SUPPLY CHAIN SUSTAINABILITY SCHOOL

National Highways RDP Waste & Resource Efficiency Lunch and Learn

8th August 2022 – 9.30am to 11.30am

Overview

1. Legislation
2. Financial Implications
3. Waste and Resource Efficiency Management Planning
4. Q&A

Introduction

Waste Management Workshop - Outcomes

At the end of this short session you will:

- Have revisited some of your legal responsibilities under waste legislation
- Considered ways to improve site waste management and resource efficiency
- Be better placed to explain requirements to others.

Please Participate

If you have **QUESTIONS**, please feel free to speak up or write them down in the chat box

Cameras on and earphones help!

Please mute during presentations but feel free to unmute and speak up if you have a question

Please, ensure your line is **UNMUTED** during group discussions and **VIDEO** is on

We will use the platform **Jamboard** to engage in different activities

SLIDES will be distributed afterwards

Introductions, using Jamboard and Chat box

- We will introduce Google Jamboard shortly – you just to open this as an interactive document via your browser – use the link we sent you by email or the one we have added in the Chat function of Zoom

- If you can't access Jamboard or have something else to ask, just use the Chat function. Again this is in the Zoom toolbar

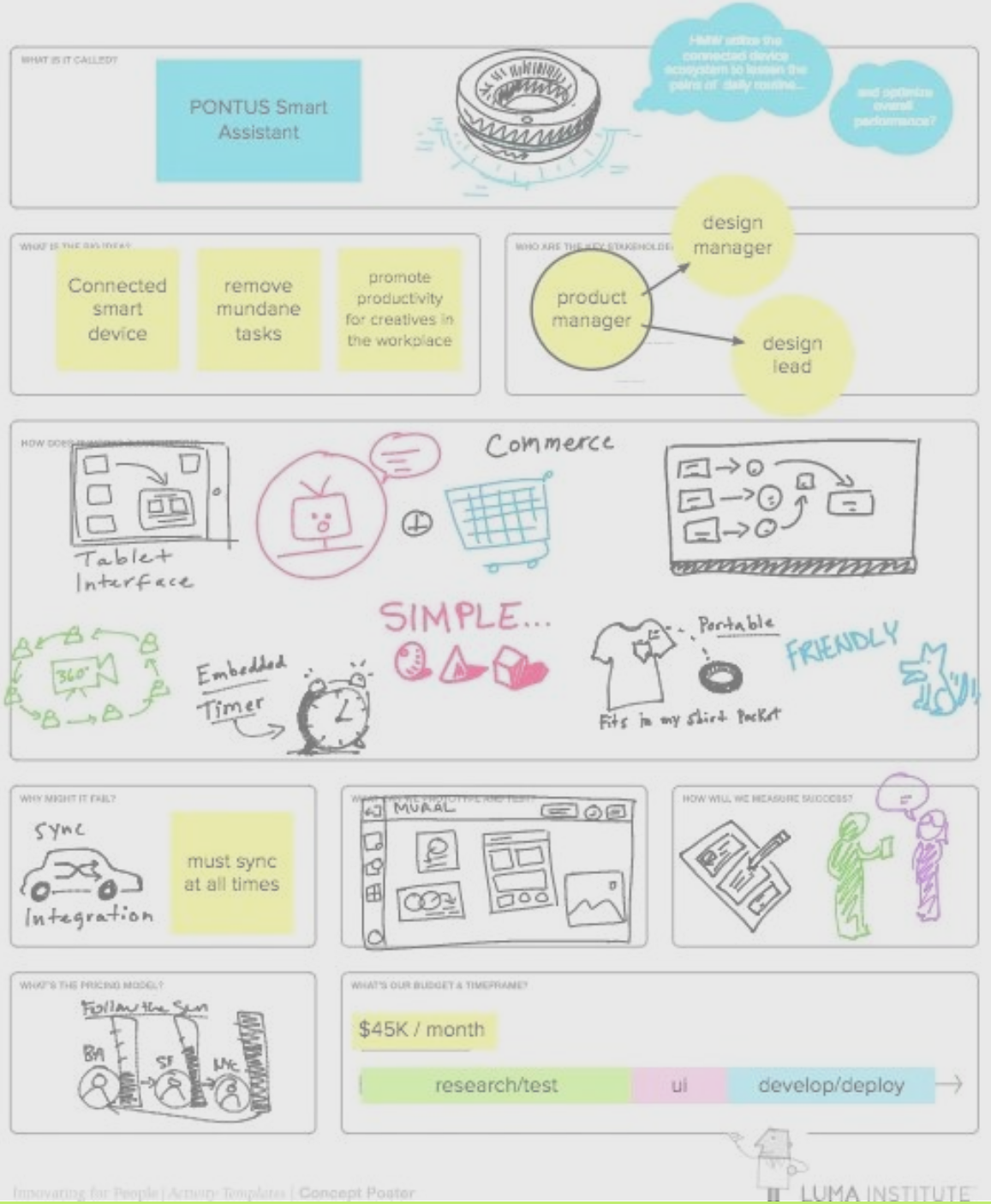
- Also use this to add other comments, keep notes of anything you think could be useful to the group, add your questions etc

- Feel free to shout out – I'm very happy to be interrupted.

LINK: https://jamboard.google.com/d/13OIt-VieM4-C0JY48e8uZmqv1Rv3F1nwY-xT4bCU6jQ/edit?usp=sharing

Jamboard

- ***FOLLOW*** the **link** we sent to you
- ***CREATE*** a post it note, double click on an empty space and start writing
- To ***MOVE*** your post it note around, click on and drag it
- To ***DELETE*** your post it note, click on it and press the 'Delete' button on your keyboard
- PLEASE DON'T press the "clear form" button!



We need your feedback please

This link will be available on the chat:
ADD LINK

SUPPLY CHAIN SUSTAINABILITY SCHOOL

What is Waste?

"Any substance or object that the holder discards, or intends to, or is required to discard."

(Waste Framework Directive)

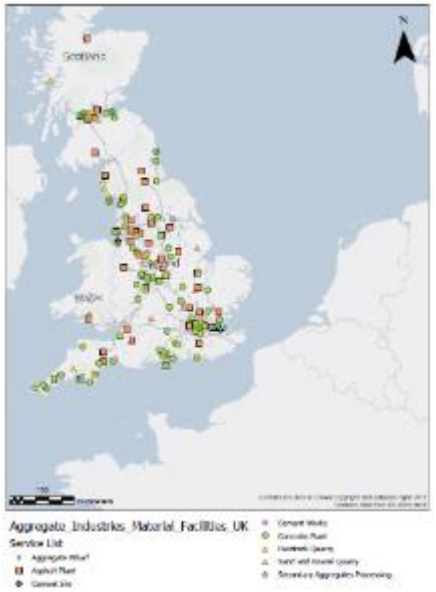
Stakeholders?

Who is interested?

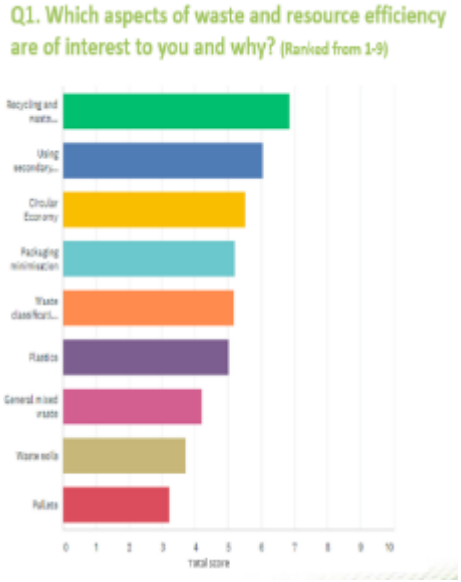
SUPPLY CHAIN SUSTAINABILITY SCHOOL

The School's Waste & Resource Use Category Group

Refreshed
-Landing page
-Resources (new and old)



Material Exchange Platforms Mapping
- Skanska collaboration



Surveys
-Member interest
- Partner plastic waste

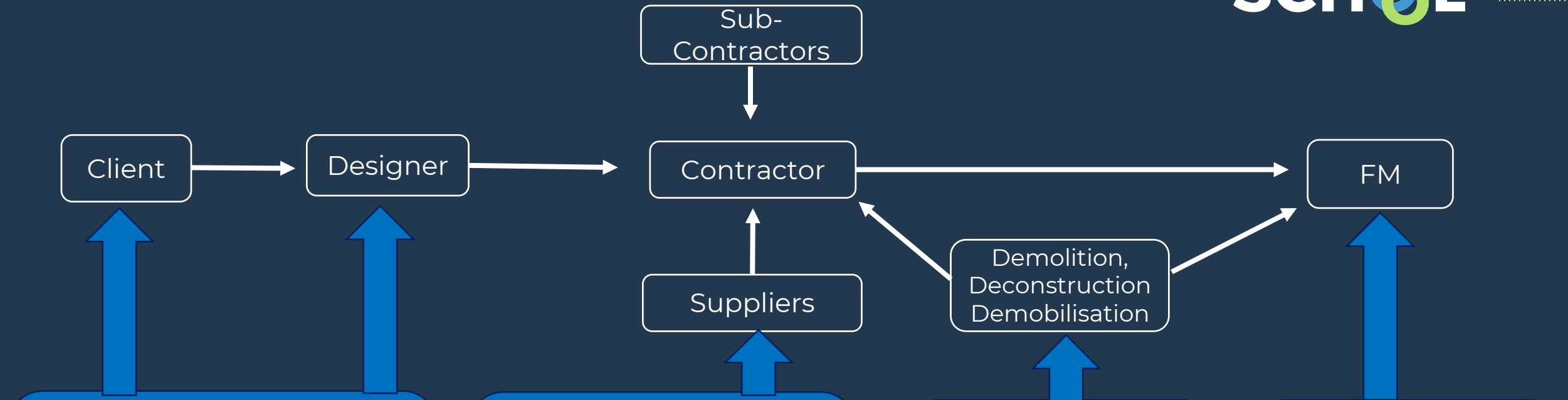
Partner case studies

Leadership group support

Our work programme

Construction project lifecycle waste*	**Developing resources to improve outcomes**
Designing out waste and design for deconstruction	Guidance and events, promoting circularity
Understanding limitations of UK waste management infrastructure	
Supporting procurement processes	Developing model tender questions and responses
Materials consolidation centres	
Plastics and aggregate reprocessing companies	Mapping and developing knowledge on how to engage
Data	material passports and waste performance reporting templates
Materials exchange platforms*	**Set up and promote a map showing where these are, how to use etc**
Zero waste to landfill	including greater input from waste management providers and demolition contractors
Embodied carbon and net zero pathways	
Packaging projects	Guidance, events, collaboration, research – Infra/Fit Out/M&E?
Social value and supporting social enterprises	Research and collaboration opportunities
Soils and aggregates	Guidance and exchange platforms
Subcontractor guidance	Site practice and site waste management tools
Informing School on policy / legislative changes *	Plastic Packaging Tax, Circular Economy, Producer Responsibility etc
Collaboration with other groups	Addressing SDGs, working with Carbon Group on scope 3 etc

Intervention points



Continuous link to circular economy

Legislation

What type is it?

“Inert”

- Non bio-degradable material
  - E.g. Non-contaminated subsoil, aggregates, etc.

