

Profitable
Markets



Sustainability

...a collective responsibility



Healthy
Communities



Environmental
Limits



Is off-site construction
greener?



Bob Francis, Director Modular Systems +



Balfour Beatty

Modular Systems +

- Who we are
- What sustainability means to us
- Building Information Modelling (BIM)
- Reduced local impact
- Zero defects
- Manufacturing process
- Safety
- Achieving customer goals
- Summary





Who we are

- Relocated to Wednesbury February 2011
- 117,000 sq ft dedicated facility
- 135 staff and operatives
- Operatives all within 10 mile radius
- West Midlands manufacturing skill base
- Supply chain structure to support lean manufacturing
- Shared best practice





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Customer imperatives

- Safety: Zero Harm
- Cost certainty
- Time certainty
- Quality: zero defects
- Sustainability





Vision model for a Sustainable Balfour Beatty





What sustainability means to us

- The term 'sustainability' is often attached to so-called environmentally friendly projects because they simply feature a green roof, solar panels or high performance insulation. But for the delivery of a truly sustainable built environment, the concept of sustainability must be embedded within the project as a collective goal and consequently, a collective responsibility.
- As sustainability is frequently misinterpreted as being just about 'the environment', we need to first understand that it actually encompasses many other factors including employee engagement and development, interaction with communities and responsible procurement.



Changing the way we work

- The M&E sector presents a multitude of possibilities for sustainable improvements. By exceeding these new expectations in the present whilst also meeting long term regulatory demands, we can literally set the standard for M&E solutions of the future with a more sustainable, renewable and efficient process.
- With the careful management of all manufacturing logistics and sequencing, this enables the reduction of potential waste, risk and costs without any compromise to product quality. As buildings, regulations and environmental targets have changed, so have the way M&E solutions are designed, manufactured and installed.



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Design for life

- By creating and delivering installations that can be easily replaced in the future, as technology or building uses change, we will be able to facilitate increasingly sustainable solutions.
- This process provides adaptable M&E packages that aim to make installations future proof and create buildings that will continue to meet the changing demands of the client and building regulations long into the future.



Sustainable benefits of a fixed facility

- Eradicate noise > 85dba
- Improve external logistics
- Eradicate kneeling operations
- Improve manual handling risks by 90%
- All material off the floor – no fork lift truck
- Improve visitor safety
- Improve employee facilities
- Eliminate need for hired cranes
- Quality process = safe process
- Separated welding bays

