



# CitA | **TECHLIVE** 2022

Challenge, Change, Learn

## Welcome to TechLive 2022

by CitA, Ireland's premier  
multidisciplinary construction  
network.



## Matthew Egan B.Eng M.Sc

Founder and Managing Director  
Modularize Limited



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## Practicalities of Designing for Modular Manufacturing Procurement



# Agenda

1. Early Engagement
2. Standardisation & Digital Design
3. Supply chain partnering
4. Collaboration
5. Procuring for Value



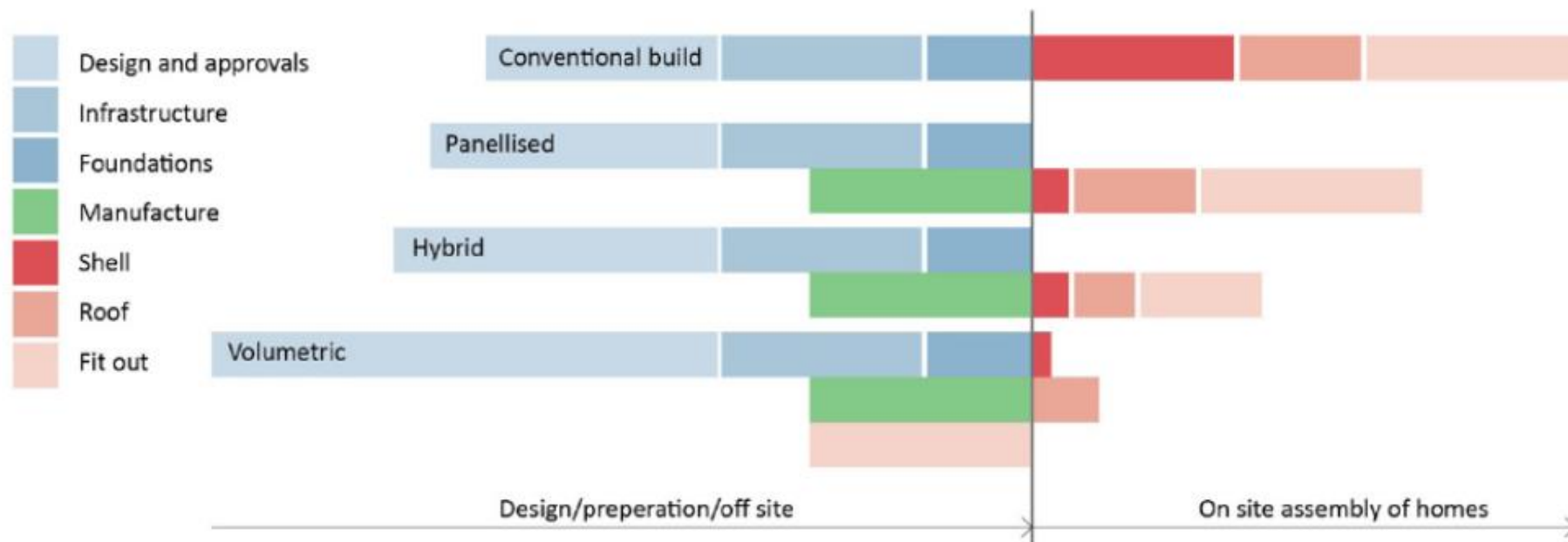
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# Early Engagement