Non-hazardous

- Non-contaminated bio-degradable materials
  - E.g. Topsoil, timber, metal, plastics

Hazardous

- Contaminated material and harmful materials
  - E.g. Oils, paints and other organic liquids

Main Waste Legislation

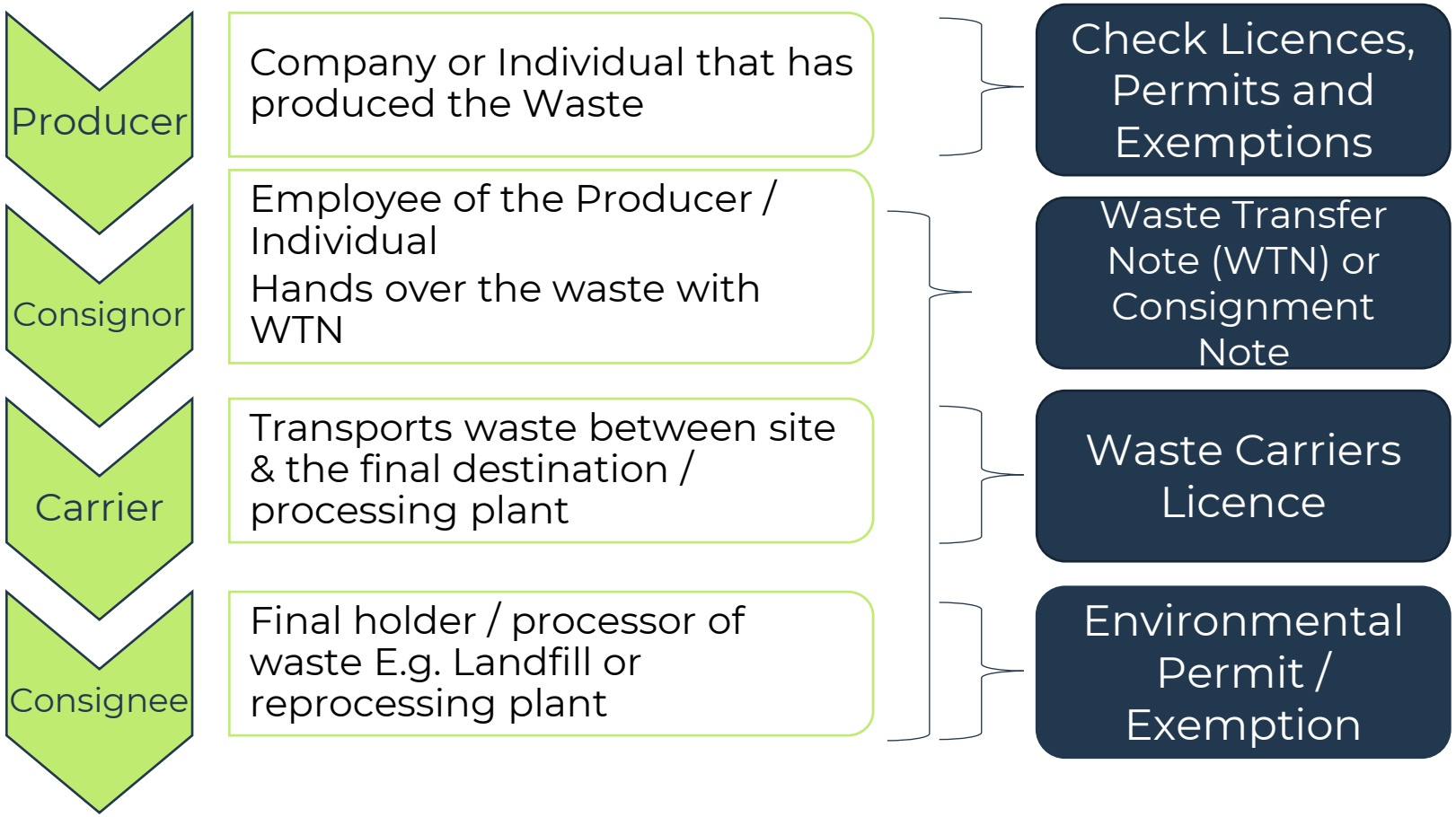
Environmental Protection Act 1990	Waste (England & Wales) Regulations 2011	Environmental Permitting (England & Wales) Regulations 2012
Waste disposal to waste management	Waste hierarchy	Permits and Exemptions for waste recovery and disposal

Main Waste Legislation

Hazardous Waste Regs 2009	Waste Electrical and Electronic Equipment Regs 2010	Producer Responsibilities Obligations (Packaging Waste) Regs 2010
Registration of premises producing or holding 500kg Hazardous waste (Wales only)	Collection, treatment, recycling and recovery of WEEE	Recover and recycle waste packaging

Environmental Protection Act 1990

Duty of Care



Environmental Protection Act 1990

Fines and Prosecutions

Deposit, treat, keeping waste in a manner likely to cause pollution of the environment or harm to human health

- £50,000 fine
- unlimited fine and/or 5 years imprisonment

Breach of Duty of Care - £5,000 or Unlimited fine

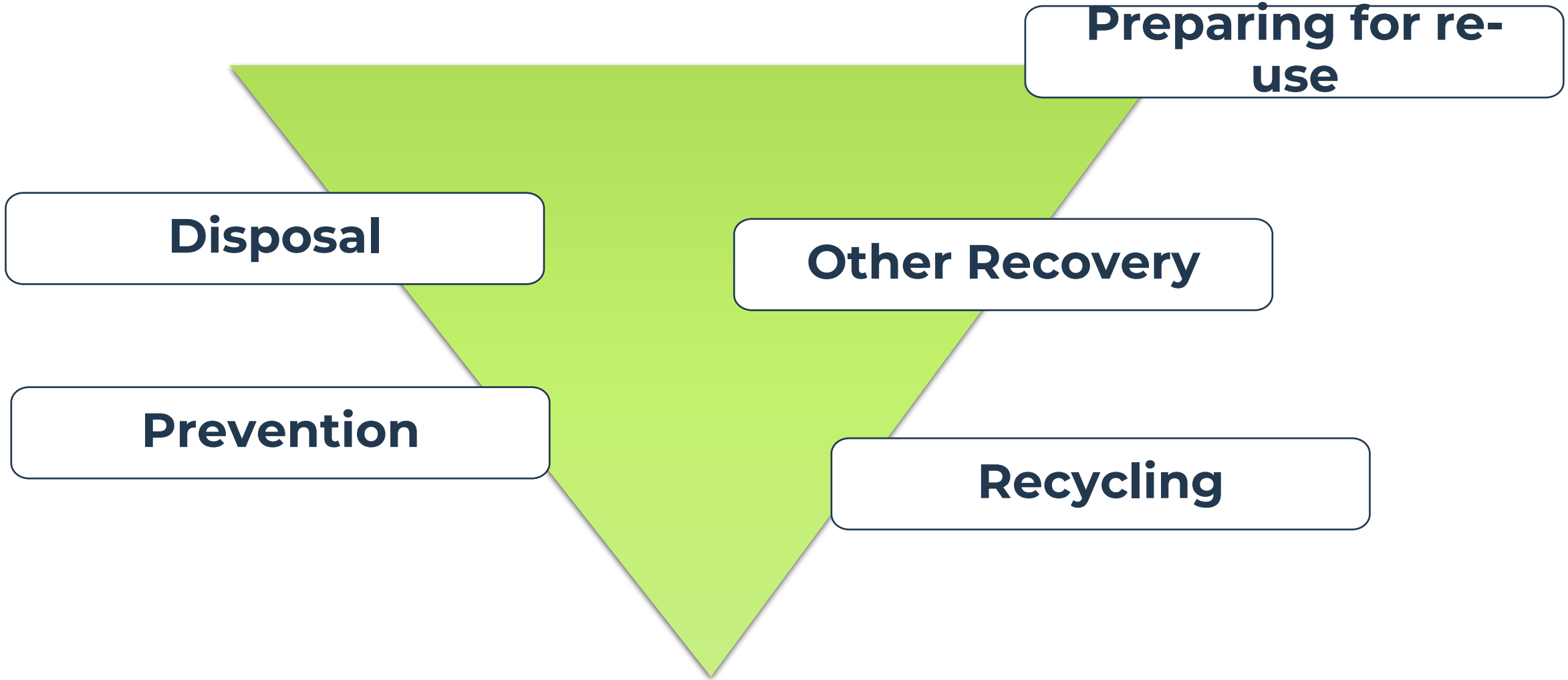
Directors' Liability

- May be punished in the same way as the company according to the offence

Fixed Penalty Notice - £300 fine

- 'civil sanctions / enforcement undertakings' can be imposed, legal action is avoided by 'voluntarily' making appropriate financial donations to environmental organisations.

The Waste Hierarchy



POLL: Two questions

1. Which do you think is the most sustainable option in the waste hierarchy?
   - Preparing for reuse
   - Other recovery
   - Recycling
   - Prevention
   - Disposal
2. Which do you think is the least sustainable option in the waste hierarchy?
   - Preparing for reuse
   - Other recovery
   - Recycling
   - Prevention
   - Disposal

The Waste Hierarchy

The Future?


LINEAR ECONOMY
RAW MATERIALS
DESIGN
MANUFACTURE
CONSUMPTION
DISPOSAL


RAW MATERIALS
DESIGN
MANUFACTURE
CONSUMPTION
MAINTENANCE
REUSE/REFURBISHMENT
RECYCLING
RESIDUAL WASTE
CIRCULAR ECONOMY

What is a circular economy?

A circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

Ellen MacArthur Foundation

"The circular economy is based on three principles, driven by design:

- *Eliminate waste and pollution*
- *Circulate products and materials (at their highest value)*
- *Regenerate nature*

It is underpinned by a transition to renewable energy and materials. A circular economy decouples economic activity from the consumption of finite resources. It is a resilient system that is good for business, people and the environment"

Source: https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview

New and future UK Waste Regulations

- THE LONDON PLAN (2019) includes requirement for all major construction projects to produce Circular Economy statements, including how the project will enable building materials, components and products to be disassembled and re-used.
- UK/EU Circular Economy Strategy
- UK ENVIRONMENT ACT framework for increasing recycling, power to make regulations relating to regulation of hazardous waste in England, import, export and transit of waste, littering enforcement powers etc
- EXTENDED PRODUCER RESPONSIBILITY for packaging
- Net-zero by 2045 (Climate Change (Scotland) Act 2009)
- Scotland - Draft 4th National Planning Framework
- Scotland - Circular Economy Bill (consultation)
- Plastic Packaging Tax

Plastic Packaging Tax

A tax of £200 per tonne applied to any plastic packaging which does not meet a minimum 30% recycled content threshold

- Applies to manufacturers, converters & importers
- Joint & several liability being considered – someone in the supply chain needs to pay if not producer
- Tax is priced to discourage use of virgin material
- Applies from April 2022.

Some more Circular Economy and Sustainability Plans

Organisation	Aims/Objectives/Policy
Environment Agency	**2030 Goals** - *Optimising our use of resources*
Network Rail	**Minimal waste and the use of materials –** *We will reuse, repurpose or redeploy all surplus resources, minimise use of resources, design out waste and embed waste life cycle/circular economy thinking into the rail industry by 2035*
National Highways	**Manufactured capital – Circular economy –** *We will push towards a 'circular' approach to our management of resources: minimising our demand for primary resources extracted from the ground, and maximise the reuse of the resources already in use on the network. Reutilising them in as high a value function as possible*
Palace of Westminster	**Circular Economy Policy** – *sets out the Programme's ambition to embed the principles of a circular economy into the Restoration and Renewal Programme*
HS2	**Circular Economy Principles** – *keep resources in use for as long as possible; recover and regenerate resources at the end of each use; keep resources at their highest quality and value at all times*
Anglian Water	**Our Goals -** *zero waste. Get it right first time, every time; to deliver a 70% reduction in capital (embodied) carbon by 2030 from a 2010 baseline*
Expo 2020 Dubai	**Programme wide Sustainability Strategy** – *Minimise depletion of natural resources; Promote use of sustainable materials; Reduce wastes and minimise quantity of waste to landfill*

Source: Jacobs – with thanks

The Green Construction Board

Construction Leadership Council

The Routemap for Zero Avoidable Waste in Construction

Introduction

Waste costs the construction industry an estimated £11 billion per annum and emits 3.5 million tonnes of CO2e, yet waste can be reduced, materials used more efficiently, and buildings and structures at end of life repurposed, refurbished or dismantled to enable products and materials to be a resource for new activities.

