

Electrifying the South Wales Mainline

ABC Electrification

Cardiff – 26th February 2016

Swansea – 11th March 2016



Tony Norris

Chair

South East Wales Best Practice Club





GWRM Wales

**ADEILADU
ARBENIGRWYDD
YNG NGHYMRO**



**CONSTRUCTING
EXCELLENCE
IN WALES**



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Great Western Route Modernisation

- In July 2012, the Secretary of State for Transport announced the decision to electrify the railway between London and Swansea - a major enhancement programme funded by the Department for Transport.

“Electrification will transform the railway between Swansea and London to make journeys faster, more reliable, greener and quieter for tens of thousands of passengers.”

- UK Transport Secretary Patrick McLoughlin said he hoped electrification of the Great Western Mainline beyond Cardiff to Swansea would take place as early as possible after 2019. Speaking at Cardiff Central Station on the 3rd of December 2015 he said:

“Once we get to Cardiff we carry on to Swansea as far as I'm concerned, so I hope that it's very much in the first part of CP [control period] 6, which is 2019-24. But the new IP trains will run to Swansea from day one.”

Programme Summary

National Electrification Programme (NEP)



- In 2012 Alstom, Babcock and Costain formed ABC Electrification (ABCel) to support Network Rail in meeting the UK railway's electrification challenges.
- ABC Electrification has secured over a billion pounds of orders to date making it one of the largest electrification contractors in Europe.
- Under the NEP, ABC have secured three significant programmes to provide new electrification to the Great Western Rail Modification (GWRM) Bristol Patchway to Swansea Route and London North West (South) routes over a seven year period.
- The ABCel Western and Wales regional team are based in Gold Tops, Newport

Who is working on the project in Wales?



- Network Rail, Infrastructure Projects, Wales
- Network Rail, Great Western Route Modernisation (GWRM)
- Network Rail, Great Western Electrification Programme (GWEP)
- ABC Electrification Ltd. Western & Wales NEP Framework

- 5 Framework Contractors:
 - Carillion - MAFA
 - BAM Nuttall -Renewals
 - Alun Griffiths- Renewals
 - Kier- Renewals
 - AMCO -Parapets RS08 & 09



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Work streams...

- Vast amount of survey and preparation work,
- Design,
- Gauge clearance of bridges and tunnels,
- Safety improvement work to bridge parapets,
- Strengthen railway embankments & retaining walls,
- Assess all footpath and level crossings,
- Clear vegetation running outside the rail,
- Fencing,
- Installation of OLE.

The Numbers (RS 8, 9 & 10)

