Engaging the Supply Chain – T5C Nodes

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Buildoffsite Stakeholder Event, 29th September 2010

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It starts with Strategies

- BAA:
  - Pier Facility Strategy – DfMA, Design once, use many
  - Commercial Strategy – Complex Build Integrator
  - The T5 Campus
- Carillion:
  - Project Delivery Strategy
- NG Bailey:
  - Manufacturing Strategy

The Pier Facilities Strategy

BAA builds a pier about every 2 years

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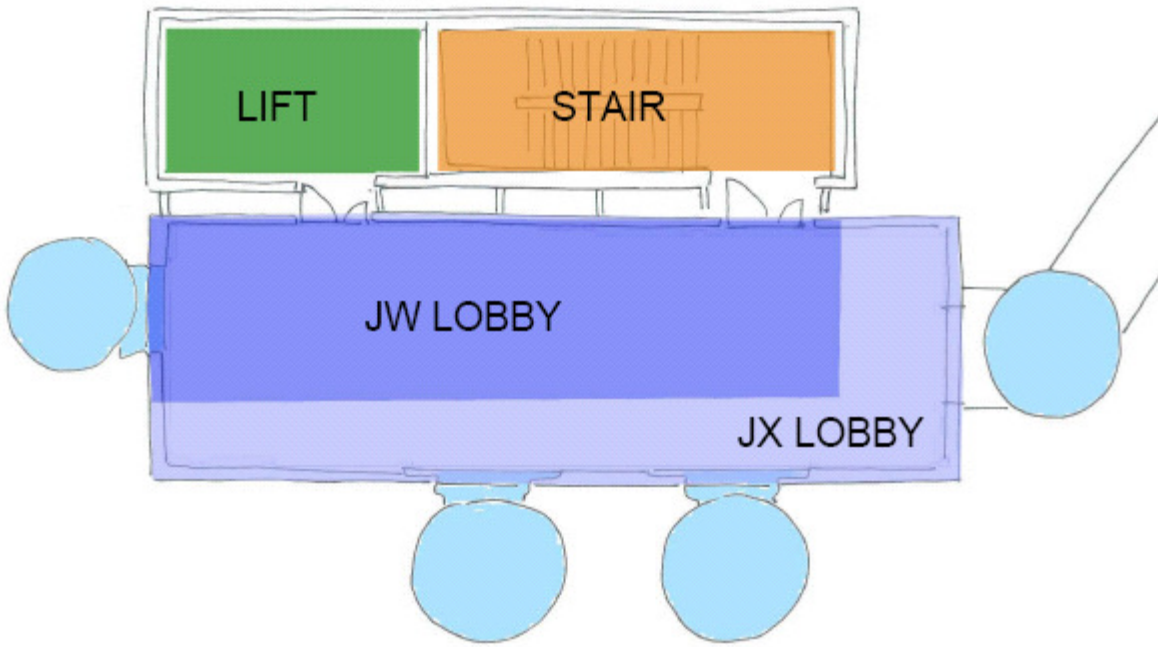
The T5 Campus

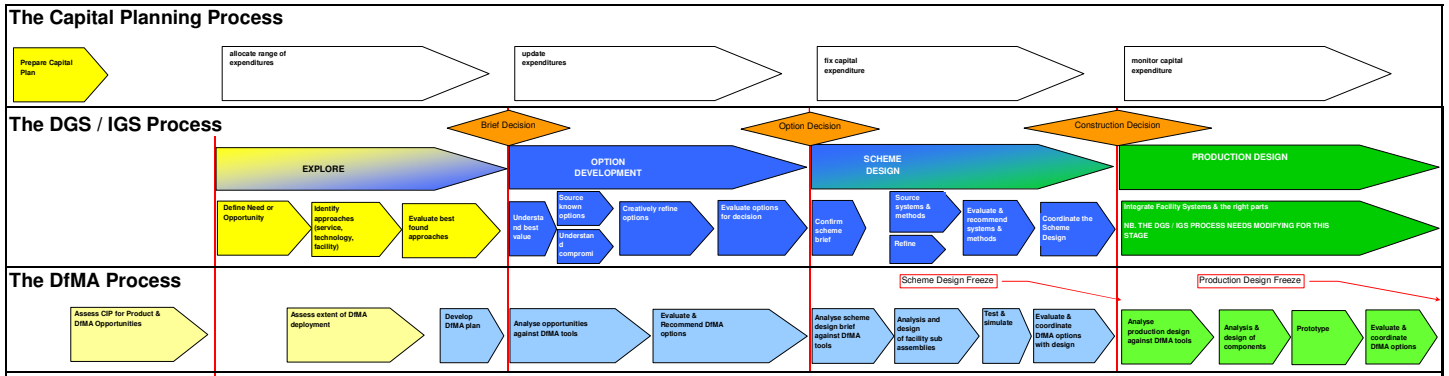
T5C needed to have the same appearance and passenger experience as T5B

