



DfMA MEP

FROM PERSPECTIVE OF TIER 1 CONTRACTOR

15 OCTOBER 2020



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- Current MEP product set deployment
- Delivering certainty through our value propositions



# Business overview



## What we believe in

Our mission is to become the recognised leader for innovation and excellence in the construction sector.

- We will differentiate ourselves through a mature DfMA and digital engineering offer.
- We will deliver on our commitments – improving productivity and profitability.
- We will always develop – embedding innovation and more sustainable approaches into our unique offering.

I am proud to say that we are currently involved in some of the most important projects in the UK and Australia, highlights being Thames Tideway Tunnel, Terminal 2 Manchester Airport, new facilities for the Jaguar Land Rover Group and a major refurbishment of Brent Cross Shopping Centre in the UK. In Australia we are delivering upgrades to the theatre spaces in the iconic Sydney Opera House and I am delighted to confirm we have been awarded the contract to deliver Sydney's Central Station Main Works – a key component of the Metro City & Southwest project – and the jewel in the Sydney Metro crown.

**Ray O'Rourke**

Group Chief Executive



# Business overview

## General introduction

Largest privately owned construction company in the UK.

Providing international engineering enterprise with world-class capabilities spanning the whole of the client value chain.

Our business model comprises the full range of engineering, manufacturing, construction and project management services.



Heathrow Terminal 5



St Pancras Station



The Francis Crick Institute



The Leadenhall Building



London 2012 Olympic and Paralympic Games

Order book **£9bn**  
Turnover **£2.9bn**

UK staff and  
operatives **6,626**

Focus on **major and mission critical projects** and **strategic frameworks**

Global mission to become the recognised leader for innovation and excellence in the construction industry



# Business overview

## Europe locations and capability

### Crown House Technologies

One of the UK's leading building and infrastructure technology services providers for MEP services

### Explore Manufacturing

Europe's largest offsite pre-cast concrete facility providing modular components with higher levels of repeatability, quality and cost surety

### Explore Transport

Specialist logistics services specifically tailored to the construction industry

### GRCUK

Glass reinforced concrete specialist services to the construction industry

### Select Plant

Owner operator of specialist plant solutions including accommodation and tower cranes

### Vetter

UK undertake the design, supply and installation of high quality stone Facades, Floors, Internal Fit-Out, Urban Landscaping, Restoration and Conservation



National coverage of our in-house Group of companies

# Business overview

## Health Safety and Environment

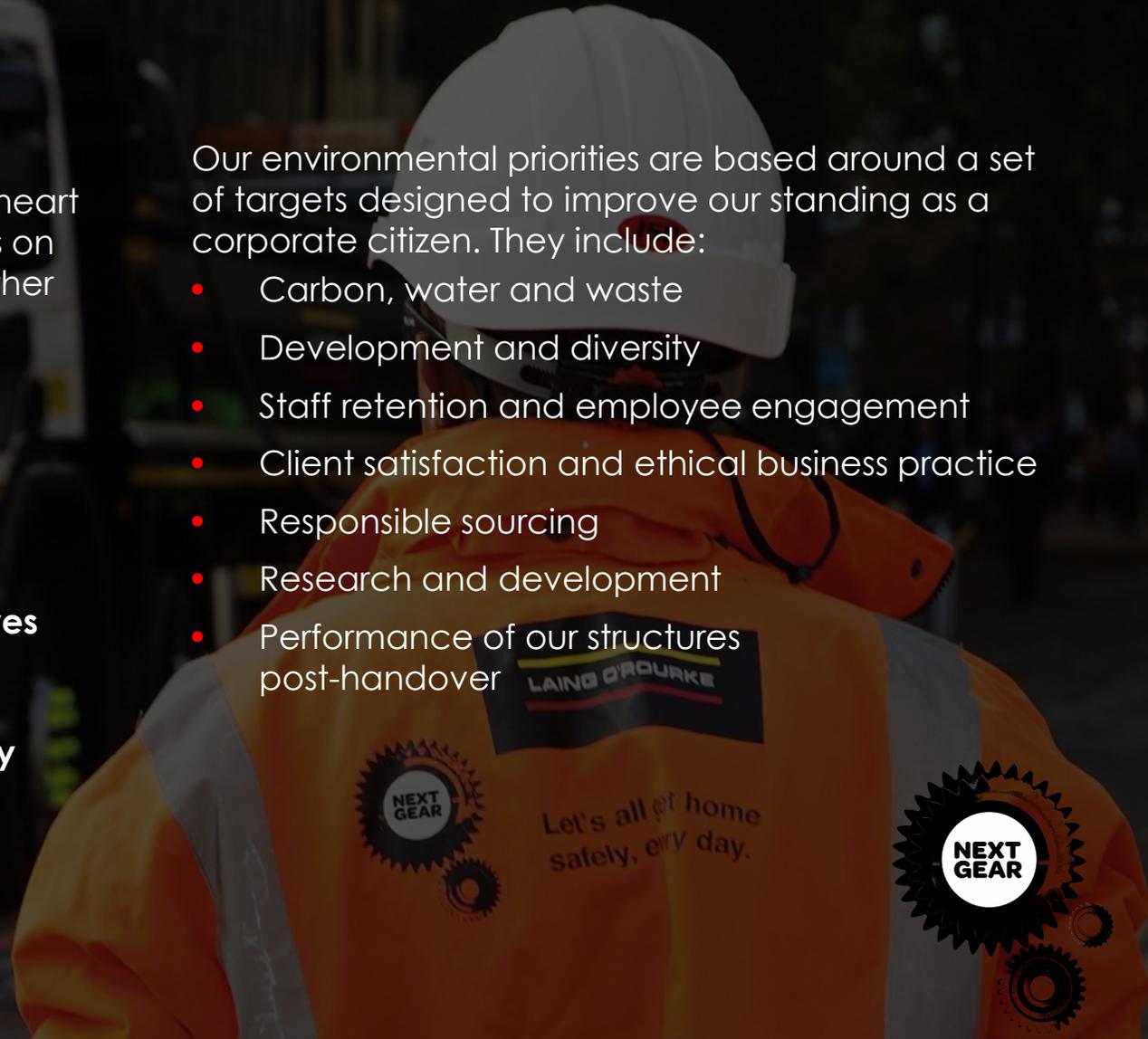
Our Health and Safety culture is founded on engagement and trust. Placing people at the heart of health and safety decision making it focuses on understanding success and learning from it, rather than a regime based on recording negatives.

