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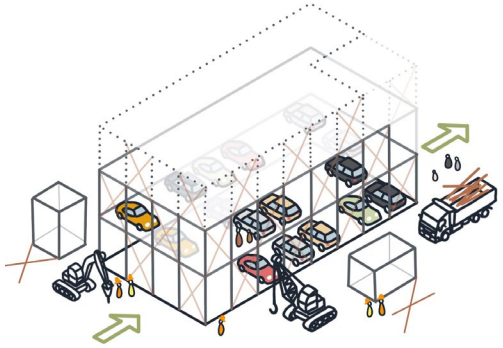

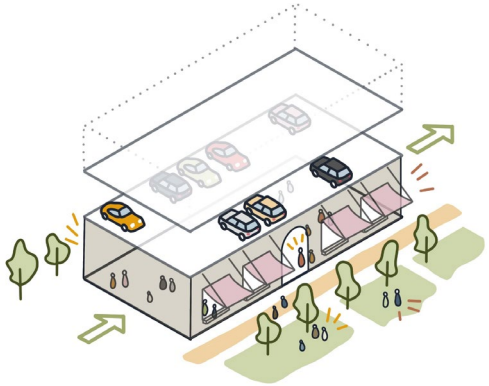

Sustainable Car Parks

Rethinking a typology

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2023

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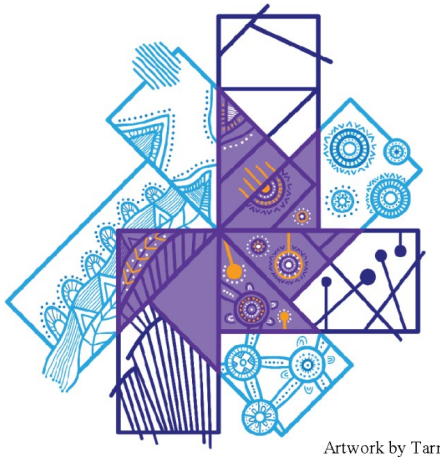
Acknowledgement of Country

I wish to acknowledge the Traditional Custodians of the places where we live, work and deliver projects. Today, I am speaking to you from Gadigal Land.

I pay my respect to Elders past, present and emerging, and celebrate the diversity of First Nations peoples, their ongoing culture and connection to this Land.



Artwork by Tarni O'Shea

Multi-storey Car Parks

Multi-storey carparks emerged as a mainstream building typology in the 1950's with the rise of mass car-ownership and drive-to-work culture.

Typically constructed from in-situ concrete, with deep floor plates, low floor-to-floor heights and open facades they are functional and are often perceived as cold and uninviting spaces.

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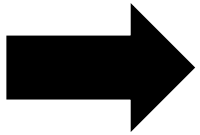
A Business-as-usual Approach

BAU Car Park design

- Highly cyclical customer base
- Wide-spread use of in-situ concrete
- Compressed floor-to-floor heights
- Façade-free
- Limited plant & service space
- Deep floor-plates
- Ramps & enclosed stairs
- Designed for demolition



Limitations

- Periods of over-use and under-use
- Carbon intensive
- Suit single purpose
- Open to the elements
- Lack of flexibility
- Poor access to natural light
- Dark & uninviting spaces
- No consideration of end-of-life

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Changing Customer Behaviours

- Changing worker habits (more diversity in commuting patterns)
- Mobility as a service (instead of car ownership)
- The rise of autonomous vehicles
- Huge uptake in EVs (new spatial and charging requirements)
- Improving public transport infrastructure (More options for customers)
- Political ambitions for car-free cities
- Investment in active transport (and resulting uptake by consumers)
- Congestion charging/ increasing parking costs