The Node at Concept stage

Capita Simmons' interpretation of the strategy with respect to the T5C Nodes



DfMA in the T5C Brief to Carillion



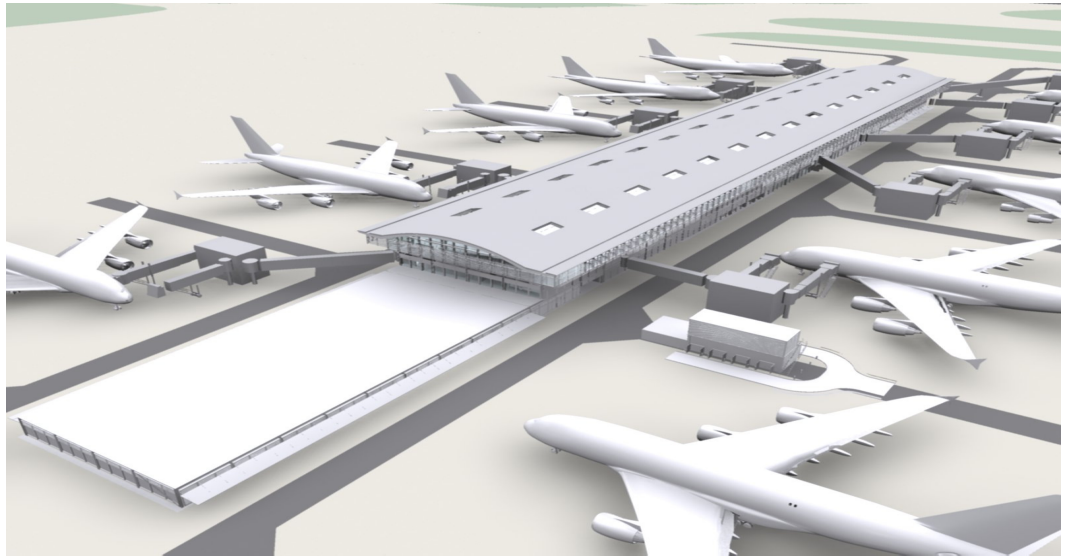
		Design for Assembly							Design For Manufacture				
DfMA Strategy		●	●	●	●	●	●	●	●	●	●	●	●
14 Tools of DfMA													
Teamwork	1. Commercial & Contractual Considerations				●	●	●	●	●	●	●	●	●
	2. Design for Productivity				●	●	●	●	●	●	●	●	●
	3. Design for Logistics				●	●	●	●	●	●	●	●	●
	4. Design To Be Modular						●	●	●	●	●	●	●
	5. Make Assembly Easy						●	●	●	●	●	●	●
	6. Optimise Design to Suppliers Capabilities						●	●	●	●	●	●	●
	7. Use Common Parts & Materials						●	●	●	●	●	●	●
	8. Model, Test, Simulate & Correlate							●	●	●	●	●	●
	9. Minimise & manage interfaces								●	●	●	●	●
	10. Simplify and Reduce Sub-Assemblies & Parts										●	●	●
	11. Reduce Assembly Risks										●	●	●
	12. Make Manufacture Easy												●
	13. Easy Handling												●
	14. Efficient Methods of Jointing												●

