



Barnesmore Gap Greenway

Appendix 13.1: Construction Noise Assumptions and Information

Donegal County Council

Table of Contents

13.1	INTRODUCTION.....	1
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Table of Tables

TABLE 13-1-1 -	PLANT AND EQUIPMENT ASSOCIATED WITH CONSTRUCTION WORKS	3
TABLE 13-1-2 -	INDICATIVE DISTANCE BAND CALCULATIONS FOR STATIC ACTIVITIES SCHEDULED IN THE PROPOSED DEVELOPMENT (WITH 10 dB AND 5 dB MITIGATION)	7
TABLE 13-1-3 -	DISTANCE AND NUMBER OF NSRs FROM STATIC ACTIVITIES	8

13.1 Introduction

The indicative construction noise levels were calculated using the procedures for prediction of construction noise set out in BS5228- 1:2009+A1:2014.

This assessment is based on the current understanding of the proposed development's design and construction methodology. A detailed construction programme is not currently available as this is determined by the Principal Contractor (hereafter referred to as 'the Contractor') which has not yet been appointed. Where construction details cannot be confirmed, reasonable worst-case scenario estimates have been made based on experience gained on similar developments and using professional judgement. Further details on the construction of the proposed development are set out in Chapter 4: Description of the proposed development.

At present, the potential noise effects related to the construction of structures such as culverts, bridges, temporary site facilities, car parks, trail heads and underpasses are predicted taking account of distances between the proposed location of the structure and NSRs within 300 metres of the works (as a worst-case scenario). Distances between sources and receivers were calculated using the geodirectory provided. The distances are an approximation based on the structure and residential building points provided and do not consider the true extent of each building or activity, additionally multiple NSR points from the geodirectory provided are located in a same building (i.e., flats in an apartment). All source–receiver distances have been shortened by 5 metres to reduce the risk of underestimating the noise levels caused by point-to-point measurements. This can be reviewed by the Contractor and if necessary calculated with greater precision to confirm the plant/equipment to adhere with the maximum permissible noise thresholds stated in this EIAR.

Construction activities will adhere to the anticipated working hours of (08:00 – 18:00) Monday to Friday with reduced hours on Saturday (08:00 – 14:00).

Works other than the pumping out of excavations, security and emergency works will not be undertaken outside these working hours without the written permission of Donegal County Council. Works shall not be permitted on Sundays or Bank Holidays.

24-hour working will be required for the construction of the three underpasses under the N15/N56 national roads. Each underpass location will require 1-2 weekends where construction activities take place outside of normal working hours (24 hours a day) while the national road is closed, as outlined in Chapter 4: Description of the Proposed Development.

In exceptional cases, where work that may lead to noise disturbance is required outside these hours, prior notification will be provided to the local authority and affected residents. It is assumed that any noise disturbance outside the standard working hours will comply with the maximum permissible noise levels in Table 13-2 and periods not covered in TII guidance using BS 5228-1 category A criteria as described in Table 13-3 in Chapter 13: Noise and Vibration for the relevant time period.

Construction operations can occur at three separate locations with a distance between them of approximately 10km. However, it is not expected that noise emission from works will contribute cumulatively across the three separate locations.

Information regarding construction activities along the route of the proposed development per structure family (see Chapter 4: Description of the Proposed Development) and the associated plant type were provided without specification of quantity or percentage on time. One of each construction plant and a % on time of a 10-hour working day is described in Table 13-1-1.

Topography, which may provide additional screening, is not included in this calculation. The surrounding ground type has been assumed to be 90% soft ground since the route generally runs through rural areas. All plant has been assumed to be static for:

- Temporary Site Facilities (Compounds; Access and Working areas)
- Drainage, Culvert and Swale Installation

- Bridge Foundation Construction: Excavation for Foundations
- Bridge Foundation Construction: Piling Scope
- Bridge Substructure Base, abutments and piers
- Bridge: Installation of Bridge Deck
- Underpass Construction: Excavation and Shoring
- Underpass Construction: Uplifting and Binding
- Underpass Construction: Retaining Wall and Headwall
- Underpass Construction: Waterproofing, Backfilling
- Car Park Construction
- Watercourses, scoping for sheet piling
- Existing Bridges Retrofit: Site Establishment and Enabling
- Existing Bridges Retrofit: Masonry Arch Repair and Repoint
- Existing Bridges Retrofit: Finishing
- Existing Bridges Retrofit: Masonry Arch Concrete Saddling

While plant is set to be mobile for works along the proposed development, the distances have been derived from an initial programme, where a month consists of 20 working days (Monday to Friday):

- Clearing and Grubbing uses a rate of construction of 540 metres per day.
- Fencing and Protection uses a rate of construction of 270 metres per day.
- Earthworks use a rate of construction of 77 metres per day.
- Pavement uses a rate of construction of 135 metres per day.

