Appendix C

Supporting Information
A87 290 Skye Bridge

Contents

1. Introduction

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.

A87 290 Skye Bridge is located approximately 1.5 miles west of Kyle of Lochalsh, as shown in Figure 1.

Skye Bridge construction was completed in 1995 to cross a 400m tidal channel of Loch Alsh from the island of Eilean Bàn to Skye. It was designed by Dyckerhoff & Widmann AG Consulting Engineers and constructed by a Miller-Dywidag Joint Venture.

The Skye Bridge crossing comprises a five-span structure in two parts:

- The approach viaduct over Eilean Bàn comprising a two span continuous spine beam and slab type deck (spans 1 & 2).

- The main crossing over the open sea channel comprising a three span continuous concrete box girder (spans 3 to 5).

The approach viaduct comprises two continuous spans of 32 metres. The superstructure comprises an insitu post-tensioned concrete deck with two post-tensioned concrete spine beams. The north abutment comprises a bearing chamber within a reinforced concrete abutment on Eilean Bàn.

The main crossing comprises a three span continuous cast insitu variable depth single cell post-tensioned concrete box girders. The bridge deck cross section varies over the spans from 3.25m to 12.6m in height. The carriageway width is 7.3m with 2m wide footpaths on the bridge deck cantilevers.

A87 Skye Bridge has two piers located in Loch Alsh (Piers 3 & 4) which are socketed into concrete caissons with a vertical layer of bentonite slurry between the north and south faces of mass concrete infill of the caissons and the structural concrete column of the piers. The bentonite provides a means for the piers to rotate due to thermal expansion and contraction. Stainless steel covers are located above the bentonite.

An annotated sketch showing typical elevation and cross-section details of the bridge is included in Figure 2.

A water main, telecoms and electric cables are located within the concrete box girder.

A navigation channel with a vertical clearance of 29m is centred on the main crossing span (span 4). 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.

Photographs of the carriageway, parapet, piers, box beam, bridge soffit, abutment, rock armour and water main are shown in Figures 3 to 10.

