Navigation Committee

Agenda 10 June 2021

2.00pm

Introduction

1. To receive apologies for absence
2. To receive declarations of interest
3. To note whether any items have been proposed as matters of urgent business
4. Public question time – to note whether any questions have been raised by members of the public
5. **To receive and confirm the minutes of the Navigation Committee meeting held on 15 April 2021** (Pages 3-10)
6. **Summary of actions and outstanding issues following discussion at previous meetings** (Pages 11-12)

Reports for information

7. **Chief Executive's report and current issues** (Pages 13-23)
   Report by Chief Executive
8. **Carrow Road Bridge repairs** (Pages 24-125)
   Report by Chief Executive and Director of Operations
9. **Delivery of mooring provision within the Integrated Access Strategy Action Plan 2019-21** (Pages 126-136)
   Report by Chief Executive, Director of Operations, and Head of Construction, Maintenance and Ecology
10. **South Walsham slipway access** (Pages 137-141)
    Report by Director of Operations
11. **Mutford Lock – operation and risk assessment** (Pages 142-147)
    Report by Rivers Engineer
12. **Annual income and expenditure 2020/21** (Pages 148-155)
    Report by Chief Financial Officer

13. **Construction, Maintenance and Ecology work programme – progress update** (Pages 156-163)
    Report by Head of Construction, Maintenance, and Ecology

Other matters

14. **To note the date of the next meeting – Thursday 2 September 2021 at 10.00am**

Navigation Committee

Minutes of the meeting held on 15 April 2021

Present

Nicky Talbot – in the Chair, Mike Barnes, Harry Blathwayt, Greg Munford, Simon Sparrow, Paul Thomas (until item 13), Alan Thomson.

In attendance

Essie Guds – Governance Officer (Moderator), Dan Hoare – Head of Construction, Maintenance and Ecology, Emma Krelle - Chief Financial Officer, Sarah Mullarney - Governance Officer, John Packman - Chief Executive, Rob Rogers - Director of Operations, Sara Utting – Governance Officer (Moderator).

Also in attendance

Bill Dickson – Chairman of the Broads Authority.

1. Apologies for absence

Apologies were received from John Ash, Linda Aspland, Matthew Bradbury, Andy Hamilton, and Leslie Mogford.

John Ash forwarded comments regarding agenda items, these were read out at the appropriate items and formed part of the discussion.

Remote meeting standing orders and recording

The Chief Executive welcomed everyone to this meeting of the Navigation Committee, which was being held remotely under the Standing Orders for remote meetings adopted by the Broads Authority on 22 May 2020. The meeting was being live streamed and recorded, with the live stream accessible from the Authority's website. The Broads Authority retained the copyright of the recording and the minutes remained the formal record of the meeting.

2. Appointment of Chair

The Chief Executive (CEO) reported that nominations for the Chair had been invited in line with the procedure adopted following the 18 May 2018 Broads Authority meeting.

Nicky Talbot had been proposed by Simon Sparrow and seconded by Greg Munford. No other nominations had been received.

It was resolved that Nicky Talbot be appointed Chair of the Navigation Committee.

Nicky Talbot in the Chair.

3. Appointment of Vice Chair

The Chair reported that nominations for Vice Chair had been received for Simon Sparrow, proposed by Nicky Talbot and seconded by Greg Munford. No other nominations had been received.

It was resolved that Simon Sparrow be appointed Vice Chair of the Navigation Committee.

Chair announcements

The Chair paid tribute to Mollie Howes, who passed away on 10 March aged 90. Mollie was an active member of Horning and Snowflake Sailing Clubs and the Norfolk Broads Yacht Club. The Chair said Mollie was passionate about boating and her enthusiasm for politics and love of the broads made her a regular attendee of Broads Authority and Navigation Committee meetings, and she had served on the NSBA for over 20 years. Affectionately known as 'Mrs Public' she opposed the Broads Bill in the Houses of Parliament fighting for her keenly held beliefs. The Chair said Mollie was a very sociable lady with a wonderful personality and expressed condolences to Mollie's family on behalf of the committee.

4. Declarations of interest

There were no additional declarations of interest to declare.

5. Matters of urgent business

No items were proposed as a matter of urgent business.

6. Public question time

No public questions were raised.

7. Minutes of last meeting

The minutes of the meeting held on 14 January 2021 were approved as a correct record and would be signed by the Chair.

8. Summary of actions and outstanding issues following discussions at previous meetings

Members received a report summarising the progress of issues that had recently been presented to the Committee.

It was reported that Network Rail (NR) had committed to a multi million pound refurbishment of Reedham, Somerleyton and Oulton swing bridges. This involved the replacement of lifting and turning mechanisms to make the opening and closing of the bridges more reliable. The CEO commented that it was a substantial piece of work that would make a big difference to the operation of the bridges. He thanked the Director of Operations for his time in building a close working relationship with NR, which he said had been critical for NR to understand the difficulties faced by the boating community.

One member raised concerns with access to the sea as a result of the issues with Haven bridge and the construction of river crossings in Yarmouth and Lowestoft. The Head of Construction, Maintenance, and Ecology (CME) discussed the implications the closure of Haven bridge had for the Authority. Contractors had been tendered to install the marker posts at Breydon water, however they were stationed on the other side of Haven bridge and unable to get through. Given the importance of this task, the Authority's work programme was

reprioritised to allow the operations team to commence the installation of the posts. It was noted that the intention for using contractors was to limit disruption to the dredging programme. The CEO added that the operation of Haven bridge was outside the Broads Authority's (BA) control and said the Authority was doing its best to raise the issue at the highest level with Norfolk County Council (NCC).

The report was noted.

9. Appointment of two co-opted members to the Broads Authority

Members were asked to recommend the appointment of two co-opted members to the Broads Authority until 13 May 2022 as set out in Section 1(2)(c) of the Norfolk and Suffolk Broads Act 1988 as amended.

Schedule 4, paragraph 4(3) of the Norfolk and Suffolk Broads Act 1988 further states that the Navigation Committee shall elect a Chair from among those of its members who are members of the Authority. Given that Nicky Talbot had been elected Chair of the Committee, she would need to take up one of the seats on the Authority.

Nicky Talbot proposed, seconded by Harry Blathwayt that Simon Sparrow be appointed as a member of the Broads Authority until 13 May 2022. No other nominations were received.

It was resolved that Nicky Talbot and Simon Sparrow be recommended to the Broads Authority for appointment as the co-opted members to the Broads Authority until 13 May 2022.

10. Chief Executive's report and current issues

Carrow Road Bridge repairs

Members had received a copy of the NCC (Norfolk County Council) Cabinet summary report regarding the future maintenance of Carrow Bridge. It was reported that the CEO and the Director of Operations had since met with Grahame Bygrave, NCC Director of Highways and Waste, to discuss the issue of the Carrow Road Bridge repairs. The CEO said it was a productive and informative meeting and highlighted key issues for members.

It was explained that the plywood decking on Carrow Bridge was replaced by NCC every 6 months, which involved drilling into the concrete base underneath. This concrete had reached its end of life and required substantial works to replace it. NCC estimated it would take a minimum 3 months to undertake the work, depending on the condition of the bridge. A road closure would also be required for the duration of the works which the CEO noted would cause serious disruption to the city. He said it was important to consider how the Authority would respond to this.

The NCC summary report also identified fixing the bridge in place, as a temporary solution, in order to undertake necessary investigations to find a permanent solution. NCC had specified the temporary period as a minimum of 5 years. The CEO commented on the legal implications

of fixing the bridge locked for 5 years, as the Act of Parliament required Carrow Bridge to be an opening bridge.

The CEO noted that additional information was required for the Navigation Committee to give a view on the future of the bridge; including the legal background, structural condition of the bridge, different repair options explored by NCC and the cost implications. Mr Bygrave had agreed to work with the Authority to supply this information so a more substantial report could be presented to members at the next committee meeting.

The Chair reiterated concerns for the potential temporary closure, and said the Committee was pleased to be kept informed of the situation and welcomed more information to be presented at a future meeting.

A member said the 5-year closure would set a precedent that British Rail could use for Trowse bridge. The CEO responded that the relationship between the different bridges was significant and the Authority needed to be mindful of this in their response. He added that he had contested the claim in the NCC summary report that there was no demand to open Carrow Bridge. He said the difficulty in opening the bridge had acted as a deterrent for larger vessels coming into Norwich and there would be a higher demand if it could open more readily.

Another member commented on the trend in commercial traffic and the increase in sail powered high super structures that would require bridge openings to access the city. He said it would be upsetting if the navigation options to a significant city were closed.

Safety videos

The CEO thanked Greg Munford and the Head of Communications for the speed in delivering the safety videos. All major navigation and safety bodies had signed up to the project and the videos had received praise for their content and value. It was also reported that the Ranger team had seen a noticeable increase in the number of people wearing lifejackets in and around moorings. The CEO said this was a combination of the videos and hire boat companies having a greater emphasis on safety. He added that safety featured highly in the latest edition of Broadcaster.

A member commented that the safety videos would make a huge difference to every hire company using them and said it was a brilliant initiative by the BA. It was also highlighted that whilst the Authority can do what it can to reduce risk, individuals had a personal responsibility for their actions.

The report was noted.

11. Construction, maintenance and environment work programme progress update

Dredging

The Head of CME explained the dredging work plan for 2021/22. He said the lower dredging volumes marked the progress of the Sediment Management Strategy, as larger volume

projects had been completed in previous years. Projects for the coming year would be more complex and time consuming, and included the river Thurne, Oulton, the river Chet, and upper Waveney.

It was noted that dredging time had been impacted by the decision to deploy the Construction team to replace the navigation posts on Breydon. This had caused a 6-week diversion from the work programme. The Head of CME said it was not a decision that was taken lightly and was balanced across multiple priorities. Alternative contractors weren't financially advantageous or within the budget available, using the Authority's own staff presented the best option.

The Head of CME addressed questions regarding mean low water levels and whether they were higher than 10 years ago. He said the method for calculating mean low water levels was more accurate due to a better and wider network of data available. It was suggested that previous records were too high given the relatively small amount of information and extreme extrapolation that was applied to the mid 90's assessment. Water levels had generally been higher at Potter Heigham over the last two years compared to the previous 13 years, however this was not a trend seen across the broads. In response to a member question, the Head of CME suggested this was a result of rainfall and higher water levels in the aquifers during the winter.

The improved network of data provided more accurate sediment volume figures, and allowed dredging to be better targeted. The Head of CME added that the mapping software was also more accurate and removed offline and non-navigable areas that were previously incorporated in the total. This refined methodology and forward strategy would be outlined in the Waterways and Management Strategy which was in development.

Moorings

It was reported that the lease issues for St Benet's mooring had been resolved and the contractors were on site this week. Lease arrangements for Burgh Castle were in progress with the landowner. BESL was on-site completing works and the handover to the Authority was expected in the early summer. A confirmed opening date for public use would be announced when known.

Navigation hazards

A member reported concern with debris floating around the network following a sunken vessel and asked what measures were being taken to prevent further hazards to boaters. The Head of CME responded that the particular vessel that was causing an obstruction on the river Waveney had been removed. He added that Rangers were on site to gather any debris from the waterways, and regularly remove any hazards when patrolling.

The Chair said it was important to highlight that the cost for the Authority to clear sunken vessels would come from toll payer money. Adding that this should be taken into consideration when assessing the Authority's involvement and use of resources with this task.

The Director of Operations added that there was a set process for responding to sunken vessels, however it was ultimately the responsibility of the vessel owner. The Authority assisted with the removal of wrecks from the water, and always made sure they were safely secured.

Bio diesel fuel

A trial is underway to see if Wherries and excavators could use Hydrotreated Vegetable Oil (HVO), bio diesel fuel. It was explained that the use of HVO represented a 90% reduction in terms of the Authority's carbon reduction targets.

In response to a member question, the Head of CME said compared to Gas-To-Liquids (GTL), the synthetic diesel alternative used by some hire yards, HVO didn't have issues with shelf life. The Authority was seeking partners to collaborate on a bulk purchase of HVO, to reduce the price per litre and delivery costs.

Future reporting of Operation work programme

Members were shown a pie chart representing the proportion of Operation Technician time spent on different navigation work. Dredging equated to 60% of the overall time, mooring maintenance and repair was 20%, riverside tree management, weed harvester, and other navigation works were each under 10%. The Head of CME commented that the committee was routinely updated on dredging projects and asked if members wanted to know more about the wider programme.

A member commented that it would be useful to understand the impact of deferred projects. The Director of Operations explained that these tasks were rolled into the following year's programme. Members supported the suggestion for additional information to be provided in the CME update report.

The report was noted.

12. Navigation income and expenditure 1 April to 28 February 2021 actual and 2020/21 forecast outturn

The Chief Financial Officer (CFO) explained that an update for March would be provided to members at the 30 April Broads Authority meeting. However, it was reported that as of 12 April, £1.4 million had been processed in private craft tolls.

Members thanked the tolls team for their work over the last year, noting the extreme pressures they had been working under.

Due to technical issues the meeting was temporarily suspended and the live stream stopped.

The meeting resumed at 15:49.

There were no further updates or questions on this item. The Chair thanked the Chief Financial Officer for her report and **the report was noted.**

13. Annual Safety Audit

The CEO introduced the report on the annual review of marine incidents. He said that the broads remained a safe place for boating but there had been more incidents recorded last year than usual.

The Chair concluded that it was hoped to assess increased awareness from the safety videos over the next season.

The report was noted.

14. Power boat racing review

The Committee was consulted on the power boat racing at Oulton Broad and the proposed fixture dates for 2021.

Members had no comments on the power boat racing dates proposed for 2021.

The report was noted.

15. Committee calendar 2021/22 – Navigation Committee dates

Members were informed that the 2021/2022 committee calendar proposed to change the start time for Navigation Committee meetings to 10am. There were no objections from members. The Chair asked that reminders be sent out to members for the amended time.

The report was noted.

16. Date of next meeting

The next meeting of the Navigation Committee would be held on **Thursday 10 June 2021 starting at 2pm.**

The CEO explained that there was still uncertainty as to whether remote meetings could continue; the Government's decision not to extend the regulations permitting local authorities and bodies such as the BA to conduct meetings remotely was being challenged in the courts. The CEO considered it to be a backwards step if regulations prevented authorities from holding some meetings remotely, noting the benefits for members who would have to travel to meetings as well as the impact on the carbon footprint. Members would be kept informed of future arrangements.

The meeting ended at 15:56.

Signed

Chairman

Navigation Committee

10 June 2021
Agenda item number 6

Summary of actions and outstanding issues following discussions at previous meetings

Title	Meeting date	Lead officer	Summary of actions	Progress so far	Target date
Network Rail Whole Life Strategy	19/10/2017	John Packman	Network Rail Whole Life Strategy planning for swing bridges and replacing Trowse Swing Bridge with fixed bridge.	**May 2020**: Following sensor replacement works at Somerleyton, Reedham & Oulton, Network Rail (NR) believes operational reliability of these bridges will be improved. As we enter Summer 2020 we will monitor opening and breakdowns to ascertain this reliability. Broads Authority (BA) and NR continue to discuss swing bridge issues. BA also in Working Group with Norfolk County Council, Norwich City Council, LEP, NR and Greater Anglia working on Trowse Bridge issues and gathering wider support and funding for replacement/ better operational reliabilty of this bridge. **Jul 2020:** Trowse Rail Bridge Working Group continuing to meet. Next phase of project is to meet with Train Services Director for Southeastern - meeting to include spokespeople from working group, incl. John Packman. Further updates provided when meeting date confirmed. **Sep 2020:** BA written officially to Norfolk County Council regarding Haven Bridge, Great Yarmouth. **Dec 2020:** Update provided in CEO report (14/01/2021): Authority officers are involved in meetings to discuss the future of Trowse Swing Bridge and the development opportunities in East Norwich presented by three large brownfield sites, namely the Carrow Works, the Deal Ground and the Utilities Site. The Chief Executive and Director of Operations are members of a working group looking at the Trowse Bridge (along with Network Rail, Abellio Greater Anglia, Norfolk County Council, Norwich City Council and New Anglia). The Head of Planning and the Senior Planning Officer sit on another group looking at the development sites. There is an important relationship between the two issues and our officers are making sure that navigation interests are considered. **Mar 2021:** Director of Operations met with Network Rail to discuss a multi-million pound refurbishment of the swing bridges (Reedham, Somerleyton & Oulton) due to commence in 2022. The NR scheme will see the lifting and turning mechanisms replaced to make the operation of opening and closing the swing bridges more reliable. At the start up meeting the BA asked if the thermal expansion to the bridges in warm weather could also be addressed. This is currently being considered by Network Rail. The BA is working with NR on communications, work planning and managing the navigation.	

Title	Meeting date	Lead officer	Summary of actions	Progress so far	Target date
Planning application with navigation implications: BA/2018/0466/FUL – Land at Burgh Castle – BFAP Compartment 34	17/01/2019	Rob Rogers	Lease arrangements and repiling at Burgh Castle for reinstatement of free 24-hour moorings.	Following exempt paper considered at Navigation Committee and Broads Authority, officers presented landowner with series of options on alternative Burgh Castle mooring site, based on recommendations in exempt report. **16 Jan 2020:** Members supported 99-year lease agreement, including BA taking on full responsibility for piling structure. **21 Jan 2020:** Management Team agreed 99-year lease at peppercorn rent and for BA to take full responsibility for piling structure at Burgh Castle moorings. **27 May 2020:** Development and improvements at Belton Reach (new name for Burgh Castle's moved mooring location) progressing from operational plannning perspective, but project deferred to 2021/2022 due to Covid-19 impact on funding issues. **15 Dec 2020:** Following funding review by Environment Agency, plans to pile original Burgh Castle mooring site reinstated - EA negotiating site access with landowner with view to start pilings works this winter. Separate negotiation taking place between BA and landowner to agree terms of lease for site to enable operation as BA 24-hour free mooring. **30 Mar 2021:** Environment Agency contractors on site and repiling of Burgy Castle underway. Summary discussions held with landowner's solicitor and draft lease for site under consideration. **17 May 2021:** Environment Agency completed piling and currently installing new timber to pile tops. BA sorting lease details with landowner, so that when site works are finished BA can reopen moorings site. Projected timescale is late June 2021.	30/06/2021
Landscapes Review	16/01/2020	John Packman	Navigation Committee asked to comment on BA's proposed response to Landscapes Review (Glover report) - to be reported to BA meeting on 31 Jan 2020.	**31 Jan 2020**: BA report on Landscapes Review Proposal 27: A new financial model – more money, more secure, more enterprising; "unnecessary complexities, such as the requirement for the Broads Authority to account for income and expenditure from National Park Grant separately … should be addressed." BA draft response is that it would be a Government decision whether to combine the finances and the BA would await the Government's response. **Dec 2020:** Still awaiting Government response. **May 2021:** Written Ministerial Statement expected in late May/early June.	
Carrow Road Bridge Repairs	15/04/2021	John Packman	Briefing provided at the April Committee meeting outling Norfolk County Council's proposals for the repair of Carrow Road Bridge. Further information is awaited from the County Council.	Report on this agenda.	10/06/2021

Date of report: 24 May 2021

Navigation Committee

10 June 2021
Agenda item number 7

Chief Executive's report and current issues

Report by Chief Executive

Purpose

To give a briefing on significant matters relating to the maintenance and management of the waterways, and allow members to raise any such issues.

Contents

1. Appointment of two co-opted members to the Broads Authority

1.1. At its meeting on 30 April, the Broads Authority appointed Nicky Talbot and Simon Sparrow as members of the Authority for one year until 13 May 2022.

2. Appointment of Monitoring Officer

2.1. At its meeting on 30 April, the Broads Authority appointed Christopher Bing as the Authority's Monitoring Officer with effect from 15 May 2021, under an agreement with East Suffolk Council. Mr Bing replaces Mrs Hilary Slater, who retired from East Suffolk Council at the end of May.

3. East Norwich Masterplan

3.1. Consultation will commence soon on the high-level principles for the re-development of three key sites in the east part of Norwich. This potentially involves significant implications for navigation particularly around the treatment of the river and the provision of moorings.

4. Clean Maritime Bid

4.1. The Department for Transport (DfT) has announced the Clean Maritime demonstration and will be investing up to £20m for innovative clean maritime and smart shipping projects. The aim is to support the design and development of technologies for the reduction of greenhouse gas emissions by the UK's maritime sector. £10m has been allocated for prototypes, and £10m for feasibly studies.

4.2. A bid will be submitted for an Electrifying the Broads feasibility study. Ren Energy will be the lead partner working with the Broads Authority, Net Zero East and Norfolk Broads Direct. The application deadline is 2 June 2021 and applicants will be notified if they are successful on 26 July 2021. The objective of the project is to produce a roadmap to a decarbonised hire boat sector, and to plan for the network of supporting infrastructure across the Broads. It will seek to identify the measures needed to enable the transition to a zero-carbon boating industry, and to ensure a zero-carbon boat can access the entire Broads network. This will be achieved by:

- Defining a case study boat

- Considering retrofit options
- Considering new build options for boats
- Mapping for charging options
- Proposals for charging infrastructure

4.3. The project will be 70% funded, with no cash costs and needs to be completed by 31 March 2022. The majority of staff time will come from the Carbon Reduction Project Manager. He has spoken to the Planning Policy Officer, and GIS Officer for planning policy and mapping support.

5. Enforcement Policy: Navigation functions

5.1. Minor changes have been made to the Authority's Enforcement Policy for navigation functions (Appendix 5). In practice, the policy is continually reviewed each time a case is taken to court, but it has not been reviewed by this Committee since 2009.

6. Navigation patrolling and performance targets

6.1. The report of the significant use of powers by the Rangers is at Appendix 1 and reflects the busy period. Appendix 2 shows the average navigation/countryside splits; these are higher on the navigation side, as expected during the summer when patrolling is a priority.

7. Sunken and abandoned vessel update

7.1. The sunken and abandoned vessel update is at Appendix 3. A large number of sunken vessels were dealt with over the winter period, with one historic case and two current cases.

8. Planning enforcement update

8.1. There are no further enforcement matters with navigation implications to report.

Author: John Packman

Date of report: 26 May 2021

Appendix 1 – Rangers exercise of powers analysis April 2021 – May 2021

Appendix 2 – Ranger duties: total time allocated and actual days

Appendix 3 – Sunken and abandoned vessels current position as at 24 May 2021

Appendix 4 – Prosecutions dealt with in court for non-payment of tolls since 08 April 2021

Appendix 5 – Enforcement Policy: Navigation functions 08 April 2021

Appendix 1 – Rangers exercise of powers analysis April 2021 – May 2021

Table 1

Verbal warnings	**Wroxham launch** Wroxham and upper Bure	**Irstead launch** Ant	**Ludham launch** Hickling, Potter Heigham, upper Thurne	**Ludham launch 2** lower Thurne and lower Bure	**Norwich launch** Norwich and upper Yare	**Hardley Launch** Reedham, Chet and middle Yare	**Burgh St Peter launch** Oulton Broad and upper/ middle Waveney	**Breydon launch** Breydon water, lower Waveney and Yare
Care and caution	14	0	2	3	8	1	0	0
Speed	411	117	112	34	3	14	8	17
Other	12	10	1	6	2	3	0	0

Table 2

Written warnings	**Wroxham launch**	**Irstead launch**	**Ludham launch**	**Ludham launch 2**	**Norwich launch**	**Hardley Launch**	**Burgh St Peter launch**	**Breydon launch**
Care and caution	2	1	0	1	0	1	0	0
Speed	6	0	0	0	0	0	2	1
Other	1	6	2	0	2	10	2	0
Special directions	0	30	20	11	0	0	0	1

Table 3

Launch patrols	Wroxham launch	Irstead launch	Ludham launch	Ludham launch 2	Norwich launch	Hardley Launch	Burgh St Peter launch	Breydon launch
Launch staffed by ranger	61	61	61	60	60	58	58	61
Volunteer patrols	0	0	0	0	0	0	0	0
IRIS reports	6	8	8	11	9	5	3	9

Table 4

Broads Control total calls

Contact method	Number of calls
Telephone	4683
VHF	1377
Total	**6060**

Appendix 2 – Ranger duties: total time allocated and actual days

Table 1
Broads Authority corporate duties

Work area	Annual allocation (days)	Actual days to date
Training	134	14.19
Broads Control	362	55.07
Team meetings, work planning	356	69.66
Partnership working	76	5.00
Assisting other sections	76	21.01
Billets and boatsheds	25	7.36
Launch – general	0	3.85
Trailers - general	0	0
Vehicle maintenance	0	0.14
Other equipment repair	0	1.35
Total	**1029**	**177.63**

Table 2
Navigation duties

Work area	Annual allocation (days)	Actual days to date
Patrolling	2136	410.20
Escorts	49	15.81
Prosecution files	0	3.11
Bankside tree management	53	0
Obstruction removal	36	7.50
Channel markers and buoys	25	1.28
Signs and boards maintenance	34	8.85
Adjacent waters	100	0
Reactive mooring maintenance	104.5	4.26
Total	**2537.5**	**451.01**

Table 3
Conservation, recreation, countryside maintenance

Work area	Annual allocation (days)	Actual days to date
Fen management	195	1.01
Lake, riverbank restoration	126	4.05
Invasive species control	22.5	3.45
Other conservation work	148	4.12
Pollution response	0	1.35
Visitor site maintenance	209	85.24
Public engagement	301	7.90
Public footpath work	44	2.03
Education work	69	3.04
Total	**1114.5**	**112.19**

Team total up to 21 May 2021
Percentage Navigation: 80%
Percentage National Park: 20%

Appendix 3 – Sunken and abandoned vessels current position as at 24 May 2021

Description	Location found	Action	Notice affixed	Result
Motor Cruiser	River Yare, old River Thorpe	Vessel sunk at owners' moorings	No	Not affecting navigation
Motor Cruiser	Sutton/Stalham Cut	Landowner has removed top section of vessel. Hull is marked and an assessment made if this can be raised by the dredging rig when it is next in the area.	No	Top section removed by landowner
Workboat	River Yare, old River Thorpe	Vessel sunk at owner's moorings	No	Working with owner to raise
Motor Cruiser	River Yare, Thorpe Island	Vessel sunk at mooring	Yes	Vessel removed

Appendix 4 – Prosecutions dealt with in court for non-payment of tolls since 08 April 2021

Type of vessel	Vessel name	Fined	Costs awarded	Victim surcharge	Compensation
Motor Boat	Lady Kay	£440.00	£380.00	£44.00	£377.46
Auxiliary Yacht	Sea Wyvern	£220.00	£170.00	£34.00	£103.40
Auxiliary Yacht	Jolly Roger	£220.00	£170.00	£34.00	£124.08
Auxiliary Yacht	Unnamed	£500.00	£175.00	£50.00	£227.48
Motor Boat	Valencia	£500.00	£175.00	£50.00	£149.18
Motor Boat	Alcedo Atthis	£220.00	£175.00	£34.00	£223.68
Auxiliary Yacht	Sunshine	£250.00	£175.00	£34.00	£258.50
Houseboat	Salvager 1	£1,000.00	£170.00	£100.00	£256.20
Sailing Boat	Physco Lea 10	£500.00	£170.00	£50.00	£97.68

Appendix 5

Enforcement Policy: Navigation functions

~~April2009~~ June 2021

1. Introduction

Effective enforcement of the legislation relating to the Authority's navigation function is essential to protect the health and safety of users of the Broads waterways. The purpose of this policy is to provide guidance on the general principles the Authority will apply when carrying out its enforcement responsibilities.

This policy has been agreed by the Authority following consultation with its Navigation Committee on ~~16 April 2009~~ 10 June 2021.