T5C Nodes

- Overview
- Pre-tender Design
- Procurement
- Post-tender Production Design

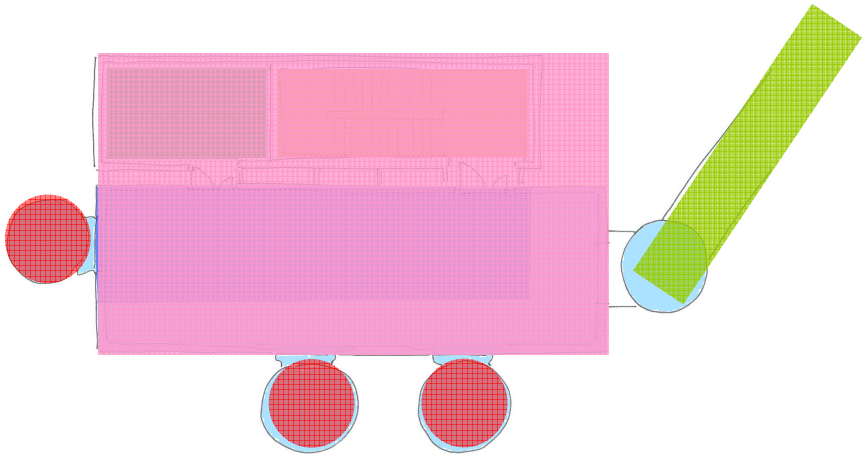
Overview

- 12 Stand Scheme
  - 8 JX nodes – Serving A380's
  - 4 JW nodes



Pre-tender Design

- Scheme Design Fixed Elements
  - Floor plan
  - Boarding bridge interface
  - Fixed Link Interface
  - Arrivals Level finished floor level
  - Apron & drainage



Pre-tender Design

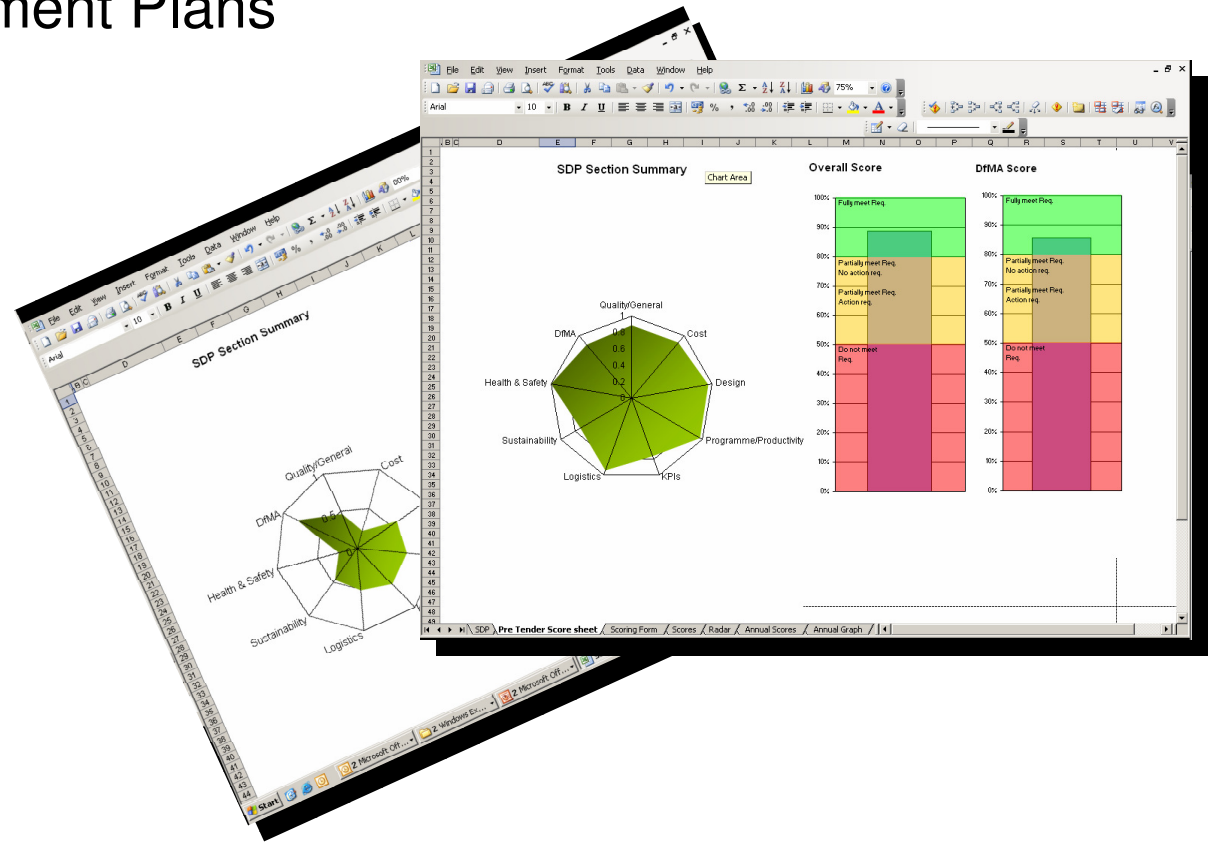
- Development of the following:
  - Designed for Productivity (off & on site)
  - Logistics
  - Simplification & reduction of assembly
  - Using common parts
  - Interface management

