

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



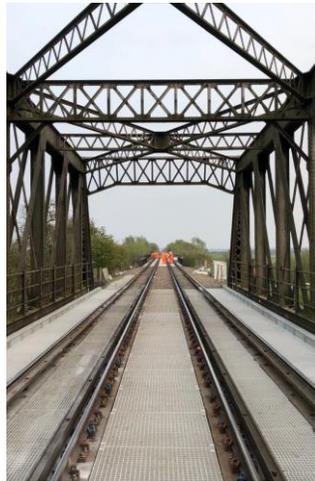
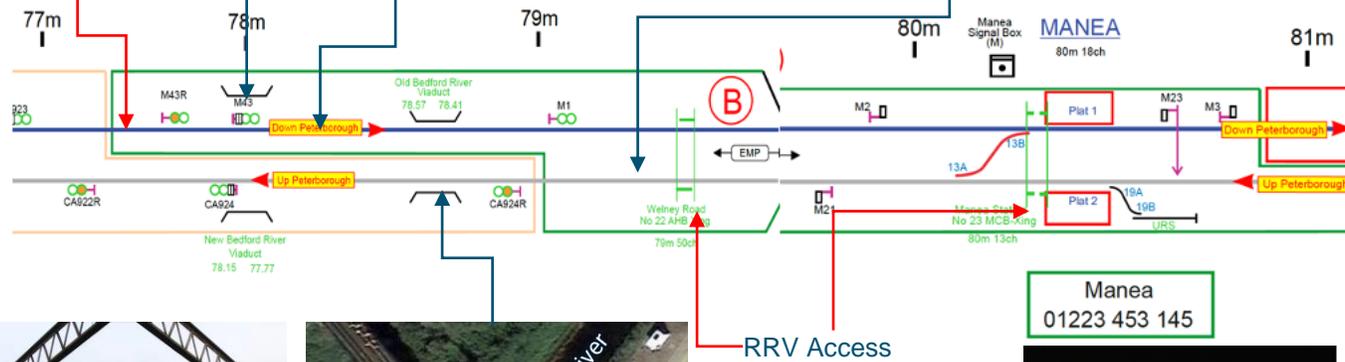
Bridge 1814

Flood span
17 Pairs Down / 21 Pairs Up



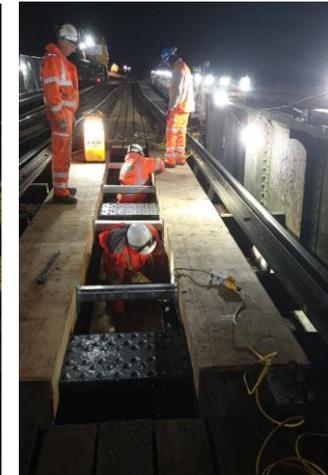
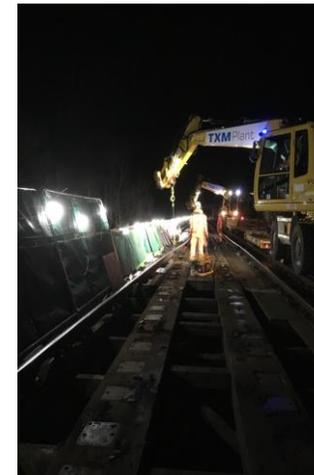
Bridge 1815