This policy incorporates the following principles of good enforcement for regulating bodies:

- Setting clear standards.
- Providing information clearly and openly.
- Helping businesses and users of the navigation by advising and assisting with compliance.
- Having a clear complaints procedure.
- Ensuring that enforcement action is proportionate to the risks involved.
- Ensuring consistent enforcement practice.

If you have any questions about this policy, please contact the Director of Operations.

2. The Policy

2.1. Setting clear standards

- For 3rd Party complaints, the Authority will:
    - Respond within 10 days with a decision on whether or not to pursue.
    - Carry out a preliminary investigation within 28 days.
    - Fully investigate and forward case papers to the Authority's Solicitor within 4 months.
    - Keep complainants informed as to progress with the investigation and any decisions relating to the complaint.

2.2. Providing information clearly and openly

- The Authority will produce guidance (e.g. publication of byelaws/directions, signage etc) in an easy to understand format for users of the Broads navigation area and ensure that it is kept up to date. This will be made available as widely as possible.

2.3. Helping businesses and users of the navigation by advising and assisting with compliance

- The Authority's officers will work closely with the hire boat industry, sailing clubs, user groups and landowners to make sure they and their staff/members are fully aware of the requirements of the legislation relating to the Broads navigation, such as the Hire Boat Licensing Code.
- Where remedial action is required, the Authority will clearly explain (in writing, if requested) why the action is necessary and when it must be carried out; a distinction will be made between best practice advice and legal requirements.

2.4. Having a clear complaints procedure

- A well-publicised complaints procedure for the Authority is already in place and this will be maintained.

2.5. Ensuring that enforcement action is proportionate to the risks involved

- Enforcement powers will be exercised only to achieve the legislative purpose for those powers. Generally, this purpose will be health and safety, but in certain circumstances the purpose of the power is to protect the environment, to avoid nuisance or to enforce the collection of tolls ~~and the display of toll plaques~~.
- Reasonableness is also key. This will include avoidance of unnecessary expense and a consideration of the likely outcome of any enforcement action, together with an assessment of the risk.
- In deciding whether or not to prosecute, the Authority will take into account:
    - The foreseeability of the offence or the circumstances leading to it.
    - The intention of the offender (including any clear disregard or contempt for the byelaws).
    - The flagrancy of the offence.
    - Any history of offending (including any previous warnings).
    - The attitude of the offender.
    - The deterrent effect of a prosecution on the offender and others.
    - Whether the offender has acted inconsiderately or in disregard for the safety or amenity of others.

- Whether the offence is compounded by offensive, loud, aggressive or drunken behaviour.
- The personal circumstances of the offender.

2.6. Ensuring consistent enforcement practice

- With a view to ensuring consistent enforcement practice, the Authority will:
  - Maintain a procedure for ensuring (as at present) that decisions to enforce are taken by officers with responsibilities across the navigation system.
  - Provide full and effective training in the relevant procedures and requirements.
  - Hold regular meetings of Rangers.
  - Ensure the prompt cascading of information.

2.7 Deterrent to others

- The use of Court Results may be used where appropriate ~~for~~ to deter bad behaviour and promote safety messages. This will be in line with the "Publicising Sentencing Outcomes" Policy.

Navigation Committee

10 June 2021
Agenda item number 8

Carrow Road Bridge repairs

Report by Chief Executive and Director of Operations

Purpose

This report seeks members' views on Norfolk County Council's proposal to carry out repairs to Carrow Road Bridge, and fix the deck into position, during the summer of 2022.

Broads Plan context

Objective 4.1 is to "Maintain existing navigation water space and develop appropriate opportunities to expand or extend access for various types of craft." Objective 4.3 is to "Implement, promote and monitor measures to maintain and improve safety and security for the navigation and boats."

1. Introduction

1.1. Prior to the last meeting of this Committee on 15 April, members received a copy of a summary report to Norfolk County Council's (NCC) Cabinet regarding the future maintenance of Carrow Bridge, together with a verbal update at the meeting following a conversation between officers and the Director of Highways and Waste. NCC has since provided a copy of a report setting out the options it has considered (see Appendix 1).

2. Carrow Bridge, Norwich

2.1. Carrow Bridge was constructed in 1923 to carry the A147 (Carrow Road) Norwich Ring Road over the River Wensum. The bridge has a single leaf bascule rolling lifting span, which when open allows tall vessels to pass on their way to the Port of Norwich. The bridge has a 4.27m (14ft) clearance at average high water.

2.2. In 1995, the bridge deck was waterproofed with Acme plywood deck panels, a propriety system with a panel surface having a high-skid resistant coating pre-applied. This decking system is now failing, with most of the original (1995) panels being replaced through maintenance carried out under emergency weekend road closures. These bridge deck repairs and weekend closures are becoming more frequent and expensive.

2.3. NCC is proposing to carry out repairs to the bridge deck during the summer of 2022.

2.4. NCC's report states the preferred option is estimated to cost £150,000 and involves "temporary maintenance and deck fixing" (para 4.3 of that report). It states that "The bridge would be fixed into position so it would not lift, on a temporary basis pending longer term strategic decisions for lifting bridges in the area". This is justified in order "to reduce disruption for maintenance". Officers' understanding, following a meeting with The Director of Highways and Waste, is that "temporary" would be for a period of at least five years.

2.5. The second option, "to refurbish the bridge as a working bascule bridge" has, according to the report, "significant drawbacks on cost (£2m+) and disruption to all highway users as works could result in closure of the bridge for at least three months".

2.6. NCC's report references, in para 7.4, "studies looking at Trowse Rail Bridge and whether a new rail bridge to double track the railway over the river is required, and on how to access development sites in East Norwich". Our current understanding is that there is not a strong economic justification for double tracking Trowse Rail Bridge. There is discussion about the provision of a marina downstream of the rail bridge, which could to some extent ameliorate the loss of access by larger boats to the Port of Norwich. However, the timescale and commitment to such provision is far from certain.

3. Present access arrangements

3.1. A navigator with a vessel needing bridge openings and wanting access to the Port of Norwich will have a number of bridges to negotiate. Bridge openings are as follows:

- Trowse Rail Bridge – opened following a 7-day pre-arranged agreement with Network Rail.
- Carrow Bridge and pedestrian bridges (Lady Julien & Novi Sad) - operated by NCC and also requiring advance notice to open.

3.2. Although demand for large vessels to navigate to the upper reaches of the River Wensum has declined in recent years, the frustrating and inconsistent opening schedule of the bridges and the various Network Rail and NCC departments one needs to liaise with to arrange an opening deters many navigators, driving this demand down even further.

4. Legal implications

4.1. Under the Norwich Corporation Act 1920, in reference to Carrow Bridge, the Corporation is required by virtue of s.61(1) to ensure that "the bridge shall at all times be maintained opened and worked by the Corporation so as to give priority to vessels requiring to pass through the opening span of the bridge over road traffic requiring to use the bridge." S.61(2) sets a penalty if any vessel is detained or unreasonably obstructed at the bridge, and s.61(3) gives the Corporation power to make byelaws as to the opening and closing of the bridge (however not so as to frustrate the

requirement to open the bridge, i.e. they could not have the effect of closing it continuously). Those duties and powers now fall to NCC.

4.2. The Broads Authority has a general statutory duty "to manage the Broads for the purposes of protecting the interests of navigation".

4.3. The Norfolk & Suffolk Broads Act 1989, Section 11 – (1) states that:

"No person shall construct, alter, renew or extend any works or undertake any dredging, within or adjacent to the navigation area, unless –

a) neither the work in question nor the manner in which it is carried out will interfere with navigation in any part of the navigation area or of the Haven or be likely to do so, or

b) that person holds a licence under this section authorising works, complies with conditions attached to that licence, carries out that work in accordance with approved plans, sections and particulars."

4.4. NCC will require a Works Licence from the Broads Authority to be able to undertake its proposed work.

5. Conclusion

5.1. While NCC's preferred option (see para 2.4 above) is cheaper than their second option (para 2.5) and would create less disruption for highway users, the purported temporary sealing of the bridge for five years would create a precedent that would, in all probability, effectively end access to the Port of Norwich by tall vessels.

5.2. The long-term implications of this proposal need to be carefully considered, along with the clauses in the Norwich Corporation Act 1920 (unchanged) that require the bridge to open as a priority over vehicles.

Author: John Packman and Rob Rogers

Date of report: 24 May 2021

Background papers: Highways Capital Programme 2021/22/23/24 and Transport Asset Management Plan - item 9

Appendix 1 – NCC Carrow Bridge Options report

Broads Plan strategic actions: 4.1, 4.3

Norwich - Carrow Bridge

Options Report

March 2021

Prepared by Bridges Team

Norwich - Carrow Bridge

Options Report

March 2021

Prepared by:- Shaun Dean

Community and Environment Services
Highways Group
Norfolk County Council
County Hall
Martineau Lane
Norwich
Norfolk
NR1 2SG

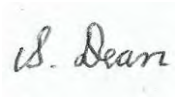
If you would like this document in large print, audio, Braille, alternative format or in a different language please contact **Kath Walpole** on **0344 800 8020** or Textphone 18001 0344 800 8020.

Options Report

Author of Report:-

(Title) Bridge Team Manager

(Name) Shaun Dean BSc C Eng MICE

(Sig) 

Reviewed and Authorised by:-

(Title) Highways Design and Development Manager

(Name) Paul Donnachie BSc C Eng MCIHT

(Sig) 

File Reference:

Issue Status: Final

Contents

Appendices

1. Introduction

This report summarises the options investigated by the County Council's Bridges Team to improve the life and serviceability of Carrow Bridge in Norwich. This is a complex and historic structure which requires specific and careful maintenance due to its age and its mechanical and electrical operation as a bascule bridge.

2 Background

2.1 Carrow Road River Bridge carries the A147 (Carrow Road) Norwich ring road, over the River Wensum in Norwich. The bridge is 98 years old, being constructed in 1923. This section of the Norwich ring road combines both the inner and outer ring roads and is heavily used by all highway modes.

2.2 It has an operational single leaf bascule rolling lifting span. When open, this allows tall vessels sailing on the River Wensum to pass to or from Norwich city centre. Smaller and leisure vessels do not require the bridge to be lifted and they can pass underneath at any time.

2.3 In 1995, the deck was waterproofed and 'Acme' plywood deck panels (a proprietary system of plywood deck panels coated on their top surface with a high skid resistance surfacing material) were installed to form the carriageway surfacing.

2.4 Since then the deck panels have been an expensive maintenance liability due to them becoming loose and breaking up due to the heavy and continuous road traffic. Most, if not all, of the original panels have had to be replaced with new panels. This has required the upper levels of the original deck troughing infill to be replaced with modern cementitious repair materials to provide a better anchorage for the additional fixings.

2.5 Emergency repairs facilitated by weekend road closures are becoming a regular quarterly event. In 2020, a road closure had to be extended due to problems with the materials setting. This caused considerable congestion within Norwich and significantly impacted the highway network.

2.6 Demand for lifting the bridge has reduced in recent years and only 2 vessels have passed in the last 3 years. One was the Vagabond (floating restaurant) in March 2020, the other being the TS Nelson in 2018. On both occasions, this was to allow the vessels to leave their long-term moorings and sail downstream. Since the Riverside development in the 1990's, the function of the area has changed, and there is no current demand for vessels (requiring the bridge to be opened) to enter the Port of Norwich. It should however be noted that the limit of navigation is New Mills, although hire craft are not permitted beyond Bishops Bridge.

2.7 As well as being a key part of the highway network, well used by cyclists and pedestrians, and where the inner and outer ring roads for Norwich meet, next to the bridge is Norwich City Football Club stadium. The proximity of this stadium along with the Premiership season means that road closures require planning to either miss planned home games or works be undertaken at the end of the football season.

2.8 As highlighted above, the City road network here is very well used by all modes including pedestrians, cyclists and vehicle users. The road typically has an annual average daily traffic flow (AADT) in excess of 25,000 vehicles each day. This location is even more key as the inner and outer City ring road system merges into one. It is significant to note that although over 25,000 vehicles use the crossing each day, the bridge has only been lifted two times in recent years for tall river vessels and this was for these vessels to be moved downstream. Leisure craft can pass under the bridge unobstructed.

2.9 Pedestrians and cyclist have a suitable and nearby diversion route by using the existing pedestrian and cycle bridges Novi Sad Bridge and Lady Julian Bridge. However, there is no such suitable nearby crossing for vehicles using the inner and outer City ring road. The alternative routes for these are the A47 southern bypass or using Foundry Bridge near the city centre. Foundry Bridge is a key walking route between the city centre and the railway station. The diversion plans are detailed in Appendix G.

2.10 The environmental impact of these vehicles using the diversion routes is significant. In terms of vehicle emissions, the daily extra vehicle miles travelled would be around 7.5 miles. Given the traffic flow figures, this equates to nearly 187,500 additional vehicle miles for each day of the bridge closure. Therefore, there is a clear environmental benefit in minimising the duration of any bridge closure.

3. Current Condition of the Structure

3.1 The bridge is inspected and maintained by the County Council on a regular basis. Appendix A and B details maintenance and inspection records, including the recent detailed Special Inspection reports for the bridge.

3.2 The condition of the bridge deck, which carries the combined Norwich inner and outer ring roads, is in poor condition and the deck panels are expensive to maintain. In addition, each time replacement or repairs are required, a road closure is necessary, causing considerable highway disruption to the City centre. Costs in recent years are as follows:

2016/17	£10, 400
2017/18	£20, 300
2018/19	£25, 000
2019/20	£27, 700
2020/21	£31, 200

3.3 Maintenance work undertaken is detailed in the following appendices:

- Appendix A maintenance records 2004 to 2020
- Appendix B Special Inspections records

3.4 In recent years maintenance/repair work has consisted mainly of patching and repairs to the uneven carriageway surface, requiring frequent repeat visits associated with heavy traffic use.

3.5 Evidence of the current condition of the bridge deck, including photos, is contained in Special Inspection Report 1 of 8 included at the front of Appendix B. This crucially identifies high priority repairs that constitute Option 1.

3.6 The bridge deck repairs are reaching the end of their life. The bridge deck concrete has been drilled into so many times over the past two decades, that it is becoming increasingly difficult to connect into solid concrete and achieve the required bolt embedment.

3.7 The photos below in Figure 1 illustrate the poor condition of the existing bridge deck. As the bridge is a bascule bridge which opens, the deck itself has to be of lightweight materials. As well as the fixings into the existing concrete being difficult due to the number of times the concrete has been drilled into over the past decades, these lightweight materials are not as durable as a more substantial and heavier deck plates. However, the bridge could not lift using these more substantial materials. Additional photos of the bridge deck can be found in Appendix B.

Figure 1: Photos illustrating the condition of the bridge deck

4. Options

4.1 A number of options to improve the condition and serviceability of the bridge have been investigated by the Council's Bridges team. This assessment has reviewed all options ranging from a do nothing through to full replacement and rebuilding of the structure.

4.2 The do-nothing option was discounted at an early stage for the reasons described in 3.6.

4.3 Option 1 is the temporary maintenance and deck fixing proposal. This scheme is estimated to cost £150,000, requiring a road closure for approximately three weeks (Details in Special Inspection 1 of 8 included at the front of Appendix B). At the same time, to reduce disruption for maintenance, the bridge would be fixed into position so it would not lift, on a temporary basis pending longer term strategic decisions for the lifting bridges in the area, which depends on future decisions around the Trowse Rail Bridge and wider area.

4.4 Option 2 is for an extensive bridge refurbishment scheme including the deck replacement and also replacement of the mechanical and electrical equipment which has reached the end of its service life. This would maintain the lifting bridge capability and would cost a minimum of £2.15m. It would also require a minimum three-month closure of the bridge to all highway and river users to allow the work to be undertaken safely. This would be immensely disruptive to road users on this heavily trafficked section of the Norwich ring road.

4.5 Supporting details for Option 2 including plans, timescales, alternative routes etc are in the following Appendices:

D- Supporting report (extract from MCF bid Oct 2019)
E- MCF Bid - Forecast Spreadsheet
F- Option 2 drawings

4.6 It should be noted that the estimated cost of £2.15m for Option 2 and the estimated three-month closure of the bridge to all highway and river users are minimum values. Our experience of maintaining and improving structures of this age and complexity suggests that these values are likely to increase as the works progress.

4.7 Both options would be a short-term fix while a longer-term solution is agreed upon. A further option for full bridge replacement would be needed in the longer term. Significant feasibility and design work on developing this option is required. Significantly longer construction duration and costs in the region £10m to £25m are anticipated.

4.8 It has been suggested that there is evidence of a demand for vessels to enter the Port of Norwich. This proposal would still allow all but very large vessels to pass under the bridge as they do currently. In the last five years, the bridge has only been opened for regular bridge maintenance works and to allow the floating restaurant and training ship to sail downstream. In addition, the whole Riverside area has changed significantly since large vessels last used the area. The warehouses and other port buildings have all disappeared and been replaced mainly by apartments and leisure facilities such as pubs and restaurants.

5. **Financial Implications**

5.1 As outlined in the previous section, the estimated scheme cost for Option 1 is £150,000 requiring a road closure for approximately three weeks. These costs could be met from the County Council's existing highways (bridges) capital programme.

5.2 The estimated scheme cost for Option 2 is a minimum of £2.15m, requiring a minimum three-month closure of the bridge to all highway and river users to allow the work to be undertaken safely. Given the significant amount of funding, this exceeds the annual approximate £1.5m bridges capital budget for Norfolk. Therefore, alternative funding options would need to be explored.

6. **Legal Implications**:

6.1 The County Council recognises the Broads Authority's Navigation Authority duties, and accordingly the Council recognises that if Option 1 was progressed (which would temporarily fix the bridge deck closed) this would need to be a temporary option until funding for a significant improvement or replacement of the existing structure can be delivered. This strikes a reasonable balance between the needs of river users and those of highway users who would be significantly impacted by Option 2.

6.2 It is recognised that any proposed scheme is strictly subject to the Broads Authority granting the required works licence required under section 11 of the Norfolk and Suffolk Broads Act 1988. The County Council recognises that one of the Broads Authority's three general duties (section two) is "protecting the interests of navigation" and as the river is tidal at Carrow Bridge there is a public right of navigation to protect.

7. Recommendation

7.1 On balance, taking account of costs to the public purse, value for money, minimising disruption to highway and river users, it is recommended that Option 1 is explored further. This is also the preferred option in terms of environmental aspects given the long vehicle diversion route coupled with the significant numbers of vehicles affected each day. This includes detailed discussions with the Broads Authority with a view to gaining the necessary works licence.

7.2 Option 1 has the support of the County Council's Cabinet and the following is extracted from the report "Highways Capital Programme 2021/22/23/24 and Transport Asset Management Plan" approved by the County Council's Cabinet at its meeting on 8th March 2021.

7.3 Therefore, subject to obtaining a works licence from the Broads Authority, it is proposed to carry out repairs to the bridge and at the same time, fix the deck into position during the summer of 2022. This will remove the need for such frequent maintenance work on the bridge and therefore minimising disruption for highway users. It will also mean that the bridge will be unable to open to enable tall vessels to pass through and therefore, given the limit of navigation, is only proposed as a temporary solution. It is important to note that this is not considered a straightforward matter and is constrained by statutory considerations and the views of various river users. The alternative option is to refurbish the bridge as a working bascule bridge but this has significant drawbacks on cost (£2m+) and disruption to all highway user grounds as works could result in closure of the bridge for at least three months.

7.4 The Cabinet also agreed that work will be carried out to determine a long-term solution for the bridge. This will be influenced by any decision taken on the replacement of the nearby single-track railway Trowse swing bridge. The County Council is a partner on the Trowse Rail Bridge Group and the East Norwich Partnership which, between them, are looking at the issues in this area and developing a long-term strategy. These include studies looking at Trowse Rail Bridge and whether a new rail bridge to double track the railway over the river is required, and on how to access development sites in East Norwich.

7.5 The Cabinet also agreed that once this strategy is finalised, if required, funding bids can then be developed for either full refurbishment or replacement of Carrow Bridge.

Appendix A

Carrow Road River Bridge (CRRB) (TG20100)
Record of movable span carriageway surfacing maintenance works

The following is a record of maintenance works relating to the carriageway surfacing on the movable span of Carrow Road River Bridge.

The record is intended to give some indication of the extent of the carriageway deck panel repairs that have had to be carried out in the past.

The following more recent works were carried out with weekend night road closures. They involved quite extensive carriageway repairs mainly repairing areas of the broken or failing carriageway deck boards with repair surfacing material.

No. ref.	Year	Road closures req'd. (No. of nights)	Dates of night closures
1.	2020	2	Fri 09/Sat 10 & Sat10/Sun 11 October 2020
2.	2020	1	Sat17/Sun 18 October 2020
3.	2019	2	Fri 06/Sat 07 & Sat07/Sun 08 September 2019
4.	2019	2	Fri 13/Sat 14 & Sat14/Sun 15 September 2019
5.	2018	2	Fri 13/Sat 14 & Sat14/Sun 15 July 2018
6.	2017	1	Sun 19/Mon 20 November 2017
7.	2016	1	4 October 2016

The following 'Record of Completed Bridge Maintenance' forms are less recent works, in chronological order starting at 15/06/2004 and ending on 30/03/2016.

Norfolk County Council **TECHNICAL GROUP** Sht. 1 Of 1

SPECIAL INSPECTION REPORT

DATE.	15/6/04	STRUCTURE NO.	TG20100
NAME/PARISH	Carrow River/ Norwich	ROAD NO.	A147
		INSPECTED BY.	[redacted]
		SIGNATURE.	
PLANNING & TRANSPORTATION REFERENCE	05259	GRID REF.	TG2391 0774

UNDER 900MM	☐	OVER 900MM	X

REPORT

Carrow River Bridge, Damaged Deck Panels

Introduction
During a routine bridge opening a metal plate, at the north east corner of the lifting deck, snagged on two adjacent timber panels on the fixed section of the bridge. A section of the top layer of plywood, has been torn away on one board and on the other the top layer of plywood has been de-laminated and is standing proud of the footway surface. Both panels required immediate repair.

It is thought likely the boards were damaged because fixings holding the panels down had failed due to corrosion. This allowed the panels to lift and catch the lifting span.

Repair
Holes have been drilled through the plywood panels and the steel angle plate below. Coach bolts have been installed fixing the panels back down to the steelwork. Areas of de-laminated boards were then secured together with wood screws.

Conclusion.
Repairs to the boards are only seen as a temporary measure. The boards should be replaced at the same time as future planned panel maintenance.

Recommendation
Replace 2 No. footway decking panels.

Estimated Costs:_

Priority		
H	M	L
X	☐	☐

Repair Works:	£ £300	Supervision : £	20	Admin : £	50
Recommended Works :	£ 1200	Supervision : £	500	Admin : £	100

Signed Project Engineer, Technical Group (Bridges) [redacted] Date [redacted]

Norfolk County Council

TECHNICAL GROUP

Form BG1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: Carrow River Bridge	Bridge No.: TG20100
Project Code: BMW~~190~~ 172 05259	Brief No.: 05259
Contractor : Norfolk P&T Partnership (North)	Actual Cost : £299.64

Dates Works Carried Out : 15/06/04	Order No: LA368331	Estimate : £200.00

Element Numbers of Ordered Maintenance Works	Report/date *

Description of Completed Maintenance Works (Including element numbers) :-
Drill deck panel and steel work and bolt down panel at Northwest end of footway.

Notes:
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached	Estimated By :- [redacted]

Signed Clerk Of Works : [redacted]	Date : 12/11/04
Approved (PEBM) :	Date : 29-11-04
Date Passed To PBEN :	13 DEC 2004

* P - Principal Inspection: G - General Inspection: M - Monitoring Inspection: S - Special Inspection: *Revision 3*

Norfolk County Council **TECHNICAL GROUP** Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW BRIDGE	**Bridge No.:** TG20100
Project Code: BMW172-04217	**Brief No.:** 04217
Contractor : NORFOLK P&T PARTNERSHIP (N)	**Approx. Cost :** £130170
Dates Works Carried Out : 23/06/04 01/07/04	**Order No :** la363114 / **Estimate :** £900.00

Element Numbers of Ordered Maintenance Works	Report/Date :- * S 22/4/04 21

Description of Completed Maintenance Works (Including element numbers) :-

Metal nosing plates fabricated and fitted to footway deck boards
Special tool provided to tighten deck board holding down bolts.
Remedial work to deck boards in the carriageway as instructed by [redacted]

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ☐	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 12/01/04
Approved (PEBM) :	**Date :** 1/3/05
Date Passed To PBEN :	13 MAR 2005

* P - Principal Inspection: G - General Inspection: M - Monitoring Inspection: S - Special Inspection:

Revision 3

Norfolk County Council TECHNICAL GROUP

SPECIAL INSPECTION REPORT

DATE.	4/5/05	STRUCTURE NO.	TG20100
NAME/PARISH	Carrow Bridge/Norwich	ROAD NO.	A147
		INSPECTED BY.	[redacted]
		SIGNATURE.	
PLANNING & TRANSPORTATION REFERENCE		GRID REF.	TG2391 0774

UNDER 900MM	☐	OVER 900MM	☒

REPORT

Introduction
It was noted that several timber boards on the bridge deck were moving under traffic loading. An SI was carried out to assess the condition of the deck boards and the maintenance requirements. Due to the volume of traffic over the bridge and the positioning of pedestrian fencing over the deck a close (hands on) inspection was not possible therefore the damaged deck boards were viewed from the footway behind the fencing.

Inspection
Several of the boards were moving under lorry and car loading. In most cases it was the edges of the boards that were flexing however, in one instance approximately ½ of the board appeared to be moving under traffic loading. Failure of the stud fixings is the main cause of the defects and many of the stud had nuts missing and appeared to be severely corroded. Despite the movement of the boards they still appear to be in fair condition with no obvious danger to traffic and it is extremely unlikely that lifting the bridge will cause panels to be dislodged.

In addition to the failed fixings and board movements it was also noted that many of the epoxy resin blocks cast into the deck boards were breaking up and an area of carriageway surfacing adjacent to the end of the deck was also breaking up.

Recommendation
Provide traffic management to allow a detailed inspection/survey to be carried out with the deck board representative present to advise on repair options. The initial inspection should be carried out within the next 4 – 6 weeks and repairs to the deck boards should be planned for Aug/Sept.

At the same time as this initial inspection the damaged area of carriageway should be repair using fast setting concrete.

Estimated Costs:_

Priority		
H	M	L
☒	☐	☐

Recommended Works : £ 500 Supervision : £ 300 Admin : £ 30

Signed Project Engineer, Technical Group (Bridges) [redacted] Date 11/5/05.

TG20100

Planning and Transportation
Internal Work Request

Form DOPM 39/A

TO: Group Manager (**)**

Bridges

Fax [redacted]

FROM:

Principal Bridge Engineer Network

Tel No: 3298

Project Number and Work Code (to be used for charging purposes):- 06/590

Project Title:- A149 – Carrow Road River Bridge – TG20100

For Fixed and Scale Fee State Allocation of Fee for this Work Request: _____

Work Request

Anglian Water is seeking a road closure near to Carrow Bridge in late March or early April. Please inspect the deck boards to see if there is an opportunity to bring forward the annual deck board maintenance. Provide a Special Inspection report and programme repairs if required.

In addition the footway on the fixed span near the football ground is ponding. Please invesitgate and reinstall a proper drainage outlet.

Charge to PH4410 57700 P00003.