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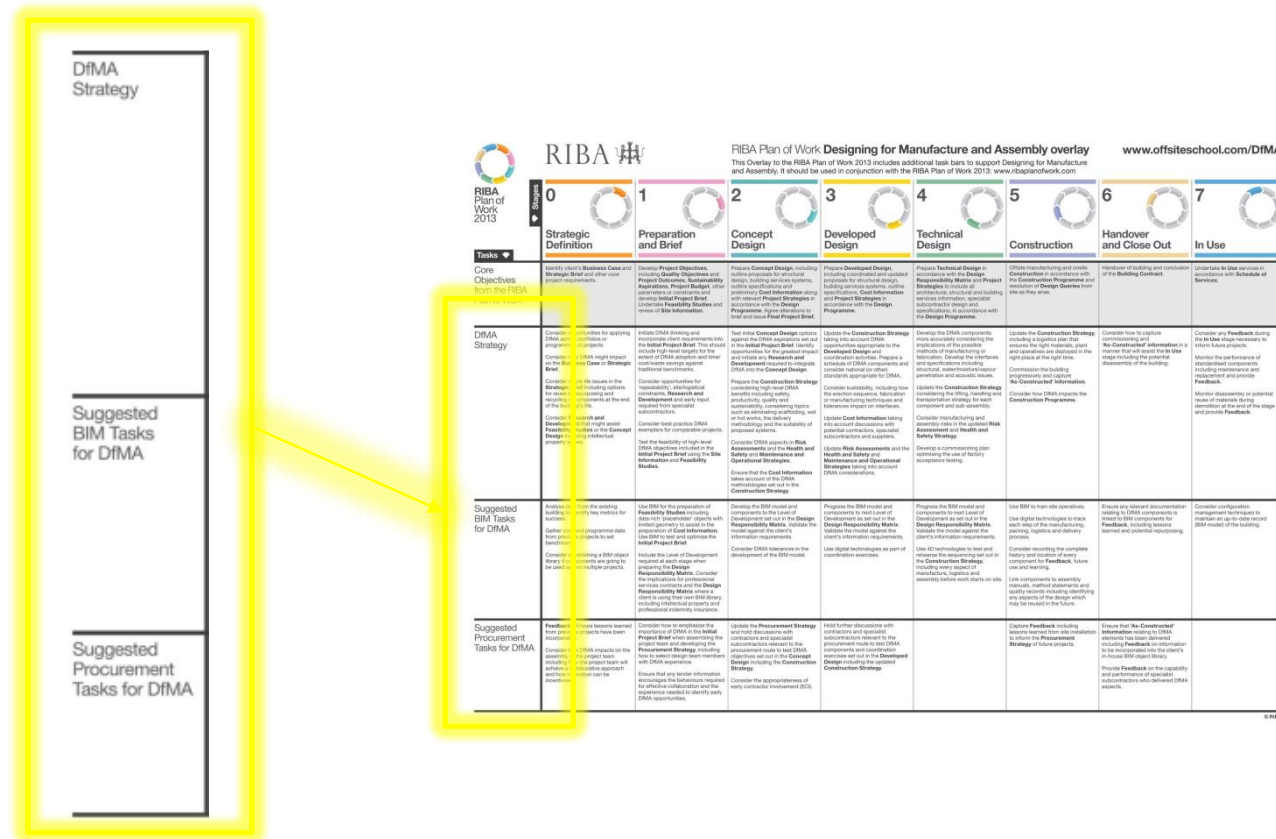


Citation: Making modular stack up: modern methods of construction in social housing.

Overview of MMC panelised, hybrid and volumetric (modular) against convectional construction.



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# Early Engagement



## Open panel systems

The construction of the structural frame for the building using panels assembled in the factory. Open panel systems are typically delivered to the site purely as a structural element with services, insulation, cladding and internal finishes installed in situ.



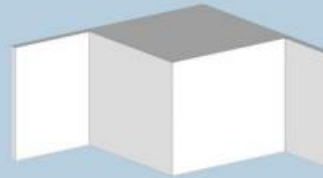
## Closed panel systems

These are similar to open panel systems in that the structural elements of the building are delivered to the site in flat panels. However, closed panel systems typically include more factory based fabrication such as lining materials and insulation and may even include cladding, internal finishes, services, doors and windows.



## Volumetric systems

The most factory-based form of production, volumetric systems involve three dimensional modules that can be used in isolation or in multiples to form the structure of the building. These modules can be pre-finished in the factory to include all fixtures and fittings, requiring a very limited amount of installation work on site.



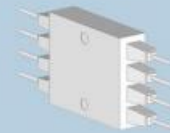
## Hybrid systems

A combination of volumetric and panelised systems where the high value areas (kitchen and bathroom) are typically formed from volumetric units (sometimes referred to as pods) and the rest of the structure formed from some form of framing system.



