



# KIRKLEES CULTURAL HEART

## WASTE STRATEGY

CDT430201-ARP-ZZ-ZZ-RP-Z-000002

ARUP

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**Kirklees Council**

# Kirklees Cultural Heart

## Kirklees Cultural Heart Waste Strategy

Reference: CDT430201-ARP-ZZ-ZZ-RP-Z-000002

Issue 1 | 28 September 2022

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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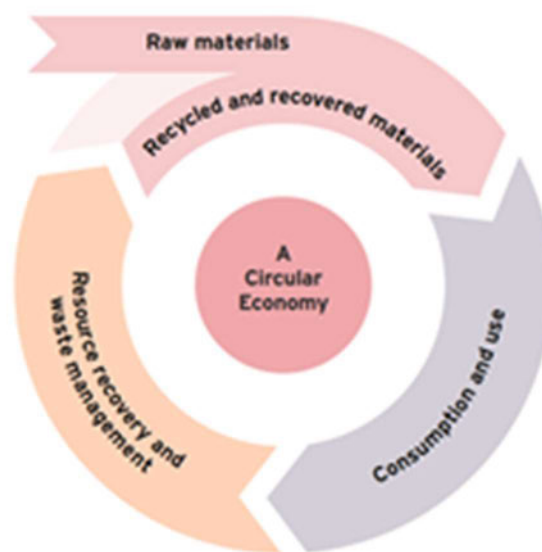
# 1. Introduction

## 1.1 Overview

This Construction and Operational Waste Strategy has been prepared by Ove Arup and Partners Ltd (Arup) for and on behalf of Kirklees Council.

In line with the environmental aspirations of the Kirklees Cultural Heart (KCH) Development (the proposed development), this document details the construction Site Waste Management Plan (SWMP) and operational waste strategy for the project. The document will be refined as future design details enable waste streams to be quantified more accurately.

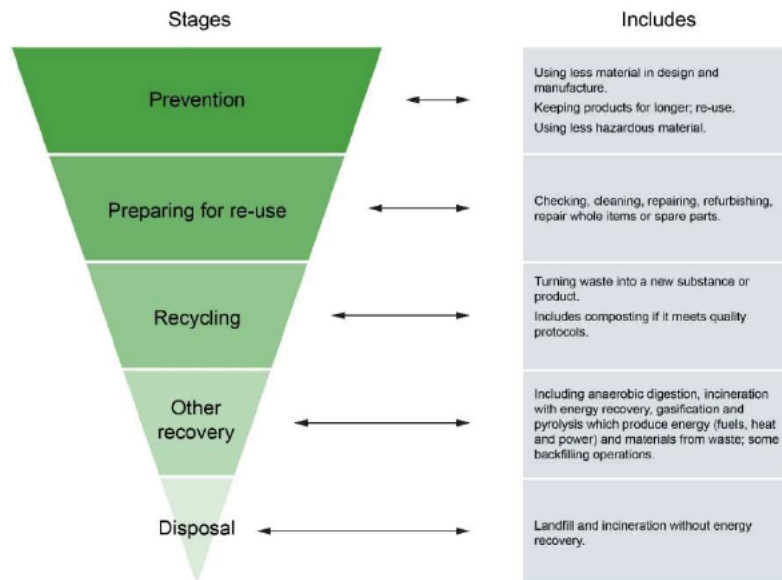
The waste strategy advocates the use of more recycled materials and mainstream products with higher recycled content to promote a circular economy. The UK is striving to move towards a circular economy where resources are in use as long as possible to maximise value, minimise waste and promote resource efficiency.



**Figure 1: The Circular Economy**

Where waste is generated it should be managed in accordance with the waste hierarchy as displayed in Figure 2. The waste hierarchy advocates, the following order of preference:

- Prevention;
- Preparing for re-use;
- Recycling;
- Other recovery; and
- Disposal as a last resort



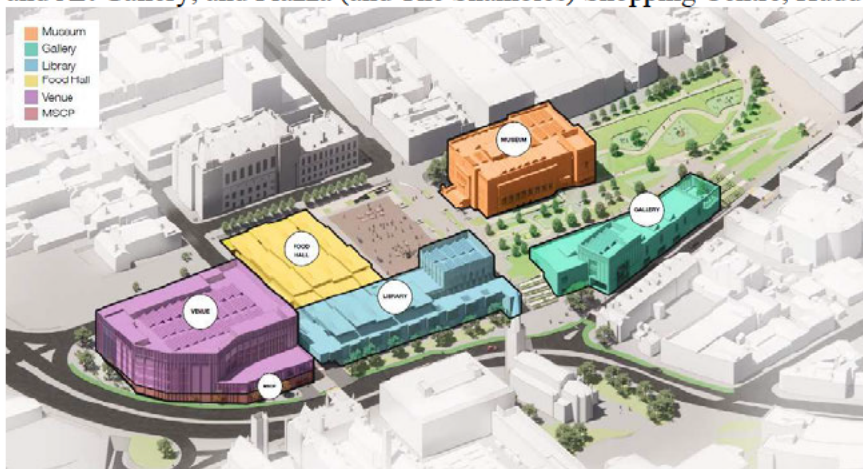
**Figure 2: The Waste Hierarchy**

The waste strategy will be submitted to Kirklees Council with the planning application to demonstrate how resources and waste have been considered during the design stage of the proposed development and how effective and sustainable waste management will be delivered during the project. Implementation of the waste strategy will ensure that significant adverse effects do not arise as a result of the construction and operational phase.

## 1.2 Development summary

The proposed development is a major new mixed use development at the heart of Huddersfield Town Centre.

Application for the Demolition of the existing Piazza shopping centre, part removal of elements of Queensgate Market, and demolition/retention of service tunnels; with redevelopment of the site to form new public realm space (including public park and gardens, play areas, public square/outdoor event space); refurbishment and change of use of existing Queensgate Market Hall into new food hall (Use Class E (b) Sale of food and drink for consumption, mostly, on the premises); refurbishment and extension of existing library and art gallery building to form a new museum (Use Class F.1); change of use of part existing market hall building and extension to form a new public library (Use Class F.1); construction of new indoor event venue incorporating multi-storey car park below (Sui-Generis); erection of new public gallery building (Class F.1); and associated infrastructure on land and buildings at Queensgate Market, Huddersfield Library and Art Gallery, and Piazza (and The Shambles) Shopping Centre, Huddersfield.



**Figure 3: Kirklees Cultural Heart Stage 2 Masterplan Design**

The KCH scheme site is located to the southeast of the town centre core within the Ring Road (A62 Castlegate / Queensgate / Southgate). The site is bounded by the vehicular routes of A62 Queensgate to the

south east, Queen Street to the east and Peel Street and Alfred Street to the west, and the pedestrianised routes of King Street to the north and Victoria Lane to the west.

The existing site is currently occupied by the Piazza Shopping Centre, Market Hall, Huddersfield Library and Art Gallery. There are a few small shops and an area of open space public realm fronting the entrance to the library and art gallery. The recently demolished Market Hall multi-story car park is also located within the footprint of the scheme.

## 2. Site Waste Management Plan (SWMP)

### 2.1 Overview

This Site Waste Management Plan (SWMP) guidance document and accompanying SWMP template has been prepared by Arup for and on behalf of Kirklees Council for the Kirklees Cultural Heart (the proposed development) in Huddersfield. In line with the environmental aspirations of the proposed development, this SWMP and accompanying template constitutes the design stage SWMP for the proposed development. The SWMP will be refined as future design details enable waste streams to be quantified more accurately. The Preferred Principal Contractor (PPC) will appraise waste management options with the aim of moving waste up the waste management hierarchy as displayed in Figure 2.

It will be used throughout the design process, to promote ‘designing out waste’ and then to monitor waste arising and optimise the strategy going forward.

It is envisaged that the final SWMP will be submitted to Kirklees Council through a planning condition to demonstrate how resources and waste have been considered during the design and construction stages of the proposed development and how effective and sustainable waste management will have been delivered during the project.

The planning condition would require the final SWMP to be submitted by the proposed development following its completion by the PPC. Implementation of the final SWMP will ensure that significant adverse effects do not arise as a result of the demolition, earthworks and construction phases.

### 2.2 SWMP Format

This document together with the SWMP template constitutes the design stage SWMP for the project. It identifies the key wastes that are likely to be produced from the project and appropriate waste management and minimisation options, with an aim to encourage resource efficiency and sustainable waste management.

The SWMP has been developed in draft format, based on the information available at the time of writing it, making it easy to update and finalise as further data becomes available.

The SWMP will be refined as future design details enable waste streams to be quantified more accurately with a final version to be submitted in due course.

The SWMP template is a spreadsheet based on a standard template developed by the Waste and Resources Action Programme (WRAP). It is designed to be used to ensure waste is considered during the design stage of the project, provide information to determine waste management and recovery options and record actual waste related actions and movements during the demolition, excavation and construction phases of project. This will ensure good practice sustainable resource and waste management is implemented.

## 2.3 Guidance and policy

### 2.3.1 Kirklees Council

Kirklees Council<sup>1</sup> has provided a Consultation Response in relation to the Waste Strategy for the proposed development. For construction activities the following comments have been made in relation to the SWMP:

*'The development includes the dismantling and demolition of existing structures on the site with refurbishment and construction of new facilities. In line with the aspirations of the waste hierarchy to better manage waste and the ethos of the circular economy to conserve resources and raw materials where possible, any waste generated from demolition should be re-processed to produce secondary products for reuse on or off site. The new buildings should be designed to enable disassembly at the end of their lifetime and incorporate repurposed materials or those with a high recycled content where practical.'*

These comments have been incorporated into the SWMP.

## 2.4 Construction, Demolition and Excavation (CD&E) Waste Forecast

The potential CD&E waste types that could arise during the construction phase are summarised in Table 1.

**Table 1: Potential waste sources during construction phase**

Construction phase	Potential wastes produced	Classification of waste
Demolition	Demolition activities will generate a range of waste streams which will include building materials, such as concrete, bricks, plastics, metals, plasterboard, timber, paint, etc.	Inert; and/or, Non-hazardous; and/or, Hazardous.
	Demolition activities will also generate a range of potentially hazardous waste streams which will include but not be limited to: <ul style="list-style-type: none"> <li>- Made ground, soil and sub-soils.</li> <li>- Asphalt and bituminous products.</li> <li>- Existing structures containing asbestos.</li> </ul>	Non-hazardous, and Hazardous which will include but not be limited to: <ul style="list-style-type: none"> <li>- Made ground, soil and sub-soils if it contains sufficiently high levels of heavy metals.</li> <li>- Asphalt if it contains coal tar.</li> <li>- Asbestos in existing structures.</li> </ul>
Excavation	Made ground, soil and sub-soils.	Inert; and/or, Non-hazardous; and/or, potentially Hazardous if it contains sufficiently high levels of heavy metals.
Construction	Construction materials, such as concrete, bricks, plastics, metals, plasterboard, timber, paint, etc.	Inert; and/or, Non-hazardous; and/or, Hazardous.
	Made ground, soil and sub-soils.	Non-hazardous, and Hazardous if it contains sufficiently high levels of heavy metals.
	Waste products arising from the presence of construction staff onsite e.g. effluent from portable	Inert; Non-hazardous and potentially Hazardous.

<sup>1</sup> Kirklees Council (2022) Consultation Response for KC Waste Strategy (Refuse & Recycling) 2022/20509 at Land and Buildings at Queensgate Market, Huddersfield Library, Piazza and The Shambles, Huddersfield, HD1 2SU Reference WPS 22-22

Construction phase	Potential wastes produced	Classification of waste
	toilets, food waste and packaging, as well as waste from surplus materials and spillages.	

The types of CD&E waste arisings likely to be generated by the proposed development are displayed in Table 2.

**Table 2: Types of CD&E waste arisings generated by the proposed development**

Activity	Waste arisings	Additional information
Site preparation and earthworks	Vegetation strip and tree removal. Existing infrastructure such as kerbs, lighting, etc.	Re-use onsite. Recycling offsite in local projects. Local recycling facilities. Disposal at an inert/non-hazardous or hazardous landfill site.
Demolition	Existing buildings and associated infrastructure	Some material may be suitable for re-use or recycled onsite. Local recycling facilities. Disposal at an inert/non-hazardous or hazardous landfill site.
Construction	Site won material	Some material may be suitable for re-use or recycled onsite. Local recycling facilities. Disposal at an inert or non-hazardous site.

The forecast of the total quantity of CD&E waste likely to be generated by the proposed development has been estimated and is displayed in Table 3.

**Table 3: Construction, Demolition and Excavation (CD&E) Waste Forecast**

Demolition Waste (tonnes)	Demolition Waste (m <sup>3</sup> )	Excavation Waste (tonnes)	Excavation Waste (m <sup>3</sup> )	Construction Waste (tonnes)	Construction Waste (m <sup>3</sup> )	Sub-total CD&E Waste (tonnes)	Sub-total CD&E Waste (m <sup>3</sup> )
71,226	81,869	0	0	4,563	4,563	75,789	87,114

#### 2.4.1 CD&E waste composition

CD&E waste is a complex mixture of different material types such as soil, concrete, other inert materials, wood, metals, plasterboard, packaging, etc. The composition of CD&E waste for the proposed development has been estimated by using the WRAP Net Waste Tool and BRE SMARTWaste data to produce a CD&E waste composition for the proposed development and is displayed in Table 4.

