The Landsec Materials Brief

Landsec

The Landsec Materials Brief
Made for Landsec by GXN

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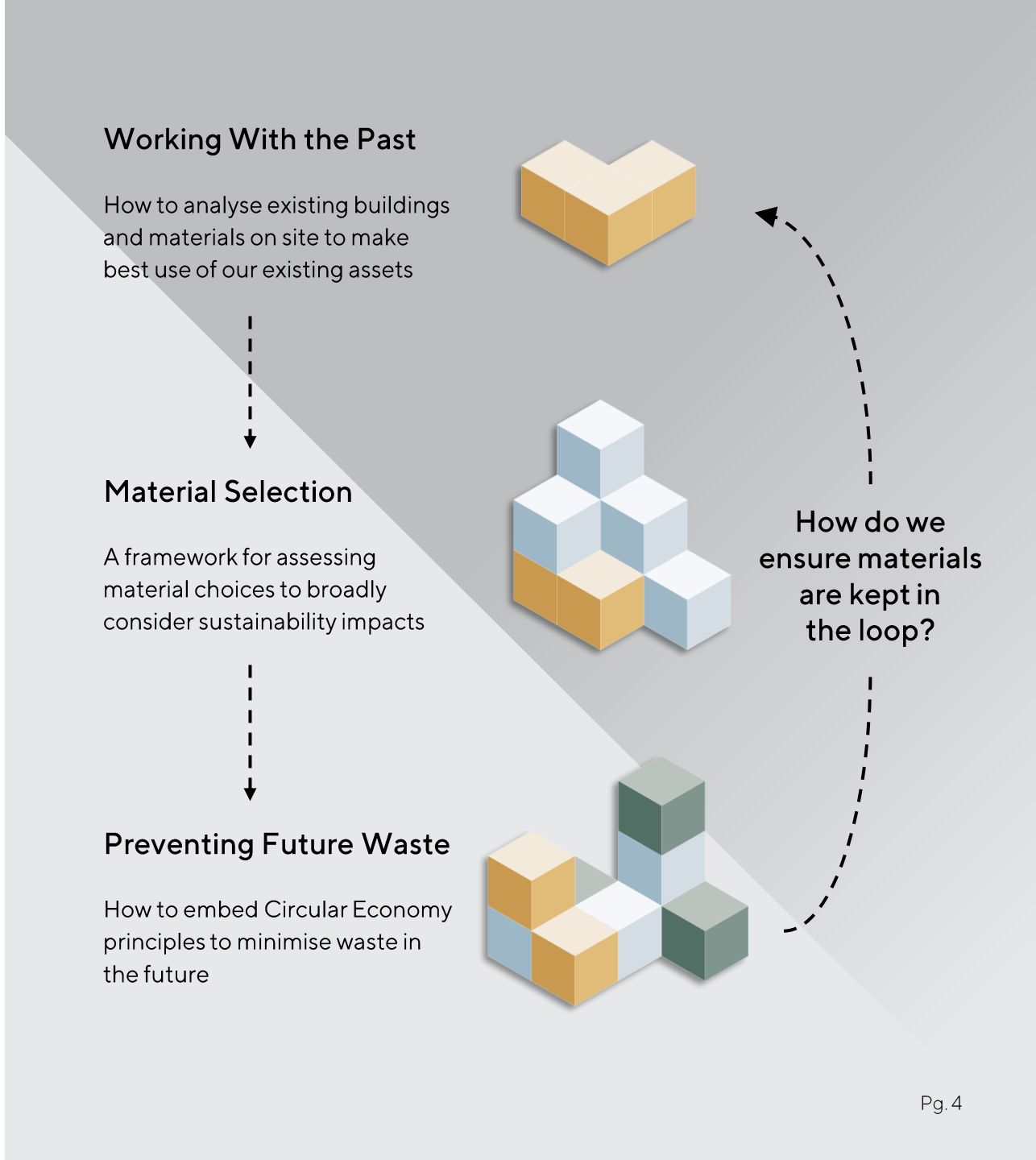
Procuring for a Circular Economy

Purpose of This Guide

We are by now familiar with the environmental shortcomings of our linear economy, and the need to quickly transition to a circular economy where resources are kept in use for as long as possible. This approach is crucial to **minimising waste, carbon emissions, and raw material demand, now and in the future**.

The purpose of this guide is **to establish framework guidance for how we work with and specify materials in a way that is compatible with this future.** This means thinking beyond the time horizon of individual buildings projects to consider:

- **The past: working with existing assets**
  Seeking value from our existing buildings by prioritising refurbishment, and seeking to reuse or recycle components and materials
- **The present: selecting materials in new developments**
  Ensuring that the materials we use in our projects are specified sustainably considering a range of environmental and social impacts
- **The future: preventing future waste**
  Adopting strategies to avoid cyclical unnecessary waste, carbon emissions, and virgin material demand.



No Projects are the Same

In our Sustainable Development Toolkit, we set out our approach to sustainability which seeks to enhance the health of our environment and improve the quality of life for our people. In essence this means a focus on environmental and social sustainability.

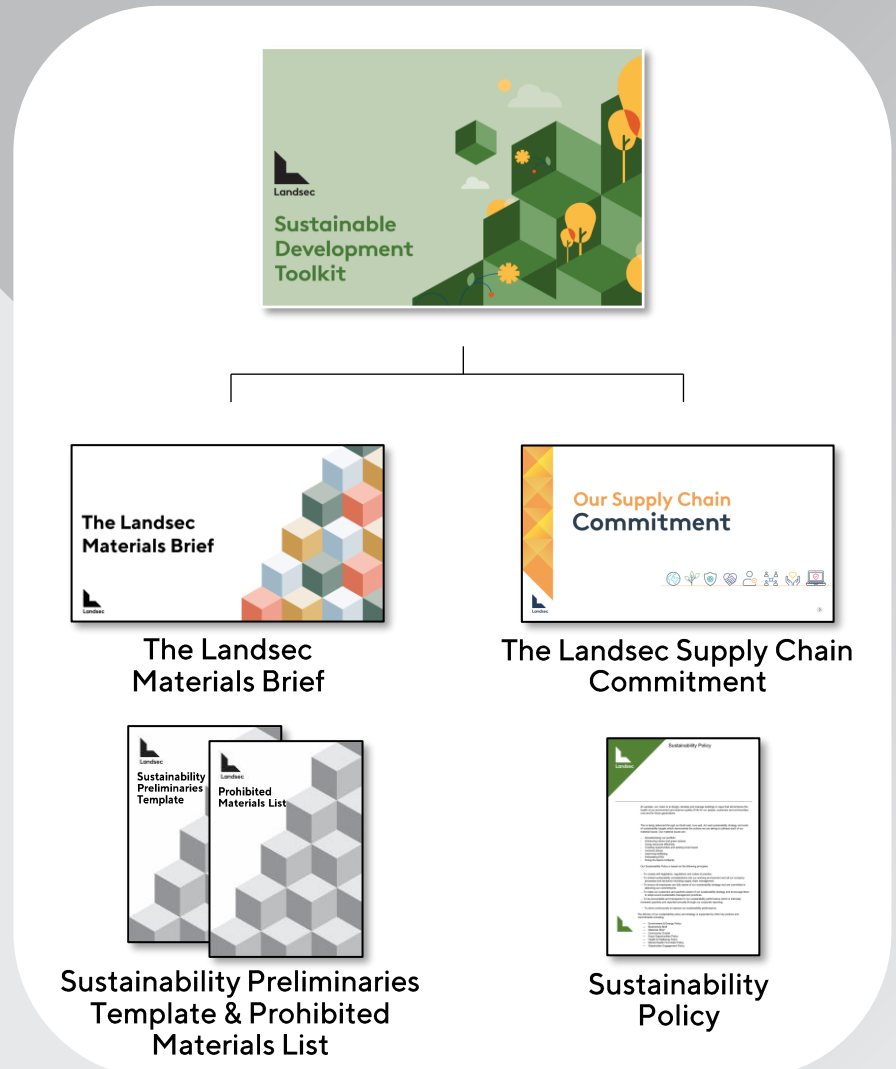
We have developed this framework guidance to help project teams examine these intersections in a systematic manner. The Sustainable Development Toolkit remains the overarching, strategic document for project teams, and is supplemented by this, and other guidance.

Each project will have its unique opportunities and constraints, as well as different levels of ambition. **The guidance is deliberately non-prescriptive, and project teams are encouraged to use this guidance as a starting point for discussion** and adapt it as suitable for their specific project requirements.

We recognise that the ambitions and guidance in this document are challenging, and there will be instances where these are in conflict**. The aim is for project teams to recognise (and often uncover) these interdependencies and make decisions based on what is important to their specific project.**

Key to delivering on our ambitions is being able to secure our work in contract. Accordingly, part of the design process should **focus on identifying key metrics and/or criteria that are precious to the project and can form part of the project specifications.**

A template for Contractor's Sustainability Preliminaries forms part of the appendices. This goes together with the Project-specific Preliminaries which describes a project's particular targets and requirements.



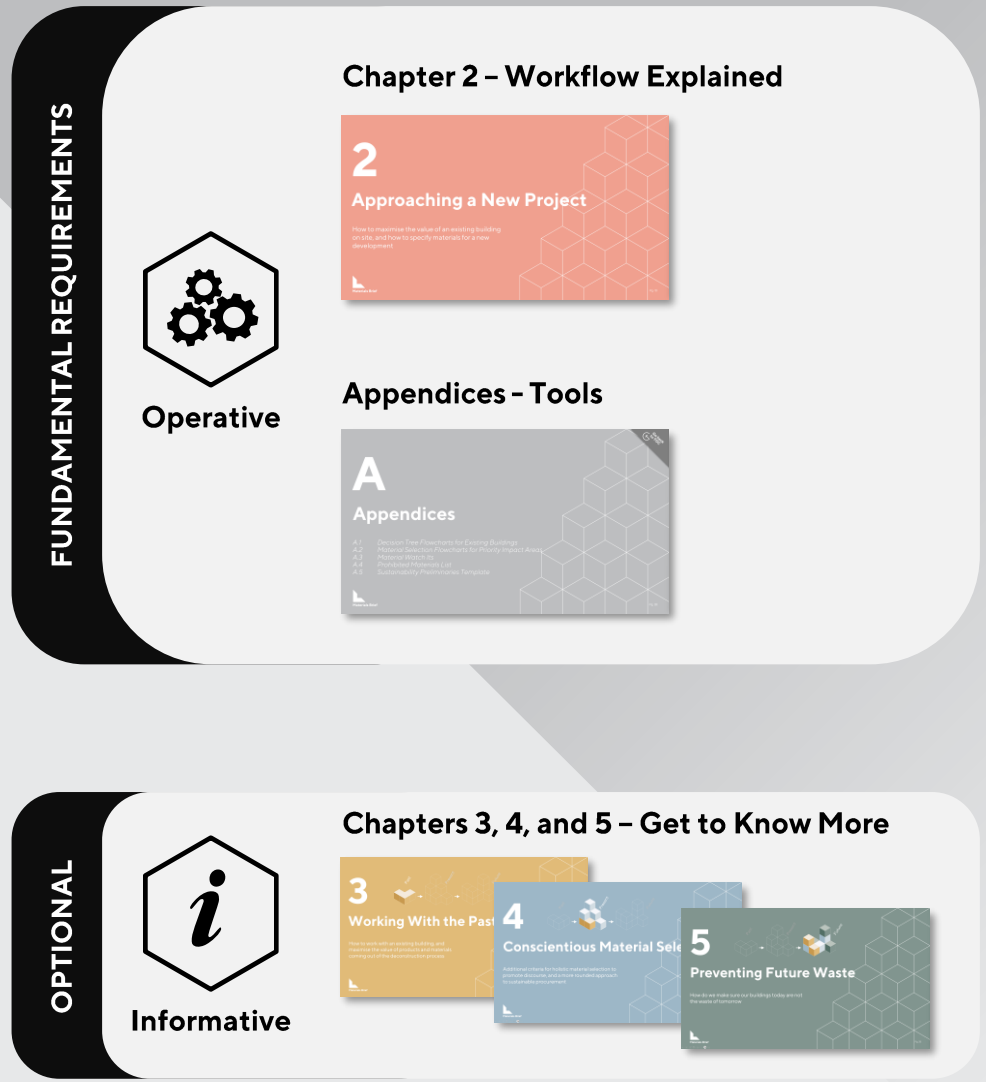
How to Navigate this Guide

This guide is divided into two sections:

- **Operative – Chapter 2 and Appendices (required reading)**
  These chapters outline the fundamental requirements, methodologies, and tools for analysing existing buildings, and specifying materials in alignment with Landsec's objectives.

  The documents are provided for both design and delivery stages. The guidance and flowcharts are intended to aid project teams during design, and these are captured in the Sustainability Preliminaries for delivery. The latter is supplemented by the Prohibited Materials List, and project-specific preliminaries for each discipline.

- **Informative – Chapters 3, 4, and 5 (optional reading)**
  These chapters provide detailed insights into supplementary information for material specifications, aimed at encouraging project teams to think broadly, and to go beyond the minimum Landsec requirements.



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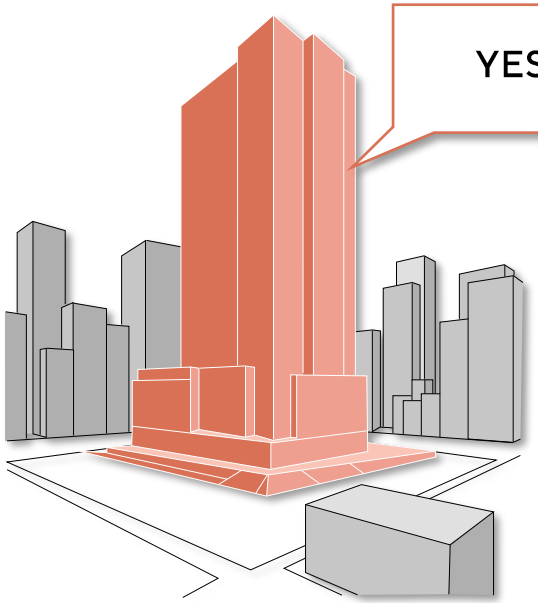
Approaching a New Project

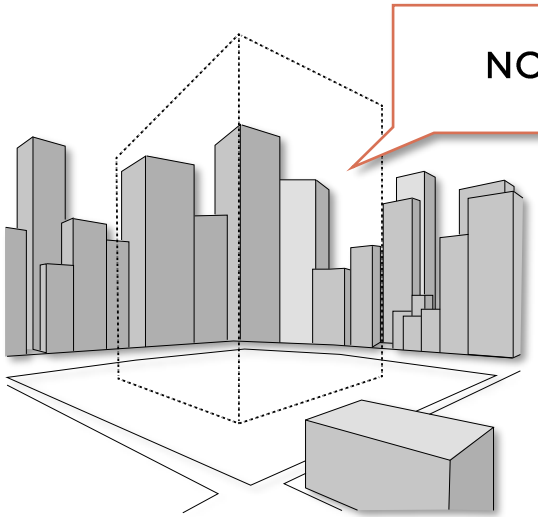
How to maximise the value of an existing building on site, and how to specify materials for a new development

Is there an existing building on site?

YES



NO



Click on the answer to quickly move to relevant section of the document.

Approaching an Existing Building
Value Hierarchy

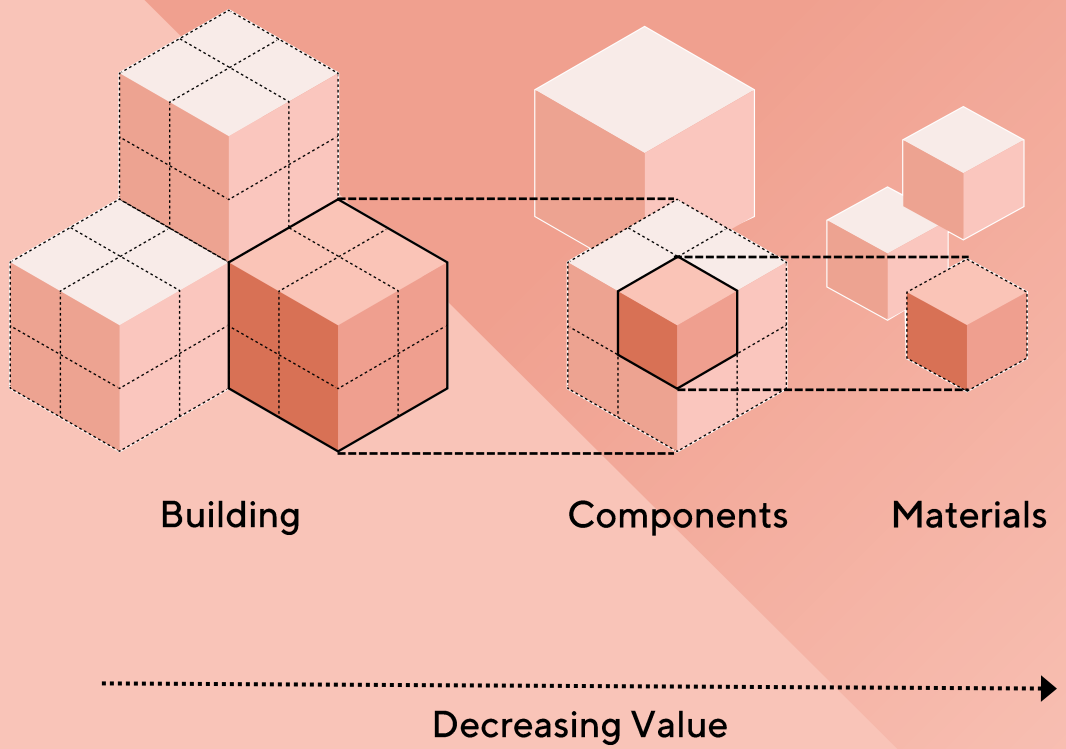
Where there is already a building on site, the project team should seek to retain as much as possible of the existing building value, keeping in mind that **the value of a building is more than the sum of its components and materials. It is in this configuration that the constituent elements have their highest value.**

Even if it were possible to disassemble the building and recover every material without any waste or damage, the energy and information that went into creating and assembling it in the first instance is lost forever. This represents a loss in value.

