

THE FORTH CROSSING ACT 2011:
THE SCOTTISH MINISTERS' MANAGEMENT PLAN –
CONSTRUCTION NOISE AND VIBRATION

1 Introduction

- 1.1 The purpose of this Management Plan is to set out the objectives of, and arrangements for, the planning, control and regulation of construction noise and vibration to be put in place by the Scottish Ministers during construction of the Forth Crossing works.
- 1.2 This Management Plan sets out the:
- a) objectives for the planning, control and regulation of construction noise and vibration (Section 2);
 - b) hierarchy of documentation covering the planning, control and regulation of construction noise and vibration (Section 3);
 - c) noise and vibration planning and control regime to be adopted (Section 4);
 - d) roles and responsibilities in relation to implementation of this Management Plan (Section 5);
 - e) community consultation requirements (Section 6).

2 Objectives

- 2.1 The objectives in relation to noise and vibration which will occur during construction of the project are that:
- a) construction works and activities will be planned, executed and monitored taking full consideration of, and appropriate actions in respect of, noise and vibration;
 - b) best practicable means, as defined in the Control of Pollution Act 1974, will be employed to minimise noise and vibration at all times and for all works;
 - c) the adverse noise and vibration effects arising from construction activities will not be worse than the residual effects reported in the Environmental Statement;
 - d) construction works will be carried out in accordance with the requirements of the Appropriate Assessment documents;
 - e) construction works will be carried out in accordance with the Code of Construction Practice; and

- f) the Relevant Parties (see section 4.2) and communities will be consulted and kept informed regarding matters relating to noise and vibration and a system will be provided for enquiries and complaints so that these can be appropriately considered, addressed and feedback provided.

3 Hierarchy of Documentation

- 3.1 The hierarchy of documentation which is applicable to the control of noise and vibration during construction of the project, in descending order, is as follows:
 - i) The Forth Crossing Act 2011 and other relevant statutory provisions;
 - ii) The Environmental Statement, the Appropriate Assessment documents and the Code of Construction Practice; and
 - iii) The contracts between the Scottish Ministers and the contractors appointed to construct the project.
- 3.2 The Scottish Ministers will, in accordance with the Forth Crossing Act 2011, do everything which is reasonably practicable in order to ensure that the:
 - a) environmental impact of the construction of the Forth Crossing works is not worse than the residual impact identified in the Environmental Statement; and
 - b) Forth Crossing works are carried out in accordance with the Code of Construction Practice.
- 3.3 The relationship between the Environmental Statement and the Code of Construction Practice is described in Section 5.3 of the Code of Construction Practice. This sets out that:
 - a) The Environmental Statement describes the predicted noise and vibration impacts and effects due to construction of the scheme, together with mitigation to reduce these effects.
 - b) The Code of Construction Practice requires the contractor to seek the approval of the Employer's Representative with regard to noise and vibration for all construction works.
 - c) In addition to describing further mitigation measures, the Code of Construction Practice describes the criteria for compliance with the Environmental Statement and defines noise level thresholds above which additional mitigation such as noise insulation or temporary re-housing will be offered to affected parties.
 - d) The Code of Construction Practice sets out that if noise or vibration effects are predicted by the contractor to be greater than those in the Environmental Statement, then provided the Employer's Representative is content that best practicable means are proposed to minimise noise and

vibration, the contractor will be required to seek approval from the relevant local authority.

- 3.4 In meeting the requirements of the Forth Crossing Act 2011, as described above, the Scottish Ministers will require that best practicable means are employed to ensure that the noise levels resulting due to the works will not be greater than the relevant Assessment Category noise levels in the Environmental Statement.
- 3.5 The Scottish Ministers will ensure that the procedures with regard to maximum noise levels and the working hours hierarchy defined in Annex A and Annex B of this Management Plan are included in the construction contracts.
- 3.6 The Scottish Ministers will ensure that the Forth Crossing works are carried out such that there are no significant effects on the integrity of the designated sites considered in the Appropriate Assessment documents.
- 3.7 The noise and vibration control regime the Scottish Ministers will employ to fulfil the above obligations is set out in Section 4 of this Management Plan.
- 3.8 In accordance with paragraph 1.2.4 of the Code of Construction Practice, the Scottish Ministers will require as part of the contract that the appointed contractors comply with the Environmental Statement, Appropriate Assessment documents and the Code of Construction Practice. The contract documents will also, where necessary, expand and provide additional detail of the procedures and approaches to be followed to define how the measures set out in the Environmental Statement, Appropriate Assessment documents and the Code of Construction Practice will be implemented.
- 3.9 The Scottish Ministers will, in line with the Environmental Statement and Code of Construction Practice, require that the contractor sets out in key documents how it will operate the construction site and the specific control measures it will implement to comply with its Environmental Management System and the documents referred to in paragraph 3.1 of this Management Plan. These key documents will include:
 - a) A Noise and Vibration Management Plan which will form an integral part of the Contractor's overall Environmental Management Plan; and
 - b) Plans for Control of Noise and Vibration which will be prepared detailing the method statements for each phase of construction works along with the associated steps to minimise noise and vibration.

