

Building Revolutions:

Applying the circular economy to the built environment

David Cheshire, AECOM

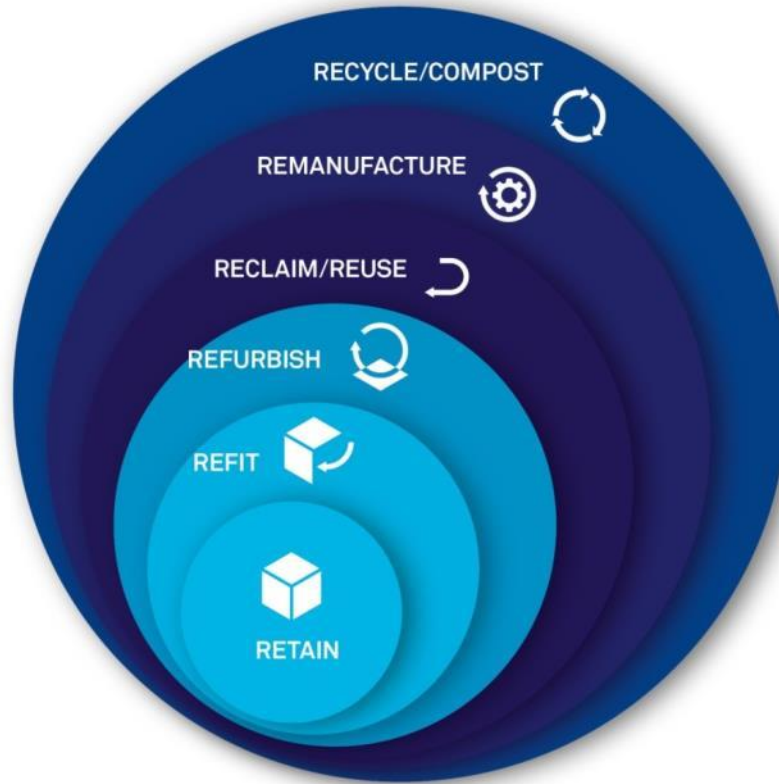




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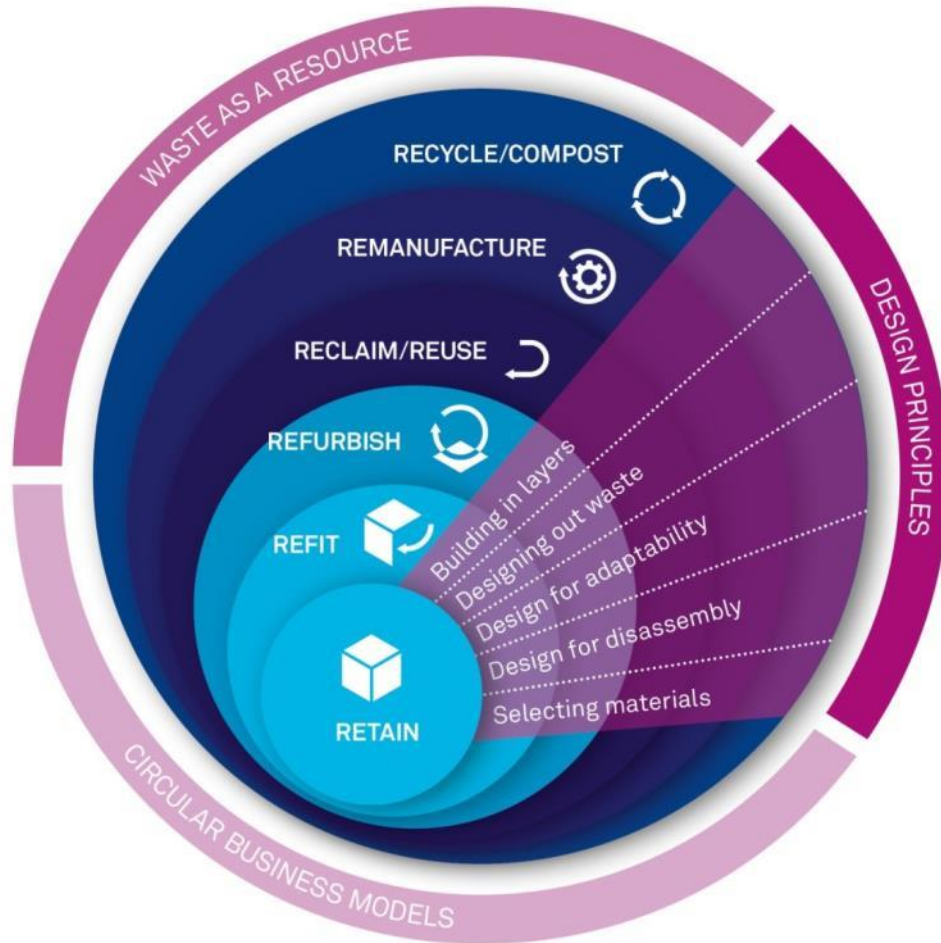






