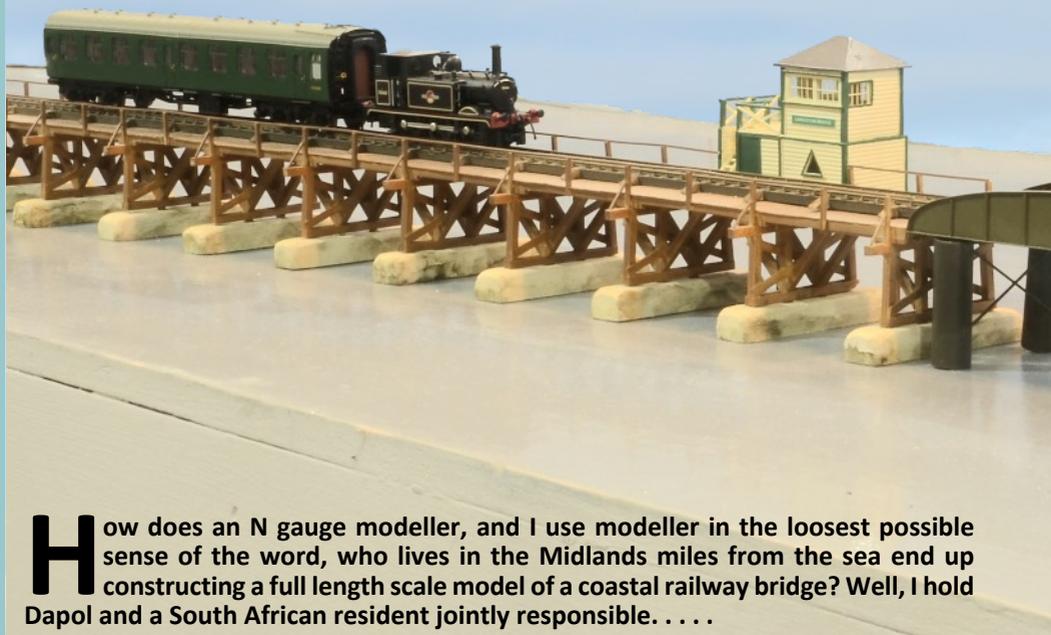


LANGSTON BRIDGE

By Julian Thornhill



How does an N gauge modeller, and I use modeller in the loosest possible sense of the word, who lives in the Midlands miles from the sea end up constructing a full length scale model of a coastal railway bridge? Well, I hold Dapol and a South African resident jointly responsible. . . .

A few years ago now Dapol started to manufacture a rather fine, dare I say cute, N gauge model of the Terrier tank locomotive. Having purchased a few I started to cast around for inspiration for a relatively simple layout project on which to run them. A photograph of North Hayling station, which is little more than a small platform and a shelter, and the surrounding easy to model landscape seemed just the thing.

I forget the exact circumstances but I ended up discussing this minor little project online with a fellow modeller who is now resident in South Africa. She said she used to live in the area and had travelled the line as a child. She then asked if I had considered building the bridge as well. At that point I had no idea that there even was a bridge, so I thought how hard can that be?

As a result I started to trawl the Internet for photographs of the bridge and any other relevant information that I could find. The first few pictures were only ever of part of the bridge, so the task didn't seem that hard and I carried on gathering pictures and getting ever more drawn into the project.

It was never entirely obvious what the precise dimensions of the bridge were, and even the basic construction was not at all clear as many of the photographs were taken from angles that created confusing images of the structure under the bridge deck. A breakthrough occurred when I came across the Hayling Island online forum. I outlined my project in their local history sub forum and appealed for any photographs that members might have.

A forum member suggested I contact Alan Bell, a local railway enthusiast, photographer and



Photograph by Grahame Hedges

author. It transpired that he had built OO models of many sections of the line over the years, with the layout ending up in Havant museum. A phone call revealed that he had crawled all over the closed bridge with a tape measure and had produced scale drawings of pretty much all of the structure, including the swing bridge and its controlling signal cabin. Furthermore, he kindly sent me a copy of the plans and some additional photographs that I had not come across. Mind you, he did think I was quite mad trying to build the bridge in N, though he expressed this sentiment in the politest of terms (*A model of the line by Stephen Ash was featured in Journal 5/01 although only one photograph was published* - editor).

Now the project had started to gain a bit of momentum, and having asked for information in public, it was increasingly difficult not to

continue. Having obtained the scale drawings, it was now a simple task to calculate some basic dimensions of the layout. I was keen to construct the whole bridge, rather than a shortened version and was therefore relieved to discover it was around 7 feet long in N and not twice that. I could accommodate a layout up to 12 feet in my railway room, so there was room for a small amount of the bridge approaches and some sharp hidden curves at either end.

