

10 Cultural Heritage

This chapter presents an assessment of the potential impacts of the proposed scheme on cultural heritage assets comprising archaeological remains, historic buildings and the historic landscape.

The study area extended 200m from the proposed scheme. Baseline conditions were established through a desk-based survey and walkover survey. Designated cultural heritage assets up to 1km from the proposed scheme were included in the baseline where there was potential for impacts on their setting. In total, 34 cultural heritage assets were considered as part of the baseline, comprising 13 archaeological remains, 17 historic buildings, and four historic landscape types (HLT).

No significant effects were predicted for archaeological remains or the historic landscape as a result of the construction or operation of the proposed scheme.

Before mitigation, a significant potential effect during construction was identified on one historic building - the Kincardine Bridge (Asset 15; a Category A Listed Building). Mitigation proposed for this cultural heritage asset comprises an enhanced historic building recording. On completion of the reporting, analysis, publication and dissemination of the results associated with this mitigation, the residual significance of effect on this cultural heritage asset has been assessed to be Moderate. The requirement for the appointed Contractor to submit an assessment report of the bridge parapet panels to provide a detailed condition assessment of the affected panels and a justified rationale for the proposed approach to their refurbishment is also identified. During operation, a Moderate adverse and Moderate beneficial effect was identified on the Kincardine Bridge (Asset 15).

The potential for the presence of unknown archaeological remains below the Mean High Water Springs (MHWS) of the study area has been assessed to be medium. Where modern development is likely to have disturbed or removed archaeological remains that may have been present the potential for unknown archaeological remains has been assessed to be low. Archaeological recording during construction (an archaeological watching brief) will be undertaken to make a permanent record of any surviving unknown archaeological remains that may be identified.

10.1 Introduction

10.1.1 This chapter of the Environmental Impact Assessment (EIA) Report presents the cultural heritage assessment for the A985 Kincardine Bridge Refurbishment: Piled Viaduct Replacement scheme (hereafter referred to as the proposed scheme). The chapter considers the impacts of the proposed scheme on cultural heritage under the three sub-topics of archaeological remains, historic buildings and the historic landscape. To facilitate assessment, the historic landscape was divided into Historic Landscape Types (HLTs) defined as 'distinctive and repeated combinations of components defining generic historic landscapes' (Highways Agency, Transport Scotland, Welsh Assembly Government and the Department for Regional Development Northern Ireland 2007; Annex 7, paragraph 7.7.3).

10.1.2 This chapter is supported by the following figures and appendices, which are cross referenced where relevant:

- Figure 10.1 (Locations of Archaeological Remains and Historic Buildings);
- Figure 10.2 (Locations of Historic Landscape Types (HLT));
- Figure 10.3 (Potential for Unknown Archaeological Remains); and
- Appendix A10.1 (Cultural Heritage Baseline Report).

10.2 Legislation, Policies and Guidance

10.2.1 Details of relevant legislation, planning policy and best practice guidance for cultural heritage are provided in Section 2 of Appendix A10.1 (Cultural Heritage Baseline Report). An assessment of the

compliance of the proposed scheme against policies relevant to cultural heritage is reported in Appendix A4.1 (Assessment of Policy Compliance) and a summary is provided in Section 10.9 (Assessment of Policy Compliance) of this chapter.

10.3 Need for the Scheme and Listed Building Consent

- 10.3.1 The piled viaduct was assessed as substandard as early as 1983 and a subsequent report proposed its replacement (Sir Alexander Gibb & Partners 1987). In 1992, as an interim measure, a steel propping system was installed beneath the deck of the existing piled viaduct to provide structural support.
- 10.3.2 An Improvement Options Report was prepared in 2007 (Jacobs 2007) which recommended that the piled viaduct be replaced for the following reasons:
- The original superstructure has insufficient load carrying capacity, with the deck slab and transverse beams having insufficient strength.
 - The original substructure is unsuitable for incorporation into the refurbished bridge owing to the poor condition of the visible portions of the substructure piles. Furthermore, the condition of the buried portion of substructure piles cannot be assessed.
 - The steel propping system is unsuitable for incorporation in the refurbished bridge.
- 10.3.3 The need for the proposed scheme and the alternatives considered are presented in Chapter 2 (Need for the Scheme and Consideration of Alternatives).
- 10.3.4 The proposed scheme will keep Kincardine Bridge in its intended use in the long-term and ensure it continues to benefit from on-going maintenance, preserving the way it is understood, experienced and appreciated. In this respect, the proposed scheme aligns with national policy (HEP2, 3 and 4 of the Historic Environment Policy for Scotland; HES 2019a), including securing the bridge for present and future generations. This also aligns with Policy PE07 of the Falkirk Local Development Plan 2 (Falkirk 2020). Detailed information is provided in Appendix A4.1 (Assessment of Policy Compliance) with a summary provided in Section 10.9 (Assessment of Policy Compliance) of this chapter.
- 10.3.5 As the Kincardine Bridge is a Category A Listed Building the proposed scheme will require listed building consent and the works will be carried out in accordance with the conditions attached to such consent.
- 10.3.6 The listed building consent application will provide a description of the temporary bridge structure and indicative construction methodology, as well as details of the design and construction of the new piled viaduct and a justification for the replacement of any historic fabric. The application will include drawings illustrating the proposed general arrangement of the new piled viaduct, including materials and finishes, as well as the indicative layout of the temporary bridge structure and the proposed join between the two structures required during construction.

10.4 Approach and Methods

- 10.4.1 The assessment was undertaken based on the guidance provided in DMRB Volume 11, Section 3, Part 2, Cultural Heritage (Highways Agency, Transport Scotland, Welsh Assembly Government and the Department for Regional Development Northern Ireland 2007; hereinafter referred to as HA208/07)¹. Both designated and undesignated cultural heritage assets have been included in this assessment. A

¹ While the DMRB Volume 11 guidance was updated during the production of this Environmental Impact Assessment Report (EIA Report), and included the publication of the LA 106 (Cultural Heritage Assessment; Highways England, Transport Scotland, Welsh Government and the Department for Infrastructure Northern Ireland 2020), the approach presented in LA 106 would not have materially changed the results of the cultural heritage assessment presented in this chapter. For further information on the rationale for using HA208/07 for the cultural heritage assessment refer to Chapter 4 (Overview of Assessment Process).

cultural heritage asset is defined as an individual archaeological site or building, a monument or group of monuments, historic building or group of buildings, or a historic landscape which, together with its setting (where relevant), can be considered as a unit for assessment.

- 10.4.2 Due to the potential for significant effects (Moderate or greater significance of effect) on the Kincardine Bridge and archaeological remains, a detailed assessment as defined by HA208/07 was undertaken for archaeological remains and historic buildings comprising a desk-based survey and a walkover survey (Appendix A10.1: Cultural Heritage Baseline Report).
- 10.4.3 Given the limited rarity, time-depth and nature of the historic landscape, a simple assessment (as defined by HA208/07) was considered proportionate to assess the potential impacts that may result from the construction and operation of the proposed scheme on the historic landscape. This comprised a review of information already gathered at the scoping stage.

Study Area

- 10.4.4 Based on the guidance provided by HA208/07 (Annex 5, paragraph 5.4.1) the study area for archaeological remains was defined as the footprint of the proposed scheme and any new land-take plus an area extending 200m in all directions from it. For the purpose of this assessment, this study area was also used for historic buildings and the historic landscape.
- 10.4.5 Guided by Managing Change in the Historic Environment: Setting (HES 2016), and based on professional judgement, designated cultural heritage assets up to 1km from the proposed scheme were included in the cultural heritage baseline due to the potential for impacts on their setting. Further information on this approach, including a list of designated cultural heritage assets included in the cultural heritage baseline, is presented in Appendix A10.1 (Cultural Heritage Baseline Report; paragraphs 3.3 to 3.5).

