



Bridge of the Month No74, February 2017 Arches in walls



This is a momentous week for me. I am seventy on Friday. 2017 also marks 50 years since I met Sue at the fresher's conference in Leeds where we were helping out at the start of our final year. She had just returned from a year in Germany (and a term in Italy) and seemed very sophisticated as well as beautiful and intelligent. Terrifying, in fact.

It is also 17 years since I started into consultancy. Longer than I imagined would be possible but it is still very enjoyable. This, my third career is not yet my longest but soon will be. I was in Universities from 77-2000 so 23 years.

And finally, it is 15 years since I had a very close call with an extremely serious bout of pancreatitis. That has left me with diabetes and pancreatic deficiency but thanks to the NHS life continues more or less as normal with a little help from drugs.

Sue meanwhile has had MS for 42 years and vascular dementia for 2 that we know of. Her life is very constrained now. I imagined taking her round with me as I worked by this stage but she really can't handle it so I just have to make sure I earn enough to provide the care she needs while I am away.

In the mean-time, I am still frantically busy. Perhaps, dear readers, you will forgive me for a little light entertainment. I hope that, next month, I will finish off the reporting on the Moco lift with a note about monitoring and what can be gleaned from it.

Known Bookings:

Talking about the Moco Lift at:

Bridges 2017 in Coventry on 16th March

Engineers Ireland in Dublin on 22nd March

IStructE HQ, London on 6th April. This last is sold out but will be webcast live so you can watch from the comfort of your own PC. Details at www.istructe.org/events

And further away and different topics

IStructE, Chester on 3rd August and Scottish Lime Centre, Limekilns on 25th August.

I will shortly start planning a cycle of Archie Seminars. If anyone would like to host one please let me know.

Arches in Buildings and walls generally

I know they aren't bridges but the behaviour is only slightly modified and we can learn a lot from looking at them. I was reminded of this just this morning walking into town when I noticed this in the pub at Mount Radford in Exeter.



This is very much like a bridge arch, with independent rings but look more closely and you will see that the bricks are what are called rubbers. That is they have been ground down to fit.

The enlargement below shows this clearly. The radial joints are very tight and parallel sided. I have not noticed this before without the bricks being placed as soldiers.



In this arch, the finishing is even more complex. It looks to be a three centred curve and where the radius tightens the bricks are all together thinner to create a sensible intrados curve.



Having noticed this, I also noted the cracks in it, which are as important an observation here as in bridges.



Some of the disturbance here is disguised by the sign board but there is a very obvious joggle in the decorative terracotta above and that is reflected in a pattern of (still very fine) cracks in the arch running diagonally through the bricks from the springing. There is very evident repointing between the rings and in the outermost ring where joints have widened over time.

Round the corner is one with a rather bigger span.



And next door a stone one of similar proportions. How do companies get away with such unsympathetic signage?



Notice the crack just peeping out to the left of centre. Some movement going on here.



This one is also near home, an extension to the beautiful Customs House. Surely this gives the lie to arches being brittle.



This little porch, a mad attempt to gothify a lovely Georgian house in Bath, is made from large slabs of stone. The only joints are at the crown and springing. It is partly stabilised by the wall but is clearly struggling despite that. Look at the side walls (similarly large stones) tipping gently outwards.

And a couple more from out of town to finish.



I think that this is opposite Costa in Newport. A fine old building but the flat arches have obviously been pushed a little too far and the cracks under the left-hand windows have an obvious enough cause.

This one at Kings Cross. There would normally be one central crack but the keystone is prevented from rotating by the ironwork so we get one each side.

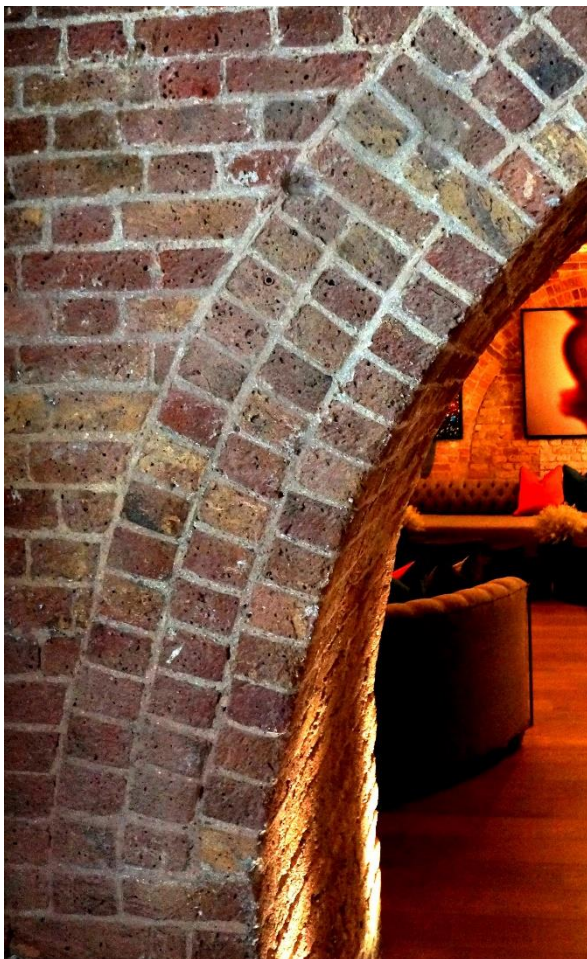


Notice that the rings are splitting too. Probably partly driven by the differential stiffness from the wall above and the space below.

The crack is worth a closer look. The joints are close enough to the key stone to run straight through the ring.



But here is one last. A relieving arch from a disused viaduct near Broad Gate in London.



The full arch is shown above with a detail to the left. At the 45 degree steps a sort of keystone is constructed where all three courses line up, though I suspect this required a bit of detailed design and specification by the engineer.

And with that, farewell till the end of March when I hope I will have a little time for more bridge oriented stuff.