The Institution of Structural Engineers

Accelerating reuse skills – An industry perspective

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THE ENGINEERS REUSE COLLECTIVE

About us

THE ENGINEERS REUSE COLLECTIVE

The Engineers Reuse Collective is a not-for-profit group of practising engineers championing, accelerating and delivering reuse in the built environment to support the transition of the UK's built environment to Net Zero Carbon.

Our mission is to dramatically increase reuse within the built environment, with minimal reprocessing, to support the transition to circular economy principles and to urgently reduce the carbon intensity of the built environment.

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"A collective of minds focused on positive action and empowerment"

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1.	Implement	We promote and implement reuse in the built environment through information sharing and positive engagement with stakeholders.
2.	Demonstrate	We actively demonstrate and share knowledge of effective solutions, overcoming barriers, success stories and lessons learnt.
3.	Champion	We challenge, encourage, and champion our clients and those we work with to maximise reuse on our projects.
4.	Advocate	We provide a proactive, influencing, and collective voice for engineers to promote increased reuse.

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ARUP
A-squared Studio
BDP.
BLYTH&BLYTH
BURO HAPPOLD
CENTRESPACE
CIVIC ENGINEERS
conisbee
Consulting Structural and Civil Engineers
CUNDALL
Davies Maguire
Design ID
Think | Design | Engineer
DESIMONE
Eckersley O'Callaghan
ElliottWood
engineersHRW
ENGENUITI
EVOLVE
expedition
Form
Structural Design
format
geni
ENGINEERING
HEYNE TILLETT STEEL
integral
engineering design
Interspan
mnp
mason navarro pledge
PRICE&MYERS
RAMBOLL
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Thornton Tomasetti
Tullys
WEBB YATES
whitby wood
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A bit of context

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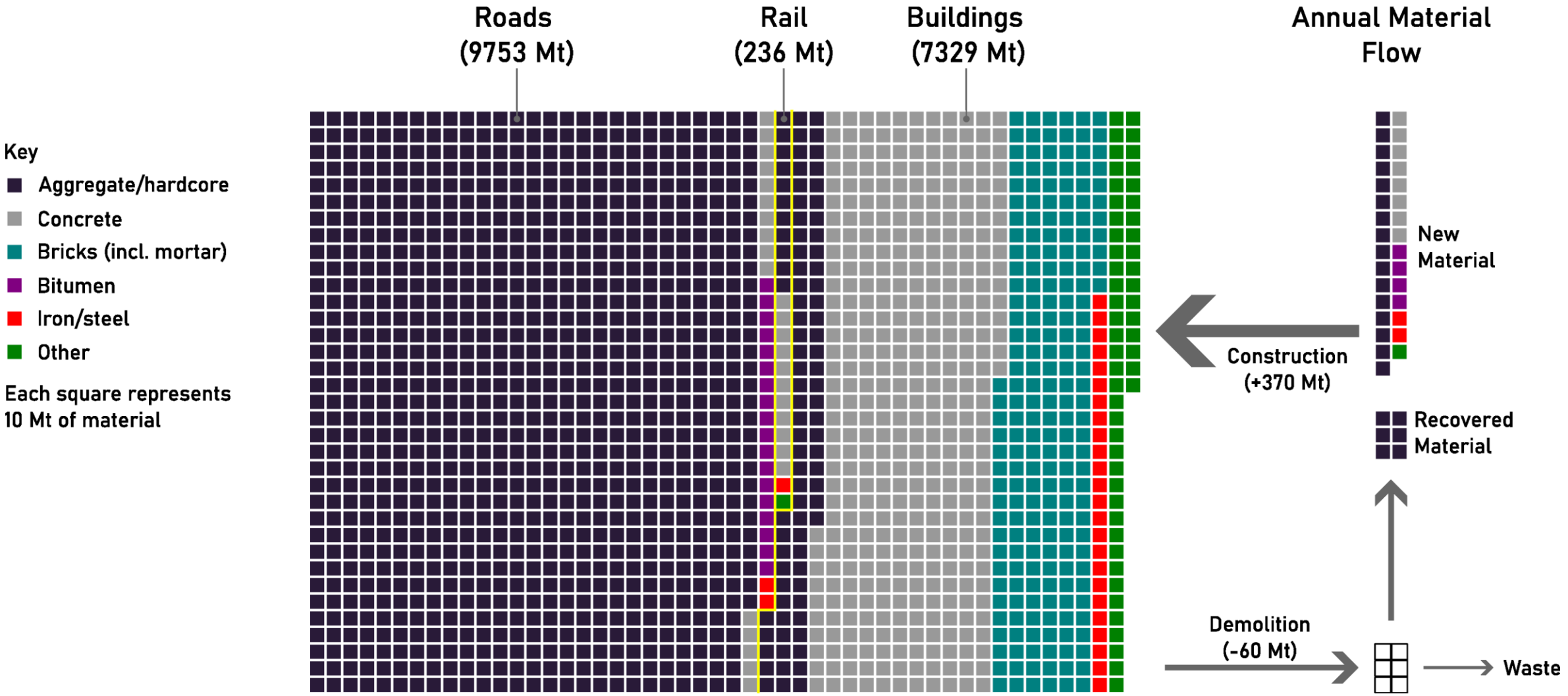
UK Material stocks



