Conditions for success

The client has a key role to establish the conditions of success for achieving circular economy outcomes on their projects. The client should challenge all those working on their project to explore and test ideas that will deliver a circular economy building/asset in a cost effective way. This means:

- Setting briefs for designers and contractors to explore and test circular economy design approaches in a systematic and practical way.
- Using cost consultants to model circular economy design solutions, technologies, and building systems over their whole life.
- Working with your cost consultants to support investigation of new ways to procure buildings, looking at end user responsibility, take back, leasing, design for deconstruction and reuse.
- Working with your project managers to ensure BIM and asset management systems include information to enable deconstruction of all elements, and either take-back, reuse, remanufacturing or recycling.
- Ensuring you use a principal contractor who demonstrates their commitment to supporting circularity and innovation in through their delivery approach.
- Setting up an innovation strategy or process that encourages suppliers to come forward with innovative circular economy ideas and technologies, and ensures viable ideas are followed through.

Read more about it on the website: www.cetoptips.com
TOP TIPS FOR EMBEDDING CIRCULAR ECONOMY PRINCIPLES IN THE CONSTRUCTION INDUSTRY
Commit to explore the circular economy

Make a commitment to explore circular economy opportunities on your project(s), and to take them forward where viable. To move towards the circular economy, we need clients who are open to the idea and are willing to test different approaches. When exploring circular economy opportunities, be sure to consider the impacts on the overall project. For example, you might need to make changes to the way you procure and manage the building/asset over the long term.
02. Use the procurement process

Find a team that can bring the right mindset and capabilities to innovate in this area. As a client, it’s really important to clearly communicate to your potential supply chain that you want circular economy approaches to be implemented. The procurement process is a powerful mechanism to do this, and it can stimulate innovation around the circular economy. Include circular economy objectives or outcomes you’re seeking in the tender brief, and include at least one tender question on the circular economy.
03.

Encourage innovation and collaboration

The circular economy is a new model for the construction industry, so it requires innovation and collaboration to make it happen. You will need to encourage much more partnership working, be prepared to use new products and systems, procure in different ways (e.g. product as a service), and do things like test new materials. Push your team and don’t settle for mediocrity!
You can drive innovation by telling your design and procurement team what you want your building/asset to do (a performance specification) rather than being prescriptive about the design, specifications and materials they must use (a technical specification). For instance, the infrastructure sector often sets performance requirements eg “the asset must pump a certain volume of water, with a given energy efficiency and service life”, and the industry innovates in response to this.
05. Establish a minimum design life

Set a minimum design life for the various layers of a building (structure, façade, services, fit-out) and elements of infrastructure projects (e.g. bridge structure, road surface), and ask your design and construction team to identify appropriate circular economy strategies to suit the design life. For example, long life infrastructure projects should be designed for durability. Shorter life elements like kitchens should be designed to be easily upgraded, reused and recycled.
To support circular economy approaches, it is best practice to make investment decisions based on whole life costs of a material, product, or building/asset. This means considering the initial capital cost, as well as operational, maintenance, repair, upgrade and eventual end of life costs. Assess whether lifecycle costs could be reduced by applying circular economy approaches including leasing, sharing, design for durability and ease of maintenance, design for adaptability, or implementing take-back arrangements etc.
Start a dialogue with the supply chain

The construction industry supply chain has expertise to help you to innovate. Communicate what you want to achieve, and find the people and companies that share your ambition and can help deliver it. Build trust. Share risks and opportunities. Understand that it may take two or three projects before you and your partners perfect new approaches.
08. Refurbish rather than demolish

Do you need a new building/asset, or can you refurbish or modify an existing one? Retaining the resource value embedded in structures is one of the most significant actions you can take to reduce waste and material consumption. Include a stage in your asset management process to review the need for a brand new building/asset.
09. Commission a pre-refurbishment/demolition audit

If refurbishing or demolishing, commission a comprehensive pre-refurbishment or pre-demolition audit to identify materials and products that can be retained, reused for high value purposes elsewhere, or recycled. You can then use this information to set targets and objectives within the refurbishment or demolition tender documents.
TOP TIPS FOR EMBEDDING CIRCULAR ECONOMY PRINCIPLES IN THE CONSTRUCTION INDUSTRY

FOR DESIGNERS
01.