Enc. ☐

Signed: [redacted] Date: 16/2/06

Response

Order issued BRDAR 6/27

Enc. ☑

Confirmation of fee estimate £_____ (telephoned in advance)

Signed: [redacted] Date: 16/2/06

WHITE: Addressee Copy **BLUE:** Acknowledgements Copy **YELLOW:** File Copy

DCBF2

Norfolk County Council **TECHNICAL GROUP** Sht. 1 Of 1

SPECIAL INSPECTION REPORT

DATE.	9/3/06	STRUCTURE NO.	TG20100
NAME/PARISH	Carrow Bridge	ROAD NO.	A147
		INSPECTED BY.	[redacted]
		SIGNATURE.	[redacted]
PLANNING & TRANSPORTATION REFERENCE	06/632	GRID REF.	TG2391 0774

UNDER 900MM ☐ OVER 900MM ☒

REPORT

A147 Carrow Bridge Deck Panels TG20100

Inspection

The deck boards are in fair condition. Many of the fixings have failed, many boards flex under traffic loading and localised areas of protective epoxy coating are missing (see attached sketch). Boards in the wheel tracks are affected most.

Conclusions

All of these defects form part of the long standing maintenance problems on this bridge and are not considered to be an indication of imminent failure of the boards. A long-term solution will be to take up and replace flexing panels and failed fixings, however, experience has shown that despite the loss of fixings and movement, at this time, the panels are still adequately fixed and are not likely to break up in the next 6 months.

At the time of the inspection the deck boards were in a safe condition for road users. Many of the panels will require replacement in the next 3 years but this is not necessary at this time. Preventative maintenance is likely to extend the life of the existing panels.

As part of the routine maintenance carried out on the deck boards in 2005, trial repairs were conducted using epoxy resins. The epoxy was pumped under flexing insitu deck boards to fill any voids and stop movement. After 6 months the trail boards remain fixed with no flexing under traffic loadings.

Recommendation

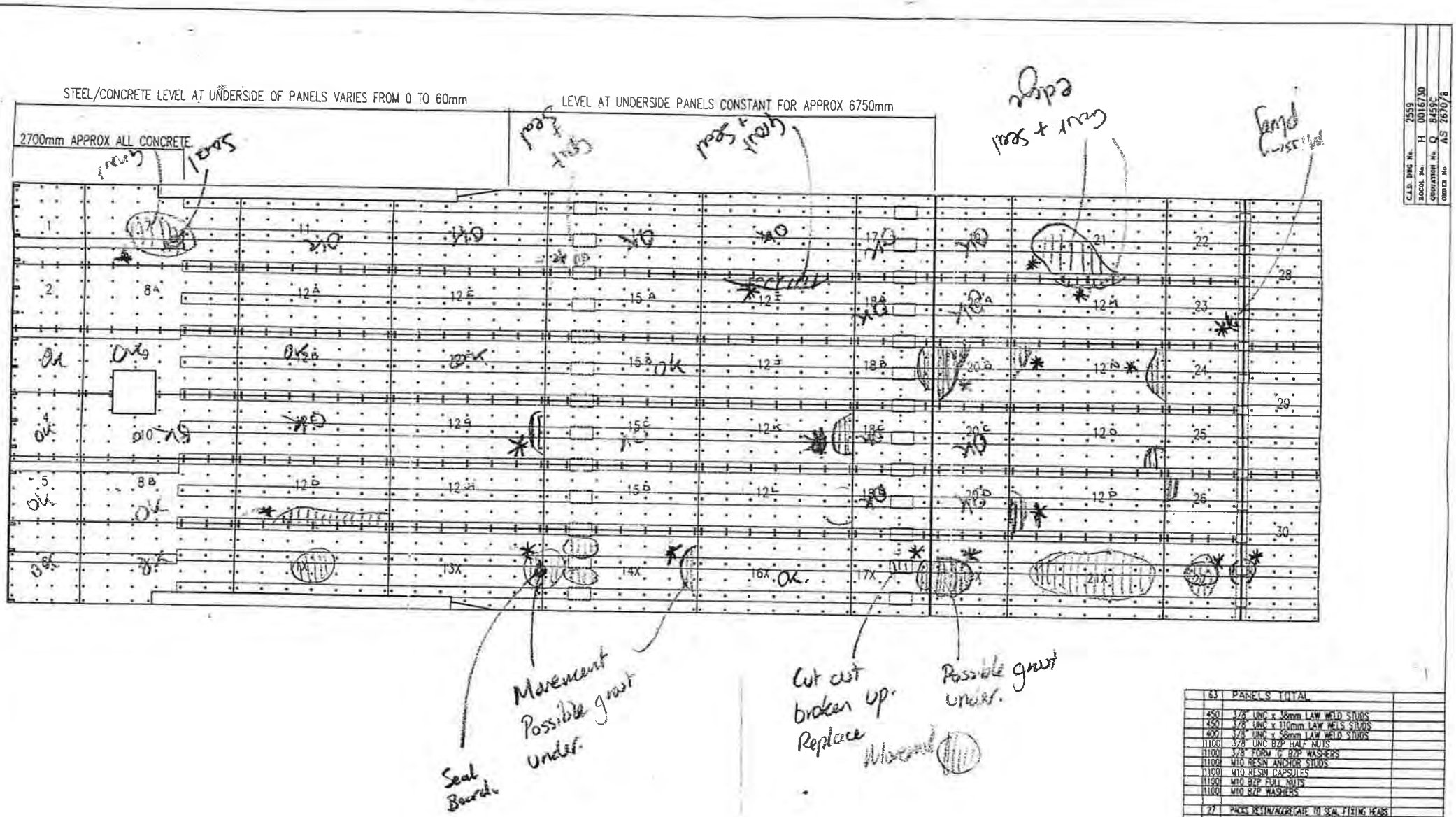
The pumped epoxy repair method should be used in areas of panel movement to stabilise the deck boards. Once these repairs have been carried out the deck boards are likely to remain serviceable for at least 18 months.

Estimated Costs:_

Priority		
H	M	L
☒	☐	☐

Recommended Works : £ 3000 Supervision : £ 500 Admin : £ 100

Signed Project Engineer, Technical Group (Bridges) [redacted] Date 14/3/06



	63	PANELS TOTAL	
	450	3/8" UNC x 38mm LAW WELD STUDS	
	450	3/8" UNC x 110mm LAW WELD STUDS	
	400	3/8" UNC x 38mm LAW WELD STUDS	
	11000	3/8" UNC BZP HALF NUTS	
	11000	3/8" 700HV C BZP WASHERS	
	11000	M10 RESIN ANCHOR STUDS	
	11000	M10 RESIN CAPSULES	
	11000	M10 BZP FULL NUTS	
	11000	M10 BZP WASHERS	
	27	PACES RESIN/AGGREGATE TO SEAL FIXING HEADS	
	180	SAUSAGES OF GUN APPLIED MASTIC	
	1	BULK GUN APPLICATOR	
ITEM	QUANT	DESCRIPTION	REMARKS

ORDER LIST

ROCOL

C.A.D. DRG No. 2559
ROCOL No. H 0016730
QUOTATION No Q 8459C
ORDER No AS 26707/6

Norfolk County Council **Programme Management Group** DCBF2 Sht. 1 Of 2

SPECIAL INSPECTION REPORT

DATE. 22 March 07 STRUCTURE NO. TG20100

NAME/PARISH Carrow River Bridge Norwich City ROAD NO. A147

INSPECTED BY [redacted]

SIGNATURE. [redacted]

PLANNING & TRANSPORTATION

REFERENCE BMW172 07/611 GRID. REF. TG2391 0774

UNDER 900MM ☐ OVER 900MM ☒

REPORT

Carrow Bridge Deck Board Inspection

Inspection date:29 March 2005
Attendants: [redacted]

Traffic Management comprising single lane working controlled by stop-go boards.

Survey Defects Noted

- Three deck board were in very poor condition (Ref. 18B, 13x & 14x). Up to 10% of the resin coating was missing and the plywood is locally delaminating and breaking up. These boards should be replaced as a high priority.
- Three more deck boards are in fair to poor condition and are flexing significantly under loading (Ref.19x, 21x & 21). The resin coating is mostly intact however cracking and failure at fixing recess indicates that the board is beginning to delaminate. These should be programmed for replacement however it is likely that these boards would last until next year if necessary.
- Approximately 40% of all the deck boards have areas of medium to small flexural movement under loading. Generally the movement occurred at the edges of the broads and all flexing was in locations were the fixings have failed.
- Many of the Cecol filled cut-outs are breaking up. Although these are not in a dangerous condition at this time they should be replaced as a high priority.

Failures are due to the following:

- Corrosion of the fixing studs, anchors, bolts and washers causing the metal fixing to disintegrate and fail (Typical failure mode).
- Resin anchor failure due to unsuitable concrete substrate (Typical failure mode).
- Movement of the board due to uneven or failing substrate causes the timber directly below the top hats to wear and fixing no long bear on board. Loss of resin coating and cracking due to movement allows water into the ply and delaminating occurs (Typical failure mode).
- Top hat nuts unscrewing with traffic vibration / board movements (not wide-spread).
- Failure of the stud welds (not wide-spread).

See Continuation Sheet For Recommendations

Estimated Costs:-

Priority: (H) M L

Recommended Works: £20,000 Supervision: £500 Admin: £3000 [redacted]

Signed Project Engineer. [redacted] Date 5-6-7

Recommended Works :- *Have Been Ordered* / *Are Awaiting An Order* / *Require A Brief Issuing*

Recommendations

- All boards should be replaced as a high priority. This will require a road closure as one of the boards is in the centre of the road.
- Boards which have small areas of movement due to localised fixing failures should have grout injected below the board while the board is instu. This should prevent the movement of the panel without the need to replace it. Panels to be injected will be identified on site.
- Resin plugs should be broken out and replaced using a polyurethane resin not usual epoxy. This will reduce the curing times and should allow the road to be closed for 24 not usual 48 hours.
- Missing / failed mastic between boards and in fixing plugs should be replaced and any fixings that have worked proud of the deck should be ground flush or removed.

Norfolk County Council

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Programme Management Group

Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW BRIDGE - 2007 BOARD MAINTENANCE	**Bridge No.:** TG20100
Project Code: BMW172-07611	**Brief No.:** 07611
Contractor : NORFOLK P&T PARTNERSHIP (N)	**Approx. Cost :** £166.88
Dates Works Carried Out : 27/03/07	**Order No :** BR164/33 **Estimate :** £250.00

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (Including element numbers) :-

T.M. provided for deck board inspection.

TM comprises stop/go boards for half a day.

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ☐	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 10/04/07
Approved (PEBM) : [redacted]	**Date :** 24/05/07
Date Passed To PBEN : 25 MAY 2007	**As Built Drwgs. Being Micro-filmed :**

Revision 4 ASL

Planning and Transportation
Internal Work Request

Form DOPM 39/A

TO: Group Manager (Bridges)
Fao [redacted]

FROM: Principal Bridge Engineer Network
Tel No: 3298

Project Number and Work Code (to be used for charging purposes):- 08/602

Project Title:- A147 – Carrow Road River Bridge – TG20100

For Fixed and Scale Fee State Allocation of Fee for this Work Request:

Work Request

Fill hole in wheel track as a matter of urgency.

Charge PH4410 57700.

Estimate £300.

Enc. ☐

Signed: [redacted] Date: 19/3/8

Response

order issued BR174/30

Enc. ☒

Confirmation of fee estimate £_____ (telephoned in advance)

Signed: [redacted] Date: 19/3/08

WHITE: Addressee Copy **BLUE:** Acknowledgements Copy **YELLOW:** File Copy

Norfolk County Council

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Programme Management Group

Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW ROAD RIVER BRIDGE	**Bridge No.:** TG20100
Project Code: BMW232-08602	**Brief No.:** 08602
Contractor : NORFOLK P&T PARTNERSHIP (N)	**Approx. Cost :** £298.15
Dates Works Carried Out : 26/03/08	**Order No :** BR174/30 **Estimate :** £300.00

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (Including element numbers) :-

Pot hole felled in the bridge deck using E33 epoxy resin with added granite aggregate. topped with cural anti slip coating.
A steel plate was fixed to the surrounding boards to allow the epoxy to cure with traffic running.

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ☐	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 18/04/08
Approved (PEBM) : [redacted]	**Date :** 28/04/08
Date Passed To PBEN :	**As Built Drwgs. Being Micro-filmed :**

Revision 4

Date	~~18 July 2008~~ 11 NOV 07	From	[redacted]
To	[redacted]	Mobile	[redacted]
Company	Norfolk County Council	E-mail	[redacted]
Tel No	[redacted]	Ref	10507154A
E-mail	[redacted]	No of Pages	03

Quotation

Supply Only

Safe Step Acme Panels®

Acme panels® ARP Anti-Slip Panels & Treads Cicol™ Acme grip

Epoxo™ SAFE STEP Pro-tread™

ROCOL Site Safety Systems
ROCOL House, Swillington, Leeds LS26 8BS Telephone: 0113 232 2600 Fax: 0113 232 2850
A Division of ITW Ltd. Registered Company No. 559693 VAT No. 651 3938 29
www.rocol.com
Registered Office: Admiral House, St. Leonard's Road, Windsor, Berkshire SL4 3BL

18 July 2008

Dear [redacted]

Project Reference: Single Replacement Acme anti-slip panel – Carrow Bridge, Norwich

Further to your recent enquiry I am pleased to confirm our proposal and quotation as follows:

ROCOL Safe Step Acme Panels® is a made-to-order anti-slip decking system engineered to fit a wide range of applications from walkways, railway platforms, platforms around machinery, to complex road and bridge constructions.

ROCOL Safe Step Acme Panels® are supplied to bespoke specifications, sizes and designs. Each Panel is fully resin encapsulated, with options of anti-slip surface texture, colour and panel thickness. They are delivered complete with all fixings, approved sealants and a coded installation plan.

Specification for ROCOL Safe Step Acme panels®
All panels will be made-to-order under ISO 9001 factory controlled conditions and are approved by Local Authorities, Highways Agency, Network Rail etc, Link Up number 2488

- Finnish Birch load bearing certification BS 5268
- 24mm, Reference 16 anti-slip surface finish
- Colour Black

Panels will be supplied complete with:
- All necessary fixings and sealants – drillscrews bzp
- Resin and aggregate to seal all fixing holes on completion to prevent moisture penetration and to match the surrounding panel surface

To cover an area not exceeding 1.3 square metres	**£184.00**
Delivery 6 weeks from receipt of order, drawings & survey details	£100.00
Total (£)	**£284.00**

18 July 2008

Project Reference: Single Replacement Acme anti-slip panel – Carrow Bridge, Norwich

Prices quoted are subject to:

- Confirmation of final design detail and dimensions
- VAT at standard rate and remains open for acceptance for a period of 30 days from the quotation date
- Substrate to be level, sound and able to retain the panel fixings
- We accept no liability for subsequent problems attributable to the condition of the substrate

All sales by ROCOL Site Safety Systems are subject to our Standard Terms & Conditions of Trading, which are available on request. Payment strictly net 20th of the month following the date of invoice to accredited customers

We thank you for the opportunity to submit our quotation and look forward to hearing from you in the near future.

Yours sincerely

[redacted]
Senior Sales Engineer
Rocol Slip Prevention

Our Ref: Q2022/1488/DBJ/MD

Your Ref: PTB/BS/2/14/1

Date: 5th May 1988

Norfolk County Council
[redacted]
County Surveyor
County Hall,
Martineau Lane,
Norwich. NR1 2DH.

Dear Sir,

Re: Walkways - Carrow Road Bascule Bridge

Further to our recent telephone conversations regarding the redecking of the above, we have pleasure in submitting our proposals and quotation all in accordance with information given on your drawing No. 14/1/33, as follows:

Our calculations are based on;

2 moving span walkways each 1830mm x 21106mm
2 fixed span walkways each 2290mm x 8892mm
Tapering to 1830mm at abuttment of panels.

The individual panels would be supported as follows:

1830 wide - (76-751-76-751-76-100)
2290 wide - (76-751-76-751-76-484-76)
Ensuring that maximum clear span is 751mm.

At which span 24mm plywood panels will carry a distributed load of 5kn/m² (100lb/sq.ft.).

Individual panels would be: fixed to supporting steelwork by the stud weld method whereby panels would be laid on steel and studs applied using panels as template.

Grooved at abutting edges and supplied complete with loose epoxy resin seal coated tongues.

After laying abutting panels joints would be sealed with gun applied mastic and heads of fixings sealed with pigmented epoxy resin and bauxite to resemble surface texture of panels.

/cont.....

St Peters Road Huntingdon Cambs PE18 7DN Telephone: 0480 52181
Directors: A.W. Garaide (Managing)
Regd. Office: St Peters Road Huntingdon Cambs Regd. in London No. 914850

QUOTATION

Supply and Deliver Only

24mm WBP Finnish Birch throughout plywood panels cut to required size, grooved, predrilled and counterbored etc., prior to surface coating Ref. 26 "Black" and double sealing edges and undersides with black pigmented epoxy resin.

Complete with:

Epoxy resin seal coated plywood tongues

Bright zinc plated acme stud nuts

Bright zinc plated welding studs and ferrules

Chuck assembly and ferrule tube for use with stud welding equipment

Gun applied mastic to seal abutting panel and kerb side longitudenal joint

Pigmented epoxy resin, calcined bauxite aggregate to seal heads of fixings.

To cover a total gross area not exceeding 112m².

For the sum of: £8,075.00 delivered.

Erection

To supply and necessary labour and equipment to carry out the installation of materials previously described.

The budget price of £2,598.00/£3,000.00 subject to confirmation of preference and site survey details.

This price assumes free and uninterrupted access to a prepared sub-floor surface and that work is carried out during normal working hours in one continuous visit to site.

Terms and Conditions

Payment:

Strictly nett 30 days from date of invoice. Subject to V.A.T. at standard rate.

Fixed price for a period of 60 days from 5th May 1988.

Delivery:

4-6 weeks from receipt of information necessary to prepare working drawings.

/cont.....

DATED 19.2.94

Acmeflooring Limited 5th May 1989

We thank you for the opportunity of submitting our quotation and look forward to hearing from you in due course.

Yours faithfully,
ACMEFLOORING LIMITED

Engineer.

E+03

Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW BRIDGE DECK MAINTENANCE	**Bridge No.:** TG20100
Project Code: BMW172-08314	**Brief No.:** 08314
Contractor : NORFOLK P&T PARTNERSHIP (N)	**Approx. Cost :** £ 908.07
Dates Works Carried Out : ~~14/09/2007~~ 03/10/07/10/08	**Order No :** BR184/10 **Estimate :** £700.00

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (Including element numbers) :-

Footway deck board 9x replaced with a new board.

Steel plate screwed over damged area of board 10x coated with anti slip surfacing

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ☐	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 21/11/08
Approved (PEBM) : [redacted]	**Date :** 24/11/08
Date Passed To PBEN 02 NOV 2008	**As Built Drwgs. Being Micro-filmed :**

Revision 4

Scanned

BMW 172

Planning and Transportation
Internal Work Request

Form DOPM 39/A

TO: Project Engineer (Bridge Maintenance)	**FROM:** Bridge Network Manager **Tel No:** 4454

Project Number and Work Code (to be used for charging purposes):- 09/086

Project Title:- A147 Norwich - Carrow Road River Bridge TG20100

For Fixed and Scale Fee State Allocation of

Fee for this Work Request:

Work Request

Carry out a special inspection and subsequently arrange annual maintenance works to the deck boards

Estimate £

Charge to PH4410 57700 Enc. ☐

Signed: [redacted] Date: 21/5/08

Response

order issued BR 184/5

Enc. ☒

Confirmation of fee estimate £_____ (telephoned in advance)

Signed: [redacted] Date: 22/5/08

WHITE: Addressee Copy **BLUE:** Acknowledgements Copy **YELLOW:** File Copy

Revision 1

Norfolk County Council | Programme Management Group | Form BG 1/A

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RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW ROAD RIVER BRIDGE	**Bridge No.:** TG20100
Project Code: BMW172-09086	**Brief No.:** 09086
Contractor : NORFOLK P&T PARTNERSHIP (N)	**Approx. Cost :** £4187.43
Dates Works Carried Out : 03-19/08/08 **Order No :** BR184/5	**Estimate :** £400.00

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (Including element numbers) :-

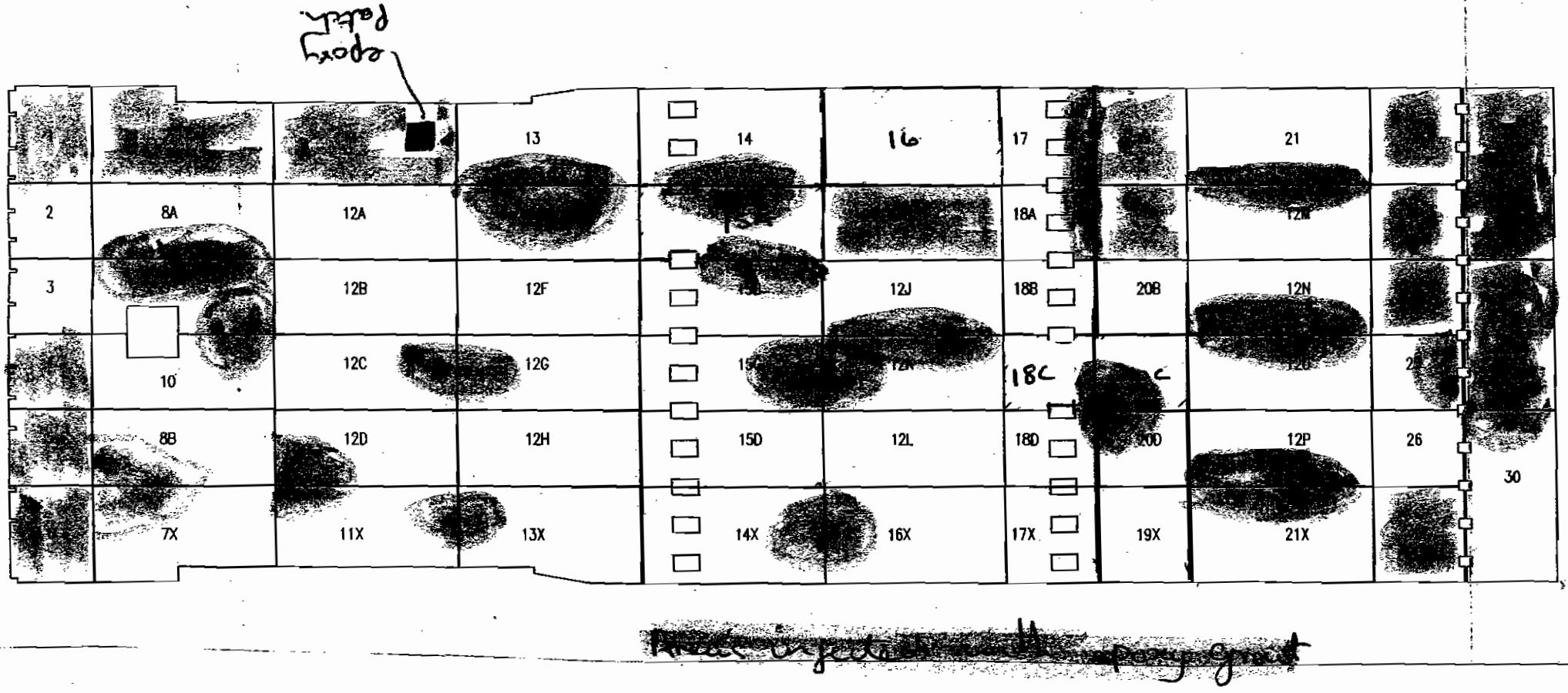
24 Deck boards (as attached drawing) injected with Teeroc Thixotropic Epoxy Injection grout. Rotten area of board 11 cut out and replaced with an epoxy patch

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ☐	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 17/10/08
Approved (PEBM) :	**Date :** 19-1-09
Date Passed To PBEN 20 JAN 2009	**As Built Drwgs. Being Micro-filmed :**

Revision 4


2
8A
12A
13
14
16
17
18A
21
3
12B
12F
12J
18B
20B
12N
10
12C
12G
18C
8B
12D
12H
15D
12L
18D
12P
26
30
7X
11X
13X
14X
16X
17X
19X
21X

Norfolk County Council

E+03

Programme Management Group

Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW BRIDGE	**Bridge No.:** TG20100
Project Code: BMW172-10042	**Brief No.:** 10042
Contractor : NORFOLK P&T PARTNERSHIP (N)	**Approx. Cost :** £104.50
Dates Works Carried Out : 01/05/09	**Order No :** BR194/4 — **Estimate :** £200.00

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (Including element numbers) :-

Traffic management assistance provided for deck board inspection

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ☐	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 04/06/09
Approved (PEBM) :	**Date :** 3/9/09
Date Passed To PBEN : 29 SEP	**As Built Drwgs. Being Micro-filmed :**

Revision 4

Internal Work Request

TO: Group Manager ( )
Bridges
Fao [redacted]

FROM:
Principal Bridge Engineer Network
Tel No: 3298

Project Number and Work Code (to be used for charging purposes):- 08/239

Project Title:- A147 – Carrow Road River Bridge – TG20100

For Fixed and Scale Fee State Allocation of Fee for this Work Request:

Work Request

Repair timber deck boards in footway adjacent to office damaged by bridge lifts.

Repair timber deck board and gully (adjacent to football ground).

Estimate £500.

Charge PH4410 57700

Enc. ☐

Signed: [redacted] Date: 6/8/7

Response

Works carried out on brief No 10/249.

Order No PS10/251

Enc. ☐

Confirmation of fee estimate £_____ (telephoned in advance)

Signed: [redacted] Date: 9/7/10

WHITE: Addressee Copy **BLUE:** Acknowledgements Copy **YELLOW:** File Copy

Norfolk County Council | Environment, Transport & Development | Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW RIVER BRIDGE	**Bridge No.:** TG20100
Project Code: BMW172-10501	**Brief No.:** 10501
Contractor : MAY GURNEY ROUTINE CONTRACT	**Approx. Cost :** £9712.81
Dates Works Carried Out : 31/05/10	**Order No :** PS10/147 — **Estimate :** £6,500.00

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (including element numbers) :-

24 Deck boards 10, 11, 11X, 12K, 12N and 27 supplied and stored at Carrow Store shed for use at a later date.

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ☐	**Estimate Prepared By :** [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 25/08/10
Approved (PEBM) :	**Date :** 7/9/10
Date Passed To PBEN : 8/9/10	**As Built Drwgs. Being Micro-filmed :**

Revision 4

Programme Management Group | Form BG1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: Carrow Bridge	**Bridge No.:** TG20100
Project Code: BMW172-10042	**Brief No.:** 10042
Contractor : May Gurney Routine Contract	**Actual Cost** £12456.01

Dates Works Carried Out : 4-5/07/09	**Order No :** PS19/169	**Estimate :** £8500.00

Element Numbers of Ordered Maintenance Works

Description of Completed Maintenance Works (Including element number)

Routine deck board Maintenance as follows

Board 29
Lifted and existing fixings ground off, new studs welded to troughs and threaded studs grouted into 50mm diameter holes drilled in infill concrete using Tecroc E33 epoxy grout.

Board 10
Area of failed /delaminated board cut out and replaced with an epoxy concrete (Tecroc E3 with 12mm granite aggregate) patch. The top of the patch finished with Rocol anti slip resin.

Board 11
As above

Areas marked with cross hatching on attached sketch were injected under with Tecroc Thixotropic epoxy injection grout. Bolt recesses filled with Rocol resin with anti slip resin and any joints between the deckboards filled with Sika 11FC polyurethane sealant.