Source: Wiedenhofer, D *et al*. (2024), *Mapping material stocks of buildings and mobility infrastructure in the United Kingdom and the Republic of Ireland*, Resources, Conservation & Recycling, vol 206, 107630. https://doi.org/10.1016/j.resconrec.2024.107630

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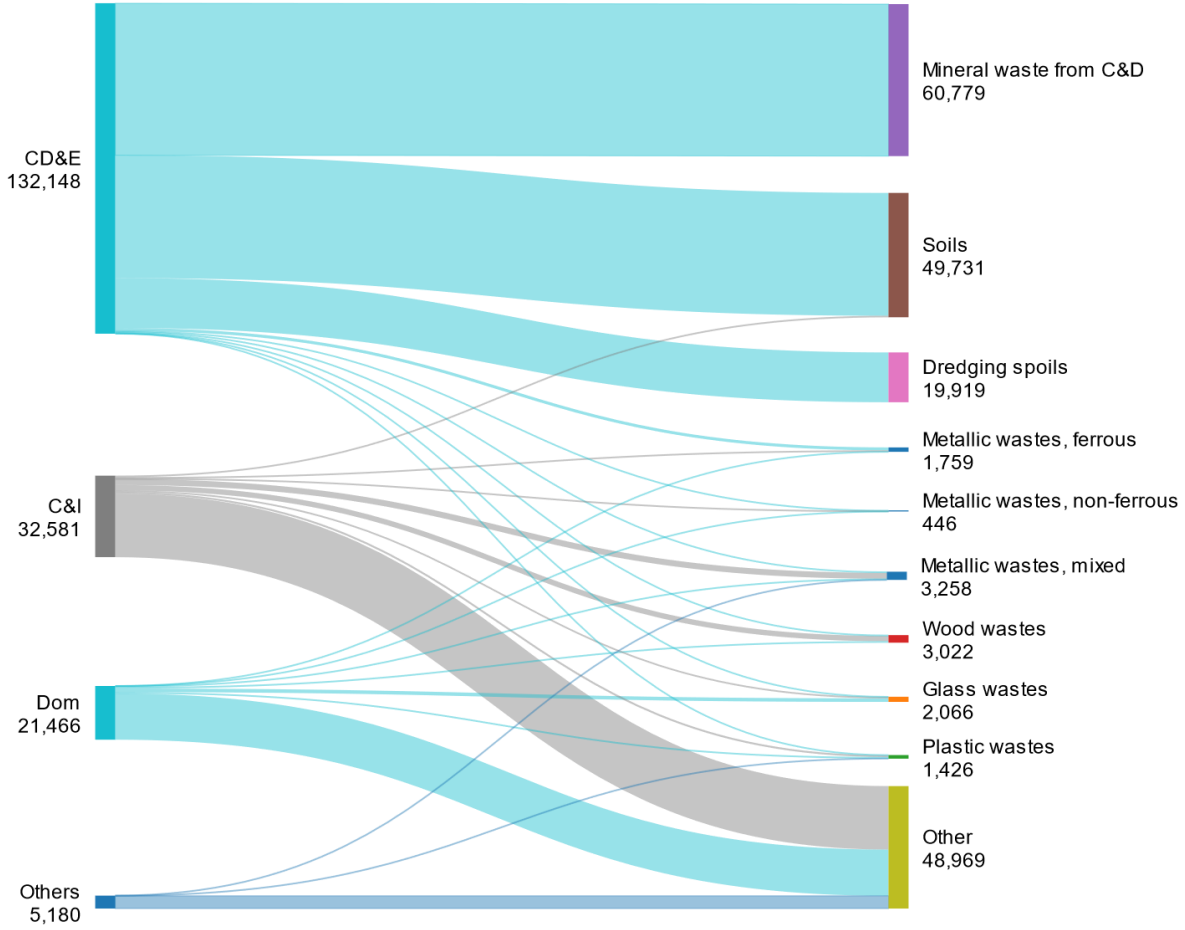
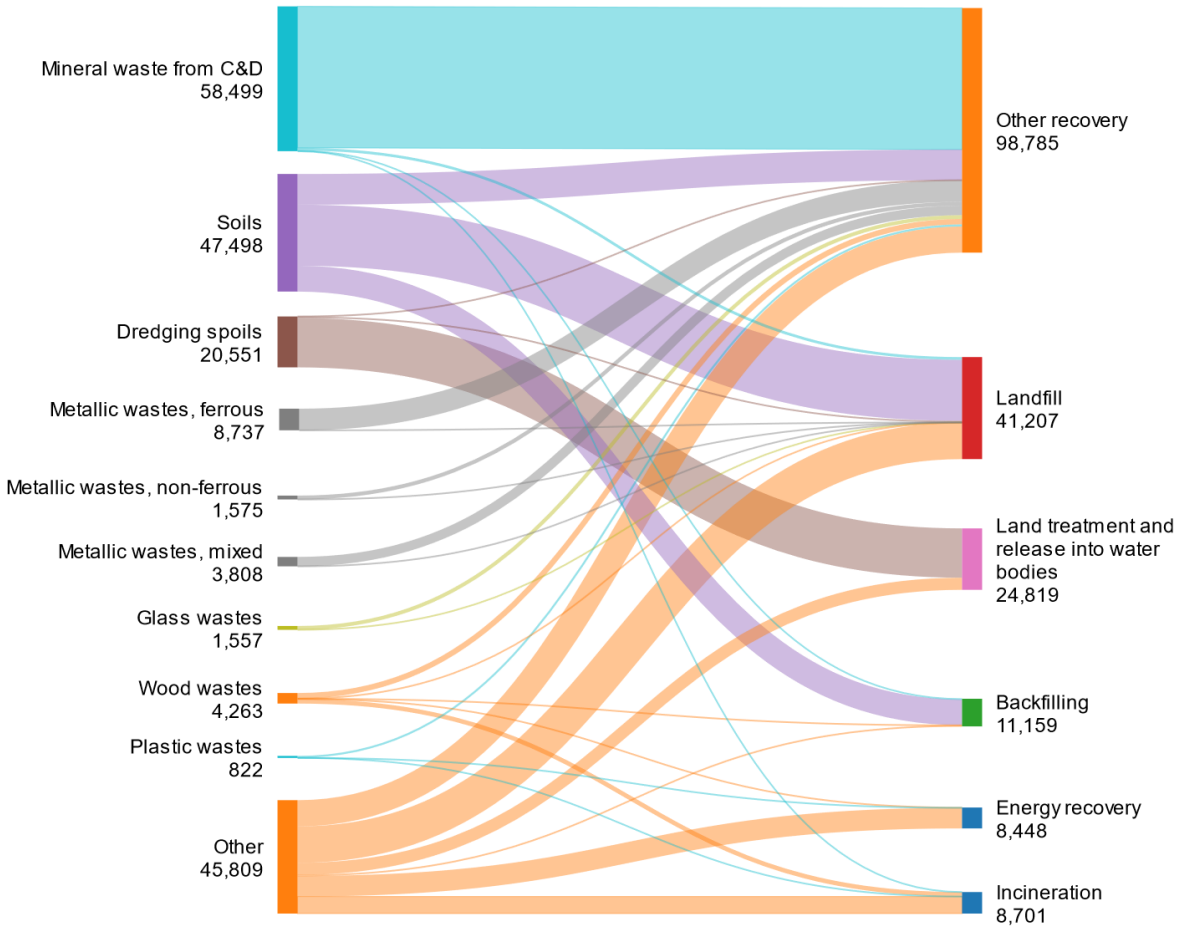
Waste

