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Saltford Environment Group

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20th October 2019

Stabilisation of Mead Lane riverbank in 2005 and the implications for moorings

On 18th October a member of Saltford Environment Group drew to my attention some key B&NES Council documents including design and environmental reports for the 2005 stabilisation of the riverbank at Mead Lane. These had only come to light the previous day (17th October) from papers that had been recently supplied by the widow of a former Mead Lane resident. These show that the riverbank stabilisation work at Mead Lane was not designed to accept moorings due to the design characteristics of the chosen scheme, constructed at what must have been considerable but necessary public expense in September 2005.

In summary, this statement in a letter dated 8th August 2005 titled "Mead Lane Stabilisation Scheme" from the Team Leader of Highways Maintenance at B&NES Council to a resident of Mead Lane says:

"The scheme is not to prevent flooding it is only to protect the highway from becoming dangerous. The aquatic planting is an integral part of the future operation of the scheme in flood times".

The Mead Lane Bank Stabilisation Design Options Report (October 2003) by Halcrow Group Ltd makes it clear that without taking action and implementing the bio-engineering solution chosen (rock armour with vegetation to secure granular and other material on the riverbank immediately behind the rock on the riverbank) the outcome was *"likely to lead to include loss of part of the road within the next 5-10 years."*

The Design Options Report and the associated Environmental Report (February 2004) had been commissioned by B&NES Council from Halcrow. These are lengthy reports which I have summarised in Annex I to this letter. At Annex II can be found an image of Halcrow's General Arrangement for Construction plan (15th January 2004) of the chosen scheme. I have also included in Annex I a photograph of the stabilisation works in progress in September 2005 (sourced from the internet).

The Halcrow reports make no mention of moorings in Mead Lane after the expensive works in September 2005 to rebuild and stabilise the riverbank where the Mead Lane riverbank was being "actively scoured at the toe, causing localised bank failures and threatening the stability of the carriageway" where "tension cracks could clearly be seen". Provision for mooring was not a design criterion. Reference was made of constructing the scheme around slipways and pontoons that were in place before the works but the pontoons were actually two small stages or "fishing bays" as shown in Annex 2 and which are still in place. The sailing club has a slipway and it also has a pontoon for its club members' private use.

The erosion over previous decades had made the Mead Lane riverbank uneven and unsuitable for mooring and local residents including myself will confirm that before the stabilisation works in 2005 and for a few years thereafter, boat moorings were only very rarely seen in Mead Lane and these were short stays, typically overnight stays during recreational use of narrow boats and other craft touring the River Avon.

The stabilisation scheme was designed to prevent erosion of the riverbank to protect the highway. It was not designed for the mooring of heavy boats which will have a negative effect on vegetation that is part of the bio-engineering that stabilises the rock armour etc. The moorings in Mead Lane that have grown significantly in number in recent years and more so as a direct result of the mooring trial; those moorings are an unforeseen consequence of the riverbank stabilisation and improvements. It is reasonable to predict that moorings of heavy boats, often two or even three abreast in peak summer periods, are adversely affecting the integrity of the scheme to protect the highway.

It is inevitable that the use of moorings stakes, for example, and other damage to vegetation and sub soils as well as underwater dislocation or displacement of the rock armour by moored boats, especially during fast river flows when the river is in flood but also when river levels are low, will degrade and greatly reduce the lifespan of the scheme that was designed with a lifespan of 40-50 years according to the Team Leader of Highways Maintenance at B&NES Council (ref. letter to resident, 23 June 2006).

English Nature's recommendation in the Environmental Report to "ensure the mitigation planting develops into riverside habitat" would not fit with any provision for moorings of residential and similar large river craft.

In summary these papers reveal a serious oversight in allowing mooring in Mead Lane after 2005, an activity that was not anticipated or designed into the 2005 riverbank stabilisation scheme. B&NES Council invested a large amount of public funds in 2005 to avoid the dangers arising from a partial loss of the highway in Mead Lane. However the Water Space Study (2017) and the decision by B&NES Council to hold a Mooring Trial (2017-18) overlooked that investment and the reasons behind it; presumably due to staffing changes and incomplete record keeping that lacked continuity for managing this key infrastructure.