Baseline Conditions

- 10.4.6 Baseline conditions were established through a desk-based survey, including consultation of the following sources:
- the National Record of the Historic Environment and local Sites and Monuments Records;
 - records held at national and local archives;
 - historic mapping;
 - aerial photographs held by the National Collection of Aerial Photography (accessed 29 October 2018),
 - results of archaeological monitoring during ground investigations and factual report for the proposed scheme (SOCOTEC UK 2019);
 - a walkover survey and a windshield survey (undertaken 15 November 2018); and
 - previous assessments, briefing papers and reports.
- 10.4.7 Further details of the sources consulted are provided in Appendix A10.1 (Cultural Heritage Baseline Report).

Consultation

- 10.4.8 On the 22 March 2018, an early dialogue meeting was held with Historic Environment Scotland (hereafter referred to as HES) and Falkirk Council to discuss the cultural heritage aspects of the proposed scheme. Discussion took place regarding the previous listed building consent for a piled viaduct replacement proposal (granted by Falkirk Council on 4 August 2009 (reference P/09/0243/LBC)), the

process and requirements for the listed building consent application for the proposed scheme, the Environmental Impact Assessment (EIA), and future consultation. HES was supportive of continued investment in the bridge and advised that it was important that the proposed scheme would be in keeping with its current character. The potential to replace the existing parapets with new parapets (on a like-for-like basis, where possible) was discussed with HES and Falkirk Council. An inspection of the condition of the parapets has taken place and the work undertaken will be used to inform whether the reuse of the parapets will be possible. The reuse of the existing parapets was preferred by HES and Falkirk Council and the use of like-for-like replacements would require strong justification. The special character of the bridge was emphasised by both HES and Falkirk Council and the requirement to treat the structure as a whole, rather than the piled viaduct in isolation was emphasised, along with safeguarding the character and key features of the bridge.

- 10.4.9 On the 10 October 2018, a letter was sent to HES, Falkirk Council and Fife Council to provide more detail on the approach to the cultural heritage assessment set out in the Scoping Report (issued for consultation in July 2018; Chapter 5: Consultation and Scoping). This letter included a list of designated cultural heritage assets outside the 200m study area and within 1km which were proposed to be included in the assessment due to the potential for impacts on their settings. Designated cultural heritage assets to be included in the cultural heritage baseline for further assessment are presented in Table 1 of Appendix A10.1 (Cultural Heritage Baseline Report). In addition, the letter included a list of designated cultural heritage assets that were identified outside the 200m study area and within 1km upon which, following preliminary assessment, no impacts on their settings were predicted; however, a windshield survey was undertaken on 15 November 2018 to confirm this. These designated cultural heritage assets are presented in Table 2 of Appendix A10.1 (Cultural Heritage Baseline Report). In emails dated 18 October and 19 October 2018, HES and Falkirk Council stated that they were content with this approach respectively. On 28 January 2019 Fife Council replied stating they had no comments regarding the approach to built heritage outlined in the letter.
- 10.4.10 A further consultation meeting with HES took place on the 9 April 2019. HES reiterated that they were content with the approach being taken for the assessment of cultural heritage for the EIA Report. HES also recognised that there needs to be a pragmatic approach to refurbishment works to ensure the bridge will have a sustainable future and that as such there wasn't a requirement that all historic fabric had to be retained. However, HES advised that any changes to the fabric of the bridge required to be justified and explained in the listed building application.
- 10.4.11 The draft cultural heritage chapter of the EIA Report was issued to HES on the 22 July 2020 for comment. In a letter received on the 14 August 2020 HES generally welcomed the content of the draft cultural heritage chapter of the EIA Report. The more focused comments related to the Category A Listed Kincardine Bridge including potential impacts and further clarification on the timing and content of the listed building consent application. In response to a recommendation from HES to consult Falkirk Community Trust regarding the potential impacts on unscheduled marine archaeology, the draft cultural heritage chapter of the EIA Report was sent to Falkirk Community Trust on 17 August 2020 for comment. No comment was received from Falkirk Community Trust.
- 10.4.12 The draft cultural heritage chapter of the EIA Report was also issued to Falkirk Council on the 22 July 2020 and Fife Council on the 17 August 2020 for comment. Falkirk Council responded in an email dated the 3 August 2020, stating they had no comments at this stage. In a letter received on the 16 September 2020 Fife Council responded in relation to built heritage. Fife Council had no comment with respect to the impact of the proposed scheme on cultural and built heritage assets affected within Fife Council's administrative area, and in an email dated 23 September 2020 confirmed they were content with the assessment of Kincardine Conservation Area (see paragraph 10.6.16).
- 10.4.13 On the 22 September 2020 Fife Council provided comment for archaeology suggesting that the assessment was overly focused on impacts on built heritage and the potential for development to impact

on buried archaeology on site and the potential for significant environmental archaeological information to be recovered as part of the project had not been appropriately addressed. A response to Fife Council was provided on 24 September which identified that:

- The approach to the cultural heritage assessment including impacts on Kincardine Bridge (Asset 15), a Category A Listed Building of national importance, reflects the results of consultation.
- The potential for the presence of unknown archaeological remains and the potential for the presence of significant paleoenvironmental remains was assessed. This assessment is presented in Appendix A10.1 (Cultural Heritage Baseline Report) and paragraphs 10.5.15 to 10.5.18.
- As there will be no impact on known archaeological remains, and based on the evidence of previous disturbance within the proposed scheme (see Appendix A10.1 (Assessment of Policy Compliance)) and the construction method (for information refer to Chapter 3: The Proposed Scheme), potential impacts on unknown archaeological remains can be appropriately mitigated through an archaeological watching brief.

10.4.14 Further information on the EIA consultation process is provided in Chapter 5 (Consultation and Scoping).

Impact Assessment

Value

10.4.15 For the three sub-topics of archaeological remains, historic buildings and the historic landscape, an assessment of the value of each cultural heritage asset was undertaken on a six-point scale of very high, high, medium, low, negligible and unknown, based on professional judgement and guided by the criteria provided in HA208/07, as presented in Table 10.1.

Table 10.1: Criteria to Assess the Value of Archaeological Remains, Historic Buildings and the Historic Landscape

Value	Criteria
Archaeological Remains	
Very High	World Heritage Sites (including nominated sites). Assets of acknowledged international importance. Assets that can contribute significantly to acknowledged international research objectives.
High	Scheduled Monuments (including proposed sites). Undesignated assets of schedulable quality and importance. Assets that can contribute significantly to acknowledged national research objectives.
Medium	Designated or undesignated assets that contribute to regional research objectives.
Low	Designated and undesignated assets of local importance. Assets compromised by poor preservation and/or poor survival of contextual associations. Assets of limited value, but with potential to contribute to local research objectives.
Negligible	Assets with very little or no surviving archaeological interest.
Unknown	The importance of the site has not been ascertained.
Historic Buildings	
Very High	Structures inscribed as of universal importance as World Heritage Sites. Other buildings of recognised international importance.
High	Scheduled Monuments with standing remains. Category A Listed Buildings. Other listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the category. Conservation Areas containing very important buildings. Undesignated structures of clear national importance.

Value	Criteria
Medium	Category B Listed Buildings. Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation Areas containing buildings which contribute significantly to their historic character. Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Low	Category C Listed Buildings. Historic (unlisted) buildings of modest quality in their fabric or historical association. Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Negligible	Buildings of no architectural or historical note; buildings of an intrusive character.
Unknown	Buildings with some hidden (i.e. inaccessible) potential for historic significance.
Historic Landscape	
Very High	World Heritage Sites inscribed for their historic landscape qualities. Historic landscapes of international value, whether designated or not. Extremely well-preserved historic landscapes with exceptional coherence, time-depth, or other critical factors.
High	Designated historic landscapes of outstanding interest. Undesignated landscapes of outstanding interest. Undesignated landscapes of high quality and importance, and of demonstrable national value. Well-preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factors.
Medium	Designated special historic landscapes. Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value. Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factors.
Low	Robust undesignated historic landscapes. Historic landscapes with importance to local interest groups. Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	Landscape with little or no significant historical interest.