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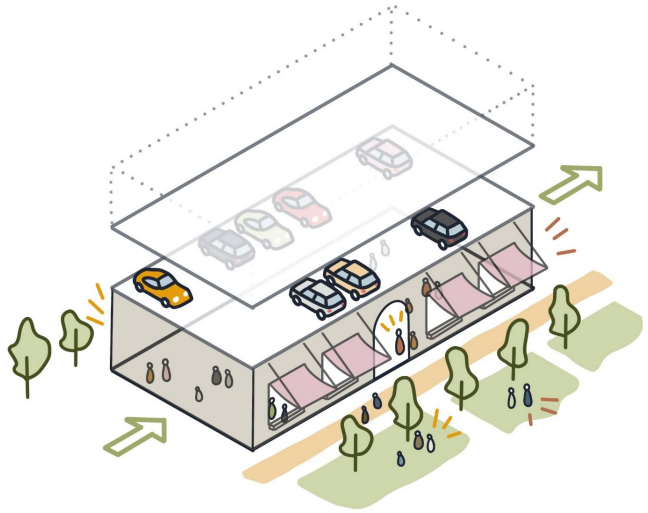
Three Alternatives

Overarching strategies

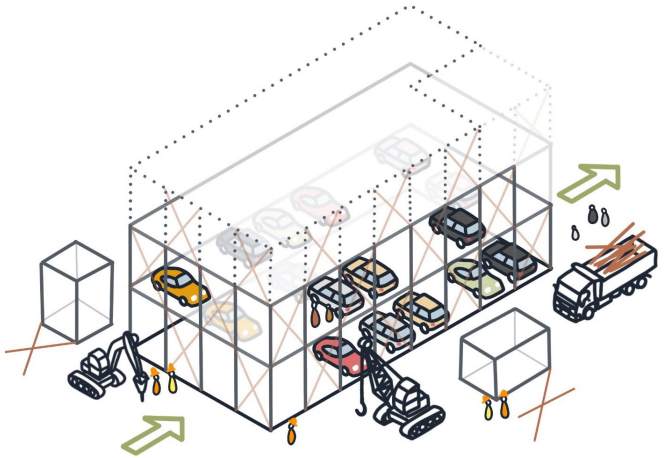


Strategy A

Design for future flexibility

Strategy B

Design for adaptive reuse



Strategy C

Design for disassembly

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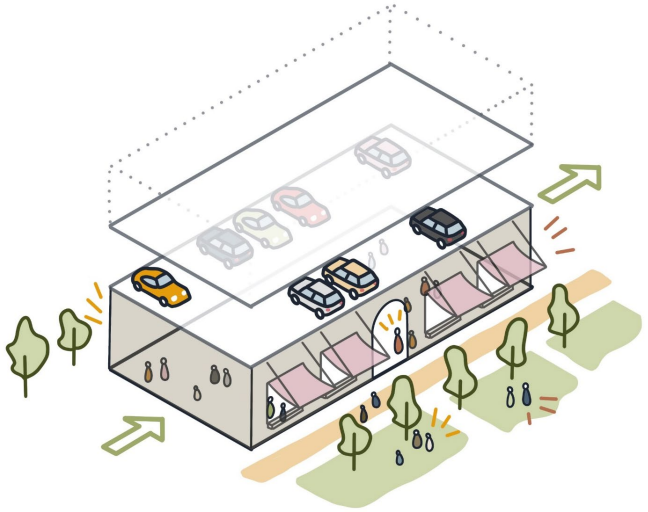
Design for Future Flexibility