We do not know what damage has already occurred to the Mead Lane riverbank stabilisation scheme below the water's surface, and the extent of the reduction in the scheme's lifespan; we know damage to vegetation has been continuous. This will have financial implications for the public purse but the timescale is unknown; autumn and winter flood events are becoming increasingly common and more severe due to climate change. It is incumbent on B&NES Council therefore to implement a mooring ban as soon as possible to mitigate safety risks and to avoid the extreme inconvenience that would follow from the future partial loss of the highway due to erosion from sudden riverbank failure.

Loss of access for Wessex Water, residential properties, businesses including the Jolly Sailor and emergency vehicles would be a very serious matter quite apart from the safety risks associated with carriageway failure. A mooring ban should therefore commence immediately with a winter mooring ban as sought by Saltford Parish Council on 1st October 2019. Mead Lane was within 4cm of flooding as recently as the night of 13/14 October; Environment Agency records show 5 river flood events at Saltford in last 7 years (2013-2019) – see end of Annex 1 for EA graph.

Please can we discuss this as soon as possible? I am sending a copy of this letter and annexes to Mark Goodman at Lemon Gazelle as supplementary evidence from SEG for the Mead Lane consultation. A copy will also be sent to Wessex Water due to the implications for their access road.

Copied to:
B&NES Council:- Cllrs xxxx; xxxx & xxxx. Officers xxxx & xxxx.
Also: Mead Lane NHW co-ordinator; Bristol Avon Sailing Club;
Saltford Parish Council.

PHIL HARDING
Chairman, SEG

See Annex 1 & 2 attached >>

Mead Lane Bank Stabilisation – The Halcrow reports & related information

(a) DESIGN OPTIONS REPORT (October 2003)

The Design Options Report describes (p.1 and p.2) the “**Extent of the Problem**” as follows:-

“Mead lane itself is a public highway providing access not only for local residents but for a Wessex Water sewage treatment works, Bristol Avon Sailing Club and a public house. It is a cul-de-sac but is relatively heavily trafficked at this point.”

“From a plan of the area, it can be seen the reach of the river in question is immediately downstream of a bend. The morphology of the river at this point is largely governed by the increased velocity and secondary spiral; flow patterns created around the outside of the bend, These spiral flows result in increased erosion on the outside of the bend and added deposition sediment on the inside of the bend. This effect can persist for considerable distances downstream.”

“This problem is evident along mead lane riverbank which is being actively scoured at the toe, causing localised bank failures and threatening the stability of the carriageway. Tension cracks can clearly be seen within mead lane road surface as a result of the erosion of the bank.”

The Design Options Report looks at survey results, constraints and 6 options. Option 1 was “Do nothing” and the report states “**This is likely to lead to include loss of part of the road within the next 5-10 years.**”

Three of the other five options were described (p.8 -11) as **Bio-engineering Solutions** and the other two were a steel sheet piled wall (most significant reduction in abundance and diversity of plants and thus habitat for invertebrates, fish and water voles) or a reinforced concrete wall (high cost, loss of Willow trees, possibly cause erosion downstream). Bio-engineering Option 4 was identified as the best and least cost option.

Bio-engineering solutions are described in the report (p. 5) to “combine the advantage of engineering structures with the engineering and environmental benefits of vegetation” and that “vegetation provides numerous mechanical and hydrological properties that are advantageous when considering riverbank solutions. The roots bind the soil particle and permeate the soil, resulting in restraint of soil movement, increased shear resistance, and a network of surface fibres that creates a tensile mat effect, thus restraining the underlying matter.”

Option 4 was described as follows:-

“Rock armour deposited at the toe of the bank providing protection against erosion up to the mean water level. Area behind the rocks to be filled with granular material at a shallow gradient, with a geotextile separation membrane behind the rock face to prevent fines being washed through. Reconstructed riverbank to be seeded and covered with a degradable geotextile matting, pinned into place at regular intervals. Fibre roll, planted with well established vegetation to be fixed on top of rock armour at the mean water level.”

Option 4 was chosen as (p.19) it “provides the best solution when considering not only the structural stability of the carriageway but also the added environmental benefits” whilst the “simplistic construction method would mean a reduced construction period effectively reducing costs and disturbance to local residents and businesses”.

