

EC DIRECTIVE 97/11 (as amended)

ROADS (SCOTLAND) ACT 1984 (as amended)

RECORD OF DETERMINATION

Name of Project:

Forth Road Bridge Suspended Span Under Deck
Access (SSUDA) Improvements – Phase 6

Location:

Forth Road Bridge
NGR 312541, 679746 (centre point)

DESCRIPTION OF PROJECT

BEAR Scotland (BEAR) has been commissioned by Transport Scotland to undertake Suspended Span Under Deck Access (SSUDA) improvement works on the Forth Road Bridge (FRB). The bridge spans the Firth of Forth between South Queensferry and North Queensferry (Appendix A, Figure 1 and Figure 2).

The FRB SSUDA system was designed and installed in 1981 and travels the full 1821 m length of the bridge. It is used for inspection of the suspended span and for carrying out minor remedial works such as painting, replacing bolted connections and maintenance of the deck half joints.

The FRB SSUDA system is comprised of walkways made of steel angle and channel sections connected through plated, bolted or welded connections. The walkway mesh is supported on longitudinally spanning angle sections with a maximum span of 3.86 m centres between the walkway hangers. The walkway hangers are mainly standard to each line; however, several bespoke hangers exist to avoid collision with the bridge structure or public utilities. The two walkways below the pedestrian footpaths / cycleways are designated as the 'A-Lines'. The walkways below each carriageway are the 'C-Lines', and the 'D-Line' is below the central reservation. The longitudinal stiffening truss, or 'top chord' is designated as the 'B-Line', from which are suspended temporary 'B-Line hangers'. Aluminium staging boards and handrails can be fitted to span transversely between the walkways and B-Lines to create safe working platforms, with temporary ladders providing access to the platforms from the footpaths (Appendix A, Figure 3).

This scheme, SSUDA Phase 6, is a continuation of the SSUDA contract, and the works being promoted are the same as the previous Phase 1 to Phase 5 schemes which were undertaken by the previous Operating Company (Amey) to strengthen and refurbish the SSUDA walkways¹.

In order to carry out the SSUDA improvement works, temporary access platforms will be constructed to provide a safe working platform. However, the majority of the works will be completed off-site e.g. after the handrails are removed, they will be shot-blast, re-galvanised and powder-coated in an offsite-factory. The handrails will then be

¹ The SSUDA system requires refurbishment and strengthening to increase its load capacity from 0.7kNm⁻² to 1.5kNm⁻² and to address the risk to safety involved in installing temporary B-Line hangers.

brought back to the bridge for reinstallation. Any damaged or corroded components that cannot be refurbished will be replaced.

Phase 6 covers refurbishment of the five walkways between Panel Points 86 and 98 on the North Main Span (Appendix A, Figure 4). The works are programmed for November 2020 (date TBC) and will take 156 days to complete, with works taking place Monday to Friday from 08:00 to 18:00. Weekend working may be programmed at the contractor's discretion to optimise weather and operational activities.

The works will comprise of the following:

- Installation of scaffold and debris netting,
- Removal of existing SSUDA steelwork members and walkway flooring,
- Disposal of steel mesh walkway flooring, corroded/failed steelwork members and fixings,
- Refurbishment of remaining steelwork members by cleaning and re-galvanising (off-site),
- Installation of refurbished steelwork members and new replacement steelwork members,
- Installation of new strengthening steelwork (additional to current configuration),
- Installation of new glass-reinforced polymer (GRP) flooring,
- Removal of scaffold and debris netting.

PROJECT PROCUREMENT

The scheme is executed by the operating company as site operations – 'As of Right' scheme.

DESCRIPTION OF LOCAL ENVIRONMENT

The sections below provide a brief description of the local environment in vicinity of the FRB. The baseline information is based on a review of currently available information obtained from a desk-based study and historical information provided by the previous Operating Company (Amey).

The headings have been set out to follow the recently updated Design Manual for Roads and Bridges (DMRB) chapters for environmental assessment and do not reflect a ranking of impact severity. Unless otherwise stated, the study area considered for the assessment of potential impacts extends 300 m in each direction between Panel Points 86 and 98 on the North Main Span of the FRB.

1.0 Population and human health

Baseline information was collected through a desktop assessment containing data obtained from online web-based mapping tools including; Google Maps and Google Street View, Envirocheck, Ordnance Survey (OS), NatureScot, Scotland's Environment (SE), Scotland's Environment Scotland's Soils (SESS), Sustrans and the Road Traffic Statistic.

1.1 Properties (within distance bands)

There are no residential properties, business or industrial premises, farmsteads, sensitive land uses (e.g. schools, churches, hospital, etc.) or public open spaces within 300 m of the scheme extents.

1.2 Land use

The scheme is located on the FRB, which crosses the Firth of Forth between South Queensferry within the City of Edinburgh local authority area and North Queensferry in the Fife Council local authority area. At the time of writing, there are no planning applications within 300 m of the FRB².

Land use within 2 km of the FRB is categorised into the following³; (i) motorway, (ii) urban, (iii) recreation area, (iv) maritime installation, (v) designed landscape, (vi) managed woodland, (vii) medieval village. The national scale land capability for agriculture⁴ for land north and south of the FRB is 'Class 888 urban⁵'. Land qualifying as urban has no agricultural value.

1.3 Non-motorised user & community facilities

National Cycle Network⁶ route 1 (NCNR1) crosses the Firth of Forth via a dedicated cycleway that runs along both sides of the FRB and a Core Path⁷ utilises the dedicated footpaths⁸, which run along both sides of the bridge. There are no Public Rights of Way⁹ (PRoW), pedestrian crossing points (controlled or uncontrolled), bus stops, bridle paths or other community assets on the FRB and no private residencies or businesses are directly accessed from the FRB. Street lighting is present on the bridge.

1.4 Vehicle travellers

The FRB is a two-lane dual carriageway with an Annual Average Daily Traffic (AADT) flow (2018 data) of 643 (ID: 90005) comprised of:

- 15 two wheeled motor vehicles,
- 179 cars and taxis.
- 325 bus and coaches,
- 119 Light Goods Vehicles (LGVs), and
- 5 Heavy Goods Vehicles (HGVs).

As of September 2017, all other traffic has used the new Queensferry Crossing.

The AADT flow recorded for pedal cycles (2018 data) was 123.

² <https://planning-applications.midlothian.gov.uk/OnlinePlanning/spatialDisplay.do?action=display&searchType=Application> [accessed 29/09/20]

³ <https://map.hlamap.org.uk> (HLAmap) [accessed 29/09/20]

⁴ http://map.environment.gov.scot/Soil_maps/?layer=1# (Scotland's Environment Scotland's Soils) [accessed 29/09/20]

⁵ The classification provides for seven grades of land based on its agricultural, forestry and recreational potential, with four of the classes further subdivided into divisions. The methodology considers climate, gradient, soil, wetness, erosion and pattern. The best and most versatile land is classified as Class 1, 2 and 3.1 as this is the land which is most flexible, productive and most likely to deliver future crops.

⁶ The National Cycle Network (NCN) is a network of cycle routes comprising minor routes, disused railways, pedestrian routes, canal towpaths and traffic calmed routes, created by the charity Sustrans. Given the mixed nature of routes that make up the NCN, sections of the network are also designated as Core Paths or Public Rights of Way.

⁷ Core Paths can include; Public Right of Ways, footpaths, cycle tracks, paths covered by path agreements / orders, waterways, or crossing land to facilitate, promote and manage the exercise of access rights under the Land Reform (Scotland) Act 2003 (Sections 20 and 21), and are identified as such in Local Authority Core Paths plans.

⁸ Local paths hold no statutory designation and can be pavements adjacent to roads or off-road paths.

⁹ The National Catalogue of Rights of Way is maintained by ScotWays in partnership with Scottish Natural Heritage and local authorities (who can also retain their own records). Access along Public Rights of Ways are protected by the Countryside (Scotland) Act 1967, Section 46.

2.0 Air quality

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Scotland's Environment (SE), Air Quality in Scotland (SEAQS), Google Maps and Google Street View, Envirocheck, EU Pollutant Release and Transfer Register (PRTR), and Ordnance Survey (OS).

Baseline air quality is mainly influenced by vehicles travelling along the FRB. Secondary sources are derived from vehicles travelling along the Queensferry Crossing, train movement on the Forth Bridge and from coastal industrial processes at Rosyth Dockyard.

There are no Air Quality Management Areas¹⁰ (AQMAs) within 300 m of the scheme. Whilst no monitoring of air quality levels has been undertaken as part of this assessment, at the time of writing, automatic monitoring stations within the wider area record bandings in the 'green zone' (Low Index 1), and it is considered that these readings are representative of air quality within the scheme extents¹¹. Readings in the 'green zone' suggest that National Air Quality Strategy (NAQS) objectives are likely to be met and that air quality in the area is relatively good. The European PRTR¹² online mapping tool does not identify any industrial or waste management sources within 1 km of the scheme extents.

