

FORTH ROAD BRIDGE

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| Scheme: | Expansion Joint Replacement |
| Document: | Construction Noise Management Plan |
| Issue: | Rev 1 |



**Long Craig Island
Construction Noise Management Plan
Forth Road Bridge Expansion Joint Replacement**



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1 Introduction

1.1 Background

1.1.1 As of the 17th August 2020, BEAR Scotland became responsible for the operation and maintenance of the Scottish SE trunk road network under the SE Network Maintenance Contract (SE NMC). The Forth Road Bridge is included within the SE NMC.

1.2 Forth Road Bridge

1.2.1 The Forth Road Bridge is a long span suspension bridge which was opened in 1964 and together with the approach viaducts is just over 2.5km in length. The Forth Road Bridge is designated by local authorities (Edinburgh City Council and Fife Council) as a Category A Listed Building. The Annual Average Daily Traffic (AADT) in 2019 was 1003 motor vehicles, and only consisted of buses, taxis, and small-engine motorcycles. As of September 2017, all other traffic has used the new Queensferry Crossing.

1.2.2 The Forth Road Bridge spans sections of the Firth of Forth Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar site; and Long Craig Island SSSI, which is a component of Forth Islands SPA.

1.2.3 As maintenance works will be undertaken over the 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.

1.3 Marine Licence

1.3.1 An application for a 6-month extension to the existing 5-year marine licence was submitted in December 2020 which included the requirement to work within 400m of Long Craig Island during the tern breeding season to complete the expansion joint replacement scheme. Marine Scotland, at the request of Nature Scot, stipulated that a Construction Noise Management Plan (CNMP) was produced for works within 400m of Long Craig Island SSSI.

1.3.2 The requirements for noise management and monitoring are to ensure that potential effects from maintenance activities do not affect the population of breeding terns on Long Craig Island. The Roseate Tern (*Sterna dougallii*) is one of the rarest breeding seabirds in the UK with a distribution restricted to just a few breeding colonies. There is a decline of breeding pairs on Long Craig Island. Both Roseate Tern and Common Tern (*Sterna hirundo*) are qualifying species for the Forth Islands

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SPA and in 2004 included Long Craig Island SSSI. Surveys have illustrated that populations are subject to fluctuation.

1.4 Purpose

1.4.1 The aim of the Construction Noise Management Plan is to put in place reasonable measures to reduce the noise impact of maintenance activities to avoid disturbance to breeding birds, particularly during their breeding season, along the Natura 2000 Sites including Long Craig Island.

1.4.2 The Plan will:

- Provide employees and contractors with a clear and concise description of their responsibilities, regarding noise management.
- Address the relevant Marine Scotland conditions in respect of noise.
- Provide details of the noise reduction and noise monitoring procedures which will be implemented during the tern breeding season.

1.5 Scope

1.5.1 In accordance with the marine licence conditions, the CNMP applies to all activities undertaken during the joint replacement as part of the Works Contract within 400m of Long Craig Island SSSI during the tern breeding season between 1st May and 15th August.

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2 Noise Management Process

2.1 Programme

- 2.1.1 The programme for the Forth Road Bridge Northbound Carriageway Expansion Joint Replacement work runs between 4th April – 8th October 2021. It is essential that the work is completed, and the bridge is available for use within the winter months as a potential diversion to the Queensferry Crossing. This requirement will result in works being undertaken within 400m of Long Craig Island during the tern breeding season.
- 2.1.2 Work within 400m of Long Craig Island will be accelerated prior to the beginning of the tern breeding season on 1st May. Activities at the North Main and Side Towers will be prioritised over the south towers and 7-day working will be implemented during the month of April.
- 2.1.3 As much of the noisy works, such as hydrodemolition and removal of existing steelwork at the North Side Tower as well as removal of the existing joint steelwork, packer plates and gussets at the North Main Tower are programmed for completion in April. Where it has not been possible to re-programme noisy works prior to 1st May, or where external factors, such as weather, delay works; additional noise reduction measures will be implemented on site for the duration of the tern breeding season.

2.2 Site Working Hours

- 2.2.1 The Forth Road Bridge maintenance works are generally undertaken between the hours of 08:00 and 18:00.

2.3 Plant and Equipment

- 2.3.1 Silent run tools are to be used wherever possible. Where it is not possible to use silent run tools, such as during grinding works, additional noise reduction measures will be implemented on site.
- 2.3.2 Grinding works to remove elements of the existing steelwork at the North Main Tower have been identified as having the most potential to cause disturbance to the tern colony. A site test was carried out on 28th February 2021 which determined that two grinders used simultaneously at the North Main Tower resulted in an increase to the baseline noise level of 0.4dB at Long Craig Island. This amounts to the grinders generating a noise level of 55.4dB L_{Aeq}.

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2.3.3 Grinding works are currently programmed to be carried out at the North Main Tower for one week in the middle of May. Daily ECoW observation reports will be provided to Marine Scotland and NatureScot during this period.