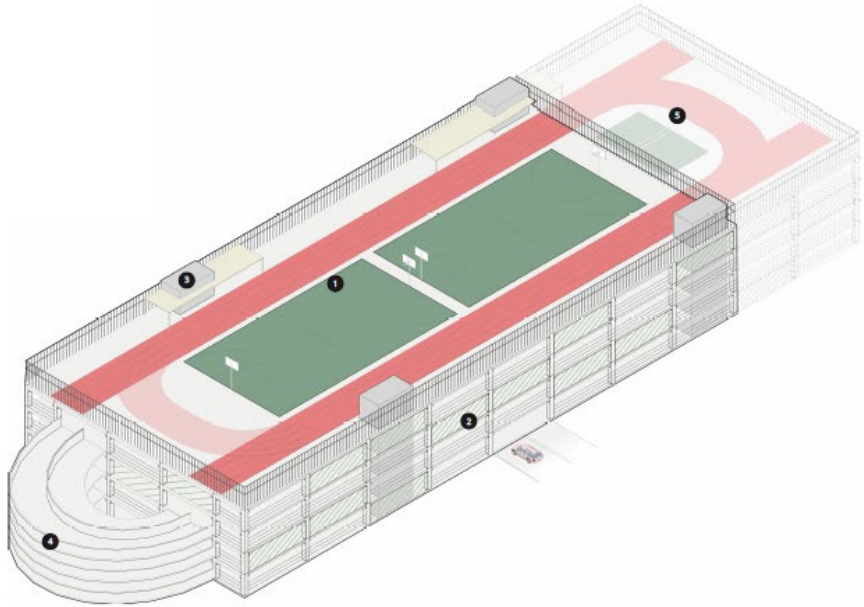
Strategy A

Design for future flexibility

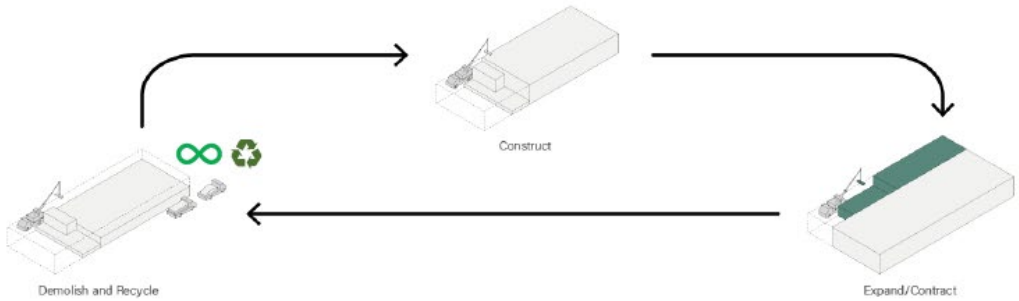
Design for Future Flexibility

Overview

- Structure is expandable or contractible to respond to changing demand
- Modular approach with demountable connections
- Opportunity to ‘give back’ parts of the site where structure is demounted
- Consideration of floor-to-floor height on ground floor to enable use change
- portion of the site to facilitate new land us or the creation of new public space.



