

## **Policy Group – 31 January 2018**

### **Northbrook Road pedestrian bridge, Swanage – proposal for replacement**

#### **1. Purpose of report**

To consider a proposal for the replacement of the pedestrian bridge adjacent to Northbrook Road, Swanage (a location plan is attached as **Appendix 1**).

#### **2. Key issues**

- 2.1 Purbeck District Council owns a pedestrian footbridge in Swanage which is now unsafe. The Council has three options: to remove the bridge, to repair the bridge or to replace it.
- 2.2 Swanage Town Council is keen for a replacement bridge to be provided because it is regularly used by local people. The Environment Agency is also keen to have a bridge on this site for operational management purposes. Both organisations are willing to contribute to the cost of a replacement bridge.
- 2.3 The approximate cost to remove the bridge would be £5,500. The approximate cost to repair the bridge would be £11,000. Replacing the bridge with one with low maintenance materials would cost approximately £24,300.
- 2.4 Although the bridge is potentially repairable, a repaired bridge would have a short life expectancy and would need to be regularly monitored.

#### **3. Recommendation**

A report be submitted to Council recommending that:

- (1) subject to partnership funding support from the Environment Agency and Swanage Town Council, the bridge be replaced;
- (2) a supplementary capital estimate be approved of £24,300, £16,000 of which will be met by partners and the remaining £8,300 to be financed from capital resources.

#### **4. Policy Issues**

##### **4.1 How does this affect the environment, social issues and the local economy?**

Providing a bridge in this location is an important piece of local infrastructure to Swanage residents. Working in partnership with other agencies also supports the Council's objective of being an efficient and effective council.

##### **4.2 Resource implications**

**Appendix 2** contains an approximate cost of the replacement bridge. Since the Engineer produced the report, quotes have been requested and the cost is likely to be slightly higher than the anticipated £24,000. With commitments from Swanage Town Council and the

Environment Agency totalling £16,000, officers recommend this Council sets aside £8,300 for its contribution to ensure delivery of the bridge.

## 5. Further information

- 5.1 The Northbrook Road pedestrian footbridge was acquired by Purbeck District Council in 2009 in order to implement the Swanage Flood alleviation scheme at the time. Earlier this year Swanage Town Council notified Purbeck District Council that the bridge had become a dangerous structure, due to lack of any maintenance for a considerable period of time. Purbeck District Council's Building Control Manager inspected the site, agreed that the structure was dangerous and required the bridge to be closed. Access has been prevented through the erection of Heras fencing. The other nearby footbridge indicated on the plan at Appendix 1 is solely for Environment Agency purposes. There is no public access over this bridge which has padlocked gates.
- 5.2 The pedestrian bridge has been used for many years as a short cut from the town centre to King Georges Field via Court Hill and Northbrook Road and is popular with dog walkers. The route which follows the southern edge of Swanage cemetery is not a definitive right of Way and for legal reasons it is understood that a right of way has not been created by historic use. It is therefore open to the Council to arrange for the removal of the bridge.
- 5.3 Swanage Town Council owns the adjoining cemetery and King George's Field and has expressed concern that the closure of the bridge has led to a new path being created through the cemetery, on a broadly north south alignment linking to the car park adjoining King George V field. This has led to some dog fouling and has disturbed the tranquillity of the cemetery. Swanage Town Council would like to see the bridge repaired and retained.
- 5.4 A Structural Engineer employed by Poole Borough Council has inspected the bridge on behalf of Purbeck District Council (through a service level agreement arrangement). He has concluded that whilst potentially repairable, the bridge would have a short life expectancy and would need to be regularly monitored for health and safety reasons and regularly maintained. His advice, should it be desired to retain a bridge in this location, is that it should be replaced using low maintenance materials such as glass reinforced plastic (GRP) and retaining the existing bridge abutments including the non Disability Discrimination Act (DDA) compliant concrete ramp. The Engineer's report is attached as Appendix 2. An approximate budget for the various options is set out in Appendix 2.
- 5.5 An added issue is that the failed bridge (see photos at **Appendix 3**) supports a power cable which operates upstream Environment Agency sluices and downstream monitoring equipment. The Environment Agency would like to see a bridge in this location principally so that this cable can be retained.
- 5.6 A meeting was held on site with the Environment Agency and our Poole Borough Council advisory colleagues on 28 November 2017. It was agreed that, if it was decided to retain a bridge in this location, then the Environment Agency would be prepared to contribute towards the estimated cost, along with Purbeck District Council and the Town Council who stand to gain most from the arrangement. The Town Council has agreed to fund up to £8,000 of a replacement structure and cover 50% of the cost of future maintenance with this Council. A flood risk activity permit will be required from the Environment Agency before work starts. In view of the potential partnership work on the replacement structure, the Environment Agency would lead on securing a permit for the development.