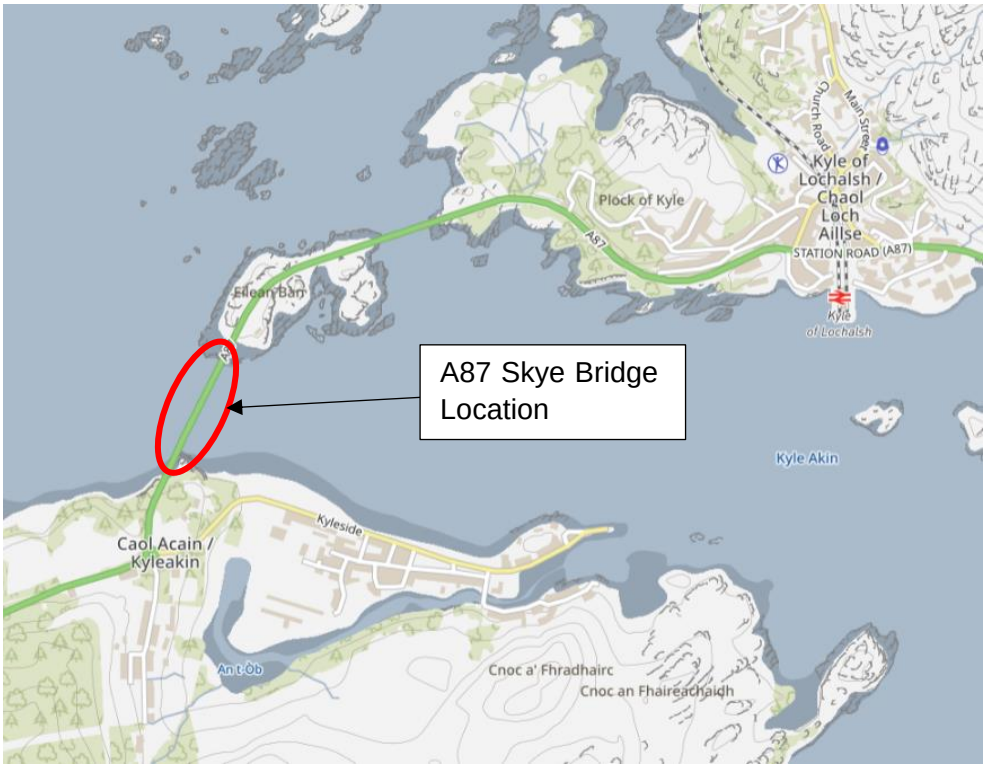

Figure 1, A87 Skye Bridge Location

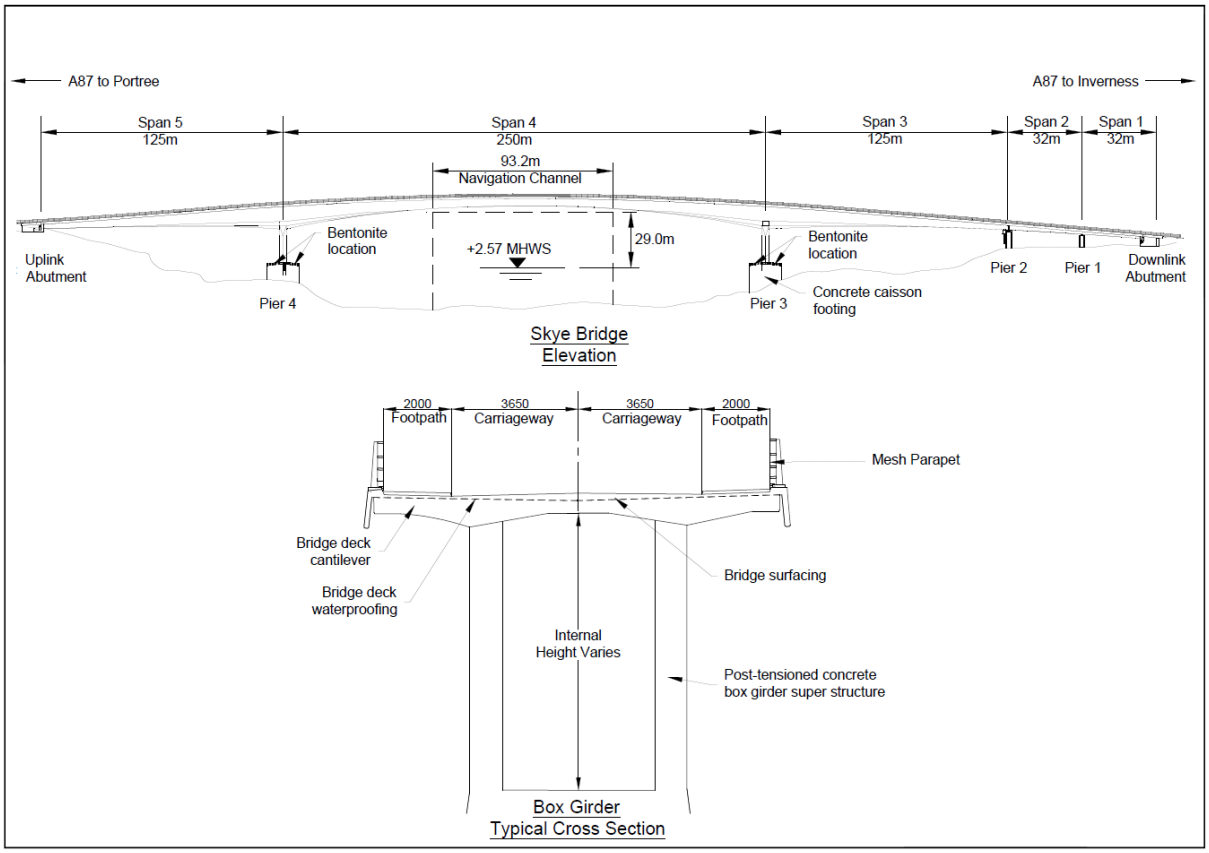

Figure 2, A87 Skye Bridge – Typical Elevation and Cross Section

Figure 3, A87 Skye Bridge – Typical view of the bridge box girder across the tidal channel (span 4)

Figure 4, A87 Skye Bridge – Typical view from Eilean Bàn.

