CitA
Construction IT Alliance

EDUCATING THE CLIENT FOR OSM

1. LMC MODULAR GROUP

LMC modular

LMC COMPANY GROUP JOURNEY

PLAN . DEVELOP . DELIVER . OPERATE . MAINTAIN

LMC modular

LMC MEP

LMC MEP

Est. 2008 as Building Services Contracting Company

Install with maintainability and life cycle care in mind. Saw opportunity to extend facilities management beyond defects liability period.

LMC modular

LMC Modular

Est 2017. to produce high quality modular building elements (pods).

LMC Modular allowed us to develop skills, expertise and experience in OSM which we can now scale up for our modular building system.

LMC FM

Est. 2014 to complete the Facilities Management suite of Services

We were installing and maintaining building services to ensure sustainability and efficiency. We started to consider the building envelope and materials and how these could affect the services performance.

LMC FM

FHS

Est. 2020 to develop a OSM Volumetric Modular Building System, NSAI Certification expected 2022

Our 3d volumetric modular building system allows us to look at the whole building performance. We consider the design from the inside out; looking at how the services and fabric can work in synergy to achieve an energy & cost-efficient building.

LMC FHS

2. OSM IN THE IRISH HOUSING SECTOR

THE DRIVERS FOR DISRUPTION

THE CONSTRUCTION SECTOR IS POISED TO ACCEPT OSM AS THE FUTURE

DEMAND DRIVERS

A talent gap, ageing workforce coupled with a deepening housing crisis, with the Governments Housing for All Strategy as a backdrop, are the biggest predictors of where OSM can gain market share in the Irish context.

THE BENEFITS

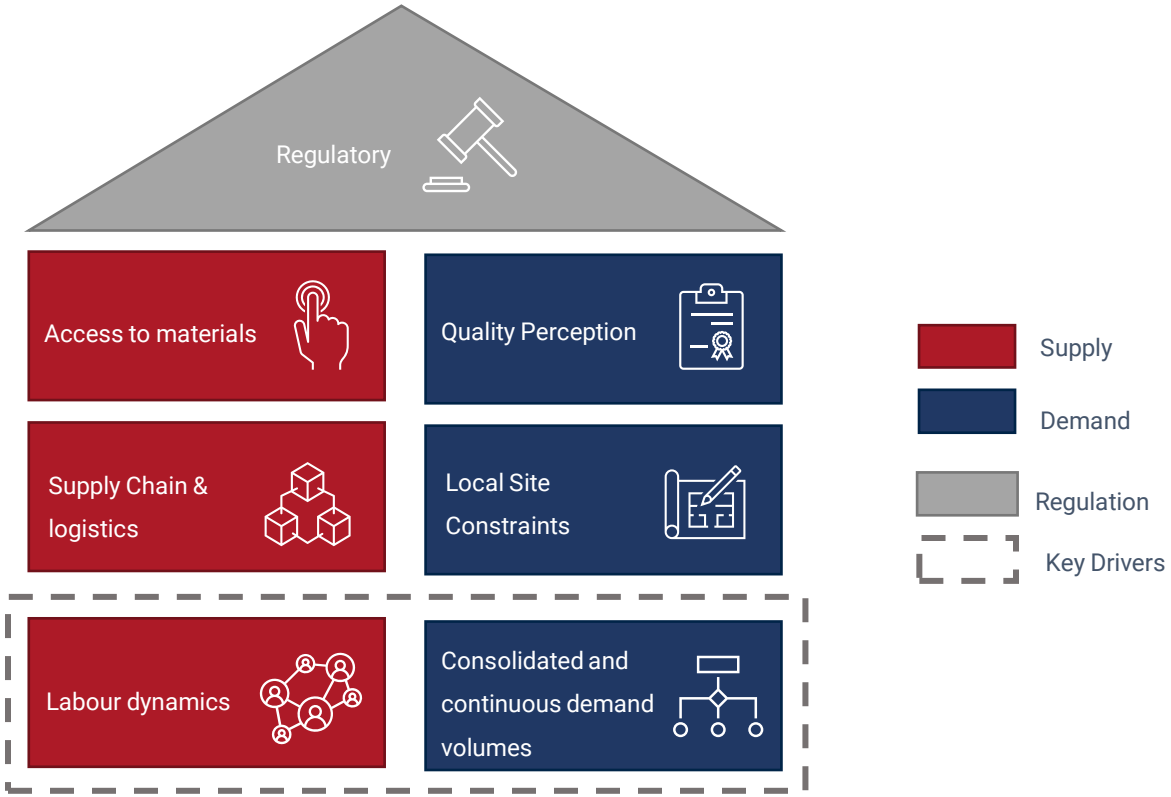
Offsite Manufacturing has been shown to reduce construction programs by up to 50%.

