



Appendix C

Supporting Information

A9 Cromarty Bridge Programme of Works

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1.0 Introduction

A9 1360 Cromarty Bridge is a low-level estuarial crossing comprising 68 no. 21.5m long simply supported spans of beam and slab construction. The bridge is 1462m in length and crosses the Cromarty Firth.

A9 Cromarty Bridge was designed by Crough and Hogg and constructed between December 1976 and April 1979 by Fairclough Ltd. The structure carries a 7.45m wide single carriageway with a 2m footway on the west side of the bridge. A 0.85m surfaced verge is located on the eastern side of the bridge.

BEAR Scotland are responsible for maintenance and improvement schemes on the bridge as part of the NW Unit Network Management Contract (NMC) with Transport Scotland for the management and maintenance of the Scottish trunk road network.

A9 Cromarty Bridge is located approximately 11 miles north of Inverness, as shown in Figure 1. Typical views above and below the bridge are shown in Figures 2 and 3. Typical elevation and cross-section sketches of the bridge are shown in Figure 4.



Figure 1, A9 Cromarty Bridge Location



Figure 2, A9 Cromarty Bridge – Typical Northbound View Above Deck



Figure 3, A9 Cromarty Bridge – Typical View below the Bridge - Piers, Crossheads and Bridge Beams.

2.0 Programme of Works

Below are details of the engineering work to be included in the next Marine Licence submission. The proposed works are classified as a Scheme (one off engineering works) or Routine (regular maintenance works) and are currently identified in the 10-year programme of works for A9 Cromarty Bridge. All engineering works detail; the estimated construction period/duration, estimated construction value, location, works description, an outline method statement and proposed mitigation measures related to the protection of the Marine Environment.

The works methodologies described below are designed to prevent any material or equipment entering the marine environment. It should be noted that additional measures may be required, and these will be be confirmed with the contractor prior to works commencing. Where access platforms are noted, any dimensional constraints caused to the Highway, private land or over the marine environment will be considered and consultation completed with stakeholders where required. Cromarty Bridge is a low-level estuarial crossing and there is no designated navigation channel. On occasion the vertical clearance above MHWS will need to be temporarily reduced for some schemes. When temporary changes to the Navigation Channel are required, consultation will be completed with the Coast Guard on an individual scheme basis.