Impact Magnitude

- 10.4.16 Magnitude of impact is the degree of change that would be experienced by a cultural heritage asset and (where relevant) its setting resulting from the construction or operation of the proposed scheme, as compared with a 'Do Nothing' scenario. Magnitude of impact is assessed without reference to the value of the cultural heritage asset, and may include physical impacts on the cultural heritage asset, or impacts on its setting or amenity value.
- 10.4.17 Assessment of magnitude of impact was undertaken on a five-point scale of major, moderate, minor, negligible and no change based on professional judgement informed by the methodology and criteria provided by HA208/07 for archaeological remains, historic buildings and the historic landscape presented in Table 10.2.

Table 10.2: Magnitude of Impact on Cultural Heritage Assets

Magnitude	Criteria
Major	Change to most or all key archaeological materials, such that the resource is totally altered. Change to key historic building elements, such that the resource is totally altered. Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit.

Magnitude	Criteria
	Comprehensive changes to setting.
Moderate	Changes to many key archaeological materials, such that the resource is clearly modified. Change to many key historic building elements, such that the resource is significantly modified. Changes to some key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to historic landscape character. Considerable changes to setting that affect the character of the asset.
Minor	Changes to key archaeological materials, such that the asset is slightly altered. Change to key historic building elements, such that the asset is slightly different. Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality, slight changes to use or access; resulting in limited changes to historic landscape character. Slight changes to setting.
Negligible	Very minor changes to archaeological materials or setting. Slight changes to historic buildings elements or setting that hardly affect it. Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality, very slight changes to use or access; resulting in a very small change to historic landscape character.
No Change	No change to elements, parcels or components; no visual or audible changes; no changes arising from amenity or community factors.

Significance of Effect

10.4.18 For all three sub-topics, the significance of effect with and without mitigation was determined as a combination of the value of the cultural heritage asset and the magnitude of impact. In accordance with the guidance provided by HA208/07, significance of effect was assessed on a five-point scale of Very Large, Large, Moderate, Slight or Neutral using professional judgement informed by the matrix illustrated in Table 10.3. Five levels of significance of effect are defined which apply equally to adverse and beneficial effects.

Table 10.3: Matrix for Determination of Significance of Effect

Magnitude Value	No change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate/Large	Large/Very Large	Very Large
High	Neutral	Slight	Slight/Moderate	Moderate/Large	Large/Very Large
Medium	Neutral	Neutral/Slight	Slight	Moderate	Moderate/Large
Low	Neutral	Neutral/Slight	Neutral/Slight	Slight	Slight/Moderate
Negligible	Neutral	Neutral	Neutral/Slight	Neutral/Slight	Slight

10.4.19 For the purpose of this assessment, effects of Moderate or greater significance are considered to be potentially 'significant' in the context of The Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as the Roads EIA Regulations).

Impacts on Setting

10.4.20 Setting is defined by Managing Change in the Historic Environment: Setting as '*the way the surroundings of a historic asset or place contribute to how it is understood, appreciated and experienced*' (HES 2016, page 6). Based on the guidance provided by this document, a three-stage process was undertaken to assess the effect of the proposed scheme on the setting of cultural heritage assets:

- Stage 1: cultural heritage assets where the setting may be affected by the proposed scheme were identified. A list of designated cultural heritage assets located outside the 200m study area but within 1km to be included in the assessment due to potential effects on setting is presented in Table 1 of Appendix A10.1 (Cultural Heritage Baseline Report). This list was agreed with HES, Falkirk Council and Fife Council.
- Stage 2: modern Ordnance Survey, on-line aerial photography and the sources identified in Appendix A10.1 (Cultural Heritage Baseline Report; paragraph 3.2), including a walkover survey, were used to define the setting of cultural heritage assets by establishing if and how it contributes to the ways in which the cultural heritage asset is understood, appreciated and experienced. Where relevant, further information on the setting of cultural heritage assets is presented in Annex A of Appendix A10.1 (Cultural Heritage Baseline Report).
- Stage 3: the way in which the proposed scheme would affect the ability to understand, appreciate, or experience a cultural heritage asset was then assessed.

Limitations to Assessment

- 10.4.21 The approach to the cultural heritage assessment, as agreed with HES, Falkirk Council and Fife Council, has allowed for a robust understanding of the cultural heritage baseline and the magnitude of potential impacts from the proposed scheme to be assessed, and for appropriate measures to mitigate these impacts to be identified. Non-invasive or invasive investigations were therefore not required to inform this assessment.
- 10.4.22 While the form of the temporary bridge structure is indicative, for the purposes of assessment it is assumed the temporary bridge structure will be of similar dimensions to the form shown on Figures 3.6 to 3.9 (Temporary Diversion Structure Indicative General Arrangement).

10.5 Baseline Conditions

- 10.5.1 This section describes the baseline condition for the three sub-topics of archaeological remains, historic buildings and the historic landscape. More detailed information on cultural heritage assets considered as part of the baseline is presented in Appendix A10.1 (Cultural Heritage Baseline Report).
- 10.5.2 From the sources identified in Appendix A10.1 (Cultural Heritage Baseline Report), a total of ten cultural heritage assets have been identified within the study area. Following the approach presented in paragraph 10.4.20, a further 24 designated cultural heritage assets located outside the study area were included in the cultural heritage baseline due to the potential for effects on their settings. The total number of cultural heritage assets assessed as part of the cultural heritage baseline is therefore 34, comprising 13 archaeological remains, 17 historic buildings, and four HLTs. A summary of the total number of cultural heritage assets and their value is provided within Table 10.4.
- 10.5.3 The locations of these cultural heritage assets are shown on Figure 10.1 (Locations of Archaeological Remains and Historic Buildings) and Figure 10.2 (Location of Historic Landscape Types (HLT)).

Table 10.4: Total Counts of Cultural Heritage Assets and their Value

Sub-topic	Unknown	Negligible	Low	Medium	High	Very High	All Values Total
Archaeological Remains	6	3	4	0	0	0	13
Historic Buildings	0	0	6	10	1	0	17

Sub-topic	Unknown	Negligible	Low	Medium	High	Very High	All Values Total
Historic Landscapes	0	1	3	0	0	0	4
TOTAL	6	4	13	10	1	0	34

Archaeological Remains

- 10.5.4 A total of 13 archaeological remains have been included in the cultural heritage baseline. These are characterised by archaeological remains dating to the post-medieval period associated with the crossing of the Firth of Forth at Airth, and national defence during the Second World War.

Archaeological Remains of High and Medium Value

- 10.5.5 No archaeological remains assessed to be of high or medium value have been identified within the study area.

Archaeological Remains of Low Value

- 10.5.6 Three archaeological remains identified within the study area comprise evidence of the crossing in use at Airth prior to the opening of the Kincardine Bridge in 1936:
- Higgins' Neuck² Landing Point (Asset 11; Photograph 10.1) comprises the remains of a timber-lined recess, dug into the mud-bank as a dock for the ferry-boat, and an associated timber-lined sluice;
 - Higgins' Neuck Drove Road (Asset 13; Photograph 10.2) comprises the remains of a walled road, running from the Keith Arms Inn (Site of) (Asset 3) to the landing point (Asset 11), used by drovers to drive their animals to market; and
 - Higgins' Neuck Ferry Pier (Asset 14; Photograph 10.3) comprises the remains of the wooden piles of the ferry pier, still visible at low tide.
- 10.5.7 The ferry crossing at Higgins' Neuck was formalised during the latter part of the post-medieval period as an alternative to travelling to Stirling to cross the Firth of Forth (Graham 1971); however, historical sources dating to the 16th century mention the 'Ferry of Airth' suggesting the crossing may have been established long before this (Graham 1971). The ferry at Higgins' Neuck was frequently and favourably used by drovers during the 18th and 19th centuries on their way to the market at Falkirk Tryst to avoid the high tolls of another crossing at Alloa (Haldane 2018; Scott 2005). Its use as a busy thoroughfare is evidenced by the substantial nature of the drove road (Asset 13) running from the Old Ferry Road to the landing point (Asset 11), necessary to accommodate such traffic. Furthermore, a plan of the Firth of Forth opposite the Tulliallan Estate dating to 1828 depicts the 'Kincardine Ferry' identifying a 'New Pier' at each of the landing points, suggesting the crossing went through a number of iterations during this period likely due to continued and sustained use.
- 10.5.8 The crossing was well-established in the late 18th century (Ure 1792) and along with the Keith Arms Inn (Site of) (Asset 3) and Higgins' Neuck Ferry House (Asset 4), Assets 11, 13 and 14 are depicted on First Edition Ordnance Survey mapping (1860s) and continued to be depicted on mapping until the 1960s. However, following the opening of the Kincardine Bridge in 1936, the ferry crossing at Higgins' Neuck went out of use.

