



**TRANSPORT
SCOTLAND**
CÒMHDHAIL ALBA

Environmental Impact Assessment Record of Determination

A90 Forth Road Bridge

Contents

Project Details	3
Description.....	3
Location	4
Description of local environment.....	5
Air quality	5
Cultural heritage	6
Landscape and visual effects	6
Biodiversity	7
Geology and soils	8
Material assets and waste	9
Noise and vibration	9
Population and human health	10
Road drainage and the water environment.....	10
Climate	11
Policies and plans	11
Description of main environmental impacts and proposed mitigation	12
Air quality	12
Cultural heritage	13
Landscape and visual effects	13
Biodiversity	14
Geology and soils	16
Material assets and waste	16
Noise and vibration	18
Population and human health	19
Road drainage and the water environment.....	20
Climate	22
Vulnerability of the project to Major Accidents and Disasters	23
Assessment of cumulative effects.....	23
Assessments of the environmental effects	24
Statement of case in support of a Determination that a statutory EIA is not required.....	24
Annex A.....	27

Project Details

Description

BEAR Scotland (BEAR) has been commissioned by Transport Scotland to undertake a programme of works to refurbish the side towers on the Forth Road Bridge (FRB). Works are predominantly to replace the elastomeric and lateral thrust bearings, with ancillary works also taking place (at the towers) following their replacement. The full package of works includes; (i) elastomeric bearing replacement, (ii) lateral thrust bearing replacement, (iii) painting of the steelwork, (iv) modifications to the existing cathodic protection system, (v) provision of structural health monitoring, (vi) waterproofing of concreting, and (vii) installation of pigeon netting around new bearings.

All works are restricted to the North and South Side Towers, located immediately below the bridge deck of the FRB. All working platforms will be encapsulated, and noise mitigation measures installed as necessary. New jacking beams and platforms will be constructed around the bearings, and each section will be jacked-up. Jacking will be staggered to ensure that one footpath and one carriageway remain open to traffic at all times. Removal of existing bearings will require breakout of bearing shelf concrete by hand or hydro-demolition (contractor to advise in Method Statements). New concrete will be cast, and new bearings installed before removing jacks and jacking platforms (jacking corbels and beams will remain in place permanently).

Construction activities include:

- Access bearings using permanent underdeck access platforms and side towers,
- Temporary staging board platforms or a scaffold platform to be installed to access the footpath bearings and internal side of bearings,
- Install encapsulation around work site,
- Replace three Macalloy bars,
- Strengthening plates and bolts to be installed,
- Remove existing elastomeric bearings by jacking the stringer beams and employing a local breakout of concrete on bearing shelves (potential for hydro-demolition),
- Replace bearings,
- Undertake ancillary works, including installation of pigeon netting, painting steelwork, modification to the cathodic protection system and waterproofing of concrete,
- Remove all waste and materials and any temporary access system from site.

The works are currently programmed to be completed within the 2022/2023 and 2023/2024 financial years (February 2023 to December 2023). It is expected that the works at the north side tower will be completed outwith the bird breeding season (1st May 2023 – 15th August 2023 inclusive), but if not then additional noise mitigation measures and ECoW presence will be introduced as per the conditions of the FRB Marine License and Construction Noise Management Plan (CNMP). Works are expected to be completed over approx. 100 days (08:00 – 17:00). Traffic management (TM) is anticipated to be required in the form of carriageway closures with contraflow and a 15-mph speed limit. One footpath will be closed during replacement of bearings beneath the footpaths, with pedestrians and cyclists diverted to use the footpath and cycleway on the opposite side of the FRB.

Location

The scheme is located on the FRB which spans the Firth of Forth, connecting South Queensferry to North Queensferry (Figure 1).



Figure 1. A90 FRB Side Towers. Source: © 2018 Europa Technologies Ltd. Contains Ordnance Survey data © Crown copyright and database right 2018

