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Concrete – a waste of resource?

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Dave Adamson, Senior Architect, Sellafield Ltd.

Date 11/05/11

SD:SPUR Conference, Birmingham.

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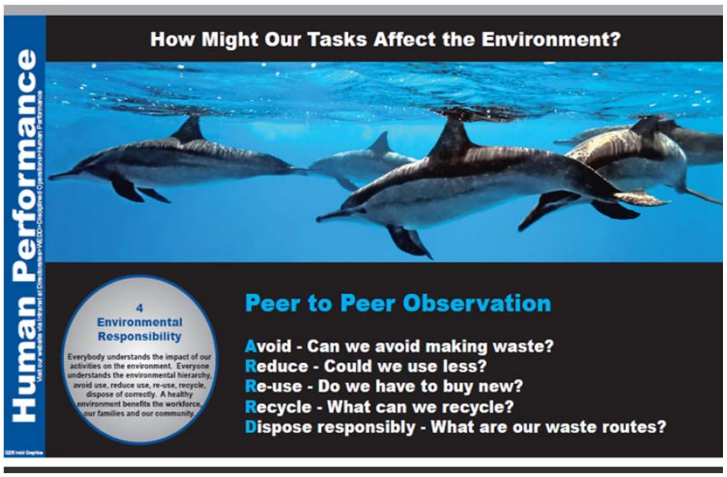

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Concrete – a waste of resource?

- Introductions & purpose of this session.

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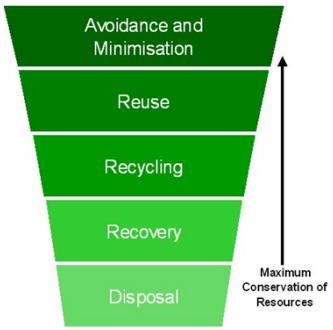
Waste Management Hierarchy



- Waste Management Hierarchy.
- Established principles and cornerstone of Waste Management Legislation.
- Most preferred option is highest, least preferred option lowest.

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The framing of the situation:

- Estimated volume of > 1,000,000 m^3 of waste concrete arising over lifetime decommissioning of Sellafield Site alone.
- Bulk of which is likely to be clean/exempt waste.
- Unable to avoid waste production – it is already in existence but we can re-use!

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Current options for re-use of waste concrete 1: Foundations/Landscaping for new projects (e.g.New Medical Building)

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Current options for re-use of waste concrete 2:

- Concrete re-use on Sellafield Site primarily for landscaping purposes. (Calder Cooling Tower basins shown)
- Other possibilities for re-use exist.
- Trial undertaken on Sealine concrete covers.
- Identified/confirmed other uses possible.

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Designing out & avoiding waste

David Adamson Sellafield Ltd

Date: 11th May 2011

"Nuclear decommissioning and the waste hierarchy: where we are, challenges and issues"

SD:SPUR Event, Birmingham

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- Large amounts of potential reuse of construction concrete
- New build programme to support the decommissioning of Sellafield Ltd
- Opportunity for new build to embrace best practice in waste management
- Use of tools and techniques in minimising waste

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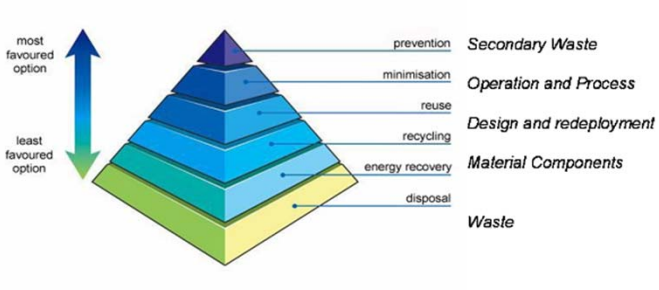
- Waste Hierarchy



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LLW Strategic Review 2009 provided:

"Reuse/recycle waste in new construction projects within the nuclear industry."

Created the opportunity for the reuse and recycling of Exempt Waste for construction projects such as rubble as aggregates for new roads, waste stores, LLWR vaults, capping materials etc.

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Demolition of iconic nuclear structures

An ideal opportunity to apply some of the methods described by the Waste Management Hierarchy (WMH) in reducing the amount of LLW being produced, and possibly designating the demolition material as either Exempt or VLLW.

The standard BS8500-2 offers a full specification for the uses of recycled concrete aggregates in concrete, although with such a vast range of recycled aggregates an all encompassing specification for the use of these aggregates is yet to be determined.

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But there are difficulties…

Recycled Concrete Aggregate (RCA) **is not permitted** as aggregate for Structural Concrete and Shielding Concrete,

RCA may be used for **non-structural** purposes such as mass concrete fill, support for hard landscaping etc.

Use of RCA - no **trend at present** and **no timeline** for Building Demolition at Sellafield.

Extent, control, ownership, responsibilities, QA/QC and use to be determined through technical engineers both at Sellafield and Risley.

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Site for new Medical Building trialed for the implementation of waste management hierarchy in recycling concrete for reuse.

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Sustainable concrete design using PFA & GGBS is well established and permitted in new non-structural concrete.

Casting GGBS Concrete at Sellafield

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Smart Shuttering

Module system

Multiple Use

Increased Durability

4 times greater use

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- Site Waste Management Plans

  Mandatory in law on Construction Sites since 2008

  Potential recycling, salvage, reuse and return areas

  Buy back schemes and efficient design can reduce the volumes of off-cut waste.

  Weekly log of site materials and those going to landfill and for recycling

  Use of landfill will be the last option

  At the conclusion of construction activities an estimation of the cost savings that have been achieved is completed from implementing the SWMP

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- WRAP tool

  Calculates potential waste arisings

  Advises on improving recycled content

  Quantifies overall Net Waste for the Project

  Generates waste forecast for SWMP

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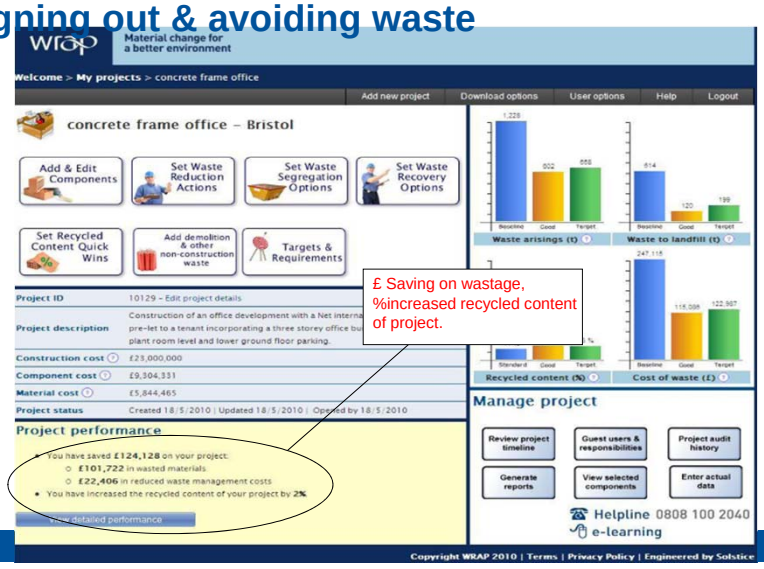

£ Saving on wastage, %increased recycled content of project.

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- Working with CIRIA on Lean Construction
  - New guidance on Lean Construction out on 9th May
  - How to change to a Lean culture within a Construction Business
  - Thinking differently about waste
  - Identify and drive out waste from processes on a day by day basis

Lean is a continuous journey

Questions?