

## Method Statement

The following table provides a method statement regarding the works known as part of the Erskine Bridge 10-year Marine Licence Application for Construction Projects. The suites of works detailed below have been assessed within the Erskine Bridge Marine Licence Non-Statutory Environmental Review document, with further detail on the methods utilised, plant, vehicles and machinery involved, and the materials required present in the table below. The Non-Statutory Environmental Review provided in conjunction with this document outlines the proposed mitigation measures related to the protection of both the marine and the surrounding environment.

All schemes have been provided with an estimate of the construction period, the value of the works to be carried out along with a brief outline description of the works and an outline method statement. Due to the length of the license being applied for, some suites of works detailed below have details yet to be confirmed. Once confirmed, these suites of works will be assessed on their own merit regarding their environmental constraints and if required, an extension/alteration to the license will be applied for.

This document should be read in conjunction with the relevant

<b>External Painting Works</b>	
<b>Estimated Construction Period</b>	2023 – 2025 (ongoing as required)
<b>Estimated Construction Value</b>	[Redacted]
<b>Description of the Works</b>	<p>Works are continuously being undertaken by C.Spencers Ltd. to complete the painting of the external elements of the Erskine Bridge. Phase 1 / 2 of the works are currently being undertaken and involve the blasting, painting, strengthening and weld repairs of the east and west cantilevers respectively. Works are being undertaken via temporary work platforms and gantries with the painting of the external deck box to be completed in Phase 3 along with the painting of the bridge towers.</p> <p>These works are a requirement under the operations and maintenance manual for the bridge. Requirements for additional strengthening works to the cantilevers was established during phase 1 of the works when partial penetration welds were discovered in critical cross sections.</p>
<b>Plant and Materials</b>	<p><b>Plant/Machinery:</b></p> <p>Blasting &amp; Painting: Blast pot, compressors, dehumidifiers, heaters (3KW Fan Heater 110v), mixer, paint can crusher, paint spraying, paint test equipment, power washer, shot blasting equipment, surveying equipment and vacuum.</p> <p>Gas Pipe: Circular saw, jigsaw, lifting gear, saw, stihl saw and water bottle.</p> <p>Metal Weld: Charger, container, drill, gas products, grinder, heat gun, impact wrench, sander, shear wrench, small tools, surveying equipment, testing kit, ventilation/extraction and weld set.</p> <p><b>Materials:</b></p> <p>Paint: Sigma Cover 690 SET LIGHT 20l, SCOVER 456 HS SET RAL 20L, SD SCOVER 456 HS SET (10B17) 20L, Sigmadur 520 SET (18B25) 20L, S EP 159 SEA SET 4L and THINNER 90-53 20L, 91 - 92 Thinner 20L.</p>

