



Bridge of the Month, September 2013 Castle Garth, Newcastle



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News and Events

Bill will be in New Zealand from 29th Oct to 6th Dec. Accessible by email
Follow Bill on Twitter @BillHarvey2

Seminars and Lectures

Hertford County Council Offices 29th Jan 2014
MottMacdonald Altrincham office early 2014

Please contact Philip@obvis.com if you are interested in attending a day seminar on Arches and Archie. The program for this year includes:

Bill's recent work (some interesting bridges!)

Skew Arches

Ring separation

Causes of live load damage

We charge £100 for the day but if you wish to host a session at your office we then wave the charge.

Recent Publications

Bill's paper about the effect of stiff spandrel walls received the John Henry Garood King Medal. The medal is awarded annually for the best paper published by the Institution on tunnels, soil mechanics or bridges.

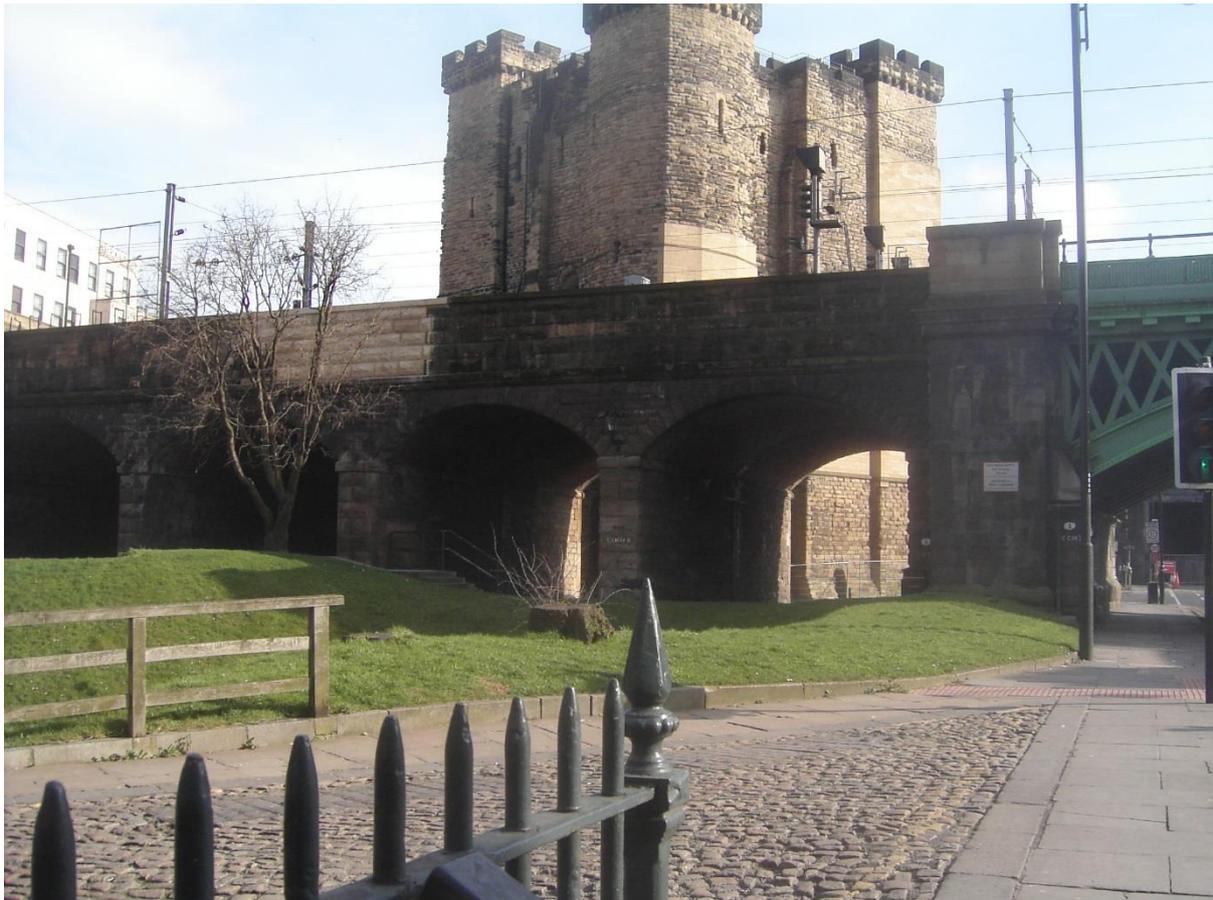
Stiffness and damage in masonry bridges. Proceedings of the Institution of Civil Engineers, Bridge Engineering 165 September 2012 Issue BE3 Paper 1100032 Pages 127–134 <http://dx.doi.org/10.1680/bren.11.00032>

A spatial view of the flow of force in masonry bridges, Proceedings of the Institution of Civil Engineers, Bridge Engineering 000 Month 2012 Issue BE000, Paper 1100026, Pages 1–8 <http://dx.doi.org/10.1680/bren.11.00026>
Sutherland History Lecture 2012 at <http://bit.ly/J4gblz>

Castle Garth, Newcastle

Just a simple railway viaduct but with a very interesting issue. <http://goo.gl/maps/YZOe8>. Had I not seen a version of this elsewhere, I would not have noticed.

Looking from the north we see a stone built viaduct of no great height or pretension, though it is nicely done. I am interested in that patch of bright fresh stonework. Has there been a derailment?



It was pure chance that I got back there in the evening when the bridge was lit with uplight from the springings.



So what is special about that?

The arch is neatly divided into 12in facets. The fact that the brick facets coincide with the width of the stone voussoirs at the edge is not just chance, because tying in would be much more difficult if the voussoirs width were not a round number of bricks.

That, in turn, adds another complication to the setting out that I hadn't spotted before. If you are going to mix brick and stone, the arc length of the arch needs to be a suitable number of brick courses to be divided into a sensible round number of equal blocks of say 9, 12 or 15inches.

Anyway. The main point here, and it is an important one, is that the centres were built using 12in wide boards and there was probably a small gap between them. Since the boards were fitted to the voussoirs, the gaps coincided with mortar joints and a lot of the mortar probably fell out, leaving the bridge to be repointed after the centre was struck.

That is a tedious and expensive business but worse, it means that the inner ring is effectively unstressed under dead load. Might this explain why ring separation is relatively common in brick arches?