Overview diagram
Expandable/contactable design



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Design for Adaptive Reuse

Strategy B

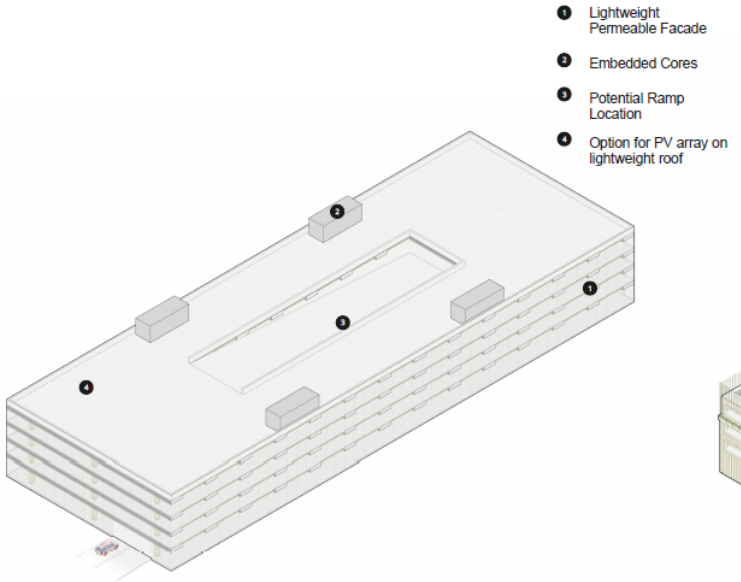
Strategy B

Design for adaptive reuse

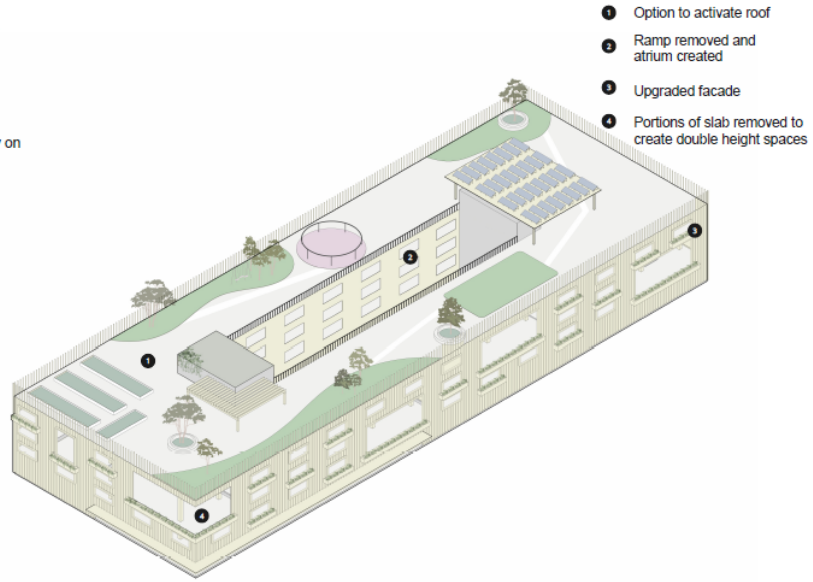
Design for Adaptive Reuse

Overview

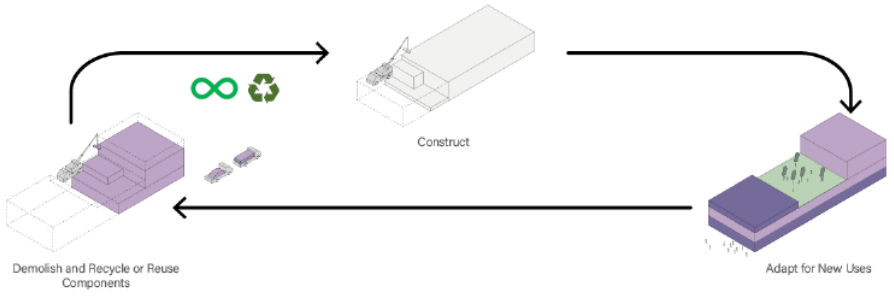
- Adaptive potential is embedded in the base build design, allowing adaptive reuse of the structure in the future to facilitate a change of use.
- The option to change the building use enables the building to maintain relevance as demand changes over time.
- The structural grid, member sizing, floor- to-floor heights, access and servicing strategies are specified and designed to support predetermined future use(s).
- One example may be the transition from a car park on day one, to a mix of retail, daycare and commercial uses in the future.



Overview diagram - Day 1 car park mode
Use as a car park in initial location with increased floor-to-floor heights to enable future use change. The centralised ramp can be demolished in the future to create an atrium void.



Overview diagram - Future adaptive reuse
Upgrade and alterations to base build to enable new functions



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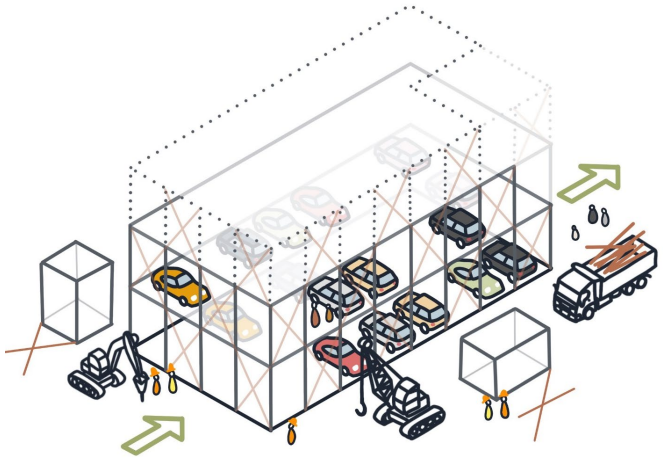
Design for Disassembly