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

Location	E/R	Start Mile	End Mile	No.	Down		Up	
					2100	1100		
1815?	EMP	?	?	2	6m	6m	6m	6m
Ballast section								
1814A	Old Bedford Road EWP	78m53c	78m58c	11	Completed	Completed	Completed	Completed
				10	Completed	Completed	Completed	Completed
				9	Completed	Completed	Completed	Completed
				8	Completed	Completed	Completed	Completed
				7	Completed	Completed	Completed	Completed
				6	Completed	Completed	Completed	Completed
				5	Completed	Completed	Completed	Completed
				4	Completed	Completed	Completed	Completed
				3	Completed	Completed	Completed	Completed
				2	Completed	Completed	Completed	Completed
				1	Completed	Completed	Completed	Completed
Ballast section 78m 51c to 78m 53c								
1814	Flood Span EWP	78m43c	78m51c	27	6m	6m	6m	6m
				26	2y	2y	6m	6m
				25	Completed	Completed	6m	6m
				24	3y	3y	12m	12m
				23	2y	2y	Completed	Completed
				22	Completed	Completed	Completed	Completed
				21	2y	2y	Completed	Completed
				20	2y	2y	Completed	Completed
				19	6m	6m	12m	12m
				18	3y	3y	2y	2y
				17	3y	3y	12m	12m
				16	2y	2y	2y	2y
				15	2y	2y	12m	12m
				14	2y	2y	12m	12m
				13	3y	3y	12m	12m
				12	3y	3y	6m	6m
				11	Completed	Completed	3y	2y
				10	Completed	Completed	3y	2y
				9	2y	2y	12m	12m
				8	2y	2y	12m	12m
				7	2y	2y	Completed	Completed
				6	2y	2y	12m	12m
				5	2y	2y	12m	12m
				4	6m	6m	6m	6m
				3	Completed	Completed	Completed	Completed
				2	2y	2y	12m	12m
				1	Completed	Completed	12m	12m
Ballast section 78m 15c to 78m 42c								
1813	New Bedford Road EWP	78m3c	78m15c	31	Completed	Completed	Completed	Completed
				30	2y	12m	Completed	Completed
				29	Completed	Completed	Completed	Completed
				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	2y	2y	Completed	Completed
				21	6m	12m	Completed	Completed
				20	12m	3y	6m	6m
				19	3y	3y	6m	6m
				18	12m	3y	2y	2y
				17	5m	12m	2y	2y
				16	2y	2y	2y	2y
				15	Completed	Completed	2y	2y
				14	Completed	Completed	2y	2y
				13	2y	2y	4y	4y
				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
				6	2y	12m	3y	3y
				5	2y	12m	3y	3y
				4	12m	12m	3y	18m
				3	6m	12m	12m	18m
				2	3y	3y	Completed	Completed
				1	3y	3y	Completed	Completed

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)

Bridge 1814 - 4 reds, 13 amber, 17 yellow, 6 whites, 10 completed
 Down - 3 reds, 1 amber, 13 yellows
 Up - 5 reds, 2 amber, 4 yellow

Bridge 1814A - 1 Red, 6 amber, 2 yellow, 2 completed
 Down - 1 amber, 2 yellow
 Up - 1 red, 3 amber

20mph TSR (up line)
 20mph TSR (down line)

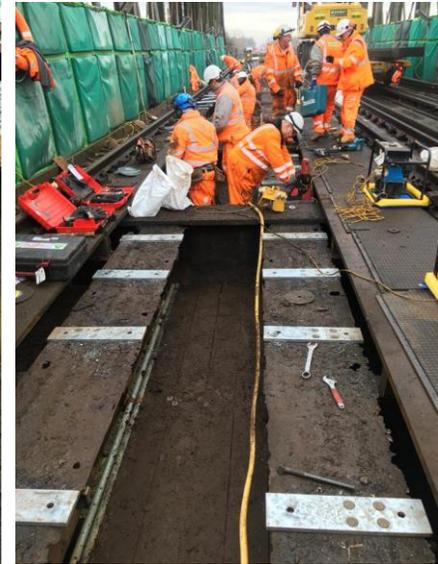
20mph TSR (up line)
 20mph TSR (down line)

Speed Restriction Information (2020)

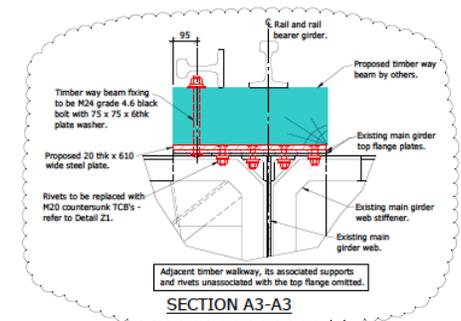
Safety and environmental considerations

- 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 Wheel-timber works in these weeks									Best weeks in this timeframe without risking the wider Anglia Plan								No Core WT		No Core WT		No Core WT	Decision criteria
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 Reds	6hr scaffold strike	27hr 1814A /1814 / 1813 Dn Reds	12hr scaffold strike	6hr strike scaffold	52hr 1814 / 1814A / 1815 Up Reds	6hr strike scaffold	52hr 1814 / 1813 Up Reds	6hr strike scaffold	52hr 1815 / 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	Bayham 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 52hr FUW			
GA											Cow Creek 52hr Core				Spikes Lane 27hr Core							Panington 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

A vertical graphic on the left side of the slide, consisting of a series of dark blue horizontal bars of varying lengths, creating a stylized representation of a railway track.

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.