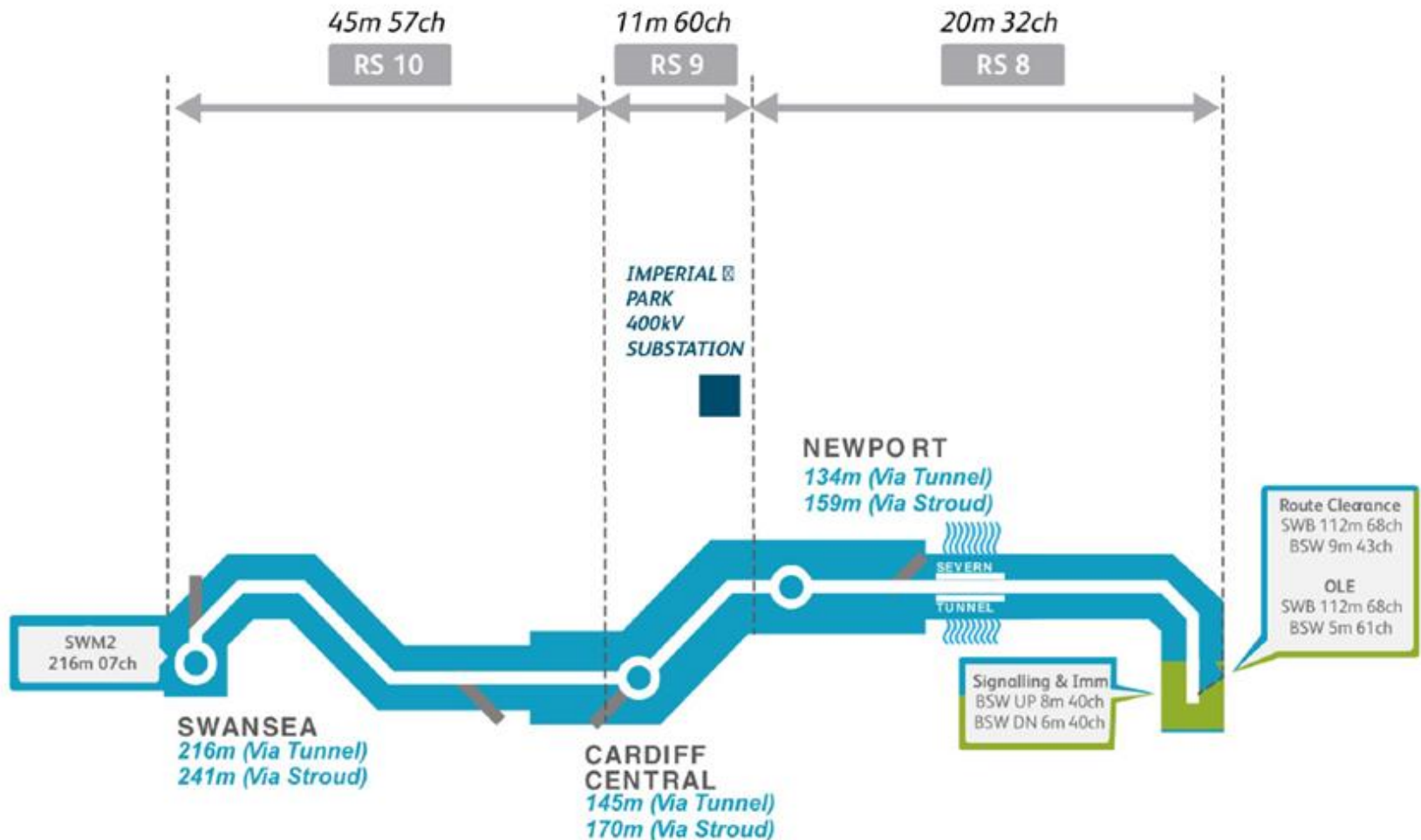
- Piles & concrete foundations approximately 50m apart required to support overhead electrical lines.
 - Approx. 5000 piles
 - Approx. 800 concrete foundations
- Installation of the supporting structures and the Overhead Line Equipment (OLE).
 - Approx. 4300 Single Track Cantilever
 - Approx. 1450 Twin Track Cantilever (Mast + Boom)
 - Approx. 170 Four Track Portals (Masts + Boom)
 - Approx. 7750 Registration & Support

Schematic of ABCeI W&W GWRM



Route	STK	comment
RS 05B	58	Conventional only
RS 06D	77	Conventional only
RS 06P	13	Conventional only
RS 08	76	OLE D&C – Conventional, Station, Tunnels and Structures
RS 09	75	OLE D&C – Conventional, Station
RS 10	162	OLE HOP's Delivery. Structures.
Bristol Temple Meads		Station OLE
SSA	7	

