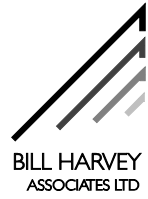




BRIDGE OF THE MONTH NO 1, JAN 2011 LLANELLYD BRIDGE



BILL HARVEY [Bill Harvey Associates Ltd](#) and [OBVIS Ltd](#)

On the A470, on the southern exit from Llanelltyd, the bridge crosses Afon Mawddach. It has been bypassed by a modern bridge which will surely be gone long before this one. It is a scheduled monument dated to the second quarter of the 18th Century. (<http://bit.ly/BillH1>). The monument record is wrong in that this was almost certainly not built on elliptical, but on three centred forms. Look carefully at the arches and you will see that the radius near the ends is essentially constant.



FIGURE 1 PONT LLANELLYD FROM DOWNSTREAM. TAKEN WITH CANON 5D 12MP WITH A 14MM LENS WHICH HAS PRODUCED THE APPEARANCE OF THE BRIDGE CURVING TOWARDS THE CAMERA AT MID SPAN.

For location see: <http://bit.ly/BillH2>

Despite appearances, the middle span is biggest. It also looks to be nearest to its original shape. The bridge is no longer open to traffic.

BRIDGE FORM

The ancient monument record declares the bridge to have elliptical spans which is not true. The picture below is of the centre span, which is nearest to its original shape. A semi-ellipse has been superimposed and clearly falls below the arch at the haunches. Note also how the ellipse radius changes continuously while that of the bridge seems relatively constant at the end of the span.



FIGURE 2 THE CENTRE SPAN WITH AN ELLIPTICAL CURVE OVERLAYED. NOTE THE SHOULDERS SITTING CLEARLY ABOVE THE LINE INDICATING A 3 CENTRED CURVE

Also visible in this picture is the fact that the coursing in the spandrel walls (between the arch and the parapet) dips into the span, modestly in the main span but quite steeply at each side. This is a sign that the arch changed shape after this masonry was placed, confirmed by the more general shot above. This span could sensibly be modelled based on a three centred curve using only central and quarter point rise as controls.

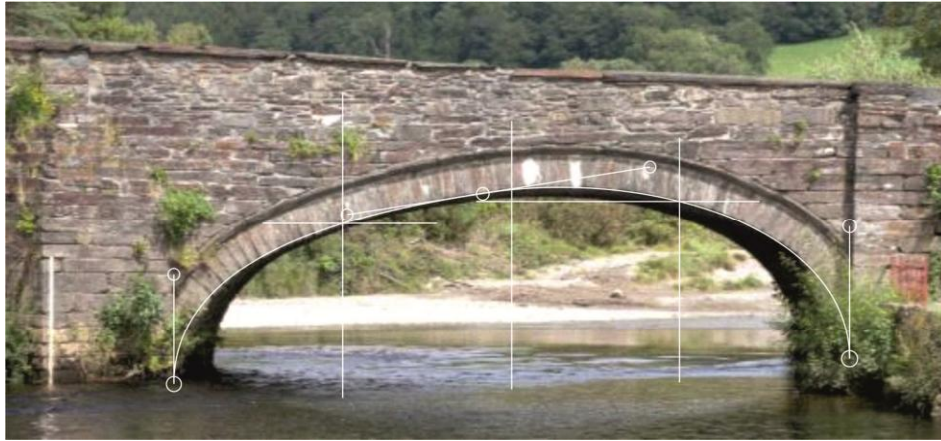


FIGURE 3 THE SOUTHERN MOST SPAN IS BADLY DEFORMED. HERE, THE WHITE LINE HAS BEEN CREATED WITH A 7 POINT B-SPLINE IN COREL DRAW

When an arch is badly deformed, it is necessary to get a decent fit to the curve before embarking on analysis. It is hard to believe that the vertical lines in Figure 3 mark the quarter span points, but they do. The seven rings mark control points for a 2 segment Bezier curve. This is, without doubt, the easiest way to fit a curve to an arch but extracting the necessary data is an issue. The curve fit element of Archie-M makes a very poor job with this arch and we are therefore working on it. The vertical lines show the quarter points and indicate what poor guides they are to the shape of a bridge.

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:

- Edinburgh Seminar 2nd Feb
- Dublin Course 15th March, Seminar 16th March
- Birmingham (Solihull) 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>