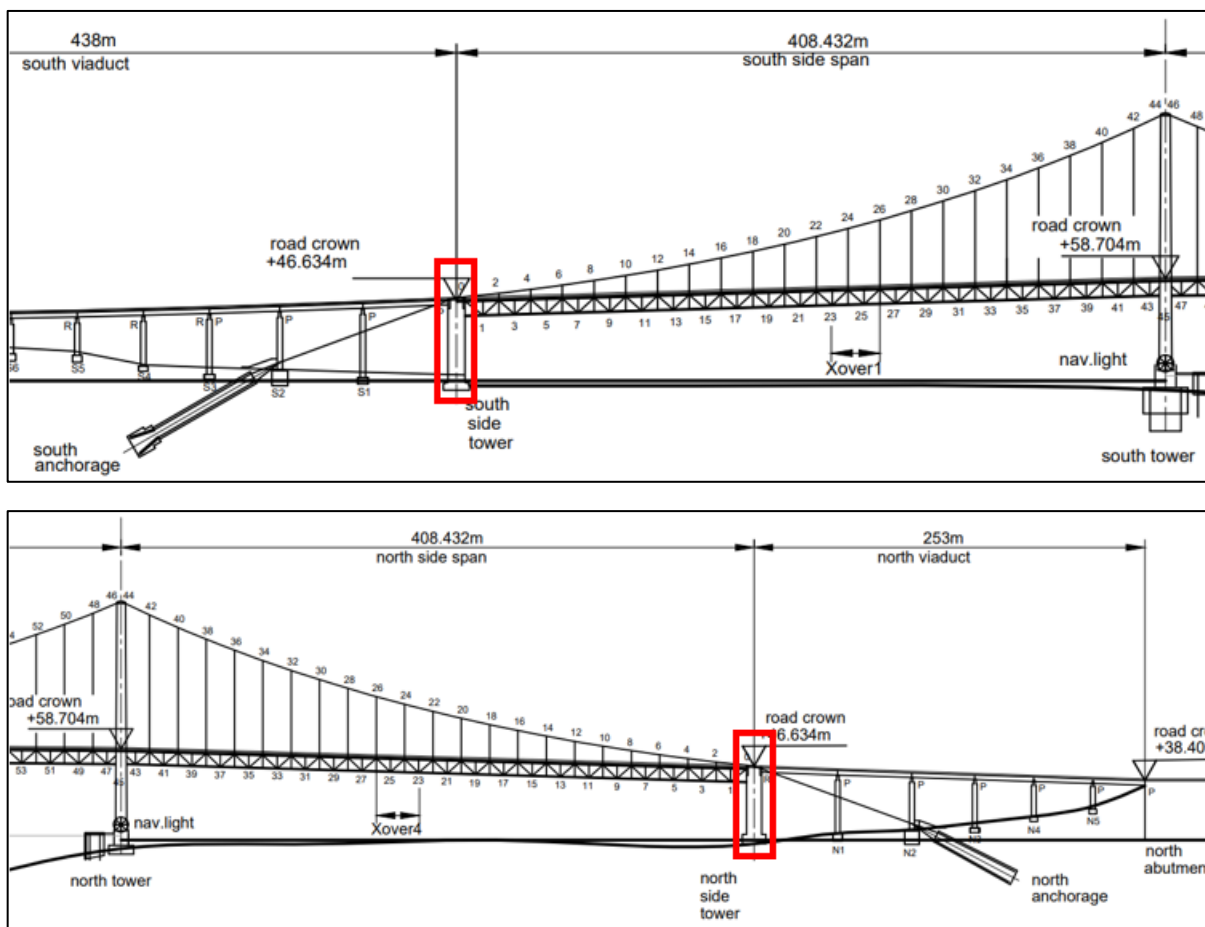


Figure 2. A90 FRB Side Towers. Source: BEAR Scotland

Description of local environment

Air quality

The scheme lies within the boundary of City of Edinburgh Council, which has six [Air Quality Management Areas](#) (AQMAs) within its administrative boundary, and Fife Council, which has two AQMAs. The nearest AQMA, 'Newton', lies approx. 3.3 km southwest of the scheme and has been declared for particulate matter <math>< 10 \mu\text{m}</math> (PM₁₀).

There are no sites registered on the Scottish Pollutant Release Inventory ([SPRI](#)) for air pollutant releases within 1 km of the scheme.

Baseline air quality in the study area is mainly influenced by vehicles travelling along the FRB. Secondary sources are likely derived from vehicles travelling along the local road network and urban activities within North and South Queensferry.

Cultural heritage

The [PastMap](#) and [Historic Environment Scotland](#) (HES) online mapping tools records that the FRB is a Category A listed building ('Forth Road Bridge, with Approach Ramps and Piers', LB49165/LB47778). Five additional listed buildings lie within 300 m of the scheme. The remaining listed buildings lie more than 100 m from the scheme extents.

The scheme borders the southern extent of the 'Battle of Inverkeithing II' Inventory Battlefield (BTL23), and the western extent of the 'Queensferry' Conservation Area (CA). The scheme also lies 40 m west of the 'North Queensferry' Conservation Area.

Of lesser cultural heritage value, the FRB, including approach ramps and piers, is also an undesignated cultural heritage asset (UCHA). Forty-one further UCHAs of known interest are also recorded within 300 m of the scheme, none of which have connectivity to the FRB.

Landscape and visual effects

The scheme is not situated within a 'sensitive area' designated for landscape features e.g., [National Park](#) (NP), [National Scenic Area](#) (NSA).

The scheme is located on the North and South Side Towers of the FRB, which spans the Firth of Forth, connecting South Queensferry to North Queensferry. Views from the FRB south side span 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. Views from the north side span are of scrub and woodland associated with the road cuttings adjacent to Ferry Hills. Excluding the FRB, the dominant structures in the landscape are the Queensferry Crossing and Forth Rail Bridge.

The Landscape Character Type (LCT) surrounding the northern end of the FRB is classified as 'Coastal Hills – Fife' (no. 192) ([Scottish Landscape Character Types](#)). The 'Coastal Hills – Fife' LCT is characterized by coastal views (particularly of the North Sea or Firth of Forth) and undulating arable fields. The LCT surrounding the southern end of the FRB is classified as 'Coastal Farmland – Lothians' (no. 280), which is characterized by gently rolling agricultural land with occasional prominent igneous rock outcrops and shelterbelt woodland.

Land use within 2 km of the scheme extents is categorized into the following: (i) quarry, (ii) rough grazing, (iii) industrial or commercial area, (iv) motorway and major roads, (v) recreation area, (vi) medieval village, (vii) maritime installation, (viii) designed landscape, and (ix) managed woodland.

The [national scale land capability for agriculture](#) classifies land north and south of the FRB as being 'Class 888' – urban (land classified as urban has no agricultural value).

Approximately one-hundred properties (including business premises and community facilities) lie within 300 m of the scheme. All properties lie more than 40 m from the scheme. As works are positioned below the FRB bridge deck, properties nearest to the scheme (e.g., within 150 m) have no screening and are therefore visible from the scheme extents. Properties further afield are somewhat screened by intervening properties.

There are no areas of ancient woodland registered on the [Ancient Woodland Inventory Scotland](#) with connectivity to the scheme extents. There are no trees on the [Native Woodland Survey of Scotland](#) with connectivity to the scheme extents.

Biodiversity

The [NatureScot Sitelink](#) online mapping tools identifies the following sensitive areas in proximity to the works:

- Firth of Forth Special Protection Area (SPA) (EU Site Code: UK9004411) and Firth of Forth Ramsar (EU Site Code UK13017) are spanned by the FRB at the location of the North and South Side Towers.
- Forth Islands SPA (EU Site Code: UK9004171) lies 170 m south of the scheme (at nearest point).
- Firth of Forth Site of Special Scientific Interest (SSSI) (EU Site Code 169840) is spanned by the FRB at the location of the North and South Side Towers.
- Long Craig Island SSSI (EU Site Code 169962) lies 170 m south of the scheme (at nearest point).

The [Firth of Forth SPA](#) is a large coastal area designated for internationally important populations of wildfowl and waders and its large overwintering waterfowl assemblage.

