

Gartree 2

Waste Management

Strategy

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1 Executive Summary

Gartree 2 is the construction of a new Category B prison on land adjacent to HMP Gartree in Leicestershire. The prison will include the construction of seven houseblocks, kitchen facilities, workshops and ancillary support buildings. A key component to allowing the prison to operate sustainably is the provision of a long-term sustainable waste management system and as such, due consideration has been given and will continue to be given to the waste generated by the buildings during its operation. The prison will aim to support the Ministry of Justice's (MoJ's) operational waste objectives and contribute positively towards Leicestershire's waste minimisation and recycling targets.

This Waste Management Strategy provides recommendations and considerations for the waste generated during the construction and operation of the prison. The Constructor will be responsible for the production of the Construction Environmental Management Plan (CEMP) to cover the construction period to ensure that all wastes are handled appropriately, material use is minimised, and recycling of construction materials maximised. Her Majesty's Prison and Probation Service (HMPPS) or their appointed operator will be responsible for operational waste management. Therefore, the waste strategy has the following aims:

- To contribute towards achieving current and long-term government and MoJ targets for waste minimisation, recycling and reuse;
- To provide convenient, clean, and efficient waste management systems that enhance the operation of the buildings and promote high levels of recycling; and
- To provide operators with reliable waste management solutions that allows them to maximise recycling and reuse.

Gartree 2 is located in southern Leicestershire. Some small existing buildings on the site will be demolished to allow this development to take place. The development will consist of seven houseblocks, a CASU, workshop buildings, catering facilities and several ancillary support buildings.

The estimated total weekly waste arising from the prison development will be approximately 8,979kg of general, 4,613kg of dry recyclables and 1,715kg of food waste. Approximately 43% of the waste generated will be recyclable including glass, metals, plastic containers, card, paper, cartons, and aerosols.

Additional space should be provided for bulky items such as furniture, with a recommended provision of a 7.5m³ skip to store these items prior to collection. Doors with clear openings of at least 1,200mm are recommended to allow manoeuvring of large items in and out of the Waste Management Unit and yard area.

A separate area should be provided for hazardous waste covered by the hazardous waste regulations and waste electrical and electronic equipment (WEEE) directive; this includes items such as fluorescent tubes and computers. Items should be collected and disposed of by a licensed waste collector.

Waste produced in the houseblocks and CASU will be consolidated in the designated waste cage areas where storage will be provided for general waste and co-mingled recyclables. From the cages, the waste will be transferred to the Waste Management Unit, where the generated waste will be sorted. These provisions will ensure that waste is handled in accordance with the Duty of Care regulations.

Co-mingled recyclables will be sorted into various groups, with cardboard, paper, plastic, plastic film and plastic bottles baled, and other recyclables compacted and stored ready for collection. General and co-mingled waste will be sorted and stored in their respective areas. Waste will be transported by road to suitable waste transfer and recycling stations. Access to the waste storage area will be provided in accordance with the building regulations and other best practice guidance.

The waste strategy aims to provide a sustainable and efficient waste collection, storage and disposal plan which follows the principals of the waste hierarchy, ensures that the development is consistent with the national policy framework and contributes positively to the MoJ's and the government's waste minimisation targets.

2 Introduction

2.1 Background

Mace has been commissioned by the MoJ to provide a Waste Management Strategy to support an outline planning application for the building of a new prison. This development will be built on a site which has partially been previously occupied. As a result, for some of the buildings, existing structures or utilities will need to be demolished to allow new prison facilities to be built on the site. The development will comprise:

- Seven new houseblocks to accommodate up to 1,715 prisoners, totalling c. 53,000m² Gross External Area (GEA)
- Supporting development including kitchen, workshop, kennels, entrance resource hub, central services hub, CASU and support buildings totalling c. 30,000m² GEA
- Ancillary development including car parking (c. 523 spaces), internal road layout and perimeter fencing totalling 1,463 linear meters enclosing a secure perimeter area of 11.69 hectares.