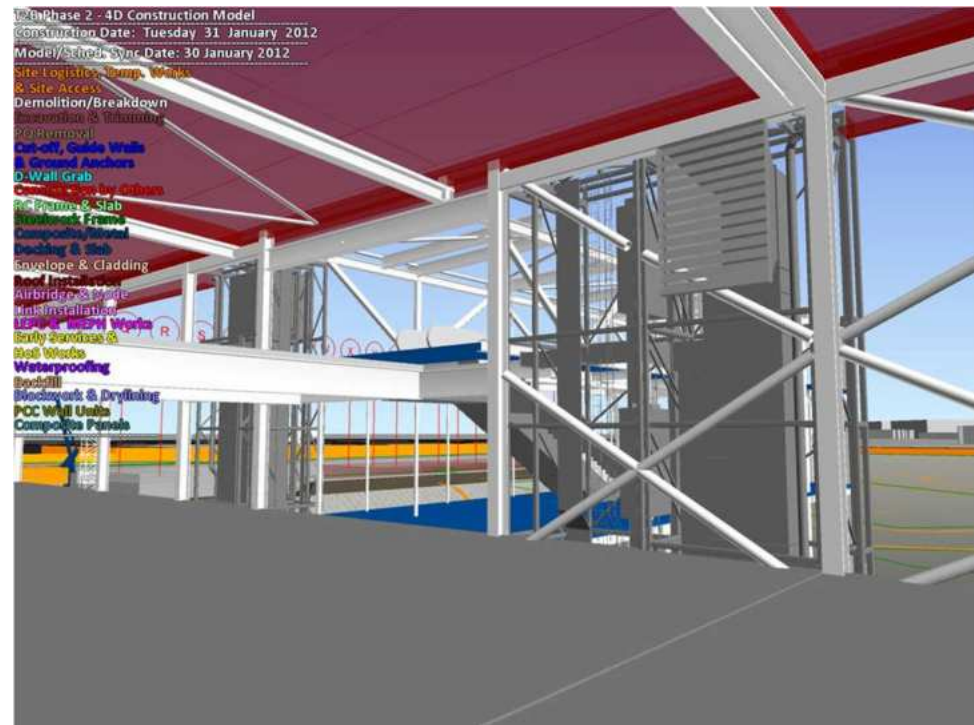


Best In Class Working Conditions



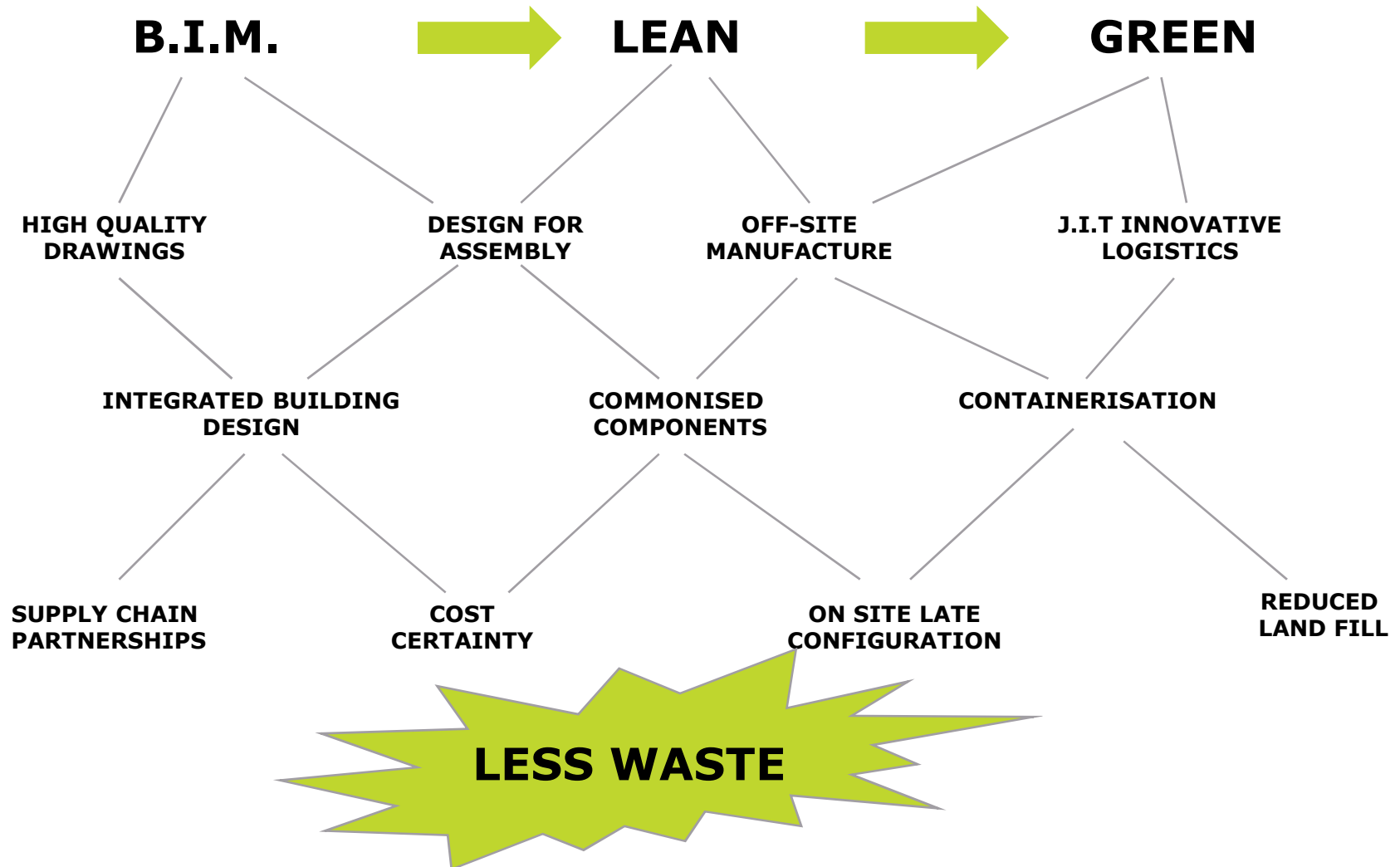
Building Information Modelling (BIM)

