TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

South East Trunk Road Unit

A985 Kincardine Bridge – Maintenance Schemes (Initial Marine Licence)
Habitats Regulations Appraisal
Appendix A: Programme of Works

December 2021

Prepared for BEAR Scotland by Jacobs

experience that delivers

BEAR SCOTLAND

CONTENTS

1 Programme of Works

1.1 Introduction

1.1.1 This appendix contains the proposed one-year programme of works provided by BEAR Scotland, issued November 2021. This comprises discrete packages of works (Section 1.2) as well as routine maintenance activities (Section 1.3). This programme of works has been used to inform the Habitats Regulations Appraisal (HRA) for the Marine Licence application for Kincardine Bridge maintenance works (hereafter the 'Proposed Works').

1.1.2 The text within Tables 1 and 2 is as provided by BEAR Scotland, with minor changes to wording to improve clarity, and does not include additional mitigation identified as required following AA, which is detailed within the HRA main text.

1.2 Proposed Works Programme

1.2.1 A breakdown of the Proposed Works which are currently identified in the one-year programme for the Kincardine Bridge is presented in Table 1 below. All works have been provided with an estimate of the construction period, the value and location of the works to be carried out, along with a brief outline description of the works, an outline method statement and proposed mitigation measures related to the protection of the environment, as proposed by BEAR Scotland.

1.2.2 Any seasonal constraints are given under the description of the works section for each works item separately (Table 1). Location plans showing the site boundary, possible site compound locations, working areas and access tracks are included in **Appendix A1**.

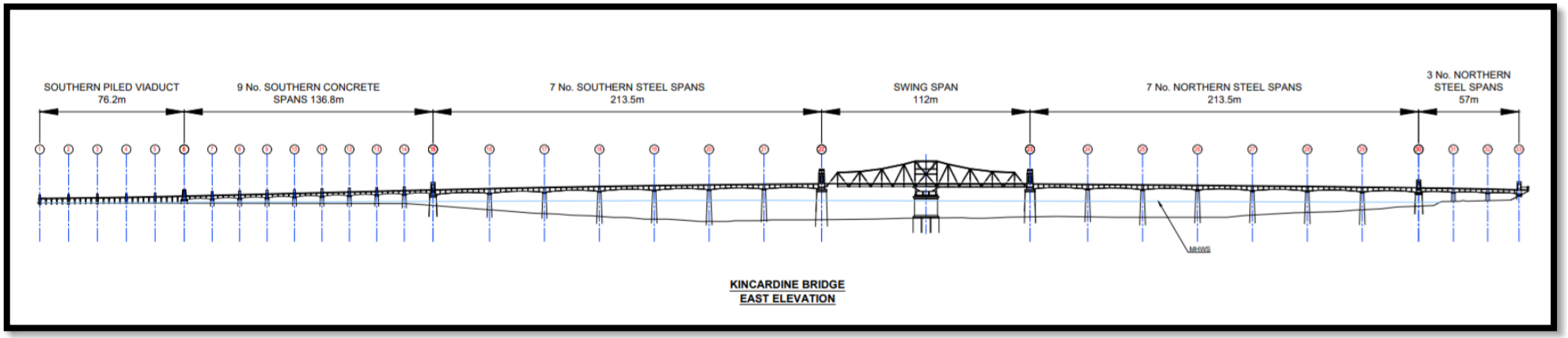

Figure 1: Overview of Locations of Proposed Works

Table 1: Proposed Works

1. Southern Piled Viaduct (SPV) Propping System Repairs	
Construction Period:	2022
Construction Value:	£0.5 million
Duration/Indicative commencement month:	Scheme is expected to commence following the Marine Licence being granted and the expected duration of the works is 7 weeks. Temporary lane closures for material deliveries might be required. Also, Southbound footway closures will be required in order to allow material and ops movement from compound to construction site (refer to **Appendix A1**). The majority of works will be carried out during daytime working hours: 08:00 – 17:00 with the exception of possible lane closures for material deliveries that will be done during night-time. Any lane closures will be confirmed during the pre-construction phase.
Estimated type/quantities of material and waste expected.	Option 1: It is anticipated that approximately 12m^3 of wet concrete will be required for this option. See 'Description of the Works' section below for a description of both options. Option 2: The amount of rusted/corroded steel and paint required for this option cannot be estimated at this stage, but it is expected that the waste from this option to be negligible. All waste arising from the works will be removed and disposed to a licensed facility.
Location on Structure:	Southern Piled Viaduct (SPV) Propping System.
Description of the Works:	From weekly/monthly inspections it has been identified by BEAR Scotland that the bases of the SPV Propping System steel columns were starting to show signs of moderate corrosion and minor section loss within the wet/dry zone. The propping system was installed circa 1992 and originally had a design life of 5 years. Further remedial work was undertaken to the props, notably circa 2007, when work was undertaken to restore contact between the prop heads and the deck using grouted steel shims. The proposed works to repair the bases of the steel columns comprise two options depending on the severity of the corrosion, which can only be determined following the excavation of the existing ground: Option 1:

	A proposed light reinforced concrete surround to be constructed around the bottom ends of the steel propping columns (corroded sections within the wet/dry zone). The works will involve removal of the existing ground (will not be stored on the saltmarsh areas) by hand digging around the steel columns in order to expose the concrete foundations, installation of formworks around each one of the steel columns, concreting and removal of formwork (once the concrete is dry). The ground will be reinstated following completion of the works. Option 2: A proposed steel protection paint applied to the bases of the steel columns to prevent further corrosion of the steel columns. The works will involve removal of the existing ground by hand digging around the steel columns in order to expose the concrete foundations, the removal of loose corroded steel by wire brushing and application of a protection paint. The ground will be reinstated following completion of the works.
Plant and Equipment:	Alloy towers, shovel, timber/plastic shutters, generator, concrete, grout, steel shims, hammer, concrete vibrators, hand tools, water pumps, site vans/welfare unit, geotextile matting, telehandler
Outline Method Statement:	Option 1 1. Traffic management/ temporary lane closures of the A985 for material/equipment deliveries might be required 2. Vehicular access to the saltmarsh area will not be required 3. Removal of existing ground over the concrete foundations of the steel propping columns – varies between 50mm to 300mm. 4. Installation of formwork around each steel column with hand tools 5. Pouring wet concrete mixture within the formwork by hand or small machinery. 6. Removal of formwork 7. Reinstate the ground back to the original profile levels 8. Removal of Traffic Management (TM) and disposal of any waste from site to a licensed facility Option 2: 1. Traffic management/ temporary lane closures of the A985 for material/equipment deliveries will be required. 2. Vehicular access to the saltmarsh area will not be required 3. Removal of existing ground over the concrete foundations of the steel propping columns. 4. Removal of loose corroded steel by wire brush- negligible amount of rust to be collected and disposed to licensed facilities 5. Application of steel protection paint. 6. Reinstatement of the ground back to the original profile levels

	7. Removal of TM and disposal of wastes to a licensed facility.
Proposed Mitigations:	• BEAR Scotland Engineer to monitor the site and working practices – works to be halted if breaches of approved method statements or best practice occur. • Reinstatement of ground levels above concrete foundations to the original levels. • Environmental mitigation measures, including ecology mitigation, to be provided in a Site Environmental Management Plan (SEMP). • Removal and erection of alloy towers in between high tides to mitigate any environmental risks.
2. Southern Piled Viaduct (SPV) Concrete Repairs	
Construction Period:	2022
Construction Value:	£0.5 million
Duration/Indicative commencement month:	Scheme is expected to commence following the granting of the marine licence. The expected duration of the proposed works is 7 weeks. Temporary lane closures for material and equipment deliveries/removals might be required. Refer to **Appendix A1**. All works will be carried during daytime working hours: 08:00 – 17:00. Day time lane closures might be required for material and equipment deliveries/removal.
Estimated type/quantities of material and waste expected.	It is anticipated that approximately 30m^3 of wet concrete will be required for this option. Approximately 20m^3 of deteriorated concrete will be removed and disposed to a licensed facility in advance of the pouring the new concrete to stop the deterioration. All waste arising from the works will be removed and disposed to a licensed facility.
Location on Structure:	Southern Piled Viaduct (SPV) – Concrete columns, crossbeams and deck soffit.
Description of the Works:	The concrete columns, crossbeams and deck soffit across the SPV are in poor condition. The whole SPV is programmed to be replaced, commencing in 2022, however the actual demolition of the SPV will not commence until the temporary/diversion bridge is in place. The construction of the temporary structure will take up to 8 months after the commencement of the SPV replacement works i.e., actual demolition of the SPV is not programmed to happen until 2023.

	As an interim measure it is proposed to carry out concrete repairs to stop further deterioration of concrete elements described above. The design for these concrete repairs will comprise a concrete collar/coating solution and localised concrete repairs with a repair mortar. A draft drawing showing the proposed works is included in **Appendix A3**. A second option for the concrete element of the SPV is to treat with a coating system, similar to that proposed for the steel elements (above). This would require the removal of salt deposits from concrete elements, and rust from steel elements prior to the application of the coating system. The removal of salt deposits and rust will require air and water pressure techniques and no heavy machinery or plant access to the saltmarsh areas is required for this option. The same site compound area, as identified for other schemes, as well as the same identified access/egress to the working area, will be used.
Plant and Equipment:	Scaffolding (below SPV), hand tools, generator, hammer, site welfare vans and cars, concrete breakout tools, access geotextile matting, concrete delivery, waste removal, telehandler.
Outline Method Statement:	Option 1 1. Traffic management/ temporary lane closures for material/equipment deliveries will be required 2. Installation of alloy towers/scaffolds. It is anticipated that either a scaffolding system or alloy towers would be required for the formworks and concreting activities. No vehicular access to the saltmarsh will be required. Operatives will access the areas where the concrete repairs are to take place, i.e. under the footprint of the SPV only. Material deliveries will be provided from the top of the SPV directly to the working area below 3. Removal of existing deteriorated concrete (localised areas), by a method to be chosen through further investigation 4. Surface preparation of concrete 5. Application of new coating/collar system as per manufacturers guidelines 6. Removal of alloy towers/scaffolding Option 2 1. Traffic management/ temporary lane closures of the A985 for material/equipment deliveries will be required. 2. Vehicular access to the saltmarsh area will not be required. 3. Removal of salt deposits from concrete elements, and rust from steel elements, using pressurized water and air techniques. 4. Application of suitable coating system to the concrete elements.