2.2 Purpose

This document comprises a Waste Management Strategy for the Gartree 2 prison development and details the infrastructure and management procedures that will ensure the development operates under best environmental practise for the lifespan of the site. The strategy will provide a framework for the Constructor to operate within in order to deliver cost effective, sustainable waste management procedures.

2.3 Scope

The document will present a range of technical information relating to the building design, local and national waste management policy and waste management best practice techniques. The report will detail the waste generation, storage requirements and facilities and the waste handling strategy.

2.4 Structure

This document contains a summary of the legislative framework guiding waste management, a review of the best practice guidance and a prediction of waste generation by the development in the immediate, medium and long term, followed by guidance on the best practicable waste management options for the site during the construction and operational phase.

3 Review of Best Practice Guidance

A range of statutory and best practice guidance has been consulted during the preparation of this waste management strategy.

Best practice guidance consulted during this process has included:

- Building Regulations 2010 Approved Document H;
- The Waste Hierarchy (The Waste Management Plan for England 2013 and the Waste (England and Wales) Regulations 2011);
- BREEAM 2018 UK New Construction;
- BEIS Guidance on production of site waste management plans;
- British standard BS 5906:2005 – Waste management in buildings;
- CIBSE Guide G – Public Health Engineering; and
- Consultation with relevant stakeholders, including the local authority.

The approach suggested for the new prison site considers the requirements of the Building Regulations, local planning policy, and aims to satisfy the best practice guidance as laid down by other sources. This will include providing sufficient space for the storage of waste and recycling, located close to the waste production point and that waste handling and storage is maintained in a hygienic manner.

4 Construction Site Waste Management

The construction of new buildings has the capacity to generate significant quantities of waste. Sources can include demolition materials, unused building materials and packaging, along with the general waste associated with day-to-day activities. It is recommended that in order to minimise the impacts of these waste streams, that the contractor produces a Resource Management Plan (RMP) for the site in accordance with BREEAM 2018. This should include provision for on-site storage and separation of recyclable materials, provide safe handling and storage practices for hazardous waste and aim to minimise the amount of waste produced.

4.1 Site Clearance and Excavations

Waste produced during the site demolition and clearance should be handled in accordance with the Waste (England and Wales) Regulations 2011 and should undergo appropriate testing prior to disposal to ensure compliance with the Landfill Regulations and Hazardous Waste Regulations.

Prior to demolition, it is highly recommended that an audit of existing buildings is conducted to identify materials that can be salvaged and reused/ recycled. This will both reduce waste production and materials consumption for production of new materials, but also potentially reduce the cost of the project by identifying marketable materials that can be sold.

The audit should, where possible, attempt to identify the major construction materials used in the existing buildings, in particular concrete to determine whether the concrete would have any value use as a secondary aggregate. The audit should also be used to identify those features that can be salvaged for immediate reuse.

Consideration should be given to whether demolition materials can be reused on site. Depending on the final construction programme and site space constraints, it may be possible to crush demolition waste on site for use as secondary aggregate, piling mat or sub-base. If this is not possible, it is recommended the appointed demolition contractor determines whether there are other local sites that could make use of the demolition waste to reduce the requirement for vehicles to transport materials to waste transfer sites.

4.2 Construction Waste

The Constructor should ensure that all waste produced during the construction of the of the MoJ Gartree 2 prison project, such as timber, steel and packaging, hazardous wastes such as lubricating and hydraulic oils are stored and disposed of in accordance with the Waste (England and Wales) Regulations 2011 and subsequent ancillary regulations. Wastes should only be transferred to appropriately licensed waste transfer stations via licensed waste carriers with fully completed waste transfer notes. The Project Environmental Manager and Construction Site Manager will be responsible for ensuring these requirements are met.

