

Works Delivery Anglia

‘Manea’ Wheel Timber Renewal Campaign

May 2020



The challenge is to renew 85no pairs of longitudinal timbers across 4 structures

Bridge 1813

New Bedford River

19 Pairs Down / 15 Pairs Up



Bridge 1814

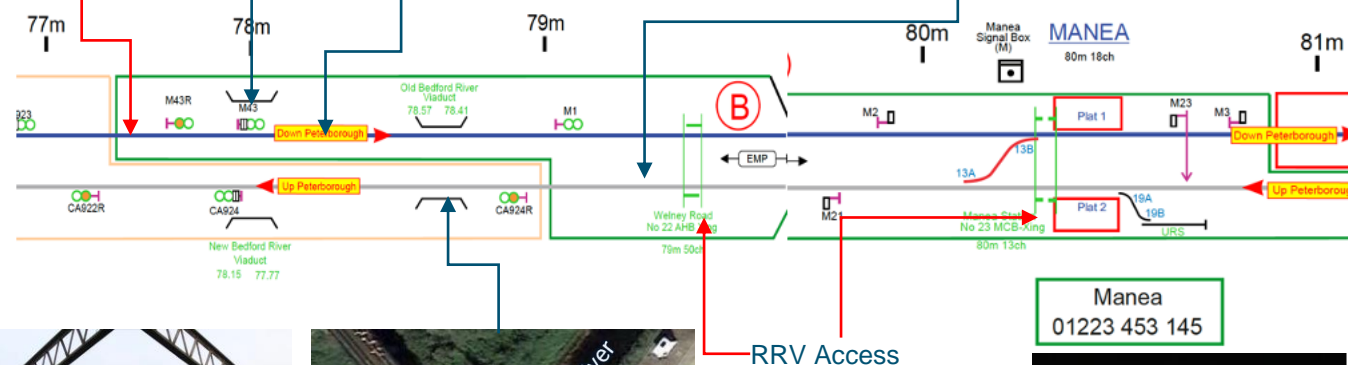
Flood span

17 Pairs Down / 21 Pairs Up



Bridge 1815

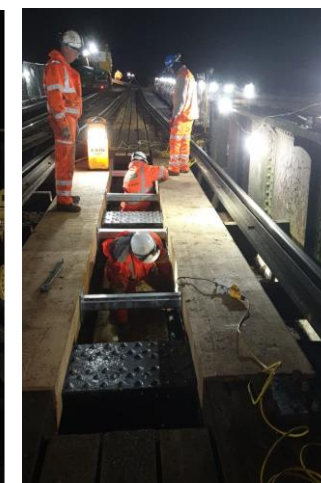
2 Pairs Down / 2 Pairs Up



Br 1814A

Old Bedford River

3 Pairs Down / 6 Pairs Up



Patchwork of wheel-timber renewals with varying life expectancy

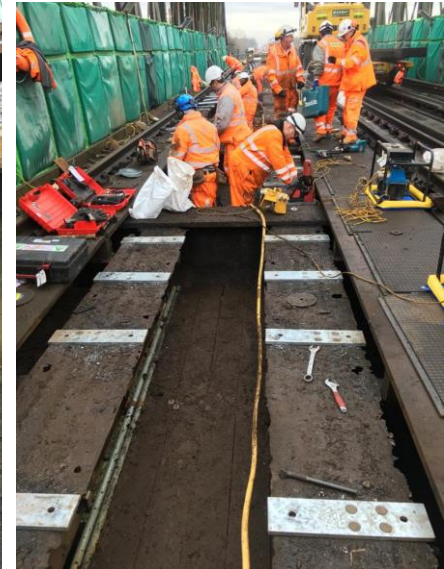
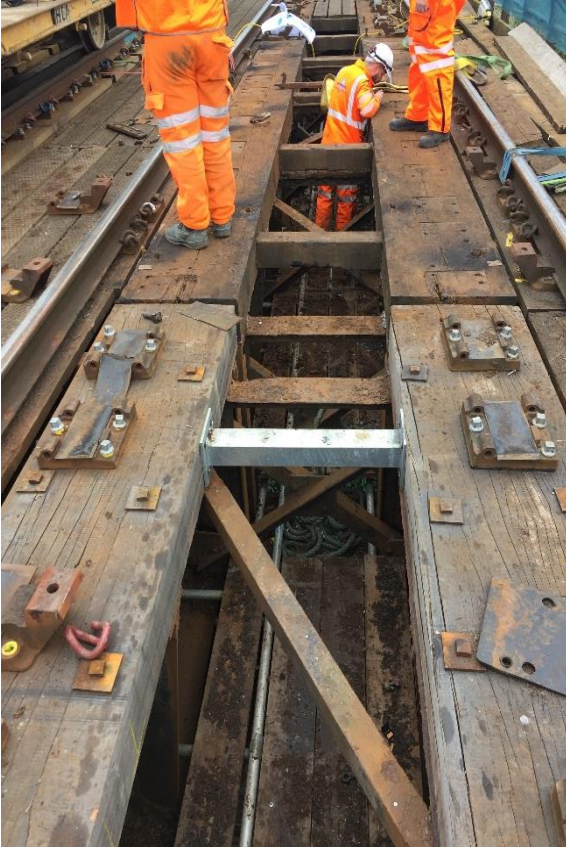
- Blues = 33 pairs renewed in recent campaigns
- Reds = 20 pairs to renew within 6 months (ie by week 26 2020)
- Oranges = 31 pairs to renew within 1 year (ie summer 2020)
- Yellows = 34 pairs to renew within 2 years (ie summer 2021)
- Whites = 22 pairs to renew within 3 – 4 years (ie summer 2022 / summer 2023)

Maneas Bridges Wheeltimber Replacement Locations V1									
Location				Down		Up			
	ELR	Start Miles	End Miles	No.	Left	Right	Left	Right	
1815.7	EMAP	?	?	1	6m	6m	6m	6m	Speed Restriction Information (2020)
				2	6m	6m	6m	6m	
Ballast section									
1814A	Old Bedford River	EMAP	78m53c	78m58c	11	Completed	Completed	Completed	Bridge 1815 - 4 Reds
				10	Completed	Completed	Completed	Completed	Down - 2 Reds
				9	Completed	Completed	Completed	Completed	Up - 2 Reds
				8	12m	12m	12m	12m	Up road states 6-12m on PS sheet
				7	2y	2y	2y	2y	Up road states 6-12m on PS sheet
				6	2y	2y	12m	12m	Up road states 6-12m on PS sheet
				5	Completed	Completed	Completed	Completed	Up road states 6-12m on PS sheet
				4	Completed	Completed	Completed	Completed	
				3	Completed	Completed	Completed	Completed	
				2	Completed	Completed	Completed	Completed	
				1	Completed	Completed	12m	12m	
Ballast section 78m 51c to 78m 52c									
1814	Flood Span	EMAP	78m43c	78m51c	27	6m	6m	6m	20mph TSSR (up line)