Our overarching aim is to retain as much value as possible. This means buildings should be retained as buildings, or part thereof, wherever it is feasible to do so.

Where this is not feasible, retention as whole components or products should be preferred, before finally separating into individual materials.

Project teams should apply this lens to their thinking when working with existing buildings and materials.



Focus Materials
Identifying Component and Material Hotspots

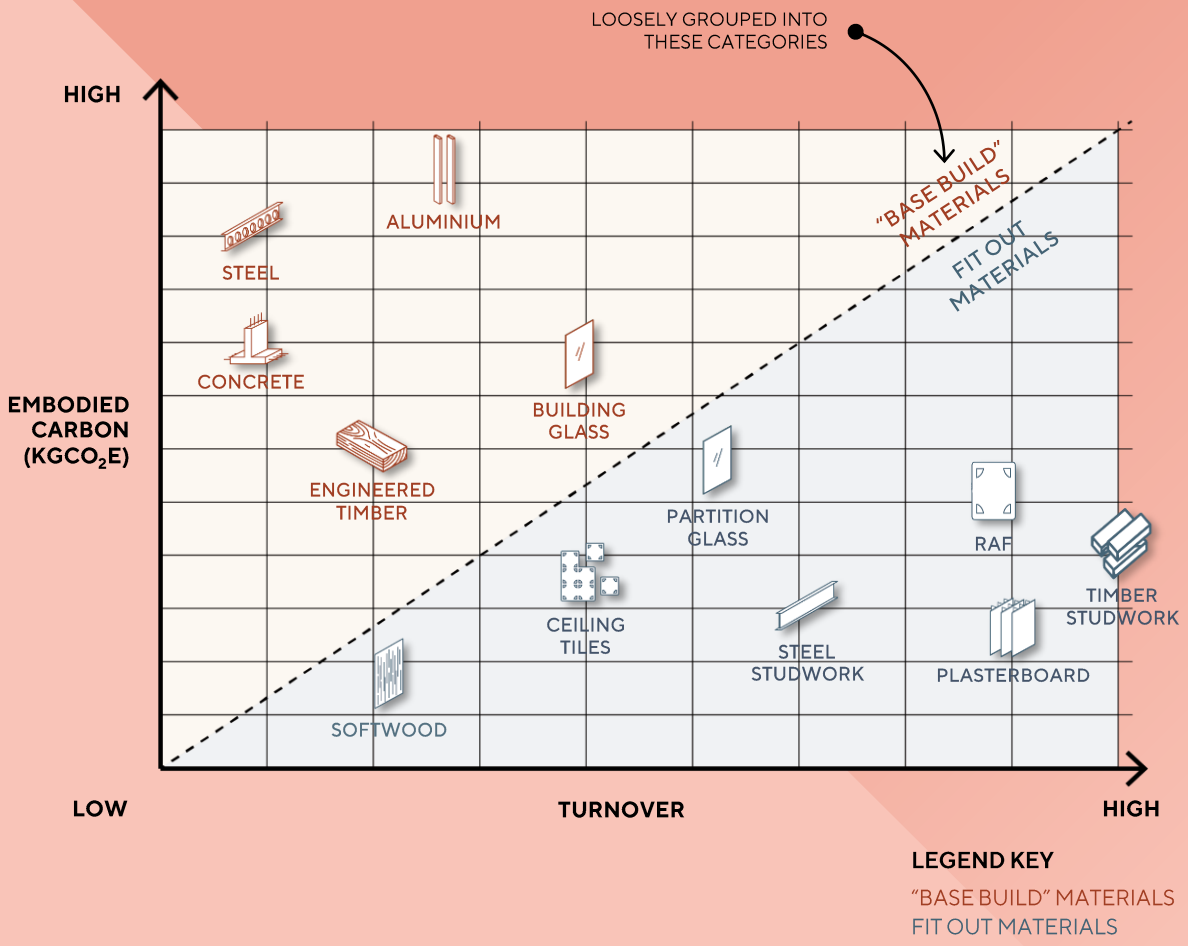
It is acknowledged that determining optimised strategies for all components and materials simultaneously is a challenge beyond the influence of an individual project. Accordingly, **project teams should identify the focus areas that are relevant to the specifics of their project.**

One way to do so is to identify which components and materials have the most impact. This may be considered in terms of carbon, turnover, resource use, waste, or any measures the project team deems important. These are known as hotspots.

The diagram alongside shows this process indicatively for a selection of common materials. It identifies that clearly materials falling near the top right of the diagram would be high priority materials to consider, and any falling in the bottom left would be low priority materials. Project teams are encouraged to categorise according to:

- **"Base build" core construction materials**
  These typically have more carbon impact but lower frequency of turnover
- **Fit out materials**
  These may have lower individual carbon impacts but are generally replaced more often.

Ambitious project teams could also focus on driving innovation, by selecting to focus on components or materials for which good practice end of life routes do not yet exist. For example, research is needed into improving the end of life routes for in-situ concrete and composite metal decks. Project teams could look to test innovative approaches for such materials and publish the findings to advance the industry's capabilities.



Working with Existing Buildings
Process Overview

Scan market for suppliers that will reincorporate post-consumer material in their supply chain, donate to charity, etc.

Optional step for more ambitious projects

1 Analyse Existing Building

Conduct a materials audit utilising the Landsec template, identifying quantities and qualities of existing components and materials. **Establish retention options in a feasibility study to be agreed with Landsec**.

2 Establish Targets & Principles

Establish a unique sustainability vision, targets, and principles, which are used to steer decision making. **This vision should be presented and agreed with Landsec.**

3 Optimise End of Life routes for Key Components & Materials

Identify the project's focus components and materials. Refer to the flowcharts in Appendix A.1 to systemically identify the optimal end of life routes for each focus component or material. **Agree a material recovery strategy with Landsec.**

3a Develop Hero Ideas

Develop hero ideas that support the project's principles. Good places to focus are innovations that shift the market, or opportunities visible in publicly-accessible areas. Work with partners and the wider supply chain and understand the steps needed to deliver the ideas. **To be agreed with Landsec.**

4 Develop Design Documentation & Specifications

Agree approaches with key stakeholders (insurance, Building Control, demolition contractor, leasing, etc). Work with the demo/enabling works contractor and wider project team to **develop design documentation and specifications so the end of life routes can be secured in contract.**

5 Track Optimised End of Life Routes

Track optimised end of life routes and/or hero ideas through demolition and construction. **Report back to Landsec**.

Go to next page for detailed roadmap

Working with Existing Buildings
Roadmap

Process Description
Led by
Deliverable
Tool from Appendix

RIBA STAGES: 0 | 1 | 2 | 3 | 4 | 5

LANDSEC STAGES: FEASIBILITY; PRE-PLANNING/PLANNING; DETAILED DESIGN; PROCUREMENT & CONSTRUCTION

Analyse Existing Building — 1

Analyse existing building. Identify potential materials/products for reuse (using flowcharts), focus materials, and conduct a materials audit.

Sustainability Consultant

Feasibility Study of Retention Options & Materials Audit

Appendix A.1 / Flowcharts 01 & 02

Establish a Vision, Targets & Principles — 2

Establish vision, briefing, targets. To be presented and agreed with Landsec.

Sustainability Consultant

Agreed targets and principles

Scan market for suppliers that will reincorporate post-consumer material in their supply chain, donate to charity, etc.

Optimise End of Life Routes for Key Components & Materials — 3

Identify focus materials and optimised end of life routes (using flowchart). End of life routes and any innovation ideas to be presented to Landsec.

Sustainability Consultant to set agenda, coordinate, and track. Research and input relating to specific materials to be undertaken by relevant discipline.

Summary of optimised end of life routes. Complement with budget costs.

Appendix A.1 / Flowchart 02

Develop Hero Ideas — 3a

Optional step for more ambitious projects

Work with demo/enabling works contractors to understand steps needed to deliver. Consider: deconstruction process, transport, storage, testing, insurance (as appropriate). To be agreed with Landsec.

Specific materials led by relevant discipline. Sustainability Consultant to coordinate.

Summary of hero ideas. Complement with budget cost estimates nearer procurement.

Develop Design Documentation & Specifications — 4

Engage with demo contractors (and other stakeholders) to develop specs and documentation to secure optimised end of life routes and/or hero.

Specific materials led by relevant discipline. Sustainability Consultant to coordinate.

Contract specifications

Track Optimised End of Life Routes — 5

Track optimised end of life routes and/or hero ideas through demolition and construction.

Specific materials tracked by relevant discipline or Contractor. Disciplines to coordinate responsibility depending on contract terms.

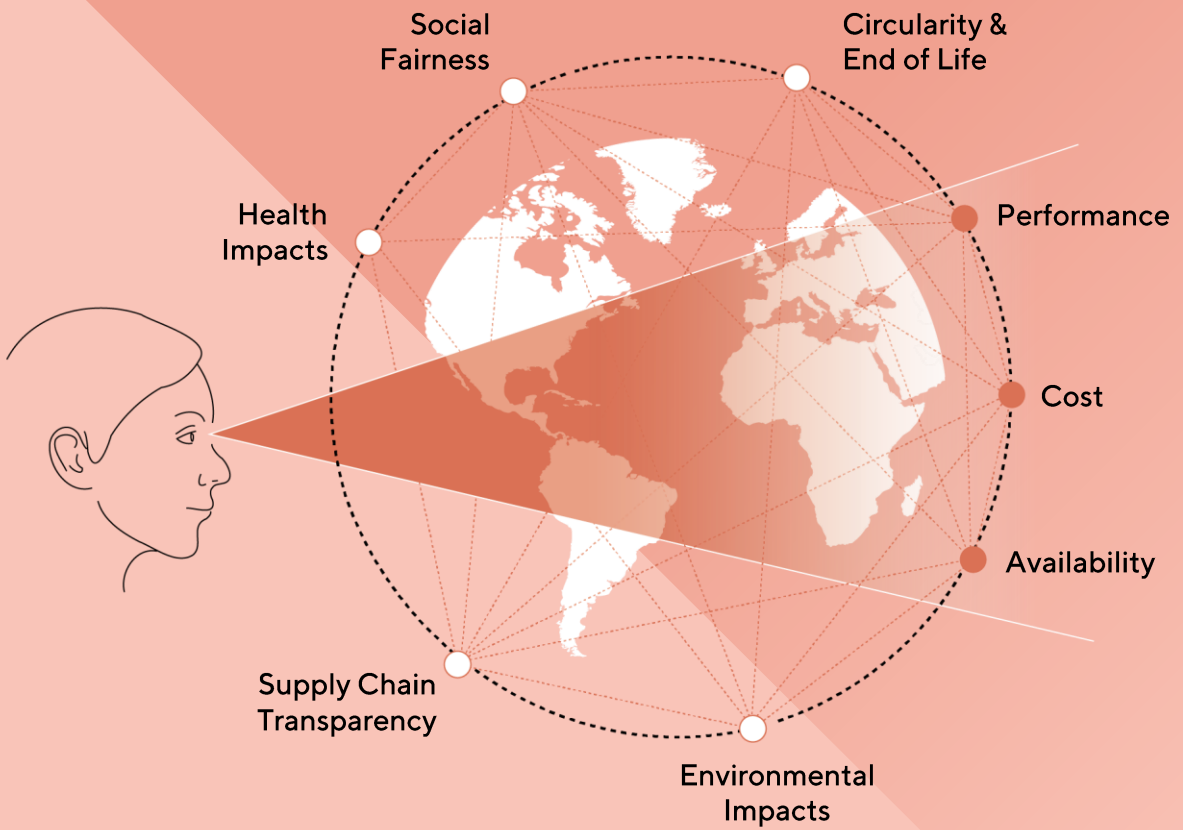
Summary report

Specifying new materials
Sustainability is Complex

Historically, choosing and specifying materials has been driven by performance, cost, and availability. But as we transition towards a more sustainable built environment, we are increasingly considering the sustainability attributes in the materials we select.

In the UK, this has led to a focus on embodied carbon emissions in materials, but we should be cognisant of the myriad other factors that impact the sustainability landscape and our material selection. These include, but of course are not limited to:

- Environmental impacts
- Health impacts
- Social fairness
- Supply chain transparency
- Circularity and end of life considerations.



Our Priority Impact Areas
Process Overview

At Landsec, we have pinpointed several priority impact areas for material selection to guide our project teams. **These areas are outlined not in a fixed or quantifiable manner but in a hierarchical order to foster discussions among the team, and promote evidence-based decision-making.**

For assistance in decision-making, flowcharts are available in Appendix A.2.

The process is to establish consensus on the specific priorities for each project, then compare selected products and materials against these impact areas.

Some data will not be readily available, and project teams should request the supply chain to provide feedback for particular materials. Teams could use the Material Supplier Questionnaire in the Sustainability Preliminaries, as part of their market research.

The feedback should be used to compare and select the most appropriate materials. This information should then translated into detailed specifications for implementation in contract.

Check the materials/products against selection hierarchy flowchart

For Priority Impact Areas Hierarchy Flowchart go to Appendix A.2

Compare and select desired materials/products/systems

Material Supplier Questionnaire in Sustainability Preliminaries could be used to facilitate research.
Example Dashboard in Appendix A.2 for tracking results.

Translate selected performance into specifications

Material Selection in a New Development

Process Overview

Define Scope and Select Materials, Systems And Products

Establish scope and select impact areas. Using the flowcharts and comparison dashboard in the Appendix, question and challenge building systems.

Establish focus materials and products (see pages 10 and 14). For more ambitious projects, check Chapter 4 for possible other additional criteria. **To be agreed with Landsec.**

Request and Analyse Data

Based on the criteria in Step 1, individual disciplines should request the data from product and material suppliers. **Discuss results with Landsec**.

Test with Market

Assess products and materials against the market with cost consultant, contractor, and wider supply chain to test the availability, feasibility, etc. May require further detailed research. **Record the results and discuss with Landsec.**

See example of dashboard in Appendix A.2

Develop Specifications

Work with the wider project team to **develop design documentation and specifications** so the material performance can be secured in contract.

Include Material Supplier Questionnaire for key materials in tender requirements.

Track Submittals

Track material submittal returns and review against performance requirements.

