Ovingham Bridge Blog – September-December 2014

3 December 2014

What's the tent for?

The tent is to provide containment, so lead based paint is not released into the atmosphere nor the river beneath. It will cover the whole length of the bridge once complete.

Once the bridge has been grit blasted the enclosure will come down to reveal the bare metal of the bridge. Once this is done repairs which have been uncovered by grit blasting will be carried out.

Photograph taken 24 November 2014

This is not an enclosure to keep the work men warm and dry! The enclosure is to contain lead based paint, once grit blasting of the truss starts. The truss has had approximately twenty coats of paint applied to it over its life. This is the first time all of those coats will be removed.

Photograph taken 24 November 2014

Taken inside the enclosure.

Note the scaffolding structure inside to provide a frame for the sheeting. The white floor is a corrugated plastic with taped joints. This provides a watertight enclosure for wet grit blasting. The water helps to suppress the lead in the atmosphere once it's released from the bridge. Lead is a highly toxic substance both to humans and wildlife. All work to enclose the bridge has to be done with permission from the Environment Agency.

15 November 2014

Why are the walls coming down?

There are two reasons for taking the walls down:-

To provide formal articulation to the bridge. This means allowing it move under thermal effects, when it heats up in the summer the bridge expands around 50mm (2"). In practice this means replacing the 130 year old simple bearing plates with modern bearings to allow full expansion and contraction of the bridge. This expansion occurs at both ends of the bridge due to the way it was constructed. The change to the bearings will be accompanied by formal movement joints at both ends of the bridge.

The existing cross girder arrangement at the abutment meant the last support for the deck was supported from the abutment (land), rather than the bridge. So this prevented the bridge from moving correctly under thermal effects, as described above. In order to provide the space to connect a cross girder to the truss, the existing bearing shelf has to be lowered.

Photograph taken 19 February 2013

General view of approach walls at Ovingham end

Photograph taken 12 November 2014

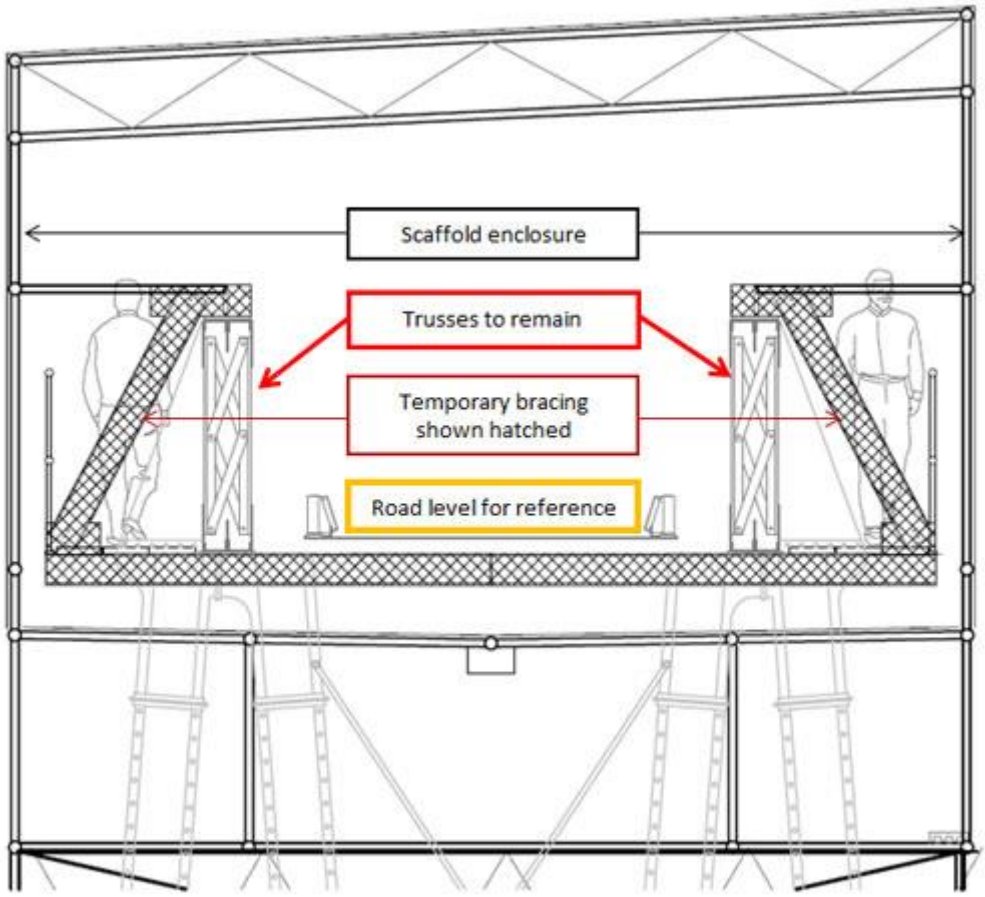
Wall and width restriction partially removed behind the truss nearest the footbridge. See photograph below for detail of corrosion at base.

