

Interim Report

'Designing out Waste' workshop Bicester Eco Town Exemplar Site



This report presents a summary of the findings from a 'Designing out Waste' workshops facilitated by Hyder Consulting in June 2012 on behalf of WRAP relating to the construction of the Bicester Eco Town Exemplar Site and recommends a set of topics for further investigation.

Research date: March 2010

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WRAP helps individuals, businesses and local authorities to reduce waste and recycle more, making better use of resources and helping to tackle climate change.

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Executive summary

Decisions on how to minimise waste and maximise resource use on projects such as Bicester Eco Town Exemplar Site have to be taken at the design stage, as this determines the approach that will be adopted at the construction stage. On behalf of WRAP, Hyder Consulting facilitated one 'Designing out Waste' workshop in June 2012 relating to the design and construction of the Bicester Eco Town Exemplar Project. The workshop was attended by some members of the design team and their purpose was to identify a set of topics that can be further investigated to ensure that the best opportunities to design out material waste on the project are being implemented.

During the workshop ideas were generated on how designs could be developed or changed to reduce material waste during construction; these ideas were then evaluated against ease of implementation and degree of beneficial impact. It was found that:

- Many of the proposals have already been incorporated within the project. The design team have been working to the project targets (zero waste to land fill, 20% recycled material) prior to the involvement of Willmott Dixon
- Additional ideas were proposed, particularly with respect to procurement.

From the ideas that were considered to be relatively easy to implement and have a potentially high impact on waste reduction and increasing reused and recycled content, the following topics are recommended for further investigation by the design team and Contractor:

- A further workshop will be run by Hyder for Willmott Dixon, addressing the development of the Site Waste Management Plan (SWMP) and reporting tools to ensure that the project targets are met
- Ensuring that the importance of Designing out Waste is appreciated by the key decision makers across the project team.

1.0 Introduction

A2Dominion is committed to divert construction, demolition and excavation waste from landfill, except for those types of waste where landfill is the least environmentally damaging option. Also, as a signatory of the Halving Waste to Landfill Commitment, Willmott Dixon is committed to achieve zero waste to landfill by 2012, and to adopt and implement standards for good practice in material efficiency by reducing waste, recycling more, and increasing the use of recycled and recovered materials. Decisions on how to minimise waste and maximise resource use on projects such as Bicester EcoTown Exemplar Site have to be taken at the design stage, as this determines the approach that will be adopted at the construction stage.

On behalf of WRAP, Hyder Consulting facilitated a 'Designing out Waste' workshop in June 2012 relating to the design and construction of the Bicester Eco Town Exemplar Site. The workshop was attended by the following members of the project team:

- Nick Westwood – Hyder Consulting
- Phil Harker – Hyder Consulting (Sustainability Manager)
- Aydin Zorlutuna – Hyder Consulting (Landscape Lead)
- Steve Hornblow – A2 Dominion (Client Project Manager)
- Chris Swordy – A2 Dominion (Client Technical Director)
- Jamie Rickard – Willmott Dixon (Design Co-ordinator)
- Ashely Coull – Silver (Client Representative)
- Mark Bell – PRP Architects (Architect Lead)

The purpose of the workshop was to identify a set of topics that can be further investigated to ensure that the best opportunities to design out material waste on the Bicester Eco Town Exemplar Site are being implemented. This report presents the best opportunities that have already been implemented, the ideas generated from the workshops and recommends a set of actions for further investigation.

2.0 Project Summary

The Bicester Eco Town Exemplar Site is the first phase of a proposed eco development to the north west of Bicester in Oxfordshire. It is to comprise c393 units, together with community facilities, and energy centre, office accommodation and a school. Only the residential accommodation is currently under consideration. The completed Bicester Eco Town is expected to comprise c5,000 properties and associated facilities and infrastructure.



The Bicester Eco Town Exemplar Site is expected to demonstrate good environmental practice to be utilised by subsequent phases of the wider development. It has stringent waste targets – zero waste to landfill, and 20% recycled material – which are embedded in planning conditions for the site.

3.0 Methodology and Scope

The methodology by which the workshop was conducted was in accordance with that proposed by WRAP in the report 'Designing out Waste: A design team guide for buildings' for conducting a design review workshop (WRAP, 2010); this is summarised here. The workshop comprised three sessions:

- 1 Awareness session.
- 2 Creativity session.
- 3 Reasoning session.

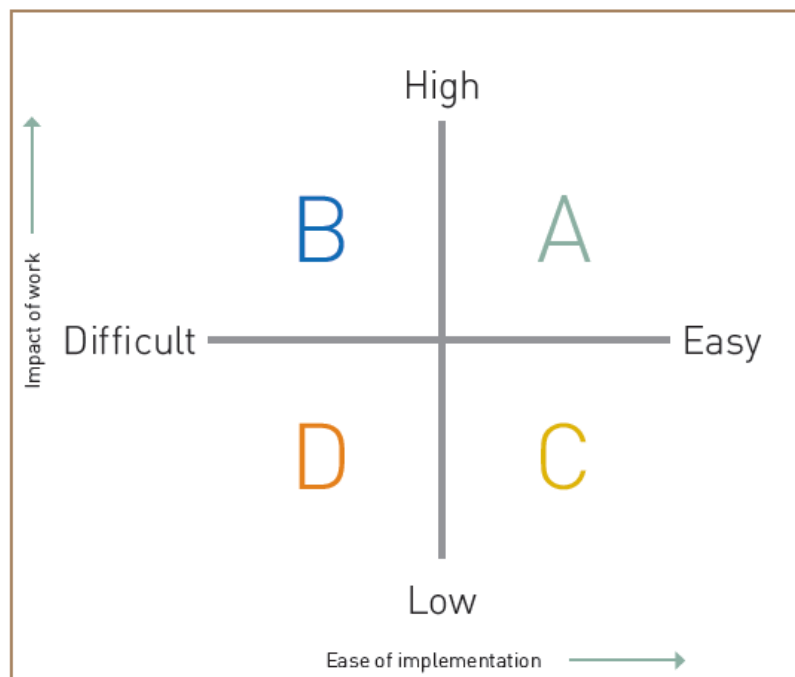
This was preceded by a presentation tailored to the Halving Waste to Landfill and the Bicester Eco Town Exemplar Site Commitments so that the delegates were aware of the increasing requirement for the supply chain to assist them design out waste and increase the amount of reused and recycled content where applicable.

