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24th October 2018

Agenda

1. Introduction
2. Crossrail Overview
3. Rail Systems Work and My Role
4. Experiences and Thoughts
5. Questions

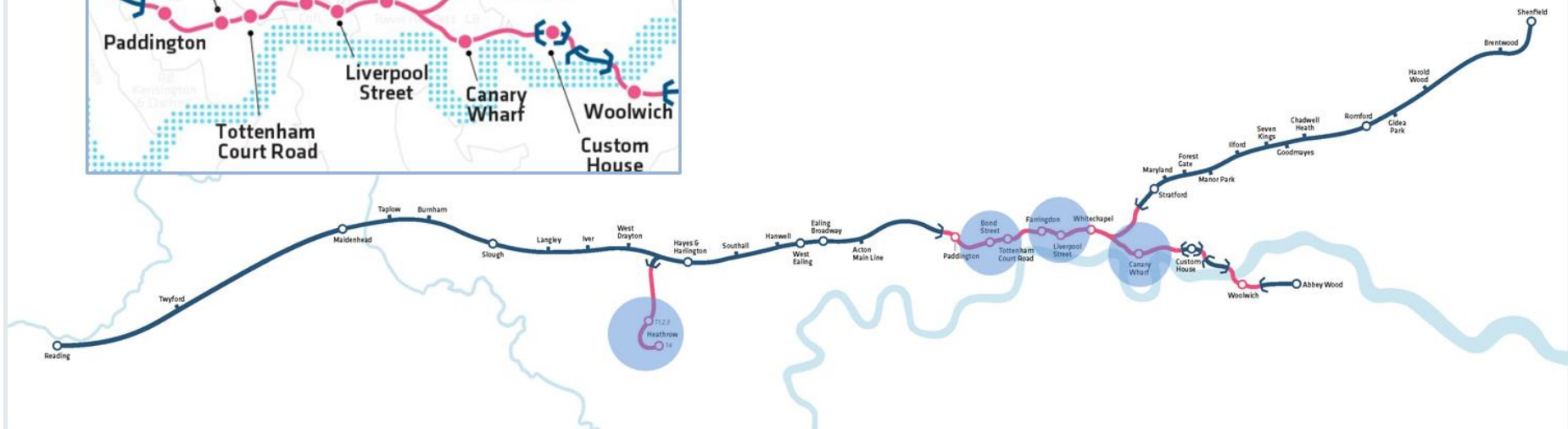
Introduction



- MEng Civil Engineering, Newcastle University
- British Army Officer College
- Bechtel Corporate Office, London
- New Hamad International Airport, Qatar
- Dulles Corridor Metrorail Project, USA
- Silicon Valley Rail, USA
- Crossrail, UK