**Table 4: Construction, Demolition and Excavation (CD&E) Waste Composition**

Product	Mass (Tonnes)
Asphalt (17 03 02)	73
Bricks (17 01 02)	5,119
Canteen/office/adhoc waste (20 03 01)	11

Product	Mass (Tonnes)
Concrete (17 01 01)	58,379
Gypsum (17 08 02)	630
Hazardous (17 09 03)	76
Inert (17 01 07)	3,924
Insulation (17 06 04)	2
Metals (17 04 07)	3,708
Mixed (17 09 04)	2,506
Other	88
Packaging (15 01 06)	43
Plastics (17 02 03)	33
Soils and earthworks (17 05 04)	
Tiles and Ceramics (17 01 03)	107
Timber (17 02 01)	1,088
<b>Total</b>	<b>75,788</b>

#### 2.4.2 Demolition Waste

The site includes several existing structures which will require demolition as part of the proposed development. Demolition waste would be generated by the proposed development through the clearance of these buildings.

The site is comprehensively redeveloped requiring the demolition of most of the piazza centre. The existing library and Queensgate market hall are to be retained and redeveloped. The superstructure to a former Multi-Storey Car Park (MSCP) at the southern end of the site has been demolished. The ground slab and foundations have been left insitu and are to be removed as part of these works.

Measurements of the existing buildings which will be cleared from the site have been provided by Arup. The Demolition Waste Calculator in the WRAP Net Waste Tool ([nwtool.wrap.org.uk](http://nwtool.wrap.org.uk)) has been used to estimate demolition wastes.

The estimated demolition waste from the clearance of existing buildings generated by the proposed development is displayed in Table 5.

**Table 5 Estimated Demolition Waste Buildings**

Building	Structure	WRAP Estimation (tonnes)
King Street (above ground)	Concrete	18,744
King Street (basement)	Concrete	4,282
<b>Total</b>		<b>23,026</b>

Measurements of the existing infrastructure that will be cleared from the site have also been provided by Arup. In addition, Arup have identified a bulking factor of 1.3 to estimate the likely volumes stored onsite. Volume to mass conversion factors have been identified using WRAP<sup>2</sup> data.

The estimated demolition waste from the clearance of existing infrastructure generated by the proposed development is displayed in Table 6.

**Table 6 Estimated Demolition Waste Existing Infrastructure**

Development	Volume (m <sup>3</sup> )	Mass (tonnes)	Bulk Volume (m <sup>3</sup> )	Bulk mass (tonnes)
Zone 1 - Market Hall	2,960	6,117	3,847	7,952
Zone 2 - Boots (West of Shambles)	3,672	7,569	4,774	9,840
Zone 3 - East of Shambles	3,110	6,379	4,043	8,293
Zone 4 - Piazza	1,697	3,451	2,206	4,487
Shambles	374	759	486	986
Piazza Walkway	471	989	612	1,286
MSCP & Venue Excavation	5,625	11,813	7,313	15,356
<b>Sub-total</b>	<b>17,909</b>	<b>37,077</b>	<b>23,281</b>	<b>48,200</b>

The assumptions and estimations used to calculate demolition waste can be found in Appendix A.

#### 2.4.3 Excavation Waste

As earthworks design is ongoing, the quantities provided are indicative only, and will be subject to change. An earthworks review will be required to form the final development levels.

Arup and Fielden Clegg Bradley Studios (FCBS) has provided initial estimations for the volume of materials that would be generated through cut and fill activities. It is estimated there will be a neutral cut and fill balance as the project is aspiring for.

At PCF Stage 2<sup>3</sup> no potentially significant sources of contaminated land have been identified that are likely to require remediation. However, ground investigation (GI) did not commence until summer 2022 and the results are not available before this iteration of the SWMP.

#### 2.4.4 Construction Waste

The mass of waste likely to be generated from constructing the proposed development has been estimated using Building Research Establishment (BRE) SMARTWaste data<sup>4</sup>.

<sup>2</sup> WRAP (2008) Net Waste Tool Guide to Reference Data

<sup>3</sup> Kirklees Council et al (2022) Kirklees Cultural Heart RIBA Stage 2 Report

<sup>4</sup> Buildings Research Establishment on behalf of Arup (BRE) (2022) SMARTWaste Data Report

The floor areas for the proposed development have been provided by FCBS<sup>5</sup> as a worse-case scenario.

The estimated construction waste generated by the proposed development is displayed in Table 7.

**Table 7 Estimated Construction Waste**

Building	Gross Internal Floor area (m <sup>2</sup> )	Mass (tonnes)	Volume (m <sup>3</sup> )
Library	4,784	588	676
Museum	5,726	704	810
Gallery	2,993	368	423
Venue	7,705	1,094	1,258
Food Hall	2,379	338	388
MSCP	11,949	1,470	1,689
<b>Total</b>	<b>35,536</b>	<b>4,563</b>	<b>5,244</b>

The assumptions used to estimate the construction waste are presented in Appendix B.

## 2.5 Waste Management Options

The information below details the actions that will be undertaken by the project team to prevent, re-use, recycle, recover and dispose of CD&E waste.

### 2.5.1 Designing Out Waste

Designers can play a key role in reducing the amount of waste generated in a construction project. By considering materials and waste in the design process there are likely to be more significant opportunities for resource efficiency. The most significant opportunities for designing out waste are in the early stages of the design process. The actions undertaken throughout the evolution of design will determine the levels of materials consumed and waste generated during the construction as well as maintenance and the end of life phase of a project.

Designing out Waste includes measures such as designing for:

- Re-use and recovery;
- Materials optimisation;
- Offsite construction;
- For deconstruction and flexibility; and
- Waste efficient procurement.

Waste is being considered by the design team of the development to ensure that the minimum amount of material is wasted and that circular opportunities are identified. At RIBA Stage 2 the following circular economy opportunities have been identified:

<sup>5</sup> Fielden Clegg Bradley Studios (FCBS) Kirklees Cultural Heart Floor Areas September 2022

- The existing building stock will be evaluated to prioritise retention and refurb;
- Pre-demo audits will be undertaken to evaluate and prioritise material re-use;
- Flexible and adaptable spaces to maximise future viability; and
- Identifying waste streams and targeting “0”.

The design team are also investigating opportunities to avoid, reduce and re-use excavated materials on-site.

The new building will be designed for deconstruction to enable the disassembly at the end of their lifetime. The proposed development will be designed for re-use and recovery and incorporate repurposed materials or those with a high recycled content where feasible.

### 2.5.2 Circular Economy

The philosophy of the circular economy has gathered momentum in recent years, however it has been difficult to quantify or score the impact of good or best practice. For the proposed development, a full review of the existing development is proposed to evaluate what level of retention is possible considering the development proposals. Apart from adopting a “use it or lose it” approach, the team also proposes to consider the future use of the new buildings and review whether there is an opportunity to future proof development, without having knock on impacts on the embodied carbon of the building.

### 2.5.3 Demolition Phase

The proposed development will generate demolition waste through the clearance of the following existing buildings and infrastructure:

- Buildings and basement along King Street;
- Boots West of Shambles;
- East of Shambles
- Market Hall;
- Piazza; and
- Shambles.

The demolition waste generated by the proposed development is likely to consist of hard and inert materials, soils, rock and stones, wood (including vegetation), asphalt, brick, concrete, and miscellaneous metals.

The potential demolition waste types and the associated classification (inert, non-hazardous and hazardous) that could arise during the construction phase in Table 2.

The proposed development will integrate demolition materials into the future works programme or at least be made available to be recycled in for use in other building projects.

The design team for the proposed development will aim to follow the principles of the ICE Demolition Protocol<sup>6</sup>, a resource efficiency model that shows how the production of demolition material can be linked to its specification as a high value material in new buildings. The principles of the Demolition Protocol include:

- Investigating the opportunities to re-use existing structures, hardstanding, walls, etc;
- Where this is not appropriate the PPC will consider crushing demolition materials for recycling as aggregates or fill on-site; and
- If on-site recycling is not feasible, the PPC will identify opportunities for recycling the demolition materials through a recycling contractor or in other external projects.

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<sup>6</sup> Institute of Civil Engineers (2008) The Demolition Protocol

Prior to demolition of each structure or building, a pre-demolition audit will be carried out to quantify materials and investigate opportunities for re-use and recycling.

There is asbestos in the existing buildings therefore the amount of demolition materials available for recovery could be reduced. Any contaminated materials will need to be segregated separately from ‘clean’ demolition materials to avoid cross contamination before they are sent for appropriate and permitted treatment/recovery/disposal.

#### 2.5.4 Excavation Phase

The approach to earthworks will enable materials excavated onsite to be re-used at areas of the site where materials are required as far as practicable. This will minimise the amount of material required from offsite.

Alternative recovery routes for excess excavated materials will be investigated such as:

- Use as fill material at other construction-sites close to the site; and
- Send for treatment through composting to produce a soil improver.

Early identification of, and communication with, other developments and processors will be undertaken by the PPC to help identify opportunities to recover this material.

The preferred approach will be identified through consultation with the regulatory authorities.

#### 2.5.5 Construction Phase

The construction waste generated by the proposed development is likely to consist of timber, asphalt, brick, concrete, paint, plasterboard, miscellaneous metals, packaging materials, etc.

The potential construction waste types and the associated classification (inert, non-hazardous and hazardous) that could arise during the construction phase in Table 2.

Efficient use of materials would make a major contribution to reducing the environmental effects of construction including reducing demand for landfill and the depletion of finite, natural resources through:

- Minimising the overall creation of waste resulting from, for example, over ordering or inefficient design;
- Reducing the quantity of material sent to landfill during the construction process through effective waste management;
- Recycling materials already on the construction-site into the new construction project; and
- Using more recycled materials and mainstream products with higher recycled content to promote a circular economy.

#### 2.5.6 Waste Minimisation

The project team will strive to minimise construction waste. Table 8 below demonstrates good practice which will be considered to further minimise waste arisings during the construction process.

**Table 8: Good Practice Waste Minimisation for the Construction Phase**

Good Practice	Description
Sustainable procurement	Materials selected will be durable to ensure long life and reduced need for replacement. Over-ordering of materials will be avoided and suppliers that minimise packaging will be used. Where feasible any packaging will be returned to the supplier for recycling.
Circular economy	Construction material specifications will prioritise the procurement and use of recycled/secondary aggregates and other recycled materials e.g. wood for formwork to promote the circular economy.

Good Practice	Description
Supply chain partners	<p>All members of the supply chain will be aware of the SWMP.</p> <p>The Project Manager will ensure that someone is responsible for the implementation of the SWMP.</p> <p>Workshops will be held throughout the construction period to help reinforce the SWMP and ensure that all partners are kept up to date with developments.</p> <p>Targets will be established for the minimisation of waste and the recycling of materials. These targets would then be communicated to the workforce and performance against them would be measured and used to promote positive PR.</p>
Avoid wasteful working practices	<p>Staff will be given appropriate training both as part of site induction and at intervals throughout the life of the project such as Toolbox Talks.</p>
Materials management	<p>Materials will be appropriately handled and stored throughout their lifecycle from delivery to inclusion, e.g. return surplus materials to storage.</p> <p>Materials will be delivered to the site 'just-on-time', this would limit the need for excess on-site storage and would limit the chance of wastage through damage of the stored materials.</p> <p>There will be a designated area for the storage of materials.</p>
Modern Methods of Construction	<p>The introduction of Modern Methods of Construction (MMC) will be investigated during the construction phase of the proposed development. MMC entails improvements in the products or processes employed in construction, ranging from innovative components to be used on-site through to whole building systems manufactured off-site will be investigated. Opportunities to introduce MMC on the project will be investigated.</p>

### 2.5.7 Re-use of materials

The PPC will maximise the re-use of any existing materials and construction elements wherever possible. The PPC will establish a waste storage and recycling area for the safe storage and processing of recovered materials to ensure that opportunities for re-use are maximised.

**Table 9: Re-use Good Practice for the Construction Phase**

Good Practice	Description
Timber	<p>Wood is a very durable material and can be re-used many times on-site before it needs to be replaced. Timber can also be re-used as formwork and hoarding. Store off cuts for use. Pallets can also be re-used for the storage of on-site unpalletised materials.</p> <p>Uncontaminated wood can be chipped and re-used in landscaping.</p>
Inert	<p>Unused bricks and blocks can be reclaimed and re-used in other buildings or could be stored for use in any paving required for public realm.</p>
Ceramic	<p>High value ceramic materials can be recovered for re-use.</p> <p>Any spare tiles can be re-used on another project or in landscaping.</p>
Insulation	<p>Insulation offcuts can be re-used for other applications across the site.</p>

### 2.5.8 Recycling of Materials

While reduction of waste will remain the highest priority, waste produced will be segregated for recovery. This will allow materials to be recycled and ultimately reduce the amount of waste that has to be finally disposed of.

