

HRE major work review template



Proforma for SAF consideration

Purpose – to document the results of the lens review undertaken for the identified structure and, based on this, offer recommendations for the proposed engineering solution for the structure.

The Structure

This section outlines the background to the structure and the issues identified with it.

Structure name	Asset ID	NH Priority Rank
Limekiln Road, Newton on Ayr	AYH/1	P3

Structure Type	Grid Reference	Date of last assessment	Date of construction	Date of decommission
Overbridge	NS 33959 23128	19/07/19	c. 1882	c. 1980

Brief description of structure

Structure AYH/1 is single span overbridge which carries a public road over the former Ayr Harbour Branch (Goods Branch) railway line. The available historic drawing of the bridge (dated 1935) records that it was constructed in c.1882

Historic Ordnance Survey mapping first records Limekiln Road and the bridge in c.1895.

Ayr Wet Dock was opened in 1873, and branch line to Ayr Harbour from a triangular junction with the existing lines meeting at Falkland Junction and Newton Junction. Coal trains were often marshalled in Falkland Yard before going to or from the dock. The dock had coal drops at the north end and sidings down both west and east sides. The line worked until the 1980s serving the Scottish Agricultural Industries Works sidings at the north end of the dock.

The bridge comprises four cast iron internal girders and two cast iron edge girders. Cast iron hogging plates span transversely between the girders. The bridge has span of 8.03m. The abutments and wingwalls are of coursed stone ashlar.

Identified issues with structure

Visual examinations confirm that the structure is still in 'Fair' condition. However, it's assessed capacity is lower than that for both BE4 and BD21 (CS454).

The bridge is on the route to the Salt pans Road access to the Port of Ayr, this route is currently unrestricted and avoids the alternative route which crosses the restricted (3Tonne mean gross weight) Bellrock Road bridge over the railway.

BE4 Assessment Conclusion – Babtie Group for Rail Property Ltd - August 2003

The internal beams were only found to be able to carry 11 ton vehicle load.

The edge beams were found capable of carrying 24 ton vehicle load.

The bridge fails the BE4 assessment.

After this BE4 assessment kerbs and footways were reinstated by the Council to limit the carriageway width and reduce the notional assessment loading to one lane; though the bridge still carries two lanes.

BD21 Assessment Conclusion – Jacobs for HRE - 19 July 2019:

The assessment demonstrates that the internal girders have sufficient capacity to support 7.5 tonnes assessment live loading and Group 2 FE loading, applied to the carriageway. The edge girders are capable of supporting accidental vehicle loading of 7.5 tonnes GVW on the verges. It is therefore, recommended the bridge is restricted to vehicles with a gross weight of 7.5 tonnes unless measures are taken improve the capacity.

The finite element analysis of the arched hogging plates shows that they are capable of withstanding 82.5kN wheel load effects and are therefore considered satisfactory for ALL vehicles to 40/44 tonnes.

Due to the lack of capacity of the girders, it is recommended the bridge be infilled to guarantee the long-term support of the road. Alternatively, a propping system could be considered.

The site suffers from anti-social behaviour problems. Although the solum is fenced it is frequently used by fly-tippers and the accumulated waste set on fire. Exposed cast iron elements can lose strength quickly when subjected to temperatures exceeding 300°C and the sudden cooling from firefighter's hoses can lead to failure from thermal shock.

Lens Review

This section documents the results of the lens review undertaken for the identified structure

 <p>New operational rail</p>	<p>Are there any identified linkages with English, Welsh or Scottish government new rail restoration programmes?</p> <p>None – the land to the south has been re-developed and the operational Ayr Harbour Branch lies to the north.</p> <p>Transport Scotland has been contacted – no response received to date.</p>
 <p>Heritage Rail</p>	<p>Are there any identified linkages with heritage rail restoration programmes?</p> <p>None – the former branch has been redeveloped apart from the c. 200m south of the bridge. The Ayr Harbour Line is still operational directly to the north of the bridge.</p>
 <p>Active Travel</p>	<p>Does the structure have potential to be repurposed for active travel use?</p> <p>Sustrans report confirmed that “: <i>Bridge only links into an area of live railway lines and a through route may be difficult to achieve due to development. South Ayrshire Council have confirmed they have no aspirations to use the bridge for active travel.</i>”</p> <p>The report’s recommendation was that AYH/1 “<i>Does not appear to have any value for active travel purposes.</i>”</p> <p>Route 7 of the National Cycle Route Network crosses over the bridge.</p> <p>Structure has known possible future use within a 20-year time span - Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
 <p>Environment and Ecology</p>	<p>Does the structure hold significant value in ecological terms?</p> <p>Part of Site of Special Scientific Interest – Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Within a conservation area - Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Within or near to a locally designated wildlife site - Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>One non-statutory designated site is present within 2km of the structure. The site is the River Ayr: Craigholm Park to Mainholm potential Local Wildlife Site (pLWS). The pLWS is not directly connected to the site at AYH/1 and no effects pathways were identified.</p> <p>Within or near to a local network recovery site - Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Any priority habitats in the vicinity - Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Any European Protected Species present - Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Ecological survey outcomes – The recommendations below were made following a tactile ecological inspection of the bridge in September 2020.</p> <p>Bats: No bats roosting and all features were found to be unsuitable for hibernation and so the entire bridge was able to be blocked.</p> <p>Barn Owl: A possible barn owl egg found on the ledge (failed breeding attempt) – precautionary approach to be taken here that it is a breeding barn owl site as we have observed a barn owl landing on the ledge under the bridge on a previous survey. Consultation with South Ayrshire Council agreed that in place of this a nest box could be provided to the council; for the Park Ranger Service to install at a more appropriate location for barn owl in South Ayrshire.</p> <p>Reptiles: When fly tipping under bridge gets removed for works an ECoW is to oversee this if the works are undertaken between November and March just to minimise risk for hibernating reptiles should they end up in piles of debris over winter.</p>