- 5.7 The replacement of the footbridge would clearly fulfil a valuable community function in safeguarding the quality of the adjoining cemetery and reinstating a safe but non DDA compliant footbridge. Officers are therefore recommending replacing the bridge.
- 5.8 It is understood that planning permission will not be required due to local authority permitted development rights.

## **Appendices:**

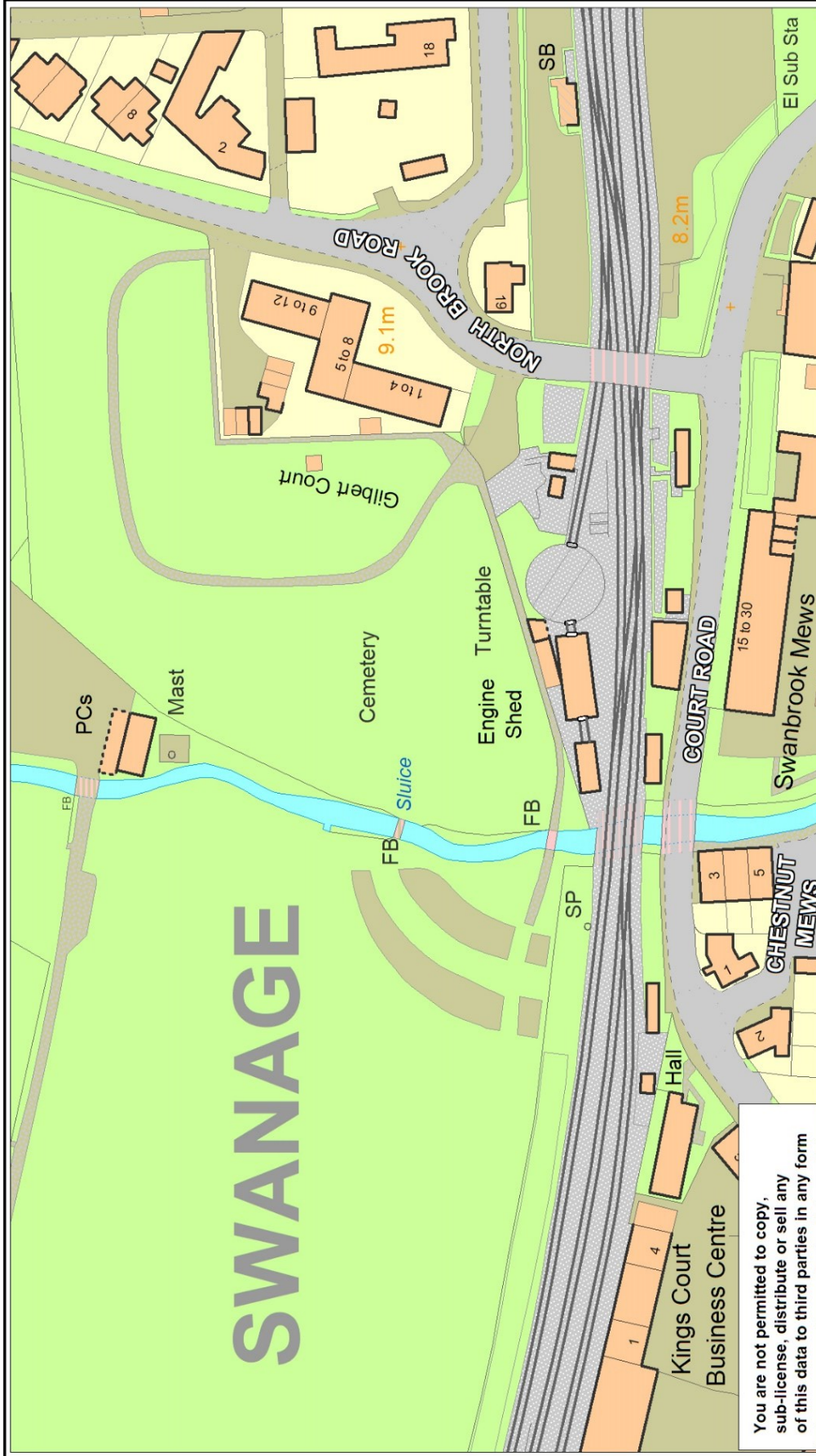
- 1 - Location plan**
- 2 - Engineer's report**
- 3 - Photographs of bridge**

