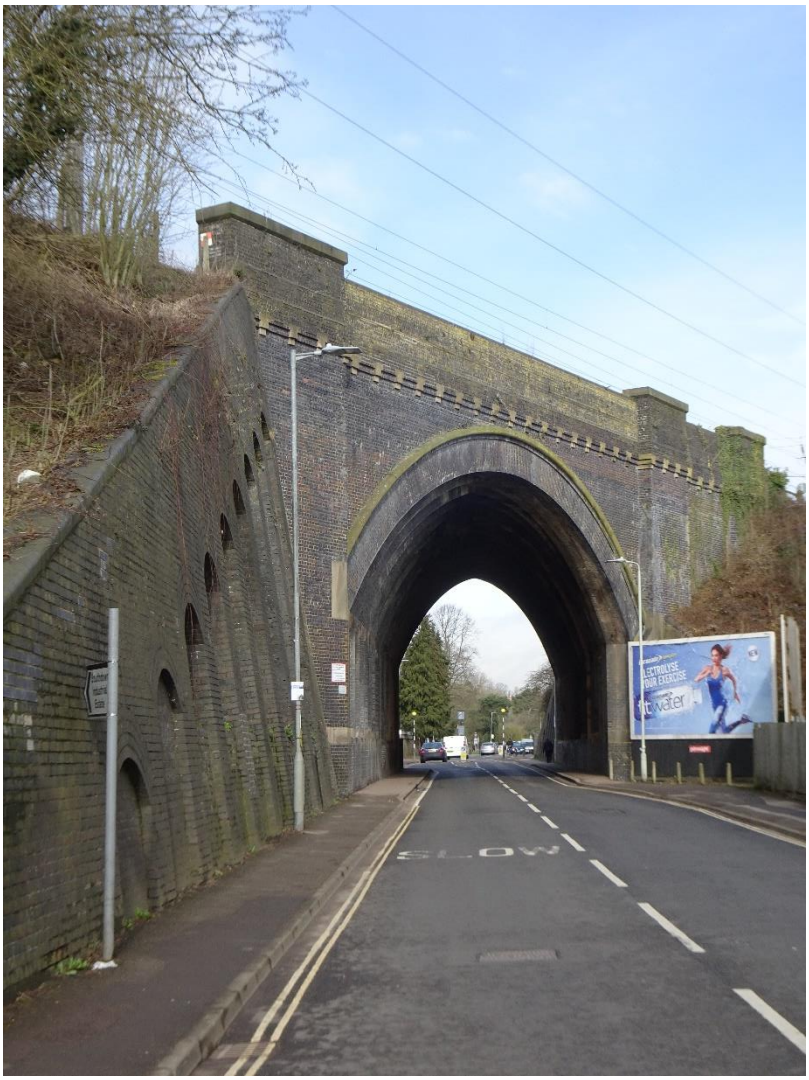
Bridge of the Month No87, March 2018
The Skew Bridge, Harpenden

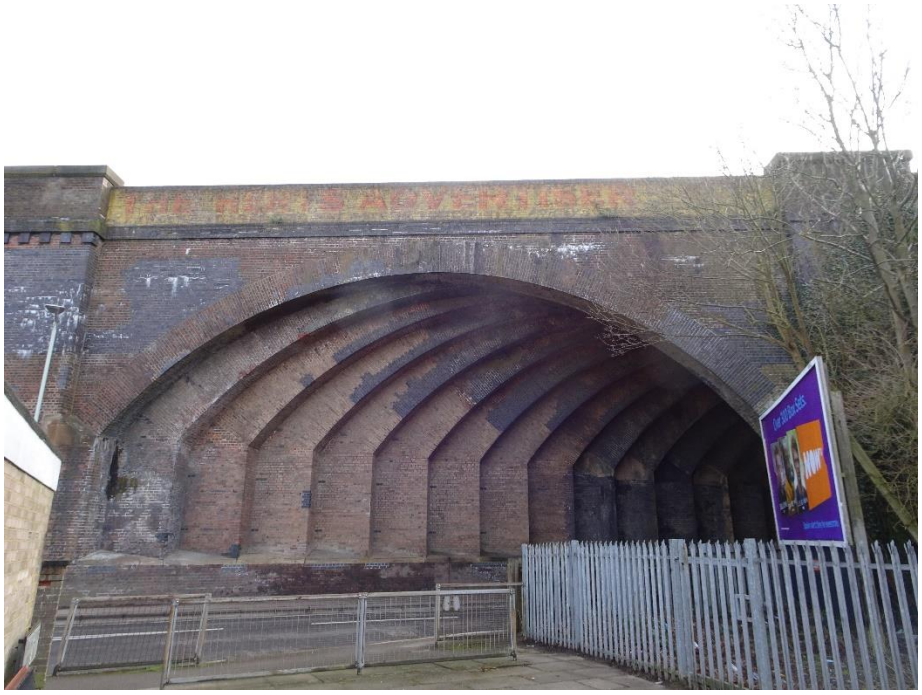
Here is something I have known about for years, probably 30 years, and never quite got back to. On the Southdown road south out of Harpenden is a magnificent bridge. The embankment is high so there is plenty of room, but the railway crosses the road at 65degrees as seen on Google Maps, here.