				26	2y	2y	6m	6m	200kph TSSR (up line)
				25	Completed	3y	6m	6m	20 mph TSSR (up line)
				24	3y	3y	12m	12m	
				23	2y	2y	Completed	Completed	
				22	Completed	2y	Completed	Completed	
				21	2y	2y	Completed	Completed	
				20	2y	2y	Completed	Completed	
				19	6m	6m	12m	12m	
				18	3y	2y	12m	12m	
				17	3y	3y	12m	12m	
				16	2y	2y	2y	2y	
				15	2y	12m	12m	12m	
				14	2y	3y	12m	12m	
				13	3y	3y	6m	6m	
				12	3y	3y	6m	6m	
				11	Completed	Completed	3y	2y	
				10	Completed	Completed	3y	3y	
				9	2y	2y	12m	12m	
				8	2y	2y	Completed	Completed	
				7	2y	2y	12m	12m	
				6	2y	2y	12m	12m	
				5	2y	2y	12m	12m	
				4	6m	12m	6m	6m	
				3	Completed	Completed	Completed	Completed	
				2	2y	3y	12m	12m	
				1	Completed	Completed	12m	12m	
Ballast section 78m 15c to 78m 12c									
1813	New Bedford Road	EMAP	78m13c	78m15c	31	Completed	Completed	Completed	Bridge 1814 - 4 Reds, 13 yellows, 6 whites, 10 completed
				30	2y	12m	Completed	Completed	Down - 3 Reds, 1 amber, 13 yellows
				29	2y	2y	4y	4y	Up - 3 Reds, 2 amber, 4 yellow
				28	Completed	Completed	4y	4y	
				27	2y	2y	4y	4y	
				26	Completed	Completed	4y	4y	
				25	2y	2y	4y	4y	
				24	Completed	Completed	4y	4y	
				23	Completed	Completed	2y	12m	
				22	6m	12m	Completed	Completed	
				21	6m	3y	6m	6m	
				20	12m	3y	6m	6m	
				19	3y	3y	2y	2y	
				18	12m	12m	2y	2y	
				17	6m	3y	2y	2y	
				16	2y	Completed	2y	2y	
				15	2y	Completed	2y	2y	
				14	2y	2y	2y	2y	
				13	2y	2y	2y	2y	
				12	12m	12m	2y	2y	
				11	3y	3y	2y	2y	
				10	12m	12m	Completed	Completed	
				9	12m	12m	3y	3y	
				8	4y	4y	3y	3y	
				7	2y	12m	3y	3y	
				6	2y	12m	3y	3y	
				5	2y	2y	3y	3y	
				4	12m	12m	3y	18m	20 mph TSSR (Down Line)
				3	6m	12m	12m	18m	20 mph TSSR (Down Line)
				2	3y	3y	Completed	Completed	20 mph TSSR (up line)
				1	3y	3y	Completed	12m	1813 - 1 red, 12 ambers, 14 yellows, 17 white, 6 whites, 10 completed
									Up - 4 reds, 2 amber, 10 yellow