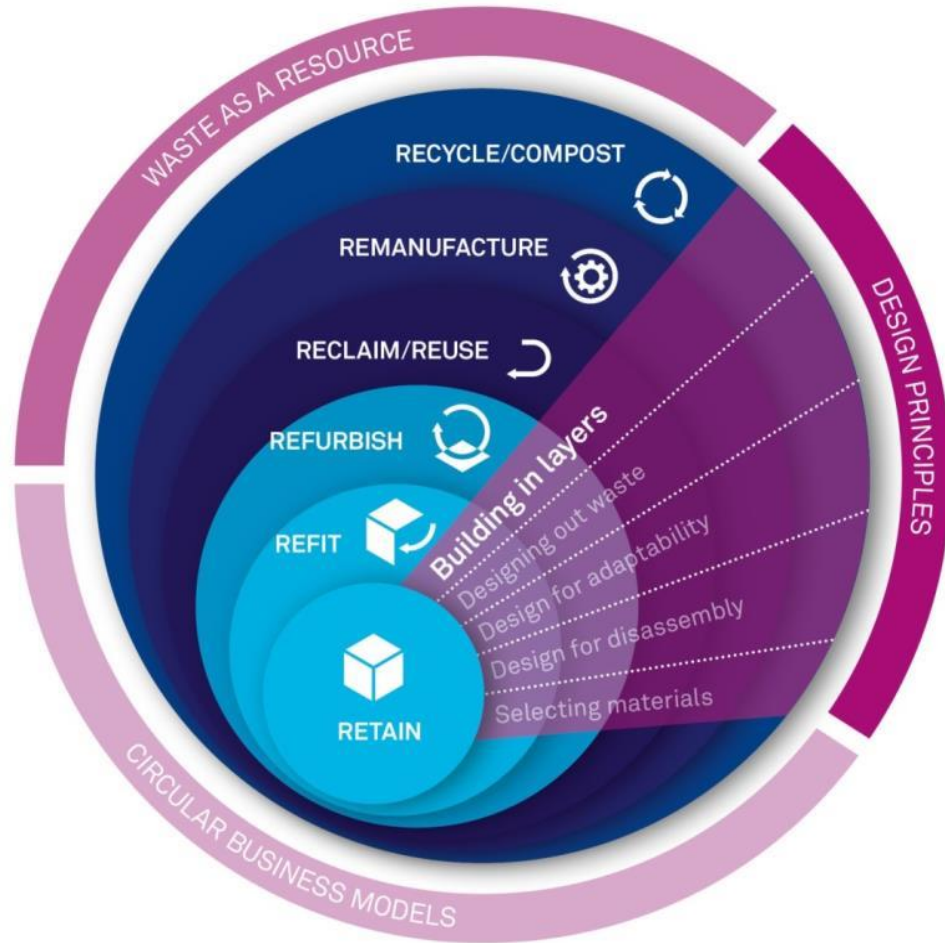
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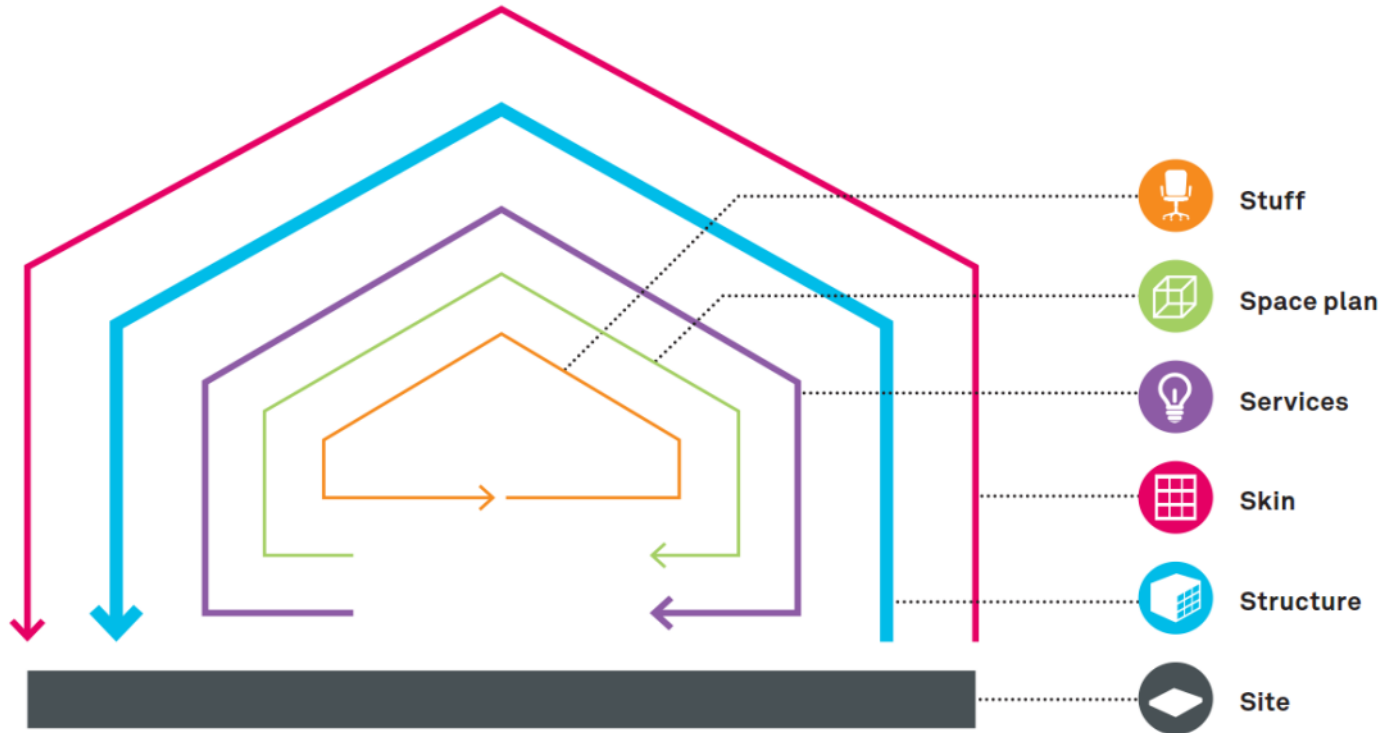
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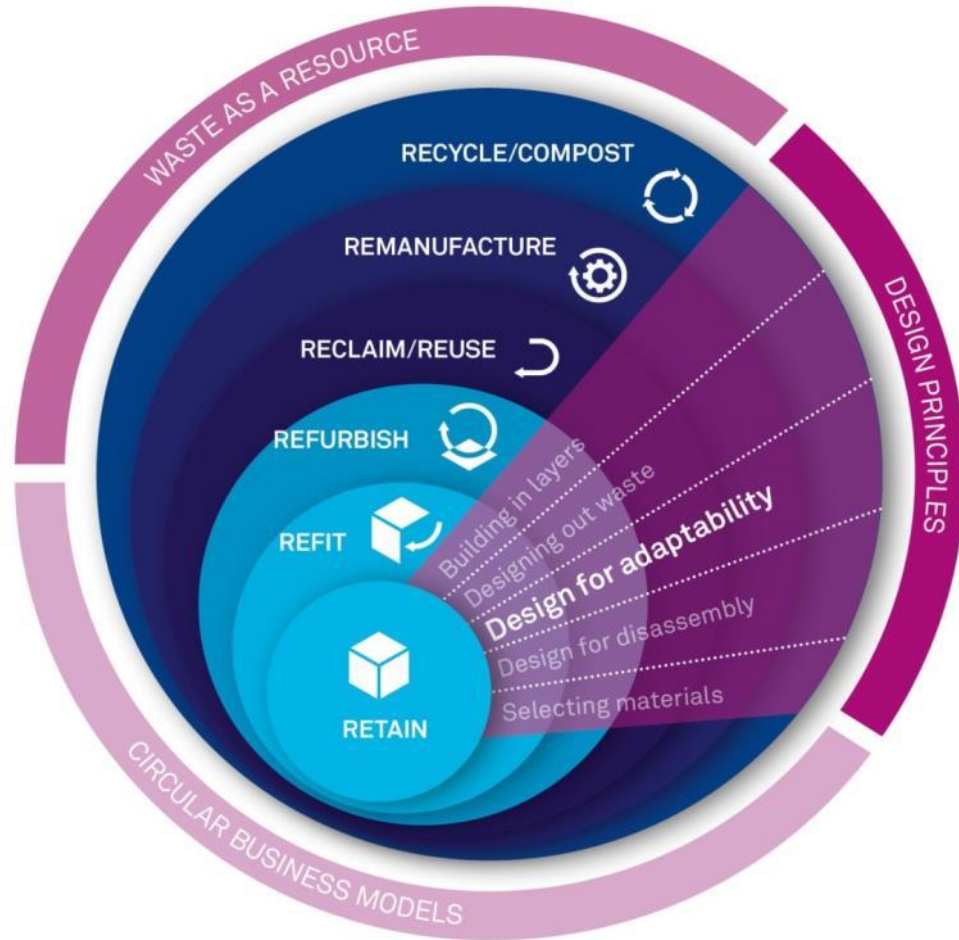
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Building in layers