The bridge appears in the Wikipedia page about skew bridges, and also has a page of its own. There are a number of errors in the Skew Bridge page but it also contains a wealth of information.

Because it is so skew, it demonstrates clearly the difference between the square and skew span shapes.

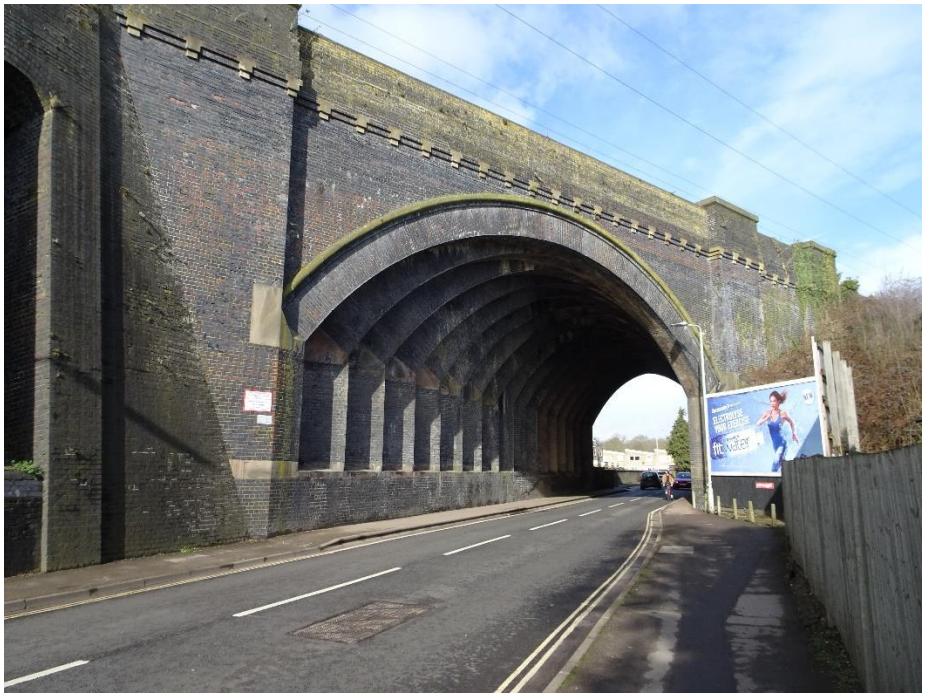


Here we see the ellipse on the square span, though it is clearest on the near side where it isn't complicated by the different edges of a rib showing in profile