3.0 Cultural heritage assessment

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), Ordnance Survey (OS), Google Maps and Google Street View.

The FRB, including approach ramps and piers, is a Category A listed structure (ID: LB47778 Edinburgh and LB49165 Fife)¹³. Of lesser cultural heritage value, the FRB, including approach ramps and piers is also recorded as a Canmore National Record (CNR) (ID: 50549). Three Canmore Maritime records are also recorded within 300 m of the scheme. There are no World Heritage Sites, Scheduled Monuments, Gardens and Designed Landscapes¹⁴, Registered Battlefields, or any other historically designated sites within 300 m of Panel Points 86 and 98 on the North Main Span of the FRB.

¹⁰ Under section 83(1) of the Environment Act 1995, Local Authorities have a duty to designate any relevant areas where air quality objectives are not (or are unlikely to be) being met as [Air Quality Management Areas](#).

¹¹ <http://www.scottishairquality.scot/latest/?la=falkirk> (Air Quality in Scotland) [accessed 30/09/20]

¹² A pollutant release and transfer register (PRTR) is an inventory of pollution from industrial sites and other sources. A PRTR is a national or regional environmental database or inventory of potentially hazardous chemical substances and/or pollutants released to air, water and soil and transferred off-site for treatment or disposal. The industrial or business facility quantify and report the amounts of substances released to each environmental medium (air, water, soil) or transferred off-site for waste management or wastewater treatment. <https://prtr.eea.europa.eu/#/home> [accessed 30/09/20]

¹³ <https://hesportal.maps.arcgis.com/apps/Viewer/index.html?appid=18d2608ac1284066ba3927312710d16d> (Historic Environment Scotland) [accessed 31/09/20]

¹⁴ Records of historic gardens and designed landscapes in Scotland are compiled and maintained by both Historic Scotland and Scottish Natural Heritage.

4.0 Biodiversity

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Google Maps and Google Street View, Spatial Hub, Ordnance Survey, NatureScot and Scotland's Environment (SE).

All environmental features have been assessed with reference to prior knowledge and experience of trunk road bridge refurbishment project construction methods, and the potential environmental impacts associated with these types of works in order to provide a robust impact assessment decision-making process. The assessment therefore aims to characterise environmental impacts rather than placing a reliance only on magnitude. The character of an impact is used to inform the determination of whether or not the impact on the feature in question is a significant one.

Based on the nature of the works, the study area was defined as an area extending to 300 m in all directions from the centre line of Panel Points 86 and 98 on the North Main Span of the FRB. Invasive non-native flowering plant species (INNS) have been scoped out from ecological evaluation due to their lack of conservation status and so are not discussed further in that context. INNS are however discussed in the context of their potential as a risk to biodiversity and, under the Wildlife and Countryside Act 1981 (as amended) (WCA), regarding legal responsibilities to prevent their transfer.

The FRB spans the Firth of Forth, which is a complex estuarine site stretching for over 100 km from the River Forth at Stirling eastwards past Edinburgh and along the coasts of Fife and East Lothian to a wide estuary mouth. A wide range of coastal and intertidal habitats is found within the site, including saltmarshes, dune systems, maritime grasslands, heath and fen, cliff slopes, shingle and brackish lagoons. Extensive mudflats occur particularly in the Inner Firth, notably at Kinneil Kerse and Skinflats on the south shore and Torry Bay on the north shore. Typically, the flats support a rich invertebrate fauna, with eelgrass (*Zostera spp.*) growing on the main mudflats. In the Outer Firth, the shoreline diversifies, with sandy shores, some rocky outcrops, mussel beds and some artificial seawalls. The North Berwick coast includes cliffs and dune grassland, with extensive dune systems at Aberlady. Several large urban areas, including Edinburgh, lie adjacent to the Firth of Forth and these include several areas of heavy industry. The Forth is also one of the most important shipping areas in Scotland. The Firth of Forth is important for a large number of wintering waders and wildfowl, many in nationally and internationally important numbers (NatureScot 2020¹⁵).

A number of designated sites were identified on NatureScot Sitelink¹⁶ that are either spanned by the FRB or connected to the FRB via the Firth of Forth. Long Craig Island for example, which forms part of the Forth Islands Special Protection Area (SPA) (EU Site Code UK9004171), is spanned by the FRB approx. 700 m north of Panel Point 98 on the North Main Span. Long Craig Island is also noted as a Site of Special Scientific Interest (SSSI) (EU Site Code 169962). The Firth of Forth SPA (EU Site Code UK9004411), Firth of Forth RAMSAR¹⁷ (EU Site Code UK13017) and Firth of Forth SSSI (EU Site Code 169840) are also spanned by the FRB approx. 900 m north of Panel Point 98 and 850 m south of Panel Point 89 on the North Main Span.

¹⁵ <https://rsis.ramsar.org/RISapp/files/RISrep/GB1111RIS.pdf?language=en>

¹⁶ <https://sitelink.nature.scot/map> (NatureScot) [Accessed 01/10/2020]

¹⁷ Wetland of International Importance.

The Forth Islands SPA consists of seven islands, together with outlying rocky islets, in the Firth of Forth. The SPA conservation objectives are to avoid deterioration of the habitats of the qualifying species¹⁸ (Table 4.1) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained. The objective is also to ensure for the qualifying species that the following are maintained in the long term: (i) population of the species as a viable component of the site, (ii) distribution of the species within site, (iii) distribution and extent of habitats supporting the species, (iv) structure, function and supporting processes of habitats supporting the species, and (v) no significant disturbance of the species¹⁹.

Table 4.1. Forth Islands SPA qualifying species

Arctic tern (<i>Sterna paradisaea</i>)	Lesser black-backed gull (<i>Larus fuscus</i>)
Common tern (<i>Sterna hirundo</i>)	Puffin (<i>Fratercula arctica</i>)
Cormorant (<i>Phalacrocorax carbo</i>)*	Razorbill (<i>Alca torda</i>)
Gannet (<i>Morus bassanus</i>)	Roseate tern (<i>Sterna dougallii</i>)
Guillemot (<i>Uria aalge</i>)*	Sandwich tern (<i>Sterna sandvicensis</i>)
Herring gull (<i>Larus argentatus</i>)*	Shag (<i>Phalacrocorax aristotelis</i>)
Kittiwake (<i>Rissa tridactyla</i>)*	Seabird assemblage

* indicates assemblage qualifier only

Long Craig Island SSSI is a low, 2.09 hectare rocky, offshore island in the Firth of Forth situated approx. 200 m south-west of North Queensferry, lying directly below the FRB. The island supports a nationally important colony of Roseate terns. The Roseate tern first bred in 1981 and numbers peaked in 1991 with 21 pairs. Since then there has been a more or less steady decline with a five-year peak mean of only 3 pairs between 2004 and 2008. A small number of Common terns also breed on the island²⁰.

The Firth of Forth SPA is designated for five Annex I species (qualifying under Article 4.1 of the EU Birds Directive), five migratory bird species (qualifying under Article 4.2 of the EU Birds Directive), and its large overwintering waterfowl assemblage (ten individually cited species plus an additional sixteen wildfowl and Sandwich terns) (Table 4.2). The SPA conservation objectives are to avoid deterioration of the habitats of the qualifying species²¹ or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained. The objective is also to ensure for the qualifying species that the following are maintained in the long-term: (i) population of the species as a viable component of the site, (ii) distribution of the species within site, (iii) distribution and extent of habitats supporting the species, (iv) structure, function and supporting processes of habitats supporting the species, and (v) no significant disturbance of the species²².