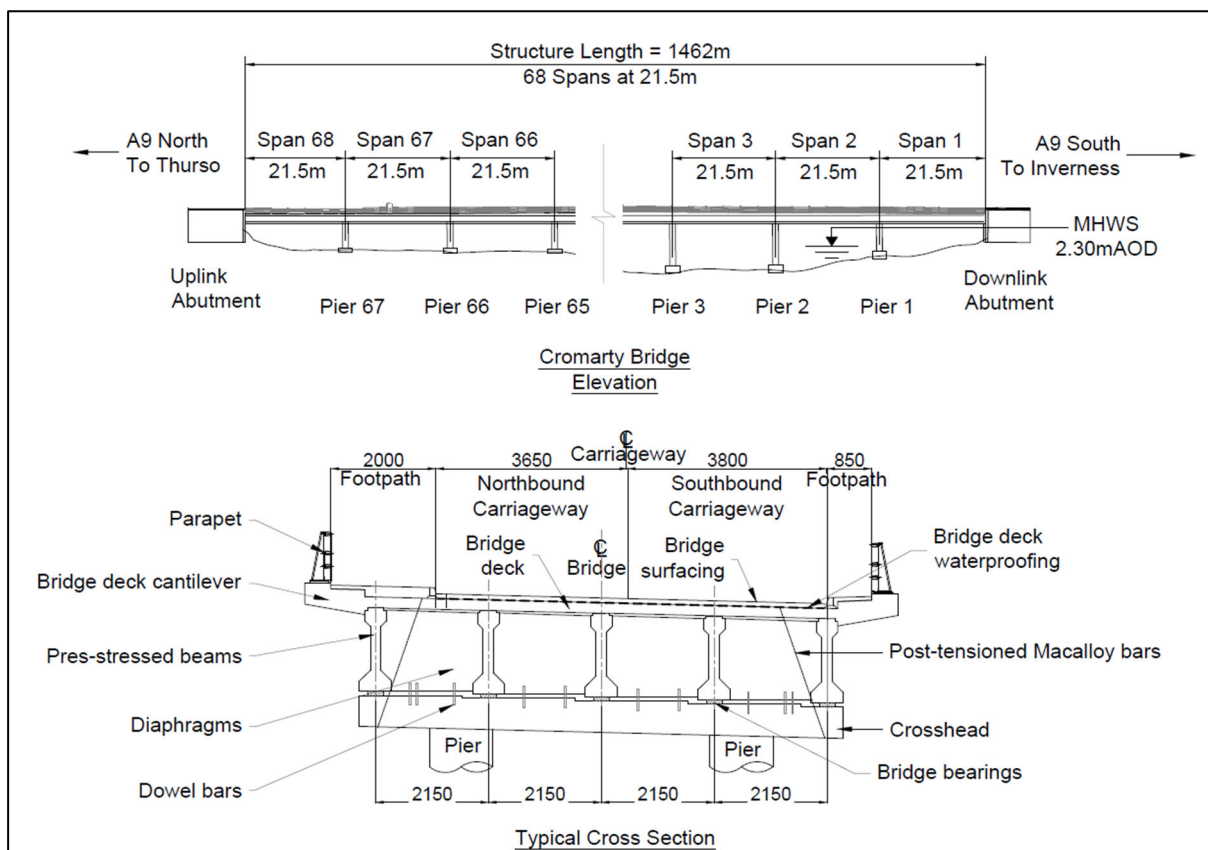


Figure 4, A9 Cromarty Bridge - Typical Elevation & Cross Section

1.1. Scheme Programme of Works

Below is a breakdown of the schemes currently identified in the 10-year programme of works for A9 Cromarty Bridge.

Phase 3 Bridge Refurbishment	
Included in Previous Marine Licence:	Yes.
Estimated Construction Period and working times.	Works are planned to be carried out between 2024 to 2026 and have an estimated duration of 6 months. Works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.
Estimated Construction Value:	£1.5M
Location on Structure:	Piers 8, 9 and 10 above and below the bridge deck.
Description of the Works:	<p>Background Information</p> <p>The permanent works planned for the Phase 3 Refurbishment include installation of a new Impressed Current Cathodic Protection system (ICCP), bearing replacement, concrete repairs, waterproofing replacement, resurfacing and expansion joint replacement at Piers 8, 9 and 10.</p> <p>The works will be a combination of day and night shifts and 24-hour access is required. There is no set construction period and there is provision to complete the works at any time throughout the year.</p> <p>The refurbishment strategy is to minimise traffic disruption. To achieve this the works will include provision for barges and jack-up barges (with “spud legs” for stability) for access to the structure. Work boats and barges will be used to transport site workers, materials, and equipment to the jack-up barge(s).</p> <p>Traffic management will be required for access to the topside of the bridge deck. Temporary bridging plates will be installed on the carriageway and footpaths at piers 8, 9 and 10. The bridging plates will be removed from a single carriageway at night (with traffic management) to allow the bridge deck to be excavated with hydro-demolition for installation of the ICCP system above piers 8, 9 and 10. Before the morning peak traffic, the temporary bridging plates will be re-instated on the bridge to allow traffic to flow freely at a reduced speed.</p> <p>Full containment will be in place during all hydro-demolition works on the carriageway or below deck on the temporary access/working platforms. Wastewater from the hydro-demolition process will be pumped to on-site water treatment equipment (Siltbuster or similar). This will lower the pH and suspended solids to comply with the conditions established in a SEPA CAR Licence. Once the pH and suspended solids compliance levels are achieved, the wastewater will be pumped into the Cromarty Firth. Waste concrete will be removed from site and landfilled by a licenced waste carrier.</p> <p>A static temporary working/access platform on bridge spans 8 to 11 will be installed underneath the bridge, above the highest astronomical tide level. An access scaffold staircase will be installed on the temporary access platform to allow access from the bridge deck (over the bridge parapet).</p>

A temporary mobile access platform will also be installed at piers 8, 9 and 10 to facilitate access to the piers at the mean low water springs level. The temporary mobile platform will be raised when the tide rises and will be stored above the highest astronomical tide level.

To ensure traffic disruption is minimised, jack-up barge(s) will be established adjacent to the worksite (piers 8, 9 and 10) provide laydown areas for plant, materials, tools and equipment off the carriageway. Spud legs will be lowered onto the seabed for stability.

All temporary access/working platforms will prevent debris or wastewater entering the Cromarty Firth and containment will be appropriate to the work activity.

Site Compound and Access to the Cromarty Firth

Provision for a site compound located to the west of the north abutment (>250m from the Arctic Tern Colony) is to be included in the application. The site compound will include provision for a temporary floating pontoon, which will extend from dry land (above MHWS) to within the Cromarty Firth. The pontoon will allow site personnel to locally access the work site using small sea vessels. Materials for the works would also be transported to small vessels using the floating pontoon.

An additional temporary mooring point may also be established adjacent to the north abutment (west side) using temporary access platforms. This will be within the Arctic Tern Colony exclusion zone and will be installed from September to March. It cannot be used during the Arctic Tern nesting restricted months of April to August.

Construction Methodology

Once the temporary access/working platforms have been installed underneath the bridge, the bridge beams and deck will be temporarily jacked (~3mm) and the bridge bearings replaced. A grout plinth will be poured below the bridge bearings. Concrete repairs to the crosshead and piers will also be completed using small hand tools to excavate the existing concrete.