	5. Removal of TM and disposal of wastes to a licensed facility.
Proposed Mitigations:	• BEAR Scotland Engineer to monitor the site and working practices – works to be halted if breaches of approved method statements or best practice occur. • Pumping contaminated water in between tides to minimise pollution of water course and saltmarsh areas to be adopted if required. Water to be filtered on special tanks and disposed back to the river/channels – if required • Environmental mitigation measures, including ecology mitigation, to be provided in a Site Environmental Management Plan (SEMP).
3. Installation of Navigation Lights	
Construction Period:	2022
Construction Value:	£30K
Duration/Indicative commencement month:	Scheme to commence following the granting of the Marine Licence and the expected duration of the proposed works is 2 weeks. Temporary Northbound footway closures for material deliveries and installation of lighting units will be required. Refer to **Appendix A2**. All works will be carried out during daytime working hours: 08:00 – 17:00.
Estimated type/quantities of material and waste expected.	It is anticipated that negligible amounts of waste will be developed from this scheme. Six lighting units will be installed (three on either side of the South swing span). All waste arising from the works will be removed and disposed to a licensed facility.
Location on Structure:	South Swing Spans – middle of Kincardine Bridge
Description of the Works:	Erection of navigation lights as per current standard requirements. Three lights to be installed on either side of the swings spans for guiding vessels which travel across the river below Kincardine Bridge. The lights are to be attached on the deck. Special bespoke brackets will be manufactured (offsite) and welded to the edge beam for the installation of the lighting units. It is anticipated that the lighting units will be powered directly from the Kincardine Bridge power supply. There are currently two options for the lighting units to be used. Please refer to **Appendix A2**. Special under-bridge platform or rope access will be required for the

	installation of lighting units.
Plant and Equipment:	Specialist access system (platform) or rope access, welding equipment, hand tools, cables, screwdriver, generator, site welfare vans and cars. No safety boat will be required.
Outline Method Statement:	1. Identification of exact areas where the Navigation lights will be installed – SE Swing Span 2. Installation of Specialist Access System (platform) if required 3. Removal of existing navigation lights & holding brackets 4. Installation of new bespoke holding brackets and lighting units as per current standard requirements 5. Application of protective paint system at localised areas – touch up painting 6. Removal of specialist platform
Proposed Mitigations:	• Due to the small scale of the works, it is proposed, BEAR Scotland Engineer to monitor the site and working practices – works to be halted if breaches of approved method statements or best practice occur. • Environmental mitigation measures, including ecology mitigation, to be provided in a SEMP.
4. Asbestos Containing Material (ACM) Removal from the Swing Span	
Construction Period:	2022
Construction Value:	TBC
Duration/Indicative commencement month:	As ACMs have been identified on various areas and components at both engine and control rooms it is anticipates the removal of these material will be carried across various phases. The works are expected to commence summer 2022 and may take a few months to complete all removal of the works (TBC).
Estimated type/quantities of material and waste expected.	Asbestos containing material is expected the primarily type of waste. However, the quantity of waste cannot be determined at this stage. All wastes arising from this scheme will be fully disposed to a licensed facility.
Location on Structure:	Swing Spans – Engine and Control rooms
Description of the Works:	Consultation with asbestos specialist contractors is currently carried out in order to establish required access and options. It is very likely, that this scheme will be split in 2 phases: the removal of asbestos containing materials below and above deck level. Full encapsulation of the working areas will be required. Only specialist contractors (registered with HSE) will be considered for the removal of these materials. ACMs have been identified on the ceilings, pipes and cable covers. Following removal some of these materials will be replaced with other

