**Office**	**Data Centre**	**Total**
Residual	0.80	7.77	8.57
Paper	2.61	10.36	12.97
Cardboard	0.28	5.18	5.46
Plastic	0.24	2.59	2.83
Aluminium	0.08	0.00	0.08

Building 1: Data Centre - Weekly Waste Generation (m³)			
Glass	0.00	0.00	0.00
Food Waste	0.00	0.00	0.00
Total	**4.02**	**25.89**	**29.91**

Table 5 Building one two-day waste generation

Table 6 sets out the storage facilities required to accommodate two days' worth of waste.

Data Centre – Waste Storage Equipment					
Waste Type	**Uncompacted Waste (m³)**	**Compacted Waste (m³)**	**Waste Container Description**	**Volume (m³)**	**Number Required**
Residual	8.57	2.86	1,100 litre Eurobin	1.1	3
Paper	12.97	6.49	100kg bales	-	7
Cardboard	5.46	1.36	100kg bales	-	7
Plastic	2.83	0.94	100kg bales	-	2
Aluminium	0.08	0.08	240 litre Eurobin	0.24	1
Total	**29.91**	**11.7**	**-**	**-**	**20**

Table 6 Waste storage equipment

A basement waste store will be provided to hold the following:

- 1 No. 100kg baler;
- 1 No. Hand pallet truck;
- 1 No. 1,100 litre in-bin compactor;
- 3 No. 1,100 litre eurobins for residual waste;
- 7 No. 100kg bales (2 per pallet) of paper waste;
- 7 No. 100kg bales (2 per pallet) of cardboard waste;
- 2 No. 100kg bales (2 per pallet) of plastic waste; and
- 1 No. 240 litre eurobins for aluminium waste.

The space required to store these waste containers is shown in Figure 5.

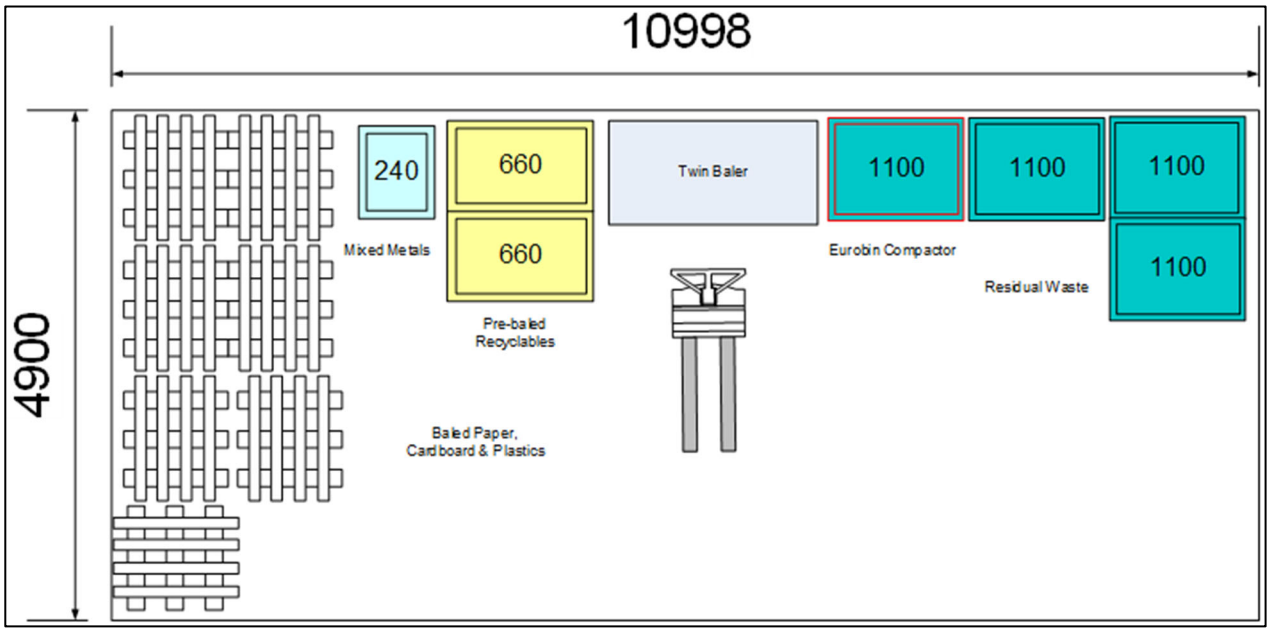


Figure 5: Building One – indicative waste storage area

5.3.2 Building Two

Based on the area schedule in Table 1 of the DSMP, the estimated two-day waste generation for building two is 35.98m³ as shown in Table 5.

