

A triage for reuse, repurposing and upcycling of existing building components

Colin Rose¹ and Prof. Julia Stegemann²

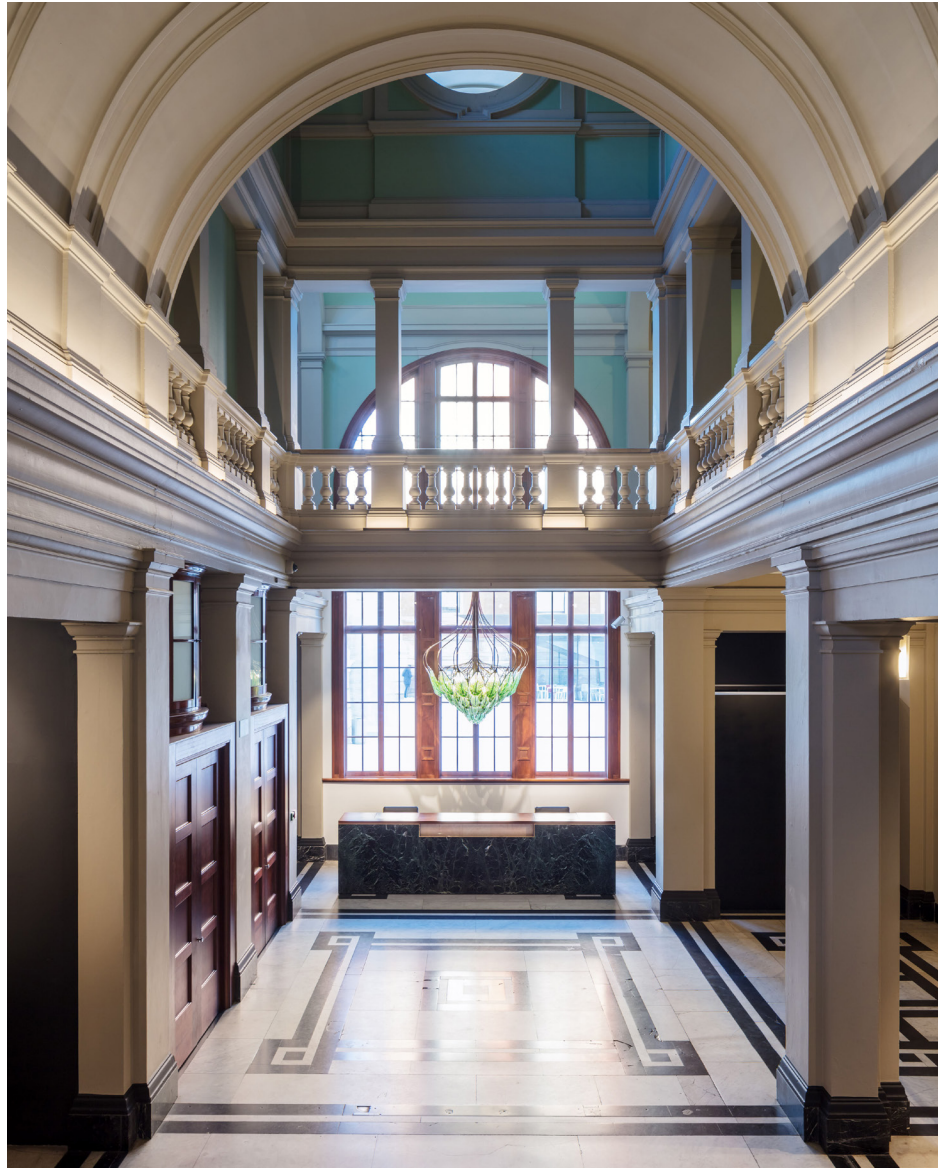


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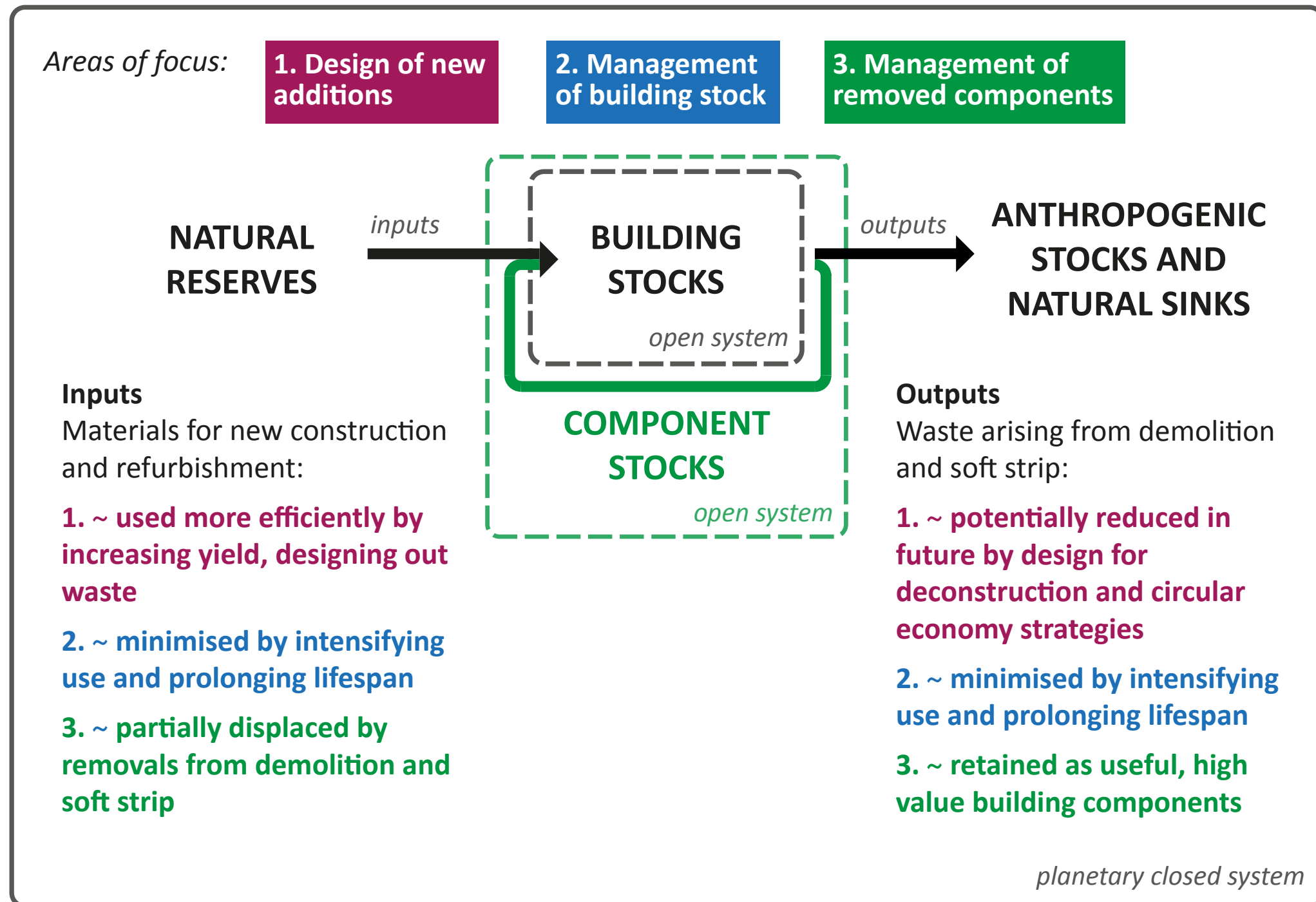