The [Firth of Forth Ramsar](#) is a large coastal area consisting of estuaries, mudflats, rocky shorelines, beaches, and saltmarshes and is designated for its internationally important waterfowl assemblage (> 20,000 birds).

The [Forth Islands SPA](#) consists of seven islands, with outlying rocky islets, throughout the Firth of Forth and is designated for fourteen breeding birds.

The [Firth of Forth SSSI](#) is designated for a variety of coastal, intertidal and grassland habitats in addition to vascular plants, invertebrates and breeding and non-breeding birds (many of which are also covered by the Firth of Forth SPA designation).

[Long Craig Island SSSI](#), which also forms part of the Forth Islands designation, is designated for breeding birds.

The south side tower spans an unnamed Local Nature Conservation Site (LNCS).

There are no Local Nature Reserves (LNRs) designated for biodiversity features with connectivity to the scheme extents.

The [National Biodiversity Network](#) (NBN) online mapping tool records one mammal species of conservation importance. Fifty-six bird species, including migratory overwintering waterfowl, wintering waders and wildfowl, were recorded (in last 10-years) within 10 km grid squares NT17 and NT18. Only records with open-use attributions (OGL, CC0, CC-BY) were included in the search criteria.

A search of NBN and the Asset Management Performance System (AMPS) online mapping tools records no invasive non-native species (INNS), invasive native perennials (as listed in the Trunk Road Inventory Manual), or injurious weeds (as listed under the Weeds Act 1959) within the scheme extents (within the last 10-years).

Geology and soils

The A90 FRB within the scheme extents is not located within a [Geological Conservation Review Site](#) (GCRS), and there are no [Local Geodiversity Sites](#) (LGS) with connectivity to the scheme extents.

The Firth of Forth SSSI, which is spanned by the FRB at the location of the North and South Side Towers, is important for the wide range of geology that can be found, especially in the firth to the 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. Of the nine geological or geomorphological features, six are in favourable condition, with three being unfavourable.

The [National Soil Map of Scotland](#) online mapping tool records that the generalised soil type and major soil group beneath the South Side Tower is brown soils. There is no generalised soil type or major soil group beneath the North Side Tower.

The [British Geological Survey](#) online mapping tool records that the superficial geology underlying the scheme extents is comprised of (i) Marine Beach Deposits (gravel, sand and silt), and (ii) Raised Marine Deposits of Holocene Age (sand and gravel). The bedrock underlying the scheme is comprised of (i) Midland Valley Sill-complex (quartz-micro-gabbro), (ii) Hopetoun Member (sedimentary rock cycles, Strathclyde group type).

There is no evidence of historical industrial processes or the storage of hazardous materials that could have given rise to significant land contamination.

Material assets and waste

The proposed works are required to replace the elastomeric and lateral thrust bearings in the North and South Side Towers of the FRB. In addition, ancillary works consisting of steelwork painting, cathodic protection, waterproofing and pigeon netting will be undertaken immediately following the bearing replacement. Materials used will consist of:

- Elastomeric bearings and fixings
- Steel thrust bearings and fixings
- Epoxy grout
- Paint
- Pigeon netting
- Cathodic protection materials (e.g., electrodes, fixings and cables)
- Concrete sealant

The value of the scheme exceeds £350,000 therefore a Site Waste Management Plan (SWMP) is required.

Works are limited to the replacement of elastomeric and lateral thrust bearings (including ancillary works); therefore, no hazardous waste will be removed from site.

Noise and vibration

Works are not located within a [Candidate Noise Management Area](#) (CNMA) and there are no [Candidate Quiet Areas](#) (CQA) on the major road networks mapped during Environmental Noise Directive (END) Round 3.

The day-time modelled noise level (Lden) for the carriageway along the FRB ranges from 75 to 80 decibels, with levels dropping to between 65 and 70 decibels at the nearest Noise Sensitive Receptors (NSR) (residential property) ([Scotland's Noise Scotland's Environment](#)).

Baseline noise levels are mainly influenced by vehicles travelling along the FRB. Secondary sources are likely derived from vehicles travelling along the local road network and urban activities within North and South Queensferry.

Population and human health

Approximately one-hundred properties (including business premises and community facilities) lie within 300 m of the scheme. All properties lie more than 40 m from the scheme. As works are positioned below the FRB bridge deck, properties nearest to the scheme (e.g., within 150 m) have no screening from the scheme extents. Properties further afield are somewhat screened by intervening properties. There are no sensitive receptors/land uses within 300 m of the scheme.

Segregated cycleways/footways run alongside the FRB northbound and southbound carriageways. [National Cycle Network](#) (NCN) Route 1 and a [Core Path](#) (ID: 28499) cross the Firth of Forth via the southbound cycleway/footway. Street lighting is present across the scheme extents.

The FRB is a dual carriageway with a 50-mph speed limit applying throughout. The Annual Average Daily Traffic (AADT) flow is low (ID: 90004) (2021 data) ([Road traffic statistics](#)) and is comprised of:

- 13 two wheeled motor vehicles,
- 143 cars and taxis,
- 201 bus and coaches,
- 108 Light Goods Vehicles (LGVs), and
- 4 Heavy Goods Vehicles (HGVs).

The AADT flow recorded for pedal cycles is 158 (2021 data).

There are no congestion issues noted on the FRB during the proposed working hours.

Road drainage and the water environment

A search of the Scotland's Environment Protection Agency ([SEPA](#)) River Basin Management Plan online mapping tool records that the FRB spans the Firth of Forth at the location of the Lower Forth Estuary transitional waterbody. The 38.6 km² Lower Forth Estuary is classified (ID: 200435) and lies in the Scotland river basin district. The Lower Forth Estuary has been assigned a Water Framework Directive 2000/60/EC (WFD) overall classification of 'Good', an ecological classification of 'Good', and a classification of 'Good' for fish migration.

A search of the Scotland's Environment (SE) online mapping tool determined that the foundations of the FRB at the north main span lie on the 'Burntisland' groundwater, which has been classified as 'Good'. Foundations at the south main

span lie on the 'South Queensferry' groundwater, which has been classified as 'Good'. Both areas are also [Drinking Water Protected Areas](#).

