

Broadway Station Footbridge – Current Situation and Proposed Forward Action Plan as at 31st December 2014

Current Situation

Main Span - this is now at Broadway. The four metal hoops which supported the roof have been removed as has all other timber and electrical conduit. A timber frame is currently being constructed, which it is intended, will support a plastic sheeted cover, thus allowing shot blasting, painting and some reconstruction work to be undertaken protected from the elements.

Tower Supports (2) – these are now at Broadway. The metalwork is badly corroded and it is thought beyond economical repair. In addition these were gas cut at the time of their recovery causing further damage. The overall height of the footbridge, as originally designed, does not meet the required structure gauge. The hoops which matched those on the main span and which supported the roof, are generally in good condition. It is intended to remove these and reuse them but attached to two new towers.

Staircase Trestles (2) – these are now at Broadway. These were gas cut at the time of their recovery and are not high enough to meet the required structure gauge. It is intended to scrap these and construct new trestles to the required height.

Staircases (2) – these are still at Wishaw and have recently been boxed in by pway materials, thus preventing attempts to relocate these to Broadway. It is hoped that these will be moved to Broadway in January and located in the car park area which is currently being prepared. N.B. because these have been positioned lying down it has not been possible to inspect the underneath of these units. However there is known to be some wastage to the main stringer beams at the lower ends and at the upper ends, the plates which attach to the towers, also require remedial work.

Consultancy Reports

Jonathan Symmonds has undertaken two assessments on the footbridge. The first has shown that the footbridge as designed and when in new condition, would meet all anticipated loading requirements. The second was a comparison with modern standards to which the footbridge will need to comply. This has raised two prime areas of concern i.e. the need to meet the current structure gauge and also to raise the parapet height to a minimum of 1.5 metres above maintained walkway.

A formal review meeting is scheduled to take place with Jonathan Symmonds on 19th January at which the way forward, including further consultancy design works, will be agreed. These design works when completed, should then enable firm estimates to be obtained for the manufacture of the new towers and trestles, together with the remedial works necessary on the main span, and the complete foundation details. The estimated cost for the next stage of consultancy work is £7,000.

Further Consultancy Work

It is proposed to progress this project with further consultancy work as follows:

- 1) Hold a review meeting at Broadway to resolve how to meet the structure gauge and parapet height requirements.
- 2) Undertake structural calculations to strengthen the main span and to produce the relevant drawings to enable a steel fabricator to quote for this work. Included in this should also be details for the two new smoke shields and their fixing arrangements. Also in this work provide design details for the staircase stringer and tower hoop repairs.
- 3) Undertake structural calculations and produce the relevant drawings for two new towers, such that a steel fabricator could quote for this work. Included in this should be the additional height requirement.
- 4) Undertake structural calculations and produce relevant drawings for the two new staircase support trestles, such that a steel fabricator could quote for this work. Included in this should be the additional height requirement.
- 5) Produce design drawings for the foundations and the fixing arrangements thereto for the two towers, the two staircase trestles and the main staircase support posts at the bottom of the stairs. Again sufficient detail is required in order to obtain quotations for these works.

Additional Detailed Design Issues

There are a number of design issues that require further consideration. Whilst it is the intention to restore the footbridge to its original appearance, there is also the opportunity to address some of the ongoing maintenance issues. For example using new galvanized steelwork and by covering the roof panels with a plastic finish would prolong their longevity. Similarly using led light fittings would reduce running costs and require less frequent replacement.