- BIM introduction by 2013
- Fully coordinated design
- DFMA
- Design commonisation
- Less waste
- Project time savings
- Zero defects
- Soft Landings





Benefits of an integrated approach





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Reduced local impact

- Reduced traffic deliveries
- Reduced noise
- Less people on site
- Up to 50% faster
- Reduced foundations/steelwork
- Faster return on investment





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Zero defects

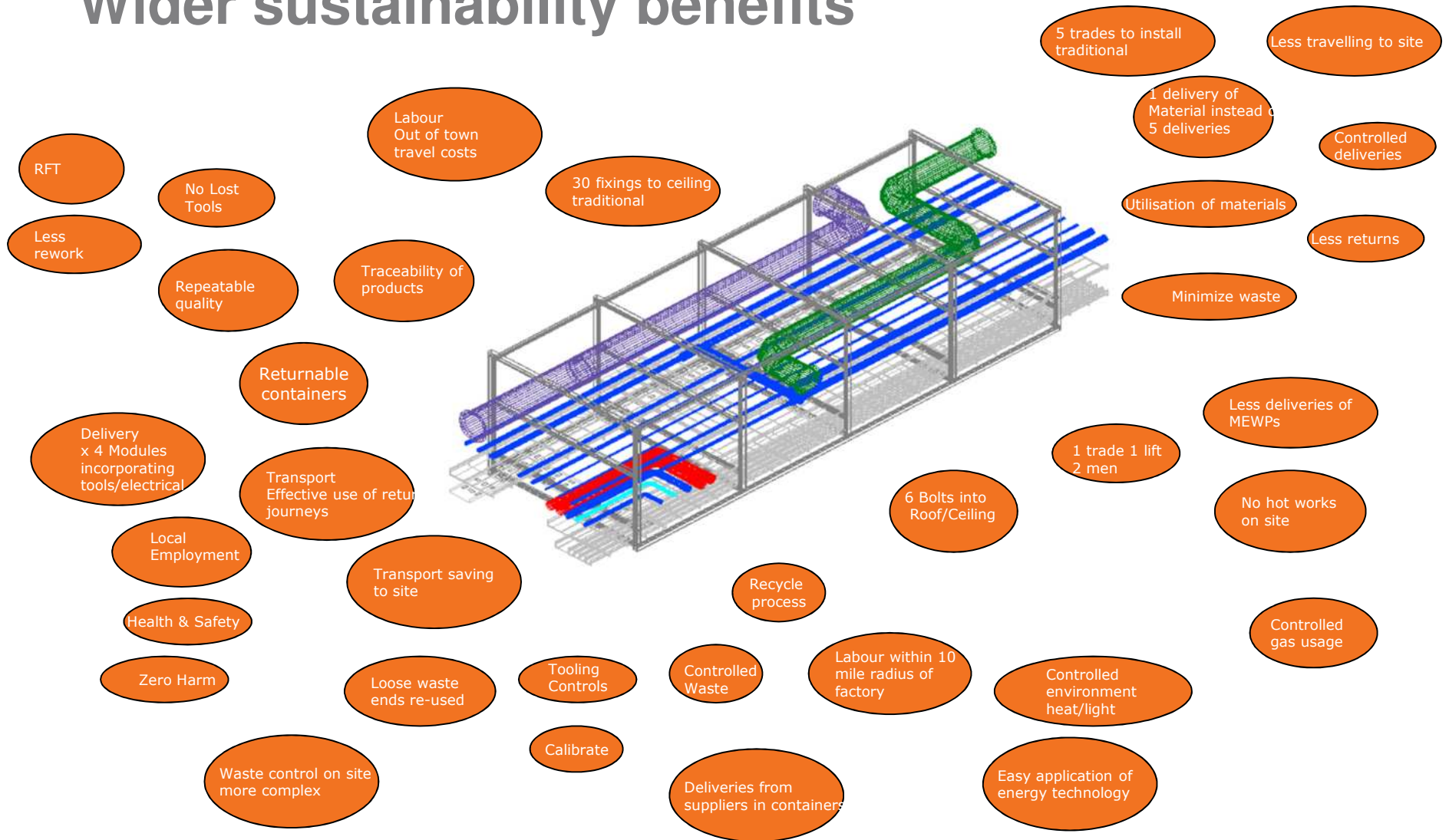
- Common repeatable process
- Competence training
- Commonisation of components
- Supply chain partnership
- In process validation
- Continuous improvement
- Quality improvement tools



