

Bridge of the Month 122. Feb 2021 Monklands Glen, Airdrie

Lockdown provides, if nothing else, encouragement to look back through old photographs. Up popped this sad little bridge in [Airdrie](#) which I visited in 2011. I have seen a few more with similar (and much worse) damage since, but this is a neat little test of thinking.



A pointed arch? Not originally, that's for sure. This is on a flood plain, but the river is right at one side against a cliff so the road comes across at high level and has to be approached on a high embankment (to the left in this picture).

First thing is to look a little closer.



Hmmm. Maybe closer yet, and a little lighter It was a very dull October day.



Now we can see clearly what is happening. Just to the right of the crown there are two joints wide open at the top. There are two diagonal cracks going up from the arch at the right where the wall has lifted on the arch. At the left, the stones are better bedded and the pattern is rather different.

There are trees in the way in the picture below but it is a little higher resolution and might be clearer.



Here, we can also see a dropped stone. How does that happen?

What I think is happening (if I were there again I would take more photos and get a 3D model to test) is that the arch is humping through the span as a result of the span being squeezed. The edges are held down by the spandrel walls, so there is a hump across the width too. The large stones means that the dome can open certain joints and allow a stone to drop.

Also here, you can see very clearly the hump in that top row of dressed stones which were the bottom course of the parapet. The hump opened up the joints and broke the mortar so the stones were much easier to push off. I am sure they made a lovely clunking splash when they landed.

If we step back again and have a look at the broader picture:



There is the cliff on the right and a rather high approach embankment on the left. The embankment was certainly just tipped and not compacted. If I remember rightly it was mostly ash.

Can we be sure that only one abutment moved? I was going to crop the bottom off the next picture but let's just note that there are the parapet stones!



And having cropped off the bottom to show those, move up and crop again.

This is the abutment against the rock face. There is a crack up the centre but otherwise very little damage until well up into the arch.



The front of the other abutment is actually tearing away from the sides.



And further up the wing wall is pushing out past the edge of the arch. A look further back shows how that fits together with the rest of the wing wall and an added buttress.





There is something of a belly in the abutment face too.



That's a massive buttress added to the other wing wall.



What's going on here? The beds don't come near to matching to the left of the left hand crack. Has that bit been rebuilt?

What is clearest, looking back at these pictures nearly 10 years on is how much I have learnt in the meantime. That, in turn, raises questions about what we can expect from young engineers with little or no training who get maybe as much as 5 years inspecting bridges before they move on. Artisan inspectors stay much longer but a) they are likely to be more set in their ways and b) there is little or no attempt to train them to see stuff.