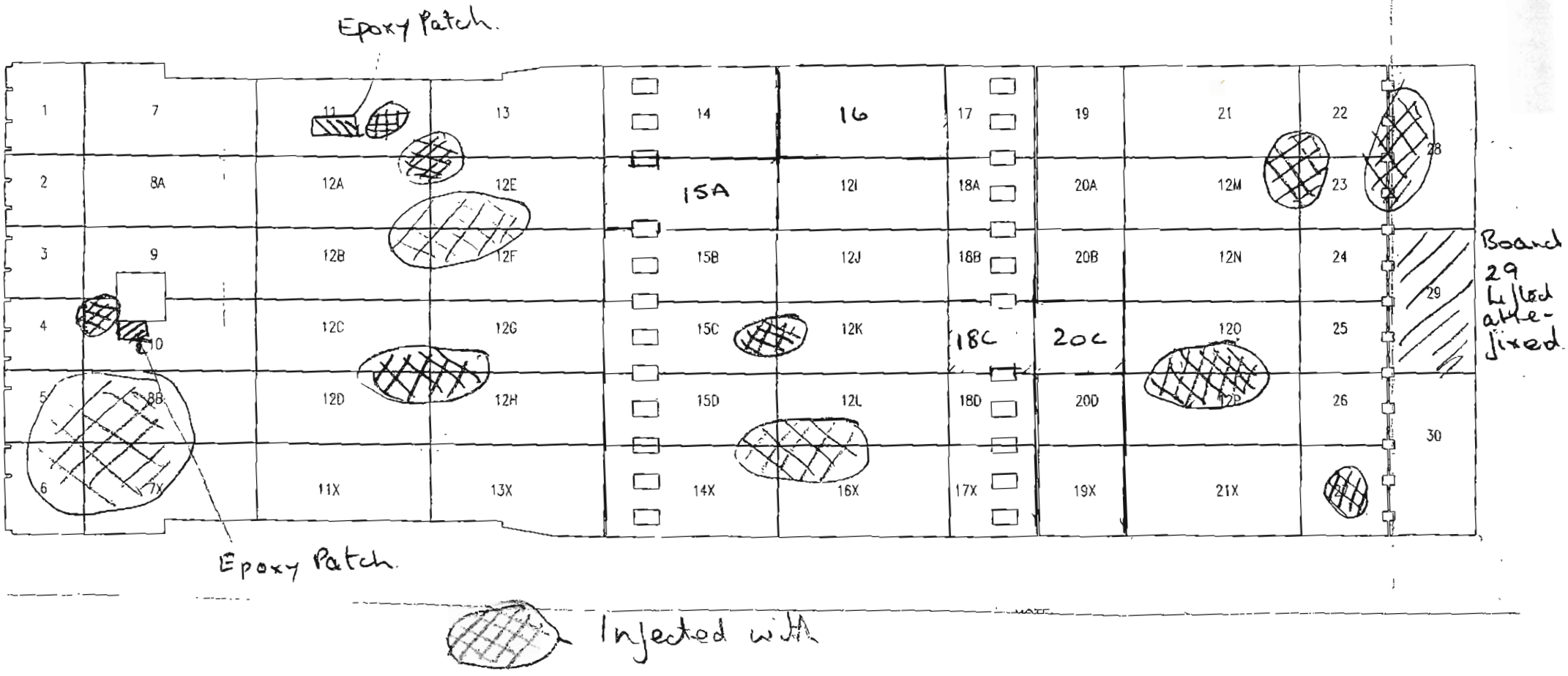
Notes:
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

~~Maintenance Painting System Sheet Attached~~ Estimated By : [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 04/06/10
Approved (PEBM) : [redacted]	**Date :** 23/3/11
Date Passed To PBEN : 23/3/11	

* P - Principal Inspection: G - General Inspection. M - Monitoring Inspection: S - Special Inspection: *Revision 3*

Cannon Bridge Deck Board Maintenance 2009



Norfolk County Council

E+04

Programme Management Group

Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW RIVER BRIDGE	**Bridge No.:** TG20100
Project Code: BMW172-10501	**Brief No.:** 10501
Contractor : MAY GURNEY ROUTINE CONTRACT	**Approx. Cost :** £143.73
Dates Works Carried Out : 26/01/10	**Order No :** PS29/412 — **Estimate :** £150.00

Element Numbers of Ordered Maintenance Works	Report/Date :-

Description of Completed Maintenance Works (Including element numbers) :-

Labour with Stop/Go boards provided for Carrow deck board inspection

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached N/A	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 06/05/10
Approved (PEBM) : [redacted]	**Date :** 23/3/11
Date Passed To PBEN : 23/3/11	**As Built Drwgs. Being Micro-filmed :**

Revision 4

[redacted]

2010

WORKS SPECIFICATION FOR DECK BOARD REPLACEMENT CARROW ROAD BRIDGE NO. TG20100

Road No. & Name:	A147 Carrow Road
Parish:	Norwich City
O.S. Grid Ref.:	E 623905 N 307733
Watercourse Name:	River Wensum
Construction Type:	Steel lifting bridge with timber deck boards
Inspection(s):	Various (refer to Database)

The work can only be carried out during good weather so three possible dates have been booked to allow for bad weather cancellations. The decision to go ahead with the planned works will be taken by MS or DM, 24 hours before the closure (i.e. Friday morning). This decision will be relayed immediate to all affected parties by either Mark Sharman or David McCarter on 01603 223304.

Introduction

Carrow bridge lifting deck comprises steel troughing filled with low strength lightweight concrete. The running surface comprises plywood panels bolted to the deck with welded steel studs and resin/grouted anchors.

Extent of Works

Replace 6 no carriageway boards.
Stabilise moving boards by pumping epoxy grout underneath
Repair patches of worn epoxy resin
Repair epoxy infill
Repair concrete troughing fill were required
Seal around boards and fixings

Plant Required

1 no Hilti TE905 electric breaker
3 no Generators with 2 no (1.5m) cable cover strips
2 no Sledge hammers
2 no Hand held hydraulic coring machines with 50mm cutters
1 no Wet vac
1 no Disc cutter
1 no Electric hand held grinder with 6 no spare metal cutting & grinding discs
2 no Stud welding sets
2 no Hand held electric drills and 4 no 10mm drill bits
1 no Paddle for mixing resins with drill
1 no Gas melting kettle & can
2 no Felt tip pens
1 no Bolt croppers
1 no Ratchet and sockets to fit top hats & bolts
1 no Sealant guns & silicon sausages

9. Cored holes are filled with the epoxy grout, the panel is placed immediately and the M10 x 120mm long threaded studs are placed into the grout fill holes.

Sunday

10. Top hats are placed on the welded studs and torqued up.
11. Each grouted anchor is tapped to ensure it is fully home and bonded with the wet grout.
12. If recesses are present the joint around the bottom of the recess is sealed with silicon sealant. Epoxy grout is then poured into the recess and towelled to give a flat even surface. The top of the epoxy should be 2-3mm below the surface of the board. Once the epoxy is cured a resin that matches the resin on the boards (supplied by the board manufacturer) is mixed and poured on top of the epoxy and the aggregate sprinkled evenly onto the wet resin. The stone will sink into the resin, which will bulk up, so more aggregate will need to be reapplied.
13. Joints between the deck boards are then sealed with Nitoseal MS600

Pumping grout under boards

1. Survey deck boards by walking over surface noting areas of boards that bounce under load.
2. Drill 10mm holes through the boards at approximately 300mm centres in the areas of movement.
3. Mix thixotropic epoxy grout and, using the cardboard cartridges and sealant gun, pump the grout through the holes to fill voids below the boards. Watch adjacent holes and edges joints for signs that the grout is flowing successfully under the panel. If the grout does not appear to be pumping well a small crowbar can be used to lever the edges of the board slightly to encourage flow.
4. Once the process is finished clean excess epoxy from the top of the board. Place cone over newly grouted panels to prevent anyone walking on the board and squeezing out unset grout.

Hot Poured Bitumen

1. Clean out bituminous material from cut outs in the deck surfacing at the toe of the bridge.
2. Seal joints around the base of the hole with silicon.
3. Fill hole with tar coated chippings and then pour in melted bitumen to fill hole.

Once works are completed and materials have sufficiently dried take down fencing/barriers and inform contractor to clear traffic management.

Norfolk County Council | Environment, Transport & Development | Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: CARROW ROAD RIVER BRIDGE	**Bridge No.:** TG20100
Project Code: BMW255-10249	**Brief No.:** 10249
Contractor : MAY GURNEY ROUTINE CONTRACT	**Approx. Cost :** £74,866.17.
Dates Works Carried Out : 14/07/10.	**Order No :** PS10/251 — **Estimate :** £35,000.00

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (Including element numbers) :-

25) Replacement of all (26 no.) downstream side footway Wooden panels.

19
~~20~~) Repainting of Cantilever footway Structure and below to approx 1m of Downstream face.

- For full Details of board replacement sizes see Drawing no 1429-D1 revB.
- For full limits of Repainting see Drawing NO: BMW172-10501-002.
- FORM HA/P1 Attached (paint Maintenance Sheet).
- For full Details of Scheme see 2010 Maintenance Manual.

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ✓	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 28/02/11
Approved (PEBM) :	**Date :** 28/2/11
Date Passed To PBEN : 5/4/11	**As Built Drwgs. Being Micro-filmed :**

Revision 4

S

WORK REQUEST FORM

Brief No. 11366

PROJECT NO. BMW255-11366

TO M.G.

Supervisor : [redacted] **Designer :** [redacted]

WORK TO BE CARRIED OUT OR GOODS TO BE DELIVERED TO

Structure No.: TG20100 **Name :** CARROW RIVER BRIDGE

Grid Ref: 623906 307736 **Maintenance Area :** N2

Road : A147 CARROW ROAD **Road Section:** A147/186

Parish : THORPE HAMLET PARISH WARD **District :** Norwich

N.R.A.S.W. ENQUIRY :- Yes / (No) / Issue Existing **Copy To PROW** ☐

DESCRIPTION

Repair Pot-hole @ NW corner off the approach span, as per attached S.I. report

ELEMENTS 24

ESTIMATED COST £1500

BUDGET:- REVENUE **FEES:-** GLOBAL

COST CODE :- PH4410/PH4400 57700

APPROVED :-

Designer [redacted] **Date** 11/11/10

Budget Holder **Date**

FIMS REQ. NO. **ORDER / EXOR No.** PS20/118

EXOR ONLY (Road Section/Area)

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RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name:	CARROW ROAD RIVER BRIDGE	**Bridge No.:**	TG20100
Project Code:	BMW255-11366	**Brief No.:**	11366
Contractor :	MAY GURNEY ROUTINE CONTRACT	**Approx. Cost :**	£1539.94
Dates Works Carried Out :	17-18/4/10	**Order No :**	PS20/118
Estimate :	£1,500.00		

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (Including element numbers) :-

24) Failed concrete removed from below the pot hole at the Northwest corner of the side span and replaced with Fosroc. FSC-10 concrete. The repair was then finished with HRA 30/14 F Surf 40/60 with coated chips

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached		Estimate Prepared By :-	[redacted]

Signed Clerk Of Works : [redacted]	**Date :** 12/04/11
Approved (PEBM) :	**Date :** 26/5/4
Date Passed To PBEN :	**As Built Drwgs. Being Micro-filmed :**

Revision 4

ORDER REQUEST FORM

No 2011/

PROJECT NO. ~~BMW172~~ BMW255

TO MG

Area : NORTH District : NORWICH CITY

WORK TO BE CARRIED OUT OR GOODS TO BE DELIVERED TO

Structure No.: T920100 Name: CARROW ROAD RIVER BRIDGE

Grid Ref: 623906 307736 Maintenance Area N2

Road: A147 Road Name: CARROW ROAD Road Section: A147/192

Parish: THORPE HAMLET WARD Fees:- Specific ☐ Global ☑

N.R.A.S.W. ENQUIRY :- Yes / No / Issue Existing Copy TO PROW ☐

Supervisor: [redacted] Designer: [redacted]

DESCRIPTION	QTY	UNIT PRICE	TOTAL AMOUNT
PROVIDE TRAFFIC MANAGEMENT (TWO-WAY STOP/GO) TO ASSIST INSPECTOR IN CARRIAGEWAY PANEL INSPECTION. DATE TO BE AGREED WITH [redacted] (Week beginning 18 July 2011)			

ESTIMATED COST	£400
SITE SUPERVISION	£
ADMINISTRATION	£

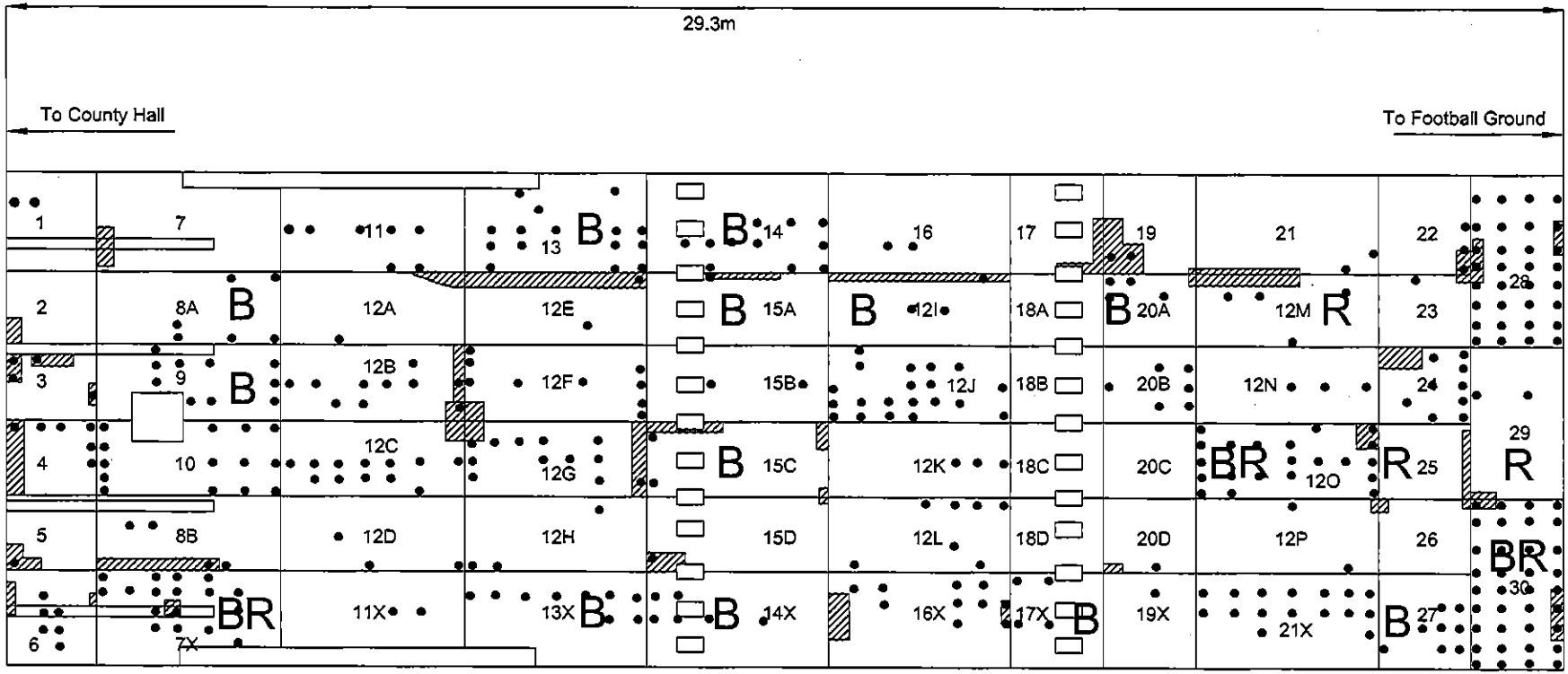
BRIEF No.	COST CODE. S7700

APPROVED :-

Project Engineer [redacted]	Date 13/6/11
Group Manager	Date 13/6/11
FIMS REQ. NO.	ORDER / EXOR No. PS11/15 - N107

EXOR ONLY

INSPECTION NO.	DEFECT NO.



KEY

B — Board bouncing

Surface texture loss

Fixing hole to be filled

R — Benefit from replacement

NB - All Locations and sizes approximate

Norfolk County Council working with MAY GURNEY Mott MacDonald

Mike Jackson
Director of Environment, Transport and Development
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

DRAWING TITLE
Carrow Road River Bridge
TG20100
Deck Board Special Inspection

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	AW	07/11
DESIGNED BY	AW	07/11
DRAWN BY	AW	07/11
CHECKED BY	MW	07/11

DRAWING No. 1
PROJECT TITLE: Carrow Road River Bridge Deck Boards Special Inspection
SCALE: NTS
FILE No.: TG20100

Norfolk County Council | Environment, Transport & Development | Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name:	CARROW RIVER BRIDGE MAINTENANCE	**Bridge No.:**	TG20100
Project Code:	BMW172	**Brief No.:**	
Contractor :	MAY GURNEY ROUTINE CONTRACT	**Approx. Cost :**	£157.54
Dates Works Carried Out :	22/07/11	**Order No :** PS11/15-N107	**Estimate :** £400.00

Element Numbers of Ordered Maintenance Works	Report/Date :- *

Description of Completed Maintenance Works (Including element numbers) :-

Stop & go boards provided for board inspection to Carrow Bridge deck boards

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]	**Date :** 18/4/11
Approved (PEBM) :	**Date :** 23/12/11
Date Passed To PBEN :	**As Built Drwgs. Being Micro-filmed :**

Revision 4

WORK REQUEST FORM

Brief No. 12208

PROJECT NO. BMW255-12208

TO MG

Supervisor : [redacted] **Designer :** [redacted]

WORK TO BE CARRIED OUT OR GOODS TO BE DELIVERED TO

Structure No.: TG20100 **Name :** CARROW RIVER BRIDGE

Grid Ref: 623906 307736 **Maintenance Area :** N2

Road : A147 CARROW ROAD **Road Section:** A147/186

Parish : THORPE HAMLET PARISH WARD **District :** Norwich

N.R.A.S.W. ENQUIRY :- Yes / (No) / Issue Existing **Copy To PROW** ☐

DESCRIPTION

CARRY OUT REPAIR WORKS AS PER ATTACHED SPECIAL INSPECTION REPORT DATED 16/8/11. REBED MOVING BOARDS WITH THIXOTROPIC EPOXY INJECTION AND REINSTATE WORN SURFACING AND EMPTY FIXING HOLES WITH CICOL NT. WORKS TO START ON SITE AT 1900. EXISTING TRAFFIC PEDESTRIAN TRAFFIC LIGHTS TO BE TURNED OFF AND AN ADDITIONAL SET OF LIGHTS TO BE ERECTED TO ALLOW A LANE CLOSURE OVER THE BRIDGE. LIGHTS TO BE LEFT ON OVERNIGHT TO ALLOW MATERIALS TO CURE THEN BE REMOVED AT 06:00 AND PEDESTRIAN LIGHTS REINSTATED. WORKS TO BE CARRIED OUT FROM 30/8/11 TO 2/9/11

ELEMENTS 24 COPY OF TMA FORM ATTACHED.

ESTIMATED COST £3500 £0.00

BUDGET:- REVENUE **FEES:-** GLOBAL

COST CODE :- PH4410/PH4400 57700

APPROVED :- [redacted]

Designer Date 19/8/11

Budget Holder Date 19/8/11

FIMS REQ. NO. **ORDER / EXOR No.** PS11/15 - N135

EXOR ONLY (Road Section/Area)

Norfolk County Council | Environment, Transport & Development | Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name:	CARROW RIVER BRIDGE	**Bridge No.:**	TG20100
Project Code:	BMW255-12208	**Brief No.:**	12208
Contractor :	MAY GURNEY ROUTINE CONTRACT	**Approx. Cost :**	£9570.31
Dates Works Carried Out :	30/8 to 02/09/11	**Order No :** PS11/15-N135	**Estimate :** £3,500.00

Element Numbers of Ordered Maintenance Works	Report/Date :- * S 16/08/2011 24

Description of Completed Maintenance Works (Including element numbers) :-

24) Mowing boards drilled and injected with Teeroc Thixotropic Epoxy injection grout. areas injected as drawing BMW255-12208/SK01/AB.

Areas of worn surfacing prepared and resurfaced using Cecol NT together with empty fixing down holes, areas repaired marked on drawing BMW 255-12208/SK03/AB

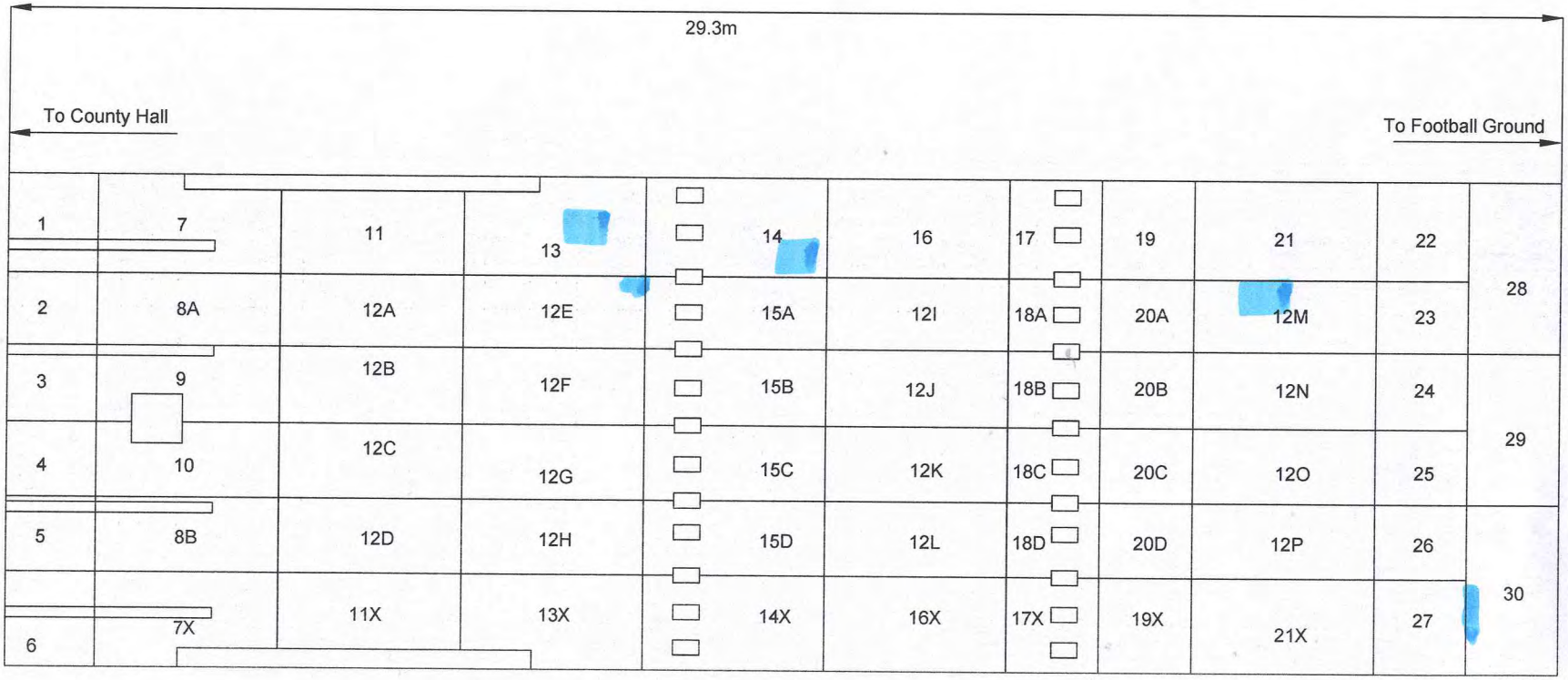
Rotten / damaged areas of deck boards removed and replaced with Teeroc epoxy E patches and finished with Cecol NT. areas marked on drawing BMW 255-12208/SK02/AB.

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached	☐	Estimate Prepared By :-	[redacted]

Signed Clerk Of Works : [redacted]	**Date :** 07/12/11
Approved (PEBM) :	**Date :** 23/12/11
Date Passed To PBEN :	**As Built Drwgs. Being Micro-filmed :**

Revision 4



EPOXY PATCH REPAIRS

BMW 255- 12208/SK02/AB

Norfolk County Council working with MAY GURNEY Mott MacDonald

Mike Jackson
Director of Environment, Transport and Development
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

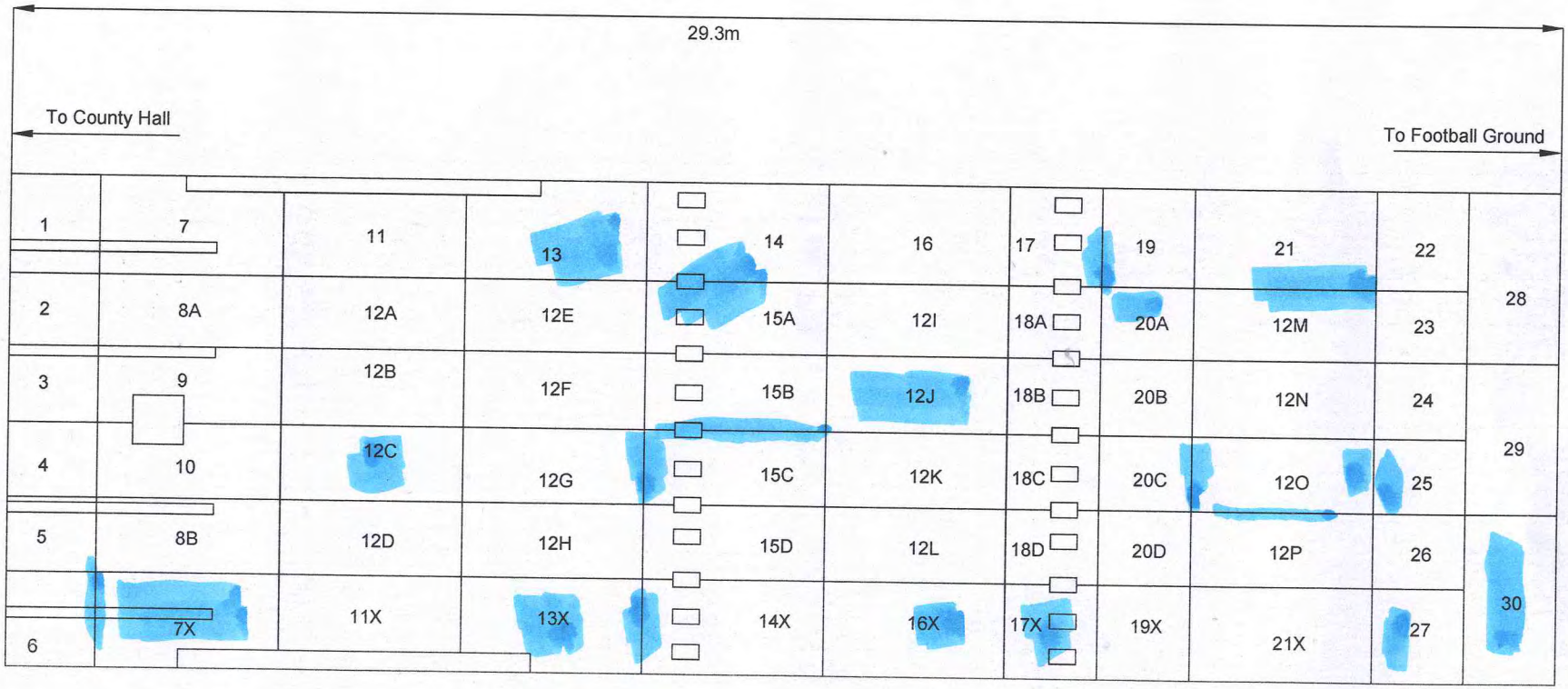
DRAWING TITLE
Carrow Road River Bridge
TG20100
Deck Board Special Inspection

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	AW	07/11
DESIGNED BY	AW	07/11
DRAWN BY	AW	07/11
CHECKED BY	MW	07/11

DRAWING No. 1
PROJECT TITLE Carrow Road River Bridge Deck Boards Special Inspection
SCALE NTS
FILE No. TG20100

ORIGINAL SIZE: A3



INJECTED WITH EPOXY.