The following is a list of the key areas that have been identified for further consideration:

- 1) Main span roof – this was originally constructed using galvanised sheeting in 18swg (1.219mm) with a 5 in. pitch. It appears to have only been attached to the timbers supporting the guttering at the edges. I have been advised that it is no longer possible to obtain this material. The most likely sheeting is now 3 in. pitch and probably in either 20 swg (0.914mm) or 22 swg (0.711mm). There is also an issue as to whether it is possible to bend this material to the tight curve which exists at the top of the roof. The new Williton footbridge on the WSR uses straight sheets with capping pieces. It also has some additional bracing steelwork between the hoops to which these straight sheets are attached. If a plastic coating is to be used this will also affect the thickness of the sheet to be used. A wooden template is being produced, which I intend to take to SLE Cladding in Whitchurch, and who have

been recommended by David Redfern (DR), in order to see what bending can be achieved.

2) Main span guttering – this was originally in OG profile 5 in. wide cast iron. However this same profile can be obtained in either an aluminium or a plastic finish at reduced cost. The HIA footbridge ended up with aluminium guttering. Cast iron is still available from the Hargreaves Foundry in Halifax according to DR.

3) Lighting – as mentioned previously consideration should be given to the type of light fitting to be used from a visual as well as a maintenance/running cost point of view.

4) Main span walkway timber – the main structural timbers have been removed. There are two which need replacing as these are badly warped, and approx. six lengths were missing. However we have recovered more than enough timber to replace these. The HIA footbridge timbers had been covered with plywood sheeting to which a non-slip “roofing” type of material had been attached. There were also drainage holes at intervals fitted with “plug hole” fittings. Should this additional protection be re-instated?

5) Main span smoke shields – I have no doubt that these will be required and a suitable design for constructing and fixing these to the main span will be required which meets the current structure gauge.

6) Towers – I believe that two new towers are required high enough to meet the current structure gauge. Whilst these are likely to be of welded construction there is the option to provide some additional bolts with rivet style heads which at least from the outside would look more like the original. There is also a requirement to provide a solid panel at either end of the towers where the original through footpath existed. Consideration should be given to making this solid panel to full height, in order to protect the flooring from the elements and to give some privacy to the B & B.

7) Trestles – same comment as above, regarding new construction.

8) Staircases – the existing handrails are too thick to meet current standards. Sufficient brackets have been recovered and it is proposed to shot blast and re-use these but with a new wooden handrail with a thinner diameter.

9) Staircases – it will be necessary to gain additional height in order to meet the current structure gauge. These units bolt onto the main span at the top. There appear to be two alternatives. Either raise the staircases up by one or two steps at the bottom, or add an additional step in at main span level. By going for new towers and trestles this additional height can be designed into these units as necessary depending on which option is chosen. My preference would be to add an additional step at the foot of each staircase and there is sufficient length on the main supporting posts to achieve this.

10) Drainage – this footbridge will collect a large amount of water and it will be necessary to provide for a proper surface water disposal connection into the main centre drain. This may affect the foundation design.

11) Electrical – in addition to the footbridge lighting requirements themselves, consideration needs to be given as to how this connects into the wider issue of station lighting generally and from where it is controlled.

12) Cable routes – the footbridge has the potential to provide a cable route facility between platforms for both domestic power as well as S & T cabling. The requirements for cable routes need to be decided early on, and if both are required then two separate cable route facilities of sufficient size should be provided.

13) Station canopy interface – the original footbridge supported the main station canopy. Whether this feature is desirable needs to be considered and taken account of as necessary. However the canopy should extend to reach the bottom of the staircase even if it is not attached to it.

14) Painting scheme – there is the choice to go for either GWR or a BR (WR) colour scheme. I would prefer GWR which is a mixture of Light and Dark Stone colours as supplied by T & R Williamson of Ripon. This is the scheme adopted by the SVR on Bewdley station footbridge and Kidderminster SB.

15) Parapet Height – This will require raising to meet current standards. One possible option is to provide a "picture frame" arrangement in timber. This also has the advantage that it will provide some additional protection against the elements. These frames could be filled using glass, plastic or timber. The original Broadway footbridge did not have this feature but the HIA footbridge did.

Manpower Issues

In view of the structural issues involved it will be necessary to use professional contractors to undertake a number of the key activities such as steelwork repair, erection, craneage and transport, in addition to any design work.