50%

20%

In the right environment and trade-offs, it can cut costs by 20% and at the end of the day money is always the biggest driver.

MARKET READINESS



According to Mc Kinsey & Co., seven factors determine the attractiveness of a market for Modular.

Source: McKinsey & Company, The next Normal in Construction, June 2020

THE HOUSING CRISIS – THE IRISH CONTEXT

HOUSING OUR GROWING POPULATION

AFFORDABILITY

- Average earners cannot afford homes with increasing construction and development costs.
- The gap is widening in many parts of Ireland between the cost of delivery and purchaser's ability to meet lenders requirements.

HOUSEBUILDING ACTIVITY BY QUARTER 2017-2021 (Q1)

SUPPLY

- There has been consistent under-investment in private and social housing and the failure of supply to keep pace with demand since the industry returned to growth in 2013.
- Less than 10,000 new homes delivered in 2016, rising to 21,138 new dwelling in 2019.
- Due to Covid 19 house completions in 2020 were approx. 21, 000 homes.
- Supply of new homes for 2021 will be approx. 18,000 homes just (50%) of the required 36,000 homes needed.

"Now is the time to adopt innovative, sensible, and sustainable approaches to delivering construction in Ireland. ***The prize could be an additional €1.85bn economic uplift and 1,200 jobs for every €1bn invested*** *in construction in addition to the delivery of essential housing and infrastructure that our society, environment and economy requires."*

Frank Kelly, CIF President

Source: CIF Budget submission 2022, CIF, 2021

HOUSING FOR ALL

A NEW HOUSING PLAN FOR IRELAND

DHLGH identified , in 'Housing for All', a housing need of **33,000** units for annum over the next **10 years**, rising to **40,000 by 2030**.

The target is **312,000** additional housing units by **2030**. This will include: 90,000 social housing units, 36,000 homes for affordable purchase, 18,000 cost-rental homes and 170,000 private homes.

In order to reach the above targets the stats intends to spend €4bn spent a year, or **€40bn over ten years,** on various State interventions and capital investments.

The plan places **OSM as a key deliverable** for modular housing solutions to meet the Irish government's needs and thus sets out a key driver for adoption of 3D Modular solutions.

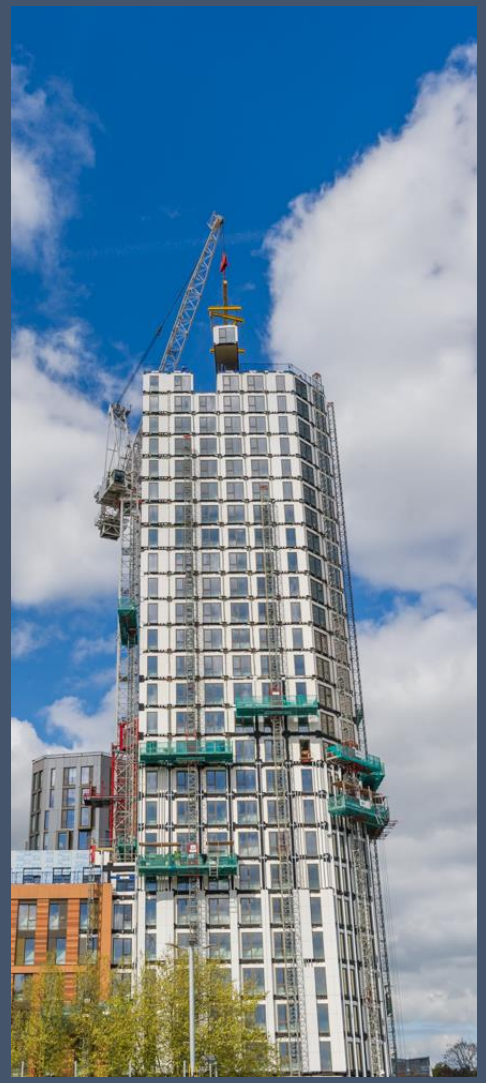
The public sector are set to provide **exemplar projects** to help build confidence and capacity in the OSM industry through public tenders for innovations that contribute to rapid delivery housing.

