

Sharing knowledge

Heathrow Terminal 2B Site Visit

7 December 2011



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

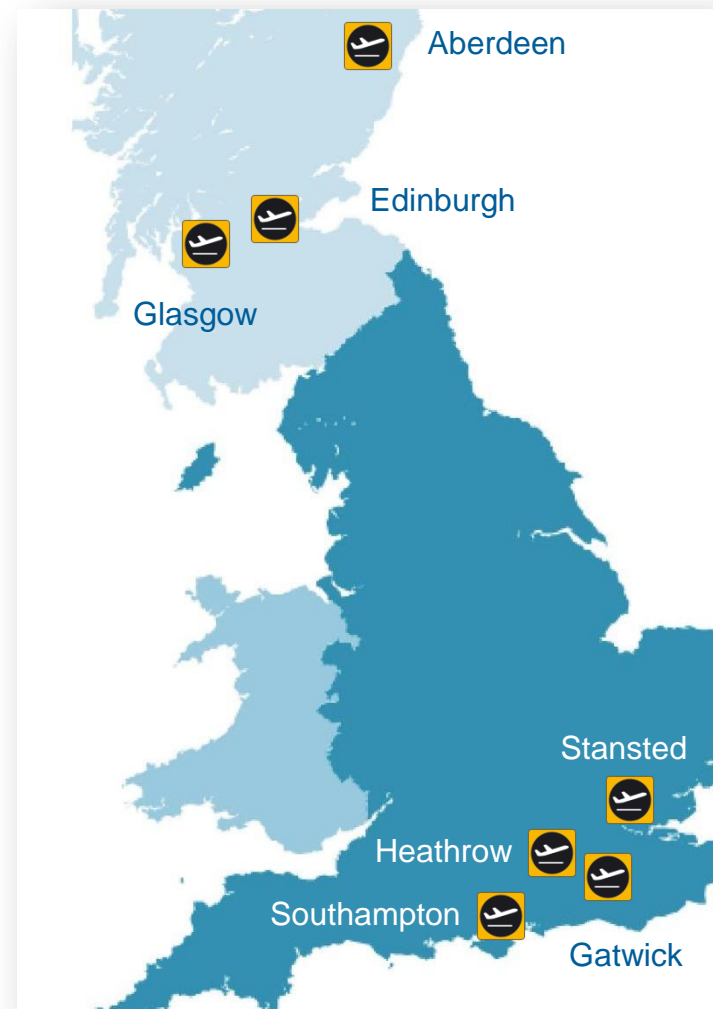
Balfour Beatty

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

Existing Western Campus

T5A

T5B

T5C

Existing Central Area

T3

T1

New Eastern Campus

T2A

T2B



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



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



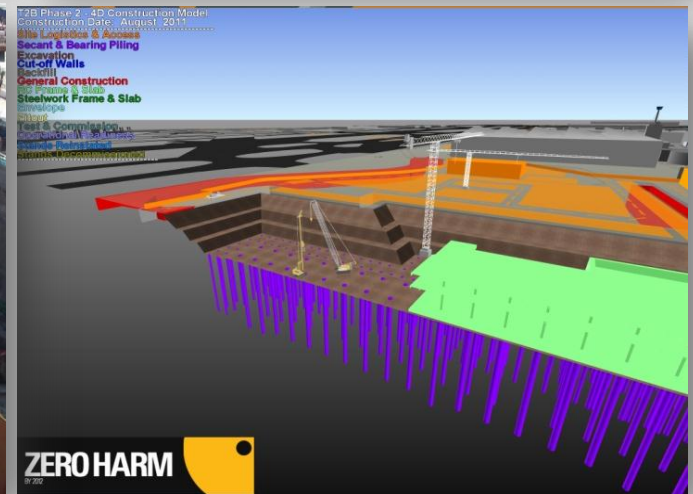
T2B Phase 2 – Being delivered by Balfour Beatty

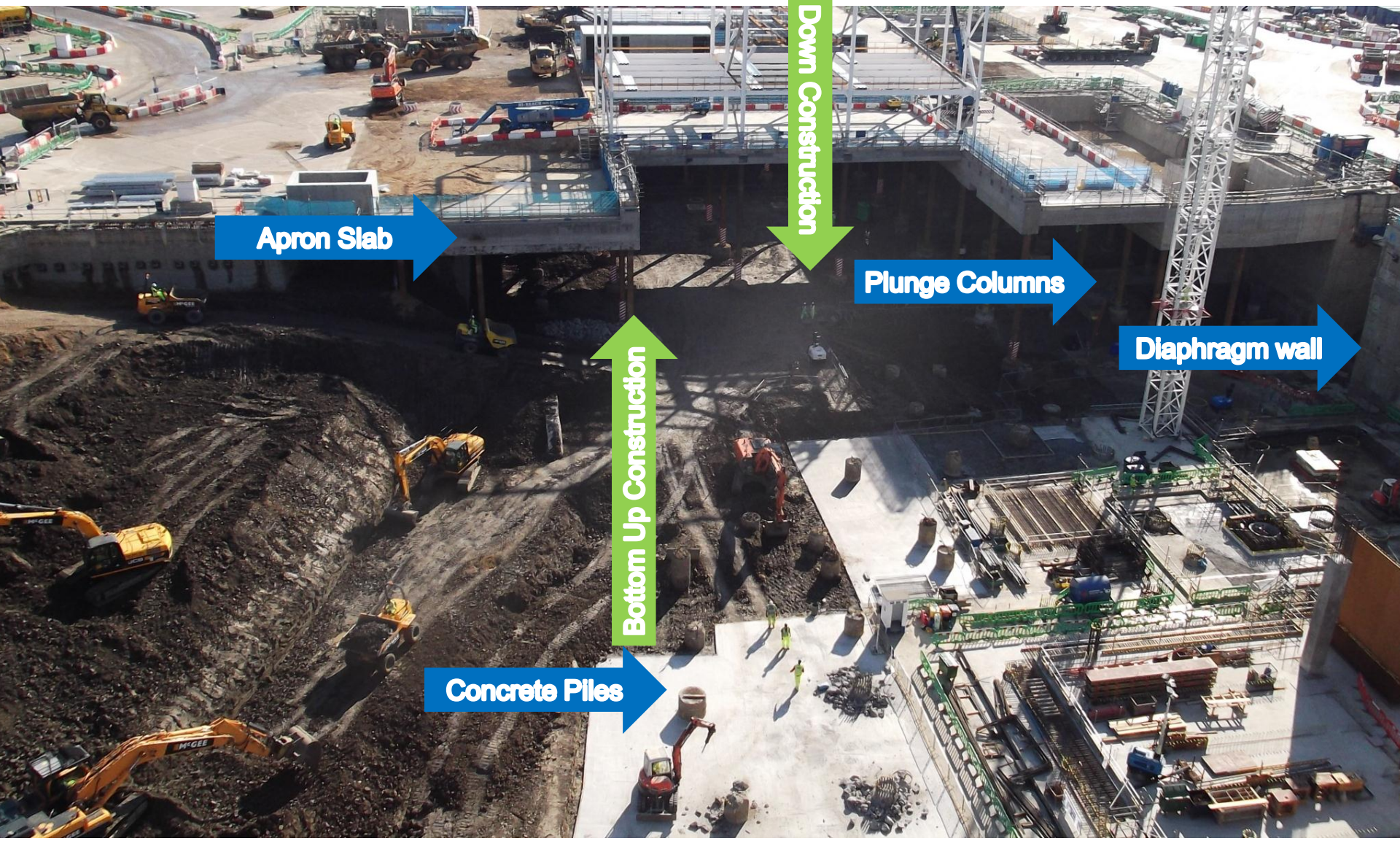
- 10 more aircraft stands
- Retail provision of approx. 1,275m²
- 3 CIP lounges with 3,600m² floor area
- 4,000m² of airline ops accommodation
- Safeguarded baggage basement
- Underground passenger access tunnel
- Safeguarding for future Track Transit System and baggage to T2C