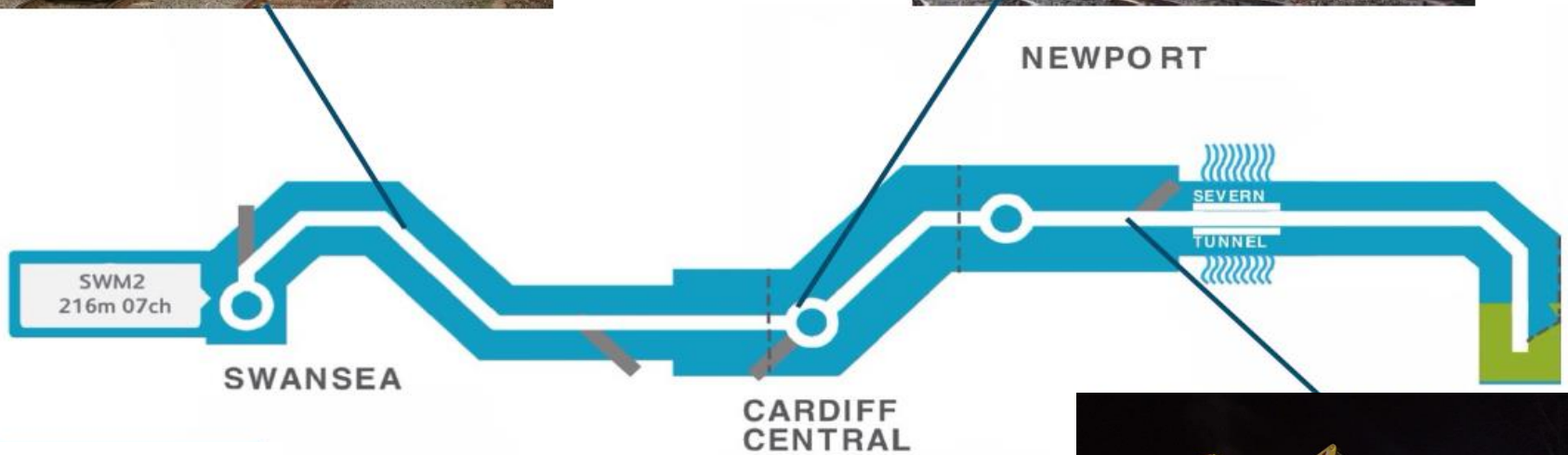
GWRM – SWM Electrification



OLE Systems



OLE Installation Areas





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More Numbers...

- The overall length of rail lines wired is about 350 STK.
- Approximate Quantities of “Wire”:
 - ATF Wire – 244 km
 - Earth Wire – 244 km
 - Return Screen Conductor – 122 km
 - Contact Catenary – 339 km
 - Contact Wire – 339 km
- “Droppers” – approx. 40,700
- Conductor Beam 14 km
- HV Cable – approx. 35.5 km

Ground Investigation Works

2200m of GI Bore Holes have been drilled

8000 tonnes of hand dug trial holes
excavated

GI – East Usk Yard, Newport



GI – Lineside Trial Holes, Liswerry

GI – Lineside Trial Holes, Liswerry



Terrier Rig carrying out Dynamic Probing in Section E





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De-Vegetation Works

53km of de-vegetation is ongoing along the route (RS8 & 9)

- 36km have been cleared to date
- 17km left to clear



Vegetation Works

2016-05-06 13:13:54
Lat: 51.581402 Lon: -9.908368

Piling Works

RS 8 - 1200 Piles

RS 9 - 1215 Piles

302 piles installed to date

Our best 'shift-performance'
achieved so far...

23 piles in a Saturday night shift

8 piles in a weekday night shift

250th pile installed in Route Section 8



GWRM Tunnels

Newport New Tunnel

704m / 2 track



Severn Tunnel

7005m / 2 track

East portal Listed



Patchway Tunnels – Single track

Up – Patchway New – 1609m – Track relay (quality issues) + 100mm lower (East)