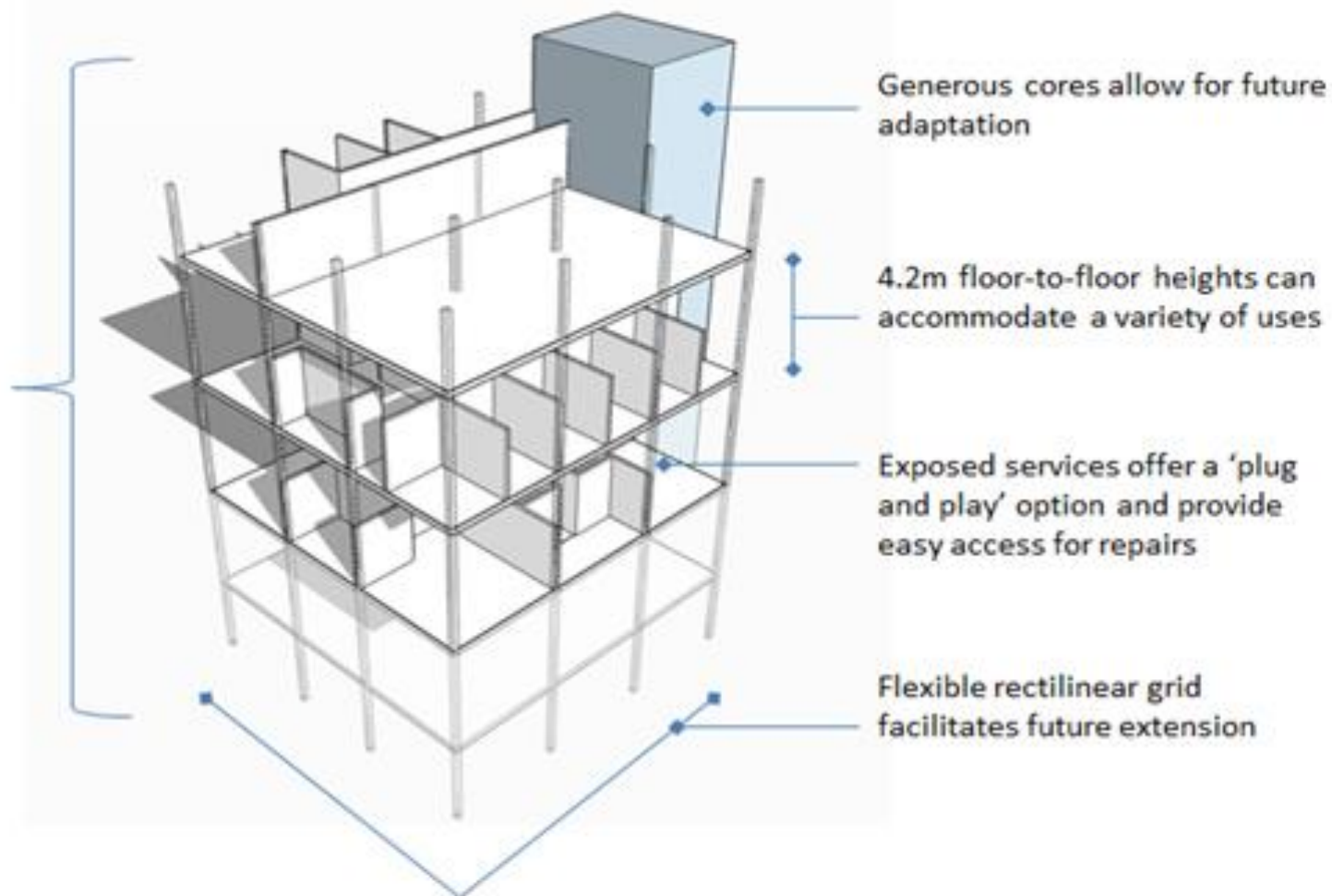
(Stewart Brand)





