CHAPTER 16: WASTE

Introduction

16.1 This chapter assesses the impact of the proposed development on waste. In particular, it considers the potential effects of from earthworks, construction materials and household[1] and commercial waste generated by future users.

16.2 For the purpose of this assessment, 'waste' is defined as:

> '*any substance or object the owner discards, intends or is required to discard.*'

16.3 This definition is as specified under the Waste Framework Directive (European Directive 2006/12/EC), as amended by Directive 2008/98/EC, which came into force in December 2010.[i]

16.4 The chapter describes the methods used to assess the impacts, the baseline conditions currently existing at the site and surroundings, the potential direct and indirect impacts of the development arising from waste, the mitigation measures required to prevent, reduce, or offset the impacts and the residual impacts. It has been written by WSP | Parsons Brinckerhoff.

Planning Policy Context

National Planning Policy

National Planning Policy Framework[ii]

16.5 The National Planning Policy Framework (NPPF) is a key part of the reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. There is an overarching presumption in favour of sustainable development that should be the basis of every plan and every decision.

16.6 The NPPF does not, however, provide specific guidance on planning policy for the development of waste facilities and states that:

> '*This Framework does not contain specific waste policies, since national waste planning policy will be published as part of the National Waste Prevention Plan for England. However, local authorities preparing waste plans and taking decisions on waste applications should have regard to policies in this Framework so far as relevant.*'

16.7 Further guidance is included in the Waste Management Plan for England which superseded Waste Strategy for England 2007, details of which are provided below.

[1] Though the waste from the holiday lodges would be defined as 'commercial waste', the composition of waste would be similar to that of household waste from residences; generation rates have therefore been based on local household waste benchmarks.

National Planning Policy for Waste (2014)[iii] [iii]

16.8 The National Planning Policy for Waste replaces 'Planning Policy Statement 10: Planning for Sustainable Waste Management' (PPS 10) and is to be considered alongside other national planning policy for England - such as in the NPPF and the Waste Management Plan for England. As its primary focus is on planning for waste management facilities, it is not considered relevant to the proposed development.

Waste Management Plan for England (2013)[iv]

16.9 The Waste Management Plan for England provides an analysis of the waste management situation in England and fulfils the mandatory requirements of Article 28 of the revised Waste Framework Directive. This requires that Member States ensure that their competent authorities establish one or more waste management plans covering all of their territory.

16.10 The Plan does not introduce new policies or change the landscape of how waste is managed in England. Its core aim is to bring current waste management policies under the umbrella of one national plan. It supersedes the Waste Strategy for England 2007.

16.11 The UK is committed to meeting its target under the Waste Framework Directive of recovering at least 70% by weight, of construction and demolition waste by 2020. England and the UK are already achieving an estimated 93% recovery rate of construction and demolition waste. The mitigation measures implemented for the proposed development by the Principal Contractor will have to keep this commitment in mind.

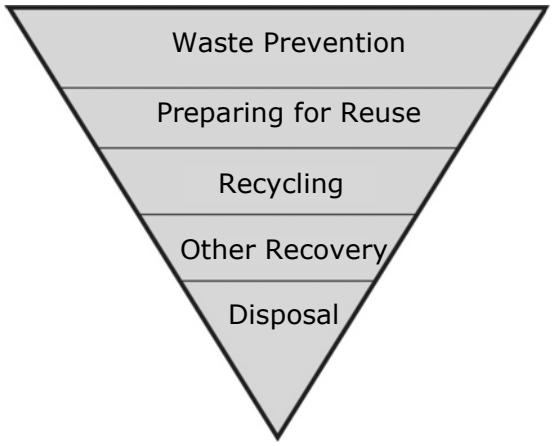
Waste Hierarchy

16.12 In 1975, The EU's Waste Framework Directive introduced for the first time the waste hierarchy concept into European waste policy. It emphasised the importance of waste minimisation, and the protection of the environment and human health, as a priority. Following the 1975 Directive, EU policy and legislation adapted to the principles of the waste hierarchy.

16.13 In 1989, it was formalised into a hierarchy of management options in the European Commission's Community Strategy for Waste Management and this waste strategy was further endorsed in the Commission's review in 1996.

