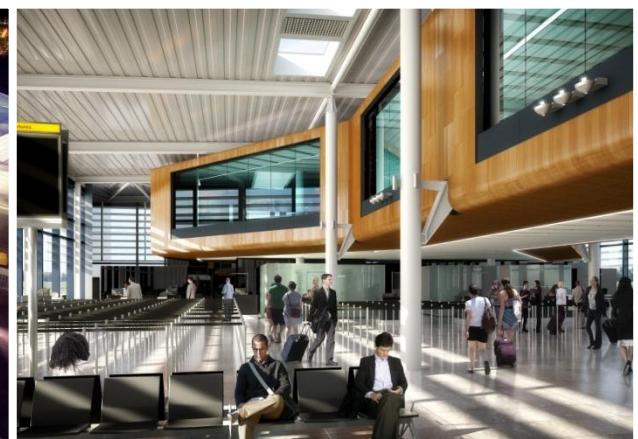


# Sharing knowledge

## Heathrow Terminal 2B Site Visit

7 December 2011



**Balfour Beatty**

**Duncan Magrath**

Chief Financial Officer

# Agenda

Heathrow Terminal 2B – Project presentation

Steve O'Sullivan

Discussion with the customer

Steven Morgan, BAA

**Safety briefing**

**Site tour**

Knowledge and integrated delivery – a key differentiator

Mike Peasland

Knowledge transfer and inter-divisional synergy

Andrew McNaughton

**Tea break**

**Q&A session**

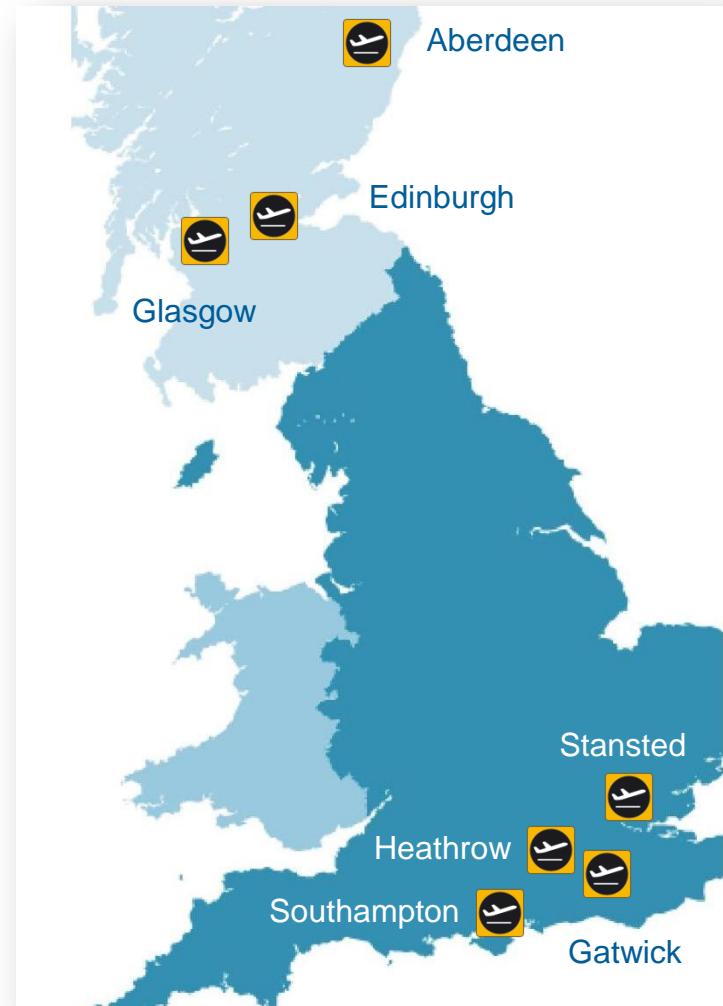
**Balfour Beatty**

**Steve O'Sullivan**

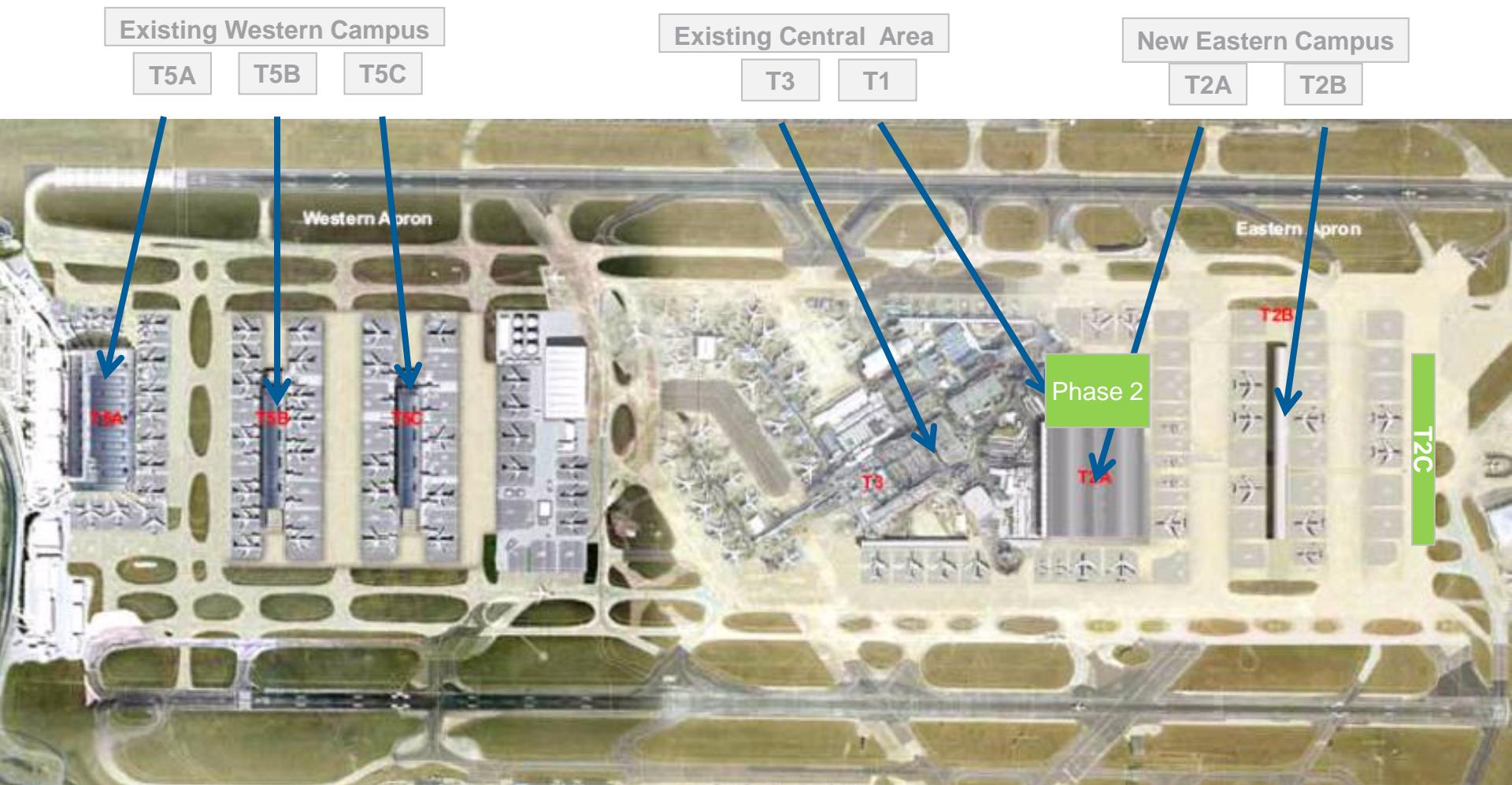
Framework Director

# Developing the BAA relationship

- Early 90's
  - Glasgow airport international pier
- 2003 – Acquisition of Mansell
  - Joined BAA partnering framework
- 2000/05 – Terminal 5, Balfour Beatty  
2nd largest contractor
  - Heathrow Express extension (Hex)
  - Piccadilly line Extension (Picex)
  - T5 Main Rail Station
  - Track Transit System T5A to T5B
  - T5 M25 road link (part funded by BAA)
- 2008 - Appointed to the current BAA's 3rd Generation Framework
  - Projects delivered at Heathrow, Edinburgh, Gatwick, Southampton and Stansted
  - Early Contractor Involvement at T2B



