

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

This month's bridge is a small, but significant, part of a substantial viaduct. It displays some interesting features that will be described in these notes. It is a large span skew bridge, its width being considerably greater than its span. The bridge is also wider on the left hand (west) side than the right hand (east) side, forming a funnel shape in plan. The arch is located at <http://g.co/maps/cf85k>. It is a skew bridge of substantial span but very much wider than the span.



The arch itself is of blue brick, as is the rest of the viaduct. To the left of the picture is the undercroft of Moor Street station. Now a car park, it was originally a goods shed with lifts to move goods wagons up and down to the railway and traversers to carry them at right angles from track to track in the shed. To the right, the viaduct becomes progressively narrower.

Just visible under the arch is an abutting viaduct of a different span rise ratio which carries the line through to Snow Hill. At the time the Google Earth photographs were take, Moor Street station was out of use.

One more note on this picture. Look how far the parapet is corbelled over the edge of the arch. Not a rare feature but one that seems to offer surprising robustness.

The construction is partly visible in the general photograph overleaf. What is prominent is the line on the spandrel wall, level with the arch intrados, below which the masonry appears quite different. This is caused by differential weathering and shows the position of the top of the solid masonry backing.



The picture above shows the nature of the arch construction. The skew angle on this face (zoom in on the map to see) is about 40 degrees. At the other face there is a much smaller skew in the other direction. The skew edges are accomplished by sweeping the brickwork round a curve so it runs parallel to the abutment over most of the width but still meets the skew edge more or less at right angles.

One result of that, very visible in the photograph above, is the dog tooth effect generated on the exposed edge of the arch. This becomes progressively more pronounced towards the springings and also indicates that the skew thickness of the arch increases in a similar way.

Also visible is a distinct line of water runs leaving lime stain. This is rather lower than one would expect in view of the line on the first picture. Another visit will be needed to think about that some time. The drains provided to try to trap the water are not being very effective.



At the obtuse corner, the sweep is accomplished over a shorter length and the courses run straight to the edge of the arch from there.

One thing that is obvious from this picture is that even the skew end is bedded on a flat skewback. In some bridges, we will see how even brick spiral coursing is usually supported on a sawtooth if the skewback is stone, but where brick is used through out the skewback is built up to a flat face. Even where the top face is sawtooth, the bottom is a flat bed. If the thrust is skew on the top face (and it surely must be) it must remain skew on the flat bottom face. And that means that shear on the bed is not an issue. The reason for spiralling the courses is to ensure that the bricks are properly bonded at the edge (see the detail below).





One good reason for bringing the courses back to parallel away from the edge is that it allows construction joints to be made. The bricklayers were very good at fitting in the bricks on these joints but they remain visible if you look for them as you can see at the left.

The inset to the right shows how this was done. The photograph comes from the Newton Collection at Leicester Record office with permission.



## News

**Bridge Management and Maintenance:** Bill is convenor of the Study Group at IStructE. It is open to anyone with an interest in bridges. Ideas for meetings are always welcome. We are trying to set up a discussion group and also a meeting to discuss preparation for and response to floods and issues of mechanical parts of bridges (eg bearings and expansion joints. Contact to join or [bill@obvis.com](mailto:bill@obvis.com) with any ideas or offers of assistance.

**Archie-M** The latest version of can be downloaded from: <http://obvis.com>

**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.

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](mailto:Philip@obvis.com) know.

Continuing (if sporadic) thoughts about arches and Archie at <http://billharvey.typepad.com>  
Moiré Tell Tales: High sensitivity, long range reading. <http://bit.ly/BillH6>

And since I am unlikely to get December out before 25th, best wishes to you all. Bill