Background papers:

There are none.

For further information contact:-

Richard Wilson, Environmental Design Manager



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**Purbeck District Council**  
 Thriving communities in balance  
 with the natural environment

**Northbrook Road Bridge,  
 Swanage**

For Identification Purposes Only

	<b>TRANSPORTATION SERVICES</b>		Inspector: A A PARFETT	
	<b>HIGHWAY STRUCTURE INSPECTION REPORT</b>		Date: 12/09/2017	
Bridge Name: KING GEORGES FOOTBRIDGE NORTHBROOK CEMETARY SWANAGE		Bridge Ref: 000	Road Ref: NOT APPLICABLE	
Inspection Type: PRINCIPAL	Next Inspection: GENERAL (12/09/2019)	Map Ref: SZ	O.S.E: 402592	O.S.N: 078930

**DEFECT IDENTIFICATION AND DESCRIPTION**

The following report sheet format and the structural elements defect identification system is in accordance with the Highways Agency approved documents:-  
 Inspection Manual for Highway Structures 2007 Vol 1: Reference Manual  
 ISBN 978 011 55297 5 and  
 Inspection Manual for Highway Structures 2007 Vol 2: Inspectors Handbook  
 ISBN 978 011 552798 2

**Element Defect Identification Key**

<b>S - Severity</b>	<b>Comments</b>
1	Sound no visible Element defect
2	Minor Element defect
3	Moderate Element defect may affect other Elements
4	Major Element defect affecting other Elements
5	Failure/collapse dangerous Element defect affecting other Elements
N/A	Not Applicable

<b>Ex - Extent</b>	<b>Comments</b>
A	No significant defect
B	Slight, not more than 5% of surface area/length/number affected
C	Moderate, 5% - 20% of surface area/length/number affected
D	Wide, 20% - 50% of surface area/length/number affected
E	Extensive, more than 50% of surface area/length/number affected
N/A	Not Applicable

<b>W - Work</b>	<b>Description</b>
A	Additional (new items to be provided, eg waterproofing)
B	Present but not inspected
C	Change (eg replacement of a defective bearing or parapet)
N	No action at present; monitor only
NW	No work required
P	Paint
R	Repair/renew/maintain existing

<b>P - Priority</b>	<b>Description</b>
U	Urgent; work should be done immediately
H	High; work should be done during the next financial year to ensure the safety of the public or safeguard structural integrity or avoid a high cost penalty
M	Medium; work should be done during the next financial year; postponement carries some cost penalty
L	Low; work should be done within the next two financial years
NP	No Priority; no work required