BMW255-12208/SK01/AB

Norfolk County Council working with MAY GURNEY Mott MacDonald

Mike Jackson
Director of Environment, Transport and Development
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

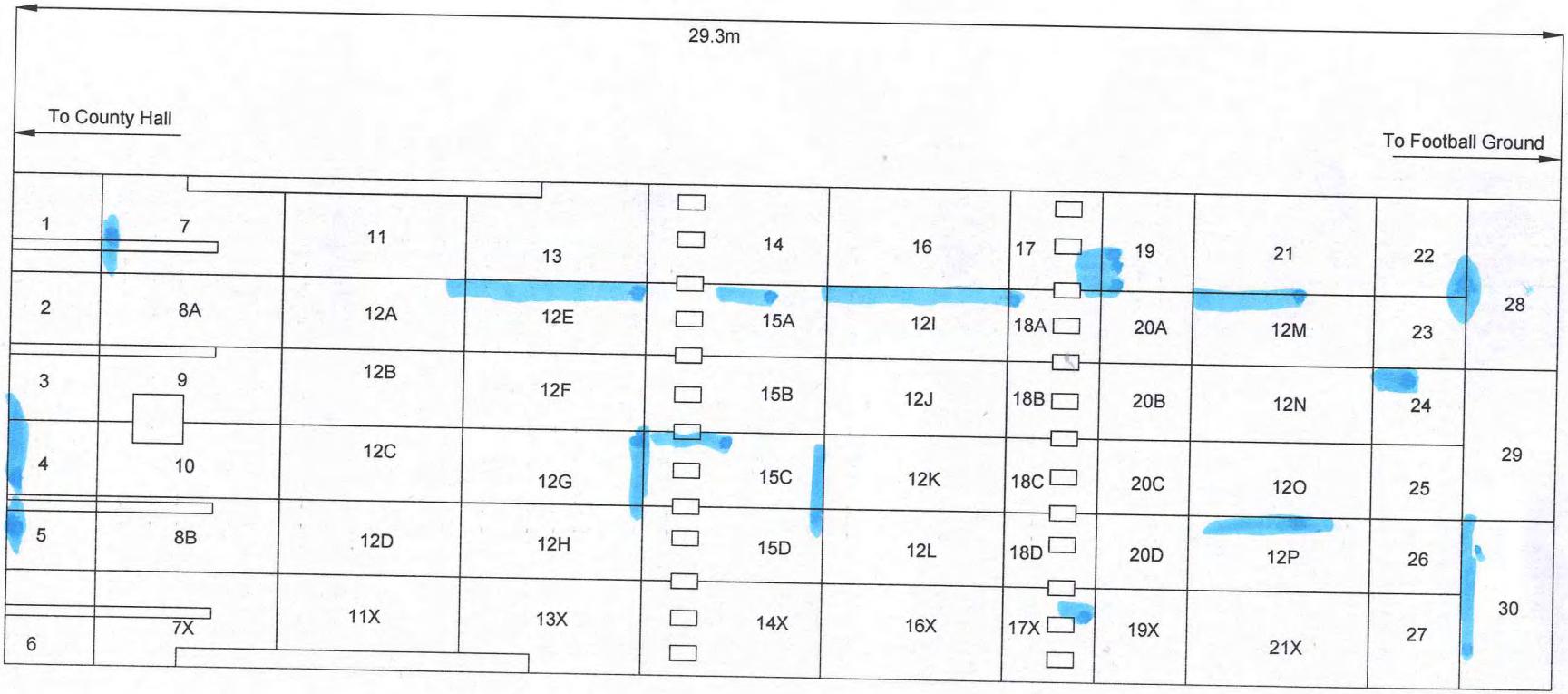
DRAWING TITLE
Carrow Road River Bridge
TG20100
Deck Board Special Inspection

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	AW	07/11
DESIGNED BY	AW	07/11
DRAWN BY	AW	07/11
CHECKED BY	MW	07/11

DRAWING No. 1
PROJECT TITLE Carrow Road River Bridge Deck Boards Special Inspection
SCALE NTS
FILE No. TG20100

ORIGINAL SIZE A3



BOARD SURFACE REPAIRS

BMW 255-12208/SK03/AB

Norfolk County Council working with MAY GURNEY Mott MacDonald

Mike Jackson
Director of Environment, Transport and Development
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

DRAWING TITLE
Carrow Road River Bridge
TG20100
Deck Board Special Inspection

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	AW	07/11
DESIGNED BY	AW	07/11
DRAWN BY	AW	07/11
CHECKED BY	MW	07/11

DRAWING No. 1
PROJECT TITLE Carrow Road River Bridge Deck Boards Special Inspection
SCALE NTS
FILE No. TG20100

ORIGINAL SIZE: A3

13

Norfolk County Council | Environment, Transport & Development

Form BG 1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name:	CARROW RIVER BRIDGE	**Bridge No.:**	TG20100
Project Code:	BMW172-12640	**Brief No.:**	12640
Contractor :	MAY GURNEY ROUTINE CONTRACT	**Approx. Cost :**	£209.43
Dates Works Carried Out :	04/04/12	**Order No :**	ps12/19-m068
Estimate :	£300.00		

Element Numbers of Ordered Maintenance Works	Report/Date :- * ✓

Description of Completed Maintenance Works (Including element numbers) :-

24) Traffic management provided for deck board inspection

Notes :
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached ☐	Estimate Prepared By :-

Signed Clerk Of Works [redacted]	**Date :** 14/09/12
Approved (PEBM) :	**Date :** 11/10/12.
Date Passed To PBEN :	**As Built Drwgs. Being Micro-filmed :**

Revision 4

WORK REQUEST FORM

Brief No. 12640

PROJECT NO. BMW172-12640

TO MG

Supervisor : [redacted] **Designer :** [redacted]

WORK TO BE CARRIED OUT OR GOODS TO BE DELIVERED TO

Structure No.: TG20100 **Name :** CARROW RIVER BRIDGE

Grid Ref: 623906 307736 **Maintenance Area :** N2

Road : A147 CARROW ROAD **Road Section:** A147/186

Parish : THORPE HAMLET PARISH WARD **District :** Norwich

N.R.A.S.W. ENQUIRY :- Yes / (No) / Issue Existing **Copy To PROW** ☐

DESCRIPTION * WORKS TO TAKE PLACE OVER 5 NIGHTS FROM 2/7/12 *
REPLACE BOARD NUMBER 12M AND PATCH REPAIR BOARDS 12B AND 12O. OPEN FIXING HOLES TO BE FILLED WITH CICOL NT THIXOTROPIC EPOXY INJECTION TO BE USED TO RE AFFIX THE MOVING DECK BOARDS. CICOL NT TO BE USED TO REINSTATE THE SURFACE WEARING COURSE.

* WORKS TO BE CARRIED OUT UNDER 2 WAY LIGHTS ON OFF PEAK HOURS (7PM TO 6AM) - DATE TO BE CONFIRMED.
SEE DRAWING 2 - 2012/13 DECK BOARD INSPECTION FOR SCOPE OF WORKS + BOARD 12M.

ELEMENTS 24

ESTIMATED COST £4500

BUDGET:- REVENUE **FEES:-** GLOBAL

COST CODE :- PH4410/~~PH4400~~ 57700 PX0001.

APPROVED :- [redacted]

Designer **Date** 25/4/12

Budget Holder **Date** 2/5/10

FIMS REQ. NO. **ER / EXOR No.** PS12/124-M136

EXOR ONLY (Road Section/Area)

Norfolk County Council | ENVIRONMENT DEVELOPMENT & TRANSPORT | Form BG1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: Carrow River Bridge	**Bridge No.:** TG20100
Project Code: BMW255-12640	**Brief No.:** 12640
Contractor : May Gurney Routine Contract	**Approx. Cost** : £17072.44
Site Technician [redacted]	

Dates Works Carried Out : 02/07>14/09/12	**Order No** PS12/19-M136	**Estimate** Rev £18000

Element Numbers of Ordered Maintenance Works	Report / Date: SI 04/04/12 and SI 12/09/12 Element: 24

Description of Completed Maintenance Works (Including element numbers) :-

24) Repair and replacement of resin coated timber deck boards:- Deck board number 12B old worn out panel removed and replaced with new deck board provided by Gripdeck Ltd, method of fixing, fixing points to the top of the steel deck troughs drilled and tapped with a M10 thread to take a M10x60 bolt and the fixing points to the concrete trough infill drilled with 40mm diameter holes 130mm deep, these holes then filled with Tecroc E33 epoxy grout and with the deck board in position M10 stainless steel threaded rod 125mm long with a stainless steel nut and washer pushed into the grout and after 6 hours curing all nuts and bolts tightened. Deck boards 12B and 12O damaged/decayed areas cut out and repaired using Tecroc E33 grout bulked up with 6mm granite aggregate, these patches then coated with anti skid resin surfacing supplied by Gripdeck Ltd. All open fixing holes filled with resin repair kits supplied by Gripdeck Ltd. Joint around deck board 12B and any other failed joints sealed using Fosroc Nitoseal MS600.
Moving deck boards grouted using Tecroc thixotropic epoxy injection grout. Areas in the deck boards to be injected drilled with 10mm diameter holes and the thixotropic epoxy grout injected under pressure using a large mastic gun and disposable card board tubes.
Pot hole in the East bound carriageway cut out and repaired with HRA by CMS surfacing.
Gap between the footway and the hinged plate at the Southwest corner of the bridge filled by welding a plate over the gap and the anti skid surfacing reinstated. This work carried out under two way traffic lights on 13/09/12.
All steel work carried out by Norwich Steel.

Notes:
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached		Estimated Prepared By :- [redacted]

Signed Site Technician : [redacted]	**Date :** 21/10/13
Approved (PEBM) :	**Date :** 28/10/13
Date Passed To PBEN :	**As Built Drwgs. Being Micro-filmed :**

Norfolk County Council | ENVIRONMENT DEVELOPMENT & TRANSPORT | Form BG1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: Carrow River Bridge	**Bridge No.:** TG20100
Project Code: BMW255-12640	**Brief No.:** 12640
Contractor : May Gurney Routine Contract	**Approx. Cost :** £209.43
Site Technician [redacted]	

Dates Works Carried Out : 04/04/12	**Order No** PS12/19	**Estimate** £300

Element Numbers of Ordered Maintenance Works	Report / Date: SI 04/04/12 Element: 24

Description of Completed Maintenance Works (Including element numbers) :-

24) Stop go boards and labour supplied to carry out deck board inspection.

Notes:
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached		Estimated Prepared By :- [redacted]

Signed Site Technician : [redacted]	**Date :** 18/10/13
Approved (PEBM) :	**Date :** 28/10/13
Date Passed To PBEN :	**As Built Drwgs. Being Micro-filmed :**

Norfolk County Council | ENVIRONMENT DEVELOPMENT & TRANSPORT | Form BG1/A

RECORD OF BRIDGE MAINTENANCE WORKS

Bridge Name: Carrow Bridge	**Bridge No.:** TG20100
Project Code: BMW255-12208	**Brief No.:** 12208
Contractor : May Gurney Routine Contract **Site Technician** [redacted]	**Approx. Cost** : £9570.31

Dates Works Carried Out : 30/08>02/09/11	**Order No** PS12/19	**Estimate** £ 3500.00

Element Numbers of Ordered Maintenance Works	Report / Date: SI 22/07/11 Element: 24

Description of Completed Maintenance Works (Including element numbers) :-

24) Grout beneath moving deck boards using Tecroc Thixotropic epoxy injection grout. Areas in the deck boards to be injected drilled with 10mm diameter holes and the thixotropic epoxy grout injected under pressure using a large mastic gun and disposable card board tubes. Any open bolt holes and 'bald patches' in the anti slip surfacing made good with repair kits supplied by Gripdeck ltd. Failed joints around the deck boards sealed using Fosroc Nitoseal MS600.
Work carried out over 4 evenings under 2 way traffic lights TM supplied by Trek.

Notes:
To include suppliers & types of pipes, bricks, parapets, concrete etc. Adjacent landowners for access etc.

Maintenance Painting System Sheet Attached		Estimated Prepared By :- [redacted]

Signed Site Technician [redacted]	**Date :** 18/10/13
Approved (PEBM) :	**Date :** 23/10/13 .
Date Passed To PBEN :	**As Built Drwgs. Being Micro-filmed :**

Norfolk County Council

Environment, Transport & Development

Form BG 1/A

Record of Bridge Maintenance Works

Bridge Name:	**CARROW ROAD RIVER BRIDGE**		Bridge No:	**TG20100**	
Project Code:	**BMw172-14421**		Brief No:	**14421**	
Contractor:			Approx Cost:	**£**	
Date works carried out:		Order No:	**PS13/167-U110**	Estimate:	**£0.00**

Element Numbers of Ordered Maintenance Works	
Description of Completed Maintenance Works (Including element numbers) :-	
	Estimate Prepared By :- [redacted]

Signed Clerk Of Works :		Date :	**26/06/2014**
Approved (PEBM) :	[redacted]	Date :	**26/06/2014**
Date Passed To PBEN :	**26/06/2014**	As Built Drwgs. Being Micro-filmed :	**No**

Norfolk County Council

Environment, Transport & Development

Form BG 1/A

Record of Bridge Maintenance Works

Bridge Name:	**CARROW ROAD RIVER BRIDGE**			Bridge No:	**TG20100**
Project Code:	**BMW255-15033**			Brief No:	**15033**
Contractor:	**LT**			Approx Cost:	**£13229**
Date works carried out:	**12/09/2014**	Order No:	**LS24/160**	Estimate:	**£10,960.10**

Element Numbers of Ordered Maintenance Works	**1**

Description of Completed Maintenance Works (Including element numbers) :-

1) Areas of severe decay in deck panels 1, 11x, 13x, 22, 23 and 30 cut out and the resulting recess filled with Parex E33 epoxy grout with the addition of 10mm granite aggregate to form an epoxy concrete, failed splice plate recesses made good with the same epoxy concrete, the tops of these patches finished with anti slip resin as supplied by Gripdeck
Areas surface texture loss made good together with open fixing holes filled with anti slip resin as supplied by Gripdeck.
All identified loose fixings in the deck boards replaced last year had the resin cored out and the bolts retightened to 35NM + 90 degrees, recesses filled with anti slip resin as supplied by Gripdeck
Identified bouncing boards injected beneath using Parex Thixotropic epoxy injection grout.
Failed fixings in the deck boards replaced by drilling a 12mm hole in the deck board and counter boring a 30mm hole 15mm deep to take a stainless steel M10 nut and 2mm thick washer, the up troughs then drilled and tapped with a M10 thread and the deck boards bolted down using M10x70mm set screws and finally tightened to 35NM + 90 degrees with the bolt recess being filled with anti slip

		Estimate Prepared By :-	[redacted]

Signed Clerk Of Works :	[redacted]	Date :	**05/11/2014**
Approved (PEBM) :		Date :	**27/01/2015**
Date Passed To PBEN :	**05/11/2014**	As Built Drwgs. Being Micro-filmed :	**No**

Norfolk County Council

Environment, Transport & Development

Form BG 1/A

Record of Bridge Maintenance Works

Bridge Name:	**CARROW ROAD RIVER BRIDGE**			Bridge No:	**TG20100**
Project Code:	**BMW255-15312**			Brief No:	**15312**
Contractor:	**LT**			Approx Cost:	**£182**
Date works carried out:	**19/01/2015**	Order No:	**LS24/601**	Estimate:	**£250.00**

Element Numbers of Ordered Maintenance Works	
Description of Completed Maintenance Works (Including element numbers) :- 23) Traffic management provided to allow the inspection of the deck boards.	
	Estimate Prepared By :-

Signed Clerk Of Works :	[redacted]	Date :	**12/02/2015**
Approved (PEBM) :		Date :	**07/05/2015**
Date Passed To PBEN :	**12/02/2015**	As Built Drwgs. Being Micro-filmed :	**No**

Norfolk County Council

Environment, Transport & Development

Form BG 1/A

Record of Bridge Maintenance Works

Bridge Name:	**CARROW ROAD RIVER BRIDGE**			Bridge No:	**TG20100**
Project Code:	**BMW172-15355**			Brief No:	**15355**
Contractor:	**LT**			Approx Cost:	**£4220**
Date works carried out:	**01/06/2015**	Order No:	**LS24/707**	Estimate:	**£4,440.66**

Element Numbers of Ordered Maintenance Works	**24**
Description of Completed Maintenance Works (Including element numbers) :- Deck boards 11X, 12C, 12G, 13X, 15C, 17X, 18C, 19X, 20B, 21X and 22 supply only for carriageway works in 2015/16. Supplied by GripDeck.	
	Estimate Prepared By :- [redacted]

Signed Clerk Of Works :	[redacted]	Date :	**17/03/2016**
Approved (PEBM) :		Date :	**21/03/2016**
Date Passed To PBEN :	**17/03/2016**	As Built Drwgs. Being Micro-filmed :	**No**

Norfolk County Council

Environment, Transport & Development

Form BG 1/A

Record of Bridge Maintenance Works

Bridge Name:	**CARROW ROAD RIVER BRIDGE**			Bridge No:	**TG20100**
Project Code:	**BMW257-16035**			Brief No:	**16035**
Contractor:	**Tarmac**			Approx Cost:	**£159**
Date works carried out:	**30/03/2016**	Order No:	**LB15/473**	Estimate:	**£170.87**

Element Numbers of Ordered Maintenance Works	**24**
Description of Completed Maintenance Works (Including element numbers) :- Stop + go boards provided for deck board inspection	
	Estimate Prepared By :- [redacted]

Signed Clerk Of Works : [redacted]		Date :	**18/05/2016**
Approved (PEBM) :		Date :	**27/05/2016**
Date Passed To PBEN :	**18/05/2016**	As Built Drwgs. Being Micro-filmed :	**No**

Appendix B

Carrow Road River Bridge (CRRB) (TG20100)
Movable span - carriageway surfacing photographs

Four photographs taken on 11/05/2021 to show current condition of the carriageway surfacing, along with two photographs showing the condition on 10/09/2018 to give an indication of the deterioration since then.

Carrow Road River Bridge (CRRB) (TG20100)
Movable span - carriageway surfacing photographs

Photograph 1. Looking northwards towards football stadium side.

Photograph 2. General view.

Carrow Road River Bridge (CRRB) (TG20100)
Movable span - carriageway surfacing photographs

Photograph 3. General view.

Photograph 4. Looking southwards towards County Hall side.

Carrow Road River Bridge (CRRB) (TG20100)
Movable span - carriageway surfacing photographs

Photograph 5. Looking northwards towards football stadium side. 2018.

Photograph 6. Looking southwards towards County Hall side. 2018.

Special Inspections relating to the carriageway surfacing of Carrow Road River Bridge

There are 11 no. Special Inspection reports on the Norfolk County Council bridges database for the bridge and 8 no. of these relate to the carriageway surfacing. One relates to the steel nosing plate on the fixed span at the southern side of the bridge but the remaining ones relate to the plywood deck boards on the movable span.

Inspection dates range from October 2020 to May 2014. They are presented with the latest first.

Special Inspection 1 of 8.

Norfolk County Council	Environment, Transport and Development	Sht. 1 of 2

Special Inspection Report

Date	16/10/2020	**Structure Number**	TG20100	
Structure Name	CARROW ROAD RIVER BRIDGE		**Road Number**	A147
Parish	Lakenham Parish Ward		**Inspected By**	[redacted]
			[redacted]	
		Signature	19/10/2020	
Brief Number	21162			
Grid Reference	**Easting:**	623906	**Northing:**	307736

Report

A special inspection of the timber deck panels was carried out following completion of annual emergency repairs on 10/11, 11/12 & 17/18 of October 2020 where further patches of deteriorated plywood were removed and replaced with an epoxy repair mortar. The purpose of the inspection was to record the condition of the panels, to estimate whether they are likely to last through the winter period and to consider what repairs are likely to prove possible in the future. The inspection was carried out by [redacted] assisted by [redacted] and [redacted] and recorded on a sketch which is attached to this SI report)

a) The decking is in a general poor condition (even after repair), with sections cut out of all but 2 of the 64 timber plywood panels (cut edges are open to accelerated deterioration due to water ingress).

b) A number of the retained panels (particularly in the wheel tracks) are in a poor condition and may not last through the 20/21 winter period. Replacement was not possible due to the patch size, time, material available and the strategy of replacing the worst panels first (i.e. the panels replaced were in an even worse condition).

c) As the remaining panel sizes shrink in size and fixings deteriorate, it becomes increasingly likely that future failures will result in panels/part panels being lost and holes being left. A macadam or asphalt patch repair is unlikely to be successful as it would butt up against moving timber panels (i.e. deflect when loaded). Any such failure is likely to occur with little or no warning.

d) The current complete deck renovation works (Long term maintenance option) has been put on hold for the foreseeable future (a number of years), while the viability of the removal of the navigation rights under the bridge is investigated.

Recommendation / Conclusions:

i) There is a fair to good chance that the current repairs will last through the 20/21 winter period (or maybe a little longer). However there is a significant and increasing risk of further failure of the remaining plywood deck panels.

ii We have or are close to reaching the point where removal of section of the plywood panels and replacement with an epoxy mortar is no longer a viable option.

iii) A future scheme, involving the replacement of the existing decking (e.g. with surfacing material or similar), needs to be msde ready. While this scheme (a short term solution) should be in planned for Summer 2021, it must be ready to implement as soon as possible and at short notice as emergency works should the remaining plywood decking start lifting off/out.

Recommended Works

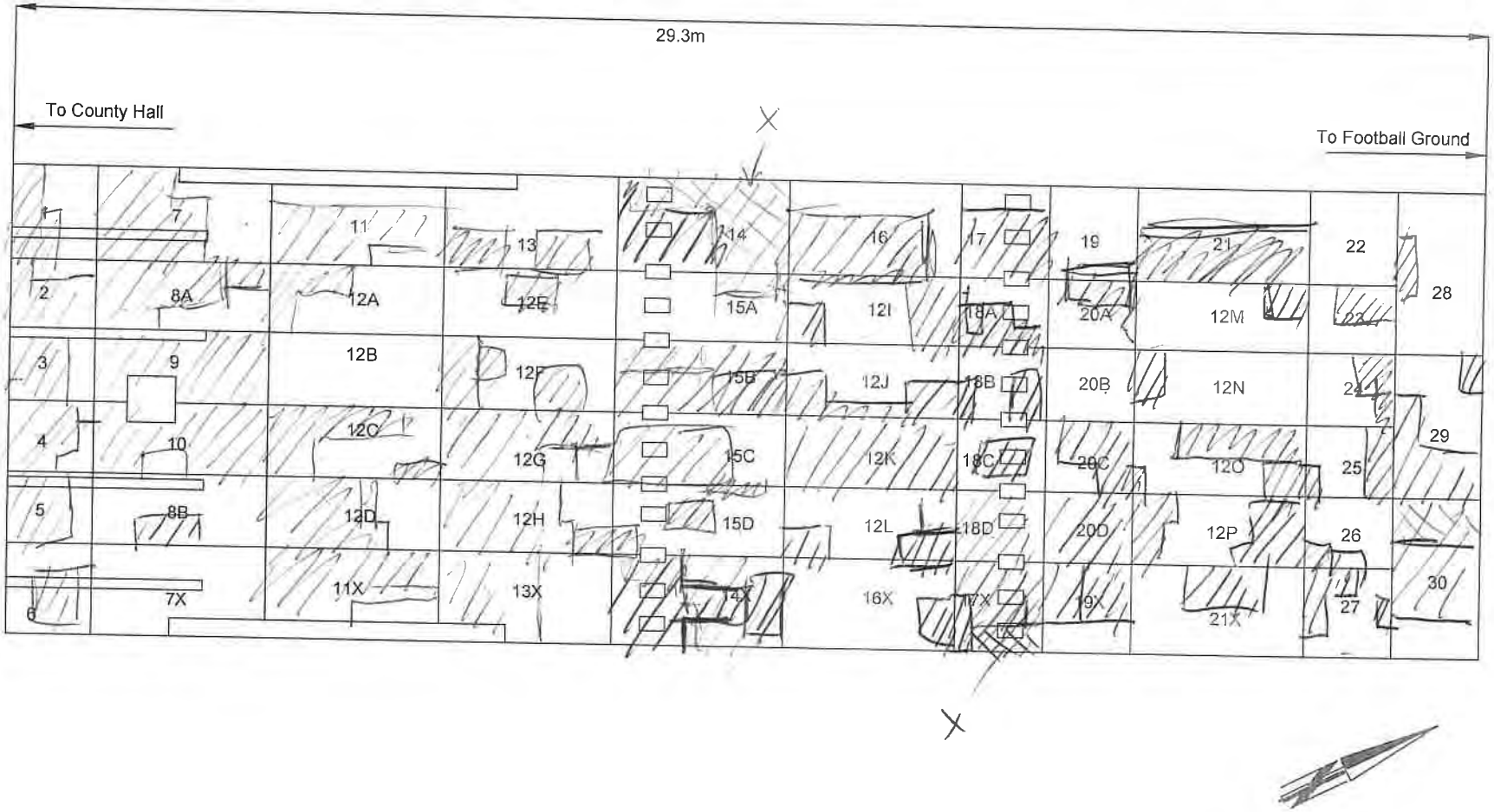
No.	Description	S	EX	Def	W	P	Cost	Comments

Team Manager (Bridge Maintenance)	**Remarks**

Signed [redacted] **Date** 19/10/2020	

Patch. E33

16/10/20
20:30 JT



Norfolk County Council
working with
MAY GURNEY
Mott MacDonald

Mike Jackson
Director of Environment, Transport and Development
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

DRAWING TITLE
Carrow Road River Bridge
TG20100
Deck Board Special Inspection

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	AW	07/11
DESIGNED BY	AW	07/11
DRAWN BY	AW	07/11
CHECKED BY	MW	07/11

DRAWING No. 1
PROJECT TITLE: Carrow Road River Bridge Deck Boards Special Inspection
SCALE: NTS
FILE No: TG20100

Photograph 1. Photograph taken 16th October 2020.

Photograph 2. Photograph taken 16th October 2020.

Special Inspection 2 of 8.

Norfolk County Council	Community and Environmental Services		

Special Inspection

Structure Name	**CARROW ROAD RIVER BRIDGE**		Parish	**Lakenham Parish Ward**		Structure Number	**TG20100**
Road Number	**A147**	Overall Width	**7m**		Depth of Water	**N/amm**	Depth of Soffit	**N/amm**
Number of spans	**3**	Span Details	**N/a**		Inspection Date		**05/05/2020**	
Number of construction forms in bridge/span:					Primary Deck Element Form - Table 2			**04**
					Primary Deck Element Material - Table 4			**E**
Number of photographs accompanying this report:			**1**		Secondary Deck Element Form - Table 3			**35**
					Secondary Deck Element - Table 4			**E**
Structure Owner	**NORFOLK CC**	Headroom	**N/amm**	Built	**1923**		
Is Assistance Required for inspection? No	N/a						

NUMBER OF PRO FORMAS IN REPORT	

No.	Element Description	Old SEX	S	EX	Def	W	P	Cost	Comments/Remarks
9	Abutments (incl. arch springing)		4	D	1.4	R	H	£2,500	Steel Nosing plate to the RH (US) corner of the bridge adjacent to the shed is bouncing due to a broken weld or corner to the L shaped angle plate. which is causing a loud banging when trafficked.- repair

General Comments

Steel Nosing plate to the RH (US) corner of the bridge adjacent to the shed is bouncing due to a broken weld or corner to the L shaped angle plate. which is causing a loud banging when trafficked.

Materials
2 x boxes E33 + 10mm stone
Steel Fabricator - Arbus
2 way stop go - day time working
Piece of steel plate minimum 5mm thick

Plant
Disc cutter
Breaker Pack
Leaf blower

Blow torch

SIGNIFICANT ACCESS HAZARDS	None
Overhead Cables Present? (Y/N)	No

Inspector	**Date** 05/05/2020

Team Manager (Bridge Maintenance) Signed [redacted] Date 07/05/2020	Remarks:

S - severity, Ex - extent, Def - defect, W - work required, P - work priority.