4 Noise and Vibration Planning and Control Regime

- 4.1 In order to achieve the objectives set out in this Management Plan, the noise planning and control regime will:
 - a) involve the Relevant Parties (refer to Section 4.2) in reviewing and providing appropriate advice regarding the planning, execution and monitoring of construction noise and vibration aspects of the project;

- b) enable the project to be constructed whilst providing the assurance that the objectives set out in this Management Plan are being met; and
- c) provide a process that is consistent across the whole of the project, transparent and auditable, and can be used to demonstrate compliance with all relevant statutory and contract requirements.

4.2 The Relevant Parties are:

- a) the Scottish Ministers' Employer's Representative;
- b) The City of Edinburgh Council;
- c) Fife Council;
- d) West Lothian Council;
- e) Scottish Natural Heritage; and
- f) the contractors.

Involvement of Relevant Parties

- 4.3 A Noise Liaison Group will be formed which will include the Relevant Parties and any other party that may be considered from time to time as appropriate.
- 4.4 The Scottish Ministers will appoint the Employer's Representative, who will be a member of the Senior Civil Service, accountable to the Scottish Government.
- 4.5 The Employer's Representative will ensure structured consultation with the Noise Liaison Group regarding all aspects of noise management. The activities of the Noise Liaison Group will be focussed to ensure that the construction works are being undertaken in line with the objectives of this Management Plan.
- 4.6 The Relevant Parties may provide advice to the Employer's Representative regarding construction noise and vibration matters. The Employer's Representative will take appropriate consideration of this advice in determining whether to approve construction works and undertaking any other necessary actions.
- 4.7 The Relevant Parties will develop and agree the Terms of Reference for the Noise Liaison Group.

Planning and executing construction works to meet the Objectives of this Management Plan

- 4.8 The Scottish Ministers will ensure through enforcement of the construction contracts with the appointed contractors that:

- a) the contractors plan all construction works and prepare appropriate noise and vibration control plans (Plans for Control of Noise and Vibration) taking full consideration of the objectives of this Management Plan;
- b) whilst planning and undertaking construction works, the contractors will, in employing best practicable means, as a minimum comply with, and have regard to the:
 - i) recommendations for practical measures to reduce noise set out in BS 5228 (all parts);
 - ii) requirements of the Environmental Statement, Appropriate Assessment documents and Code of Construction Practice;
 - iii) requirements of Annex A of this Management Plan in respect of maximum noise levels;
 - iv) working hours for construction works, including Annex B of this Management Plan;
 - v) selection, operation and maintenance of construction plant, machinery and equipment and the selection of construction methods and sequencing of construction works with regard to minimising noise and vibration effects;
 - vi) provision of all reasonably practicable means (mitigation) to achieve residual effects that are no worse than those defined in the Environmental Statement and Appropriate Assessment documents (that includes for example the commitments to employ best practicable means to minimise work at night and not to undertake percussive piling at night);
 - vii) provision of appropriate additional mitigation to minimise noise and vibration effects, which will, where necessary, include noise insulation or temporary re-housing; and
 - viii) development and implementation of an appropriate noise and vibration monitoring system.
- c) the contractors do not undertake any construction activities that are not covered by a Plan for Control of Noise and Vibration, unless these are exceptional works as defined in the Code of Construction Practice;
- d) the contractors do not undertake any construction activities covered by a Plan for Control of Noise and Vibration until the relevant plan is approved by the Employer's Representative;
- e) the contractors set out the general requirements in the Noise and Vibration Management Plan and specific measures in a Plan for Control of Noise and Vibration for monitoring to be employed. The monitoring set out will be implemented to provide assurance that works are being undertaken in

accordance with the plans and to provide appropriate warning when works may be outwith the plans. The monitoring set out will be implemented to enable appropriate actions to be taken before the noise effects in the Environmental Statement occurs may be exceeded; and

