

Bulford Bridge Briefing Note.

The Existing Structure

Bulford Bridge carries the A3028 over the River Avon between the communities of Bulford and Durrington. The present bridge dates from circa 1913 although it was subsequently widened with the addition of a cantilevered footway in the 1950's. There is a main span of about 12metres wide and a smaller side culvert of about 1.5m wide some 10 metres or so to the east. A recent assessment of the bridge has confirmed that it is structurally substandard and generally in a poor state of repair.



The bridge forms a strategic part of the county road network and is on occasions used as a diversion route when the east bound lane of the close by A303 trunk road becomes blocked. Due to this, imposing a weight restriction on the bridge is not an option. The bridge was built in the pioneering days of reinforced concrete construction and some of the detailing and methods of construction have resulted in a structure that has proved impossible to maintain in good condition. An initial feasibility study has been commissioned which confirms that the bridge would not be viable to repair and recommends full replacement.

Constraints

The main structural elements of the existing bridge comprise two large riveted plate girders "I" beams enclosed in concrete, which sit parallel to the road spanning from abutment to abutment across the river. The southern enclosed "I" beam sits beneath the baluster parapet, whilst the northern beam sits just under the northern kerb line.

The roadway is supported on smaller steel joints (smaller "I" beams) which span between the bottom flanges of the larger "I" beams. These smaller transverse or cross beams are also encased in a concrete slab.

This arrangement renders it very difficult to keep traffic running on half of the existing bridge whilst the other half is demolished. Such an arrangement would require extensive propping beneath the bridge (which would almost certainly be unacceptable to the Environment Agency) or fabricating a support system and "hanging" the deck edge from a beam above road level.

The River Avon which flows beneath the bridge is a Special Site of Scientific Interest and a Special Area of Conservation, this designation ensures that great care must be taken working in and close to the water. The Environment Agency has also specified that due to the salmon/trout spawning period work can only take place in the river between May and October.

The Environment Agency are also very sensitive about the possibility of flooding and the need to maintain as much waterway through the construction site as possible, this reduces the amount of temporary works that can be placed in the river and ensures that the work has to be carried out as a number of discreet phases.

In common with many bridges there is a concentration of public utility services crossing the river via Bulford Bridge. These can not be disconnected for the duration of the work without interrupting local service supplies and must be diverted either temporarily or permanently to enable the new bridge to be built.

Two further issues that affect the scheme are that the road is on an embankment on the approaches to the bridge making it very difficult to provide an adjacent parallel off line diversion and the bridge lies within the conservation area of Bulford.

Replacement proposals

A scheme has previously been prepared with a view to starting on site in May 2009 - this year (option 1). The Council's term consultants as part of the feasibility study looked at several options prior to working on the final design. They carefully considered the restraints that the current bridge and site location imposed and prepared a scheme which was the most efficient, effective and economic. The term consultant's chosen method minimised the chance of pollution and minimised the volume of excavated material that need transporting to land fill, in line with the Council's goal of waste minimisation. Unfortunately due to the site topography the only way that the scheme could be built would have required at least a seven and a half month closure of the road over the bridge which the Parish Councils and the local business communities considered to be unacceptable. In February, Mark

Baker, the then sitting County Council Member, requested that the scheme should be postponed for a year so that further options could be considered to reduce the length of time the road needed to be closed even if the revised solution resulted in an increase in construction cost. The initial estimate for this original solution was projected to be in the region of £800,000, this being the figure given to the Parish Councils, subsequent detailed pricing has now indicated that £1.02M is a more accurate figure.

The Council's term consultant has now looked at two alternative schemes which will allow the road to remain open for the majority of the time (Options 2 & 3). The only way the road could be kept fully open would be to construct a temporary road and bridge alongside, and a few metres away, from the existing bridge; the costs and environmental impact of such a proposal renders it unacceptable even if landowner consent could be obtained.

Option 2

This essentially delivers the same scheme as option 1, but the works are phased differently to try and keep the traffic flowing through the site for as much of the time as possible. Due to the EA restrictions the works will have to be spread over two summers, working for seven months in year one and six months in year two. Initial thoughts are that the road would however have to be closed for 67 days spread throughout the construction period, the remainder of the time would see the route limited to vehicles of 3 tonnes or less and narrower than 6'6". Cost would be £1.34M some £320,000 more than option 1

Option 3

This is a major departure from the originally planned scheme; it involves replacing the existing cantilevered footway with a 3m wide concrete footbridge which will then be temporarily used for light cars whilst the main bridge is reconstructed. Again these works would have to be spread over two years with similar time scales although the periods of road closure will be reduced to possibly 35 days overall. The disadvantage of this scheme is that additional land will be required, the final finished product will be less of a cohesive structure and the wide pavement may be visually unacceptable. The cost of this option is £1.26M some £240,000 more than option 1.

These three options are briefly compared in Appendix A

Parish Concerns

The main concern from the Parish Council and local businesses is the signed diversion route planned for the scheme. As the road across the bridge is an “A” road, the Council’s policy is that “A” roads have to be used for the signed diversion, so there is only one acceptable alternative route. This alternative route uses a section of the A303 trunk road local to Countess Roundabout.



Bridge location shown in red,
diversion route shown in blue

Unfortunately during the summer months the west bound lane of the dual carriageway leading into Countess Roundabout often becomes grid locked on Friday afternoon/evenings and on Saturday mornings, which in turn often clogs up the roundabout itself. Understandably such perceived difficulty with the signed diversion route was always going to be a concern to local residents and businesses alike. However, when the replacement bridge is constructed the temporary diversion will be needed at sometime. The Council’s term consultants have been in contact with the Highway Agency’s consultant who manages the A303. They will monitor the traffic at the roundabout, and attempt to ensure that the traffic remains free flowing at all times.

Recommended Option

Option one has the least cost and is therefore the recommended option. It is also the option with the lowest environmental impact, both through materials and waste minimisation and reduced disturbance to the watercourse. However, in view of the previously expressed local concern it is important that the Amesbury Area Board should be part of the decision making process to ensure that the delivery of this project focuses on the local customer needs. The next full Amesbury Area Board meeting is scheduled for the 8th September, it may therefore be necessary to convene a meeting of the Area Board members in advance of this date.

Appendix A

Table of Options

Option	Brief Outline of Construction	Cost	Overall Duration	Closure Duration	Disadvantages	Advantages
1- Originally designed scheme	Reinforced concrete deck supported by steel sheet piled wingwalls	£1.02M	10 Months	7.5 Months [225 days]	Prolonged Road Closure	Cheapest, Least risk to environment and waste is minimised Shortest Overall Duration, Most homogeneous finished product
2. As above but programmed to minimise road closures	As Above	£1.34M	7 Months year one 6 months year two	21 days in year one 46 days in year two	Scheme extends over two years, with a number of road closures each year [road opens and closes through the scheme possibly leading to local frustration and confusion] 3 tonne weight limit. Temporary diverted water main requires lagging through the winter.	Road remains open for majority of time, again least risk to environment
3, Independent Footbridge	Reinforced concrete footbridge built alongside existing bridge, used as temporary vehicular bridge whilst reconstruction of main bridge in progress	£1.26M	7 Months year one 6 months year two	30 days in year one, 5 in year two	Scheme extends over two years, , with a number of road closures each year [road opens and closes through the scheme possibly leading to local frustration and confusion] 3 tonne weight limit for majority of time Requires additional land take. Wide footway may appear unattractive, Water main will require lagging through the winter.	Minimum road closures require, possible cost savings with Utility diversions