Waste generation by sector, England, 2022, (thousand tonnes)



Waste sent to final treatment, England, 2022, (thousand tonnes)



Source: DEFRA (2024). *UK Statistics on waste*. https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste [accessed Nov 2024]

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The Hierarchy of Net Zero Design

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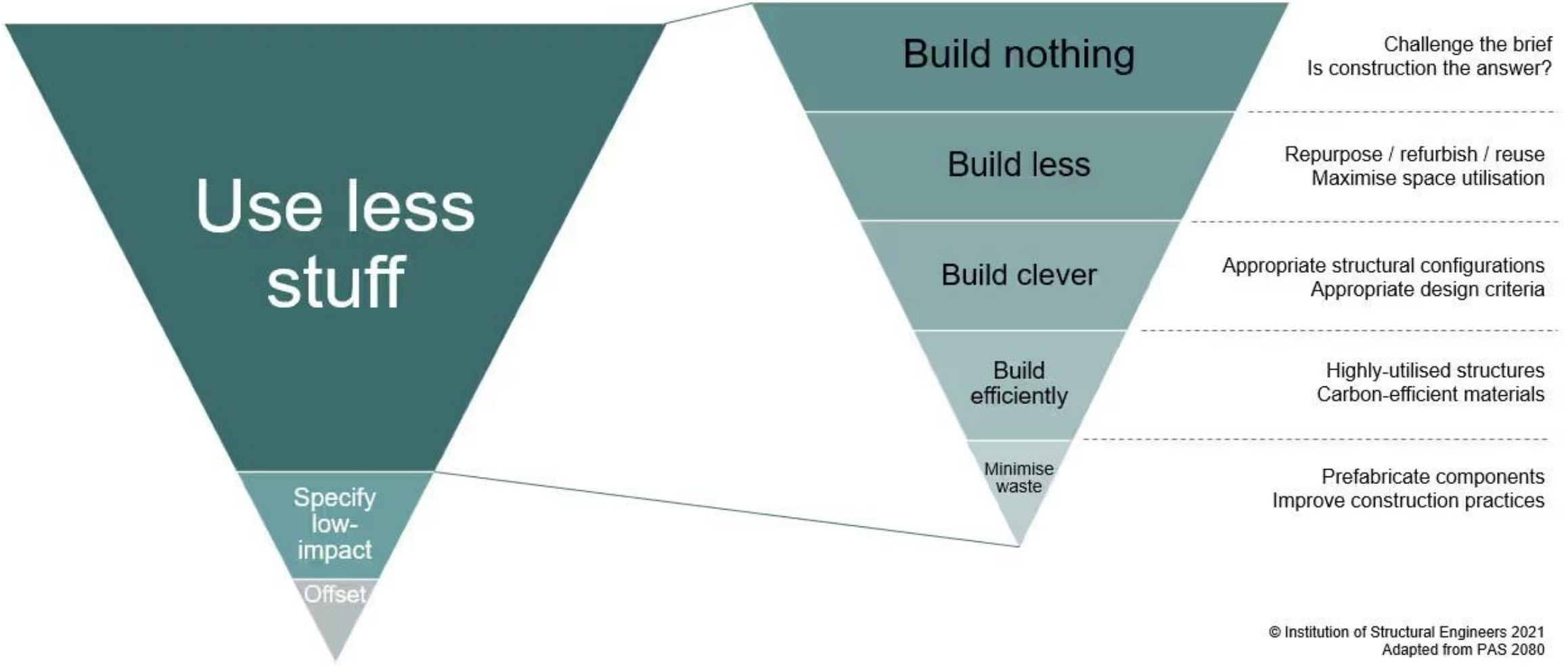