Advise your client

Proactively identify where the project could benefit from circular economy design approaches and advise your client. For example, greater use of reused and recycled products (providing it does not increase environmental impact), material efficient design, design to enable ease of maintenance and upgrade, design for adaptability and deconstruction, use of different business models etc.
02. Include the circular economy in design reviews

During the key stages of your practice’s design review process, assess how well the design and specification addresses circular economy principles, and identify further opportunities for improvement.
03. Engage with manufacturers

Manufacturers have their own programmes of innovation, and talking to them early in the design process may provide opportunities you have not thought of. Ask manufacturers what actions they are taking to embed circular economy thinking in their product offer.
04. Align with the design life

Identify the design life your client has set for the building/asset and the different ‘layers’ of the building/asset (e.g. bridge structure 120 years, pavement 20 years). Align your design accordingly: identify the appropriate circular economy design principles for the lifecycle length. This should lead to material efficient design, less waste and higher levels of reuse over the building/asset’s 2nd, 3rd, 4th life etc.
Design for ease of future maintenance and upgrade work on the main elements, e.g. structure and services, to prolong the life of the building/asset and avoid waste. Ideally, asset managers/facilities managers and end uses should be engaged to help inform the design and specification from a maintenance perspective.
Does your design brief include designing to enable future flexibility and reconfiguration of the building/asset? Think about the lifecycle of what you are designing. Consider if it is appropriate and possible to design for future flexibility, to enable reconfiguration and reuse. Demonstrate the benefits of this approach to your client.
Design for deconstruction

Does your design brief include designing for deconstruction? This is commonplace for temporary buildings/assets, but at present, rare for permanent buildings/assets. Designing for deconstruction enables reuse of the whole building/asset, or individual components and materials at the end of life. Investigate for instance bolted connections and fixings, which enable easier dismantling and reuse.
TOP TIPS FOR EMBEDDING CIRCULAR ECONOMY PRINCIPLES IN THE CONSTRUCTION INDUSTRY

FOR MATERIAL AND COMPONENT SUPPLIERS AND MANUFACTURERS
Communicate end of life options

Describe the potential options for your product/material at the end of life for your customer’s benefit. For example, is it recyclable? Can it be returned to you for remanufacture? Clearly communicate this in your product information.
Consider take-back schemes

Assess whether take-back schemes are viable for your components or materials. Take-back enables you to recover the value of materials at the end of life and reduce virgin material inputs into your manufacturing process. If a take-back scheme isn’t feasible, can you collaborate with others in the industry who can reuse or recycle your products?
Consider offering your product as a service

Consider whether selling your product as a service is viable and makes commercial sense. With this business model, you sell the benefits of your product (rather than the product itself), retain ownership of the product and responsibility for it at end of life, and have a longer-term relationship with your customers. This business model works best if the contractual relationship is directly with the end user.
04. Minimise waste during manufacture

Establish how much waste is generated in your own manufacturing process and set targets for year on year reduction. Include this in your marketing. Also review whether your by-products can be used by other companies.
05. Optimise packaging

Your packaging should use the minimum amount of material to deliver your product without damaging it. Can some or all of the packaging be taken back for reuse (e.g. crates or pallets)? Is your packaging recyclable?
06.

Design for remanufacture

Remanufacturing is the rebuilding of a product to specifications of the original manufactured product using a combination of reused, repaired and new parts. Can you design the product, component or material for remanufacture, so it can be kept at its highest utility in the future? Can you offer a remanufacturing service? If remanufacture is not appropriate or possible for some product sectors, then consider other design options for improving circularity.
07. Optimise secondary materials

Optimise the amount of secondary (recycled) material in your product. This means using the maximum amount for the intended quality and durability requirements, without having a detrimental impact on the product’s environmental footprint.
TOP TIPS FOR EMBEDDING CIRCULAR ECONOMY PRINCIPLES IN THE CONSTRUCTION INDUSTRY
01. Advise your client