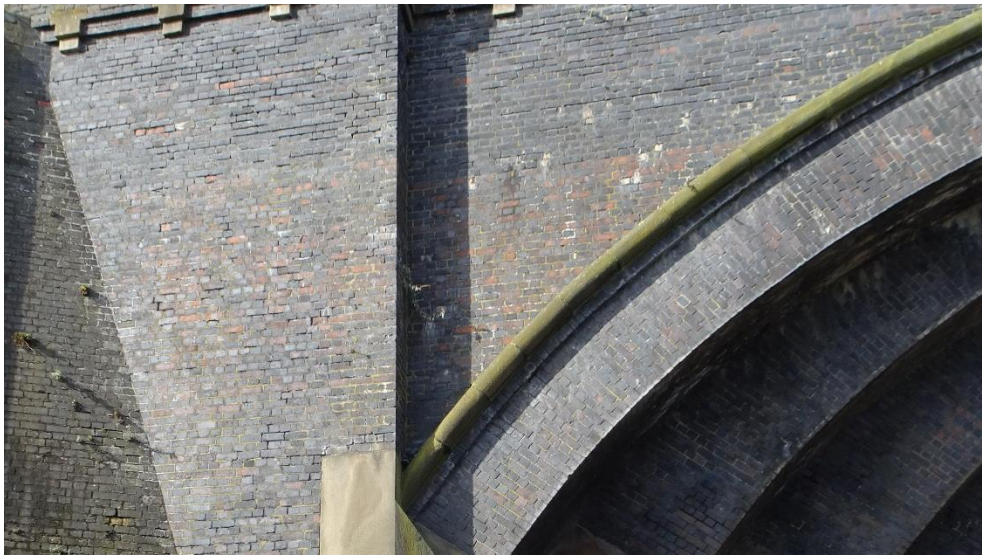


This alleyway provides a square view. Though I still had to tilt the camera upwards, it is still clear that the curve is a circular arc in this direction.

Note that the first picture shows a decorated elevation with stone finishings. This is the Southdown side. To the North, the bridge was widened rather later and is all in stone, even the skewbacks. This picture also shows a vast amount of patching in both the arch rib and the spandrels. The parapet is a completely different colour. Are those the original bricks which proved inadequate for the arches?



In this broader elevation, there is a very clear change in the mortar condition, roughly level with the crown of the arch. That, almost certainly, marks the level of backing behind the spandrel. The enlarged view below shows the change more clearly

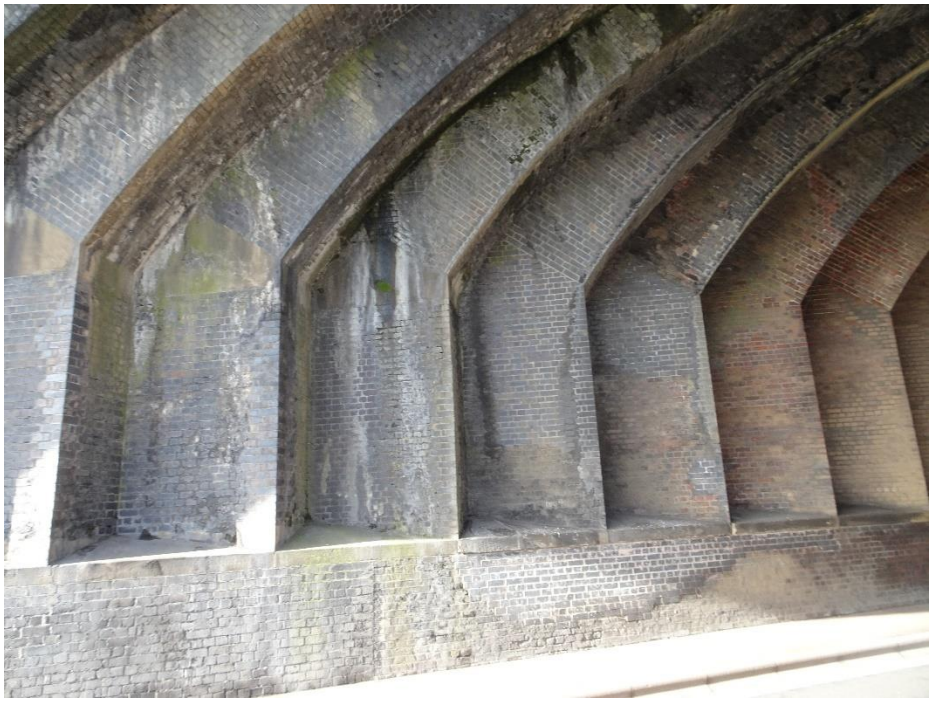


Lots to see in this picture.

