		Early Considerations RIBA Stages 0-1	Project Planning & Design RIBA Stages 2-4	Construction & Handover RIBA Stages 5-6	In Use & End of Life RIBA Stage 7
Retrofit	Maximise reuse	**1.** Evaluate whether this asset is suitable for retrofit **2.** Conduct an initial audit of the asset considering the current building fabric and layout and the needs of the client. **3.** Hold an initial workshop with the client to determine current and future use scenarios. This will inform the basis of the decision as to whether the existing building will satisfy the requirements. **4.** Conduct initial building assessment of building fabric, airtightness, ventilation, and energy use of the existing building to determine whether retrofitting is the most efficient solution.	**1.** Set out the required changes and performance targets. In this stage of works, the focus is on balancing maximum carbon savings (retaining the maximum within the existing structure) whilst achieving the desired building performance and function for the client's use (current and future). **2.** In the technical design phase, the sequence of works should be planned along with the details of the interventions. **3.** Create an inventory of materials sent onward for reuse. Material passports ensure the future reuse of materials. Their production should begin as early as possible by surveying and logging the existing asset and new components.	**1.** To deal with any construction problems that might change a design detail, develop strategies to address the uncertainties arising from using reclaimed materials (e.g. flexible procurement). **2.** The design and construction teams should collaborate to find solutions to onsite problems without compromising circular strategies. Hold regular workshops during the construction phase to maintain collaborative problem solving and information flow between the design and construction team. **3.** Enrich the existing material passport data with exact specification information, including but not limited to type, quantities, material composition, and assembly details. **4.** At Handover, hold workshops with the client explaining the format and information included in the material passports produced. Ensure the client or building management can monitor and modify the information contained in the passports so that the documentation can be updated in case of maintenance works during the asset's life.	**1.** At this stage of works, ideally, an end-of-life strategy is already in place (e.g. leasing agreements, pre-agreed take back programmes). For building components with no end-of-life agreements. If for certain elements there was no agreement during procurement, re-engage with the product manufacturer during the use phase of the building to develop and end-of-life strategy for the building element together. **2.** During the use phase of the building, ensure that there is a digital data management strategy that assigns responsibilities for data ownership and maintenance long-term. **3.** Ensure retrofitted parts are modelled in detail to enable future reuse. **4.** Improve the detail of pre-deconstruction audits to be material passport quality. 5. Do not overlook the carbon savings that smaller reuse opportunities (e.g. finishes or interior elements) offer.
	Design for optimisation	**1.** Hold a workshop with stakeholders to do future scenario modelling and explore how the building users' needs might change over time. **2.** Include a time factor within the design brief, which means that the design isn't just focused on the initial program, but considers multiple use scenarios for the building and its components, considering future occupants and owners. **3.** The building should be designed for exchangeability. Apply a layered approach, where each building layer is independent from each other. Layers should depend on element type and lifespan.	**1.** Building the components should be independent and exchangeable. Independency means that the assembly, transformation and disassembly of components within a building layer can be carried out without affecting others. **2.** Develop an adaptability plan. **3.** Break down the proposal into layers, dividing the building into the different elements. **4.** When adding new elements into the building, standardise dimensions across the layers and position circulations and access that do not inhibit the future alterations. **5.** Assess the future disassembly potential of the building. **6.** Develop a construction plan, focus on the physical reversibility of the elements. Break down the building proposal into shearing layers and cluster components based on building functions. 7. Cluster elements and components together based on their life cycle where possible. **8.** Interface design and physical connections. There are three distinct types of connections to consider: integral, accessory or filled. **9.** When possible, prioritise open or overlapping geometries in the design, as these are the easiest to disassemble. **10.** For all new elements, prioritise external joints where possible, as they provide an easier opportunity for dismantling. Hold workshops with all the relevant stakeholders to design all new joints. **11.** For all new elements, consider assembly and disassembly sequences.	**1.** Data collection: Continue to enrich the data on your chosen platform. **2.** Handover documentation: Engage with the client, building maintenance team and the end users through a series of workshops in the handover stage.	**1.** Ideally avoid end of life by continuously refurbishing and keeping the building in use for as long as possible. **2.** Include a circular management strategy in the O&M manuals, which outlines the necessary future upgrades and adaptability instructions detailins the least intrusive ways to execute it. **3.** Encourage an annual review of material end of life strategies by clients and maintance teams. **4.** Encourage a mid-term improvement plan.