Figure 5, A87 Skye Bridge – Typical internal view from within the box girder, showing the water main and cable trays.

Figure 6, A87 Skye Bridge – Typical internal view from with the box girder at one of the main piers, showing the water main, access ladder, drainage and cable trays.

Figure 7, A87 Skye Bridge – Typical view of carriageway and footpaths.

Figure 8, A87 Skye Bridge – Typical view of the bridge piers, concrete box girder and parapet from below the bridge.

Figure 9, A87 Skye Bridge – Typical view of one of the main pier caissons and bentonite covers (Piers 3 & 4) within the tidal Channel of Loch Alsh.

Figure 10, A87 Skye Bridge – Typical view from on Pier 3 & 4 of the bentonite cover.

2. Programme of Works

Below are details of the engineering works to be included in the 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 A87 Skye 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 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.

Skye Bridge has a navigation channel with a vertical clearance of 29m and 93.2m wide centred on the main crossing span (span 4). 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.

3. Scheme Programme of Works

Below is a breakdown of the schemes currently identified in the 10-year programme of works for A87 Skye Bridge.

Bridge Deck Resurfacing and Waterproofing	
Included in previous marine licence:	Yes.
Construction Period and working times.	Works are planned to be carried out between 2024 to 2034. The works are estimated to take 4 weeks 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:	£3M.
Location on Structure:	Carriageway and footpaths on all spans of the bridge.
Description of the Works:	Footpath and road resurfacing, waterproofing, road studs and lining works require periodic renewal. Traffic management will be established on the bridge. A road planer will remove the surfacing by milling, without damaging the waterproofing 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). The concrete kerbs and concrete kerb bed will be removed using hand tools and mechanical excavators. The waterproofing system will be removed with mechanical plant (excavators and proprietary grit blasting machines) and hand tools. Any grit blasting plant used will ensure that all grit used is contained and all grit cleaned from site. If required, small/medium concrete repairs to be bridge deck will be completed by hand and repaired with proprietary concrete repair materials. A new proprietary waterproofing system will be spray applied to the concrete bridge deck. Kerbs and the concrete kerb bed will be reinstated. 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 installed and the traffic management removed from site.
Plant and Equipment:	Hand tools, excavator, self-contained grit blasting waterproofing removal equipment, road planer, lorries, resurfacing plant/equipment, spray applied waterproofing equipment.
Outline Method Statement:	• Establish Traffic Management. • Plane/mill out existing surfacing. • Remove kerbs and concrete kerb bed. • Remove bridge deck waterproofing. • Complete concrete repairs to concrete bridge deck. • Install spray applied waterproofing system • Install new kerbs on concrete bed. • Spray apply bond coat and mechanically resurface. • Paint new white lining and install road studs.

	• Remove traffic management.
Materials/Waste	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 Loch Alsh.
Proposed Mitigations:	Removed bituminous material will be re-used on other work sites (with SEPA Paragraph 13 Waste Management Licence). Concrete kerbs, excavated concrete and existing waterproofing will be removed from site and landfilled by a licenced waste carrier. 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.
Structural Health Monitoring	
Included in previous marine licence:	No.
Construction Period and working times.	Works are planned to be carried out between 2026 to 2034 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.
Construction Value:	£500k.
Location on Structure:	Above and below all bridge spans.
Description of the Works:	Bridge monitoring equipment (strain gauges etc) will be installed on the bridge to monitor various bridge elements. Power and data cables will also be required to be installed and connected to the monitoring equipment. Traffic management will be established on the bridge and a combination of temporary access/working platforms or underbridge access vehicles will be used to access the underside of the bridge, piers and abutments. Bridge monitoring equipment will be fixed to the bridge using bolted connections or adhesives. Lightweight power and data cables will be fixed to the bridge using conduit/trunking where required. Minor concrete breakout may be required using hand tools to install the monitoring system. Concrete will be reinstated using a proprietary concrete repair material. Suitable containment will be installed to prevent any materials falling into the Loch Alsh. Bridge monitoring equipment will also be installed inside the concrete box girder. Once all works are complete, the temporary working/access platforms and underbridge access vehicles will be removed along with the traffic management.
Plant and Equipment:	Temporary access/working platforms, underbridge access vehicles, hand tools, generators and site vehicles.