Donmar Warehouse, Dryden Street, Haworth Tompkins Architects (2013)

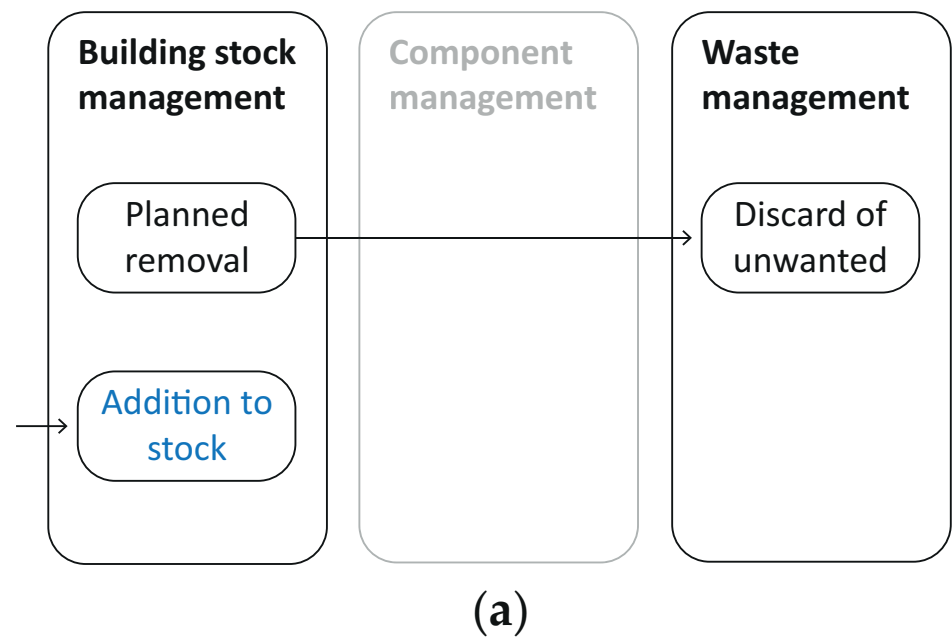


V&A Museum, Members Reception and Tunnel Entrance, Reed Watts Architects (2017)

Potential areas of focus



Existing
scenarios



*Reliance on waste management;
no connection of demolition/soft strip
to new construction*

Current sequences of activities for end-of-use existing building components
(Rose and Stegemann, 2018a)

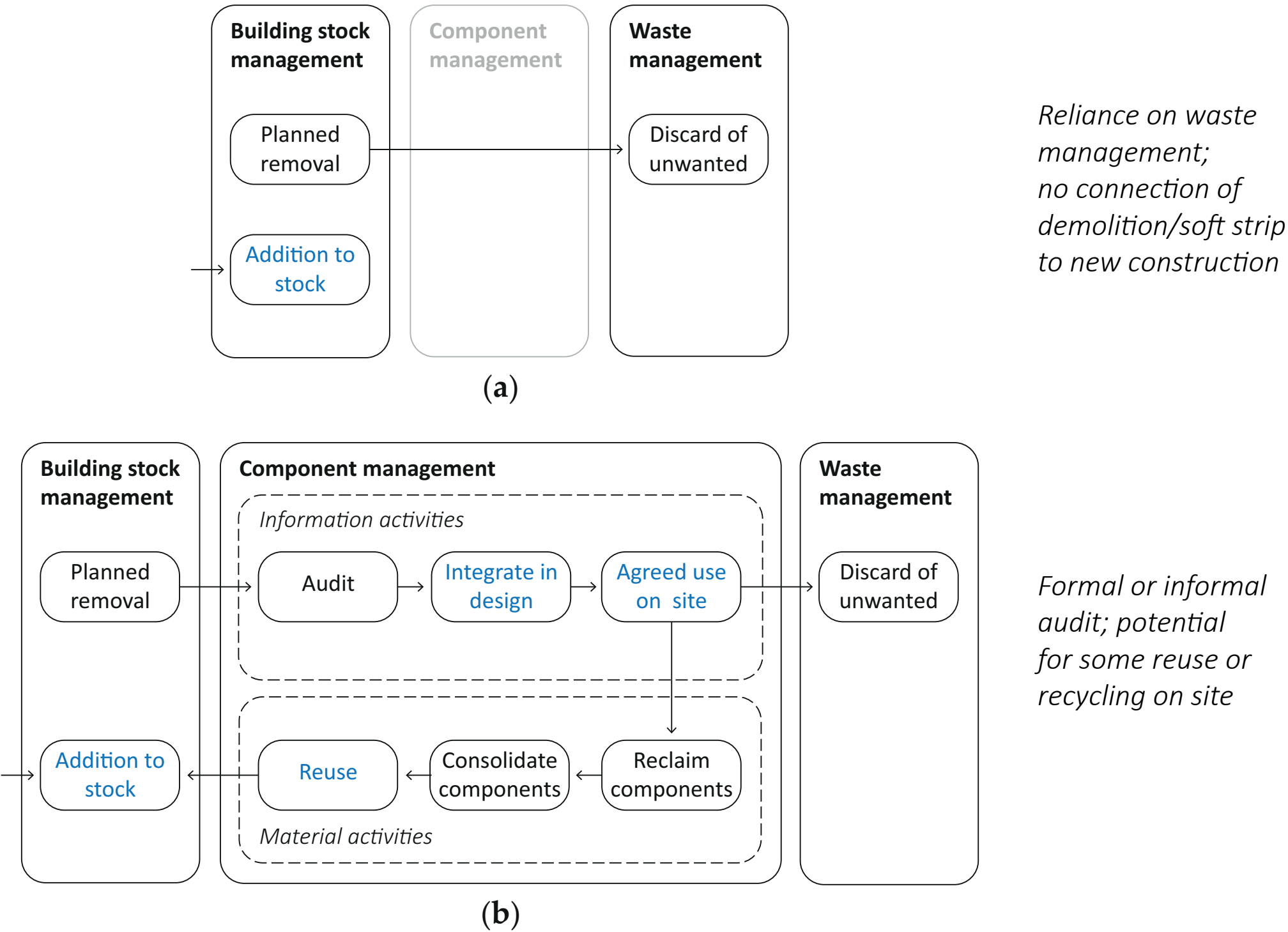
Legend

Existing building
team action

New build
team action

Salvage trade
action

Existing scenarios



Current sequences of activities for end-of-use existing building components (Rose and Stegemann, 2018a)