	similar materials. As Kincardine Bridge is a Category A listed building, consultation with the Planning Authority will be undertaken regarding the works.
Plant and Equipment:	Specialist Accesses, encapsulation system of working areas, hand tools
Outline Method Statement:	A detailed programme will be prepared showing the sequence and phases of the proposed scheme. Works to commence first on the control room (above deck level). Specialist access and encapsulation of the whole control room will be required – this is likely to include the access stairs and upstream footway closure - no access to members of the public for the whole duration of the works can be permitted. Site compound and welfare facilities to be installed adjacent to the SuDS pond to the south-east of Higgins Neuk Roundabout.
Summary Proposed Mitigation:	• BEAR Scotland Engineer to monitor the site and working practices – works to be halted if breaches of approved method statements or best practice occur. • Environmental mitigation measures, including ecology mitigation, to be provided in a SEMP.
5. **Decommissioning of unused elements**	
Construction Period:	2022
Construction Value:	TBC
Duration/Indicative commencement month:	10 weeks (excluding installation/removal of temporary access arrangements). Indicative commencement month July/August 2022.
Estimated type/quantities of material and waste expected.	Steel is expected the primarily type of waste. However, the quantity of waste cannot be determined at this stage. All waste arising from this scheme will be fully disposed of to a licensed facility.
Location on Structure:	Across the whole length of the Kincardine Bridge.
Description of the Works:	Decommissioning of unused elements of the Kincardine Bridge.
Plant and Equipment:	Specialist temporary accesses, hand tools and cutting equipment. Lifting equipment.
Outline Method Statement:	As Kincardine Bridge is a Category A listed building, consultation with the Planning Authority will be undertaken regarding the works. A detailed programme will be prepared showing the sequence and phases of the proposed scheme. Works on the swing span concrete portals will commence first. Specialist temporary access will be required which is likely to require upstream footway closure (no access to members of the public for the whole duration of the works can be permitted). The site compound and welfare facilities are to be installed to the southeast of Higgins Neuk roundabout. The site compound and welfare facilities location is the same as for all previous outlined schemes. The elements that are to be decommissioned are as follows: the safety barriers (which are currently set to fixed/closed position on the concrete portals (gates) on either end of the

	swing span); fuel tanks located below deck level; and disused cables and pipes which currently obstruct visual inspection of hidden defects across the whole length of the Kincardine Bridge. The elements to be decommissioned do not include those as part of the ACM removal which is discussed separately (above).
Summary Proposed Mitigation:	• BEAR Scotland Engineer to monitor the site and working practices – works to be halted if breaches of approved method statements or best practice occur. • Environmental mitigation measures, including ecology mitigation, to be provided in a SEMP.

1.3 Routine Maintenance Activities

1.3.1 In addition to the maintenance schemes to be taken forward on the Kincardine Bridge, there are a number of smaller routine maintenance activities which can be carried out on a regular basis. In addition, some of these routine maintenance activities may also be encompassed within the maintenance schemes as outlined in Section 1.2.

1.3.2 Below is a breakdown of location and activities of the proposed routine maintenance which may be carried out throughout the duration of the proposed licence period (initial Marine Licence). These works are typically reactive and vary in nature therefore it is not possible to provide an estimate construction value. These works may be required at any location on the structure. However, environmental mitigation measures appropriate to the task will be employed at all times.

1.3.3 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 Kincardine Bridge Marine Licences where relevant.

Table 2: Routine Maintenance Activities

Location	Activity
Piers, Abutments, Wing Walls	Remove graffiti.
	Removal of vegetation
	Clean debris from bearing shelves.
	Clean drainage channels.
	Rod outlet pipes to ensure effective operation.
	Rod weep pipes and remove silt and debris.
	Check gap sealant on movement joints.
	Check paving slabs on south abutment.
	Reset slabs and reinstate joints material where necessary.

Location	Activity
Steel Columns	Remove graffiti.
	Remove debris and bird droppings.
Approach embankments (north and south)	General requirements, inspection and maintenance requirements are in accordance with the operating company's term maintenance contract with any special requirements for highway structures on the network.
Landscape Maintenance (grassed areas and scrub)	Grassed areas include the embankment slopes at the north and south approach and the grassed area below the approach spans within the highway boundaries. General requirements, inspection and maintenance requirements are in accordance with the operating company's term maintenance contract with any special requirements for highway structures on the network.
Landscape Maintenance (hedges, trees and planted areas, wetlands and special ecological measures)	General requirements, inspection and maintenance requirements are in accordance with the operating company's term maintenance contract with any special requirements for highway structures on the network.
Safety Fences and Barriers	Existing fencing at north and south approaches. General requirements, inspection and maintenance requirements shall be in accordance with the operating company's term maintenance contract and with any special requirements for highway structures on the network.
Fences, Walls Screens and Environmental Barriers	General requirements, inspection and maintenance requirements are in accordance with the operating company's term maintenance contract with any special requirements for highway structures on the network.
Steel Beams, Girders, Truss and Concrete Beams	Remove graffiti.
	Remove debris and bird droppings from all surfaces. No specialist access required.
	Clear drainage holes.
	Check and tighten fixing arrangements of electrical cables and equipment, drainage and service tied to the beams, girders, copings and pillars (to be undertaken by BEAR Scotland's Electrical team).
Deck Carriageway, Footways and Parapet Cantilever	Grass and weeds should be removed from gaps in surfacing and from channels.
	Repair joint and gap sealant to joints in foot ways surfacing (transverse and longitudinal).
Steel Spans	Until major refurbishment of bridge, brush down areas of corrosion in beams at outlet of deck drainage and apply minor repairs to coating system.
Concrete Spans and Concrete Deck/Copings	Brush down any flaking in protective coating and apply repair painting.