- f) the contractors undertake construction works in accordance with the approved Plans for Control of Noise and Vibration.
- 4.9 In considering whether to approve a Plan for Control of Noise and Vibration, the Employer's Representative will have regard to the requirements of the Forth Crossing Act 2011, the Environmental Statement, the Appropriate Assessment documents, the Code of Construction Practice, this Management Plan and the advice and recommendations of the Noise Liaison Group.
- 4.10 In planning construction activities, where required by the Code of Construction Practice (if noise effects are predicted by the contractor to be greater than those in the Environmental Statement), the contractor will seek approval from the relevant local authority. The contractor will only be permitted to seek local authority approval if the related Plan for Control of Noise and Vibration has been accepted by the Employer's Representative.
- 4.11 The contractor will only be permitted to undertake construction works in accordance with an approved Plan for Control of Noise and Vibration and where required, the approval of the relevant local authority.

Transparent and Auditable Process

- 4.12 The Scottish Ministers will ensure that the noise and vibration management and control process is fully transparent and auditable and can be used to demonstrate compliance with all relevant statutory and contract requirements. In being able to meet this obligation, the Scottish Ministers will ensure, including through enforcement of the construction contracts with the appointed contractors where appropriate, that:
- a) the contractors consult with, and take consideration of the views of, those regulatory bodies listed in paragraph 1.7.7 of the Code of Construction Practice and the Noise Liaison Group during development of their Environmental Management Plans and its subsidiary plans such as the Noise and Vibration Management Plan;
 - b) the contractors provide appropriate information relating to the planning and monitoring of noise and vibration to the Relevant Parties as part of their involvement in the Noise Liaison Group;
 - c) the contractors' Environmental Management Plan, including its subsidiary plans such as the Noise and Vibration Management Plan, are made publicly available on the project website; and
 - d) monitoring records are made publicly available on the project website.

4.13 The Scottish Ministers will keep appropriate records of the considerations given in approving any Plans for Control of Noise and Vibration and will make these available to the Relevant Parties upon request.

5 Roles and Responsibilities

5.1 The Scottish Ministers will:

- a) comply with their obligations under the Forth Crossing Act 2011 and ensure the contractors' compliance with the Environmental Statement, Appropriate Assessment documents and Code of Construction Practice through the construction contracts;
- b) attend and support the operation of the Noise Liaison Group as part of the means by which they will provide assurance that construction works are being undertaken in accordance with the Forth Crossing Act 2011, the Environmental Statement, Appropriate Assessment documents and the Code of Construction Practice;
- c) ensure that the Councils receive a monthly forward programme which identifies those activities which are likely to result in significant adverse noise effects resulting in community disturbance within their boundary, so they may provide advice to the Scottish Ministers on those activities prior to the issue of consent for construction;
- d) provide consent for construction works to be undertaken where noise and vibration levels are below the thresholds in the Code of Construction Practice only where it is demonstrated in Plans for Control of Noise and Vibration that the objectives of this Management Plan will be achieved;
- e) strictly enforce the terms of the contracts between the Scottish Ministers and the appointed contractors;
- f) procure or undertake appropriate investigations into noise and vibration as a result of their own monitoring of construction works or as a result of representations from the Relevant Parties or requests or complaints from other parties regarding noise and vibration;
- g) take appropriate actions (including requiring the contractors to take appropriate actions) following any representations from the Relevant Parties or where investigations undertaken demonstrate that construction works were not undertaken in accordance with the objectives of this Management Plan;
- h) ensure the contractor provides information to the Relevant Parties regarding any complaints received in relation to noise or vibration as soon as practicable after receipt of the complaint;
- i) procure or undertake such noise and vibration monitoring as is necessary to support their role in monitoring construction works and the contractors'

compliance with the Environmental Statement, Appropriate Assessment documents, Code of Construction Practice and construction contract;

- j) make available to the Relevant Parties the results of any investigations undertaken and provide information regarding any enforcement measures taken under the contract to control or improve the contractor's performance regarding noise and vibration;
- k) make their noise and vibration monitoring information available to the Relevant Parties and also to communities and the public through the project website; and
- l) in addition to ensuring that the information described in this Management Plan is provided to the Relevant Parties, be supportive of and accommodate (including requiring the contractors to support and accommodate) any investigations into noise and vibration or additional noise and vibration monitoring that the Relevant Parties wish to undertake.