16.14 In 2008, the EU Parliament introduced a new five-step waste hierarchy to its waste legislation, which Member States must introduce into national waste management laws, as shown in **Figure 16.1**.

Figure 16.1: The Waste Hierarchy



Source: Directive 2008/98/EC

16.15 The main principles of the Waste Hierarchy are:

- Waste should be prevented or reduced at source as far as possible;
- Where waste cannot be prevented, waste materials or products should be reused directly or refurbished and then reused;
- Waste materials should be recycled or reprocessed into a form that allows them to be reclaimed as a secondary raw material;
- Where useful secondary materials cannot be reclaimed, the energy content of the waste should be recovered and used as a substitute for non-renewable energy resources; and
- Only if waste cannot be prevented, reclaimed or recovered, should it be disposed of into the environment and this should only be undertaken in a controlled manner.

16.16 The Waste Hierarchy has been implemented in England and Wales by the Waste (England and Wales) Regulations 2011 (as amended). These regulations require that an establishment or undertaking that imports, produces, collects, transports, recovers or disposes of waste must take reasonable steps to apply the Waste Hierarchy when waste is transferred or disposed of. A departure from the priority order is only permitted where this is justified by lifecycle thinking on the overall effect of generation or management of waste.

Local Planning Policy

Staffordshire Moorlands Core Strategy[v]

16.17 The Core Strategy is the key LDF document and a strategic District-wide plan which influences how and where Staffordshire Moorlands will develop in the future. It contains all of the policies required to control development.

16.18 With regard to waste, the following extract from the Core Strategy is considered to be of relevance to the proposed development.

SD1 - Sustainable Use of Resources

The Council will require all development to make sustainable use of resources, and adapt to climate change. This will be achieved by:

…

5. The Council will expect that all developers investigate the potential for re-using construction or construction waste materials, especially those sourced locally (which can include those minerals available on site, as appropriate) and integrates where possible on-site waste management facilities.

Churnet Valley Masterplan Supplementary Planning Document[vi]

16.19 The Churnet Valley Masterplan SPD guides the detailed planning and management of the Churnet Valley area.

16.20 The following extract from the SPD is considered to be of relevance to the proposed development from a sustainable construction perspective.

'8.6 Green Initiatives

The use of sustainable construction methods and materials shall be encouraged that will blend into the landscape in order that development has a minimal impact on its surroundings.'

Approach

Assessment Methodology

Scope of the Assessment

16.21 This section provides the scope of the assessment and re-iterates the evidence base for insignificant effects.

Extent of the Study Area

16.22 The study area for the assessment has considered the proposed development footprint, the area of Staffordshire and the wider area of the West Midlands region (i.e. where it is anticipated the treatment and/or disposal of the majority of waste from the proposed development would take place). For the purposes of this assessment, the West Midlands region consists of Birmingham and Wolverhampton, together with the predominantly rural counties of Herefordshire, Shropshire, Staffordshire, Warwickshire and Worcestershire.

Method of Baseline Data Collation

Desk Study

16.23 In order to determine the baseline scenario with regards to current waste arisings, waste collection schemes, waste management facilities and disposal arrangements, a desk-top study has been undertaken using the following sources of information, in addition to the policy documents discussed in the previous section of this Chapter:

- Building Research Establishment (BRE) Waste Benchmarking Data (2012);

- Survey of Arisings and Use of Alternatives of Primary Aggregates in England, 2005: Construction, Demolition and Excavation Waste (2005);
- Waste Management Plan for England (2013); and
- British Standards Institution BS5906:2005 Waste management in buildings - Code of practice (2005).

16.24 The estimated quantities of waste that will be generated from the construction and operation of the proposed development have been primarily calculated through the use of applicable benchmarking data. In the case of construction waste, the BRE data enables waste from specific development project types (i.e. residential, education, retail) to be calculated. With regard to household and commercial waste, SMDC waste statistics collated by Defra and BS5906:2005 are used respectively.

Significance Criteria

16.25 The assessment of potential effects as a result of the proposed development has taken into account the construction and operational phases. The significance level attributed to each effect has been assessed based on the magnitude of change due to the proposed development and the sensitivity of the affected receptor/receiving environment to change (how significant the volume of waste requiring management is estimated to be and the presence of suitable local waste treatment and disposal facilities), as well as a number of other factors that are outlined in more detail in Chapter 2 - Approach to EIA.