Table 4.2. Firth of Forth SPA qualifying species

Bar-tailed godwit (<i>Limosa lapponica</i>),	Oystercatcher (<i>Haematopus</i>)
Common scoter (<i>Melanitta nigra</i>)*,	Pink-footed goose (<i>Anser brachyrhynchus</i>)
Cormorant (<i>Phalacrocorax carbo</i>)*	Red-breasted merganser (<i>Mergus serrator</i>)*
Curlew (<i>Numenius arquata</i>)*	Redshank (<i>Tringa totanus</i>)
Dunlin (<i>Calidris alpina alpina</i>)*	Red-throated diver (<i>Gavia ste</i>)
Eider (<i>Somateria mollissima</i>)*	Ringed plover (<i>Charadrius hiaticula</i>)*
Golden plover (<i>Pluvialis apricaria</i>)	Sandwich tern (<i>Sterna sandvicensis</i>)
Goldeneye (<i>Bucephala clangula</i>)*	Scaup (<i>Aythya marila</i>)*

¹⁸ Forth Islands SPA Conservation Objectives. <https://sitelink.nature.scot/site/8500> (NatureScot) [Accessed 01/10/2020]

¹⁹ Forth Islands SPA Conservation Objectives. <https://sitelink.nature.scot/site/8500> (NatureScot) [Accessed 01/10/2020]

²⁰ Long Craig Island SSSI. Site Management Statement. <https://sitelink.nature.scot/site/1658> (NatureScot) [Accessed 01/10/2020]

²¹ Firth of Forth SPA Conservation Objectives. <https://sitelink.nature.scot/site/8499> (NatureScot) [Accessed 01/10/2020]

²² Firth of Forth SPA Conservation Objectives. <https://sitelink.nature.scot/site/8499> (NatureScot) [Accessed 01/10/2020]

Great crested grebe (<i>Podiceps cristatus</i>)*	Shelduck (<i>Tadorna tadorna</i>)
Grey plover (<i>Pluvialis squatarola</i>)*	Slavonian grebe (<i>Podiceps au</i>)
Knot (<i>Calidris canutus</i>)	Turnstone (<i>Arenaria interpres</i>)
Lapwing (<i>Vanellus vanellus</i>)*	Velvet scoter (<i>Melanitta fusca</i>)*
Long-tailed duck (<i>Clangula hyemalis</i>) *	Wigeon (<i>Anas penelope</i>)*
Mallard (<i>Anas platyrhynchos</i>)*	Waterfowl assemblage

* indicates assemblage qualifier only

The Firth of Forth RAMSAR has been designated for its internationally important waterfowl assemblage (greater than 20,000 birds). The RAMSAR is a large coastal area comprising a complex of estuaries, mudflats, rocky shorelines, beaches and saltmarshes, including many fragmentary bits of shoreline considered to act as a single ecological unit. Several large urban areas, including Edinburgh, are adjacent to the site and include areas of heavy industry and well-used maritime shipping lanes. The site provides habitat for large numbers of wintering waders and wildfowl, many in nationally and internationally important numbers. Over winter the site regularly supports internationally important populations of waterfowl assemblage²³ (Table 4.3).

Table 4.3. internationally important populations of waterfowl assemblage

Bar-tailed Godwit (<i>Limosa lapponica</i>)	Sandwich Tern (<i>Sterna sandvicensis</i>)
Goldeneye (<i>Bucephala clangula</i>)	Shelduck (<i>Tadorna tadorna</i>)
Knot (<i>Calidris canutus</i>)	Slavonian Grebe (<i>Podiceps auritus</i>)
Pink-footed Goose (<i>Anser brachyrhynchus</i>)	Turnstone (<i>Arenaria interpres</i>)
Redshank (<i>Tringa totanus</i>)	

The Firth of Forth SSSI stretches from Alloa to Crail on the north shore and to Dunbar on the south shore. It includes the estuary upriver from the Forth bridges and the firth east of the bridges. The Firth of Forth SSSI natural and biological features are detailed in Table 4.4.

Table 4.4. Firth of Forth SSSI biological notified features

Coastlands:	Maritime cliff, Saltmarsh, Sand dunes
Intertidal marine habitats and saline lagoons:	Mudflats, Saline lagoon
Lowland grassland:	Lowland neutral grassland
Fens:	Transition grassland
Vascular plants:	Vascular plant assemblage
Invertebrates:	Beetle assemblage
Butterflies:	Northern brown argus (<i>Aricia artaxerxes</i>)
Birds (non-breeding):	Red-throated diver (<i>Gavia stellata</i>) Great crested grebe (<i>Podiceps cristatus</i>) Slavonian grebe (<i>Podiceps auritus</i>) Cormorant (<i>Phalacrocorax carbo</i>) Pink-footed goose (<i>Anser brachyrhynchus</i>) Shelduck (<i>Tadorna tadorna</i>) Mallard (<i>Anas platythynchos</i>) Wigeon (<i>Anas penelope</i>) Scaup (<i>Aythya marila</i>) Eider (<i>Somateria mollissima</i>) Long-tailed duck (<i>Clangula hyemalis</i>) Common scoter (<i>Melanitta nigra</i>) Velvet scoter (<i>Melanitta fusca</i>) Goldeneye (<i>Bucephala clangula</i>) Red-breasted merganser (<i>Mergus serrator</i>) Oystercatcher (<i>Haematopus ostralegus</i>)

²³ https://rsis.ramsar.org/RISapp/files/RISrep/GB1111RISformer2001_EN.pdf?language=en

	Ringed plover (<i>Charadrius hiaticula</i>) Golden plover (<i>Pluvialis apricaria</i>) Grey plover (<i>Pluvialis squatarola</i>) Lapwing (<i>Vanellus vanellus</i>) Knot (<i>Calidris canutus</i>) Dunlin (<i>Calidris alpina alpina</i>) Bar-tailed godwit (<i>Limosa lapponica</i>) Curlew (<i>Numenius arquata</i>) Redshank (<i>Tringa totanus</i>) Turnstone (<i>Arenaria interpres</i>) Sandwich tern (<i>Sterna sandvicensis</i>)
Birds (breeding):	Eider (<i>Somateria mollissima</i>) Shelduck (<i>Tadorna tadorna</i>) Ringed plover (<i>Charadrius hiaticula</i>)

The NBN online mapping tool records no mammal species of conservation significance within 300 m of the scheme (in the last 10 years) within 10 km grid square NT17. Forty-three bird species, including migratory overwintering waterfowl, wintering waders and wildfowl are recorded²⁴.

The SSUDA system is installed from the underside of the FRB therefore it is not expected that any INNS, as listed on Schedule 9 of the WCA 1981, will be encountered.

5.0 Landscape & visual effects

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Google Maps and Google Street View, Inventory of Gardens and Designed Landscapes, Ordnance Survey (OS), NatureScot and Scotland’s Environment (SE).

The scheme is located on the FRB between Panel Points 86 and 98 on the North Main Span (Figure 2, Appendix A). The FRB passes over the lower Forth estuary, which is an active waterway, and views from the bridge are of large-scale exposed coastlines with harbours containing moored shipping vessels. Inland of the coastline, an array of urban and industrial zones are a feature of the landscape.

Excluding the FRB, the dominant structures in the landscape are the Queensferry Crossing and Forth Rail Bridge. Large shipping vessels sailing up the Forth estuary are also distinct features. North and south of the FRB, the A90 and A9000 spurs form large linear elements in the landscape that are distinct from surrounding landscape features. The spurs are characterised by cuttings through hills and large embankments with scrub woodland planting in places.

There are no National Scenic Areas within 2 km of the FRB.

²⁴ [https://scotland-records.nbnatlas.org/occurrences/search?q=%3A*&qc=cl28%3AScotland&lat=56.000877&lon=-3.404088&radius=0.3&fq=\(year%3A%222013%22%20OR%20year%3A%222012%22%20OR%20year%3A%222018%22%20OR%20year%3A%222014%22%20OR%20year%3A%222019%22%20OR%20year%3A%222016%22%20OR%20year%3A%222010%22%20OR%20year%3A%222017%22%20OR%20year%3A%222011%22%20OR%20year%3A%222015%22\)#tab_mapView](https://scotland-records.nbnatlas.org/occurrences/search?q=%3A*&qc=cl28%3AScotland&lat=56.000877&lon=-3.404088&radius=0.3&fq=(year%3A%222013%22%20OR%20year%3A%222012%22%20OR%20year%3A%222018%22%20OR%20year%3A%222014%22%20OR%20year%3A%222019%22%20OR%20year%3A%222016%22%20OR%20year%3A%222010%22%20OR%20year%3A%222017%22%20OR%20year%3A%222011%22%20OR%20year%3A%222015%22)#tab_mapView) (NBN Gateway) [Accessed 01/10/2020]

6.0 Noise & vibration

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Scotland's Noise, Ordnance Survey (OS), Google Maps and Google Street View.

Based on the nature of the works, the demarcation of the study area for the assessment of noise and vibration is limited to all land within 300 m in all directions from the centre line of Panel Points 86 and 98 on the North Main Span of the FRB.

The FRB does not fall within a Candidate Noise Management Area (CNMA), as defined by the Transportation Noise Action Plan Road Maps²⁵. The day and night modelled noise level (Lden) for the carriageway along the FRB ranges from 75dB up to 80dB whereas the night only modelled noise level (Lnight) ranges between 60dB and 70dB. The 'barrier' effect of the bridge deck ensures that traffic noise experienced by receptors directly below the FRB will experience levels lower than receptors slightly further away. That said, areas beneath and directly adjacent to the bridge abutments are subject to rhythmic low frequency noise caused by vehicles passing over bridge expansion joints.

7.0 Road drainage & the water environment

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Drinking Water Quality Regulator for Scotland (DWQRS), Google Maps and Google Street View, Ordnance Survey (OS), SEPA Flood Maps, SEPA Water Environment Hub, UK Soil Observatory and Scotland's Environment (SE).