Steel Noising Bouncing Due to possible Broken Weld

Special Inspection 3 of 8.

Norfolk County Council	Environment, Transport and Development	Sht. 1 of 1

Special Inspection Report

Date	11/09/2017	**Structure Number**	TG20100	
Structure Name	CARROW ROAD RIVER BRIDGE		**Road Number**	A147
Parish	Lakenham Parish Ward		**Inspected By**	[redacted]
			[redacted] 11/09/2017	
		Signature		
Brief Number	18088			
Grid Reference	**Easting:**	623906	**Northing:**	307736

Report
I received a report from Tarmac [redacted] that the previous pothole repairs were breaking up. Visited site at 10am and identified a total of 6 potholes developing in boards 3,9, 15b, 18c,19 and 21. The worst potholes being 15b and 21.

Recommended Works

No.	Description	S	EX	Def	W	P	Cost	Comments
24	Carriageway surface	1	A	9.4	R	H	£2,000	Repair potholes. Visited site at 10am and identified a total of 6 potholes developing in boards 3,9, 15b, 18c,19 and 21. The worst potholes being 15b and 21.

Team Manager (Bridge Maintenance)	Remarks
Signed [redacted] **Date** 11/09/2017	

Special Inspection 4 of 8.

Norfolk County Council	Environment, Transport and Development	Sht. 1 of 5

Special Inspection Report

Date	06/07/2017	**Structure Number**	TG20100	
Structure Name	CARROW ROAD RIVER BRIDGE		**Road Number**	A147
Parish	Lakenham Parish Ward		**Inspected By**	[redacted]
			[redacted]	
		Signature	06/07/2017	
Brief Number				
Grid Reference	**Easting:**	623906	**Northing:**	307736

Report

Deck boards inspected by [redacted] and [redacted] following call form CSC where member of public reported that "there is a big hole that can be seen through on the middle of the bridge. Tarmac and wood have worn away. Looks very dangerous."

[redacted] spoke with [redacted] and agreed that holes would be filled with Viafix,. Largest of holes were filled on Friday 7th July.

Recommended Works

No.	Description	S	EX	Def	W	P	Cost	Comments
24	Carriageway surface	5	E	9.4	R	H	£10,000	Areas of surface texture loss, open holding down bolt fixing holes, loose fixings and bouncing boards - Repair. Emergency works will require 1 night road closure. Defect added to this inspection report following SD/ SR visit on 25.07.2017.

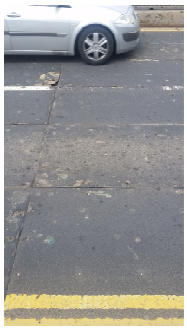
Team Manager (Bridge Maintenance)	**Remarks**
Signed [redacted] **Date** 25/07/2017	

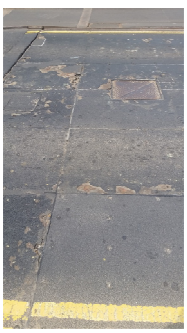


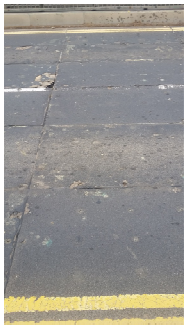


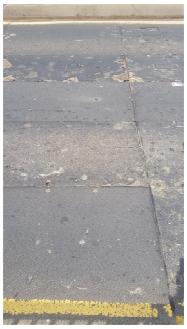










Special Inspection 5 of 8.

Norfolk County Council	Environment, Transport and Development	Sht. 1 of 2

Special Inspection Report

Date	26/06/2017	**Structure Number**	TG20100	
Structure Name	CARROW ROAD RIVER BRIDGE		**Road Number**	A147
Parish	Lakenham Parish Ward		**Inspected By**	[redacted]
			[redacted] 27/06/2017	
		Signature		
Brief Number	18060			
Grid Reference	**Easting:**	623906	**Northing:**	307736

Report
Inspected deck due to report of sharp objects that could cause punctures.

Various deck boards are bouncing some with loose fixings, various other board have surface de laminations with lose of anti slip surfacing and some boards failed completely at the corners allowing pot holes to start to form.

A designer will need to visit site and observe vehicle movements over the bridge to identify What boards, fixings need replacing and areas for new anti slip surface.

I would recommend to look at replacing the complete deck with fibreglass boards as we have spent a significant amount of money patching this up over the last few years.

Please note you will never stop movement with timber deck boards.

Recommended Works

No.	Description	S	EX	Def	W	P	Cost	Comments
24	Carriageway surface	5	E	9.4	R	H	£35,000	Areas of surface texture loss, open holding down bolt fixing holes, loose fixings and bouncing boards - Repair. Works will require 2 night road closure.

Team Manager (Bridge Maintenance)	Remarks
Signed [redacted] **Date** 28/06/2017	Repairs to be programmed as soon as practicable

Typical Loose Fixings

Typical view of Deck Board

Typical Anti Slip Surface Lose

Broken Corner to Deck Board

Fixing proud of Surface

Typical view of Deck Board

Special Inspection 6 of 8.

Norfolk County Council	Environment, Transport and Development	Sht. 1 of 2

Special Inspection Report

Date	29/03/2016	**Structure Number**	TG20100	
Structure Name	CARROW ROAD RIVER BRIDGE		**Road Number**	A147
Parish	Lakenham Parish Ward		**Inspected By**	[redacted]
			[redacted] 04/04/2016	
		Signature		
Brief Number	16035			
Grid Reference	**Easting:**	623906	**Northing:**	307736

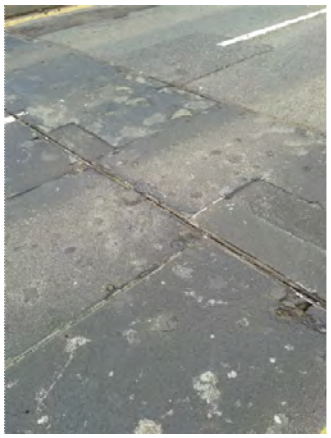
Report
Annual inspection of carriageway deck boards to identify any remedial works - see attached drawing for areas of repair.

No replacement boards recommended for this years work - but boards 3, 5, 12l, 17, 20C, 27, 28, 29 & 30 are deteriorating. These may need to be replaced next year

Recommended Works

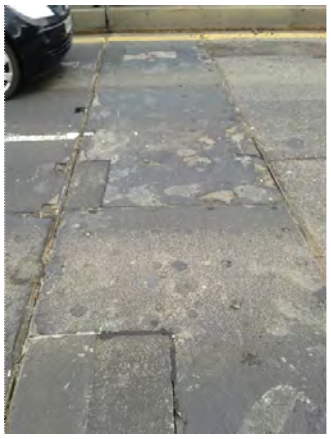
No.	Description	S	EX	Def	W	P	Cost	Comments
24	Carriageway surface	3	C	9.1	R	H	£8,000	Areas of surface texture loss, open holding down bolt fixing holes and bouncing boards identified on attached drawing - Repair. Works will require 2 nights with convoy working due to works in centre of carriageway.

Team Manager (Bridge Maintenance)	Remarks
Signed [redacted] **Date** 22/04/2016	

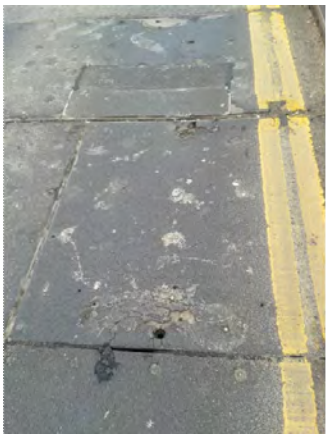


Typical view on Deck Board requiring probable replacement next financial year. a

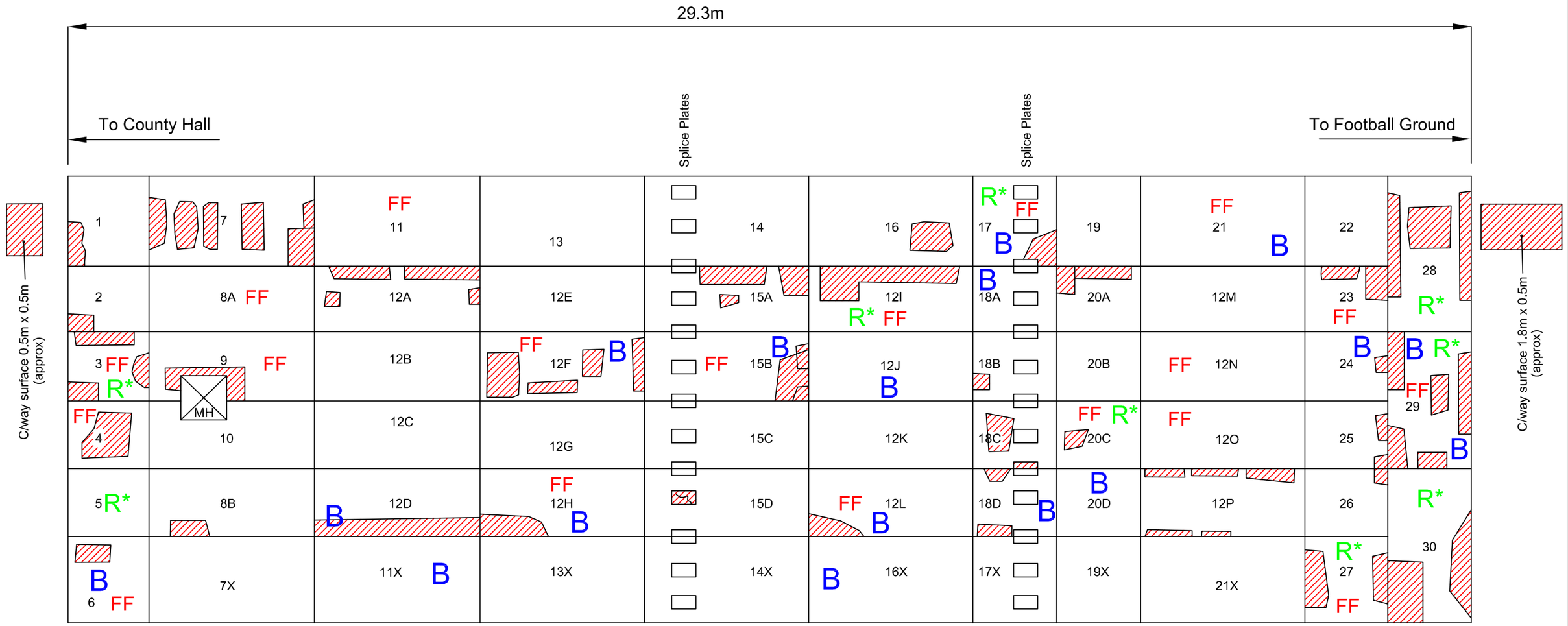
Typical view on Deck Board requiring probable replacement next financial year. c



Typical view on Deck Board requiring probable replacement next financial year. d



Typical view on Deck Board requiring probable replacement next financial year. b



KEY

B — Board bouncing

Surface texture loss

FF — Failed Fixings & Fixing holes to be filled

R* — Benefit from replacement (Next financial year - 2017/18)

Note - All Locations and sizes approximate

Norfolk County Council
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

DRAWING TITLE
Carrow Road River Bridge
TG20100
2016/17 Deck Board Special Inspection

119

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	KP	03/16
DESIGNED BY	KP	03/16
DRAWN BY	KP	03/16
CHECKED BY	MW	03/16

DRAWING No. 1

PROJECT TITLE
Carrow Road River Bridge
Deck Boards Special Inspection

SCALE NTS

FILE No. TG20100

ORIGINAL SIZE: A3

Special Inspection 7 of 8.

Norfolk County Council	Environment, Transport and Development	Sht. 1 of 1

Special Inspection Report

Date	19/01/2015	**Structure Number**	TG20100	
Structure Name	CARROW ROAD RIVER BRIDGE		**Road Number**	A147
Parish	Lakenham Parish Ward		**Inspected By**	[redacted]
			[redacted] 19/01/2015	
		Signature		
Brief Number	15355			
Grid Reference	**Easting:**	623907.161639539	**Northing:**	307742.865894946

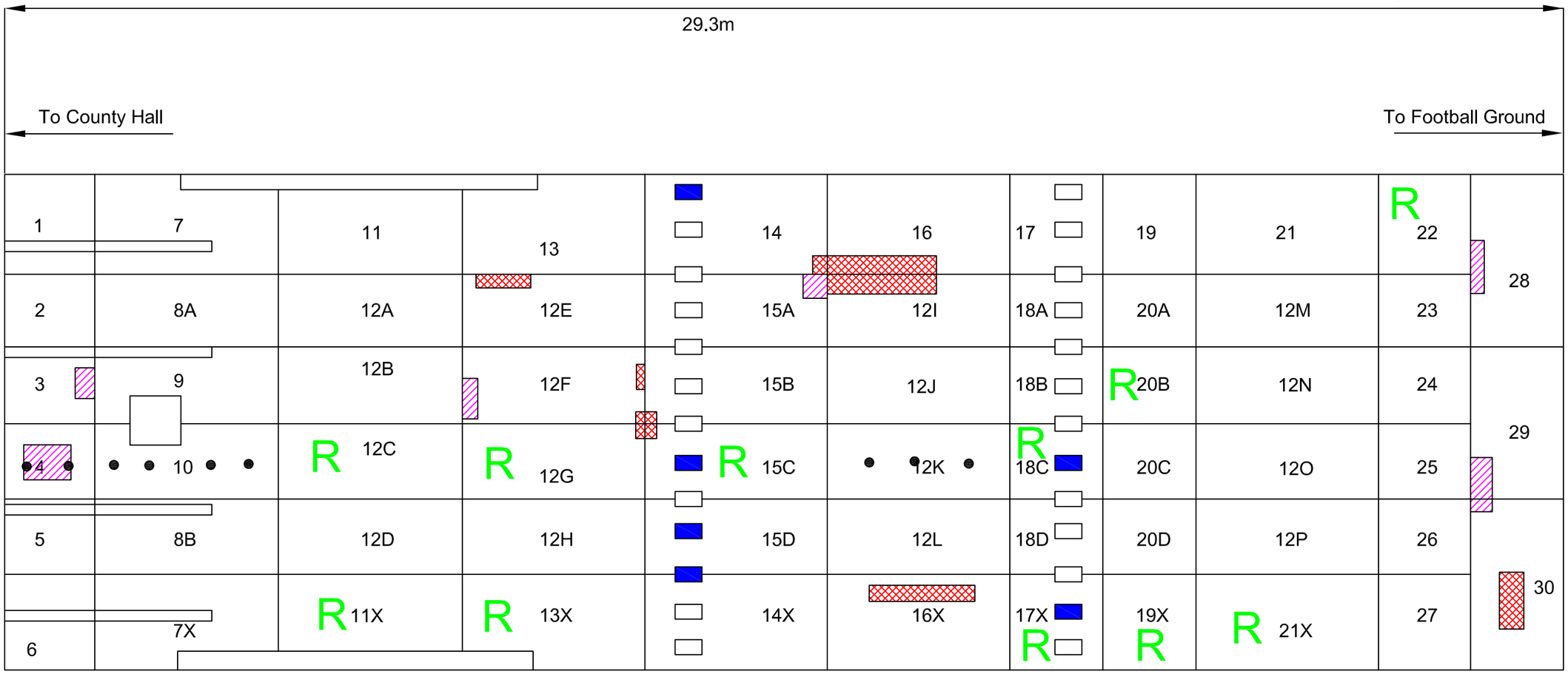
Report
Annual inspection of carriageway deck boards to identify any remedial works - see attached drawing for areas of repair.

Replacement boards recommended for this years work - Boards 11X, 12C, 12G, 13X, 15C, 17X, 18C, 19X, 20B, 21X and 22.

Recommended Works

No.	Description	S	EX	Def	W	P	Cost	Comments
24	Carriageway surface	1	A	9.4	R	H	£45,000	Areas of surface texture loss, open holding down bolt fixing holes and boards in need of replacement identified on attached drawing - Repair. Suggest a weekend road closure to allow works in centre of carriageway to take place.

Team Manager (Bridge Maintenance)	Remarks
Signed [redacted] **Date** 26/01/2015	



KEY

- Cut out and replace splice plate with E33 patch
- Resurface with resin and gripdeck repair kit
- Cut out and create new E33 patch
- New fixing to be installed
- R — Board to be replaced

NB - All Locations and sizes approximate

Norfolk County Council working with MAY GURNEY Mott MacDonald

ORIGINAL SIZE: A3

Mike Jackson
Director of Environment, Transport and Development
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

DRAWING TITLE

Carrow Road River Bridge
TG20100
2015/16 Deck Board Special Inspection

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	AW	19/01/15
DESIGNED BY	AW	19/01/15
DRAWN BY	AW	19/01/15
CHECKED BY	MW	20/01/15

DRAWING No. 1

PROJECT TITLE
Carrow Road River Bridge
Deck Boards Special Inspection

SCALE NTS | FILE No. TG20100

Special Inspection 8 of 8.

Norfolk County Council	Environment, Transport and Development	Sht. 1 of 1

Special Inspection Report

Date	16/05/2014	**Structure Number**	TG20100	
Structure Name	CARROW ROAD RIVER BRIDGE		**Road Number**	A147
Parish	Lakenham Parish Ward		**Inspected By**	[redacted]
			[redacted] 19/05/2014	
		Signature		
Brief Number	15033			
Grid Reference	**Easting:**	623906	**Northing:**	307736

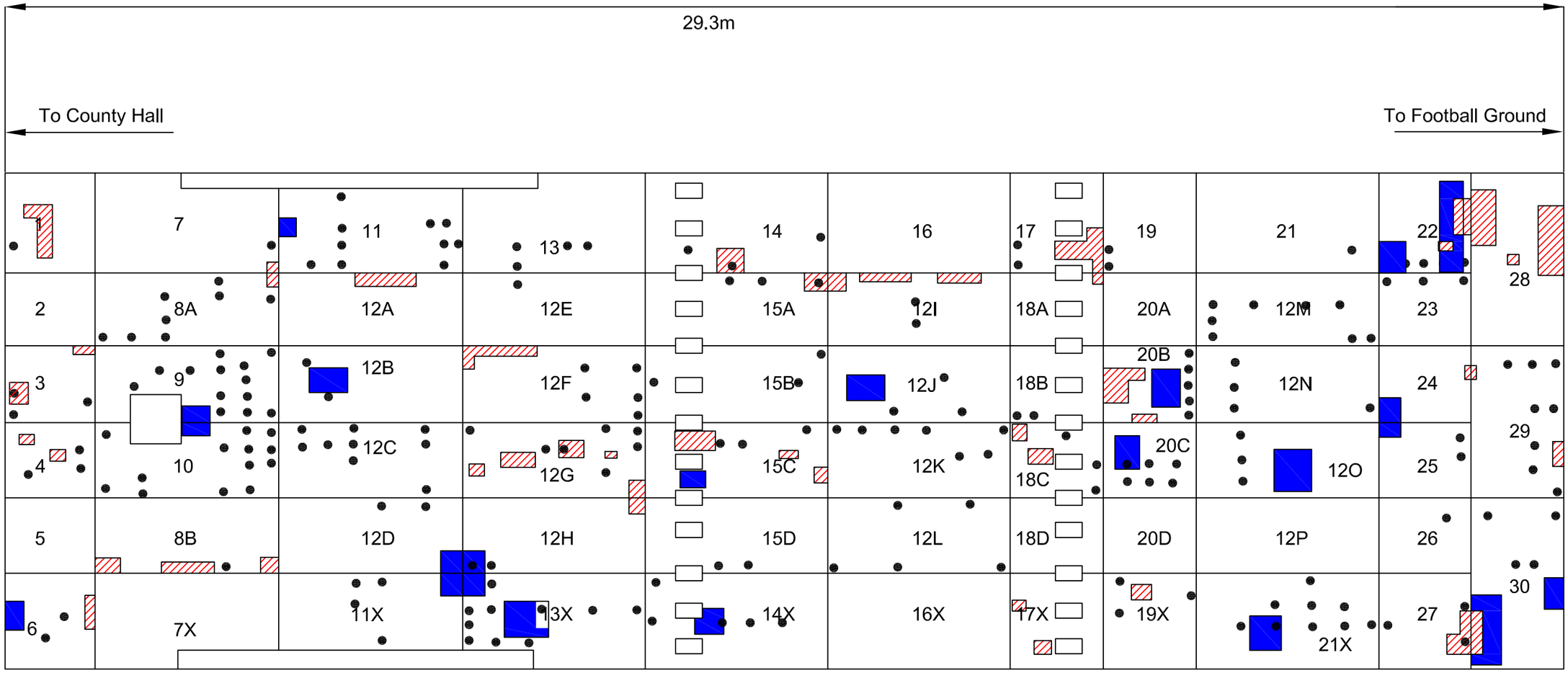
Report
Annual inspection of carriageway deck boards to identify any remedial works - see attached drawing for areas of repair.

No replacement boards recommended for this years work - but boards 12C, 12G, 15C are deteriorating with 22, 23 and 30 following closely behind. these may need to be replaced next year

Recommended Works

No.	Description	S	EX	Def	W	P	Cost	Comments
24	Carriageway surface	3	C			H	£6,000	Areas of surface texture loss, open holding down bolt fixing holes and bouncing boards identified on attached drawing - Repair. Suggest a weekend road closure to allow works in centre of carriageway to take place.

Team Manager (Bridge Maintenance)	Remarks
Signed [redacted] **Date** 21/05/2014	



KEY

- Board bouncing
- Surface texture loss
- Fixing hole to be filled
- R — Benefit from replacement

NB - All Locations and sizes approximate

Boards 12B, 15B, 12J & 12O new boards - remove fixings and inject grout to stop bouncing.

Norfolk County Council working with MAY GURNEY Mott MacDonald

Mike Jackson
Director of Environment, Transport and Development
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Norwich NR1 2SG

DRAWING TITLE

Carrow Road River Bridge
TG20100
Deck Board Special Inspection 2014/15

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	AW	05/14
DESIGNED BY	AW	05/14
DRAWN BY	AW	05/14
CHECKED BY	MW	05/14

DRAWING No. 1

PROJECT TITLE
Carrow Road River Bridge
Deck Boards Special Inspection

SCALE NTS

FILE No. TG20100

ORIGINAL SIZE: A3

Navigation Committee

10 June 2021
Agenda item number 9

Delivery of mooring provision within the Integrated Access Strategy Action Plan 2019-21

Report by Chief Executive, Director of Operations, and Head of Construction, Maintenance and Ecology

Purpose

This report gives an update on progressing the development and retention of the Broads Authority's network of mooring assets as set out in the Integrated Access Strategy Action Plan for 2019-21. It analyses the financial implications of the maintenance of these assets, and sets out a prioritised list of piling replacement projects.

Broads Plan context

Objective 4.3 is to 'Implement, promote and monitor measures to maintain and improve safety and security for the navigation and boats' – the emphasis is on providing safe and secure mooring locations, maintained to a high standard including safety features, aiming to give moorings within thirty minutes across the Broads Authority network.

Contents

1. Asset Management Strategy

1.1. The Broads Authority adopted an Asset Management Strategy in July 2012, which identified how the Authority would ensure that its land, property and other assets were managed and maintained as effectively as possible. A consolidated asset database was then developed, with assigned responsibilities; land and property records were centralised and all associated documentation scanned and stored in a document management system. A review of the revenue budgets was also undertaken and it was agreed to make provision to a number of earmarked reserves to ensure assets were maintained and fit for purpose. For 24-moorings, £150,000 is allocated specifically for piling on an annual basis, and that if it is not fully utilised the balance is transferred to reserves. Currently, the earmarked reserve is empty as the money is shown in the profiled budget.

1.2. Appendix 1 lists the current Broads Authority mooring assets; the list includes de-masting provision and emergency moorings as well as 24-hour free mooring sites.

1.3. This report assesses whether that level of expenditure is sufficient to maintain the moorings network in the medium to long term, and seeks the views of the Navigation Committee on the priority between maintenance of the existing moorings and acquisition of new sites.

2. Integrated Access Strategy

2.1. At its meeting in July 2019, the Broads Authority adopted an updated version of its Integrated Access Strategy together with an Action Plan for 2019-21, following consultation with this committee and a wide range of stakeholders. The Action Plan identified eight projects for moorings in the three following years. Progress is set out in Appendix 2.

3. Maintenance of mooring assets

3.1. Appendix 2 shows that, of the 8,711.8m of frontage for which the Broads Authority has responsibility, 3,719m of this is piling. Using an average of £1,000 per metre to replace sheet steel piling, the current value of this liability is £3.7 million (this value does not include leasing or purchasing costs). When divided over 25 years, this equates to an average yearly spend on piling replacement of £148,760, close to the budget allocation of £150,000 per year.

3.2. A key aspect of work undertaken by the Asset Officer, with guidance and support from the Management Team, is the re-negotiation of leases relating to mooring sites. The Broads Authority's approach to moorings states that to secure the longevity of the investment and security of a mooring, and where possible purchase rather than lease, is the preferred option. Where purchase is not possible, the longest possible lease duration is the next preferred position.

3.3. Due to the time needed to re-negotiate mooring leases and the fact that a renewed lease is not a given, officers start the renewal process 18 month prior to the end of the lease. This timescale is under review, as recent experience has shown that some locations have complicated legal work and a need for protracted discussion with third parties or organisations. Having said that, it is not always possible to predict timescales, particularly when the land ownership changes in the run up to the end of the lease.

3.4. The Authority is seeing an increasing tendency for landowners wishing to mitigate their responsibility for the piling at mooring locations, with many landowners wanting the Authority to assume and pay for piling replacement within the terms of the lease.

3.5. The Authority's Scheme of Delegations gives the Chief Executive the ability to negotiate the following: Freehold purchases not exceeding £75,000; new leasehold terms with rents not exceeding £25,000; and increases in rent not exceeding £20,000 per annum. The renewal of leases has often involved the Authority taking on responsibility for the retained piling, which may involve substantial costs. Officers are careful to assess the implications of these responsibilities against the existing maintenance programme and the annual resources made available. Directors may authorise additional expenditure of up to £10,000 for maintenance on Authority owned, leased or rented land, or within any budget provision made for such works (whichever is higher).

3.6. The ability to use delegated powers when negotiating new leases and lease renewal is essential to enable these agreements to be secured in a timely manner. Negotiations can be fast moving and require accurate and timely decisions and expedient answers, often with a number of parties including landowners, agents and their legal representatives.

3.7. As para 3.1 shows, the Authority's current liabilities are manageable within our accounting, and the Integrated Access Strategy mantra about maintaining as a minimum the present number of moorings available for visitor use is correct. However, it raises questions about the desirability and sustainability of taking on additional sites and the funding to acquire them.

4. Piling replacement programme

4.1. To manage the expenditure and procedures for piling replacements the Authority operates a rolling programme, with a prioritised list for locations where it is responsible for the replacement of the piling (see Appendix 3).

4.2. The target for provision of accessible public moorings within thirty minutes cruising time helps ensure an even spread of mooring locations around the whole system. The next Broads boat survey is due in 2022, and will offer an opportunity to gather boating information in a slightly different way so that capacity issues at moorings can be better understood. Data gathering options, such as vessel counts from aerial photography and fixed-point surveyors using tablet computers to record vessel movement information, could gain more benefit from the survey. Future review of the Integrated Access

Strategy can then bring mooring capacity into the scope of forward target setting, not just the cruising distance between locations.

5. Saint Benet's mooring

5.1. The issues raised in the retention of the mooring at St Benet's is a good example of the complexity that can be involved. A recent change in land ownership, and negotiations between the new landowner and the Environment Agency over responsibility for the piling, delayed the renewal of the Authority's lease of the site for a 24-hour mooring.