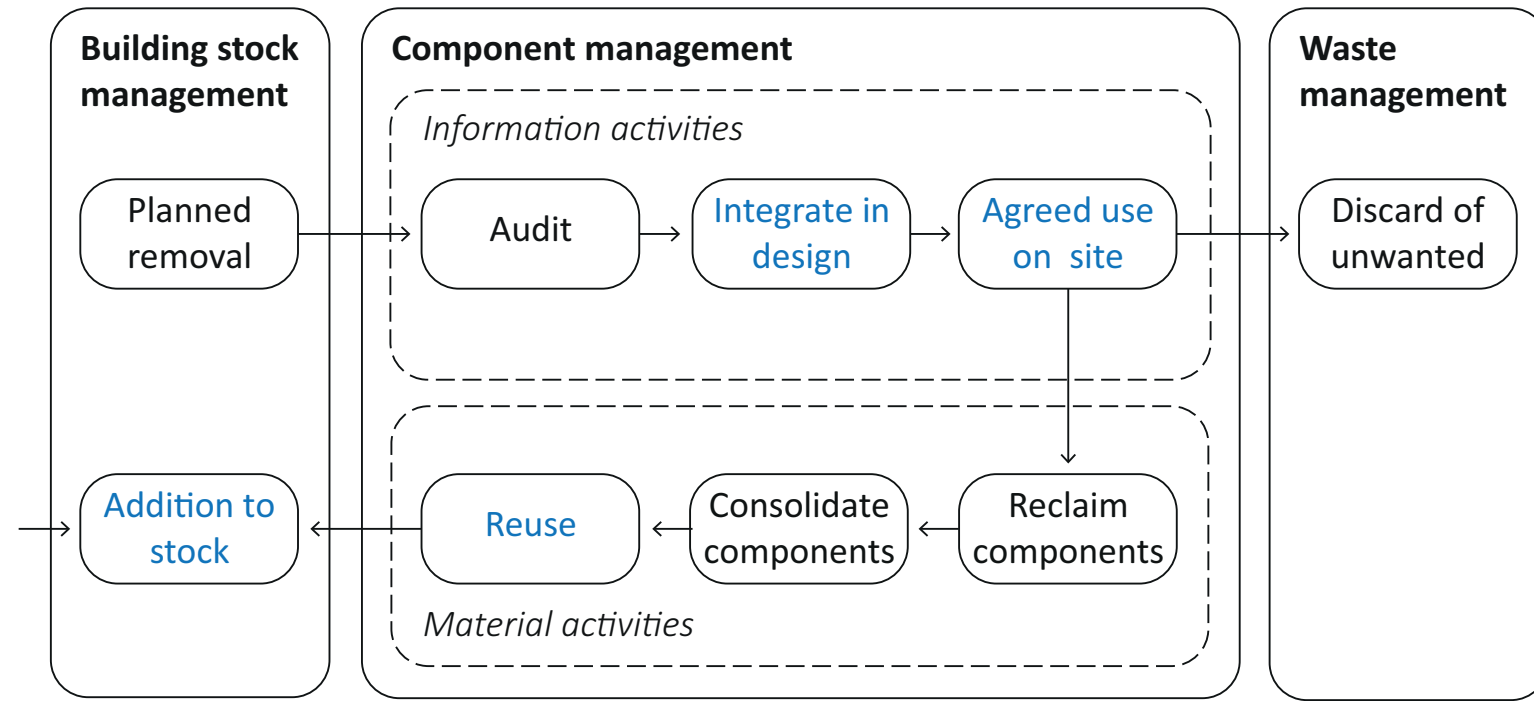
Legend

Existing building team action

New build team action

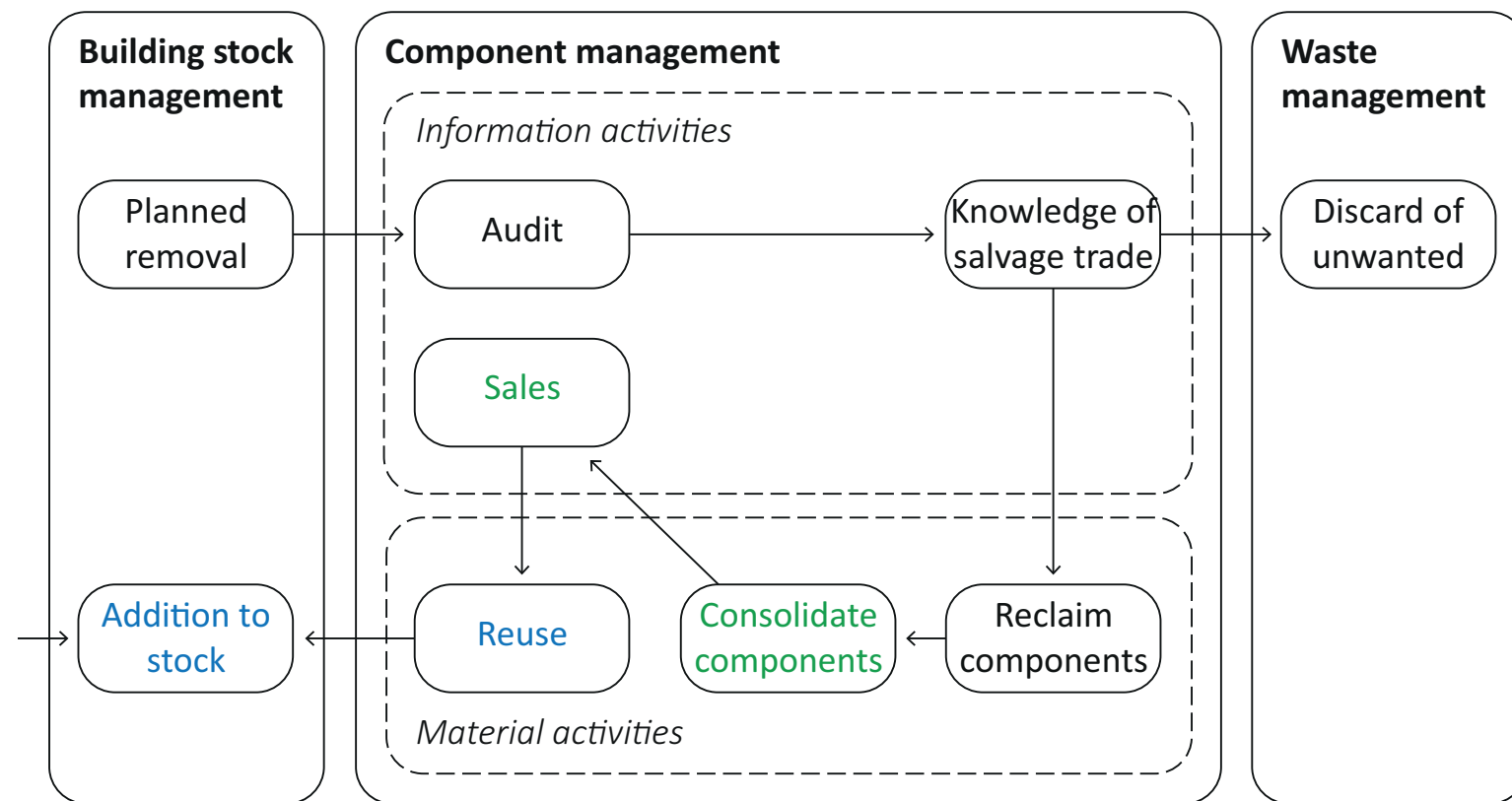
Salvage trade action

Existing scenarios



(b)

Formal or informal audit; potential for some reuse or recycling on site



(c)

Formal or informal audit; some components of value to salvage industry; reuse off site

Current sequences of activities for end-of-use existing building components (Rose and Stegemann, 2018a)