Comment: Option 4 may have been the least cost option but nevertheless it was obviously an expensive programme of infrastructure work to protect the carriageway; the photograph below shows the work in progress in September 2005.

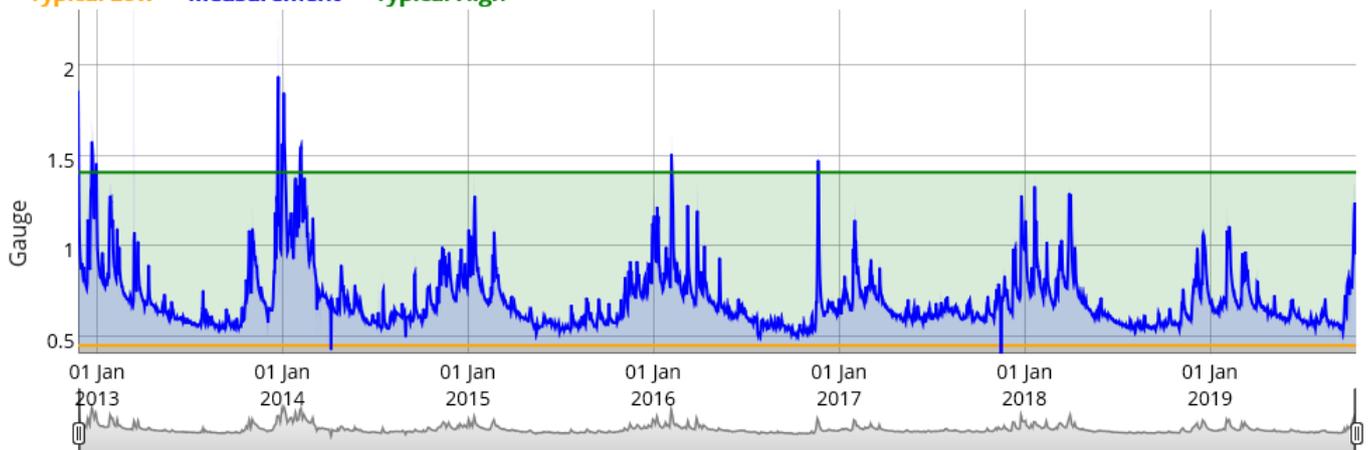


Long term river flooding at Saltford: January 2013 to October 2019 data.

Source: Environment Agency (<https://riverlevels.uk/river-avon-saltford#.XawWZTFYbDc> October 2019)

Long Term

— Typical Low — Measurement — Typical High



Darker blue shaded areas on long term data indicate maximum and minimum levels for the date (you may need to zoom in closer to see them).

Long term data may have gaps where the API data was not available.

(b) ENVIRONMENTAL REPORT (February 2004)

This report by Halcrow for B&NES Council presents an environmental assessment of the preferred bio-engineering option and an environmental impact matrices table for the proposed works. Its main value now, therefore, is to see the support then given on environmental grounds by the appropriate environmental organisations for the selected scheme and thus the need to protect the scheme's biodiversity thereafter.

The report lists the statutory and non-statutory organisations consulted, namely the Bristol Regional Environmental Records Centre (BRERC), various Departments in B&NES, DEFRA, English Nature, English Heritage, and the Environment Agency. These organisations were not opposed to the bio-engineering options proposed.

English Nature, for example, stated that they

“welcome the bio-engineering options, which are proposed, and would recommend that a long-lasting solution with sloping berm is prioritised, in order to ensure the mitigation planting develops into riverside habitat.”

A site walkover survey (June 2003 and January 2004) by an “experienced ecologist” under limiting survey conditions (bank steepness and tall overhanging vegetation) found (p.10 – 11) the “following protected and notable species: nesting wildfowl in banks*; veteran willows on the top of the bank (with bat roosting potential, especially the pollarded ones); Himalayan Balsam and other non-native/invasive species; presence of salmonids.” The variety of trees were also listed.

*Note: Residents have observed that wildfowl nesting has ceased in Mead Lane as a result of the mooring trial.

The report described (p.9) the River Avon as an SSSI (Site of Nature Conservation Interest) “designated for its running river water with associated marginal habitats.”

General Arrangement for Construction Plan (15th January 2004)

This plan by Halcrow shows the extent of the work and other detail.