# Aerial view of Heathrow – 2014



# Heathrow's new Terminal 2



# Terminal 2 replacement (T2) at Heathrow



T2B



T2A



- T2 Programme is a £2bn major capital investment by BAA
- Brings 18 STAR Alliance partners under one roof
- 20m passengers under initial phase
- Replacement of the old 1950's Terminal 2
- Operating by summer 2014
- Built in a Live Airport environment whilst maintaining a safe, efficient operating airport
- Next phase increases passenger numbers to 30m

# T2B – Design and Build by Balfour Beatty



**£590 million**

# T2B Phase 1 – Completed by Balfour Beatty

- Phase 1 of development – cost of £95m
- Brought 6 aircraft stands into operations
- Enabled construction of 2nd phase
- Exceptional safety record
- Delivered early, defect-free and to budget



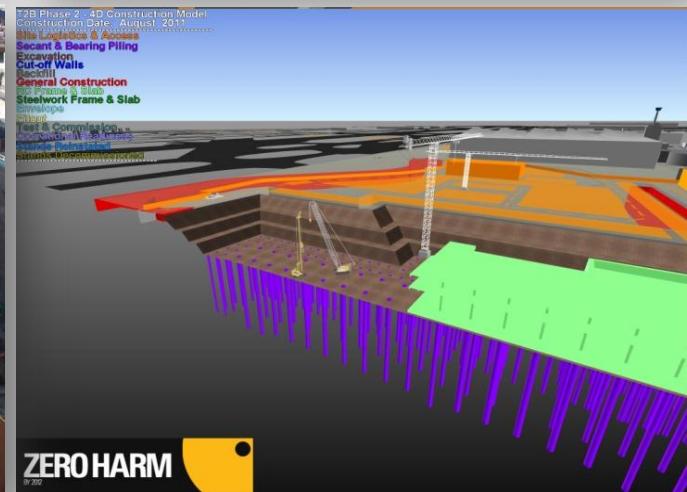
# T2B Phase 2 – Being delivered by Balfour Beatty

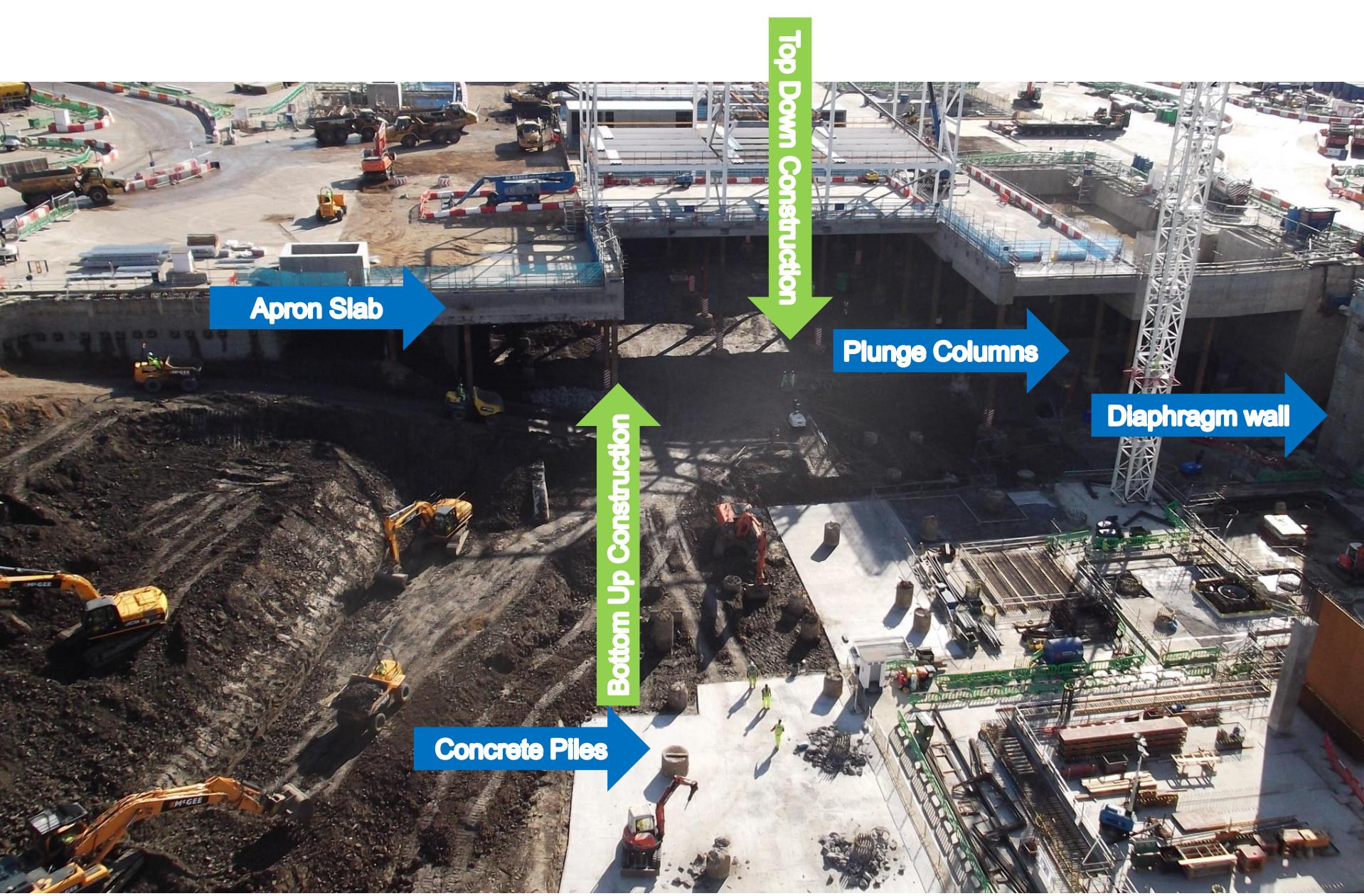
- 10 more aircraft stands
- Retail provision of approx. 1,275m<sup>2</sup>
- 3 CIP lounges with 3,600m<sup>2</sup> floor area
- 4,000m<sup>2</sup> of airline ops accommodation
- Safeguarded baggage basement
- Underground passenger access tunnel
- Safeguarding for future Track Transit System and baggage to T2C