Building 2: Data Centre - Weekly Waste Generation (m³)		
Waste Stream	**Data Centre**	**Total**
Residual	10.80	10.80
Paper	14.39	14.39
Cardboard	7.20	7.20
Plastic	3.60	3.60
Aluminium	0.00	0.00
Glass	0.00	0.00
Food Waste	0.00	0.00
Total	**35.98**	**35.98**

Table 7 Building two two-day waste generation

Table 6 sets out the storage facilities required to accommodate two days' worth of waste.

Data Centre – Waste Storage Equipment					
Waste Type	**Uncompacted Waste (m^3)**	**Compacted Waste (m^3)**	**Waste Container Description**	**Volume (m^3)**	**Number Required**
Residual	10.80	3.60	1,100 litre Eurobin	1.1	4
Paper	14.39	7.20	100kg bales	-	8
Cardboard	7.20	1.80	100kg bales	-	9
Plastic	3.60	1.20	100kg bales	-	2
Total	**35.98**	**13.8**	**-**	**-**	**23**

Table 8 Building two waste storage equipment

A basement waste store will be provided at to hold the following:

- 1 No. 100kg baler;
- 1 No. Hand pallet truck;
- 1 No. 1,100 litre in-bin compactor;
- 4 No. 1,100 litre eurobins for residual waste;
- 8 No. 100kg bales (2 per pallet) of paper waste;
- 9 No. 100kg bales (2 per pallet) of cardboard waste; and
- 2 No. 100kg bales (2 per pallet) of plastic waste.

The space required to store these waste containers is shown in Figure 6.

