

**alinea**

**Buildoffsite Residential Hub**

19<sup>th</sup> March 2019

*buildoffsite*

## 3 | Our Business

- 7 equity Partners - combined 180+ years experience
- The owners will deliver and positively influence this project
- Fully **self-funded**, robust business plan
- Steady growth: **current headcount - 107**
- 1<sup>st</sup> placed Cost Consultant in Building Good Employer Guide 2015, 2016, 2017 & 2018
- 22 Partners in the business providing Senior project time
- Investment in people and infrastructure
- A business for the long term, a legacy
- Independent cost advice - we don't work for Contractors
- Covenant/PI equal to competitors
- RICS registered, QA compliant (BSI 15001)
- A culture of excellence
- A culture of innovation
- Passionate about everything we do



alinea<sub>Q</sub>  
knowledge  
Can we fix the housebuilding crisis piece by piece?  
September 2015

## ECONOMICS

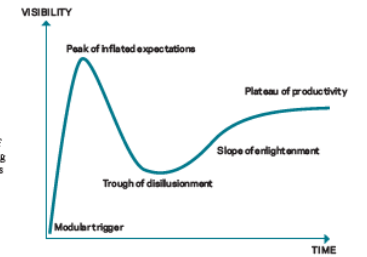
analysis/facts/forecast

## CONSTRUCTION METHODS MODULAR

Modular construction is touted as the future of the building industry, but while the sector is rapidly growing in some areas, there are still obstacles to overcome. Alex Hyams of Alinea, Ed McCann of Expedition assess the pros and cons of volumetric modular offsite construction

Technology is in the "peak of inflated expectations" followed by the "Trough of disillusionment" (see 2016 Farmer review in the spotlight of the solution to industry's ills. So is climbing Gartner's "ghetto" to reach of productivity? This study reassesses benefits of modular and explores the have limited uptake of in the UK - including understand the business to overcome its image. It examines how they have not and what potential for growth is.

Figure 1: Gartner hype cycle, showing a technology's journey to mainstream acceptance



alinea<sub>Q</sub>  
knowledge  
Residential Timber  
Cost Model  
For Building Magazine  
June 2017

Other volumetric modules are "frame-stiff", using posts and beams - typically formed from hot-rolled steel sections - to frame the units. Non-structural infill panels are inserted between the posts to form the walls, providing greater flexibility in room layout than a solid-wall module. Floors and ceilings span to the perimeter of the frame.

- Panel systems (or flat panel systems) - 2D panels are prefabricated, delivered to site and craned into position, then connected to form a structure. Materials are typically precast concrete, timber, cross-laminated timber or structural insulated panels. Finishes and services are usually installed on site after assembly.
- Pods are relatively small prefabricated modules, usually fully fitted out, which may be used in conjunction with another construction method. Common examples are bathroom or kitchen pods.
- Hybrid systems may combine volumetric or panelised systems with other precast elements and/or a primary structural frame.

Magnum Concrete, by Vitrum Modular

# Overview

- Relevant Experience
- Key Cost Drivers
- Quality as a Driver?
- Cost Comparisons
  - Executive Summary
- How do we improve?

# Relevant Experience

Project Experience & Cost Intel mainly based on the following:

- London & South East
- Schemes of 200nr + Units
- Schemes of 200,000 ft<sup>2</sup> or more
- Schemes of 7/8 storeys or above
- Mixed Tenure but mainly Market / BTR led (i.e no pure RP Affordable products)
- DfMA, CLT and Volumetric projects and studies



# Relevant Experience



# Key Cost Drivers

- **Competition (or lack thereof)**



Volumetric manufacturers		£50m+ projects (all sectors)	£50m+ projects (residential)	Volumetric manufacturers		£50m+ projects (all sectors)	£50m+ projects (residential)	Timber products				
								CLT	Glulam	LVL	Cassettes	Hybrid
Actavo		●	●	M-Ar								
Caledonian Modular		●	●	Modular Wise								
Eco Modular				Modulek				●				
Elements Europe		●	●	Premier Modular		●	●			●		
Elliott Group		●		Pod Living				●				
Enegroup				Rollalong				●	●		●	
Extraspace				Simply Modular				●	●			
Ideal Modular				Swan Homes/Nu Living				●	●			●
Ilke Homes				Thurston Group				●	●			
Legal & General Modular Homes				Urban Splash				●			●	
LoCal Homes				Vision Modular		●	●	●				
McAvoy		●		Yorkon		●		●			●	
				Wiehag				●	●		●	
				Rubner Holzbau				●	●			
				Hess Timber				●	●			