This Routemap aims to catalyse actions by all parts of the supply chain to reduce and ultimately eliminate all avoidable waste. It adopts the interpretation of Zero Avoidable Waste in construction published by the Green Construction Board (GCB) in 2020 and adopts the principles of the waste hierarchy and life cycle assessment.

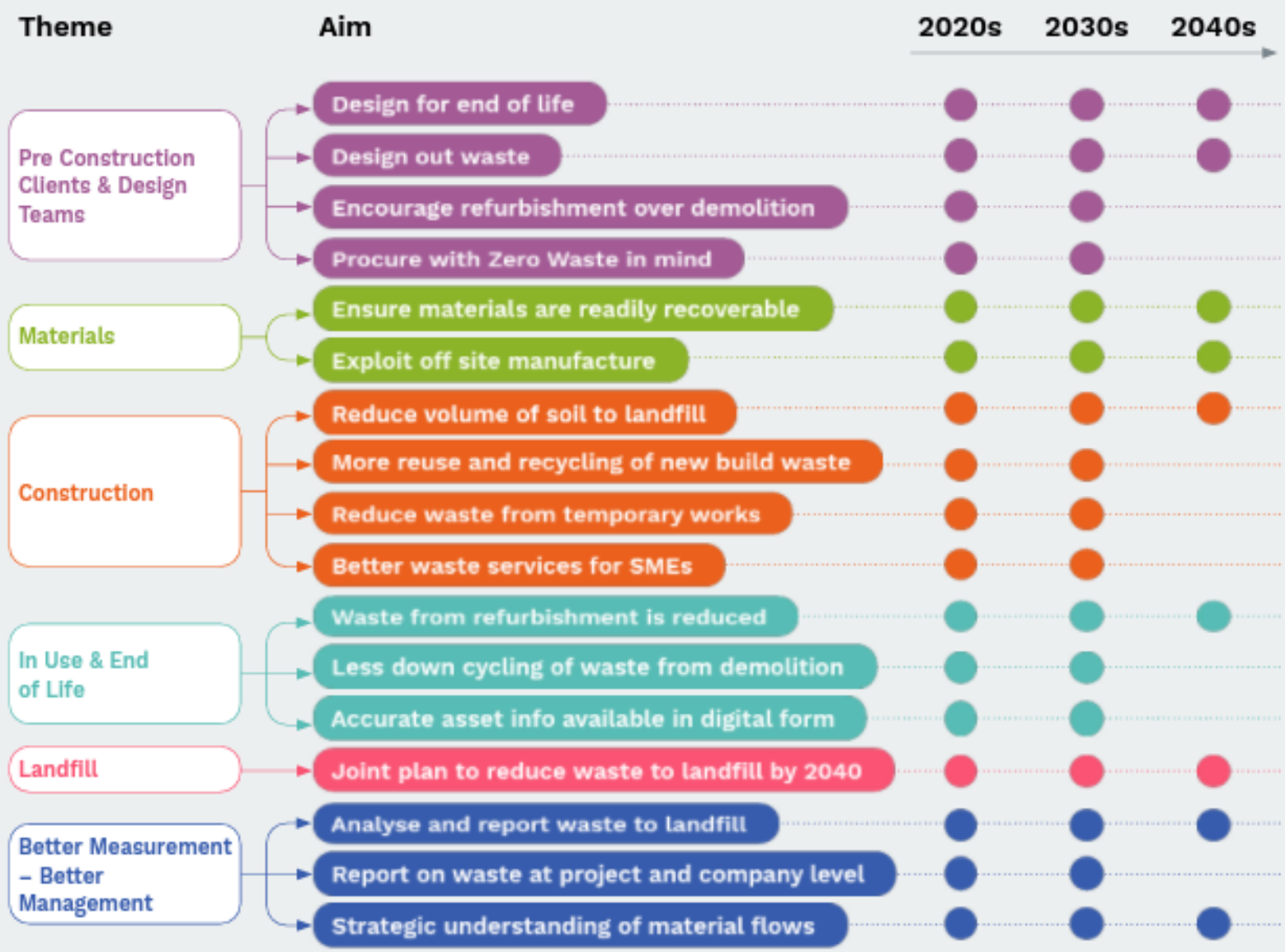
The Routemap is an interactive infographic identifying aims, actions, context and guidance. Click on an Aims button and a new page appears. Hover over Context and an explanation appears. Click Guidance and a new page links to published guidance.

It has been prepared by the GCB's Resources and Waste Task Group with the principal authors being Katherine Adams, Rob Pearce and Jane Thornback. The project received financial support from BEIS, and was in collaboration with Defra.

Click for Context

Targets and Guiding Principles

Click for Acknowledgements



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Design out waste

Aim: **The use of materials is optimised in the design of the buildings and structures and waste is designed out throughout the design and construction process**

2020s	2030s	2040s
• Waste reduction targets are commonplace in most construction projects. • Professional institutions develop training and CPD. • BS8895 is widely adopted throughout the design process for major projects.	• By 2030 costs are reduced by 10% through designing out waste and material optimisation.	• The amount of waste generated from new build construction is minimal.

Click for Guidance

Act now

- Clients, design teams and contractors set project waste reduction targets during design and construction.
- Design teams share their learnings and best practice on designing out waste within their practices and externally through their networks.
- Design teams write up case studies on how designing out waste has been considered within the design process and what changed as a result.
- Design teams implement waste reduction practices in their design work.
- Design teams undertake material optimisation through design choices and material selection working with manufacturers.
- Professional institutions and universities and colleges include designing out waste in training, CPD and academic courses.
- If participating in environmental certification schemes, such as BREEAM, LEED etc pursue the credits that relate to waste reduction and material efficiency.
- At project level, contractors and quantity surveyors, reduce the wastage allowances that are set for materials and do not over order.
- Contractors incentivise subcontractors to reduce waste.
- Contractors and subcontractors manage materials on site carefully to avoid damage.
- Manufacturers and contractors collaborate to implement reusable packaging schemes.

Project lifecycle waste web feature

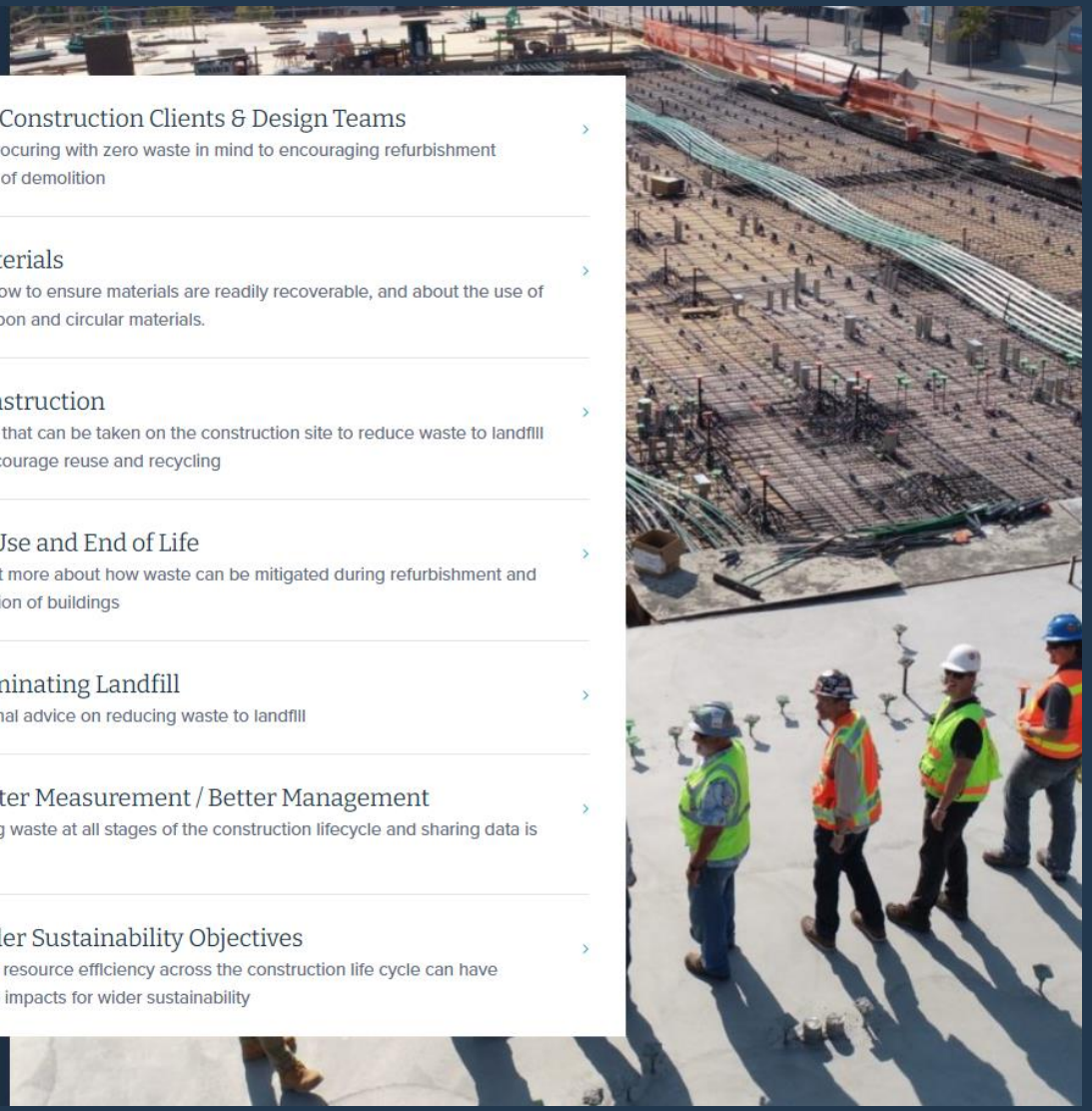
A practical guide to

Reducing construction lifecycle waste

These resources help users from all parts of the built environment value chain reduce construction lifecycle waste.

Explore themes and topics for practical examples, learning about the different stages and aspects of a wide variety of construction projects.

https://www.supplychainschool.co.uk/partners/groups/waste-group/



1. Pre Construction Clients & Design Teams
From procuring with zero waste in mind to encouraging refurbishment instead of demolition

2. Materials
Learn how to ensure materials are readily recoverable, and about the use of low carbon and circular materials.