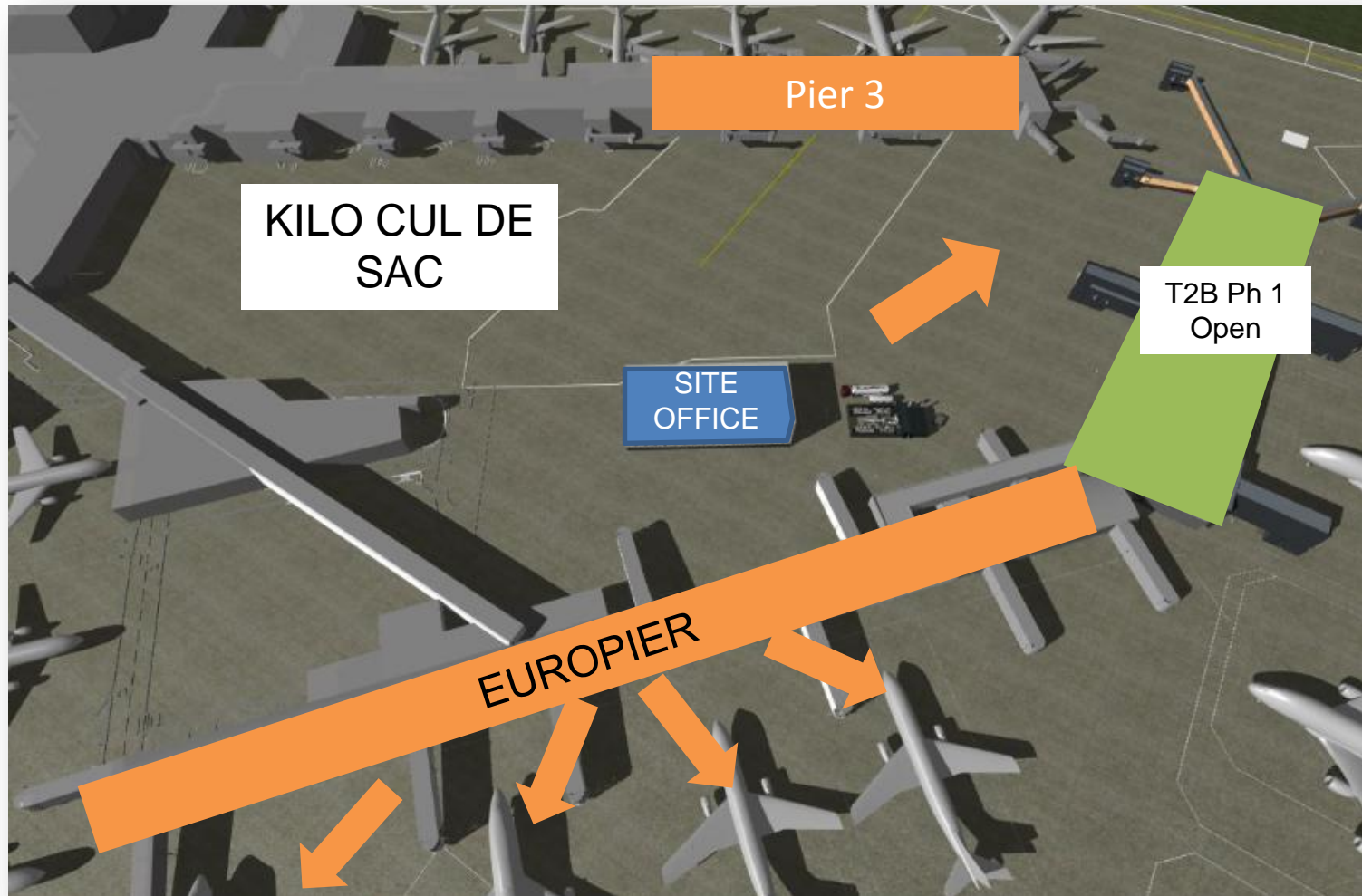
T2B Phase 2 – Programme challenge

- 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

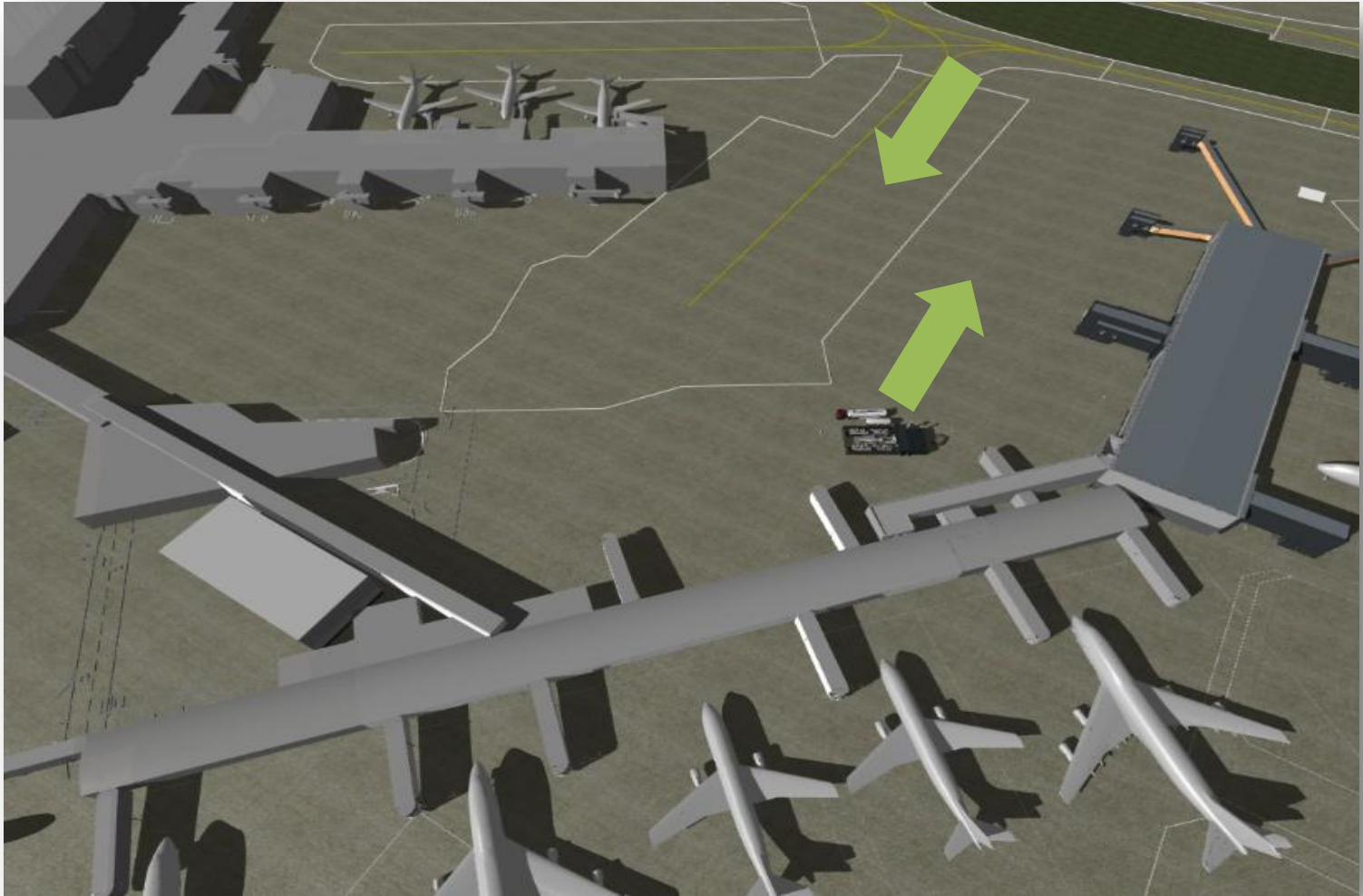




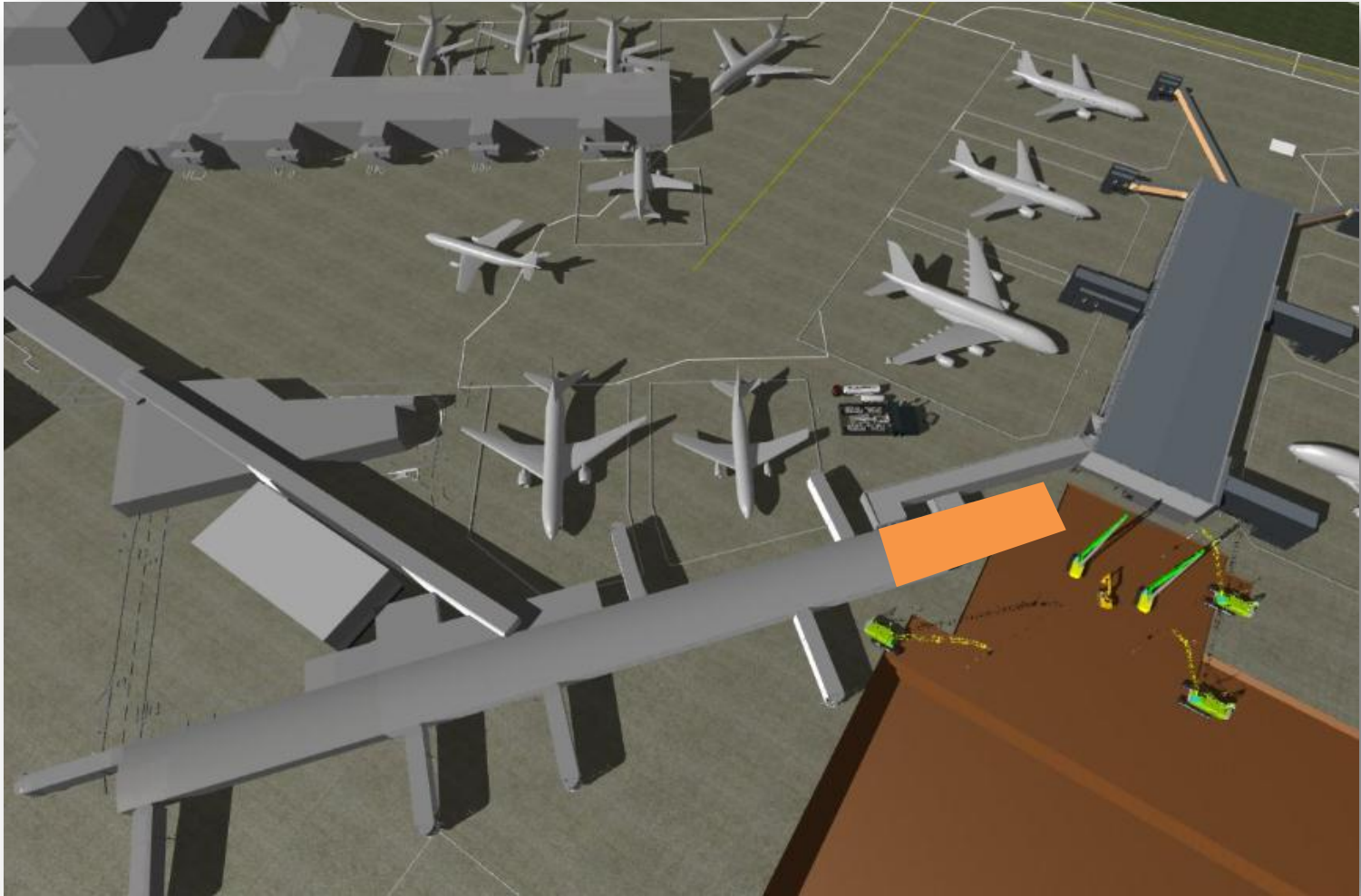
Enabling phase 2 – the October 2010 story



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 m³ of excavation (15m deep)
- 165,000 m³ 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



