HOW OFFSITE MANUFACTURING IS TRANSFORMING OUR INDUSTRY

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A little bit about us

- Cogent is a building technology consultancy
- We specialise in Offsite Manufacturing/Construction
- Key focus is on enabling greater uptake...
- Product & process development

www.cogent-consulting.co.uk
Sister company of Radar Communications

- Specialist in building technology communications
- PR/marketing/social media etc.
- Focused events and publications
- Specialist focus on offsite construction
Context

- Construction reputation
- Behind schedule & over budget!
- Time, cost & quality relationship is critical
- Technological & commercial industry innovations e.g. BIM
- Poor productivity trend not being reversed
- Increased skills shortage (crisis really!)
State of the industry

- Construction makes up 6.5% of the UK economy
- Healthy growth rate projections of 3.6% per annum
- Underperforming in four key area
- Fragmented with little cohesion
- Learning/innovation is not spread widely enough
- Industry fails to make the bigger leaps that are required!
- Concerted effort is required to break the cycle
State of the industry

Underperforming in four key area:

- **Productivity** – low labour productivity rates – static for 20yrs
- **Certainty of delivery** – unreliable delivery times & cost
- **Skills shortage** – cannot provide a skilled workforce
- **Data transparency** – lack of timely & accurate data

**IN 2015 ONLY 69% OF PROJECTS WERE COMPLETED ON BUDGET AND 40% ON TIME!**
Labour GDP/Worker – G7 Countries – ONS Stats

GDP per worker - G7 countries
(UK = 100)
An onsite focused industry

- Using onsite labour and resources to build assets using raw aggregate materials – some prefabrication
- Allows fast adaptation
- Permits client requirement and design changes
- Breeds uncertainty in project delivery performance
- Causal factors – site conditions – weather – location - bespoke designs - layers of onsite trades and suppliers - tiered contractor structure - over-reliance on specialist skills - multi-contractual relationships - lack of shared digital platforms etc.
Productivity Comparison – LCI

**MANUFACTURING**
- 12% Waste
- 88% Productive Time

**CONSTRUCTION**
- 43% Waste
- 57% Productive Time
Offsite construction

- Offers an alternative to current status-quo
- Promises transformative improvements across the asset life-cycle in time/cost/quality and H&S etc.
- Most importantly it offers PREDICTABILITY
The Challenge

- Underperformance in FOUR strategic area
  - Productivity
  - Certainty of delivery
  - Skills shortage
  - Data transparency

Offsite construction continues to be quoted as a potential catalyst to meet these challenges.

Why does offsite only contribute 7% to construction GDP?

...and don’t government and private clients mandate it?
Barriers

There are many barriers often cited

- High cost of entry
- Requirement for fully front-end loaded supplier engagement
- Lack of confidence in product quality and certification
Barriers

- Core reason for slow take-up = lack of value demonstration
- Only 51% of clients consider offsite to increase value
- Commercial drive required for compelling case for change
Value across the lifecycle

Recent KPMG research

- Project level – 7% net financial savings when applying OSC
- Portfolio – Anglian Water 30% efficiency savings
- Whole-life – improved quality lowers failure rates
Construction Cost Benchmark – T&T

Average construction cost of 6 building types ($/sqm)
Opportunities

- There is latent capacity within the offsite supply-chain.
- Early adopter clients developing strategic partnerships.
- Insufficient data to reliably assess the offsite market value.
- Greater transparency will improve client confidence and may generate investment opportunities.
- To stimulate transformation there needs to be an onus on clients and suppliers to quantify long-term assets/WLC.
- Re-develop compatible procurement and contractual strategies.
Strategic Challenges

- We need to actively do more to quantify OSM value
- Recognise the crucial part OSM will play in transforming the construction industry
- Encourage clients to make a ‘presumption for offsite’
- Ensure the supply-chain sufficiently invests and develops better offsite construction solutions
OSM Demographics

- Annual output delivered by >350 offsite manufacturers
- Offsite sector estimated to reach £9bn/annum by 2018
- Growth rate of 30%/annum

www.offsitehub.co.uk – SUPPLIER DIRECTORY
Economic Push/Pull factors

- 56.8% off 22,544 home planned by 17 of largest RP’s will be constructed using offsite methods
- Strategic alliances
- Major projects and government interest (AMSCI investment)
- Construction 2025
- Emergence of the Private Rental Sector
- Sector is still predominantly driven by supply-chain ‘PUSH’
- Failed to gain traction across a wide client spectrum
Supplier over-capacity

- Circa 72% capacity on single-shift patterns
- More recent data required – BCIS data
- Excess capacity discourages investment in new factories
Increasing client demand

- New alliances – but mainly in the housing sector
  - Modular Allianz
  - Procure Plus
  - LHC/EEM Frameworks
Market opportunity

- The opportunity is significant!
- More than 70% of each project can be taken offsite
- Potential to transform UK construction delivery performance – but ‘case for change’ needs underpinning
Traditional contract & procurement

- Traditional linear design and procurement relationships
- Buildability is tested onsite!
- Rectifying mistakes is costly and disruptive
- Design-induced rework is purported to contribute 70% of the total amount of rework on construction projects
- Total rework typically amounts to 5% of the total project cost – money that we just throw away!
Design for Manufacture & Assembly (DfMA)

Enables optimal configuration of prefabricated modules on site by engaging multi-discipline and multi-tier suppliers ideally from the beginning of the design development process – to think about ASSEMBLY rather than construction!
The S-word! - standardisation

- Standardisation will find capex savings
- Economies of scale of production
- Reduced professional input
- Unit costs will be reduced
- Industry will become more efficient & more predictable
- Capital cost gap will be reduced
Offsite technology options

A wide ‘toolkit’ of options:
Offsite case for change

- The BIG 3 - faster delivery, better quality and safer working sites
- Onsite currently offers lower construction costs
- Shortened and more reliable programme
- Schedule savings of up to 60% Vs. trad construction
- Earlier revenue generation
- Reduced risk of cost inflation
Offsite case for change

- Improved predictability
- Buildable design before construction on site begins
- Projects cash-flow and forecasted costs
- Ability to validate the buildability
Offsite case for change

- Returns beyond the project level
- Leverage intrinsic financial, time and quality benefits
- Stronger case for investment in offsite can be made by assessing value added beyond the project level
Whole-life asset value

Optimal whole life savings are locked in to the design

Biggest benefits:

- Reduced WLC of asset
- Improve asset management – optimised maintenance

“Offsite construction offers benefits across asset lifecycle, not just during construction. It also allows for less complex asset replacement and enhancement due to ‘Lego-brick’ modular structures”

John Pelton – Project Director - Crossrail
Summary of demand drivers

- Faster construction process
- Improved value for money
- Overcome skills shortage
- Reduce site disruption
- Greater certainty & predictability
- Better quality – first time
- Exemplar Health & Safety
- Demonstrable sustainability
- Lower whole-life cost
Key messages

- It is more about **process** than **product**!
- System integration – **off/on site systems (BIM)**
- Optimise the process – **supply chain focus**
- Increased activity – **access the right info**
- **DfMA approach** – is critical moving forward
Constructing Excellence Opportunities

- Address the **barriers to uptake**
- Focus on collecting **real live date!**
- Establish **factual benefits & benchmarks**
- Facilitate **knowledge/data sharing between regions**
- Establish a **network of offsite forums**
- Focus on winning over hearts & minds of **Contractors**
...and finally!

- Offsite Hub
- Offsite Magazine
- Inside Offsite Factory Tours
- Explore Offsite Conferences
- Ecobuild

...more industry engagement