The FRB is not located within a [Nitrate Vulnerable Zone](#).

The SEPA indicative surface water online [flood mapping](#) tool records that the FRB is not at risk of surface water flooding.

Climate

The Climate Change (Scotland) Act 2009 sets out the target and vision set by the Scottish Government for tackling and responding to climate change ([The Climate Change \(Scotland\) Act 2009](#)). The Act includes a target of reducing CO2 emissions by 80% before 2050 (from the baseline year 1990). The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 amended the Climate Change (Scotland) Act 2009 to bring the target of reaching net-zero emissions in Scotland forward to 2045 ([Climate Change \(Emissions Reduction Targets\) \(Scotland\) Act 2019](#)).

The Scottish Government has since published its indicative Nationally Determined Contribution (iNDC) to set out how it will reach net-zero emissions by 2045, working to reduce emissions of all major greenhouse gases by at least 75% by 2030 ([Scotland's contribution to the Paris Agreement: indicative Nationally Determined Contribution - gov.scot \(www.gov.scot\)](#)). By 2040, the Scottish Government is committed to reducing emissions by 90%, with the aim of reaching net-zero by 2045 at the latest.

Transport Scotland is committed to reducing carbon across Scotland's transport network and this commitment is being enacted through the Mission Zero for Transport ([Mission Zero for transport | Transport Scotland](#)). Transport is the largest contributor to harmful climate emissions in Scotland. In response to the climate emergency, Transport Scotland are committed to reducing their emissions by 75% by 2030 and to a legally binding target of net-zero by 2045.

Policies and plans

This Record of Determination has been undertaken in accordance with all relevant regulations, guidance, policies and plans, notably including the Environment and Sustainability Discipline of the Design Manual for Roads and Bridges ([Design Manual for Roads and Bridges \(DMRB\)](#)) and Transport Scotland's Environmental Impact Assessment Guidance ([Guidance - Environmental Impact Assessments for road projects \(transport.gov.scot\)](#)).

Description of main environmental impacts and proposed mitigation

Air quality

During the construction phase, activities undertaken on site could potentially have some minor localised and short-term air quality impacts in proximity to the works. The construction phase will, for example, require a range of ancillary plant, vehicles, and non-road mobile machinery (NRMM) which will contribute to local dust and air pollutants. Additional sources include dust generated by the localised breaking-out of concrete. As a result, there is potential for dust, particulate matter, and exhaust emissions (DPMEE) to be emitted to the atmosphere.

However, DPMEE associated with the construction phase will be localised to the works footprint. Moreover, considering the nature, size, and scale of the scheme, and with implementation of mitigation detailed below, the proposed works' impacts on local air quality levels during the construction period are assessed to be temporary negligible adverse in magnitude.

Upon completion of the works, no residual air quality impacts are anticipated.

Proposed air quality mitigation measures:

- Ancillary plant, vehicles and NRMM will have been regularly maintained, paying attention to the integrity of exhaust systems.
- Ancillary plant, vehicles and NRMM will be switched off when stationary to prevent exhaust emissions (e.g., there will be no idling vehicles).
- Where practicable, if powered generators are required, the use of mains electricity or battery powered ancillary plant will be considered in place of diesel or petrol alternatives.
- Cutting, grinding, and sawing equipment (if required) will be fitted or used in conjunction with suitable dust suppression techniques e.g., local exhaust ventilation system that fits directly onto tools.
- Materials that have a potential to produce dust will be removed from site as soon as possible.
- Regular monitoring (e.g., by engineer or Clerk of Works) will take place when 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) changing the method of working, etc.

Cultural heritage

Historical consultation with the City of Edinburgh Council and Fife Council regarding consent requirements for maintenance works on the Category A listed FRB concluded that all maintenance work concerned with the FRB, that is undertaken on a like-for-like basis, does not require Listed Building Consent.

People, ancillary plant, vehicles, NRMM and materials are restricted to areas of made ground on the FRB, therefore there is no connectivity between the scheme and the remaining listed buildings, 'North Queensferry' CA, 'Queensferry' CA or 'Battle of Inverkeithing II' Inventory Battlefield. Moreover, the works do not include any alterations that would affect the historic and architectural character of these features. As such, application for consent or any other permission pertaining to these features is not required.

The works do not entail any earthworks or vegetation clearance, and people, ancillary plant, vehicles, NRMM and materials are restricted to the FRB. As such, there is negligible risk of disturbing or damaging previously undiscovered or unrecorded items of cultural interest.

With the implementation of mitigation detailed below, the proposed works impacts on cultural heritage during the construction period are assessed to be negligible in magnitude.

Upon completion of the works, no residual impacts on cultural heritage are anticipated.

Proposed cultural heritage mitigation measures:

- People, ancillary plant, vehicles, NRMM and materials will be restricted to the A90 FRB (as much as is reasonably practicable).
- 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 / Fife Council to discuss requirements for listed building consent.

Landscape and visual effects

There will be a short-term impact on the landscape character and visual amenity of the site as a result of the presence of traffic management, vehicles and equipment.

However, people, ancillary plant, vehicles, NRMM and materials are restricted to the FRB, with construction works confined to below the FRB deck at the location of the North and South Side Towers. As such, the visual impact of the works will be somewhat reduced.

Considering the nature, size, and scale of the scheme, and with implementation of mitigation detailed below, impacts on landscape are assessed as temporary negligible adverse in magnitude.

Upon completion of the works, no significant residual impacts are anticipated.

Proposed landscape and visual effects mitigation measures:

- 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 be left clean and tidy following construction.

Biodiversity

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 submitted and approved on 30th September 2021 (MS-00009380). The application, as submitted, included a Habitats Regulation Appraisal (HRA) of all FRB cyclic, routine, and planned maintenance activities on the FRB as part of the Scottish Trunk Road Network Management Contract for the South East Scottish Trunk Road Unit (STRU). The list of schemes approved in Marine Licence (MS-00009380) include the works being considered within this RoD. The HRA concluded that with mitigation in place (as per the SMP and CNMP) there will be no implications for the conservation objectives of the Firth of Forth SPA and Ramsar sites and the Forth Islands SPA for the five year duration of the Proposed Works. There will therefore be no adverse effects on site integrity (AESI) for the sites, either alone or in combination with other plans and projects. As such, a further HRA is not required.