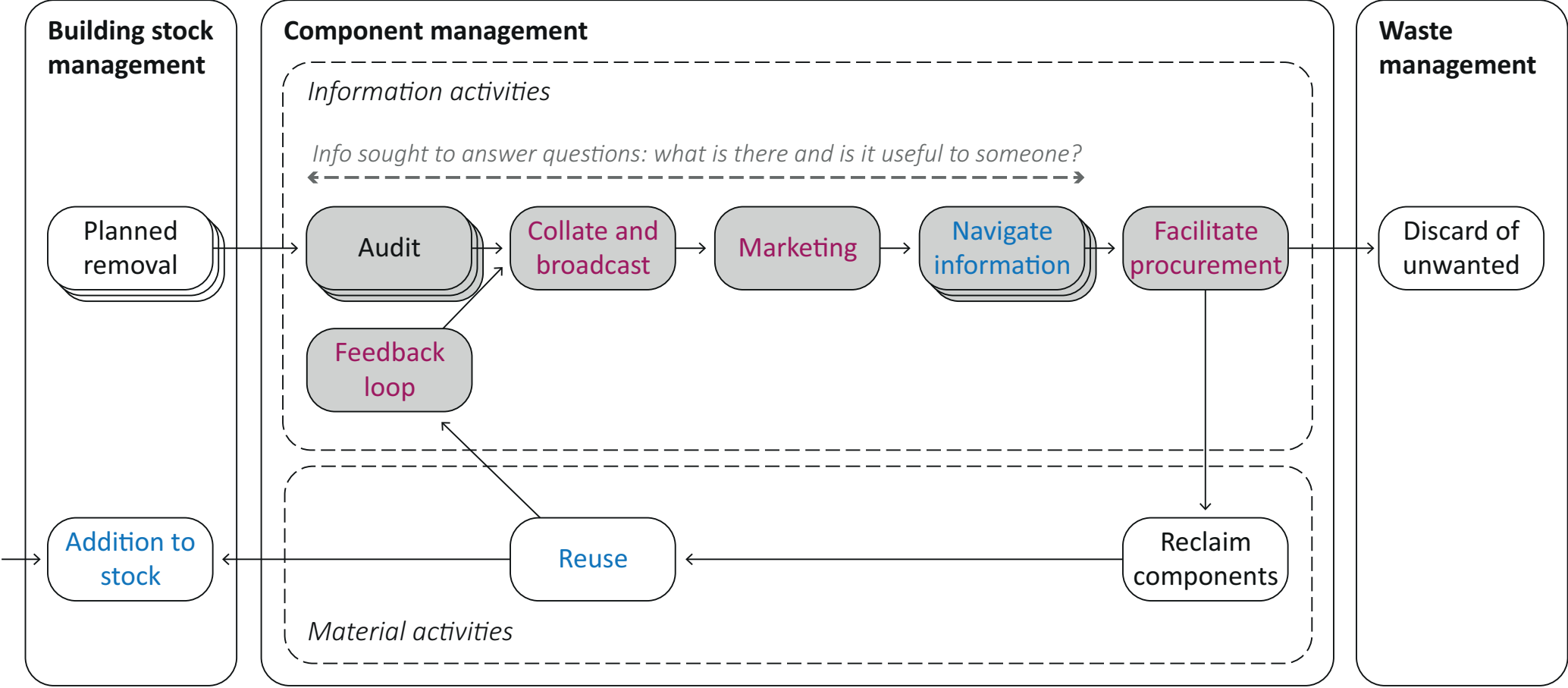
Legend

Existing building team action

New build team action

Salvage trade action

Triage



(a)

Triage: audits submitted at planning stage; collated and broadcast to make visible to specifiers, allowing direct substitution in some circumstances

Proposed sequences of activities for end-of-use existing building components (Rose and Stegemann, 2018a, 2018b)

Existing building team action

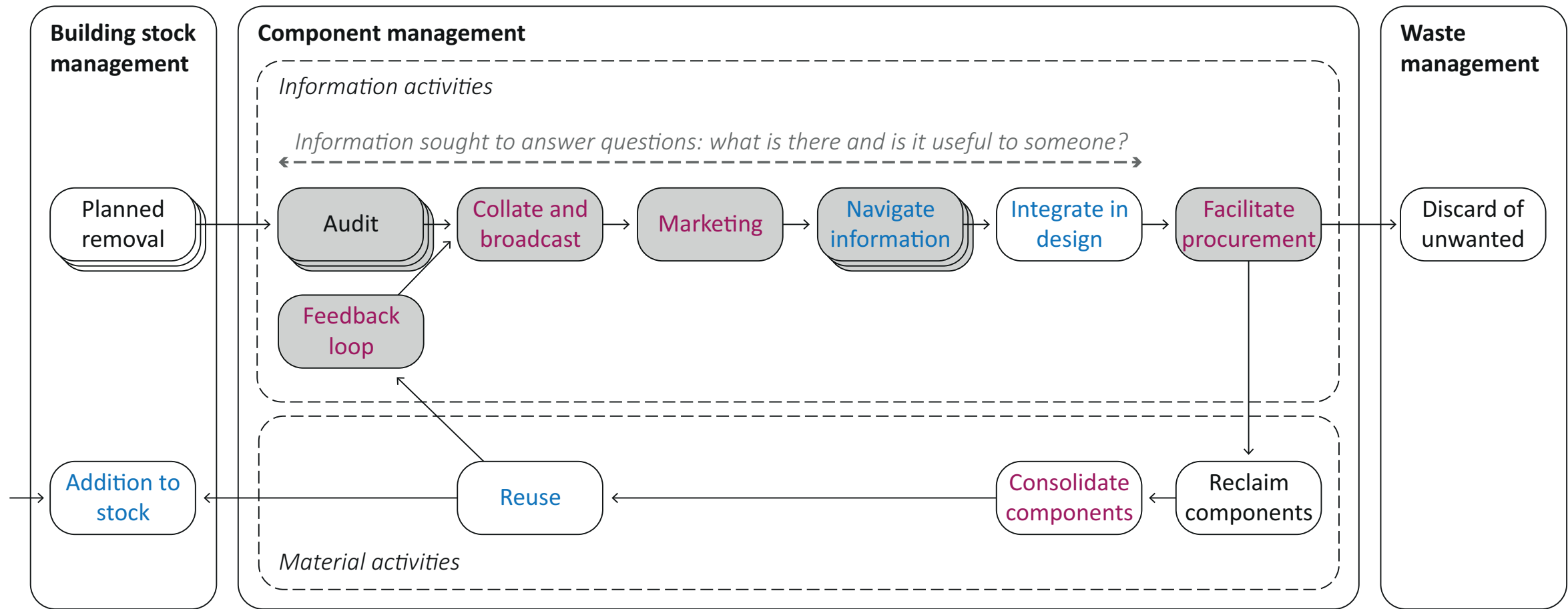
New build team action

Upcycling enterprise action

Action requiring support

Database related action

Triage



(b)

Triage: adding consolidation activity provides confidence over quantity; makes integration into design possible in more types of projects

Proposed sequences of activities for end-of-use existing building components (Rose and Stegemann, 2018a)