² Please note 'Higgins' Neuck' is an historic spelling and has been retained for consistency with the Historic Environment Record and historic mapping.

- 10.5.9 While in a poor state of preservation, these cultural heritage assets are still extant and as a group they contribute to our understanding of activities associated with the crossing at Higgins' Neuck prior to the opening of the bridge. In consideration of this, Assets 11, 13 and 14 have been assessed to be of low value.



Photograph 10.1: Higgins' Neuck Landing Point (Asset 11) and associated timber-lined sluice, looking north-east



Photograph 10.2: Higgins' Neuck Drove Road (Asset 13), looking south-west



Photograph 10.3: Higgins' Neuck Ferry Pier (Asset 14), looking south-east

- 10.5.10 Higgins' Neuck Machine Gun Post (Asset 12; Photograph 10.4) comprises the remaining set of three revetted loopholes, of formed concrete, inserted into the stone wall of the Higgins' Neuck Drove Road (Asset 13; low value). Prior to the construction of the Clackmannanshire Bridge, four sets of loopholes were extant at either end of the parallel walls of the drove road; however, Asset 12 is the only remaining set. While this cultural heritage asset is not identified on post-war mapping (Ordnance Survey National Grid map 1961), the wall, along with other national defences (Asset 1 and 2), is visible on aerial photographs dating to the 1940s and 1970s and likely marks the location of a machine gun post to protect the Kincardine Bridge during the Second World War. Given modern redevelopment, in the form of the Clackmannanshire Bridge, has destroyed part of this cultural heritage asset but in consideration of the contribution it makes to our understanding of national defence during the Second World War at a local level, Asset 12 has been assessed to be of low value.



Photograph 10.4: Higgins' Neuck Machine Gun Post (Asset 12), looking north

Archaeological Remains of Negligible Value

- 10.5.11 Higgins' Neuck Pillbox 1 (Asset 1) and Higgins' Neuck Pillbox 2 (Asset 2), a pair of Second World War pillboxes, were identified on aerial photographs to the south and north of the Southern Approach to the Kincardine Bridge, respectively. While these cultural heritage assets evidence Second World War national defence in the study area, they are no longer extant and therefore Assets 1 and 2 have been assessed to be of negligible value.
- 10.5.12 Keith Arms Inn (Site of) (Asset 3) is the location of a recently demolished public house. Asset 3 is depicted on First Edition Ordnance Survey mapping (1860s) as a 'U'-shaped building with associated detached ranges. The inn was situated on the road that historically led to the ferry crossing at Higgins' Neuck. However, given this building is no longer extant, Asset 3 has been assessed to be of negligible value.

Archaeological Remains of Unknown Value

- 10.5.13 Six archaeological remains comprise the conjectured locations of vessels recorded as wrecked within the study area:
- River Forth Hopper Barge (Asset 5) – an unregistered hopper barge carrying dredgings that was reported lost in 1897 following a collision with the schooner, Sea Lark;
 - River Forth Lighter (Asset 6) – an iron lighter transporting maize reported as sunk in 1873;
 - Soho (Asset 7) – a vessel that slipped its chains while anchored and was blown up the Forth where it grounded near Kincardine in 1864;
 - Rising Sun (Asset 8) – a fishing boat reported to have wrecked near Kincardine in 1872;
 - River Forth Sloop (Asset 9) – a sloop that reportedly wrecked in 1856; and
 - River Forth Craft (Asset 10) – a passage boat, possibly Higgins' Neuck ferry, carrying horses and whisky was reported as stranded in 1810.
- 10.5.14 While these archaeological remains evidence the maritime past within the study area, the locations of these wrecks are recorded as either unclear or tentative, none of the vessels are depicted on the Admiralty Charts of Scotland (1795-1963), and no remains of any wrecked vessels were identified at low tide on the foreshore during the cultural heritage walkover survey. In consideration of their uncertain location, these cultural heritage assets have been assessed to be of unknown value.

Potential for the Presence of Unknown Archaeological Remains

- 10.5.15 The results of the desk-based survey and walkover survey presented in A10.1 (Cultural Heritage Baseline Report) provide a good understanding of the potential for the presence of archaeological remains within the study area. Areas of potential for unknown archaeological remains are presented on Figure 10.3.
- 10.5.16 There has been extensive modern redevelopment within the study area above Mean High Water Springs (MHWS) in the form of the Higgins Neuck Roundabout and associated infrastructure, the A876 Southern Approach Road and the Kincardine Bridge, and the Clackmannanshire Bridge which is likely to have removed any archaeological remains that may have been present. In addition, post-medieval agricultural improvement in the area is also likely to have disturbed or removed any archaeological remains present. In consideration of this, the potential for the presence of unknown archaeological remains in these parts of the study area has been assessed to be low.
- 10.5.17 Despite some modern disturbance, including a ramp to the north of the southern approach to Kincardine Bridge (now removed) and a former electricity pylon, the potential for the presence of unknown archaeological remains is considered to be greater below the MHWS. This area, characterised by HLT 4,

has the potential to contain archaeological remains that date from the prehistoric period (GUARD 1996). While few archaeological remains have been identified in the study area on the southern shore, as noted by Fife Council the northern foreshore is particularly well-known for archaeological remains (please see Chapter 5: Consultation and Scoping), including the Kincardine Ship Graveyard 0.4km to the north-east of the study area (refer to Figure 10.3), and the potential for the presence of unknown archaeological remains on the southern foreshore is considered equally likely. Any unknown archaeological remains that may be present would likely to be of similar form and date to those on the northern foreshore. Following a review of the geotechnical investigation results (SOCOTEC UK 2019) sub-surface sediments were interpreted as alluvial or estuarine in origin, and no preserved layers of buried peat or organic horizons of palaeoenvironmental potential were encountered.

- 10.5.18 The potential for the presence of unknown archaeological remains in this part of the study area has been assessed to be medium.

Historic Buildings

- 10.5.19 A total of 17 historic buildings have been included in the cultural heritage baseline and, aside from the Kincardine Bridge (Asset 15; Category A Listed Building), the majority of these consist of 18th and 19th century public and domestic buildings within Kincardine.

Historic Buildings of High Value

- 10.5.20 A road bridge across the Forth downstream of Stirling was first mooted in 1817 (Lothian 1862). Yet it wasn't until the 1930s that the increased vehicular traffic saw the local authorities in the area come together enabling the construction of a bridge between Kincardine in the north and Higgins' Neuck to the south. Designed by Sir Alexander Gibb & Partners in 1930-31 and built by the Cleveland Bridge and Engineering Company Ltd. of Darlington, the Kincardine Bridge (Asset 15; Photograph 10.5) opened for traffic in 1936.
- 10.5.21 The Kincardine Bridge (Asset 15) was designated as a Category A Listed Building in 2005. The highest level of designation is a reflection of the bridge as a landmark in the development of road transport and its associated infrastructure, as well as its significance as an engineering achievement in overcoming conflicting demands of road transport and shipping.
- 10.5.22 The special architectural and historical interest of Kincardine Bridge (Asset 15) has been identified through desk-based research, walkover survey and drawn from the 'Statement of Special Interest' (HES 2005) and is presented below. More detailed information is presented in Appendix A10.1 (Cultural Heritage Baseline Report).

Design

- 10.5.23 The design of the bridge accommodated the requirements of both road transport and shipping by incorporating a central 110m long steel truss turning section allowing large vessels to traverse the Forth to and from the port of Alloa. The bridge piers were cast in situ (cast on site) using reinforced concrete and steel girders to support the roadway formed of long concrete slabs. The bridge has a total length of 822m and is constructed as a series of identical shallow-arched spans with a central swing span that swivelled with cantilevered spans to either side. The swing span of the bridge has not been operational since 1987, but the machinery that turned this section was operated from a central control cabin within the central pier. The turning machinery and its controls remain in situ (on site).