The Route



£14.8bn
cost

£42bn
net benefit

118 km
length

40 (10 new)
stations

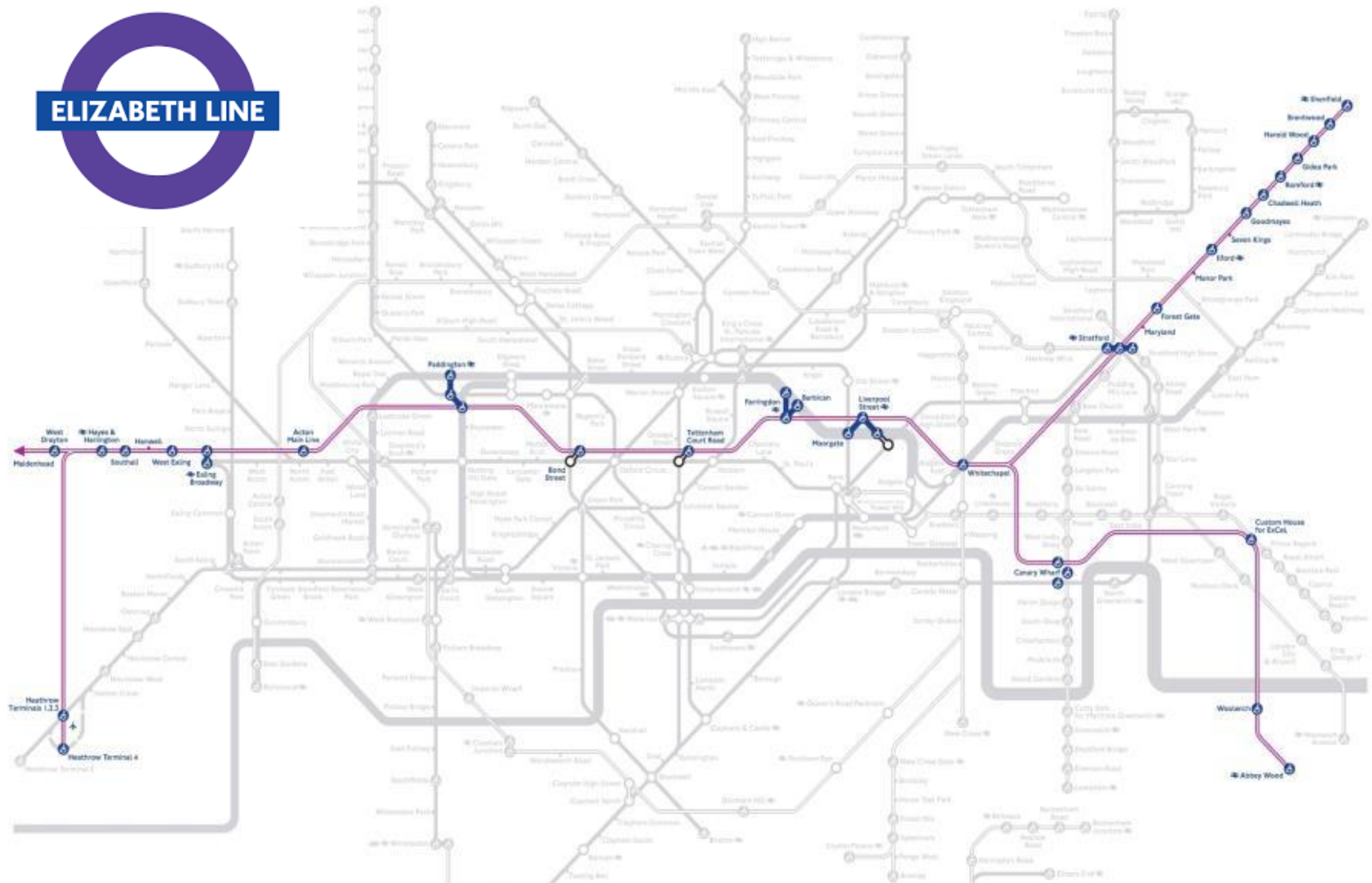
24
Trains/hour

200m
journeys pa

Crossrail on the Tube Map



ELIZABETH LINE



Crossrail in Numbers



- Europe's largest construction project
- 90 million working hours so far
- 1000s of business and job opportunities including 400 apprenticeships
- Will increase central London rail capacity by 10%
- Will bring extra 11.5 million people to w/in 45mins of central London
- Trains to start late 2019



Crossrail's Stations



- **40** Crossrail stations
- **10 new** stations in central London
- Canary Wharf station is the most developed



Crossrail's Trains

- 200m long
- **1,500 passengers** will be able to travel on each Crossrail train
- Interconnecting carriages provide more space inside
- Bombardier Transportation are building the trains in Derby
- Air- conditioned energy efficient



Crossrail's Environment



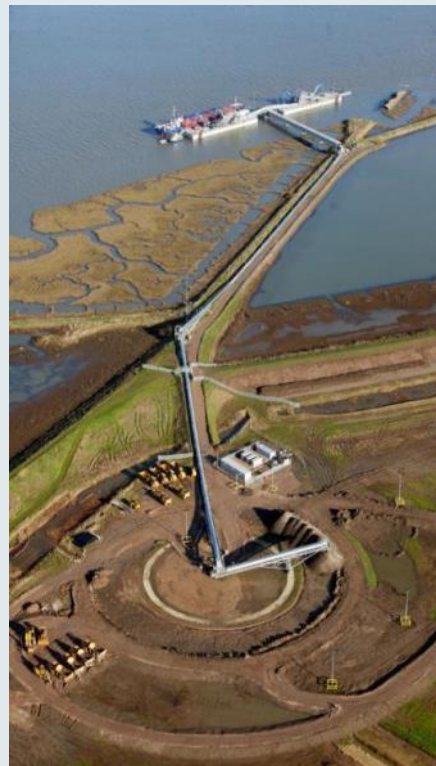
- Crossrail will produce 4.5 million tonnes of excavated material
- 3 million tonnes of excavated material has already been shipped to Wallasea Island
- Wallasea Island is 3x bigger than the Olympic park
- Emission controls on equipment
- Responsible procurement to drive sustainability