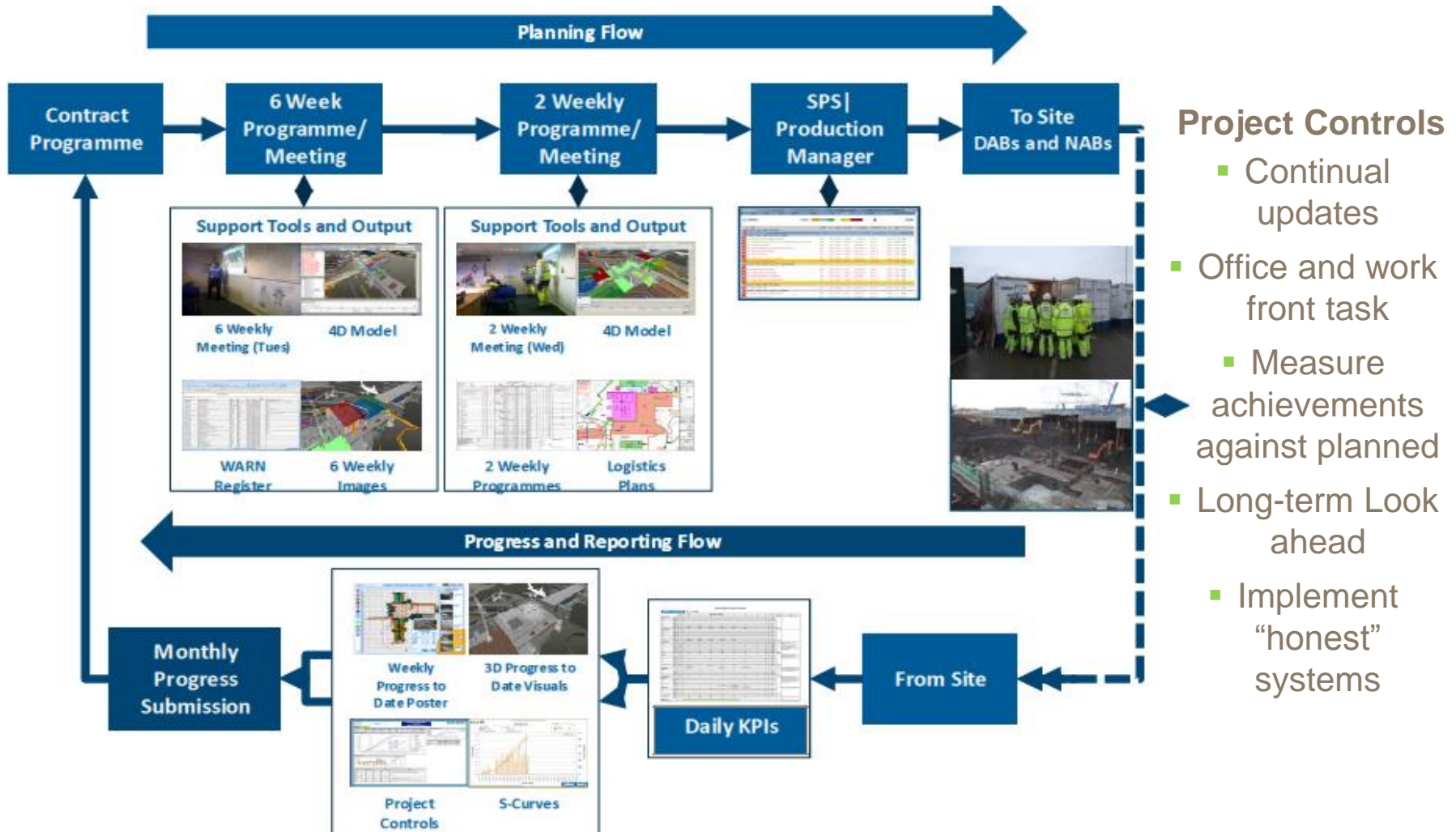
Capital Safety League Table September & October 2011