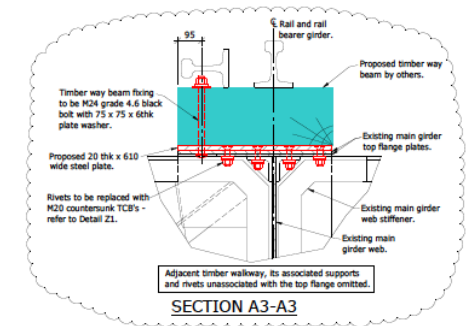
Safety and environmental considerations

- Vortok fencing will be erected throughout the site / 10mph TSR on open road throughout the site during SLW for protection of staff
- 6 hours in every 24 hours requires double line blocks for completing works in the 6 foot, replenishing stocks at site and removing redundant materials. The timing of this can be flexible
- S&T cable route has to be moved clear and GRP decking has to be removed to access the timbers
- Scaffolded deck to be erected beneath each structure for safety of staff and to prevent contamination of the water courses below
- Integrated guard rail has to be removed necessitating a 20mph construction TSR if line is re-opened prior to reinstatement
- Same restriction will cover the hot weather risk associated with the management of critical rail temperatures
- Flexibility around timing for when we switch construction from Up to Down during a continuous blockade
- Acoustic screens are erected to lesson the impact on protected bird species
- Consent for construction work is required from Natural England and we will be restricted to July – early October

Construction is complex



- Steelwork repairs to top flanges of girders can vary considerably.
- The positioning of rivets does not always follow convention which often leads to additional routing of the timbers on site.



- S&T cable route has to be moved clear and GRP decking has to be removed to access the timbers.
- Acoustic screens are erected to lesson the impact on protected bird species.
- Integrated guard rail has to be removed necessitating a 20mph construction TSR for the duration of the works and complicates the restressing of the CWR.
- Scaffold deck erected beneath each structure for safety of staff and to prevent contamination of the water courses below.
- Running rails will be cut to facilitate renewal of the wheel-timbers by RRVs working 'under toes' on single line and back-hole drilled pending re-railing.