3. Construction
Actions that can be taken on the construction site to reduce waste to landfill and encourage reuse and recycling

4. In Use and End of Life
Find out more about how waste can be mitigated during refurbishment and demolition of buildings

5. Eliminating Landfill
Additional advice on reducing waste to landfill

6. Better Measurement / Better Management
Tracking waste at all stages of the construction lifecycle and sharing data is vital

7. Wider Sustainability Objectives
Greater resource efficiency across the construction life cycle can have positive impacts for wider sustainability

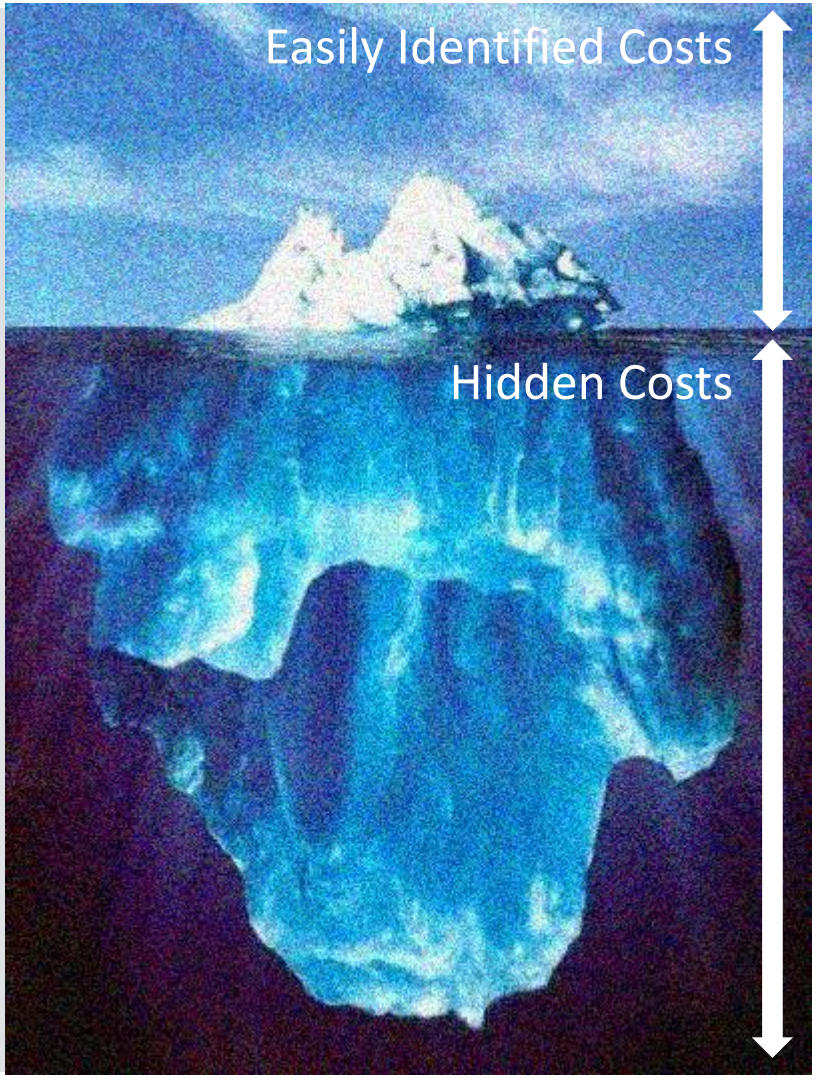
Financial Implications

Waste Facts

Construction Demolition and Excavation Industry

Landfill Tax

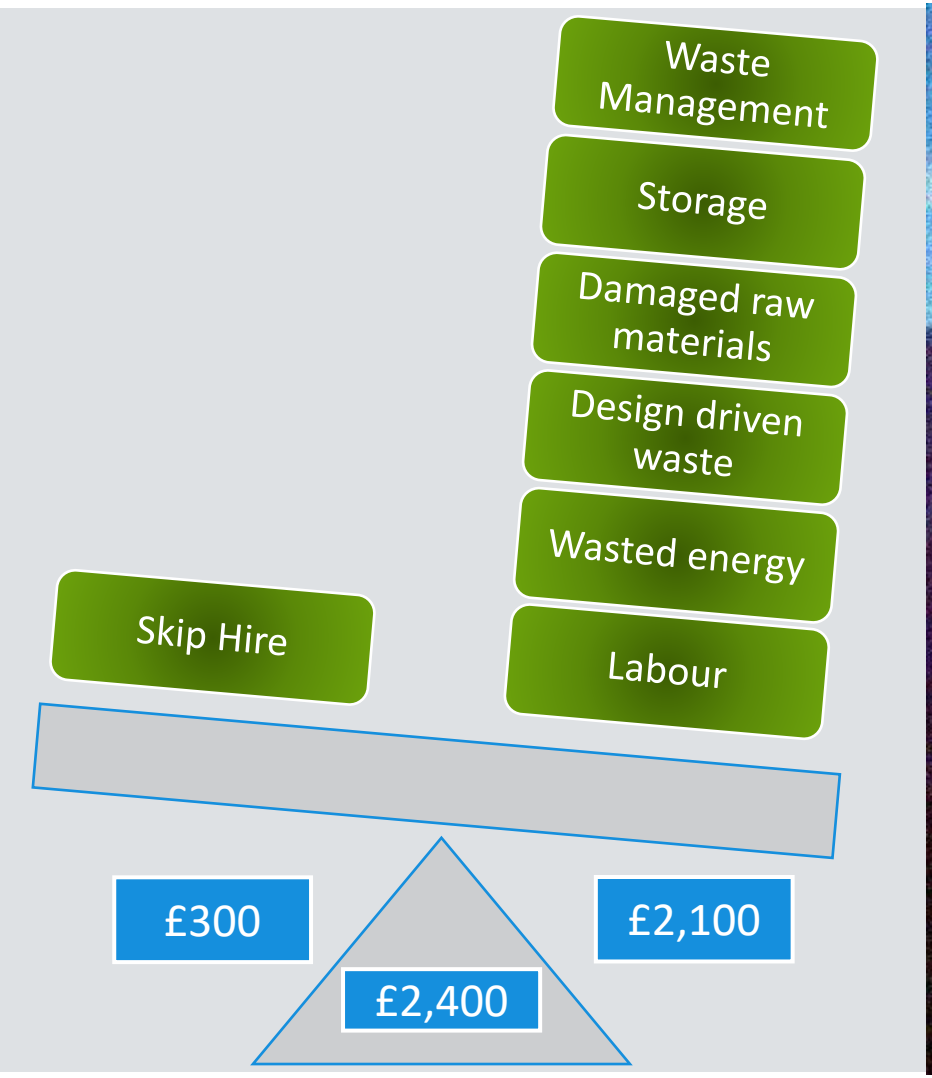
True Cost of Waste

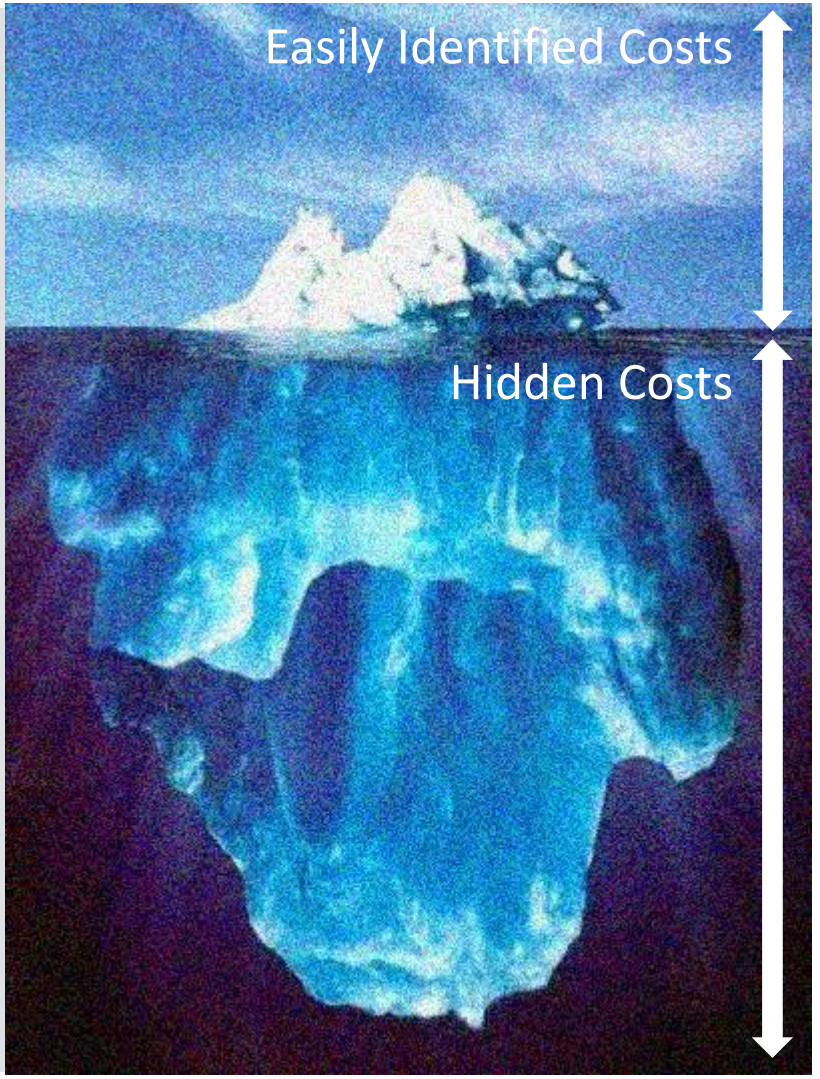


Jamboard exercise

What are the other contributing factors to the true cost of waste?