Photograph taken 12 November 2014

End stiffener badly corroded at its base. There are four of these in total, each will be replaced. The truss has to be grit blasted to remove the lead based paint, prior to carrying out any repairs.

14 November 2014

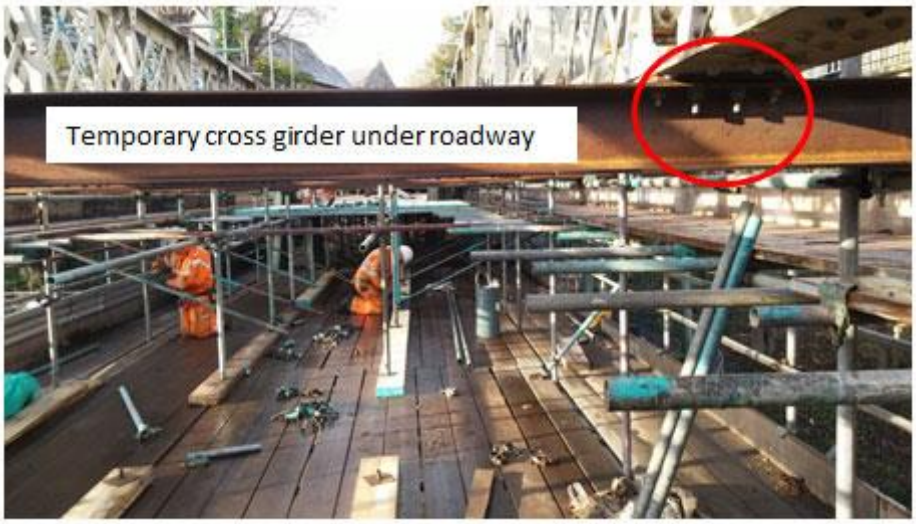
Demolition and temporary bracing



Scaffold enclosure, showing temporary bracing

Photograph taken 27 October 2014. The roadway to span 1 (nearest Ovingham) has been removed showing temporary bracing (five furthest away) and existing cross girders (two nearest).

Photograph taken 12 November 2014 showing knee braces along upstream truss. Note scaffold level is now within 500mm (20”) of the old road level.



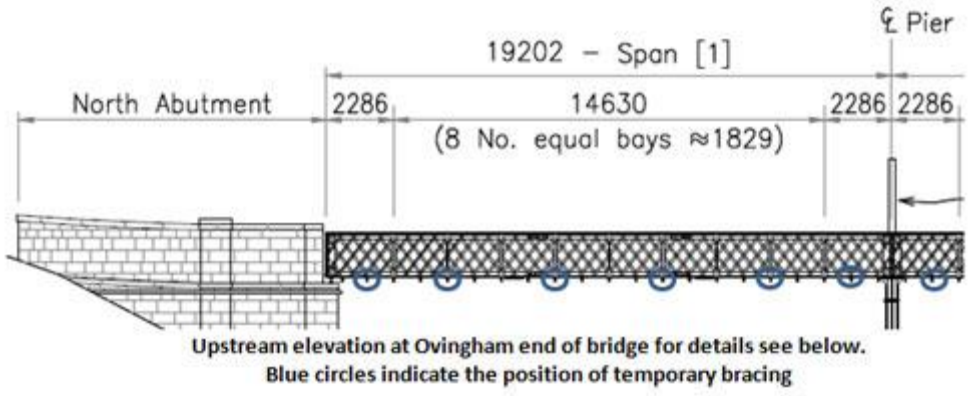
Photograph taken 12 November 2014 Scaffold beneath the road is being constructed. For connection detail (within red circle) see photograph below.

Photograph taken 27 October 2014 Connection detail between painted truss and temporary bracing.

Four Tension Control Bolts have been torqued and are marked to denote they have been installed correctly.

16 October 2014

Why are localised points along the truss being painted?



Upstream elevation at Ovingham end of bridge for details see below.
Blue circles indicate the position of temporary bracing

Refer to the blog dated 15 October, which gives the extent of the area to be prepared, repaired and painted.

The areas being painted are at temporary bracing positions. The temporary bracing is installed to ensure the trusses remain stable. The critical load case is when the painting enclosure is loaded by wind. The painted areas will be covered by steelwork elements for the remainder of the scheme.