Setting

- 10.5.24 The setting of the bridge is defined by the low-lying, flat landscape of the upper part of the Firth of Forth. The bridge itself is a low structure and this strongly horizontal design is complemented by the sinuous

landscape of the estuarine tidal-plane and the low-lying marsh and agricultural land that characterise the surrounding area. The bridge has been designed to provide a solution to the practical problem the Firth of Forth and the surrounding landscape presents, and as such the setting forms an integral part of our understanding, appreciation and experience of the bridge.

Age and Rarity

- 10.5.25 At the time of its construction, the Kincardine Bridge (Asset 15) was the largest swing bridge in Europe as well as Scotland's longest road bridge and was described as '*a perfect combination of electrical and mechanical excellence*' (Dean 1937). As a distinctive and rare bridge type, the Kincardine Bridge (Asset 15) has special interest as an arguably unique structure in Scotland. At the time of its construction (1930s) bridge building using steel reinforced concrete piles and in situ (on site) casting of concrete piers was still a pioneering approach to bridge engineering, and the bridge is an early example of this type of construction.

Associative

- 10.5.26 With a design that is both elegant and functional, the Kincardine Bridge is also an example of the work of the internationally renowned engineering firm of Alexander Gibb and Partners and notable Scottish Railway architect James Miller. The associative value derived from these connections adds to the special interest of the bridge.



Photograph 10.5: the Kincardine Bridge (Asset 15), looking north-east

- 10.5.27 In consideration of its designation as a Category A Listed Building, as well as its historical significance and aesthetic quality the Kincardine Bridge has been assessed as being of high value.

Historic Buildings of Medium Value

- 10.5.28 Kincardine Conservation Area (Asset 16; Photograph 10.6) was designated in 1971. The Conservation Area encompasses the historical core of Kincardine. The majority of buildings date from the 18th and 19th centuries while the organic street pattern of narrow streets is indicative of Kincardine's history as a medieval burgh. As a result, the Conservation Area has an enclosed, inward-looking and self-contained

character. This clearly defined geographical extent of the town as a small coastal settlement is further emphasised by the presence of the coastal railway line which acts a barrier between the town and the northern bank of the Firth of Forth to the south, and the rising grounds towards Tulliallan Castle in the north.



Photograph 10.6 Kincardine Conservation Area (Asset 16), looking east from the south-western end of the Kincardine Bridge (Asset 15)

- 10.5.29 The architectural significance of the Conservation Area derives from its well-preserved and distinctive stock of historic buildings. The majority of the buildings within the Conservation Area are constructed in the Scottish vernacular style using traditional local materials (Drummond 1968). Stone walls, sometimes harled, with stone quoins, stone window and door surrounds, and stone skews, often with a scroll skew-putt at eaves, bordering pitched roofs of Scotch slate or terracotta pantiles give the Conservation Area its unique character (Gray, Marshall & Associates 2009; Drummond 1968). The houses are, in the main, sited parallel to the street with the long façade containing a centrally placed front door.
- 10.5.30 The setting of Kincardine Conservation Area (Asset 16) is defined by the location of the historical village core on the eastern bank of the flat flood plain of the Forth. This coastal location gives Kincardine a historical significance that reaches beyond the confines of the town and is linked to its involvement in shipbuilding and trade to all parts of Scotland, Northern Europe and beyond. The land surrounding the town is still mainly agricultural with the designed landscape of Tulliallan Castle, approximately 1.7km to the north-east of the study area, providing a green backdrop to the north. The openness of the surrounding landscape contrasts with the enclosed character of the Conservation Area and as such contributes our understanding, appreciation and experience of it as a historic settlement and the role of individual cultural heritage assets within it.
- 10.5.31 In consideration of its well-preserved and distinctive historical character and the positive contribution it makes to the historic built environment of West Fife, Kincardine Conservation Area (Asset 16) is assessed as being of medium value.
- 10.5.32 There are two principal types of domestic architecture in Kincardine: the smaller single-storey type with or without an attic, and the more substantial two-storey type (Gray, Marshall & Associates 2009; Miller and Shephard 1998).

- 10.5.33 The two-storey properties generally occupy the more prominent sites in the town and the main public streets such as Elphinstone Street and High Street (2 High Street; Asset 28) and the southern end of Kilbagie Street. Number 2 High Street (Asset 28) is a Category B Listed two-storey stone house with its pantile roof replaced with concrete tiles and scroll skew putts.
- 10.5.34 There are also examples of this larger domestic building type on Keith Street (Assets 17, 18, 26, 27, and 30) which at one time lead directly to the shipping pier:
- Numbers 34 & 36 Keith Street (Asset 17) and 52 & 54 Keith Street (Assets 26 and 27) - two-storey structures, of a similar date and both also built as two houses but now combined into one property;
 - Numbers 26, 28, 30 Keith Street (Asset 18) - a late 18th century, two-storey house with an attic, with stone rubble walls, pantile roof with scroll skew putts, and a central gable with round-headed attic window. Built as three houses, it is now one property; and
 - Number 38 Keith Street (Asset 30) – an example of a two-storey Category B Listed Building with harled walls and a slate roof.
- 10.5.35 The setting of Assets 17, 18, 26, 27, 28 and 30 is defined by the close urban grain of the historical core of Kincardine which has an enclosed, inward-looking and self-contained character. The historical character of the built environment is well-preserved contributing to our understanding, appreciation and experience of the individual historic buildings within Kincardine, as well as the history and development of the town as a whole.
- 10.5.36 Forth Street once fronted the river and has many important houses on both its south-west river side and north-west side fronting the old Drover's Green where cattle waiting to use the Higgins' Neuck ferry were corralled in the 18th and 19th centuries. For example, Shore House (Asset 23; Photograph 10.7) at 21 Forth Street is a Category B Listed house with a probable early 19th century date over-looking the Forth. It is a two-storey house with a symmetrical façade and a two-way forestair. The setting of Asset 23 is defined by its position on the northern side of the Drover's Green in Kincardine. In contrast to the majority of Kincardine Conservation Area (Asset 16) which has an enclosed, inward-looking and self-contained character, the façade of Shore House has an open aspect south-west towards the Firth of Forth. The historical character of the built environment within the Conservation Area is well-preserved contributing to our understanding, appreciation and experience of the individual cultural heritage assets within Kincardine, as well as the history and development of the town as a whole.



Photograph 10.7: South-west facing elevations of Shore House (Asset 23) and 23 Forth Street (Asset 24), looking east

- 10.5.37 There are two non-domestic Category B Listed Buildings included in the cultural heritage baseline. These are the early 19th century Church of Scotland (Asset 22) and Ye Olde House Inn, 25-26 Forth Street (Asset 25).
- 10.5.38 The early 19th century Church of Scotland (Asset 22) is constructed of coursed rubble with a slate roof and a 5-stage bell tower and has subsequently been converted into residential use. Despite being located within Kincardine Conservation Area (Asset 16), given its proximity to the A876, modern infrastructure and traffic noise form part of this cultural heritage asset's setting.
- 10.5.39 Ye Olde House Inn, at 25-26 Forth Street (Asset 25) is a single-storey building, originally built as two cottages and later converted into a public house. It has harled walls and a pantile roof. The setting of Asset 25 is defined by its position on the northern side of the Drover's Green in Kincardine and the building's close proximity to the raised embankment of the A876 approach to the Kincardine Bridge. In contrast to the majority of Kincardine Conservation Area which has an enclosed, inward-looking and self-contained character, the façade of this single storey building faces south-west towards the Firth of Forth. However, the raised embankment of the A876 entirely obscures the potential views towards Falkirk and the proposed scheme.
- 10.5.40 In consideration of this, their designation as Category B Listed Buildings and the contribution they make to our understanding of the history and development of Kincardine, these cultural heritage assets have been assessed as being of medium value.