	Minimise impact and waste	**1.** Hold an initial workshop with the client and relevant stakeholders to introduce key concepts of minimising waste and impact, such as the R-frameworks and material cascades. **2.** Explain the idea of material cascades, which considers the possibilities of extending a material's lifecycle by transforming it into different products. **3.** Minimise the total input of materials while ensuring the quality of the design. **4.** Prioritise natural, renewable and biodegradable materials whenever possible and engage with relevant stakeholders early. **5.** Consider local resources **6.** Set targets to specify high percentages of remanufactured and recycled products. **7.** Avoid mixing technical and biological materials together to preserve clean and non toxic material cycles.	**1.** Develop the strategy of dematerialisation. Make sure the design is optimised in terms of the structure. **2.** Specify whenever possible, natural, renewable and bio-degradable products. Products with high remanufactured and recycled content. **3.** Design with standardised and modular components and off-site manufactured products as these reduce construction waste significantly. **4.** Avoid the use of glues and aim to use mechanical and accessible fixings where possible, while making sure fabric efficiency is not compromised. **5.** Avoid unnecessary finishes and keep surfaces exposed where possible. **6.** Develop strategy for future end-of-life. **7.** Documenting the building components through material passports and BIM **8.** Whenever possible, specify products from manufacturers with established take-back schemes. **9.** Consider products as a service approach. **10.** Develop a waste management strategy during construction.	**1.** Make sure a detailed waste management plan and reuse mandate are part of the tender documents for the contractor. **2.** The waste management plan that is in place aspires towards 0% waste and stringent targets for the lead contractor and sub-contractors are set. **3.** To ensure future reusability, make sure the components are physically tagged with product information during the construction process. **4.** The design team should closely collaborate with the construction team during this stage and ensure a continuous flow of information.	**1.** The handover process should ensure that the user receives all the necessary information to operate the building in a circular manner. **2.** The design team should stay engaged to carry out post-occupancy performance evaluation and aftercare reviews. **3.** Decisions made post-handover about modifying the asset should follow a circularity plan, which should be guided by the adaptability details outlined in the handover documentation. **4.** Consider extended design life for primary building elements. **5.** Include documentation to let users know how to recycle / reuse materials when it reaches its end of life and its service life. **6.** Make sure the material/building passports are specific e.g. some products look similar but have very different recycling options due to age/composition. e.g. mineral ceiling tiles. therefore it's important to have labelling and traceability data access. **7.** At the end of the built asset's life, the deconstruction plan should be followed.

A!		**Early Considerations** RIBA Stages 0-1	**Project Planning & Design** RIBA Stages 2-4	**Construction & Handover** RIBA Stages 5-6	**In Use & End of Life** RIBA Stage 7
Partial Reuse	**Maximise reuse**	**1.** If the asset is not suitable to be reused entirely, its materials and components should be deconstructed (instead of demolished), ensuring their reuse is possible in another project **2.** Carry out a reclamation audit for buildings scheduled for demolition or strip out and refurbishment, identifying building components and materials with high reuse potential. **3.** Produce a inventory consisting of the materials' details: dimensions, quantity, condition, environmental impact, technical characteristics and disassembly.	**1.** Conduct a reclamation audit - materials should be carefully documented in the inventory. **2.** Following the audit, procede to make material passports for all the items that can be reused. **3.** Evaluate whether the materials identified can be reused on site or sent to another site or material broker. **4.** With respect to materials that would be reused off-site, the team should begin to search for buyers and set up a material storage policy. **5.** Organise the logistics of the material handling with the contractor; to manage the storage, packaging and transportation of the materials.	**1.** Prepare a method statement for the disassembly of elements with the contractor, before the start of deconstruction. **2.** At the start of this stage, carry out trials of deconstructing certain components to understand barriers and sensibly allocate time for deconstruction activities. **3.** Evaluate the hierarchy of materials based on reuse value in the deconstruction plan. **4.** Consider which materials are the most valuable based on environmental, economic and practical criteria. **5.** As a general rule of thumb, working with reclaimed materials requires more flexibility from the construction team in terms of the timing and installation and from the client to allow for aesthetic variations. **6.** Set up a storage and logistics plan for the materials salvaged before the works begin. **7.** Hold regular workshops between the deconstruction and the design team and appoint a person in the team who is in charge of logging material details.	**1.** At this stage of works, ideally, an end-of-life strategy is already in place (e.g. leasing agreements, pre-agreed take back programmes). For building components with no end-of-life agreements. If for certain elements there was no agreement during procurement, re-engage with the product manufacturer during the use phase of the building to develop and end-of-life strategy for the building element together. **2.** During the use phase of the building, ensure that there is a digital data management strategy that assigns responsibilities for data ownership and maintenance long-term. **3.**Ensure retrofitted parts are modelled in detail to enable future reuse. **4.** Improve the detail of pre-deconstruction audits to be material passport quality. **5.** Do not overlook the carbon savings that smaller reuse opportunities (e.g. finishes or interior elements) offer.