17 Sept – pattress plate and bottom chord soffit painted

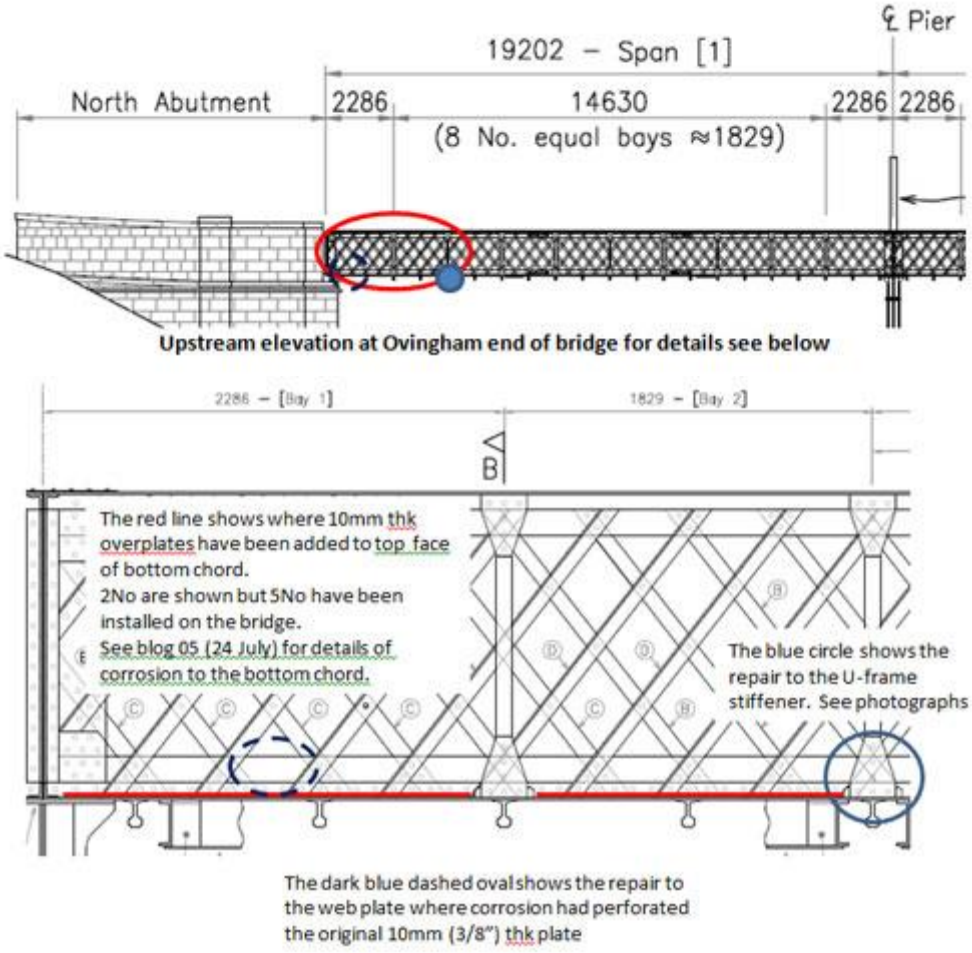
Elements already painted will be masked during the grit blasting phase. The mask will be set within already treated areas.

So will the final colour of the bridge by grey?
No the final colour of the bridge will be Dark Green. This was its original coating.
How was this determined?
Examination under microscope of the existing paint demonstrated there were approx twenty coats over the bridges' lifespan.
The original colour was Dark Green.

19 Sept – bottom chord soffit after repair and painting
The holes are for a c ross girder and have yet to be reamed out.

15 October 2014

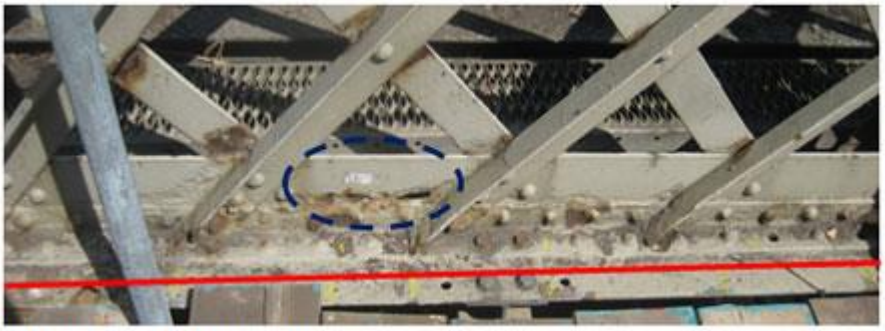
Repairs to span 1 (nearest Ovingham)