Traffic management will be established, and the surfacing will be locally removed from piers 8, 9 and 10 using road planers and hand tools. The existing bridge deck waterproofing contains Chrysotile Asbestos within a bitumen matrix. Licenced contractors will use small hand tools to remove the waterproofing with water suppression as mitigation. The asbestos waterproofing will be removed from site by a licenced special waste carrier.

Temporary bridging plates will be installed on the bridge deck above piers 8, 9 and 10. Over a series of night shifts, the bridge deck will be excavated with hydro-demolition and the ICCP system will be installed using small hand tools. New steel reinforcement will be installed, and continuity joints will be cast at piers 8 and 9. The bridge deck will be re-formed at pier 10. Once the concrete has sufficiently cured, a spray applied waterproofing system will be applied to the bridge deck and new gullies will be installed. The bridge deck will be locally resurfaced once the temporary bridging plates are removed. A new expansion joint will then be installed at pier 10. White lining and road studs will follow to complete all works above the bridge deck.

	<p>Prior to installing the ICCP system on the bridge substructure, the concrete surface will be prepared using hydro-demolition to create a rough surface texture. Hand tools will then be used to install the ICCP system on the crosshead, diaphragms, and piers. A sprayed concrete overlay will then be applied to the same areas.</p> <p>Divers will install galvanic anodes on the pile caps of piers 8, 9 and 10. If the tidal coefficient is high and the low tide level is below the pile caps, the galvanic anodes may be installed on foot.</p> <p>New ICCP equipment will be installed on the bridge just above the cross heads at piers 8, 9 and 10.</p> <p>A concrete sealant (Pavix CCC100 or similar approved) will be spray applied to the surfaces of all pre-stressed beams on spans 8 to 11. Where possible, the temporary working/access platform (with containment) will be used for access. On spans 8 and 11, an underbridge vehicle (with traffic management) will be used for access. The underbridge vehicle will be positioned underneath the spray area to contain the concrete sealant.</p> <p>The static and mobile temporary access/working platforms will be removed from site once all works are complete. The jack-up barge(s), barges and other work boats will be demobilised from site.</p>
<p>Construction Plant and Equipment:</p>	<p>Temporary Works Equipment: Static and mobile working/access platforms, floating pontoon, bridge jacking equipment and carriageway bridging plates.</p> <p>Plant and equipment: Jack-up barges, barges, work boats, hydro-demolition equipment, wastewater treatment equipment, compressors, pumps, hand tools, road planer, road paver, sprayed concrete equipment.</p>
<p>Outline Method Statement:</p>	<ul style="list-style-type: none"> • Establish jack-up barges adjacent to the bridge. • Install static and mobile temporary access/working platforms. • Jack up bridge deck and replace bridge bearings at piers 8, 9 and 10. • Complete concrete repairs to the crossheads and piers as required. • Establish traffic management and locally plane off surfacing above piers 8, 9, and 10. Remove existing waterproofing above piers (bitumen with chrysotile asbestos). • Install temporary bridging plates on the carriageway. Remove traffic management. • Commence night-time topside works with traffic management as required. • Excavate bridge deck above piers 8, and 10 with hydro-demolition. Treat wastewater and pump into Cromarty Firth, once compliant with the SEPA CAR Licence. • Install ICCP system from carriageway above piers 8, 9 and 10. • Install steel reinforcement at piers 8 and 9 and form continuity joints with structural concrete. • Cast new joint at pier 10 with structural concrete. • Waterproof exposed concrete deck and install new gullies at piers 8, 9 and 10. • Locally resurface at piers 8, 9 and 10. Complete white lining and install road studs as required. • Install new expansion joint at pier 10. • Prepare substructure surfaces with hydro-demolition and install ICCP equipment on the piers, crossheads, diaphragms at piers 8, 9 and 10.