Existing building team action

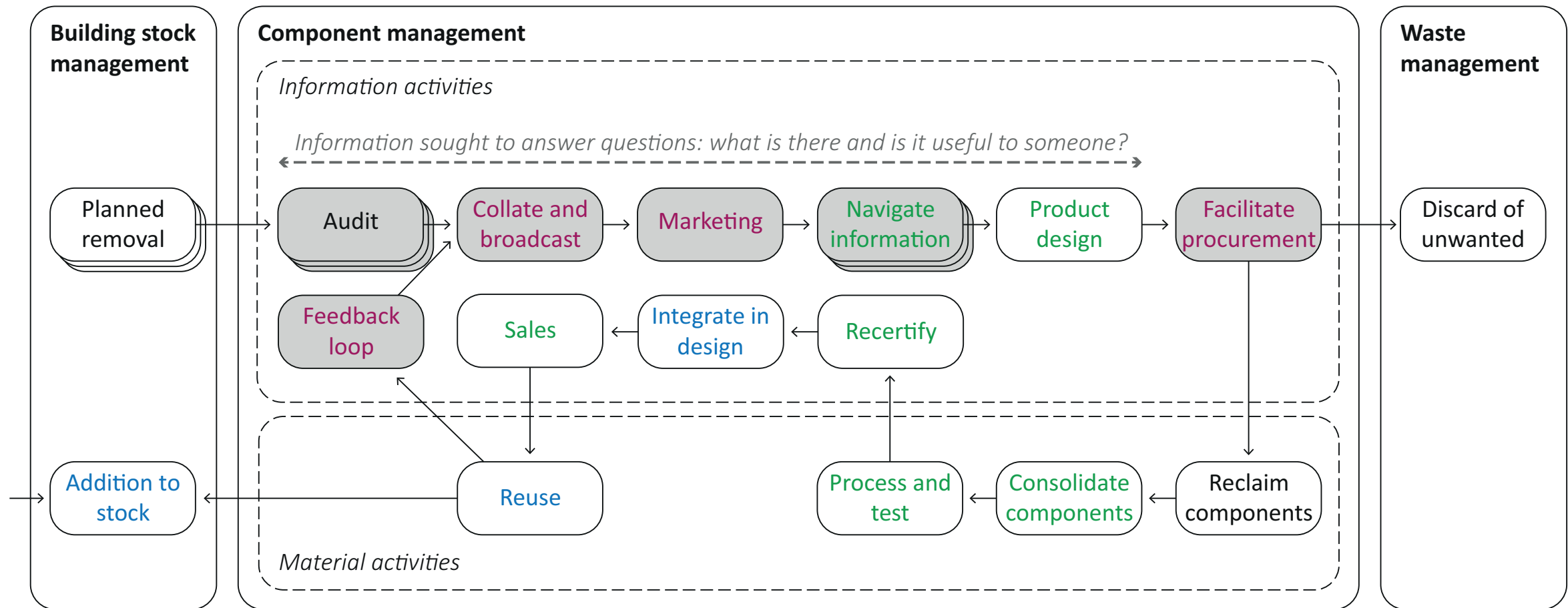
New build team action

Upcycling enterprise action

Action requiring support

Database related action

Triage



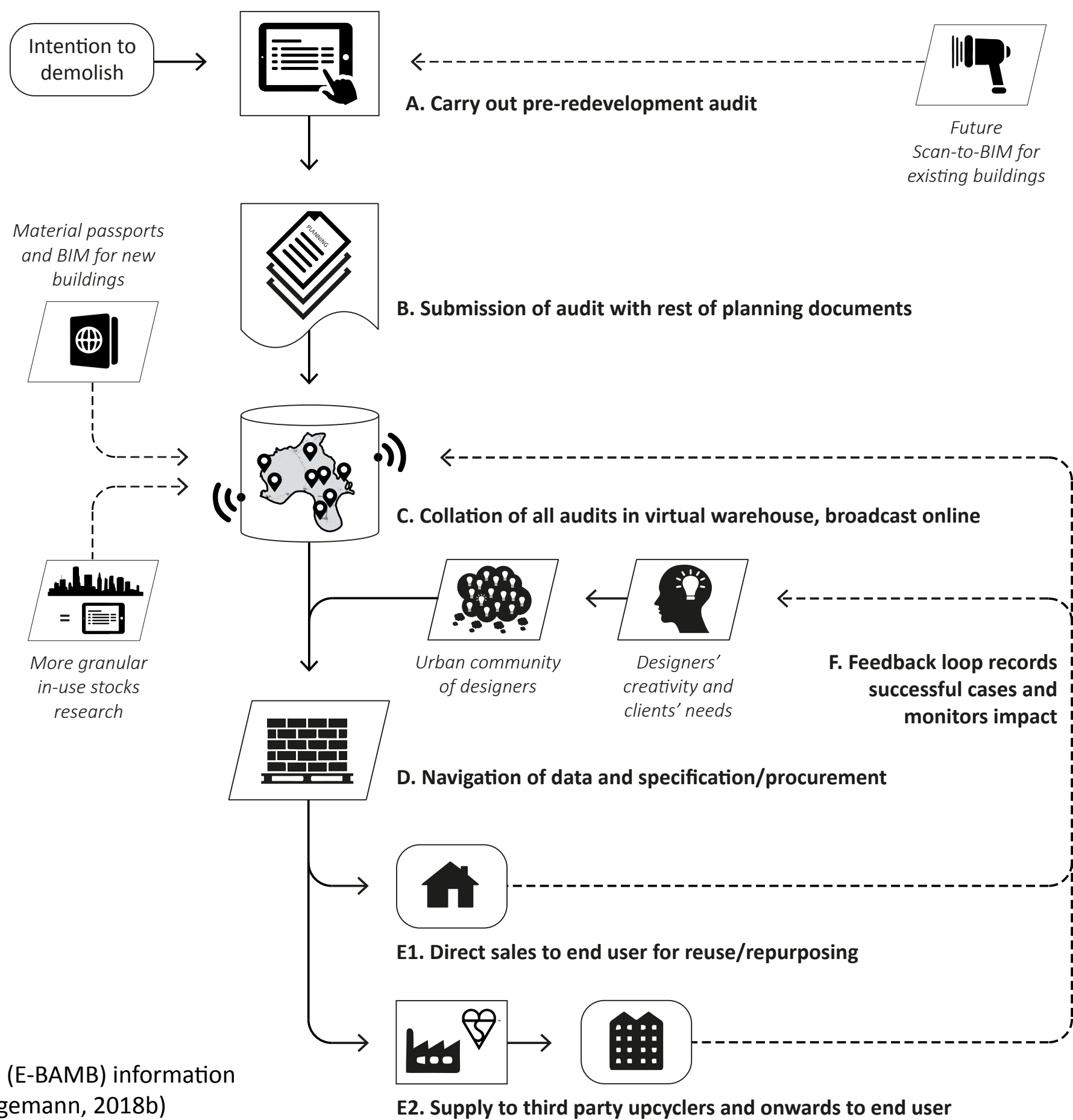
(c)

Triage: adding third party upcyclers provides confidence over quantity and quality; makes secondary use more like normal procurement

Proposed sequences of activities for end-of-use existing building components (Rose and Stegemann, 2018a)