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	<p>Blast:</p> <p>JBLAST SUPA in 25kg bags S/W on pallets and steel.</p>
<b>Outline Method Statement</b>	<p>Phase 1 &amp; 2 – west &amp; east cantilevers (Phases undertaken Concurrently)</p> <ul style="list-style-type: none"> <li>Working from 2 No. temporary platforms on the west side cantilevers and 4 No. on the east side, the Contractor will abrasive grit blast the remaining areas with full containment in place.</li> <li>Bolted and welded strengthening plates will be installed to cantilevers as appropriate. General weld repairs, edge dressing and repairs to arc strikes will then be undertaken.</li> <li>Second round of abrasive grit blasting.</li> <li>Four coat paint system will then be applied.</li> <li>On completion of all strengthening and painting, the work platforms will be used to reinstall footway panels that were previously removed to site compound, repaired and painted. Temporary wooden infill panels that were installed as a safety measure will be removed prior to panel reinstatement. Salvageable wooden supports will be retained for use during Phase 2.</li> </ul> <p>Phase 3 – Deck box underside</p> <ul style="list-style-type: none"> <li>New temporary work platform will be installed on the structure, designed to span from both cantilevers and the underside of the deck box.</li> <li>Underside of the deck box will be locally abrasive grit (full containment) blasted to allow general weld repairs and repairs to backing flats.</li> <li>Area blasted prior to painting (full containment).</li> <li>Four coat paint system applied.</li> </ul> <p>Phase 4 - Towers</p> <ul style="list-style-type: none"> <li>Tower access platform installed.</li> <li>2 No. Towers abrasive grit blasted (full containment)</li> <li>Four coat paint system applied to both towers.</li> </ul>
<b>Noising Joint Replacement and Surfacing Trial / Patching</b>	
<b>Estimated Construction Period</b>	2023 – 2025
<b>Estimated Construction Value</b>	[Redacted]
<b>Description of the Works</b>	<p>Works are being undertaken to carry out the replacement of the south-abutment nosing joint and application of Supreme AI surfacing. Works will involve the removal of a steel upstand by grinding and welding on new steel inserts.</p> <p>Following the replacement of the bearings, the replacement of the failed south abutment nosing joint is required to protect the abutment gallery and bearings from water ingress. The new joint will utilise a hybrid nosing mortar (off bridge) with a welded steel rail (on bridge) system which is bespoke to the Erskine Bridge. Surfacing refurbishment to the surfacing on the approach to the joint and select areas of the bridge's southbound carriageway will also be undertaken. White line renewal and cyclic maintenance activities will also be undertaken as required.</p>
<b>Plant and Materials</b>	<p><b>Plant/Machinery:</b></p> <p>Milling Machine, welding gear and burning gear.</p> <p><b>Materials:</b></p> <p>Waterproofing (MIF Grip NT), Colbond 50 Bond Coat, Aggregate Industries</p>

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	Supreme AI, ZED S94 Primer and TS2010 Stone Mastic Asphalt.
<b>Outline Method Statement</b>	<ol style="list-style-type: none"> <li>1. Traffic management will be installed over the bridge.</li> <li>2. Mill out existing surface course (Areas on bridge and off bridge) localised to the south abutment.</li> <li>3. Mechanically remove steel upstand by grinding.</li> <li>4. Weld on new steel rail.</li> <li>5. New surface course.</li> <li>6. Cut back 100mm from off bridge and form nosing mortar.</li> <li>7. Install waterproof seal.</li> </ol>
<b>Cable Re-Tensioning</b>	
<b>Estimated Construction Period</b>	2023 - 2025
<b>Estimated Construction Value</b>	[Redacted]
<b>Description of the Works</b>	<p>Works are required to jack the deck of the Erskine Bridge and re-tension the cables. Jacking equipment will be installed within the cable anchorage chambers.</p> <p>The Erskine bridge deck sagging has been an issue since the initial construction of the structure. The cables were last re-tensioned in 1976. An attempt was made to re-tension the cables in 2016 by using the existing cable jacking equipment however, this attempt failed. The failed jacking equipment is due to be removed by March 2024. Following this, new cable jacking equipment will be designed and installed as part of these works to allow the cables to be re-tensioned and pull the deck level upwards.</p>
<b>Plant and Materials</b>	Cable jacking equipment and ancillary equipment.
<b>Outline Method Statement</b>	<ol style="list-style-type: none"> <li>1. Install additional strengthening to the internal deck box.</li> <li>2. Make an opening in the deck box bottom flange to allow room for pull of cable.</li> <li>3. Install jacking equipment.</li> <li>4. Tension the cables stays.</li> <li>5. Remove the jacking equipment.</li> </ol>
<b>Trough to Deck Welds Remedial Works</b>	
<b>Estimated Construction Period</b>	2023 - 2025
<b>Estimated Construction Value</b>	[Redacte
<b>Description of the Works</b>	These works are required to refurbish the trough to deck welds following internal inspections in 20218 and 2020. During these inspections, a number of trough to deck welds were identified. Recommendations from these inspections were to prepare a weld repair brief of works in accordance with the maintenance programme.
<b>Plant and Materials</b>	<p>Metal Weld:</p> <p>Charger, container, drill, gas products, grinder, heat gun, impact wrench, sander, shear wrench, small tools, surveying equipment, testing kit, ventilation/extraction, weld set and gas monitors.</p>
<b>Outline Method Statement</b>	<ol style="list-style-type: none"> <li>1. Mechanically removed existing paint system. Mechanical ventilation will be required.</li> </ol>