## Sub-assemblies

Major building elements that are manufactured off site but do not form the primary structure of the building. Foundation systems and cassette panels are typical examples.



## Components

Non-structural elements that are assembled off site. Although currently less common than structural elements, components such as mechanical and electrical services infrastructures are being developed with significant assembly work being carried out off site.



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Citation: Making modular stack up: modern methods of construction in social housing.



# Early Engagement



Standard Product Range

Customisable & Configurable



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# Standardisation & Digital Design



CB/301 Offsite and Modern Methods of Construction Committee  
Focusing on terminology to begin with, moving on to interfaces, tolerances and control of data

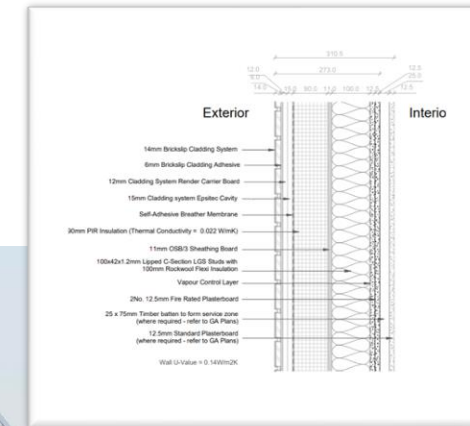
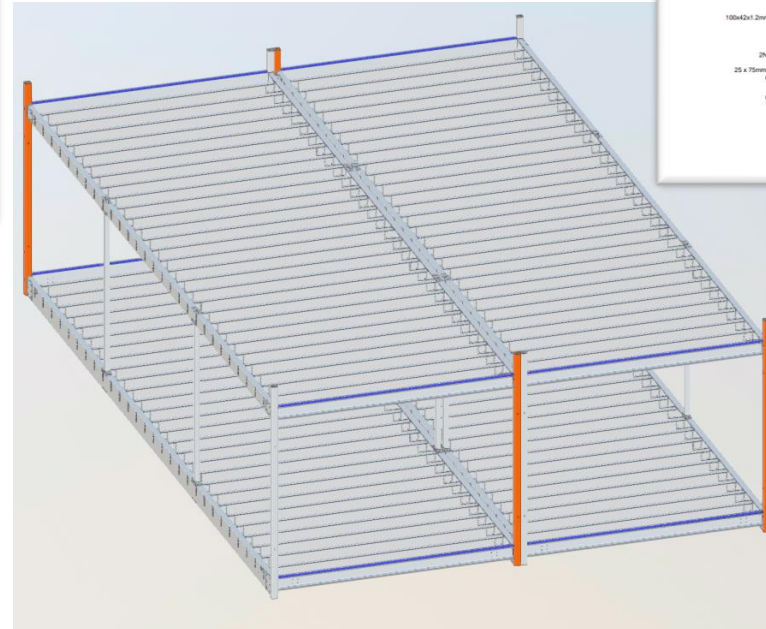
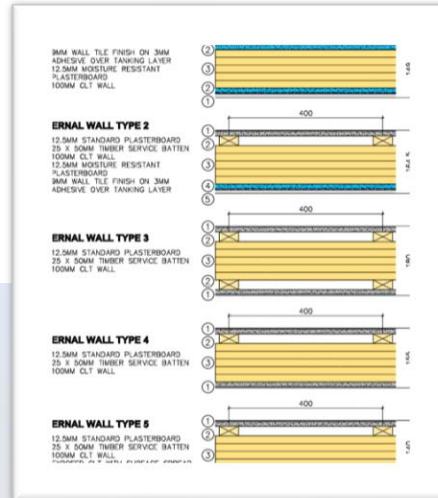
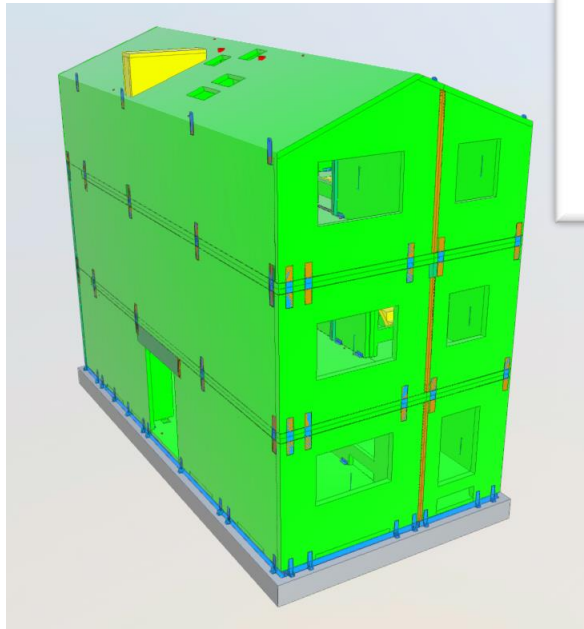