Historic Buildings of Low Value

- 10.5.41 Four domestic Category C Listed Buildings have been included as part of the cultural heritage baseline. These comprise of three late 18th century two-storey buildings, one with harled walls and a pantile roof with scroll skew putts on 11 Station Road (Asset 21); 23 Forth Street (Asset 24; Photograph 10.7), with pebble dashed walls, stone margins and a pantile roof. This building also has a cubical sundial with human face on the south western skew putt. Number 48 Keith Street (Asset 29) is of a similar date and has harled walls and a pantile roof.

- 10.5.42 The fourth Category C Listed Building represents the single storey domestic building type. This row of cottages on the south side of Keith Street comprises of nine individual residences at (15-31 Keith Street; Asset 19; Photograph 10.8). The cottages are constructed of ashlar with pantile roofs and date from the late 18th and early 19th centuries.



Photograph 10.8: 15-31 Keith Street (Asset 19) on the right; looking east along Keith Street towards Kincardine High Street

- 10.5.43 There is one non-domestic Category C Listed Building within the cultural heritage baseline: Railway Tavern, 16 Forth Street (Asset 20). This rubble walled public house has a slate roof and steep stone stair from the pavement to a timber gate and then onto a first-floor door in the north gable. The interior is described as a rare survival of mid-19th century public house interior of a bar used by drovers en-route to markets in Falkirk Tryst. It is suggested (Gray, Marshall & Associates 2009) that the pub is located on the site of an earlier (pre-1800) drovers inn, and that it has probably been raised from single storey to its present day two-storey form.
- 10.5.44 The setting of these buildings is defined by the close urban grain of the historical core of Kincardine which has an enclosed, inward-looking and self-contained character. The historical character of the built environment is well-preserved contributing to our understanding, appreciation and experience of these cultural heritage assets and the history and development of Kincardine.
- 10.5.45 In consideration of this, their designation as Category C Listed Buildings, and the contribution they make to our understanding of the history and development of Kincardine, these cultural heritage assets have been assessed as being of low value.
- 10.5.46 Higgins' Neuck Ferry House (Asset 4), a stone structure, is a small single storey building covered with grey wet dash with a wide band of dressed stone visible at the first-floor level. The setting of this building is defined by its location on the foreshore of the Firth of Forth and the historic association with the Higgins' Neuck Ferry crossing. Setting makes a modest contribution to our understanding, appreciation and experience of this cultural heritage asset.
- 10.5.47 Falkirk Sites and Monuments Record suggest an early 19th century date for the Higgins' Neuck Ferry House (Asset 4), but due to its much-altered fabric and the limited contribution this building makes to the local historic environment and our understanding of the shoreline activities associated with the Higgins' Neuck Ferry, Asset 4 has been assessed as being of low value.

Historic Landscape Types

10.5.48 Four HLTs have been included in the cultural heritage baseline.

Historic Landscape Types of High and Medium Value

10.5.49 No HLTs assessed to be of high or medium value have been identified within the study area.

Historic Landscape Types of Low Value

10.5.50 Agricultural HLTs within the study area comprise Rough Grazing (HLT 1) and Rectilinear Fields and Farms (HLT 3). HLT 1, two strips of grassland to the west of the Firth of Forth, comprises marginal areas that coincide with those that were reclaimed from the water during the 18th and 19th centuries as part of a programme of agricultural improvement in the area. HLT 3, two small areas to the either side of the Southern Approach Road, is characterised by rectilinear field systems typifying 18th and 19th century agricultural improvement. Within the study area, HLT 3 comprises agricultural fields with straight field boundaries that generally follow those depicted on First Edition Ordnance Survey mapping dating to the 1860s. In consideration of their ability to contribute to our understanding of the local post-medieval agricultural landscape, but given these HLTs are common types in Scotland, HLT 1 and HLT 3 have been assessed to be of low value.

10.5.51 The Firth of Forth Intertidal Mudflats (HLT 4; Photograph 10.9) is defined by the intertidal areas above the MLWS tide of the Firth of Forth. In the study area, HLT 4 is characterised by the low-lying topography of the mudflats and saltings of the coastal salt marsh. Features of this HLT include meandering tidal burns and rough marginal grassland. This intertidal area is depicted on historic mapping, including the Roy Military Survey of Scotland (1750s) and First Edition Ordnance Survey mapping (1860s), as an area of rough or heathy pasture and mud. While this HLT has the potential to contain archaeological remains that date from the prehistoric period (GUARD 1996) (the potential for the presence of unknown archaeological remains is considered separately; see paragraph 10.5.15 to 10.5.18), improvement in the 18th and 19th century for local agriculture resulted in the draining and reclamation of some areas of this HLT (Ure 1792; Menzies 1839; SCAPE 2016) which may have reduced this potential. Breakwaters and embankments are depicted on historic mapping, including a plan of the Firth of Forth opposite the Tulliallan Estate (1828) and Ordnance Survey mapping dating to the 1890s, and aerial photographs dating to the 1940s and 1970s. The remains of such management features can still be identified in the landscape, such as the breakwater immediately to the south of the study area, comprising a row of wooden stakes, and the earthen embankment to the north of the study area. This HLT has also been subject to modern development, in the form of the Kincardine Bridge and the Clackmannanshire Bridge and their associated infrastructure; however, much of the historic character of this HLT remains legible. As a robust example of an intertidal landscape that has largely retained its historic character, but given this HLT is not unusual, HLT 4 has been assessed to be of low value.



Photograph 10.9: Firth of Forth Intertidal Mudflats (HLT 4), looking north-east

Historic Landscape Types of Negligible Value

- 10.5.52 Motorways and Major Roads (HLT 2) evidences modern transport systems within the study area. These transport networks link major cities, cover considerable areas and are formed of dual carriageways, major junctions and associated infrastructure. Within the study area this HLT comprises the A876 Southern Approach Road, Higgins Neuk Roundabout, and the Clackmannanshire Bridge. Given this HLT is a common type in Scotland and is of limited historic significance, HLT 2 has been assessed to be of negligible value.

10.6 Potential Impacts

- 10.6.1 Throughout the design process, a number of 'embedded mitigation' features have been included in the proposed scheme design. This section considers the embedded mitigation outlined below and describes the impacts that would be expected to occur in the absence of essential mitigation.
- 10.6.2 Impacts on cultural heritage assets resulting from the proposed scheme can be both direct and indirect. Direct impacts would include the loss of archaeological remains, loss of the fabric of historic buildings or changes in use of the historic landscape and impacts on setting. Indirect impacts arise from the proposed scheme via a complex route; where the connection between the proposed scheme and the impact is complicated, unpredictable or remote; for example, changes to local land drainage as a result of the proposed scheme could indirectly affect the condition of waterlogged archaeological remains a distance away from the proposed scheme.
- 10.6.3 Based on the data from the visual bridge parapet condition survey (Amey 2018) it is envisaged that approximately 25% of the bridge parapet panels (on the piled viaduct section and the sections of the bridge where the temporary bridge would connect to the existing bridge) will require replacement. However, in line with EIA best practice and in order to accommodate the worst-case scenario, this impact assessment is based on a case where all of the 71 removed panels would be replaced.

Embedded Mitigation

- 10.6.4 The key design developments are summarised below:

- Only parapet panels that are not in a suitable condition to be refurbished will be replaced. The replacements will resemble the design and materials of originals. The remaining parapet panels will be reinstated as part of the viaduct replacement structure, following refurbishment off-site.
- Replacement reinforced concrete columns (pilasters), which are situated at the pier positions, will resemble the design and materials of originals. The four replacement concrete columns (pilasters) on the retained section of the bridge (referred to in section 10.6.11) will also be reinstated to their original pier positions.
- The existing lamp posts will be retained, refurbished and installed on the piled viaduct replacement structure.
- The design of the new piers will match the spans of the adjacent part of the bridge, ensuring the special architectural and historic interest of the bridge is complemented by the architectural form and quality of the new construction. The proposed new structure will consist of a deck formed using in situ reinforced concrete beams with curved soffits. The deck will be supported at the north end by a new reinforced concrete pier on piled supports, independent from and adjacent to the existing pier at the southernmost 15m span, and elsewhere by piled reinforced concrete piers of similar appearance to the existing piers of the adjacent 15m spans.
- The temporary bridge structure will be a stand-alone structure, abutting the bridge during construction. Bridge plates and a temporary road surface will be used to cover the abutment.