It is expected that the Principal Contractor will, where possible, engage with take back and re-use schemes such as the returning of Gypsum plasterboard offcuts for processing into new plasterboard, the use of Community Wood Recycling for waste wood on site and Protec takeback or recycling schemes.

Full details of waste production and management techniques relevant to the Construction Environmental Management Plan (CEMP) and Resource Management Plan (RMP) will be submitted to

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the planning authority prior to the development commencing. It is recommended that emissions controls, such as the dust suppression on potentially contaminated soils and storage of waste oils is covered in detail in the CEMP and be in line with legal and best practice obligations.

The adoption of these procedures will ensure that best practice standards of the Leicestershire's Validation Requirements for Planning Applications will be met for Recycling and Waste.

Reducing and recycling materials produced during demolition of buildings can lead to significant environmental and financial benefits. Crushing and reusing concrete as secondary aggregate, reusing bricks and timber and refurbishing existing building facades can reduce the requirement for 'clean' aggregate and significantly decrease the number of vehicle movements required to remove waste and bring in new materials. Planning authorities are increasingly requiring the re-use of materials as a requirement of new developments. BREEAM also reward the recycling and re-use of building materials. It is recommended that the Gartree 2 project makes use of recycled and re-used materials wherever practicable. In addition, it is recommended that the contractor set waste production targets in line with current best practice KPIs as set by BREEAM.

Planning guidance requires that the development considers the sustainable use of materials, minimises waste and encourages re-use and recycling of materials. Therefore, it is recommended that the guidelines produced by BIS and BREEAM 2018 are followed.

Indicative waste prediction figures based on Mace data and the BRE's database of similar historic projects is shown in Table 1. It predicts that the total construction waste generated will be approximately 14,812m³ which is equivalent to approximately 1,614no. 12-yard skips. Diversion from landfill rate is influenced by the chosen waste management contractor but the construction phase is expected to divert 95% (tonnes) from landfill and 98% (tonnes) diversion from landfill including the earthworks phase.

Table 1: Construction Waste Forecast

Type of Waste	Waste management route (%)				Forecast (m ³)
	Reuse	Recycle	Recover	Landfill	
Bricks	10%	90%	0%	0%	740.6
Tiles and Ceramics	0%	100%	0%	0%	740.6
Concrete	0%	100%	0%	0%	1,629.3
Inert	20%	20%	55%	5%	2,369.9
Insulation materials (non-hazardous)	0%	0%	80%	20%	296.2
Metals	0%	0%	100%	0%	1,481.2
Packaging materials	0%	40%	60%	0%	1,481.2
Plasterboard / Gypsum	50%	50%	0%	0%	1,481.2
Binders	0%	40%	55%	5%	148.1
Plastic (excluding packaging waste)	0%	10%	85%	5%	740.6
Timber	35%	45%	20%	0%	2,221.8
Floor coverings (soft)	0%	0%	90%	10%	0.0
Electrical and electronic equipment (non-hazardous)	0%	0%	100%	0%	148.1
Furniture	0%	100%	0%	0%	0.0
Canteen/Office/Adhoc waste	0%	95%	0%	5%	740.6
Liquids	0%	0%	95%	5%	148.1

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Oils	0%	0%	95%	5%	0.0
Bituminous mixtures (non-hazardous e.g. asphalt)	0%	0%	95%	5%	296.2
Hazardous waste	0%	0%	95%	5%	148.1
Mixed construction and/or demolition waste	0%	98%	0%	2%	0.0
TOTAL	-	-	-	-	14,812

5 Operational Waste Management

5.1 Outline Development Proposals

The Gartree 2 project development is a new prison development which will provide 1,715 Category B prison places. The development is a combination of c. 83,000 m² of houseblocks and supporting development including kitchen, workshops, kennels, entrance resource hub, central services hub and support building.

5.2 Houseblock and Kitchen Waste Predictions

Waste from the new prison development will be collected in individual buildings then transferred to a central workshop for sorting. Table 2 below suggests capacity guidelines for waste storage based on the number of prisoners and the type of waste produced.