Dn – Patchway Old – 1139m - 230mm track lower at East Portal

Dn – Patchway Short – 57m



Chipping Sodbury Tunnel

4065m / 2 track

6 vent shafts & Portals – Grade II Listed



Swindon

Box Tunnel

2920m / 2 track

Portals Grade II Listed



Swindon

Parkway

Bath

Bristol
Temple
Meads

Newport

Newport Old Tunnel

678m / 2 track - 140mm track lower

Grade II Listed



Ableton Tunnel

88m / 2 track

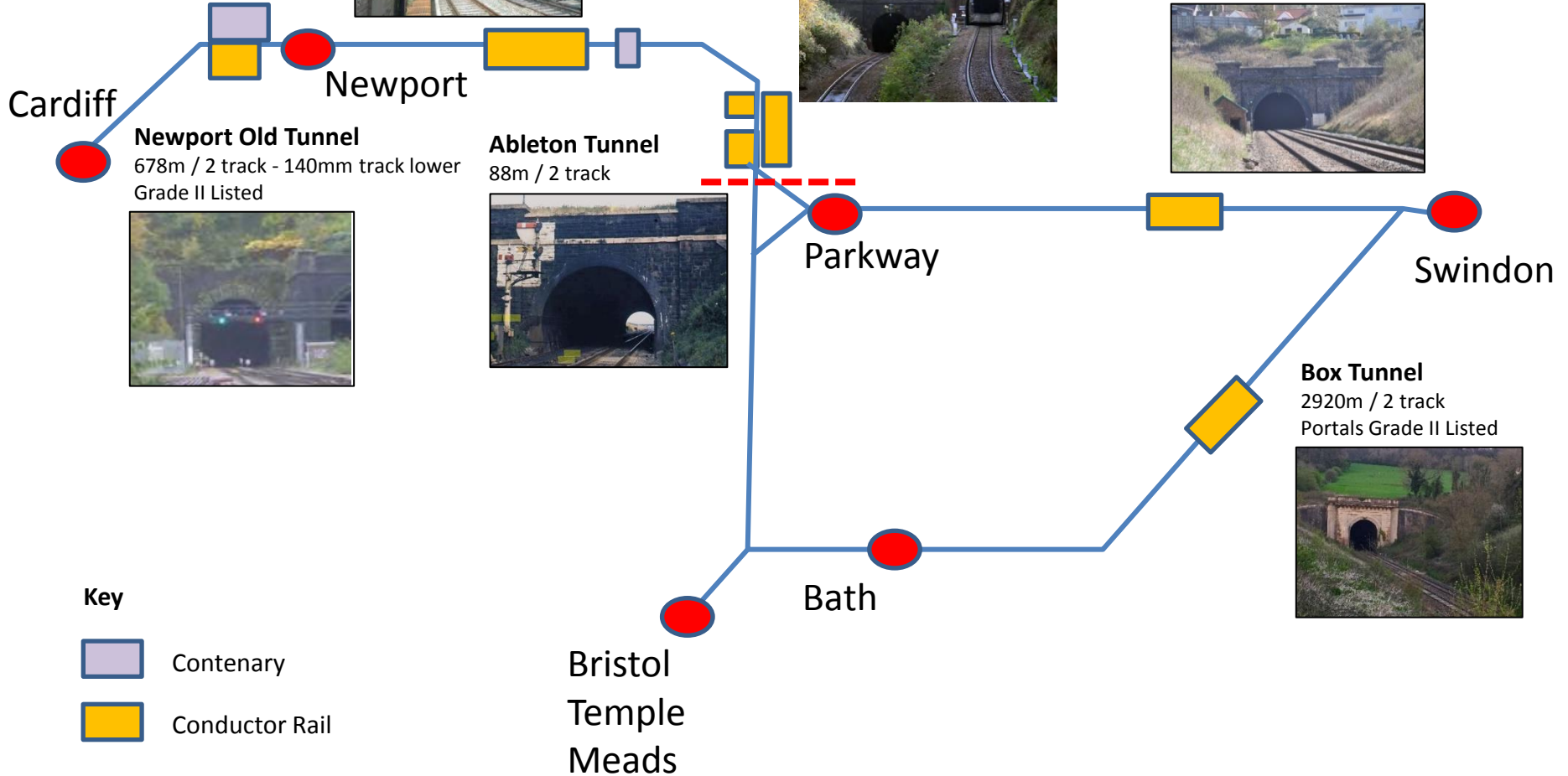


Cardiff

Key

 Contenary

 Conductor Rail



Tunnels Programme



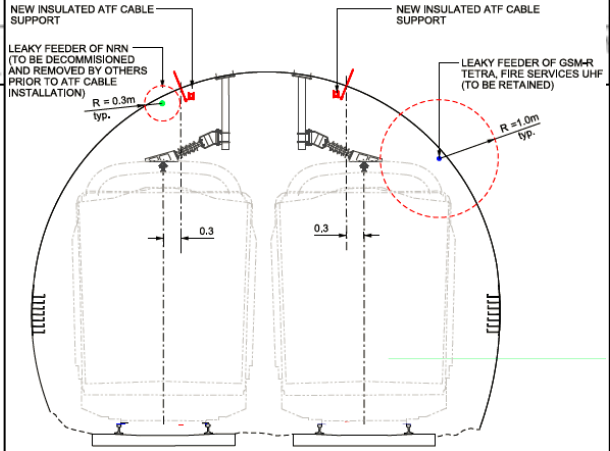
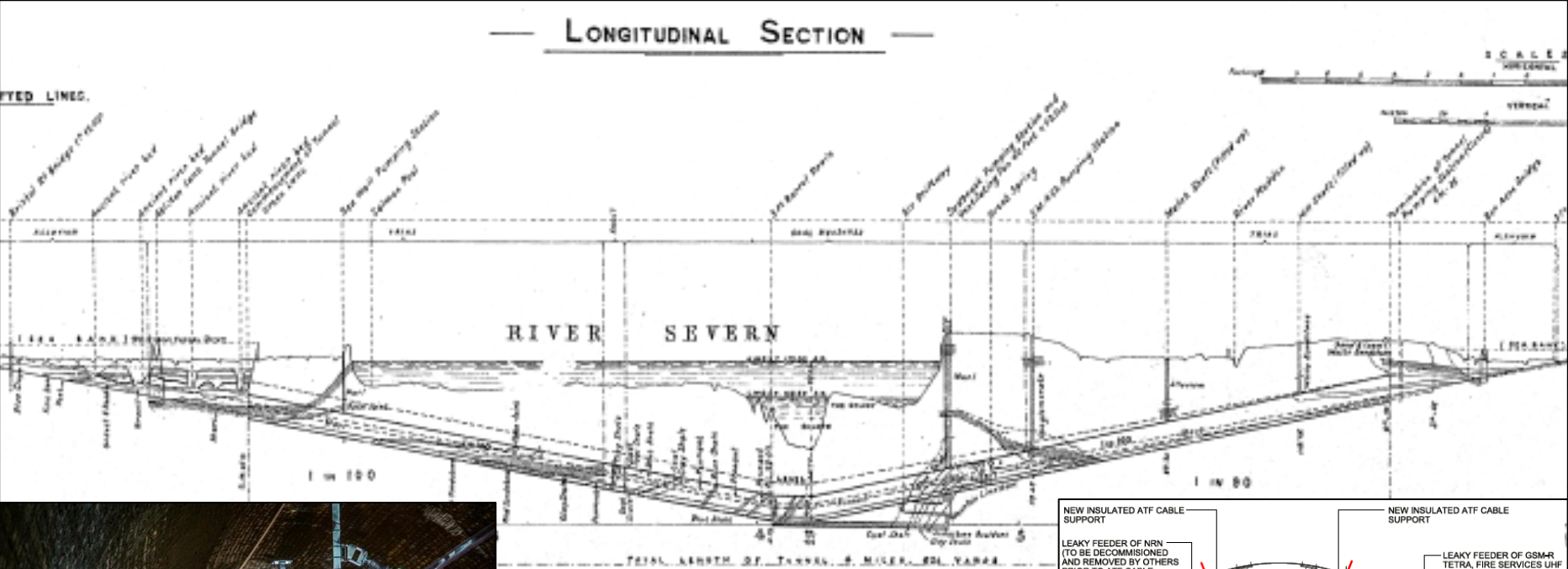
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Tunnel	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17
Patchway Old															
- Track Lower															
- OLE installation															
Patchway Short															
- OLE installation															
Patchway New															
- Track Lower															
- OLE installation															
Ableton															
- OLE installation															
Severn															
- NRN cable removal															
- Soot clearance															
- ATF Cleat installation															
- OLE installation															
Newport New															
- OLE installation															
Newport Old															
- Track Lower															
- OLE installation															