5.2 The Employer's Representative will ensure the following activities which may be undertaken by The City of Edinburgh Council, Fife Council and West Lothian Council are accommodated:

- a) making representations regarding any aspect of noise and vibration management, control and effects to the Employer's Representative as they consider necessary to facilitate the undertaking of appropriate actions to meet the objectives of this Management Plan. This may include, for example, representations regarding the effects of noise due to activities which are either unforeseen or which it is not possible to cover in the Plans for Control of Noise and Vibration;
- b) providing any advice they consider necessary or appropriate to the Employer's Representative regarding construction activities which may cause community disturbance due to noise or vibration;
- c) providing information they consider appropriate to the Employer's Representative regarding any complaints received relating to noise or vibration to facilitate their undertaking of any investigations, which may be co-ordinated or undertaken jointly with any investigations undertaken by the local authorities, and undertaking of any other appropriate actions;
- d) undertaking appropriate investigations into noise and vibration as they consider necessary or in response to any complaint regarding noise and vibration, including undertaking any monitoring they consider appropriate;
- e) making available, as appropriate, to the Employer's Representative the results of any investigations into noise and vibration;
- f) making available to the Employer's Representative the results of any monitoring undertaken by them that they consider are appropriate so that this may be used to inform any future noise and vibration planning undertaken by the contractor and may be published on the project website

alongside monitoring undertaken by the Employer's Representative and the contractor;

6 Community Consultation

- 6.1 The Scottish Ministers will develop an ongoing community engagement strategy and will require the contractor to notify local residents of the nature and programme of upcoming construction activities in accordance with the Code of Construction Practice.
- 6.2 The Scottish Ministers and the contractors will bring forward proposals which will identify the most appropriate media conduits for the dissemination of information having regard to the scope of coverage, impact and timing in relation to the nature of several elements of information to be disclosed. The proposals will be reviewed by the Noise Liaison Group from time to time and recommendations from the Group will be taken into account in the ongoing development and improvement of the dissemination of information.
- 6.3 A 24 hour attended help line will be provided where enquiries and complaints can be made and which will provide rapid investigation, response to the query/complaint and corrective action (if necessary). The contractor will staff the help line and ensure that all enquiries and complaints are considered, appropriately addressed and that feedback is provided to those who have made the enquiry or complaint and to the relevant local authority.
- 6.4 In addition to the proposals developed in accordance with paragraph 6.2, above, the Scottish Ministers and the contractors will consult with communities through structured forums organised with community councils. These forums will provide an opportunity outside of the queries/complaints help line for communities to advise of any concerns they have so these may be considered and addressed as appropriate.
- 6.5 The information that will be made available through community consultation will include:
 - a) quarterly strategic programme of construction activity;
 - b) advance notice of two weeks for any planned potentially noisy activities close to homes or communities;
 - c) prompt notification of any delayed or emergency works which may result in the extension of inappropriate noise into evening or night time periods;
 - d) arrangements for monitoring activities adjacent to homes or communities; and
 - e) the results of monitoring activities and the comparison with predicted noise.

THE FORTH CROSSING ACT 2011:
THE SCOTTISH MINISTERS' MANAGEMENT PLAN –
CONSTRUCTION NOISE AND VIBRATION
LIST OF ANNEXES

- Annex A Maximum Noise Levels
- Annex B Hierarchy of Working Hours

Forth Replacement Crossing
The Scottish Ministers' Management Plan – Construction Noise And Vibration
Annex A Maximum Noise Levels