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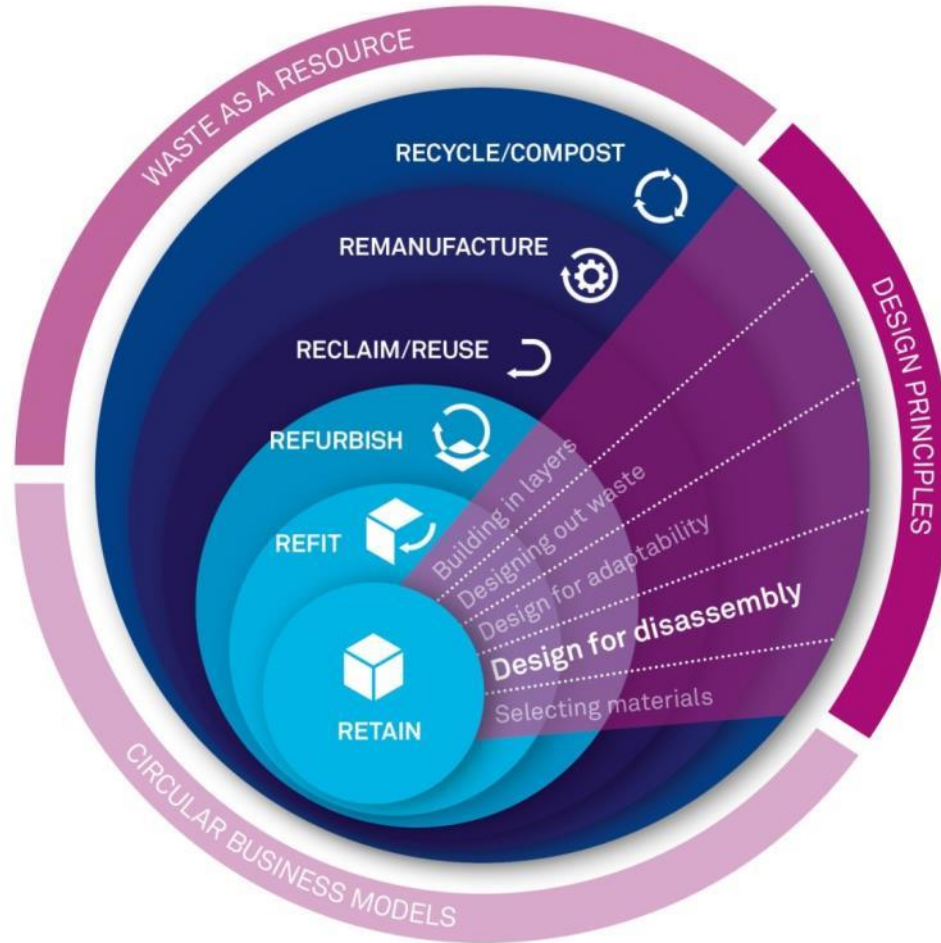


Scenario modelling has been carried out to demonstrate how each floor can be reconfigured for different functions