Access scenarios

Manea Wheel Timbers	No Core Wheeltimber works in these weeks									Best weeks in this timeframe without risking the wider Anglia Plan								No Core WT		No Core WT		No Core WT	
Week	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Decision criteria		
DEFCON0	27hr Cable diversions / scaffold prep	12hr Cable diversions / scaffold prep	6hr scaffold prep	6hr scaffold prep	10hr scaffold prep	6hr scaffold prep	6hr scaffold prep	52hr Scaffold Prep	6hr scaffold prep	52hr 1815 /1814A / 1814 Dn strike scaffold Reds	6hr 1814A /1814 / 1813 Dn strike scaffold Reds	27hr 1814A /1814 / 1813 Dn strike scaffold	6hr strike scaffold	52hr 1814 / 1814A / 1815 Up Reds	6hr strike scaffold	52hr 1814 / 1813 Up Reds	6hr strike scaffold	52hr 1813 / 1814 / 1814A Up Reds completed, stressing, strike scaffold	27hr Stressing, reinstate cables, strike scaffold	Will take us 3 years of near constant access through each summer period. Runs the risk of further deterioration in condition / ESRs / line closure. Would wreck the current year [and likely subsequent years] Anglia-wide projects delivery programme(s).			
DEFCON1	27hr Scaffold Prep	12hr Cable Diversion Prep			10hr RRAP/Scaffold Prep			52hr Scaffold Prep		Core 14 Day Blockade All Reds 100% complete		27hr Scaffold strike	12hr Cable Reinstate							Further access for wheel-timber renewals required summer 2021. Runs the risk of further deterioration in condition / ESRs / line closure.			
DEFCON2	27hr Scaffold Prep	12hr Cable Diversion Prep			10hr RRAP/Scaffold Prep			52hr Scaffold Prep		52hr Br1813		Core 14 Day Blockade Br1814a/1814/1815 Reds & Oranges 100% complete					27hr Scaffold strike		12hr Cable Reinstate	Further access for wheel-timber renewals required summer 2021. Runs the risk of further deterioration in condition / ESRs / line closure.			
DEFCON3	27hr Scaffold Prep	12hr Cable Diversion Prep			10hr RRAP/Scaffold Prep			52hr Scaffold Prep		Core 14 Day Blockade Br1813 Red & Orange Br1814a Red & Orange, some yellow		Core 14 Day Blockade Br1814 Red & Orange Br1815 Red, some yellow					52hr Br1814 / 1814a / 1813 Yellow		27hr Scaffold strike	12hr Cable Reinstate	Protects the Anglia-wide projects delivery programme. Further access for wheel-timber renewals not required until summer 2022.		
DEFCON4	27hr Scaffold Prep	12hr Cable Diversion Prep			10hr RRAP/Scaffold Prep			52hr Scaffold Prep		28 Day Blockade Br1813 / 1814a / 1814 / 1813 Red & Orange					52hr Br1814a / 1813 Yellow		52hr Br1814 Yellow		52hr Scaffold Strike Stressing	27hr Cable Diversions Stressing	Protects the Anglia-wide projects delivery programme. Further access for wheel-timber renewals not required until summer 2022. Greater construction flexibility during the blockade. Follow-up possessions provide post-blockade contingency.		
DEFCON5	27hr Scaffold Prep	12hr Cable Diversion Prep			10hr RRAP/Scaffold Prep			52hr Scaffold Prep		42 Day Blockade All works completed Scaffold Struck / Cable Diversions Stressing											Protects the Anglia-wide projects delivery programme. Further access for wheel-timber renewals not required until summer 2024. No post-blockade contingency.		

Weekends + 28-day Blockade* + weekends

*Blockade ~ 18hrs of SLW and 6 hours of double line blocks (at the best time to suit) for completing works in the 6 foot and for the replenishment of stocks on site / removal of redundant materials, etc. Weekends are double line blocks.

- Delivers the remitted volumes in the required timescales
- Protects the Anglia-wide projects delivery programme
- Further access for wheel-timber renewals not required before summer 2022
- Greater construction flexibility during the blockade
- Follow up possessions provide some post-blockade contingency
- Will accommodate other compatible works which can be safely delivered within the defined access footprint

Manea Bridges (Anglia Wide Projects Delivery Programme)