Heritage

Does the structure hold significant value in heritage terms?

Structure has significant Engineering / Architectural / historic merit - Yes No

Listed – Yes No

Locally listed - Yes No

Has the Historic Environment Record been consulted - Yes No

Rapid Heritage Assessment conducted - Yes No

Rapid Heritage Assessment outcomes –

The Overall Heritage Value of the bridge is **Low**.

The bridge is not recorded by the WoSAS HER as a non-designated heritage asset. While the bridge retains some limited historical and evidential interest as part of the former Ayr Harbour Branch (Goods Branch) railway line, it lacks any significant architectural or engineering merit to warrant any formal heritage designation.

However, it is a well-preserved and aesthetically pleasing example of a bridge over a goods line.

A sufficient photographic record of the bridge exists from the historic inspection reports to negate the need for any heritage mitigation. This photographic record could be shared with the WoSAS HER.

It is noted that planning consent for the infilling of the bridge has been granted, reference 20/01013/APP, and that no heritage concerns were raised.

Other factors and considerations

This section documents any additional factors or considerations that have been taken into account as part of the review for the identified structure

Are there any other factors that affect the structure or the proposals for it?	
No	
Have transfer opportunities been considered? If yes, with who and why discounted	
<p>Ayrshire Roads Alliance (the local highway authority) would only consider a transfer of the structure once the issues with its assessed capacity have been resolved to their satisfaction.</p> <p>Has the structure been offered to the local authority? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>Is there another suitable owner for the structure? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	
Is the structure protected under any Local Planning policies?	
No	
Any significant Stakeholder comments	
Local Planning Authority	<p>Planning Application 20/01013/APP was approved by South Ayrshire Council on 29/01/21. Works were initially delayed because a neighbouring property owner had registered a small piece of the land shown in DfT's title and to allow time for a water main diversion. The title issue has been resolved by including a small gabion basket wall to avoid the constructing an embankment on the affected land – because of the delay that change now requires a new planning submission.</p> <p>A further planning application will be made for the inclusion of the gabion basket retaining wall at the toe of the northeast embankment.</p>
Local Highways Authority	Ayrshire Roads Alliance offered no objections to the planning application.
Sub-national Transport Body	Not contacted.
Community	<p>The development proposal was assessed by the planning authority against the policies listed below and was considered to be in accordance with the development plan:</p> <ul style="list-style-type: none"> • LDP Policy: Spatial Strategy (Core Investment Town); • LDP Policy: Sustainable Development; • LDP Policy: Business and Industry; • LDP Policy: Newton on Ayr; • LDP Policy: Open Space; • LDP Policy: Natural Heritage; and • Modified Proposed Replacement South Ayrshire Local Development Plan (MPLDP2).
Other interested parties e.g. MP, Bat Group, local active travel groups, heritage groups etc	HRE met with Sharon Dowey MSP on 21.08.21 to discuss the retention of railway infrastructure in Ayrshire and AYH/1 specifically. The MSP was supportive of the proposed works at AYH/1.