Strategy C



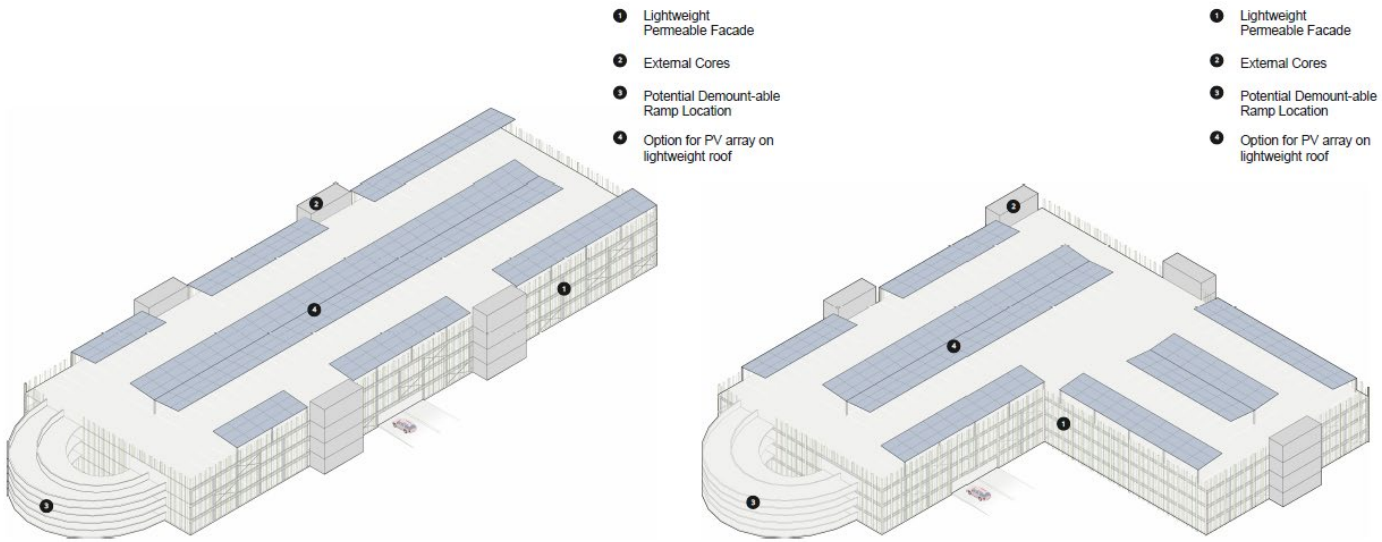
Strategy C

Design for disassembly

Design for Disassembly

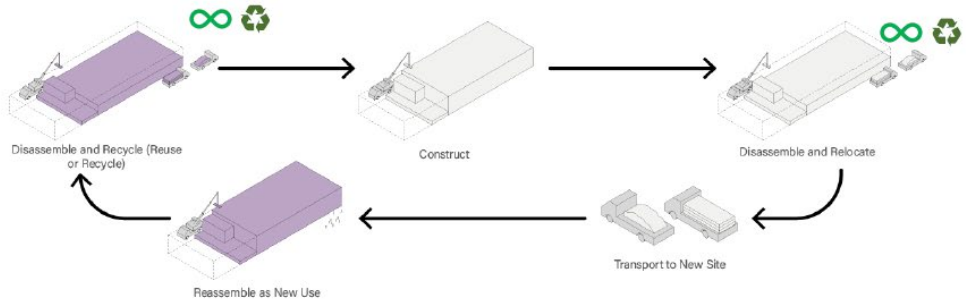
Overview

- The structure, facade and services are designed to allow allows the whole structure to be de- mounted, transported be reassembled in a new location for use as a car park.
- Best suited to sites where a 'short-term' solution is required, such as undeveloped areas which are about to undergo significant development.