Go to next page for roadmap

Material Selection Process
Roadmap

Process Description
Led by
Deliverable
Tool from Appendix

RIBA STAGES: 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7

LANDSEC STAGES:
- FEASIBILITY
- PRE-PLANNING/PLANNING
- DETAILED DESIGN
- PROCUREMENT & CONSTRUCTION
- COMMISSIONING/POST-CONSTR
- BUILDING OCCUPATION

Define Scope and Select Materials, Systems And Products — 1

- Evaluate baseline systems design and establish focus materials and priority impact areas (beyond min. Landsec requirements). See pages 10 and 14. To be presented and agreed with Landsec.
- Sustainability Consultant to lead and coordinate. Specific materials led by relevant discipline.
- Summary of focus materials and priority impact areas

Request and Analyse Data — 2

- Request and analyse data against chosen impact areas (use selection hierarchy flowcharts). Teams could use Material Supplier Questionnaire in Sustainability Preliminaries to help research.
- Specific materials led by relevant discipline. Sustainability Consultant to coordinate and track.
- Discuss results with Landsec
- Appendix A.2 / Material Selection Flowcharts
- Appendix A.2 / Material Selection Dashboard Example

Not a hard deliverable, but a conversation at strategic times

Test with Market — 3

- Test materials with market considering procurement, cost, risk, etc. Update dashboard to reflect market testing.
- Specific materials led by relevant discipline. Sustainability Consultant to coordinate and track.
- Discuss results with Landsec
- Appendix A.2 / Material Selection Dashboard Example

Not a hard deliverable, but a conversation at strategic times

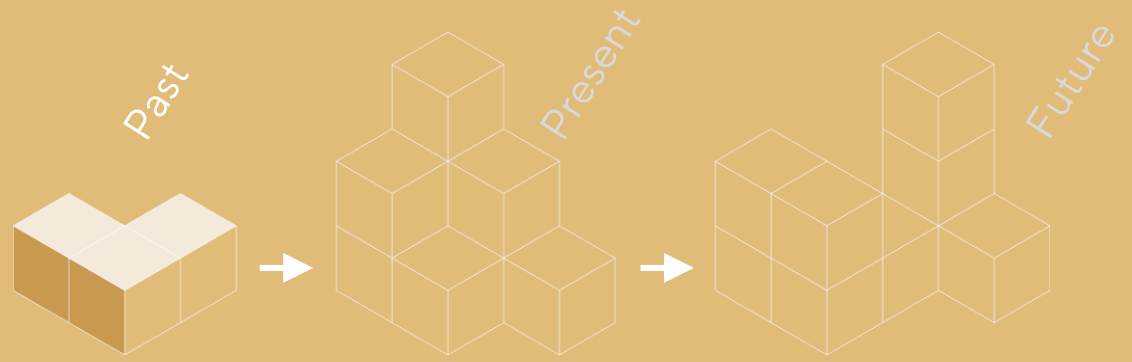
Develop Specifications — 4

- Develop specifications and documentation to secure performance in contract.
- Specific materials led by relevant discipline. Sustainability Consultant to coordinate.
- Contract specifications (including Material Supplier Questionnaires, as appropriate).

Track Submittals — 5

- Track material submittal returns and review against performance requirements.
- Specific materials led by relevant discipline.

3



Working With the Past

How to work with an existing building, and maximise the value of products and materials coming out of the deconstruction process

Net Zero Design and the Waste Hierarchy

Materials Have a Hierarchy Too

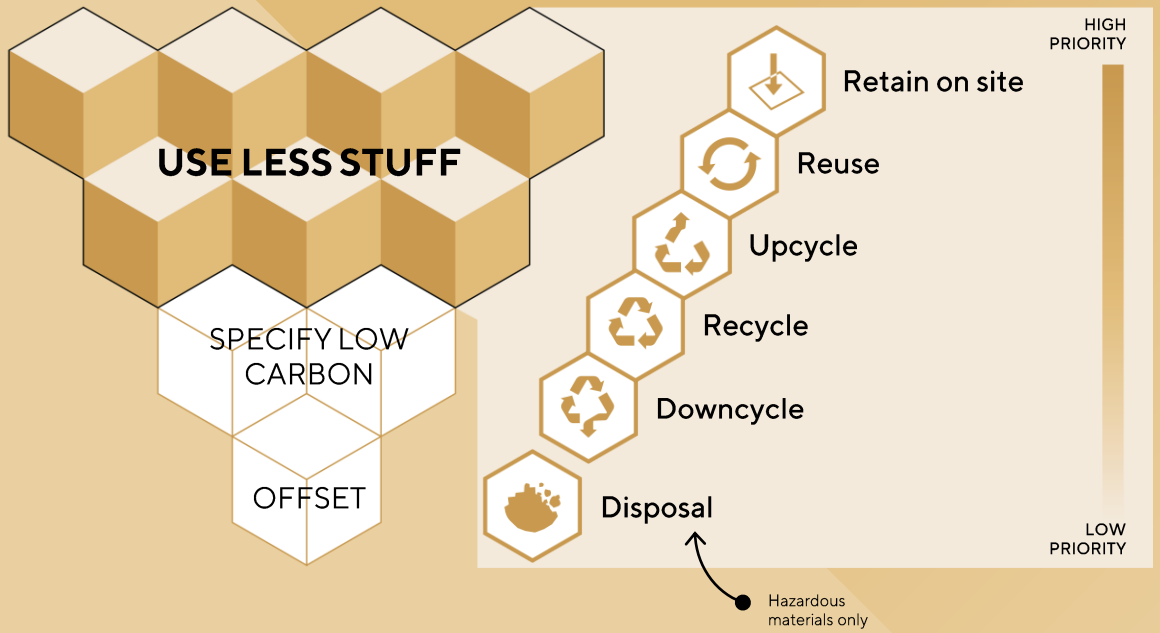
The diagram alongside describes an approach to net zero design, inspired by the IStructE and PAS2080. Most carbon reduction / avoidance strategies fall into one of two categories: minimising the amount of material used ("use less stuff") or minimising the carbon emissions released in production (specification).

Our priority during design is on the first category**. This is a key link with the circular economy, because the surest way to use less stuff, is to make better use of what we already have.** This means retaining existing buildings. Where it established that a building, or part thereof, cannot feasibly be retained as-is, the components and materials generated in the deconstruction should be treated according to the waste hierarchy alongside.

In all scenarios, we should seek optimal "end of life" routes for these components and materials. **This means aiming to keep elements as high up the waste hierarchy as possible,** with downcycling (and disposal) as a last resort.

The following pages present case studies at each rung of the hierarchy. Developing such ideas and implementing them often requires innovation, so early collaboration with the wider project team and the supply chains is encouraged.

The flowcharts in Appendix A.1. codify this approach so it can be applied in a systematic manner.



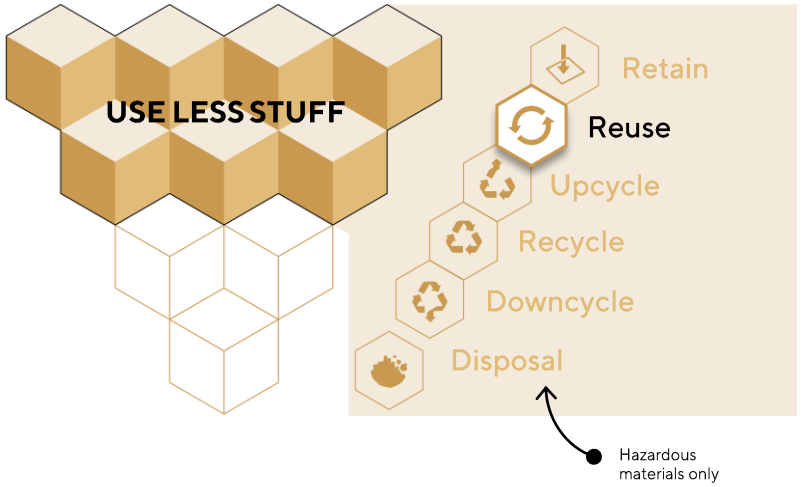
Our Reuse Priorities

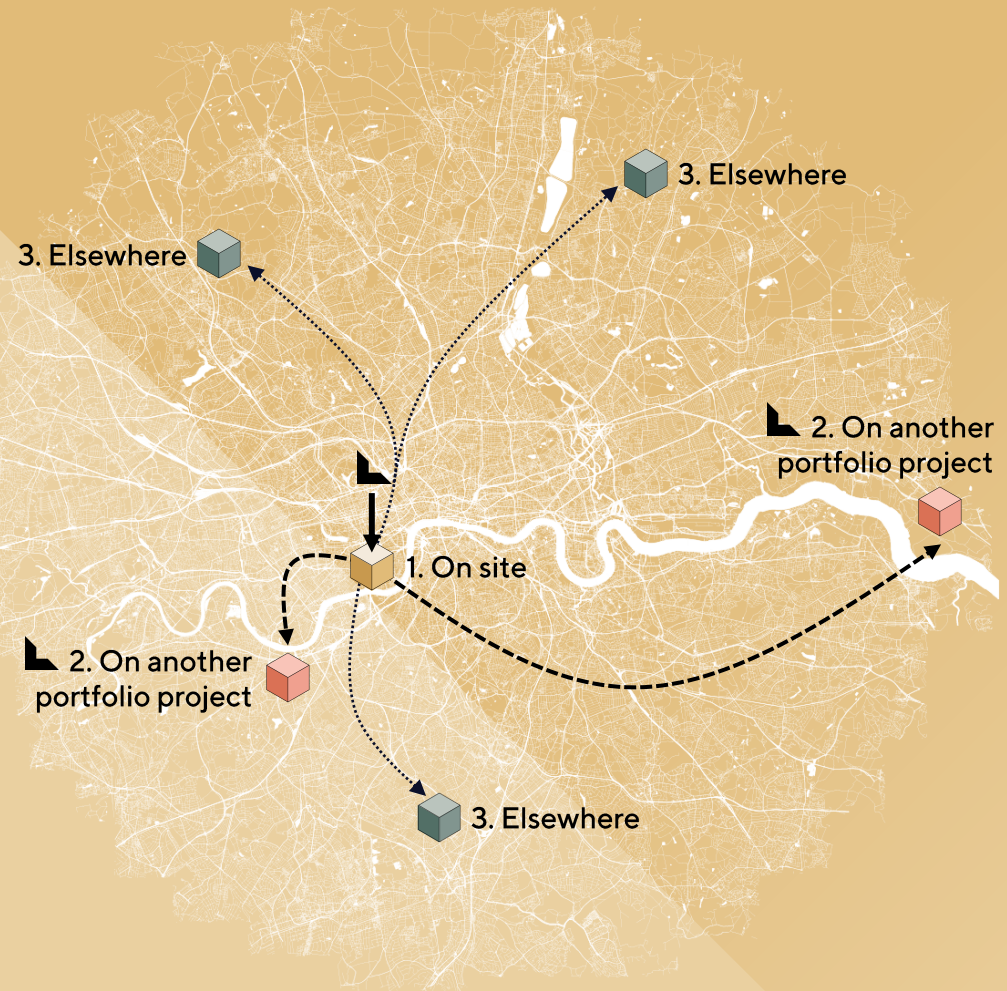
Once a building is deconstructed, there is no limit to where these elements can be reused, and **we use the following scale for prioritising where we reuse our materials.**

1. Reuse on site
Prioritise reusing components and materials on or near the originating site, especially if they can be stored locally (and processed as required), to minimise logistics and transport emissions

2. Reuse on another Landsec site
Review the Landsec development pipeline, and seek synergies for reusing components and materials on other Landsec development sites (both as a donor and recipient)

3. Reuse elsewhere
Where is it not possible any of the above, opportunities should be pursued to reuse elements elsewhere by collaborating with the wider industry.





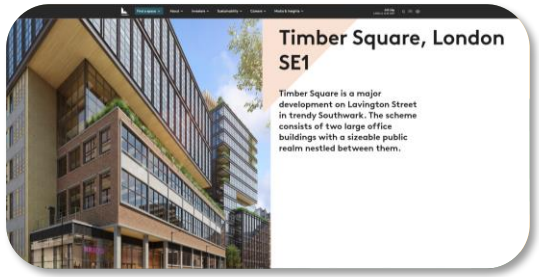
The Waste Hierarchy
Retain on Site

Our priority is to **retain existing buildings as-is, in whole or in part.**

This approach is aligned with the circular economy policies in the London Plan 2021, and the policies of many local planning authorities.

However, retaining existing buildings is a means to end – specifically avoiding carbon emissions, wate, and raw material use – and this should be tested alongside the technical, practical, and economic implications of doing so.

Timber Square landing page:
https://landsec.com/properties/timber-square-london-se1

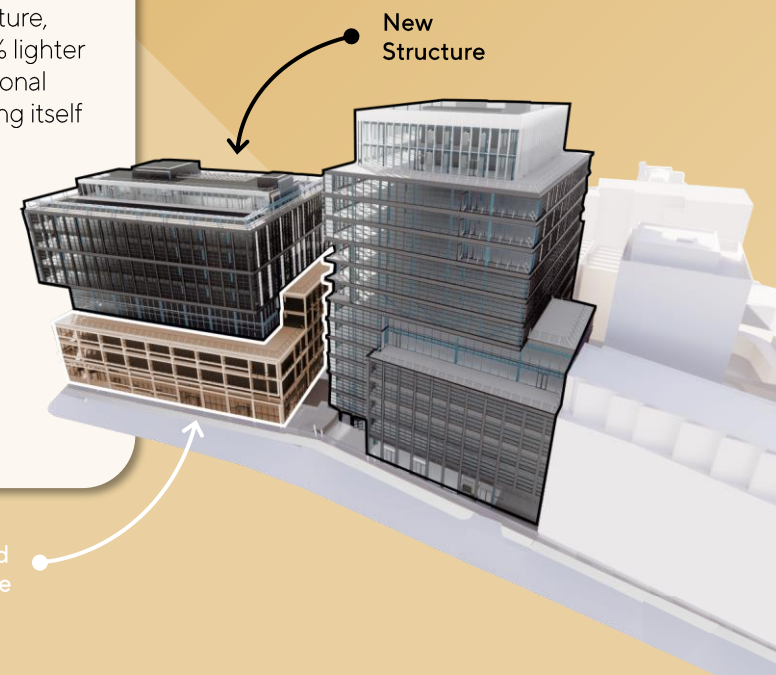


CASE STUDY: RETENTION AT TIMBER SQUARE

Timber Square in London, UK is one of our foremost examples of exiting building transformation at scale. The Print Building was originally built as printworks, and the Ink Building, dating from the 1970s, was built as an office block.

The scheme retains 85% of the existing structure in the Print Building, helping to avoid 234 $kgCO_2e/m^2$ compared to a typical new build. The new CLT/steel structure, added above the existing, is 20-25% lighter than if it were delivered using traditional materials, and helps the Print Building itself achieve a carbon intensity of 434 $kgCO_2e/m^2$.

This exemplary carbon performance demonstrates the potential of retention for mitigating carbon emissions.



The Waste Hierarchy
Reuse

If retention of existing buildings in-situ is not feasible, our next priority is the **direct reuse of components and materials.**

Direct reuse involves minor intervention to the components or materials, **resulting in little or no loss of value.** The process will vary depending on material, but generally involves validating quality and performance, careful removal, transport, processing, and reinstallation.

Implementing reuse often requires testing and certification. Project teams should identify all the stakeholders, from concept to implementation, so that these parties can be engaged as early as possible.

In assessing direct reuse possibilities, we prioritise reuse on the originating site, followed by other Landsec sites, and finally elsewhere.

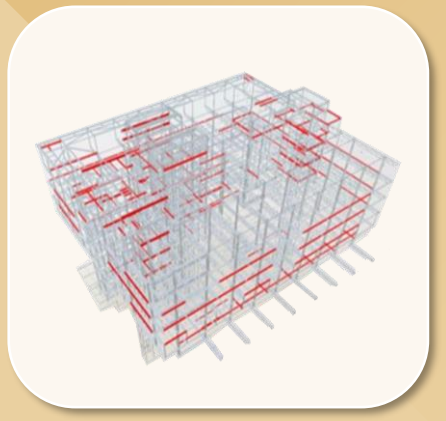
Timber Square UKGBC case study:
https://ukgbc.org/resources/timber-square/

CASE STUDY: STEEL REUSE AT TIMBER SQUARE

On Timber Square in London, we focussed on existing structural retention as one of our primary levers to reducing carbon emissions and virgin material use. See page 20.

To further reduce emissions and virgin material use in the new structure, we explored the use of reused steel sections. These steel sections, sourced from columns and beams in donor buildings, were reused in the new steel structure.

In total, 120 tonnes of reused steel was proposed, comprising 5% of the overall steel frame tonnage. The result is 288,000 $kgCO_2e$ avoided in the manufacture of typical, new steel sections, equivalent to 5.6 $kgCO_2e/m^2$.



Structural steel model of the Print Building with reused steel locations in red (below).

The Waste Hierarchy
Upcycle

Upcycling is the creative repurposing of discarded components or materials, into new items of higher quality or value than the original or sometimes redirecting them higher in the waste hierarchy that the material would normally go.

The best instances of upcycling are those that at once reduce carbon emissions, waste, raw material use, and cost. Sometimes these aims will be at odds, and project teams will need to consider this within the context of their specific project's ambitions.

There will be opportunities where upcycling can be used as a demonstrator to the wider industry, or to help expose the sustainability narrative of a particular project. Project teams are encouraged to explore and prioritise such opportunities.

By their nature, upcycling ideas are often novel. Project teams should identify all the stakeholders, from concept to implementation, so that these parties can be engaged as early as possible.

Green Solutions House 2.0 landing page:
https://gxn.3xn.com/project/green-solution-house-2-new

CASE STUDY: TILES AT GREEN SOLUTION HOUSE 2.0

Green Solution House 2.0 is a hotel in the town of Rønne on the Danish island of Bornholm. The hotel's design is rooted in rigorous sustainability principles in materials, construction, and performance.

GXN developed bespoke glass tiles for the outdoor shower finishes (see below), upcycling local glass waste that would otherwise have been downcycled.