Crossrail's Sustainability



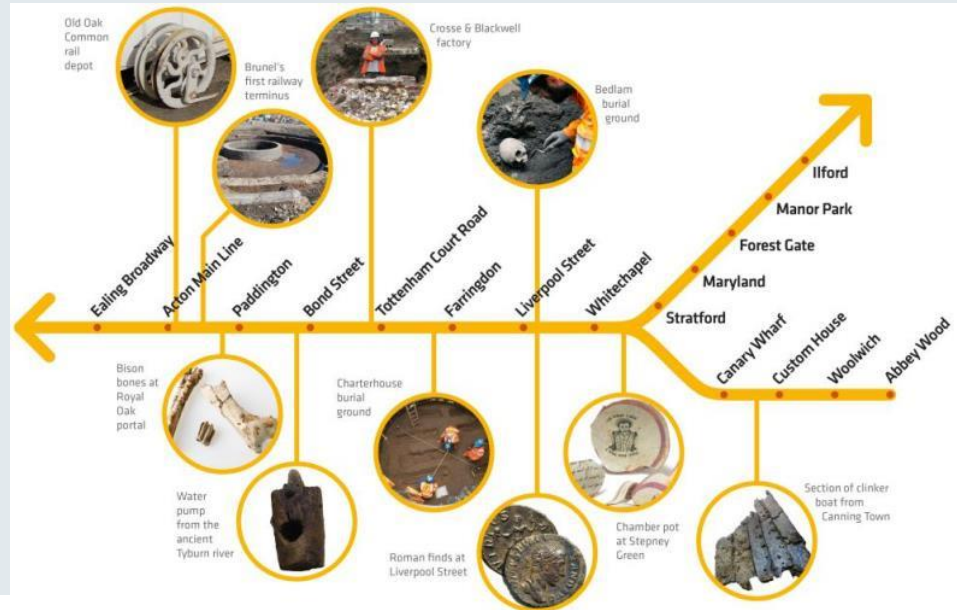
- 98 per cent of excavated material recycled
- 86 per cent of construction equipment in the central section of the route fitted with emissions controls
- Four Crossrail construction sites won a Considerate Contractor Scheme National Award



Crossrail's Archaeology



- Over **10,000** artefacts have been discovered and recorded over the project
- The finds span approximately **65,000** years
- **3,346** skeletons were excavated from the Bedlam burial ground below Liverpool Street
- Around **60** Roman skulls and crania have been recovered