Penoyre
& Prasad

White AECOM

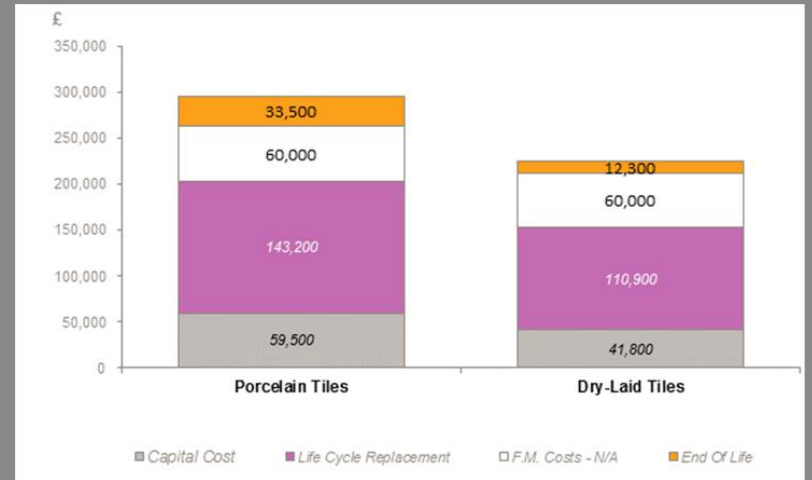
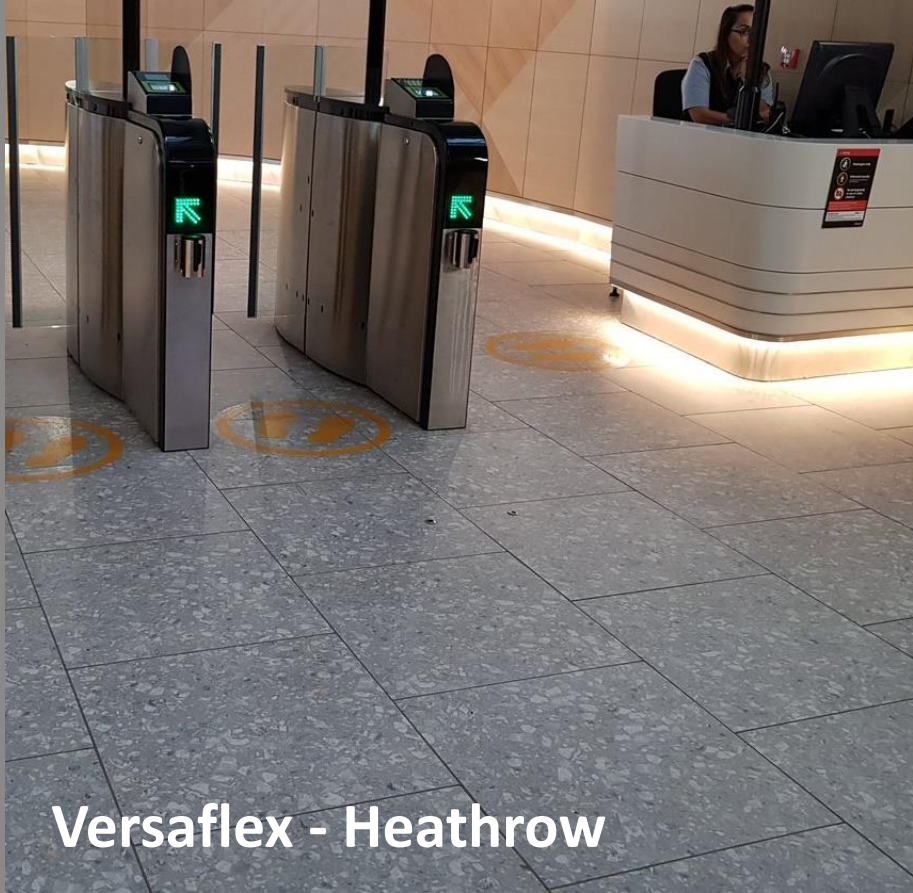