The Waste Hierarchy
Recycle

Where direct reuse or genuine upcycling is not feasible, our next priority is the **closed-loop recycling of materials.** This will entail separating components into their constituent materials, which may need to be done by us or by third-parties.

Closed-loop recycling is the **conversion of a material into something of equal or similar value or quality to the original material.** This is conducted in a way where the fundamental material properties are not changed, allowing materials to be repeatedly recycled without degradation of quality.

Key to successfully implementing closed-loop recycling is avoiding contamination of materials on site, considering both material type and quality. This means identifying the materials destined for recycling at an early stage, and working with demolition contractors and the wider supply chain to ensure that these materials can be segregated and fed back into the supply chain at their highest value.

Recyclable core construction materials	Standard practice recycling*	Best practice recycling*
• Aggregates	Recycled aggregate	-
• Aluminium - quality segregation is key	Global market scrap	Closed-loop recycling
• Brick	Crushed to aggregate**	-
• Ceramic	Crushed to aggregate**	-
• Concrete	Crushed to aggregate**	-
• Glass - early engagement required	-	Float glass recycling
• Gypsum - typically only new offcuts	-	Closed-loop recycling
• Insulation	-	Closed-loop recycling
• Steel	Global market scrap	Closed-loop recycling

* Direct reuse is typically a preferred end of life route
** Typically indicated as recycling, but strictly downcycling

CASE STUDY: GLASS RECYCLING AT CHALCOTS

While glass is widely considered as being a recyclable material, building glass rarely is, due to challenges in collecting it cleanly and efficiently from demolition sites.

But using post-consumer recycled glass in the manufacture of new building (float) glass, has a direct and positive environmental impact by reducing carbon emissions and virgin material use.

Several recent schemes in London have been developing methodologies to overcome these barriers. At the Chalcots Estate redevelopment, McLaren, Powerday, and Saint Gobain collaborated to recover nearly 4,000 windows and send them back to the float line for recycling.

This avoided the business as usual downcycling applications for building glass, such as aggregate, reflective beads, or glass-based insulation.

Once we have exhausted the previous end of life routes for components and materials, our next priority is downcycling. **Downcycling is the opposite of upcycling, where material is recovered and transformed, but the resulting material is of a lower quality or value than the original.**

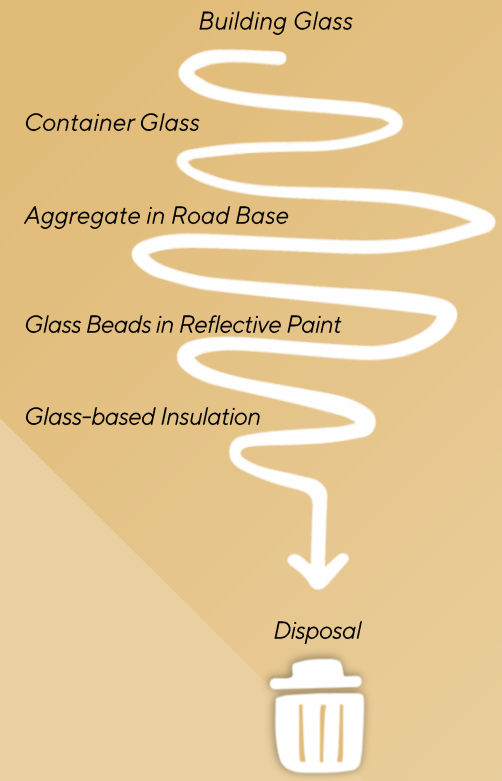
The process of downcycling is irreversible, meaning the resulting material can never be returned to achieve the quality of the original material. **It can therefore be thought of as part of a spiral economy, and project teams should avoid this where feasible.** An example of building glass in a spiral economy is shown in the diagram alongside.

While this is our least preferable option, downcycling can still be better than standard practice for certain materials. This is especially the case if the downcycled material can itself be repeatedly cycled at its lower value, for example container glass recycling.

CASE STUDY: THE SPIRAL ECONOMY

In the UK, downcycling is considered within the recycling pathway. For example, building glass is said to be recycled, when unless it is recycled into float glass which is rare (see page 23), the resulting product is often of a lower value than the original.

This is downcycling and forms part of a "spiral economy", where the product in each consecutive step is of a lower value than the step before.



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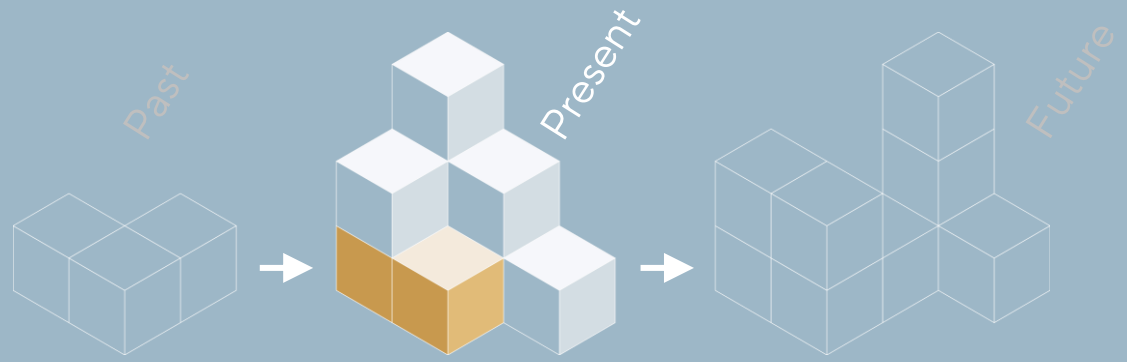


Conscientious Material Selection

Additional criteria for holistic material selection to promote discourse, and a more rounded approach to sustainable procurement

Material Selection

Exploring New Frontiers

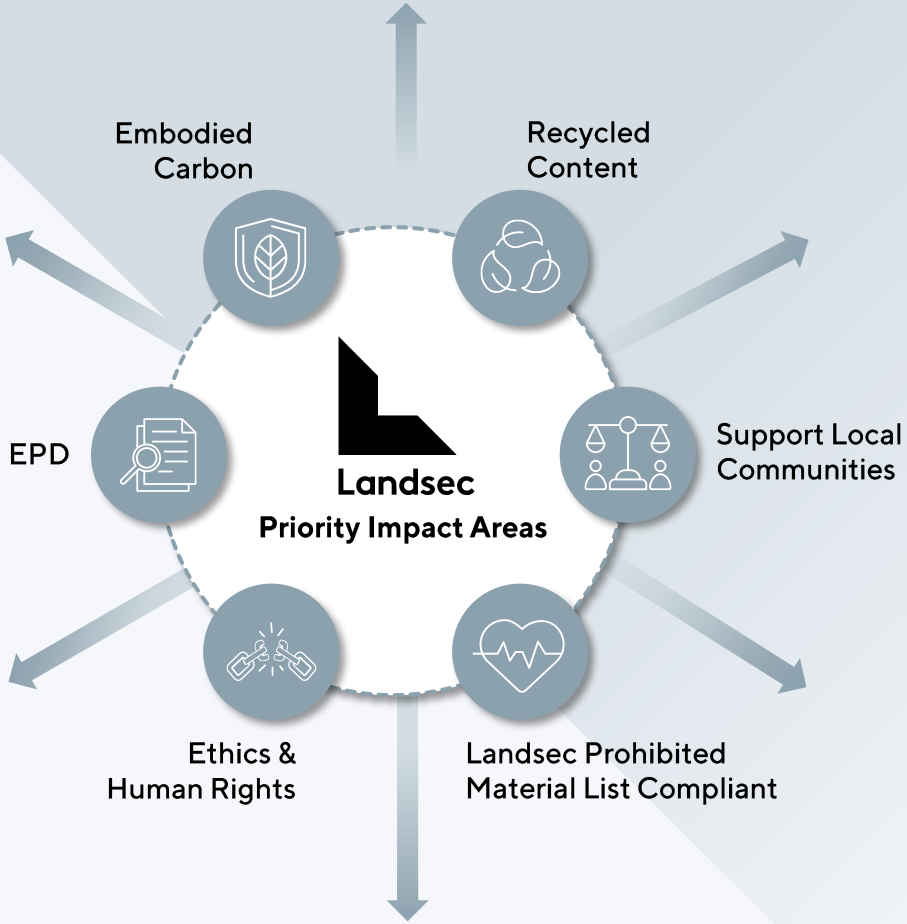
We are encouraging project teams to more broadly study the sustainability impacts of their material selections, by considering them through various lenses / criteria.

The characteristics of sustainable materials and products will vary depending on the material type. For example, in concrete the most impactful attribute might be its embodied carbon emissions so it is likely project teams will focus on this, while for internal paints more focus might be given to its VOC content and ensuring good indoor air quality. It is acknowledged that specific materials may have positive attributes under some categories, and negative attributes under others.

Each project is unique, and project teams are encouraged to determine what is important based on the specific ambitions and sustainability vision of their project and push forward the minimum requirements from our team (explained in Appendix A.2).

Considerations for procurement will be common across projects, though different projects may have a different appetite for risk.

On the following page we gather some other criteria teams explore.



Possible Additional Criteria

Renewable

Preferring the selection of renewable materials, those that can be replenished naturally over a short period (e.g. timber, bamboo, cork, straw, hemp, cotton, wool, linoleum, etc.).

Renewable materials should still be subject to the same waste hierarchy as all other materials. But their ultimate "disposal" route is preferred, because they can be replenished naturally, allowing for repeated and sustainable sourcing.

Embodied water

Like carbon, embodied water refers to the total volume of water used in the production and manufacturing of materials and products throughout their lifecycle.

Unit: kg or m^3
Lower is better

Further reading
https://slattery.com.au/wp-content/uploads/2023/03/Carbon-Mini-Series-04-Embodied-Water.pdf

Take back schemes

Preferring the selection of materials and products that have an active take back scheme.

Project teams should ensure that details of the take back scheme are well documented in O&M manuals and/or as part of a material passporting process.

Avoiding conflict materials

Preferring suppliers that can demonstrate a commitment to avoiding conflict materials.

Conflict materials are resources extracted where the mining and sale are used to fund or perpetuate conflict, human rights abuses, or labour exploitation. Their procurement may support violence, human rights violations, continued poverty, and corruption. Avoiding these helps ensure supply chains don't contribute to social injustices.

Labour practices

Preferring suppliers than can demonstrate a commitment to good labour practices.

This goes beyond ethical treatment of workers and no child labour, to consider how employers are empowering and looking after their workforces. This may entail benefits such as training allowances, job security, private medical care, etc. These practices result in more resilient communities, and a more sustainable supply chain.

Cradle to Cradle material health

Cradle to cradle material health assesses that chemicals and materials used in materials and products. Cradle to cradle social fairness assesses that companies are committed to upholding human rights and applying fair and equitable business practices.

Forward thinking projects may seek to align with the Cradle-to-Cradle material health and/or social fairness requirements.

Further reading
https://c2ccertified.org/

Embodied ecological impacts

Embodied ecological impacts refer to a virgin material's environmental effects such as habitat disruption, species loss, and ecosystem degradation.

Unit: not yet developed

Further reading
https://ukgbc.org/our-work/topics/embodied-ecological-impacts/#:~:text=Similar%20to%20embodied%20carbon%2C%20embodied,extraction%20and%20the%20supply%20chain.

Ozone depletion potential

Ozone depletion potential (ODP) measures how much a substance harms the ozone layer in the earth's atmosphere, often linked to certain chemicals like CFCs.

Unit: kgCFC11e
Lower is better

Declare label

A declare label discloses comprehensive information about a product's composition, for any intentionally-added ingredients and residuals at or above 0.01% by weight.

Declare labels may or may not be third-party verified.

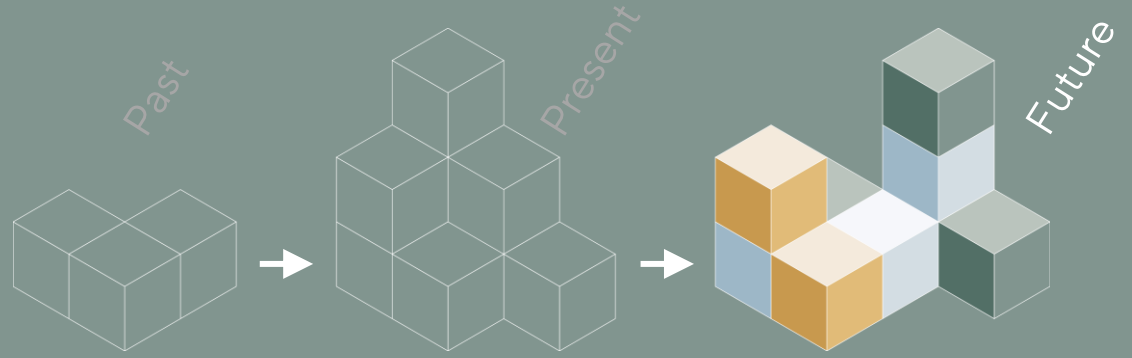
Further reading
https://living-future.org/declare/

Equity and inclusion

Preferring materials and products produced by manufactures than can demonstrate a commitment to improving equity and inclusion.

Promoting equity and inclusion within the workforce means ensuring that opportunities and benefits are distributed fairly among all individuals and groups. This helps to enhances the social and economic well-being of communities, leading to a more resilient and ethical market.

5



Preventing Future Waste

How do we make sure our buildings today are not the waste of tomorrow

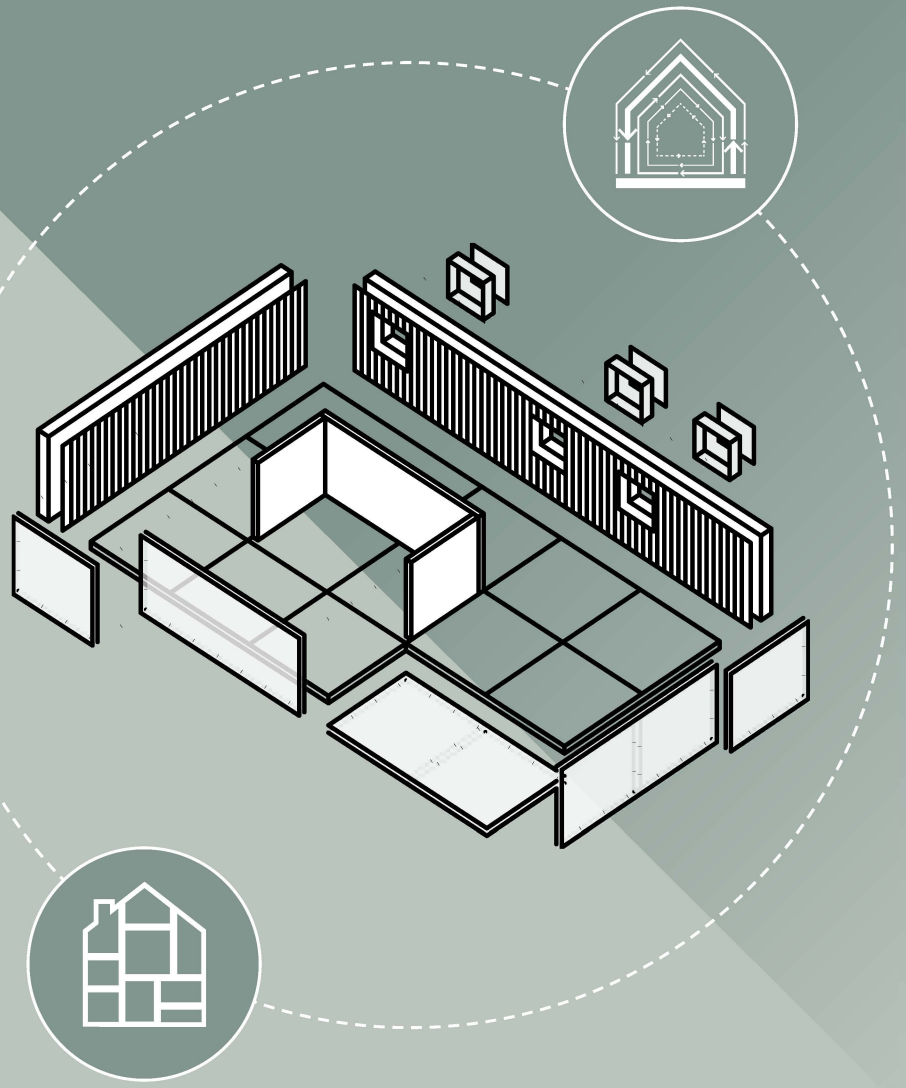
Building for a Changing World
Principles to Consider

Constructing buildings with flexibility for future changes can enhance the long term value of the structure, its systems, and materials. This approach encourages adaptability and sustainable use of resources over time by minimising premature obsolesce and waste.

The ability to modify a building for future use relies heavily on two main principles: Building in Layers and Design for Disassembly and Recoverability (DfD).