# Key Cost Drivers

- **Understanding (or lack thereof)**



- Exploring Offsite too late !!
- Re-engineering a traditional scheme to fit a modular delivery
- Attempting to tender as per Traditional (Client / Funder need to demonstrate competition)
- Late changes / variations cost more (lack of understanding / discipline)

- **Design**



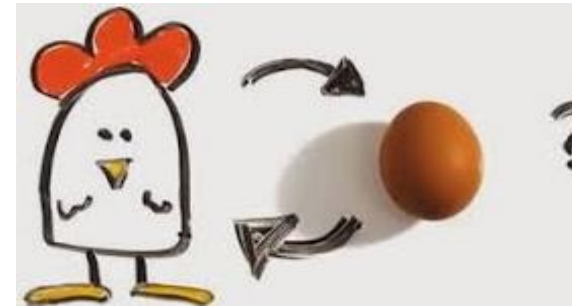
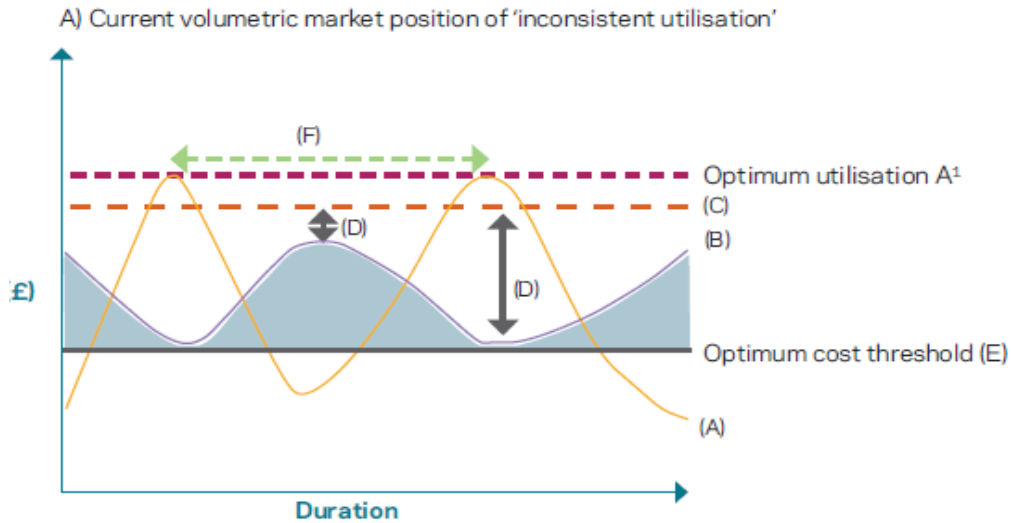
- Understanding the constraints of off-site (Geometry, fabric, grid, loadings)
- Standardisation of layouts and key areas
- Standardisation of key components



# Key Cost Drivers

- **Transactional Behaviour**

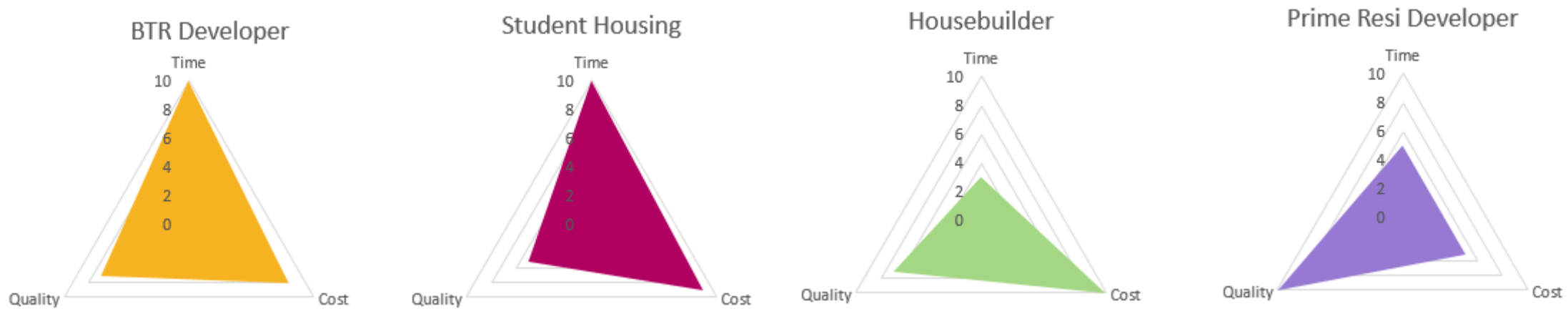
- Large Initial Investment > High Overheads > Needs High Utilisation to keep unit costs low  
**ISSUE: Control of Supply** - unlike car factory – manufacturer far removed from ultimate client