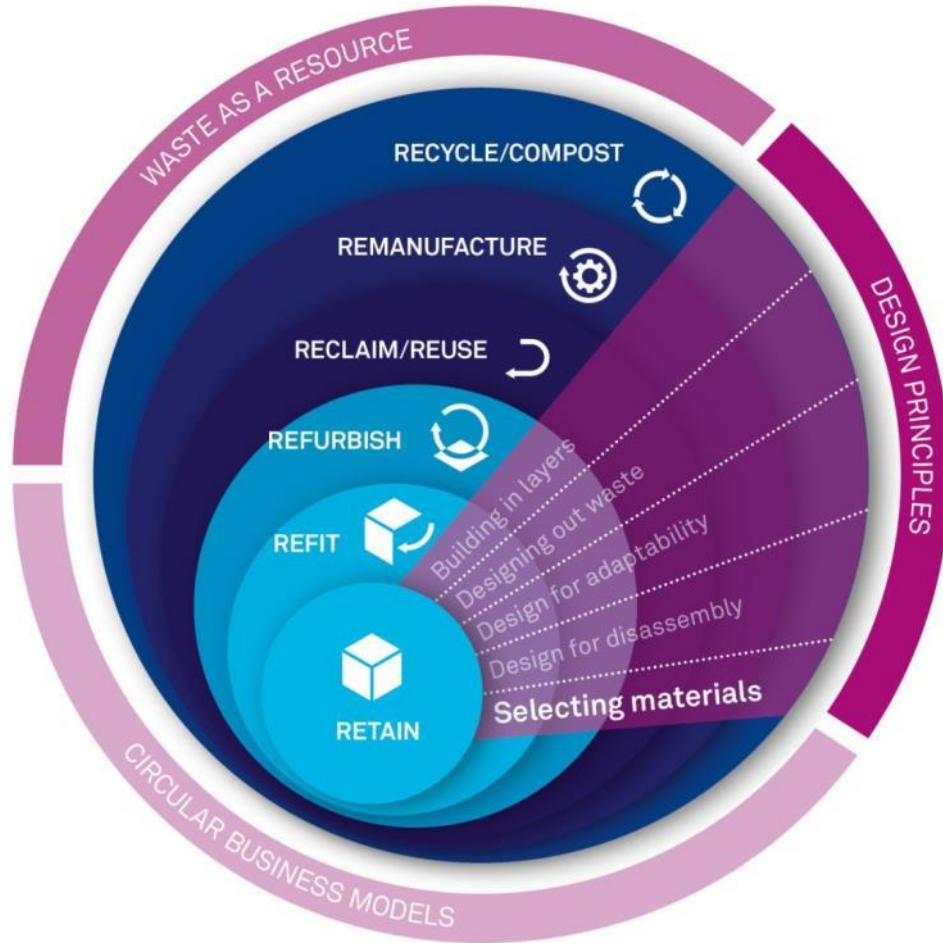


Y:Cube Mitcham

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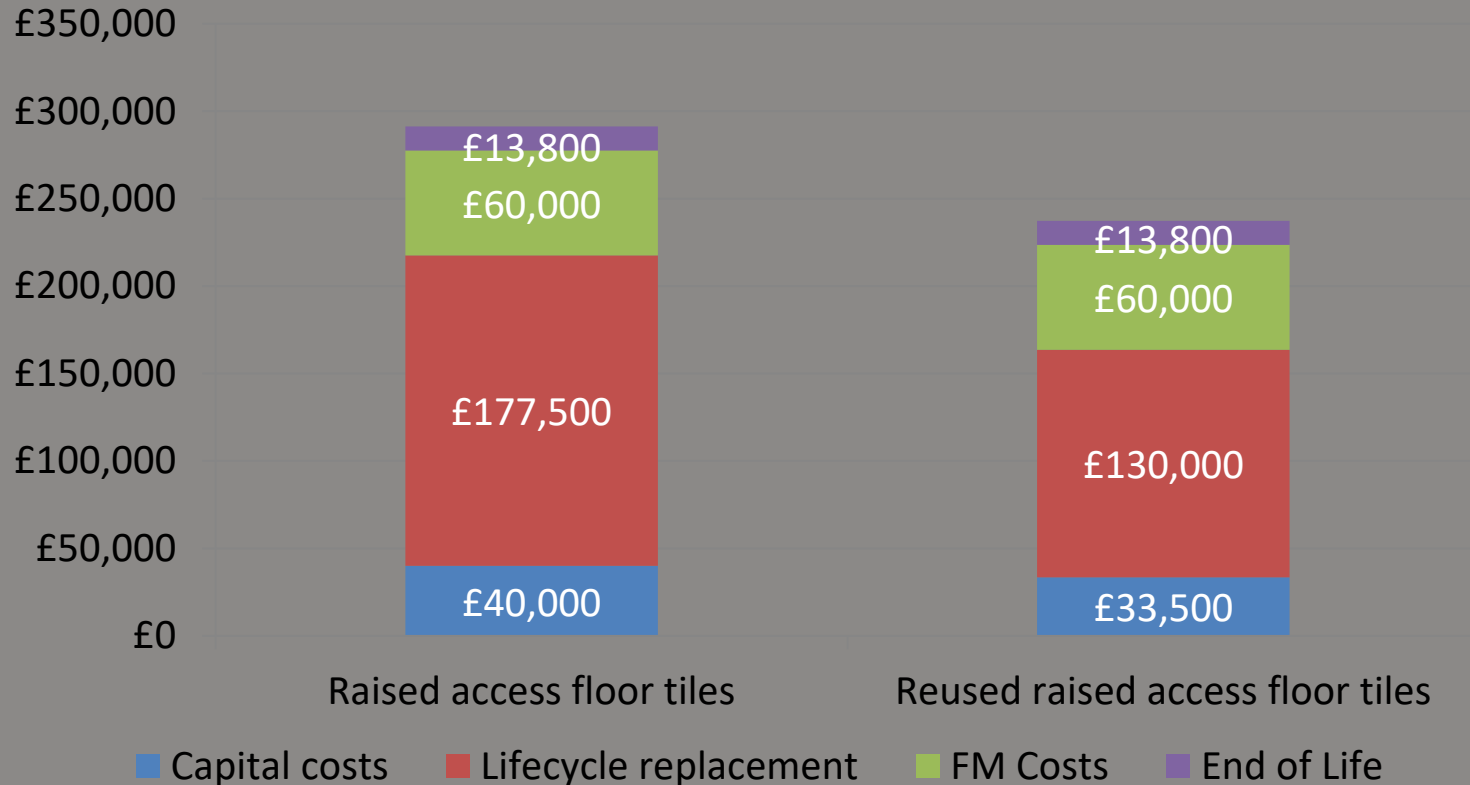
**Rogers
Stirk
Harbour
+ Partners**