All works are restricted to the FRB therefore no direct land take or site clearance is required, and the works will therefore not result in habitat loss or function (e.g., habitat loss or species fragmentation) of any of the designated sites. Moreover, it is not anticipated that the works will result in any change to water quality provided pollution control measures outlined in the 'Road drainage and the water environment' section are followed.

The proposed works do have the potential to cause noise and visual disturbance impacts to the qualifying interests of the Firth of Forth SPA/Ramsar and Forth Islands SPA. The works will, for example, require a range of ancillary plant, vehicles and NRMM which will emit noise and create potential disturbance. The works will also require delivery of materials and the presence of personnel to facilitate replacement of the elastomeric and lateral thrust bearings. However, disturbance will be localised to the North and South Side Towers. Given the nature of the works, and the height of the FRB above the Lower Forth Estuary, no ground-borne vibration impacts have been forecast. Artificial lighting may be required to facilitate safe working as the days become darker, which has the potential to cause disturbance to local wildlife. However, the overall use of artificial lighting will be restricted as construction hours are limited to 08:00 to 17:00.

Whilst works will not result in a direct impact on the Firth of Forth SPA/Ramsar or Forth Islands SPA, potential indirect risk exists. The main risk being that proposed works will take place directly above the Lower Forth Estuary. Any loss of containment e.g., a spill of fuel, oil, chemicals (i.e., hydraulic fluid) or concrete/cement wastewater from a breach of hydro-demolition bunding (if required) could therefore have an impact. The severity of the impact is contingent on the substance and quantity lost. That said, the accidental release of pollutants is extremely unlikely and hydro-demolition bunding will follow industry best practice, and materials will be stored in the North Side Tower compound located off the FRB on Ferry Road. Pollution prevention measures, for example, will be strictly enforced onsite and Pollution Prevention Guidance (PPGs) and Guidance for Pollution Prevention (GGP) will be strictly adhered to, reducing the likelihood of a loss of containment occurring.

There are no invasive non-native species, invasive native perennials or injurious flowering plant species recorded within the scheme extents.

Considering the nature, size, and scale of the scheme, and with implementation of mitigation detailed below, the proposed work impacts on biodiversity throughout the construction period are therefore assessed to be temporary minor adverse in magnitude.

Upon completion of the works, no residual impacts are anticipated in relation to biodiversity.

Proposed biodiversity mitigation measures:

- All site personal will be made aware of the protected status of the Firth of Forth SPA/Ramsar and Forth Islands SPA.
- To reduce disturbance, standard construction hours will be 08:00 to 17:00 (Monday to Friday, weekend working at contractor's discretion). If any works are required outwith the agreed working hours, BEAR Scotland's Environmental Team will be contacted to discuss.
- Works at the North Side Tower are currently programmed to be completed before the start of the sensitive bird breeding period (1st May 2023). However, should works be delayed into the sensitive period, all mitigation as contained within the HRA/SMP will be adhered to i.e. a suitably qualified ECoW will be consulted on appropriate mitigation measures required, prior to works resuming within the sensitive period.
- Where artificial lighting is required, the site lighting layout will be positioned and angled to only illuminate the working area (e.g., not shining onto the Lower Forth Estuary).
- Site personnel will remain vigilant for protected species and will not approach or touch any animals seen on site. Any sightings of protected species will be reported to BEARs Environmental Team. Should a protected species be encountered or move within 50 m of the active works (including compounds), works will be temporarily halted until the animal(s) move at least 50 m away from the construction site, or until BEARs Environmental Team can provide advice.

- The Contractor will employ 'soft-start' techniques for all noisy activity to avoid sudden and unexpected disturbance during works. Each time the activity is started up after a period of inactivity, the noise levels must be gradually increased over a period of 30 minutes to permit animals (and birds) to move away from the disturbance.
- All equipment stored onsite will be checked at the start of each workday to ensure protected species, and any or other mammal species, are not present. Any storage containers/plant within the compound will also be secured overnight to prevent exploration by protected species (and any or other mammal species). Any areas where an animal could become trapped (e.g., storage containers) will also be covered at the end of each working day, to avoid mammals falling in and becoming trapped.
- People, ancillary plant, vehicles, NRMM and materials will be restricted to areas of made ground (as much as is reasonably practicable). If during works unforeseen access to the surrounding environment is required, works will cease in this area and BEAR Scotland's Environmental Team will be contacted to allow consideration of potential environmental effects. BEAR Scotland's Environmental Team will be contacted to allow consideration of potential environmental effects if: (i) unforeseen site clearance is required, (ii) unplanned works must be undertaken outwith the carriageway boundary, (iii) there is any deviation from the agreed plan, programme and/or method of working, (iv) nesting birds are found onsite.
- Toolbox Talk TTN 095 'Noise and Vibration (wildlife)' will be briefed to all personnel onsite prior to works commencing.
- The use of tool tethers will be implemented when working from suspended areas.
- Access platforms will be fully encapsulated during the works (e.g., Envirowrap or similar).

Geology and soils

Scoped out. 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.

Material assets and waste

Minimising impacts arising from construction materials are focussed upon making the most efficient use of materials onsite to reduce the need for imported primary materials and minimise the creation and disposal of waste through (i) reduction, (ii) re-use, and (iii) recycling. Potential impacts have been assessed for both the construction and operational phases of this scheme. It is anticipated that most material impacts are likely to arise during construction, though long-term residual impacts could occur post construction during the operational phase e.g., during the disposal of materials arising from routine maintenance operations.

There will be limited consumption of materials and natural resources e.g., mainly elastomeric bearings (rubber) and lateral thrust bearings (rubber and steel).