	<ul style="list-style-type: none"> • Install sprayed concrete overlay on piers and install galvanic anodes on the pile caps of 8, 9 and 10. These are located at the base of the piers. • Sever dowel bars located on crossheads. • Spray apply concrete sealant to the prestressed beams on spans 8 to 11. • Remove static and mobile temporary access working/access platforms from site. • Remove jack-up barges, barges and other work boats from site.
Materials/Waste	<p>Waste construction materials removed from the bridge include asphalt surfacing, bitumen asbestos waterproofing, concrete, steel expansion joint, steel/rubber bridge bearings. Where possible waste materials will be recycled by a licenced waste carrier (e.g. steel bearings). Other waste materials will be landfilled by a licenced waste carrier.</p> <p>Materials to be added to the bridge include rubber/steel bearings, steel/rubber expansion joint, concrete, sprayed concrete, steel reinforcement, cabling, ICCP materials, galvanic anodes and concrete sealant (Pavix CCC100 or similar).</p>
Proposed Mitigations:	<ul style="list-style-type: none"> • Full containment will be in place during all hydro-demolition works on the carriageway or below deck on the temporary access/working platforms. • Site based water treatment will be used to reduce suspended solids and pH levels to comply with CAR Licence conditions prior to discharging to the Cromarty Firth. • Containment and dust suppression (water spray) will be used when removing the asbestos waterproofing from the bridge deck. The site will be cleaned to ensure all Asbestos Containing Materials are removed from site. • Edge protection will be in place to prevent debris falling into the Cromarty Firth. • Containment will be in place for spray applied concrete sealant onto the pre-stressed beams.
Phase 4 Bridge Refurbishment	
Included in Previous Marine Licence:	No.
Estimated Construction Period and working times.	Works are planned to be carried out between 2025 to 2029 and have an estimated duration of 6 months. Works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.
Estimated Construction Value:	£1.5M
Location on Structure:	Piers 11,12 and 13 above and below the bridge deck.
Description of the Works:	The permanent and temporary works will be identical to the Phase 3 Refurbishment above. The only change will be the location of the works which will be on piers 11,12 and 13 (adjacent to the Phase 3 worksite).
Construction Plant and Equipment:	Refer to Phase 3 refurbishment above. Work site location will be piers 11, 12 and 13 above and below deck.
Outline Method Statement:	
Materials/Waste	

Proposed Mitigations:	
Advanced Electrical Supply	
Included in Previous Marine Licence:	No.
Estimated Construction Period and working times.	Works are planned to be carried out between 2025 to 2030 and have an estimated duration of 1 month. Works will take place from September to March to avoid the Artic Tern restrictions at the north end of the bridge. Works may take place during daytime hours, at night, or a mixture of both and will be on site 7 days per week.
Estimated Construction Value:	£400k
Location on Structure:	Western bridge deck cantilever from Pier 37 to the North Abutment.
Description of the Works:	A cable tray is to be installed to the underside of the western bridge deck cantilever from Pier 37 to the north abutment (~430m). Non-metallic fixings will be drilled into the underside of the concrete bridge deck cantilever and anchored using chemical resin. The cable tray will be installed and power/data cables laid within the newly installed cable tray. To access the western bridge deck cantilever, traffic management will be established and an underbridge access vehicle and/or temporary working/access platform will be used.
Construction Plant and Equipment	Temporary access/working platform equipment, underbridge access vehicle, works vehicles, cable laying equipment, hand tools.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish traffic management. • Install temporary access/working platform and/or underbridge access vehicle. • Install non-metallic cable tray fixings with chemical anchor resin from pier 37 to north abutment. • Install non-metallic cable tray from pier 37 to north abutment. • Install power and communication cables within the cable tray from pier 37 to north abutment. • Fix cover to the cable tray. • Demobilise temporary working/access platforms and underbridge access vehicle. Remove TM from site.
Materials/Waste	There will be no construction materials removed from the bridge. Spare construction materials will be recycled where possible. Materials for the works include non-metallic cable tray and fixings, chemical resin anchors and power/communications cables.
Proposed Mitigations:	Edge protection on the temporary working/access platform or underbridge access vehicle will be sufficient to prevent any pollution to the marine environment (i.e. dust from drilling fixings or chemical anchor resin).

1.2. Routine Maintenance Programme of Works

In addition to the one-off schemes listed above, there are several routine maintenance activities that are completed on a regular basis. Some of these routine maintenance activities may also be encompassed within the one-off schemes.

Below is a breakdown of the routine maintenance activities that may be carried out throughout the duration of the proposed licence period along with a description of the proposed works. The works can be both routine and reactive and vary in nature, therefore it is not possible to provide an estimated construction value. These works may also be required at any location of the structure. However environmental mitigation measures appropriate to the task and outlined in the method statements will be employed at all times.

This list is not exhaustive and there may be other low-risk routine maintenance activities carried out on the structure on a like-for-like basis. Any unidentified routine maintenance activities will be subject to the terms and conditions of the Marine Licence for this Structure.

Scour Repairs	
Included in Previous Marine Licence:	Yes
Estimated Construction Period and working times.	<p>This will be reactive maintenance based on inspections and monitoring of the structure. No works are currently planned. Any scour works required will be carried out between 2024 to 2034 and have an estimated duration of 4 months.</p> <p>Works located out-with the Arctic Tern exclusion zone may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.</p> <p>Works located within the Arctic Tern exclusion zone will be completed from September to March, 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.</p>
Estimated Construction Value:	This scheme has not yet been conceptualised and will be completed if scour around the piers is found during inspections/monitoring. Typical values of previous scour schemes are circa £1.5M.
Location on Structure:	10m radius on the seabed around the pier pile caps.
Description of the Works:	<p>Scour repairs may be required to any of the 67 No. piers following inspection by dive teams or bathymetric survey. A maximum of six piers will have scour protection installed in a single year.</p> <p>A temporary access platform will be installed adjacent to the north abutment (west side) to create a temporary mooring point. This will allow site personnel to locally access the work site using small sea vessels. It will be within the Arctic Tern exclusion zone, however, it will be installed from September to March. The temporary mooring point may be used throughout the year.</p> <p>Site accommodation will be located at the layby adjacent to the north bridge abutment, also within the exclusion zone.</p> <p>Access to the works area will be by barge and jack-up barge positioned adjacent to the east pier. Jack-up barges have “spud legs” that will be lowered onto the seabed for stability.</p> <p>Once access is established at the required pier, an excavator located on the jack-up barge will excavate the seabed around the pier pile caps. The excavated seabed material will be side cast adjacent to the worksite for re-use once the scour protection rock armour is installed.</p>