'Next Gear' is based on three simple principles

- **People are the solution**  
People should be placed at the centre of solutions
- **Health and Safety is the presence of positives**  
Recognises and measures the things that go well
- **Health and Safety is an ethical responsibility**  
Health and safety systems that enable safer work

Our environmental priorities are based around a set of targets designed to improve our standing as a corporate citizen. They include:

- Carbon, water and waste
- Development and diversity
- Staff retention and employee engagement
- Client satisfaction and ethical business practice
- Responsible sourcing
- Research and development
- Performance of our structures post-handover





# Business overview

Investing in people

### Transforming skills

### Investment

Training, development, education networks

**£47m**

### Development

Employees on programmes

**938**

### ICE professional review

Graduate employee pass rate

**90%**

Note: Totals shown are typical annual values

### Lifestyle and Wellbeing

The health and wellbeing of our employees is a core value for Laing O'Rourke and the provision of occupational health is a key aspect of this.

...there are other health kiosks and then there's

## Wellpoint

Digital Health Solutions  
new 7000 model for 2015

Wellpoint providing health & lifestyle screening since 2003



# How we go to work

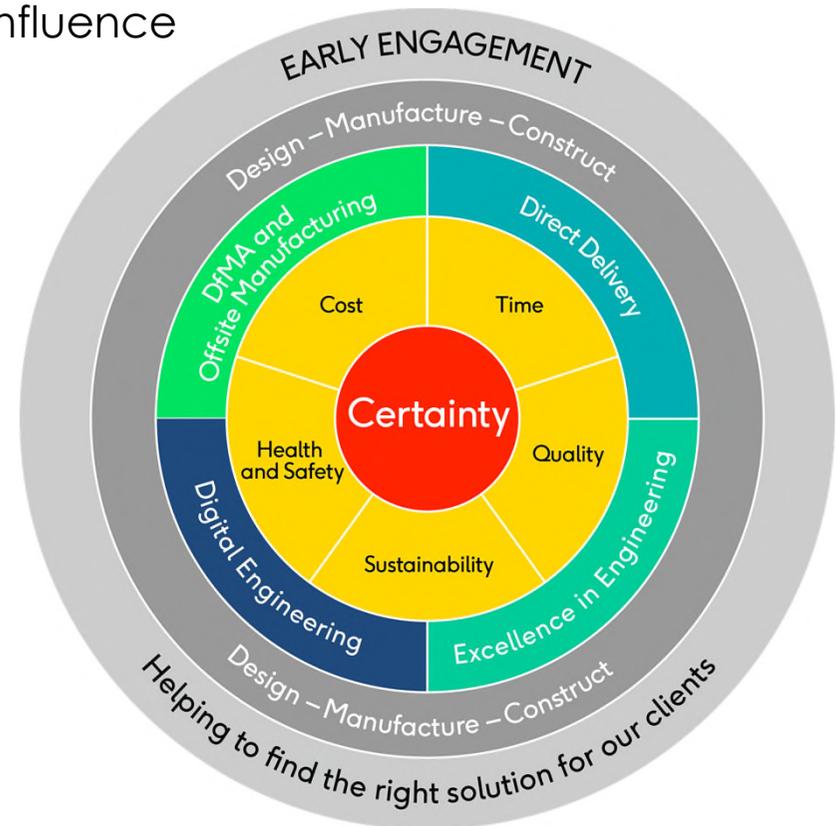
Our operating model



# The Laing O'Rourke approach – our operating model

Driving certainty into construction – Delivering unique solutions as an Engineering Enterprise

- Collaborative early engagement into projects to influence solutions upstream
- Deploy a consistent operating model and management system to guide delivery methodology
- Drive four key enablers:
  - Design for Manufacture and Assembly (DfMA) and Offsite Manufacture
  - Direct Delivery
  - Digital Engineering
  - Excellence in Engineering





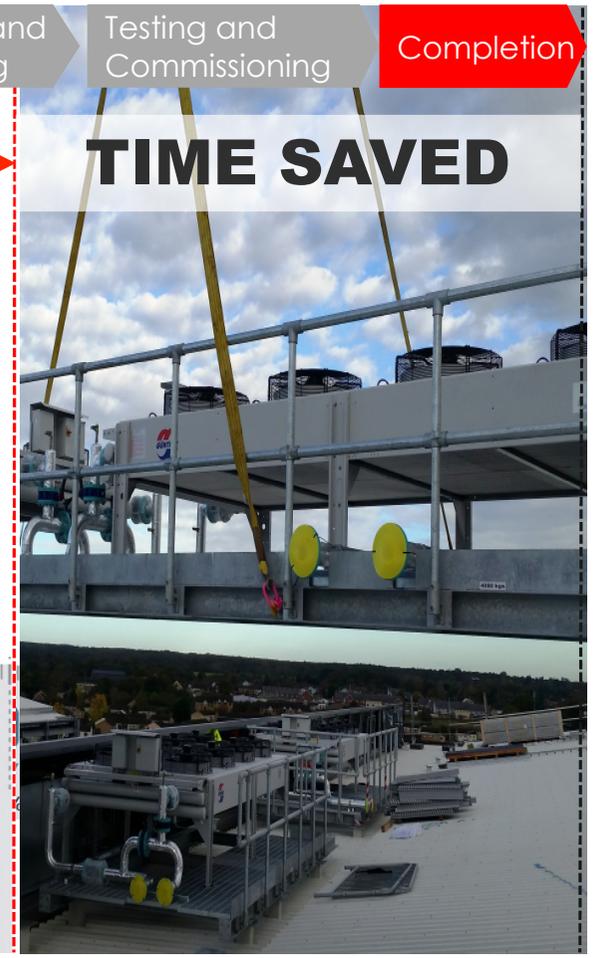
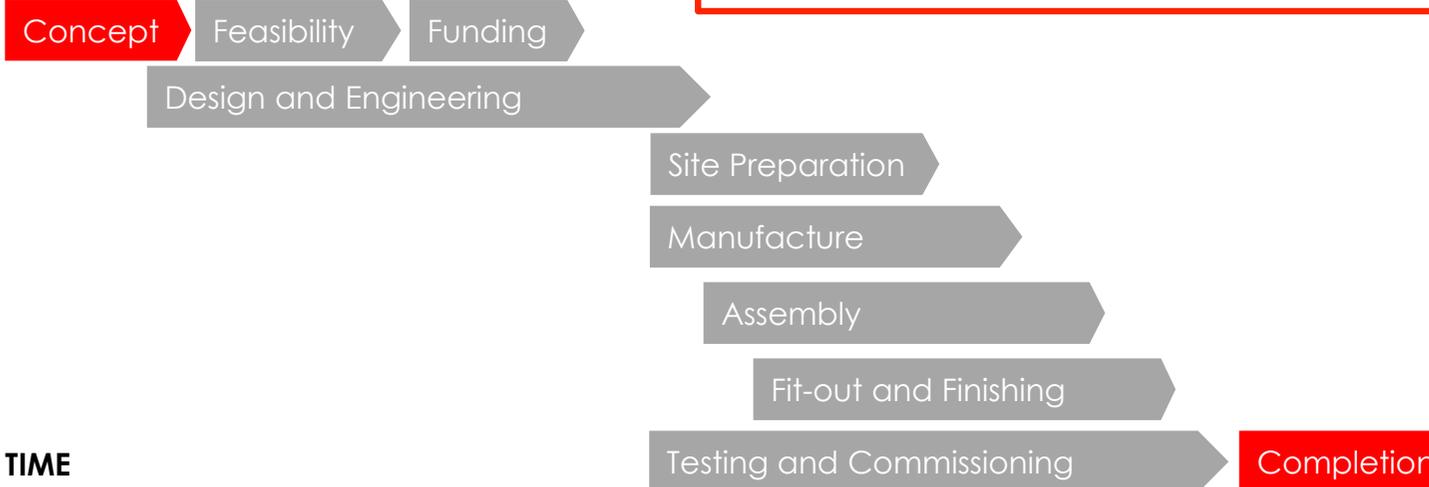
# Early engagement