The 3d volumetric market is expected to account for **15%** of this market, yielding approx. **5,000** units annually.

3. OSM ADVANTAGES

BENEFITS OF OSM & MODULAR CONSTRCTION

WHY WOULD A CLIENT CONSIDER OSM VOLUMETRIC CONSTRUCTION SYSTEMS?



- **QUAILTY**
- **SPEED OF DELIVERY**
- **REDUCED CARBON FOOTPRINT**
- **PROGRAM CERTAINTY**
- **SITE OPTIMISATION**

Image sources: visionmodular.com

OSM TARGET MARKET- 3D

OSM ACROSS CONSTRUCTION SECTORS

APARTMENTS

HOSPITALITY

EDUCATION

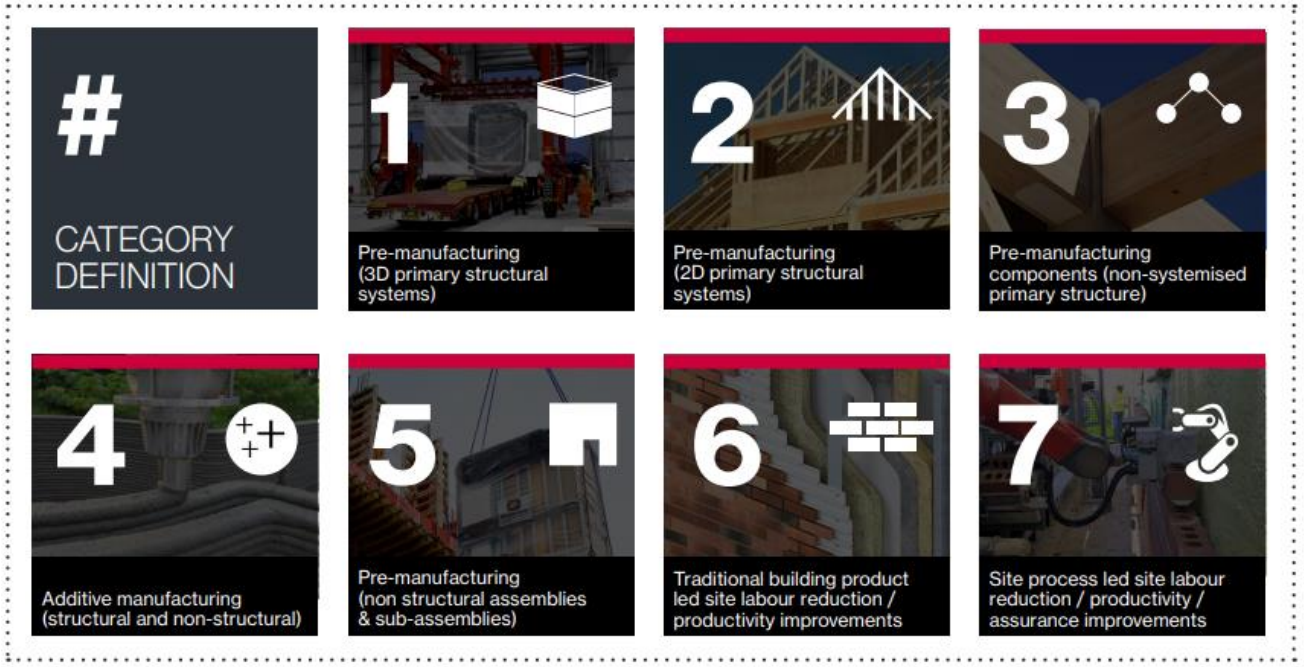
HOUSING

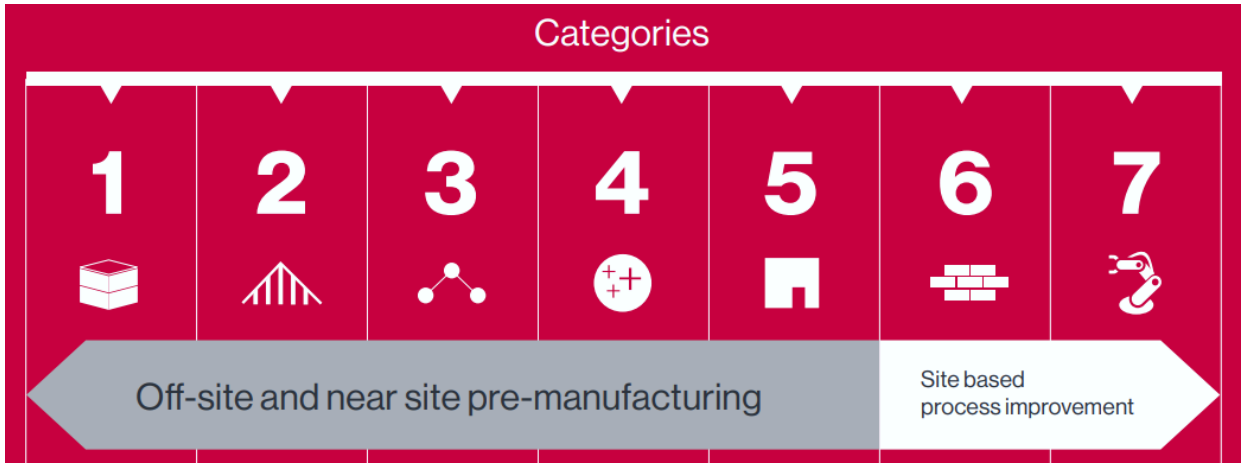
FIT-OUT

HEALTHCARE

MMC CATEGORY DEFINITIONS

OFF SITE MANUFACTURING AND MODERN METHODS OF CONSTRUCTION





CATEGORIES OF MMC		
Pre-Manufactured led approaches	Category 1	3D primary structural system, e.g. 3d volumetric modules
	Category 2	2D primary structural systems, e.g. off site panelised systems for walls, floors and roofs.
	Category 3	Non-systemised structural components (structural assemblies and sub assemblies), e.g. staircases, pre-fabricated pile caps & ring beams, pre-cast floor slabs, pre-fabricated roof trusses