Volunteer activities are likely to be restricted to supporting these activities and undertaking any dismantling of the staircase timber, removing the tower hoops, new timber work, fitting roofing, guttering and drainage as well as painting. It may also be possible to needle gun the staircase steelwork using volunteers, as this appears in generally good condition. As much as possible of the refitting is to be done prior to erection, to avoid working at height.

Provisional Order of Events

There is an urgent need to agree the outstanding design issues and to commence the further consultancy design works.

In the immediate future the following activities are required:

- 1) Complete the shelter for the main span
- 2) Remove the two hoops from the towers and position adjacent to the main span

- 3) Transport four trestles from Wishaw to the car park to support the staircase units
- 4) Re-locate the two staircases units from Wishaw to the car park, install security fencing and supporting scaffolding at the high end. Template staircase feet either at Wishaw or before positioning at Broadway
- 5) Provide a semi-permanent roof to the staircases using plywood recovered from the spare span, old handrails and tarpaulins
- 6) Obtain a container in the car park and recover all materials from the Wishaw container

Once the design work is completed arrange quotes and appoint appropriate contractors for shot blasting, construction of the new steelwork and repairs to the main span, the roof support hoops and the staircase main stringers.

- 7) Then once we have a steel fabricator on board commence shot blasting of the main span together with its four hoops, the hoops from the two towers and the handrail brackets.
- 8) Commence new fabrication of the two towers, the two trestles and the two smoke shields.
- 9) Commence remedial repairs to the main span, the tower hoops and the two staircase units
- 10) Paint new towers, hoops, handrail brackets and smoke shields
- 11) Paint main span when access available and fit smoke shields and hoops
- 12) Fit out main span with walkway timber, roofing, high level woodwork and guttering
- 13) Excavate and construct the six foundation bases
- 14) Strip down the first (r/h) staircase unit, needle gun the metalwork and paint
- 15) Using the second staircase unit as a guide rebuild the timber and re-roof the first (r/h) staircase unit.
- 16) Paint the r/h staircase unit if not already done so as part of the rebuilding exercise.
- 17) Repeat steps (14), (15) and (16) for the second (l/h) staircase unit.
- 18) Attach the original hoops to the new towers and fit as much high level timber, roofing and guttering as possible.
- 19) Crane the towers into position on the appropriate foundation pad. Position the two new trestles at the same time.
- 20) Crane the main span into position, attach it to the two towers and attach the towers to their concrete foundations.

- 21) Transport and crane into position the first (r/h) staircase and secure to the r/h tower, the mid platform trestle and the foundation pads.
- 22) Transport and crane into position the second (l/h) staircase and secure to the l/h tower, the mid platform trestle and the foundation pads.
- 23) Complete the fitting out of the main span roof, guttering downpipes and drainage.
- 24) Install the main span and staircase lighting plus any additional above platform lighting, if not already done prior to erection.
- 25) Install any additional cable routes for domestic and/or S & T purposes.
- 26) Touch up any damaged paintwork.

The above is a somewhat condensed list of the main activities, and the order is very much a provisional one at this stage. Indeed it is likely that several activities will be ongoing at the same time. As usual progress will be governed by not only funding but also the skills and manpower available.

Health Warning

The paint used on this footbridge has a significant lead content. This must be borne in mind when working on it and gloves and face masks to P2 standard with non return valves should be used at all times when paint dust is in the atmosphere. In addition to limiting your exposure to such dust, good personal hygiene, particularly thorough washing including finger nails, must be practised so that there is no risk to eating contaminated food and/or drink. Overalls should be washed following exposure or alternatively "forensic" disposable overalls used. All paint fragments removed should be collected up and treated as hazardous waste.

Finally I hope this paper will get you thinking about this project. Nothing is cast in stone at this stage and all constructive suggestions will be welcomed.

Jim Hitchen

31/12/2014