Adapted from PAS 2080

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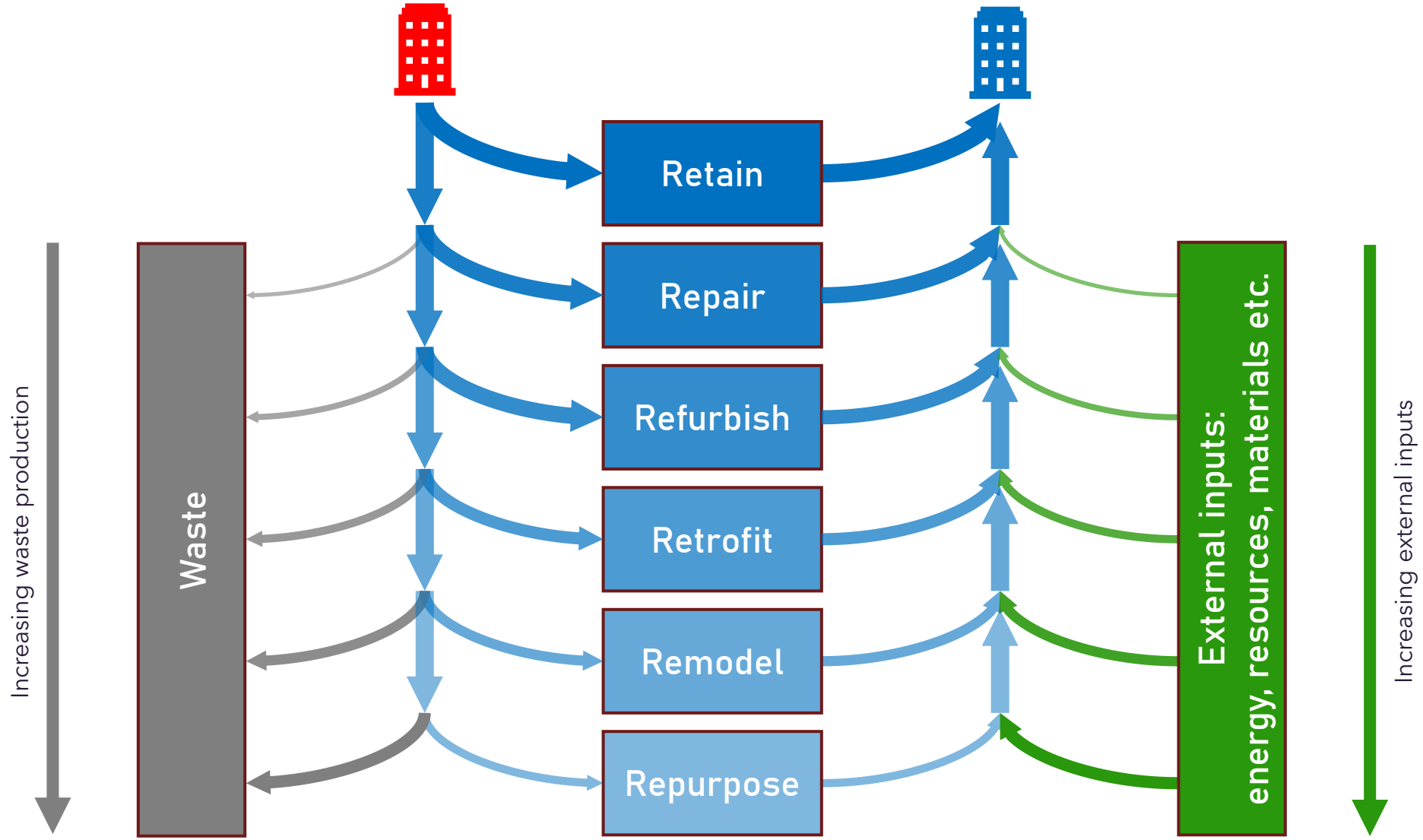
The Reuse Hierarchy