Overview diagram - Day 1 location
Use as a car park in initial location

Overview diagram - Future relocation
Use as a car park in new site location



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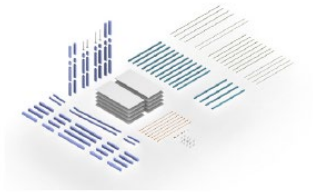
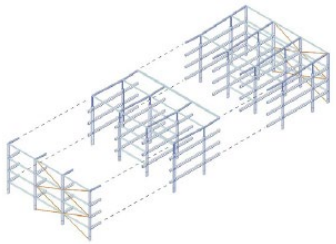
Design for Disassembly

Kit-of-Parts

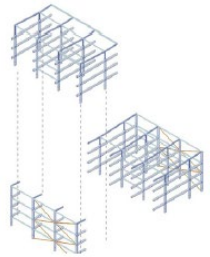


1. Kit of parts

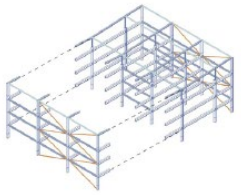
2. Day one



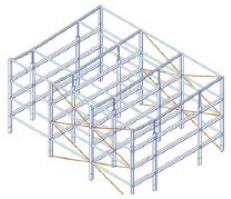
3. Reuse, external columns, and module A