True Cost of Waste

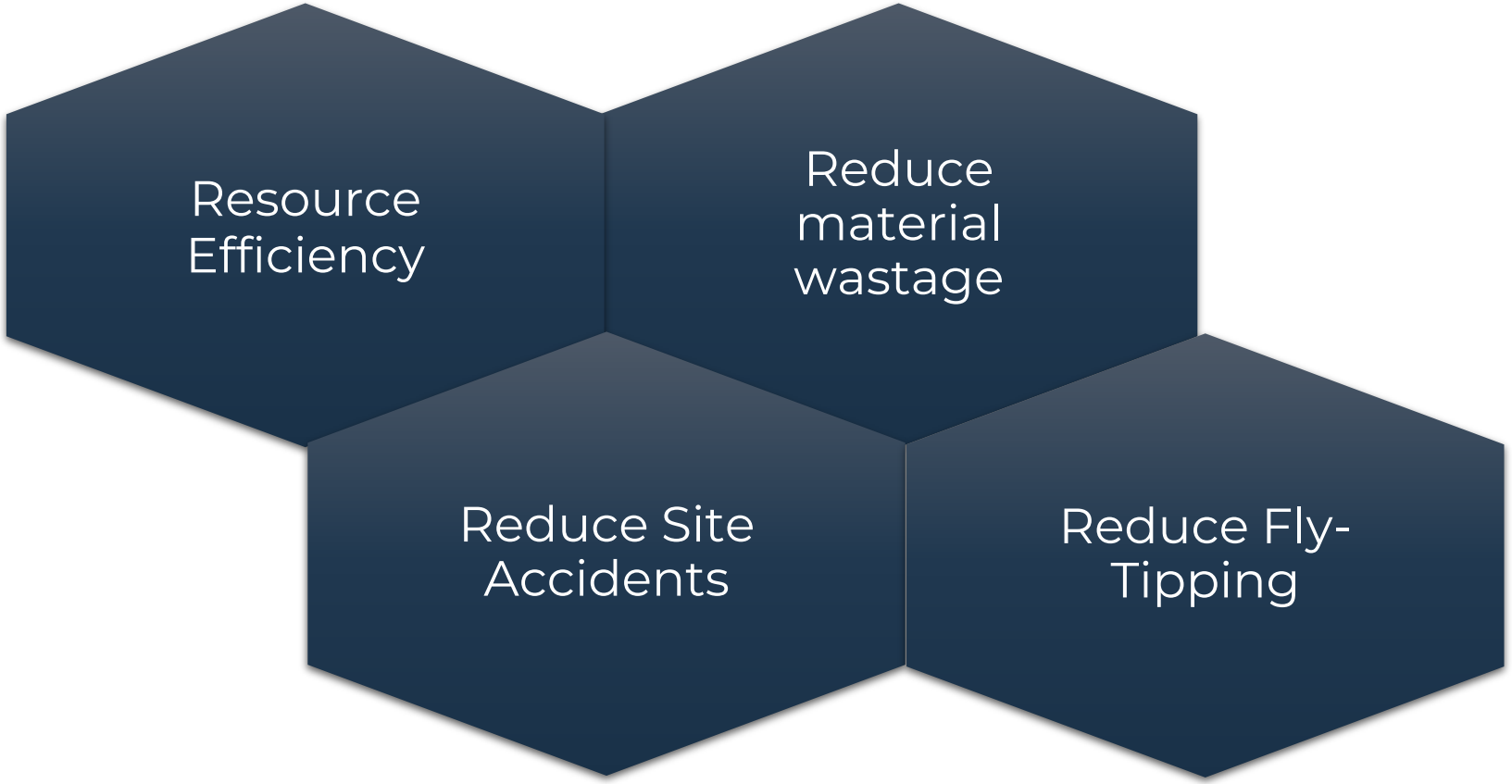




Waste Management & Reduction

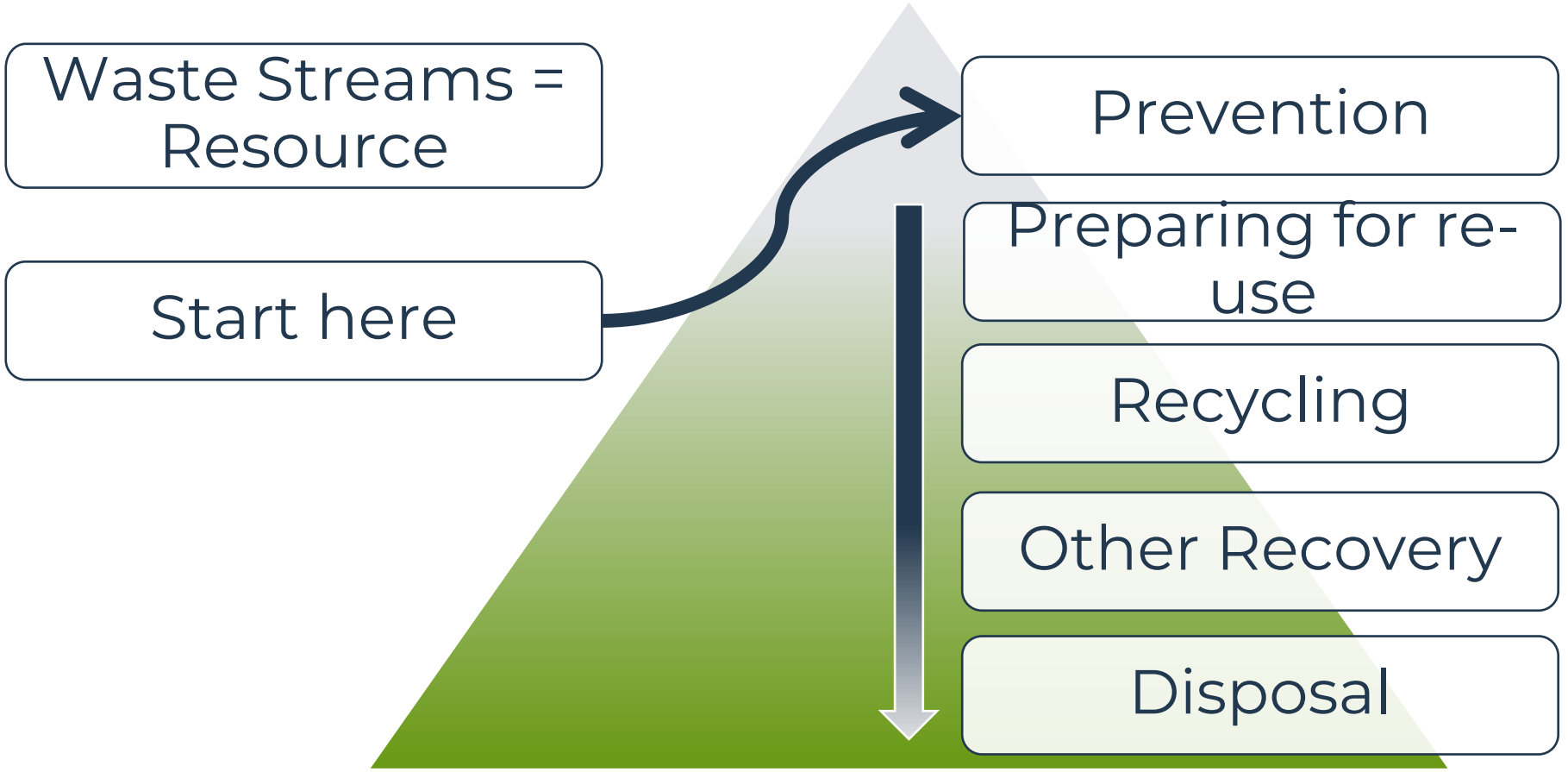
Waste Management Planning

Why bother?



Waste Management Planning

Hierarchy - legislative requirement!



Waste Management Planning

Designing out waste

- Prevention
- Preparing for re-use
- Recycling
- Other Recovery
- Disposal

- Value Engineering
- Pre-fabrication
- Design to Standard Sizes
- Good works planning

Waste Management Planning

What could we do?

- Prevention
- Preparing for re-use
- Recycling
- Other Recovery
- Disposal

- On-Site Aggregate Crusher
- Social Enterprise Schemes /MEPs
- Use on other projects
- Pallet Take-Back

Waste Management Planning

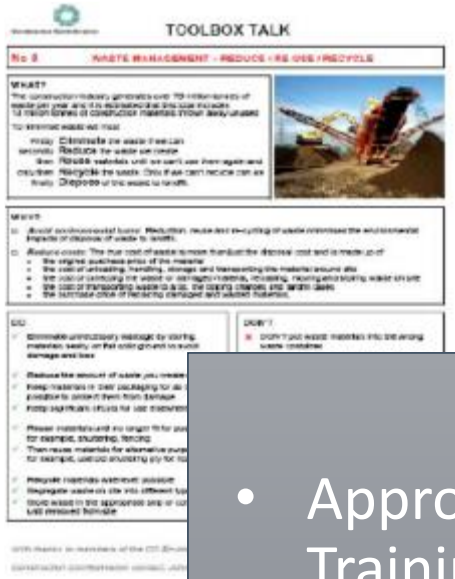
What can we do?

- Prevention
- Preparing for re-use
- Recycling
- Other Recovery
- Disposal

- Inert Skip
- Plasterboard
- Waste Segregation
- Plastics!

Waste Management Planning

Training and Awareness


TOOLBOX TALK

- Appropriate Training
  - Specific Trades
  - Waste Minimisation

- In-House and Sub-Contracted employees
- Waste Management Plan available for all

Waste Management Planning

Good Housekeeping

Plan for efficient materials and waste handling

Set indicative targets on trades and sub-contracts

Early planning essential

Waste Management Planning

Measure

Record

- Quantities and Types of Waste
- Disposal Method

Compare

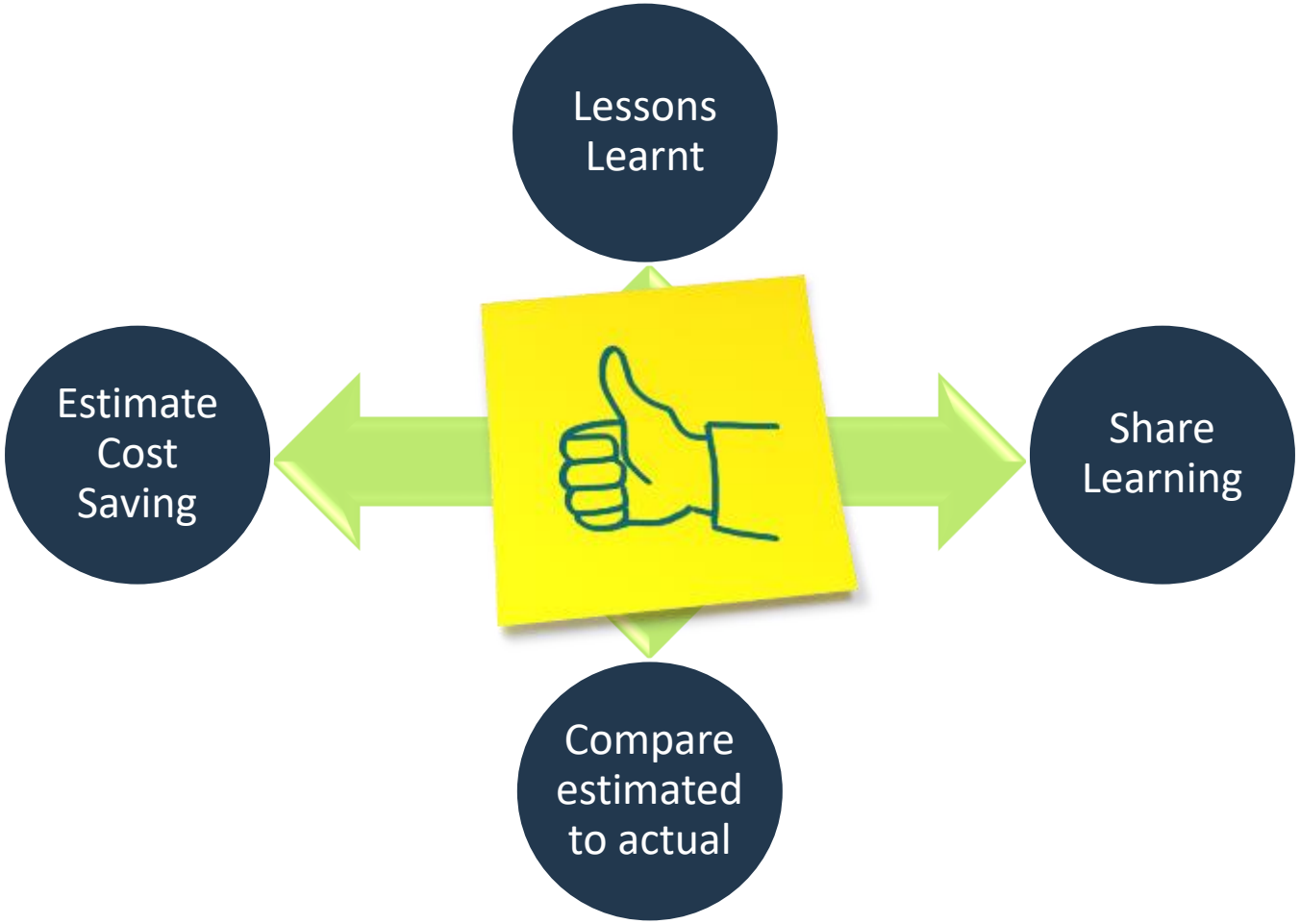
- Actual Vs. Targets
- Review if required