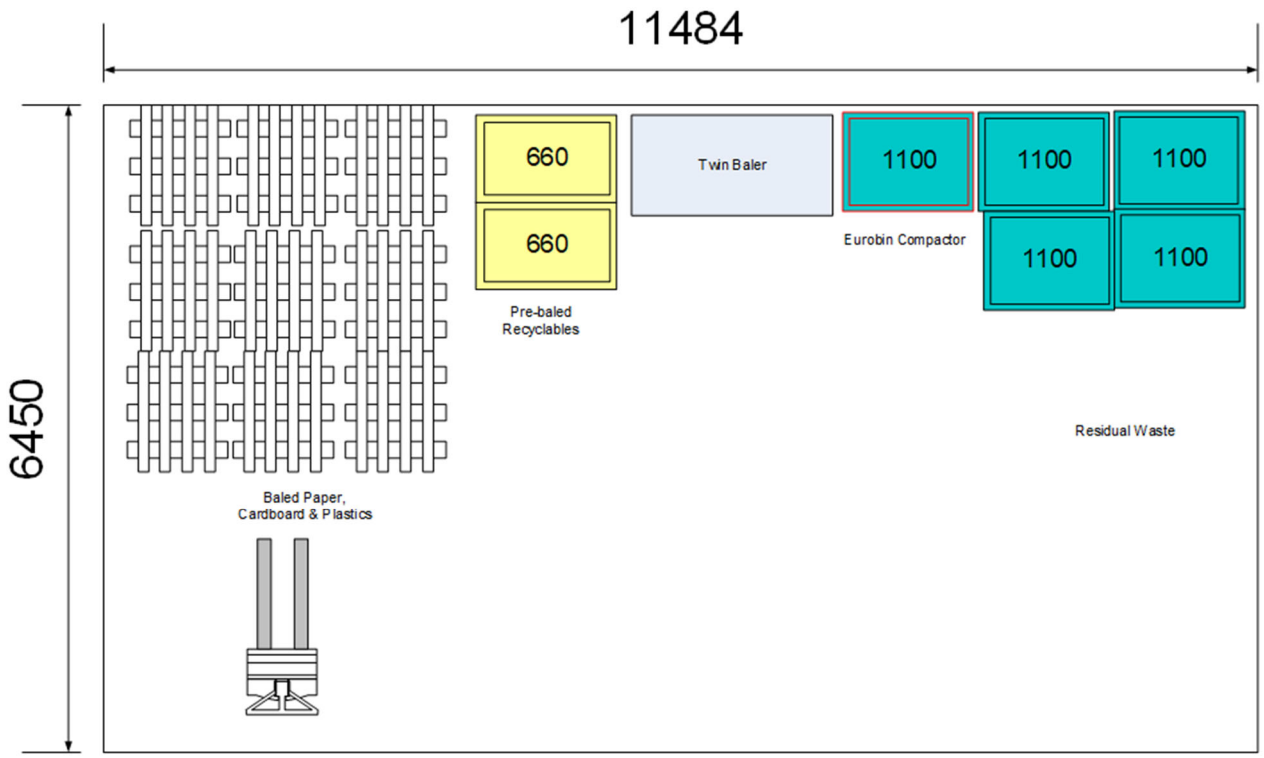


Figure 6: Building Two – indicative waste storage area

5.4 Internal waste disposal

Within the building, waste will be stored at recycling points distributed throughout each floor. Waste streams will be segregated using colour-coded polythene sacks.

Waste will be taken by each of the tenants to the waste store periodically throughout the day using the goods lifts in the cores. The waste will then be brought from the waste store to the service yard each day immediately prior to collection. 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.

5.4.1 General waste

Non-recoverable waste streams will be placed in bags and clearly labelled to help waste producers and the team responsible for transferring the waste to the waste room to ensure that they place waste in the grey general waste bins. General waste will be placed into bins and the FM team will compact this waste using an in-bin compactor.

5.4.2 Paper

Paper waste will be taken to the waste store where it will be baled into 100kg bales and placed on pallets.

5.4.3 Cardboard

Large pieces of cardboard will be flattened and separated from other waste and taken to the waste store where it will be baled into 100kg bales and placed on pallets.

5.4.4 Plastic

Recyclable plastic waste will be separated from other waste and taken to the waste store where it will be baled into 100kg bales and placed on pallets.

5.4.5 Aluminium/metal

Metal waste will be segregated from other waste in all areas, collected in bags and placed into the metal bins in the waste store

5.4.6 Specialist waste stream disposal

Waste Electrical and Electronic Equipment (WEEE)

WEEE and other specialist waste are to be stored within the tenants demise and will be brought for collection directly to the loading bay immediately prior to collection by a waste contractor.

Confidential paper waste

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 from the tenants' demise in situ by a specialist contractor and shredded and disposed of off-site.

Hazardous waste

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.

A specific request should be sent to the FM team for the collection of hazardous waste. Waste will then be taken directly from the tenant's demise to the loading bay immediately prior to collection.

Construction and demolition materials

Construction and demolition waste is excluded and managed under the Construction Management Plan (CMP) or by any contractors. No communal space will be provided for the storage of construction waste and this will need to be managed within the tenant's demise.

Batteries

Batteries will be collected in pots (separate for lithium and alkaline types) located by the photocopiers in the offices, which will be periodically collected by the FM team for storage in the general waste store prior to collection by a waste contractor.

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

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

Arup recommend that light fittings are specified with long-lasting LED bulbs to minimise the amount of light fitting waste created. 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.

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.

Sanitary waste

Sanitary waste from the washrooms will be collected and disposed of by the cleaning contractor and will be dealt with separately from the rest of the building waste. Like all other types of waste materials collected from site a Waste Transfer Note (WTN) must be held on file for auditing purposes.

Landscape maintenance waste

Any waste generated during maintenance of the landscaping will be removed by the landscape contractors and will not be stored on site.

5.5 Waste reduction interventions

This section presents initiatives to encourage environmental thinking to reuse, recycle and reduce waste through the building's supply chain.

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 7.