Table 10 below demonstrates construction site waste management good practices which will be investigated to optimise the amount of materials recovered during the construction process.

**Table 10: Recycling Good Practice for the Construction Phase**

Good Practice	Description
Timber	Unusable timber waste can be separated in a container so that off-site recycling can occur. The PPC will also consider returning storage pallets where possible.
Concrete	A cost benefit analysis should be undertaken to identify if any concrete waste could be segregated from the general construction waste and be suitably stored for crushing concrete on-site for use as aggregate where it is not possible to use it in their current form.
Inert	A cost benefit analysis should be undertaken to identify if any inert waste from construction works can be stored on-site for crushing on-site for use as aggregate for highways and landscaping where it is not possible to use it in their current form.
Ceramic	Ceramics can be segregated and investigations should be made to identify a recycler.
Insulation	Any insulation can be segregated and investigations should be made to identify a recycler or a take back scheme with a local supplier.
Plastic	Plastics can be segregated and investigations will be made to identify a plastics recycler. It may be possible to recycle a range of plastics including High Density Polyethylene (HDPE), Low Density Polyethylene (LDPE), Polypropylene (PP), Polyvinyl chloride (PVC) and Polystyrene.
Packaging	The PPC will encourage its suppliers to reduce packaging materials and deliver products in returnable transport packaging where possible.
Metals	Metal wastes will be segregated and sent for off-site recycling. It is recommended that high value metals, such as steel, aluminium and copper are stored separately and sold on to merchants and/or material suppliers.
Plasterboard and cement	Uncontaminated plasterboard can be crushed and recycled in landscaping (this would need to be approved by the projects architects and designers). There may also be options for recycling plasterboard off site or establish a take-back scheme with the supplier.
Miscellaneous	Textiles disposed by labourers can be recycled as rags and protecting materials. Glass can be collected, segregated and sent for recycling.
Hazardous Waste	Hazardous waste such as oils and solvents will be recycled where possible.

### 2.5.9 Recovery Targets

Kirklees Council and the PPC will set targets for waste recovery (both on-site and off-site). The PPC will aim for Best Practice Recovery rates and will be expected to demonstrate why it is not technically or financially feasible to achieve these rates.

Table 11 displays the construction waste recovery targets identified for the proposed development. The PPC will aim for Good Practice Recovery rates and will be expected to demonstrate why it is not technically or financially feasible to achieve these rates. Rates shown below in Table 11 are from a WRAP report entitled Achieving Good Practice Waste Minimisation and Management.

**Table 11: Construction Waste Tonnage based Recovery Targets**

Material	Standard recovery (%)	Good practice quick win (%)	Best practice recovery (%)
Wood	57	90	95
Metals (ferrous and non-ferrous)	95	100	100
Plasterboard	30	90	95
Packaging	60	85	95

Material	Standard recovery (%)	Good practice quick win (%)	Best practice recovery (%)
Ceramics	75	85	100
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical Equipment	Limited information	70	95
Furniture	0-15	25	50
Insulation	12	50	75
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information <sup>7</sup>	Limited information

#### 2.5.10 Take-back schemes with suppliers

Wherever possible the PPC will establish take-back schemes with suppliers to accept surplus material not incorporated in the works.

#### 2.5.11 Other recovery options

The PPC will identify potential off-site recovery options for all remaining residual waste. Many waste management companies can recover residual waste through technologies such as materials recovery facilities (MRFs) which could help further segregate and divert waste from disposal.

## 2.6 On-site Practice

The PPC will introduce good on-site practice to ensure waste is managed effectively. While reduction of waste will remain the highest priority, waste produced will be segregated. This will allow materials to be re-used / recycled and ultimately reduce the amount of waste that has to be finally disposed of.

The PPC will establish waste storage and recycling areas for the safe storage and processing of recovered materials to ensure that opportunities for re-use are maximised. The proposed development will strive to implement industry best practice with regard to the segregation of waste by adopting the Considerate Constructors Scheme<sup>8</sup> (CCS) Colour Coding Waste Skips system. The colour coding scheme is a simple system which colour labels waste skips indicating the types of waste that can be placed in them.

Where no other waste management option is found to be feasible, wastes shall be sent to an appropriately permitted landfill site in accordance with UK legislation.

The waste storage areas shall include impermeable surfaces with appropriate drainage as well as hazardous waste storage areas to minimise cross contamination of other waste streams and surrounding ground. The PPC will identify the appropriate drainage which would include temporary interceptors or bunded areas. The separate storage area for hazardous waste shall include labelled bins for aerosols, oil, oily rags and Waste Electrical and Electronic Equipment (WEEE).

<sup>7</sup> This cannot be 100% as much hazardous waste (e.g. asbestos) must be landfilled.

<sup>8</sup> Considerate Constructors Scheme (2017) Colour Coded Waste Skips, available at: <https://ccsbestpractice.org.uk/entries/colour-coding-waste-skips/> [accessed 23 June 2022]

### 2.6.1 Hazardous Waste

Hazardous waste will be correctly labelled, will not be mixed with non-hazardous waste, securely contained and disposed of by a registered waste carrier for hazardous waste. The Duty of Care (DoC) applies to hazardous wastes.

Asbestos has been identified in the BHS store which will be demolished as part of the development of the Piazza. Asbestos is classified as a hazardous waste in England<sup>9</sup>. All asbestos waste is subject to The Control of Asbestos Regulations 2012<sup>10</sup>. Waste must be packed in UN-approved packaging with a Control of Dangerous Goods (CDG) hazard label and asbestos code information visible. Double-wrap and label asbestos waste. Standard practice is to use a red inner bag with asbestos warnings, and a clear outer bag with the CDG label, if required.

The PPC will retain all consignment notes in accordance with waste collection and transfer by an approved supplier before they are sent for appropriate and permitted treatment/recovery/disposal.

### 2.6.2 Landfill

Where no other waste management option is found to be feasible, wastes will be sent to an appropriately permitted landfill site.

### 2.6.3 Waste Champions

The PPC will nominate a designated Waste Champion at all stages of the development including design. The Waste Champion will have sufficient authority and clear responsibilities.

### 2.6.4 Site Induction and Toolbox Talks

The PPC will provide general information on waste and specific information relating to the SWMP in site inductions and toolbox talks. This training will include information on the segregation strategy and recovery targets in place at the site.

Any changes to the SWMP will be communicated at toolbox talks.

### 2.6.5 Environmental Training for Key Staff

The PPC will implement a programme of environmental training for key staff at the site. This will enable them to train other operatives through toolbox talks and gather feedback from site personnel.

### 2.6.6 Sub-Contractors

The PPC will establish agreements with sub-contractors for the management of waste.

### 2.6.7 Waste Management Facilities

The PPC will identify waste management facilities for the management of all waste streams arising from the site whilst achieving compliance with all relevant legislation. The waste management facilities, where feasible, will be as close to the site as possible, in line with the proximity principle for waste treatment. The proximity principle is the requirement to treat and/or dispose of wastes in reasonable proximity to their point of generation.

### 2.6.8 Waste Management Contractors

The PPC will engage with waste management contractors early in the design process to identify opportunities for recycling materials generated by the development. The PPC will review the evidence of the waste management contractors registration and environmental permitting prior to waste departing the proposed development. The PPC will verify the waste management contractor through the Defra website.

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<sup>9</sup> Health and Safety Executive (2022) What are the packaging and documentation requirements related to the carriage of asbestos and asbestos waste? available at: <https://www.hse.gov.uk/cdg/commonproblems/asbestos.htm> [accessed 23 June 2022]

<sup>10</sup> Health and Safety Executive (2012) Control of Asbestos Regulations 2012 available at: <https://www.hse.gov.uk/asbestos/regulations.htm> [accessed 23 June 2022]

The PPC will also store documentation provided by the waste management contractors such as waste transfer notes.

### 2.6.9 Monitoring

Monitoring and measurement of waste will be undertaken on a regular basis by the PPC, with regular interpretations to identify trends and rectify wasteful practices. The results of monitoring will be included in regular site meetings.

### 2.6.10 Review

As often as necessary to ensure that the plan accurately reflects the progress of the project, the PPC will:

- a. review the plan;
- b. record the types and quantities of waste produced;
- c. record the types and quantities of waste that have been:
  - re-used (and whether this was on or off site);
  - recycled (and whether this was on or off site);
  - sent for another form of recovery (and whether this was on or off site);
  - sent to landfill; or
  - otherwise disposed of; and
  - update the plan to reflect the progress of the project.

Best practice would be considered to be update the SWMP monthly.

### 2.6.11 Update prior to hand back

Within three months of the work being completed the PPC will add to the plan:

- confirmation that the SWMP has been monitored on a regular basis to ensure that work is progressing according to the plan and that the plan was updated;
- a comparison of the estimated quantities of each waste type against the actual quantities of each waste type;
- an explanation of any deviation from the plan; and
- an estimate of the cost savings that have been achieved by completing and implementing the plan.

## 2.7 The Site Waste Management Plan Template

The accompanying Microsoft Excel Spreadsheet entitled ‘Kirklees Cultural Heart SWMP Template’ referred to herewith as the ‘SWMP template’ is based on a template devised by WRAP.

The SWMP template identifies eight steps, as displayed in Table 12 below as well as the designated responsible owner for each of these steps.

**Table 12: Steps and responsibilities Kirklees Cultural Heart SWMP Template**

Step	Title	Example responsible owner
Step 1	Project Homepage	Kirklees Council
Step 2	Basic Details	Kirklees Council
Step 3	Waste Actions	Kirklees Council, the Project Designer, Preferred

Step	Title	Example responsible owner
		Demolition Contractor, Preferred Principal Contractor
Step 4	Forecast Waste	Preferred Demolition Contractor, Preferred Principal Contractor
Step 5a	Specify Waste Carriers	Preferred Principal Contractor
Step 5b	Plan Waste Destinations	Preferred Principal Contractor
Step 6	Actual Waste Movements	Preferred Demolition Contractor, Preferred Principal Contractor
Step 7	KPIS	Preferred Demolition Contractor, Preferred Principal Contractor
Step 8	Declaration	Kirklees Council, Preferred Principal Contractor
Step 9	Reporting	Preferred Demolition Contractor, Preferred Principal Contractor

Arup have completed the template using the data provided by Kirklees Council and information on good practice produced by WRAP and is available in Appendix C. Completing the following steps will encourage improved waste minimisation and waste management performance.

The accompanying SWMP template will be completed by Kirklees Council and the designer through to Step 2 of the WRAP template as the design details progress, prior to work starting on-site. When the works commence on-site the remaining Steps will be completed by the Preferred Demolition Contractor and Preferred Principal Contractor and Kirklees Council. More details on how to complete this document are included in Appendix D.

## 2.8 Summary

This design stage SWMP has been prepared for and on behalf of Kirklees Council for the proposed development in line with all of their requirements and the guidance in the pre-application consultation request<sup>1</sup>. Waste is being considered by the design team of the proposed development to ensure that the minimum amount of material is wasted and that circular opportunities are identified. A full review of the existing development has evaluated what level of retention is possible. For the existing buildings and infrastructure any demolition materials will be re-used or recycled onsite or offsite.

The SWMP will be refined by the PPC as future design details enable waste streams to be quantified more accurately.

It is envisaged that the final SWMP will be submitted to Kirklees Council through a planning condition to demonstrate how resources and waste have been considered during the project. The planning condition would require the final SWMP to be submitted by the proposed development following its completion by the PPC. Implementation of the final SWMP will ensure that significant adverse effects do not arise as a result of the demolition, earthworks and construction phases.

## 3. Operational Recycling and Waste Strategy

### 3.1 Overview

This Operational Recycling and Waste Strategy (operational waste strategy) explains how commercial recyclables and waste will be stored, transferred and collected at the proposed development. The operational waste strategy has been developed to follow the recycling and waste requirements of Kirklees Council.

Compliance with this operational waste strategy will ensure that there is sufficient waste storage areas across the development to enable tenants and users to segregate their waste and recyclables, and provide appropriate access for refuse collection vehicles (RCVs).

The recycling and waste objectives relating to the proposed development are summarised below:

- Introduce an appropriate collection system for commercial waste across the proposed development;
- Provide adequate storage facilities to segregate recyclables and general / residual waste and potentially organics;
- Enable compliance with all relevant requirements, specifically:
  - The Building Regulations - Approved Document H6 –Solid Waste Storage<sup>11</sup>;
  - BS 5906:2005 Waste management in buildings<sup>12</sup>; and
  - Kirklees Council waste requirements.

### 3.2 Methodology

The operational waste strategy has been developed as a result of the four phases described in the following sections.

#### 3.2.1 Phase 1 Data Gathering and Consultation

Phase 1 entailed the collation of waste data and consultation with key stakeholders as summarised below:

- Review the development and the associated waste management facilities and engage in dialogue with the design team;
- Review of the Building Regulation H6 to ensure the emerging design of the waste management facilities, where appropriate;
- Review Kirklees Council guidance for storage and collection; and
- Dialogue with Kirklees Council to better understand their waste requirements and key concerns.