As a consequence of my appeals for information on the Hayling forum I was approached by the organiser of the Hayling Billy (this being the local name for the train service) 50 celebrations. It transpired that 2013 was going to be the half century since the line's closure and various local exhibitions including a model railway show were planned. Could I bring my bridge along please? I'd never exhibited anything before and hadn't even



Photograph by Grahame Hedges

started my model. However, I did have three years to the deadline, so it seemed possible - I had reached the point of no return.

Having the constraints of getting the layout to an exhibition I needed a baseboard that would fit in my admittedly reasonably spacious estate car. A tape measure revealed that three four by two foot boards would fit, provided the boards could be stacked in the car. This would give me a twelve by two foot layout, which seemed to be just about right. I could have spent time perfecting my carpentry skills but would then have no time to build my bridge, so I decided to buy my way out of trouble. Model Railway Solutions of Poole provided me with what was needed – boards, stacking frame and legs - at a very reasonable price.

Having now attended three exhibitions, I cannot recommend their system highly enough. All three boards in their stacking carrier are light enough for two people to carry with ease and everything bolts together in perfect alignment in a few minutes. A far better system than anything I was ever likely to produce.

As I wanted to construct at least some of the approaches to the bridge I decided upon a site visit. Online photographs indicated that much of the original approaches still existed, indeed most of the original track bed has been retained as a cycle path. A family trip ensued and

I spent an afternoon photographing the bridge remains and the surroundings.

The concrete piers are still present and the bridge approaches are in relatively good condition. Surprisingly, the metal supports for the swing bridge are still there after 50 years and it is quite easy to imagine the missing wooden parts of the bridge. The indestructible concrete piers and modern technology combined to provide even more assistance. The piers are highly visible on Google Earth aerial photography, and knowing their dimensions from Alan Bell's plans it is straight forwards to scale the photographs and work out the exact position of each pier.

This revealed what I had started to suspect from my site visit, that the bridge is not straight. The first half from the mainland to the swing bridge is indeed straight, but the second half is curved. The other dawning truth was that there were 50 piers, which meant 50 sets of vertical supports would have to be constructed.

A further consideration was what should the bridge be made from? The original was wood, and so was Alan Bell's OO model. The structure of the bridge also has strong suggestions of matchsticks. The major problem with using wood on such a small scale is that of dimensional stability. I might have a nicely constructed bridge one day, and a warped

twisted mess a few months later. Eventually I settled upon plastic styrene strip from Plastruct. This comes in a huge range of sizes, being ideal not only for both the major bridge supports but also for the bridge deck planking and even the slender handrails. It is also easy to cut and can be glued by a quick setting solvent. Perhaps the only downside is the cost – I must have spent several hundreds of pounds on the product by the end of the project.

To construct 50 sets of identical bridge supports I built a jig. This consisted of a small block of aluminium with slots milled out for the Plastruct strips. The strips could be slid into the slots and glued at the joints. I also invested in a small guillotine with adjustable stops, so that the strip could be cut quickly and accurately to length.

Before I embarked upon full mass production I built a small section of the bridge, consisting of two piers and vertical supports, together with the bridge deck, handrails, a short length of Peco track and a Terrier on top. This immediately showed an unexpected problem – the track. The track and sleepers looked over scale and out of place.

Closer examination of the photographs showed that the track was non standard. The load bearing sleepers ran under and in the same direction as the rails, with small lateral spacer beams every few feet, very similar to Brunel's broad gauge track but at standard gauge. The solution was to make from scratch. The wooden parts are again Plastruct and the rail is code 40, purchased from the 2mm Society. The rail is attached to the wooden support beam, which runs parallel to and directly under the rail, by chairs. These, again, came from the 2mm Scale Association, as sprues intended for one of their points kits. Unfortunately, I needed about 1000 chairs, with each one having to be threaded onto the rail, accurately spaced and then glued down. It is going to be a long time before I embark on constructing hand built track again.

Several months later I had 50 vertical bridge supports constructed. But they are not all that is required – there is also the swing bridge and its associated signal box. I've been frequently asked if the bridge actually opens, and in the interests of accuracy it doesn't. Fortunately, in the latter years of the bridge's existence the swing bridge was not operational. There are photographs of local yachtsmen having to capsized their boats by ninety degrees and swimming their boats through simply to avoid entangling the mast with the bridge.

Having neatly sidestepped the need to build a working mechanism there was still a lot of work needed to accurately reproduce both the swing bridge and the signal box. It is all scratch built, with quite a few hours spent cutting and gluing various bits of plastic, but made easier by having the proper dimensioned plans mentioned earlier. The swing bridge also makes a natural point at which to divide the model bridge in two for ease of transport, a seven foot model not being that easy to handle.