Full encapsulation of the works area will ensure that all waste generated from the construction activities (removal of bearings, concrete breakout, etc.) will be contained and controlled to minimise the risk of unwanted emissions of pollutants.

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.

Considering the nature, size and scale of the scheme, and with implementation of the mitigation detailed below, the proposed works impacts on material assets and waste throughout the construction period are therefore assessed to be temporary negligible adverse in magnitude.

Upon completion of the works, no residual impacts are anticipated on materials or waste.

Proposed material and waste mitigation measures:

- Good materials management methods (e.g., 'just-in-time' delivery) will be implemented wherever possible.
- The Contractor will comply with all 'Duty of Care' requirements, ensuring that any surplus materials or waste are stored, transported, treated, used, and disposed of safely without endangering human health or harming the environment. Material transfer notes and/or waste exemption certificates (if required) will also be completed and retained.
- Where possible, material removed from site will be taken to a licensed recycling facility.
- Designated areas will be identified within which all materials and personnel, including construction compounds, will be contained to limit environmental disturbance during construction works. This will include a designated area (if required) for segregation and reuse of waste materials.
- The selection of areas for materials stockpiling will avoid sensitive locations such as road drainage and the edge of the bridge deck. Stockpiled materials with leachate potential, for example, will be stored away from road drainage to prevent cross-contamination with other materials, wastes, or groundwater.

- Materials will be stored with the appropriate security to prevent loss, theft, or vandalism.
- All temporary road signs and traffic cones will be removed from site on completion of works.
- Wastewater from welfare facilities (if required) will be subject to effluent treatment followed by tanker removal.
- If hazardous substances are used onsite, each substance will be subject to assessment under the Control of Substances Hazardous to Health (COSHH) Regulations 2002. Hazardous substances will also be clearly labelled, and disposed of, in line with COSHH safety data sheets and the Special Waste Regulations 1996. Special waste will also not be mixed with general waste and/or other recyclables.

Noise and vibration

Activities undertaken on site could potentially have some localised and short-term noise impacts in proximity to the works. Noise will be generated during delivery and replacement of elastomeric and lateral thrust bearings, particularly during jacking up of the bridge and breakout of existing bearings (if hydro-demolition is required). As a result, there is potential for noise and vibration effects.

However, the works are not located within a CNMA or CQA, and the proximity of road space suggests that residents within the local area will have a degree of tolerance to noise and disturbance. Works will also be completed utilising a daytime working programme. Works with the potential to induce worst-case scenario noise and vibration (jacking of bridge, breakout of bearings, use of vehicles etc.) will also be intermittent, transient, temporary, and short-lived. The potential for disturbance will therefore be somewhat diminished.

Considering the likely sources of noise and vibration, the distance from the point of generation to NSRs, the nature, size and scale of the scheme, and with implementation of the mitigation detailed below, it is unlikely that noise and vibration associated with the works will lead to significant impacts, disruption and/or complaints. The proposed scheme is therefore anticipated to result in temporary minor adverse noise impacts.

Proposed noise mitigation measures:

- 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 and actioned through to closeout, and fully auditable and traceable.

- Ancillary plant, vehicles and NRMM with directional noise characteristic will (where practical) be shut down in intervening periods between site operations.
- The use of percussive hand-tools, grinders, impact wrench's, chipping hammers, etc. will be avoided (except where there is an overriding justification), and if used must be fitted with mufflers or silencers of the type recommended by the manufacturer.
- Drop heights from vehicles and NRMM will be kept to a minimum to minimise noise when unloading.
- All ancillary plant, vehicles and NRMM used onsite will have been regularly maintained, paying attention to the integrity of silencers and acoustic enclosures.
- 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.

Population and human health

During construction, activities undertaken on site have the potential to have temporary adverse impacts on local residents, vehicle travellers, and non-motorised users (NMUs). However, the scheme does not require permanent (or temporary) land-take, accommodation works, site clearance or locally gained resources, and there is no requirement for a Compulsory Purchase Order (CPO). One cycleway/footway above the worksite will be closed during replacement of the bearings beneath the footpaths for site access, however, through access to NCN Route 1 and the Core Path (ID: 28499) will be maintained at all times.

Considering the nature, duration, size and scale of the scheme, and with implementation of the mitigation described below, impacts on population and human health are assessed as temporary minor adverse in magnitude.

Upon completion of the works, no residual impacts are anticipated in relation to population and human health:

Proposed population and human health mitigation measures:

- Where appropriate, a communication strategy (e.g., social media, consultation with local authority and other stakeholders, letter drop etc.) will be initiated to keep local residents and/or businesses informed of the proposed working schedule, particularly the times and durations of noisy construction activities. The communication strategy will also provide a 24-hour contact number for the BEAR Scotland Control Room.

- Through access will be maintained at all times on one of the dedicated footpaths which run along both sides of the FRB and accommodates National Cycle Network Route 1 (NCN1) and the Core Path (ID: 28499). If access must be restricted, appropriate signage will be in place, at either end of the bridge, to direct travellers along the cycleway / footpath on the other side of the FRB.

Road drainage and the water environment

During construction, there is potential for temporary adverse impacts on the water environment. Potential changes in water quality e.g., from pollution events (either by accidental spillage of sediments, particulate matter, chemicals, fuels or by mobilisation of these in surface water caused by rain) during works have the potential to have a direct or indirect effect on surrounding waterbodies. There is also a risk that material and equipment could fall into the Lower Forth Estuary during the works. However, all works are restricted to the FRB and will be fully encapsulated e.g., utilising Enviwrap or similar to ensure no material can escape to the Lower Forth Estuary. 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.

There is the potential requirement for hydro-demolition to aid in localised breakout of the concrete surrounding the bearings. The hydro-demolition process involves high-pressure delivery of clean potable water to remove areas of concrete. Resulting waste-water will contain a high volume of suspended solids and have an elevated pH which, if released into the Lower Forth Estuary, would have a significant detrimental impact.