Post-tender Design

- Post-tender further development of the above and:
  - Jointing & connections
  - Manufacturing alignment
  - H&S risk mitigation

Procurement

- Supplier Development Plans
  - QA
  - Cost
  - Design
  - Programme
  - KPI
  - Logistics
  - Sustainability
  - H&S
  - DfMA



Procurement

- Strategy involved:
  - Traditional
  - Partial Modular
  - Modular
- Approached 4 companies
  - UK – 3
  - China – 1

Post-tender Design

- Design workshops/meetings:
  - Shared interface schedule with all related trades
  - Regular Design meetings and schedule updates

- Benchmark sign-off:
  - Factory
  - Site benchmarks on-going as nodes were completed and presented to the client

Production Benefits

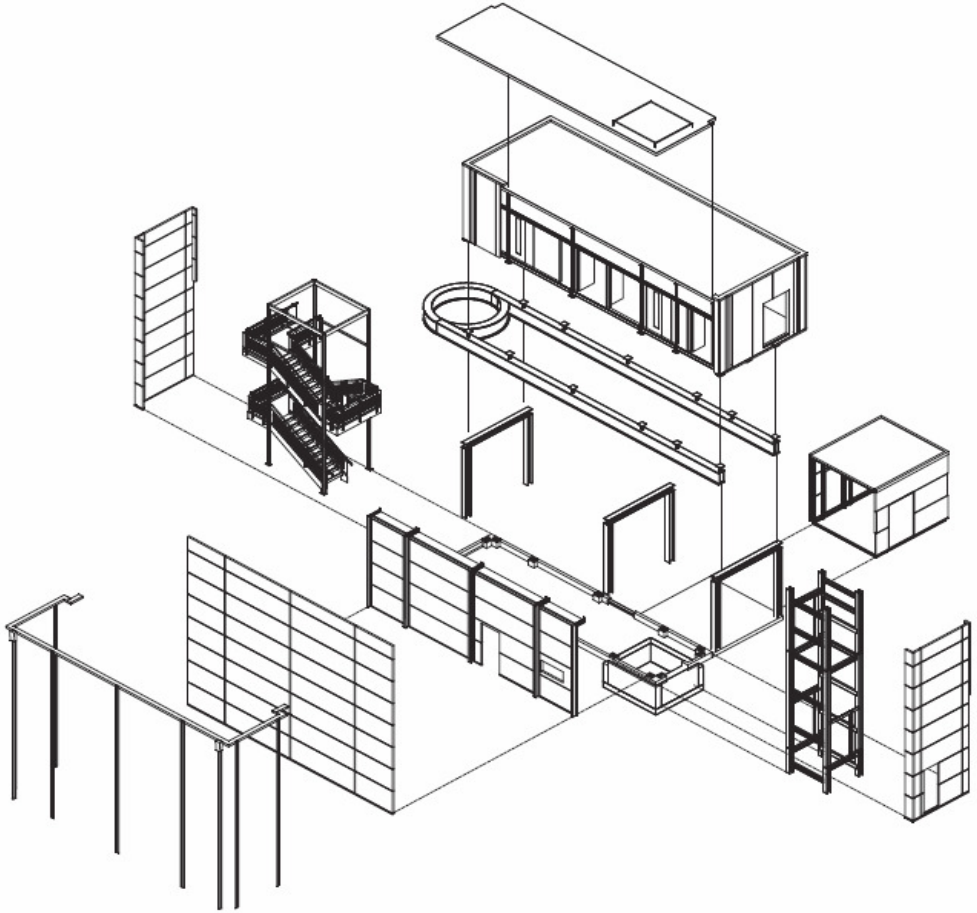
- Optimised and improved tolerances
- Minimised Interfaces
- Reduced Assembly Risk
- Modular standard design for both JX and JW stand types
- Met the 2 week programme per 2 stands