	<p>Using the excavator on the jack-up barge, clean imported granular material is placed under and around the pile caps to fill any small voids. Weighted geotextile material is then positioned around the pile caps by divers. Clean/washed rock armour (each rock 300kg – 1000kg) is then carefully lifted from barges and placed onto the geotextile around the piers to the required level.</p> <p>Seabed material excavated from around the pile caps will be placed on top of the new rock armour as required.</p> <p>Once complete, the jack-up barge will be moved to the next pier and the above process will be repeated as necessary on the remaining piers on the east side of the bridge.</p> <p>Once the works on the east side of the bridge are complete, the jack-up barge will transfer to the west side of the bridge once the spud legs have been removed from the jack-up barge. To do this, traffic management will be established on the bridge to allow the spud legs to be lifted by a crane on the carriageway from the barge and re-established on the western side of the bridge.</p> <p>The same process outlined above will be followed to finish the scour protection installation.</p>
<p>Construction Plant and Equipment:</p>	<p>Jack-up barge(s), barges, excavator(s), crane, temporary access platform equipment.</p>
<p>Outline Method Statement:</p>	<ul style="list-style-type: none"> • Establish traffic management and install site accommodation at south bound layby adjacent to the north abutment. • Install temporary access platform adjacent to the north abutment (west side) to create a temporary mooring point. • Establish jack-up barge adjacent to scour work site on east side of piers. • Excavate around pier base as per design. Side cast excavated seabed material for re-use. • Using the excavator on the jack-up barge, transfer clean granular rock from a barge and place under/around pile cap voids. • Install geotextile material on excavated area around piers. • Using the excavator on the jack-up barge, transfer clean rock armour from a barge and place under/around pile cap voids. • Side cast seabed material to be excavated and placed on the rock armour as per the design. • Repeat above works on other piers, as required on east side of bridge. • Establish traffic management. Remove spud legs using crane on carriageway. Transfer the jack-up barge & excavator to the west side of the bridge. • Repeat works outlined above on the western piers. • Demobilise from site.
<p>Materials/Waste</p>	<p>There will be no construction materials removed from the bridge. Side cast seabed material will be re-used and placed on top of the rock armour.</p> <p>Materials for the works include geotextile, clean washed granular rock and rock armour. Spare rock will be stored for re-use or returned to the quarry. Spare geotextile material will be stored for re-use on other schemes. Small geo-textile cut-offs will be landfilled by a licenced waste carrier.</p>

Proposed Mitigations:	All rock products will be clean and washed to prevent pollution to the Cromarty Firth.
Expansion Joint Replacement	
Included in Previous Marine Licence:	No
Construction Period and working times.	This will be reactive maintenance based on inspections and monitoring of the structure. Any required works will to be carried out between 2024 to 2034 and each joint replacement has an estimated duration of 1 week. Works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.
Estimated Construction Value:	Typically, ~£50k.
Location on Structure:	Expansion joints are located on the carriageway above the north/south abutments and each of the 67 No. piers.
Description of the Works:	<p>Traffic management will be established/removed on the bridge throughout the expansion joint replacement. The existing expansion joints will be removed using a combination of hand tools and thermal cutting equipment. Temporary steel bridging plates will then be installed over the bridge gap and temporary surfacing material installed on top of the bridging plates.</p> <p>The carriageway surfacing approaches (~15m total length) will be resurfaced by planing the wearing course (typically ~45mm) and resurfaced as required.</p> <p>The surfacing will be saw cut and excavated across the full width of the bridge at the expansion joint location. The temporary bridging plates will be removed and new waterproofing installed on the bridge deck prior to installing the new expansion joint. Depending on the type of expansion joint, on site thermal welding or anchoring the expansion joint into the bridge deck will be required.</p> <p>Nosing mortars will be poured on either side of the expansion joint and high friction surfacing will be applied to the nosings.</p> <p>Repeat on opposite carriageway as required.</p>
Construction Plant and Equipment:	Hand tools, floor saw, road planar, resurfacing plant and equipment, welding equipment.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish traffic management. • Saw cut expansion joint extremities and remove existing expansion joint(s). • Install temporary bridging plates on exposed bridge deck. • Plane out surfacing on expansion joint approaches. • Resurface expansion joint approaches. • Saw cut and excavate surfacing to install new expansion joint. Remove temporary bridging plates. • Install waterproofing to bridge deck as required. • Install new expansion joint and nosing material. • If required, weld expansion joint rails and/or drill and resin fix anchors into concrete bridge deck.