The demarcation of the study area for the assessment of road drainage and the water environment has been defined as all land within 300 m in all directions from the centre line of Panel Points 86 and 98 on the North Main Span of the FRB.

The catchments of the River Forth and Firth of Forth Estuary cover a total area greater than 3600 km². The area can be split into two distinct sections; the River Forth drainage basin and those catchments that drain into the southern side of the Forth estuary. The FRB spans the Firth of Forth at the location of the Lower Forth Estuary transitional waterbody. The 38.6 km² Lower Forth Estuary transitional waterbody is classified²⁶ (ID: 200435) and lies in the Scotland river basin district. The transitional waterbody possesses an overall classification of 'Good' and possesses an ecological classification of 'Good'. The transitional waterbody has also been assigned a Water Framework Directive 2000/60/EC (WFD) classification of 'High' for fish. As the scheme spans a transitional waterbody, there is no groundwater data available. There is no likelihood of flooding on the FRB due to its height above the estuary²⁷. However, SEPA records that the area around the Firth of Forth is subject to varying likelihoods of coastal flooding risks²⁸.

²⁵ <https://noise.environment.gov.scot/action-planning-round-two.html> (Scotland's Environment Scotland's Noise) [Accessed 01/10/2020]

²⁶ The Scottish Environment Protection Agency (SEPA) have developed a surface waterbody classification system in line with the requirements of the River Basin Management Plan in accordance with Annex V of the European Union Water Framework Directive 2000/60/EC (WFD), which is applied to all significant surface waterbodies in Scotland. This system is based on an assessment of key chemical and ecological indicators. The classification system categorizes waterbodies into the following bands; High, Good, Moderate, Poor, Bad.

²⁷ <https://www.sepa.org.uk/data-visualisation/water-environment-hub/> (SEPA Water Environment Hub) [Accessed 02/10/2020]

²⁸ <http://map.sepa.org.uk/floodmap/map.htm> (SEPA Flood Map) [Accessed 01/10/2020]

The FRB is not located within a Nitrate Vulnerable Zone²⁹, and the bridge foundations at the northern and southern extents lie on the ‘South Queensferry’ groundwater, which has been classified as ‘Good’³⁰.

8.0 Geology & soils

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Spatial Hub, British Geological Survey (BGS) Superficial and Bedrock Geological map viewer, BGS Geoviewer, BGS UK Hydrogeology viewer and UK Soil Observatory Soils map viewer.

In addition to its biological interest, the Firth of Forth SSSI is important for the wide range of geology that can be found, especially in the firth west of the three bridges where the coastline is rockier. The SSSI geological and geomorphological diversity includes an array of recorded fossil deposits, volcanic rocks, minerals, strata exposures and raised beaches (Table 8.1). Of the nine geological or geomorphological features, six are in favourable condition, with three being unfavourable. All three unfavourable features are obscured in some way, either by graffiti or dumped material³¹.

Table 8.1. Firth of Forth SSSI Geological notified features

Stratigraphy:	Lower Carboniferous [Dinantian – Namurian part] Upper Carboniferous [Namurian (part) - Westphalian]
Igneous petrology:	Carboniferous – Permian Igneous
Mineralogy:	Mineralogy of Scotland
Palaeontology:	Arthropoda (excluding insects & trilobites) Palaeozoic Palaeobotany Permian - Carboniferous Fish/Amphibia
Quaternary geology and geomorphology:	Quaternary of Scotland
Geomorphology:	Coastal Geomorphology of Scotland

The bedrock geology under the FRB South Queensferry foundations are recorded as Strathclyde Group, which has a lithological description of ‘sandstone, siltstone, mudstone and seatrock, with some coal seams, ironstones and limestones; non-marine faunas common; marine faunal bands rare except in top part’. The bedrock geology under the FRB North Queensferry foundations are recorded as unnamed Igneous Intrusion, Carboniferous to Permian - Dolerite and Tholeiitic Basalt. The superficial geology (deposits overlying the bedrock) under the FRB South Queensferry foundations are recorded as Till (Diamicton) which is unsorted and unstratified drift, generally over consolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier. It consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape. There is no superficial geology recorded under the FRB North Queensferry foundations³².

9.0 Material assets & waste

Baseline data has been obtained from the Design Engineer.

²⁹ A Nitrate Vulnerable Zone defines areas designated under the EU Nitrates Directive that are at risk of pollution from nitrates used in agricultural practice.

³⁰ <https://map.environment.gov.scot/sewebmap/> (Scotland’s Environment) [Accessed 02/10/2020]

³¹ file:///n4-cld-fs-02/Environmental/02%20Screening%20Study%20Reports/2020%20-%202021/02%20Bridges/M90_A90/A90%20Forth%20Road%20Bridge%20-%20SSUDA%20Phase%206/Sensitive%20Site%20downloads/Firth%20of%20Forth%20SSSI/Firth%20of%20Forth%20SSSI%20Site_Management_Statement_8163.pdf

³² http://mapapps.bgs.ac.uk/geologyofbritain/home.html?&_ga=2.136273905.1738612801.1601396294-1677363405.1601396294 (British Geological Survey) [Accessed 01/10/2020]

As the value of the scheme is over £350,000, a Site Waste Management Plan (SWMP) is required.

The materials required for the project include:

- Galvanised and powder-coated steel and fixings,
- Neoprene,
- Nylon,
- Glass-reinforced polymer,
- Paint.

The equipment required for the project include:

- Forklift,
- Crane,
- Flatbed truck,
- Crew bus,
- Generator,
- Hand tools (110 v grinder, battery-operated impact wrench),
- Stepladder and scaffolding (tubing, fittings, wooden boards, plywood, nylon rope, straps & netting),
- Galvanised steel wire rope and fixings,
- Heras fencing,
- Polymer barriers and signs,
- Polymer netting and fixings,
- Traffic barriers,
- Electrical task lighting,
- Mobile elevated work platform (MEWP) / under-bridge unit.

The following fuel and/or chemicals will be stored on site for the duration of the scheme:

- Diesel
- Petrol
- Gas
- Oil

The main waste produced during the construction phase will be 53.58 tonnes of steel, European Waste Catalogue Code: 17 04 05. There is no lead paint coating on the steel.

10.0 Climate

Fuel will be required for transport to and from the scheme which will lead to greenhouse gas emissions. Any release of greenhouse gas emissions can contribute to climate change. The project is unlikely to be affected by the impacts of climate change, other than increasing likelihood of extreme weather events leading to issues with work taking place on site.

DESCRIPTION OF THE MAIN ENVIRONMENTAL IMPACTS OF THE PROJECT AND PROPOSED MITIGATION

As a result of a desktop study and site visit, issues requiring consideration have been identified and potential effects, their magnitude and overall significance (based on the sensitivity of receptor) have been considered in terms of both construction and operational effects. Residual effects are based on consideration of potential impacts (i.e. impacts in the absence of mitigation, and with mitigation implemented). Compliance with environmental mitigation measures detailed in the current five-year Marine Licence³³ (05568/15/0) and Construction Noise Management Plan (CNMP), which formed part of the Marine Licence, will also form part of the mitigation measures in place to minimise environmental impacts.

Headings have been set out to follow the recently updated DMRB chapters for environmental assessment and do not reflect a ranking of impact severity. Unless otherwise stated, the study area considered for the assessment of potential impacts extends 300 m in each direction between Panel Points 86 and 98 on the North Main Span of the FRB.

11.0 Population and human health (properties, land use, vehicle travellers, NMU & community facilities)

There are no properties within 300 m of the scheme extents, no access will be restricted to properties during the works and there will be no loss of land or change in land use as a result of the works.

The FRB is currently closed to southbound traffic³⁴, with all traffic utilising a contraflow on the northbound lanes. However, AADT flow is low and no traffic management has been arranged for the SSUDA Phase 6 scheme as the SSUDA system is installed from the underside of the bridge. As such, no temporary effects on traffic movement is predicted from the works. Closure of the southbound carriageway also permits material lay-down and welfare facilities to be accommodated within the closure, thus ensuring safety of the workforce. Through-access will also be maintained at all times on the dedicated footpaths which run along both sides of the FRB and accommodates NCNR1 and a Core Path.

The following mitigation measures will reduce impacts of works on vehicle travellers and non-motorised users³⁵ (NMUs) using the FRB during the construction phase:

- Appropriate measures will be implemented to permit the safe passage of pedestrians and cyclists of all abilities through the site.
- Journey planning information will be made available for drivers online at the trafficscotland.org website. Journey planning information will also be available for drivers online through BEARs social media platforms.