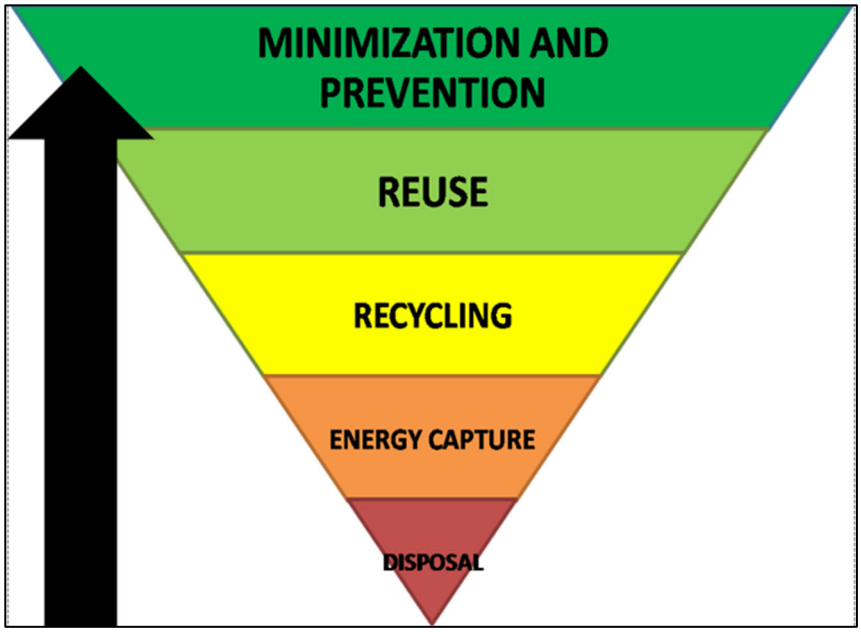


Figure 7 Waste hierarchy

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.

5.5.1 Packaging

The building management team will 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 standardize packaging;
- Encouraging and adopting returnable packaging methods;
- Minimising material uses and time to unpack;
- Using a recyclable pallet system; and
- Saving energy in warehouses throughout the supply chain.

5.5.2 Supply chain

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.

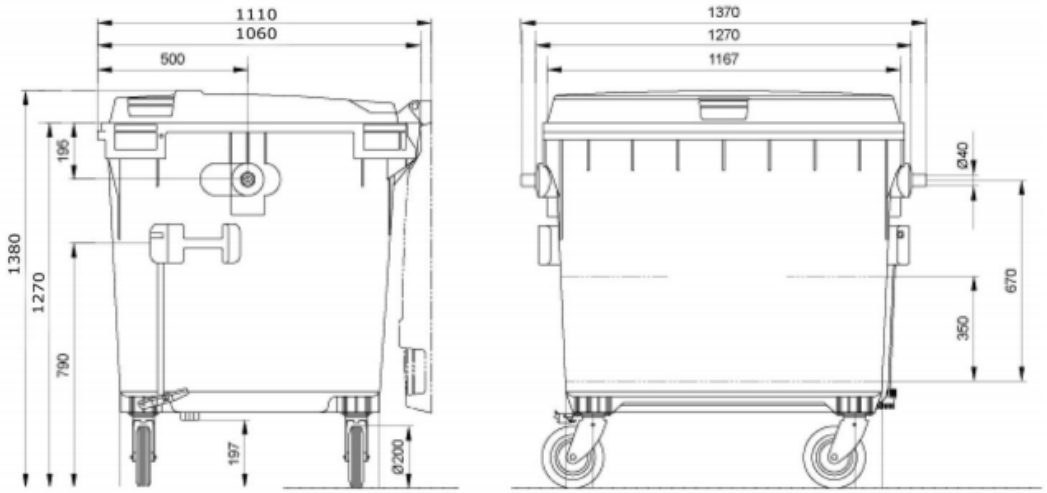
5.5.3 Behaviour change

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.