 <b>TRANSPORTATION SERVICES</b>		Inspector: A A PARFETT						
<b>HIGHWAY STRUCTURE INSPECTION REPORT</b>						Form 1 of 1	Date: 12/09/2017	
<b>Bridge Name:</b> KING GEORGES FOOTBRIDGE NORTHBROOK CEMETARY SWANAGE				<b>Bridge Ref:</b> 000		<b>Road Ref:</b> NOT APPLICABLE		
<b>Description:</b> ARCH 1 - SOUTH EMBANKMENT			<b>Span</b> 1 of 1		<b>Square Span:</b> 4.57m		<b>Span Width:</b> 1.07m	
<b>Inspection Type:</b> PRINCIPAL		<b>Next Inspection:</b> GENERAL (12/09/2019)			<b>Map Ref:</b> SZ		<b>O.S.E:</b> 402592	<b>O.S.N:</b> 078930
Set	No.	Element Description	S	Ex	W	P	Comments/Remarks	
Deck Elements	01	Primary Deck Element	3	E	R	U	Single 380 x 150mm Steel I Section Beam Span. Extensive surface corrosion. Majority of painted surface flaking and debonding with previous paint layers. Some section loss on edges of flanges. Significant corrosion where transverse I section beams are welded to the top of the main beam.	
	02	Secondary Deck Element	5	E	R	U	5 No. 100 x 75mm Steel I Section Transverse Beams. Webs of the two beams at the quarter spans have corroded away and majority of the flanges also missing. These beams are no longer supporting the timber deck or providing support for posts of the parapet handrails. Remaining beams severely corroded with significant section loss, particularly at welded connection bearing on the single beam span.	
	03	Secondary Deck Element	3	C	R	H	3No. 100 x 50mm Longitudinal Timber Purlins supporting 24 No. 1.070m long x 220 x 32mm Timber Deck Planks. Purlins and planks in early stages of decay with some areas of rot in surface and ends of deck planks. Algae and fungal growth covering underside of timbers.	
Load-Bearing Substructure	04	Foundations	2	A	B	NP	Little or no evidence of structural movement in the concrete abutments construction indicate any foundation defect.	
	05	East Abutment	3	D	R	H	Mass Insitu Concrete Bank Seat faced with coursed random cut dry stone wall, which forms part of a training wall to watercourse. The I section main beam passes through the stonework and is encapsulated into the concrete behind. Top of the stone work either side of bridge has fallen away causing retained material to spill over the wall.	
	06	West Abutment	2	B	R	H	Mass Insitu Concrete Abutment incorporating a mass concrete approach ramp behind. The I section main beam is encapsulated in to the concrete. All concrete surfaces have an exposed aggregate open textured finish indicating poor compaction and or the concrete was too dry when poured. A sloping 75 x 75mm steel I beam is exposed in the elevation faces of the concrete ramp. The beams are connected to a transverse I beam also encapsulated in the concrete behind the watercourse abutment face. It is probable the concrete is a more recent construction with the original abutment and steel framed approach ramp buried beneath.	
Safety Elements	07	Handrail/Parapets	5	E	R	U	42.4mm Dia. Key Clamp galvanised tubular post and rail handrails with square mesh infill panels. Handrails are in good condition, but post baseplates are secured to the severely corroded/missing transverse beams. Some of the rail/post joints have pulled apart due to flexing of the unsupported bridge deck. In addition the handrail height is below the minimum 1.0m high design standard and preferred 1.15m height for footbridges.	
	08	Footway Surface	5	E	R	U	Timber Decking slippery when wet with no anti-slip surface finish.	
Other Elements	09	Invert	1	A	NW	NP	Natural Bed Invert. 100-150mm of silt/mud overlying a granular bed material. No evidence of scour around west concrete abutment.	
	10	Approach Embankments/ Training Walls	3	C	R	M	Vegetation overgrowth and ivy root infestation of east abutment and training wall stonework. Some vegetation overgrowth around downstream face of west abutment concrete ramp, including a maple tree sapling becoming established.	
	11	Cable Duct Tray	3	D	R	M	Galvanised Steel Tray secured to both abutments and web of down stream main beam span elevation. Ivy root infestation of duct becoming well established. Some minor surface corrosion Duct cover plate missing on west abutment exposing the power cables.	