Share

- Inform workforce of progress

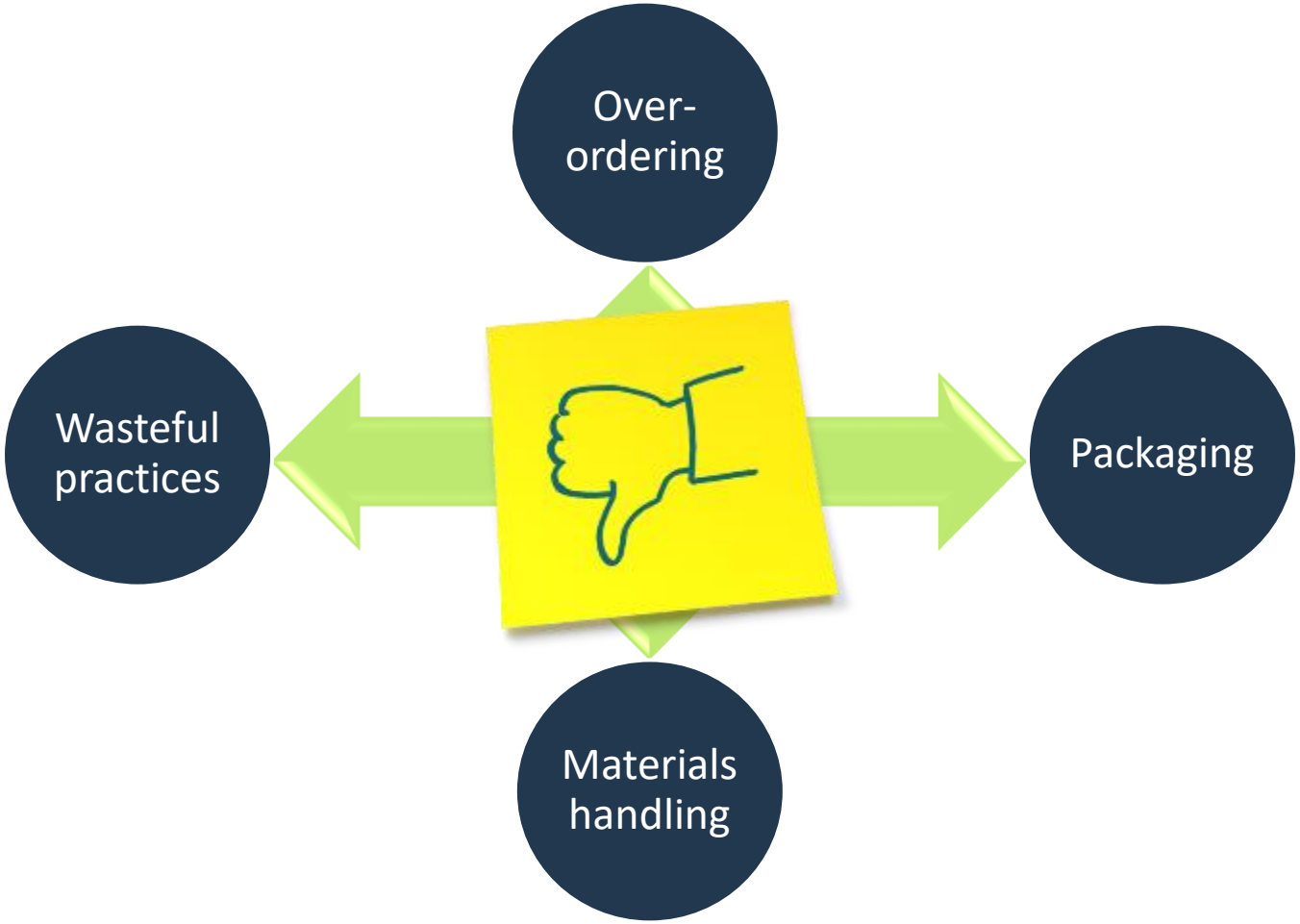
Waste Management Planning

Review



Keep an eye on the enemies!

Review



REDROW

SUSTAINABILITY

WASTE REDUCTION CASE STUDY

OCTOBER 2021

WASTE RESEARCH PROJECT

Built Oxford House type in 3 different regions - Yorkshire, Lancashire and the South East.

Carefully segregated waste from each plot in to different containers for individual waste streams.

REDROW

A VISUAL REPRESENTATION…

1 SKIP FULL OF WASTE WOOD

CONTAINER WITH 8 TONNE BAGS OF PLASTIC/CARDBOARD PACKAGING

1 SKIP OF INERT WASTE

5 TONNE BAGS OF PLASTERBOARD

OFFCUTS

PLASTERBOARD

TIMBER

ELECTRICAL WIRES

ANGLE BEADING

CHIPBOARD FLOORING

PLASTIC PIPING

PREVENTION + REDUCTION

The Waste Hierarchy

Following the waste hierarchy, during the waste project I tried to focus mostly on ideas which could help to prevent and reduce waste.

Therefore the findings here are mostly relating to preventing/reducing waste, but there will be a short section at the end about recycling.

OVER ORDERING

Leftover items:

skirting boards, architraves, timber, soffits & fascias, chipboard flooring, staircase balustrades parts, bricks, blocks, tiles, plastic guttering.

‘Double’ cost to the business:

1) Materials purchased but not required.
2) Costs associated with transporting, offloading, storing and disposing of the surplus items.

PACKAGING

Packaging included shrink wrap, plastic banding and containers for adhesive and paint.

Most packaging waste was generated from the second fix - kitchen and bathroom appliances, radiators and towel radiators, shower screens, door casing wrapping, staircase balustrade wrapping and straps.

INEFFICIENT USE OF MATERIALS

Have the plasterers opened significantly more bags of plaster than can be realistically used before setting?

Traditional low prioritisation of materials costs?

MATERIAL HANDLING

Batch of roof tiles were delivered cracked - damaged during transportation or offloading?

Other products damaged during installation: plasterboard, angle beading, roof tiles, a bath panel and these could not be used.

REDROW

MATERIAL PROTECTION

Some sites were better than others at protecting materials.
Eg use of Brick Jackets (cost £3 each, re-usable) vs not protecting bricks > leading to damage

REDROW

SUPPLY CHAIN ISSUES

WHAT SHALL WE DO WITH THESE?

Long lead-times and material supply issues are making it harder for sites to reject incorrect or inadequate deliveries.

Sites don’t want to wait weeks for a new delivery.

REDROW

SUPPLIER/MANUFACTURER ERROR

Granite worktop for kitchen of plot 121 was manufactured 5mm too short on either side (expensive mistake!)

Some deliveries were incorrect, short in quantity or late.

FREQUENT DESIGN CHANGES

Frequent design changes can cause issues for sites and suppliers.

This batch of rood products was delivered to a waste project plot, for a previous / outdated version of the Oxford House type.

If the products can’t be used on another plot then they may end up as waste.

Tension/restraint straps (60 x £1.48 each = £88.80)

Joist hangers (14 x £3.11 each = £43.54)

Framing anchors (62 x £0.30 each = £18.60)

Joist caps (15 x £2 each = £30)

COMPLEX DESIGN FEATURES

Bespoke door under the stairs was specially manufactured for Redrow and needed to be cut to size on site.

Door was damaged and chipped during cutting and installation and had to be repaired by an external repair worker who filled and painted the door – costing time and money.

REDROW

REDROW

REDUCING WASTE
NEXT STEPS

APRIL 2021

WASTE + BUILDABILITY WORKING GROUP

The research project has given us many good starting points for reducing our waste and identified quick win opportunities.

Working group has been established internally, with various heads of departments eg Commercial, Technical, Construction and Sales. Meeting every other month.

Aims:

- Implement some of the improvement opportunities identified in the research project.
- Determine waste reduction priorities for Redrow, taking various departments and experiences into consideration.
- Identify ways to enhance buildability, in turn improving elements of project performance (eg time, cost)

THE REDUCE RUBBLE
INITIATIVE FROM REDROW

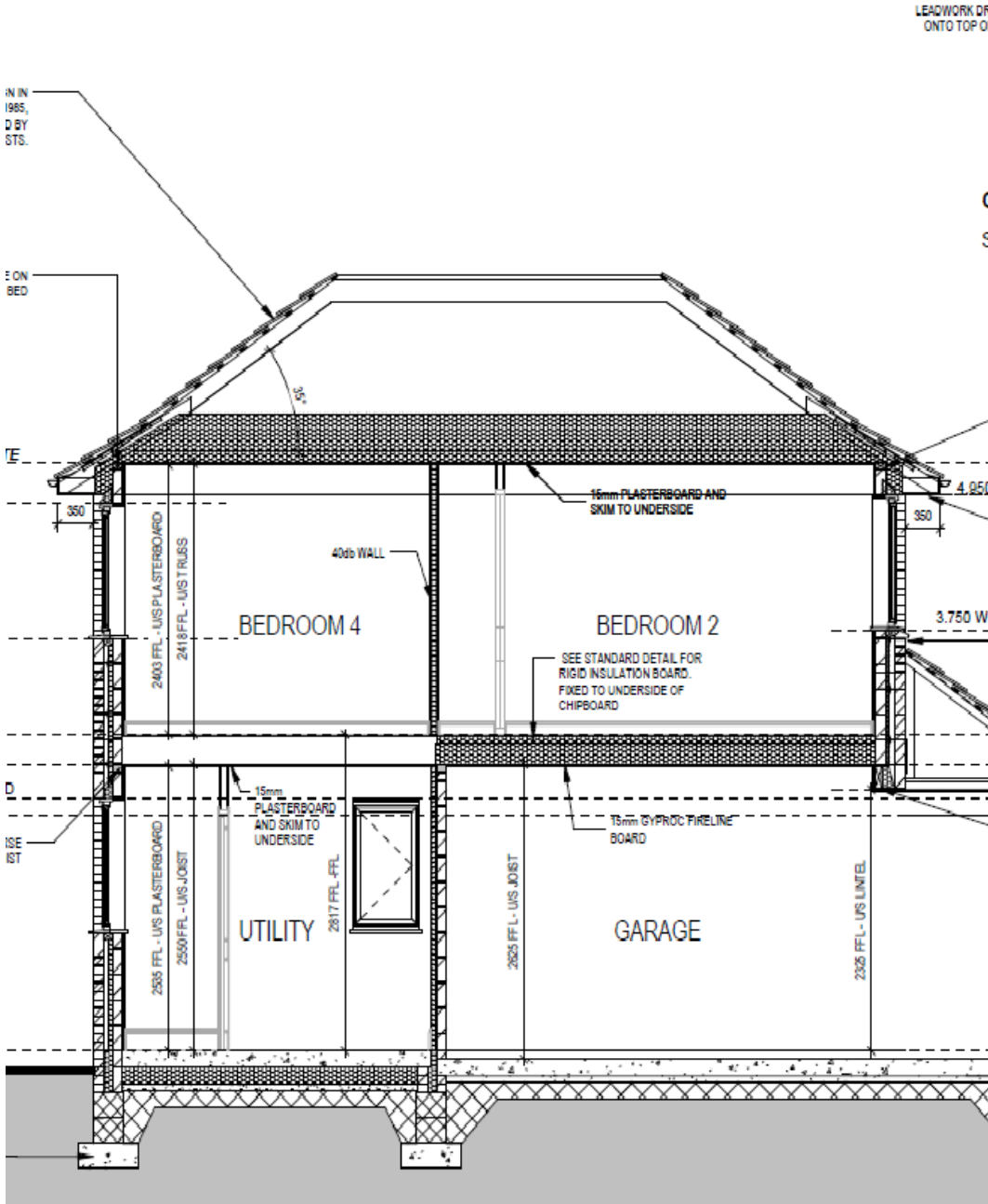
REDROW

Source: REDROW – Supply Chain Sustainability School waste reduction case study webinar

DESIGNING OUT WASTE

We have made some changes to our designs to reduce offcuts or waste generated from complex design features.