— Optimum utilisation (A <sup>1</sup> )	↔ Risk margin + profit (D)
— Utilisation (A)	■ Excess cost driver by low utilisation
— Actual cost of manufacture (B)	— Optimum 'cost' threshold (E)
— Actual price to client (C)	↔ Comfort/confidence (period between utilisation) (F)

# Quality?

“In reviewing the traditional construction triangle of time, cost & quality you start to understand the reasons for success and that Off-Site is not a one size fits all”



- ✓ Quantum of units
- ✗ Planning Unit Mix
- ✓ Dumbbell style apartment layouts
- ✓ No ability to pre-let

**Neutral**



- ✓ Quantum of units
- ✓ Limited number of unit types
- ✓ No ability to pre-let

- ✓ Quantum of units
- ✗ Planning Unit Mix
- ✓ Have pipeline
- ✗ Speed not beneficial

**Neutral /** ✓

- ✗ Planning Unit Mix
- ✗ Speed not requirement
- ✗ More bespoke layouts



# Cost Comparison (vs Traditional)

	Traditional	CLT	DfMA	Volumetric
Cost	Baseline	(3% - 7%)	+ 1% - 5%	+ 10% - 15%
Programme		(7% - 15%)	(5% - 15%)	(40% - 50%)

Costs based on

- London & South East
- Schemes of 200nr + Units
- Schemes of 200,000 ft<sup>2</sup> or more
- Mid Rise Schemes (above 7 storey / below 25 storey)
- Comparison @ Tender Stage

# How do we improve?

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xxxx Modular		Modular (Volumetric)	Original Data
LOGO		<b>Financials</b>	
		Turnover (actual) 2014 / 2015	£50.0m
Company Information		Turnover (actual) 2015 / 2016	£50.0m
		Turnover (actual) 2016 / 2017	£50.0m
		Turnover (actual) 2017 / 2018	£50.0m
		Turnover (forecast) 2018 / 2019	£100.0m
		Turnover (forecast) 2019 / 2020	£100.0m
Experience		Current Sector Split as % of Turnover	
		Sector Split	
		Residential	Student
		Hotel	Key Worker
		School	Other
Design		<b>Capability &amp; Preferences</b>	
		Factory Capacity (modules / week)	Yes / No
		Ability to Expand Operations:	Yes / No
		Expansion Plans:	Yes / No
		Main Contractor Capability:	Design & Build
Performance		Preferred Form of Contract:	Stage 2 / 3 / 4
		Preferred stage to be engaged:	£m
		Maximum Project Size (value)	£m - £vm
		Preferred Project Size (value range)	20
		Maximum Project Height (nr of storey's)	4-6
Contact + Website		Preferred Project Height (nr of storey's)	£180 - £200 / M <sup>2</sup> GIA
		Indicative Cost Range (£/M <sup>2</sup> )	1,000 M <sup>2</sup>
		Indicative Programme Range (M <sup>2</sup> / week)	x weeks
		Lead in (from order)	
		Payment Structure:	
Contact + Website		Deposit	10%
		Off-Site / Factory Stage	40%
		Installation	40%
		Testing & Commissioning	10%
		Primary Module Material:	Light gauge steel
Residential Storey Height:	3.15m	% Factory Utilisation 2015 / 2016	100%
Party Wall Thickness:	400mm	% Factory Utilisation 2016 / 2017	100%
Structural Floor Thickness:	225mm	% Factory Utilisation 2017 / 2018	100%
Ability to integrate balconies:	Yes / No		

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