16.26 The current capacity of waste treatment and disposal facilities is commercially sensitive information and therefore not publicly available on the Environment Agency's registers. The magnitude of change from the proposed development is dependent on the extent of the effect, and would take into account the volumes of waste arisings generated, the nature of the material, (e.g. whether it is hazardous, non-hazardous or inert), the ease of handling and the implications for treatment and disposal (e.g. whether facilities are easily available or whether treatment or disposal capacity is restricted).

16.27 The magnitude of change has therefore been established from WSP | Parsons Brinckerhoff's professional judgement on waste facilities' likely ability to manage the volumes of waste expected over the duration of the construction phase. This, together with the sensitivity of the affected receptor/receiving environment are both assessed on a scale of high, medium, low and negligible (as shown in Chapter 2 - Approach to EIA).

Effect Significance

16.28 No standard criteria exist for assessing the significance of the potential effects that may arise from the generation of waste from new development. Therefore, criteria have been derived for this assessment based on the guidelines in PPS10[iii] and local policy relating to waste management. The assessment criteria are based on several factors, including:

- The ability to treat the waste generated by the proposed development, which is determined by its physical and chemical characteristics, (i.e. whether the waste can be easily treated with minimal residual waste, such as recycled waste, or whether the waste requires a specialised treatment with potentially hazardous residual waste);

- The availability of suitable facilities within the study area to treat the waste generated;
- Compatibility of the Best Available Technique for the waste within the context of the Waste Hierarchy, i.e. whether generation of the waste can be minimised, the waste can be recycled, landfilled etc.; and
- Potential environmental effects associated with the waste e.g. if it is hazardous etc.

16.29 The following terms have been used to define the significance of the effects identified:

- **Major effect**: where the proposed development could be expected to have a very significant effect (either beneficial or adverse) on the capacity of the local waste treatment and disposal facilities;
- **Moderate effect**: where the proposed development could be expected to have a noticeable effect (either beneficial or adverse) on the capacity of the local waste treatment and disposal facilities;
- **Minor effect**: where the proposed development could be expected to result in a small, barely noticeable effect (either beneficial or adverse) on the capacity of the local waste treatment and disposal facilities; and
- **Negligible**: where the proposed development will have no discernible effect on the capacity of the local waste treatment and disposal facilities.

Assumptions/Limitations

16.30 The waste management facilities which will treat and/or dispose of waste from the proposed development have not yet been determined. Therefore, it has not been possible to assess with a degree of certainty how these facilities would be potentially affected by the proposed development. Moreover, information pertaining to the capacities of waste management facilities is commercially sensitive and not publicly available for review.

16.31 During the construction phase of the proposed development, it will be important for contractors to regularly review waste generation estimates, taking into account any changes in legislation, the available waste management facilities' capacity and any advancement in waste treatment technologies.

Baseline Conditions

16.32 Current waste arisings at the Site are anticipated to comprise minor volumes of agricultural waste associated with the existing land uses and management regime. No data is publicly available regarding existing waste generation and its management.

Current Waste Management Arrangements

Construction Waste

16.33 Table 16.1 summarises the methods used for the treatment and disposal of inert Construction, Demolition and Excavation (CD&E) waste in the West Midlands region and England as a whole (as a comparator). A 2005 survey[vii] commissioned by the Department for Communities and Local Government (DCLG) provides the most recent and comprehensive nationwide dataset currently available and offers an

indicative assessment of methods used to manage inert CD&E waste within the region.

Table 16.1: Management of inert CD&E waste in the West Midlands region and England as a whole

Waste Management Method	West Midlands (million tonnes)	England (million tonnes)
Recycled aggregate and soil	4.92 (50.0%)	46.4 (51.8%)
Spread on registered exempt sites*	2.91 (30.0%)	15.4 (17.2%)
Waste entering licensed landfills (total for engineering, capping and disposal):	2.01 (20.0%)	27.7 (30.9%)
Landfill engineering	*0.47 (4.8%)*	*4.2 (4.7%)*
Landfill capping	*0.36 (3.7%)*	*5.4 (6.0%)*
Landfill disposal	*1.18 (12.0%)*	*18.1 (20.2%)*
Total managed	**9.8 (100.0%)**	**89.6 (100.0%)**

Source: The Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005
Note: Figures have been rounded.
* Sites which are notified by the site operator as being exempt from environmental permitting (though not exempt from waste regulation) and where this exemption has been placed on the public register by the Environment Agency.