#### 3.2.2 Phase 2 Waste Forecasting

Phase 2 entailed the production of a waste forecast for the proposed development as summarised below:

- Forecasting the required capacity, using the bins and storage capacity specified by the Kirklees Council guidance and British Standard BS 5906:2005 Waste management in buildings.

#### 3.2.3 Phase 3 Assessment of Design

Phase 3 entailed an assessment of the design and identifying any shortcomings with the emerging design for waste management facilities as well as opportunities for improvements.

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<sup>11</sup> HM Government (2010) *The Building Regulations 2010 Drainage and Waste Disposal*

<sup>12</sup> British Standard BS 5906:2005 Waste management in buildings – Code of Practice

### 3.2.4 Phase 4 Design consultation

Phase 4 involved ongoing consultations with the design team to ensure the project waste management facilities meet the requirements of Kirklees Council waste guidance and the Building Regulations.

## 3.3 Guidance and policy

The proposed development is required to comply with a range of waste legislation, policy, standards and specifications including:

- Kirklees Council Waste Management Design Guide for New Developments<sup>13</sup>;
- Making Space for Waste Designing Waste Management in New Developments<sup>14</sup>;
- BS 5906; and
- The Building Regulations - Approved Document H6 –Solid Waste Storage<sup>3</sup>.

### 3.3.1 Kirklees Council Consultation Response

Kirklees Council<sup>15</sup> has provided a Consultation Response in relation to the Waste Strategy for the proposed development. For operational activities the following comments have been made in relation to the waste strategy.

#### Waste storage and presentation

The Kirklees Council Waste Collection Authority wants to ensure any new developments have appropriate waste storage capacity on-site for a range of source separated wastes and to maximise recycling and efficient collection.

Consideration will be given to waste storage within the buildings or across the site, including provision for litter collection.

Use of Underground Refuse Systems in public open space should also be considered.

BS:5906 Waste management in buildings —Code of practice dated 2005 provides figures for Typical weekly waste arisings and subsequent storage requirements. These figures may not be representative of current waste generation or translate related directly to Huddersfield but are indicative of waste volumes and storage requirements.

Refuse Collection Vehicle (RCV) access:

With regards to turning circles and sweep analysis colleagues in Highway Development will be able to provide more informed comments the following observations should be addressed:

- Suitable site access and manoeuvrability space for a large RCV is vital to enable waste collection from premises. This requirement will exist in perpetuity on any development and as such, manoeuvrability must be demonstrated from the outset;
- Reversing of RCV's is a recognised safety risk and therefore should be avoided by provision of turning points and good layout of storage areas; and
- RCV access and storage space will vary depending on container type (e.g. compactors, Front End Loader (FEL), Ro-Ros, etc).

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<sup>13</sup> Kirklees Council (2020) Waste Management Design Guide for New Developments October 2020

<sup>14</sup> Association of Directors of Environment, Economy, Planning and Transport (ADEPT) (2018) Making Space for Waste Designing Waste Management in New Developments A Practical Guide for Developers and Local Authorities

<sup>15</sup> Kirklees Council (2022) Consultation Response for KC Waste Strategy( Refuse & Recycling) 2022/20509 at Land and Buildings at Queensgate Market, Huddersfield Library, Piazza and The Shambles, Huddersfield, HD1 2SU Reference WPS 22-22

Further advice on highway matters is contained in the Kirklees Highway Design Guide SPD<sup>16</sup>.

The full consultation response for Kirklees Council in relation to the Waste Strategy for the proposed development is available in Appendix E.

### 3.3.2 Commercial Waste - Kirklees Council Waste Management Design Guide for New Developments

The proposed development will also need to comply with Kirklees Council’s Waste Management Design Guide for New Developments. This requires the proposed development to provide appropriate space for the storage of recyclables and waste. Recycling and waste storage facilities will be well-designed and form an integral part of the development proposals.

The key considerations for commercial waste storage and collection are:

- Designated storage space – must be within the boundary of the property, not on the highway;
- Size - storage should be large enough for the predicted type and size of bins required for the activity in the building;
- Nuisance issues - noise, odour, antisocial hours of use, proximity to windows, visual intrusion; and the effect on the property itself, its users and neighbours;
- Security - stores should be vandal proof and secure to prevent fly-tipping, unauthorised use and spreading of waste into the surrounding area;
- Access - Bins should not have to be brought through the building to be emptied and suitable collection vehicles must be able to reach the storage or collection point; and
- Fire risk - in terms of container construction/material, type of waste, potential for arson attack and proximity to building and neighbours.

Adequate access for suitable collection vehicles must be provided along with suitable working areas, the wider road network must be capable of accommodating the required service vehicles.

Kirklees Council provide a commercial waste service to local businesses across through the Trade Waste Service.

### 3.3.3 Building Regulations - H6 -Solid Waste Storage

The operational waste strategy for the proposed development has been informed by the waste storage requirements in the Building Regulations H6<sup>11</sup>. The requirements of the regulations relating to solid waste storage in residences are summarised in Table 13 below.

**Table 13: Requirements of Building Regulations - H6 –Solid Waste Storage**

Development Type	Requirements
Non-domestic developments	<p>Consult the waste collection authority for guidance on resolving the following points.</p> <p>The volume and nature of the waste and the storage capacity required, will be based on the frequency of collection and the size and type of waste container.</p> <p>Any requirements for segregation of waste which can be recycled</p> <p>The method of waste storage, including any on-site treatment proposed, related to the intended layout and building density.</p> <p>The location of waste storage areas, waste treatment areas and waste collection points and the access to these locations for operatives and vehicles.</p>

<sup>16</sup> Kirklees Council (2022) Highways Design Guide Supplementary Planning Document Available from: <https://www.kirklees.gov.uk/beta/planning-policy/adopted-supplementary-planning-documents.aspx>

Development Type	Requirements
	<p>Fire hazards and protection measures.</p> <p>Waste storage areas should have an impervious floor and should have provision for washing down and draining the floor into a system suitable for receiving a polluted effluent. Gullies should incorporate a trap which maintains a seal even during prolonged periods of disuse.</p> <p>Any room for the open storage of waste should be secure and prevent access by vermin. Any compound for the storage of waste should be secure to prevent access by vermin unless the waste is to be stored in secure containers with close fitting lids.</p> <p>Waste storage areas should be marked and signs should be provided.</p>

### 3.3.4 BS5906:2005 Waste Management in Buildings

British Standard BS 5906:2005 sets out a code of practice for methods of storage, collection, segregation for recycling and recovery, and on-site treatment of waste from residential and non-residential buildings. The requirements of the standard relating to waste storage in multi-occupancy developments are summarised in Appendix F.

## 3.4 Commercial Waste Strategy

Commercial waste will be managed by the proposed development's operators, occupants and an appropriate waste management contractor. Occupants will be specifically expected to separate recyclable items for collection by the proposed development's operators. The recycling and waste objectives relating to the proposed development are summarised below:

- Introduce an appropriate segregation system for commercial waste;
- Provide adequate storage facilities to enable the properties to segregate recyclables and general / residual waste and potentially organics;
- Introduce an appropriate collection system for commercial waste;
- Enable compliance with all relevant requirements, specifically:
  - The Building Regulations<sup>17</sup>;
  - Kirklees Council waste requirements; and
  - BS5906.

Space will need to be provided with sufficient capacity to enable the segregation and recycling of wastes generated from the proposed development in order to limit the quantity of waste sent for disposal. These storage areas must also be easily accessible from the properties and by RCVs.

There will also be adequate space for the storage of bulky waste and the small amounts of hazardous waste produced.

### 3.4.1 Consultation

Kirklees Council Planning Policy and Waste team have been consulted in relation to commercial waste management and storage requirements and the consultation response is summarised in section 3.2.1.

The full consultation response for Kirklees Council in relation to the Waste Strategy for the proposed development is available in Appendix E.

<sup>17</sup> HM Government (2010) *The Building Regulations 2010 Drainage and Waste Disposal*

### 3.4.2 Commercial Waste Strategy

Commercial waste will be managed across the proposed development onsite through the appointed operators, facilities management teams, any commercial occupants and appointed waste management contractors.

The plan for managing the commercial waste onsite will be finalised once the appointed operators have established tenancy agreements with the future occupants have been finalised.

#### 3.4.2.1 Commercial Waste Storage Capacity Forecast

It has been possible to forecast the volume and associated waste capacity using guidance advocated by BSi 5906 using the following assumptions:

- Floor areas have been provided by FCBS<sup>18</sup> as a worse-case scenario;
- A recycling rate of 50% will be achieved across the proposed development;
- BSi 5906 benchmark for weekly waste arising of 5 litres of waste for every m<sup>2</sup> of floor area for the Venue and Food Hall;
- Bespoke benchmark for weekly waste arising of 2.5 litres of waste for every m<sup>2</sup> of floor area for the Museum and Gallery to reflect the nature of their operations; and
- Bespoke benchmark for weekly waste arising of 1 litre of waste for every m<sup>2</sup> of floor area for the Library to reflect the nature of the operation.
- Bespoke waste storage area for the MSCP to reflect the nature of the operation.

The minimum commercial waste container capacity and the estimated floor area across the proposed development is given in Table 14.

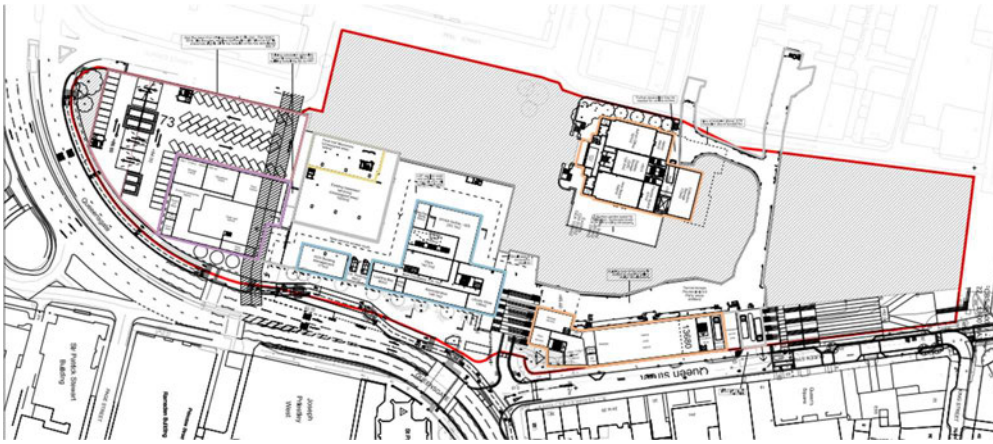
**Table 14: Commercial Waste Container Capacity**

Unit	Gross Floor Area (m <sup>2</sup> )	Minimum Bin Capacity (litres)	Recycling Capacity (litres)	Number of 1,100 litre bins	Residual Capacity (litres)	Number of 1,100 litre bins	Estimated floor area (m <sup>2</sup> )
Library	4,784	4,784	3,300	3	3,300	3	10.6
Museum	5,726	14,003	7,700	7	7,700	7	24.7
Gallery	2,993	7,373	4,400	4	4,400	4	14.1
Venue	7,705	38,525	19,263	18	19,263	18	63.5
Food Hall	2,379	11,895	6,600	6	6,600	6	21.2
MSCP	11,949	N/A	1,100	1	1,100	1	3.5

#### 3.4.2.2 Servicing and Waste Removal

All occupiers at the proposed development will be serviced from the communal servicing area located at Lower Ground Level as displayed in Figure 4.

<sup>18</sup> Fielden Clegg Bradley Studios (FCBS) Kirklees Cultural Heart Floor Areas September 2022



**Figure 4 Servicing Routes**

### **3.4.2.3 Food Hall Commercial Waste Storage**

The Food Hall will be owned by Kirklees Council and operated by a third party appointed in the future.