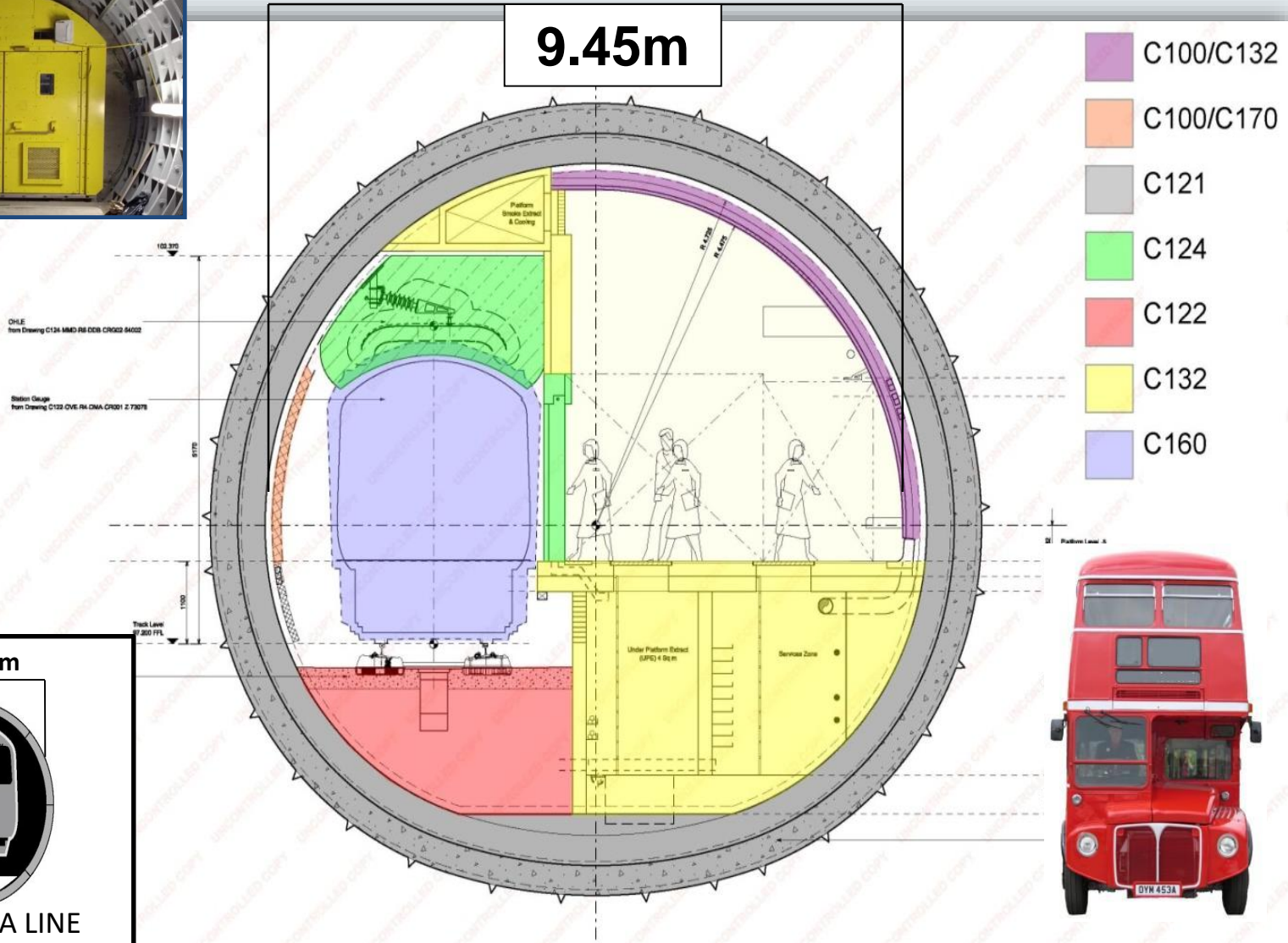
Tunneling



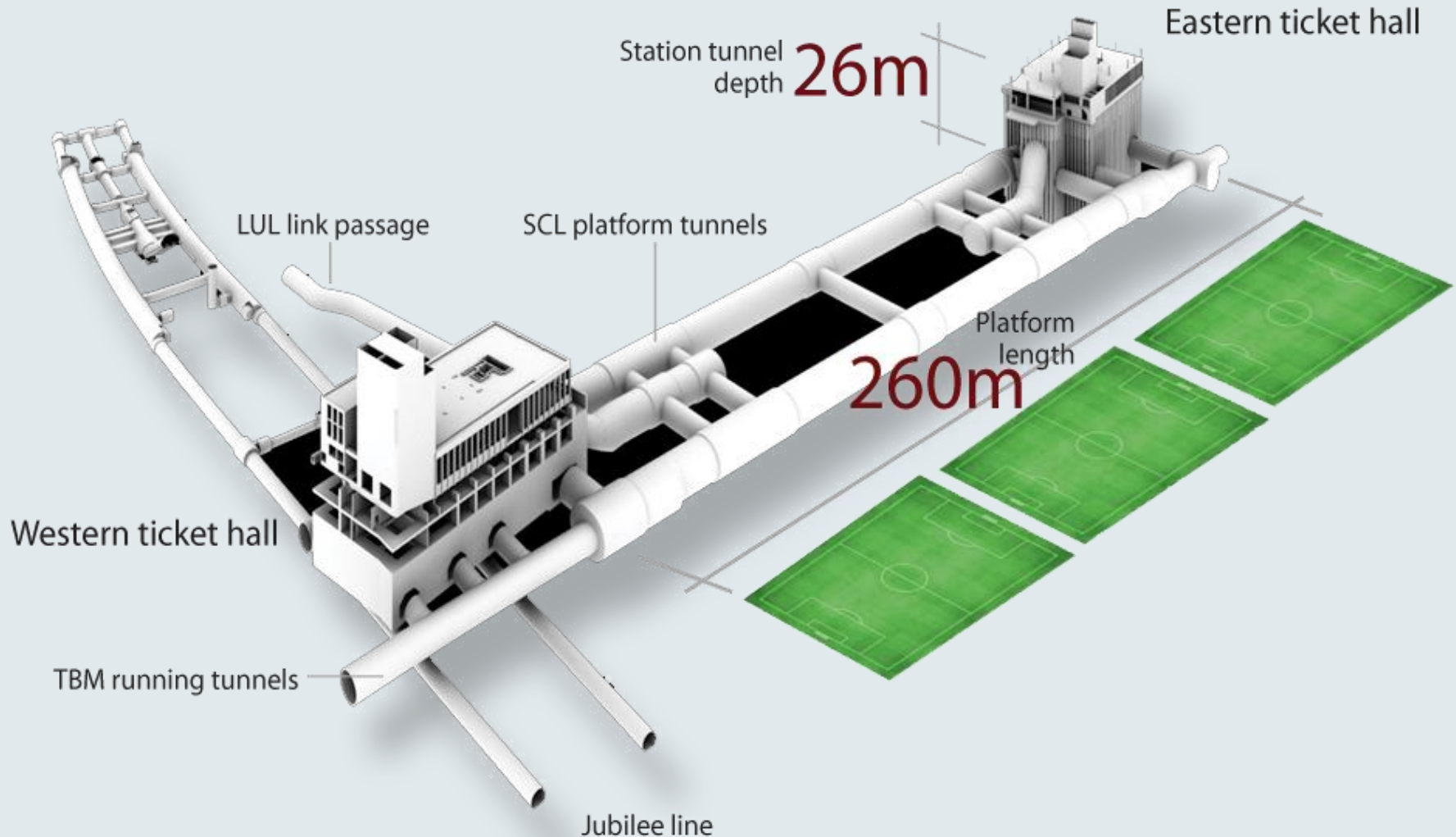
- 42km of tunnelling completed 26th May 2015
- 8 tunnel boring machines (TBMs) have bored 26 miles of tunnels
- Each TBM weighs 1,000 tonnes and measures 150m