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	<ol style="list-style-type: none"> <li>2. Visual inspect welds and magnetic-particle-inspection/ultrasonic.</li> <li>3. Identify defects.</li> <li>4. Dig out existing weld.</li> <li>5. Repair weld and dress edges.</li> <li>6. Retest repaired welds.</li> <li>7. Reapply paint system.</li> </ol>
<b>Inspection and Servicing of Access Equipment</b>	
<b>Estimated Construction Period</b>	Ongoing (continuous)
<b>Estimated Construction Value</b>	[Redacted]
<b>Description of the Works</b>	The Erskine Bridge access equipment, including underdeck gantries and the tower access cradle is subject to an inspection regime as per their maintenance manuals in accordance with Lifting Operations and Lifting Equipment Regulations (LOLER) regulations. Servicing will be undertaken continuously as per the recommendations made within the inspection reports.
<b>Plant and Materials</b>	<p>General:</p> <p>Handtools and non-destructive testing (NDT) equipment.</p> <p>Metal Weld:</p> <p>Charger, container, drill, gas products, grinder, heat gun, impact wrench, sander, shear wrench, small tools, surveying equipment, testing kit, ventilation/extraction, weld set and gas monitors.</p>
<b>Outline Method Statement</b>	<ol style="list-style-type: none"> <li>1. Inspection of access equipment in accordance with the maintenance manual e.g. daily, weekly...Principal (6-yearly) &amp; severe weather checks.</li> <li>2. Checks, cleaning, relubrication as required by the maintenance manual Appendix E.</li> <li>3. If further maintenance is required, gantry will be disassembled and repairs made off site.</li> </ol>
<b>Bridge Tower Top Saddle Replacement</b>	
<b>Estimated Construction Period</b>	2023 - 2025
<b>Estimated Construction Value</b>	[Redacted]
<b>Description of the Works</b>	The Erskine Bridge tower top cable saddles require replacing.
<b>Plant and Materials</b>	New tower top cable saddle.
<b>Outline Method Statement</b>	<ol style="list-style-type: none"> <li>1. Traffic management installed.</li> <li>2. Mobile cranes used to dismantle existing saddle covers.</li> <li>3. Inspect cables below existing saddle.</li> <li>4. If repairs to the coating are required (coating thought to be bitumen), then test area to determine coating and apply like for like replacement.</li> <li>5. Install prefabricated saddle replacements</li> </ol>
<b>Main Carriageway Resurfacing</b>	
<b>Estimated Construction</b>	2024 – 2025 & 2025 – 2026

