



Case Study – Practical Experience of Reducing Construction Waste

Stuart Mee – Carillion, Environmental Advisor

8 July 2004



Introduction to Carillion

- Construction to Services Organisation
- Demerged from Tarmac in May 1999
- 18,000 people, £2bn turnover
- Health, Building, Facilities Management, Road and Rail Sectors
- UK and overseas... Great Western Hospital in Swindon, Beetham Tower in Manchester, Royal Parks in London, M25 for HA, M6 Toll Project, Copenhagen Metro

What is Waste?

Legal Definition for Waste Management

- Any substances which the holder intends to discard, or is required to discard

Present Day

- The volume of waste produced in the UK in one hour will fill the Albert Hall
- If all the aluminium cans in the UK were recycled, there would be 12 million fewer dustbins each year
- Each tonne of paper recycled saves 15 average sized trees, as well as their surrounding habitat and wildlife

Particular to Construction...

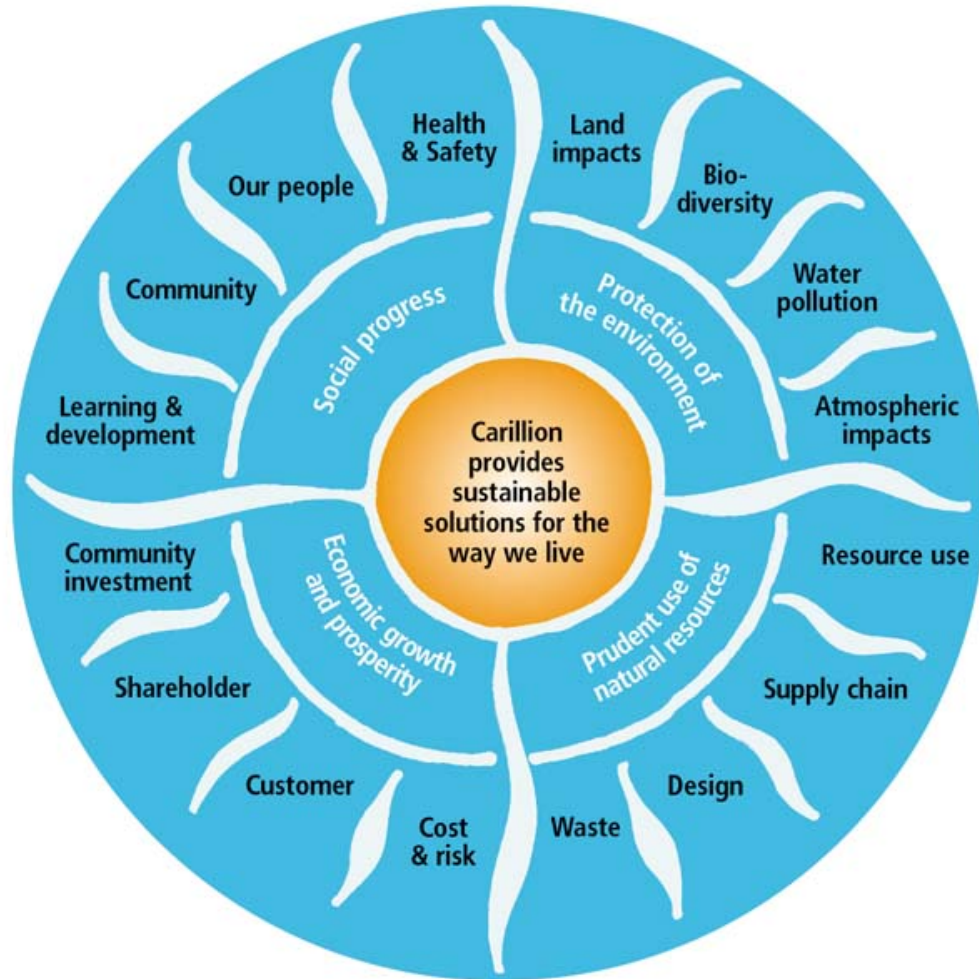
- The Construction Industry directly produces over 1/3 of all waste produced in the UK each year
- The Construction Industry throws away 13 million tonnes of waste unused each year
- No other industry has such a pivotal role to play...

Approach to Waste Management

- Part of our Sustainability Strategy
- Strategic Objective for 2010...

To demonstrate peer group leadership in delivering solutions to reduce our impact on the environment and in prudent use of natural resources

- Sustainability Targets for 2004



What is Sustainable?