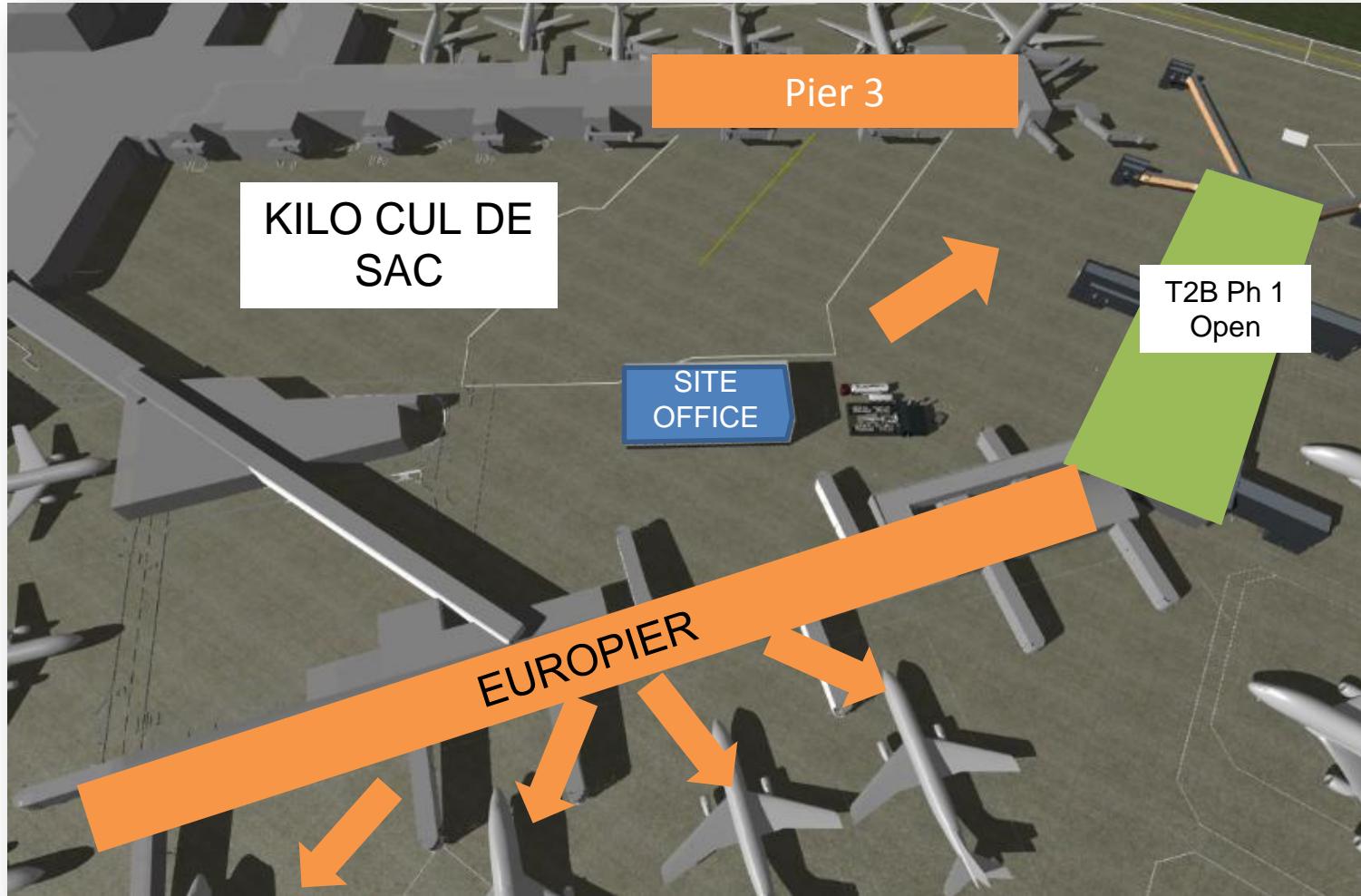
# T2B Phase 2 – Programme challenge

- 30+ active stakeholders
- 90+ design briefs
- Safeguarded baggage facility to T2B and extension to T2C
- Programme demands changed construction techniques
- Open Cut “Bath Tub” replaced with Diaphragm Wall solution
- Longer piles driven from Apron Level (35km of piles)
- Top Down construction introduced in two sections





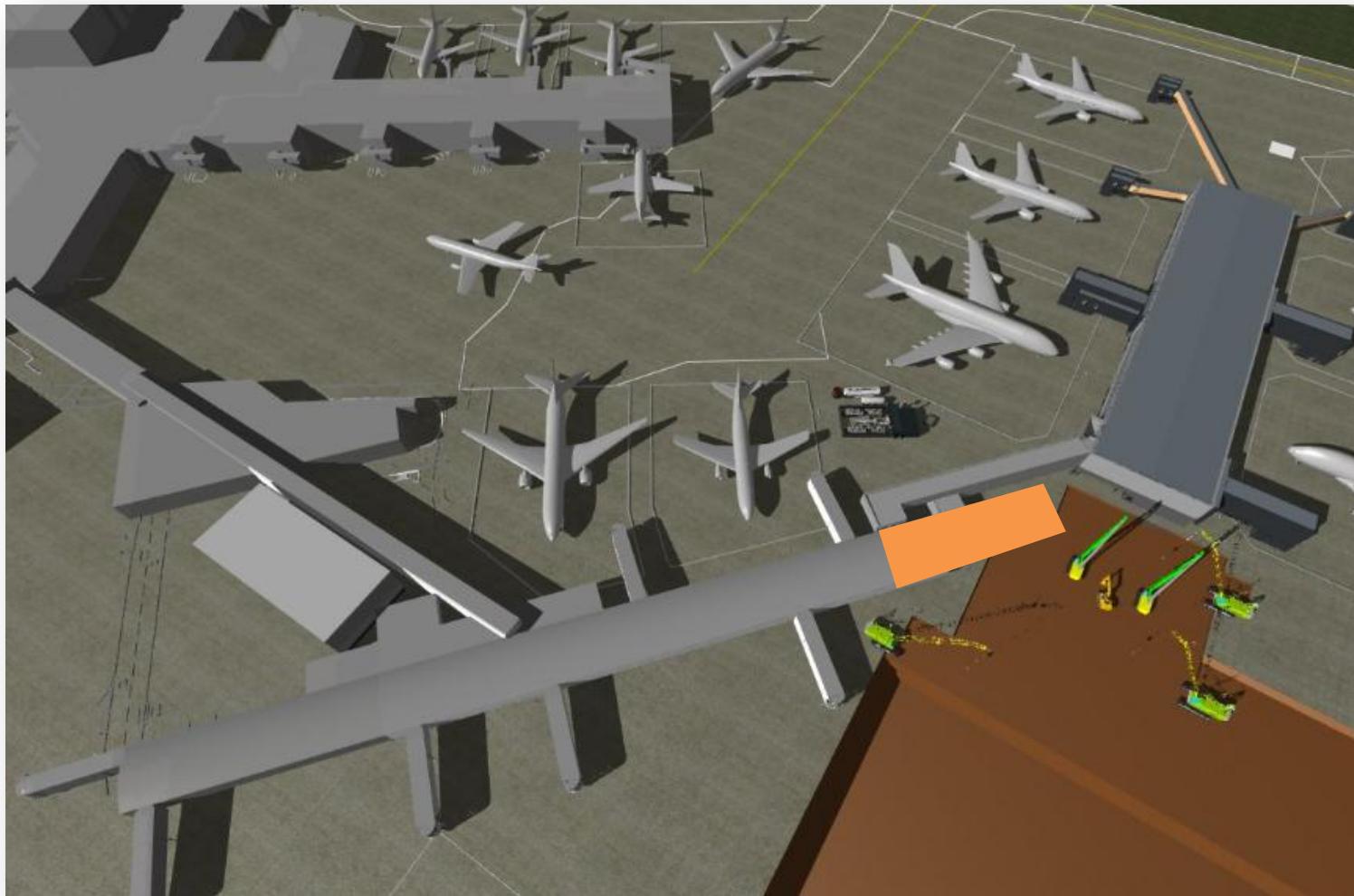
# Enabling phase 2 – the October 2010 story



## Enabling phase 2 – the October 2010 story



# Enabling phase 2 – the October 2010 story



# Construction challenges

- Largest ever airside project at Heathrow
- Enabling works to clear entire footprint
- 2km of diaphragm walling; largest in Europe
- 700 large bore piles and 160 plunge columns
- 575,000 m<sup>3</sup> of excavation (15m deep)
- 165,000 m<sup>3</sup> of reinforced concrete
- 5,000 t of structural steel
- 13 interfacing projects
- Peak construction workforce 1,600
- Construction to be completed in Q4 2013



# Achievements

- Design completed – PB integral part of team – leading to £30m betterment
- Diaphragm Wall completed ahead of schedule by engineering services
- Earthworks ahead of programme
- Spoil being used to regenerate local household waste tip
- Structural steelwork commenced on time
- Third RoSPA Gold safety Award received
- 2m hours worked without injury (RIDDOR)
- T2B makes front cover of New Civil Engineer