- 20 people work on each TBM
- All TBMs named after influential women
- Sprayed Concrete Lining



Internal tunnel diameter



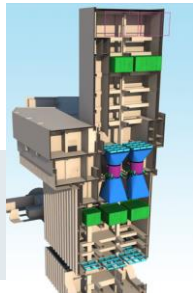
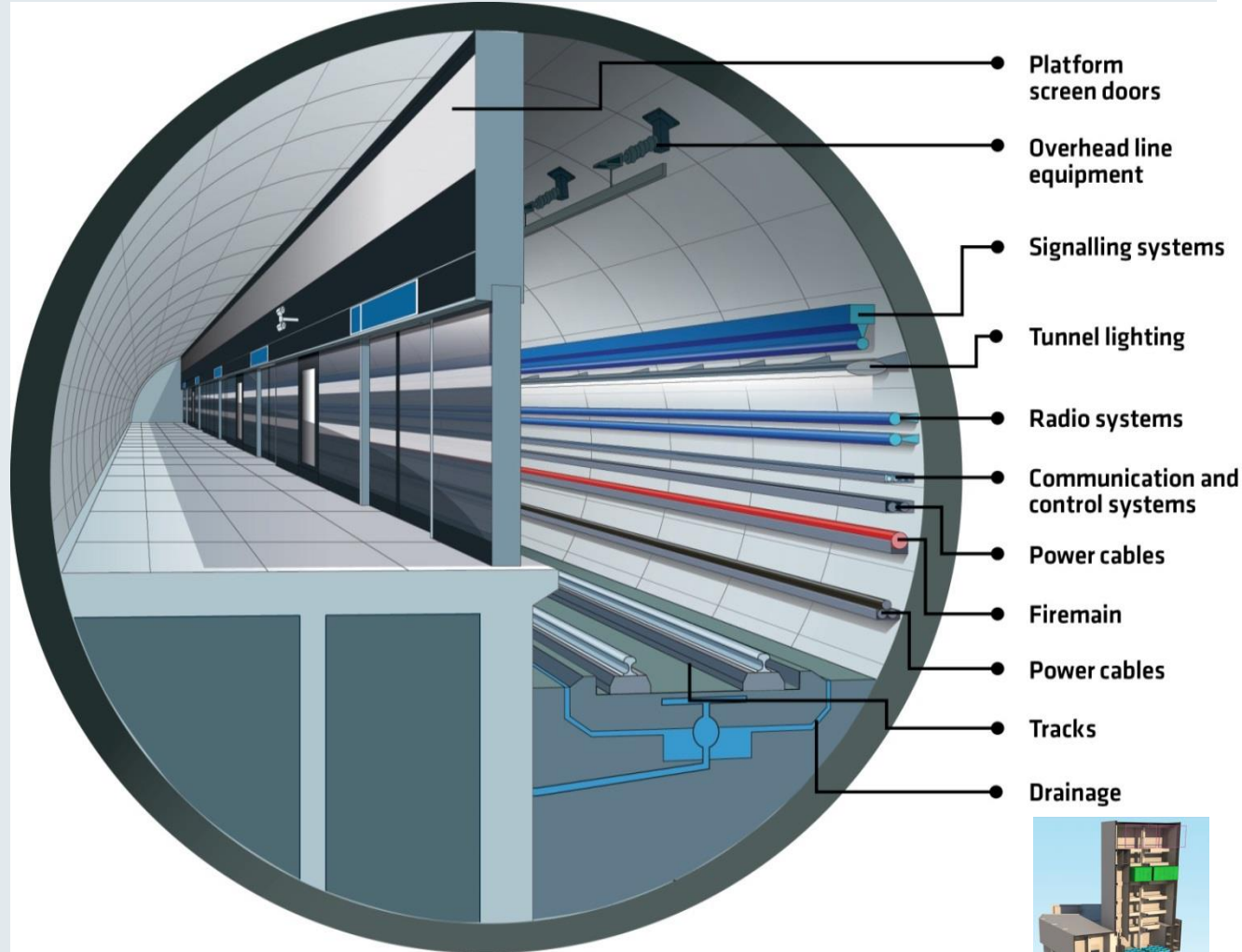
Typical Station Layout