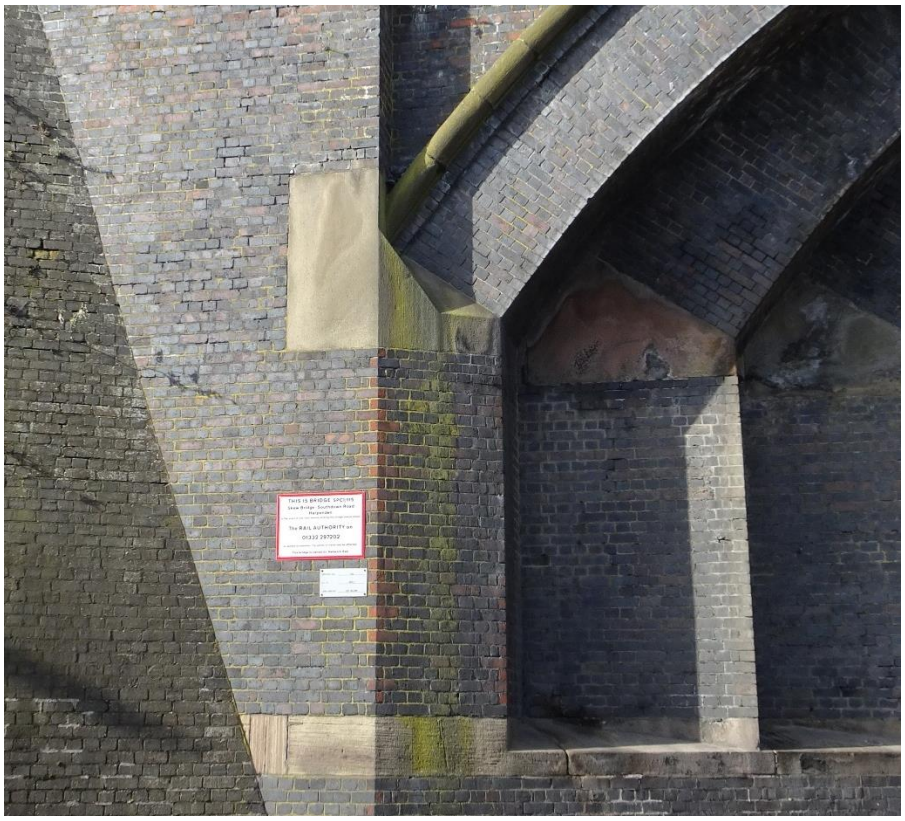
First, note that the skewbacks and arches are made thick enough that the arches overlap even at the springing.

Then note the zigzag crown with no continuous horizontal line through. This is what creates the apparent cusp in the first photo.

Notice, too, the water leaks which are surely sufficient evidence that these arch ribs are completely independent, at least down to the level where the backing links them together.