Offsite Alliance – Technical Workstream  
Sustainability, gas membranes, fire

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# Standardisation & Digital Design



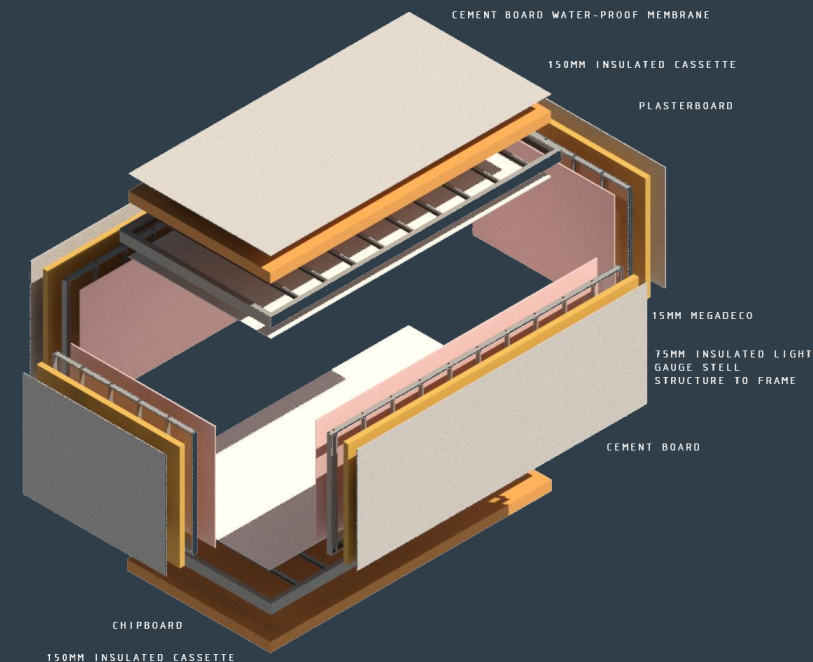
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# Standardisation & Digital Design