Outline Method Statement:	• Establish traffic management and underbridge access vehicle. • Install temporary working/access platform with containment as required • Complete minor concrete repairs as required. • Install bridge monitoring equipment and cabling on bridge as per the design. • Remove temporary bridge access/working platforms, underbridge access vehicles and traffic management from site.
Materials/Waste	Waste construction materials removed from the bridge include small quantities of concrete. Where possible waste materials will be recycled by a licenced waste carrier. Other waste materials will be landfilled by a licenced waste carrier. Materials to be added to the bridge include bridge monitoring equipment, proprietary concrete repair material, adhesives, fixings, power cables, data cables and conduit/trunking.
Proposed Mitigations:	Containment, edge protection and dust suppression (water spray) will be used for all works to prevent materials falling into the Loch Alsh and entering the atmosphere.
Internal Access Improvements	
Included in previous marine licence:	No.
Construction Period and working times.	Works are planned to be carried out between 2024 to 2034 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.
Construction Value:	£500k.
Location on Structure:	All spans. The works over MHWS will be confined within the internal box girder.
Description of the Works:	All plant, equipment and materials for the works will be brought into the structure from an access point at the southern abutment (Skye end of the bridge). Traffic management will be established on the bridge as required for deliveries. New access stairs, cable tray modifications and handrails are to be installed within the concrete box girder. All works over MHWS will be confined within the internal box girder. Steel handrails will be installed on concrete post tensioned thrust blocks located within the box section on spans 3 and 5, to prevent falls from height. Cable trays and cables at the piers will be modified and re-routed where required to allow room for installing the access stairs. Remove the existing ladders and Davit arm winches currently located on the Pier head walkways. The steel installation works (access stairs, cable tray modifications and handrails) will largely only require hand tools. Welding equipment may be required for the access stairs installation.

Plant and Equipment:	Hand tools, welding equipment, generators, access ladders/towers and site vehicles.
Outline Method Statement:	• Establish traffic management on the structure and deliver materials, plant and equipment as required. • Install handrails on thrust blocks. • Modify cable tray routing. • Install new steel stairs at piers. • Remove existing ladders and davit arms from piers.
Materials/Waste	There will be minimal waste from these works. Excess steel from the permanent works will be recycled by a licenced waste carrier. Other waste materials will be landfilled by a licenced waste carrier. Materials to be added to the bridge include steel stairs, steel handrails, and additional cable trays.
Proposed Mitigations:	The works are fully contained within the Skye Bridge box girder which will prevent materials or waste falling into the Loch Alsh and entering the atmosphere.
Bentonite Replacement	
Included in Previous Marine Licence:	No.
Construction Period and working times.	Works are planned to be carried out between 2024 to 2034. The works are estimated to take 4 weeks 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:	£300k.
Location on Structure:	On top of the concrete caissons at piers 3 and 4.
Description of the Works:	A vertical layer of bentonite slurry is located between the north and south faces of mass concrete infill of the concrete caissons on piers 3 and 4. A stainless steel cover is located over the bentonite. The cover is not watertight and rain/sea water has been leaking into the bentonite void. Work boats and barges will be used to access to the piers to deliver plant, materials and site personnel to the piers. Work boats and barges will also be used to take waste materials to land for disposal by a licenced waste contractor. Suitable containment/edge protection will be installed on each caisson to prevent pollution to the water course. The stainless-steel cover and fixings will be removed using hand tools. The stainless-steel cover will be transported to land using a work boat and disposed of by a licenced waste carrier. For safety, edge protection will be installed around the bentonite void. The surface water is estimated to be ~20m^3 and will either be pumped into water tanks and taken off site for disposal or discharged into the ocean with a SEPA CAR licence consent. Bentonite slurry (~20m^3) will either be mixed on site or on land and delivered to site. It will be pumped into the vertical void to the required design level. The edge protection around the bentonite will be removed and the new stain-less steel cover and fixings will be installed over the bentonite