16.34 The proportion of inert CD&E waste in the West Midlands being used as recycled aggregate and soil was slightly lower than the England average. The proportion of inert CD&E waste being utilised on registered exempt sites is significantly higher in the West Midlands. A lower proportion of inert CD&E waste in the West Midlands is entering licensed landfills, with the majority of this material being sent for landfill disposal.

16.35 The regional estimate indicates that approximately 88% of inert CD&E waste was reused or recycled in 2005 (this figure has been derived from all the waste management methods not including 'Landfill disposal'). Therefore considerable opportunity exists during the construction phase of the proposed development for the reuse / recycling of these materials. Such an approach will be dependent on the quality and presence of any contamination of the material.

16.36 Regarding non-inert CD&E waste, such as wood and plastics, the 2007 Waste and Resources Action Programme (WRAP) report[viii], stated that:

> '*…the annual tonnage of non-inert C&D waste arising in Britain probably lies about half way between two contrasting pre-existing estimates (of 7.5 million and 22 million tonnes per year).'*

16.37 This supports the view that definitive figures to accurately quantify non-inert CD&E waste arisings are not currently known.

16.38 Based on current working methods, a significant opportunity exists for segregating non-inert CD&E waste streams for reuse/recycling at the Site.

Household Waste

16.39 Table 16.2 outlines the household waste figures and percentage of waste recycled/composted for SMDC, in comparison to England, between 2010-11 and 2014-15.

Table 16.2: Household waste figures for SMDC, in comparison to England average

Period	Household waste	
	Recycled / composted in SMDC	Average recycled / composted in England
2014-15	55.2%	44.8%
2013-14	50.8%	43.5%
2012-13	54.0%	43.2%
2011-12	58.9%	43.0%
2010-11	60.0%	41.5%

16.40 According to the data, from 2010-11 until 2013-14 Staffordshire Moorlands' recycling rate decreased by a total of almost 8%, but it remained significantly higher than the England average. This decrease in performance was due to increasing levels of contaminated recycling bins and a change in guidance which prevented the composting of street sweepings.[ix] The recycling rate subsequently increased by 4.4% in 2014-15 after a campaign to improve contamination levels.

16.41 Table 16.3 outlines how the average household waste generation rate per residential unit was established using SMDC waste data for 2014-15.

Table 16.3: Average household waste generation for Staffordshire Moorlands

Total household waste generated within Staffordshire Moorlands in 2014-15 (tonnes) [x]	38,204
Total number of households within SMDC boundary[xi]	42,949
Estimated mean waste generation per household per annum (tonnes)	0.89

16.42 The average household waste generation rate per residential unit per annum was therefore 0.89 tonnes in 2014-15.

16.43 Table 16.4 outlines the waste services that SMDC currently provides within the district that would be applicable to the proposed development.

Table 16.4: Waste management services provided by SMDC

Recycling centres	29 locations across the district (glass, paper, cans, textiles and plastic bottles)
Household Recycling Centres	Operated by SCC (distance from proposed development): ■ Cheadle Recycling Centre (3.7 miles) ■ Uttoxeter Recycling Centre (7.8 miles) ■ Leek Recycling Centre (8.1 miles)
Commercial waste	Chargeable collection service (no recycling provided)

Commercial Waste

16.44 The national survey of commercial waste arisings, published by Defra in December 2010, represents the most up to date and comprehensive dataset.

16.45 According to the survey, the West Midlands region generated 5.25 million tonnes of commercial (and industrial) waste in 2009. The primary waste management methods used were recycling and land disposal.

Potential Impacts

Construction

16.46 The intention will be to reuse as much clean excavated material onsite as possible, however the volume of material that will require removal from the Site is still expected to be significant.

16.47 Calculations of excavated material generation from the proposed development have not yet been undertaken, therefore, it is not possible to generate a quantitative assessment of the effects of waste from earthworks at this stage.