	Design for optimisation	**1.** Hold a workshop with stakeholders to do future scenario modelling and explore how the building users' needs might change over time. **2.** Include a time factor in the design brief; this means that the design isn't just focused on the initial program, but considers multiple use scenarios for the building and its components, considering future occupants and owners. **3.** The building should be designed for exchangeability. Apply a layered approach, where each building layer is independent from each other. Layers should depend on element type and lifespan.	**1.** Building the components should be independent and exchangeable. Independency means that the assembly, transformation and disassembly of components within a building layer can be carried out without affecting others. **2.** Develop an adaptability plan. **3.** Choose a regular approach to the building grid. **4.** Break down the proposal into layers, dividing the building into the different elements. **5.** When adding new elements into the building, standardise dimensions across the layers and position circulations and access that do not inhibit the future alterations. **6.** Clustering core elements such as load bearing, installation and communication, enables buildings to be designed with higher transformation capacity. **7.** Assess the future disassembly potential of the building. **8.** Develop a construction plan, focusing on the physical reversibility of the elements. Break down the building proposal into shearing layers and cluster components based on building functions. **9.** Cluster elements and components together based on their life cycle where possible. **10.** Interface design and physical connections. There are three distinct types of connections to consider: integral, accessory or filled. **11.** Prioritise open or overlapping geometries in the design, as these are the easiest to disassemble. **12.** Prioritise external joints where possible, as they provide an easier opportunity for dismantling. Hold workshops with all the relevant stakeholders to design all new joints. **13.** Consider assembly and disassembly sequences.	**1.** Data collection: Continue to enrich the data on your chosen platform. **2.** Handover documentation: Engage with the client, building maintenance team and the end users through a series of workshops in the handover stage.	**1.** Ideally avoid end of life by continuously refurbishing and keeping the building in use for as long as possible. **2.** Include a circular management strategy in the O&M manuals, which outlines the necessary future upgrades and adaptability instructions detailins the least intrusive ways to execute it. **3.** Encourage an annual review of material end of life strategies by clients and maintance teams. **4.** Encourage a mid-term improvement plan. **5.** Test out principles of deconstruction and material reuse on shorter lifespan assets that are more easily controlled to learn and then apply to long lifespan assets.