	void. Hand tools and welding equipment will be used to install the stainless-steel cover. The handrails, access ladders and timber rubbing strip will all be removed from site and replaced using hand tools. All edge protection and containment will be removed from site prior to the works concluding.
Construction Plant and Equipment:	Work boats, barges, pumps, generators, hand tools, welding equipment, water tanks, bentonite slurry mixing/pumping equipment.
Outline Method Statement:	The following applies to piers 3 and 4. • Establish access using works boats and barges as required. • Install appropriate containment/edge protection. • Remove stainless steel cover. • Install edge protection around bentonite void. • Pump out surface water. • Top-up bentonite to design levels. • Install new stainless-steel cover over bentonite. • Remove edge protection from around bentonite cover. • Replace handrails, access ladders and timber rubbing strips. • Remove containment /edge protection.
Materials/ Waste	The existing stainless steel covers, steel handrails and access ladders will be recycled by a licenced waste carrier. Other waste materials will be landfilled by a licenced waste carrier. Wastewater removed from site will either be pumped into storage tanks and removed from site for disposal with a licenced waste contractor or pumped into Loch Alsh with a SEPA CAR Licence (still to be agreed). Materials to be added to the bridge include bentonite slurry, stainless-steel access covers, steel handrails, steel access ladders and timber rubbing strips.
Proposed Mitigations:	Suitable containment/edge protection will be installed on each caisson to prevent pollution to the water course.

4. 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. 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.

Parapet Replacement	
Included in Previous Marine Licence:	Yes.
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 has an estimated duration of 4 weeks. 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 cantilever, all spans.
Description of the Works:	The existing parapet will require period replacement. Traffic management will be established and a temporary vehicle restraint system (Varioguard or similar) installed on the carriageway. A temporary edge protection system will also be installed on the bridge deck cantilever to prevent materials falling into Loch Alsh. The existing parapet will be removed with hand tools and a lorry mounted mobile crane (for heavy items). The parapet grout plinths will be removed with hand tools. The new parapet components will be lifted onto the bridge deck cantilever by hand and a mobile crane used for heavy items. Hand tools will be used to install the parapet fixings. Where additional fixings are required, holes will be drilled into the existing concrete bridge deck cantilever. Chemical resin anchors will be installed into the drill holes and threaded steel bars will be installed. Once the parapet is installed, grout plinths underneath the parapet posts will be poured. Timber shuttering will prevent the grout spilling onto the bridge deck.

	Once the parapet has been installed on one side of the bridge, the edge protection and temporary vehicle restraint will be removed from the bridge. The opposite parapet will be replaced using the same methodology detailed above.
Construction Plant and Equipment:	Hand tools, lorry mounted crane, temporary vehicle restraint and temporary edge protection.
Outline Method Statement:	• Establish Traffic Management. • Install temporary vehicle restraint and temporary edge protection. • Remove existing parapet and grout plinths. • Install new parapet and new fixings (if required). • Install shuttering around parapet post bases and pour grout plinths. • Remove temporary vehicle restraint, temporary edge protection system and Traffic Management. • Repeat as above for the parapet on the opposite carriageway.
Materials/ Waste	Removed steelwork transported off site and recycled by a licenced waste carrier. Grout plinths disposed for landfill by a licenced waste carrier. Materials to be added to the bridge include a steel parapet system, resin chemical anchors and grout.
Proposed Mitigations:	Edge protection to be installed to ensure materials can't spill over the edge of the bridge.
Parapet Repair	
Included in Previous Marine Licence:	Yes.
Construction Period and working times.	This is reactive maintenance if a road vehicle damages the parapet. Works will be 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 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:	• Establish Traffic Management. • Install temporary vehicle restraint and temporary edge protection. • Remove existing/defective parapet components. • Install new parapet. • Remove safety barrier and Traffic Management.
Materials/ Waste	Edge protection to be installed to ensure materials can't spill over the edge of the bridge.
Proposed Mitigations:	Removed steelwork transported off site and recycled by a licenced waste carrier.