Table 2: Houseblock and Kitchen Waste Predictions

Building type	Number of Prisoners	Type of waste	Amount of waste produced
Houseblocks & CASU	1,715	General Waste	Total waste is estimated to be 707 tonnes per year (Approximately 412kg per prisoner per year). Leicestershire target 65% diversion from landfill by 2030 and as such it is estimated this development will send an estimated 247 tonnes of waste to landfill per year.
Houseblocks & CASU	1,715	Mixed recyclables and re-use	From existing prison data, it is expected that on average residents will produce 0.14 tonnes of recyclable waste annually. Consequently, it is estimated that 240 tonnes of recyclable waste will be produced each year.
Kitchen	N/A	Food waste	Estimated to be 1kg per resident per week. This is approximately 245kg per day for the whole development.

5.3 Inflationary Waste Predictions from MoJ New Prisons Programme

Inflationary waste growth predictions have not been applied to the waste production estimates for this project. Estimates of waste inflation vary widely. Given the population of the building is unlikely to alter dramatically over its lifetime, and improvements in waste management behaviour that are already occurring across the country, it is likely that the current refuse generation represents a worst case, with

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long-term improvements in waste and recycling performance likely to reduce the volume of waste produced significantly.

5.4 Waste Management Unit Storage, Segregation and Collection

The Waste Management Unit (WMU) is one of the ancillary buildings on the site that provides facilities for the separation, recycling and disposal of solid waste streams generated across the site. It provides a central location for the collection of unseparated waste and sorting into general waste and recyclable materials. It requires good access from the entrance gate for waste processing contractors who will make regular visits. Vehicle movements should also be kept to a minimum to reduce the impact on the local area.

The unit will comprise a workshop where sorting, baling, compaction, and storage of waste takes place and a yard area where skips for the separated solid waste streams are stored prior to removal by waste processors. The building would need to consist of a large workshop, an office area, a prisoner changing and storage area for work wear, a storage area for materials/confidential waste a classroom/prisoner tearoom and storage area for recyclables.

The WMU would be managed by two staff. The sizing of the waste storage facilities are based off data from HMP Five Wells and HMP Berwyn, with some adjustments made based off lessons learnt during the process.

Provision shall be made for the following equipment in the workshop:

- 1 Food Waste Dryer with capacity of at least 735kg. This is to process food waste primarily from kitchen, houseblocks and CASU into a dry inert material that can be used for composting on site or off-site processing. As this will not be run over the weekend or on bank holidays, there must be storage for at least three days' worth of food waste.
- 2 Sorting Tables for separating of solid waste. These tables will be manufactured in stainless steel by Prison Industries who will supply drawing and dimensions. There will be space for approximately six residents per table.
- 1 Mill Sized Baler to bale cardboard, paper, plastic, plastic film and plastic bottles. The storage area is required to have space for at least 20 bales.
- 1 Confidential Waste Shredder.
- 1 Bag Compactor.
- 1 Can Crusher (Manual) suitable for both small and large catering size cans.
- 1 Washing Machine for cleaning recycled prison clothing that is distributed back to the stores for reissue.
- 1 Tumble Dryer for drying recycled prison clothing that is distributed back to the stores for reissue.
- 1 wire stripping machine for stripping cables to extract the bright wire.
- 1 small Biodiesel machine- to turn cooking oil into biodiesel that can be used by the WMU to run tractors and ride on mowers.
- 1 electronic platform scales for weighing up to 100kg.
- Storage for rags in bags or bins.

Provision shall be made for the following in the yard area:

- 1 Metal waste skip (7.5m³). This may need to be enclosed.
- 1 General Waste Compactor.
- 1 Wood waste skip (7.5m³). This may need to be enclosed.
- 1 Construction waste skip (7.5m³)
- 1 Bulky waste skip (7.5m³)
- 10 WEEE skips with approximate dimensions 2m high x 1m wide x 1m deep.
- 1 Clinical Waste Skip. This should be close to healthcare areas but would require a secure location.