	Category 4	Additive Manufacturing, e.g. 3d Printing concrete
	Category 5	Non- structural assemblies and sub-assemblies, e.g. bathroom and utility pods, pre-hung door sets, M&E riser assemblies
Site Process led approaches	Category 6	Traditional building product led site labour reduction/ productivity improvements . E.g. brick slip panels, flexible pipework
	Category 7	Site process led labour reduction/ productivity improvements, e.g. exoskeletons, robots, drones, driverless cranes

Source: www.gov.uk

4. OSM CHALLENGES

LMC modular

OSM CHALLENGES

CHALLENGES TO THE ADOPTION OF OSM MODULAR CONSTRUCTION

CULTURAL CHANGE

It will take time and many exemplar examples of OSM before it is accepted.

SUPPLY CHAIN

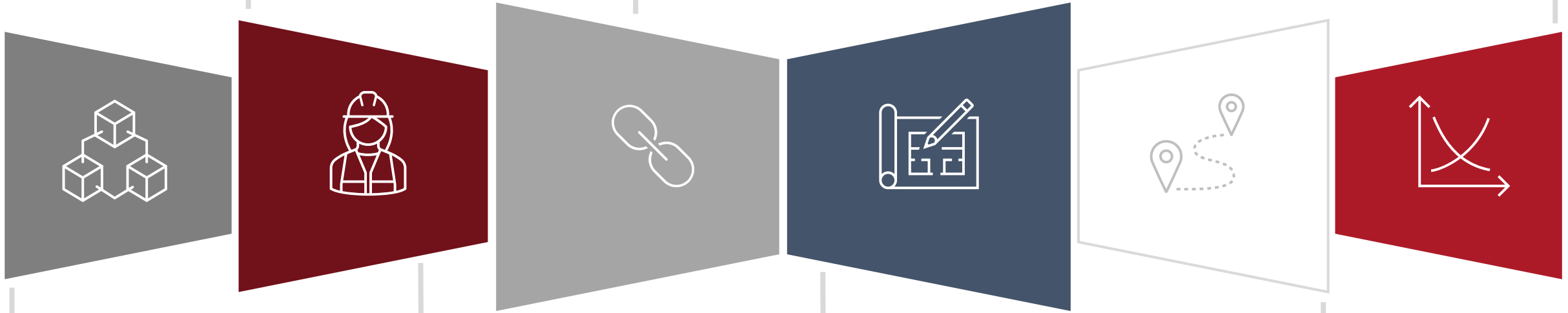
Although there are benefits there are also risks associated with fewer suppliers.

EARLY DESIGN FREEZE

Higher amount of complex decisions/ front loaded design. Approvals process can be complicated.