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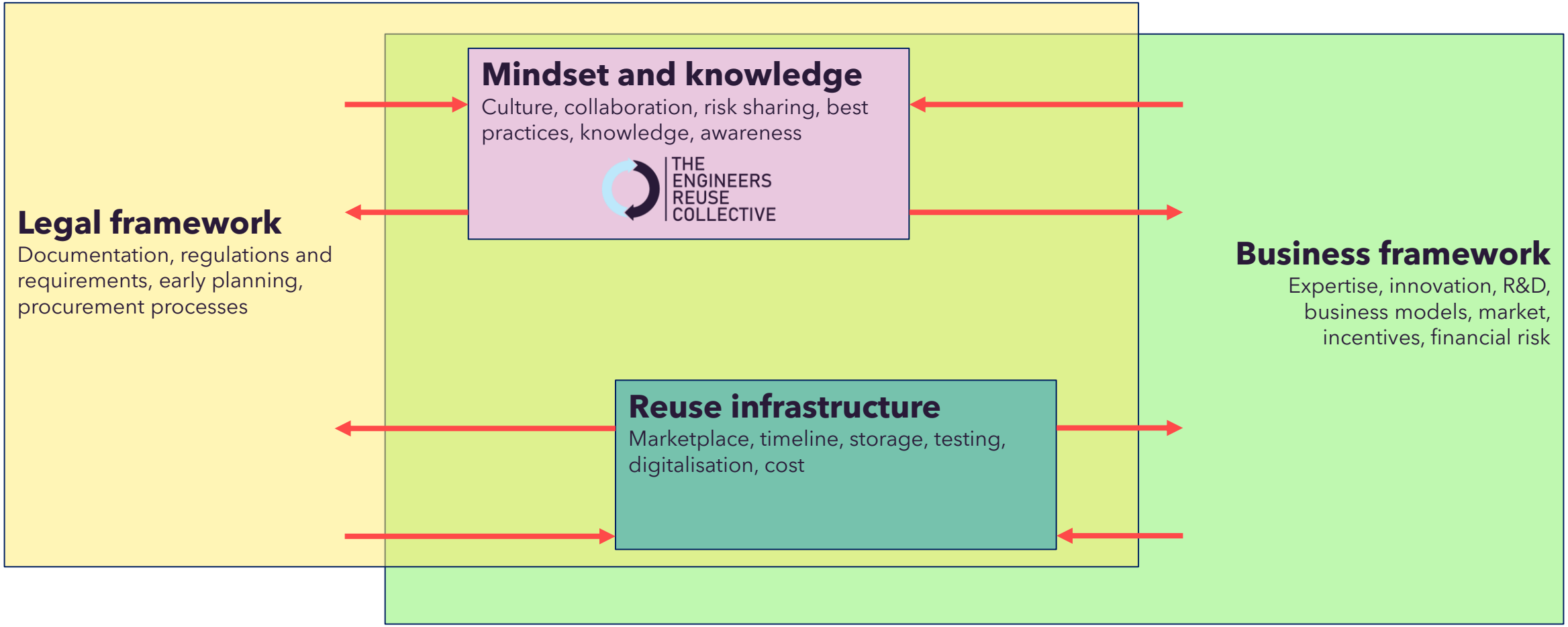
Barriers and success factors to reuse



Source: Knoth, K *et al*. (2022), *Barriers, success factors, and perspectives for the reuse of construction products in Norway*, Journal of Cleaner Production, vol 337, 130494. https://doi.org/10.1016/j.jclepro.2022.130494

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What will future generations say about how wasteful we are?

How can we justify continuing to be consume ever increasing amounts of new materials?

Have we got enough materials already?

When and how will we stop consuming?

What if we have no new materials to build from?

What can we build from what we already have?

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"The greenest building is the one that already exists"

"The future is already built, we just need to unlock its potential"

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What skills do we need?

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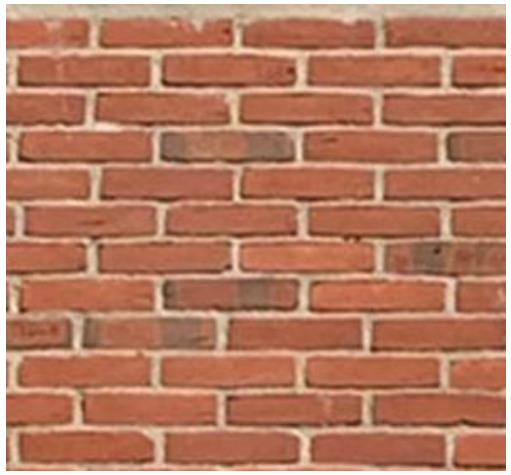
Knowledge of structural design