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

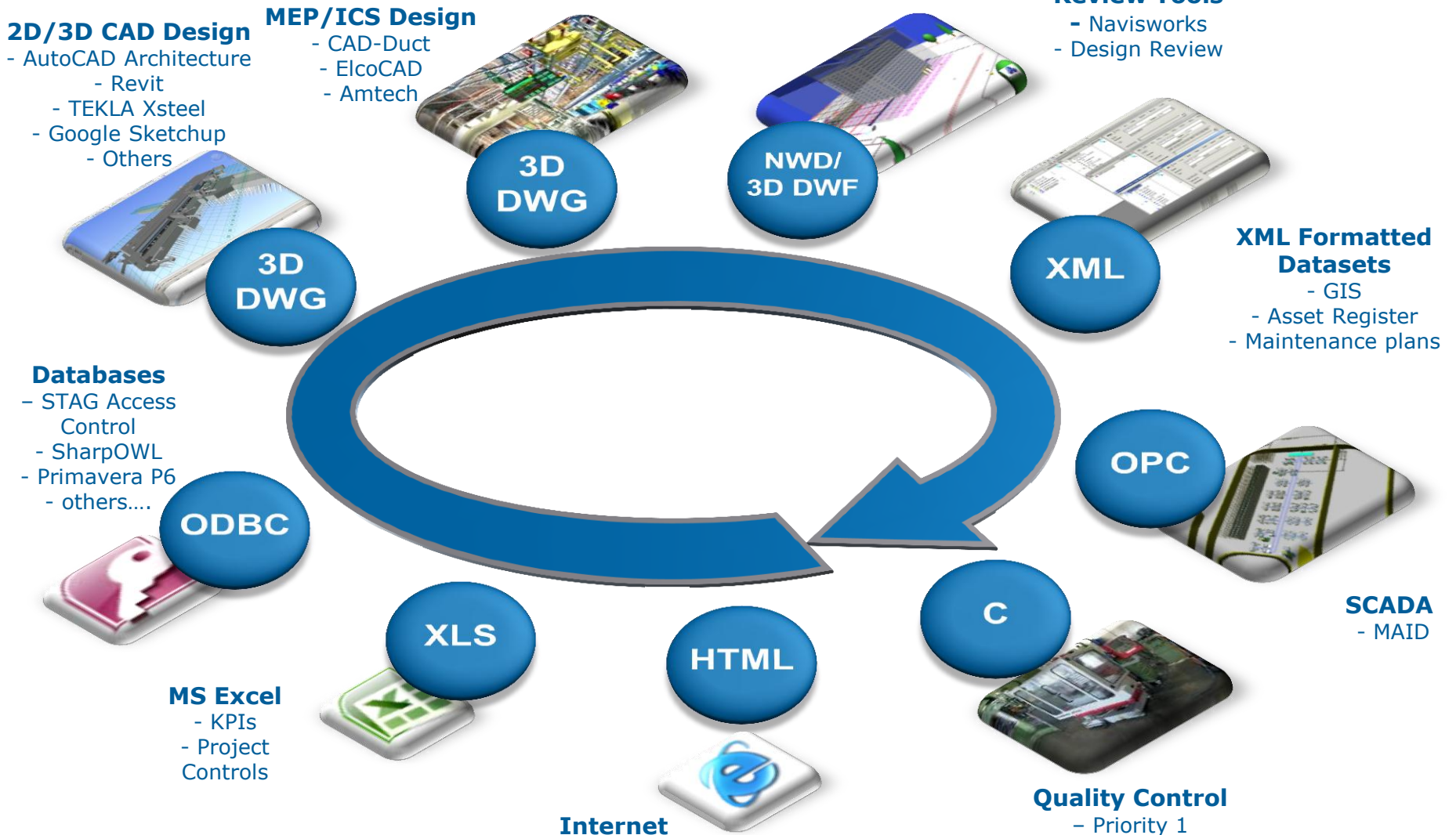
BAA Suppliers Safety League

2010	BBG 1st Position	8/12 Months
2011	BBG 1st Position	9/9 Months
		17/21 Months

Effective project controls

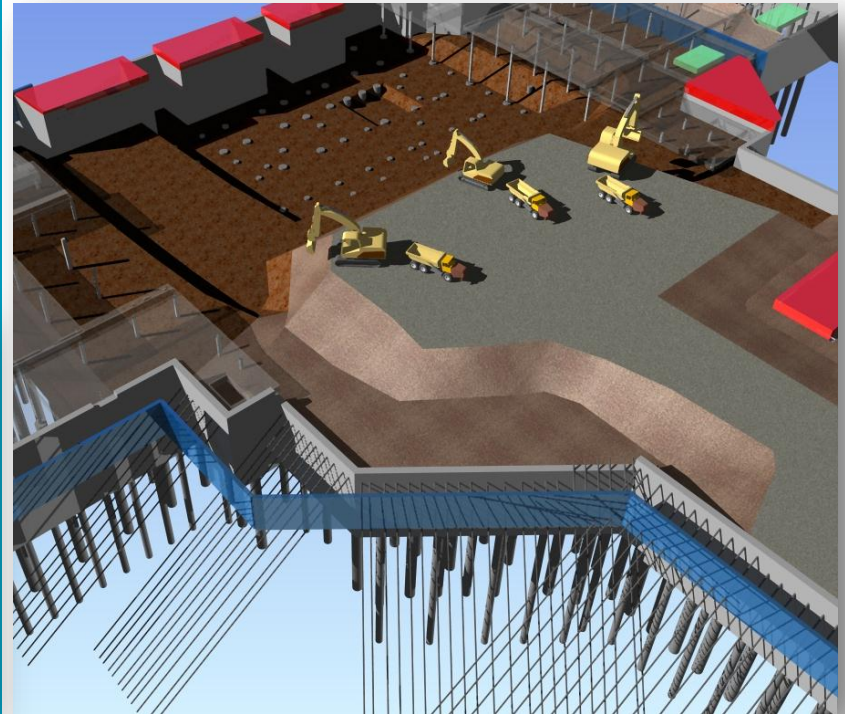


Systems map – Realising BIM



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



Balfour Beatty

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

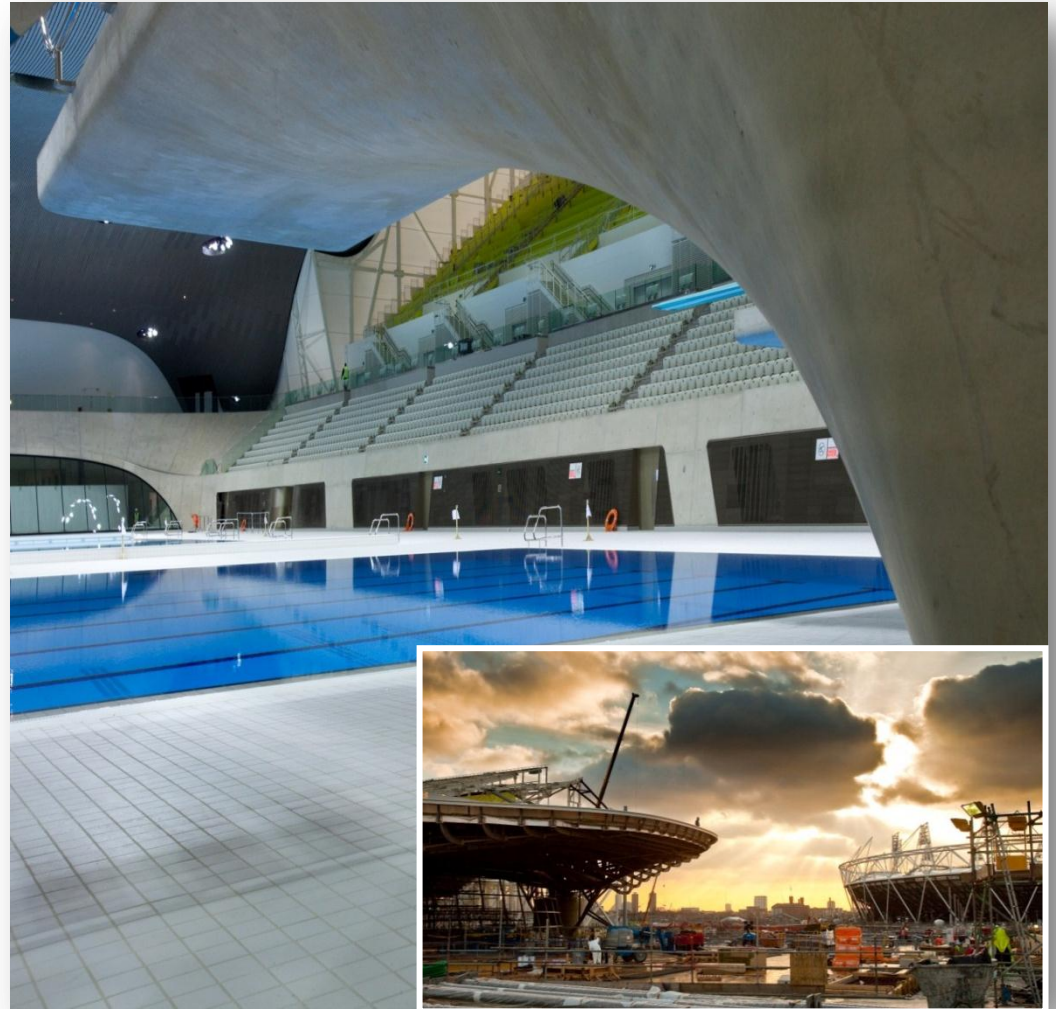


Aquatics Centre

Value £265m

Completed July 2011

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

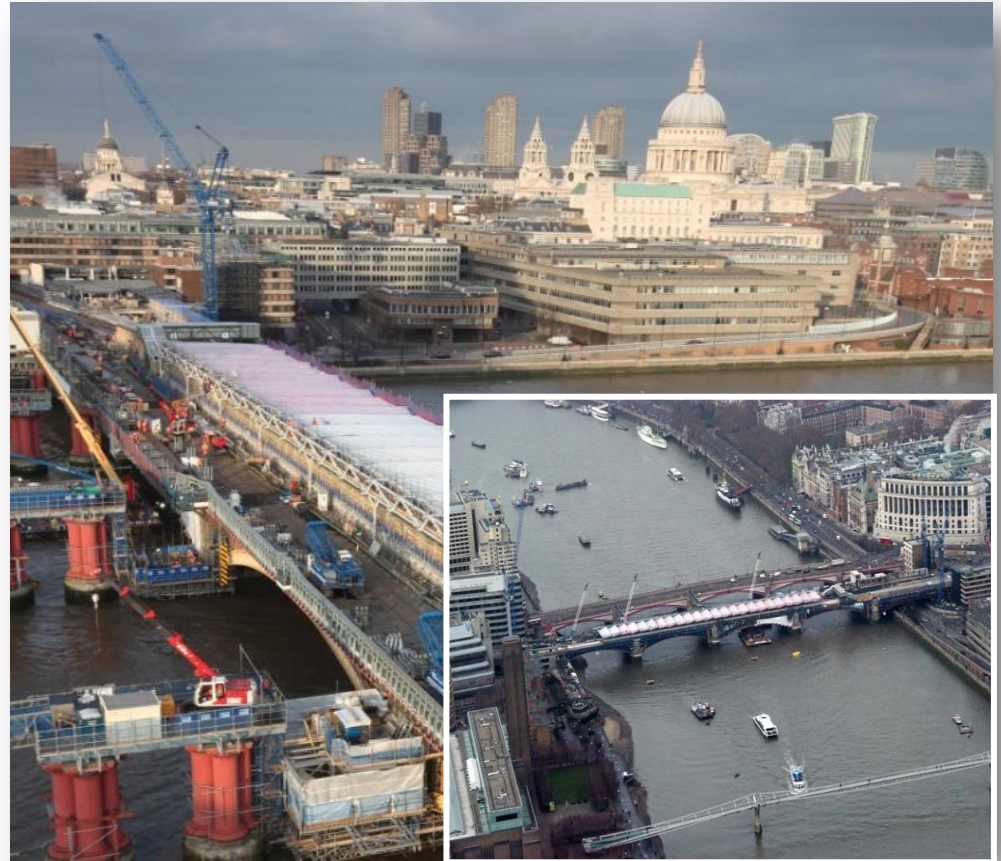


Blackfriars

Value £460m

Construction in progress