FINANCIAL MODEL

Earlier procurement, higher material costs upfront. Modular projects rely on faster purchases and short completion times, which typically involve higher outlay sooner .



CONTINUOUS PIPELINE

For OSM to be financially viable and achieve the potential economies of a scale a continuous pipeline for the factory is essential.

PRECISE PLANNING

Precise scheduling, project team must be ready to erect modules and make them water-tight as they arrive to site to avoid cost and risk in temporary weather protections.

DESIGN RESTRICTIONS

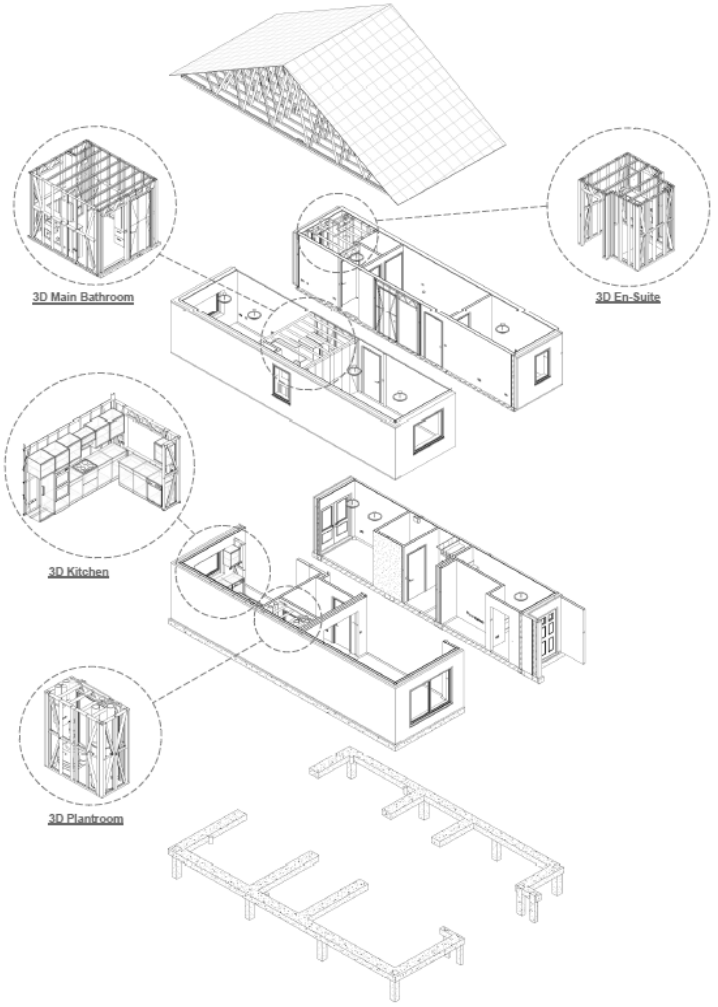
Design must work with modular system parameters, e.g. size for transportation. The more unusual the shape of a design, the more challenging it would be to build with modules.