Building in Layers
If each layer of a building can function independently, it can be altered without impacting the other parts. By designing different levels of independence between building layers, we can avoid the risk of small changes within a building, resulting in disproportionate knock-on demolition of other parts of the building.

Design for Disassembly and Recoverability
If the building, or a single component/material, is designed to be disassembled and recovered easily, it enables any disassembled components/materials to be appropriately recovered, therefore reducing waste and the need for new materials.



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A

Appendices

A.1 Decision Tree Flowcharts for Existing Buildings

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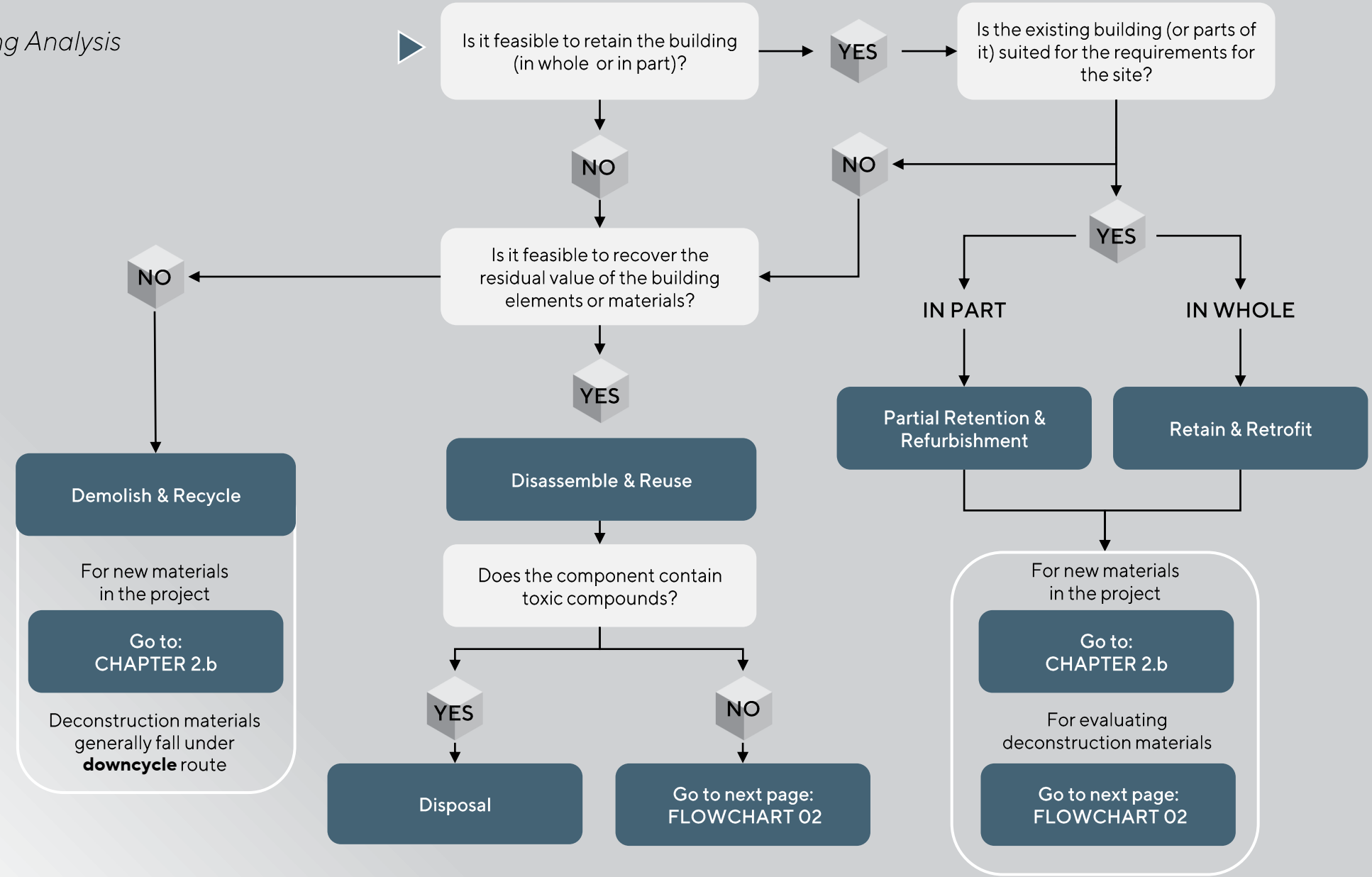
Flowchart 01

Existing Building Analysis



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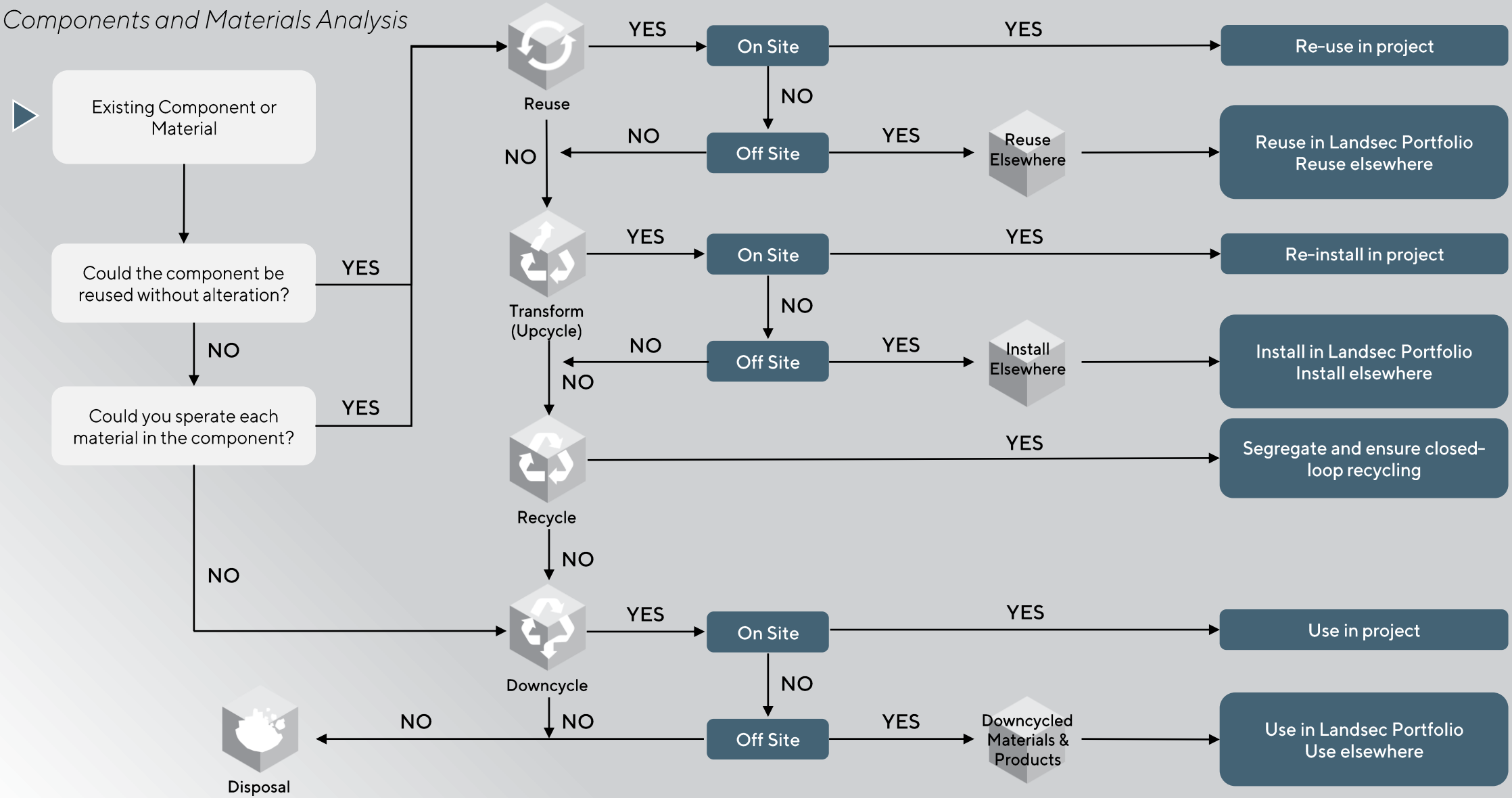
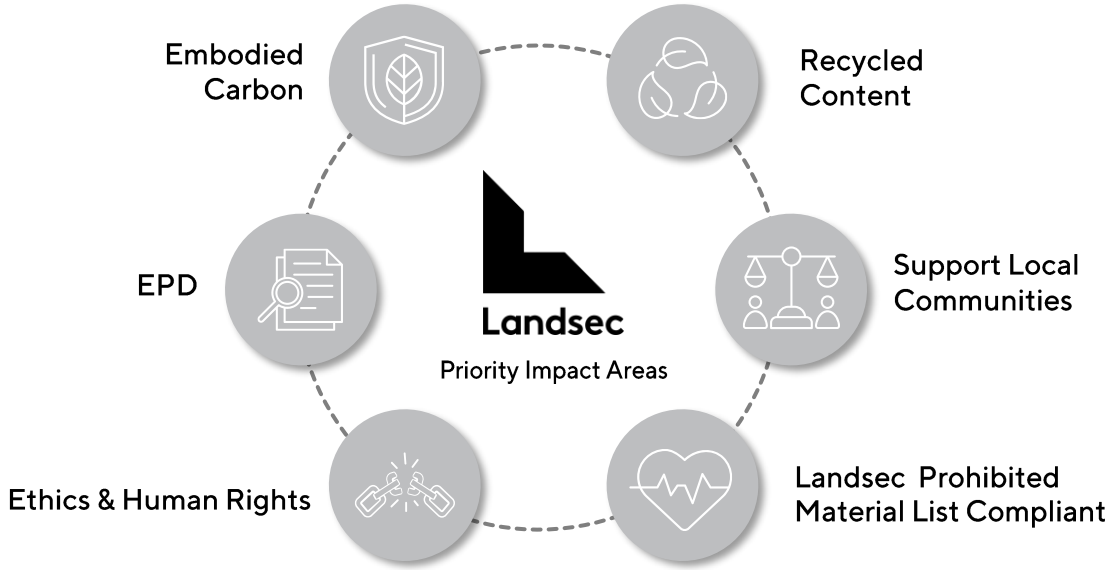
Flowchart 02

Components and Materials Analysis



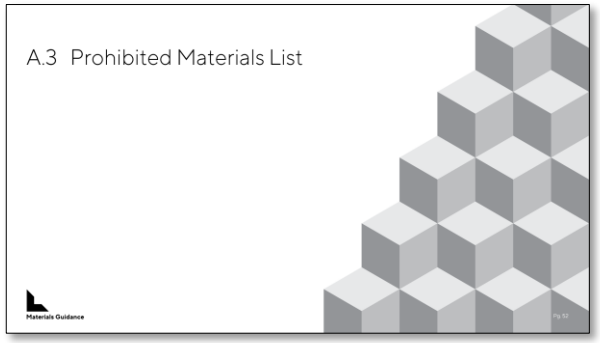
A.2 Material Selection Flowcharts for Priority Impact Areas

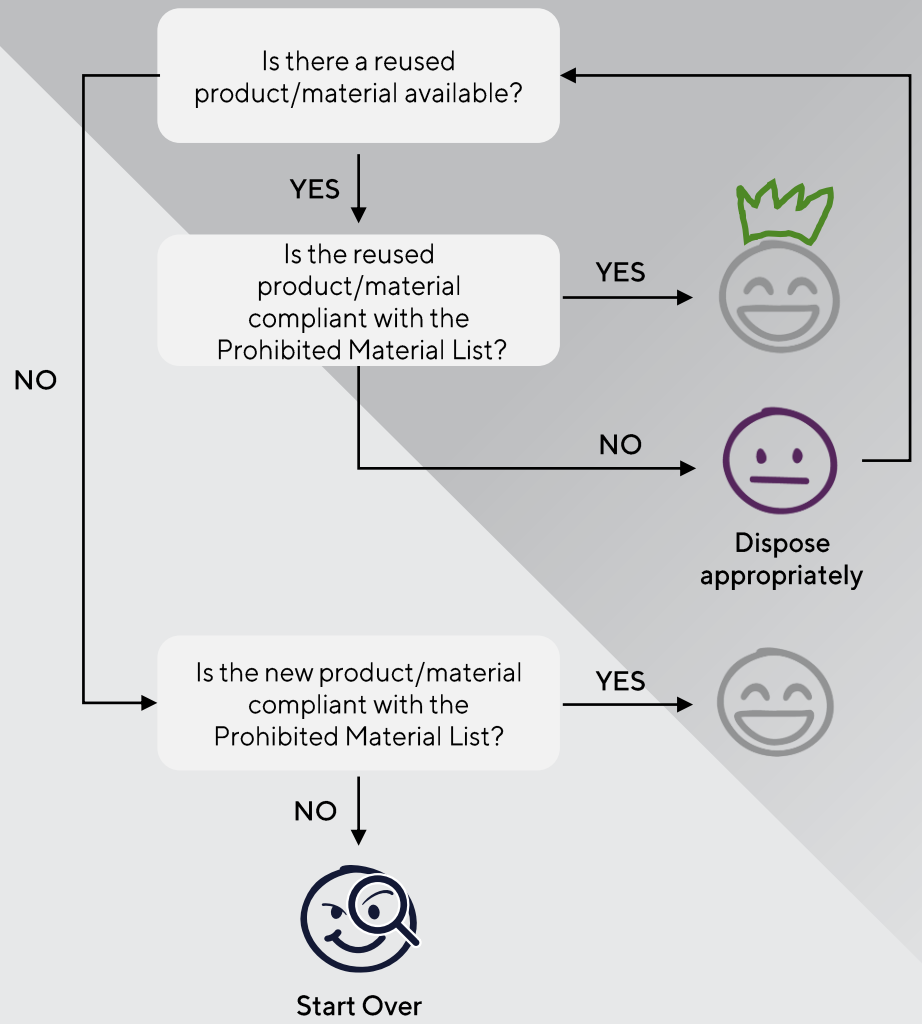


Teams could use the Material Supplier Questionnaire in the Sustainability Preliminaries to help request feedback from manufacturers/suppliers

Prohibited Material List Compliant

For Prohibited Materials List go to Appendix A.5





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EPD

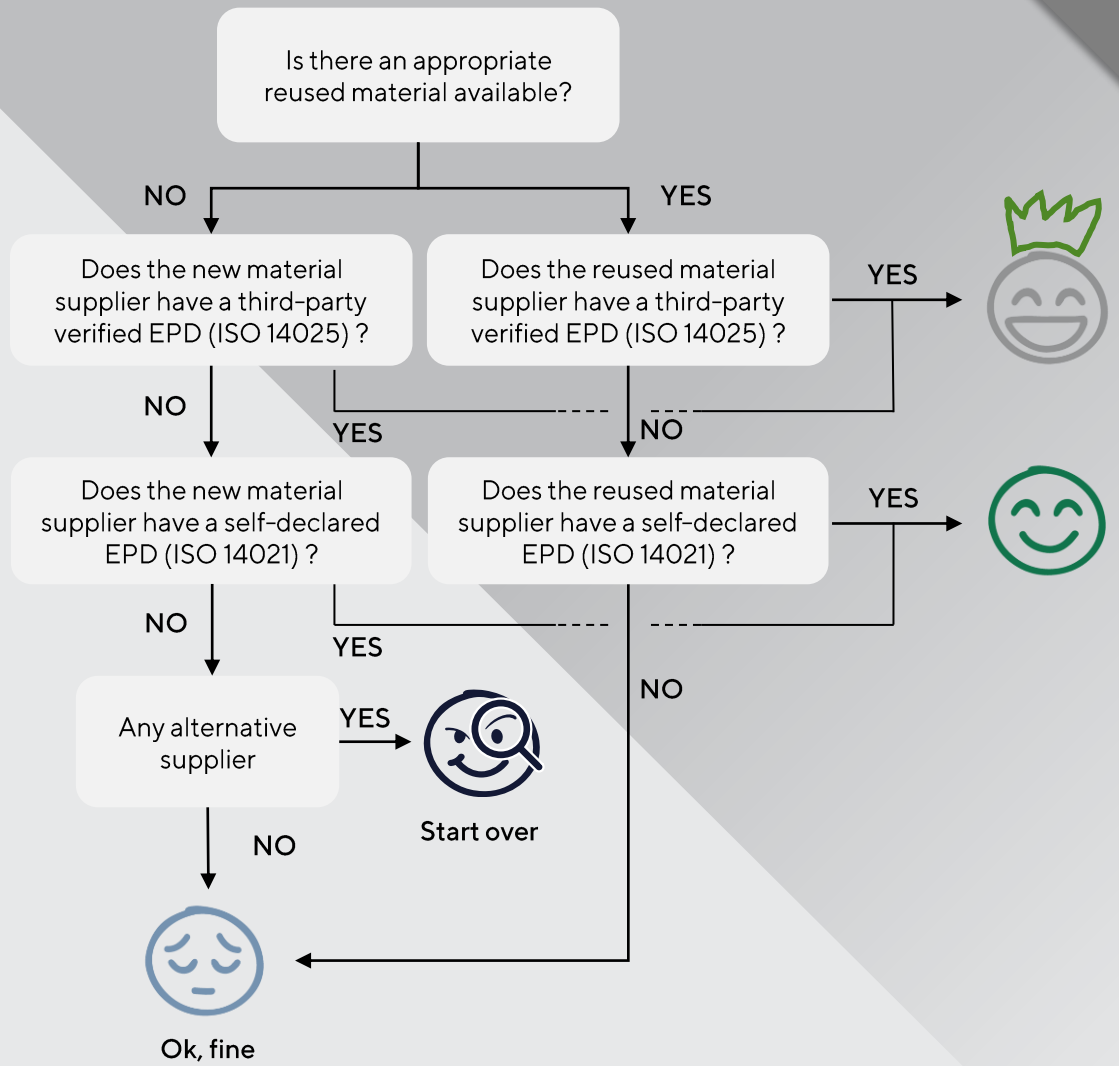
There are numerous EPD standards and a wide range of EPD quality. It's essential for project teams to understand the distinctions and nuances across different EPD types.