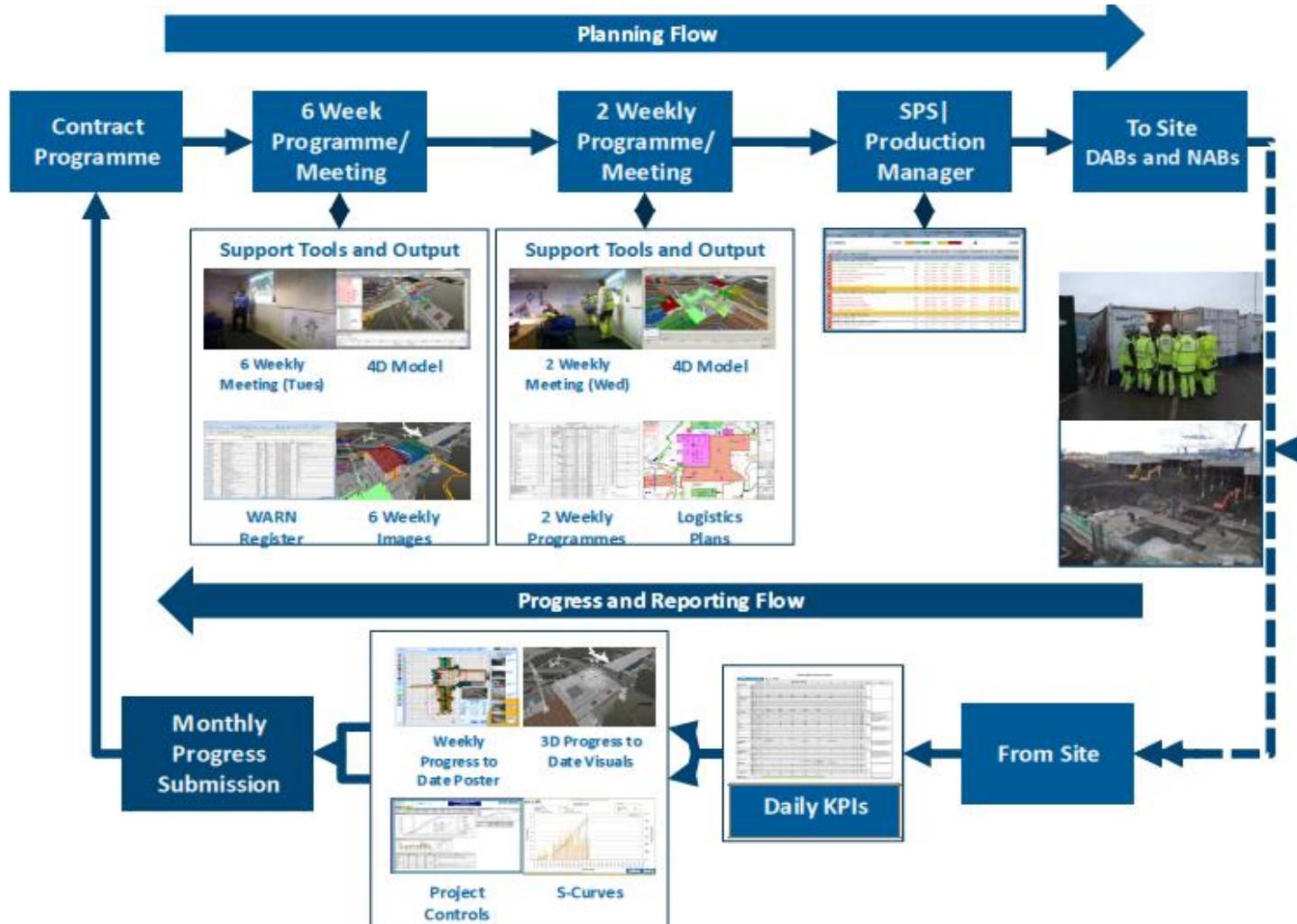


Capital Safety League Table September & October 2011										
Position	Supplier	Leadership (15)	Training & Behavioural Programme (15)	Worker Engagement (15)	Visible HS&E (15)	Fire Safety (15)	H&E Mgmt (20)	Safety Performance (Reductions)	Bonus (5)	TOTAL SCORE
1	Balfour Beatty	15	11	11	13	12	15	4	3	76
2=	Supplier 1	12	8	12	12	9	13	3	3	66
2=	Supplier 2	12	9	9	12	11	12	4	5	66
4=	Supplier 3	10	8	9	11	10	12	0	5	65
4=	Supplier 4	11	9	12	9	9	12	2	5	65
6	Supplier 5	10	8	9	11	9	12	0	5	64

BAA Suppliers Safety League		
2010	BBG 1st Position	8/12 Months
2011	BBG 1st Position	9/9 Months
		17/21 Months

# Effective project controls



## Project Controls

- Continual updates
- Office and work front task
  - Measure achievements against planned
- Long-term Look ahead
- Implement “honest” systems

# Systems map – Realising BIM

## 2D/3D CAD Design

- AutoCAD Architecture
- Revit
- TEKLA Xsteel
- Google Sketchup
- Others



## MEP/ICS Design

- CAD-Duct
- ElcoCAD
- Amtech



3D  
DWG

3D  
DWG

## Databases

- STAG Access Control
- SharpOWL
- Primavera P6
- others....



ODBC

## MS Excel

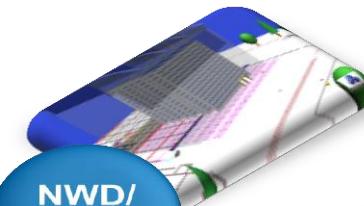
- KPIs
- Project Controls



XLS

Internet

HTML



NWD/  
3D DWF



XML

## XML Formatted Datasets

- GIS
- Asset Register
- Maintenance plans

OPC



C

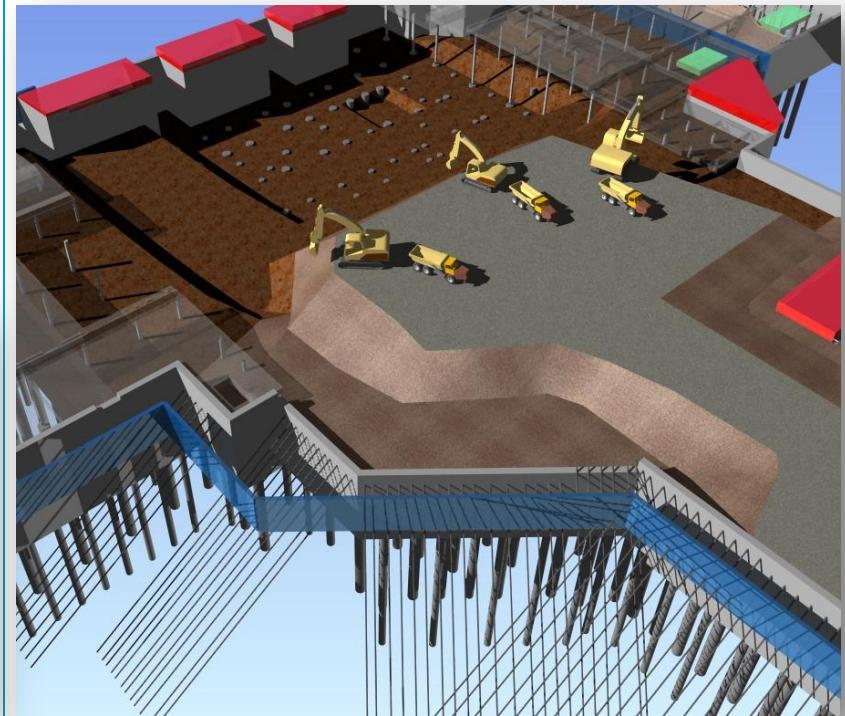


## Quality Control

- Priority 1

# Building Information Management (BIM)

- Use of BIM allows change to be fully assessed before making untested decisions



# Next steps

- M&E off-site modules arriving
  - Procurement complete
  - £1m / day spend profile in 2012
  - Construction completion by Q4 2013
  - Integrating project into operations by Q2 2014
  - Maintain and improve upon safety achievements
  - Continue development of BIM
  - Transfer innovation into future Q6 spend with BAA
  - Strengthen further relationship with BAA