Six Sigma



Wider sustainability benefits





Manufacturing process

- Strong community links
- JIT deliveries avoids double handling
- Security of materials on site
- Minimised packaging
- Repeatable processes
- Controlled distribution centres
- Controlled layout
- Best practice
- Just In Time
- < 15cu ft waste/month
- Recycle off cuts
- Cost control





Achieving Customer Goals





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Featherstone Prison



Innovative
logistics



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Birmingham New Hospital

- 137,000m² scheme comprising 1,200 beds, 30 operating theatres, 300 teaching room, 100 bed critical care unit.
- Phase 1 handed over six months early.
- Over 500 miles of cable, flexible containment and connector assemblies are being supplied and will be used with the system's pre-wired distribution boards, distribution boxes and fast-fit accessories.
- Horizontal service modules and risers removed 107,000 working at height hours and 45,500 hot works hours to off site manufacturing.





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Multi service modules

- Up to 40% install labour reduced
- Reduced deliveries on site
- Reduced congestion on site
- Improved client maintenance access
- Improved quality
- Programme certainty



BAA Modules 9m x 3m x 2m
installed 3 per day with team of 4



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Multi service risers

- Larger pipe work handling reduced
- Integrate into structure design
- Reduced working at height
- Improved construction coordination
- Reduced scaffolding
- Hot works reduced
- Reduced access permits





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Modular electrical systems

- Reduced labour on site
- Reduced skill levels on site
- Reduced live testing risk
- Installation speed
- 100% DB completion prior to live work
- Factory quality test traceability





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Packaged plant rooms

- On site time savings
- Install in 10 days
- Controlled assembly on site
- Improved subcontractor coordination
- Zero hot works
- Zero defect reduces unplanned work
- Reduced operatives in high level areas
- Reduced operatives in confined basements