Expansion Joint 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 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:	Unknown.
Location on Structure:	Expansion joints are located on the carriageway above the east & west abutments.
Description of the Works:	Traffic management will be established on the bridge to access the expansion joint from the bridge carriageway. Access to underneath the expansion joint will be from the abutment gallery, where a temporary access platform will be installed. Expansion joint components will be replaced where required. This will require hand tools and on-site welding. Appropriate containment will be established to prevent materials entering Loch Alsh. Repeat as necessary on the opposing carriageway, remove traffic management and access/working platform once works are complete.
Construction Plant and Equipment:	Hand tools, temporary access/working platform, welding equipment.
Outline Method Statement:	• Establish traffic management and install temporary access/working platform within the abutment gallery. • Install appropriate containment on the carriageway and within the abutment gallery. • Replace expansion joint components as required using hand tools and welding equipment. • Repeat on opposing carriageway. • Remove traffic management and temporary working/access platform.
Proposed Mitigations:	Containment will prevent any materials falling into Loch Alsh.
Materials/ Waste	Materials removed from site include the existing expansion joint components such as sliding springs, sliding bearings, control springs, joist beam frames, bolts, nuts, washers and rubber seals. Where possible, these components will be recycled or landfilled by licenced waste carriers. Components to be installed on site include expansion joint components such as sliding springs, sliding bearings, control springs, joist beam frames, bolts, nuts, washers and rubber seals.
Expansion Joint Replacement	
Included in Previous Marine Licence:	Yes.
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:	Unknown.
Location on Structure:	Expansion joints are located on the carriageway above the east & west abutments.
Description of the Works:	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. The carriageway surfacing approaches (~15m total length) will be resurfaced by planing the wearing course (typically ~45mm depth) and resurfaced as required. The surfacing will be saw cut and excavated across a full carriageway width 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. If required, nosing material will be installed on the approaches to the 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. Works will also be required underneath the expansion joint within the confines of the abutment gallery to install various expansion joint components. Repeat the above method on the opposite carriageway. Remove traffic management once all works complete.
Construction Plant and Equipment:	Hand tools, floor saw, road planar, resurfacing plant and equipment, welding equipment.
Outline Method Statement:	• 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. • Install expansion joint components from within the abutment gallery below the expansion joint. • Repeat on opposing carriageway.
Proposed Mitigations:	Temporary bridging plates to be installed to prevent materials entering into Loch Alsh.
Materials/ Waste	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. Materials being installed on the bridge include surfacing materials, resin anchors, waterproofing, expansion joints and nosing material.
Concrete Repairs	
Included in Previous Marine Licence:	Yes.
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:	Concrete repairs to the bridge deck, crossheads, piers or box girder may be required if defects are found during inspections. 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. **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 Loch Alsh. 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. **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 Loch Alsh (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.
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:	**Small Concrete Repairs** • 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. **Large Concrete Repairs** • 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 Loch Alsh 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 Loch Alsh. Edge protection and debris netting will prevent concrete waste entering the Loch Alsh.
Materials/ Waste	Removed bituminous surfacing material will be taken off site and re-used on other work sites (with SEPA Paragraph 13 Waste Management Licence). Solid waste concrete and waterproofing material will be transported off site and landfilled by a licenced waste carrier. Wastewater from the hydro-demolition process will be treated on site and discharged into Loch Alsh (under SEPA CAR licence) or pumped into storage tanks and disposed by a licenced waste carrier. Proprietary concrete mortar will be added to the structure.
Structural Health Monitoring 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 structural health monitoring system components, electrical connections 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:	• 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 by a licenced waste carrier.
Drainage Cleaning	
Included in Previous Marine Licence:	Yes.
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:	• Establish Traffic Management as required, • Open kerb gully with hand tools. • Clean debris from gulley or chamber using vacuum truck or hand tools. Use jet washing to clean gulley. • 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.
Resurfacing Maintenance	
Included in Previous Marine Licence:	Yes.
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. Works may take place during daytime hours, at night, or a mixture of both.
Construction Value:	Unknown
Location on Structure:	Carriageway and footpaths on all spans of the bridge.