# Balfour Beatty differentiators

- Single point of service to clients utilising full Group capabilities
- Early Contractor Involvement – Using PB at scheme design
- End-to-end ownership of project
- Strong, open relationship with BAA
- Leading Health, Safety and Sustainability Agendas
- Leading implementation BIM Technology
- Developing and transferring identified innovations



*"Balfour Beatty is one of those companies who routinely looks for the better way to make things better. From what I have seen innovation and safety are clearly culturally embedded values in the Balfour Beatty T2B culture"*

**Steve Morgan BAA Capital Projects Programme Director**



Balfour Beatty T2B Milestones	Date	Timing
Start of FRC Works	23/03/11	On time
South of Euro-pier truncated	31/03/11	Early
Zone 3 basement FRC start	30/06/11	On time
Ready for steelwork start North	06/07/11	On time
Ready for steelwork start South	26/08/11	On time
Ready for steelwork start Centre	21/12/11	On time
Envelope start	17/10/11	On time
Completion of LIMA FRC Works	20/06/12	On time
PQ area available for stand constr.	31/07/12	On time
Power on	12/08/12	On time
Weather tight (Envelope / roof)	11/09/12	On time
Mech. services available (via PAX)	02/05/13	On time
Sectional completion	30/10/13	On time

Please note: Milestones may complete early

 **T2B 13 by 13 Milestones**

# Why Balfour Beatty

## INDUSTRY DIFFERENTIATORS

- Proven Group capability (T5, T2B, Edinburgh Airport)
- Design and BIM capability in Parsons Brinckerhoff
- Unsurpassed track record in UK Construction Services
- Leading Health and Safety
- Caring approach to Sustainability



## BAA DIFFERENTIATORS

- Mature business-to-business relationship
- Proven delivery in complex airside restricted areas
- Understanding stakeholders' needs
- Long-term committed people delivering projects from options to operations
- Early Design Involvement has led to £30m reduction to budget

## DEVELOPING NEW DIFFERENTIATORS

- Multi disciplinary team involvement at outset of design
- Developing innovative solutions and sharing these across Balfour Beatty
- Bringing IT solutions together to create a best practice area - BIM development via Parsons Brinckerhoff
- Leading project management techniques via Parsons Brinckerhoff – from Office to Work Face and back again
- Modular M&E facility and design support



## Steven Morgan

Capital Projects Programme Director  
BAA

# Discussion with the customer

## Mike Peasland

Chief Executive Officer  
Construction Services UK

# Knowledge and integrated delivery as a key differentiator

# M74

Value £440m  
Completed June 2011

- Major Civil Engineering
- Regional Civil Engineering
- Regional Building



# A3 Hindhead

Value £289m  
Completed July 2011

- Civil Engineering
- Building Construction
- Mechanical & Electrical Systems



# Fife Hospital

Value £170m  
Completed Oct 2011

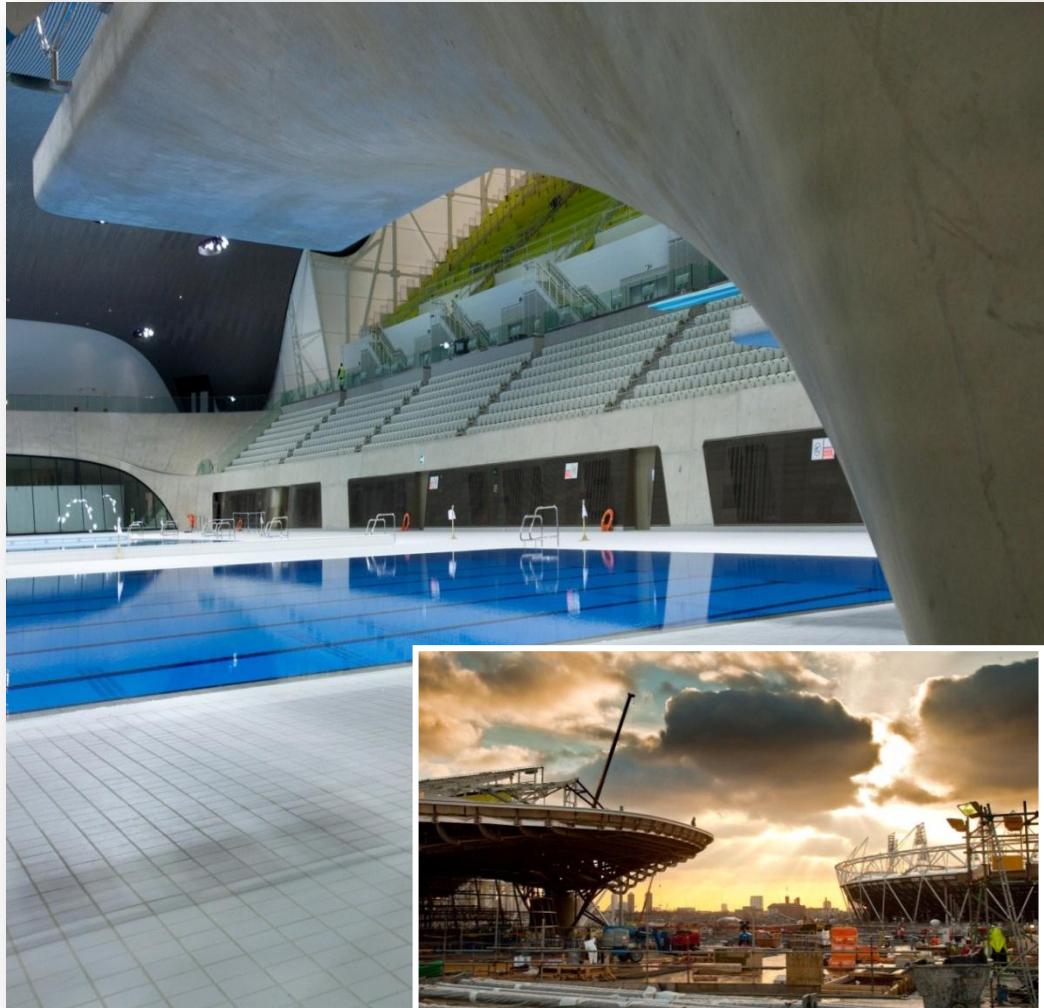
- Investments
- Construction
- Mechanical and Electrical Services
- FM Services



# Aquatics Centre

Value £265m  
Completed July 2011

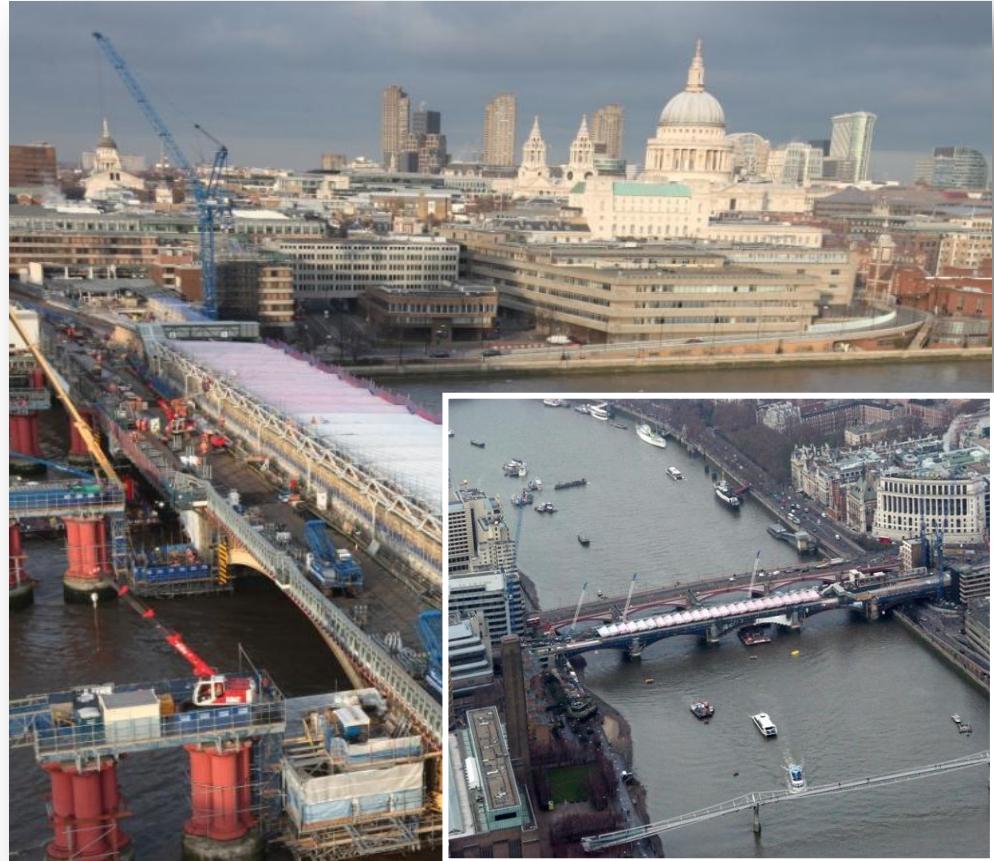
- Parsons Brinckerhoff
- Ground Engineering
- Civil Engineering
- Building Construction
- Mechanical and Electrical Services