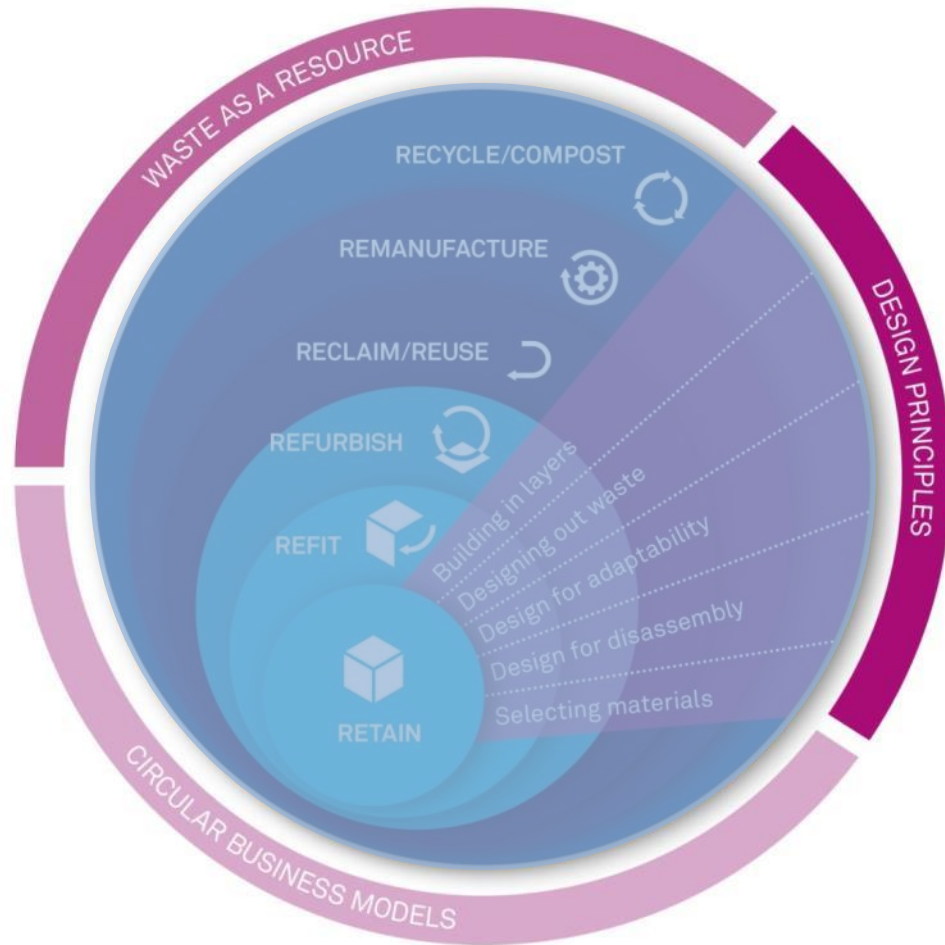






Reclaimed raised floor tiles





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Remanufactured paint

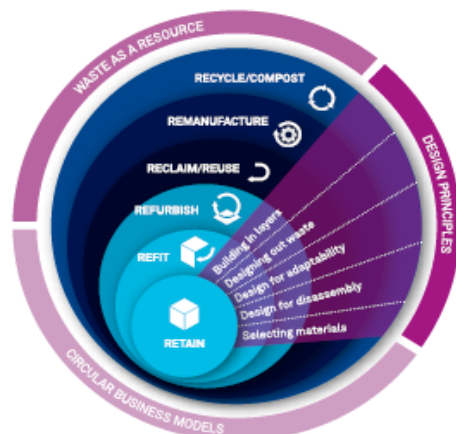
- Remanufactured paint costs roughly the same as ordinary paint of similar quality, but discounts could be available through participation in a paint recycling scheme.
- In one case study (Debenhams) the estimated cost savings were around 22-24% which includes the purchase of paint and removal of unused paint.

Paint360



3.1.12 Figure 3.1 shows a hierarchy for building approaches which maximises use of existing materials. Diminishing returns are gained by moving through the hierarchy outwards, working through refurbishment and re-use through to the least preferable option of recycling materials produced by the building or demolition process. The best use of the land needs to be taken into consideration when deciding whether to retain existing buildings in a development.

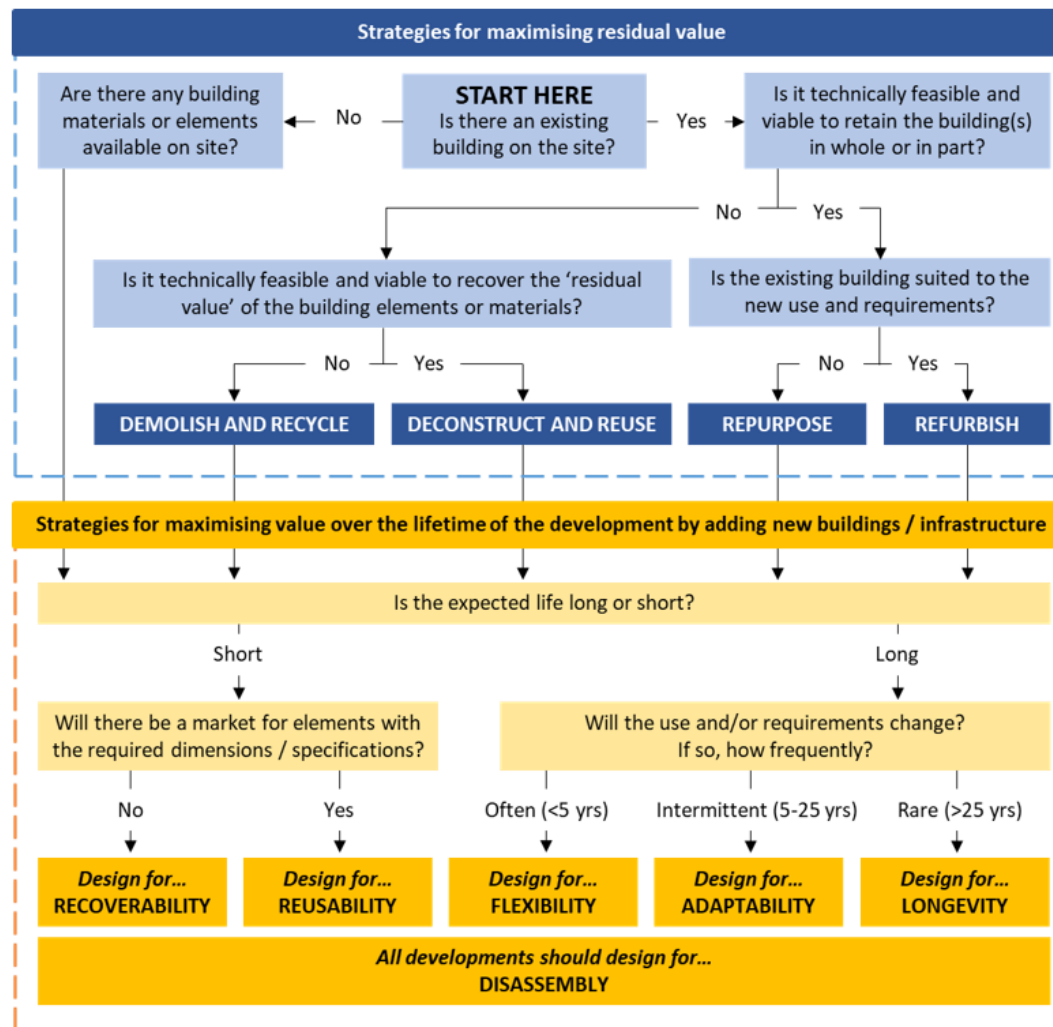
Figure 3.1 - Circular economy hierarchy for building approaches