**GROWTH AND INFRASTRUCTURE**

**September 2017**

**KING GEORGES FOOTBRIDGE – NORTHBROOK CEMETARY SWANAGE  
INSPECTION SUMMARY & RECOMMENDATIONS**

**Bridge Deck**

Although the main I beam span is in reasonable salvageable condition the transverse I beams are completely degraded or in the advanced stages. In addition the timber purlins and deck planks are beyond a serviceable condition. Despite the bridge being barriered off there is evidence it is still being accessed by the public. Consideration should be given to removing the bridge deck as soon as possible to prevent any further usage. Thus mitigating the risk of collapse from the continued public access.

Retaining the main beam and constructing a new similar bridge deck using the existing abutments is an option. However there are constraints to consider which may make this uneconomically viable. The primary issue is the demolition/removal of the existing deck and cleaning, surface preparation and re painting of the main beam. To carry out this operation insitu will require extensive encapsulation temporary works to prevent any pollution of the watercourse and surrounding site. Due to the ecologically sensitive location any works would require approval and licences from various environmental bodies, the EA in particular.

To remove the beam off site to carry out the surface preparation and painting would require similar encapsulation and approvals to be obtained, given the additional requirement for some localised demolition of the abutments. The new bridge deck could then be either built on the refurbished beam and lifted in as a whole or constructed on the beam insitu once installed.

Due to the minor construction and span of the bridge, combined with the inconvenience of trying to re use the single main beam it is recommended the whole bridge span should be replaced with a new alternative design, whilst retaining the existing abutments as much as possible.

The least expensive replacement would be a similar steel beam and timber deck design. Clearly the existing structure has been neglected and therefore without a regular inspection and maintenance regime the life expectancy the replacement would be greatly reduced.

If it is accepted that the new structure would also not be benefiting from a routine maintenance programme then consideration should be given to a design using low maintenance materials such as GRP. The initial construction costs would be significantly higher, but the life of the structure will be considerably increased.

**Abutments**

The existing concrete abutments are fit for purpose and could be reused to support a refurbished I beam with a like for like bridge deck. Equally they could be modified to support a new design bridge which would reduce costs and cause minimal environmental disturbance.

## **Handrail/Parapets**

The tubular handrail parapets are in good serviceable condition despite some of the joints working loose from the flexing of the unsupported deck. Unfortunately they do not conform to the required min height of 1.00m or preferred height of 1.15m for pedestrians. This specification would be essential in any replacement bridge.

## **Cable Duct Tray**

Whatever reconstruction option is adopted there will be a requirement to temporarily take down, protect, reinstate or divert the power cables in the cable tray attached to the bridge. It is believed they supply the sluice gates located up stream from the bridge, and are the responsibility of the Environment Agency.

## **Proposed Works**

For budget requirement purposes see table below. Works detailed include for the additional costs for the environmental protection measures required. These estimates do not include for the administration, site supervision and any fees for licences or approvals.

<b>Works Recommended</b>	<b>Est Cost</b>
Demolish and remove existing bridge deck as soon as possible to prevent further public access.	£5,500
Demolish and remove existing bridge deck. Refurbish existing I beam either insitu or off site. Fabricate/Install/construct new like for like bridge deck with parapet modification on refurbished I beam.	£11,000
Demolish and remove existing bridge deck including I beam. Fabricate/Install/construct new GRP bridge deck with parapets and abutment modification. <i>(updated 17/01/18 based on quotes for replacement structure and estimate of construction costs)</i>	£24,000



**Photographs**

**1. Upstream Elevation**



**2. Downstream Elevation**



3. East Abutment



4. East Abutment



5. West Abutment



6. West Abutment



7. Deck View East



8. Deck View West



9. Corroded Traverse Beam



10. Corroded Traverse Beam





11. Corroded Traverse Beam



12. Corroded Traverse Beam



13. West Approach Ramp



14. West Approach Ramp