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



Major customers 2011



Knowledge capability



Customer asset knowledge



Vertical markets

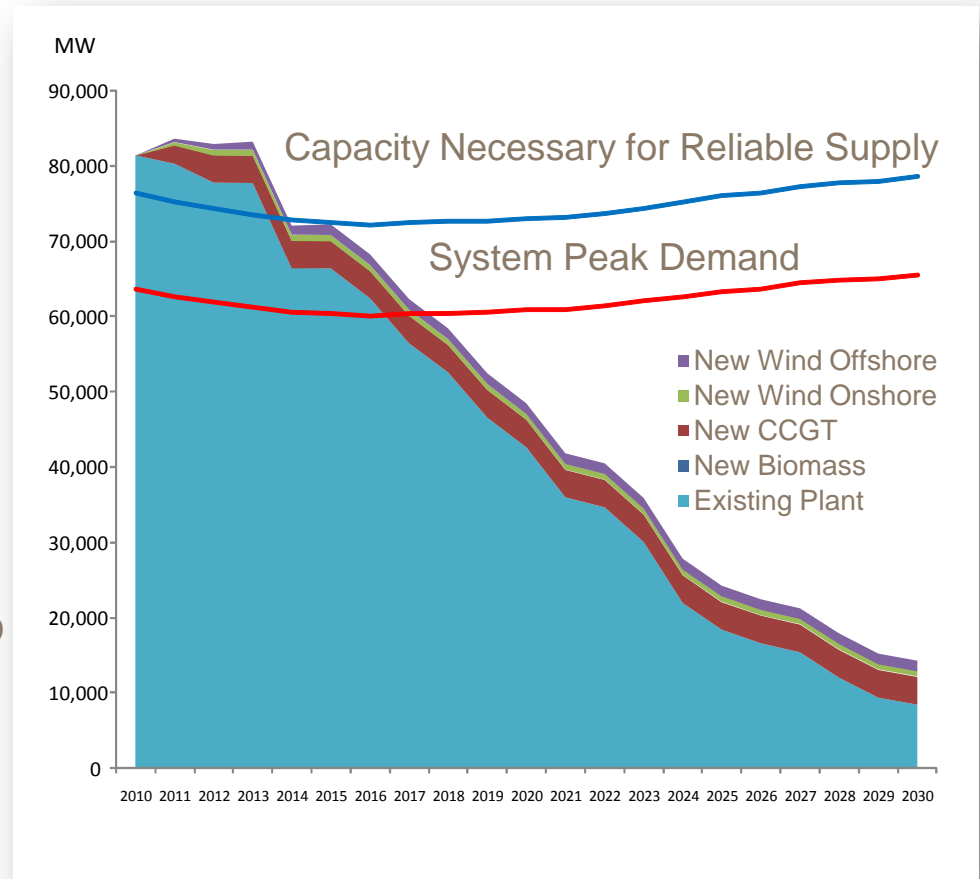
Growth markets

- Energy
- New nuclear
- Rail

Energy

Energy gap

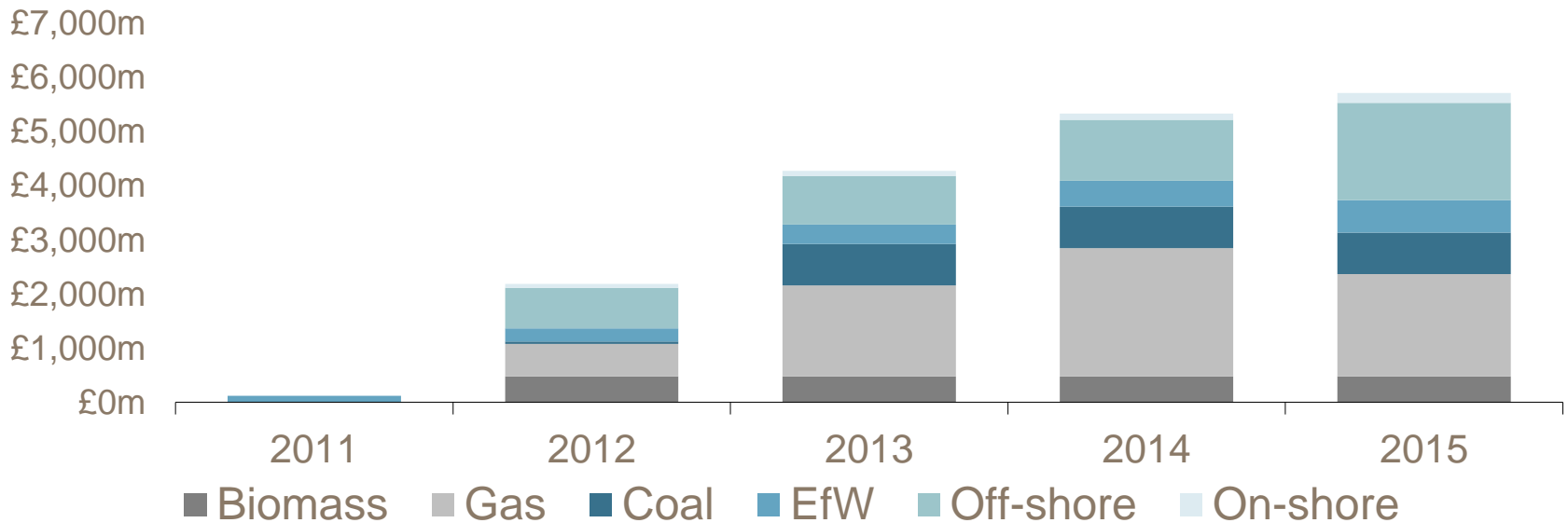
- Significant long-term growth anticipated as UK strives to manage key policy objectives
 - Security of supply
 - Reduction in carbon emissions (80% target by 2050)
 - Delivery of affordable energy
- Electricity Market Reform a key factor
- Demand for electricity expected to double by 2050 and substantially 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