10.6.5 As Kincardine Bridge is a Category A Listed Building the proposed scheme, including the embedded mitigation items outlined above, will require listed building consent and will be carried out in accordance with the conditions attached to such consent.

10.6.6 Potential impacts on all cultural heritage assets are discussed in full detail below.

Construction

Archaeological Remains

10.6.7 No impacts are predicted on known archaeological remains as a result of the construction of the proposed scheme.

10.6.8 While Assets 5, 6, 7, 8, 9, and 10 fall within the indicative area for temporary works and construction (see Figure 10.1), these are the conjectured locations of vessels that have wrecked within the study area (see paragraphs 10.5.13 to 10.5.14 above) and are depicted within the current road line of the Clackmannanshire Bridge, which is likely to have removed any archaeological remains that may have been present at this location.

10.6.9 While there has been modern disturbance within the footprint of the proposed scheme which is likely to have removed, truncated or disturbed any archaeological remains that may have been present in this area (see paragraph 10.5.17 and paragraph 5.19 in Appendix A10.1) and truncated the upper sequences of palaeoenvironmental deposits, limiting their value, construction of the proposed scheme outwith the area of the raised platform and areas of previous disturbance has the potential to remove any previously unknown archaeological remains that may be present. The potential for the presence of unknown archaeological remains in the study area has been assessed to be low above MHWS and medium below the MHWS (see Figure 10.3).

Historic Buildings

10.6.10 Construction of the proposed scheme has the potential to impact on the special architectural and historical interest of the Kincardine Bridge (Asset 15; Category A Listed Building). A summary of the potential construction impacts on the bridge is provided below.

- 10.6.11 To allow traffic to pass between the Kincardine Bridge and the temporary bridge structure, construction of the proposed scheme would:
- Permanently remove four steel reinforced concrete lamp columns (pilasters); and temporarily remove 21 bridge parapet panels and two lamp posts on the northern side of the bridge resulting in loss of original fabric that contributes to the architectural and historical interest of the bridge.
 - Potentially remove original building fabric in the process of creating a physical join between the temporary bridge structure and the existing bridge.
- 10.6.12 To enable the demolition of the existing piled viaduct, construction of the proposed scheme would temporarily remove 50 bridge parapets panels and six lamp posts detracting from the architectural and historical interest of the bridge.
- 10.6.13 To enable to the construction of the new piled viaduct, construction of the proposed scheme would:
- Demolish the existing piled viaduct resulting in the loss of original built fabric that contributes to the age and rarity of the bridge, including the original steel reinforced concrete piles and in situ cast concrete piers.
 - While the existing bridge deck and its temporary steel support frame will also be demolished, it should be noted that these features date from the 1980s and are not part of the original construction.
- 10.6.14 In addition, the proposed scheme would introduce additional visual intrusion into the setting of the Kincardine Bridge (Asset 15) for the duration of construction. This would result from the presence of the temporary bridge structure to the north-west of the existing piled viaduct, as well as increased vehicular movement from construction traffic in proximity to the bridge, the operation of machinery, in the form of piling rigs and cranes, and the presence of temporary structures, such as shuttering. While this would result in a loss of understanding, appreciation and experience of this cultural heritage asset in its wider context, construction activities would be temporary and limited to the southern end of the Kincardine Bridge.
- 10.6.15 During construction the magnitude of impact on the Kincardine Bridge (Asset 15) has been assessed to be moderate and the significance of effect Moderate.
- 10.6.16 Construction of the proposed scheme may be visible in glimpsed views from Kincardine Conservation Area (Asset 16); however, given the proposed scheme is located on the southern bank of the Forth (in excess of 500m away), these views would be distant. The Conservation Area's character and appearance is largely defined by the close urban grain of Kincardine's historical core with the town having an enclosed, inward-looking and self-contained character. This character and the relationships between the individual historic buildings within the Conservation Area will remain unaffected by the construction of the proposed scheme. During construction the magnitude of impact on Asset 16 has been assessed to be negligible and the significance of effect Neutral.
- 10.6.17 Construction of the proposed scheme may be visible in glimpsed views from Shore House, 21 Forth Street (Asset 23); however, given the proposed scheme is located on the southern bank of the Forth (in excess of 500m away), these views would be distant. The value of this cultural heritage asset is principally derived from its historic fabric, which would remain unchanged. As a result, the magnitude of impact on Asset 23 has been assessed to be negligible and the significance of effect Neutral.

Historic Landscape Types

- 10.6.18 No significant impacts are predicted on the historic landscape as a result of the construction of the proposed scheme.

- 10.6.19 Construction of the proposed scheme would result in a slight temporary change to the character of Rough Grazing (HLT 1) and Firth of Forth Intertidal Mudflats (HLT 4) by altering the use of two small sections of each HLT adjacent to the Kincardine Bridge (Asset 15). However, given the scale and duration of the works and the lack of rarity of HLT 1 as a common type of agricultural landscape in Scotland and the robust nature of HLT 4, this would not affect our understanding of these HLTs. During construction the magnitude of impact has been assessed to be of negligible magnitude and the significance of effect Neutral.

Operation

Archaeological Remains

- 10.6.20 No impacts on archaeological remains as a result of the operation of the proposed scheme are predicted.

Historic Buildings

- 10.6.21 Under the worst case scenario identified in paragraph 10.6.3, the magnitude of impact on Kincardine Bridge (Asset 15; Category A Listed Building) during operation has been assessed to be of moderate magnitude and the significance of effect Moderate.
- 10.6.22 The proposed scheme would keep the bridge in its intended use in the long-term thus ensuring the future maintenance of the structure and preserving the way the bridge is understood, experienced and appreciated. The design of the new piled viaduct would be of a similar appearance to the spans of the adjacent part of the bridge in terms of architectural design and massing as well as the use of materials ensuring the special interest of the bridge is complemented by the architectural form and quality of the new construction.
- 10.6.23 Based on this, the impact on the Kincardine Bridge (Asset 15; Category A Listed Building) during operation has been assessed to be of minor beneficial magnitude and the significance of effect has been assessed as Moderate beneficial.
- 10.6.24 No impacts are predicted on the remaining 16 historic buildings as a result of the operation of the proposed scheme.

Historic Landscape Types

- 10.6.25 Given only part of the existing bridge would be replaced with a design in keeping with its current design and any disturbed land would be restored as far as practicable, no impacts on HLT are predicted during operation.

10.7 Mitigation

- 10.7.1 Essential mitigation for impacts on cultural heritage assets is described below. For information on embedded mitigation refer to paragraph 10.6.4.

Essential Mitigation

Archaeological Remains

- 10.7.2 Archaeological recording during construction (an archaeological watching brief) will be undertaken to make a permanent record of any surviving unknown archaeological remains that may be identified (**Mitigation Item CH1**). This will be undertaken in accordance with relevant guidance provided by the Chartered Institute for Archaeologists, HES and Historic England, and a Written Scheme of Investigation (WSI) that will be agreed with Falkirk Community Trust's Heritage Engagement Officer (the Curator) and

Transport Scotland's historic environment advisor. As part of this mitigation item a programme of assessment, reporting, analysis, publication, archiving and dissemination of the results of the archaeological watching brief is required including submission of reports produced to Falkirk and Fife's Historic Environment Records and the National Record of the Historic Environment and the archive to the National Record of the Historic Environment.