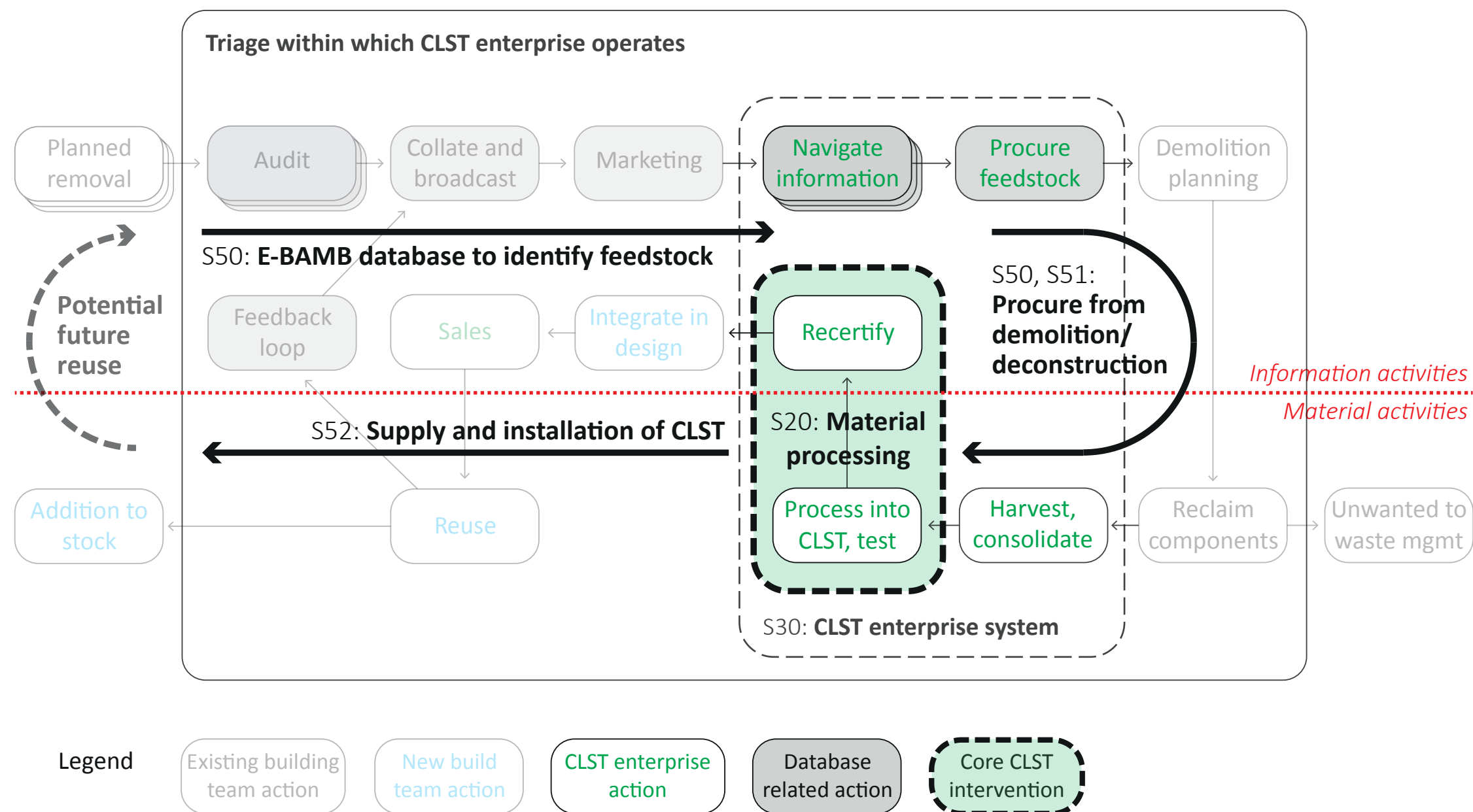


E-BAMB
information system



Existing buildings as material banks (E-BAMB) information system flow diagram (Rose and Stegemann, 2018b)

Cross-laminated secondary timber (CLST)



Cross-laminated secondary timber (CLST)



(a)



(b)