Severn Tunnel



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Over Bridges

- For Over Bridges requiring gauge clearance modification, one of the following solutions will be applied;
 - Bridge reconstruction – the bridge will be demolished and rebuilt
 - Track lowering – the formation level is reduced to lower the track and gain sufficient clearance
 - Bridge jacking – some structures can be lifted into a higher position
 - Structure removal – a small number of bridges that are no longer used may be removed.
- Raise the parapet on majority of existing bridges - solid parapets at a min height of 1.85 metres from the footway.

Structures Overview

- 69 structures require interventions
 - These include
 - Road Bridges
 - Foot Bridges
 - Tunnels
 - Level Crossings
- 5 ABC Structures in RS 8
 - These include
 - Farm Road Caldicot Road Bridge
 - Newport Station Footbridge
 - Bridge Street Newport Road Bridge
 - Tunnel Terrace Newport Footbridge
 - Chepstow Road Newport Rail Bridge

Structures Work to date

Farm Road bridge demolition completed and replacement bridge installed

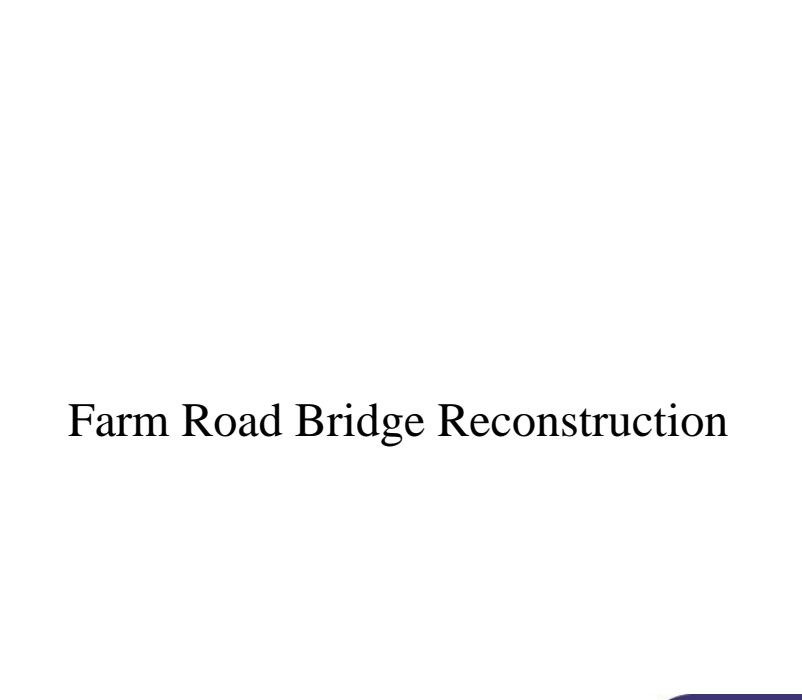
26m long brick arch tunnel...