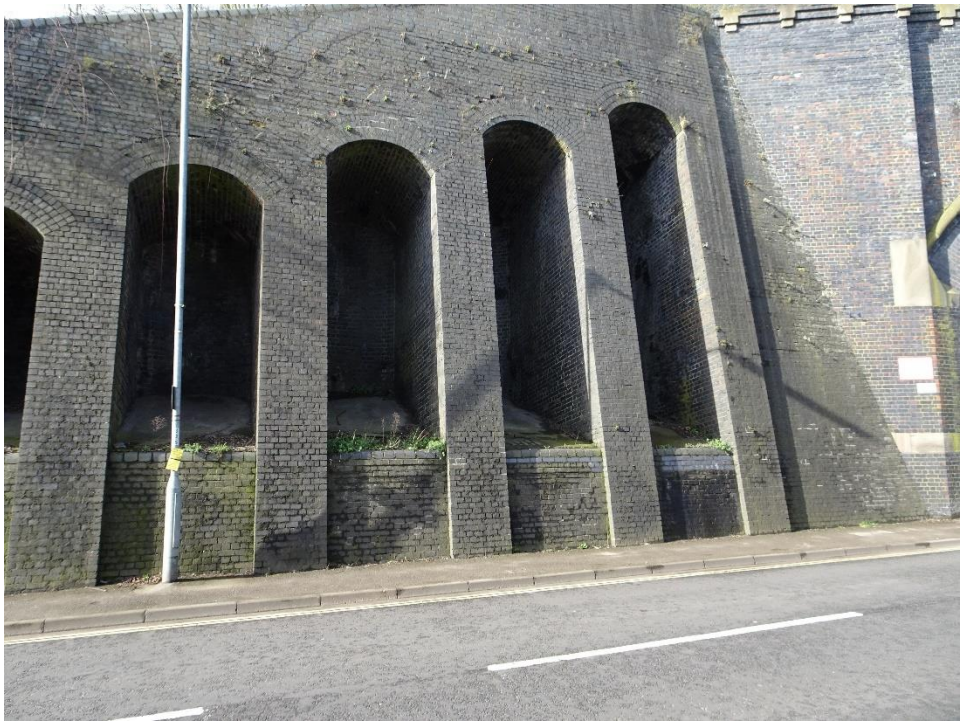


In this closer shot, the water running down the skewback has obviously tracked down from higher. The run naturally hugs the intersection.



The end skewback is a magnificent piece of masonry work. The original piece of stone must have been a metre high and wide and nearly 2m long.

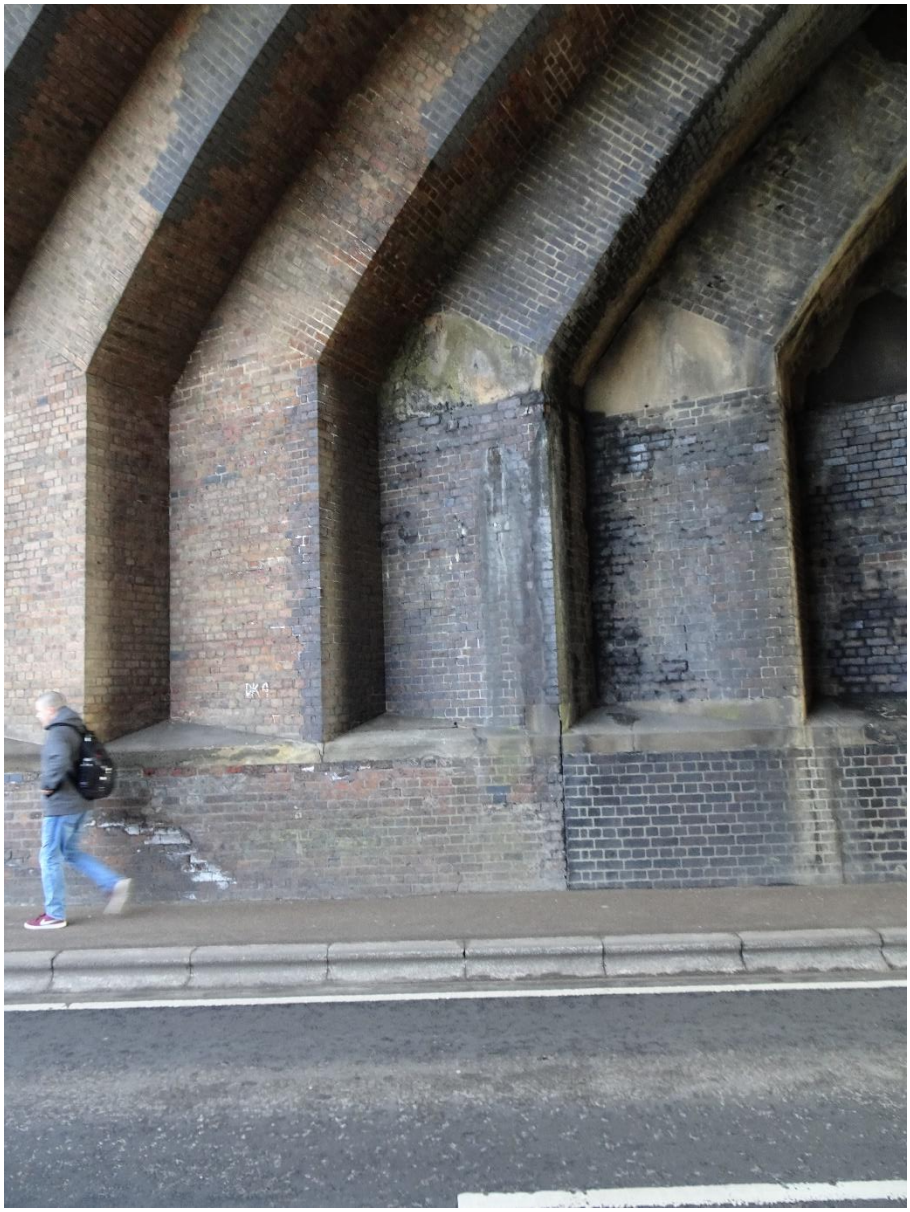
A bridge of this skew and height demands a big retaining wall on one side of each approach. The ones here are colossal. Notice how the counterforts get closer together as they get higher.