# Blackfriars

Value £460m  
Construction in progress

- Parsons Brinckerhoff
- Civil Engineering
- Building Construction
- Mechanical and Electrical Services



# Major customers 2011

OLYMPIC  
DELIVERY  
AUTHORITY

 HIGHWAYS  
AGENCY

 ENVIRONMENT  
AGENCY

BAA 

 NetworkRail

  
upp  
University Partnerships  
Programme

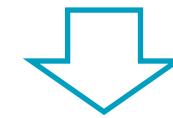
Department for  
**Education**

  
DEFENCE ESTATES  
Delivering Estate Solutions to Defence Needs

# Knowledge capability



## Customer asset knowledge



## Vertical markets

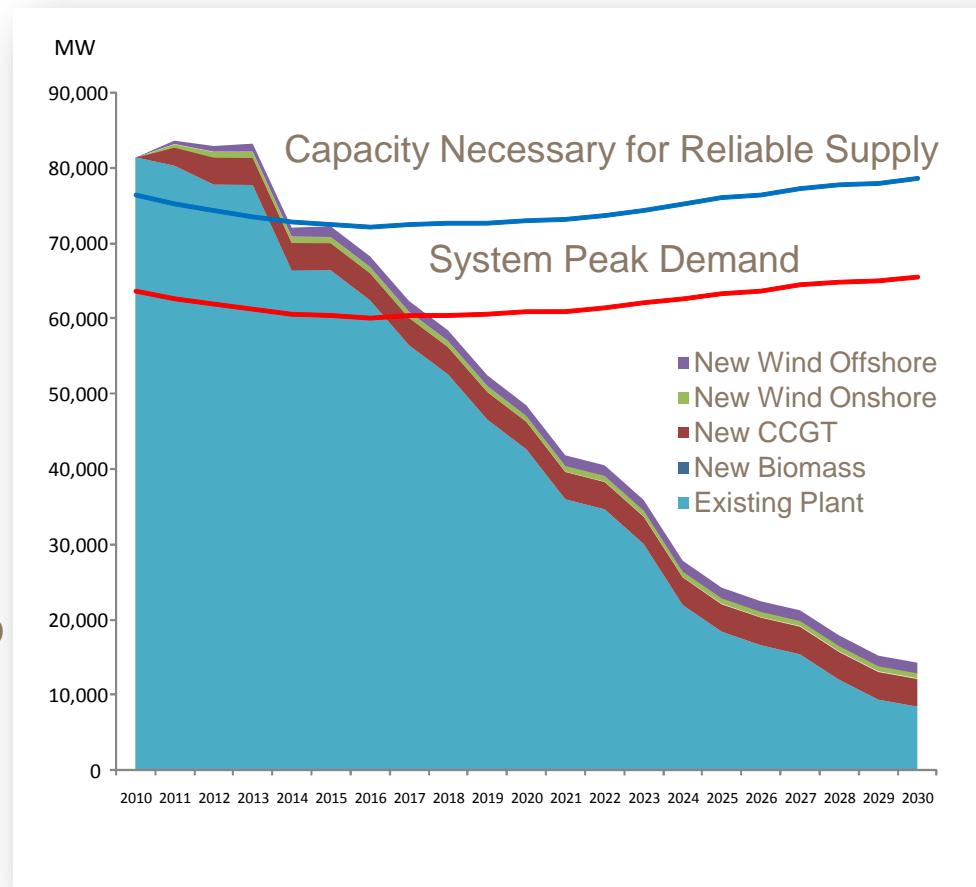
# Growth markets

- Energy
- New nuclear
- Rail

# Energy

# Energy gap

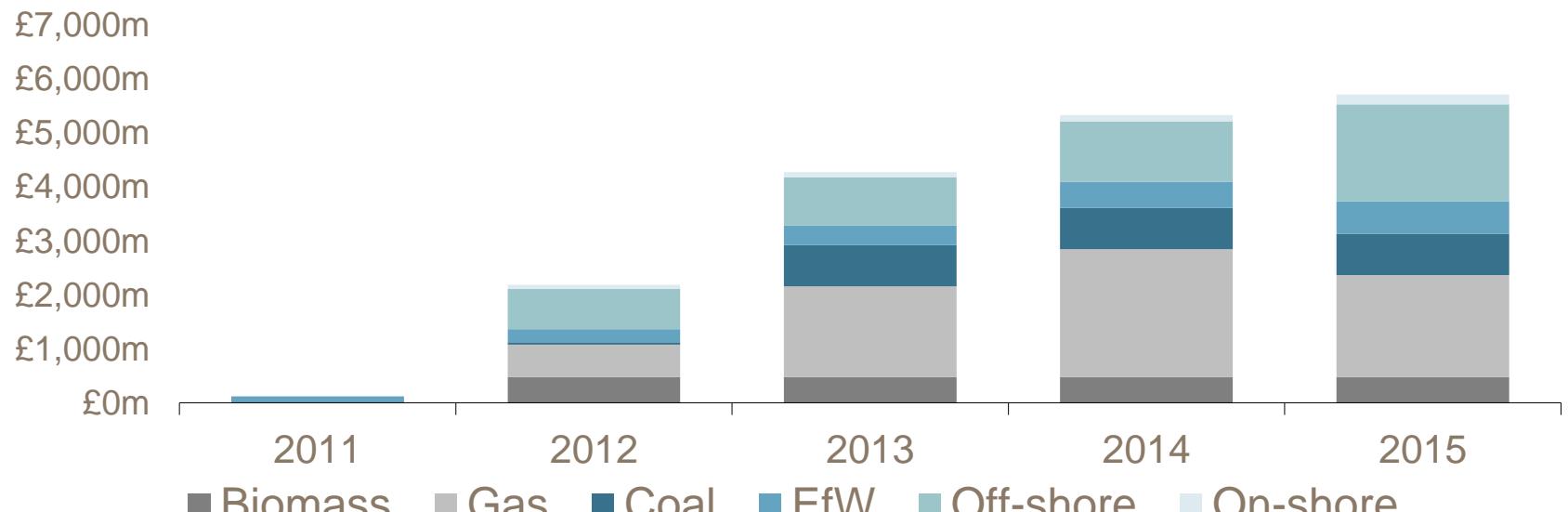
- Significant long-term growth anticipated as UK strives to manage key policy objectives
  - Security of supply
  - Reduction in carbon emissions (80% target by 2050)
  - Delivery of affordable energy
- Electricity Market Reform a key factor
- Demand for electricity expected to double by 2050 and substantially from low carbon sources by 2040
  - Utilising wind, new nuclear, carbon capture and storage, biomass and energy from waste initiatives