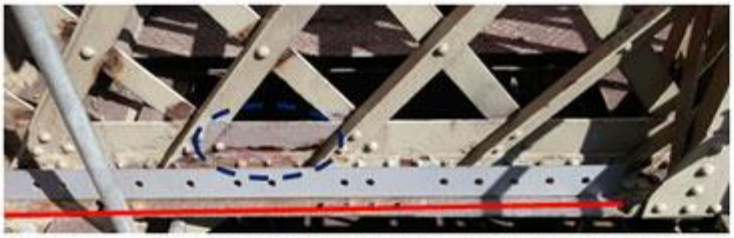
Detail to upstream elevation at Ovingham end of bridge showing extent of repairs

Members called off as B and C are flats, members called off as D and E are angles

10mm thk overplates (red lines) and web plate repair (dark blue oval)



July 2014 – initial inspection



28 August – web plate after needle gunning to remove lead based paint and loose material. Over plate offered up to bottom chord to ensure holes match between existing and new elements.
New holes cannot be drilled into the bridge as this weakens the original structure.

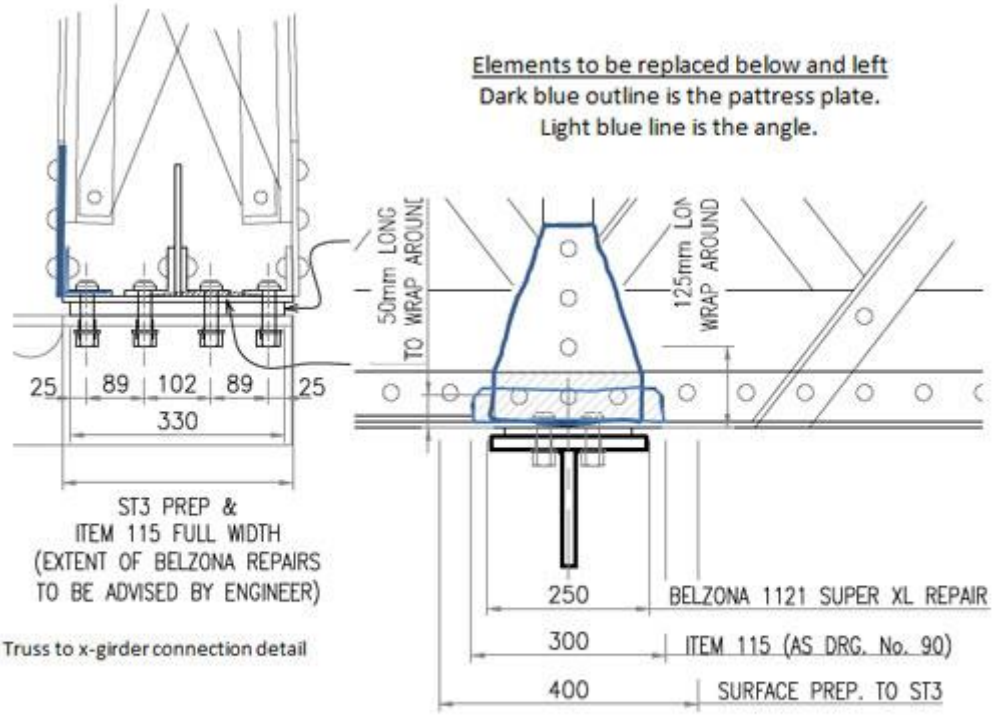
25 Sept 2014 – repair after installing Belzona, note 10mm thk overplate to bottom chord is now installed

26 Sept – web plates installed (both faces), with 10mm thk overplate beneath

U-frame stiffener repairs

The U-frame stiffeners provide stiffness to the bridge and help to provide restraint to the truss. This, in turn, makes it stronger.

Replacement of the U-frame stiffener elements require the top and bottom chords (1.5m (5') apart) to be propped.



Truss to x-girder connection detail

Truss to x-girder connection detail, showing permanent x-girder.
See photo dated 29 August for the marked up surface preparation

29 August - yellow chalk shows the extent of surface prep required at the U-frame stiffeners

This U-frame stiffener is at location T2, which is the second temporary bracing frame from the Ovingham end of the bridge. It has to be repaired before the temporary bracing goes in because it provides bracing to the trusses, so they remain stable when the deck (what was the road) is removed.

10 October – existing pattress plate and angle replaced with new elements. Note angle is not yet fixed to bottom chord.

14 October – Pattress plate and angle fixed to bridge. Belzona repair metal used to provide a good contact between all elements.