5.2. With assistance from professional advisors, officers have negotiated a new 25-year lease for this vitally important mooring site, which will include the responsibility to re-pile the site at some point within the next 25 years. In terms of materials, a number of options will be available at that point, and within the current programme the necessary finance should be available from earmarked reserves.

5.3. Maintenance work has also been commissioned to bring the site up to the required condition at a cost of £48,000, with the smaller repairs undertaken by the Authority's own Maintenance Team, and the larger scale timber replacement work contracted to a third party.

5.4. The piling is in good condition with an estimated 10-15 years life before they would need replacement.

6. Financial implications

6.1. The re-piling of 24-hour mooring sites is funded from an annual revenue budget of £150,000 per annum. For some of the larger piling jobs, such as the long length of mooring at Hoveton Viaduct, the Authority has to phase the work over two financial years; for others, resources are saved from one year to another to make it affordable. Looking forward, the financial provision appears to be adequate[1] to support the Authority's existing piling liabilities, though further detailed assessments are necessary to confirm this. It will be kept under constant review and an updated programme for 2022-25 will be brought to this committee to comment on in due course.

7. Conclusions

7.1. Good progress has been made in implementing the 2019-21 Action Plan. The Broads now has a very extensive network of free 24-hour moorings provided by the Authority but with this comes considerable maintenance liabilities.

[1] The price of steel is volatile, currently up 40%. These costings don't take that into account and we will come back to the Committee with further information when hopefully raw material costs have fallen.

7.2. Officers will continue to follow the ambitions set out in the Integrated Access Strategy and follow the principles already adopted when negotiating for the acquisition, lease and repair of moorings as follows:

i. The Authority's preference is to purchase freehold sites where possible for its mooring network;

ii. Where there is a desire/requirement for the Authority to take on the responsibility for the maintenance of piled edges, the Authority will, given the high cost of replacement, look either to purchase the site or to acquire a long lease at a nominal rental;

iii. Where the acquisition of a site or the renewal of a lease for a 24-hour mooring involves a piling responsibility officers will carefully assess the importance of the site within the mooring network and whether its maintenance can be accommodated within the existing maintenance programme; and;

iv. Sites offered for lease or lease renewal with a high maintenance liability without a long leasehold at a nominal rental will be declined and responsibilities on an existing mooring site returned to the landowner.

7.3. Further reports on this matter will be brought to the Committee addressing issues such as whether the Authority should look to acquire further mooring sites, if so where, and how these should be funded.

Author: John Packman, Rob Rogers, Dan Hoare

Date of report: 18 May 2021

Broads Plan strategic actions

Appendix 1 – Integrated Access Strategy 2019-21 Action Plan

Appendix 2 – List of Broads Authority mooring assets (2020/21)

Appendix 3 – Prioritised list of piling replacement projects

Appendix 1 – Integrated Access Strategy 2019-21 Action Plan

No	Location	Mooring type/proposal	Year	Progress
1	Lower Waveney/Burgh Castle	Investigate possibility of providing a 24-hour mooring on the lower Waveney/Burgh Castle on piled edge if a suitable site can be identified. Also consider viability of pontoon moorings.	2019/20	Using additional money granted from the Government, the Environment Agency has re-piled the flood defence structure at Burgh Castle (the original mooring location). The BA is negotiating the terms of a long lease with the landowner.
2	Breydon Water	Review layby pontoon mooring provision in lower Breydon at Breydon Bridge.	2019/20	Existing dolphins have been modified to make mooring simpler for a range of wind and tide options.
3	Ludham Bridge	Investigate possibility of providing demasting moorings with EA/other landowners	2019/20	BA in ongoing negotiations with Environment Agency on this location; currently a mooring but provided by others. BA has demasting area and mooring site on Horning Marshes side.
4	Norwich	Work with Norwich City Council and Norwich City Football Club to provide moorings required under Section 106 agreement immediately upstream of Trowse Railway Bridge	2019/20	The BA has an agreement in principle to take on and manage these City moorings; legal issues need to be resolved due to different development companies being involved.
5	Middle Bure - Upton/South Walsham Marshes/Oby	Investigate possibility of providing a 24-hour mooring on piled edge if a suitable site can be found.	2020	Discussions ongoing with the Environment Agency.
6	Waveney upstream of Somerleyton	Trial provision of dolphin type mooring with no land access.	2020	Deferred to 2022/23 due to workloads.
7	Norwich	Short stay visitor mooring	2020/21	Following a recent review, this additional Norwich mooring was removed from the strategy as

No	Location	Mooring type/proposal	Year	Progress
				there was no demand for extra moorings at this time.
8	Peto's Marsh	Provide pontoon moorings at Peto's Marsh, Carlton Colville (Oulton Dyke and Carlton Marshes River Waveney).	2021	Pontoon moorings to allow access to Carlton Marshes, with links to the reserve footways, was installed in May 2021.

Appendix 2 – List of Broads Authority mooring assets (2020/21)

Asset	Length of frontage (m)	Piling responsibility	Status	Lease end	Comments
Acle Bridge	660	y	Freehold	n/a	
Acle, Scare Gap	36	y	Freehold	n/a	
Barton Turf	40.6	n	Agreement	n/a	Currently under negotiation
Beccles North Bank	20.5	?	Holding over	n/a	No agreement/ owner not known
Beccles Marsh	59.5	y	Leasehold	20/08/2052	Repair in safe and useable condition
Belaugh Staithe	21.9	n	Leasehold	31/03/2029	
Berney Arms Mill	150	n	Leasehold	05/08/2044	
Berney Arms Reach	37	y	Freehold	n/a	
Boundary Farm, Oby	40	y	Freehold	n/a	
Bramerton	188.3	y	Leasehold	29/07/2023	Substantial repair to quay heading - piling not specified
Breydon De-Masting	20	n/a	n/a	n/a	
Brundall Church Fen	40.3	y	Leasehold	30/01/2046	
Burgh Castle	0	y	Leasehold		Lease not completed
Cantley	150	n	Leasehold	05/08/2044	
Catfield Staithe	36	n	Leasehold	15/10/2027	Good and useable repair
Chedgrave	39.2	n	Agreement	05/01/2023	Initial piling installed but no further obligations
Cockshoot	148.6	y	Leasehold	10/10/2035	
Coltishall Common	231.3	n	Leasehold	28/12/2027	
Deep Dyke	193	n	Leasehold	10/10/2035	To repair and keep in repair, and renew when necessary
Deep Go Dyke	111.5	n	Leasehold	10/10/2035	To repair and keep in repair, and renew when necessary
Dilham Staithe	50	y	Freehold	n/a	
Dutch Tea Gardens, Oulton Dyke	50	y	Leasehold	15/12/2028	
Dutch Tea Garden Pontoons	54	n	n/a	n/a	
Gaye's Staithe	81.4	n	Agreement	06/02/2028	No future maintenance responsibility after piling site in 1978
Geldeston	64	y	Freehold	n/a	
Great Yarmouth Yacht Station	535.2	n	Agreement	n/a	
Haddiscoe Demasting East	20	n/a	n/a	n/a	
Haddiscoe Demasting West	20	n/a	n/a	n/a	
Hardley Cross	88.9	n	Leasehold	17/12/2038	Keep safe and useable, but no responsibility for piling
Herringfleet	117	n	Leasehold	01/07/2025	Keep the riverbank in safe and usable condition, maintaining the same in a condition suitable for safe mooring of vessels

Asset	Length of frontage (m)	Piling responsibility	Status	Lease end	Comments
Horning Marshes	300	n	Leasehold	12/11/2019	Not responsible for structural repairs or flood defences or renewal of piling. Holding over due to landowner passing away.
Horning Staithe	101	n	Leasehold	26/03/2025	Keep the whole of the property in such state of repair to enable it to be used for the purposes specified.
How Hill Staithe	300	y	Freehold	n/a	Moorings not registered/ownership to be proved.
Hoveton St John	86.8	y	Freehold	n/a	
Hoveton Viaduct	319.1	Y	Leasehold	31/03/2020	Repair or replace as appropriate the western half of quay heading with boardwalk, moorings or steel
Irstead Staithe	18.2	y	Freehold	n/a	
Langley Dyke	97.9	n	Leasehold	12/06/2023	
Loddon Staithe	82	n	Agreement	n/a	
Neatishead	150.4	n	Leasehold	28/10/2068	Repair and keep in repair quay heading, tenant may choose a different form of mooring construction with written consent
North Cove	45	n	Leasehold	20/09/2028	Not responsible for maintaining river wall for flood defence
Norwich Yacht Station	507.4	n	Agreement	on going	
Paddy's Lane, Barton	156.4	y	Leasehold	10/10/2035	
Petos Marsh Pontoon	25	n/a	n/a	n/a	
Polkeys Mill, River Yare	72	n	Holding over	n/a	Keep the property in a safe and useable condition (not including structural repairs in respect of which it is hereby agreed and declared that neither the Landlord nor the Tenant shall have responsibility for under the terms of this Lease.)
Postwick Wharf	32	y	Freehold	n/a	
Potter Heigham - Bridge green	102	y	Freehold	n/a	
Potter Heigham Martham Bank	144.4	n	Leasehold	01/04/2085	To put and keep the existing piling and staging in good and substantial repair and condition suitable for safe mooring - not to remove at expiration of Lease.
Potter Heigham Repps Bank	145.3	n	Leasehold	01/04/2085	To put and keep the existing piling and staging in good and substantial repair and condition suitable for safe mooring - not to remove at expiration of Lease.
Potter Heigham Staithe	68	y	Freehold	n/a	
Potter Heigham Dinghy Park	31	y	Freehold	n/a	
Pye's Mill	300	n	agreement	n/a	
Ranworth	170.1	y	Freehold	n/a	
Reedham Quay	217.1	n	Holding over	n/a	
Reedham Pontoon	46	n/a	n/a	n/a	
Rockland Short Dyke	150	n	Leasehold	05/08/2044	

Asset	Length of frontage (m)	Piling responsibility	Status	Lease end	Comments
Rockland St Mary Staithe	81.4	n	Leasehold	31/07/2025	Keep and leave quay heading in good and substantial repair
Runham Layby Moorings	22	n	n/a	n/a	
Somerleyton	209.5	n	Leasehold	01/07/2025	Keep riverbank in safe and usable condition. maintaining same in condition suitable for safe mooring of vessels.
Somerleyton Pontoon	69	n/a	n/a	n/a	
Stalham Staithe	50	n	Agreement	31/12/2069	
St Benet's Abbey	300	y	Leasehold	??/05/2046	Not yet completed
St Olaves	50.5	y	Freehold	n/a	
Stokesby	33	y	Freehold	n/a	
Sutton Staithe	219.8	y	Freehold/leasehold	Holding over	Two parts
Wayford Bridge	52.7	y	Freehold	n/a	
West Somerton	150	y	Freehold	n/a	
White Slea	25	n	Leasehold	10/10/2035	To repair & keep in repair & renew when necessary.
Whitlingham Country Park	80	n/a	n/a	31/08/2021	
Commisioners' Cut	126.1	y	Freehold	n/a	
Womack Island	33.7	y	Freehold	n/a	
Worlingham Staithe	29.5	y	Freehold	n/a	
Womack Dyke	139	y	Freehold	n/a	
Wroxham Broad Island	69.3		Leasehold	31/03/2029	Not responsible for the installation, maintenance, renewal replacement or repair of piling.
Total length	**8711.8**				

Appendix 3 – Prioritised list of piling replacement projects

Mooring asset	Life end	Lease end	Prog year	Priority	Comment
Commissioners Cut	2023	Freehold	2021	1	Project being developed, but piles and tie rods need replacement
Acle Bridge	2025	Freehold	2022	2	Phase one -24-hour mooring completed); Phase two – non-mooring section near cafe
Neatishead Staithe	2023	Leasehold (2069)	2023	3	Corroding piles, some leaning near car park
Dilham	2023	Freehold	2024	4	Tie rods failing
Deep Dyke	2024	Leasehold (2035)	2025	5	Some piles reduced to 30% thickness. Corrosion has not been uniform.

Navigation Committee

10 June 2021
Agenda item number 10

South Walsham slipway access

Report by Director of Operations

Purpose

To seek the Committee's view on improving the access arrangements at South Walsham slipway.

Broads Plan context

Strategic objective 4.1 relates to opportunities to increase access.

1. Introduction

1.1. In 1989, Edward and Marilyn Brewster gifted the South Walsham slipway to the Broads Authority. Prior to this gift, the Parish Council and the donor were in dispute as to the existence of any public right of way. It was argued that the access was by way of custom, not by way of deed.

1.2. The slipway is located in the Parish of South Walsham at the southern end of South Walsham Broad along Fleet Lane. The slipway is approximately 10m^2 and is of wooden construction surrounded by timber piling. Access to the slipway is governed by means of a metal barrier which is locked, with key holder access restricted to a set number of local parishioners. Immediately adjoining the slipway is a grassed area with wooden posts demarcating its extent. Land Registry title number NK421515 states that the Broads Authority is proprietor (see Appendix 1).

1.3. In November 1989, the Broads Authority entered into an agreement whereby the Parish Council would manage the slipway on behalf of the Authority. The agreement required the Parish Council to carry out basic maintenance at the site, but the Broads Authority liability for major works or repairs remained.

1.4. Under the agreement, the Parish Council is to ensure that the primary uses are to be for the temporary moorings of dinghies and tenders, the landing of such craft and the launching of such craft. The Parish Council will permit the slipway to be used for launching and landing of permitted craft, and will provide a 'lockable restriction bar' to prevent the use of the slipway "other than by persons permitted to use it under this clause".

1.5. South Walsham slipway is identified as ‘priority location’ in the Slipways Strategy, as an increase in smaller craft has seen a demand for suitable launching and recovery points within the Broads.

2. Challenges

2.1. The location of the slipway on Kingfisher Lane, South Walsham is accessed via small, narrow country lanes. Near the slip is a very small public space used to park vehicles, but this does not provide space for the associated equipment that slipping a small craft often entails.

2.2. The Parish Council has been concerned about the damage to verges caused by vehicles with trailers passing, and ‘on verge’ parking when the slipway is in high demand. Although not a frequent occurrence, it is a situation that has caused the Parish Council and the local community concern.

2.3. Under the Parish Council’s management, access to the locked barrier is controlled by a 3-key application process: Parishioner keys (£25 per annum), Non-Parishioner keys (eight available via a ballot, £25 per annum), and Day key – publicly available, issued by the Parish Clerk (£5 per day).

2.4. In January 2011, a report to the Broads Authority gave details of considerations requested by the Navigation Committee (in December 2010) to allow improved access at South Walsham. Officers were asked to seek the views of the Parish Council on:

- The replacement of the barrier with a lockable post – this would enable canoe and small boat use to occur (but with slightly easier access) but would still prevent use by larger boats and present access to the slipway by trailers.
- For the Parish Council to be responsible for all day keys.
- For the Broads Authority to give an appropriate number of keys to recognised angling clubs (numbers to be agreed).
- For new signage advertising the slipway as suitable for canoe and small boat use to be erected by the Broads Authority.
- For the slipway to be advertised in Broads Authority canoe (or similar) leaflets as being suitable for canoe or small boat use and for the details of how to access the day keys to be publicised.

2.5. Broads Authority members expressed sympathy with the Parish Council over the parking issues and encouraged a joint discussion to reach a workable arrangement to cover access and slipway management. To date, no changes to the management or arrangement at the slipway have been agreed.

3. Recommendation

3.1. The Integrated Access Strategy has ambitions to increase the availability of access points to smaller craft, a situation that has become even more pertinent following the increase in paddle sport craft during the various phases of Covid-19 national lockdown.

3.2. The lockable barrier is seen by officers as an unnecessary restriction to public access, and the '3-keys' system is complicated and non-inclusive. However, we understand the concerns of the Parish Council and appreciate the issues around parking.

3.3. Therefore, this committee's views are sought on a proposal to improve parking by creating some additional spaces near the slipway, which once completed would see a trial period of removing the locked barrier to allow open access. To address concerns about increased use and associated issues, the trial would be not be publicised by the Broads Authority.

4. Risk implications

4.1. In previous conversations, the Parish Council has been reluctant to make any changes to the access or management of the slipway. The Council was asked for its views in summer 2010 and held a public meeting on 17 August 2010, which was attended by Broads Authority officers. The Council's formal response following that meeting was to object strongly to the proposal for unrestricted usage.

4.2. The concerns expressed in 2010, and still raised today, relate to an increase in traffic, parking issues, noise, rubbish and the impact that increased visitor numbers would have on the wildlife.

5. Conclusion

5.1. Members' views are sought on a recommendation to approach South Walsham Parish Council about a short trial period to allow unbarred, keyless access to South Walsham Broad, with a small investment to create some additional parking on Broads Authority land near to the slipway, to help mitigate Parish Council concerns.

Author: Rob Rogers

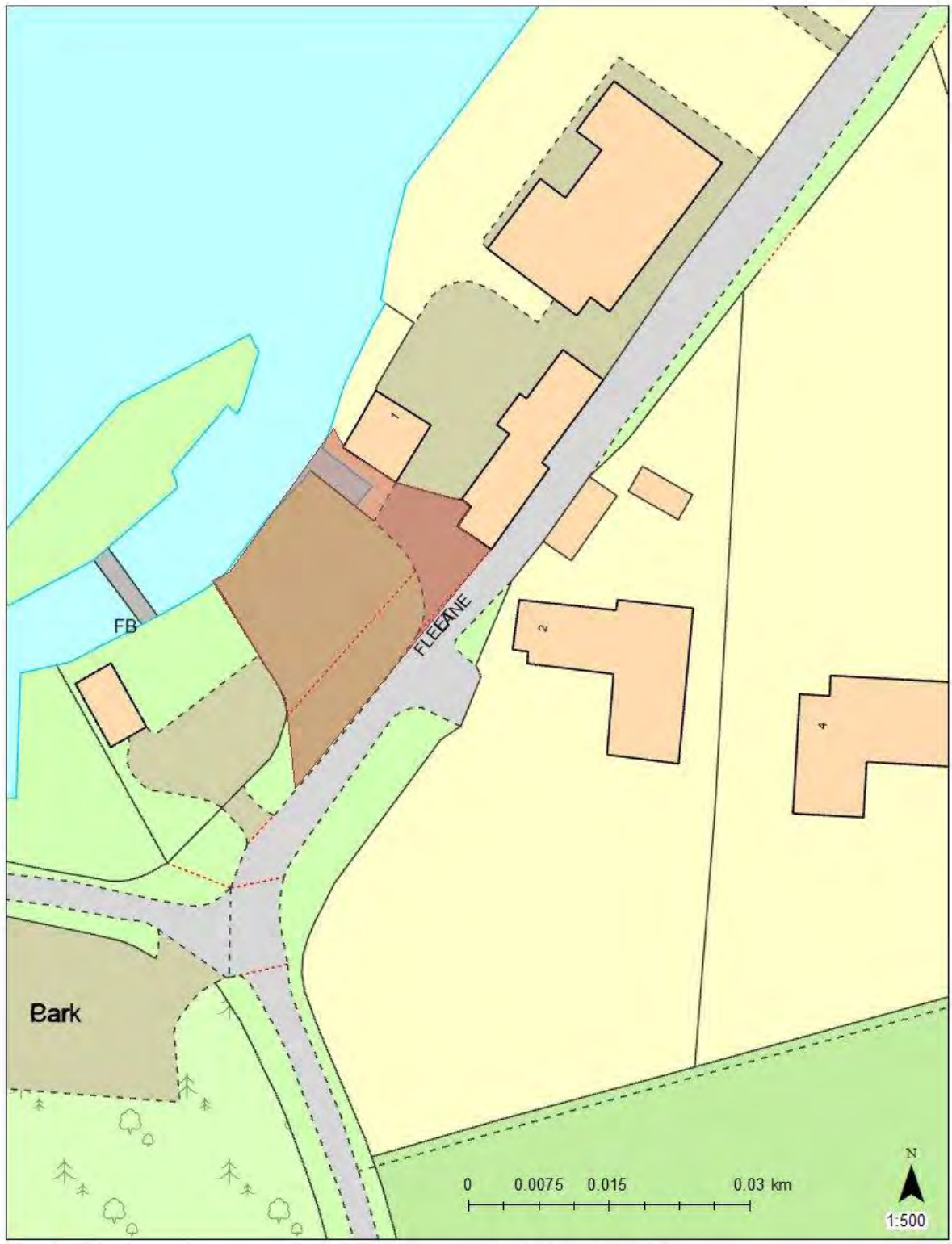
Date of report: 14 May 2021

Background papers: Broads Authority report 21 January 2011; Navigation Committee report 9 December 2009.

Broads Plan strategic actions: 4.1

Appendix 1 – Maps detailing Broads Authority landownership at South Walsham

Appendix 1 – Maps detailing Broads Authority landownership at South Walsham



Broads Authority

South Walsham Slipway

Broads Authority

South Walsham Slipway

Navigation Committee

10 June 2021
Agenda item number 11

Mutford Lock - operation and risk assessment

Report by Rivers Engineer

Purpose

This report highlights the completed Harbour Revision Order, a review of the structural integrity of Mutford Lock and the operational risk assessment for vessel passage through the lock. The Committee's view is sought on the proposals by the Rivers Engineer to restrict the beam width of vessels using Mutford Lock to 6.050 m; and to suspend the procedure of 'free flow' through the lock until further notice.

Broads Plan context

Objective 4.3 is to implement, promote and monitor safety measures for the navigation and boats.

1. Introduction

1.1. Mutford Lock is the Broads' second principal gateway to the North Sea, connecting Oulton Broad with Lake Lothing. A tripartite operational agreement has been in place from 1992 until autumn 2020 between Associated British Ports, Suffolk County Council and the Broads Authority. The new Harbour Revision Order (HRO) completed on 19 February 2021 covers the formal transfer of land and matters such as easements, rights of way and indemnities from Associated British Ports to the Broads Authority. https://www.gov.uk/government/publications/broads-authority-transfer-of-mutford-lock-habour-revision-order

1.2. A new Service Level Agreement between Suffolk County Council, the Broads Authority and East Suffolk Council for the operation of the Lock and Bridge systems was agreed and signed in October 2020.

2. Overview – free flow

2.1. Due to different tides in Lake Lothing and Oulton Broad, the lock structure has an unusual bi-directional design. It has two pairs of opposing gates at each end to allow for different water levels on either side of the lock.

2.2. Free flow can occur when the outside sea level is equal to Oulton Broad level and both sets of lock gates are opened to allow free transit to and from Lake Lothing. This potentially allows passage of craft larger than the lock chamber. The procedure

requires matching fresh and saltwater tide levels and the window for passage on suitable tides is very limited (typically no more than 6 minutes). Free flow times can vary from those published due to a number of factors including barometric pressure, weather conditions, and Suffolk County Council road bridge opening requirements.

3. Lock condition and risk assessment

3.1. In August 2020, 'Durrant Diving Ltd' undertook maintenance work to clear accumulated debris from around the lock gates, and reported: "The concrete bulge from a historical repair is behind the South West Lower Gate on the salt water side, approximately 1.5m from the heel post and 500mm up from the lock bottom. The size of bulge is approximately 600mm high x 400mm wide x 400mm deep."

3.2. With the new operational and service level agreements in place, the Broads Authority has revisited the locks operational procedures and risk assessments governing the lock itself and its surroundings.

3.3. The revised Mutford Lock Risk Assessment (Appendix 1) has raised the question of lock structural safety and protection, particularly with reference to the vulnerability of the lock walls where historical repairs have been undertaken (item 3.1).

3.4. In order to mitigate further risks to the lock structure, and to create a safety zone from the concrete bulge (item 3.1), the recommendation is to reduce the maximum beam width of vessels using the lock system from 6.450m to 6.050m and to temporarily suspend 'free flow'. These measures decrease the risk factor of damage to the lock structures (walls, sills, pintles and lock gates).

3.5. Large vessels (over 21.945m in length & 6.050m beam width) wanting to enter the Broads system are best suited to enter via Gt Yarmouth, where there are fewer vessel dimension restrictions and the Port can assist if needed.

4. Financial implications

4.1. Mutford Lock is approximately 200 years old. Almost every part of the lock has been repaired or replaced over this time. To give some perspective on likely costs of capital works, a summary of current best estimates is in Table 1 with an indication of timescales. Members should note that these estimates, particularly with regard to lock wall repairs, need some further engineering consideration.

4.2. A report to the Navigation Committee in 2017 (Mutford Lock Navigation Committee report 19 October 2017) estimated that capital costs to repair the lock, under the worst-case scenarios, could amount to £1.67 million over 40 years.

Table 1
Mutford Lock - estimate of capital cost works

Element	Estimated cost	Timescale
River Tours Quay (35m)	£52,500	High priority and to be assessed this summer
Penstocks	£64,000	30 years (if 4 year maintenance plan is implemented)
Steel sheet piling (25m)	£150,000	20 years
De-watering	£500,000	Unknown
Masonry walls incl. gate quoins - repair or rebuild	£100,000 - £500,000	Unknown
Hydraulics	£70,000	30 years
Paving	£10,000	20 years
Lock gates	£320,000	40 years

4.3. The Authority has an earmarked reserve fund for maintenance of Mutford Lock, which forms part of the Property Reserve. The potential requirement for significant structural repairs to the lock has always been known, and the Authority has made annual contributions to build up the reserve fund.

4.4. The 2017 report outlines the estimated annual and capital costs associated with owning and managing the asset. The report also provides a summary of the current usage and value of the lock as an asset to the Authority and local area.

4.5. In terms of managing the lock over the long term, the Authority can expect to face the cost of some significant capital works. The most significant costs are likely to be associated with any major repair or reconstruction of the lock walls. The central part of the lock chamber was rebuilt in 1964 following a collapse. This part of the lock chamber is in good condition; however, the older masonry walls local to the lock gates are in poor condition in some areas and the stability of the masonry walls has not been fully determined. The proposal to reduce maximum beam width and temporarily suspend free-flow reduces the risk of damage, associated requirement for remedial repair and any delays in normal operation while damage is rectified.

4.6. The recently completed HRO includes an indemnity by the Authority to Associated British Ports to keep the lock in good and substantial repair.

5. Risk implications

5.1. The Mutford Lock Site Risk Assessment (Appendix 1) was reviewed and updated in May 2021.

5.2. In addition to providing a physical access point to and from the Broads, Mutford Lock is also a physical controllable barrier between the North Sea and the fresh water of Oulton Broad and the River Waveney. The lock gates are a major control for the water level and flows on Oulton Broad and the separation of saline and fresh water. The Broads Authority manages the lock for the purpose of providing navigational access, not as a tidal barrier. However, it does provide this added value to the area and may be considered by the Environment Agency as a third-party flood risk management asset.

6. Conclusion

6.1. Based on the information provided above, the Committee's view is sought on the following proposals:

- A reduction in maximum vessel beam width to 6.05 when making passage through the lock system; and
- Free-flow unavailable until further notice.