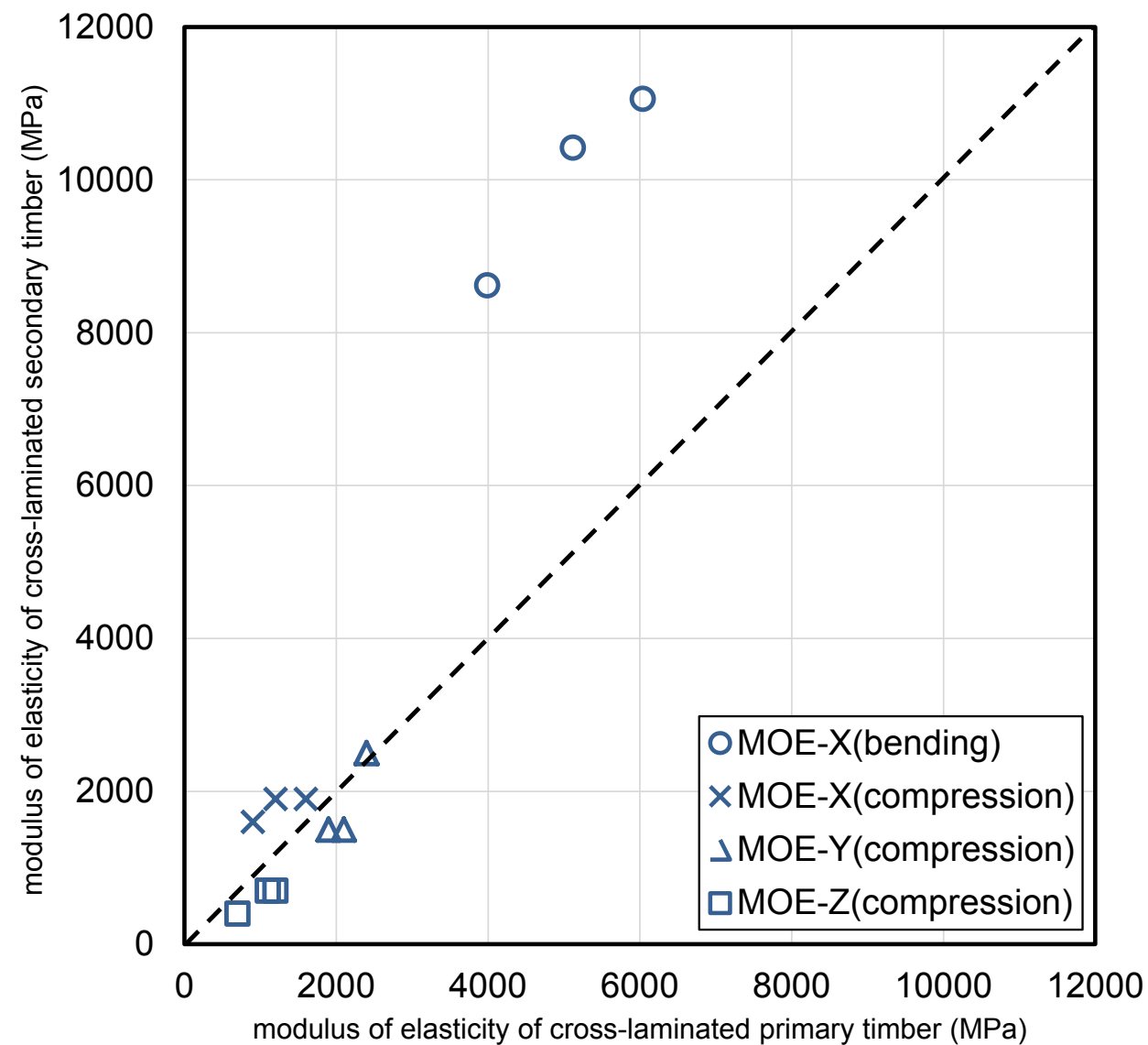
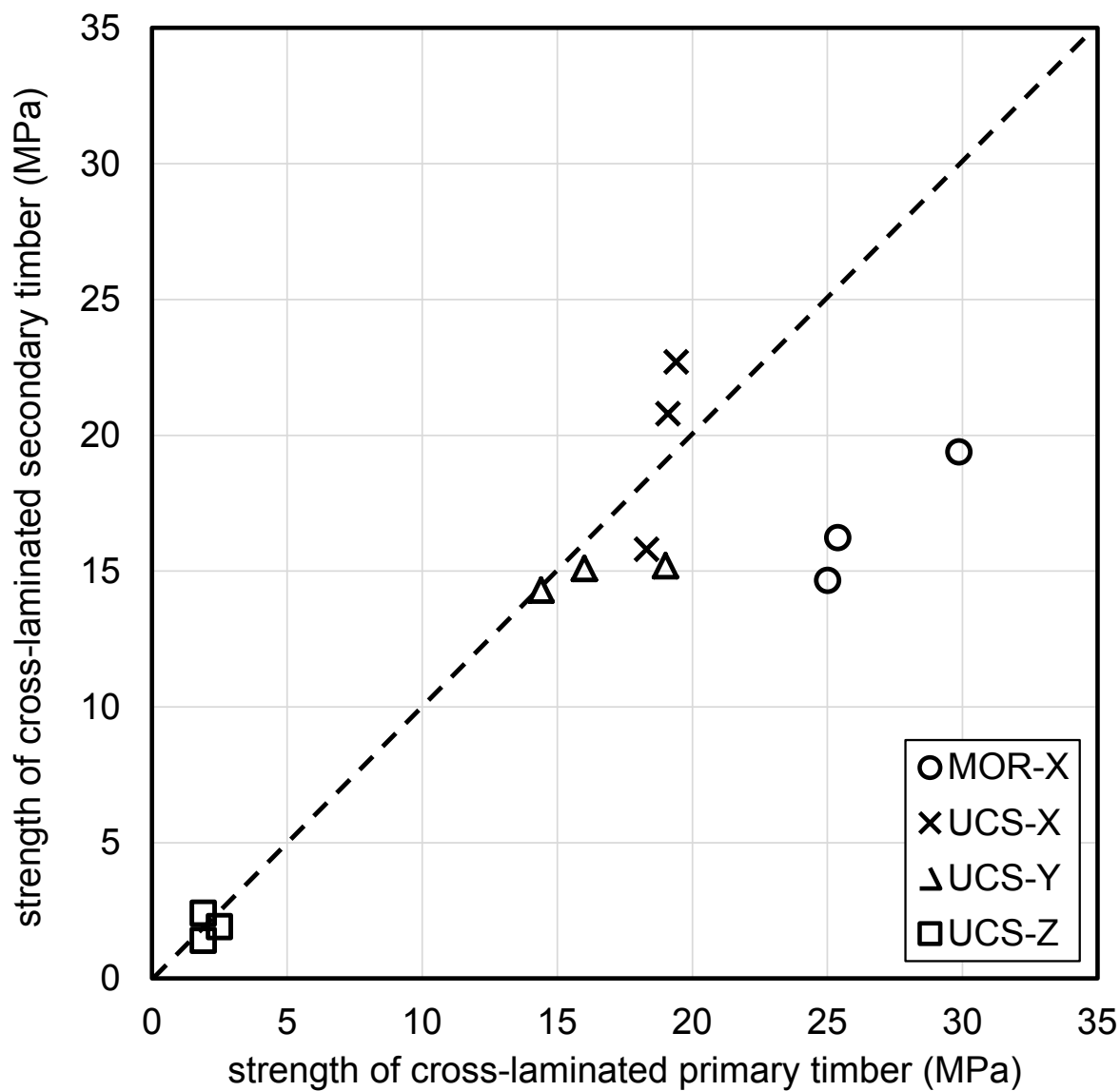


(c)



(d)

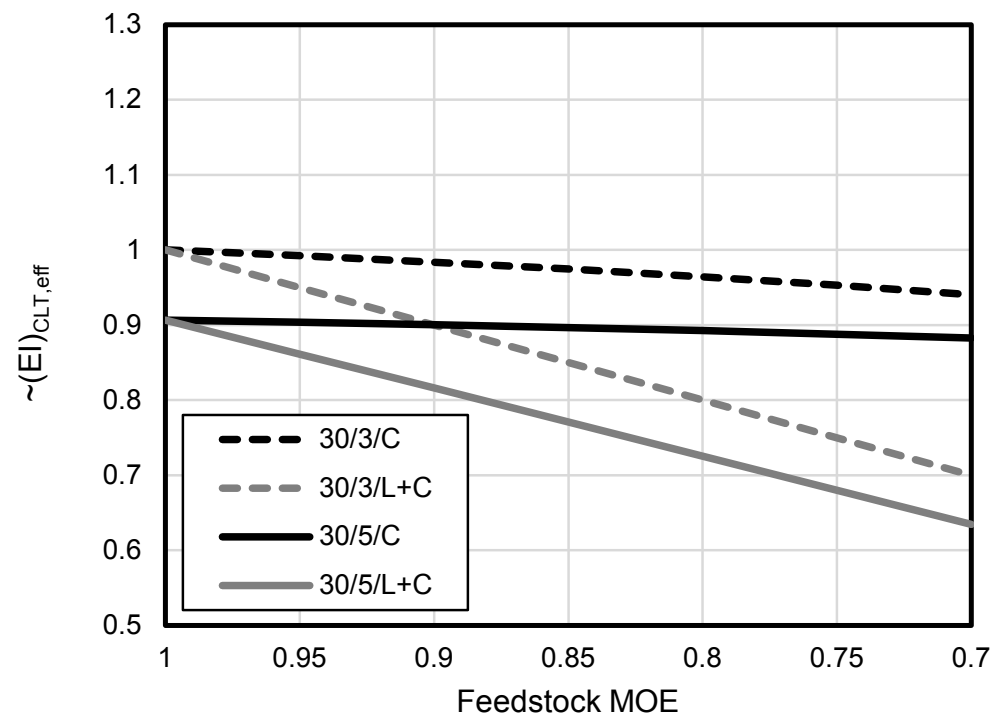
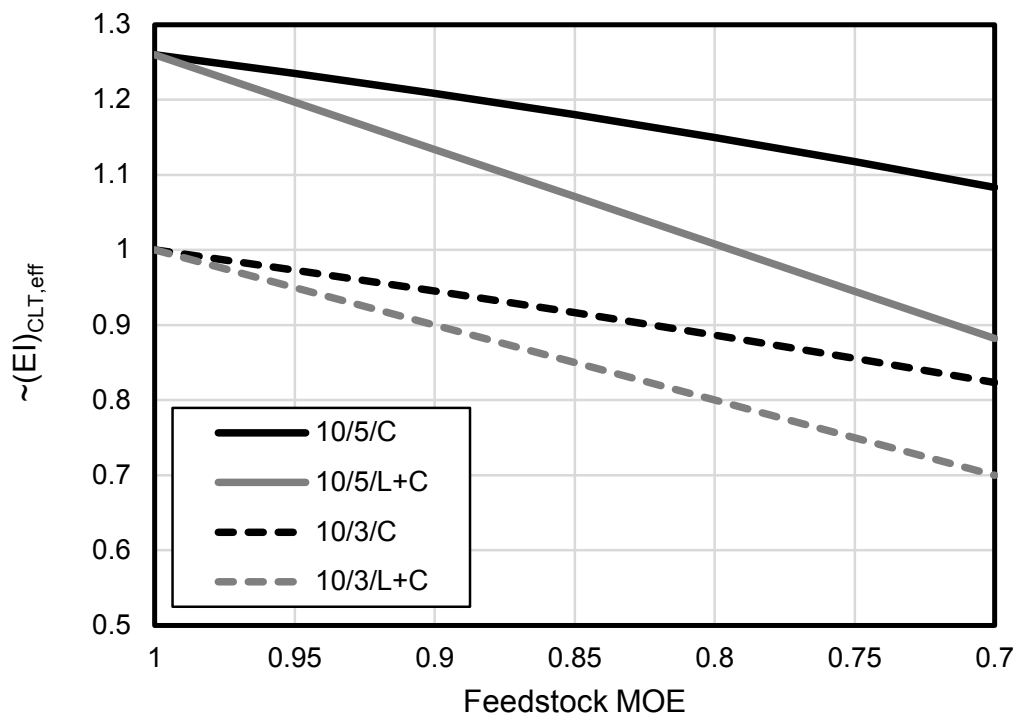
Cross-laminated secondary timber (CLST)