1. Reduce

-Minimise the amount of waste produced

2. Reuse

-Use as many times as possible

3. Recycle

-Recycle what you can, after re-use
-High volume and high value materials



The Natural Step

- International Organisation
- Common science based systems framework to help organisations understand and move towards sustainability
- A way of helping to find a solution – focuses on initial causes rather than reacting to the environmental effects
- Gets people talking



The System Conditions

In a sustainable society, nature is not subject to systematically increasing...

1. ...concentrations of substances extracted from the earth's crust
2. ...concentrations of substances produced by society
3. ...degradation by physical means

And, in that society

4. ... human needs are met worldwide

The business drivers

- Identify our social and environmental impacts
- Reduce cost, less raw materials and less waste, resulting in savings
- Reduce risk and minimise risk of prosecution
- Improve relationships with customers
- Improve relationships with the community
- Create more effective supply chain management
- Achieve greater employee motivation



Approach to Waste Management

- Focus on Design, Supply Chain and Site Procedures
- Site Waste Management Plan Guidance
- Waste Management Compliance Checklist
- Waste Management Procedure
- Training
- Tool box talks
- Sustainability Action Plans – with one of the key themes being Waste Management
- Sustainability Key Performance Indicators
- Case Records

Waste Management

Design Procedures

Supply Chain Procedures

Site Procedures

Waste Handling

Design for a Just in Time delivery to site and/or ensure materials are carefully stored on site.

Work closely with designers to ensure that waste is eradicated at the design stage by considering, for example, minimising cutting of materials and standardisation.

Explore the benefits/possibilities of using prefabrication.

Staff Training

Think about how waste could be reduced. Design it out.

Invite key suppliers to design and sustainability workshops.

Arrange toolbox talks with suppliers and project team/designers.

Demonstrate the potential amount of waste savings by the designed method, as a result of the workshops, against traditional methods.

Waste Handling

Talk to suppliers about the waste generated. Can they take back the waste on their delivery lorries to re-incorporate into their production cycles?

Obtain information as to the percentage of waste taken back by each supplier.

Confirm validity of information and ensure that potential waste is being re-incorporated into suppliers production cycles by factory visits.

Supplier Training

Reduce packaging at source by working with your suppliers.

Consider bulk packaging e.g. paint could be delivered in larger cans, reducing the number of cans arriving on site.

Invite key suppliers to design and sustainability workshops and encourage toolbox talks with suppliers.

Waste Handling

List out the types of waste that will be generated i.e timber, plaster, aggregate, concrete, metals etc.

Separate waste at source.

Individual marked bins for the waste collection per floor/location etc.

Collected waste to be kept in one location on site.

Explore options for waste handling e.g. re-use off site - local businesses may have uses for the waste and recycling waste.

Obtain information as to the percentage of waste diverted from landfill.

Confirm validity of information and ensure that waste is being reused/recycled by visits to operations.

Staff Training

Arrange toolbox talks or discuss with site operatives during site induction. Explain clearly what waste will be collected and how it will be stored.

Focus on reducing amount of waste produced on site and leaving site – look at storage of materials and re-use on site where possible.

Measure quantities of waste that are leaving the site (see Waste Measurement template).

Raise awareness of amount of waste being produced e.g.: average amount of waste produced per person on site each week on notice board.

- Recommended Minimum Requirements
- Good Practice
- Best Practice

Design

- Work closely with designers to ensure that waste is eradicated at the design stage
- Design to standard size and minimise cutting of materials
- Explore the possibilities / benefits of prefabrication
- Invite key suppliers to Design and Sustainability Workshops
- Use long life materials – Whole Life Cost
- Record the process and demonstrate the savings – environmental and financial

Supply Chain

- Reduce packaging at source by working with suppliers
- Talk to suppliers about waste generated
- Can they take back the waste on their delivery lorries to re-incorporate into their production cycle?
- Consider bulk packaging – e.g.: paint could be delivered in larger cans reducing the number of cans arriving on site
- Close the loop by buying recycled products

Site Procedures

- List out the types of waste that will be generated
- Separate at source - concentrate on high volume and high value materials – Keep materials ‘clean’
- Collected waste to be kept in one location on site
- Skips and bins to be clearly labelled
- Explore options for waste handling – local businesses may have use for waste

Site Procedures

- Record information – seek to reduce
- Visit Waste Contractors Operations
- Ensure everyone is aware of waste procedures for the site, what waste will be collected and how it will be stored
- Raise awareness of amount of waste being produced e.g.: average amount of waste produced per person each month