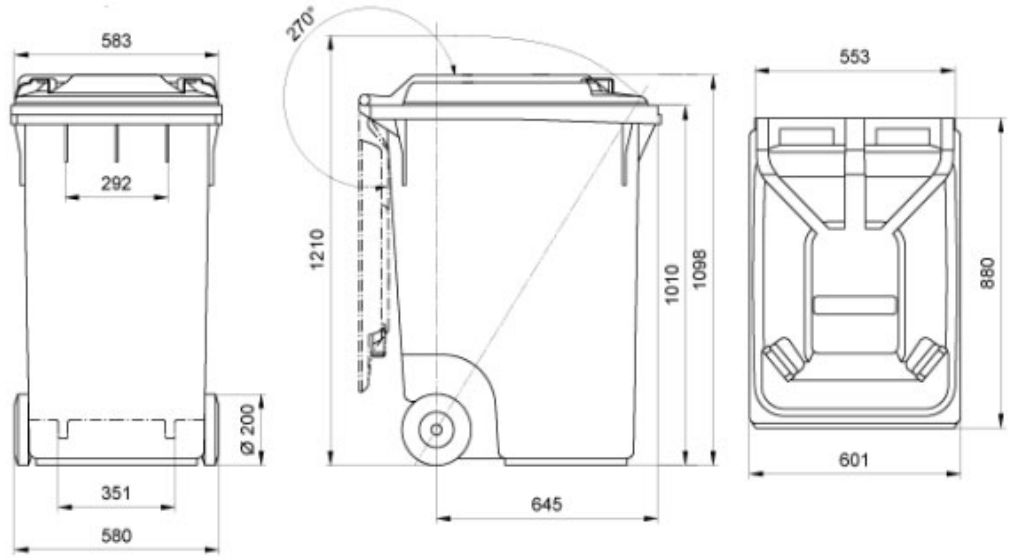
5.6 Example equipment specification

1,100 Litre Eurobin



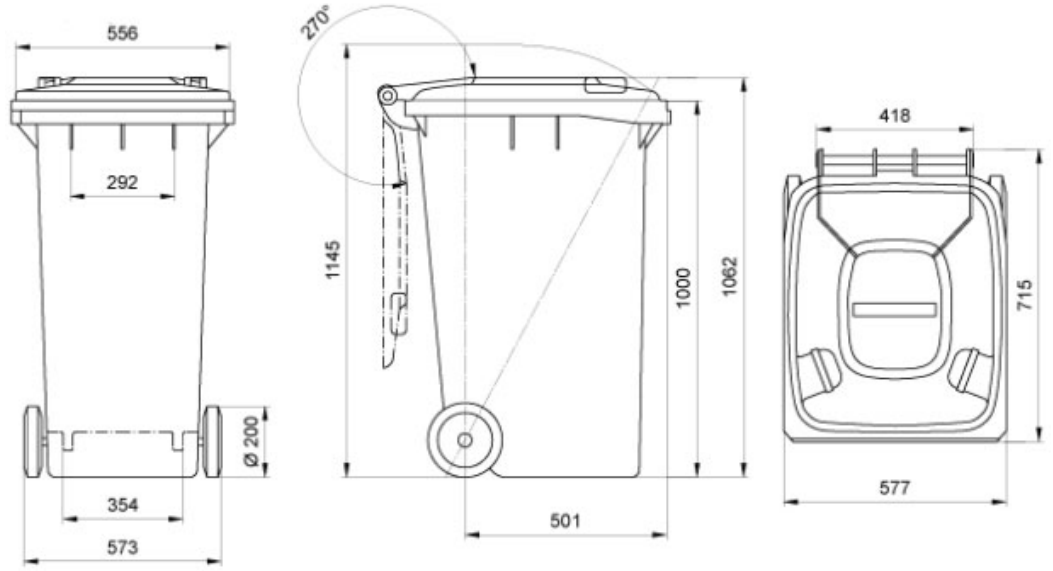
Length: 1.37m Width: 1.11m Height: 1.38m

360 Litre Wheelie Bin



Length: 0.88m Width: 0.53m Height: 1.21m

240 Litre Wheelie Bin



Length: 0.72m Width: 0.55m Height: 1.15m

In-bin compactor

Length: 1.15m Width: 1.15m Height: 2.1m

Baler

Length: 1.03m Width: 1.56m Height: 2.63m

5.7 Waste management plan review

The success of the strategy as detailed above will be closely monitored by the FM team.

Feedback will be provided as a minimum on a monthly basis and as and when required where immediate action is required and dealt with in accordance to this strategy.

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.

An annual review will be provided to the local authority at their written request to confirm the success of the strategy and any amendments that may have been required to the original document based on lessons learned.

6. DSMP review process

This DSMP is intended to be updated frequently. The following sub-sections set out how the document will be reviewed and maintained.

6.1 Facilities management (FM) team

In terms of the day-to-day management of incoming goods and consignments, it is proposed that the site FM team be responsible for the following:

- Communication and liaison with each customer;
- 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.

6.2 Delivery monitoring

The FM team will be responsible for keeping a record of servicing activity, monitoring the effectiveness of the scheduling strategy and making amendments to the plan. Key data to be captured are as follows:

- Date booked;
- Type and volume of carried goods; and
- Company details.

An initial survey of servicing activity will be undertaken within 12 months of occupation.

6.3 DSMP review process

The on-site FM team will use information and feedback from customers, suppliers and residents to conduct an annual review of this DSMP. This review will assess the efficiency of the DSMP to meet the objectives of minimising the environmental impact on the surrounding area and providing servicing arrangements for the building which meet road management and safety requirements.

The FM team (on behalf of the building owner) will conduct the first review within 12 months after occupation and reviews will be conducted as necessary thereafter on an annual basis. Where necessary, changes to the DSMP will be made to reflect the findings of any review. A daily record of the service traffic movements will be conducted during a typical week to obtain the details.