16.48 The BRE has developed indicators to aid in the calculation of construction waste arisings at the design stage of a variety of development types. These indicators do not include demolition, excavation or groundworks waste, however. The Environmental Performance Indicators (EPIs) measure the tonnes of construction waste per 100m^2 of Gross Internal Area (GIA) floorspace. These are outlined in Table 16.5.

Table 16.5: BRE waste benchmarks for new build construction

Project Type	Average tonnes / 100m^2
Residential	16.8
Public Buildings	22.4
Leisure	21.6
Industrial Buildings	12.6
Healthcare	12.0
Education	23.3
Commercial Offices	23.8
Commercial Retail	27.5
Commercial Other	7.0

16.49 The indicators applicable to the Development have been used to measure construction waste generation and relate to rates where no minimisation, reuse or recycling of materials has taken place. This will provide the baseline figure against which a reduction in waste arisings would then be planned.

16.50 Table 16.6 shows the estimated construction waste arisings for the proposed development's indoor facilities, based on the indicative floor areas of the buildings and the relevant EPI from the BRE. The multi-sports area, equipped play area and woodland activity area have been excluded as there are no available benchmarks for construction waste from outdoor facilities.

Table 16.6: Estimated construction waste arisings

Description	Number of units	Indicative average GIA (sqm)	Indicative total GIA (sqm)	Tonnes/ 100m² GIA (BRE)	Construction waste arisings (tonnes)**
Holiday lodges	Up to 250	72	18,000	1.68*	302
Leisure hub building	1	-	Up to 2,115	21.6	457
Lake café	1	-	Up to 130	27.5	36
Visitor centre	1	-	Up to 490	21.6	106
Archery centre	1	-	Up to 260	21.6	56
Administration building †	1	-	525	-	0
Maintenance depot	1	-	Up to 500	7.0	35
Substation †	1	-	600	-	0
Water sports centre	1	-	Up to 500	21.6	108
		Total	**Up to 23,120**	**-**	**1,100**

* The lodges are prefabricated and will be brought to site whole and placed on to a concrete (or similar) base. As a worst case scenario the construction waste arisings have therefore been calculated at 10% of the level if they were constructed on site.
** Figures have been rounded.
† Existing buildings, so no construction waste will be generated.

16.51 It is estimated that approximately 1,100 tonnes of construction waste will be generated from the proposed development. Over the duration of the construction works (expected to be approximately three years from 2017 to 2019), this equates to an average of approximately 367 tonnes per year, although this is likely to vary significantly according to the construction programme and phasing.

16.52 The information based in Table 16.6 above is based on standard waste management practices in the UK and the estimated volumes identified have significant potential to be reduced through best practice on-site waste minimisation and management. The estimated waste arisings data can be used as an indicator for measuring and monitoring waste generated. This will enable the setting of realistic and attainable waste minimisation and management targets.

16.53 From the assessment criteria outlined previously, the predominance of treatment (e.g. segregation of recyclable materials) of significant quantities of construction waste on-site (for both environmental and economic reasons), is operated on the vast majority of sites in the UK, thus reducing the need to send waste to landfill. Adherence to the Waste Hierarchy by reusing and/or recycling waste materials will reduce the significance of the effect. It is likely that the key waste streams generated by the construction phase of the proposed development that have the potential to be reused/recycled will predominantly comprise soils, concrete, bricks, metal, glass, plastic and timber.

16.54 Based on WSP | Parsons Brinckerhoff's professional judgement and working knowledge of waste management from construction projects of this scale elsewhere in the UK, the sensitivity of the waste management infrastructure is anticipated to be medium and the magnitude of effect, prior to mitigation is low.

16.55 This is anticipated to introduce a direct, temporary long-term effect on waste management infrastructure of **minor adverse** significance at the regional level prior to the implementation of mitigation measures.

Completed Development

16.56 The *Controlled Waste (England and Wales) Regulations 2012* states that holiday lets are businesses and should pay for a commercial waste service, including collection and disposal charges. Though the waste is defined as commercial, its composition would be similar to that of household waste from residences.

16.57 The calculation of operational waste generation has been estimated using SMDC waste statistics. The figure can only be considered indicative as a variety of factors, such as the on-going national and local promotion of waste minimisation and recycling and consumer habits, will affect waste generation rates in future years.