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<b>Period</b>	
<b>Estimated Construction Value</b>	[Redacted]
<b>Description of the Works</b>	Surfacing defects are monitored via a monthly routine superficial inspection. There is extensive defects on both the northbound and southbound carriageways. In-situ and ex-situ trials of new surfacing materials have been undertaken. Further trials of the material (AI Supreme) are planned for Autumn 2023. Once the material has been deemed as suitable, a wider resurfacing regime may take place combined with the associated renewal of road markings.
<b>Plant and Materials</b>	<p><b>Plant/Machinery:</b></p> <p>Milling Machine/planer.</p> <p><b>Materials:</b></p> <p>Waterproofing (MIF Grip NT), Colbond 50 Bond Coat, Aggregate Industries Supreme AI, ZED S94 Primer and TS2010 Stone Mastic Asphalt.</p>
<b>Outline Method Statement</b>	<ol style="list-style-type: none"> <li>1. Mill existing epoxy asphalt to an approximate 15mm depth. Hand break the remaining surfacing to full 35mm depth.</li> <li>2. Inspect &amp; Holiday test the existing waterproofing layer.</li> <li>3. If waterproofing repairs required, remove existing waterproofing layer and reapply (MIF Grit NT) and allow to cure.</li> <li>4. Lay EME2 'Supreme' surface course/</li> <li>5. Apply road markings.</li> </ol>
<b>Concrete Repairs</b>	
<b>Estimated Construction Period</b>	2024 – 2025
<b>Estimated Construction Value</b>	[Redacted]
<b>Description of the Works</b>	Concrete repairs are required to the reinforced concrete piers supporting the structure. Inspections have identified that the reinforced concrete piers have various defects including cracking and spalling of which require a programme of works to repair.
<b>Plant and Materials</b>	<p><b>Plant/Machinery:</b></p> <p>Hand tools, Access Equipment: MEWP or similar long armed boom (possibly tracked).</p> <p><b>Materials:</b></p> <p>Corrosion inhibiting impregnation silia ferrogard 903+, Siloxane Water repellent impregnation Sikagard 705L (or similar), Concrete reinstatement Sika Monotop 612 (or similar) and Class R4 Low Shrinkage Mortar.</p>
<b>Outline Method Statement</b>	<ol style="list-style-type: none"> <li>1. Access pier via MEWP.</li> <li>2. Clean the surfaces and remove loose concrete, dirt, moss and salt.</li> <li>3. Survey concrete repair areas, tap to identify delaminated or deteriorated concrete.</li> <li>4. Break out contaminated concrete</li> <li>5. Clean exposed area with compressed air.</li> <li>6. Seal cracks</li> <li>7. Replace reinforcing steel if required.</li> <li>8. Soak substrate with clean water.</li> <li>9. Hand apply cement-based repair mortar to manufacturer instructions.</li> <li>10. Finishing surface and apply protective coating by brush.</li> </ol>

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Internal Electrical Maintenance & Principal, General and Safety Inspections	
Estimated Construction Period	2024 – 2035
Estimated Construction Value	[Redacted]
Description of the Works	The Erskine bridge requires ongoing electrical maintenance to maintain the accessibility and general usage of the structure.
Plant and Materials	Misc.
Outline Method Statement	<ol style="list-style-type: none"> <li>1. Access the internal deck box via the web access platform manholes.</li> <li>2. Inspect the Erskine Bridge Internal electrical systems in accordance with the maintenance manual.</li> <li>3. Undertake repairs to defective components as required e.g. internal lighting, marine/aviation navigation lighting, cameras etc.</li> </ol>
Dehumidification / Fire Protection	
Estimated Construction Period	2024 – 2025
Estimated Construction Value	[Redacted]
Description of the Works	This suite of works refers to the installation of dehumidification and fire protection for the cables on the structure. Investigative work on the bridge indicated that the cables are susceptible to fire damage and in turn, it has been proposed to add additional protection from fire. This work requires taking the cable bands off and driving wedges to take apart and inspect the cables. The cables are then repainted using a 'metal paint' product. Shrouds are also proposed to be placed around cables of which utilise hot air to create a dry environment.
Plant and Materials	<p><b>Plant/Machinery:</b> Specialist access equipment, cable wedges.</p> <p><b>Materials:</b> Metal paint products,</p>
Outline Method Statement	Full method statement for works TBC. Likely works will be an off-site trial of the proposed system.
Structural Health Monitoring	
Estimated Construction Period	2025 – 2026
Estimated Construction Value	[Redacted]
Description of the Works	This suite of works entails the installation of sensors and permanent survey equipment to allow for continuous structural health monitoring of the Erskine Bridge.
Plant and Materials	Surveying equipment, fixings.

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<b>Outline Method Statement</b>	<ol style="list-style-type: none"> <li>1. Access the internal deck box via web access platform manholes.</li> <li>2. Perform maintenance or installation of existing and new electronic sensors as required.</li> </ol>
<b>Met Forecasting Equipment</b>	
<b>Estimated Construction Period</b>	2025 – 2026
<b>Estimated Construction Value</b>	[R
<b>Description of the Works</b>	Met office contracted to provide weather forecasts. This is used to determine if gantries will stand down due to high winds etc. No construction work expected.
<b>Plant and Materials</b>	N/A
<b>Outline Method Statement</b>	N/A