

Bill Harvey Bill Harvey Associates Ltd and OBVIS Ltd

The Skew Bridge, Monkhide. (<http://bit.ly/billmonkhide>)

Designed by Stephen Ballard (<http://bit.ly/gOPI2w>) in 1843 to take a minor (no through) road over the Hereford to Gloucester Canal (<http://www.h-g-canal.org.uk>). If you want to go and see it you could stay with his great-grand-daughter at Old Country House (<http://www.oldcountryhouse.co.uk>). That's how I was introduced to this remarkable bridge.



A general view of the most severely skew arch I know. Notice how the arch bulges so the end profile cannot be seen at top right. Look carefully and you will see that the arch curve appears to have a flat in it.



Here I have highlighted the line of the bridge and of the canal wall. The latter is less obvious so there is an arrow to point it out. In this sketch view the angle is measured as 27.1 degrees so the skew angle is truly 63 degrees.



This view is as square as I can get it to the spandrel. The 14mm lens produces some slight stretching but one can imagine that building a centre to this form would be unduly difficult. The centres for this bridge were semi-circular and there must have been many of them and none supporting a full ring. The arch was built on semi-circular centring, but the haunches in the acute corners distorted when the centres were stripped. Ballard was relatively calm about this and the movement stopped reasonably quickly.

Notice the marked change in lime coverage at roughly mid width of the bridge. Rain running down the outside face can turn under wherever the slope of the arch face is downwards. Thus the line marks the steepest slope from the crown of the arch.



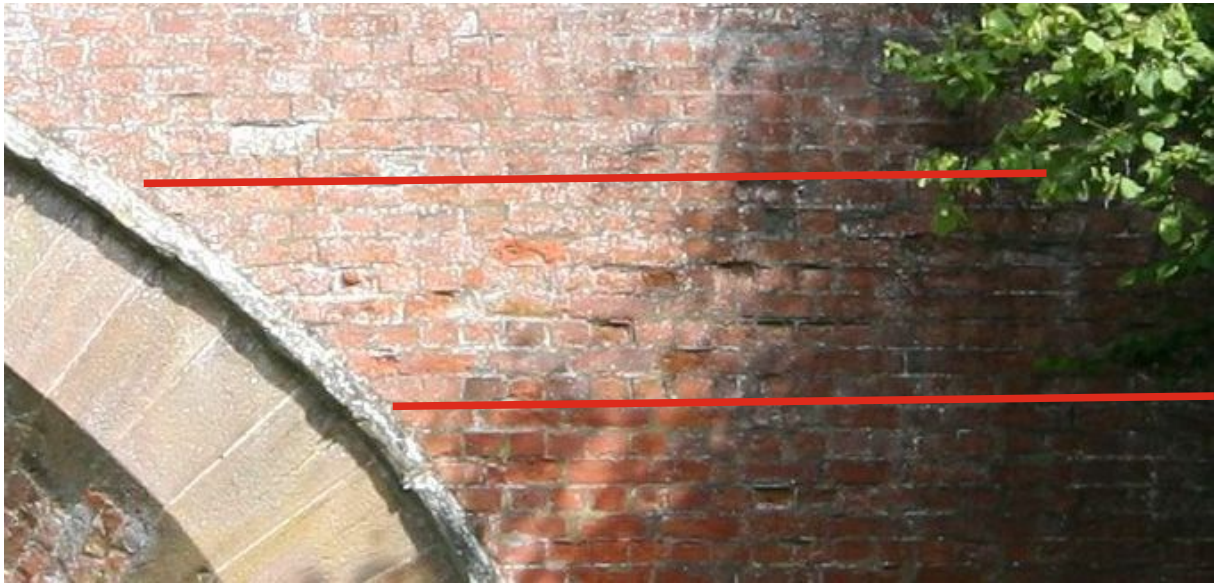
The edges have stone voussoirs keyed in to the main brick ring. The voussoir angles are very complex, especially in this corner where it is necessary to get from horizontal to the main spiral. In the spandrel elevation it is possible to see the lozenging of the exposed face of the voussoirs caused by cutting off a helical face at an acute angle.



At the obtuse corner, the voussoirs are less determinedly brought into line with the helical coursing of the bricks.



Weathering is a very important indicator of construction. Under the arch there is a modest change in lime markings. On the face the weathering of bricks changes. Arches of this type always have solid backing. They wouldn't work without it. Without drawings or investigation these indicators can often provide sufficient confidence that backing is present and to what level. Here there is a roughly horizontal line on the wing wall below which the bricks and mortar are more weathered. This is exactly the reverse of the usual situation. The normal level of backing in a ring of this form would be at the crown intrados, though it might be that the top surface slopes upwards to meet the extrados at a tangent.



Here are some enlargements from the previous page. On the spandrel wall above there are actually two changes of condition marked by the red lines. Similarly, one might spot two changes on the soffit (below) but only one is highlighted.



The photograph to the right shows an arch with backing, built around 1900.



And just a final shocker, here is a photo taken from the sharp edge of the abutment!
If you look closely, you will see that the nearer part of the arch has a different shape from the far end profile. This is the reverse view of the profile changes noted on page 1



This picture from 1900 shows how a skew bridge is built over square centres.

Bill will be speaking to the ICE City Clubs at:
Cheltenham on 22nd March and
Truro on 18th May

Always happy to talk about arches for expenses and a dinner!

News

Archie-M The latest version of can be downloaded from: <http://bit.ly/BillH5>

Seminars and courses. Courses are run as a profit making concern by Bill Harvey Associates and need take £3000 to cover the costs so say 10 people at £300 each. The standard charge for Seminars, run as part of the support for Archie-M is £100 which is intended to cover costs only. Dates:

- Dublin Course 15th March, Seminar 16th March
- Birmingham Seminar 13th April
- York Seminar 13th May

Book at <http://bit.ly/BillH4>

If you would like us to run a course (a full day intensive training) or a seminar (intended as an update on arch studies and Archie plus discussion between users) near you, please let Philip@obvis.com know.

Continuing thoughts about arches and Archie at <http://billharvey.typepad.com>

Moiré Tell Tales: High sensitivity, long range reading. <http://bit.ly/BillH6>