³³ As FRB Cyclic, Routine and Planned Maintenance works are undertaken over the Lower Forth Estuary, within the Mean High Water Springs (MHWS), a Marine Licence is required under Part 4 of the Marine (Scotland) Act 2010 and Part 4 of the Marine and Coastal Access Act 2009. A five-year Marine Licence application was therefore secured on October 25th, 2015 by the previous Operating Company (Amey). The current licence will expire on 25th October 2020, therefore a licence extension (until 31st March 2021) has been secured (MS-00008903) to permit a new five-year Marine Licence application to be submitted. Extensive consultation with a range of stakeholders is currently being undertaken to support the application for the new five-year Marine Licence.

³⁴ A Works Contract is currently underway to replace the FRB expansion joints.

³⁵ For the purposes of this report, NMUs are considered to be all non-motorised traffic, including pedestrians, cyclists and equestrians (with particular consideration of the needs of those with disabilities).

The works will provide a permanent improvement for workers accessing the structure for maintenance and inspections, and no residual impacts are anticipated at the operational phase of the proposed scheme.

12.0 Air quality

During the construction phase, activities undertaken on site could potentially have some localised and short-term air quality impacts in proximity to the works. The construction phase will, for example, require a range of equipment, vehicles and non-road mobile machinery³⁶ (NRMM) which will contribute to local dust and air pollutants. There is also the potential for fugitive dust emissions during removal of the bridge SSUDA steelwork members and walkway flooring.

However, there are no properties within 300 m of the scheme and the SSUDA system is installed from the underside of the FRB therefore the bridge deck provides a barrier to significant air quality impacts for pedestrians and cyclist utilising the bridge footpaths. Moreover, with mitigation in place following 'Best Practicable Means' and 'Best Practice Guidelines'³⁷, effects on air quality during construction are not anticipated to be significant, and any minor impacts will only last for the duration of the works.

Provided the following mitigation measures are followed, potential impacts on air quality during the construction phase are not anticipated to be significant:

- A designated laydown area for plant, material and welfare facilities will be established on the southbound road closure. Good housekeeping will also be employed throughout the works.
- Wherever possible, equipment, vehicles and NRMM will be shut-down when stationary.
- All equipment, vehicles and NRMM will have been regularly maintained, paying attention to the integrity of exhaust systems.
- If any emissions of dark smoke should occur (except at start up) the machinery involved will be taken out of service immediately and any defect rectified before use.
- If powered generators are required, the use of diesel or petrol will be avoided and the use of mains electricity or battery powered equipment will be used (where practicable).
- Cutting, grinding and sawing equipment will be fitted or used in conjunction with suitable dust suppression techniques e.g. water spray or local exhaust ventilation system that fits directly onto tools.
- Regular monitoring (e.g. site walkover by engineer or Clerk of Works) will take place when dust, particulate matter and exhaust emissions (DPMEE) generating activities are occurring. In the unlikely event that unacceptable DPMEE are emanating from the site, the operation will, where practicable, be modified and re-checked to verify that the corrective action has been effective. Actions to be considered include: (a) minimizing cutting and grinding on-site, (b) reducing the operating hours, (c) repositioning equipment, (d) changing the method of working, etc.
- Upon completion of the works, the working area will be cleaned.

The works will not result in any significant impacts on air quality during the operational phase.

³⁶ Non-Road Mobile Machinery is a broad category which includes mobile machines, and transportable industrial equipment or vehicles which are fitted with either an internal spark ignition petrol engine, or a compression ignition diesel engine and not intended for transporting goods or passengers on roads. Examples of non-road mobile machinery include, but are not limited to: (i) generators, (ii) bulldozers, (iii) pumps, (iv) construction machinery, (v) mobile cranes, etc.

³⁷ Institute of Air Quality Management. (2014). Guidance on the assessment of dust from demolition and construction (version 1.1).

13.0 Cultural heritage assessment

Consultation was undertaken with the City of Edinburgh Council by the previous Operating Company (Amey) regarding consent requirements for maintenance works on the Category A listed structure. The consultation process concluded that all maintenance work concerned with the FRB, that is undertaken on a like-for-like basis (e.g. Cyclic and Routine Maintenance), does not require Listed Building Consent.

No significant adverse impacts on the cultural heritage or material assets of the FRB are therefore predicted as the works are restricted to upgrading and strengthening, on a like-for-like basis, the FRB SSUDA system. However, if during the works it is assessed that 'new' engineering works are deemed necessary to complete the scheme, consultation will take place with the City of Edinburgh Council to discuss requirements for Listed Building Consent.

14.0 Biodiversity

The works are contained to the underside of the FRB therefore no direct land take or clearance within the designated sites is required, and the works will therefore not result in loss or function (e.g. habitat loss or species fragmentation) of the designated sites. There is also no requirement for resources from the designated sites. Moreover, it is not anticipated that the works will result in changes to water quality provided pollution control measures outlined in Section 17.0 'Road drainage and the water environment' are followed.

When granting the current five-year Marine Licence (05568/15/0), Marine Scotland, at the request of NatureScot, stipulated that a baseline noise survey should be carried out and a Construction Noise Management Plan (CNMP) established (for the five-year Marine Licence) which would be mandatory for any works undertaken within 400 m of Long Craig Island SSSI between 1st May and 15th August. The SSUDA Phase 6 works are outwith the stipulated timeframe and are not within 400 m of Long Craig Island. However, it is likely that equipment, vehicles and NRMM as part of the work processes will lead to a slight increase in noise in the area surrounding the works. This could potentially disturb local wildlife.

The following mitigation measures will therefore be implemented to ensure potential impacts on wildlife and designated sites are not significant.

- All mitigation measures detailed within Section 12.0 'Air quality', Section 16.0 'Noise and vibration' and Section 17.0 'Road drainage and the water environment' will be followed to protect wildlife and designated sites.
- BEAR Scotland will appoint an Environmental Clerk of Works (EnvCoW) to visit the site periodically to supervise operations onsite during critical work phases and to ensure appropriate environmental safeguards are being adhered to. The EnvCoW will undertake an initial day-one site visit to review site management practices, provide toolbox talks and highlight the requirements of the Marine Licence. Following this, site visits are anticipated to be arranged around (i) installation of debris netting, (ii) removal of SSUDA sections, and (iii) installation of SSUDA sections.
- Equipment, vehicles, NRMM and personnel will be constrained to the FRB, thereby eliminating damage to designated sites and potential direct mortality and disturbance to species.
- If during works unforeseen disturbance of protected species becomes evident, works will cease, and appropriate mitigation measures will be discussed, agreed and implemented with stakeholders e.g. SNH, SEPA, Marine Scotland, etc.

- BEAR Scotland's Environmental Team will be contacted to allow consideration of potential environmental effects if unplanned works will be undertaken outwith the agreed SSUDA Phase 6 working area, or there is any deviation from the agreed programme and/or method of working.

Based on the like-for-like maintenance nature of the works, there will be no operational impacts to the FRB upon completion of the works. As such, it is not anticipated that there will be any impacts on designated sites or their qualifying features during the operational phase.

15.0 Landscape & visual effects

During the estimated 156-day construction period there will be temporary short-term impact on the visual amenity of the area due to the presence of equipment, vehicles and NRMM, site compounds and stockpiles of materials on the FRB. However, the overall visual impact of the works is somewhat offset by the fact that the SSUDA system is installed from the underside of the bridge therefore the works are not visible from carriageway level, and only an obscured view of the works will be evident from the shoreline or water.

The following mitigation measures will reduce the visual impacts of the works:

- During all stages of the works, the site will be kept clean and tidy, with equipment, vehicles, NRMM, materials and wastes stored appropriately in the designated laydown area on the southbound road closure.
- Good housekeeping will also be employed throughout the works.

Based on the like-for-like maintenance nature of the works, there will be no operational impacts to the FRB upon completion of the works.

16.0 Noise & vibration

During the construction phase, activities undertaken on site could potentially have some localised and short-term noise impacts in proximity to the works. The works will, for example, require a range of equipment, vehicles and NRMM, and noise will also be generated through the use of grinders, impact wrench's, chipping hammers, etc. However, there are no properties within 300 m of the scheme and the SSUDA system is installed from the underside of the FRB therefore the bridge deck provides a barrier to significant noise impacts for pedestrians and cyclists utilising the bridge footpaths.

A temporary short-term increase in noise levels may cause disturbance to local wildlife. However, any increases will be intermittent and will only last for the duration of the works. Long Craig Island also lies approx. 700 m north of Panel Point 98 on the North Main Span and the works are taking place outwith the breeding season of Roseate tern (1st May to 15th August). The works are therefore outwith the requirements for noise monitoring and management, as set out in the current five-year Marine Licence (05568/15/0) (refer to Section 14.0). No ground-borne vibration impacts are forecast.