Author: Adrian Sewell

Date of report: 20 May 2021

Background papers: Report to Navigation Committee on Mutford Lock condition 19 October 2017

Appendix 1 – Mutford Lock Risk Assessment

Appendix 1 – Mutford Lock Risk Assessment

Hazard	Persons at risk	Existing control measures	Initial risk L	Initial risk S	Initial risk IR	Revised/Additional control measures Recommendation	Revised/Additional control measures Owner & Deadline	Residual risk L	Residual risk S	Residual risk RR
Escaping lock in event of a fall into the enclosed water	Boat users Lock operatives	2 No. ladders within the lock. Lock Personel in attendance. Safety lines & Rings 1 No. ladder on inside face of each gate pair	2	2	4	Low risk	Broads Authority			
Unauthorised access into operational area with exposed quay edge - potential for fall into water and drowning	Public	Operational area fenced and gated with 'No access' signs. Exception is gate into northwest operational area which has no signage	2	2	4	Low risk	Suffolk County Council / Broads Authority			
No means of escape from water on Oulton Broad side of lock - potential for drowning in event of fall into water	Boat users Lock operatives Public	None	2	2	4	**Low Risk:** A ladder should be installed. This should be located so as not to cause a hazard to boats, or be protected by timber fendering.	Broads Authority	1	1	2
Uneven surfacing on quay edge forming trip hazard - possible injury and fall into water.	Lock operatives	None	2	2	4	Remove and replace degraded concrete with suitable repair mortar and ramp stepped slab edges.	Broads Authority	1	2	2
Lock gate retraction arms are painted black and may form a trip hazard in poor light	Lock operatives	White box painted around rollers. None around retraction arms	2	2	4	Paint white lines either side of arms or alternatively re-paint arms a brighter colour	Broads Authority	1	2	2
Exposed access to gate top walkway with steel tread-plate - potential for slip and fall into water	Lock operatives	Handrailing either side of walkway, but the inner railing stops short of walkway end - Only use in emergency	2	2	4	**Low Risk:** Provide inner handrailing or barrier to close the gap and replace steel tread plate with non-slip material	Broads Authority	2	1	3
Catwalk access over fendering toward bascule road bridge. Handrailing extends beyond walkway encouraging operatives to walk onto timber fendering (high over water) which is slippery with marine growth.	Lock operatives Bridge inspectors	Keep Out' signs in place, but handrailing present - Guard Rails present	1	3	3	**Low Risk:** Fixed arrest points/forward fencing	Suffolk County Council	1	1	1
Unmarked and exposed quay edge at seaward end of north lock quay.	Lock operatives	**None:** Also no means of escape from adjacent water	1	3	3	**Low Risk:** within exclusion Zone - Paint white line at quay edge and install quay edge ladder	Broads Authority	1	2	2

Hazard	Persons at risk	Existing control measures	Initial risk L	Initial risk S	Initial risk IR	Revised/Additional control measures Recommendation	Revised/Additional control measures Owner & Deadline	Residual risk L	Residual risk S	Residual risk RR
Cyclists using Pedestrian overbridge	General public	Signage in place	2	2	4	Install Bike barrier making cyclist dismount	Suffolk County Council / Broads Authority	1	1	2
General Lock System Condition Integrity of structure Closure of Lock	General public Lock Operators	**Site Survey's**- The concrete bulge from a historical repair is behind the South West Lower Gate on the salt water side approximately 1.5m from the heel post and 500mm up from the lock bottom. The size of bulge is approximately 600mm high x 400mm wide x 400mm deep. A minor safety fault or when the asset itself is likely to be compromised if action is not taken.	3	5	15	Defect that can be addressed when resources allow Programmed delivery Limit beam of vessels making passage through the Lock too 6.050m Free Flow - Unavailable until further notice	Broads Authority	1	1	2
Lock Gates Potential lock gate being unable to close Temporary Lock Closure	Boat users	South east lock gate not returning back into sill Monitoring of gate mechanism	2	2	4	Routine maintenance cleaning	Broads Authority	1	1	2
Unpropelled Passage through Lock Vessel blockage of Lock	Boat users Lock operatives Public	Maximum length 21m Passage Plan required	1	1	2					

Navigation Committee

10 June 2021
Agenda item number 12

Annual income and expenditure 2020/21

Report by Chief Financial Officer

Purpose

To inform the Committee of the summary of the Authority's income and expenditure for the 2020/21 financial year, analysed between General (National Park) and Navigation funds. Original and Latest Available Budget information is provided for comparison.

1. Introduction

1.1. The Broads Act 2009 requires the Authority to prepare a report as soon as reasonable possible after the end of each financial year describing the navigation income received by it and the navigation expenditure incurred by it in that year.

2. Actual income and expenditure 2020/21

2.1. The tables in Appendix 1 sets out the Authority's income and expenditure attributed to General (National Park Grant) and Navigation funds for the financial year ended 31 March 2021. To the extent that they are included within the Authority's Statement of Accounts, these figures are subject to audit and formal approval by the Authority's external auditors. For comparative purposes, the Original and Latest Available Budget (LAB) figures are also shown. This information is published on the Authority's website.

2.2. The actual outturn for 2020/21 was a surplus of £128,515 for Navigation compared with a budgeted LAB deficit for the year of £209,969. The original budget was for a deficit of £121,478. The final forecast outturn was a deficit of £102,677.

2.3. Total core income for the year was £3,396,351, which was £129,249 below budget, principally due to the adverse variance of £94,323 within the Hire Craft following the outbreak of COVID-19. There continued to be smaller adverse variances within Private, Short Visit and Other Toll income budget lines. The economic impact of the pandemic also affected the interest budget line, with interest rates falling.

2.4. Other income remained broadly in line with budget predictions.

2.5. Total net navigation expenditure in 2020/21 was £3,267,836, which was £467,733 below the budget. This was achieved by making savings during the year, including cancelling some of the contributions to the earmarked reserves and some work being postponed until 2021/22, in order to bring the forecast back into balance. The

lockdown after Christmas further impacted the workplan and as a result a number of carry forward requests were received at the end of the financial year.

3. Earmarked reserves

3.1. The earmarked reserves have funded the following expenditure:

- Property Reserve includes rental income from land at Oulton Broad (£2,000).
- Plant, Vessels and Equipment Reserve includes replacement cost of two vehicles (£39,243), a second hand JCB, mini excavator and five NATO floats (£47,565). It also includes the insurance proceeds from the written off vehicle (£5,905). The annual contributions for replacement electric vehicles that were reinstated at the end of the financial year following the overall Navigation surplus exceeding the deficit forecast. It also includes the adjustment to correct the split between General and Navigation as highlighted in budget report on 14 January 2021, paragraph 12.2.
- Premises Reserve includes the topographical survey and the river edge piling design at the Dockyard (£686).
- CANAPE Reserve has funded the project expenditure less the grant reimbursement.
- Computer Software has funded some of the costs for the implementation of the new HR software called iTrent that was installed at the beginning of 2021 (£309). The annual contribution was reinstated at the end of the financial year.

3.2. After the year end transfer of interest, the closing position on the earmarked reserves is as follows:

Table 1
Navigation earmarked reserves

Reserve Name	Balance at 1 April 2020 £	In-year movements £	Balance at 31 March 2021 £
Property	(393,440)	(4,218)	(397,658)
Plant, Vessels and Equipment	(310,245)	51,231	(259,014)
Premises	(89,966)	185	(89,781)
CANAPE	(155,922)	(39,739)	(195,661)
Computer Software	(7,184)	(3,048)	(10,232)
Total	**(956,757)**	**4,411**	**(952,346)**

4. Summary

4.1. The total Navigation surplus for 2020/21 was higher than the budgeted and forecast deficit. The main reason for the considerable variance between the forecast and actual position was due to COVID-19 and the latest lockdown that ran from Christmas that further delayed some practical works. As a consequence, there were some high value carry forwards agreed so the work could be completed in 2021/22. These were considered and approved by the Broads Authority on 30 April 2021, totalling £77,972.

4.2. The impact of COVID-19 has seen increased numbers of visitors to the Broads due to the increased popularity of a "staycation". In order to increase the safety of the visitors it was agreed with DEFRA that a transfer would be made at the end of the financial year to cover the costs of these additional safety measures over the next two years. After the transfer of this £250,000 the balance on the navigation reserve at the end of 2020/21 was £913,595. This is above the recommended minimum reserve balance of 10% at 28%. However, it should be noted that once the £250,000 is spent during 2021/22 and 2022/23 this reduces the reserve balance to 13% at the end of 2022/23 based on the Financial Strategy. This will be refined later on this year when the level of tolls for 2022/23 is considered.

Author: Emma Krelle

Date of report: 24 May 2021

Appendix 1 – General and Navigation income and expenditure 2020/21

Appendix 1 – General and Navigation income and expenditure 2020/21

The Broads Authority Act 2009 requires the Authority to prepare a report as soon as reasonably possible after the end of each financial year describing the navigation income received by it and the navigation expenditure incurred by it in that year. The table below sets out the Authority's income and expenditure attributed to general (National Park Grant) and navigation funds for the financial year ended 31 March 2021. These figures are derived from the annual Statement of Accounts which is subject to audit and formal approval by the Authority's external auditors, Ernst & Young. For comparative purposes, the final approved budget figures are also shown.

Further details are available on request from the Chief Financial Officer, Yare House, 62-64 Thorpe Road, Norwich NR1 1RY or by email from emma.krelle@broads-authority.gov.uk.

The Draft Statement of Accounts for 2020/21 are due to be audited 19 July to 13 August 2021 with the Final Statement of Accounts due to be considered by the Authority on 24 September 2021.

Table 1
Income

Income Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Income General £	Actual Income Navigation £	Actual Income Consolidated £
National Park Grant	(3,414,078)	0	(3,414,078)	(3,414,078)	0	(3,414,078)	(3,414,078)	0	(3,414,078)
Hire Craft Tolls	0	(1,199,000)	(1,199,000)	0	(1,199,000)	(1,199,000)	-	(1,104,677)	(1,104,677)
Private Craft Tolls	0	(2,244,000)	(2,244,000)	0	(2,244,000)	(2,244,000)	-	(2,228,404)	(2,228,404)
Short Visit Tolls	0	(43,000)	(43,000)	0	(43,000)	(43,000)	-	(36,392)	(36,392)
Other Toll income	0	(19,100)	(19,100)	0	(19,100)	(19,100)	-	(15,711)	(15,711)
Interest received	(20,500)	(20,500)	(41,000)	(20,500)	(20,500)	(41,000)	(11,167)	(11,167)	(22,334)
Income Total	**(3,434,578)**	**(3,525,600)**	**(6,960,178)**	**(3,434,578)**	**(3,525,600)**	**(6,960,178)**	**(3,425,245)**	**(3,396,351)**	**(6,821,597)**

Table 2
Operations

Expenditure Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Expenditure General £	Actual Expenditure Navigation £	Actual Expenditure Consolidated £
Construction & Maintenance Salaries	479,392	812,328	1,291,720	479,392	812,328	1,291,720	473,263	796,032	1,269,295
Equipment, Vehicles & Vessels	161,040	375,760	536,800	161,040	375,760	536,800	131,280	306,319	437,599
Water Management	5,000	98,670	103,670	5,000	111,670	116,670	5,156	78,683	83,839
Land Management	58,710	0	58,710	58,710	0	58,710	50,781	0	50,781

Expenditure Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Expenditure General £	Actual Expenditure Navigation £	Actual Expenditure Consolidated £
Practical Maintenance	89,300	430,260	519,560	89,300	500,198	589,498	94,324	273,646	367,970
Waterways & Recreation Strategy	18,180	27,180	45,360	18,180	27,180	45,360	18,303	23,103	41,406
Rangers Salaries	215,823	503,587	719,410	215,823	503,587	719,410	213,898	499,095	712,993
Ranger Services	12,405	133,145	145,550	12,405	133,145	145,550	14,306	132,148	146,454
Safety	60,651	89,819	150,470	60,651	89,819	150,470	34,756	75,870	110,626
Project Funding	60,793	1,067	61,860	60,793	1,067	61,860	61,002	1,087	62,089
Operational Premises	98,973	132,937	231,910	98,973	132,937	231,910	72,829	66,859	139,688
Premises Head Office	183,805	75,075	258,880	183,805	75,075	258,880	182,172	74,408	256,581
Management & Admin	88,916	43,794	132,710	88,916	43,794	132,710	91,794	45,212	137,006
Operations Income	(104,096)	(11,200)	(115,296)	(104,096)	(11,200)	(115,296)	(118,973)	(37,048)	(156,021)
Operations Total	**1,428,891**	**2,712,423**	**4,141,314**	**1,428,891**	**2,795,361**	**4,224,252**	**1,324,890**	**2,335,416**	**3,660,305**

Table 3
Strategic Services

Expenditure Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Expenditure General £	Actual Expenditure Navigation £	Actual Expenditure Consolidated £
Development Management	466,427	4,244	470,670	466,427	4,244	470,670	445,003	4,270	449,273
Strategy & Projects Salaries	140,051	8,719	148,770	140,051	8,719	148,770	135,644	8,378	144,023
Biodiversity Strategy	55,693	0	55,693	11,870	0	11,870	55,365	0	55,365
Strategy & Projects	117,925	90	118,015	122,459	90	122,549	91,549	24	91,573
Human Resources	82,146	57,084	139,230	82,146	57,084	139,230	79,855	55,492	135,347

Expenditure Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Expenditure General £	Actual Expenditure Navigation £	Actual Expenditure Consolidated £
Volunteers	44,088	29,392	73,480	44,088	29,392	73,480	31,342	20,894	52,236
Communications	362,057	78,473	440,530	268,133	84,026	352,159	372,481	77,670	450,151
Visitor Centres & Yacht Stations	300,128	158,753	458,880	300,128	158,753	458,880	266,311	148,140	414,451
Management & Admin	75,817	32,493	108,310	75,817	32,493	108,310	76,541	32,803	109,344
Strategic Services Income	(336,603)	(68,700)	(405,303)	(179,900)	(68,700)	(248,600)	(399,505)	(43,562)	(443,067)
Strategic Services Total	**1,307,727**	**300,548**	**1,608,275**	**1,331,217**	**306,101**	**1,637,318**	**1,154,585**	**304,111**	**1,458,696**

Table 4
Chief Executive

Expenditure Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Expenditure General £	Actual Expenditure Navigation £	Actual Expenditure Consolidated £
Legal	70,000	30,000	100,000	70,000	30,000	100,000	76,853	31,977	108,830
Governance	201,214	96,670	297,884	201,214	96,670	297,884	175,204	84,954	260,158
Finance & Insurance	206,740	183,810	390,550	206,740	183,810	390,550	202,316	179,954	382,270
Collection of Tolls	0	146,440	146,440	0	146,440	146,440	0	142,955	142,955
ICT	220,001	108,359	328,360	220,001	108,359	328,360	222,390	109,535	331,926
Asset Management	91,009	85,284	176,293	91,009	85,284	176,293	77,677	70,363	148,040
Chief Executive	73,870	48,370	122,240	73,870	48,370	122,240	71,624	46,900	118,525
Chief Executive Income	(21,000)	(4,500)	(25,500)	(21,000)	(4,500)	(25,500)	(22,106)	(8,159)	(30,264)
Chief Executive Total	**841,835**	**694,432**	**1,536,267**	**841,835**	**694,432**	**1,536,267**	**803,959**	**658,479**	**1,462,437**

Table 5
Projects and Corporate Items

Expenditure Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Expenditure General £	Actual Expenditure Navigation £	Actual Expenditure Consolidated £
Heritage Lottery Fund	0	0	0	0	0	0	179,876	0	179,876
CANAPE	38,494	38,494	76,987	38,494	38,494	76,987	(38,648)	(38,648)	(77,297)
Pension Lump Sum Payments	72,000	48,000	120,000	72,000	48,000	120,000	72,000	48,000	120,000
Apprenticeship Levy	2,100	1,400	3,500	2,100	1,400	3,500	2,069	1,379	3,448
WRE	0	0	0	0	0	0	7,500	0	7,500
Projects and Corporate Items Total	**112,594**	**87,894**	**200,487**	**112,594**	**87,894**	**200,487**	**222,797**	**10,731**	**233,528**

Table 6
Contributions from reserves

Expenditure Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Expenditure General £	Actual Expenditure Navigation £	Actual Expenditure Consolidated £
Property	0	2,000	2,000	0	2,000	2,000	0	2,000	2,000
Plant, Vessels & Equipment	(76,775)	(110,225)	(187,000)	(76,775)	(110,225)	(187,000)	(25,783)	(80,553)	(106,336)
Premises	(13,500)	(31,500)	(45,000)	(13,500)	(31,500)	(45,000)	(34,953)	(686)	(35,639)
Planning Delivery Grant	(34,220)	0	(34,220)	(34,220)	0	(34,220)	(4,159)	0	(4,159)
Section 106 Agreements	0	0	0	0	0	0	(10,008)	0	(10,008)
Heritage Lottery Fund	0	0	0	0	0	0	(79,876)	0	(79,876)
Upper Thurne	(8,000)	0	(8,000)	(8,000)	0	(8,000)	(3,597)	0	(3,597)
Catchment Partnership	(83,440)	0	(83,440)	(83,440)	0	(83,440)	(33,934)	0	(33,934)
CANAPE	(8,494)	(8,494)	(16,987)	(8,494)	(8,494)	(16,987)	38,648	38,648	77,297

Expenditure Type	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Expenditure General £	Actual Expenditure Navigation £	Actual Expenditure Consolidated £
Computer Software	0	0	0	0	0	0	(628)	(309)	(937)
UK National Park Communications Team	0	0	0	0	0	0	19,254	0	19,254
Contributions from reserves Total	**(111,835)**	**(60,325)**	**(172,160)**	**(111,835)**	**(60,325)**	**(172,160)**	**87,759**	**(30,169)**	**57,589**

Table 7
Net (Surplus)/Deficit

(Surplus)/Deficit	Original Budget General £	Original Budget Navigation £	Original Budget Consolidated £	Latest Available Budget General £	Latest Available Budget Navigation £	Latest Available Budget Consolidated £	Actual Surplus General £	Actual Surplus Navigation £	Actual Surplus Consolidated £
Grand Total	**32,040**	**121,478**	**153,518**	**55,530**	**209,969**	**265,499**	**(54,053)**	**(128,515)**	**(182,569)**

Navigation Committee

10 June 2021
Agenda item number 13

Construction, Maintenance and Ecology work programme- progress update

Report by Head of Construction, Maintenance and Ecology

Purpose

To give an update on the Broads Authority's management activities to maintain the public navigation, develop mooring facilities for public use and demonstrate the effective use of available resources.

Broads Plan context

Construction, Maintenance and Ecology (CME) activities contribute to multiple objectives, in particular to Aspirations 3, 4 and 6 to manage sediment sustainably, maintain a safe open navigation, and maintain the access network and visitor facilities.

Contents

1. Maintaining water depths for navigation

1.1. The detailed breakdown in Appendix 1 gives the total volumes for the annual dredging programme for the whole of 2020/21 to the end of March 2021. A total of 43,990 m^3 of

dredged sediment was removed from the prioritised sites. This figure represents 106% of the programmed target of 41,400m³ for 2020/21.

1.2. The final work of the 2021/2022 dredging reporting year was completing the dredging on the River Thurne near Martham Ferry. The sediment dredged was all brought back to Chara Bay in Hickling Broad and was used to fill the reedbed created as part of the CANAPE project. As per the project plan, the end point of work in the Upper Thurne was in response to the seasonal increase in water temperature. To protect against the risk of harmful algal blooms the dredging and reedbed creation work was only able to occur when water temperatures were below 8 °C, so works stopped once this was exceeded.

1.3. From the dredge projects listed in Appendix 1, the actual cost of all the work for the year was lower than the planned figure. In terms of the revenue budget allocated for expenditure, for dredging this had a forecast outturn of £94,980 with actual project expenditure coming to £78,680. This represented an underspend of £16,960. The majority of this was for work not completed or needing to be completed in the 20/21 financial year due to methodology changes, such as less contractor costs for water vole mitigation at Peto's Marsh, less requirement for equipment hire and fewer contract lifts of large equipment. The actual costs for staff and Authority plant and vessels are as accurate as we can record from staff and equipment usage timesheets. It is the predicted costs generated prior to the start of the financial year where the largest source of variation occurs. The over achievement of the planned dredge volume target indicates that the work was done efficiently and within budget.

1.4. April 2021 saw the demobilisation from the winter dredge projects and mobilisation to the two dredging projects on the southern rivers. In May, dredging started at Beccles and Oulton Broad respectively. On the Waveney, the dredging has started at Beccles with a small amount to be removed near the town. The main volume to be removed is focussed around the upper part of the navigation towards Geldeston. In Oulton Broad, the dredging is initially focussed on the approach toward Mutford Lock, then if time allows moving towards the southern basin.

2. Maintaining safe public mooring facilities

2.1. Replacement of the timbers at St Benets 24 hour mooring is underway with contractors. In addition to new capping and waling timbers, the level of the capping and the mooring path is being raised so that overtopping by water during higher tides is less frequent. As sections are being completed by the contractor, they are being opened for public use to minimise disruption on this very busy mooring.

2.2. The project planning and site investigations at Commissioners Cut 24 hour mooring has begun. Soil cores, investigations of the tie rods and anchoring, and land registration of the area to the west of the mooring are all under way. Once the preliminary tasks by the Ecology & Design Team are completed, a design for a wider mooring cut with new

sheet piling is due by the end of June 2021. Tendering and delivery of the construction work is intended for autumn/early winter 2021.

3. Our resources

3.1. A new, 20 tonne, 12 metre long reach JCB excavator was delivered in mid-April. This replaces a long reach excavator that was purchased in 2010. The new machine shall be largely used for dredging work.

3.2. Appendix 2 gives an indication of the proportions of Operations Technicians time spend on the different navigation work types over the past five years. The main summary is that most work types have a fairly consistent level of annual effort over this period. The one noticeable variation to the general pattern was in 2017/18 when a greater proportion of time was spent on “other navigation works”. In that year, there was a project to remove the channel markers from along the River Chet and there were several wrecks raised. All of this work was carried out by the Construction Team, using staff time and equipment that would otherwise have been spent on dredging work.

3.3. Appendix 3 gives the planned proportion of Operations Technicians time to be spend on the different navigation work types over the next year (2021/22). This set of figures is the baseline with which reporting can be compared at the end of this financial year.

4. Managing water plants

4.1. The first round of water plant cutting for the 2021 season has been completed in the northern rivers, with cutting having happened on the Upper Thurne (Martham to Somerton) and River Bure (Belaugh to Coltishall Lock) and the River Ant (Wayford to Dilham Staithe).

4.2. On the River Ant, operations staff have been removing invasive floating pennywort, which poses a serious risk to navigation if it is allowed to grow unchecked. New patches have been found during May along Tyler’s Cut. The Authority continues to work in partnership with the Environment Agency, Internal Drainage Board and the Norfolk Non-Native Species Initiative to track, plan, remove and ultimately eradicate this species from the whole of the River Ant.

5. Other navigation works

5.1. The revised timetable for the consultation on the Waterways Management Strategy & Action Plan is as follows:

- 15 July – internal consultation on final draft – Operations Group meeting
- 26 August – Navigation Committee papers – members provided with link to draft document for comment
- 2 September – Navigation Committee – presentation, discussion and recommendations

5.2. In the previous Navigation Committee meeting the results of the revision of the Mean Low Water modelling surface was presented with respect to the impact on total sediment volume identified for dredging. To provide some more detail on the reporting boundaries for sediment volume calculations, within the rivers and broads, the following "rule of thumb" have been followed. These general principles follow closely those adopted within the Sediment Management Strategy (2007) Sediment mgt strategy nov 06 (broads-authority.gov.uk). Following improvements in the GIS mapping and the hydrographic survey data resolution, greater accuracy and repeatability can be applied to the methodology for calculating the volume required for dredging. Given the Waterways Management Strategy aims to incorporate all of the management activities required to meet Broads Plan objectives for the waterways, some of these principles also apply to water plant management, as indicated in the examples below:

- 20 m non-intervention margin around the edges of broads.
- For river channels at least two thirds (66%) of the total bank to bank width, is aimed to be within the stated Waterways Specification depth for that stretch.
- For river channels, there will be a non-intervention margin where no dredging or water plant cutting takes place. The untouched strip aims to maintain valuable habitat that supports the unique wetland ecology of the Broads. The width of this margin varies according to total channel width. The exceptions are very narrow dykes and channels where it would be impractical to leave any of the width unmanaged.
- Where there are existing publicly accessible moorings within the public navigation, when required, any dredging and water plant cutting shall be up to these moorings.
- Where a channel is defined by marker posts, the Waterways Specification depth for dredging and water plant cutting shall be maintained for the channel width up to the marker posts.
- Waterways Specification depth is only that which can be achieved by maintenance dredging of recently accumulated sediments. If the natural substrate of the river or broad bed is reached during dredging works, for example previously undisturbed gravels or peat, then these areas are to be left and the appropriate navigation information given (see the Water depths and Navigation notes section of the Authority's website Water depths and navigation notes (broads-authority.gov.uk)). Excavation of undisturbed bed sediments is beyond the scope of the Broads Authority's permitted activity and routine operation. Such dredging activity would be deemed as capital dredging, as defined by the OSPAR Convention rules (The Convention for the Protection of the Marine Environment of the North-East Atlantic) administered by the Marine Management Organisation through its Marine Licensing procedures.

Author: Dan Hoare

Date of report: 24 May 2021

Background papers: Sediment Management Strategy 2007 Water conservation reports (broads-authority.gov.uk)

Broads Plan strategic actions: 2.1; 2.3; 3.1; 3.2; 4.2; 6.1

Appendix 1 – Annual dredging figures 2020-21

Appendix 2 – Percentage of operational staff time spent on navigation work types

Appendix 3 – Planned staff allocation for navigation work types in 2021/22

Appendix 1 – Annual dredging figures 2020-21

Project title	**Active Broads Authority dredging weeks** completed/ planned	**Planned volume removed m³**	**Actual volume removed m³**	**Planned annual project cost** [1]	**Actual project cost**
River Bure – COMPLETED South Walsham & Acle to Oby (Apr-May)	6/8	2,000	4,605	40,703	36,860
River Waveney – COMPLETED Oulton Broad to Peto's Marsh (May-Sept)	13/20	8,500	7,655	110,104	89,340
River Yare – COMPLETED Prioritised shoals between Trowse & Cantley (Jun-Sept)	16/15	6,400	8,570	114,507	95,960
River Thurne – COMPLETED River Thurne sites & Catfield Dyke to Chara Bay (Oct-Mar)	25/19	8,000	11,920	150,664	118,860
River Yare – COMPLETED Haddiscoe Cut to Raveningham (Nov-Dec)	10/20	8,500	8,240	106,990	63,270
River Thurne, Waxham Cut – COMPLETED Sidecast (Jan-Feb)	6/7	6,000	3,000	26,862	14,640
Lower Bure – COMPLETED	Contractor	2,000	1,000	10,000	5,250

1 project costs include staff time for all elements (pre-works ecological mitigation, site set-up, active dredging & site restoration); BA plant; & budgetary expenditure (equipment hire, survey costs, contractor costs, mitigation works, materials & consumables etc); within the reporting period.

Project title	**Active Broads Authority dredging weeks** completed/ planned	**Planned volume removed m³**	**Actual volume removed m³**	**Planned annual project cost** [1]	**Actual project cost**
Plough dredge (Mar)					
Site restoration – COMPLETED Waxham Cut (Phase 1), Tyler's Cut	-	-	-	12,000	16,720
Site preparation – COMPLETED Peto's Marsh, Carlton Marshes	-	-	-	16,000	19,850
Total	**76/89**	**41,400**	**44,990**	**587,830**	**442,910**

Appendix 2 – Percentage of operational staff time spent on navigation work types

Navigation work type	2016/17	2017/18	2018/19	2019/20	2020/21
Dredging	62.6	56.1	63.0	64.6	68.0
Mooring maintenance & repairs	19.2	20.9	19.3	18.3	16.5
Riverside tree management	4.3	3.4	8.1	4.9	3.9
Aquatic plant cutting	4.6	5.8	5.1	5.8	6.5
Other navigation works	9.3	13.9	4.5	6.3	5.1

Appendix 3 – Planned staff allocation for navigation work types in 2021/22

Navigation work type	Staff days planned	% of total
Dredging	1843	60.5
Mooring maintenance & repairs	626	20.6
Riverside tree management	180	5.9
Aquatic plant cutting	230	7.6
Other navigation works	165	5.4
Total in plan (2021/22)	**3044**	