- A1.1 The construction noise & vibration assessment is reported in Chapter 19 of the Environmental Statement. The assessment uses the $L_{Aeq,T}$ environmental noise descriptor to assess noise levels outside potentially affected residential and noise sensitive non-residential receptors. The $L_{Aeq,T}$ indicator is the equivalent continuous A-weighted sound pressure level over the time period 'T' (i.e. an energy average over the assessment period 'T'). The 'A-weighting' reflects the varying sensitivity of the human ear to sound at different frequencies.
- A1.2 As BS 5228 notes the $L_{Aeq,T}$ indicator gives "an indication of loudness" at the receptor and is a "measure that is in general use and recommended internationally for the description of environmental noise".
- A1.3 Annex E of BS 5228 provides guidance on significance of noise effects and describes the 'ABC Method' (which takes account of existing ambient noise levels) that was used to assess construction noise for the FRC. The guidance provided in Annex E of the standard is in terms of the $L_{Aeq,T}$ indicator only.
- A1.4 Based on the guidance of BS 5228, Table 19.10 of the Environmental Statement identifies the noise Assessment Categories used to identify whether construction noise resulting from the scheme would give rise to a noise impact.
- A1.5 As noted by BS 5228 "when describing noise from isolated events that might not always be apparent from a longer period $L_{Aeq,T}$, it can be useful to use a short term $L_{Aeq,T}$ (e.g. T = 5 minutes). Alternatively the maximum sound level ... can be used". The L_{Amax} indicator evaluates the maximum instantaneous noise level during a measurement/assessment period.
- A1.6 BS 5228 provides no guidance on L_{Amax} noise levels in terms of noise effects on people in their homes or other noise sensitive receptors. Unlike the $L_{Aeq,T}$ indicator, there is very little source data available to enable maximum noise level predictions to be made.
- A1.7 Maximum noise levels can form a valuable part of managing noise from a construction site, especially in dealing with short term events that could cause disturbance but which might not significantly alter the $L_{Aeq,T}$ levels.
- A1.8 Where the L_{Amax} indicator has previously been used for construction noise it has generally been to consider the risk of sleep disturbance from repetitive, impulsive noise such as impact piling. It is committed in the Environmental Statement not to undertake percussive piling at night.
- A1.9 This Annex includes a table of maximum noise levels based on Table 19.10 of the Environmental Statement. For each of the ABC Assessment Categories, that reflect existing ambient noise levels, L_{Amax} noise level criteria are set out in addition to the standard $L_{Aeq,T}$ criteria.
- A1.10 The construction noise management regime for the scheme, as set out in the Management Plan, is focused on planning the works to ensure that the noise control is integrated into the works from the outset. This process will be informed by the contractor's forecasts of the construction noise $L_{Aeq,T}$ levels presented as part of its Plans for Control of Noise and Vibration, using the prediction methods and source data available from BS 5228. It will not be possible to make route forecasts of maximum noise levels (L_{Amax}) as no standard prediction method nor source terms data is available.

Forth Replacement Crossing
The Scottish Ministers' Management Plan – Construction Noise And Vibration
Annex A Maximum Noise Levels

- A1.11 The contractor will be required to identify as part of his Plans for Control of Noise and Vibration that cover activities to be undertaken during the evening and night time, those construction activities covered by each Plan that could give rise to significant impulsive noise events and the mitigation, or management processes, in accordance with best practicable means to minimise the impulsive noise.
- A1.12 The Contractor will be required, as part of the relevant Plan for Control of Noise and Vibration to provide forecasts for maximum noise levels for construction methods that generate loud and regular impulsive noise (e.g. percussively driven piles) where it is practicable to do so (i.e. where source data is available to support calculations). The contractor's Plan will be required to commit to mitigation to ensure, subject to best practicable means, that the maximum noise levels generated by the construction activity fall within the levels set out in Tables A1 and A2.
- A1.13 For short term programme critical works (e.g. demolition of the B800 bridge over the A90) the Employer's Representative, in consultation with the Noise Liaison Group), may approve a Plan for Noise and Vibration Control where the forecast or expected maximum noise levels are likely to exceed those defined in Tables A1 and A2. In such cases, information will be provided to local residents in advance of the approved works explaining the nature, duration and likely noise impact of the works.
- A1.14 For the majority of construction works the maximum noise levels in Tables A1 and A2, will be used as part of the noise monitoring regime implemented once the construction works are being undertaken. Attended monitoring by competent acoustic specialists will be undertaken at the start of each new phase of work. This is to confirm that any noise generated is in line with the approved Plan for Control of Noise and Vibration (and local authority consent where relevant). Monitoring will then be undertaken by a mixture of continuous unattended monitoring and further short term attended monitoring over the duration of the construction activity to assure ongoing compliance with the relevant Plan (and local authority consent where relevant).
- A1.15 Where measured levels are identified as exceeding, or being likely to exceed, the relevant maximum noise level criterion and it is confirmed that the works being undertaken as part of the scheme are the source of the noise, then the contractor will be required to undertake a further review of the best practicable means employed for the activity to minimise noise. At night, the contractor will be required to investigate the exceedence or likely exceedence immediately, report this and the findings of the review to the Relevant Parties and implement any further mitigation identified as soon as is reasonably practicable. At other times, the same actions will be taken except that the review may be reported within 3 days. Where the exceedence coincides with a noise complaint, then the contractor shall implement any additional mitigation identified by the investigation before the next shift when the relevant activity will be undertaken again (i.e. if the maximum level exceedence and complaint occur at night then the additional mitigation shall be implemented by the contractor before the same works can be undertaken at night again).
- A1.16 Whilst undertaking the investigations, the contractor will be permitted to continue construction works provided the relevant criterion is not exceeded by more than 5dB(A) unless instructed otherwise by the Employer's Representative. The