	<ul style="list-style-type: none"> Repeat on opposing carriageway (steps 6 – 9).
Proposed Mitigations:	Temporary bridging plates to be installed to prevent materials entering the Cromarty Firth.
Materials/ Waste	<p>Materials removed from site include the existing expansion joint, nosing material and surfacing. If possible, the expansion joint and nosing material will be transported off site and recycled by a licenced waste carrier. Road surfacing planings will be re-used locally, with a SEPA Paragraph 13 exemption.</p> <p>Materials being installed on the bridge include surfacing materials, resin anchors, waterproofing, expansion joints and nosing material.</p>
Concrete Repairs	
Included in Previous Marine Licence:	No
Construction Period and working times.	This will be reactive maintenance based on inspections and monitoring of the structure. Any works required will be planned to be carried out between 2024 to 2034. The works have an estimated duration of 1 month for small concrete repairs and 3 months for larger concrete repairs. Works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.
Estimated Construction Value:	Value unknown.
Location on Structure:	Above and below the bridge deck. All spans.
Description of the Works:	<p>Concrete repairs to the bridge deck, crossheads, piers or beams may be required if defects are found during inspections.</p> <p>Access will be established above and below the bridge deck which will require traffic management and an underbridge access vehicle or temporary access/working platform.</p> <p>Small Concrete Repairs Small concrete repairs will be saw cut and excavated with hand tools. Edge protection containment and debris netting will be installed to prevent excavated concrete entering the Cromarty Firth. Hand tools will be used to prepare the steel reinforcement and apply proprietary concrete repair mortar to the structure. If located on the bridge deck, waterproofing and surfacing will be installed. The underbridge access vehicle, temporary working/access platform and Traffic Management will be removed from site.</p> <p>Larger Concrete Repairs Large concrete repairs will require hydro-demolition to excavate defective concrete. Full containment on the temporary working platform will be used if hydro-demolition is required. Wastewater will be contained within the temporary working platform and will be either pumped into a storage tank and disposed of under licence or treated onsite prior to discharging to the Cromarty Firth (with SEPA CAR Licence consent). Hand tools will be used to prepare the steel reinforcement and apply proprietary concrete repair mortar to the structure. If located on the bridge deck, waterproofing and surfacing will be installed. Temporary access/working platforms and the traffic management will be removed from site following the concrete repairs.</p>

Construction Plant and Equipment:	Temporary access/working platforms, underbridge access vehicle, hydro-demolition equipment, water pumps, water treatment equipment, road planer, surfacing equipment and hand tools.
Outline Method Statement:	<p>Small Concrete Repairs</p> <ul style="list-style-type: none"> • Establish temporary access/working platform, underbridge access vehicle and traffic management as required. • Install containment appropriate to the works. • Remove defective concrete and surfacing/waterproofing if located on the bridge deck. • Prepare steel reinforcement and complete concrete repairs as required. • Relay waterproofing and surfacing if defect located on the bridge deck. • Remove temporary access/working platform or Traffic Management. <p>Large Concrete Repairs</p> <ul style="list-style-type: none"> • Establish temporary access/working platform and traffic management as required. • Install containment appropriate to the works. • Remove surfacing/waterproofing if located on the bridge deck with a road planer and hand tools. • Remove defective concrete using hydro-demolition. • Treat waste hydro-demolition water and discharge to the Cromarty Firth or pump into storage tank. • Prepare steel reinforcement and complete concrete repairs as required. • Relay waterproofing and surfacing if defect located on the bridge deck. • Remove temporary access/working platform or Traffic Management.
Proposed Mitigations:	Full containment will be in place to prevent untreated wastewater entering the Cromarty Firth. Edge protection and debris netting will prevent concrete waste entering the Cromarty Firth.
Materials/ Waste	<p>Removed bituminous surfacing material will be taken off site and re-used on other work sites (with SEPA Paragraph 13 Waste Management Licence).</p> <p>Solid waste concrete and waterproofing material will be transported off site and landfilled by a licenced waste carrier.</p> <p>Wastewater from the hydro-demolition process will be treated on site and discharged into the Cromarty Firth (under SEPA CAR licence) or pumped into storage tanks and disposed by a licenced waste carrier.</p> <p>Proprietary concrete mortar will be added to the structure.</p>
Cathodic Protection System Repair and Maintenance	
Included in Previous Marine Licence:	No
Construction Period and working times.	This will be reactive maintenance based on inspections and monitoring of the structure. Any works required will be planned to be carried out between 2024 to 2034. The works are estimated to take 1 month to complete. The works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.
Estimated Location Construction Value:	Value unknown.