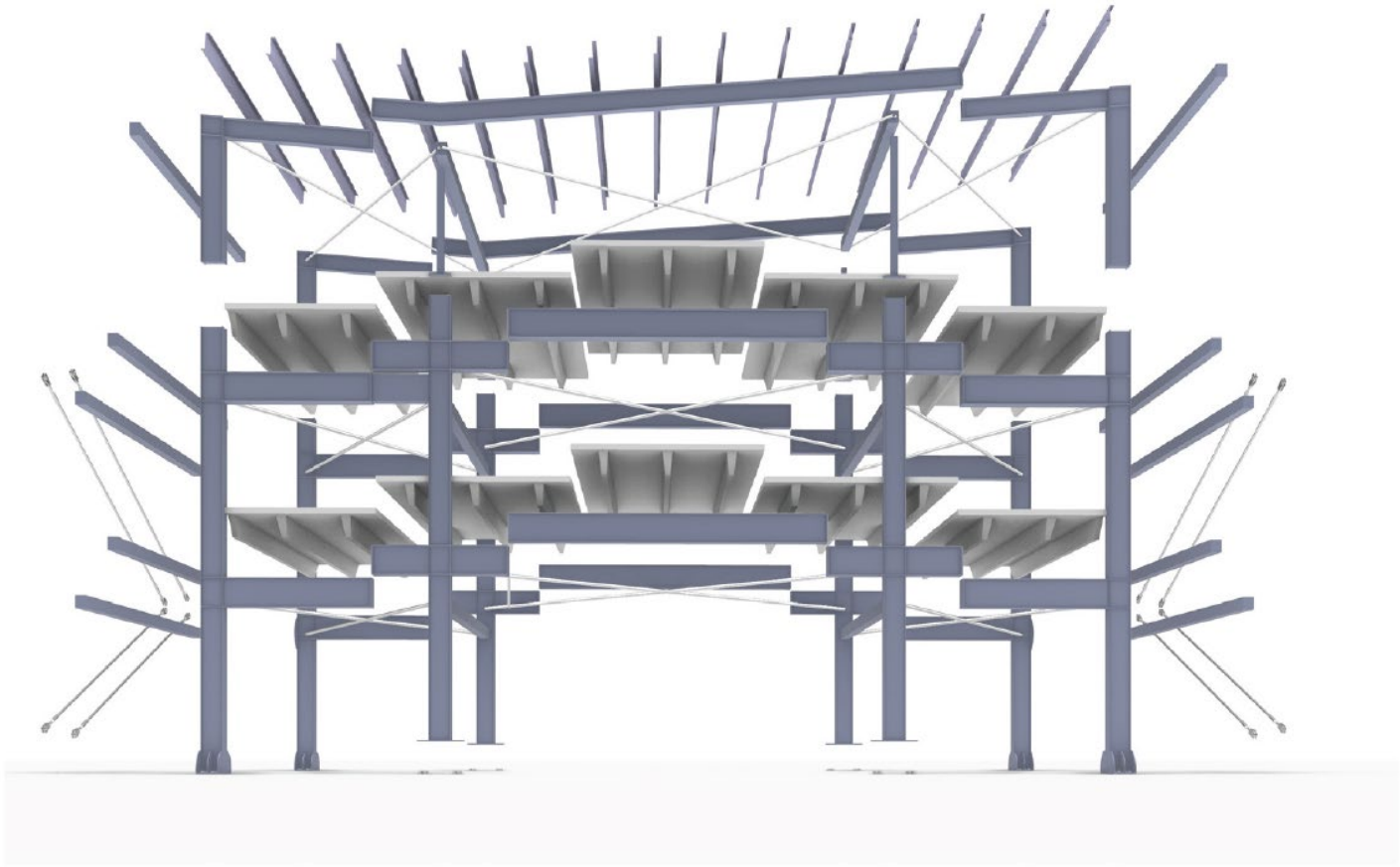
4. Remove excess frames



5. Join external bracing system and module A



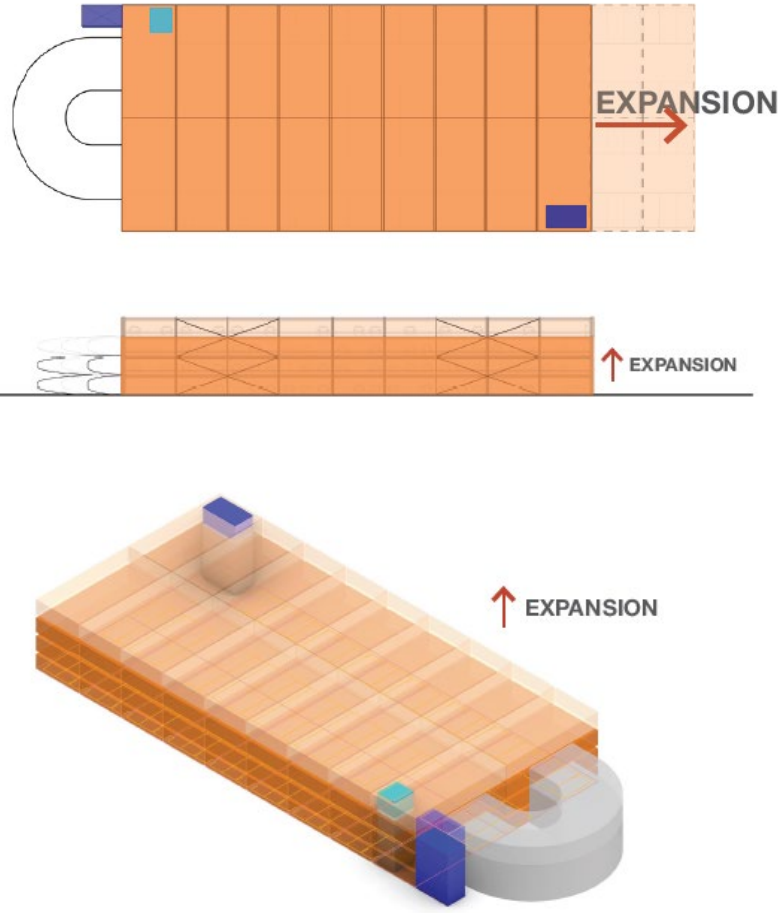
6. Location one resized for location two (possible but an unlikely outcome)



Design for Disassembly

Future Expansion

- Faster construction: Kit-of-parts/ standardised members & connections
- CAPEX – reduction cost than a conventional car park
- Rapid assembly – reduction in construction duration on-site
- Flexibility to accommodate future land use changes
- Enable future expansion – horizontally or vertically
- Light-weight elements for transportation and cranage
- Transport, relocate and rebuild elsewhere



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What Next?

To consider

- We are delivering a flexible approach for an unknown future
- Define your ‘knowns’
- Define (or agree) your ‘unknowns’
- Think beyond immediate need
- Think smart about cost planning, and ‘intelligent compliance’
- Where and who?
- Dare to think differently!

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