Innovative Engineering and Construction Expertise

## Traditional Construction

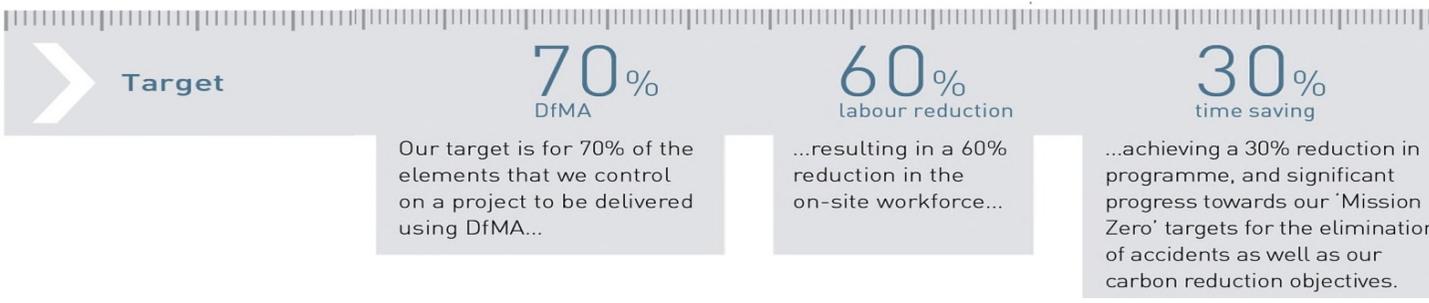


## Laing O'Rourke's Unique Business Offering



**TIME SAVED**

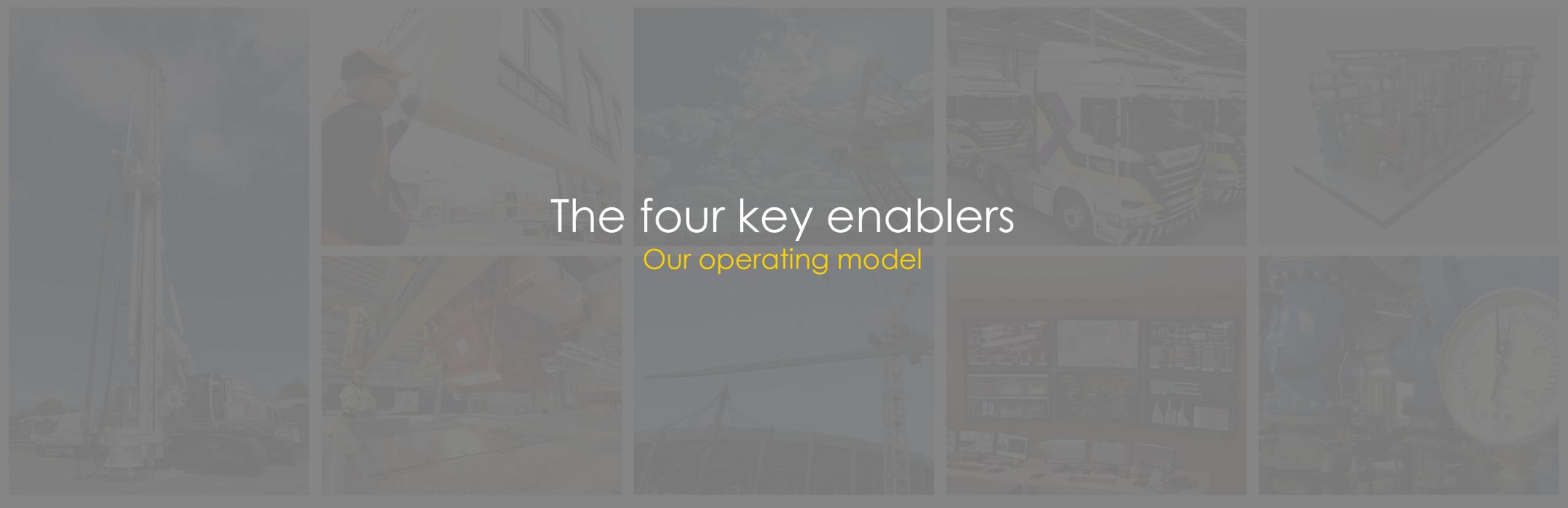
TIME





# The four key enablers

Our operating model





# Design for manufacture and assembly

How we go to work

Laing O'Rourke integrates our suite of services from early engagement, digital engineering, optimises the build process through DfMA and delivers just-in-time through our specialist logistics function across a range of sectors.