With this in mind, should hydro-demolition be required, a three-stage hydro-demolition Waste Water Management Plan will be implemented e.g. (1) management of the hydro-demolition process and the collection of waste-water, (2) treatment of hydro-demolition waste-water using a two stage silt-buster process (for pH and suspended solids), and (3) disposal of the treated water (treated waste-water will be fed into an Intermediate Bulk Container (IBC) and disposed offsite).

Hydro-demolition will involve the following: (i) scaffolding will be installed on the underside of the structure, and the scaffolding will be tanked using visqueen sheeting to create a watertight bund, (ii) pumps will be placed into the bund and will feed back to the bridge deck, where a Siltbuster HD unit will be positioned, (iii) the sub-contractor will saw cut and break out the existing bearings to expose the concrete where hydro-demolition is required, (iv) the sub-contractor will set up protective tenting to enclose the bearing locations, (v) pumps will be installed to feed any wastewater into the Siltbuster HD unit, (vi) hydro-demolition will begin to remove the concrete, (vii) all wastewaters will be collected by the bund and pumped into the Siltbuster HD unit to remove any suspended solids and neutralise the high pH by using a fully automated CO₂ dosing process to counterbalance the alkalinity. Safe estimate target values are: suspended solids – 50 mg/l, and pH level to be neutral (7 to 9) at disposal, (ix) once the required quantity of concrete has been removed, any spoil created within the sheeting during the hydro-demolition process will be cleared

by hand, and (x) treated wastewater will be disposed of in an appropriate manner e.g., fed into an IBC and disposed offsite to a licenced facility.

Considering the nature, size and scale of the scheme, and with implementation of the mitigation detailed below, the proposed works impacts on the road drainage and water environment are assessed as temporary negligible adverse in magnitude.

Upon completion of the works, no residual impacts are anticipated in relation to the road drainage and water environment.

Proposed road drainage and water environment mitigation measures:

- No works are permitted to take place within the Lower Forth Estuary.
- 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, or drainage systems, will be permitted.
- Before works commence, the working area will be fully encapsulated (e.g., using Envirowrap) to ensure no material can escape to the Lower Forth Estuary.
- The Contractor will submit Risk Assessments and Method Statements (for approval) prior to works commencing which details how pollution control measures will be managed (including how the control measures will be installed, inspected and maintained to prevent failure during the work). The Contractor will also inspect the control measures daily for movement, leakage and general deterioration and will take immediate remedial action to rectify any defects.
- Should hydro-demolition be required, the following mitigation will be in place:
 - All water used onsite will be delivered by bulk tanker and be of potable quality.
 - Hydro-demolition works will avoid heavy rainfall periods which could affect the performance of the Siltbuster HD Unit.
- The Contractor will develop an Incident (Emergency) Response Plan (IRP) which describes the procedures, lines of authority and processes that will be followed to ensure that incident response efforts are prompt, efficient, and suitable for particular circumstances. The IRP will detail the procedures to be undertaken in the event of the release of any sediment into the Lower Forth Estuary, serious spillage of chemical, fuel or other hazardous wastes (e.g., concrete), non-compliance incident with any permit or license, or other such risks that could lead to a pollution incident, including flood risks. 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 Site Supervisor. 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 or other authorities. However, all such incidents must be recorded and reported to BEAR Scotland's Environmental Team. In the event of a 'serious incident', SEPA 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.

- All waste, vehicles, ancillary plant, NRMM and fuels will be stored in the compound(s) or laydown area and will be secured and located, if space is available, at least 10 m from drainage entry points, in order to comply with GPP 5 'works and maintenance in or near water'. Refuelling will only be undertaken at designated refuelling areas (e.g., on hardstanding, with spill kits available, and >10 m from drainage entry points, where practicable). Spill kits will also be available within all site vehicles and spill kits will be replenished onsite when required. Only designated trained and competent operatives will be authorised to refuel plant. Generators, and other ancillary plant and NRMM, where there is a risk of leakage of oil or fuel, will have internal bunding or must have a secondary containment system placed beneath them that meets 110% capacity requirements. Containment systems will also be emptied regularly. All waste, vehicles, ancillary plant, NRMM and fuels will also be stored in a manner that ensures they are protected from damage by collision or extremes of weather.
- Regular visual pollution inspections of the designated laydown area and work site (particularly near road drainage entry points) will be conducted (e.g., site walkover by engineer or Site Supervisor), especially during periods of heavy rain.
- All vehicles and NRMM onsite will have been regularly maintained, paying attention to the integrity of oil tanks, coolant systems, gaskets etc. A checklist must be present to make sure that the checks have been carried out.
- When the works are complete, the Contractor will ensure that all materials, debris, tools, plant, and equipment are removed from the work area. The Contractor will also check the area thoroughly for spillages or potential pollution sources and remove or clean-up anything found.

Climate

BEAR Scotland, working on behalf of Transport Scotland, undertake carbon monitoring of major projects and operational activities. Emissions from 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. The replacement of the elastomeric and lateral thrust bearings will extend the maintenance intervals required for future works. In doing so, the service life of the FRB is also extended.

During works there is potential for impacts as a result of the emission of greenhouse gases through the use of equipment, vehicles, and NRMM, material use and production, and transportation of material/waste. However, considering the nature, duration, size and scale of the scheme, and the mitigation detailed below, the risk of significant impacts to climate are considered to be negligible adverse in magnitude.

Upon completion of the proposed scheme no residual impacts are anticipated on the climate.

Proposed climate mitigation measures:

- Local contractors and suppliers will be used as far as practicable to reduce fuel use and greenhouse gas emitted as part of the works.
- BEAR Scotland will adhere to its Carbon Management Policy.
- Where possible, waste will be disposed of at local waste management facilities.

Vulnerability of the project to Major Accidents and Disasters

The FRB is not at risk of surface water flooding and there will be no change to the likelihood of flooding on the FRB within the scheme extents upon completion of the works.

Works are restricted to areas of made-ground on the FRB, with access to the scheme gained via the A90 and M90. TM is anticipated to be required in the form of carriageway closures with contraflow and a 15-mph speed limit. One footpath will be closed during replacement of bearings beneath the footpaths, with pedestrians and cyclists diverted to use the footpath and cycleway on the opposite side of the FRB. As such, the proposed works impacts on road traffic accidents is assessed to be negligible magnitude.