Provided the following mitigation measures are followed, potential noise impacts during the construction phase are not anticipated to be significant, and any minor impacts will only last for the duration of the works:

- If unacceptable noise is emanating from the site the operation will, where possible, be modified and re-checked to verify that the corrective action has been effective. Actions to be considered include (a) minimizing cutting and grinding on-site, (b) reducing the operating hours, (c) repositioning equipment, (d) changing the method of working etc. Corrective actions will be actioned through the non-conformance reporting procedure, which ensures a root-cause analysis is carried out on each incident. The non-conformance procedure also ensures that appropriate corrective and preventative action measures are agreed and implemented in a timely fashion with all parties and are recorded, actioned through to closeout, and fully auditable and traceable.
- If equipment, vehicles or NRMM not assessed by this RoD are required to complete the works, then an immediate review will take place between the Clerk of Works, Senior Engineer and BEARs Environmental Team, as appropriate.
- Equipment, vehicles and NRMM with directional noise characteristic will (where practical) be shut down in intervening periods between site operations.
- Drop heights from vehicles and NRMM will be kept to a minimum to minimise noise when unloading.
- Equipment, vehicles and NRMM will be started sequentially rather than all together
- All equipment, vehicles and NRMM used onsite will have been regularly maintained, paying attention to the integrity of silencers and acoustic enclosures.
- The use of grinders, impact wrench's, chipping hammers, etc. will be avoided (except where there is an overriding justification), and if used will be fitted with mufflers or silencers of the type recommended by the manufacturer.
- All compressors will be 'sound-reduced' models fitted with properly lined and sealed acoustic covers which will be kept closed when in use.
- HGV, site vehicles and NRMM will be switched to the minimum setting required by HSE and, where possible, will utilise 'broadband non-tonal' or 'directional sound reversing' alarms. Speed limits will also be reduced through the works.

The works will not result in any significant impacts on noise during the operational phase.

17.0 Road drainage & the water environment

Any construction work above a waterbody has inherent risk factors. Potential risks to the Lower Forth Estuary from the SSUDA Phase 6 works include spills from equipment, vehicles and NRMM, and dirty water runoff from the designated laydown area. There is also a risk that material and equipment could fall into the Lower Forth Estuary during the works. The risk factor has however been somewhat reduced through adoption of offsite fabrication e.g. the handrails will be shot-blast, re-galvanised and powder-coated by a local company in an offsite-factory, and then brought back to the bridge for installation. Debris catch-netting will also be installed before works commence to ensure no material can escape to the Lower Forth Estuary. Plant, fuel, oils, generators etc., will also be bunded appropriately in the designated laydown area. The likelihood of flooding on the FRB is also not a risk factor, due to the bridge decks height above the estuary. There is also no requirement for in-water works.

Provided the following mitigation measures are adhered to during the works, potential risk factors are not anticipated to be significant:

- All mitigation measures detailed within Section 14.0 'Biodiversity' will be followed to protect the water environment.
- The abstraction or transfers of water, or the washing of tools in the Lower Forth Estuary is not permitted.
- No discharges into the Lower Forth Estuary will be permitted.

- Regular visual pollution inspections of the designated laydown area and work site (particularly near road drainage at the laydown area) shall be conducted (e.g. site walkover by engineer or Clerk of Works), especially during periods of heavy rain.
- All site personnel will be made aware of site spillage response procedures and in the event of a spill, all works associated with the spill will STOP, and the incident reported to the Clerk of Works. Small spills that did not leave the site boundary and are cleaned up without material environmental harm or residual environmental impact would most likely not be required to be notified to SEPA, NatureScot, Marine Scotland or other stakeholders. However, all such incidents will be recorded and reported to BEAR Scotland's Environmental Team. In the event of a 'serious incident'³⁸, SEPA, NatureScot and Marine Scotland will be notified without delay. Such notification will include: (i) the time and duration of the incident, (ii) a description of the cause of the incident, (iii) any effect on the environment as a result of the incident, and (iv) any measures taken to minimise or mitigate the effect and prevent a recurrence.
- Spill kits will be available and replenished onsite when required.
- Refuelling and material storage areas will be fully bunded and secure and will be located, if space is available, at least 10 m from drainage entry points, in order to comply with SEPA Guidance for Pollution Prevention (GPP) 5 'works and maintenance in or near water' and to minimise pollution risk.
- Material, plant, fuel, oils, generators etc., will be stored in the laydown area in a manner that ensures they are protected from damage by collision or extremes of weather.
- All vehicles and NRMM used onsite will have been regularly maintained, paying attention to the integrity of oil tanks, coolant systems, gaskets etc. A checklist will be present to make sure that the checks have been carried out.
- Any vehicles and NRMM not in operation will (where possible) be sited in designated areas.
- No refuelling or vehicle washing will take place on the FRB e.g. all refuelling and vehicle washing will take place in approved vehicle washing areas with access to appropriate drainage.
- No fuel or materials will be stored under the bridge during works.
- Generators, and other NRMM, where there is a risk of leakage of oil or fuel, will have internal bunding OR will have a secondary containment system (e.g. drip trays, plant nappies, etc.) placed beneath them that meets 110% capacity requirements.

18.0 Geology & soils

As the works will take place entirely on the FRB, and due to the structure's height above the estuary, there will be no impact on geology and soils.

19.0 Material assets & waste

There will be limited consumption of materials and natural resources or generation of waste associated with the works. The existing structurally-sound steel components, for example, will be removed from site and will be shot-blast, re-galvanised and powder-coated in an offsite-factory. Any damaged or corroded components that cannot be refurbished will be replaced at this point. The Design Engineer has estimated that 83.7% of the steel will be reused, with the remaining 16.3% being replaced with new components.

³⁸ 'serious incident' means: (i) any accident, spillages, or uncontrolled discharge which has had, or could have, an adverse impact on the water environment, or (ii) any malfunction, breakdown or failure of plant or techniques which has had an adverse impact on the water environment, or (iii) any event, such as force majeure or action taken to save human life or limb, which results, or is likely to result, in a breach of contract or any condition of a licence.

A SWMP template, which is available within BEAR SharePoint, will also be partially completed by the Design Engineer (design section) and then the Design Engineer will supply the Contractor with the SWMP to complete the contract delivery section. The SWMP will provide details of the following:

- The quantity and type of waste that will be produced,
- How waste will be minimised, reused, recycled, recovered or otherwise diverted from landfill,
- How materials that cannot be reused, recycled or recovered will be removed from site and consigned, transported and disposed of in full accordance with all relevant UK legislation. Duty of Care³⁹ requirements, for example, apply e.g. evidence of material transfer notes and/or waste exemption certificates will be supplied by a licenced waste carrier.

Provided the following mitigation measures are followed, environment impacts from the use of materials and natural resources and disposal of waste during the construction phase are not anticipated to be significant:

- If hazardous substances must be used on site, each substance will be required to undergo assessment under the Control of Substances Hazardous to Health (COSHH) Regulations 2002. Hazardous substances (if required) will also be clearly labelled and stored in line with COSHH safety data sheets within the designated laydown area, at least 10 m from surface drains (where possible).
- COSHH waste will NOT be mixed with general waste and/or other recyclables.
- COSHH waste and/or special waste (if required) will be removed from site by a specialised waste carrier.
- If any substance used on site displays the 'Dangerous to the Environment' COSHH symbol, then the following controls will be implemented: (i) the substance will not be permitted to enter surface drains (ii) any spillages will be contained using bunding and then absorbed with an absorbent material (e.g. dry sand or earth) and then collected and stored in a suitable container which is properly labelled and sealed securely in preparation for disposal, (iii) spillages or uncontrolled discharges will be immediately reported to SEPA.
- The site will be monitored regularly for signs of litter and other potential contaminants and litter will be removed before and after works take place. The site will also be left clean and tidy.
- Wastewater from welfare facilities (if required) will be subject to effluent treatment followed by tanker removal.

20.0 Climate

The Climate Change (Scotland) Act sets out the target and vision set by the Scottish Government for tackling and responding to climate change. The Act includes a target of reducing CO₂ emissions by 80% before 2050 (from the baseline year 1990). In response, BEAR Scotland, working on behalf of Transport Scotland, undertake carbon monitoring of our major projects and operational activities. Emissions from our activities are recorded using Transport Scotland's Carbon Management System. BEAR Scotland also undertakes resource efficiency activities to manage and reduce emissions contributing to climate change. Actions and considerations for this SSUDA Phase 6 scheme are detailed in Section 19 'Material assets & waste'.

³⁹ The 'Duty of Care' requires that a waste holder (producer, carrier or disposer) takes all reasonable steps to ensure that waste is described in a way that permits its safe handling and management and that any transfer of waste is accompanied by a written description of the waste, including an EWC code.