Forth Replacement Crossing
The Scottish Ministers' Management Plan – Construction Noise And Vibration
Annex A Maximum Noise Levels

Employer's Representative shall consider whether best practicable means are being used to minimise noise and take appropriate consideration of any advice provided by the Noise Liaison Group in making his determination.

A1.17 The Employer's Representative will consider the report provided by the contractor, including taking appropriate consideration any advice provided by the Noise Liaison Group. Where it is accepted by the Employer's Representative following this consideration that:

- (a) an activity will significantly exceed the Category C maximum noise levels;
- (b) the resulting maximum noise levels would seriously affect the enjoyment of property for a substantial period of time; and
- (c) there is no additional best practicable means mitigation that could be implemented at source to avoid an ongoing exceedence;

then the contractor will be required to consider additional mitigation at the receptor consistent with the measures set out in the Code of Construction Practice (e.g. provision of noise insulation or temporary re-housing).

A1.18 The Noise Liaison Group may review the maximum noise level criteria set out in this Annex, particularly at the start of each new phase of major construction activities. The review will take account of matters including, but not limited to:

- (a) noise complaints received;
- (b) the correlation between FRC noise events, their maximum noise levels and any complaints;
- (c) the need to minimise 'false triggering' of mitigation reviews;
- (d) best practicable means; and
- (e) the need to minimise overall noise exposure (e.g. balancing maximum noise levels with the duration of the relevant works).

A1.19 This Annex may be updated with any revised maximum noise level criteria agreed by the Relevant Parties.

**Forth Replacement Crossing
The Scottish Ministers' Management Plan – Construction Noise And Vibration
Annex A Maximum Noise Levels**

Table A1: Construction Noise Impact Criteria (based on Table 19.10 of the Environmental Statement) – Main Crossing

Period (refer to CoCP)	Assessment time	Assessment Category					
		A		B		C	
		L _{Aeq,T}	L _{Amax}	L _{Aeq,T}	L _{Amax}	L _{Aeq,T}	L _{Amax}
Night	1 hr	45	65	50	70	55	75
Evening	1 hr	55	75	60	80	65	85
Day ⁽¹⁾	12 hr	65	85	70	90	75	95

Category A: are threshold values to use when ambient noise levels (rounded to the nearest 5 dB) are less than the category A L_{Aeq} values.

Category B: are values to use when ambient noise levels (rounded to the nearest 5 dB) are the same as category A L_{Aeq} values.

Category C: are values to use when ambient noise levels (rounded to the nearest 5 dB) are higher than category A L_{Aeq} values.

Criteria in the FRC Environmental Statement to identify noise impacts and significant adverse noise effects.

All L_{Amax} noise levels are L_{Amax,F} (Fast time response).

Measured exceedence of maximum noise level thresholds triggers additional review of Best Practicable Means as defined in this Annex.

All noise levels are measured 1m from windows in the façade of a noise sensitive receptor facing the construction works

(1) Percussive piling permitted where it is shown to be best practicable means. A criterion of 96 dBL_{Amax} will apply for percussive piling in all daytime Assessment Categories. Duration of piling operations may need to be controlled in accordance with the relevant L_{Aeq,T} criterion.