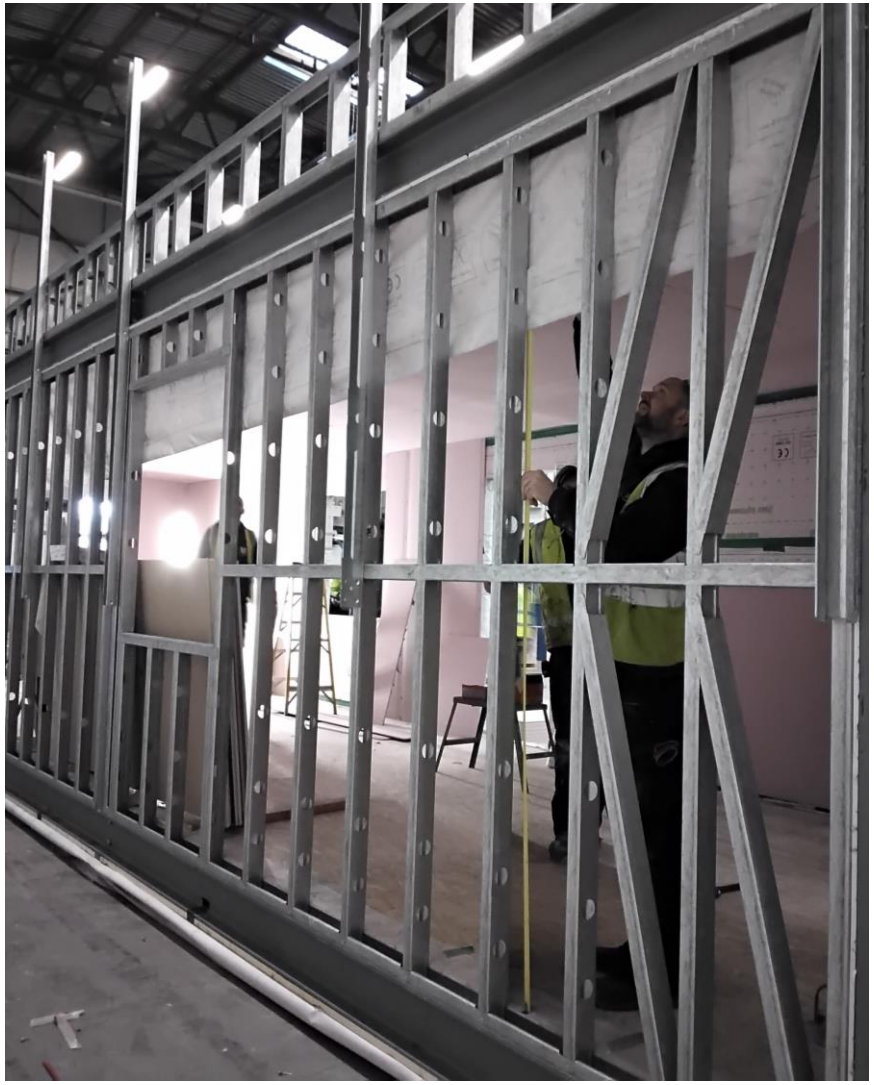
LOGISTICAL COMPLICATIONS

Risk with transporting 3d Modules with high PMV. Higher cost of insurance to cover these units during transport and installation.

DESIGN FOR MANUFACTURE

A MINDSET SHIFT IN DESIGN APPROACH





RISK COMPARISON

TRADITIONAL VERSUS MODULAR CONSTRUCTION RISK COMPARISON

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	Risks	Traditional	Modular
Time	Change in market conditions (best overall schedule duration	HIGH RISK	LOW RISK
	Skilled labour shortage	HIGH RISK	LOW RISK
	Impact of offsite material delays (i.e. modules, pods, etc)	MEDIUM RISK	HIGH RISK
	Weather at jobsite	MEDIUM RISK	LOW RISK
	Onsite/offsite coordination	LOW RISK	HIGH RISK
	Schedule certainty	HIGH RISK	LOW RISK
Quality	Water intrusion damage	HIGH RISK	LOW RISK
	Skilled labour Shortages	HIGH RISK	LOW RISK
	Marketability (multiple unit types, unique floor plans, etc.)	LOW RISK	MEDIUM RISK
	Number of construction tasks (onsite coordination)	HIGH RISK	LOW RISK
	Different people performing same tasks (repetition)	MEDIUM RISK	LOW RISK
	Acoustic performance	MEDIUM RISK	LOW RISK
	Space Utilisation (avoiding double thickness walls and floors)	LOW RISK	HIGH RISK
Cost	Project viability (lowest total cost)	HIGH RISK	MEDIUM RISK
	Project buyout	MEDIUM RISK	LOW RISK
	Cost of losing operating revenue	HIGH RISK	LOW RISK
	Cost of financing (time to permanent loan)	HIGH RISK	LOW RISK
	Cost of plan B (if GC or modular company defaults)	LOW RISK	HIGH RISK
	Ability to obtain construction financing	LOW RISK	LOW RISK
	Cost of construction waste	MEDIUM RISK	LOW RISK