	Minimise impact and waste	**1.** Hold an initial workshop with the client and relevant stakeholders to introduce key concepts of minimising waste and impact, such as the R-frameworks and material cascades. **2.** Explain the idea of material cascades, which considers the possibilities of extending a material's lifecycle by transforming it into different products. **3.** Minimise the total input of materials while ensuring the quality of the design. **4.** Prioritise natural, renewable and biodegradable materials whenever possible and engage with relevant stakeholders early. **5.** Consider local resources **6.** Set targets to specify high percentages of remanufactured and recycled products. **7.** Avoid mixing technical and biological materials together to preserve clean and non toxic material cycles.	**1.** Develop the strategy of dematerialisation. Make sure the design is optimised in terms of the structure. **2.** Specify wherever possible, natural, renewable and biodegradable products and products with high remanufactured and recycled content. **3.** Design with standardised and modular components and off-site manufactured products as these reduce construction waste significantly. **4.** Avoid the use of glues and aim to use mechanical and accessible fixings where possible, while making sure fabric efficiency is not compromised. **5.** Avoid unnecessary finishes and keep surfaces exposed where possible. **6.** Develop strategy for future end-of-life. **7.** Documenting the building components through material passports and BIM **8.** Wherever possible, specify products from manufacturers with established take-back schemes. **9.** Consider products as a service approach. **10.** Develop a waste management strategy during construction.	**1.** Make sure a detailed waste management plan and a reuse mandate are part of the contractor's tender documentation. **2.** The waste management plan that is in place aspires towards 0% waste and stringent targets for the lead contractor and sub-contractors are set. **3.** To ensure future reusability, make sure the components are physically tagged with product information during the construction process. **4.** The design team should closely collaborate with the construction team during this stage and ensure a continuous flow of information.	**1.** The handover process should ensure that the user receive all the necessary information to operate the building in a circular manner. **2.** The design team should stay engaged to carry out post-occupancy performance evaluation and aftercare reviews. **3.** Decisions made post handover about modifying the asset should follow a circularity plan, which should be guided by the adaptability details outlined in the handover documentation. **4.** Ensure that there's a long term strategy in place for material passporting, including assigning responsibilities for data ownership and maintenance. **5.** At the building's end of life, prepare the deconstruction audit to the quality of material passports, to spare time and costs.

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New Build	**Maximise reuse**	**1.** When sourcing new materials for a project, the priority is to look into reusing materials instead of sourcing virgin materials. Set reuse objectives with the client. **2.** Hold a workshop with the key stakeholders to assess the viability of the most easily reusable materials to suit the concept design and to familiarise them with materials available for reuse and their specific performance and aesthetic characteristics **3.** Formulate the reuse objective with the client and the design team by the end of this stage. **4.** Hold a workshop with the client to establish specific reuse objectives alongside environmental and circularity ambitions	**1.** Agree with the client on reuse objectives or targets. Reuse objectives, either in a quantitative or qualitative form should be included in the contractor's contract documents and used as a basis for the tender. **2.** Once the objectives are set; engage with the contractors via workshops. **3.** Start developing a supply strategy to source the reclaimed materials and work alongside the contractors iteratively to develop the construction details and ensure there aren't any buildability issues. **4.** Standard specification clauses are not written with reuse being considered. It is likely you will need to edit and adapt the clauses, tailoring them towards reuse.	**1.** Prepare a method statement for the disassembly of elements together with the contractor, before the start of deconstruction.Carry out trials of deconstructing certain components to understand barriers and sensibly allocate time for deconstruction activities. **2.** Hold regular workshops with manufacturers and the design and construction team to allow for more collaboration. **3.** Engage the facilities/management team as early as possible into the built process, for them to contribute and have a good understanding of the new build. **4.** Encourage the contractor to start collating the O&M manual early, and provide a comprehensive document that captures specific information on building elements, including deconstruction or any existing end of life interest from suppliers or customers. **5.** At handover, hold workshops with the client explaining the format and information included in the material passports and other documentation produced. Ensure the client / building management can monitor and modify the information contained in the passports so that the documentation can be updated in case of maintenance works during the asset's life.	**1.** At this stage of works, ideally, an end-of-life strategy is already in place (e.g. leasing agreements, pre-agreed take back programmes). For building components with no end-of-life agreements. If for certain elements there was no agreement during procurement, re-engage with the product manufacturer during the use phase of the building to develop and end-of-life strategy for the building element together. **2.** During the use phase of the building, ensure that there is a digital data management strategy that assigns responsibilities for data ownership and maintenance long-term. **3.** Ensure retrofitted parts are modelled in detail to enable future reuse. **4.** Improve the detail of pre-deconstruction audits to be material passport quality. **5.** Do not overlook the carbon savings that smaller reuse opportunities (e.g. finishes or interior elements) offer. **6.** Re-evaluate any existing storage plan for future reuse scenarios.