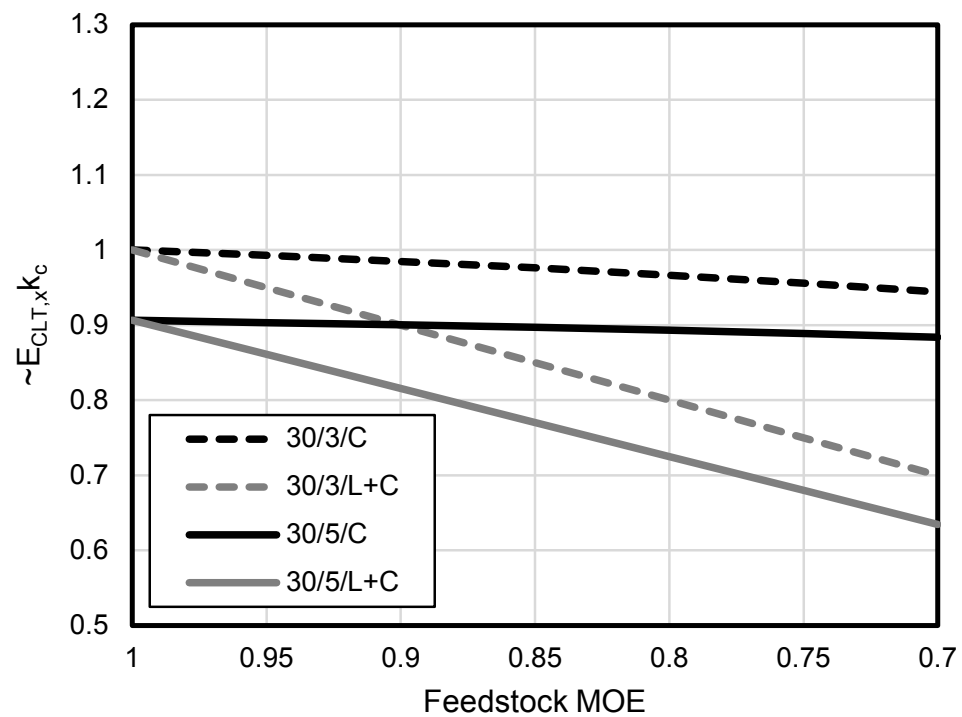
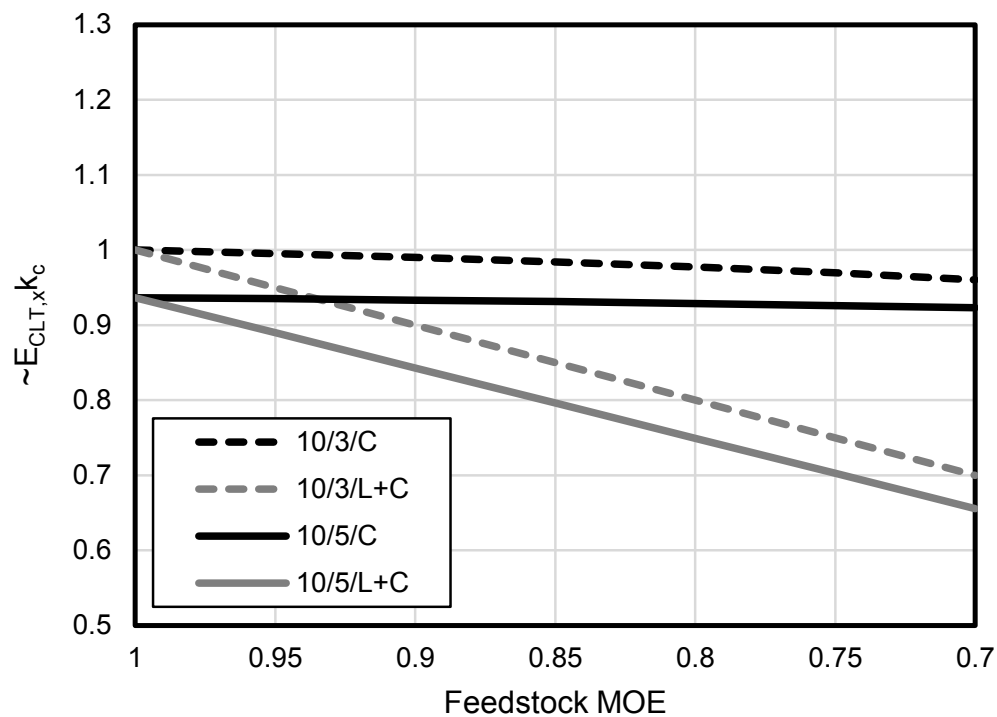
Bending and compression strength; bending and compression stiffness test results for CLST and cross-laminated primary timber (Rose et al., 2018)

Cross-laminated secondary timber (CLST)

Bending
stiffness
calculations



Compression
stiffness
calculations



Calculations using mechanical jointed beams theory to assess combinations of primary and secondary timber in different length:depth ratios and different nnumbers of lamellae (Rose et al., 2018)

Thank you!

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References

Rose, C.M., Stegemann, J.A., 2018a. From Waste Management to Component Management in the Construction Industry. Sustainability 10, 229. doi:10.3390/su10010229

Rose, C.M., Stegemann, J.A., 2018b. Characterising Existing Buildings as Material Banks (E-BAMB) to Enable Component Reuse. Proc. Inst. Civ. Eng. - Eng. Sustain. 00074, 1–42. doi:10.1680/jensu.17.00074

Rose, C.M., Bergsagel, D., Dufresne, T., Unubreme, E., Lyu, T., Duffour, P., Stegemann, J.A., 2018. Cross-Laminated Secondary Timber: Proof of Concept - under peer review 1–22.