# Energy

- In the short term, the “energy gap” is anticipated to open up by 2015-2017 as existing coal and nuclear plants start closing
- Addressable market of some £6bn pa (excl. new nuclear) by 2015

## Addressable market

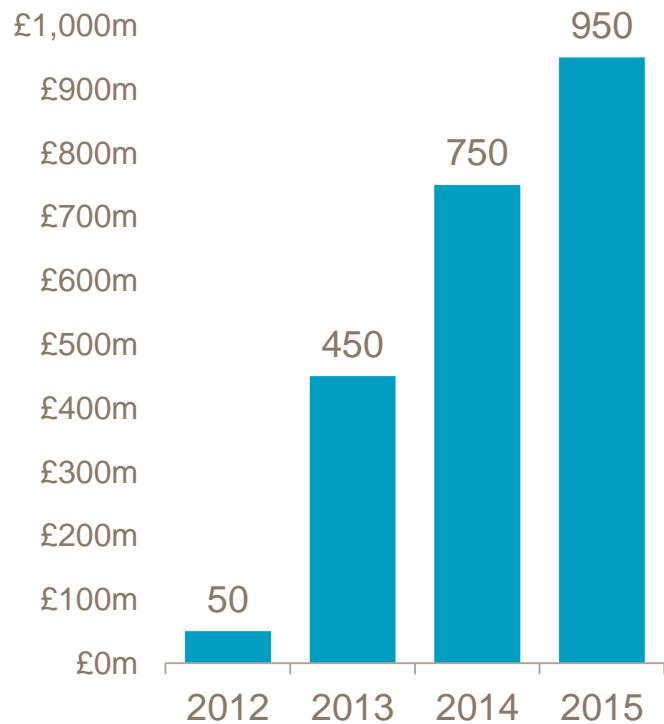


# New nuclear

# New nuclear

- Growth market as low carbon alternative energy source to meet UK demand
  - Ageing nuclear and coal plants to come offline
- Coalition government has adopted pro-nuclear stance with eight sites identified for investment over next 20 years
  - £100bn (of which construction work some £40bn)
- Intention that first of new stations will come online by 2017
  - First two projects will be Hinkley Point and Wylfa
- Key issue is Energy Market Reform and commercial viability
- Fukushima not seen as significant barrier to progress
- Ongoing accessible market to Balfour Beatty of c. £1bn pa
- Balfour Beatty well placed through experience at Sellafield and collaboration with Vinci
- Growth plans assume revenues from 2014 onwards

Addressable market



# Rail

# Rail

- Sector left relatively unscathed by CSR despite £1bn scope reduction on Crossrail and output expected to increase significantly given anticipated 30% passenger growth in mainline rail to 2017
- Investment to exceed that for Roads for the first time on record
- Network Rail funding of £34.6bn under CP4 (2009-14) although cuts of c.£5bn likely under CP5 (2014-19)
- CSR confirmed allocation of £750m for design works on High Speed Rail 2, £5.5bn Thameslink project also confirmed
- Major upgrade programme being undertaken by London Underground through to 2017/18 with £8.6bn spend on enhancement and renewals
- Accessible construction spend of £2.5bn pa by 2015

# Andrew McNaughton

Chief Operating Officer

# Knowledge transfer and inter-divisional synergy

# Knowledge transfer

- Broad capability across the life cycle of key infrastructure assets
- Deep asset knowledge
- Transferring knowledge
  - Drives innovation
  - Creates opportunity by differentiating us

# BAA

- Offsite manufacturing process
- BIM modelling
- Manufacturing and assembly facility in Wednesbury
- Design innovation
- Value to customer



# Birmingham Hospital

## Modelling and modular construction

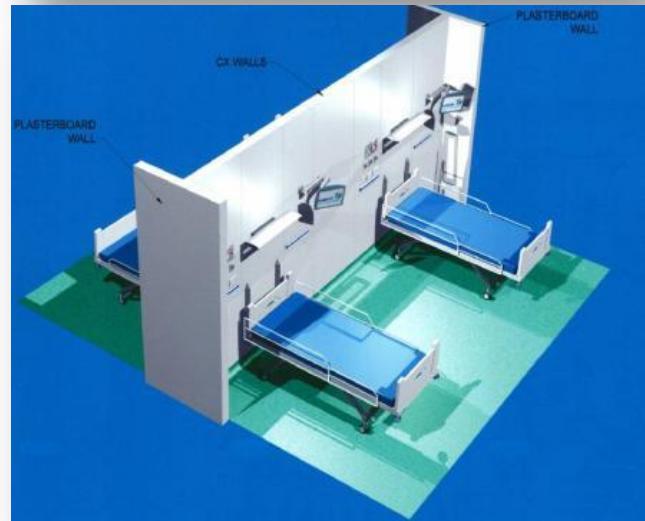
- BIM model-enabled development
- Prefabrication and pre-assembly of M&E systems
- Applied to quality, commissioning risk management and efficiency
- Cladding and curtain walling



# Birmingham Hospital

## Hospital knowledge applied to design

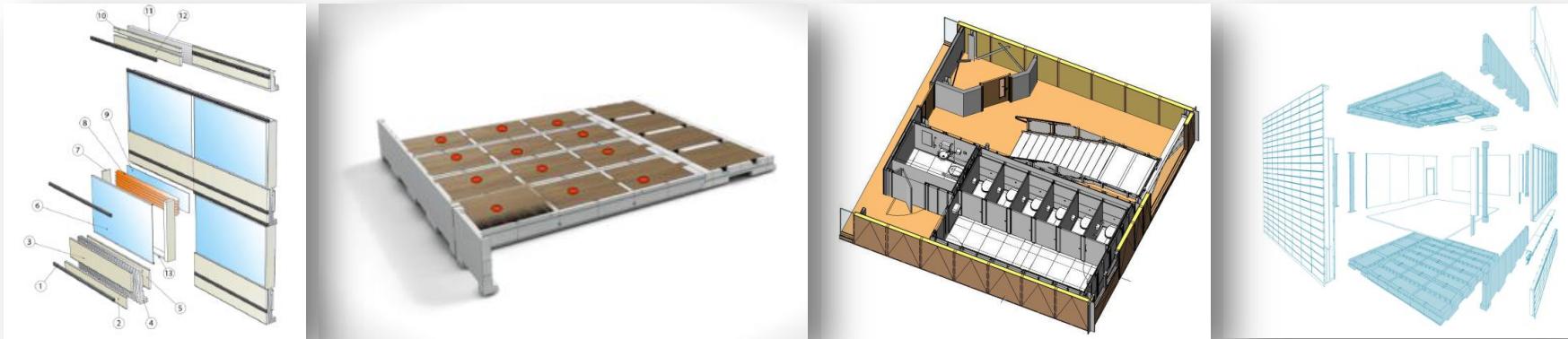
- Integrated modular walls in wards and operating theatres
- Simplifies installation
  - Electrical systems and medical gasses
- Interfaces with modules and modular wiring
- Experience of owning and operating hospitals



# Education sector

## Reducing the cost of delivery

- Designed a system build model that allows flexibility
- Now being used at Hertfordshire Schools
- Thought leadership in the industry
  - Submitted to the Department of Education's Capital Review



# Energy sector

## New service offerings through asset knowledge

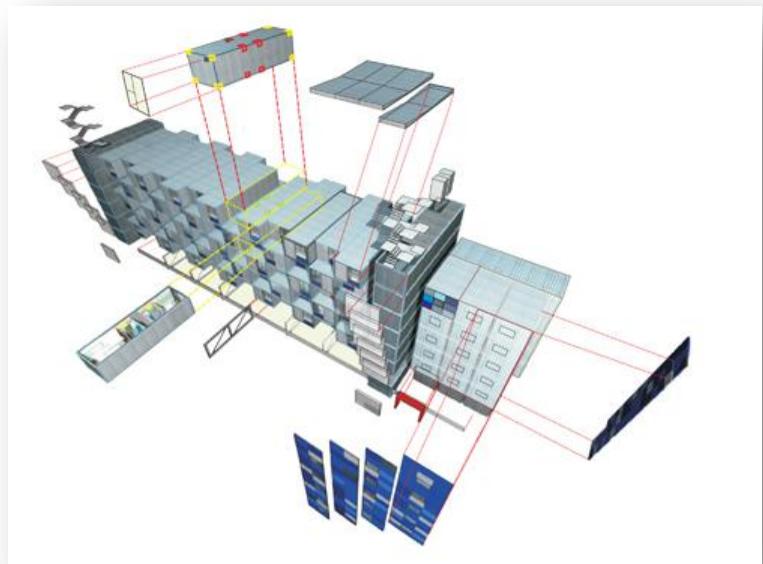
- Energy services company model developed by Support Services
- Making improvements to assets to reduce energy consumption