Rail Systems & My Role



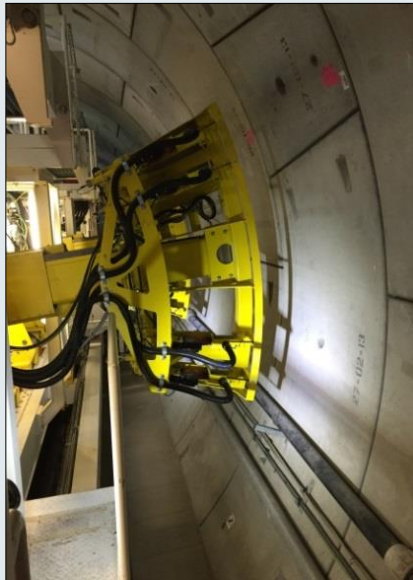
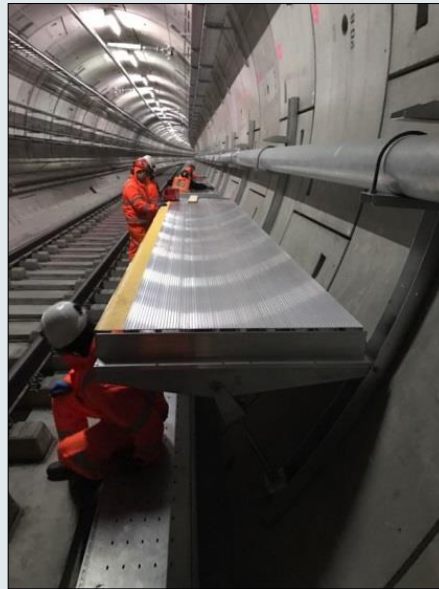
- ✓ 23 interfacing contracts
- ✓ Logistics Rail Hubs
- ✓ 250,000 holes to drill
- ✓ 60 drainage pumps
- ✓ 55km of track (846 rails)
- ✓ 63,100 STS sleepers
- ✓ 4,500 HAS units
- ✓ 52 ventilation fans at 18 locations
- ✓ 4,000 luminaries & LV
- ✓ > 1 million mtrs cable
- ✓ Multiple switch rooms
- ✓ 42km fire mains
- ✓ 40km emergency walkways
- ✓ Cross-passage doors
- ✓ Overhead Line Equipment
- ✓ Signage



Rail Systems



Rail Systems



Experiences and Thoughts



Questions