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- Cooking oil banded storage for bio-diesel production for land-based activities vehicles and equipment i.e., tractors, mowers etc.

Doors with clear openings of at least 1,200mm are recommended to allow manoeuvring of large items in and out of the WMU.

5.5 Houseblock and CASU Waste Storage, Segregation and Collection

A waste cage shall be provided externally to each houseblock and workshop. The cage will have approximate dimensions of 4m wide x 4m deep x 2m high; the cage will be fully enclosed with a lockable gate. The cage may be sub-divided to segregate particular waste streams, but this is to be confirmed. Prison Industries can fabricate and supply the cages and will provide drawings.

Houseblock residents shall deposit waste in the cage for collection by the waste detail. Waste will be collected by residents detailed to the WMU. There shall be two collections per day, five days per week (no collections at weekends or bank holidays) from the houseblock cages to the WMU. The vehicle for waste collection shall be a tractor and caged trailer or a flatbed van with cage.

5.6 Workshop Waste Predictions, Segregation, Storage and Collection

Workshop waste must be collected separately to the houseblock and kitchen waste. Waste streams generated by light and heavy industries will be dealt with by the individual workshop operators who shall be responsible for providing a waste management strategy for their operations as part of their contract. Provision for an area near the workshops will need to be made from waste streams created by such workshops which will be separate to the WMU.

Different types of workshops will produce different amounts of waste. As a result, the amount of waste storage required will be dependent on the type of workshops on site. The decision of what is manufactured on site is related to the resources and demand in the local area, and the specific products and processes will be defined and implemented by the prison operator. As a result, the amount of waste produced is difficult to estimate at this stage. Table 3 outlines the approximate waste provision which will be required for various workshop types.

Table 3: Waste Produced by Different Workshop Types

Workshop Type	Waste Provision Required
Textiles	Bins and/or covered skips should be provided in the workshop waste cage for the collection of scrap textiles materials. The collected scrap textiles will be sold for re-use.
Print industry	All waste produced will be recyclable. No specialist sorting will be required, and as such the WMU could process any waste produced. Bins and/or covered skips should be provided in the workshop waste cage to store this material.
Woodwork/Timber	Skips should be provided for the collection of any offcuts and waste produced in the workshop. If the wood is untreated, it may be used as biomass for energy production. Treated and untreated wood should be segregated and collected in separate bins.
Plastics	All plastic material will be recycled. Any plastic offcuts will be collected and recycled to be melted down and used in the creation of new products. A bin and/or covered skip will be required in the workshop waste cage for collection of these materials.
Other types	In all other workshop types, materials should be segregated based on type. In particular, metals and any other materials which can be reused or sold should be collected separately and care taken to reduce the chance of mixing.

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The prison operator is to ensure waste storage provision is sized appropriately for the workshop type present onsite.

6 Summary

In summary, this Waste Management Strategy has outlined an approach for the Gartree 2 development to manage waste in an environmentally conscious manner throughout the construction and operational phase, whilst meeting all relevant best practice guidance from the Government, MoJ, Leicestershire County Council and BREEAM.

The waste strategy dictates that during the construction phase a Resource Management Plan (RMP) will be prepared by the Principal Contractor and form part of the CEMP. The strategy outlines an indicative forecast for the construction phase and suggests a diversion from landfill rate of 95% (tonnes) could be achieved and 98% (tonnes) diversion from landfill including the earthworks phase.

During the operation of the development, it is thought that the most practicable and efficient manner of waste collection is through the residents manually carrying waste to external cage storage areas where a tractor with caged trailer or a flatbed truck will collect the waste twice a day and deliver it to the WMU for sorting.

It is thought that these measures will help fulfil all the development BREEAM waste targets whilst meeting the MoJ's, the Government's and Leicestershire County Council's best practice guidance.