Circa 2000 tonnes of material removed

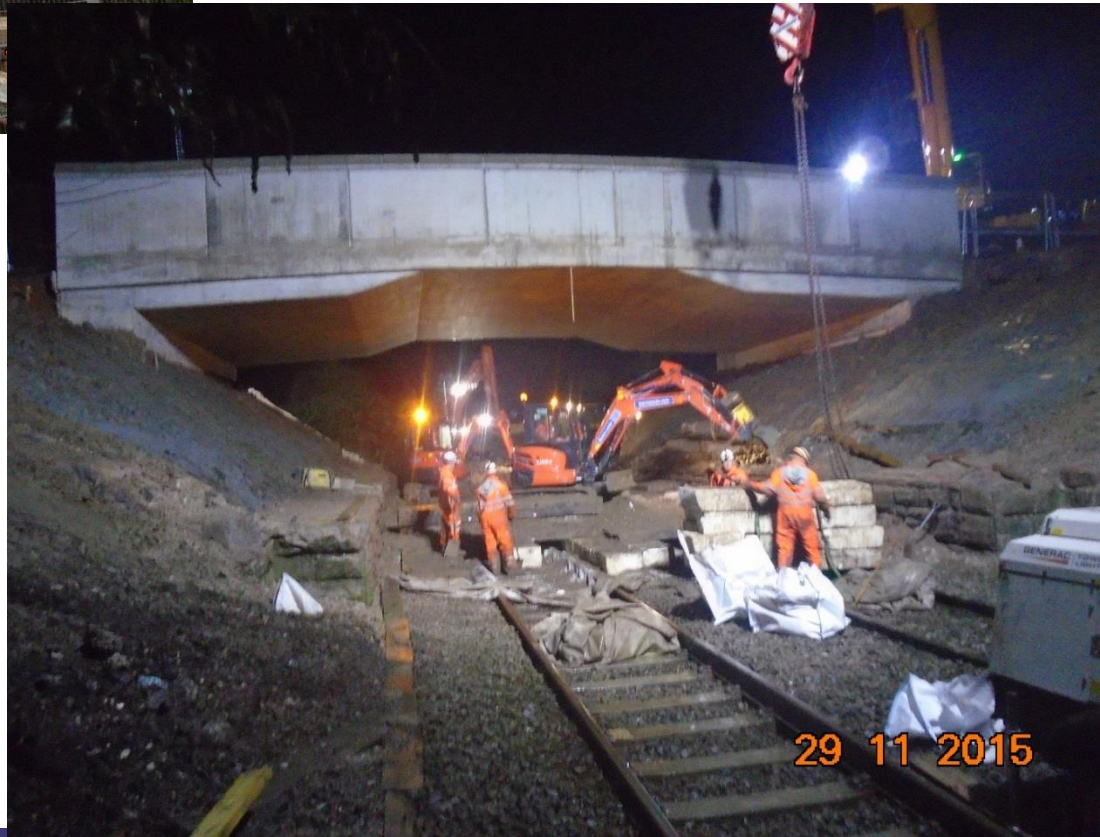
Handed back 1hr 40min before the first train



Farm Road Bridge Demolition...before



Farm Road Bridge Reconstruction



Stations



- Along the Route we will be providing electrification through 17 Stations
- The most significant at Newport, Cardiff and Swansea.
- Require structural support for OLE
- Gauge clearance required on canopies
- Electrification of Cardiff Central Station a significant challenge