Safe & Correct Disposal

- Ensure have 'Duty of Care' Documentation that covers ALL waste streams
- Identify a Waste Co-coordinator for the site
- Ensure good house keeping
- Ensure changes in legislation are communicated
- Ensure procedures are in place for disposal of Hazardous Waste

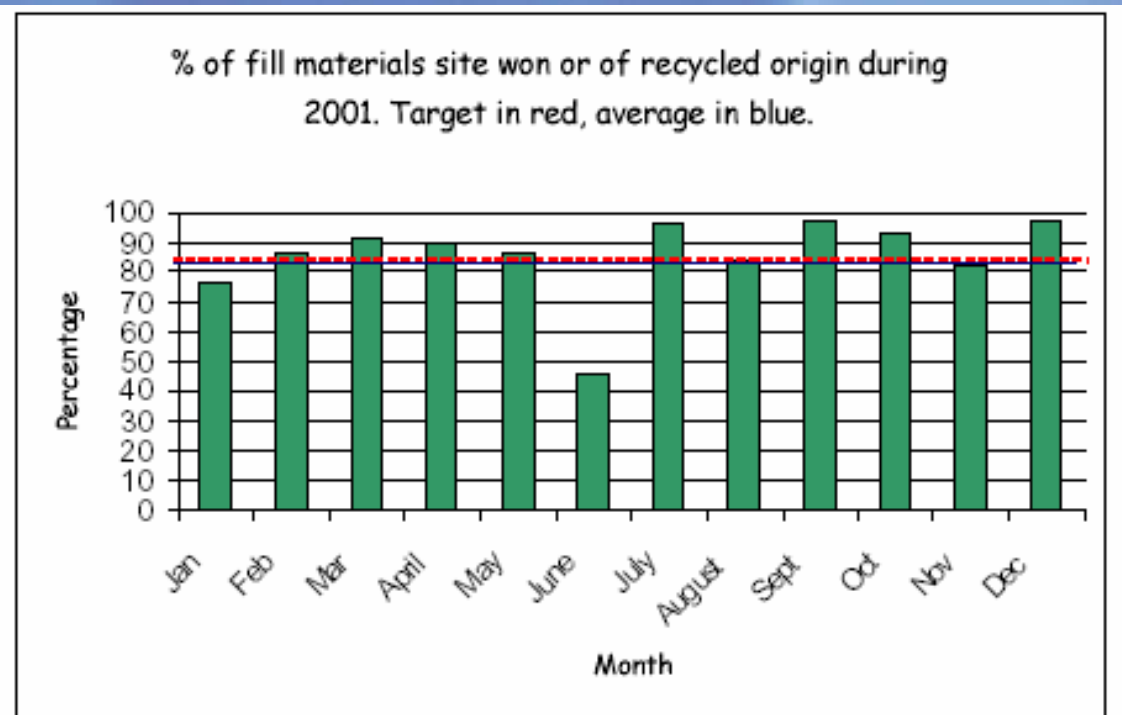
Alexandra Parade Residential Development, Glasgow



- Reduction of removal of contaminated material off site
- Levels of floors and roads adjusted to minimise removal of material from site
- Demolition material crushed on site and used as capping layer
- Reuse of an existing fence for a new boundary wall
- Life long lamps used
- Steel tubes from oil rigs re-used as piles – innovation in reuse
- Excavated material removed off site by the transport bringing hardcore to site
- Waste material segregated and recycled