- Loads, stresses, forces etc.
- Structural forms and behaviour
- Embodied carbon

Knowledge of materials

- Strength, stiffness, behaviour etc.
- Durability
- Repair and maintenance



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Mindset

- Applying our knowledge of materials and structural design in different ways
- Positive thinking; we can do this better and we can reuse more

Culture

- Speak up to promote change and different ways of thinking and doing things
- Speak up and challenge preconceived ideas and ‘that’s the way we do things’

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Collaboration

- Share our knowledge and learning (especially lessons learnt)
- Work together to share ideas and positivity

Awareness

- Speak up and demonstrate that we can change the culture of the industry
- Engaging we those we work with to push for and deliver greater reuse

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Thinking differently

- Asking questions: Why can't we try this? Why don't we do this?
- Existing materials and structures: How can we use / reuse what we already have?
- Challenging those we work with to strive for better
- Challenging clients' briefs: What could we do which would be even better for the project?
- Engage with organisations' ESG policies and targets: Use this to leverage change
- Share knowledge and collaborate: Ideas, trials and lessons learnt should benefit all
- Positive mindset: We want to change the industry for the better

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We want engineers who:

- Understand materials and structural principles
- Are engaged with the climate emergency and the role of the structural engineer
- Have confidence to speak up and challenge those we work with
- Think differently

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What are we already doing?

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Case studies and examples

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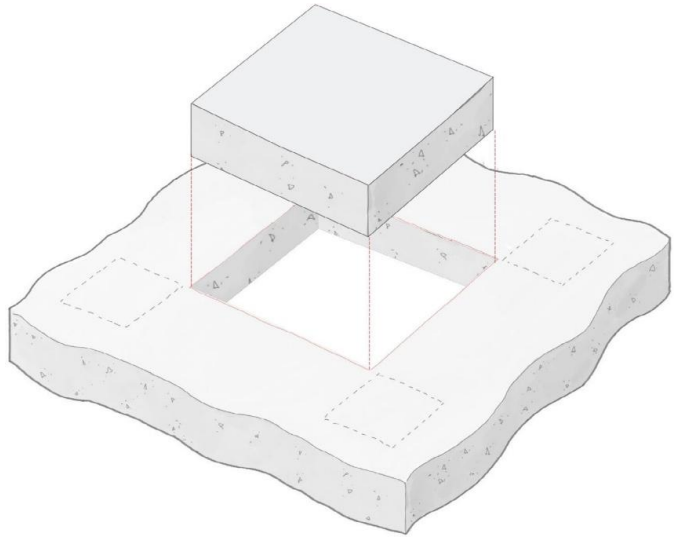