Our preference is always for third-party, verified EPDs.

For construction product manufacturers, the two relevant ISO standards are:

- **ISO 14025 / Third-party verified**
  EPDs verified by a third-party are the most universally acknowledged type, mandated by numerous regulations and certification schemes, and accepted broadly. They are issued by an EPD programme operator and are applicable for nearly any use.
- **ISO 14021 / Self-declared**
  As the name suggests, is a standard for claims made by the manufacturer. It defines those as "environmental claim that is made, without independent third-party certification, by manufacturers, importers, distributors, retailers or anyone else likely to benefit from such a claim".

The intent behind an EPD is to encourage the use of materials and products that declare their life cycle information. Having some declared data is better than having no data at all.



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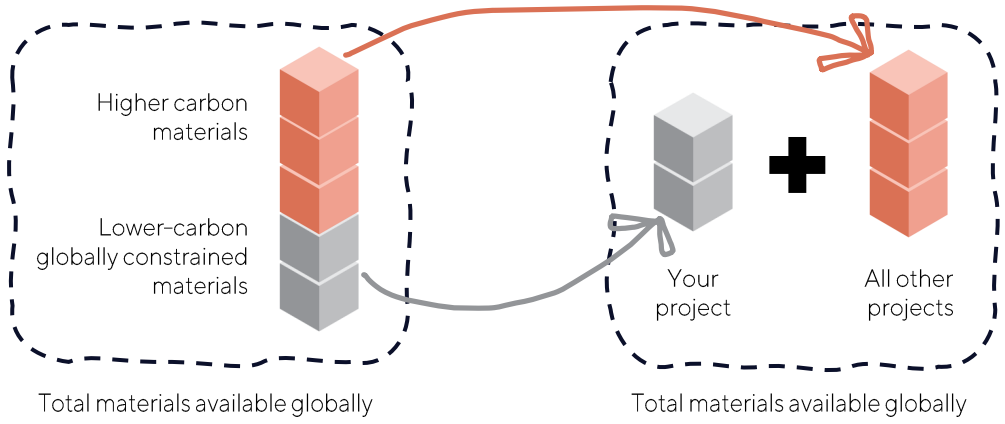
Embodied Carbon

Our preference is always selections that reduce global greenhouse gas (GHG) emissions.

This means having the effect of reducing carbon dioxide emissions at a global level, not simply in local project accounting.

Why is this important?

When a resource's global supply is constrained, its ability to significantly reduce worldwide emissions is curtailed. Any local increase in consumption will likely be offset by a decrease in another area, neutralising any potential global emissions reduction. This is the case currently with GGBS, where specifying high GGBS concrete mixes, only results in decreased GGBS availability for other mixes, therefore having no impact on global emissions.



Further reading
https://www.leti.uk/ecp
https://www.istructe.org/resources/guidance/efficient-use-of-ggbs-in-reducing-global-emissions/

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Recycled Content

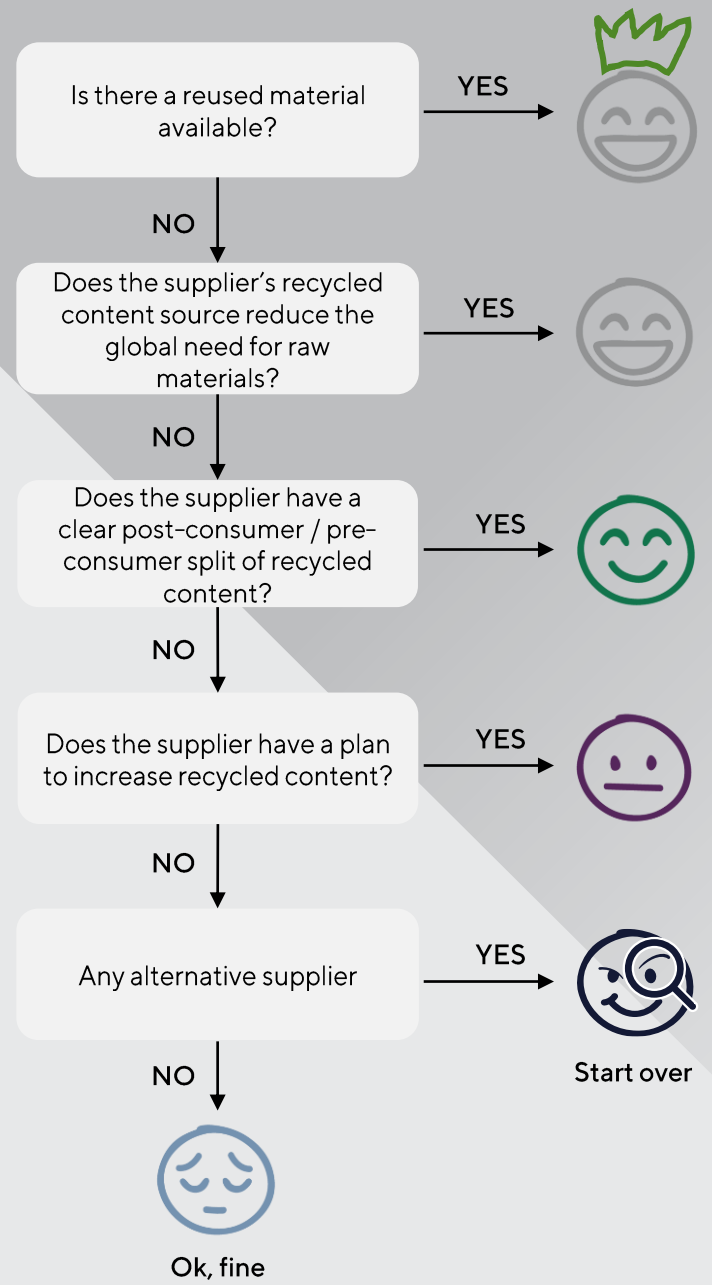
Our preference is always selections reduce raw material demand, by using post-consumer recycled content.

Recycled content refers to the proportion of materials used in a product or material, that has been previously recovered or reclaimed from waste materials and displaces virgin material use.

Recycled content can be a nebulous term. There are two broad categories of scrap: **pre-consumer** (scrap that comes from the production process and has never been used) and **post-consumer** (scrap that has had a life as a product).

Post-consumer scrap should be prioritised because it reduces the global demand for virgin materials. Pre-consumer scrap, while useful, should be interrogated because prioritising it may reward inefficient manufacturing processes.

But remember, recycling is good, but direct reuse is better.



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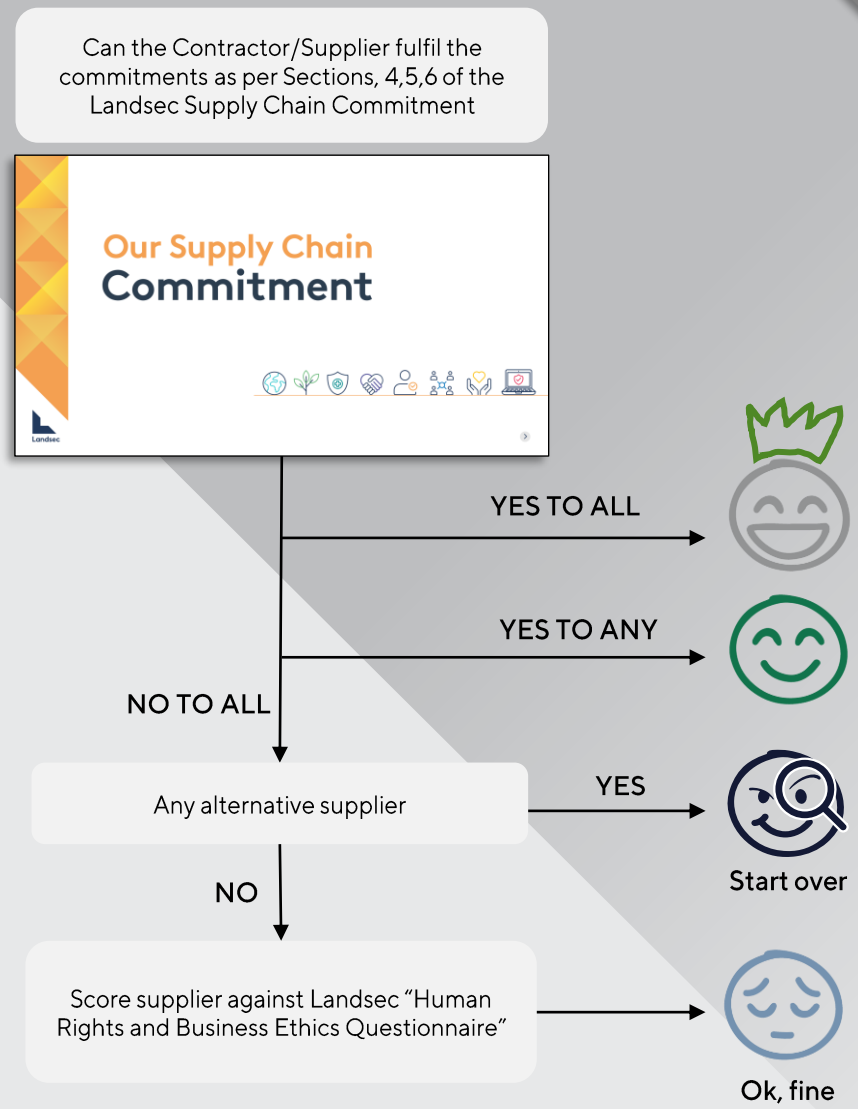
Ethics & Human Rights

Our preference is to encourage project teams to uncover some of the wider social issues that are present up and down our supply chains. The aim is to be non-prescriptive, and encourage project teams to ask questions of the supply chain.

This section refers to the Landsec Supply Chain Commitment.

We recognise that these attributes are difficult to adjudicate, and sometimes there may simply be no alternative material. But the idea here is to encourage discussion, in the hope that this will catalyse action.



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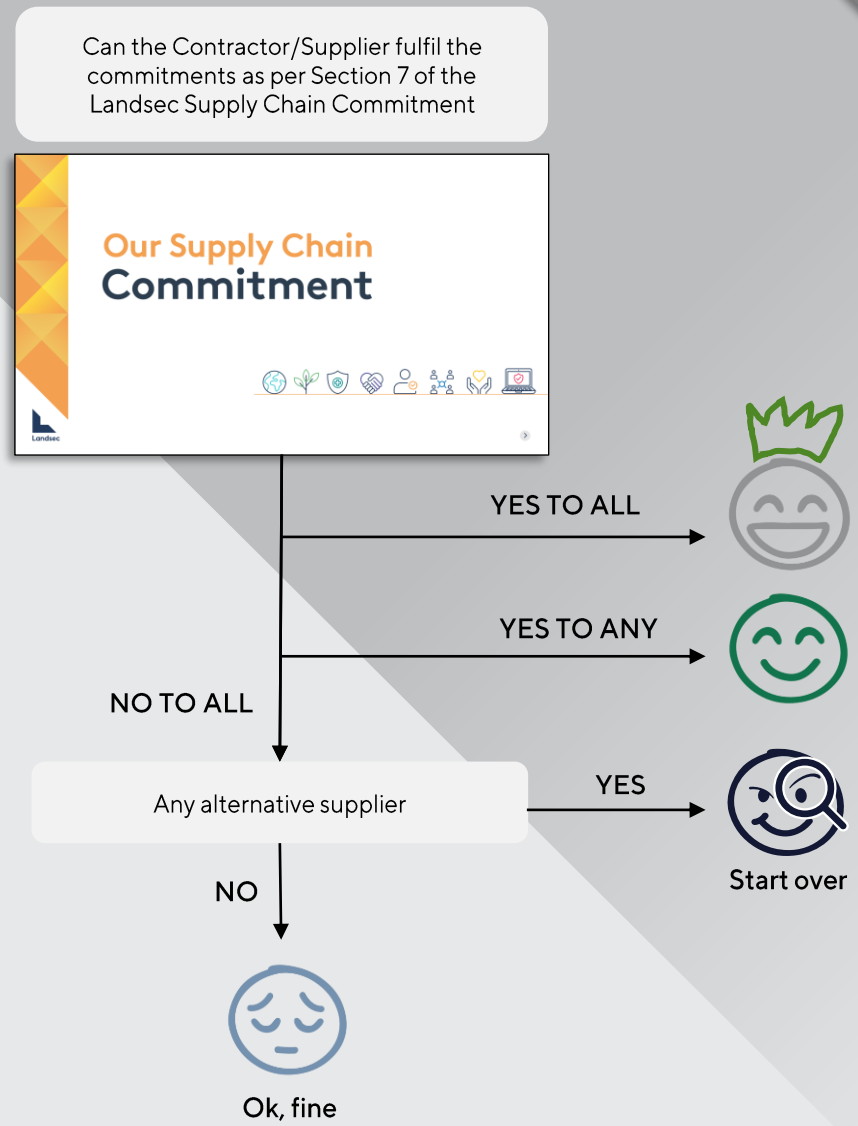
Support Local Communities

Our preference is to encourage project teams to support local communities through local employment, work, and procurement. The aim is to be non-prescriptive, and encourage project teams to ask questions of the supply chain.

This section refers to the Landsec Supply Chain Commitment.

We recognise that these attributes are difficult to adjudicate, and sometimes there may simply be no alternative material. But the idea here is to encourage discussion, in the hope that this will catalyse action.