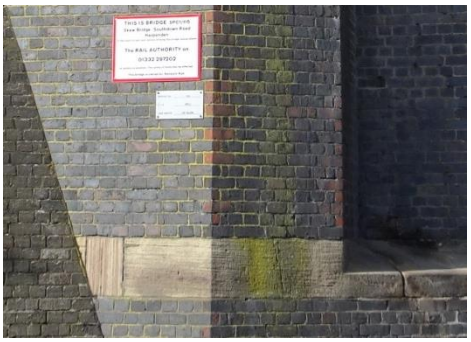


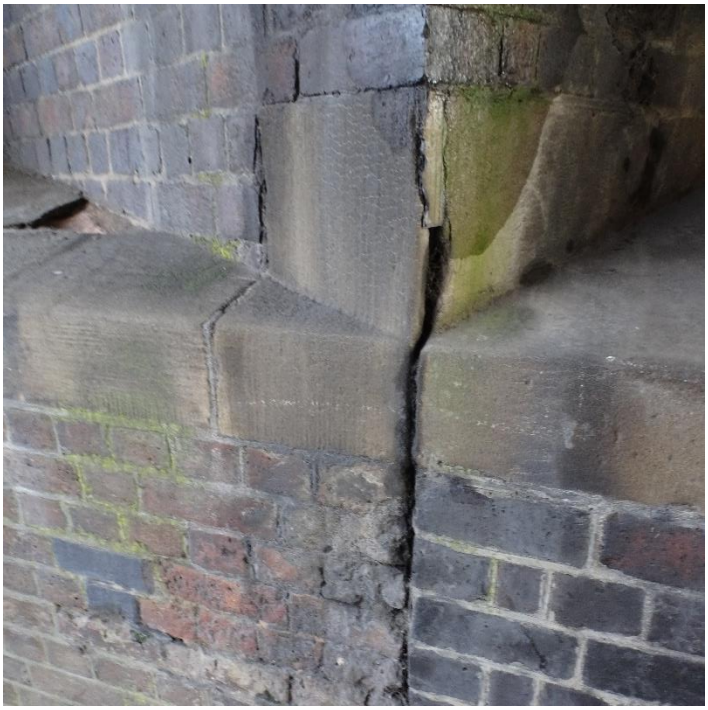
What isn’t quite so clear is that the voids also get deeper.

Dealing with that wall when the bridge was widened must have been quite a business, as the railway would have had to be kept open.

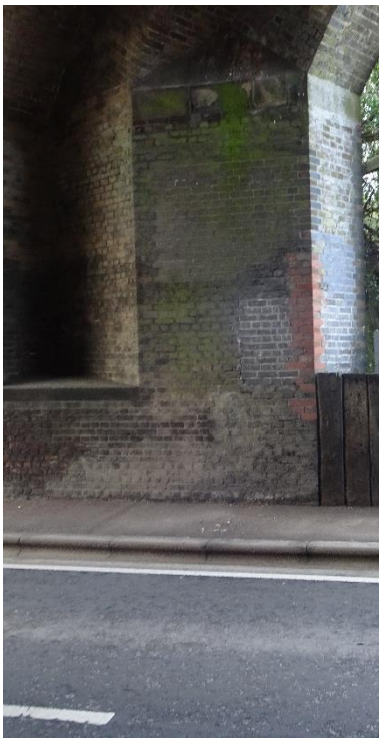
Looking at photo 1, it was almost certainly possible to just build the new abutment into the old wall. Exactly how the stone base of the first new rib was cut in is an interesting question.