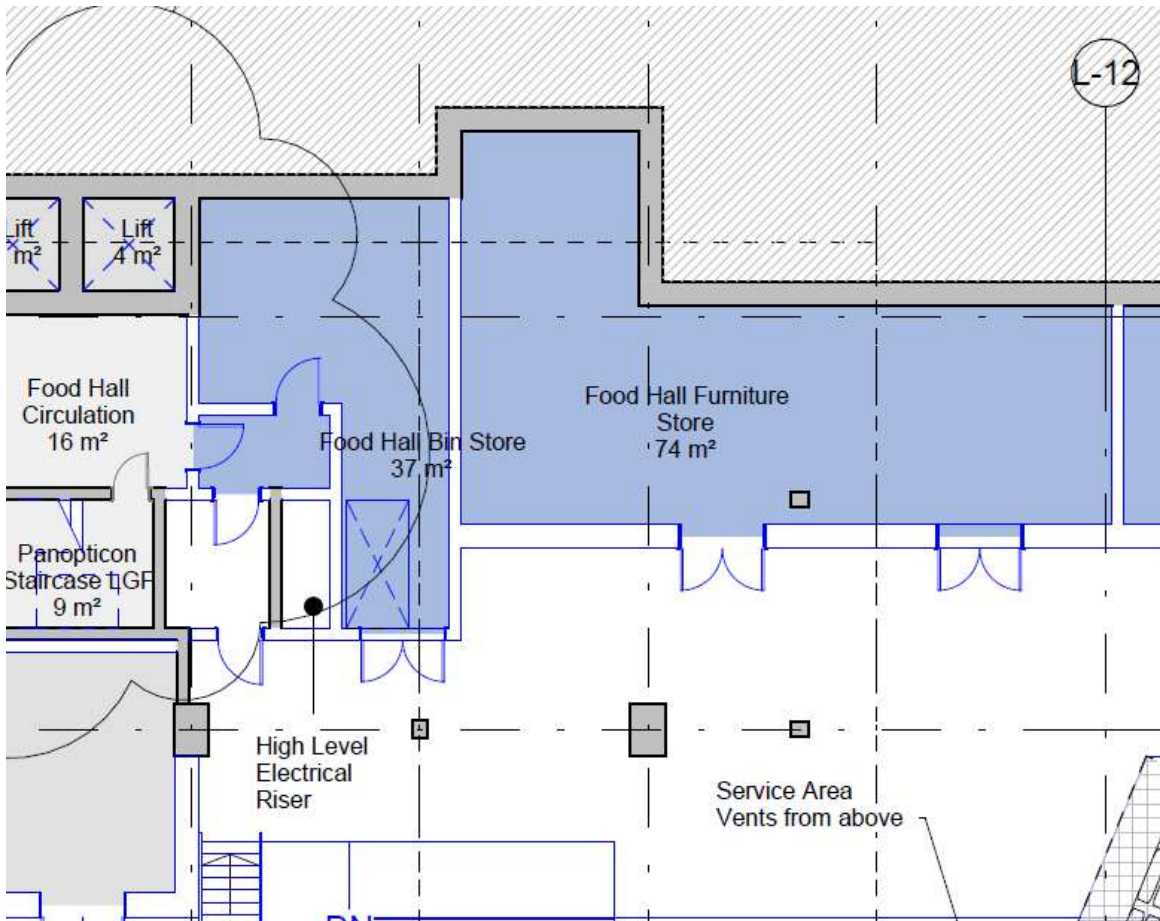
#### **Commercial Waste Storage and Collection**

Commercial waste management contracts will be entered into for the removal of the waste either by the operator of the Food Hall or the occupants directly depending on the lease terms that are negotiated.

#### **Internal Commercial Waste Storage**

Sufficient space will be provided with capacity to enable the segregation and recycling of wastes generated from the Food Hall in order to limit the quantity of waste sent for disposal. There will be internal space within each commercial unit to store recycling (potentially including organic waste) and general waste bins.

The indicative location for the Food Hall commercial waste storage area is the lower ground floor as displayed in Figure 5. The indicative estimated floor area of the Food Hall commercial waste storage area is 37m<sup>2</sup>. This is in excess of the minimum floor area of 21.2m<sup>2</sup> identified by BSi 5606.



**Figure 5 Indicative Location of the Food Hall Waste Storage Area**

**Access**

The RCVs collecting commercial waste from the Food Hall would enter the proposed development through the existing tunnels on Queen Street and exit from Queensgate.

**3.4.2.4 Library Waste Storage**

The Library will be owned and operated by Kirklees Council. West Yorkshire Archiving Service (WYAS) will also reside in the Library.

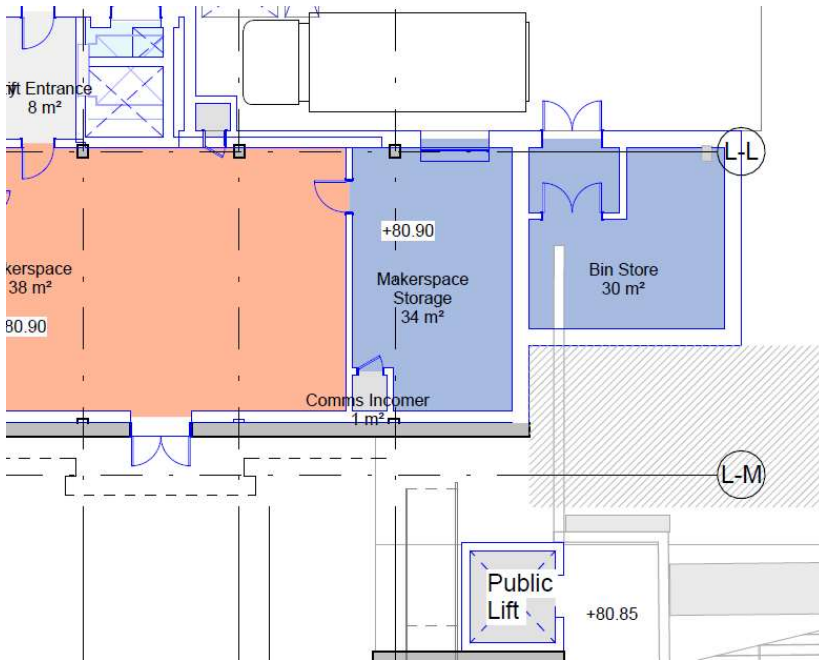
**Waste Storage and Collection**

Kirklees Council will arrange the contract for the removal of waste from the Library including WYAS operations.

**Internal Waste Storage**

Sufficient space will be provided with capacity to enable the segregation and recycling of wastes generated from the Library (including WYAS) in order to store recycling (potentially including organic waste) and general waste bins.

The indicative location for the Library waste storage area is the lower ground floor as displayed in Figure 6. The indicative estimated floor area of the Library for commercial waste storage area is 30m<sup>2</sup>. This is in excess of the minimum floor area of 10.6m<sup>2</sup>



**Figure 6 Indicative Location of the Library Waste Storage Area**

### Access

The RCVs collecting commercial waste from the Library would enter the proposed development through the existing tunnels on Queen Street and exit from Queensgate.

### 3.4.2.5 Gallery Waste Storage

The Gallery will be owned and operated by Kirklees Council.

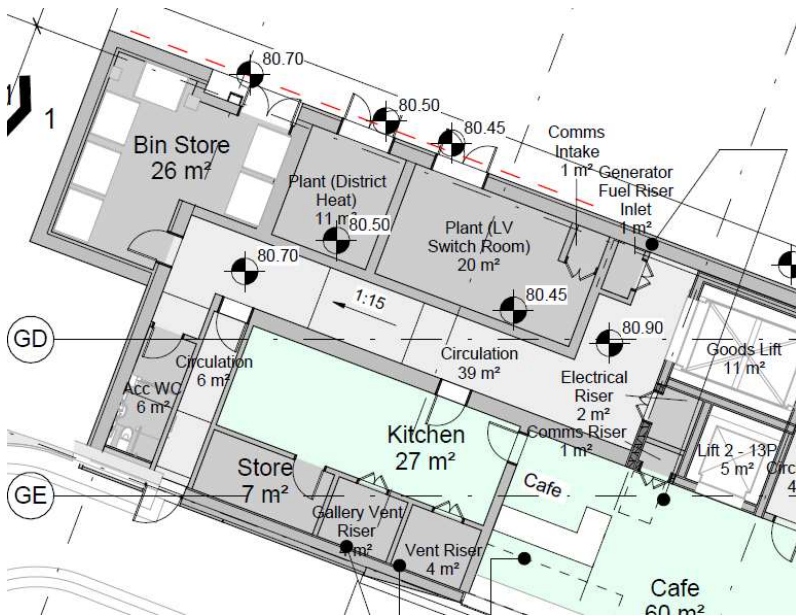
### Waste Storage and Collection

Kirklees Council will arrange the contract for the removal of waste from the Gallery.

### Internal Commercial Waste Storage

Sufficient space will be provided with capacity to enable the segregation and recycling of wastes generated from the Gallery in order to limit the quantity of waste sent for disposal. There will be internal space within the Gallery to store recycling (potentially including organic waste) and general waste bins.

The indicative location for the Gallery waste storage area is the lower ground floor as displayed in Figure 7. The indicative estimated floor area of the Gallery waste storage area is 26m<sup>2</sup>. This is in excess of the minimum floor area of 14.1m<sup>2</sup> identified.



**Figure 7 Indicative Location of the Gallery Waste Storage Area**

### Access

The RCVs collecting waste from the Gallery would enter the proposed development through the existing tunnels on Queen Street and exit from Queensgate.

### 3.4.2.6 Venue Commercial Waste Storage

The Venue will be owned by Kirklees Council and operated by a third party appointed in the future.

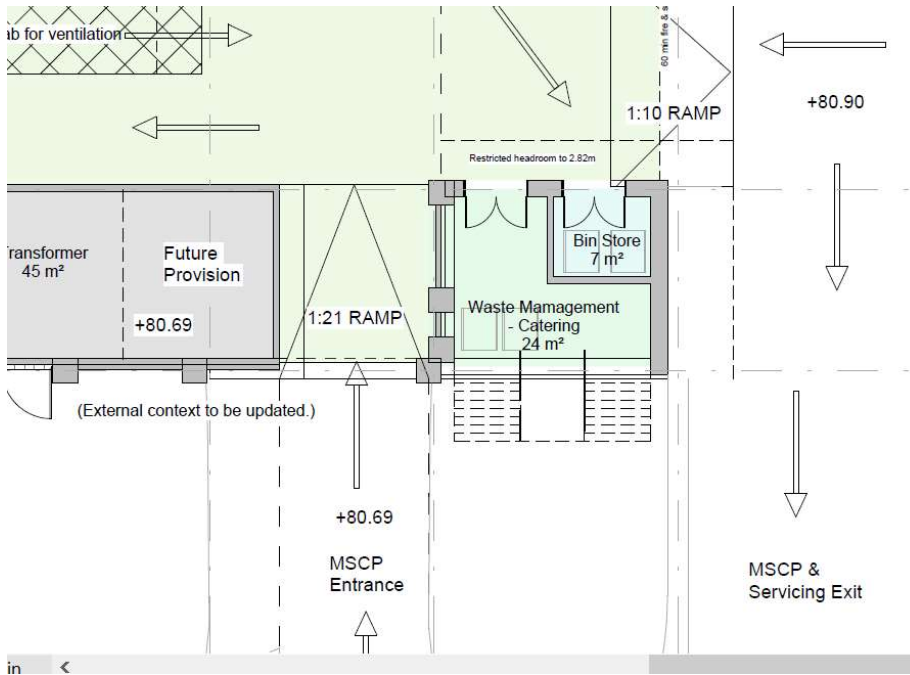
### Commercial Waste Storage and Collection

Commercial waste management contracts are likely to be entered into for the removal of the waste by the operator of the Venue depending on the lease terms that are negotiated.

### Internal Commercial Waste Storage

Sufficient space will be provided with capacity to enable the segregation and recycling of wastes generated from the Venue in order to limit the quantity of waste sent for disposal. There will be internal space within the Venue to store recycling (potentially including organic waste) and general waste bins.

The indicative location for the Venue waste storage area is located on the lower ground floor as displayed in Figure 8. The indicative estimated floor area of the Venue commercial waste storage area is 31m<sup>2</sup>. This is below the minimum floor area of 63.5m<sup>2</sup> identified by BSi 5606. The operators of the Venue will increase the frequency of collections of commercial waste and recycling e.g. after each major event, to ensure there is adequate waste storage space available. In addition the use of equipment to consolidate waste such as compactors will be considered for use by the Venue operator.



**Figure 8 Indicative Location of the Venue Waste Storage Areas**

### Access

The RCVs collecting commercial waste from the Venue would enter the proposed development through the existing tunnels on Queen Street and exit from Queensgate.

#### 3.4.2.7 Museum Waste Storage

The Museum will be owned and operated by Kirklees Council.

### Waste Storage and Collection

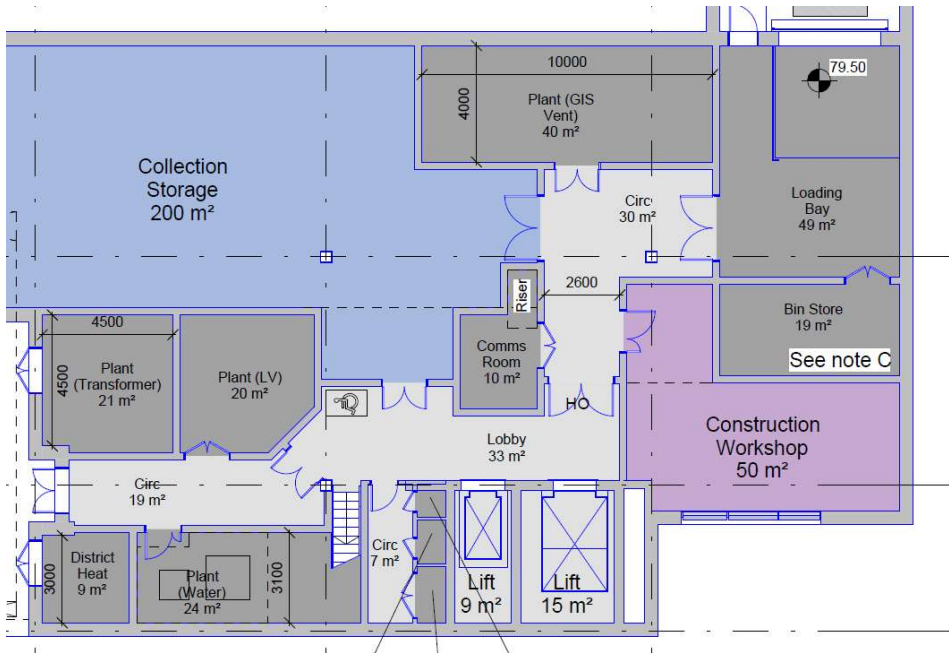
Kirklees Council will arrange the contract for the removal of waste from the Museum.