Description of the Works:	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. 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). If required, the concrete kerbs and concrete kerb bed will be removed using hand tools and mechanical excavators. If required, small/medium concrete repairs to be bridge deck will be completed by hand with proprietary concrete repair materials. 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. 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.
Construction Plant and Equipment:	Hand tools, excavator, road planer, lorries, resurfacing plant/equipment, spray applied waterproofing equipment.
Outline Method Statement:	• Establish Traffic Management. • Plane/mill out existing surfacing. • Remove kerbs and concrete kerb bed. • Remove bridge deck waterproofing. • Complete concrete repairs to concrete bridge deck. • Install spray applied waterproofing system • Install new kerbs on concrete bed. • Spray apply bond coat and mechanically resurface. • Paint new white lining and install road studs. • Remove any Traffic Management.
Proposed Mitigations:	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 Loch Alsh.
Materials/ Waste	Removed bituminous material will be re-used on other work sites (with SEPA Paragraph 13 Waste Management Licence). Concrete kerbs and concrete will be removed from site and landfilled by a licenced waste carrier. 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.
Ancillary Highway item repair	
Included in Previous Marine Licence:	No
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:	• 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.
Daymark Board Maintenance	
Included in Previous Marine Licence:	No
Construction Period and working times.	This is reactive maintenance. Works will be carried out between 2024 to 2034. Works 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:	Navigation channel, box beam superstructure.
Description of the Works:	Traffic management and an underbridge access vehicle will be established on the bridge. Daymark boards will either be replaced in full or maintained by painting. The underbridge access vehicle will contain any paint spilled.
Construction Plant and Equipment:	Underbridge access vehicle, electrician tools and equipment.
Outline Method Statement:	• Establish traffic Management and underbridge access vehicle. • Replace or repair as necessary. • Replace or paint daymark navigation boards. • Demobilise underbridge access vehicle and traffic management
Proposed Mitigations:	Underbridge access vehicle will contain any materials or paint for the daymark boards.
Materials/ Waste	Opened paint will be disposed of by a licenced waste carrier. Unopened paint will be returned to the depot for storage and re-use.
Inspections and Surveys	
Included in Previous Marine Licence:	Yes.

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 Loch Alsh to complete bathymetric surveys. Dive surveys will also be completed to inspect the underwater bridge elements. The bentonite on piers 3 and 4 will be periodically sampled. Access to the piers will be using small work boats.
Construction Plant and Equipment:	Temporary access/working platforms, barges, small vessels, hand tools, survey equipment, hand tools and generators.
Outline Method Statement:	• 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.
Minor Mechanical and Electrical Maintenance	
Included in Previous Marine Licence:	Yes.
Construction Period and working times.	Works are generally reactive maintenance based on inspections carried out between 2024 to 2034. M&E tasks generally take 1 or 2 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:	Throughout Bridge. All spans.
Description of the Works:	Various mechanical and electrical (M&E) tasks are required on Skye Bridge and include the following: • Lighting repair within the box girder. • Navigation lighting repair located on the pier 3 and 4 caissons. Access to the piers will be using small work boats. • Water main apparatus repair within the bridge structure. • Installation of additional electric or communication cables within the structure.

Construction Plant and Equipment:	Temporary access/working platforms, barges, small vessels, hand tools and generators.
Outline Method Statement:	• Establish access which may include temporary working platforms or small vessels. • Complete repairs or installation works as required. • Demobilise from site.
Proposed Mitigations:	Minor M&E maintenance are generally non-intrusive and will not result in any breaking out of material.
Materials/ Waste	Replacement lighting equipment to be taken off the site and disposed by a licenced waste carrier.