The FRB also has provision of road lighting therefore there is no requirement for additional power generated tower lighting along the scheme extents. Moreover, local contractors and suppliers will be used as far as practicable to reduce fuel use and greenhouse gas emitted as part of the works. The existing structurally-sound steel components, for example, will be shot-blast, re-galvanised and powder-coated in an offsite-factory, and the subcontractor for these works will, where feasible, be sourced locally. The subcontractor's factory for the SSUDA Phase 5 works, for example, was located only 29 miles from the FRB.

21.0 Risk of major accidents or disasters

The FRB is not located within a geographical region that is subject to natural disasters and there is no likelihood of flooding on the FRB due to its height above the estuary.

The SSUDA system is installed from the underside of the FRB therefore there is no risk of collision from errant vehicles within traffic management.

Release of pollutants during works, or as a result of an accidental spillage, have the potential to affect all habitats and species present within the Lower Forth Estuary. The key issue with respect to pollution is the procedures put in place to minimise the risk of contaminants entering the Forth Estuary in sufficient concentrations to cause adverse effects on site integrity. A Site Environmental Management Plan (SEMP) will therefore be produced by BEAR Scotland which will set out a framework to reduce the risk of adverse impacts from construction activities on sensitive environmental receptors. The SEMP will set-out a process for recording environmental risks, commitments and constraints and will identify the procedures and measures that will be used to manage and control these aspects. In addition, the SEMP seeks to ensure compliance with environmental legislation, government policy, and scheme-specific environmental objectives. The SEMP will also formalises a mechanism for monitoring, reviewing and auditing environmental performance and compliance. As such, the sub-contractor will comply with all conditions of the SEMP during works and may be subject to audit throughout the contract.

A Designer's Risk Register will also been prepared by BEAR Scotland, which addresses potential environmental risks. Activity-specific Method Statements will be produced by the sub-contractor and will recognise and highlight the environmental risks and detail how these will be addressed, as well as contingency plans to deal with environmental incidents. RAMS will be approved by BEAR Scotland prior to works commencing.

Considering the above, it is judged that the residual effects of the scheme to risks from major accidents or disasters is low.

22.0 Cumulative effects

There are no known external projects currently planned, or recently completed, that have the potential to contribute to in-combination or cumulative effects on the designated sites in vicinity of the scheme⁴⁰ & ⁴¹.

⁴⁰ <https://citydev-portal.edinburgh.gov.uk/idoxpa-web/search.do?action=simple&searchType=Application> (Edinburgh City Council) [accessed 02/10/20]

⁴¹ <https://planning.fife.gov.uk/online/> (Fife Council) [accessed 02/10/20]

FRB maintenance works are delivered on Cyclic, Routine and Planned Maintenance programmes. A Works Contract, for example, is currently underway to replace the FRB expansion joints, and further Cyclic, Routine and Planned Maintenance schemes will be progressed during 2020/2021 and in subsequent years. However, there are no known major projects currently at the planning stage that will be carried out by BEAR Scotland or sub-contractors on the FRB, or in the immediate vicinity of the bridge during 2020/2021. As the SSUDA Phase 6 works on their own are not anticipated to have a significant effect, there will be no cumulative impacts of the works on any of the designated sites given that standard best practice mitigation measures will be in place to avoid environmental impacts.

The SSUDA upgrade and refurbishment works will improve safety on the bridge and protect against future deterioration of the structure. Consequently, carrying out these works now will reduce the need for major works at a future date. This in turn will minimize the extent of work required on the FRB. Therefore, it is not expected that the works will contribute to long-term significant cumulative effects on the environment in vicinity of the FRB.

EXTENT OF EIA WORK UNDERTAKEN AND DETAILS OF CONSULTATION

The following environmental parameters have been considered within this RoD:

- Population and human health (properties, land use, NMU & community facilities)
- Air quality
- Cultural heritage assessment
- Biodiversity
- Landscape & visual effects
- Noise & vibration
- Road drainage & the water environment
- Geology & soils
- Material assets & waste
- Climate
- Risk of major accidents or disasters
- Cumulative effects:

As FRB Cyclic, Routine and Planned Maintenance works are undertaken over the Lower Forth Estuary, within the Mean High Water Springs (MHWS), a Marine Licence is required under Part 4 of the Marine (Scotland) Act 2010 and Part 4 of the Marine and Coastal Access Act 2009. A five-year Marine Licence application was therefore prepared in March 2015 by the previous Operating Company (Amey). The application, as submitted, included an environmental risk assessment of all maintenance activities that would be undertaken on the FRB as part of the 4th Generation Term Contract for Management and Maintenance of the Scottish Trunk Road Network. A Habitats Regulations Assessment (HRA) was also submitted as part of the application. As part of the HRA, an Assessment of Implications on European Sites (AIES) was undertaken which covered a range of FRB Cyclic, Routine and Planned Maintenance activities, including the removal and/or disposal of steelwork. As the impacts of the SSUDA works have been covered by the AIES, an Appropriate Assessment is not required.

The current five-year Marine Licence (05568/15/0) will expire on 25th October 2020, therefore an extension of the licence until 31st March 2021 has been secured (MS-00008903) to permit a new five-year Marine Licence application to be submitted. Extensive consultation with a range of stakeholders is currently being undertaken to support the application for the new five-year Marine Licence.



STATEMENT OF CASE IN SUPPORT OF A DETERMINATION THAT A FORMAL EIA AND ENVIRONMENTAL STATEMENT IS NOT REQUIRED

The works are considered to constitute a relevant project falling within Annex II of the Environmental Impact Assessment Directive 2014/52/EU because the FRB spans has connectivity to several 'sensitive areas'.

The SSUDA Phase 6 project has been subject to screening using the Annex III criteria to determine if a formal Environmental Impact Assessment (EIA) is required under the Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017. Screening using Annex III criteria, reference to the current five-year Marine Licence (05568/15/0) and review of available information has not identified the need for an EIA.

The project will not have significant effects on the environment by virtue of factors such as:

▪ Characteristics of the scheme

- The total working area is less than 1ha.
- There will be limited consumption of materials and natural resources or generation of waste associated with the works e.g. 83.7% of the steel will be reused.
- The works will be temporary and short-term (156 days in total).
- The works are like-for-like maintenance that will not damage, modify, or alter the character or footprint of the FRB.
- A Marine Licence has been obtained for all maintenance works on the FRB. Marine Scotland undertook consultation with NatureScot who considered no significant impacts with mitigation implemented. As part of the HRA, an AIES was also undertaken which covered a range of FRB Cyclic, Routine and Planned Maintenance activities, including the removal and/or disposal of steelwork. As the impacts of the SSUDA works have been covered by the AIES, an Appropriate Assessment is not required.

▪ Location of the scheme

- The works are located on the FRB, which spans the Firth of Forth SPA, RAMSAR, and SSSI.
- Land use will not change as a result of the works.
- All works are confined to the FRB.
- The scheme is not located within a densely populated area.
- The scheme is not located within any areas designated for landscape interests.

▪ Characteristics of potential impacts of the scheme

- No nationally or internationally designated nature conservation sites will be significantly affected by the proposed works.
- No change is predicted in respect to the vulnerability of the FRB to the risk (or severity) of major accidents or disasters.
- With good practice pollution prevention measures implemented onsite, there is a negligible risk of a pollution event, and any potential impacts of the works are expected to be temporary, short-term, and limited to the construction phase.
- Measures will be in place to limit any short-term impacts on NMUs.
- Measures will be in place to ensure appropriate removal and disposal of waste.
- The SEMP, Designer's Risk Register, and activity-specific method statements (produced by the sub-contractor) will include plans to address environmental incidents.
- Upon completion of the works, a refurbished SSUDA system will provide a permanent improvement for workers accessing the structure for maintenance and inspections and will protect against future deterioration of the structure, thus minimising the extent of future works required on the FRB.

- Following construction, the area in which the works are to be completed will not be significantly different from that which currently exists.
- No impacts on the environment are expected during the operational phase as a result of the works.

Mitigation measures detailed above and compliance with mitigation stipulated in requirements of Marine Licence 05568/15/0 and MS-00008903 will ensure no significant negative impacts on sensitive receptors.