	Design for optimisation	**1.** Hold a workshop with stakeholders to do future scenario modelling and explore how the building users' needs might change over time. **2.** Include a time factor in the design brief, which means that the design isn't just focused on the initial program, but considers multiple use scenarios for the building and its components, considering future occupants and owners. **3.** The building should be design for exchangeability. Apply a layered approach, where each building layer is independent from each other. Layers should depend on element type and lifespan.	**1.** Building the components should be independent and exchangeable. Independency means that the assembly, transformation and disassembly of components within a building layer can be carried out without affecting others. **2.** Develop an adaptability plan. **3.** Choose a regular approach to the building grid. **4.** Break down the proposal into layers, dividing the building into the different elements. **5.** Standardise dimensions across the layers and position circulations and access that do not inhibit future alterations. **6.** Clustering core elements such as load bearing, installation and communication, enables buildings to be designed with higher transformation capacity. **7.** Assess the future disassembly potential of the building. **8.** Develop a construction plan, focus on the physical reversibility of elements. Break down the building proposal into shearing layers and cluster components based on building functions. **9.** Cluster elements and components together based on their life cycle where possible. **10.** Interface design and physical connections. There are three distinct types of connections to consider: integral, accessory or filled. **11.** Prioritise open or overlapping geometries in the design, as these are the easiest to disassemble. **12.** Prioritise external joints where possible, as they provide an easier opportunity for dismantling. Hold workshops with all the relevant stakeholders to design all new joints. **13.** Consider assembly and disassembly sequences.	**1.** During construction run a checklist in order to ensure any on site changes retain the measures and flexibility noted in the adaptability plan. **2.** Data collection: Continue to enrich the data on your chosen platform. **3.** Ensure handover documentation contains along all other documentation the future scenario modelling, adaptability plan and assembly and disassembly sequences identified within the design process. **4.** Engage with the client, building maintenance team and the end users through a series of workshops in the handover stage.	**1.** Decisions made post-handover about modifying the asset should follow a circularity plan, which should be guided by the adaptability details outlined in the handover documentation. **2.** Any individuals and companies undertaking maintenance, replacement or additional works should be provided with material passports and assembly and disassembly sequences for assets where relevant. **3.** The building owner/manager should ensure that individuals and companies undertaking works are competent and skilled with regard to the asset. **4.** Where the user/occupier of the building is changed, identify if existing assets to be removed can be stored on site for future re-use on site. e.g. acoustic panels, kit and FF&E within offices.
	Minimise impact and waste	**1.** Hold an initial workshop with the client and relevant stakeholders to introduce key concepts of minimising waste and impact, such as the R-frameworks and material cascades. **2.** Explain the idea of material cascades, which considers the possibilities of extending a material's lifecycle by transforming it into different products. **3.** Minimise the total input of materials while ensuring the quality of the design. **4.** Prioritise natural, renewable and biodegradable materials wherever possible and engage with relevant stakeholders early. **5.** Consider local resources **6.** Set targets to specify high percentages of remanufactured and recycled products. **7.** Avoid mixing technical and biological materials together to preserve clean and non-toxic material cycles.	**1.** Develop the strategy of dematerialisation. Ensure that the design is optimised in terms of the structure. **2.** Specify wherever possible, natural, renewable and biodegradable products and products with high remanufactured and recycled content. **3.** Design with standarised and modular components and off-site manufactured products, as these reduce construction waste significantly. **4.** Avoid the use of glues and aim to use mechanical and accessible fixings where possible, while making sure fabric efficiency is not compromised. **5.** Avoid unnecessary finishes and keep surfaces exposed where possible. **6.** Develop strategy for future end-of-life. **7.** Document the building components through material passports and BIM **8.** Wherever possible, specify products from manufacturers with established take-back schemes. **9.** Consider products as a service approach. **10.** Develop waste management strategy during construction.	**1.** Consider multiple locations for information on building elements and systems to be retained, from material passports, material tags, O&M manual etc. **2.** Make sure a detailed waste management plan and a reuse mandate are part of the tender documents of the contractor. **3.** The waste management plan that is in place aspires towards 0 % waste and stringent targets for the lead contractor and sub-contractors are set. **4.** To ensure future reusability, make sure the components are physically tagged with product information during the construction process. **5.** The design team should closely collaborate with the construction team during this stage and ensure a continuous fl ow of information.	**1.** The handover process should ensure that the user receive all the necessary information to operate the building in a circular manner. **2.** The design team should stay engaged to carry out post-occupancy performance evaluation and aftercare reviews. **3.** At the end of the built asset's life, the deconstruction plan should be followed.