Engineering Proposals

Based on the review work conducted, this section documents proposals for engineering solutions for the structure and highlights the recommended solution by HRE Engineers

Sustainable management considerations	
Structure forms a current transport link	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Structural deterioration issues	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Health, safety and/or environmental concerns	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Engineering options	Pro's	Con's	Estimated cost of remedy
Do Nothing	No cost	The bridge's assessed capacity is below that of the route. The bridge's visible condition is Fair but cast iron provides very little warning of failure.	£0
Steel propping to support the Cast Iron Beams	Removes the risk of a cast iron beam failing from a single localised fracture. Would provide 40 tonne Assessment capacity.	Failure of a cast iron beam or hogging plate would necessitate its replacement. Fire damage is still a risk. Additional maintenance requirement for the steel propping system.	£150k*
Steel propping of main beam and cast a replacement concrete deck slab	Removes the risk of a cast iron beam failing from a single localised fracture and replaced the cast iron hogging plates.	Disruption to the port's access and to services carried in bridge during construction. Failure of a cast iron beam would necessitate its replacement. Fire damage is still a risk to the beams. Additional maintenance requirement for the steel propping system.	£205k*
GRP plates to strengthen the Cast Iron beams	Would increase the capacity of the cast iron beams – analysis required to confirm what capacity could be achieved.	Failure of a cast iron beam or hogging plate would necessitate its replacement. Fire damage is a risk to the GRP plates and the cast iron elements.	£290*
Infill the structure forming an embankment.	Removes the need to examine the structure and the long-term risk of its unknown condition and capacity. Removes the risk of failure of a Cast Iron member, either beam or hogging plates. Negligible future or whole life cost issues. Works can be completed without significant disruption to traffic using the bridge.	Ongoing reduced maintenance liability for embankment and parapets.	£220k*
Provide a new bridge deck.	Removes the risk of having a cast iron deck and provides full assessment live load capacity.	Disruption to the port's access and to services carried in bridge during construction.	£495k*

**Prices are intended as rough estimates only*

Responsible NH Engineer	Colin McNicol
Date of proforma completion	26/09/22

Map and photos of site:



Figure 1 – AYH/1 - General Location



Figure 2 – AYH/1 – Location, Limekiln Road



Figure 3 – AYH/1 – View looking east over the bridge



Figure 4 – South Elevation



Figure 5 – Fire Damage to fence and gate



Figure 6 – Soffit view looking west



Figure 7 – Fly tipping below bridge



Figure 8 -Fly tipping below bridge.