Source: Building Revolutions (2016), David Cheshire, RIBA Publishing ©

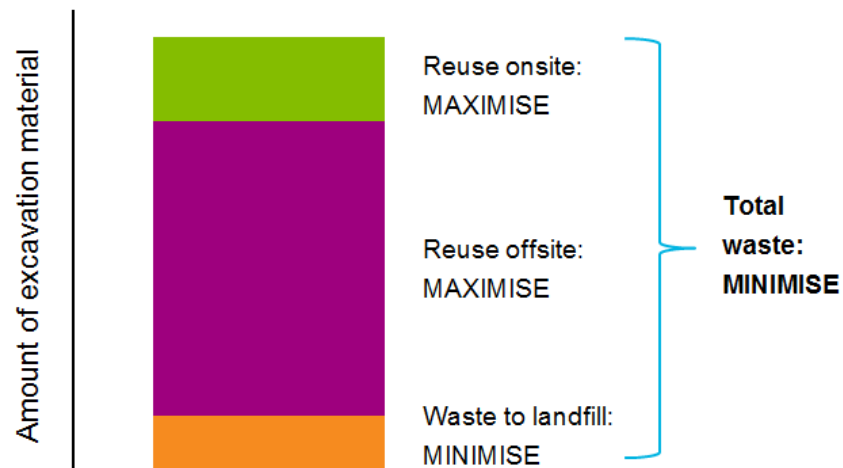


'Strategic Approach'



Core metrics

Construction phase metrics	Target	
Excavation material leaving site during the construction phase (t)	↓	✓
Excavation waste leaving site during the construction phase (t)	↓	✓
Excavation waste to be reused or recycled or for other beneficial use during the construction phase (%)	↑	✓





‘Bill of Materials’: Conserving resources and ethical sourcing

Layer	Element	Material quantity (kg)	Material intensity (kg/m ² GIA or NIA)	Recycled content (% by value)	Reused content (% by value)	Estimated reusable materials (kg/m ²)	Estimated recyclable materials (kg/m ²)	Reference
Structure	<i>e.g. Foundation</i>				OPTIONAL	OPTIONAL	OPTIONAL	<p>For each metric, state the methodology used to supply the estimate.</p> <p>Also provide a reference to the relevant section of the Circular Economy Statement describing the process for optimising use of materials, responsible sourcing and monitoring/ reporting.</p>
	<i>e.g. Floors</i>							
	<i>e.g. Roof</i>							
	<i>Add rows as needed</i>							
Shell	<i>e.g. Cladding</i>							
	<i>Add rows as needed</i>							
Space	<i>e.g. Partitions</i>							
	<i>Add rows as needed</i>							

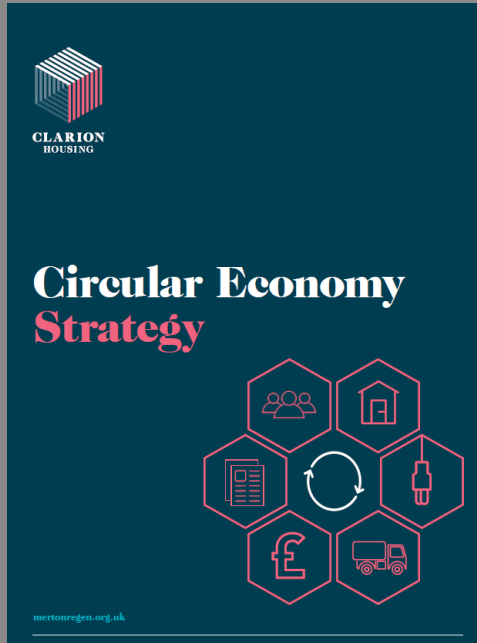
The Enterprise Centre

Architype

AECOM



Clarion Housing



Based on initial assessment of the 202,000m² GIFA Merton Regeneration project the scale of benefits that may be realised through comprehensive implementation of the Circular Economy Strategy are significant. For the demolition and construction phase benefits could include:

- **£5,000,000** cost savings in waste disposal and materials purchase;
- **16,500** fewer HGV movements;
- **7,760** tonnes CO₂ e saving, equivalent to the annual operation of approximately 2000 homes; and
- **122,000** tonnes of virgin material use avoided.

BUILDING REVOLUTIONS

APPLYING THE CIRCULAR ECONOMY
TO THE BUILT ENVIRONMENT



RIBA Publishing

David Cheshire

"Buildings as material banks, energy generators and service providers... The future of architecture and construction will play a key role in the transition to a circular economy, and David Cheshire's book makes a compelling case for a profound rethink."

The Ellen MacArthur Foundation

"I welcome the work David Cheshire has put into articulating a different future for an industry with so much potential for greater efficiencies."

Julie Hirigoyen, CEO, UK Green Building Council

AECOM

Thank you

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