Location	Activity
	Remove any loose spalling concrete, apply rust-inhibitor to exposed reinforcement and apply minor repair concrete.
Expansion Joints	Clean out debris and vegetation.
	Check and reinstate joint sealant where necessary.
	Clear and check drainage system.
	Check and tighten where necessary any loose nuts and bolts. Replace where appropriate.
Deck Drainage	Unless already available, a record of all gullies, catchpits and other drainage elements should be developed and maintained.
	The gullies and catchpits shall be inspected and emptied once a year. The need for a greater frequency will depend on the proposed footway protection scheme currently under consideration.
Bridge Parapet	Check and tighten where necessary any loose nuts and bolts. Replace where appropriate.
	Brush down any flaking in protective coating and apply where possible touch up painting.
	Remove graffiti on concrete pillars and reset copings.
	Clean the surface of the concrete pillar by low pressure water jetting.
	Clean and reinstate the historical bridge plates fixed to the concrete pillars at the north end of the bridge.
Covers, Gratings, Frames and Boxes	There are a number of manholes and services chambers in both footways including manholes in the carriageway and in the footways at the ends of the swing span for access to the voids within the piers and walkways to the bearing shelves. The general, inspection and maintenance requirements shall be in accordance with the operating company's term maintenance contract.
Carriageway Surfacing, Road Markings, Road Studs, Kerbs and Road Lighting	The requirements shall be as per the requirements in the relevant sections of the operating company's term maintenance contract with any special requirements for highway structures on the network.
Cabin and Engine Room	General cleaning: Dusting of surfaces and equipment, mopping floor and cleaning windows at intervals of one month.
	Fire extinguishers: The maintenance requirements and intervals shall be in accordance with BS5306 pt.3: 2017
	Heating system: Routine maintenance requirements and frequency in accordance with the manufacturer's instructions.
	Window and door frames: Check, clean, repair the paint work and reinstate sealant when necessary.
	Building fire alarm and security alarms systems: Maintenance as per manufacturer’s instructions.

Location	Activity
	Engine room floor, access to centre pier core/bearing area - check and clean the manhole cover and frame and undertake any necessary repair works. Check access ladder and tighten bolts. Check area and ensure that it is dry and clean.
Swing Span End Portal Frames	Clean all external concrete surfaces by low pressure water jetting.
	Remove any loose spalling concrete and undertake the necessary concrete repairs.
	Clear all drains channels.
	Clear and test all drainage pipes.
	Check the frame, the fixings and the rails of the disused mounted traffic barriers, including tighten fixing bolts, clear channels, brush down any rust in metal surfaces and apply touch up repair protective coating where necessary.
	Check the fixings of the weather monitor equipment mounted on the north portal.
	Check and clean the historical bridge plates fixed to the elevations of the portals. Tighten or reinstate fixings if necessary.
Metal Walkways, Guard Rails, Stairs and Ladders	Fixing bolts shall be checked and tightened.
	Damaged sections shall be repaired or replaced unless damage is clearly superficial with no loss of integrity of the element.
	Clean all surfaces of dirt and bird droppings.
Swing Span End Supports - Voids in Piers/Access to Bearing Shelf	Check access ladders and their fixings and undertake any necessary repairs.
	Clean areas of any pigeon droppings and close any openings.
	Check and maintain doors and frames. Undertake any necessary repairs.
	At bearing shelf clean walkways and all areas of pigeon droppings.
Swing Span Mechanical/Rocker Bearings	Clean surrounding area.
	Clean all surfaces and remove any debris around the bearing and ensure that there is adequate drainage around the bearing.
	Check general alignment of the top plate to the base part of the bearing.
	Check and tighten all bolts and fixings.
	Grease all accessible sliding surfaces.
	Remove any loose grout.
	Reinstate any missing or removed bedding mortar using non-shrink high strength cementitious grout.
	Check, clean and tighten connections to the hydraulic equipment.
	Check that the corrosion protection system applied has not been compromised (where applicable).
Timber Jetties	Clear the decking of vegetation, debris and loose material.
	Check and tighten bolts in all connections.

Location	Activity
	Secure any loose decking boards.
	Remove and replace broken decking boards.
	Check and maintain metal guard rails.
Varioguard	Any special requirement by the designer or manufacturer.
	Check and clean and test the drainage openings and deck gullies.
	Any requirements for safety fencing in accordance with the operating company's term maintenance contract.
North West Embankment-Enclosure Below Concrete Staircase	Maintenance subject to the condition and usage of this area.
	Maintain in a clean, dry and secure condition.