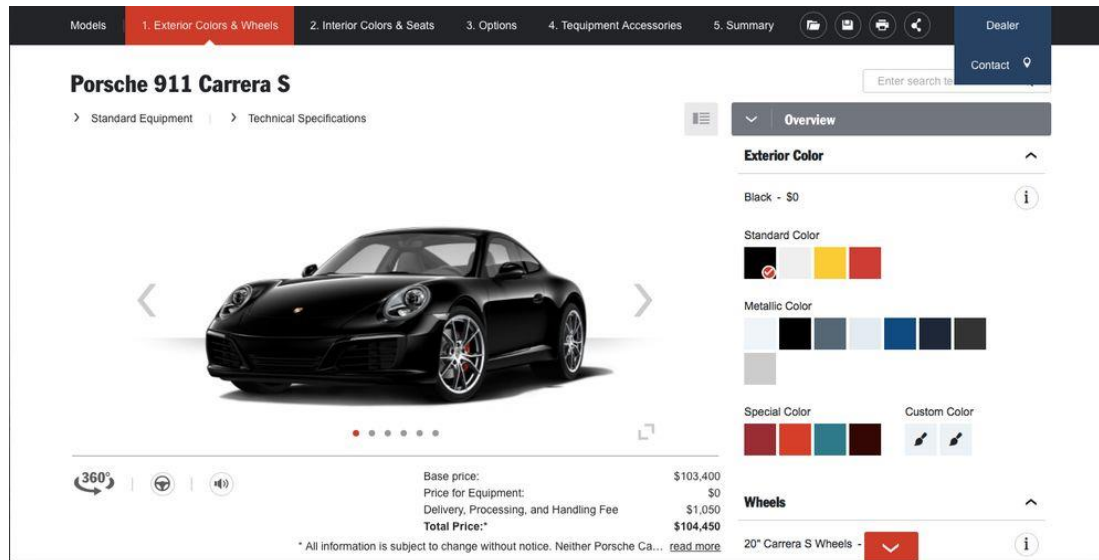
EXPLODED VIEW



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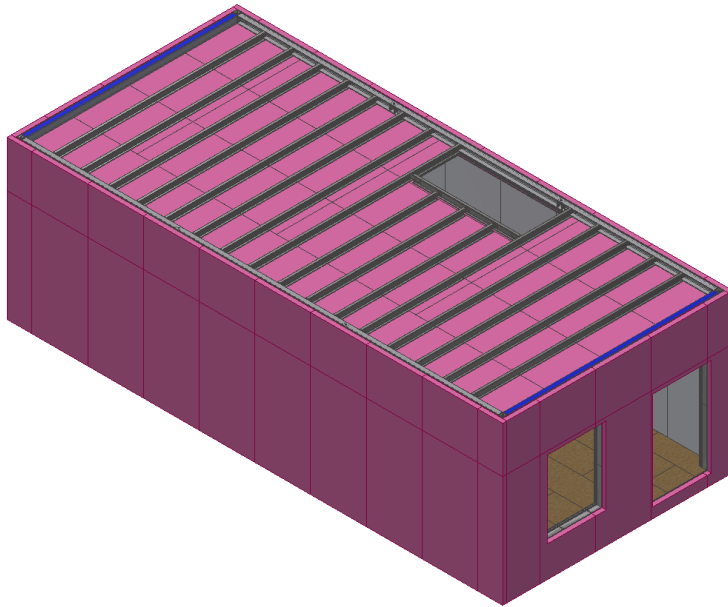
# Standardisation & Digital Design



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# Standardisation & Digital Design



Part Number	Thumbnail	BOM Struc...	Unit	Q...	Stock No...	Description	Δ	R...	Length	Width	Thickness	Area	Waste	TOTAL_F...	PLength	PWidth	G.L	Height	TOTAL_L...	SubGr
22002-CF9-00002		Normal	Each	2	04-CB-126...	Cement Particle Board 2400 x 464 x 12	8	2400	464	12	1.114 m <sup>2</sup>	61.333 ul			2400	1200				Bot
22002-CF9-00003		Normal	Each	2	04-CB-126...	Cement Particle Board 2400 x 712 x 12	8	2400	712	12	1.709 m <sup>2</sup>	40.667 ul			2400	1200				Bot
22002-CF9-00005		Normal	Each	22	04-CB-126...	Cement Particle Board 997 x 1200 x 12	8	997	1200	12	1.196 m <sup>2</sup>	58.458 ul			2400	1200				Bot
22002-CF9-00008		Normal	Each	4	04-CB-126...	Cement Particle Board 997 x 435 x 12	8	997	435	12	0.433 m <sup>2</sup>	84.958 ul			2400	1200				Bot
22002-CF9-00004		Normal	Each	2	04-CB-126...	Cement Particle Board 997 x 464 x 12	8	997	464	12	0.463 m <sup>2</sup>	83.937 ul			2400	1200				Bot
22002-CF9-00006		Normal	Each	2	04-CB-126...	Cement Particle Board 997 x 712 x 12	8	997	712	12	0.710 m <sup>2</sup>	75.352 ul			2400	1200				Bot
22002-CB0-00006		Normal	Each	4	02-C-120...	Chigboard 539 x 2400 x 22	8	2400	539	22	1.29	10.167 ul			2400	600				
22002-CB0-00005		Normal	Each	2	02-C-120...	Chigboard 539 x 425 x 22	8	425	539	22	0.23	84.111 ul			2400	600				
22002-CB0-00002		Normal	Each	4	02-C-120...	Chigboard 600 x 1225 x 22	8	1225	600	22	0.73	48.979 ul			2400	600				
22002-CB0-00004		Normal	Each	4	02-C-120...	Chigboard 600 x 2025 x 22	8	2025	600	22	1.21	15.646 ul			2400	600				
22002-CB0-00001		Normal	Each	24	02-C-120...	Chigboard 600 x 2400 x 22	8	2400	600	22	1.44	0.800 ul			2400	600				
22002-CB0-00003		Normal	Each	6	02-C-120...	Chigboard 600 x 425 x 22	8	425	600	22	0.25	82.313 ul			2400	600				