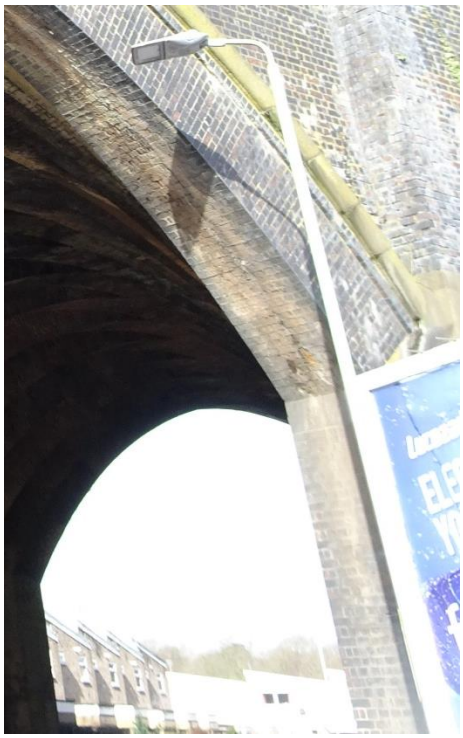






The obtuse corner of the newer work is very different. The upright section is built in solid to the second rib, presumably to provide a degree of stability.

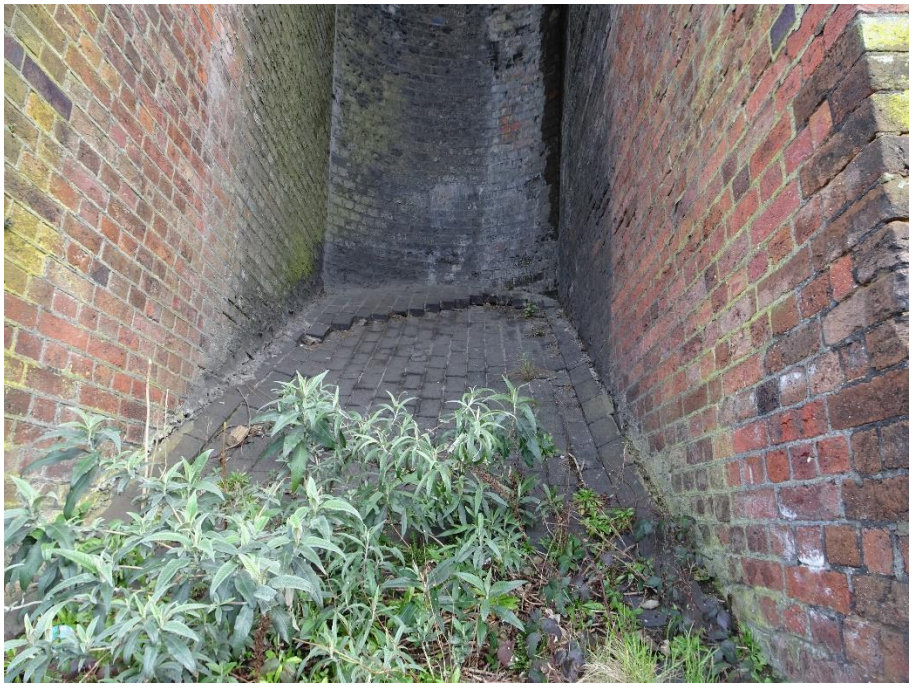




The older corner is concealed but the skewback is just visible, blending into the buttress behind. There is no infilled V, though I don't have a photo to prove it.

Looking up to the crown, it is interesting to note that some of the joints between ribs are tight and some not.

Finally, a quick look at the retaining wall. Interestingly, the coffers in the older wall have concrete fill at the bottom. The newer one is obviously just a skin of brick on soil and the soil has settled beneath.



Which raises interesting questions about construction.

In the next month I will be in London, Leeds, Bradford, Newcastle, Dublin, Edinburgh, Dundee. I wonder what I will find.