Appendix A1: Location Plans

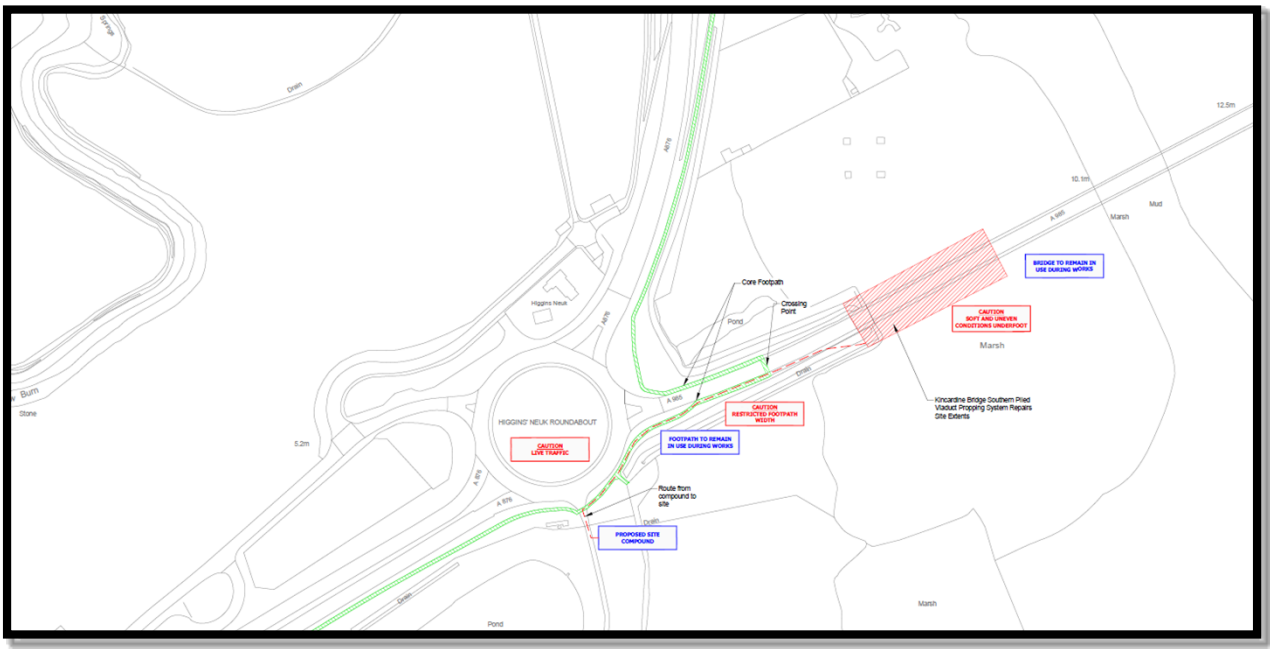

Figure A1.1: SPV Propping System Repairs Scheme Location Plan

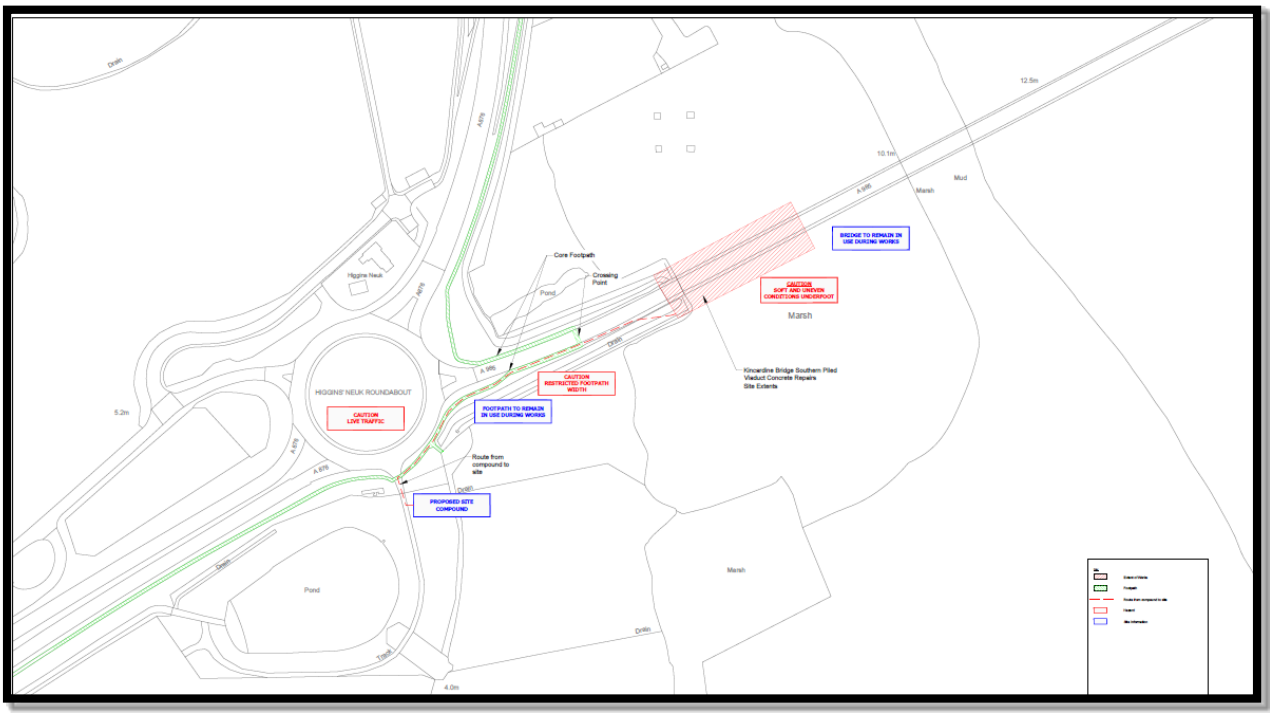

Figure A1.2: SPV Concrete Repairs Location Plan

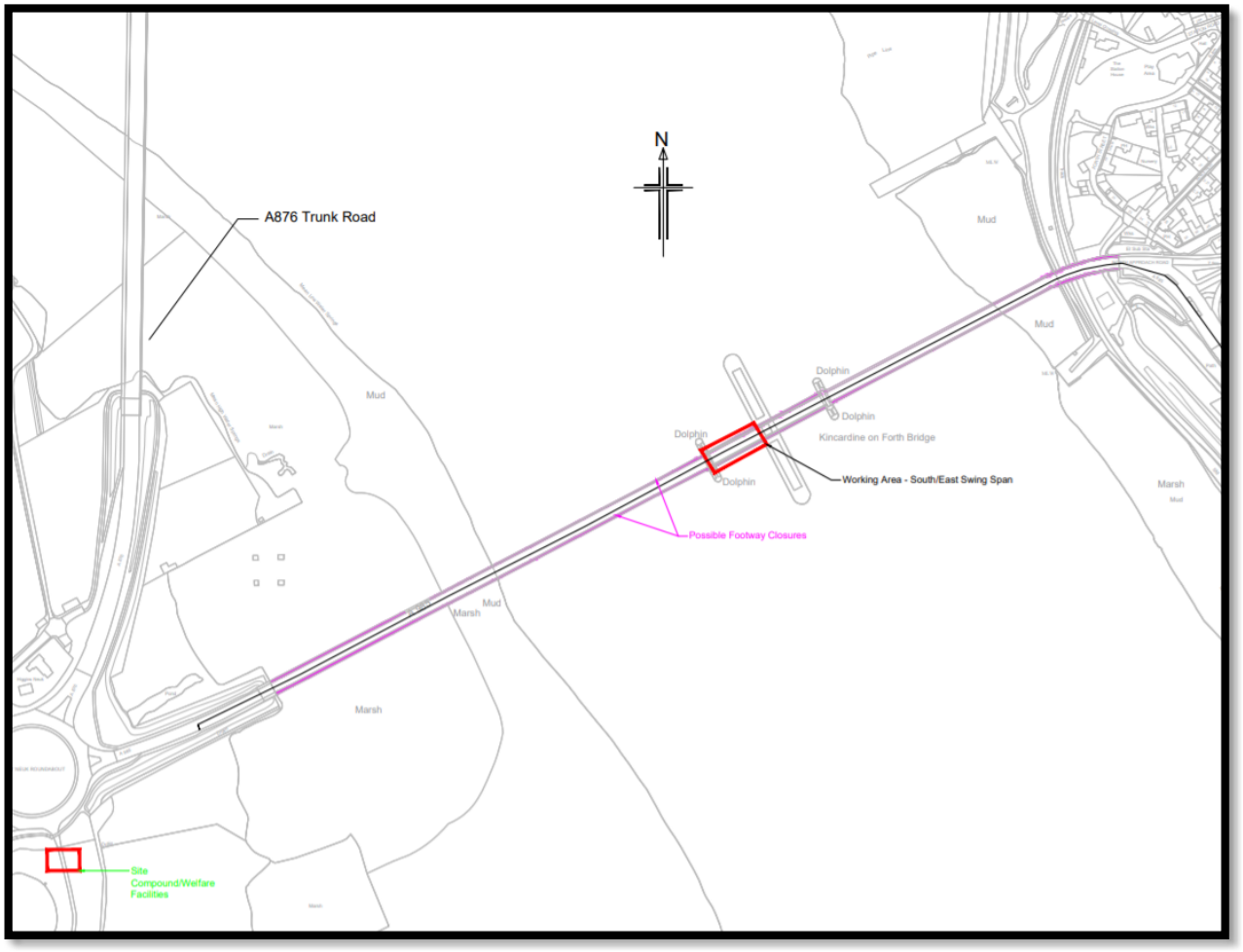

Figure A1.3: Navigation Lights Location Plan

Appendix A2: Navigation Lights Options

Figure A2.1: Navigation lights option 1

5.5 NM MARINE BEACON

VLB-5X

SHORT-RANGE LANTERN 5.5 NM AT 0.74T

Vega's flagship short range beacon is available in four models, to suit a wide range of locations and environments. The VLB-5X includes the latest LED technology; new battery technology; and an advanced charging algorithm, which supports the battery to perform well in extreme weather conditions.