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## Supply Chain Partnering

Do not put all your eggs in one basket.

— Warren Buffett —



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# Supply Chain Partnering

**Allenby Connaught**

**£1.45 billion project**

**8 year construction programme**

**562 new buildings delivered at a rate of 1 per week**

**Rollalong and Tata Living Solutions**



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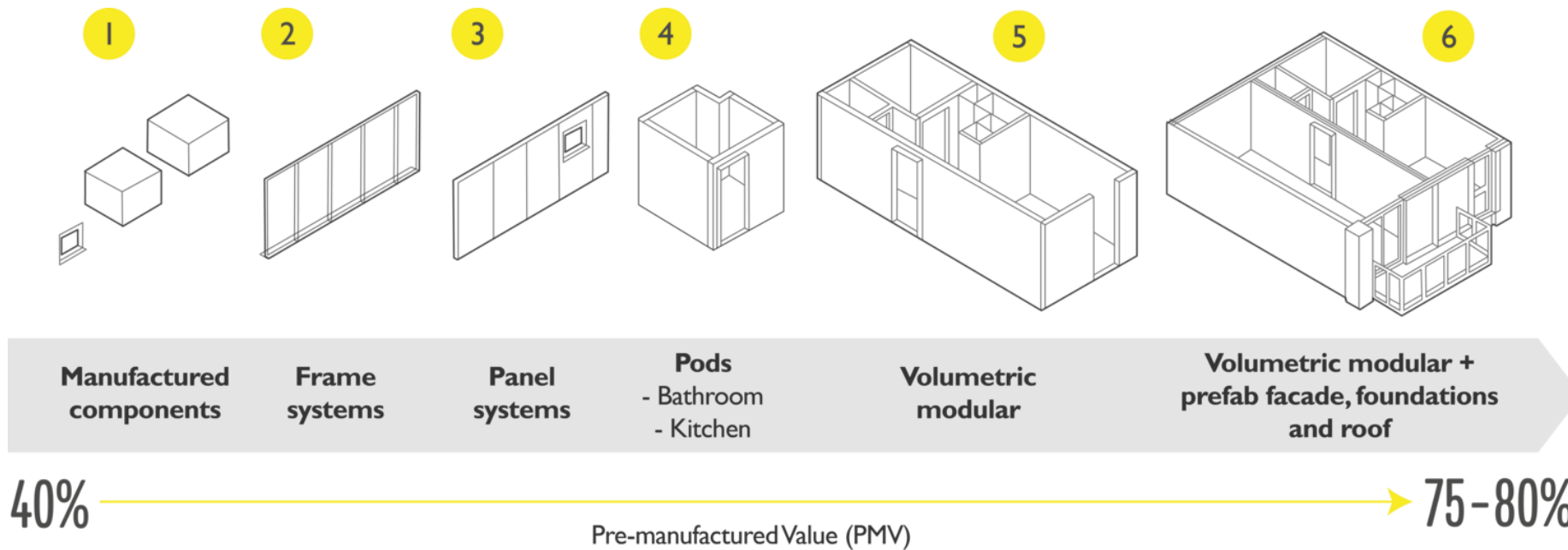
# Collaboration



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# Procuring for Value



**AKERLOF**

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# Procuring for Value



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# Procuring for Value



**MEP4**  
Offsite

ThermaSkirt™ **e**



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# Conclusions

- Early engagement at RIBA 0 with an MMC consultant.
- Identify manufacturing partners and their systems early.
- Understand components and sub-assemblies and how to maximise value to lower the pre-con and production overhead.
- Procure for real value, not just the offsite quantum.