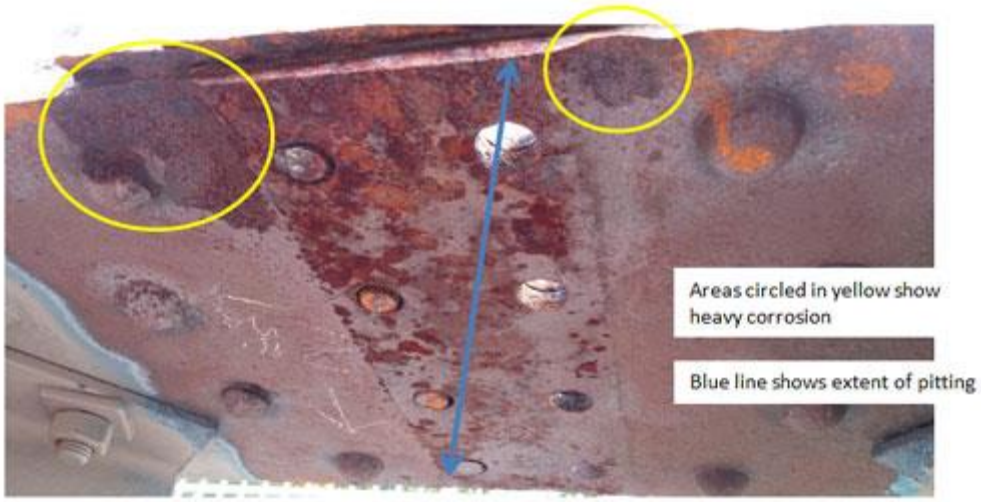
All of these repairs have to be completed prior to commencing demolition.

15 September 2014

Difference in condition of underside of truss at cross girder positions

Photograph ref A above taken 11 September 2014 showing cross girder removed and finished surface preparation to underside of truss.

The 130 year old plate has survived well. The prepared plate shows no evidence of pitting or corrosion.



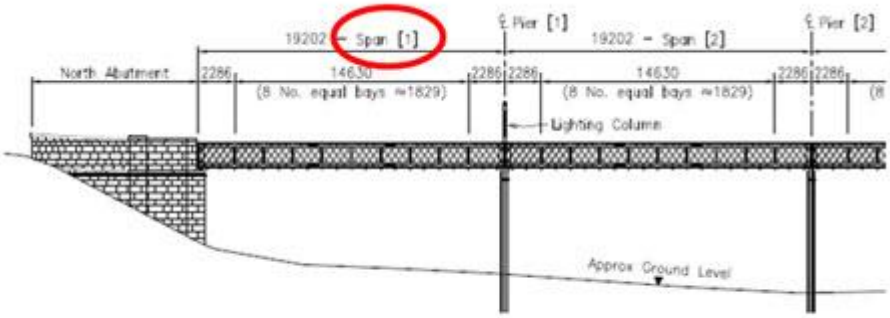
Photograph ref B taken 11 September 2014 showing cross girder removed and surface preparation to underside of truss, at a different position to photo ref A.

Note heavy pitting and extensive corrosion at the cross girder position.

This variation is typically due to inclusions within the wrought iron which were not removed during the manufacturing process.

All the corrosion and pitting shown in photograph ref B will require repair, while photograph ref A will not.

9 September 2014



Upstream elevation at Ovingham end of bridge

Photographs below were taken on the underside of the truss in span 1

Photograph ref A taken 29 August 2014 showing cross girder removed and surface preparation to truss soffit

Photograph ref B taken 2 September 2014, showing repair to truss soffit

The two photographs show before and after, where repairs have been undertaken to the underside of the truss.

Photo ref A was taken following cross girder removal and surface preparation using a vacuum blast.

The vacuum blast controls the release of the lead based paint.

Photo ref B was taken after applying repair material to the prepared area.

The partial repair sequence is detailed below, and must be repeated for each span before commencing full demolition of the same span. All this is required because once the temporary bracing is installed these contact points will be inaccessible until the new deck is installed;

It is a time consuming process because each of the twelve contact points per span require:-

Removal of cross girders from bottom of truss at temporary bracing positions;

Prepare surface while controlling the release of lead based paint;

Main truss plate thickness measured by Engineer;

Repair material applied as directed by Engineer; (This activity is weather dependent.)

Check cured repair material has achieved the required plate thickness;

Ream out holes for bolts;

Abrade repair material to provide key for paint;

Apply paint; (This activity is weather dependent.)

Once painting has been completed, demolition of span 1 can commence.