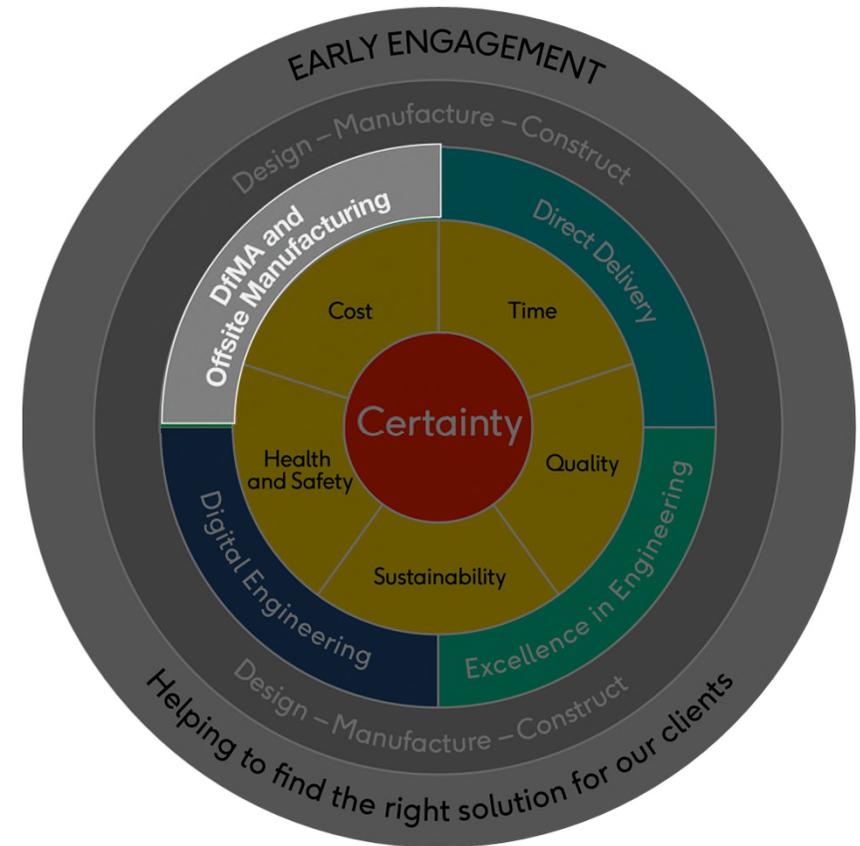


# Design for manufacture and assembly

## Client benefits

### Design for Manufacture and Assembly (DfMA ) is key to our delivery model

- **Factory-assured quality** – defect-free delivery, predictable asset performance
- **Much of the build can be manufactured off-site** – but we do this only where it adds client value
- **Speed** – controlled, efficient site assembly means more time to design and commission
- **Reduced labour on site** – helps tackle major resource constraints in our industry
- **Less traffic and pollution on site** – minimises waste and disruption to local stakeholders
- **Building services manufactured and tested off site** – delivers unparalleled quality and faster, more predictable commissioning
- **In-house manufacturing facilities** – offer cost stability and certainty of supply





# Direct delivery – In house expertise

How we go to work

## GEOTECHNICAL



- Structural frame product assembly
- Piling and diaphragm walling



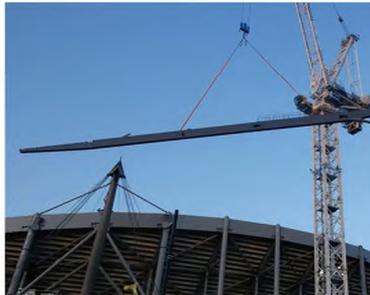
## MANUFACTURING



- Broad product set



## PLANT & EQUIPMENT



- Heavy capacity lifting



## LOGISTICS MANAGEMENT MECHANICAL AND ELECTRICAL



- Logistics planning and controls
- Industry leading transportation



- AMEP Manufacturing
- Building services
- BMS Commissioning

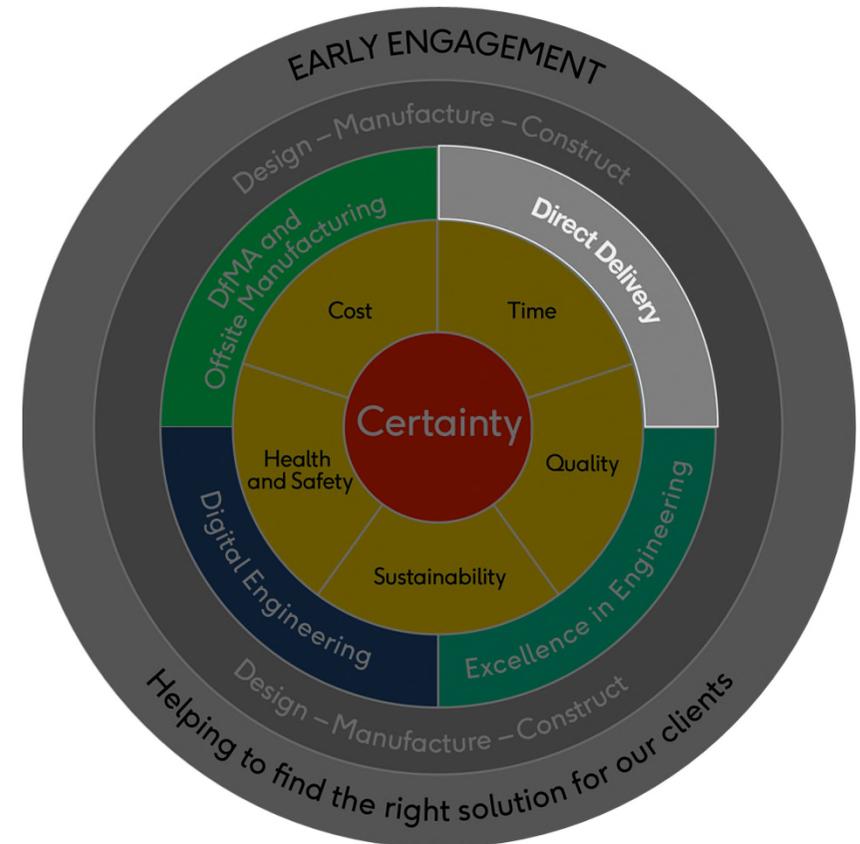




# Direct delivery

## Client benefits

- Up to 70% of scope delivered in-house through **Expanded, CHt, Explore Manufacturing and Select** – security of supply in a market where there is a shortage of skilled labour and risk of insolvency
- **Unrivalled control over key resources** – 4,000 strong workforce: highly skilled and directly employed
- **In-house engineering expertise** – timely design and buildability advice available to de-risk the project
- **Knowledge retained within the Group** – supports continuous improvement, lessons learnt and knowledge transfer
- **Better integration across all key disciplines** – structures, MEP, logistics, manufacturing
- **Improved visibility of cost** – for direct delivery elements we provide greater granularity through tier two and tier three supply chain
- **No subcontract warranties or bonding costs for direct delivery packages** – a significant proportion of works underpinned by security of the Laing O'Rourke Group