Week	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Decision criteria
HO	March 27hr Core	March 12hr Core	Westley 52hr Core	Base Green 52hrs Core	Base Green 52hrs Core	Thorpe 28hrs Core	CGH 28hrs FUW	Ely 52hr Core	Needham 28hr Core	Baylham 52hr Core	Littleport 52hr Core									Brentwood 8hrs RDT	
SRSA	Haringay 14hr RDT	Ely 8hrs PREP						Haringay 47hr Core	Haringay 52hr Core	Haringay 52hr Core		Moulton LC 52hr Core	Claydon Barham 52hr Core	Pitsea 52hr Core	Ely 52hrs Core		Brampton 6 Days Core	Brampton 52hrs Core		Somerleyton 52hr Core	
SRSA	Clapton 8hr PREP	Clapton 52hr CORE	Clapton 52hr CORE	Clapton 52hr CORE	Clapton 52hr CORE	Cantley 28hrs Prep	Cantley 9 days Core	Cantley 9 days Core	Clapton 28hr FUW	Bamford 52hr Core	Clacton 52hr Prep		Clacton 52hr Prep	Clacton 52hr Prep	Clacton 52hr Prep	Colchester 52hr Core		Ely 52hrs Core	Ely 27hrs Core	Colchester 52hr Prep	
SRSA	Stowmarket 8hr RDT	Ipswich London Rd 8hr RDT								Rectory Rd 52hr Core	Ipswich London Rd 52hr Core	Ipswich London Rd 52hr Core	Audley End 52hr Core			2nd Drove LC 28hr Core	Foxton LC 52hr Core			Manningtree 52hr Core	
SRSA																				Halifax Jn 47hr Core	
HO			Brentwood 14hrs Prep																		
BRE				Barking 52hr Core					Barking 52hr Core					Barking 52hr Core						Barking 52hr Core	
Maintenance					Manea 10hrs Maintenance						Manea 10hrs Maintenance			Manea 28hrs Maintenance	Broxbourne Jn 27hr Core		Manea 10hrs Maintenance		Manea 27hrs Maintenance		
WDA WT							Jarrow Rd 28hr WT		Jarrow Rd 52hr Core	Jarrow Rd 52hr Core	Coffin 52hr Core	Coffin 52hr Core			Ely Dock 52hr Core		Strode 47hr Core	Ely Dock 52hr Core		Pitmire 52hr Core	
CDA Civil									BGK 52hr Core	BGK 52hr Core					Eccles 52hr Core			Eccles 52hrs Core	Eccles 52hr FUW		
GA											Cow Creek 52hr Core				Spikes Lane 52hr Core					Pannington Hall LC 52hr Core	
CDA Signals															Hiam Fen Hse 52hr Core			EMP Sig 52hrs Prep	Roundham Hall LC 52hr Core		
CDA Signals																		Park Lane LC 52hr Core			
CDA M&E												BGK 47hr Core	BGK 47hr Core								
WDA Structures														Stowmarket 27hrs Core							

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Environmental management

- The Ouse washes is an artificially constructed flood reservoir that tends to floods in the winter and dry out sufficiently for grazing and hay making to occur on the grassland in the summer.
- This has made it internationally important for both wintering and breeding wildfowl and waders, several of which are qualifying features of the special protection area and Ramsar wetland.
- Two water courses that run along the length of the site and the counter drain along with the delph are notified as a special area of conservation for the presence of the Black tailed Godwit and, along with flora and neutral grassland, are of national significance.
- **Access to Manea SSSI is controlled by Natural England for renewals work who will allow access between July and October only.**
- Whilst Christmas / New Year working has been permitted previously, it was a concession and can therefore only be considered as a contingency.
- JMS [aka Murphy's] acting as Principal Contractor are currently progressing the consents on behalf of Network Rail.

Asset management

A recent review of wheel timber management identified that despite inspections being undertaken in accordance with current standards there were knowledge gaps in the way they were being condition-assessed, prioritised, and recommended for renewal by some of our inspectors.

To address these issues a supplementary training programme was undertaken between October 2019 and January 2020 for all wheel-timber inspectors on Anglia route. One of the new tools used within this enhanced training was the timber density probe which helps us understand the internal condition of the timbers.

The timber probe uses a 2mm drill up to 500mm long to penetrate the timber and provide an electronic record of timber hardness identifying any soft or voided timbers at each and every baseplate. Previously hidden defects are now identifiable.

Following the derailment of a freight train on a wheel-timber bridge at Wanstead Park earlier this year, softwood timbers on track category 1 were prioritised for a one-off inspection using the new test probe. The Manea bridges were part of this re-inspection programme and some 85 pairs of wheel-timbers now requiring urgent replacement.

Softwood (Douglas Fir) has traditionally been used for longitudinal bearers and has a working life of between 5-10 years depending on environment and loading. All Anglia timbers are now replaced with sustainably sourced hardwood with a service life of up to 25 years.