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Example Comparison Dashboard

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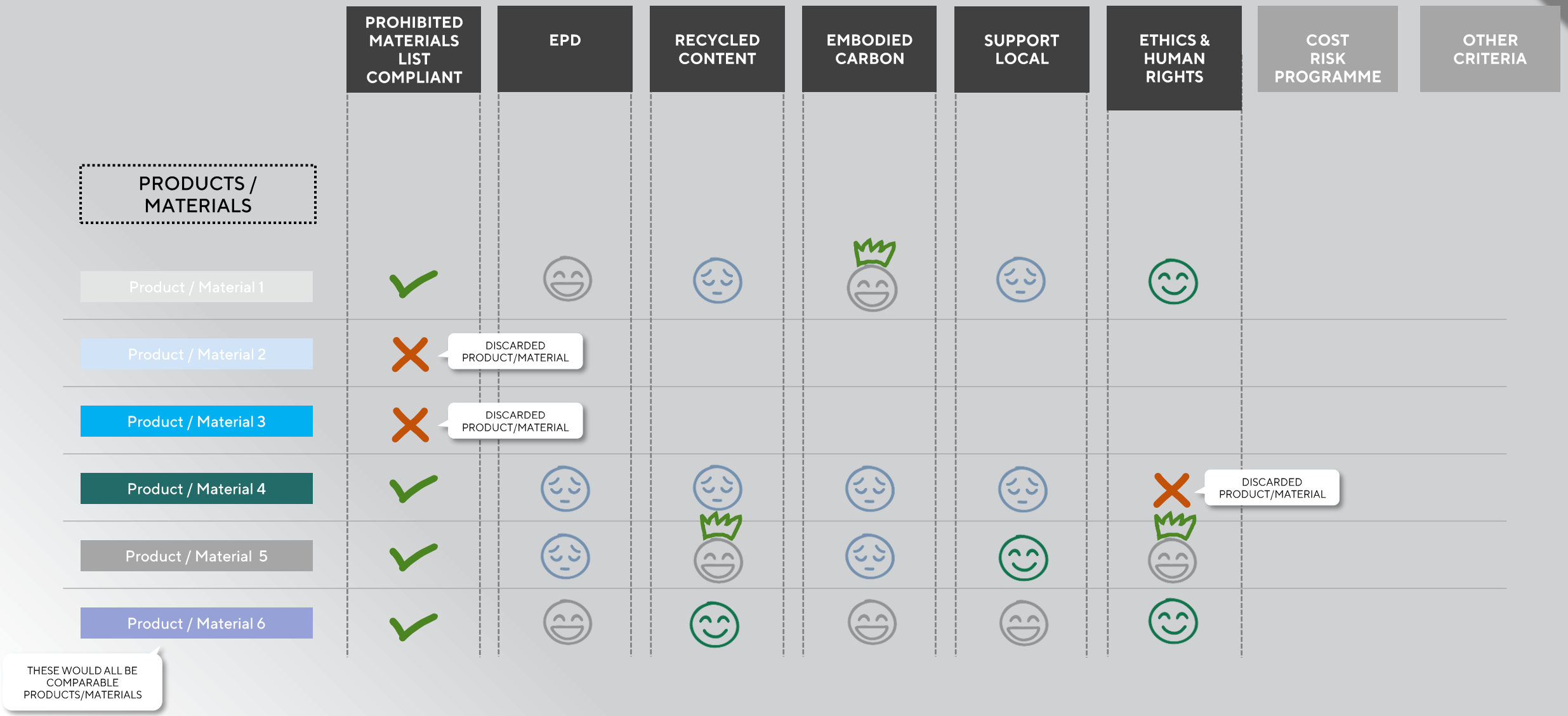

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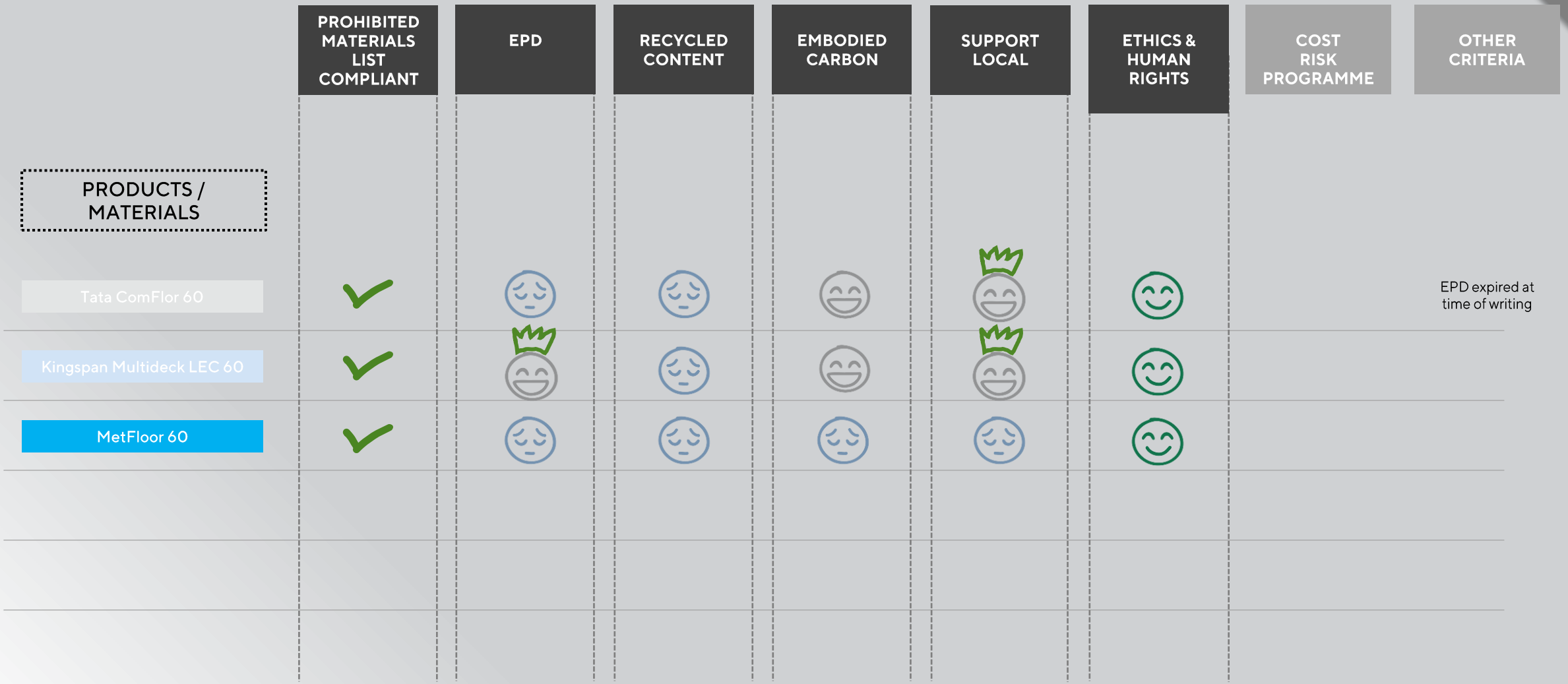
Example Comparison Dashboard

Composite metal deck



Indicative performance only, does not reflect true performance of manufacturers
Suppliers should be contacted to provide information not readily available

Material Supplier Questionnaire

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EXAMPLE ANSWERS PROVIDED. SEE MATERIAL SUPPLIER QUESTIONNAIRE IN THE SUSTAINABILITY PRELIMINARIES FOR MORE DETAIL

Supplier/Contractor Details	
Specialist contractor name	xx
Supplier Name	xx
Supplier contacts	hello@gmail.com / +4412345678910

General	
Material Description & Specification	Concrete mix type 2
Material quantity	120 m^3
Provenance	Aggregate: London, UK / Cement: Beijing, China
Product compliant with Prohibited Material List	Yes

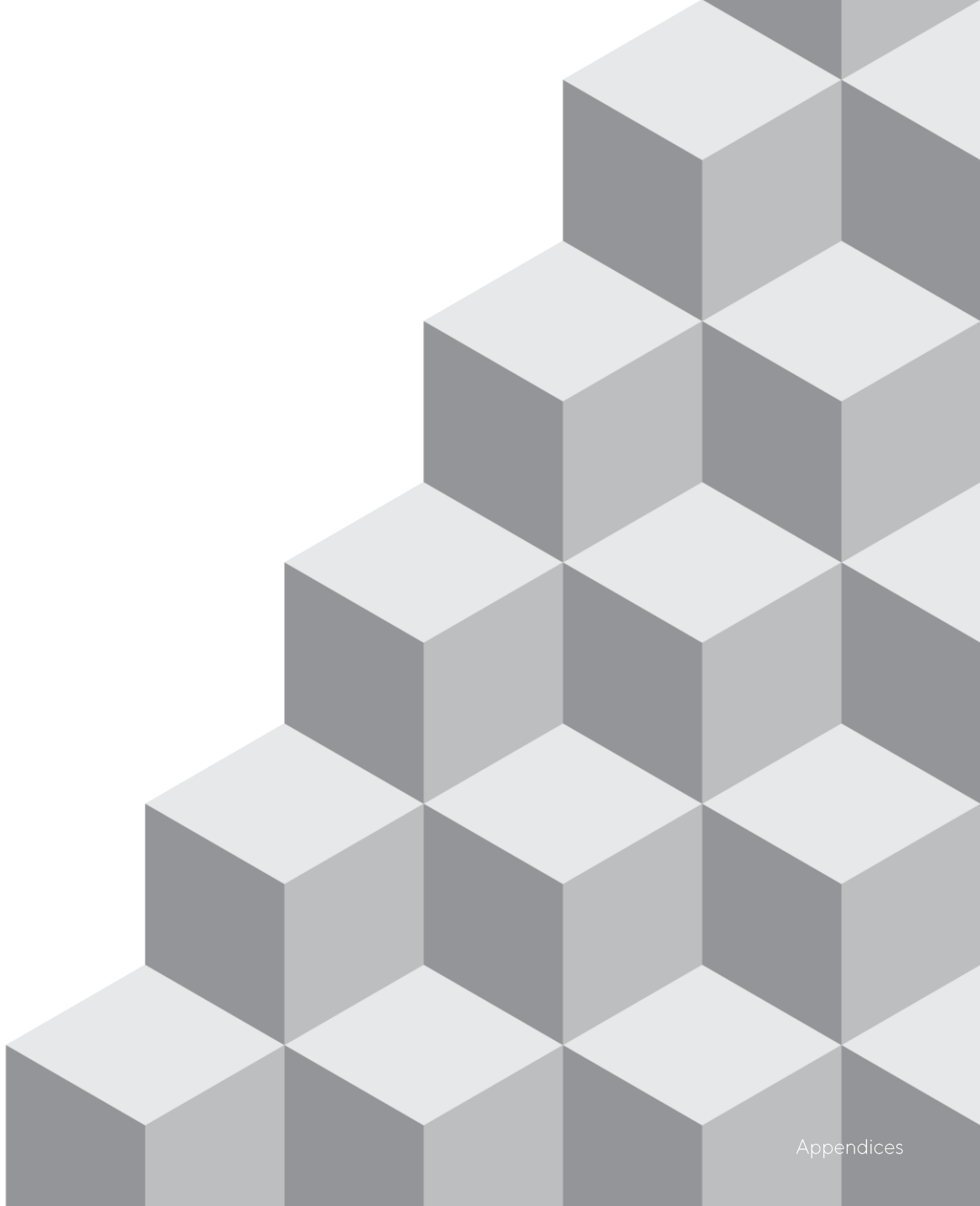
Embodied Carbon	
Material Description & Specification	XXX $kgCO_2e/kg$
Source of embodied carbon factor	EPD
EPD type	Aggregate: ISO 14021 / Cement: ISO 14025

Recycled content	
Recycled Content	30%
Post-consumer recycled content	N/A
Pre-consumer recycled content	N/A
Plan to increase recycle content and/or reduce reliance on virgin materials	See PDF attached

Ethics, human rights, and social value	
Community	See PDF attached with our commitments
Business ethics	See PDF attached with our commitments
Human rights	See PDF attached with our commitments
Diversity and inclusion	N/A

Others	
Any other relevant environmental or social certification, that are not listed in this questionnaire (e.g. SteelZero, ConcreteZero, FSC, PEFC)	See PDF attached with our ESG policies and ConcreteZero commitment.

A.3 Material Watch Its



Concrete
Watch Its

Concrete, the most used man-made material after drinking water, sees 14 billion cubic meters produced annually. Cement, essential for concrete, is responsible for about 7% of global CO_2 emissions, with its production making up almost 60% of typical reinforced concrete's embodied carbon.

Given its environmental footprint and importance in the construction sector, no single "silver bullet" technology can instantly resolve the emissions from global concrete production. Instead, a combination of technological advancements and design-focused decisions is required.

Useful resources

https://www.istructe.org/resources/guidance/concrete-technology-tracker/

https://www.istructe.org/resources/guidance/arup-material-guides/

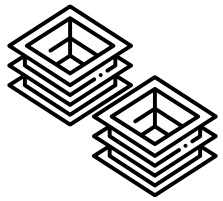
https://www.theclimategroup.org/concretezero

https://gccassociation.org/concretefuture/

SCMs are limited

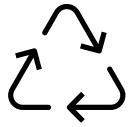
Supplementary Cementitious Materials (SCMs), like GGBS, can only meet 10-15% of today's cement global demand. Specifying SCMs beyond their global availability at a local level, will not result in reduced global CO_2 emissions.

Look out for the formwork for in-situ concrete



Timber formwork is essential for concrete shuttering, but its embodied carbon is significantly affected by reuse and end-of-life scenarios. Despite guidelines suggesting up to three reuses, actual usage data often indicates a single use due to specific finish requirements. **Project teams to engage early with contractors, exploring lower-grade finishes and alternative materials to improve sustainability and increase reuse rates.**

Specify recycled aggregate when locally available



Recovered concrete can be recycled as aggregate in new concrete, but the quantities may be limited by local regulations and physical properties, especially for structural concrete applications. **It is important to only specify recycled aggregates when there is a local source available, otherwise transportation emissions may outweigh the intended carbon benefits.**

Route to ConcreteZero

Cement production, and consequently concrete emissions, will not reduce in step change. **Project teams should use the ConcreteZero interim targets, to set limits for concrete carbon emissions.**

Steel
Watch Its

Despite technologies existing for its production to be decarbonised, **steelmaking is one of the biggest emitters of CO_2 globally today. Total carbon emissions from the steel sector alone account for 11% of annual global carbon emissions, and this is projected to rise in line with increasing demand.**

We play a crucial role in reducing steel-related emissions through informed design and material choices, and collaborating with the wider constriction team.

Useful resources

https://www.istructe.org/resources/guidance/making-your-steel-specification-more-sustainable/

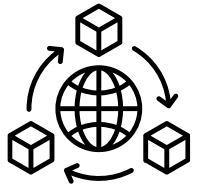
https://www.makeuk.org/about/uk-steel/net-zero-steel---a-vision-for-the-future-of-uk-steel-production

https://www.theclimategroup.org/join-steelzero

Use less is fundamental

Effective decarbonisation of the steel sector goes beyond transitioning production processes to lower carbon technologies. **The sector must maximise efficient use of steel in the first place, as well as the quantity and quality that's then injected back into the supply chain.** This means ensuring designs are as lean as possible, and making sure reused steel is well-utilised.

Supply chain is complex



The supply chain for steel is complex and global. Ensuring that steel is produced, certified, and transported in a way that meets zero or low-carbon standards can be challenging, requiring significant coordination and transparency across the supply chain. **Steel mills tend to be located close to the consumer market, as opposed to the raw material extraction sites, so a mill in the UK would likely import heavy raw materials from a considerable distance,** but the steel produced would generally be for the UK or European market.

Route to SteelZero

Low carbon steel generally makes use high proportions of recycled content. But there is insufficient scrap to feed global steel demand, and consequently global carbon emissions are unlikely to reduce. **Project teams should use the SteelZero interim targets, to set limits for steel carbon emissions.**

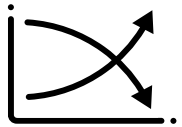
Aluminium
Watch Its

Aluminium as a building material is popular in contemporary buildings because it is lightweight, strong, durable, and easy to form. Annually in the UK, 40% of aluminium is used by the construction industry.

The main market sectors are windows, roofing, cladding, curtain walling, prefabricated buildings, architectural hardware, shop fitting and partitions.

Up to 90% of the aluminium used in construction is recycled, using 95% less energy than primary aluminium production, which significantly reduces carbon emissions.

Supply & demand mismatch



The growing demand for aluminium with high recycled content, driven by increased environmental consciousness and regulatory demands, is challenged by insufficient recycling infrastructure, particularly in regions with high demand. **This scarcity contributes to discrepancies between the supply of construction-grade recycled aluminium and its demand, causing potential shortages and cost premiums.** Looking to 2050, an expected 80% surge in aluminium demand underscores the **need for efficient and long-lasting design to mitigate potential global supply shortages.**

Not all "scrap" is the same

Post-consumer scrap should be prioritised because it reduces the global demand for virgin materials. Pre-consumer scrap, while useful, should be interrogated because prioritising it may reward inefficient manufacturing processes. **Only post-consumer scrap should be thought of as decarbonised, and project teams should ask suppliers for the post-consumer recycled content percentage.**

Designing for the future

To ensure high quality aluminium reuse/recycling, it's vital to address challenges in material separation caused by complex designs and joining techniques at the product's end of life phase. **Designing with end of life recycling and reuse in mind, particularly by selecting easily separable joining methods, can significantly reduce contamination and enhance the reuse/ recyclability of aluminium scrap.**

Timber
Watch Its

Rapidly renewable, bio-based materials are often viewed as more sustainable alternatives to conventional materials, because they can sequester carbon and can form part of a closed loop system. However, accurately evaluating their biogenic advantages in Life Cycle Assessments (LCAs) remains complex, leading to uncertainty in their overall sustainability assessment.

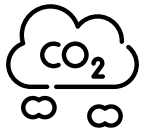
Globally, forests play a crucial role in the earth's carbon management, acting as significant carbon sinks by storing carbon in both soil and trees for extended periods. Timber from sustainably managed forests can offer sequestration benefits that contribute to carbon reductions.

Timber should be regarded as a finite resource, with design practices reflecting its scarcity and locality. The growing demand for timber could outpace the supply from sustainably managed forests in Europe/UK within the next decade, posing challenges for sustainability commitments.

Useful resources

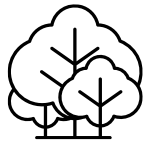
https://www.istructe.org/resources/guidance/arup-material-guides/

Source it locally



Approximately **50-55% of upfront carbon emissions** of a generic CLT product are **related to module [A4] transport to site**. Considering sourcing location is fundamental to specifying sustainable timber products.