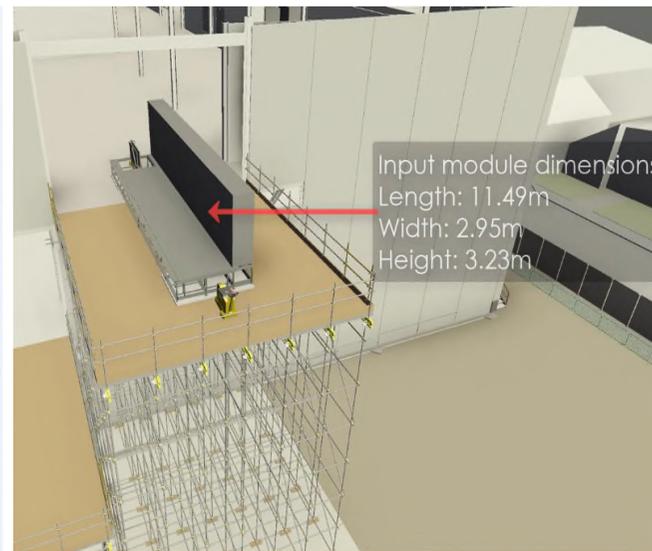
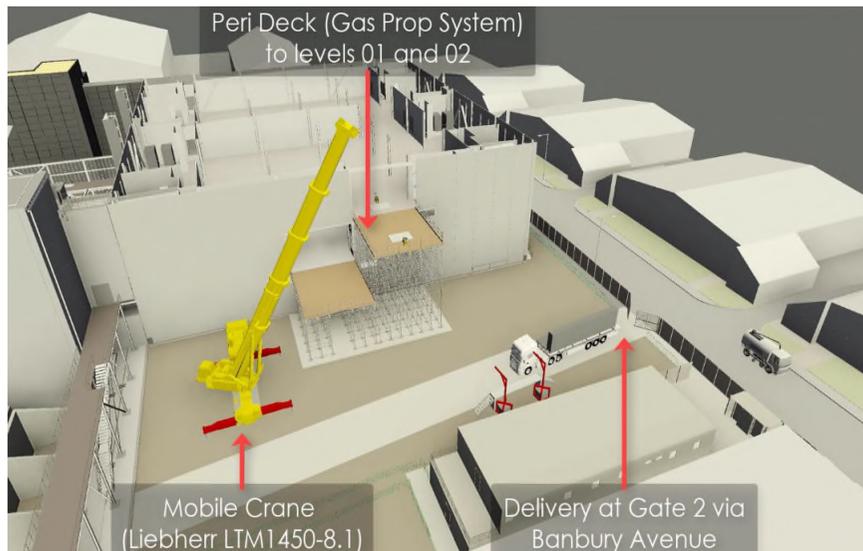
# Digital engineering

How we go to work

## Virtual to reality

### Delivering certainty through our unique approach

We build in a virtual world, commit our engineering led thinking to manufacture, use intelligent logistics and direct delivery capability to construct. Converting our clients aspirations into reality

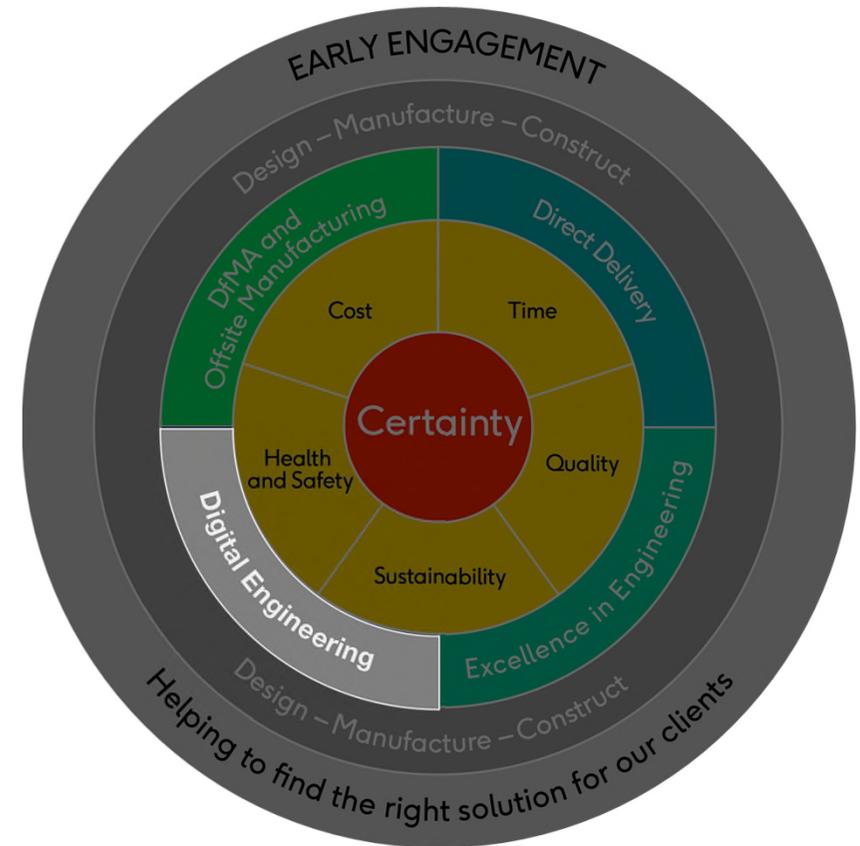




# Digital engineering

## Client benefits

- **Validation in a virtual world** – provides certainty of project outcome: cost, programme, quality
- **Working in a coordinated model environment** – improves design integration and reduces risk at discipline interfaces
- **Quicker understanding of impacts of change** – promotes informed decision making
- **Assists timely planning and stakeholder approvals** – for streamlined process and better buy-in
- **Smart technology now** – transforming materials handling, product tracking and logistics
- **Digital work packs drive improved productivity** – easily accessible, accurate, real-time data directly at the work front
- **Data in digital model available for efficient asset management** – focus on whole lifecycle value and performance in use



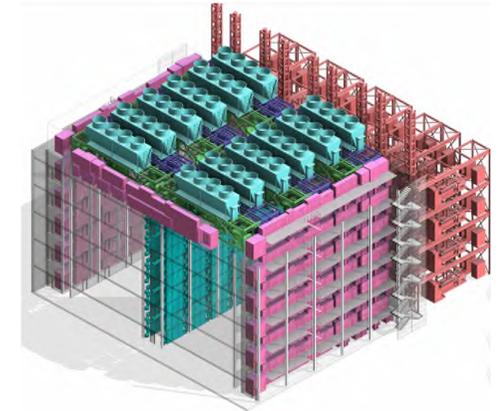
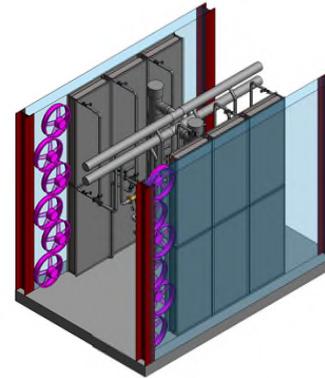
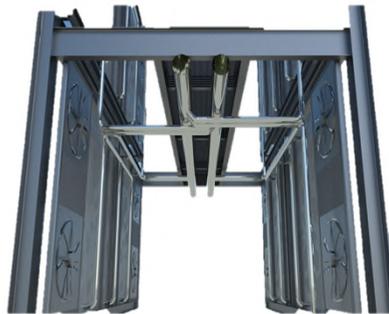


