



Bridge of the Month No70, October 2016 Moco Farm accommodation bridge 1



This month, really, nothing else will do. On 18th and 26th October, we picked up the arch of this bridge by 900mm (Yes, three feet in old money) then set it back down to 435mm to build it in an exact number of courses above its original position.

This was the culmination of 10 years of effort on my part followed by the better part of three years during which Freyssinet out their considerable reputation on the line behind my idea. Naturally, this demonstration project took more time, effort and money than we had thought, but the principle is now proved and we can set about engineering some cost and time out of the process.

I am going to take two newsletters over this because there is so much to record. There will then be several more formal papers to put the lessons firmly on record.

In a sense, the logical thing to do would be to put the background first and the lift second, but we are all rather excited by having done it and so I will begin with the lift itself.

I will be in New Zealand for the whole of November. I may get part two done before I leave but it is really quite unlikely. If I don't, there will probably be a delay into December.

Other News

Please note that we now have an email group for Archie support messages. Please would any readers who make any use of Archie [signup to the lists](#). There are separate threads for engineers and IT support people so please pass on this message to everyone who might have need.

Following considerable discussion with Bill Smollett of Aecom and then with Katalin Andradi of Mott MacDonald, there is a new, thoroughly tested [SV load file](#) for Archie and a [note detailing how it was put together](#). Click the links to download those.

Zoltan is working on Version 2.6 of Archie (2.5.1 was a bug fix issued a couple of months ago) Hamish and Keith are working on version 3 when they get time between panic projects on monitoring. Version 3 has major improvements in functionality.

Hamish will be presenting at the BD&E meeting in Manchester, launching the hidden defects guide from CIRIA. We weren't involved so this will be a personal rather than a team view.

Moco Farm Bridge Lift.

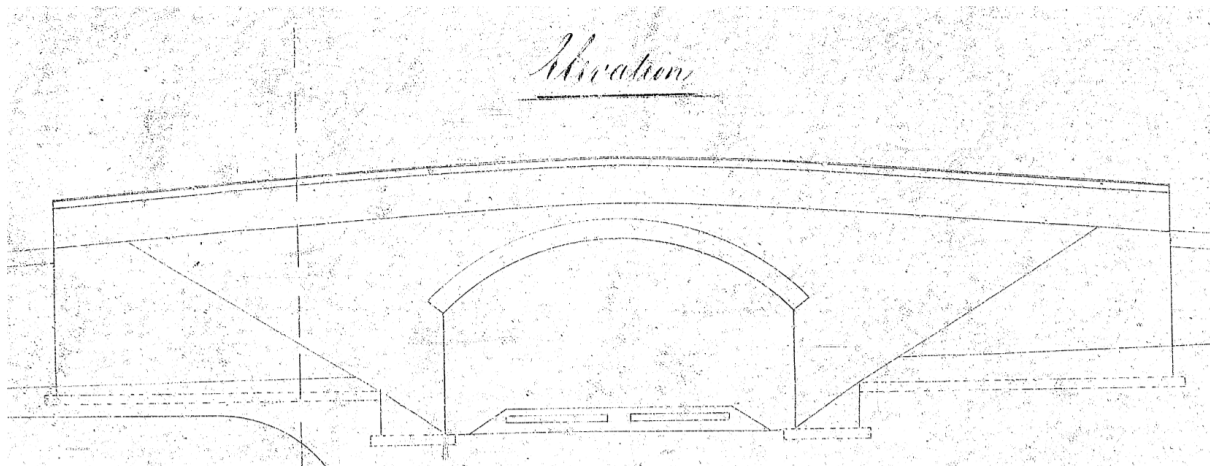
The bridge at Moco is not, to me, a normal rail bridge. The span is fully 10m (33ft) which itself is quite unusual and the rise is 2m so at 5:1 not flat, but a shallower curve than many. It is also quite narrow at just over 4m, so we expected (and found) there to be no counterfort behind the face of the abutments.



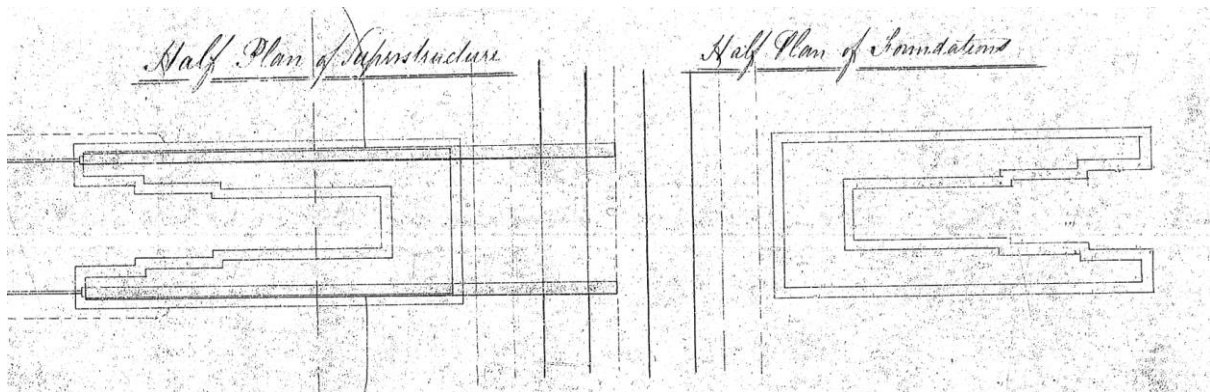
The bridge is built in very shallow cut, only about 1m so the wing walls were built on shallow, level, foundations just decently below original ground level. The abutment walls are founded below the base of the cut, of course. As shown above, the bricks in the wing walls are laid to a slope throughout much of the height. Once the abutment was dug out we found that the inside stepped faces were all level, which presents an interesting question about bond.