File references of supporting documentation

- BEAR Environmental Screening Report
- Marine Licence 05568/15/0 (issued by Marine Scotland, 22nd October 2015)
- Marine Licence MS-00008903 (issued by Marine Scotland, 20th October 2020)

Appendix A: Scheme location and site photographs

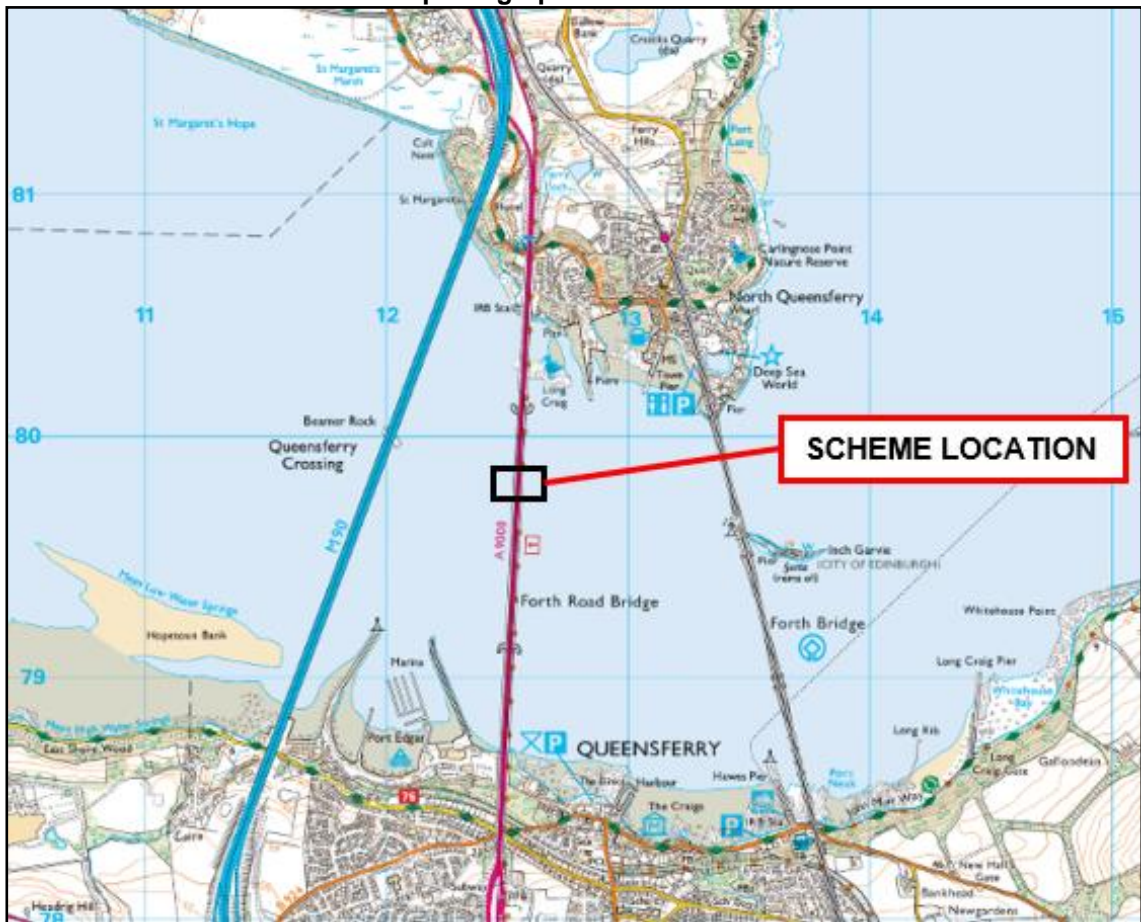


Figure 1. A90 Forth Road Bridge (showing SSUDA Phase 6 Panel Points 86 to 98 scheme extents). Source: Grid Reference Finder. Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown Copyright and database right 2020.



Figure 2. The Forth Road Bridge. Source: New Civil Engineer.

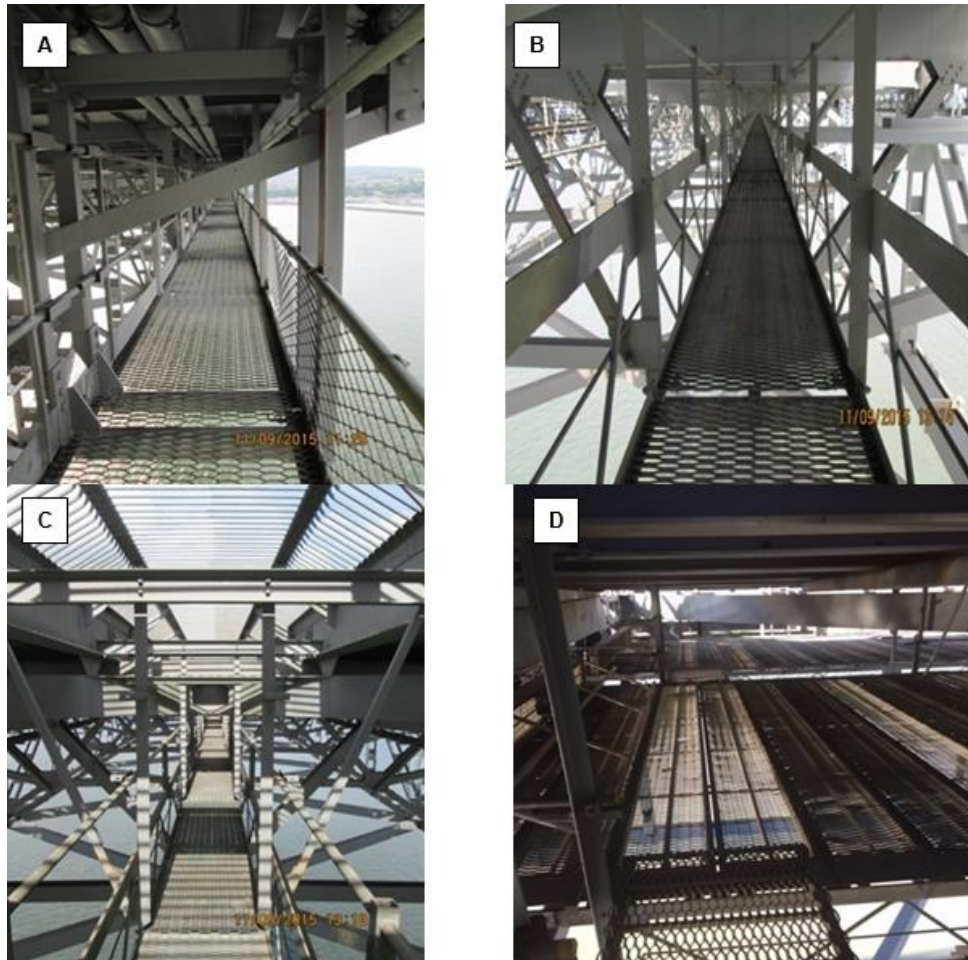


Figure 3. View of SSUDA system from underside of FRB. A = Typical A-Line walkway, B = Typical C-Line walkway, C = Typical D-Line walkway, D = Staging board.
 Source: BEAR Scotland.

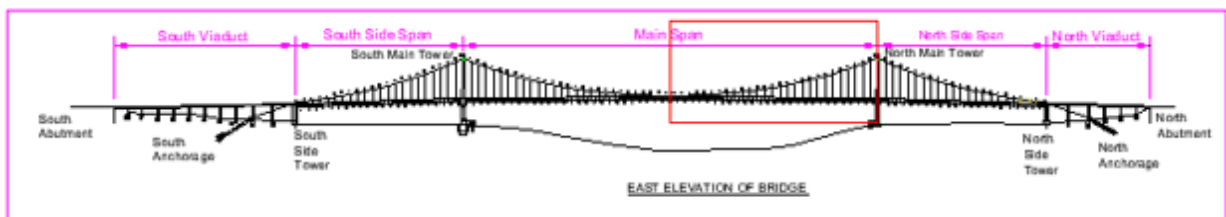
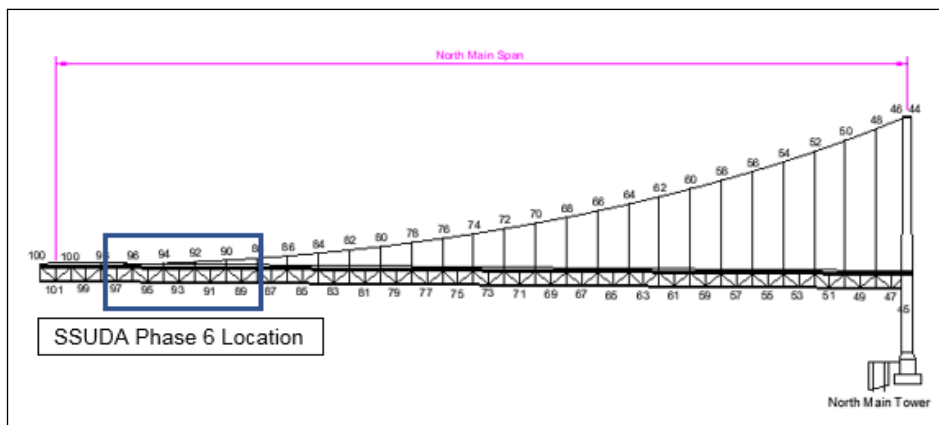


Figure 4. Cross-section SSUDA Phase 6 (Panel Points 86 to 98 North Main Span). Source: BEAR Scotland

Transport Scotland