Location on Structure:	All bridge spans, underneath the bridge deck on the bridge deck cantilever, crossheads and piers.
Description of the Works:	Carry out maintenance to cathodic protection system components, electrical connections, cabinets and cabling. Traffic management and an underbridge access vehicle will be used for access underneath the structure.
Construction Plant and Equipment:	Underbridge access vehicle and hand tools.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish Traffic Management and underbridge access vehicle • Complete testing and repairs as required. • Install new components, • Remove traffic management.
Proposed Mitigations:	Work to be carried out will be planned to ensure that tools and materials are contained and not able to enter the marine environment.
Materials/ Waste	WEEE waste will be disposed of in accordance with guidelines. Cabling and other materials will be transported off site for recycling where possible or landfilled.
Drainage Cleaning	
Construction Period and working times.	This is cyclic maintenance and reactive maintenance based on inspections and monitoring of the structure. Works are planned to be carried out between 2024 to 2034. The works are estimated to take 1 day to complete. The works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.
Construction Value:	Unknown
Location on Structure:	Deck drainage at gullies from road level.
Description of the Works:	The drainage gullies on bridge require periodic maintenance to ensure they are effective for draining water from the carriageway.
Construction Plant and Equipment:	Gully cleaning and road sweeper vehicles, jet washing equipment, hand tools, rodding equipment.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish Traffic Management as required, • Open kerb gully with hand tools. • Clean debris from gully or chamber using vacuum truck or hand tools. Use jet washing to clean gully. • Remove Traffic Management.
Proposed Mitigations:	Swept detritus, water and waste material from the road carriageway will be collected and removed from site.
Materials/ Waste	Waste collected will be removed off site and landfilled by a licenced waste carrier.
Bird Guano Removal	
Construction Period and working times.	This is cyclic maintenance. Works are planned to be carried out between 2024 to 2034. The works are estimated to take 1 week to complete. The works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.
Construction Value:	Unknown

Location on Structure:	All bearing shelves on piers and abutments.
Description of the Works:	Establish traffic management, underbridge access vehicle and temporary working/access platform to access underneath the bridge deck. Bird guano on the bearing shelves and other sheltered areas requires periodic cleaning and removal to prevent build up.
Construction Plant and Equipment:	Hand tools, cleaning equipment, underbridge access vehicle and temporary working/access platform.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish Traffic Management, underbridge access vehicle and temporary working/access platform to access underneath the bridge deck. • Clean bearing shelves using hand tools. • Remove Traffic Management.
Proposed Mitigations:	In order to prevent the materials entering the marine environment, the following measures will be taken. Bird Guano will need to be bagged disposed by a licenced waste carrier.
Materials/ Waste	Guano and detritus will be removed off site and disposed by a licenced waste carrier.
Resurfacing Operations	
Construction Period and working times.	This is reactive maintenance based on inspections and monitoring of the structure. Works are planned to be carried out between 2024 to 2034. The works are estimated to take between 1 and 4 weeks to complete, depending on the scope of works. The works may take place any time of year, up to 7 days per week. Resurfacing areas within the Artic Tern exclusion zone will be restricted and be completed from September to March. Works may take place during daytime hours, at night, or a mixture of both.
Construction Value:	Unknown.
Location on Structure:	Carriageways and footpaths on all spans of the bridge.
Description of the Works:	<p>Footpath and road resurfacing, waterproofing, road studs and lining works require periodic maintenance and renewal. The bridge deck waterproofing may require renewing as part of the resurfacing works. Note that the bridge deck waterproofing from spans 8 to 68 contains Chrysotile Asbestos within a bitumen matrix, which will be removed and disposed of by specialist teams.</p> <p>Traffic management will be established on the bridge. A road planer will remove the surfacing by milling, without damaging the water proofing layer. The milled surfacing material is transferred into lorries to remove from site and reuse on other work sites (with SEPA Paragraph 13 Waste Management Licence).</p> <p>If required, the concrete kerbs and concrete kerb bed will be removed using hand tools and mechanical excavators.</p> <p>Specialist teams will remove the asbestos waterproofing with a combination of hand tools and excavator buckets. The waterproofing has been assessed as low risk as it is bound within the bitumen matrix. Dust suppression (water spray) will be used to prevent dust contaminating the atmosphere or water body below. The site area will be cleaned and all Asbestos Containing Materials (ACM) will be removed from site by specialist licenced waste carriers.</p> <p>If required, small/medium concrete repairs to be bridge deck will be completed by hand with proprietary concrete repair materials.</p>