Historic Buildings

- 10.7.3 Historic building recording will be undertaken prior to construction to make a record of the original piled viaduct, and its temporary steel support structure, in the context of the bridge as a whole (**Mitigation Item CH2**). This will be achieved through a laser scan of the bridge and the production of an enhanced historic building record in accordance with the guidance provided Historic Building Recording Guidance (ALGAO: Scotland 2013) and a WSI that will be agreed with the Curator and Transport Scotland's historic environment advisor. As part of this mitigation item a programme of assessment, reporting, analysis, publication, archiving and dissemination of the results of the historic building recording is required including submission of reports produced to Falkirk and Fife's Historic Environment Records and the National Record of the Historic Environment and the archive to the National Record of the Historic Environment.
- 10.7.4 While this mitigation would not reduce the magnitude of impact, it aligns with the guidance provided on page 11 of *Managing Change in the Historic Environment: Demolition of Listed Buildings* (HES 2019b) which states that owners and developers should carry out detailed recording of all listed buildings when fundamental changes are proposed.
- 10.7.5 The appointed Contractor will be required to submit an assessment report of the bridge parapet panels following their removal off site (**Mitigation Item CH3**) for approval by Falkirk Council, who may undertake further consultation with HES. The purpose of this report will be to provide a detailed condition assessment of the affected panels and a justified rationale for the proposed approach to their refurbishment.

Historic Landscape Types

- 10.7.6 No essential mitigation is proposed for impacts on the historic landscape.

Schedule of Environmental Commitments

- 10.7.7 A summary of the essential mitigation measures, to be implemented in constructing and operating the proposed scheme relevant to cultural heritage, is provided in Table 10.5. Chapter 17 (Schedule of Environmental Commitments) contains the complete schedule of measures for the proposed scheme.

Table 10.5: Schedule of Environmental Commitments - Cultural Heritage

Mitigation Item	Party Responsible for Implementation	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required	Compliance / Monitoring
CH1	Contractor	Construction	Archaeological recording during construction (an archaeological watching brief) will be undertaken to make a permanent record of any surviving unknown archaeological remains that may be identified. This will be undertaken in accordance with relevant guidance provided by the Chartered Institute for Archaeologists, HES and Historic England, and a Written Scheme of Investigation (WSI) that will be agreed with the Curator and Transport Scotland's historic environment advisor. This includes a programme of assessment, reporting, analysis, publication and dissemination of the results of the archaeological watching brief, including the submission of a report to Falkirk and Fife's Historic Environment Records and the National Record of the Historic Environment.	To make a permanent record of any affected unknown archaeological remains.	Consultation with the Curator and Transport Scotland	To be included as an Employer's Requirement in the Contract.
CH2	Transport Scotland	Pre-construction	A historic building survey will be undertaken prior to construction to make a record of the original piled viaduct, and its temporary steel support structure, in the context of the bridge as a whole. This will be achieved through a laser scan of the bridge and the production of an enhanced historic building record in accordance with the guidance provided in Historic Building Recording Guidance (ALGAO: Scotland, 2013) and a WSI that will be agreed with the Curator and Transport Scotland's historic environment advisor. This includes a programme of assessment, reporting, analysis, publication and dissemination of the results, including the submission of a report to Falkirk and Fife's Historic Environment Records and the National Record of the Historic Environment.	To make a permanent record of Kincardine Bridge.	Consultation with the Curator and Transport Scotland	n/a
CH3	Contractor	Construction	Following the removal of the bridge parapet panels from site the appointed Contractor will undertake a detailed condition assessment of each removed bridge parapet panel. The appointed Contractor will prepare a report detailing the findings of this assessment and a justification for the retention or replacement of removed each bridge parapet panel. The report will be submitted to Falkirk Council for approval, who may undertake further consultation with HES. No disposal or replacement of any of the removed bridge parapet panels shall be undertaken by the appointed Contractor until after written approval of the findings of the report is received from Falkirk Council.	To provide a clear rationale and justification for the retention or replacement of each removed bridge parapet panel.	Approval of report required from Falkirk Council.	To be included as an Employer's Requirement in the Contract.

10.8 Residual Effects

- 10.8.1 Residual effects are those that remain once the proposed mitigation measures have been implemented. All residual effects are described below.

Archaeological Remains

- 10.8.2 As no impacts were identified on archaeological remains during the construction and operation of the proposed scheme, no residual effects have been identified.
- 10.8.3 Based on the evidence of previous disturbance within the footprint of the proposed scheme (See paragraphs 10.5.15 to 10.5.18) and construction methodology (see Chapter 3: The Proposed Scheme), an archaeological watching brief (**Mitigation Item CH1**) undertaken during construction is expected to mitigate impacts on unknown archaeological remains that may be present.

Historic Buildings

- 10.8.4 After mitigation, during construction, the magnitude of residual impact for the Kincardine Bridge (Asset 15) has been assessed to be moderate adverse and the residual significance of effect Moderate.
- 10.8.5 As no mitigation is proposed for impacts on Kincardine Conservation Area (Asset 16) and Shore House, 21 Forth Street (Asset 23), the residual significance of effect has been assessed to be Neutral for these two historic buildings during construction.
- 10.8.6 Under the worst case scenario identified in paragraph 10.6.3, while use of replacement panels in keeping with the design and materials of originals would ameliorate the impact resulting from the loss of panels continuing from construction into operation it would not wholly mitigate this impact. A residual effect of Moderate adverse significance has therefore been assessed. A Moderate beneficial effect during operation has also been assessed.

Historic Landscape Types

- 10.8.7 As no mitigation was proposed for impacts on Rough Grazing (HLT 1) and Firth of Forth Intertidal Mudflats (HLT 4), the residual significance of effects have been assessed to be Neutral for these two HLTs during construction.
- 10.8.8 As no impacts were identified on the historic landscape during the operation of the proposed scheme, no residual effects have been identified.

10.9 Assessment of Policy Compliance

- 10.9.1 DMRB LA 104 (Highways England, Transport Scotland, Welsh Government and Department for Infrastructure Northern Ireland 2019) states that environmental assessment, reporting and monitoring shall meet the requirements of the national planning policy for each relevant Overseeing Organisation.
- 10.9.2 Appendix A4.1 (Assessment of Policy Compliance) provides a review of national and local policy documents which are of relevance to the assessment undertaken and reported in this chapter in accordance with DMRB guidance.
- 10.9.3 National planning policy objectives (and accompanying best practice guidance) of relevance to this assessment are included in the Scottish Planning Policy (SPP) (2014) theme *Valuing the Historic Environment*, as well as the Historic Environment Policy for Scotland (HEPS) (HES 2019a), Policy GEN 6 (Historic Environment) of Scotland's National Marine Plan (SNMP) (2015), and PAN 2/2011 (Planning and Archaeology) (Scottish Government 2011). In addition, Falkirk Local Development Plan policies PE06 (Archaeological Sites), PE07 (Listed Buildings), PE08 (Conservation Areas), PE09 (Areas of

Townscape Value), and PE10 (Historic Gardens and Designated Landscapes), and Policy 14 (Built and Historic Environment) of the FIFEplan are of relevance (Falkirk Council 2020; Fife Council 2017).

Summary of Policy Compliance

- 10.9.4 In the interest of undertaking a robust assessment, the proposed scheme is assessed under a worst-case scenario. Although a Moderate adverse significance of effect has been identified during operation, the overall context of the proposed scheme generally satisfies the objectives of national and local policy. A full policy compliance assessment can be found in Table 5 of Appendix A4.1 (Assessment of Policy Compliance).

10.10 Statement of Significance

- 10.10.1 The overall residual effect on the cultural heritage resource comprising archaeological remains and the historic landscape has been assessed to be of Neutral significance. The understanding of any unknown archaeological remains that may be present would be increased through the dissemination of the results of the archaeological watching brief.
- 10.10.2 With proposed mitigation, the overall residual effect on historic buildings has been assessed to be of Moderate adverse significance during construction and Moderate adverse during operation. A Moderate beneficial significance of effect is also reported during operation. The dissemination of the results of the historic building recording would add to the understanding of Kincardine Bridge and the proposed scheme would also increase the longevity of the bridge, maintaining the ability of present and future generations to understand and appreciate it.

10.11 References

EU Directives and National Legislation

The Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017, SSI2017/137.

Maps

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Ordnance Survey 25-Inch, Stirlingshire XXV.1 & XVIIIA.13 (Airth; Culross; Tulliallan), Revised: 1895 and 1896, published: 1897

Ordnance Survey National Grid maps (1940s-1960s), NS9287-NS9387 - AA (includes: Airth; Tulliallan), Revised: 1959, published: 1961

Plan of the Firth of Forth opposite Tulliallan estate showing the line and section of proposed embankment (1828)

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