CONTRACT MODELS FOR OSM

NEW WAY OF DOING BUSINESS

TRADITIONAL BUILD CONTRACT MODEL

- DESIGN TEAM
- PLANNING
- TENDER
- APPOINT MAIN CONTRACTOR
- DESIGN BUILD CONTRACT

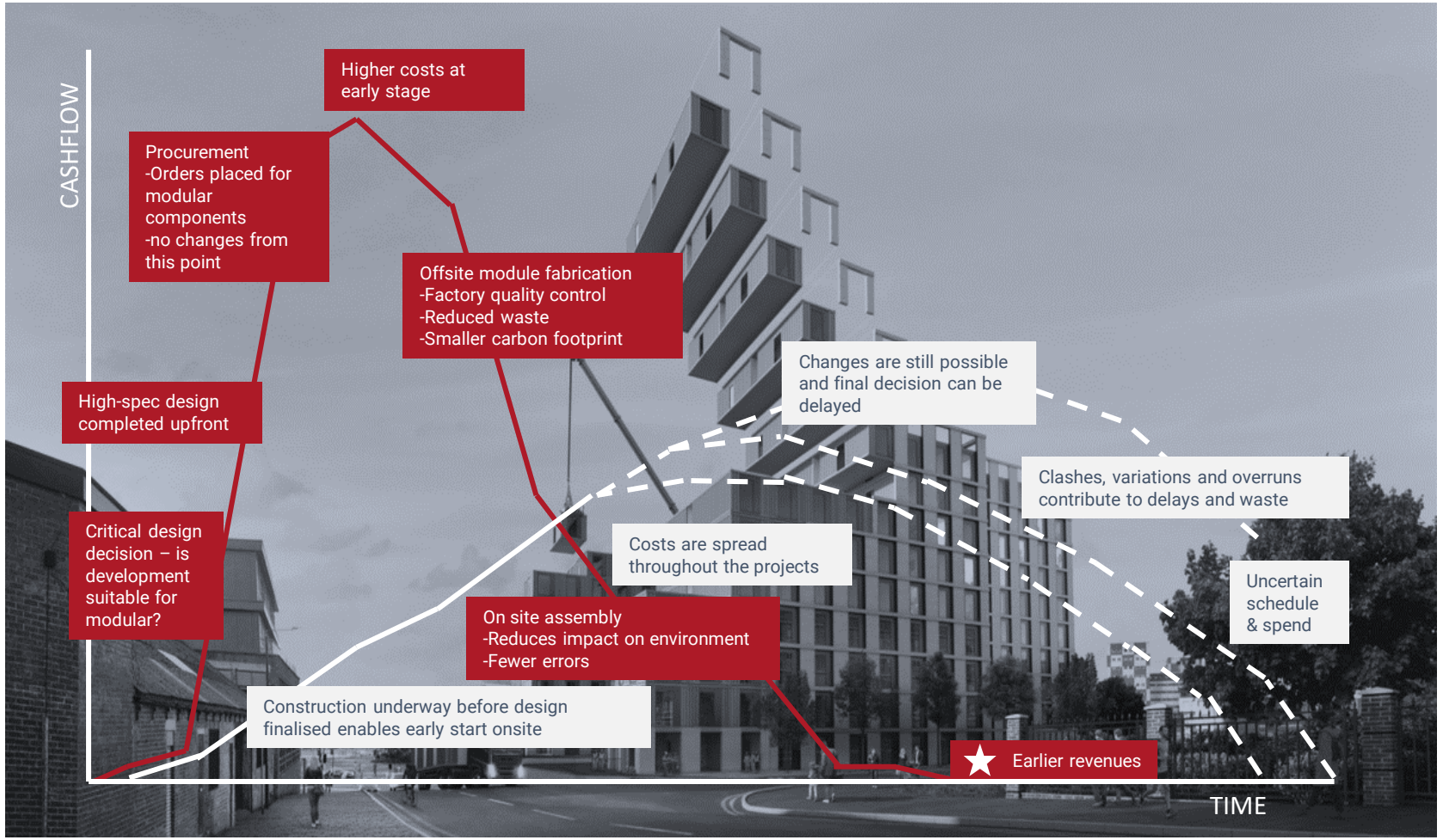
OSM MODULAR CONTRACT MODEL

- DESIGN TEAM INCLUDES APPOINTED OSM MANUFACTURER, DESIGNED FOR MODULAR
- PLANNING
- DESIGN SIGN OFF PRE-PRODUCTION, OSM MANUFACTURER HOSTS CONFEDERATED MODEL
- MODULES MANUFACTURED WHILE GROUND WORKS COMPLETE ON SITE
- MODULES INSTALLED AND PROJECT COMPLETE

COST MODEL FOR OSM

A NEW WAY OF DOING BUSINESS

CONSTRUCTION CASH FLOW
TRADITIONAL VS OFFSITE



- High Front end cash flow
- Structured advance or deposit payments
- Vesting certs on materials and component parts
- Staged payments agreed upfront
- Insurance of vested modules/materials during storage and transport
- Contractually clear on point of transfer of ownership

Source: https://www.meed.com/repeatable-success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