Standard design, manufacture and build processes

From design requirements developed the build strategy
- volumetric 3D / panelised 2D / modular / bespoke

- design / FMEA
- prototype / first run study
- jigs / transport / logistics
- supply chain engagement
- quality

Innovative Construction Methodology & the Building Information Model



Exploded Components

Completed Node

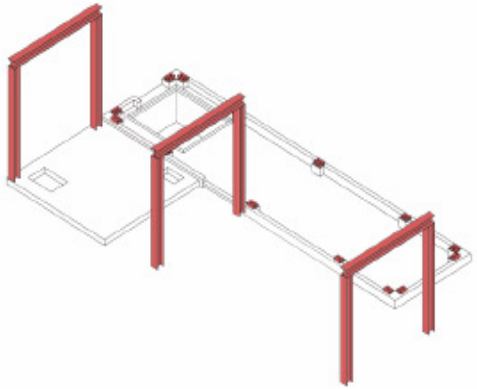
bwm NG Bailey

Project:
327 _ T5 Nodes

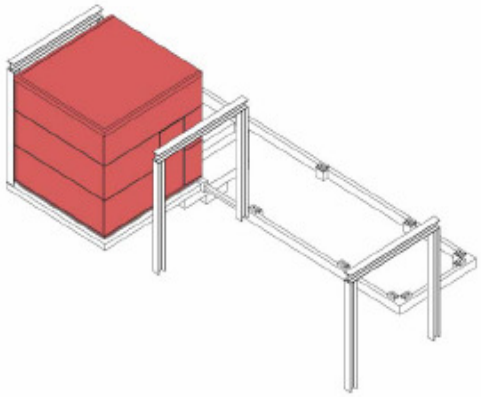
Document Title:
Assembly Guide

Date:
2009 _ 06 _04

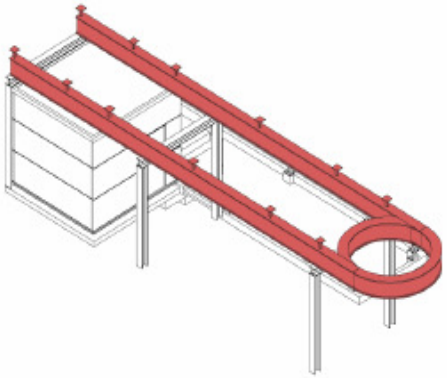
01 Assembly Sequence
Goalposts