16.58 The average household waste generation rate calculated in Table 16.3 above was used as a starting point to provide an estimate of the waste arisings from the future holidaymakers of the proposed development. Similarly, the estimated waste generation from the non-residential elements of the proposed development, which are based on floor areas and appropriate benchmarks from British Standard *BS5906:2005 Waste management in buildings - Code of practice* unless otherwise stated are also outlined in Table 16.7.

Table 16.7: Estimated operational waste arisings

Description	Indicative GIA (m^2)	Weekly waste arising (t)*	Annual waste arising (t)*	Comments on waste calculations - methodology and assumptions
Holiday lodges (x 250)	-	2.2	113	50% of the estimated mean waste generation per household per annum for SMDC (0.89 tonnes) i.e. 0.45 tonnes per holiday lodge per year. The rational being no garden waste generation and occupancy levels would be lower than residential units.
Leisure hub building	Up to 2,115	1.0	52	Volume per m^2 of floor area [10 litres] x floor area
Lake café	Up to 130	0.3	17	Volume per m^2 of sales area [75 litres] x sales area. Sales area assumed to be 75% of floor area.
Visitor centre	Up to 490	0.1	6	Volume per m^2 of floor area [5 litres] x floor area
Archery centre	Up to 260	0.06	3.1	Volume per m^2 of floor area [5 litres] x floor area
Administration building	525	0.1	4.6	Volume arising per employee [50 l] x number of employees. Assumed 10m^2 per employee and useable space to be 75% of floor area
Maintenance depot	Up to 500	0.2	8	Volume per m^2 of floor area [5 litres] x floor area
Water sports centre	Up to 500	0.1	6	Volume per m^2 of floor area [5 litres] x floor area
Total		**4.1**	**210**	**-**

* Figures have been rounded.

16.59 The proposed development could therefore potentially generate 210 tonnes of commercial waste per annum (approximately 4.1 tonnes per week), assuming that the maximum gross floorspace will be constructed. Please note that these figures should be considered as indicative as the application is at the outline stage and so to determine the worst case effect, maximum numbers have been considered.

16.60 The outdoor multi-sports area, equipped play area and woodland activity area would also generate waste from the activities, but these volumes are expected to be negligible.

16.61 Based on the above estimation of operational commercial waste arisings, it has been considered that the proposed development could be expected to have a noticeable effect on the quantity of waste generated. There is likely to be a direct, permanent, long-term effect on waste management infrastructure of **minor adverse** significance at the district level prior to the implementation of mitigation measures.

Mitigation Measures

Construction

16.62 The consideration of a programme of realistic waste management targets and subsequent monitoring arrangements at an early stage during the construction phase will assist in reducing the amount of waste disposed off-site.

16.63 Implementation of good practice measures in terms of on-site storage will assist in reducing unnecessary wastage of material and ensure that high standards are maintained throughout the development process.

16.64 Best practice measures and recommendations for the minimisation and management of waste will be incorporated into a Construction Environmental Management Plan (CEMP), and provided to SMDC prior to commencement of works on-site.

16.65 To ensure that the system of waste minimisation, reuse and recycling is effective, consideration will be given to the setting of on-site waste targets for the Development and a suitable programme of monitoring at regular intervals to focus upon:

- Quantifying raw material wastage;
- Quantifying the generation of each waste stream
- Any improvements in any working practices
- Methods by which the waste streams are being handled and stored; and
- The available waste disposal routes used, e.g. landfill, waste transfer stations

16.66 The Principal Contractor will be responsible for the setting and review of waste targets from the outset to ensure that high standards are maintained with the emphasis being on continual improvement.

16.67 Specific waste quantification and monitoring will assist in determining the success of waste management initiatives employed and progress against these targets should be relayed back to the Project Team.

16.68 All construction works will be undertaken in accordance with the Considerate Constructors Scheme. This is a national initiative set up by the construction industry. Sites that register with the Scheme sign up to and are monitored against a Code of Considerate Practice designed to encourage best practice beyond statutory requirements. The Scheme is concerned about any area of construction activity that may have a direct or indirect effect on the image of the industry as a whole. The main areas of concern fall into three main categories: the environment, the workforce and the general public. Waste management is a key area of focus and on-site considerations may include:

- How waste is avoided, reduced, reused and/or recycled;
- Whether there is a Waste Management Plan/Strategy and how this is monitored; and
- The type of feedback received (if any) as to how much waste on-site is diverted from landfill.