# Mission critical excellence in engineering

How we go to work

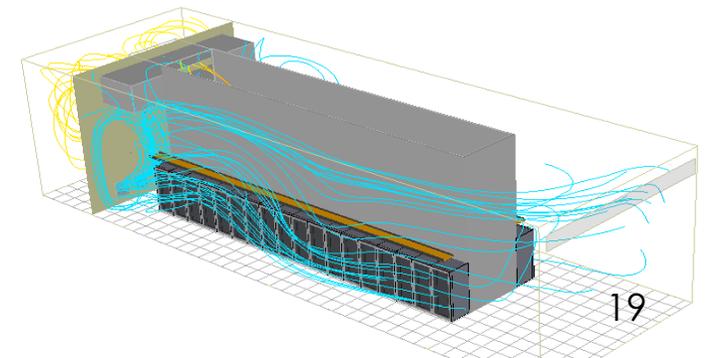
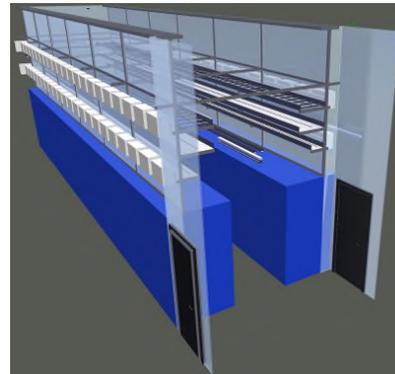
## PRODUCT INNOVATION

Challenging the standard approach working with supply chain to optimise design



## EARLY ENGAGEMENT

Collaboratively working with Design Partners

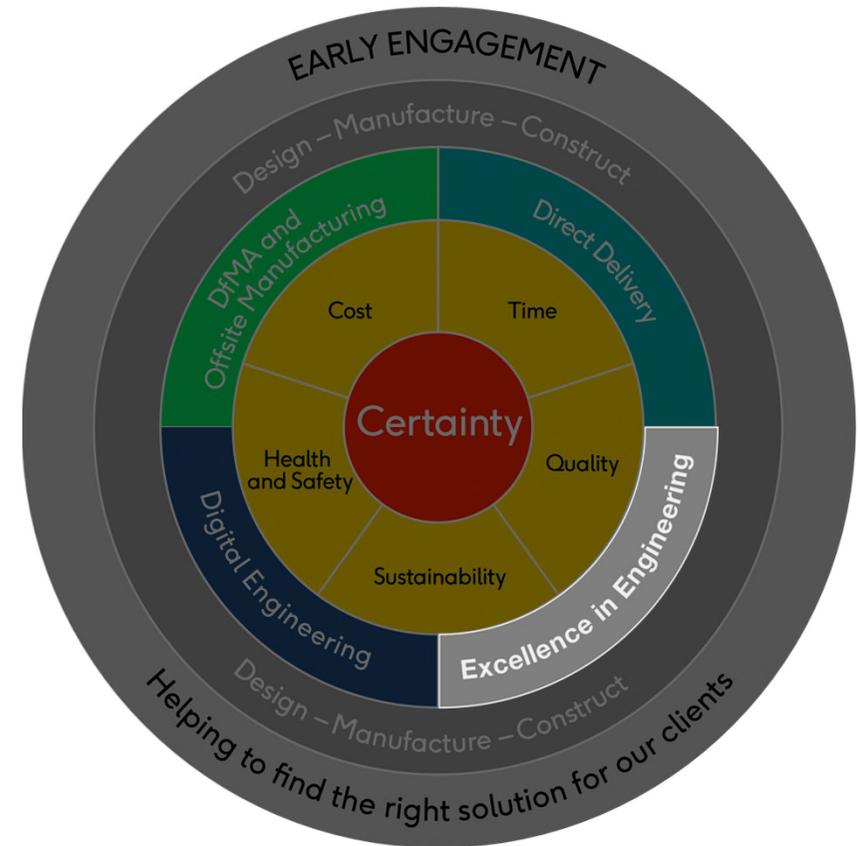


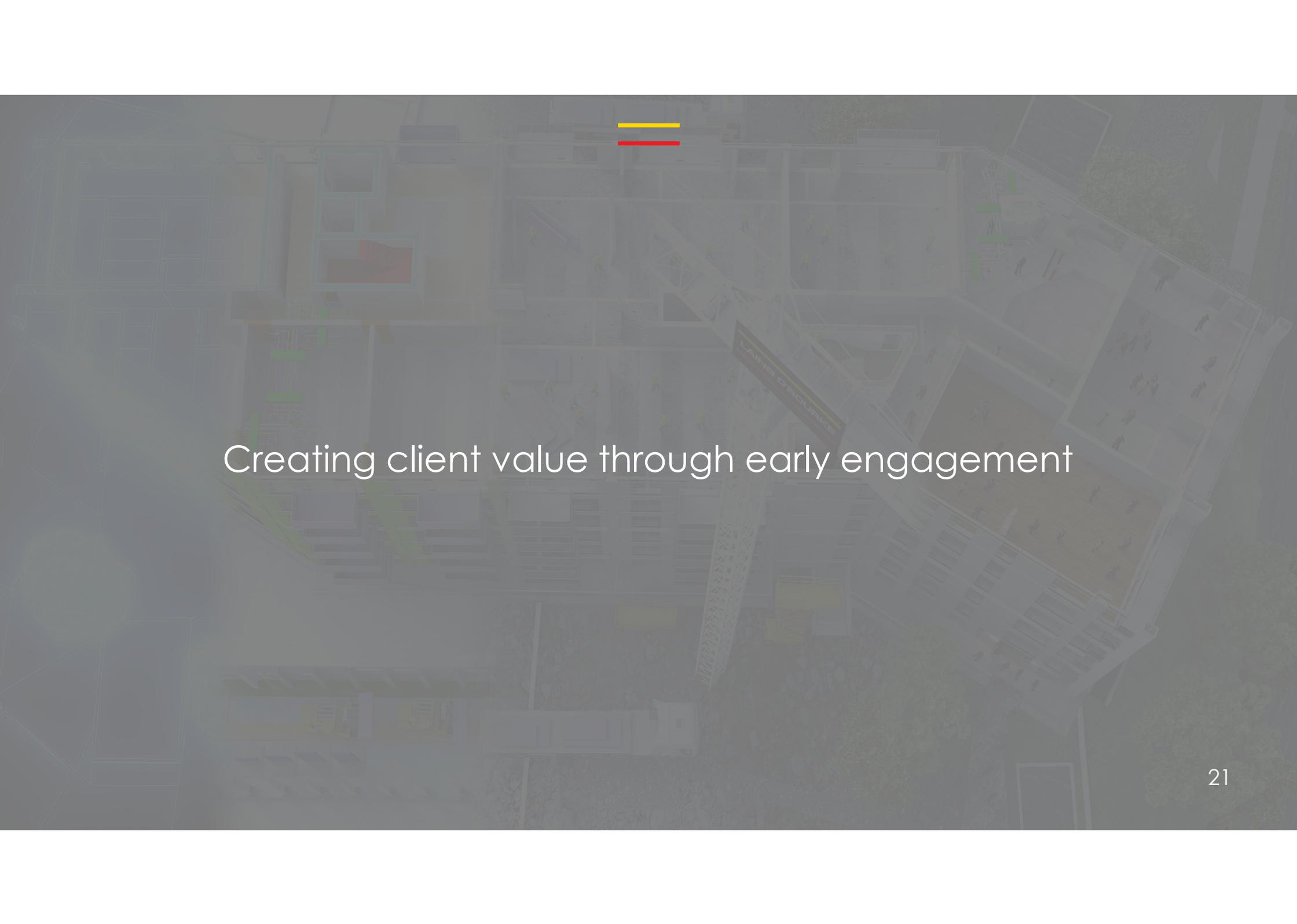


# Excellence in engineering

## Client benefits

- **Huge depth of engineering expertise throughout the Group** – the right solution found through early engagement, significantly de-risking design and delivery
- **Engineering Excellence Group** – available to all our clients: a unique, complimentary service allowing research, innovation, direct expertise, advice and direction through some of the world's leading innovators
- **Added value** – delivered through early engagement: the driving force around standardized design protocols, maximizing value-based offsite manufactured solutions via design, technology, supply chain and educational partners to support client vision