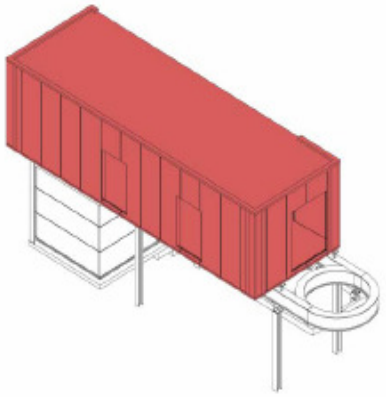
02 Service Pod



03 Chassis Beam



04 Lobby Module



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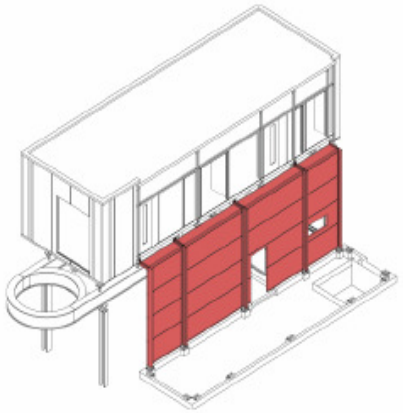
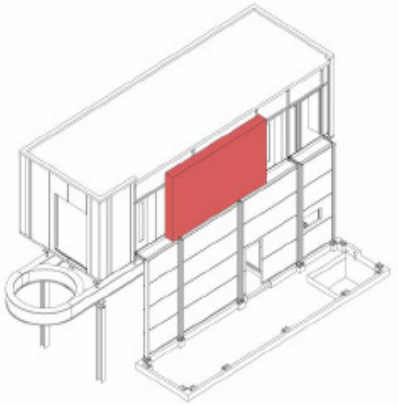
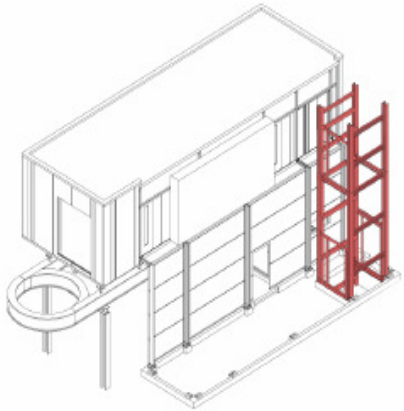
05 Assembly Sequence
Half Wall



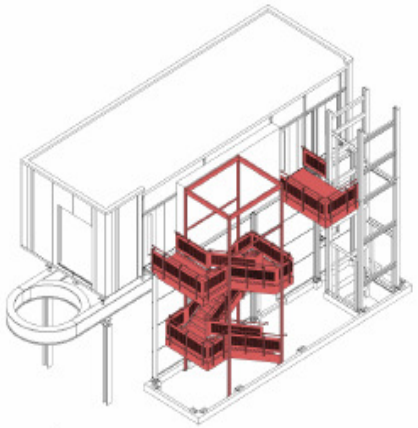
06 Cupboard Module



07 Lift Shaft



08 Staircase Pod



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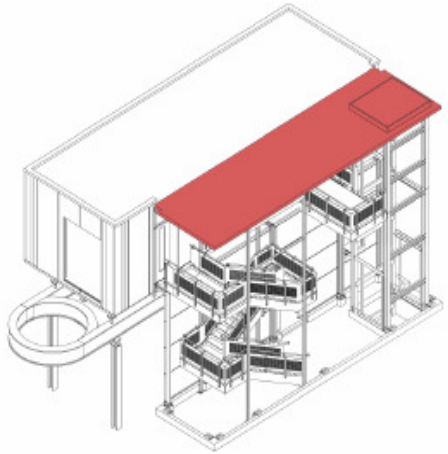
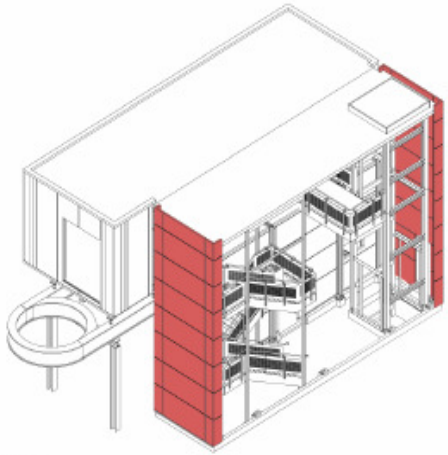
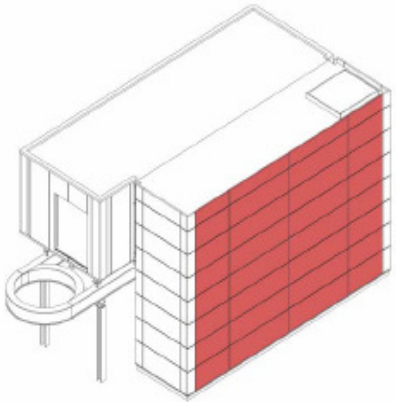
09 Assembly Sequence
Roof Cassette