#### 3.4.2.8 Museum Commercial Waste Storage

### Internal Waste Storage

Sufficient space will be provided with capacity to enable the segregation and recycling of wastes generated from the Museum in order to limit the quantity of waste sent for disposal. There will be internal space to store recycling (potentially including organic waste) and general waste bins.

The indicative location for the Museum waste storage area is the lower ground floor as displayed in Figure 9. The indicative estimated floor area of the Museum waste storage area is 19m<sup>2</sup>. The size of the bin store for the Library will be reviewed with Kirklees Council.



**Figure 9 Indicative Location of the Museum Waste Storage Area**

### Access

The RCVs collecting waste from the Museum would enter the proposed development through the existing tunnels on Queen Street and exit from Queensgate.

### 3.4.2.9 Multi Storey Car Park (MSCP) Commercial Waste Storage

The MSCP will be owned by Kirklees Council and envisaged to be operated by a third party appointed in the future.

### Commercial Waste Storage and Collection

Commercial waste management contracts are likely to be entered into for the removal of the waste by the operator of the MSCP depending on the lease terms that are negotiated.

### Internal Commercial Waste Storage

Sufficient space will be provided with capacity to enable the segregation and recycling of the anticipated small quantities of wastes generated from the MSCP.

A commercial waste storage area located on the lower ground floor will be provided for the MSCP with a floor area of 7m<sup>2</sup>.

### Access

The RCVs collecting waste from the MSCP would enter the proposed development through the existing tunnels from Queen Street and exit from Queensgate.

### Urban Park Waste Storage

The Urban Park will be owned and operated by Kirklees Council.

### Waste Storage and Collection

Kirklees Council will arrange the contract for the removal of waste from the Urban Park.

The Urban Park waste storage area is likely to be located on the lower ground floor.

There are likely to be additional events organised by third parties such as live music which would generate commercial waste. For these events the third party operator would arrange for the collection of waste in consultation with Kirklees Council.

## Access

The RCVs collecting waste from the Urban Park would enter the proposed development through the existing tunnels on Queen Street and exit from Queensgate.

### 3.4.3 Other waste streams

There are other non-recyclable waste streams which will be segregated and managed separately to the residual waste. This includes a number of hazardous waste streams such as healthcare waste and Waste Electrical and Electronic Equipment (WEEE) as displayed in Table 15.

**Table 15: Other non-recyclable waste streams**

Waste Stream	Product	Source
Waste Electrical and Electronic Equipment (WEEE)	Spent batteries, miscellaneous electrical equipment, computers	Retail, other commercial development.
Healthcare waste	Medicines, needles, used bandages, etc.	Retail, other commercial development.
Miscellaneous Hazardous Waste	Cleaning products, oil, chemicals	Retail, other commercial development.

#### 3.4.3.1 Hazardous Waste

There will be adequate space within the waste storage facilities for the small amounts of hazardous waste which will be produced by the proposed development.

Oils and solvents shall not be disposed as liquid waste. These hazardous wastes need to be separated and disposed of appropriately. Occupants will need to be aware of this procedure and facilities and collections need to be established by the proposed development to ensure the appropriate facilities are in place.

#### 3.4.3.2 Waste Electrical and Electronic Equipment (WEEE)

There will also be adequate space within the waste storage facilities for any WEEE which will be produced by the proposed development.

Sound design and procurement practices can prevent the generation of WEEE. Designers shall specify non-hazardous light bulbs such as those which do not mercury.

#### 3.4.3.3 Healthcare waste

There will be rigid, colour coded and labelled bins the following healthcare waste streams:

- Chemical / pharmaceutical waste; and
- Infectious waste and sharps.

### 3.4.4 Commercial Waste Summary

This commercial recycling and waste strategy demonstrates how waste and recyclables will be stored, transferred and collected for each part of the proposed development (the Library, Museum, Gallery, Venue, Food Hall, MSCP and Urban Park). The strategy has been developed to comply with the recycling and waste requirements of Kirklees Council<sup>15</sup> including the guidance in the pre-application consultation request. It also demonstrates how the proposed development will satisfy other requirements including the Building Regulations.

Compliance with this waste strategy will ensure there are sufficient waste storage areas across the proposed development to segregate waste and recyclables, appropriate commercial waste storage areas and suitable

access for refuse collection vehicles (RCVs). This includes sufficient space to enable the segregation of recyclable materials across the proposed development to limit the quantity of waste sent for disposal.

# Appendix A

## Demolition Waste Estimations

Appendix A contains the assumptions and estimations used to estimate the demolition waste arising from the proposed development. Table A1 below displays the estimated demolition waste generated from the Proposed Development.

Measurements of these existing buildings which will be cleared from the site have been provided by Arup<sup>19</sup>.

The Demolition Waste Calculator in the WRAP Net Waste Tool ([nwtool.wrap.org.uk](http://nwtool.wrap.org.uk)) has been used to estimate demolition wastes.

Table A1 below displays the estimated demolition waste generated associated with the demolition works associated with the proposed development.

**Table A1: Estimated demolition waste for the proposed development**

Building	Structure	WRAP Estimation (tonnes)
King Street (above ground)	Concrete	18,744
King Street (basement)	Concrete	4,282
Total		23,026

Measurements of the existing infrastructure that will be cleared from the site have also been provided by Arup. In addition, Arup have identified a bulking factor of 1.3 to estimate the likely volumes stored onsite. Volume to mass conversion factors have been identified using WRAP<sup>20</sup> data.

The estimated demolition waste from the clearance of existing infrastructure generated by the proposed development is displayed in Table A2.

**A2 Estimated Demolition Waste Infrastructure**

Development	Volume (m <sup>3</sup> )	Mass (tonnes)	Bulk Volume (m <sup>3</sup> )	Bulk mass (tonnes)
Zone 1 - Market Hall	2,960	6,117	3,847	7,952
Zone 2 - Boots (West of Shambles)	3,672	7,569	4,774	9,840
Zone 3 - East of Shambles	3,110	6,379	4,043	8,293
Zone 4 - Piazza	1,697	3,451	2,206	4,487
Shambles	374	759	486	986
Piazza Walkway	471	989	612	1,286

<sup>19</sup> Arup (2015) *Demolition – Existing Buildings Rev B*

<sup>20</sup> WRAP (2008) *Net Waste Tool Guide to Reference Data*

MSCP & Venue Excavation	5,625	11,813	7,313	15,356
<b>Sub-total</b>	<b>17,909</b>	<b>37,077</b>	<b>23,281</b>	<b>48,200</b>

Table A3 below displays the estimated waste streams that will be generated from the demolition of the associated buildings before recycling onsite.

**Table A3: The demolition waste estimated by the WRAP Net Waste Tool**

Material	Quantity (tonnes)
Concrete	58,096
Metals	3,649
Bricks	4,341
Timber	913
Plasterboard	604
Tiles and Ceramics	105
Inert	3,377
Mixed	109
Miscellaneous	31
<b>Total</b>	<b>71,225</b>

# Appendix B

## Construction Waste Estimations

Appendix B contains the assumptions and estimations used to calculate the construction waste arising from the Proposed Development.

The indicative floor areas have been provided by Fielden Clegg Bradley Studios (FCBS)<sup>21</sup> as displayed in Table B1 below.

**Table B1: Floor areas at the Proposed Development**

Unit	Gross Internal Area (m <sup>2</sup> )
Library	4,784
Museum	5,726
Gallery	2,993
Venue	7,705
Food Hall	2,379
MSCP	11,949

The mass of waste likely to be generated from constructing the proposed development has been estimated using Building Research Establishment (BRE) SMARTWaste data<sup>22</sup>. Table B2 displays the estimate construction forecast for the proposed development.

**Table B2: Estimated Construction Waste Generated from the Proposed Development**

Building	Gross Internal Floor Area (m <sup>2</sup> )	BRE Project Type	Average Tonnes / 100m <sup>2</sup>	Mass (tonnes)
Library	4,784	Public Building	12.3	588
Museum	5,726	Public Building	12.3	704
Gallery	2,993	Public Building	12.3	368
Venue	7,705	Leisure	14.2	1,094
Food Hall	2,379	Leisure	14.2	338
MSCP	11,949	Public Building	12.3	1,470
<b>Total</b>				<b>4,563</b>

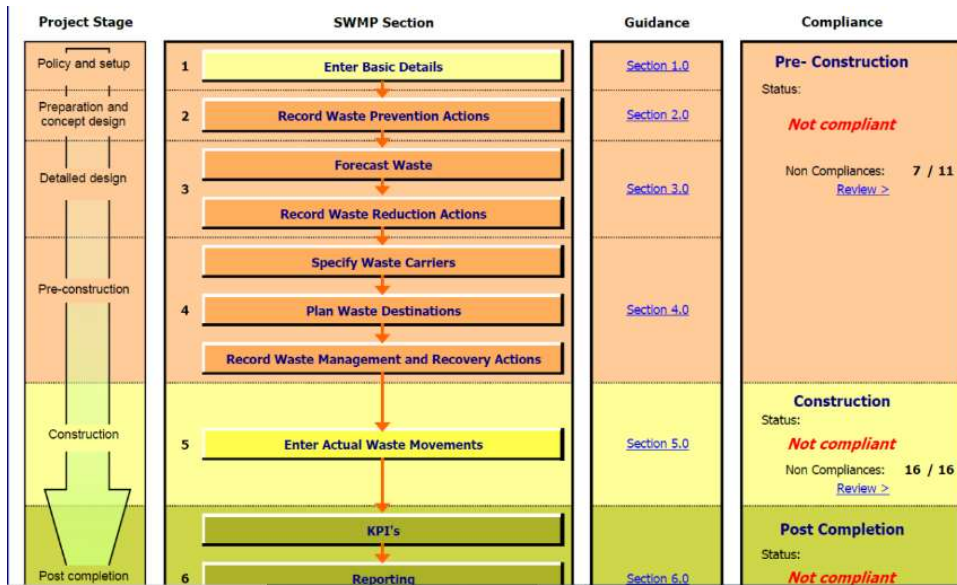
<sup>21</sup> Fielden Clegg Bradley Studios (FCBS) Kirklees Cultural Heart Floor Areas September 2022

<sup>22</sup> Buildings Research Establishment on behalf of Arup (BRE) (2022) *SMARTWaste Data Report*

# Appendix C

## Kirklees Cultural Heart SWMP Template

Appendix C demonstrates the Kirklees Cultural Heart Site Waste Management Plan (SWMP) template.



**Basic Details**

Client name :	Kirklees Council
Principal contractor :	TBC
Owner of document :	Kirklees Council
Project title :	Kirklees Cultural Heart
Project Reference :	
Project location :	Huddersfield
Project postcode :	HD1 1RY
Construction value :	
Type of construction :	Public buildings
Activity :	Both (new build and refurb)

**Metrics**  
Please select metrics applicable to your project. These metrics are then used in the KPI sheet to track your progress.