	<p>A new proprietary waterproofing system will be spray applied to the concrete bridge deck. Kerbs and the concrete kerb bed will be reinstated, if required.</p> <p>A bond coat will be applied to the waterproofing system and mechanically resurfaced using a surfacing paving machine. Following the resurfacing white lines and road studs will be applied and the traffic management removed from site.</p>
Construction Plant and Equipment:	Hand tools, excavator, road planer, lorries, resurfacing plant/equipment, spray applied waterproofing equipment.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish Traffic Management. • Plane/mill out existing surfacing. • Remove kerbs and concrete kerb bed. • Remove bridge deck waterproofing (ACM). • Complete concrete repairs to concrete bridge deck. • Install spray applied waterproofing system • Install new kerbs on concrete bed. • Spray apply tack coat and mechanically resurface. • Paint new white lining and install road studs. • Remove any Traffic Management.
Proposed Mitigations:	<p>Ensure that all milling works are carried out during suitable periods of weather to ensure that waste material is not blown or washed in the water. Gullies covered to prevent surfacing material entering Cromarty Firth.</p> <p>Asbestos waterproofing material will be safely removed by specialist teams. Dust suppression (water spray) will be used to prevent atmospheric/water pollution.</p>
Materials/ Waste	<p>Removed bituminous material will be re-used on other work sites (with SEPA Paragraph 13 Waste Management Licence).</p> <p>ACM waste will be treated as special waster and removed from site by a licenced waste carrier.</p> <p>Concrete kerbs and concrete will be removed from site and landfilled by a licenced waste carrier.</p> <p>Materials added to the bridge include proprietary concrete repair material, concrete, concrete kerbs, proprietary spray applied waterproofing, surfacing material, bond coat, white lining and road studs.</p>
Parapet Repair	
Construction Period and working times.	This is reactive maintenance. Works are planned to be carried out between 2024 to 2034. The works are estimated to take 1 week to complete. The works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both.
Construction Value:	Unknown
Location on Structure:	Bridge footpaths, all spans.
Description of the Works:	The existing parapet will require periodic renewal or repair from vehicle damage. Establish traffic management, temporary vehicle restraint system (Varioguard or similar) and temporary edge protection. Remove defective parapet components and replace like-for-like.
Construction Plant and Equipment:	Hand tools, lorry mounted crane, temporary vehicle restraint and temporary edge protection.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish Traffic Management • Install temporary vehicle restraint and temporary edge protection. • Remove existing/defective parapet components

	<ul style="list-style-type: none"> • Install new parapet • Remove safety barrier and Traffic Management
Proposed Mitigations:	Edge protection to be installed to ensure materials can't spill over the edge of the bridge.
Materials/ Waste	Removed steelwork transported off site and recycled by a licenced waste carrier.
Ancillary Highway item repair	
Construction Period and working times.	This is reactive maintenance. Works are planned to be carried out between 2024 to 2034. The works are estimated to take up to 3 days to complete. The works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both
Construction Value:	Unknown
Location on Structure:	Bridge deck throughout structure.
Description of the Works:	Repair and replacement of any traffic signs and any other trunk road apparatus.
Construction Plant and Equipment:	Access platforms and hand tools.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish Traffic Management and MEWP. • Remove and replace ancillary highway equipment. • Remove access platform and Traffic Management
Proposed Mitigations:	Work to be carried out using protection and tethers for tools where required to prevent materials or tools entering watercourse.
Materials/ Waste	Removed equipment transported off site and recycled where possible or disposed to landfill.
Inspections and Surveys	
Construction Period and working times.	Inspections and surveys take place on a regular basis. Works are planned to be carried out between 2024 to 2034. Inspections and surveys each take up to 1 week to complete. The works may take place any time of year, up to 7 days per week. Works may take place during daytime hours, at night, or a mixture of both
Construction Value:	Unknown
Location on Structure:	Throughout Bridge. All spans.
Description of the Works:	Intermittent inspections and surveys of the entire bridge will be required. Access required will include traffic management, temporary access/working platforms, underbridge vehicles and mobile elevated work platforms. Roped access teams will be used along with UAVs (drones) for inspections and surveys. All equipment used will be tethered to the individuals completing inspections and surveys. Barges and small vessels will also be used to survey the seabed of the Cromarty Firth to complete bathymetric surveys.

Construction Plant and Equipment:	Temporary access/working platforms, barges, small vessels, hand tools, survey equipment, hand tools and generators.
Outline Method Statement:	<ul style="list-style-type: none"> • Establish access which may include, traffic Management, temporary working/access platforms, underbridge vehicles, mobile elevated working platforms, barges and small vessels. • Complete inspection and/or survey. • Demobilise access.
Proposed Mitigations:	Inspections and surveys are generally non-intrusive and will not result in any breaking out of material. Loose material may be removed as part of the inspection (e.g. concrete).
Materials/ Waste	Unlikely to be any waste, however, any loose material (e.g. concrete) will be removed as part of inspections to be taken off the site and landfilled by a licenced waste carrier.