Proactively identify where the project could benefit from circular economy construction approaches and advise your client. For example, greater use of reused and recycled products (providing it does not increase environmental impact), modular construction that can be dissembled, use of different business models etc. This is a way of providing added value to your client.
Procure from suppliers offering circular economy benefits

The procurement team has a key role to identify suppliers who deliver circular economy benefits, i.e. those offering reused or reconditioned components which will meet the design life, products with a high recycled content, take-back schemes, or suppliers offering products as a service. Or you may be able to find pre-used materials yourself or in cooperation with demolition companies, reclamation yards or recycling centres.
Seek to eliminate waste during construction, use, maintenance and end of life by engaging with the design team, client and suppliers/ manufacturers. Could the building/asset become a pre-fabricated kit of parts with no waste? During construction, set waste reduction and reuse and recycling targets, and work with the supply chain to achieve these.
04. Review the business case for procuring reused or recycled components

Regularly assess the business case for procuring reused and recycled components - changes over time in the economics (e.g. due to changes in virgin material prices and availability), and logistics, can increase deliverability of this circular economy approach. Have a dialogue with your client about the pros and cons of using reused or recycled products.
Use digitalisation and BIM to support the circular economy

The benefits of using BIM to reduce waste during construction are well known. BIM can also be used to hold an inventory of design, materials and component information over the life of the buildings/asset. This will support future maintenance and reuse or take-back. BIM also has the potential to show how the building/asset could be reconfigured or deconstructed in the future.
TOP TIPS FOR EMBEDDING CIRCULAR ECONOMY PRINCIPLES IN THE CONSTRUCTION INDUSTRY
01. Provide feedback

You are in a unique position to see how the design and construction of a building/asset affects its ability to be efficiently deconstructed or demolished, and the materials reused or recovered. Find ways to give the design and construction industry feedback on what you are learning through your demolition projects.
Consider a pre-demolition audit

Use pre-demolition audits to identify opportunities for reuse, and communicate to your client if deconstruction rather than demolition is viable. Advise the team about any markets for pre-used materials and components.
03. Maximise reuse

Prioritise reuse and high value recycling where possible, to retain the product’s value and utility. Aim to deconstruct as much as possible, to enable reuse. Write up case studies of projects with high levels of reuse, demonstrating the economic and environmental benefits.
04. Measure and report how much is reused, how much is recycled and how much is recovered or sent to landfill. Aim to increase levels of reuse over time.
TOP TIPS FOR EMBEDDING CIRCULAR ECONOMY PRINCIPLES IN THE CONSTRUCTION INDUSTRY
01.

Demonstrate leadership

Everyone involved in the creation of buildings/assets can influence and drive change to unlock the benefits of moving towards the circular economy. You can demonstrate leadership by taking action to proactively identify and implement circular economy approaches, and sharing your experience with others across industry.
02.

Develop your knowledge

Find out more about the circular economy to understand how you can apply it to what you do - this could be through CPD training and events, reading online resources and case studies, and talking to others. The Green Construction Board’s knowledge resource for circular economy thinking in construction is a good signpost to useful sources of information.
03. Consider end of life, upfront

Every part of the construction industry can contribute to circularity by considering the end of life consequences of a material, component, or building/asset, upfront. For example: can it be adapted or disassembled? Can it be reused for high value purposes elsewhere? Can it be returned to the manufacturer? Is it recyclable? Everyone has a role to identify better end of life solutions, and contribute to delivering circular economy outcomes.
Setting out the business case can help build support for circular economy approaches within your organisation and with a wider project team. Consider opportunities presented by the circular economy and risks of not taking action (e.g. due to resource unavailability in the future). The business case for circular economy can include hard and soft benefits, e.g. cost savings through material efficiency and reducing waste, improving long term value, as well as risk management, improving reputation, and environmental and social benefits.
Top Tips for Embedding Circular Economy Principles in the Construction Industry

This resource is intended to help the construction industry start its journey towards the circular economy. It offers a series of practical tips - for Clients, the Design Team, Contractors, Material and Product Manufacturers, and Demolition Contractors. Those who have already developed and are practicing a sophisticated approach to circular economy may find these tips useful as a checklist.

Read more about it on the website:
www.cetoptips.com

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