Forth Replacement Crossing
The Scottish Ministers' Management Plan – Construction Noise And Vibration
Annex A Maximum Noise Levels

Table A2: Construction Noise Impact Criteria - Road Connections

Period (refer to CoCP)	Assessment time	Assessment Category					
		A		B		C	
		$L_{Aeq,T}$	L_{Amax}	$L_{Aeq,T}$	L_{Amax}	$L_{Aeq,T}$	L_{Amax}
Night	1 hr	45	65	50	70	55	70
Evening	1 hr	55	75	60	80	65	85
Weekday	11 hr	65	85	70	90	75	95
Saturday	10 hr	65	85	70	90	75	95

Category A: are threshold values to use when ambient noise levels (rounded to the nearest 5 dB) are less than the category A L_{Aeq} values.

Category B: are values to use when ambient noise levels (rounded to the nearest 5 dB) are the same as category A L_{Aeq} values.

Category C: are values to use when ambient noise levels (rounded to the nearest 5 dB) are higher than category A L_{Aeq} values.

Criteria in the FRC Environmental Statement to identify noise impacts and significant adverse noise effects.

All L_{Amax} noise levels are $L_{Amax,F}$ (Fast time response).

Measured exceedence of maximum noise level thresholds triggers additional review of Best Practicable Means as defined in this Annex.

All noise levels are measured 1m from windows in the façade of a noise sensitive receptor facing the construction works

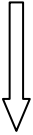

Forth Replacement Crossing Principal Contract Plans for Control of Noise and Vibration - Checklist

Best Practicable Means

- B1.1 A fundamental commitment within the Environmental Statement and the Code of Construction Practice is to employ best practicable means to minimise noise and vibration for all works and at all times.
- B1.2 Minimising work beyond normal working hours (defined by the Code of Construction Practice as 0700 to 1900 Monday to Saturday) is a fundamental of minimising noise and vibration impact on residential property.
- B1.3 As with any major infrastructure project there will be periods of work that will need to be undertaken outside of normal working hours (e.g. demolition of a bridge over an operational road, large scale concrete pours). The need for works outside normal working hours will be considered on a case-by-case basis as part of the contractor's Plans for Control of Noise and Vibration, as explained in the Memorandum of Understanding, which will be submitted to the Employer's Representative for approval.
- B1.4 It is accepted from the outset that the marine works associated with the construction of the main crossing will require night-time and weekend working. For example this is because of constraints associated with:
- (a) tidal conditions;
 - (b) the scale of the marine works and the need to complete structures such as foundation piles once started to ensure completion of the works and structural integrity (e.g. the need to avoid cold joints which would occur if each concrete pour was stopped part way through); and
 - (c) the requirement for scarce and very expensive specialist construction equipment.
- B1.5 Chapter 19 of the Environmental Statement assesses the likely noise and vibration impact arising from these works.
- B1.6 In providing a best practicable means justification for extended working, in addition to minimising noise and vibration at source or adverse effects through other mitigation measures, the contractor will be required to demonstrate that, on a hierarchical basis, it has considered undertaking works in those hours that minimise potential disturbance.

**Forth Replacement Crossing Principal Contract
Plans for Control of Noise and Vibration - Checklist**

B1.7 In terms of noise and vibration control, the hierarchy of extended working hours outwith normal working hours is set out in the table below.

Potential Additional Noise Impact	Preference	Extended Working Hours	
		Areas with low ambient noise	Areas with high ambient noise
Lowest  Highest	Most preferred  Least preferred	Sunday 10:00 to 19:00	Evenings 19:00 to 22:00
		Sunday 07:00 to 10:00	Sunday 10:00 to 19:00
		Evenings 19:00 to 22:00	Sunday 07:00 to 10:00
		Night-time 22:00 to 07:00	Night-time 22:00 to 07:00

B1.8 The contractor will be required to employ best practicable means to provide a respite period each week except where it is accepted by the Employer’s Representative through the Plans for Control of Noise and Vibration that continuous working over this period is necessary for certain activities. In evaluating best practicable means that Contractor will be required to consider:

- (a) local community needs (e.g. controlling construction noise in the evening in dense, currently quiet residential areas with young children) as well as construction requirements (e.g. safety, engineering practicability etc); and
- (b) the cumulative effect of additional working hours (for example there is a greater need to control evening construction noise, and/or provide respite periods during the weekends, if the works are concurrent with major daytime activities and already permitted long term noisy night-time activities).