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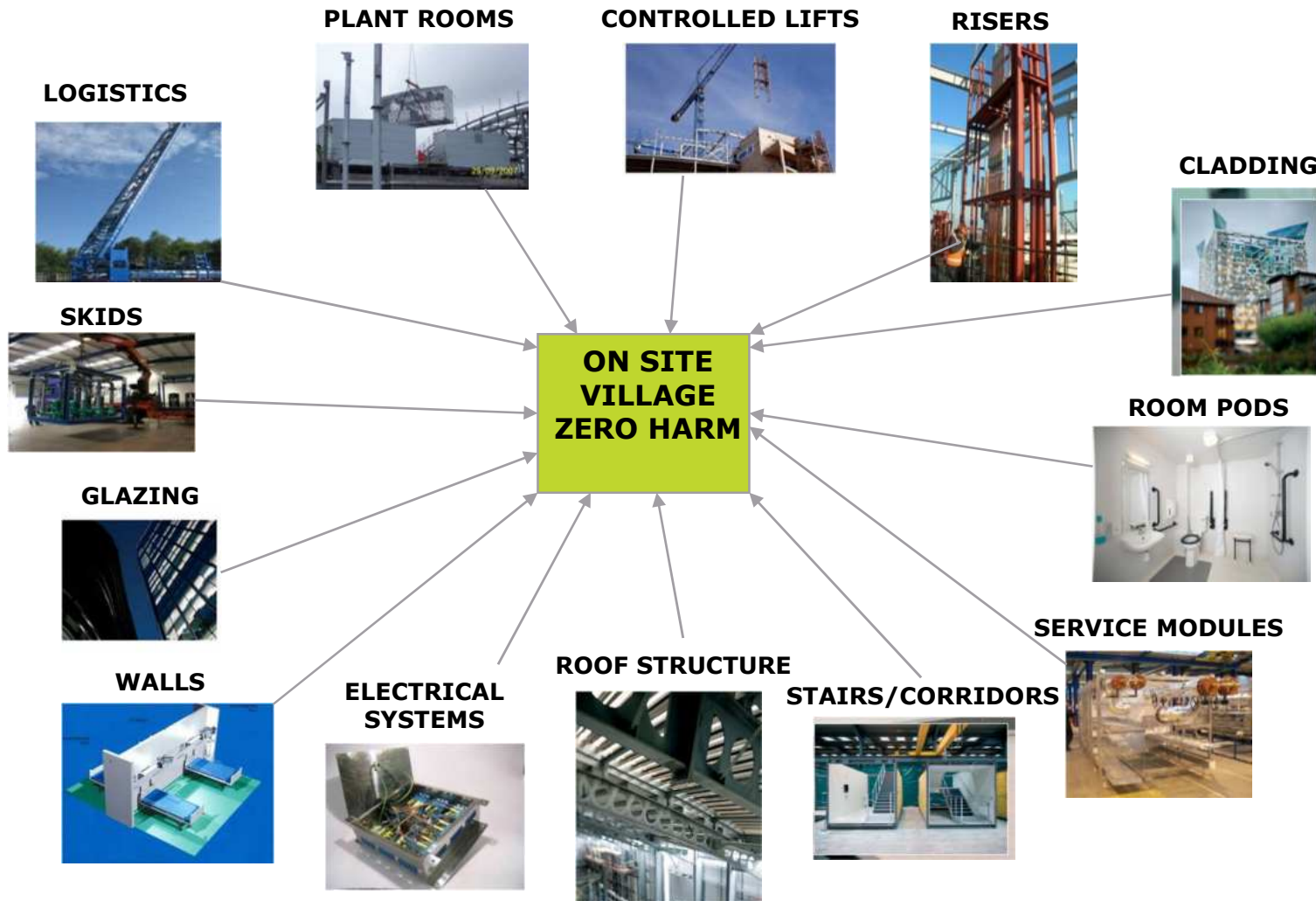
The Green | Listerhills

- Student accommodation built by GB Solutions.
- 1,026 bedrooms across six and seven storey apartments and four storey townhouses built in just 84 weeks.
- Rainwater harvesting system, a CHP (Combined heat and Power) system and a hot water system that utilises solar thermal collectors.
- One of the highest ever BREEAM rated building in the world.