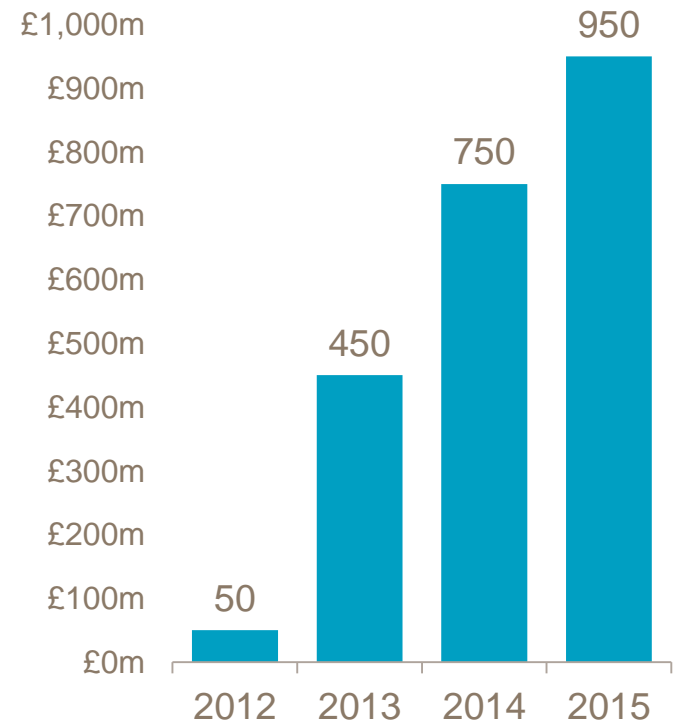


New nuclear

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

Balfour Beatty

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

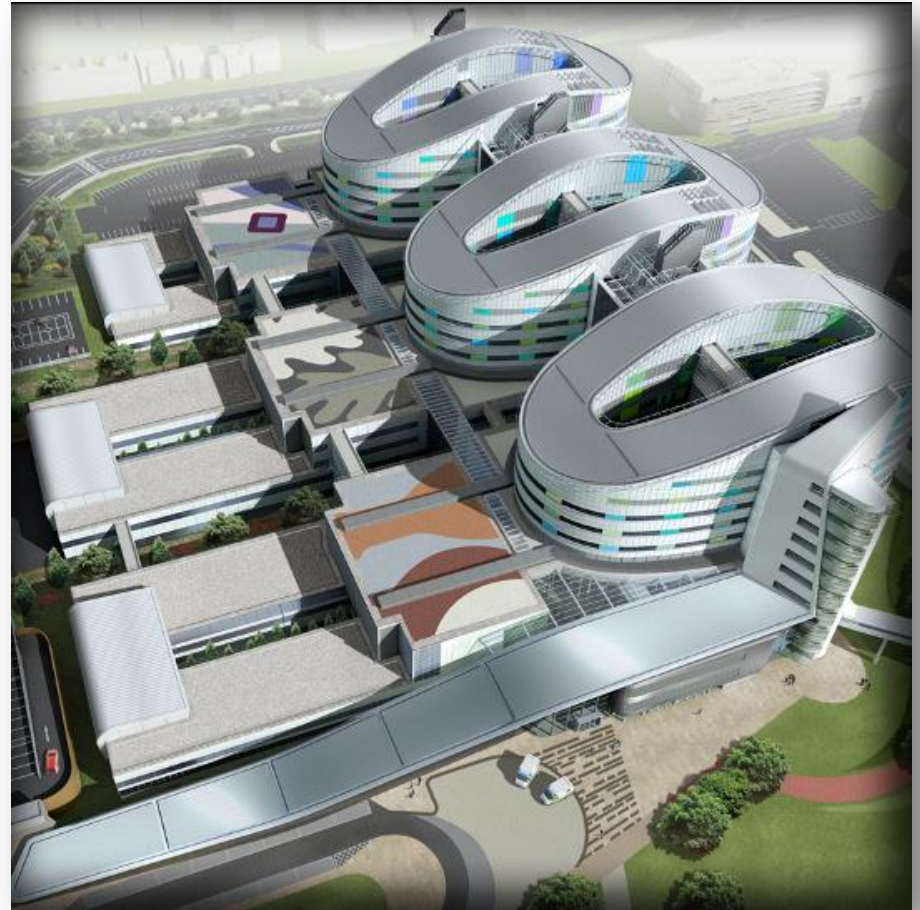
- Offsite manufacturing process
- BIM modelling
- Manufacturing and assembly facility in Wednesbury
- Design innovation
- Value to customer



Birmingham Hospital

Modelling and modular construction

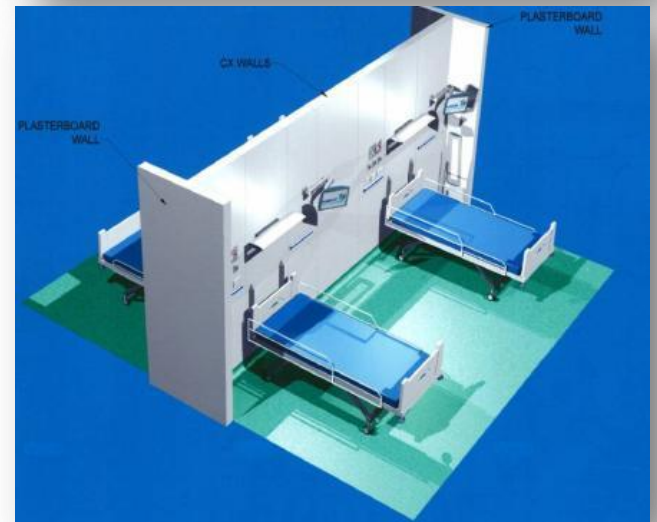
- BIM model-enabled development
- Prefabrication and pre-assembly of M&E systems
- Applied to quality, commissioning risk management and efficiency
- Cladding and curtain walling



Birmingham Hospital

Hospital knowledge applied to design

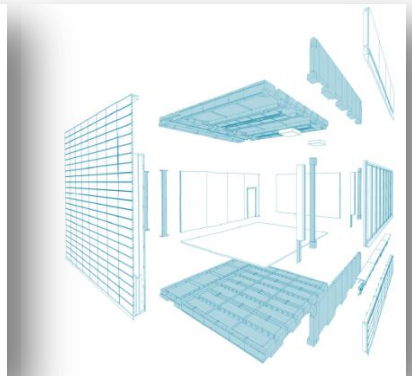
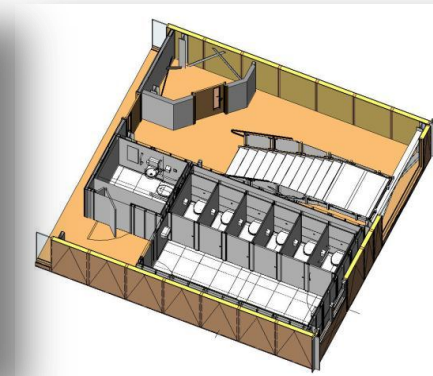
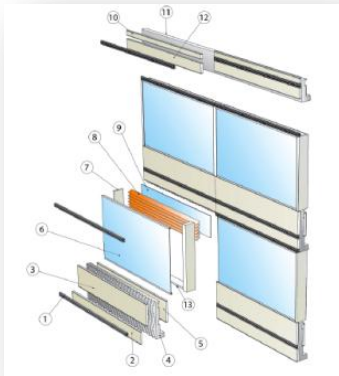
- Integrated modular walls in wards and operating theatres
- Simplifies installation
 - Electrical systems and medical gasses
- Interfaces with modules and modular wiring
- Experience of owning and operating hospitals