The Owner shall notify the local authority of any change the occupancy of the Development that may have a material change to the approved DSMP as soon as is reasonably practicable and in any event one month prior to the commencement of such occupancy.

Any amendments that the Owner may wish to make to the DSMP shall be submitted to the local authority for approval and no amendments shall come into force until they have been approved.

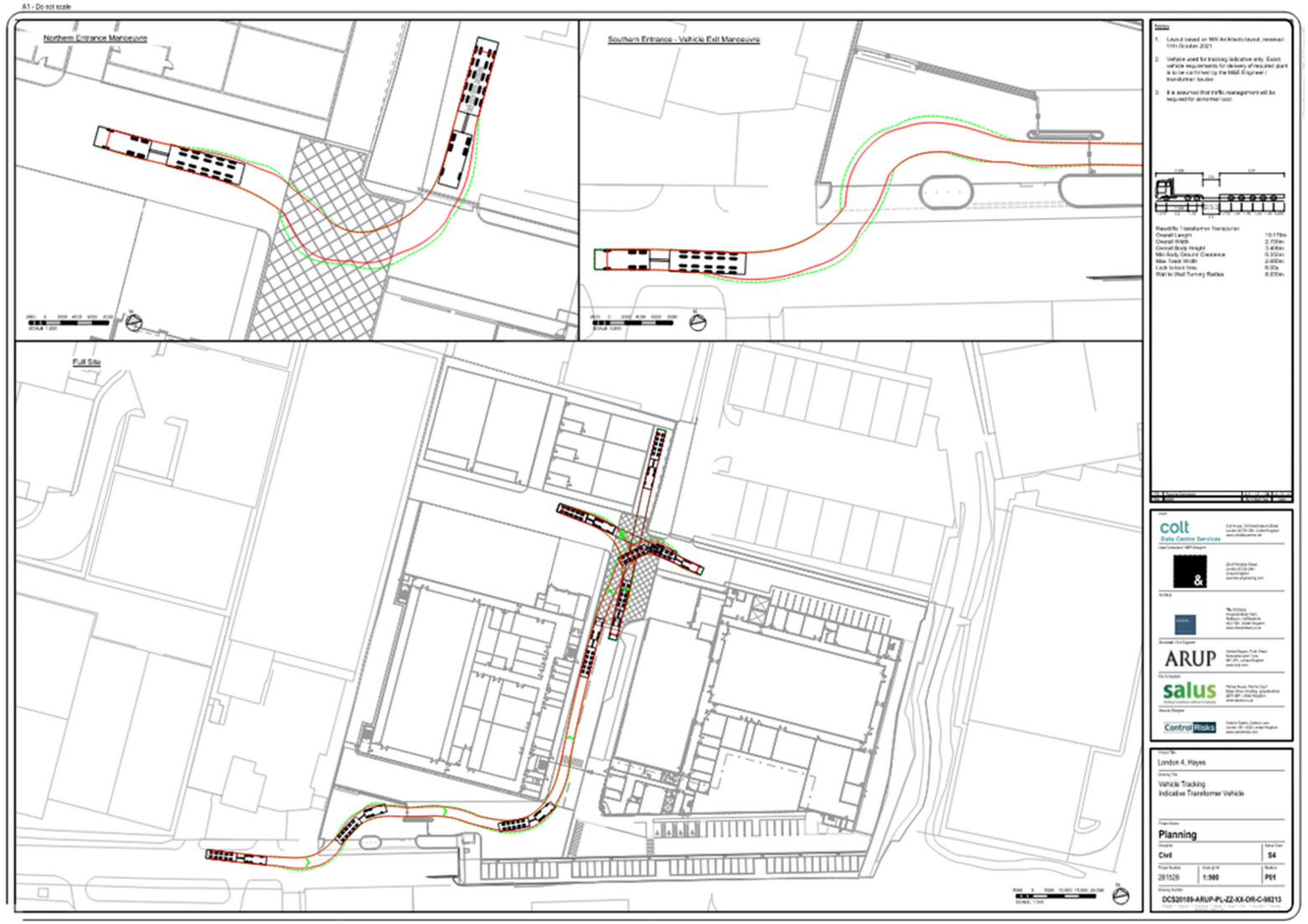
Appendix A

Swept Path Analysis

A.1 Articulated Vehicle

A.2 Fire Tender

A.3 Transformer Transporter



A.4 400T Mobile Crane