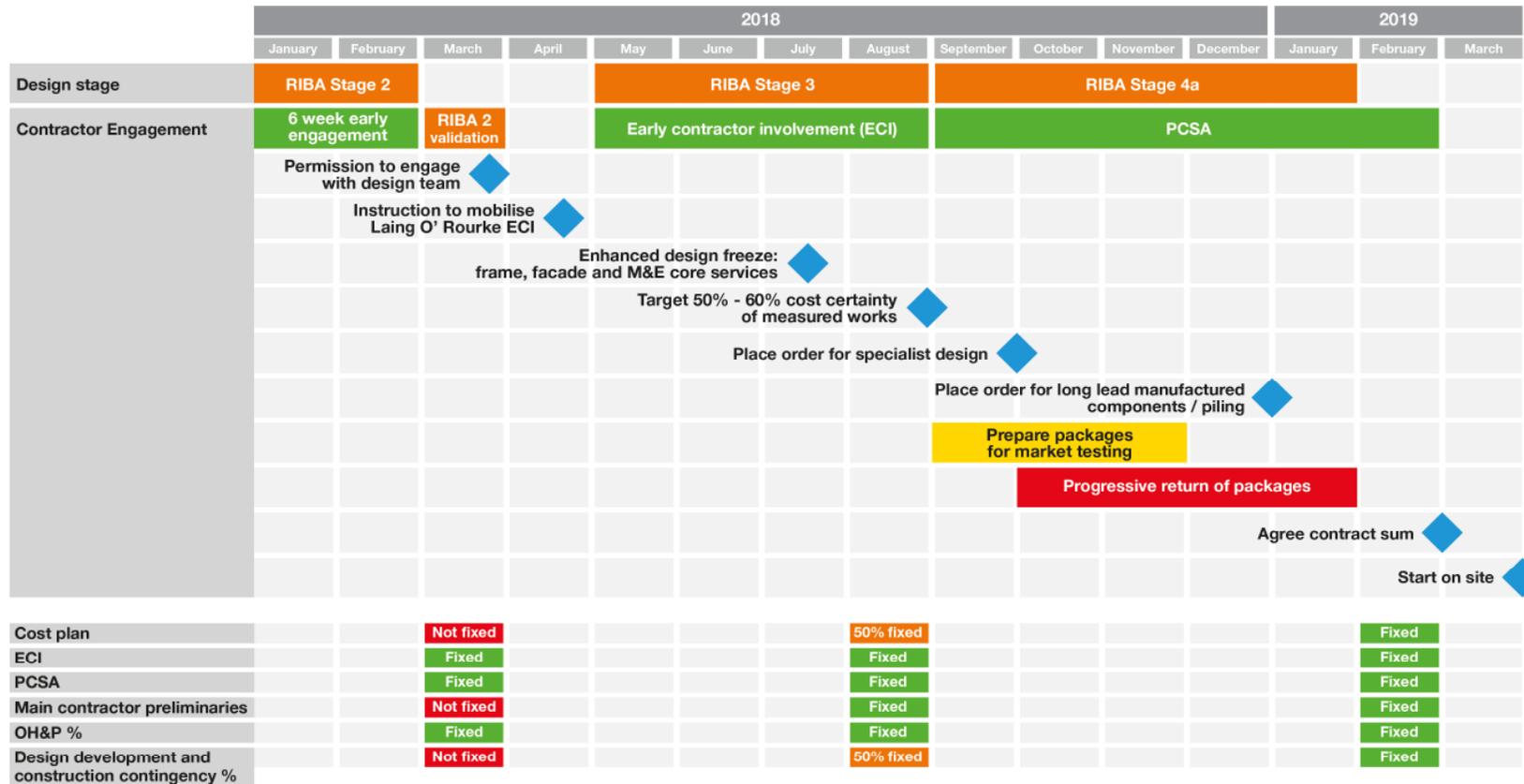




Creating client value through early engagement



# Typical early engagement preconstruction programme



- Value add:**
- Early advice on technical options
  - Early advice on logistics/buildability
  - Design for buildability/improved coordination
  - Optimised solution through the use of Digital Engineering
  - Professional engineering advice / in-house capability
  - Early cost certainty
  - Progressive agreement of contract sum
  - Construction partner approach



# Early engagement

## Case studies

### Equinix LD 7.1: £55m



#### Benefits:

- ✓ Fast track programme enabled by our DfMA approach
- ✓ Developed a further set of large-scale MEP modules in addition to our standard suite
- ✓ Commissioning programme optimisation through early engagement & direct delivery solutions

**Next generation modular DC**

### Here East: £85m



#### Benefits:

- ✓ Collaborated to redistribute the M&E plant, enabling an optimised foundation design (reducing both time and cost)
- ✓ Delivered in just 83 weeks
- ✓ Rendered images from 3D model enabled client to change the cladding design without increasing programme

**Programme sensitive mission critical facility**

### Sir Francis Crick Institute: £475m



#### Benefits:

- ✓ 60% directly delivered
- ✓ Digital engineering and DfMA used to plan, install and track complex multidisciplinary MEP building services, structural and facade components totalling 45% of the project

**Highly serviced and complex MEP delivery**



# Early engagement

## Case studies

### Two Fifty One - £120m



#### Benefits:

- ✓ 70% of the 41-storey residential tower was produced offsite
- ✓ DfMA approach showed 33% programme reduction compared to traditional in situ approach used on the neighbouring commercial building

**Logistics and modular component driven solution**

### The Leadenhall Building - £250m



#### Benefits:

- ✓ 85% manufactured off site
- ✓ UK's first contractor to use precast concrete floor modules in a high-rise building
- ✓ DfMA enabled offsite testing and upfront commissioning, of MEP, minimising risk at the end of the project

**Integrated structure & MEP DfMA solutions**

### Manchester Airport Group - £600m



#### Benefits:

- ✓ Over 50% of project value delivered in-house by our MEP and structures businesses, de-risking delivery of a programme that turns over £1m / day peak
- ✓ 95% of a key multi-storey car park built using DfMA, for a faster, safer build

**Large scale campus type project**

A faded, semi-transparent image of a complex mechanical assembly, possibly a motor or engine component, resting on a metal table. The assembly consists of various parts, including a central cylindrical component, a fan-like structure, and various pipes and brackets. The background is a solid dark grey color.