These is a mismatch in that the baseboards come in three equal four foot lengths while the bridge divides in two at the middle. So how is it all dismantled for transport? Magnets are the answer. The bridge is held down to the concrete piers by a plug and socket arrangement constructed from small circular magnets.

The concrete piers are modelled from balsa wood strips, which are glued to the baseboard. Where the two wooden verticals originally rose out of the concrete I have drilled two small holes and glued in place a 3mm diameter neodymium magnet. The magnets sit at the bottom of a recessed socket and are about 2mm from the top. On the wooden bridge supports I have glued 2mm diameter magnets and these act as a pin of a plug and fit into the holes in the piers. Using 2mm diameter magnets and a 3mm hole allows a small amount of slop to aid alignment.

The magnets are extremely powerful and make for a very effective joint. However, they

Using Super-glue

I used cyanoacrylate adhesive (CAA), probably better known as super-glue for gluing the magnets in place. Before embarking on this project I never had much luck with this type of glue, agreeing with the common refrain that it stuck fingers effectively but not much else. By chance I met the owner of a specialist adhesive manufacturing company, Bondchem, who explained that there were various grades of CAA, with much of what is available to the consumer being made of cheap raw materials in the far east. He sent me a pack of his product and the difference between that and the consumer adhesives I had previously used was huge. I've taken to gluing many things on my railway with a drop of this adhesive applied with the tip of a cocktail stick. So, if you've been cursing the super glue purchased in a pound shop try some of the more exotic expensive products – there is a real difference.

The History of Langston Bridge

Langston Bridge connected Hayling Island with the mainland. Hayling Island lies on the south coast of England, a few miles to the east of Portsmouth and is separated from the mainland by a narrow strip of water approximately 1000 feet wide.

The island was first connected to the mainland by a frail road bridge in 1824. In 1859 the London and South Western Railway reached Havant, the nearest town to Hayling Island on the mainland. Local business interests formed the Hayling Railway Company in 1860 with a view to constructing a branch line from Havant to Hayling, the main settlement on the southern end of the island. Construction funds were in short supply and much of the route was across difficult terrain on the island so the bridge across the water to the mainland village of Langstone was built as cheaply as possible. Note that although the village name is spelt with an 'e', while the station serving the community and the the railway bridge have always lacked this final letter – perhaps another minor economy measure by the railway?

In 1867, after a few false starts, the line finally opened to passenger traffic. The railway bridge ran roughly parallel to the existing road bridge and was of very similar wooden construction. Both bridges featured a swing bridge in their centre to allow for the passage of local boats. As already mentioned, the road bridge was a flimsy affair, with the maximum permitted vehicle weight a shade over six tons. Until its replacement in 1956 buses were limited to no more than 13 passengers, any more than this being forced to walk across. Although the newer railway bridge was more substantial, it too was subject to a relatively low weight limit which prevented the use of anything heavier than a 28 ton Terrier tank locomotive. Apart from a few obscure locomotive types used in the early years, the Terrier has been the only locomotive type used right up until the line's closure.

Originally the bridge was entirely of wooden construction but it was soon found that the tidal currents were damaging the vertical underwater supports. The problem was solved by encasing the supports in concrete up to the high water mark. The concrete structures proved to be extremely strong and remain in place to this day. When the bridge was demolished attempts were made to remove the concrete piers by the use of explosives but this proved to be entirely unsuccessful leaving only minor damage to two supports.

The approximately ten mile single track branch ran an intensive service, latterly serving holiday traffic as Hayling Island developed into a popular seaside destination. The bridge, however, was to be the line's undoing. By 1963 the bridge was in need of expensive repair, and despite the line operationally breaking even it fell victim to the then current fashion of closing branch lines. The final train ran in November 1963 and the bridge was demolished in 1966.



This photograph by Grahame Hedges, all remaining photos (on pages 49 & 50) are by Julian Thornhill

are pulled apart reasonably easily, making it simple to lift the bridge from the baseboard. For transportation I obtained a long thin cardboard box and stuck a thin steel plate inside the box. The bridge simply sticks to the plate with its magnets inside the box.

The bridge deck is also constructed with Plastruct. I laid every single deck plank as an individual plastic strip as I could see no other way to obtain a pleasing representation of a planked deck. Once the deck was in place I ended up with a long thin bridge like structure, but in gleaming white. Next was to make it look like a wooden bridge.

After a bit of experimentation, I found that painting the different surfaces in slightly different shades of brown gave a realistic effect. Therefore, the vertical supports are a different shade to the bridge deck and the deck top is lighter than the deck underside. I used matt acrylic paint applied with an airbrush. However, I'd never used an airbrush before, and despite reading a lot on the subject I decided I needed someone to teach me how to use one. I found that Hobby Holidays offers weekend courses and booked myself onto the beginners course. I became an expert at painting empty dog food tins, this being the preferred learning aid.