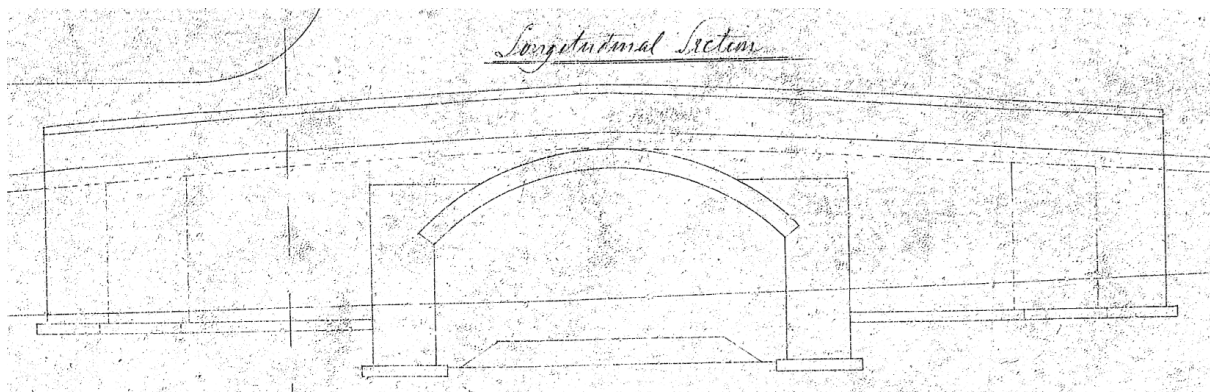
There is a drawing but after copying and microfilming it is not the clearest.



This section shows the foundation levels, though there is actually a corbel between the abutment and wing wall base.



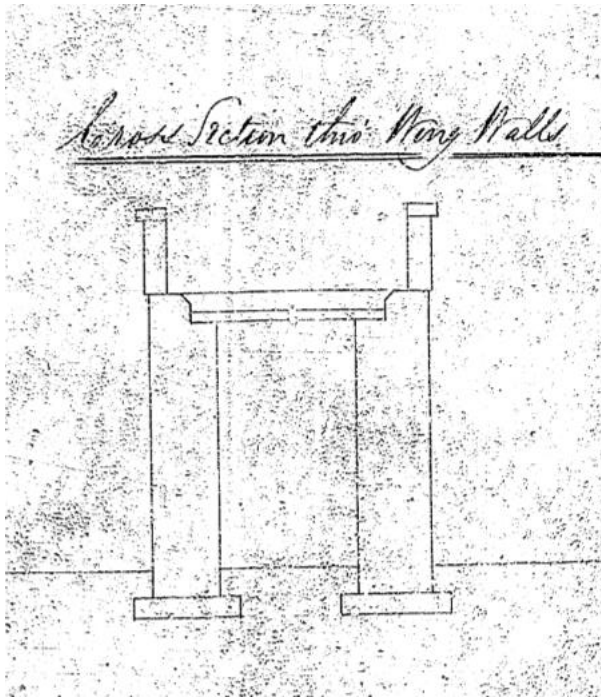
The plan views show how solid the structure is. Note that the parapets overfly the spandrels slightly.



The long section indicate the steps in wing wall thickness extending to the sloping line but we need a section the other way to see what that means.

That section shows two levels of step on the inside of the wing walls. The photo above shows three, with the inner layers stopping far short of the wall tops.

What is more, the brick beds on the thicker layers are horizontal while those in the outer skin are laid to a slope. It is, of course, impossible to tell where and how that joint is made.



Another fascinating feature of the drawing is the costings, tabulated at bottom right.

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		L	s	d
453	Cube Yds of Brickwork	509	6	0
210	Cube Feet of Coping (Yorkshire Stone)	31	10	0
588	Sup Yds of Metalling	73	10	0
3624	Cube Yds of (presumably) suitable fill in approaches	90	10	6
497	Lineal Yards of Post and Rail Fencing	74	11	0
2	Field Gates	10	0	0
24	Sup Yds of Clay Puddle	1	5	0
		790	12	6

I read that as:

		£	s	d
453	Cube Yds of Brickwork	509	6	0
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But 10186shillings doesn't divide sensibly by 453. Surely 270p per cube is more realistic and would give £509..12..6. Perhaps transcribed in error or perhaps some strange discount applied. The other rates look sensible at 36p per foot of coping, 30p per sup.yd of metal, 6d per cu yd of fill, 36d per yard of fence and 12.5p per super yd of clay puddle.

Typical puddle thicknesses is 12 in so 37.5p per cu yd. Given the work involved in puddling this seems reasonable against 6d for fill. I wonder if they got paid for it even though there was no sign of it in excavation.

To be continued in our next

It is already 1st Nov. We leave at lunch time for our annual trek to New Zealand. I will right more abot the lift for next month which might be late as we are not back till 30th Nov.