Metric	Amount	Unit

**Project targets**  
Please select project targets applicable to your project

KPI	Phase	Target	Unit

**Waste Actions**  
Enter actions in the next available row below

Number	Type of Waste Action	Action Taken	Action owner	Reference to project document /	Waste stream	Material type	Estimated Cost Saving	Waste reduced	
								(m <sup>3</sup> )	(tonnes)
1	Waste Reduction Action	The project team are striving to re-use excavation materials onsite where feasible.	Designers		Inert - Soil & stones	soil and stones other than those mentioned in 17.05.03			
2	Waste Reduction Action	The project team are striving to recycle crushed demolition materials onsite.	Designers		Inert - mixture of concrete, bricks, tiles etc.	concrete			
3	Waste Prevention Action	the existing library and Queensgate market hall are to be retained and refurbished.							
4	Waste Reduction Action	The existing building stock will be evaluated to prioritise retention and refurb.							
5	Waste Reduction Action	Pre-demolition audits will be undertaken to evaluate and prioritise material re-use.							
6	Waste Prevention Action	Flexible and adaptable spaces to maximise future viability.							
7		The new building will be designed for deconstruction to enable the disassembly at the end of their lifetime.							
8									
9									

Forecast Waste						Forecast Quantities		Calculated Quantities (Converting between m <sup>3</sup> and t)	
C, D or E Activity	Waste Stream	Material Type	Further description of waste - optional	Suggested LOW Code	Waste or Re-Use	(m <sup>3</sup> )	(tonnes)	(m <sup>3</sup> )	(tonnes)
Excavation	Packaging	plastic packaging	plastic packaging	15 02 02	Off-site destruction	###	###	###	###
Excavation	Inert - Soil & stones	soil and stones other than those mentioned in 17 09 03	inert excavation materials re-use onsite	17 05 04	On-site re-use			0.00	0.00
Excavation	Inert - Soil & stones	soil and stones other than those mentioned in 17 09 03	inert materials treated and recycled onsite	17 05 04	On-site recycled			0.00	0.00
Construction	Other C&D segregated waste	Other C&D segregated waste mentioned in 17 09 01	Asphalt	17 03 02	Off-site segregated		75	91.46	75.00
Construction	Other C&D segregated waste	Other C&D segregated waste mentioned in 17 09 01	Flies and ceramics	17 03 03	Off-site mixed		2	3.29	3.00
Construction	Inert - mixture of concrete, bricks, tiles etc.	bricks		17 01 02	Off-site segregated		795	662.59	795.00
Construction	Other C&D segregated waste	biological waste kitchen and garden waste	Curbside	20 01 08	Off-site segregated		11	55.00	11.00
Construction	Inert - mixture of concrete, bricks, tiles etc.	concrete		17 01 01	Off-site segregated		290	238.25	290.00
Construction	Other C&D segregated waste	tiles	Floor coverings	20 01 11	Off-site mixed		0	0.00	0.00
Construction	Gypsum (17 08 02)	gypsum-based construction materials other than those mentioned in 17 09 04		17 08 02			27	81.83	27.00
Construction	Mixed Hazardous - C&D waste (17 09 03*)	Other construction and demolition wastes containing dangerous substances mentioned in 17 09 01, 17 09 02 and 17 09 03		17 09 03*	Off-site segregated		77	88.51	77.00
Construction	Inert - mixture of concrete, bricks, tiles etc.	inert materials other than those mentioned in 17 09 01		17 01 07	Off-site segregated		560	451.61	560.00
Construction	Other C&D segregated waste	metallic waste other than those mentioned in 17 06 01 and 17 06 02		17 06 04	Off-site segregated		2	8.08	2.00
Construction	Other C&D segregated waste	metals		17 04 07	Off-site segregated		61	145.24	61.00
Construction	Mixed C&D waste (17 09 04)	Other construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03		17 09 04	Off-site mixed		2452	3818.39	2452.00
Construction	Mixed C&D waste (17 09 04)	Other construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	Other waste	17 09 04	Off-site mixed		50	66.67	50.00
Construction	Packaging	mixed packaging		15 01 06	Off-site segregated		44	299.52	44.00
Construction	Packaging	plastic packaging		15 01 02	Off-site segregated		34	154.55	34.00
Construction	Wood	wood		17 02 01	Off-site segregated		178	523.53	178.00
								0.00	0.00
Demolition	Inert - mixture of concrete, bricks, tiles etc.	bricks		17 01 02	Off-site segregated		4341	3617.50	4341.00
Demolition	Inert - mixture of concrete, bricks, tiles etc.	concrete		17 01 01	Off-site segregated		58096	45744.68	58096.00
Demolition	Gypsum (17 08 02)	gypsum-based construction materials other than those mentioned in 17 09 04		17 08 02	Off-site segregated		604	1830.30	604.00
Demolition	Inert - mixture of concrete, bricks, tiles etc.	inert materials other than those mentioned in 17 01 01		17 01 07	Off-site mixed		3777	3045.97	3777.00
Demolition	Metals	metallic waste other than those mentioned in 17 06 01, 17 06 02 and 17 06 03		17 04 07	Off-site segregated		3649	8886.10	3649.00
Demolition	Mixed C&D waste (17 09 04)	Other construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03		17 09 04	Off-site mixed		109	129.29	109.00
Demolition	Mixed C&D waste (17 09 04)	Other construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	Other waste	17 09 04	Off-site mixed		31	35.63	31.00
Demolition	Inert - mixture of concrete, bricks, tiles etc.	tiles and ceramics		17 01 03	Off-site mixed		105	177.87	105.00

# Appendix D

## Completing the SWMP Template

Appendix D identifies contains the instructions how to complete the Site Waste Management Plan (SWMP) template.

The SWMP template identifies eight steps, as displayed in Table D1. Table D1 also displays examples of who may be identified as the designated responsible owner for each of these steps.

**Table D1: Steps and responsibilities**

Step	Title	Example responsible owner
Step 1	Project Homepage	Kirklees Council
Step 2	Basic Details	Kirklees Council
Step 3	Waste Actions	Kirklees Council, the Project Designer, Preferred Demolition Contractor, Preferred Principal Contractor
Step 4	Forecast Waste	Preferred Demolition Contractor, Preferred Principal Contractor
Step 5a	Specify Waste Carriers	Preferred Principal Contractor
Step 5b	Plan Waste Destinations	Preferred Principal Contractor
Step 6	Actual Waste Movements	Preferred Demolition Contractor, Preferred Principal Contractor
Step 7	KPIS	Preferred Demolition Contractor, Preferred Principal Contractor
Step 8	Declaration	Kirklees Council, Preferred Principal Contractor
Step 9	Reporting	Preferred Demolition Contractor, Preferred Principal Contractor

Arup have completed the template using the data provided by Kirklees Council and information on good practice produced by WRAP. Completing the following steps will encourage improved waste minimisation and waste management performance.

The accompanying SWMP template will be completed by Kirklees Council and the designer through to Step 2 of the WRAP template as the design details progress, prior to work starting on-site. When the works commence on-site the remaining Steps will be completed by the Preferred Demolition Contractor and Preferred Principal Contractor and Kirklees Council.

### Step 1: Project Homepage

The Project Homepage worksheet of the SWMP template links to guidance in other areas of the Plan.

### Step 2: Basic Details

Key project data must be entered by Kirklees Council into the worksheet entitled '2 Basic Details' in the SWMP template. When the PPC is appointed, their name needs to be added to the Basic Details Box. This is displayed in Figure D1 below.

<b>Client name</b>	Kirklees Council
<b>Principal contractor</b>	Project not yet awarded
<b>Owner of document</b>	Kirklees Council
<b>Project title</b>	Kirklees Cultural Heart
<b>Project Reference</b>	
<b>Project location</b>	Huddersfield
<b>Project postcode</b>	
<b>Construction value</b>	
<b>Type of construction</b>	Mixed Development
<b>Activity</b>	New construction and Refurbishment

**Figure D1: Basic Details**

### Metrics

Metrics can also be added for the project. These metrics can be used in the KPI sheet to track project progress in relation to waste produced during demolition and construction. For this project, it is likely to be most appropriate to use the footprint (m<sup>2</sup>) of the scheme. However, the PDC and PPC will agree with Kirklees Council the most appropriate metrics for the project. A list of metrics is provided in the SWMP template.

### Project Targets

Targets are used to maintain project progress through the scheme. They enable the effectiveness of waste management measures both during the project and at the completion of the project to be appraised.

No targets have been established yet. The appropriate targets will be identified by Kirklees Council, the PDC and the PPC prior to work starting on-site.

### Schedule of work

The finalised dates for the schedule of work will be added to the SWMP template by Kirklees Council.

### Key personnel

Key Project Staff are identified in the Plan. The information displayed in Figure D2 will be completed by Kirklees Council.

<b>Position</b>	<b>Name</b>	<b>Contact Details</b>
<b>Client</b>	Kirklees Council	TBC
<b>Principal Contractor</b>	Project not awarded	TBC
<b>SWMP Drafter</b>	Arup	Bob Hudson 0113 242 8498
<b>Others (not legally required)</b>		
<b>Client Waste Management Representative (if applicable)</b>	TBC	TBC
<b>Project Manager</b>	TBC	TBC
<b>Waste Management Coordinator/Champion</b>	TBC	TBC

<b>Design Coordinator</b>	TBC	TBC
<b>Document Controller / Secretary</b>	TBC	TBC

Figure D2: Key Personnel

### Step 3 Designing Out Waste

Any measures taken through the design stages of a project to minimise the waste produced should be incorporated into the design and the SWMP.

Kirklees Council and the Project Designer need to complete any actions that have reduced waste during the design stage of the project in the worksheet entitled '3 Actions' in the SWMP template. Some project specific examples have been added.

### Step 4 Forecast Waste

An estimate of waste generation for some aspects of the project has been calculated and included in the worksheet entitled '4 Forecast Waste' in the SWMP template.

### Step 5a Specify Waste Carriers

Step 5a featured in the worksheet entitled '5a Specify Waste Carriers' in the SWMP template enables the user to identify the waste carriers removing materials.

There are four questions which the PPC must answer. The questions link to the Compliance worksheet and assess the Plan's performance against various waste legislation.

#### Duty of Care

All those who produce or handle wastes from demolition, earthworks and construction activities have a duty of care for its safe keeping, transport and subsequent recovery. Since October 2007, all producers of waste have been required to pre-treat waste prior to disposal to landfill. The PPC must demonstrate how they will comply with all regulation and good practice guidance.

### Step 5b Plan Waste Destinations

Step 5b featured in the worksheet entitled '5b Plan Waste Destinations' in the SWMP template enables the user to identify the destinations for waste. Waste streams which inputted in worksheet Step 4 are displayed alongside the waste management facilities inputted in Step 5b. The worksheet sorts the waste streams forecasted by the user into Construction, Demolition and Excavation.

There are three questions at the top of the worksheet which the PPC must answer.

### Step 6 Actual Waste Movements

When any waste is removed from the site the PPC must record these movements in the SWMP.

Step 6 featured in the worksheet entitled '6 Actual Waste Movements' enables the user to input the actual waste activities once work has commenced on-site.

The PPC must input each waste movement and allocate by type of activity using the three options from the drop down menu; Construction; Demolition or Excavation.

### Step 7 KPIs

Step 7 featured in the worksheet entitled '7 KPIS' in the SWMP template enables the project team to review the performance of the project.

### Step 8 Declaration

A representative of Kirklees Council should sign and date the declaration at the bottom of the worksheet entitled '2 Basic Details' in the SWMP template.

### Step 9 Reporting

Step 9 featured in the worksheet entitled '9 Reporting' enables the project team to monitor the forecasted waste against the actual waste arising and present the performance of the project to stakeholders. The Reporting worksheet displays the total waste generated by the project.

# Appendix E

## Kirklees Council Consultation Response

Appendix E contains a Consultation Response from Kirklees Council<sup>23</sup> in relation to the Waste Strategy for the proposed development.

The following comments are made without prejudice and purely from the point of view of the Waste Collection Authority.

To meet the operational requirements of the Authority the following issues need to be addressed. Solving these will help create an environment that functions safely and efficiently for waste management. This will also enable the proposal to better meet the Kirklees Council policy requirements and the Kirklees Highway Design Guide SPD in respect of waste collection. Ultimately this will be to the benefit both tenants, facilities managers, and waste contractors for the life of the development.

The development includes the dismantling and demolition of existing structures on the site with refurbishment and construction of new facilities.

In line with the aspirations of the waste hierarchy to better manage waste and the ethos of the circular economy to conserve resources and raw materials where possible, any waste generated from demolition should be re processed to produce secondary products for reuse on or off site. The new buildings should be designed to enable disassembly at the end of their lifetime and incorporate repurposed materials or those with a high recycled content where practical.

### Waste storage and presentation

The proposed redevelopment does not include residential properties and therefore the Waste Collection Authority does not have a duty to collect waste from the site unless requested to do so. The WCA does want to ensure any new developments have appropriate waste storage capacity on site for a range of source separated wastes and to maximise recycling and efficient collection.

Whilst the proposals are to be finalised it is vital thought is given to waste storage within the buildings or across the site, including provision for litter collection.

Use of Underground Refuse Systems in public open space should be considered.

BS:5906 Waste management in buildings —Code of practice dated 2005 provides figures for Typical weekly waste arisings and subsequent storage requirements. These figures may not be representative of current waste generation or translate related directly to Huddersfield but are indicative of waste volumes and storage requirements.

The Waste Strategy for England 2018 sets out targets to encourage minimising waste, promoting resource efficiency, and moving towards a circular economy. Implementation of these policies will result in the requirement to source segregate waste to enhance recycling and recovery. This will not increase the volume of waste overall but will require storage capacity for additional containers e.g., food waste, glass, and packaging in addition to residual wastes.

### Refuse Collection Vehicle access:

With regards to turning circles and sweep analysis colleagues in Highway Development will be able to provide more informed comments but the following observations should be addressed.

Suitable site access and manoeuvrability space for a large Refuse Collection Vehicle is vital to enable waste collection from premises. This requirement will exist in perpetuity on any development and as such, manoeuvrability must be demonstrated from the outset.