- Redesigned the under stairs cupboard and make it more open.
- Simplified skirt/arch lengths used… we used to have large skirt+arch down vs small skirt+arch up.
- Removed internal nibs and reviewed internal inlets/small walls.
- Reduced ground floor ceiling level by 65mm and removed a single course of brickwork, so we can use 2.4m timber instead of 3m (reducing offcuts)



We need to move towards a more Circular model

We want to keep materials and resources in use for as long as possible and avoid waste....

How can you help? And how can we help you?

SUPPLY CHAIN SUSTAINABILITY SCHOOL

Can you think of any good examples of circularity in your business?

Or things that went less well? Why??

Or *things you could introduce that would benefit you and your customers?..*

Construction lifecycle waste web feature

A practical guide to

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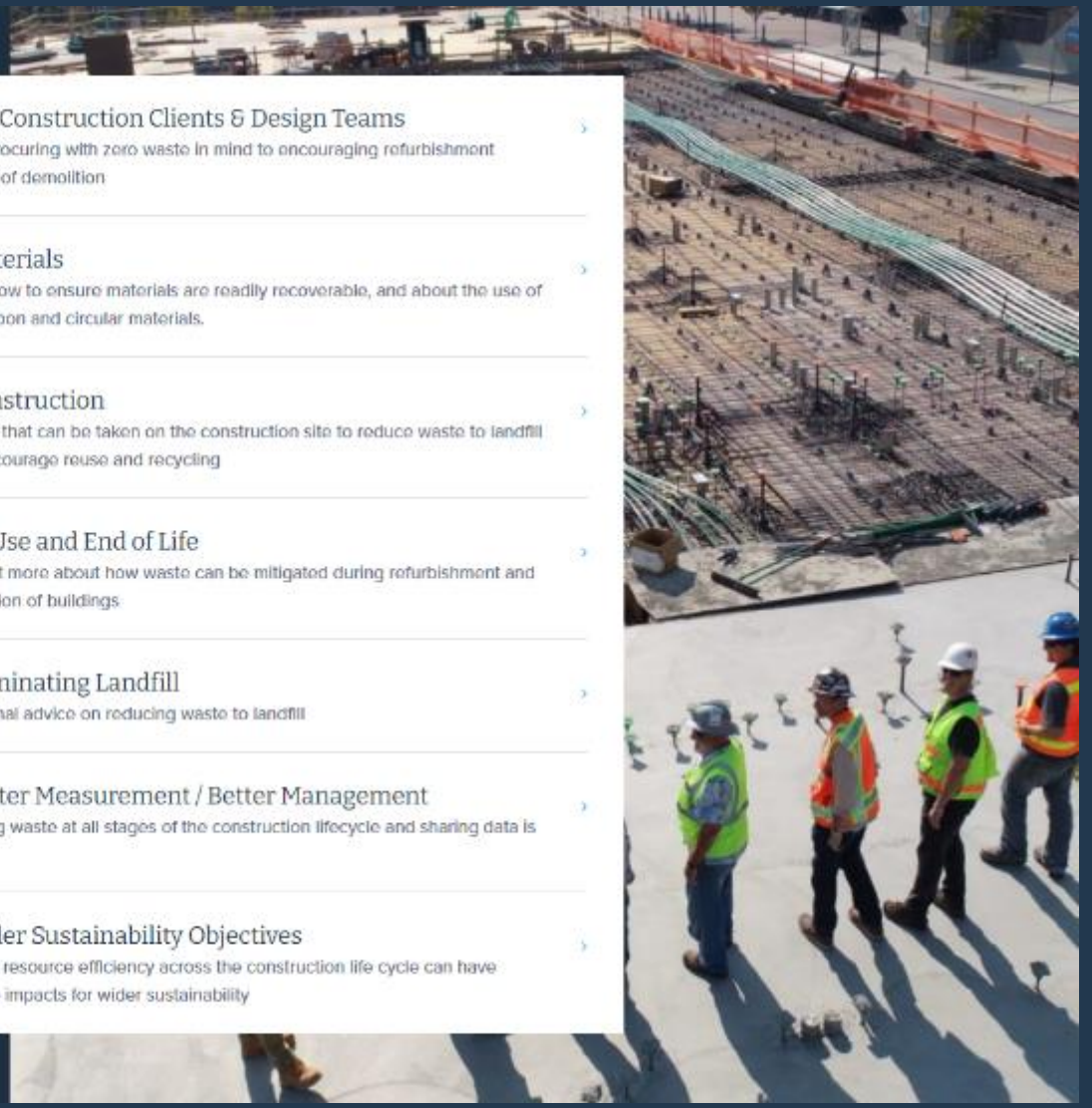
Explore themes and topics for practical examples, learning about the different stages and aspects of a wide variety of construction projects.



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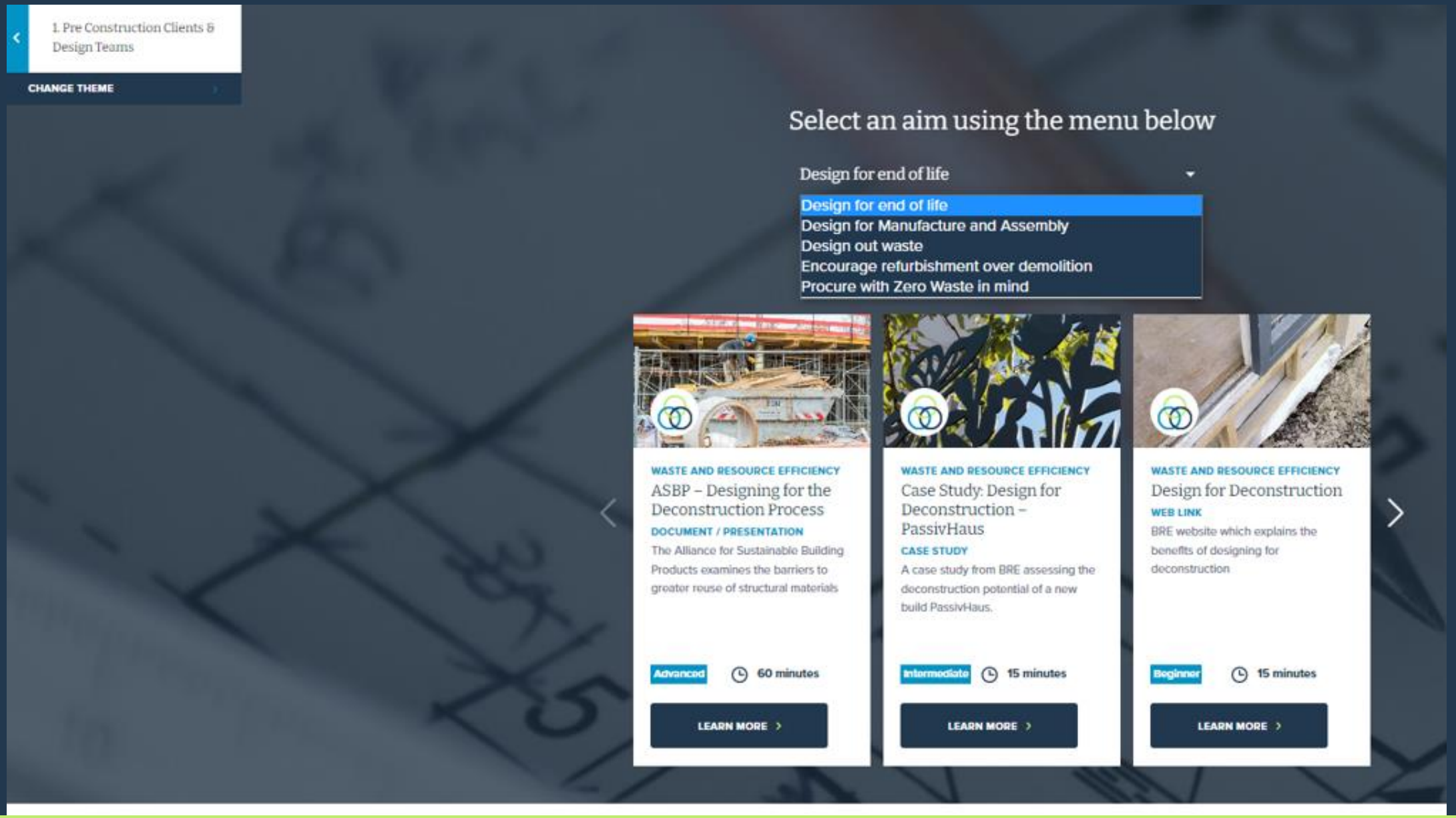
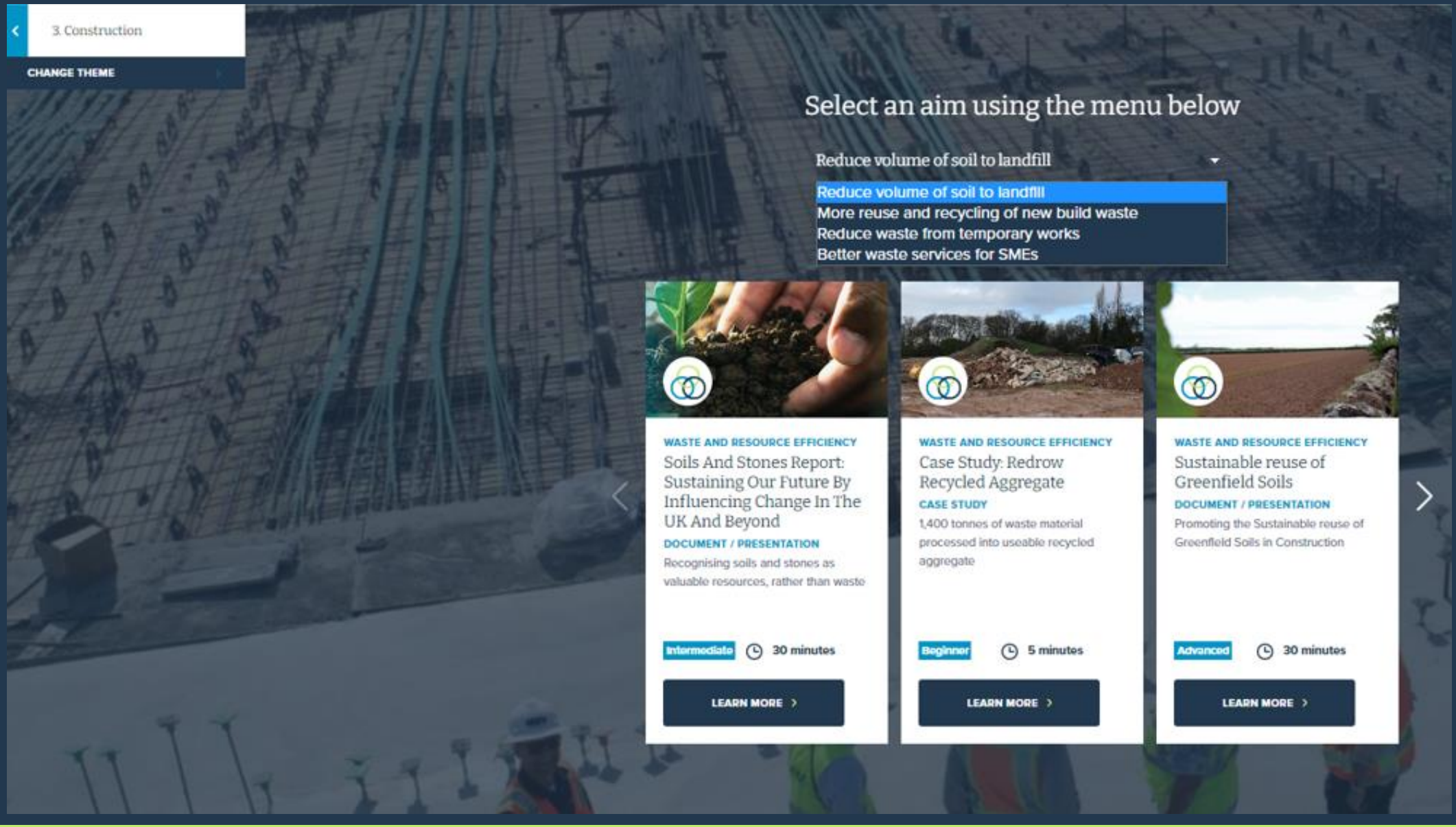
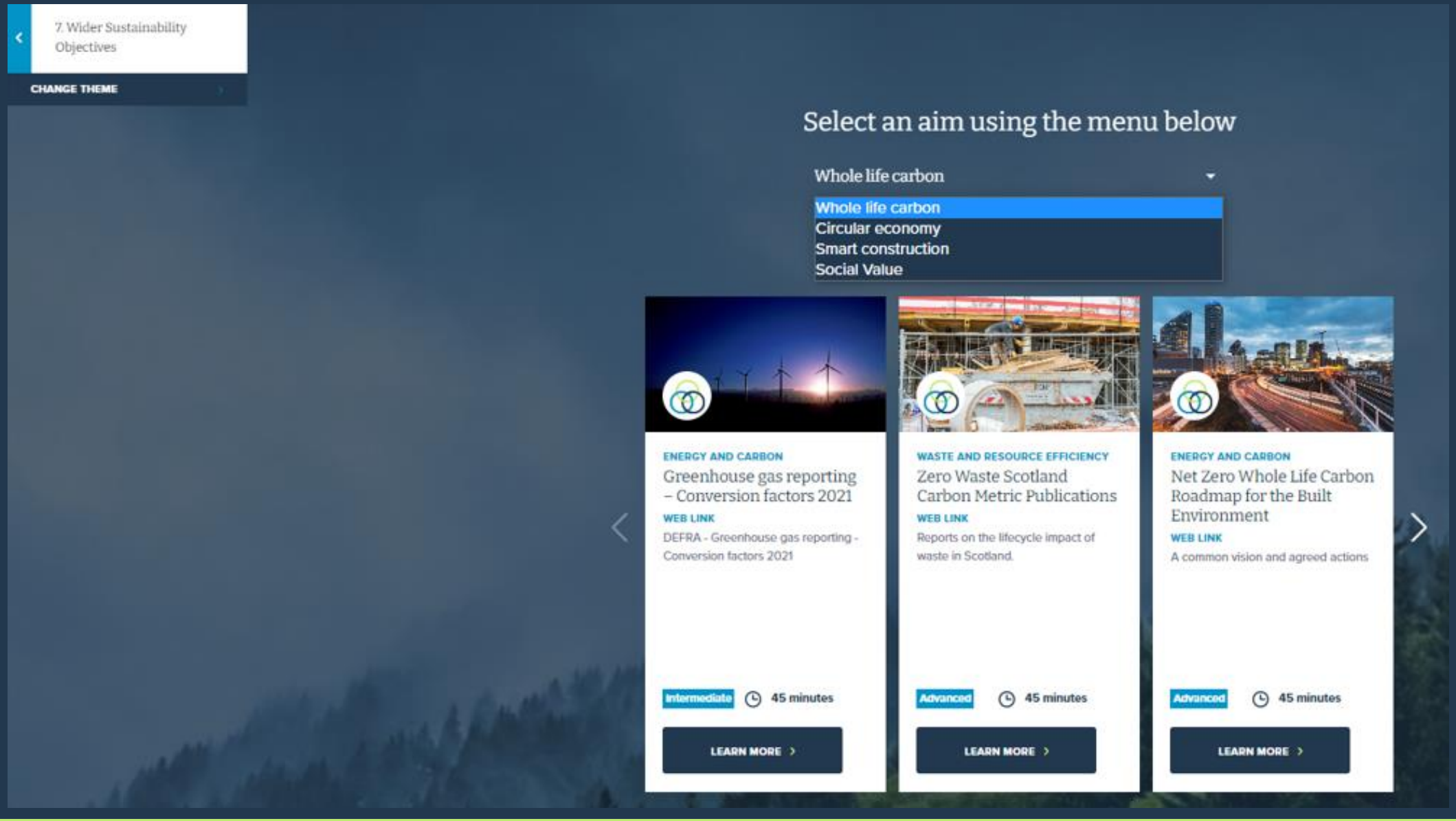