Nottingham Express Transit

- Set a target of 85% of fill materials to be site won or of recycled origin

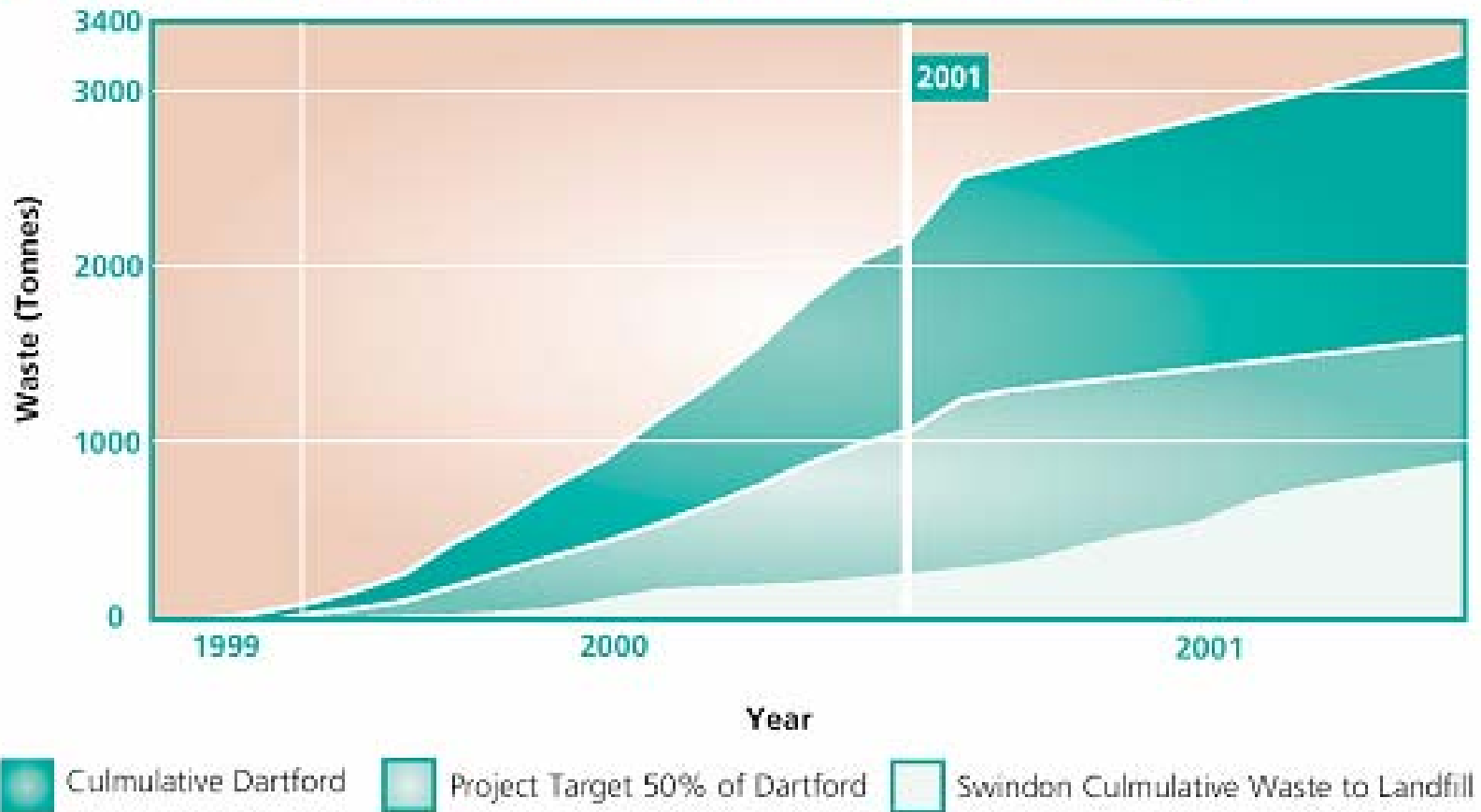


Great Western Hospital, Swindon

- 50% target reduction on waste to landfill from our previous best practice project at Darent Valley, Dartford
- Waste was segregated as pallets, plasterboard, plastic, cardboard, hardcore, green waste and general waste



Great Western Hospital Swindon - Landfill Waste Target



Great Western Hospital, Swindon

Plasterboard story...

- Worked in partnership with the plasterboard manufacturer
- Modified design from double skin plasterboard to single skin plasterboard – enabled waste and material used to be minimised
- Pre-sealed board, eliminating skimming, reducing quantity of paint used
- Reduced the need for labour intensive wet trades on site
- Plasterboard was delivered to site using plasterboard pallets instead of traditional wooden pallets
- Plasterboard skip transported directly back to manufacturer for recycling

Great Western Hospital, Swindon



- 500 tonnes timber composted or recycled..... supply chain involvement
- 400 tonnes paper and cardboard
- Compost added to topsoil for use in landscaping
- 300 tonnes hardcore / concrete recycled
- Saving approx. £20k
- Needed buy in from all the supply chain to achieve this

Now and the future...

- Using Sustainability Key Performance Indicators on Projects, of which one is Waste Management
- Recording and Reporting through Monthly Management report the percentage of Waste diverted from landfill and the percentage of waste going to landfill on Projects
- Benchmarking between similar types of projects
- Learning lessons for the future
- Setting improvement targets

- Through our Supply Chain, looking to work with regional waste management companies

Challenges and Opportunities

- Shortage of landfill space
- Declining number of waste management sites
- Increasing legislation
- Increasing costs – environmentally and financially

- Ownership and leadership is vital
- Energy and enthusiasm... with expert help
- Involvement by all... with continuous improvement philosophy
- Measure success and failure... and learn