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## Questions?



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**ARUP**



## Gold Sponsors

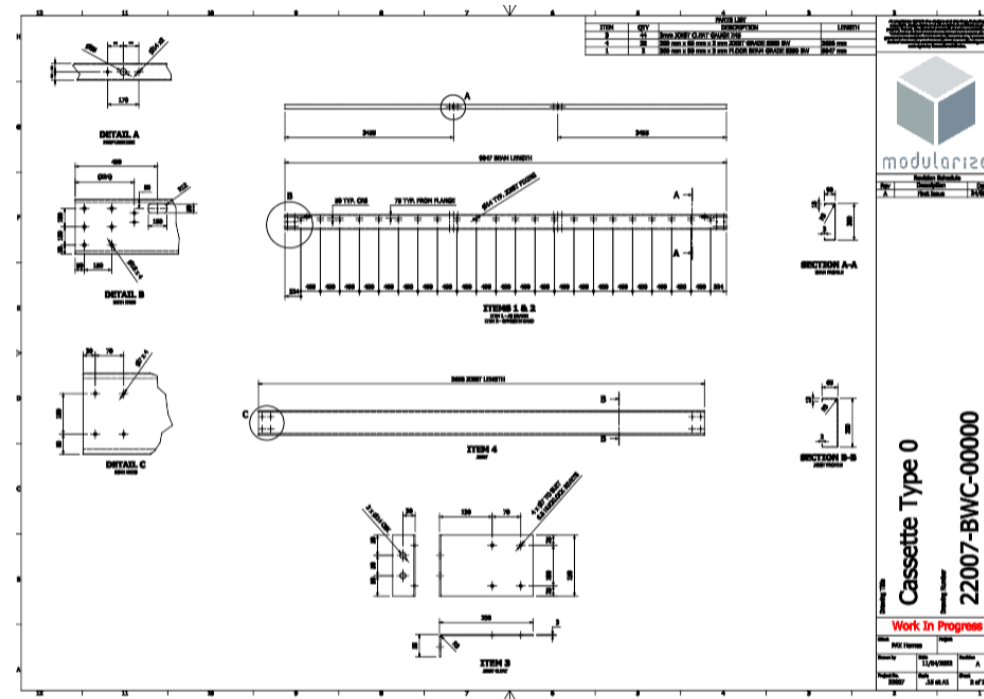
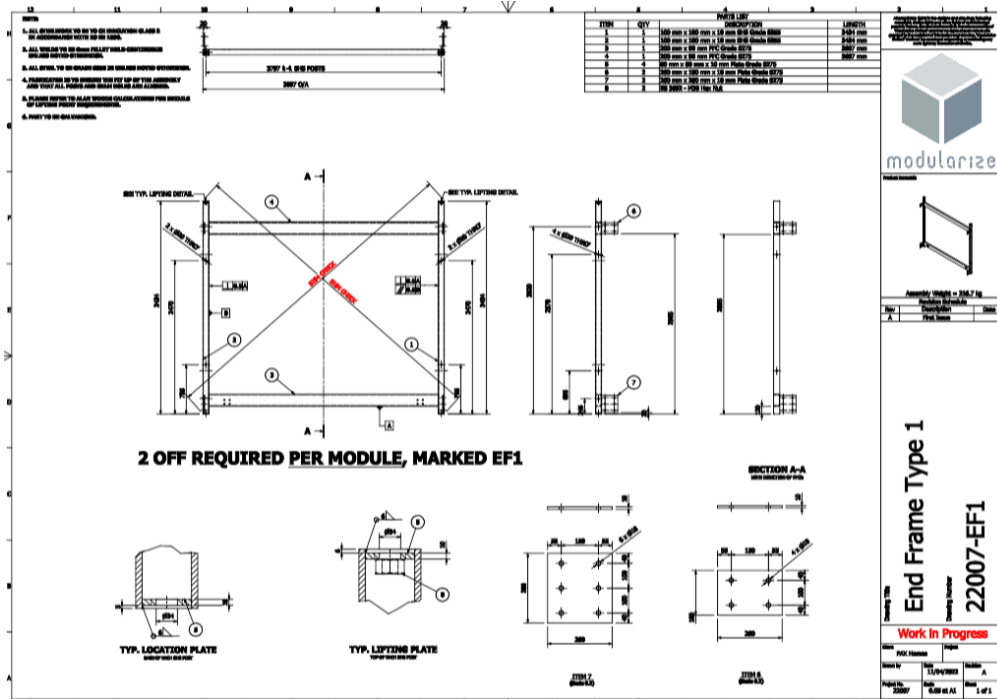