A Site Environmental Management Plan (SEMP) will be produced by BEAR Scotland which sets out a framework to reduce the risk of adverse impacts from construction activities on sensitive environmental receptors. The Contractor will comply with all conditions of the SEMP during works and may be subject to audit throughout the contract.

Considering the above, the vulnerability of the project to risks of major accidents and disasters is considered to be low.

Assessment of cumulative effects

The proposed works are not anticipated to result in significant environmental effects. Due to the nature of the proposed works, no cumulative effects are anticipated with any other developments in the vicinity. Any future BEAR Scotland schemes will be programmed to take into account already-programmed works and as such, any cumulative effect will be limited.

A search using [City of Edinburgh Council Simple Search](#) and [Fife Council Simple Search](#) identified seven planning applications within 300 m of the scheme extents:

- Erection of service building adjacent to Port Edgar Marina, Existing hard and soft landscaping within Port Edgar Marina (In retrospect).
- Interpretation /orientation tourism signs, as part of a wider signing network for South and North Queensferry.
- Alterations are to be made to the underdeck access system on the Forth Road Bridge in the form of additional access points.
- Single storey extension and installation of 2 rooflights to side and installation of French doors to rear of dwellinghouse.
- Porch extension and raised deck to front of dwellinghouse.
- Listed building consent for installation of tourist signage.
- Display of 4 non-illuminated interpretation signs.

The works associated with these applications are minor in nature therefore it is unlikely that the proposed works will have a significant cumulative effect with any other future works in the area.

Assessments of the environmental effects

As detailed in the Description of Main Environmental Impacts and Proposed Mitigation section, there are no significant effects anticipated on any environmental receptors as a result of the proposed works.

Statement of case in support of a Determination that a statutory EIA is not required

This is a relevant project in terms of section 55A(16) of the Roads (Scotland) Act 1984 as it is a project for the improvement of a road and the works (together with any area occupied by apparatus, equipment, machinery, materials, plant, spoil heaps, or other such facilities or stores required during the period of construction) are situated in whole or in part in the Firth of Forth SPA, Firth of Forth Ramsar and Forth Islands SPA, which are sensitive areas within the meaning of regulation 2(1) of the Environmental Impact Assessment (Scotland) Regulations 1999.

The project has been subject to screening using the Annex III criteria to determine whether a formal Environmental Impact Assessment (EIA) is required under the Roads (Scotland) Act 1984 (as amended by The Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017). Screening using Annex III criteria, reference to consultations undertaken, and review of available information has not identified the need for a statutory EIA.

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

Characteristics of the scheme:

- All works are restricted to made-ground on the FRB at the location of the North and South Side Towers.
- The total working area is less than 1 ha.
- Containment measures of the working area will be in place to prevent debris or pollutants from entering the surrounding environment.
- Works will be temporary and localised.
- Works will be undertaken utilising a daytime working programme.
- Works are not expected to result in significant disturbance to protected species that may be present in the wider area.
- No in-combination effects have been identified.
- The risk of major accidents or disasters is considered to be low.
- Lateral Thrust and Elastomeric Bearing replacement will protect against future deterioration of the structure, thus minimising the extent of future works required at the FRB.

Location of the scheme:

- The HRA concluded that with mitigation in place (as per the SMP and CNMP) there will be no implications for the conservation objectives of the Firth of Forth SPA and Ramsar sites and the Forth Islands SPA for the five year duration of the Proposed Works. There will therefore be no adverse effects on site integrity (AESI) for the sites, either alone or in combination with other plans and projects.
- Historical consultation with the City of Edinburgh Council and Fife Council regarding maintenance works on the Category A listed FRB concluded that all maintenance work concerned with the FRB, that is undertaken on a like-for-like basis, does not require Listed Building consent.
- The scheme is not located within any areas designated for landscape interests.
- Land use will not change as a result of the works.
- The works do not require any private land acquisition.
- The scheme does not lie within any sites designated for geology or soils.
- The scheme is not located within a densely populated area.

Characteristics of potential impacts of the scheme:

- Any potential impacts of the works are expected to be temporary, short-term, not significant, and limited to the construction phase.

- There will be limited consumption of materials and natural resources, and limited waste or generation associated with the works. Measures will also be in place to ensure appropriate removal and disposal of waste.
- With good practice pollution prevention measures implemented onsite, there is a negligible risk of a pollution event e.g., compliance with the SEMP.
- There is no change to the vulnerability of the road to the risk or severity of major accidents/disasters that would impact on the environment.
- No impacts on the environment are expected during the operational phase as a result of the works.

Annex A

“sensitive area” means any of the following:

- land notified under sections 3(1) or 5(1) (sites of special scientific interest) of the Nature Conservation (Scotland) Act 2004
- land in respect of which an order has been made under section 23 (nature conservation orders) of the Nature Conservation (Scotland) Act 2004
- a European site within the meaning of regulation 10 of the Conservation (Natural Habitats, &c.) Regulations 1994
- a property appearing in the World Heritage List kept under article 11(2) of the 1972 UNESCO Convention for the Protection of the World Cultural and Natural Heritage
- a scheduled monument within the meaning of the Ancient Monuments and Archaeological Areas Act 1979
- a National Scenic Area as designated by a direction made by the Scottish Ministers under section 263A of the Town and Country Planning (Scotland) Act 1997
- an area designated as a National Park by a designation order made by the Scottish Ministers under section 6(1) of the National Parks (Scotland) Act 2000.



**TRANSPORT
SCOTLAND**

CÒMHDHAIL ALBA

© Crown copyright 2023

You may re-use this information (excluding logos and images) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence> or e-mail: psi@nationalarchives.gsi.gov.uk

Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.

Further copies of this document are available, on request, in audio and visual formats and in community languages. Any enquiries regarding this document / publication should be sent to us at info@transport.gov.scot

This document is also available on the Transport Scotland website: www.transport.gov.scot

Published by Transport Scotland, February 2023

Follow us:



transport.gov.scot