Source it responsibly



Being conscious about where timber is harvested from plays a significant role in preserving ecosystems and biodiversity. **FSC and PEFC are the current two main global certification schemes** which aim to ensure supplies are from sustainably managed forests. **All timber should be FSC or PEFC certified.**

Beware of the adhesives

CLT and glulam contain 1-2% and 1.5-2.5% adhesive volume respectively, often with toxic formaldehyde. **Opting for no added formaldehyde or certified low-emission products can reduce health risks, contribute to GHG emissions, and should be prioritised.**

Glass
Watch Its

The UK generates almost 200,000 tonnes of post-consumer glass waste annually, much of which ends up in landfills or is downcycled, despite the significant material, energy, and carbon emission savings that recycling into new glass products could provide.

Glass is a 100% recyclable material. It can be remelted an infinite number of times, and the **architectural glass industry has the potential to be a perfect example of a scalable circular economy in action**. However, current deconstruction methodologies prevent the widespread reuse/recycling of most building glass.

Across the EU, the high quality recycling of all building glass waste, compared to the business as usual scenario, could avoid nearly a 1 million tonnes of landfilled waste, save more than 1.2 million tonnes of primary raw materials, and reduce carbon emissions by more than 230,000 tonnes annually.

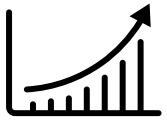
Useful resources

https://ukgbc.org/resources/building-glass-into-a-circular-economy/

Designing for the future

Designers and engineers must not only alter their approach to material use but also innovate to make recycling of key components feasible. **This includes rethinking connections for easy disassembly, avoiding materials like laminated glass units or ceramic frit that hinder high quality recycling.**

Procurement is a risk



The cost of recycled or sustainable glass can be higher than that of new glass due to the added processes of collection, sorting, and processing. **Finding suppliers that can provide sustainable or recycled glass in the quantities needed and within project timelines can be challenging.** Limited availability may result in longer lead times, affecting cost and programme.

A.4 Prohibited Materials List

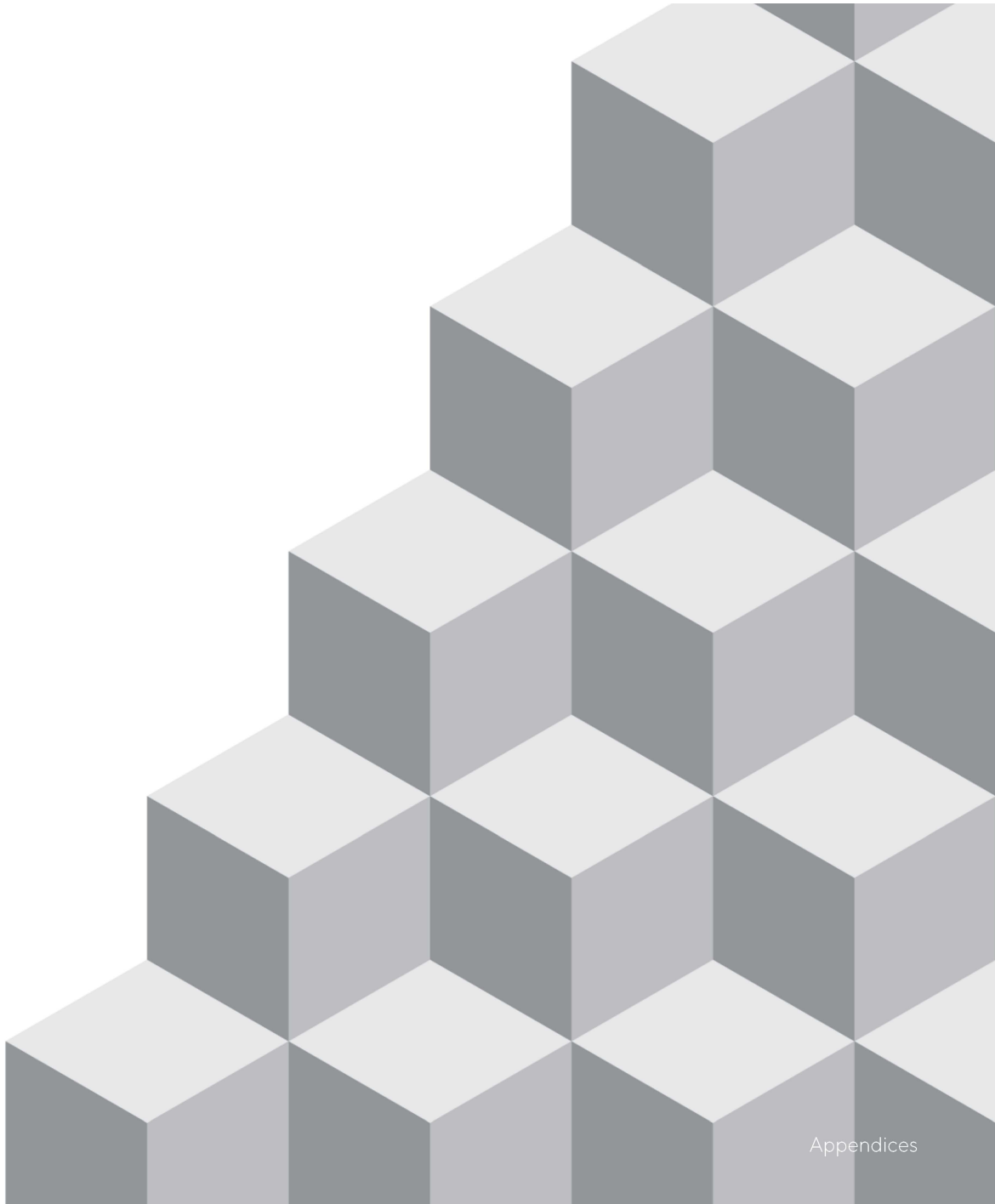


TABLE OF CONTENTS

1. Prohibited Materials List

1.1. General

1.1.1. The requirements of this section shall apply to materials/products as relevant.

1.1.2. The Contractor shall ensure that all materials/products are compliant with the following:

- All relevant legislation for materials/products containing, but limited to: asbestos, lead, polychlorinated biphenyls (PCBs), and the like
- WELL Building Standard Materials pre-requisites (latest version)
- UK REACH Regulations
- EU Paints Directive (2004/42/CE) (implemented in the UK as Statutory Instrument 2012 No. 1715).

1.1.3. The Contractor shall bring to the attention of the Employer and Consultant, in advance and in writing, any materials/products that do not comply with 1.1.2, and agree alternative measures with the Employer.

1.1.4. In discharging 1.1.3, the Contractor shall demonstrate, to the satisfaction of the Employer, that no feasible alternative material/product is available.

1.1.5. Where the labels “Acutely Toxic” and “Serious Health Hazard” are referred to in these Sustainability Preliminaries, they refer to labelling as per the Classification, Labelling and Packaging Regulation (CLP Regulation), which implements the United Nations’ Globally Harmonised System of Classification and Labelling or Chemicals (GHS).

1.1.6. The Contractor shall not use of any products/materials that are described in Section **Error! Reference s ource not found.**. Such products/materials shall be taken to be expressly prohibited.

1.2. Modern Slavery and Child Labour

1.2.1. The Contractor, and any relevant subcontractors, shall demonstrate, in writing and to the satisfaction of the Employer, that the following measures are in place:

- A due diligence process which determines human rights risks in the supply chain, and takes appropriate actions as a result
- Modern slavery online training has been completed via the Supply Chain Sustainability School:

  Log In - Supply Chain Sustainability School (supplychainschool.co.uk)
- A programme to raise awareness of the signs of modern slavery, and information on how to raise complaints within the company for all staff
- A written policy on Human Rights
- An anonymous company-wide grievance/whistleblowing mechanism accessible to all staff.

1.2.2. The Contractor shall at the request of the Employer, participate in modern slavery audits on its supply chain, providing evidence as required.

1.2.3. The Contractor shall, at the request of the Employer, participate and provide evidence, if required, in the workforce engagement surveys carried out by the Employer.

1.2.4. Specific products/materials are identified as being possibly sourced from countries at high-risk of using modern slavery and/or child labour. Notwithstanding 1.2.1, the Contractor shall not use any products/materials sourced from high-risk countries, as identified in this section, without agreement from the Landsec Project Manager.

1.2.5. Prior to seeking agreement in 1.2.4, the Contractor shall actively demonstrate compliance with 1.2.1, in writing and to the satisfaction of the Employer, for the manufacturer and/or supplier of said product/material.

1.2.6. The products/materials identified in this section are based on the following. Where more recent versions of these documents exist, the more recent versions shall apply.

- Walk Free Global Slavery Index 2023, Final list of products at risk of modern slavery by source country
- ILAB List of Goods Produced by Child Labor or Forced Labor 2022.

1.2.7. In selecting Sub-contractors, manufacturers, suppliers, agencies, and the like, whether for products/materials or labour, the Contractor shall include clauses on modern slavery that demonstrate consideration for practices regarding labour rights.

1.3. Definitions

1.3.1. The following definitions apply shall apply in this section, aligned with BREEAM Mat 03, unless otherwise noted:

- Product/material
  A manufacturer specific construction product/material (with a manufacturer reference number) that is specified by the Consultant, or selected by the Contractor (Principle, Sub-contractor), to be used and/or installed in the works (adapted from BREEAM Guidance Note 24).
- Constituent product/material
  A manufacturer specific construction product/material (with a manufacturer reference number) that is not specified by the Consultant, nor selected by the Contractor (Principle, Sub-contractor), but is used in the manufacture of a product/material (adapted from BREEAM Guidance Note 24).
- Raw materials
  Unprocessed materials that are acquired from nature for subsequent use in the realisation of a material/product (adapted from Criteria for the evaluation of responsible sourcing certification schemes within BREEAM).
- Raw material extraction
  The processes required to extract, from the environment, the raw materials included in the product/material.

- Production/manufacture
  Processes involved in transforming raw materials into a finished product/material. This may be used as finished, or as a constituent product/material.

1.4. Adhesives and Sealants (applied on-site)

1.4.1. Products labelled as “Acutely Toxic” or “Serious Health Hazard”.

1.4.2. Products containing epichlorohydrin (ECH).

1.4.3. Products containing phthalates and di-2-ethylhexyl phthalate (DEHP).

1.5. Aggregates

1.5.1. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture and raw material extraction.

1.6. Aluminium

1.6.1. Products manufactured or treated with Chromium (IV) pre-treatment.

1.6.2. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture and raw material extraction.

1.7. Blockwork

1.7.1. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture and raw material extraction.

1.8. Bricks

1.8.1. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture and raw material extraction.

1.8.2. High risk source countries for modern slavery and/or child labour:

- Brazil *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Burma *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Afghanistan *(Walk Free Global Slavery Index 2023)*
- Cambodia *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- China *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Columbia *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Ecuador *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Egypt *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- India *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Iran *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Nepal *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- North Korea *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Pakistan *(Walk Free Global Slavery Index 2023 (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Paraguay *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Peru *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Russia *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Uganda *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Vietnam *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022).*

1.9. Concrete

1.9.1. Products containing/using vermiculate.

1.9.2. In-situ concrete without BES 6001 “Very Good” certification, or better.

1.9.3. Pre-cast concrete without ISO 14001 certification for the product/material manufacture and raw material extraction.

1.10. Copper

1.10.1. Products without ISO 14001 certification for the product/material manufacture and raw material extraction.

1.10.2. High risk source countries for modern slavery and/or child labour:

- Democratic Republic of the Congo *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022).*

1.11. Electronics and Electrical Equipment

1.11.1. Products containing mercury, lead, polyvinylchloride (PVC), chlorinated polyethylene (CPE), chlorinated polyvinylchloride (CPVC), chlorosulfonated polyethylene (CSPE), polychloroprene rubber (CR), halogenated flame retardants, and/or hexavalent chromium.

1.11.2. High risk source countries for modern slavery and/or child labour:

- China *(Walk Free Global Slavery Index 2023 & ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Malaysia (*Walk Free Global Slavery Index 2023 & ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Pakistan *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022).*

1.12. Flooring

1.12.1. Products labelled as “Acutely Toxic” or “Serious Health Hazard”.

1.12.2. Products containing polyvinyl chloride (PVC).

1.12.3. Products containing polyurethane.

1.12.4. Products containing fly ash.

1.12.5. Products containing antimony, antimony oxide, or antimony trioxide (ATO).

1.12.6. Products with treatments containing perfluoroalkyl substances (PFAS).

1.12.7. Products containing phthalates and di-2-ethylhexyl phthalate (DEHP).

1.12.8. Products with antimicrobial treatments where the active ingredients are classified as Persistent Bio-accumulative Toxic (PBT).

1.12.9. Rubber or vinyl products containing post-consumer recycled content.

1.12.10. High risk source countries for modern slavery and/or child labour:

- Afghanistan *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Iran *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- India *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Nepal *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Pakistan *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*.

1.13. Furniture

1.13.1. Products labelled as “Acutely Toxic” or “Serious Health Hazard”.

1.13.2. Products containing Rayon (also called viscose).

1.13.3. Products containing animal hides.

1.13.4. Products containing antimony, antimony oxide, or antimony trioxide (ATO).

1.13.5. Products containing engineered nanomaterials (ENMs).

1.13.6. Products containing phthalates and di-2-ethylhexyl phthalate (DEHP).

1.13.7. High risk source countries for modern slavery and/or child labour (finished products):

- Bangladesh *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Pakistan *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Turkey *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Vietnam *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022).*

1.13.8. High risk source countries for modern slavery and/or child labour (fabrics/textiles):

- Bangladesh *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- *Cambodia (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- China *(Walk Free Global Slavery Index 2023 & ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Ethiopia *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Ghana *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- North Korea *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Pakistan *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Vietnam *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- India *(Walk Free Global Slavery Index 2023).*

1.13.9. The requirements for aluminium, glass, steel, and/or timber in 1.6, 1.14, 1.19, 1.22 shall apply.

1.14. Glass

1.14.1. Products and/or treatments containing heavy metals.

1.14.2. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture and raw material extraction.

1.15. Gypsum/Plasterboard

1.15.1. Products without BES 6001 “Very Good” certification, or better.

1.15.2. High risk source countries for modern slavery and/or child labour:

- Niger *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022).*

1.16. Insulation (thermal and acoustic)

1.16.1. Products labelled as “Acutely Toxic” or “Serious Health Hazard”.

1.16.2. Products with Ozone Depletion Potential (ODP) that is non-zero.

1.16.3. Products with Global Warming Potential (GWP) exceeding 10.

1.16.4. Products containing antimony, antimony oxide, or antimony trioxide (ATO).

1.16.5. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture and raw material extraction.

1.17. Paints and Coatings (applied on site)

1.17.1. Products labelled as “Acutely Toxic” or “Serious Health Hazard”.

1.17.2. Products classified as acrylic paints.

1.17.3. Products containing alkylphenol ethoxylates (APEs).

1.17.4. Products containing engineered nanomaterials (ENMs).

1.17.5. Products containing cadmium.

1.17.6. Products with antimicrobial treatments where the active ingredients are classified as Persistent Bio-accumulative Toxic (PBT).

1.17.7. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture.

1.18. Plastics (where plastics are the key constituent in a product/material)

1.18.1. Products labelled as “Acutely Toxic” or “Serious Health Hazard”.

1.18.2. Plastic lumber products containing wood-plastic composites.

1.18.3. Products containing multiple commingled recycled plastics.

1.18.4. Products containing fibreglass, polystyrene, and/or polyvinyl chloride (PVC)

1.18.5. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture.

1.19. Steel

1.19.1. Structural steel products without BES 6001 certification.

1.19.2. Secondary steel, and non-structural steel products, without ISO 14001 certification for the product/material manufacture and raw material extraction.

1.19.3. Reinforcing steel without CARES Sustainable Constructional Steel Scheme or Eco-Reinforcement certification.

1.20. Stone

1.20.1. Products containing asbestos.

1.20.2. Products without BES 6001 certification, or ISO 14001 certification for the product/material manufacture and raw material extraction.

1.21. Solar Photovoltaic Panels

1.21.1. We know that China is a high risk country for modern slavery and/or child labour in the Solar PV supply chain however we also appreciate that most panels are sourced from there. We therefore want to see evidence from suppliers of efforts to tackle Modern Slavery and comply with the Modern Slavery Act 2015. We also want to see evidence of whether PV modules, inverters, electrical and electronic equipment can be sourced with no association with China.

1.22. Timber

1.22.1. Structural timber products without FSC or PEFC certification (full chain of custody).

1.22.2. Non-structural timber products without FSC certification (full chain of custody).

1.22.3. High risk source countries for modern slavery and/or child labour (finished products):

- Brazil *(Walk Free Global Slavery Index 2023)*
- Cambodia (*ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Burma *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Peru *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Russia *(Walk Free Global Slavery Index 2023 & (ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- North Korea *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022)*
- Vietnam *(ILAB List of Goods Produced by Child Labor or Forced Labor 2022).*

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