Construction lifecycle waste web feature



Construction lifecycle waste web feature



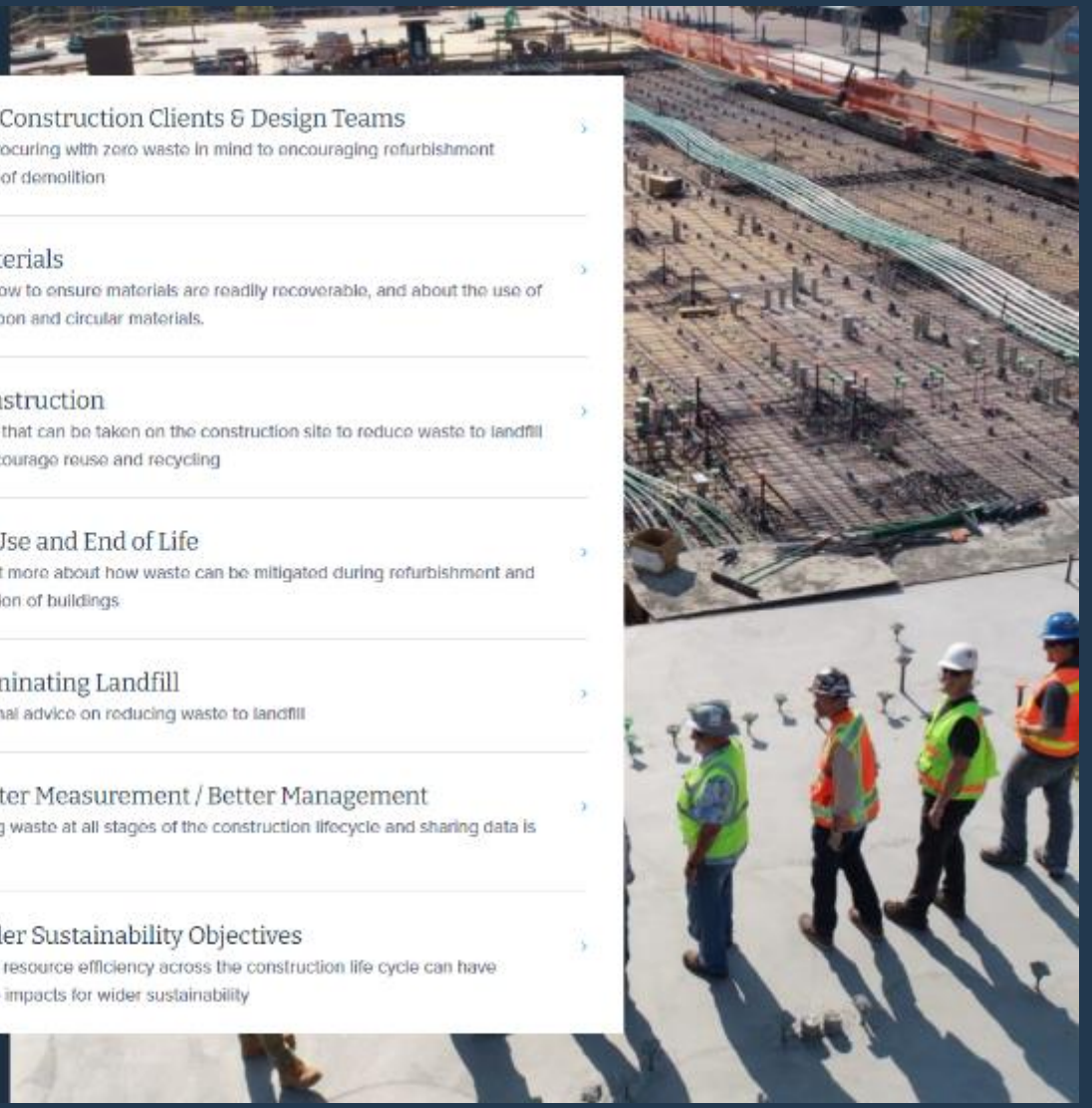
Construction lifecycle waste web feature

A practical guide to

Reducing construction lifecycle waste

These resources help users from all parts of the built environment value chain reduce construction lifecycle waste.

Explore themes and topics for practical examples, learning about the different stages and aspects of a wide variety of construction projects.



1. Pre Construction Clients & Design Teams
From procuring with zero waste in mind to encouraging refurbishment instead of demolition

2. Materials
Learn how to ensure materials are readily recoverable, and about the use of low carbon and circular materials.

3. Construction
Actions that can be taken on the construction site to reduce waste to landfill and encourage reuse and recycling

4. In Use and End of Life
Find out more about how waste can be mitigated during refurbishment and demolition of buildings

5. Eliminating Landfill
Additional advice on reducing waste to landfill

6. Better Measurement / Better Management
Tracking waste at all stages of the construction lifecycle and sharing data is vital

7. Wider Sustainability Objectives
Greater resource efficiency across the construction life cycle can have positive impacts for wider sustainability

Find it here!

https://www.supplychainschool.co.uk/partners/groups/waste-group/

SUPPLY CHAIN SUSTAINABILITY SCHOOL

Other School resources to help you

1. **'Introduction to Waste' e-learning** – available here

2. **MEP map:**
   - Feedback template ✓
   - Promotion & marketing ✓
   - Courtesy email to organisations ✓
   - New recommendations received ✓
     - *Now need to be added*
     - *New tags for social enterprises and academic institutions to be added*

Further learning

Training and Awareness – loads of content in the School library

VIRTUAL: Circular Economy Workshop

Join this event to understand the drivers for moving ...

Tuesday, 21 July 2020, 11:30 AM - 1:00 PM

VIRTUAL: A Circular Economy case study: Whitecroft Lighting and BAM

Join this discussion with BAM and Whitecroft Lighting ...

Monday, 3 August 2020, 1:00 PM - 2:00 PM

Wales and the Circular Economy

The opportunities and benefits for Wales for developing a ...

"Towards the Circular Economy" reports

Ellen MacArthur Foundation

Circular Economy and Resource Efficiency

European Commission: Circular Economy and Resource ...

Circular Economy for SMEs - Project Summary

Project summary and details of European partnerships

European Circular Economy project in Wales

European Circular Economy project kicks off in Wales

Circular Economy Metrics Case Study: Asphalt

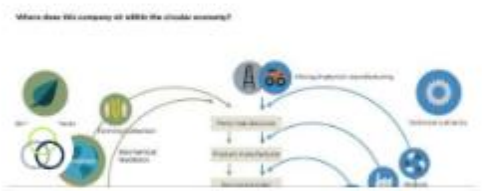
Three of Tarmac's asphalt products were selected to ...

Circular Economy Metrics Case Study: Built Assets

Case study: how progress towards the circular economy ...

CE Indicators and Metrics Tool

Created to calculate the values of Circular Economy Key ...



CE Indicators and Metrics Tool Guidance

Circular Economy Indicators and Metrics Tool Guidance

Embedding Circular Economy Principles

Top Tips for Embedding Circular Economy Principles in the ...

Questions & your feedback please

LINK FOR FEEDBACK

SUPPLY CHAIN SUSTAINABILITY SCHOOL

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