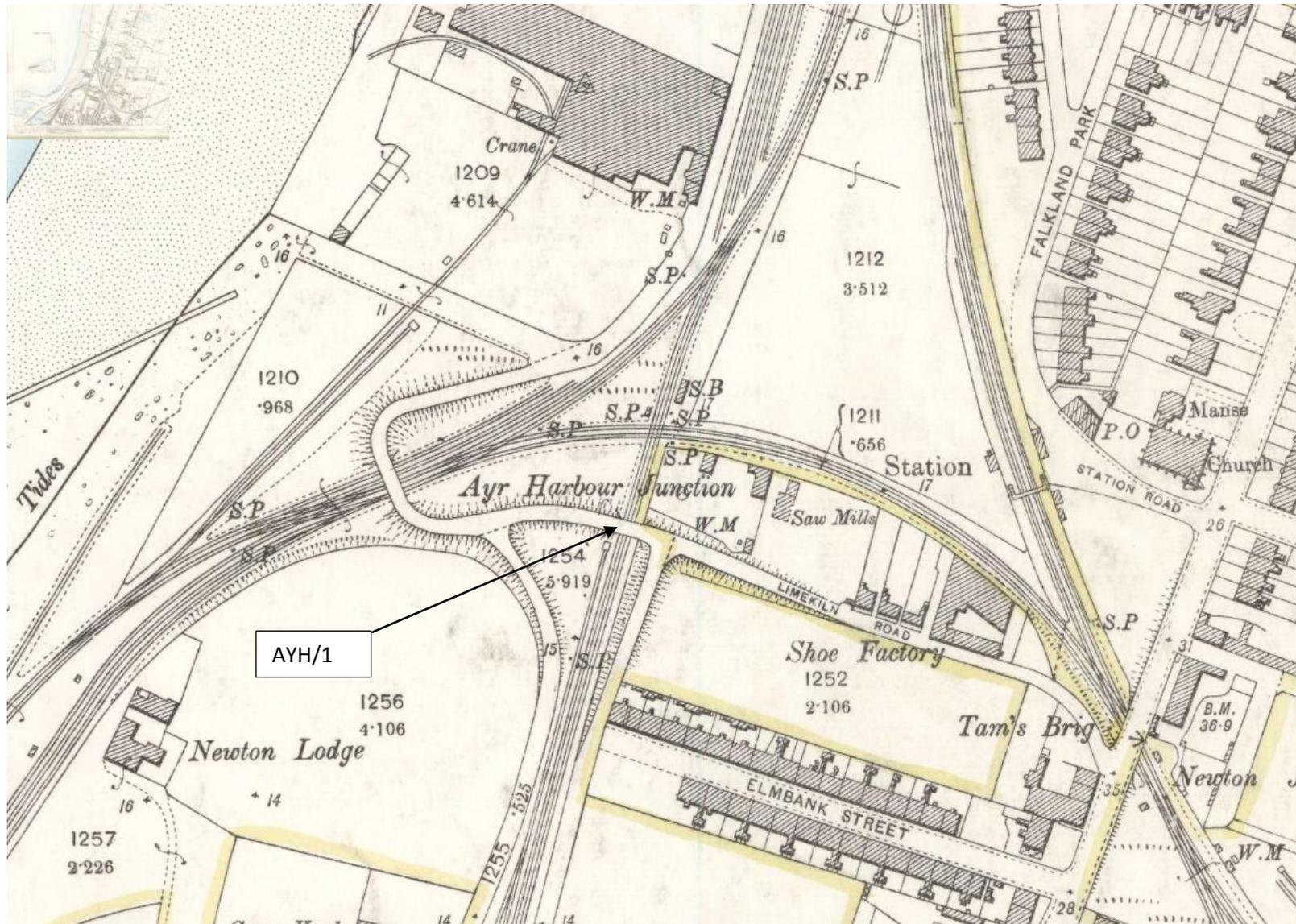


Figure 9 – Extract from 1895 OS map

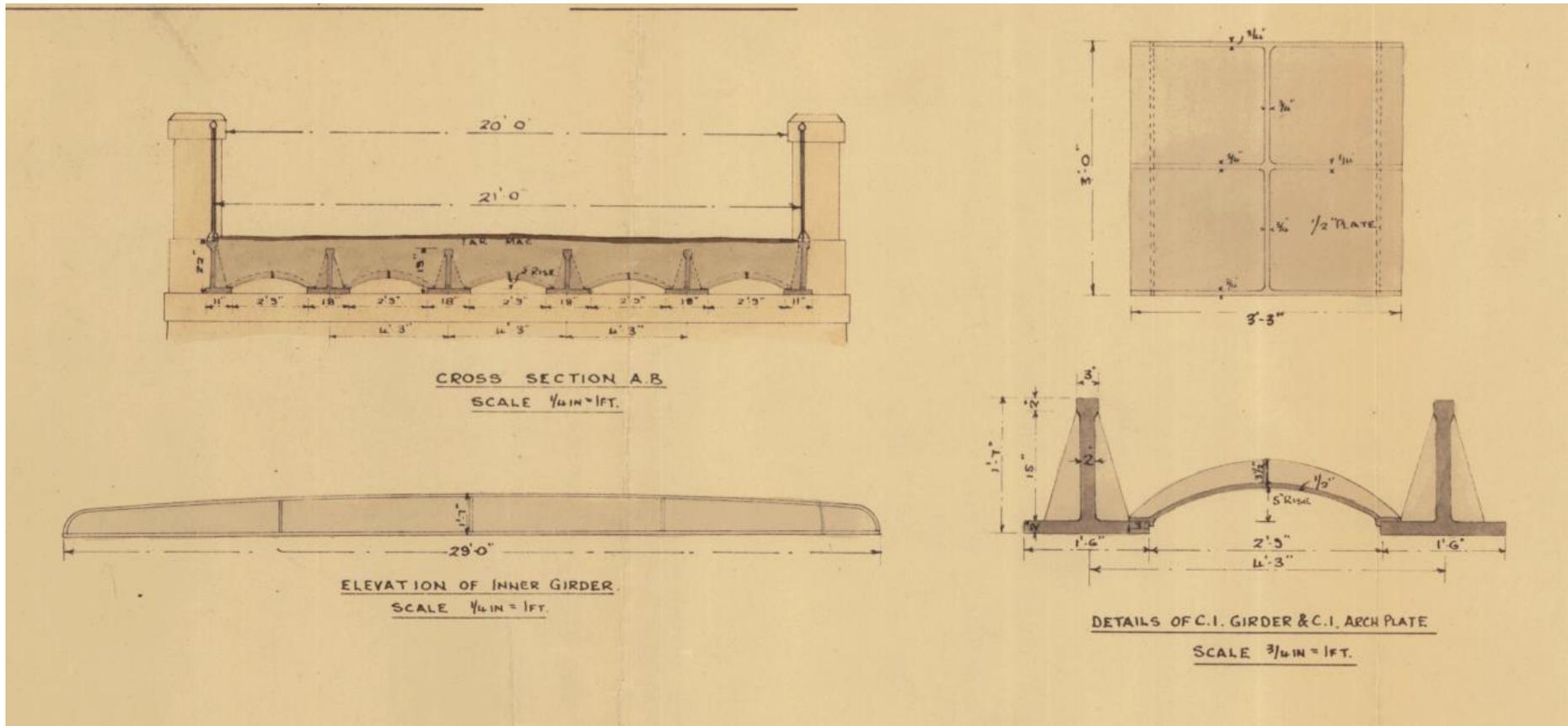


Figure 10 – Record drawing of AYH/1