16.69 As part of the encouragement of on-site best practice, there will also be a need to ensure that suppliers for the construction phase of the Development are committed to reducing surplus packaging associated with the supply of any raw materials. This includes the reduction of plastics (i.e. shrink wrap and bubble wrap), cardboard and wooden pallets. This may involve improved procurement and consultation with selected suppliers regarding commitments to waste minimisation, recycling and the emphasis on continual improvement in environmental performance. Where practicable, the off-site manufacture/pre-fabrication of building components will be undertaken to help minimise the generation of on-site construction waste.

16.70 Table 16.8 summarises the most important mitigation measures to reduce the potential waste of on-site materials during the construction of the Development.

Table 16.8: Measures to reduce the wastage of raw materials

Ordering	**Delivery**
Avoid: Over-ordering (i.e. order 'just in time'); Ordering standard lengths rather than lengths required; and Ordering for delivery at the wrong time (update programme regularly).	Avoid: Damage during unloading; Delivery to inappropriate areas of the Site; and Accepting incorrect deliveries, specification or quantity.
Storage	**Handling**
Avoid: Damage to materials from incorrect storage; and Loss, theft or vandalism through secure storage and on-site security.	Avoid: Damage or spillage through incorrect or repetitive handling.

16.71 Where practicable, waste streams that have the potential to be reused on-site or transported off-site for recycling will need to be segregated. Although every effort will be made to retain all suitable materials on-site, it is possible that some of these materials cannot be reused or recycled during the construction of the Development. In these situations, the Site Manager will work to identify suitably licensed waste facilities in order for material to be redistributed to other suitable sites. This represents the most sustainable alternative to landfill disposal.

Completed Development

16.72 Design measures for the proposed development will ensure that patrons and visitors will have access to both internal and external refuse and recycling storage facilities.

16.73 Containers will be located within the curtilage of each holiday lodge, easily accessible for both patrons and collection crews.

16.74 The non-residential elements of the proposed development will be provided with dedicated or shared waste storage areas to facilitate the segregation of recyclable materials.

16.75 All waste storage areas will be clearly labelled to ensure that cross contamination of refuse and recycling is minimised.

16.76 Retailers and commercial tenants will be encouraged to undertake their own 'waste audit' and create an Action Plan to set targets for preventing, reducing, reusing and recycling their waste streams.

16.77 It is assumed that collection of commercial waste will be undertaken via external waste management contractors. It will be the responsibility of the occupiers to arrange for refuse and recycling to be collected from their premises.

16.78 The frequency of waste collection will be dependent upon several factors including the volume of waste generated; the storage method used; and the schedule of the appointed waste contractor.

16.79 The opportunity for the segregation and off-site composting of organic waste generated from any landscaping and grounds maintenance activities will be provided by the external company contracted to undertake this work.

Residual Impacts

Construction

16.80 It is considered that, if the majority of the construction waste is appropriately reused on-site or reused/recycled off-site, due to its scale and nature the Proposed Development will still result in a considerable volume of waste generation requiring removal to local waste treatment and disposal facilities.

16.81 The sensitivity of waste management infrastructure is low and the magnitude of change, following mitigation is low. Therefore, considering all stages of construction, there is likely to be direct, temporary and medium-term effect on waste management infrastructure of **negligible to minor** significance at the regional level following the implementation of mitigation measures.

Completed Development

16.82 The mitigation measures outlined above will ensure that a significant proportion of commercial waste can be separated for recycling by both occupiers and users, thereby maximising recycling opportunities and reducing the waste contributions for disposal to landfill.

16.83 Therefore, there is likely to be a direct, permanent, long-term residual effect on waste infrastructure from commercial waste of **negligible** significance at the district level following the implementation of mitigation measures.

Conclusions

16.84 The assessment of waste impacts has taken into account the generation of waste of both the construction and operation of the development. Once appropriate controls such as a SWMP and the sorting and recycling of waste are taken into account the impacts on waste generation have been evaluated to be of **negligible to minor** significance.

References

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