Benefits include:

- Optical range – 5.5 NM
- Battery technology and advanced charging algorithm
  - Excellent battery life in hot climates
  - Excellent battery capacity in cold climates
  - Excellent battery tolerance to becoming flat
- Large solar cell capacity 8W or 16W

Figure A2.2: Navigation lights option 2

Appendix A3: SPV Concrete Repairs

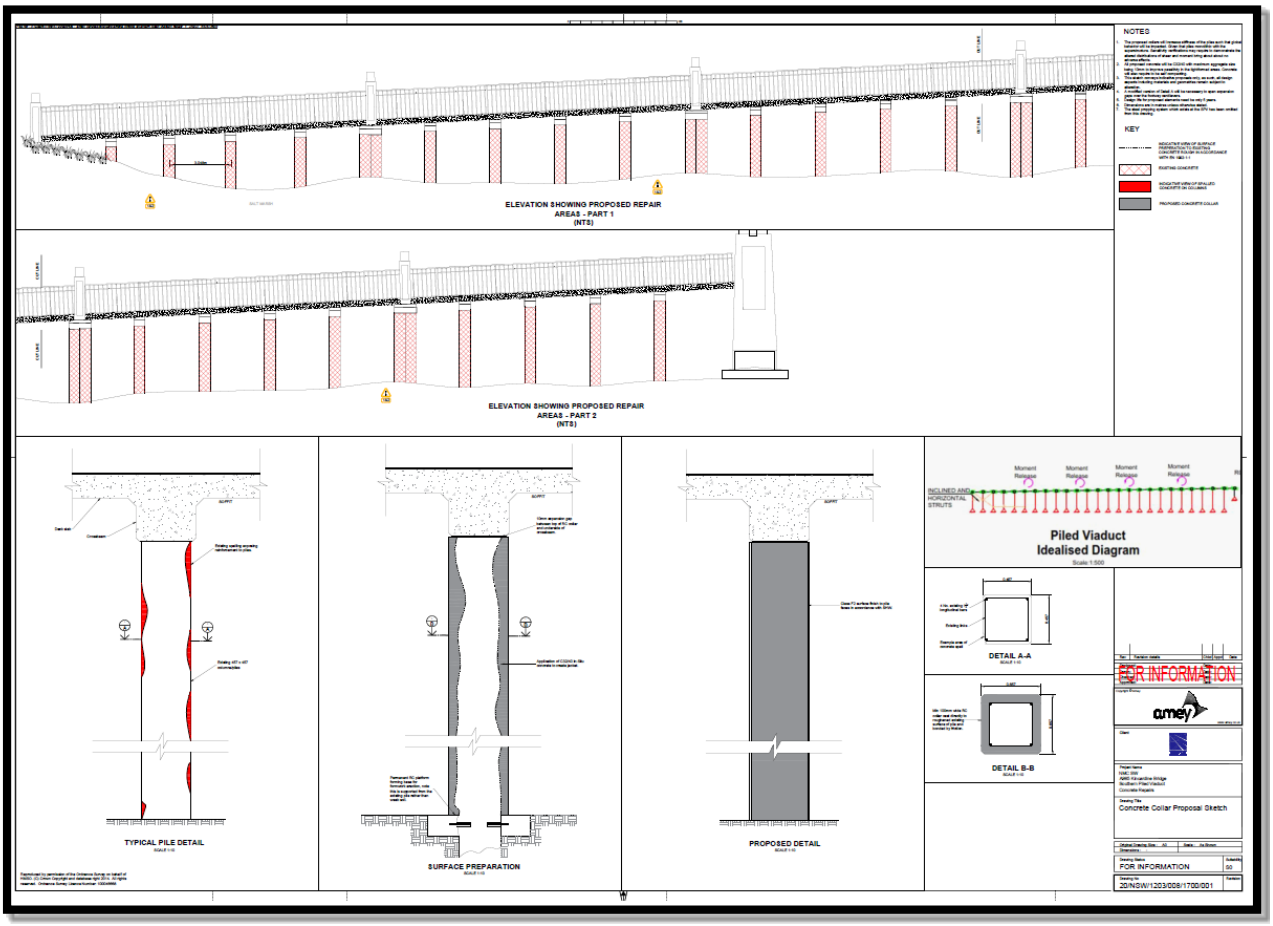

Figure A3.1: SPV concrete repairs proposal