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<sup>23</sup> Kirklees Council (2022) Consultation Response for KC Waste Strategy( Refuse & Recycling) 2022/20509 at Land and Buildings at Queensgate Market, Huddersfield Library, Piazza and The Shambles, Huddersfield, HD1 2SU Reference WPS 22-22

Reversing of RCV's and skip wagons is a recognised safety risk and therefore should be avoided by provision of turning points and good layout of skip and wheeliebin storage areas.

Vehicle access and storage space will vary depending on container type. Indicative requirements are detailed below.

### Compactors

Compactors have a large capacity and can achieve volume reductions of up to 4:1. This kind of container is suitable for use in premises where a significant volume of waste is likely to be produced, such as large offices, retail units and hotels as well as mixed developments.

They require direct access by a skip or Ro-Ro vehicle. Additional length is required to that given below for the service bay to accommodate the collection vehicle.

#### 10.7m<sup>3</sup> compactor

Vehicle (Roll-on, Roll-off 4 axle). Compactor Dimensions - 4.375m (l) x 1.99m (w) x 2.46m (h). Service Bay Dimensions – 6m (l) x 5m (w) x 5m (h).

Other requirements:

- Smooth, impervious, level surface;
- Minimum width of entrance to service bay: 4.0 metres; and
- Power Supply 3x400V, 50Hz (three-phase neutral & earth), CEE-connector 32A, commando plug connector suitable for external use. The power supply should terminate with an RCD box located within two metres of the compactor.

Note: In developments where the service bay opens directly on to the street, the distance from the entrance to the rear of the service bay should be a minimum of 12m. This is to prevent the vehicle encroaching on to the footway when loading or unloading the skip.

### Closed, secure walk-in containers (Ro-Ro's)

This container type tends to be used only for recyclates and where very large volumes are produced.

Mainly 26.8m<sup>3</sup> roll-on, roll-off containers are in use. These containers are entered via a single hinged door to the back of the container. Dimensions (of a 26.7m<sup>3</sup> container) – 6.1m (l) x 2.5m (w) x 2.4m (h). Service Bay Dimensions – 9.5m (l) x 6m (w) x 5m (h). Vehicle (Roll-on, Roll-off) Other requirements:

- Smooth, impervious, relatively level surface (low gradients can be acceptable but only along a particular orientation);
- Minimum width of entrance to service area: 4.0 metres; and
- Sufficient space to the side to enable the door to be fully opened in order to be connected to a catch on the side of the container.

### Front End Loader (FEL)

This container type is used for medium volume general waste (wet). Dimensions – 2.14m (l) x 2.0m (w) x 2.14m (h). Other requirements:

- Additional 2.0m height required to open bins for normal use;
- Smooth, impervious, level surface for storage;
- Containers must sit at least 1m away from building walls and 0.5m away from any other container; and
- Containers are tipped on site and as a result have extra height requirements.

Typical vehicle specification and requirements are detailed below but may differ due to individual service providers and vehicle fleets.

### Skip vehicle

- Gross Vehicle Weight – 18,000kg
- Number of axels – 2
- Width – 2500mm truck body / 2650 including mirrors
- Height – 4000mm truck height / 4500 mm full height loading
- Length – 6700mm vehicle length / 15,000mm operating length when collecting

### Ro-Ro vehicle

- Gross Vehicle Weight – 32,000kg
- Number of axels – 2
- Width – 2500mm truck body / 2650 including mirrors
- Height – 3850mm truck height / 4950 mm full height loading
- Length – 9140mm vehicle length / 20,000mm operating length when collecting

### FEL vehicle

- Gross Vehicle Weight – 32,000kg
- Number of axels – 4
- Width – 2500mm truck body / 2650 including mirrors
- Height – 4500mm truck height / 5500mm full height top loader
- Length – 12000mm

Regardless of collection vehicle or waste containers the following general site requirements need to be considered.

Roads providing access to the building should have foundations and a hard-wearing surface capable of withstanding a fully laden refuse vehicle of 32 tonnes gross vehicle weight (GVW), with a maximum axle weight of 20 tonnes.

Roads should have a minimum width of 5m and arranged so that the collection vehicle can continue mainly in a forward direction.

If turning space is necessary, the road layout should permit a turning circle of 21.5m<sup>24</sup>, kerb to kerb.

Any gates or arches on the vehicle route to the refuse/recycling storage area should give a minimum clearance of 3.72m width and 4.5m height.

There should also be a water supply and a trapped gully to allow for regular cleansing, adequate lighting and sufficient space around to allow safe access by staff to all containers (and any bin compaction units where present).

Surface of the service bay and between the service bay and the building should be rendered with a smooth continuous finish.

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<sup>24</sup> To be confirmed with Kirklees Council highways team and fleet manager

Additional guidance on waste management requirements can be found in in the Kirklees Waste Management Design Guide 2020 (available on the Planning advice notes page at: <https://www.kirklees.gov.uk/beta/planning-applications/guidance-and-advice-notes.aspx>)

Policy context:

1. Scheme design should conform to Building Regulations 2010 part H6; and British Standard 5906:2005 Waste Management in Buildings Code of Practice.
2. Further advice on Highway matters is contained in the Kirklees Highway Design Guide SPD which can be found at <https://www.kirklees.gov.uk/beta/planning-policy/adopted-supplementary-planning-documents.aspx>

# Appendix F

## British Standard BS 5906

Appendix F provides a summary of British Standard BS 5906:2005<sup>25</sup> which sets out a code of practice for methods of storage, collection, segregation for recycling and recovery, and on-site treatment of waste from residential and non-residential buildings.

The requirements of the standard relating to waste storage in multi-occupancy developments are summarised in Table F1 below.

**Table F1: Requirements of BS5906:2005 for the construction and maintenance of multi occupancy waste storage**

Topic	Requirements
<b>Waste storage</b>	<p>Ground floor communal storage facilities, i.e. a residents' bring facility, or management arrangements for transporting waste and recyclable material to a ground floor storage facility are preferred options. If internal management arrangements make provision for collecting waste from each floor, similar provision should be made for recyclable materials, including storage. A concierge system of collecting and taking waste and recyclables down to the storage area is good practice for buildings with three floors and above.</p> <p>In buildings with more than four storeys, communal chutes (see BS 1703) are a recognized option but they do not lend themselves to the segregation of recyclable material, and their maintenance, e.g. repair, cleaning and unblocking, can be problematic. Chutes, if installed, should be spaced at not more than 60 m intervals, on the assumption that an occupier should not be required to carry waste a distance of more than 30 m. The main considerations for all types of facilities should be to maximize the source separation of recyclables and the ease with which people can access the containers, and to minimize the distances travelled to those containers. The local authority should be consulted. Waste storage chambers, detached or as part of the building, should be sited within 30 m (excluding any vertical distance) from each dwelling. They should provide convenient access for the collection of the containers by the collection agent (see Clause 11 dealing with the collection of containers).</p> <p>Considerable fire risks are involved when large quantities of waste or recycled materials are stored. Therefore, waste storage chambers should be situated in readily accessible positions and, where practicable, suitable precautions provided, e.g. sprinklers, fire extinguishers and smoke detection equipment.</p> <p>Underground waste containers used for communal buildings and public open spaces are another option that could be considered. All that is visible to the user is the container top that has a "litter bin" or other appropriate type of chute for users to place recyclables into the containers. The upper surface of the container top should be of a non-slip material. The container is fitted with bottom discharge doors and a specially equipped vehicle is often required to handle the containers.</p>

<sup>25</sup> British Standard BS5906:2005 *Waste Management in Buildings Code of Practice*

Topic	Requirements
<b>Older persons and persons with disabilities</b>	<p>Bin storage needs to be designed with consideration for older persons and persons with disabilities. There is a separate British Standard, BS 8300: 2009 which provides guidelines and advice related to these design issues. It includes details of designing access from households to external waste storage and the requirements for disposing of waste and recyclables.</p> <p>The designer should ensure that waste storage is free from obstructions, consider the reach and force required to open the container, have a firm, slip resistant surface and allow easy manoeuvring of a wheelchair.</p>
<b>Roads and approaches</b>	<p>Roads providing access to households should have appropriate foundations and durable surface that can with stand the gross vehicle weight of the refuse collection vehicle (RCV). According to the BS 5906 “the maximum gross weight used currently is 26 tonnes. Where turning circles are required these should be up to 20.3 metres. The layout of roads should have a maximum width of 5 metres and the distance required to reverse a RCV should not exceed 12 metres.</p>
<b>Collection</b>	<p>The distance collectors should have to cover in respect of transporting waste containers to and from the collection vehicle should be minimized to achieve an economical service.</p> <p>Contents of kerbside recycling boxes should not exceed 15 kg and should comply with the Manual Handling Regulations 1992.</p> <p>The collector should not normally be required to carry individual waste containers (Manual Handling Regulations 1992 and Getting to Grips with Manual Handling), or move two-wheeled containers, for a distance of more than 15 m, nor to manoeuvre four-wheeled waste storage containers from the storage points to collecting vehicles for a distance of more than 10 m. Where bulk containers are used, direct vehicular access to the containers is necessary.</p> <p>The collectors should not be required to move wheeled waste storage containers over surfaces that may hinder the smooth passage of the container. An adjacent storage area designed to not block the pavement should be provided where a large number of households use the same collection point.</p>

Additional requirements of BS5906:2005 relating to communal refuse storage are summarised in Table F2 below.

**Table F2 Requirements of BS5906:2005 for the construction and maintenance of communal bin stores**

Element	Requirements
<b>Walls and roof</b>	<p>Formed of non-combustible, robust, secure and impervious material.</p> <p>Has a fire resistance of one hour when tested in accordance with BS 476-21.</p> <p>Smooth finish suitable for washing down.</p>
<b>Floor</b>	<p>Formed of hard impervious material no less than 100mm thick.</p> <p>Smooth finish suitable for cleansing.</p> <p>No steps or projections at the entrance.</p> <p>Junction of walls and floor coved to prevent damage to walls by containers.</p>

Element	Requirements
	Suitable fall towards drainage point.
<b>Door</b>	<p>Made of steel or have fire resistance of 30 minutes.</p> <p>Door frame made of metal, hardwood or metal-clad softwood.</p> <p>Doorframes rebated into the reveals of the opening and doors hung in such a way that their hinges are not subject to damage by leverage.</p> <p>Door will be capable of being opened from inside as well as outside.</p>
<b>Closing mechanisms</b>	<p><i>Non electronic locking mechanisms</i> - Preferable if room is locked with a universal lock and key system i.e. standard fire brigade mortise lock and key. To be agreed with South Gloucestershire Council.</p> <p><i>Electronic entry systems</i> – Will be capable of being programmed to allow collection at a time period specified by the Council, or operating devices will be made available.</p>
<b>Ventilation</b>	<p>Permanent passive ventilators to give a total ventilation area of not less than 0.2m<sup>2</sup>. Will not be louvered doors.</p> <p>Will be fly and vermin proof and located as near to the ceiling and floor of the chamber as possible, but away from windows of dwellings.</p>
<b>Lighting</b>	<p>Electrical lighting will be provided.</p> <p>Sealed bulkhead fittings for the purpose of cleaning down with hoses.</p> <p>Luminaires will be low energy light fittings or low energy lamp bulbs should be used.</p> <p>Switching will be either proximity detection or on a time delay button to prevent lights being left on.</p>
<b>Concierge</b>	Concierge system of collecting and taking waste and recyclables down to the storage area is good practice for buildings with over three floors
<b>Chutes</b>	In buildings with over four storeys communal chutes are a recognised method, however they cannot be used to segregate recyclable materials. Maintenance such as cleaning can also be problematic. Where chutes are installed they should be spaced not more than 60 m intervals. See BS 1703 for more details.
<b>Cleansing</b>	<p>Arrangements will be made for cleansing of the chamber with water, providing a hose union tap, in agreement with the local water authority and the Environment Agency.</p> <p>Drainage will be by means of a trapped gully connected to the foul sewer.</p> <p>Gullies will be positioned so as not to be in the track of container trolley wheels.</p>
<b>Collection</b>	<p>The distance collectors should have to cover in respect of transporting waste containers to and from the collection vehicle should be minimized to achieve an economical service.</p> <p>Contents of kerbside recycling boxes should not exceed 15 kg and should comply with the Manual Handling Regulations 1992.</p> <p>The collector should not normally be required to carry individual waste containers (Manual Handling Regulations 1992 and Getting</p>

Element	Requirements
	<p>to <i>Grips with Manual Handling</i>), or move two-wheeled containers, for a distance of more than 15 m, nor to manoeuvre four-wheeled waste storage containers from the storage points to collecting vehicles for a distance of more than 10 m. Where bulk containers are used, direct vehicular access to the containers is necessary.</p> <p>The collectors should not be required to move wheeled waste storage containers over surfaces that may hinder the smooth passage of the container. An adjacent storage area designed to not block the pavement should be provided where a large number of households use the same collection point.</p>
<p><b>Older persons and persons with disabilities</b></p>	<p><b>The bin stores will be free from obstructions, have a firm, slip resistant surface and allow easy manoeuvring of a wheelchair. A turning circle of 1,800mm has been provided to allow a wheelchair user to turn and return in the other direction.</b></p>