2.4 Noise Reduction Measures

- 2.4.1 A layer of 15mm Acoustilay (or equivalent product) placed between two 12mm sheets of plywood will be installed on the access platform floor. This will provide both airborne and impact noise attenuation.
- 2.4.2 Soundex Deciblock Quilt acoustic barriers (or equivalent product) will be installed on the vertical faces of the underdeck access platforms. The barriers shall overlap at the top and bottom of the structure to prevent gaps and potential flanking transmission.
- 2.4.3 The installation of the above noise reduction measures will be completed prior to 1st May and will remain in place until at least 15th August. If installation or removal of noise reduction measures is required during the tern breeding season, it must be done under instruction and supervision of the ECoW.

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3 Ecological Clerk of Works (ECoW)

3.1 Role and Responsibilities

- 3.1.1 An appropriately qualified ECoW will be employed to monitor the joint replacement works. The ECoW shall have previous ornithological experience and will have a membership to an appropriate professional body such as CIEEM or equivalent.
- 3.1.2 The ECoW will be based at the Forth Road Bridge during the tern breeding season between 1st May – 15th August and will be responsible for the monitoring of the tern colony, the work activities and noise monitoring.
- 3.1.3 The ECoW shall ensure that the conditions of the Marine License are being followed and that works are carried out in accordance with the Construction Noise Management Plan (CNMP) and Construction Environmental Management Plan (CEMP).

3.2 Stop Events

- 3.2.1 The ECoW will use their experience and professional judgement to assess any instances of dreading of the tern colony and will:
- Stop works if a significant percentage (50% or more) of the tern colony dread and there is a clear link to bridge works
 - Stop works if a significant percentage (50% or more) of the tern colony dread and there is no clear external influence to cause that behaviour
 - Not stop works if dreading is clearly in response to the presence of a natural predator (e.g. gull, crow)
 - Not stop works if dreading is clearly caused by weather, sea state conditions or a clear external influence (e.g. private vessel)

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- 3.2.2 Marine Scotland and NatureScot will be notified as soon as possible (within the day) if a stop event occurs. Notification emails shall be sent to forth@nature.scot and Malcolm.Fraser@nature.scot as well as MS.MarineLicensing@gov.scot.
- 3.2.3 An investigation will be undertaken if a stop event occurs. The investigation will review the circumstances of the event and refer to the work being undertaken on the bridge at the time and the noise monitoring data recorded during the period.
- 3.2.4 If the investigation determines that there is no link between the dreading and the work activities, then work will re-commence. If a link is found between work activities and the dreading, then the activity will not recommence until the cause of the disturbance is removed or suitably mitigated.
- 3.2.5 Upon conclusion of the investigation, a report will be prepared by the ECoW and submitted to Marine Scotland and NatureScot covering the stop event.
- 3.2.6 The trigger conditions for stopping works shall be reviewed throughout the breeding season and Marine Scotland and NatureScot shall be consulted on any proposal to amend the trigger conditions if deemed necessary by the ECoW.

3.3 Reporting

- 3.3.1 Monthly reports are to be prepared by the ECoW during the tern breeding season. The reports shall provide details of the ECoW's observations, number of terns observed in the colony, details of significant dreading events and reporting of noise monitoring data.
- 3.3.2 An end of period report on construction noise and the impacts on the tern colony will be submitted following the end of the tern breeding season.

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4 Noise Monitoring Programme

4.1 Noise Monitoring Equipment

4.1.1 The permanent equipment meets the requirements for a Class 1 Sound Level Meter under BS EN 61672-1:2013. The make and model are:

NTi Audio XL2-TA Sound Level Analyser (Serial No. A2A-16378-E0)

NTi Audio XL2-TA Sound Level Analyser (Serial No. A2A-16298-E0)



Figure 1 - Permanent Noise Monitoring Equipment

4.1.2 Noise monitoring equipment was installed at two locations on and adjacent to the Forth Road Bridge structure between the north west and north east main tower legs and adjacent to the north west side tower leg.

4.1.3 Calibration of the noise monitoring equipment will be undertaken by the manufacturer on an annual basis, using their suitably calibrated equipment. A certificate will be provided following each annual calibration.

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4.2 Noise Monitoring Parameters

4.2.1 The noise monitoring equipment has previously been set up to measure average and maximum noise levels, L_{Aeq} and L_{Amax} , for comparison against the 75dB fixed upper limit imposed by the marine license

4.2.2 The noise monitoring equipment will be set up to provide an increased range of measurement parameters following those suggested in 'A Review of the Effects of Noise on Birds Version 1' published by Natural England in October 2018 and these include the following:

- Broadband L_{Aeq}
- Broadband L_{Amax}
- Broadband L_{Amin}
- Broadband L_{A90}
- Broadband L_{A10}
- Third Octave Period L_{Aeq} (as required)

4.2.3 The increased range of measurement parameters will generate a significant volume of data every day so a timer function within the equipment is to be used to limit the measurement of noise data to within construction hours.

4.3 Reporting

4.3.1 Measured data from the noise monitoring equipment (including frequency and tone, as required) will be compared with the ECoW's observed activity data during the work activities. Once tabulated, the data will be shared with Marine Scotland and NatureScot as part of the ECoW's monthly report.