In the Awareness session, the purpose of the workshops was explained, the scope of the workshop defined and the five Designing out Waste principles identified by WRAP introduced:

- 1 Design for reuse and recovery.
- 2 Design for offsite construction.
- 3 Design for materials optimisation.
- 4 Design for waste efficient procurement.
- 5 Design for deconstruction and flexibility.

In the Creativity session, ideas were generated focusing on how designs could be developed or changed to reduce material waste during construction and increase the amount of reused and recycled content during design, procurement and construction. These ideas were then evaluated in the Reasoning session against ease of implementation and degree of beneficial impact using the Opportunities Matrix shown in Figure 1 below.

Figure 1: Opportunities Matrix



- A: High impact on waste reduction, Easy to implement
- B: High impact on waste reduction, Difficult to implement
- C: Low impact on waste reduction, Easy to implement
- D: Low impact on waste reduction, Difficult to implement

High/Low impact on waste reduction refers to whether the design opportunity will greatly or minimally reduce the waste generated during construction. Easy/Difficult to implement refers to whether project constraints (cost, programme, procurement method, availability of materials or other economic considerations) are likely to permit

or restrict the implementation of the opportunity on the project. In addition, ideas have also been divided by Designing out Waste principle.

Ideas in Groups C or D may divert waste from landfill at a macro environmental level; however their impact on waste reduction at project level may be relatively low. For the purpose of the workshop (to identify feasible design solutions with a direct impact on construction waste reduction) the focus was primarily on opportunities in quadrants A and B.

However the project team was advised that all opportunities need to be considered as they can bring other benefits to the project, especially in the context of wider sustainability initiatives, for example Code for Sustainable Homes credits.

4.0 Ideas Generated

Opportunities to Reduce Waste in Design		Already implemented
A – High Impact on Waste Reduction, Easy to Implement		
Design for reuse and recovery	Segregate skips to facilitate recycling by WM contractor	x
	Use recycled material on subbase	x
	Incorporate rainwater harvesting	✓
	Retain and reuse existing topsoil	x
Design for off site construction	Closed panel timber frames constructed off site	✓
Design for materials optimisation	Cut and fill balance	
	Standard height rooms to match plasterboard dimensions	✓
	Supplier designed block paviour construction for thinner construction	x
Design for waste efficient procurement	Specify biodegradable packaging where possible	
	Use timber from a sustainable source	✓
	Make suppliers responsible for own waste	x
All	Embed targets and opportunities in drawings/specifications to reinforce compliance	x

C- Low Impact on Waste Reduction, Easy to Implement		
Design for reuse and recovery	Ceramic tiles - use a proportion of recycled material	✓
	Reconstituted facing stone - uses a proportion of recycled material	✓
	Reconstituted slates - use a proportion of recycled material	✓
	Use street furniture made with recycled plastic	✓
	Use recycled material in compost	✓
	Windows to use recycled PVC	✓
	Translocate existing hedgerows	✓
	Some suppliers will remove and process waste, eg Dulux paint	x
	Recycled content in hard landscaping, eg eco kerb 75% quarry waste	✓

	Recycled plant pots or root ball wrapping	x
	Use biodegradable packaging	x
	Use recycled plastic planks for pedestrian and cycle bridges	x
Design for off site construction	Prefit windows into house panels	✓
	Pedestrian/cycle bridges delivered pre made	x
Design for materials optimisation	Thermawood cladding - kiln dried, so doesn't require treatment	✓
	Use street furniture made with stainless steel (for long life)	✓
	Standardised bathroom layouts	✓
	Combine utilities in single trench	✓
	Minimise number of house types	✓
	Buildings to tie in with brick dimensions	✓
	Use of BIM for more accurate prediction of quantities	✓
	Vary turning head construction for long life	✓
Design for waste efficient procurement	Order components as required for plots	x
Design for deconstruction and flexibility	Loft spaces designed to enable easy conversion	✓
	Design to lifetime homes standard	✓
	Windows recyclable in future	✓

D - Low Impact on Waste Reduction. Difficult to Implement

Design for materials optimisation	Design of hard landscaping to reduce cutting	✓
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5.0 Next Steps

Due to the stage of the project, many opportunities have already been implemented. The table below highlights those additional measures which warrant further investigation, and potential inclusion within the scheme proposals.

Opportunity	Responsibility	Inclusion in the SWMP	Procurement Implementation	Monitoring
Segregate skips to facilitate recycling by WM contractor	Contractor			
Use recycled material on subbase	Infrastructure Consultant			
Supplier designed block paviour construction for thinner construction	Landscape Consultant			
Specify biodegradable packaging where possible	Contractor			
Make suppliers responsible for own waste	Contractor			
Embed targets and opportunities in drawings/specifications to reinforce compliance	All Designers			

Some suppliers will remove and process waste, eg Dulux paint	Contractor			
Recycled plant pots or root ball wrapping	Landscape Consultant			
Use biodegradable packaging	Contractor			
Use recycled plastic planks for pedestrian and cycle bridges	Landscape Consultant			
Order components as required for plots	Contractor			

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