Next to tackle was modelling the water. Fortunately there are no great waves around the bridge, the area being an almost enclosed sheltered body of water. Also, the sea is not bright blue, it not being the brilliantly lit Mediterranean. In the end I painted the baseboard a grey blue and added patches of slightly more intense blue with the air brush. This represents the patchy cloud covered illumination that is often found on the south coast. I then applied six coats of cheap Wilko acrylic varnish which creates a pleasing watery reflective effect.

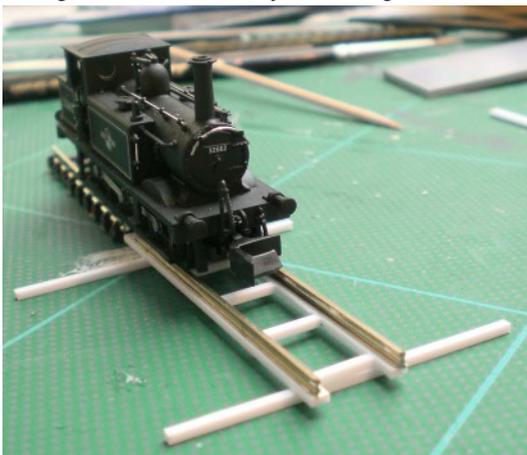
The back-scene is probably the part of the layout that has given me the most pause for thought. The background of the prototype is just sky in the distance. My back-scene is just a few inches behind the bridge, the baseboard being only two feet wide. Back-scenes with a bright blue sky with white fluffy clouds rarely look right, especially when they are not several feet in the distance. In the end I plumped for a plain blue grey card, in an attempt not to draw attention away from the bridge to a

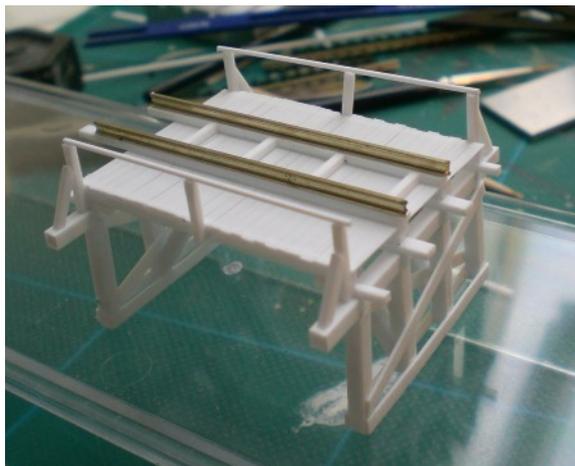


Above : *The bridge supporting concrete pier remnants.*



Above : *The remains of the bridge swing mechanism protective bulwark and support.* **Below :** *Building and testing the hand-built track for the bridge.*





Above : *The test build section of the bridge.*



Above : *Trial running over the completed and painted bridge although not yet located on the piers. Below :* *The land areas and sea take shape as the layout nears completion.*



poorly executed sky representation. The reaction to this at exhibitions is roughly split half and half between those who think it is exactly the right approach and those who think I need a better back-scene.

Operationally, the layout is very simple, being just a large oval of track. At each end of the bridge the track disappears through a hole in the back-scene and returns at the back of the layout. I've broken the track supply into two regions, the visible and the hidden areas. The hidden area section is fed with one DC controller and the visible with another. The controllers' speeds are set such that the train runs slowly across the bridge and then races round the back, ready to cross the bridge again as quickly as possible. This keeps a moving train in view for the audience for as long as possible and keeps people's attention at exhibitions.

The layout had its first outing at Hayling Island, this being the first ever show that I've exhibited at. I was somewhat apprehensive about the reception I might receive, given that the audience was a mixture of railway modellers and locals who know the area. Happily everyone was most kind and complementary, including a gentleman who said he used to drive Terriers across the bridge. I've since exhibited at Bideford, thanks to an invite from Maurice at Osborn's Models, and recently at TINGS in Leamington. The latter was a really nerve wracking experience – yes it is possible to get stage fright with model railways – given the specialist knowledge of the audience and the quality of the other exhibits. However, again everyone was most kind and I enjoyed the experience once the show got underway.

Finally, I've found that the bridge is very hard to photograph. Yes, it is possible to capture some fine close up shots, but pictures of the whole bridge just look like a long thin stick. Looking at the model in the flesh, so to speak, is quite a different experience. I haven't quite worked out why perception differs so greatly. This is clearly an excuse for us all to get out to more exhibitions.