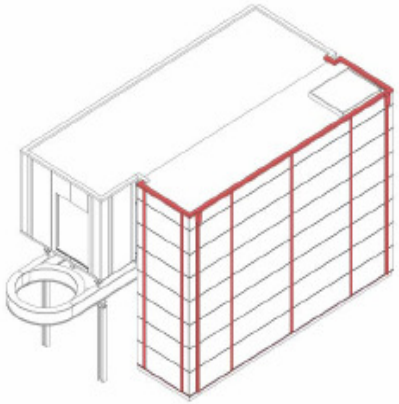
10 End Panel



11 Stair Wall Panels



12 Cladding Junction



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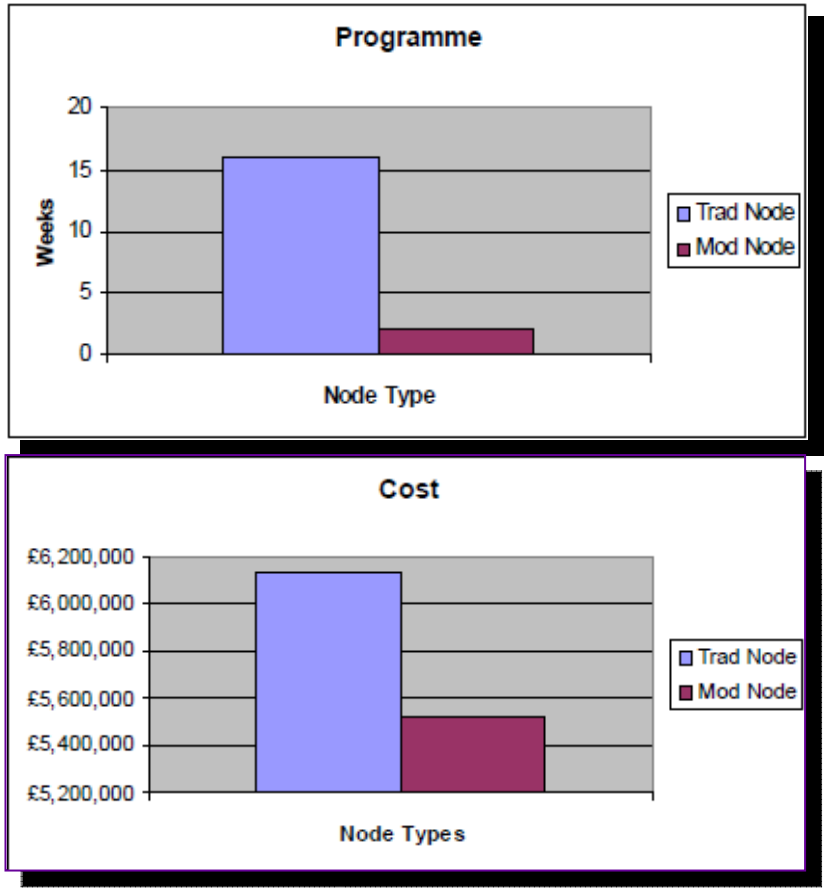
Node Installation on Stand 561

Headline Benefits



- 85% Reduction - onsite build time
- Stands available 14 weeks earlier

- estimated value £2.5m

- less delays for passengers

- 11% Reduction in cost
- Jigs available for future use
- BIM Models available for future use

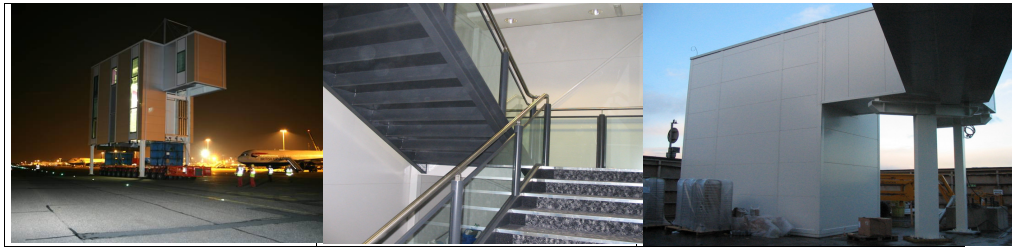
- Potential to relocate

And the rest....

- Off site:
  - Local staff to work place & lower cost per hour
  - Productivity gain offsite
  - Better working environment offsite
  - Reduced waste offsite
  - Continuous improvement with successive assemblies
  - Creates a potential product opportunity
- At site:
  - Less lifts, less risk to programme
  - Less personnel Airside & less security costs
  - Safer assembly processes including less work at height
  - No hot works on airport
  - Less deliveries airside & less logistics & security costs
  - Less deliveries in the Heathrow area better for local residents

Capturing learning for T2B, T2C, T5D ....

Aircraft Stand Nodes and VCCs



Design Performance Standard

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Why make a project out of a product?

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