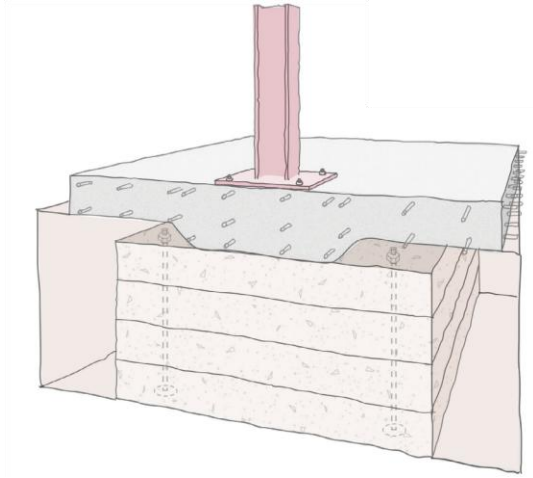

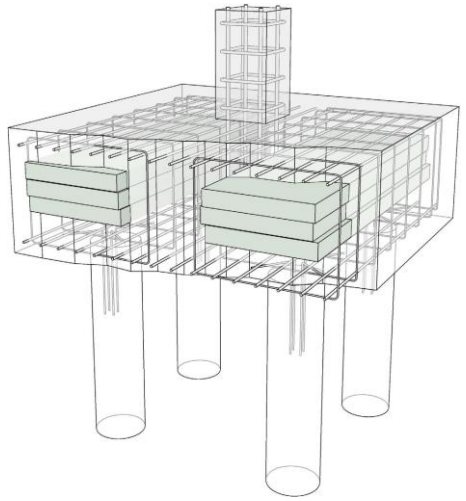

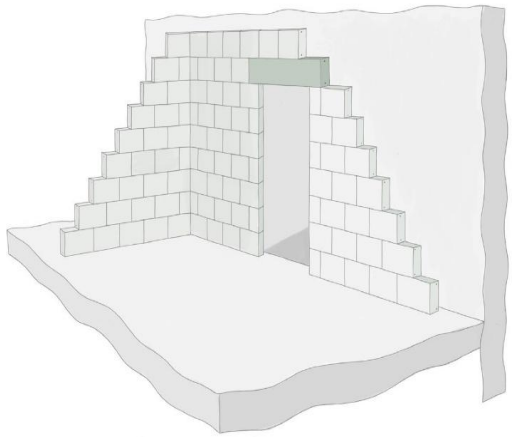

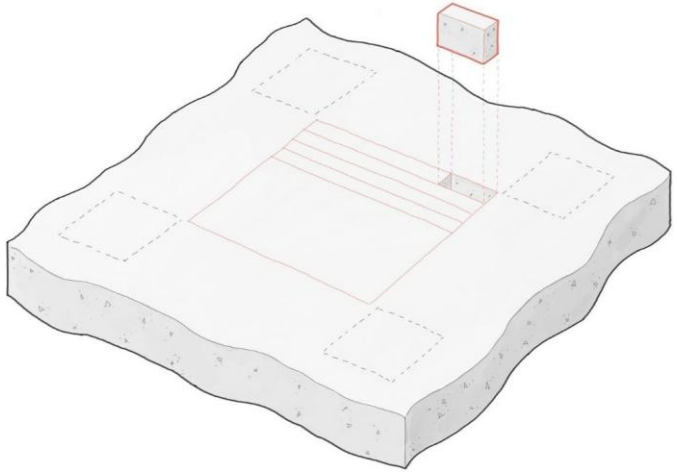

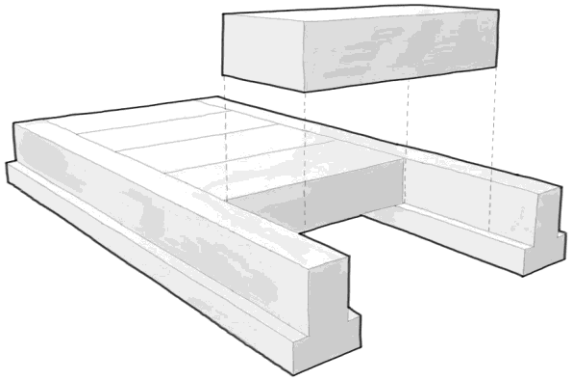

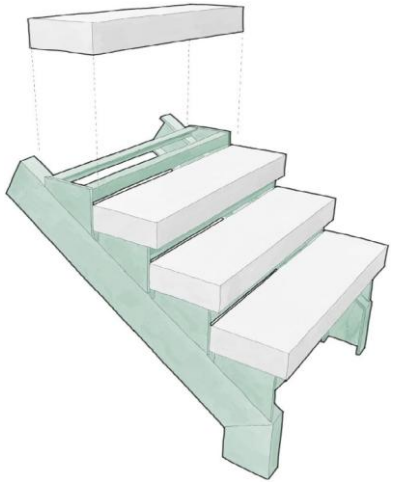

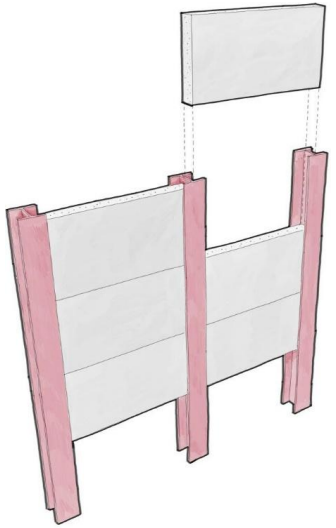

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Case studies and examples

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Final thoughts

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We have the technical skills.

We are very good at solving problems.

We need to apply our creativity and design skills.

We need to change our and others' mindsets.

We need to think differently.

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Thank you

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