# Mission Critical - MEP Product Deployment

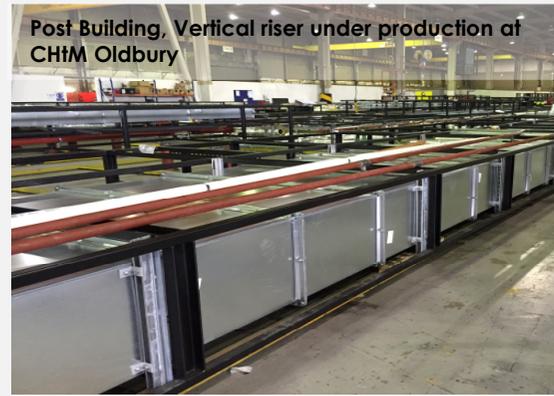
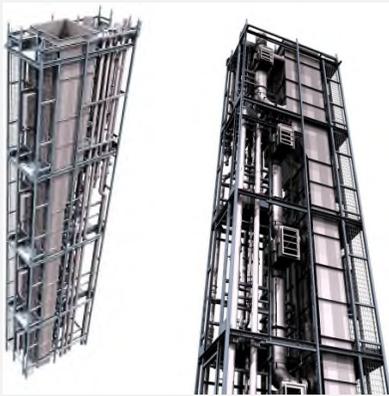
Standardised offsite manufactured product set



# Mission Critical – Mechanical and Electrical products

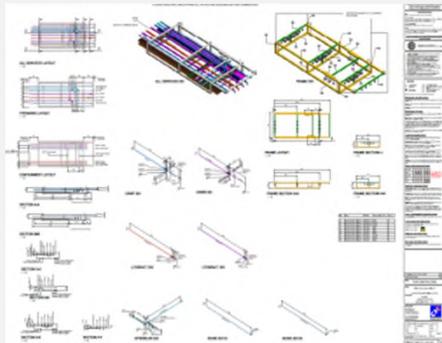
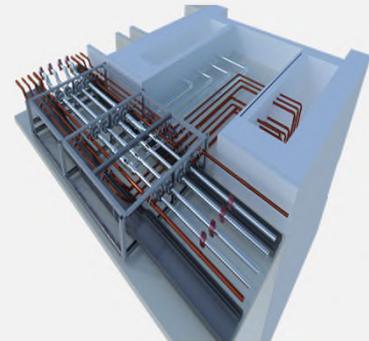
MEP product set

## Vertical risers



- ✓ Modules lined and levelled by laser
- ✓ Full connectivity in final site location
- ✓ When volume allows we employ 'Flow Line' manufacturing for lightweight floor to floor risers
- ✓ Pressure tested for final quality check
- ✓ Batch produce stored off site
- ✓ Rapid site installation periods and not reliant upon situation on site
- ✓ Maximise tower crane availability

## Horizontal Containment module



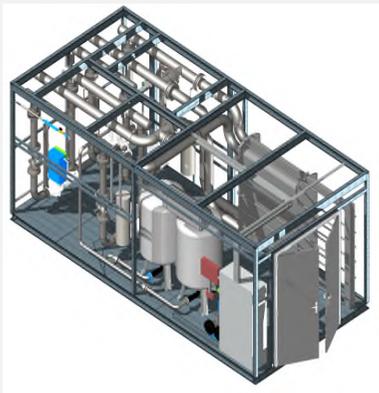
- ✓ Designed to carry services within a corridor and /or room, serving adjacent rooms and offices
- ✓ Integrated within the walls and ceiling voids containing all M&E services and fire bulkheads.
- ✓ Built as one complete corridor length
- ✓ Pressure tested as full system
- ✓ Dispatched in 3 to 12 metre sections that suits site access



# Mission Critical - Mechanical and Electrical products

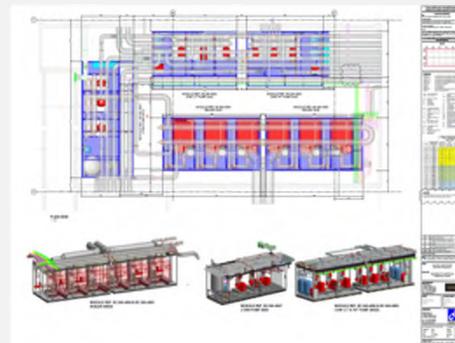
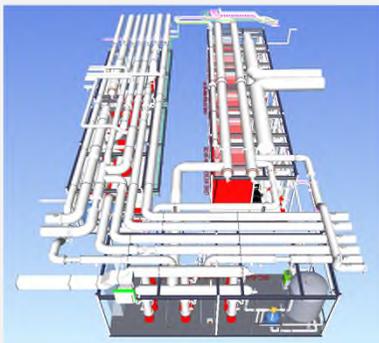
MEP product set

## Energy centres & plantroom

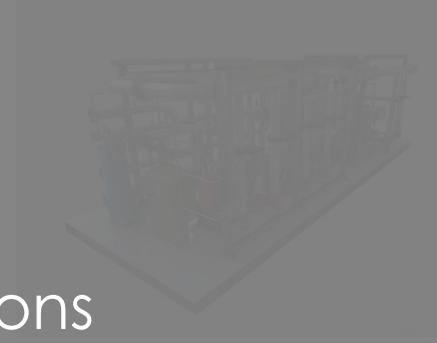


- ✓ Fully Packaged Plant room completed and transported to site – lifted into position of alignment with electrical, ductwork and pipework risers
- ✓ A complete solution offering whole range of shapes, sizes and containment. Permanent and temporary modules manufactured for clients

## Plant equipment module



- ✓ Used where difficult to install complete modular plant room
- ✓ Includes several smaller modules working together
- ✓ Installed as finished product reducing need for specialist builders work
- ✓ Complete electrical panels
- ✓ Pre-commissioned
- ✓ Ready for start-up



Delivering certainty through our value propositions





# Delivering certainty through our value propositions

Early engagement is key to providing the right solution for our clients

## Design – Manufacture – Construction is how we deliver

- Strategic involvement to ensure the most efficient engineering solution and buildability
- Maximum use of offsite manufacturing to de-risk design and delivery, but only where it adds client value
- Controlled, efficient site assembly with a highly skilled directly employed workforce

## Our unique approach

- DfMA and offsite manufacturing
- Direct delivery
- Excellence in engineering
- Digital engineering

## Provides 'Certainty' around

- Time
- Cost
- Quality Health and safety
- Sustainability