# Thank you for your participation



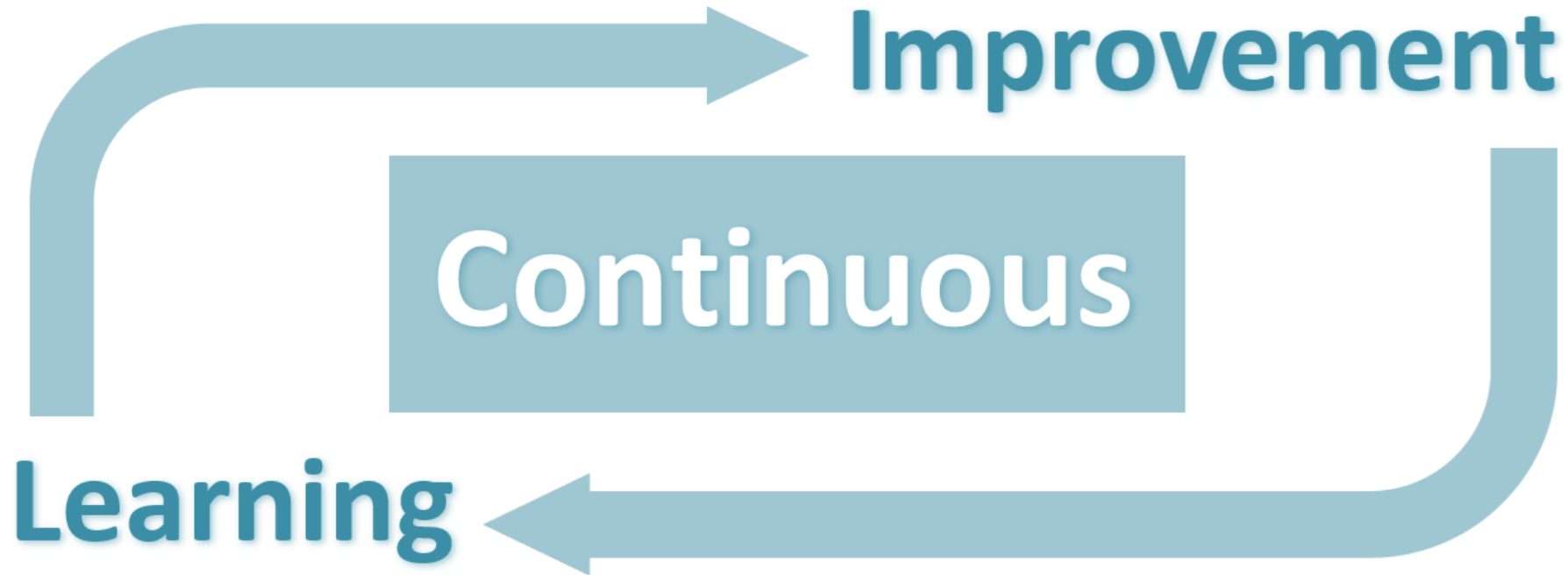
# Collaboration



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## Procuring for Value



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