# Parkland Hospital, Dallas

## Knowledge transfer to the US

- Prefabrication knowledge transfer
- Manufacturing facility in Texas commences in February 2012
- Operational savings
- Market differentiation in US building sector with BIM modelling



# Abu Dhabi BK Gulf

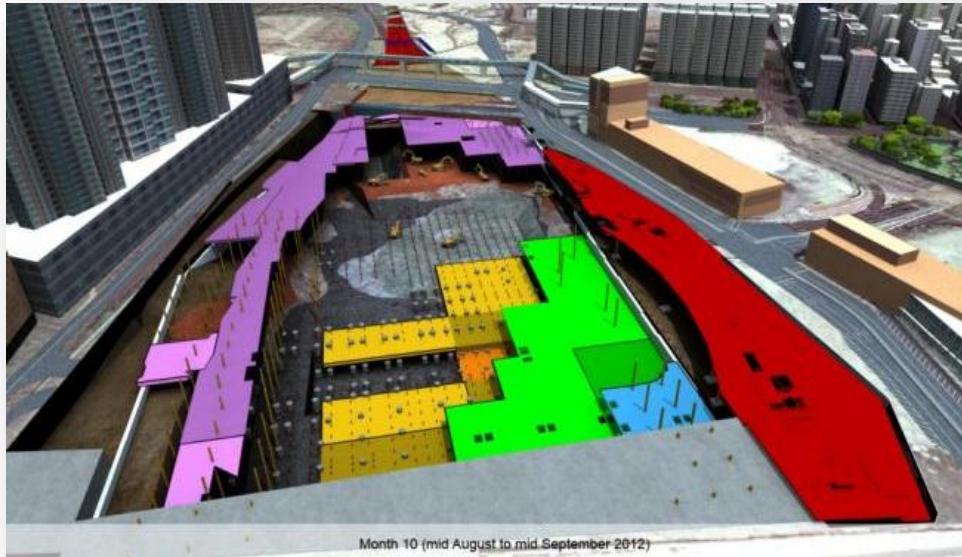
- Trialled in Dubai three years ago
- Servicing ongoing M&E contracts across the UAE
- Crowne Plaza Hotel in Abu Dhabi completed 18 months ago
  - Traditional construction required 1200 people
  - Was completed with under 1000 with offsite assembly



# BIM modelling in infrastructure projects

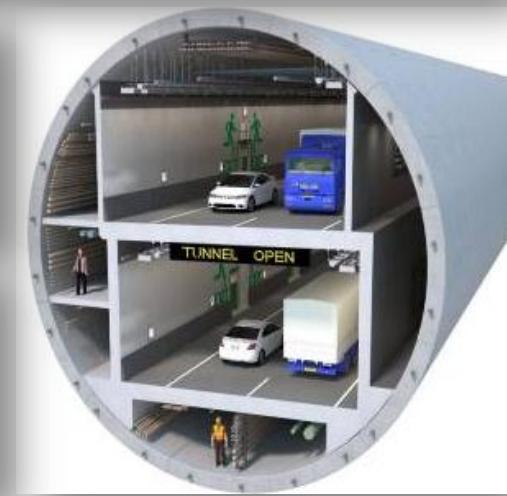
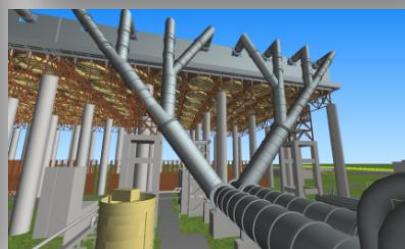
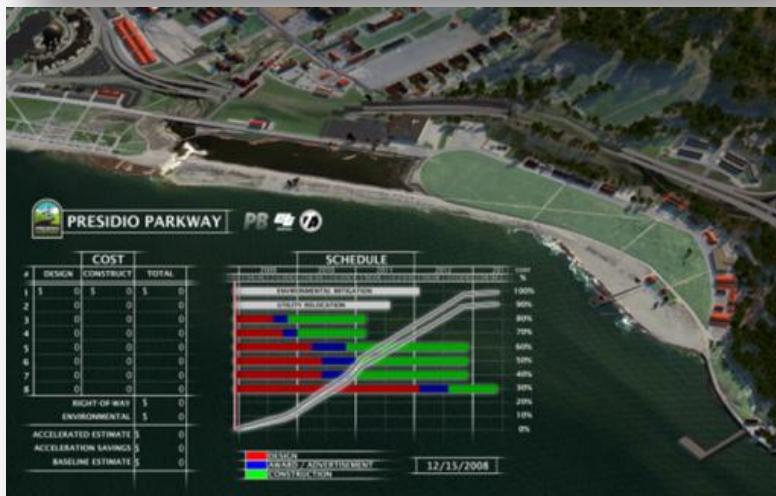
## Hong Kong West Kowloon Terminus

- Differentiation through:
  - Clarity of design
  - Management of risk and quality
  - Confidence in delivery



# Transportation infrastructure

## Use of knowledge as a differentiator



# Rail

## Denver P3 project

- Developed capability in rail projects and maintenance in the US
- Position enhanced significantly with the acquisition of PB
  - Design
  - Project management
  - Systems integration



# Delivery capability transferred to PB

- Knowledge and experience of upgrading the London Tube network
- Key factor in PB becoming the programme manager for Washington MTA



# Bringing wider capability together in rail

- Rail design and rail delivery
- Civil, building and M&E capability
- Solution to East Kent Spur for Crossrail
- One integrated team for Network Rail



# Integrated capability in Australia

- PB and Rail Construction
- Design and construction capability in JV with civil contractor
- Unique proposition in Australia



# Conclusion

- Integration of capability
- Transferring knowledge
- Applicable to many sectors from rail and transportation through to power and natural resources
- Increasing breadth of business opportunity

# Forward-looking statements

This presentation may include certain forward-looking statements, beliefs or opinions, including statements with respect to Balfour Beatty plc's business, financial condition and results of operations. These forward-looking statements can be identified by the use of forward-looking terminology, including the terms "believes", "estimates", "plans", "anticipates", "targets", "aims", "continues", "expects", "intends", "hopes", "may", "will", "would", "could" or "should" or, in each case, their negative or other various or comparable terminology. These statements reflect the Balfour Beatty plc Directors' beliefs and expectations and involve risk and uncertainty because they relate to events and depend on circumstances that may or may not occur in the future. A number of factors could cause actual results and developments to differ materially from those expressed or implied by the forward-looking statements, including, without limitation: developments in the global economy; changes in UK and US government policies, spending and procurement methodologies; and the failure in Balfour Beatty's health, safety or environmental policies.

No representation is made that any of these statements or forecasts will come to pass or that any forecast results will be achieved. Forward-looking statements speak only as at the date of the relevant materials and Balfour Beatty plc and its advisers expressly disclaim any obligations or undertaking to release any update of, or revisions to, any forward-looking statements in the materials. No statement in the presentation is intended to be, or intended to be construed as, a profit forecast or to be interpreted to mean that earnings per Balfour Beatty plc share for the current or future financial years will necessarily match or exceed the historical earnings per Balfour Beatty plc share. As a result, you are cautioned not to place any undue reliance on such forward-looking statements.