Christmas 2015

3

SOMERTON RD



5

CUCKOO ROAD



1

OLE WORKS



6

MAERDY



4

CARDIFF RD

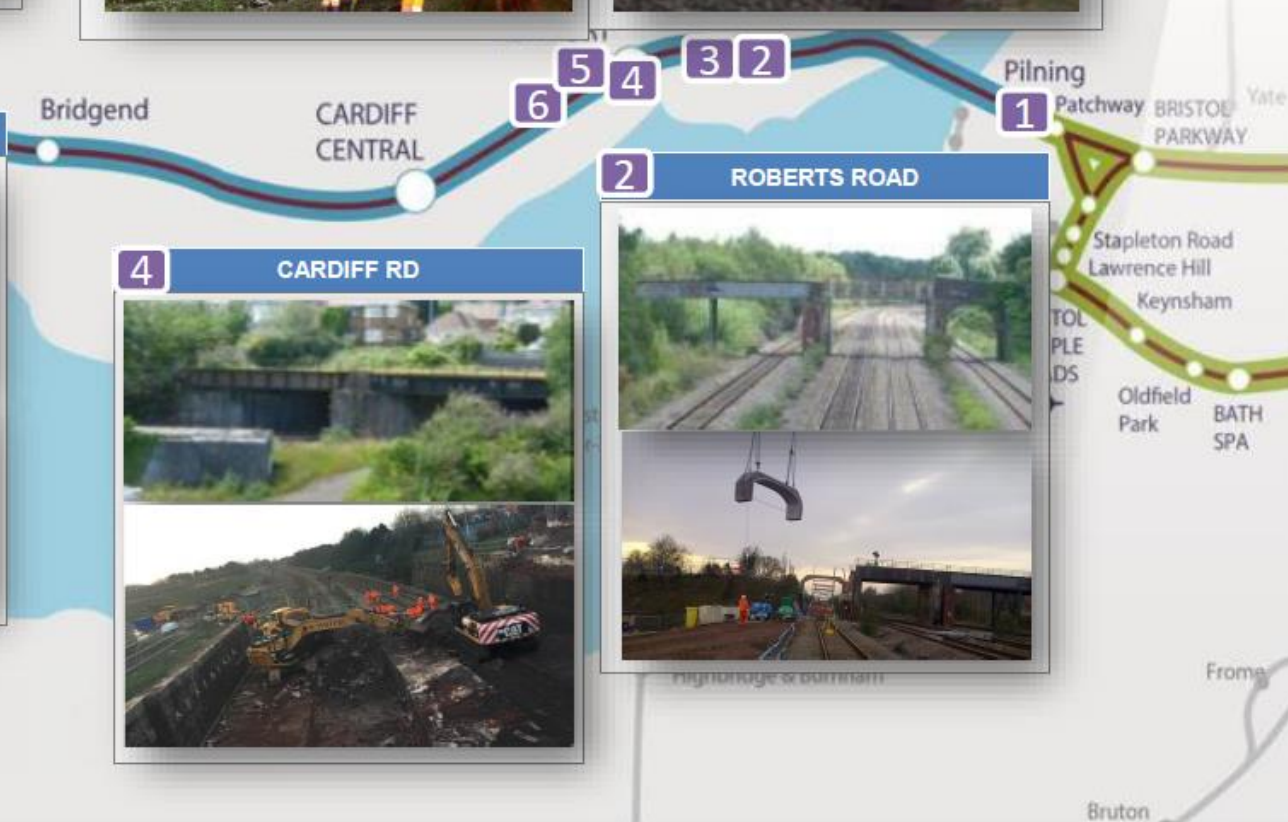


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ROBERTS ROAD



Network Rail



Barnstaple

Chapelton

Bruton

2016 Wales Area



2 NEWPORT AREA



3 GAUGE CLEARANCE



6 WEEK BLOCKADE SEPT – OCT 2016





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Community Relations

We aim to nurture positive relationships with communities impacted by our works:

- Hosted 13 Public meetings in key locations close to our work sites

Pilning

Rogiet

Undy

Caldicot

Somerton

Magor

Marshfield

St Brides

- 6 drop in's planned for Newport Centre Works

Newport Indoor Market

St Wollo's Cathedral

Stow Hill Share Centre

Stow Park Community Centre





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Schools Engagement

- Identified 91 Schools within 1km of the Mainline
 - To Date Engaged with:
 - 3010 Schools Pupils
 - 9 Schools in South Glos., Monmouthshire and Newport
- Comprehensive Plan for Newport Centre schools 30 visits with 4 key schools activities include
 - Project and Construction site safety briefings
 - Welsh Bacallaureate Challenge
 - ICE Bridges to Schools
 - Breakfast Club Support





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Community Engagement

- 2015 raised £15,000 for Charity
 - Macmillan
 - Princes Trust
 - Samaritans
 - British Heart Foundation
- Utilised staff volunteering time to benefit groups close to our works
 - Community pond maintenance and management
 - Community building redecoration
 - Christmas Collection for homeless charity





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THANK YOU