Truly green construction





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Changing the way we work

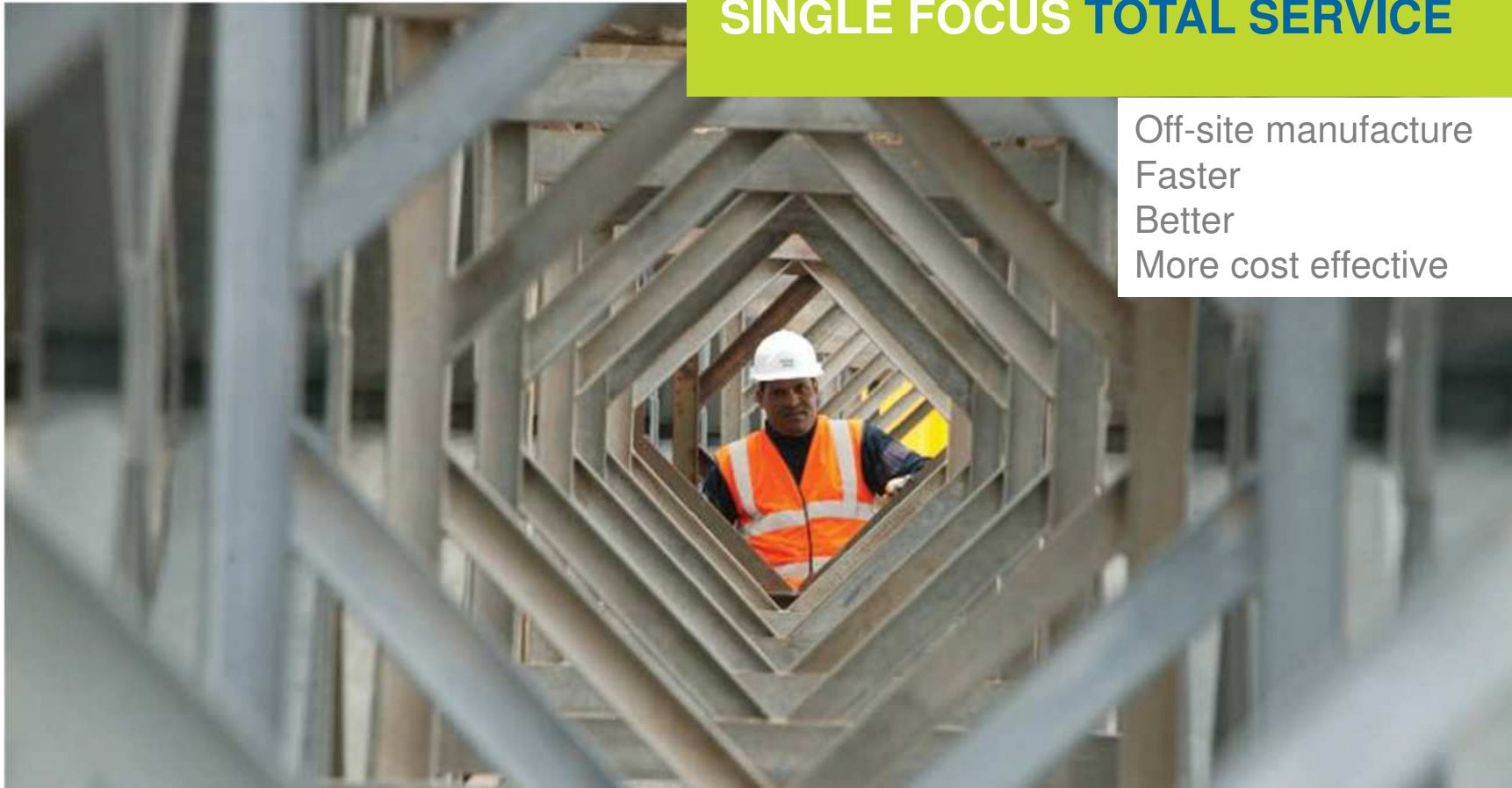
- Team work culture
- Lean approach
- Logistics
- Integrated supply chain
- Assemble the building – don't construct!





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SINGLE FOCUS TOTAL SERVICE



Off-site manufacture
Faster
Better
More cost effective



Thank You | Questions

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