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

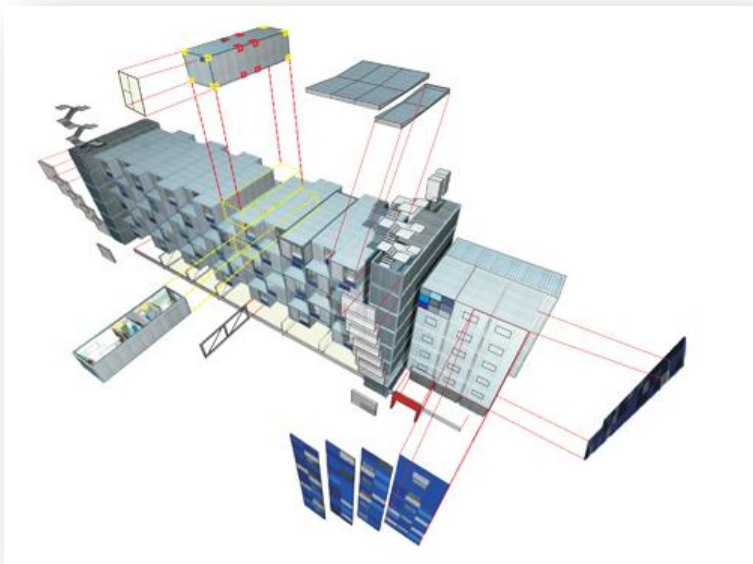
- Energy services company model developed by Support Services
- Making improvements to assets to reduce energy consumption



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

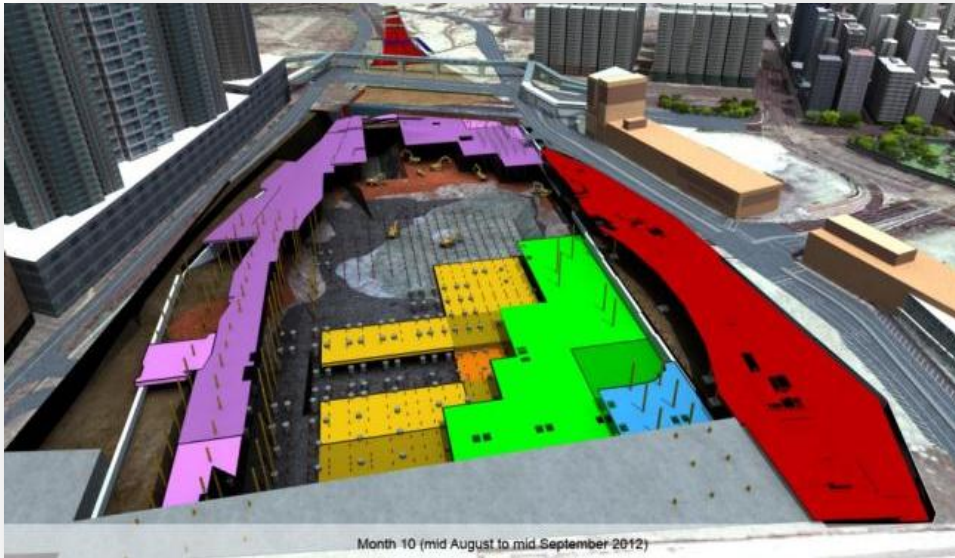
- Trialled in Dubai three years ago
- Servicing ongoing M&E contracts across the UAE
- Crowne Plaza Hotel in Abu Dhabi completed 18 months ago
 - Traditional construction required 1200 people
 - Was completed with under 1000 with offsite assembly



BIM modelling in infrastructure projects

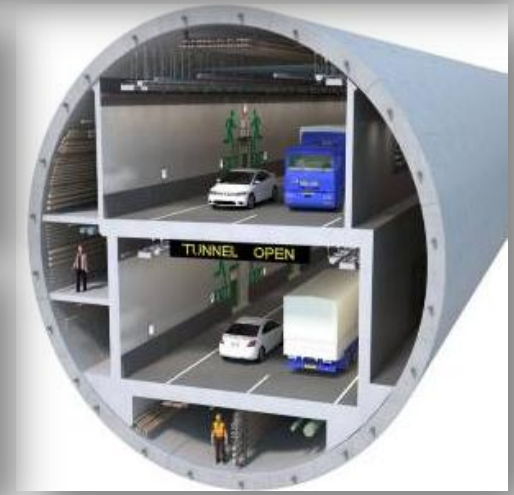
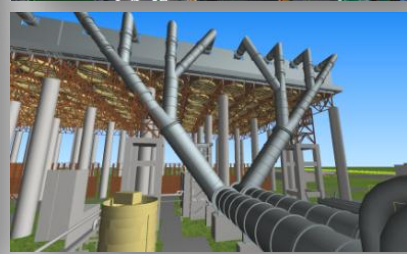
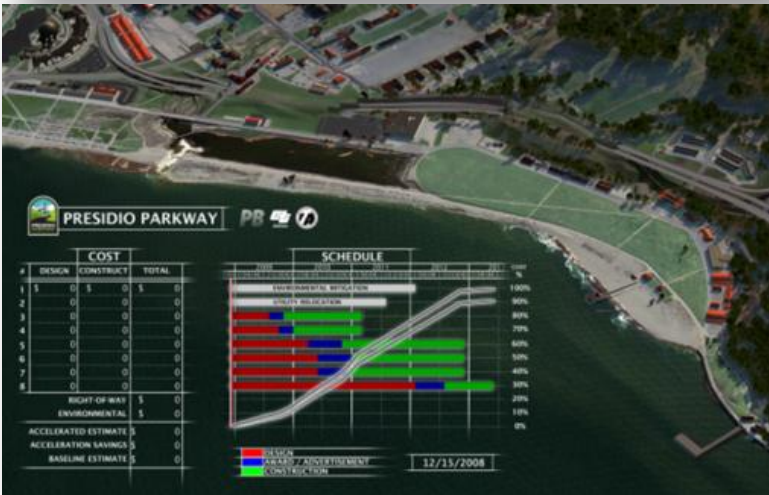
Hong Kong West Kowloon Terminus

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



Transportation infrastructure

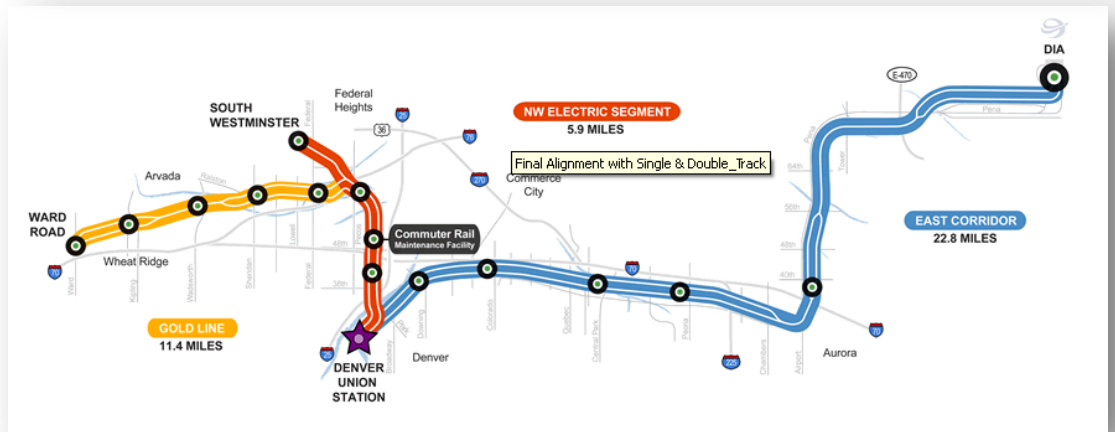
Use of knowledge as a differentiator



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

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