Note that the calculations carried out at Phase 3 are indicative and consistent with the level of information available at the time. Where necessary, mitigation measures and appropriate strategies will be reviewed and confirmed by the construction contractor once the construction plant, methods, and traffic management plans have been finalized. This process will ensure that construction noise thresholds and limits for the relevant time periods are adhered to, in accordance with the requirements outlined in the Construction Environmental Management Plan (CEMP).

Information regarding traffic for the assessment is missing speed information, the speed has therefore been assumed to be that of the speed limit on the roads assessed. There are assumed to be no changes in speed for the with Proposed Development and without Proposed Development traffic. All traffic predictions have been evaluated at a horizontal distance of 10 metres from the carriageway.

A full list of plant associated with construction activities and associated sound power data from BS5228 and % on time is presented in Table 13-1-1.

Table 13-1-1 - Plant and equipment associated with construction works

Activity	Plant	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
				63	125	250	500	1k	2k	4k	8k		
Temporary Site Facilities	Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Rollers	1	80	112	112	106	98	98	98	95	89	105	BS 5228: Tab C.5 #26
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
Clearing and Grubbing	Mulchers	1	50	112	112	110	113	116	115	111	105	121	From HSE research report RR618 for Chipper C Trimmed hardwood
	Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Chainshaws	1	50	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Skid Steer Loaders	1	80	104	101	90	94	90	87	82	77	96	BS 5228: Tab C.3 #20
Fencing and Protection	Post Hole Diggers or Augers	1	60	115	114	105	101	103	100	95	87	107	BS 5228: Tab C.3 #16
	Excavators (3-5t)	1	60	115	107	104	98	96	92	85	76	102	BS 5228: Tab C.4 #67
Earthworks	Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Dozers	1	80	113	102	104	101	100	106	90	84	109	BS 5228: Tab C.2 #12
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Rollers	1	80	112	112	106	98	98	98	95	89	105	BS 5228: Tab C.5 #26
Drainage, Culvert and Swale Installation	Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Backhoe Loaders	1	80	102	94	92	92	91	88	87	78	96	BS 5228: Tab C.2 #8
	Crawler Cranes	1	80	109	105	97	95	90	88	89	79	98	BS 5228: Tab C.3 #29
	Wheel Loaders	1	80	100	91	95	95	91	90	84	78	97	BS 5228: Tab C.4 #66
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4

Activity	Plant	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
				63	125	250	500	1k	2k	4k	8k		
Pavement	Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Paver	1	80	106	105	100	100	99	97	90	84	103	BS 5228: Tab C.5 #30
	Dump Trucks (6t)	1	80	117	114	105	102	100	100	94	90	107	BS 5228: Tab C.4 #6
	Rollers (2t)	1	80	113	98	90	90	89	87	81	73	95	BS 5228: Tab C.5 #27
Bridge Foundation Construction: Excavation for Foundations	Excavators	1	80	113	106	105	105	101	99	96	91	107	BS 5228: Tab C.2 #14
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Dewatering Pumps	1	80	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
Bridge Foundation Construction: Piling Scope	Excavators	1	80	113	106	105	105	101	99	96	91	107	BS 5228: Tab C.2 #14
	Piling Rig (CFA)	1	80	112	120	109	108	106	104	96	89	111	BS 5228: Tab C.3 #14
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Dewatering Pumps	1	80	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
Bridge Sub-structure Base, abutments and piers	Articulated trucks	1	80	118	115	105	107	103	101	95	91	109	BS 5228: Tab C.4 #1
	Concrete Mixer	1	80	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Rollers	1	80	112	112	106	98	98	98	95	89	105	BS 5228: Tab C.5 #26
	Drainage Installation Equipment	1	80	Not Significant									
	Mobile Crane	1	80	108	100	99	95	93	90	85	77	98	BS 5228: Tab C.3 #30
Installation of Bridge Deck	Mobile Cranes	1	80	108	100	99	95	93	90	85	77	98	BS 5228: Tab C.3 #30
	Articulated trucks	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
Underpass Construction: Excavation and Shoring	Large Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Dewatering Pumps	1	80	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
Underpass Construction: Uplifting and Binding	Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4

Activity	Plant	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
				63	125	250	500	1k	2k	4k	8k		
Underpass Construction: Retaining Wall and Headwall	Concrete Truck	1	80	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
	Cranes	1	80	108	100	99	95	93	90	85	77	98	BS 5228: Tab C.3 #30
	Articulated trucks	1	80	113	108	105	100	102	98	93	86	106	BS 5228: Tab C.4 #2
Underpass Construction: Waterproofing, Backfilling	Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Rollers	1	80	112	112	106	98	98	98	95	89	105	BS 5228: Tab C.5 #26
	Compactors	1	80	104	106	102	105	105	105	101	98	110	BS 5228: Tab C.5 #29
Car Park Construction	Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Lorries	1	20	101	106	106	106	102	101	96	94	108	BS 5228: Tab C.2 #34
Existing Bridges Retrofit: Site establishment	Large Excavators	1	80	100	99	102	101	97	94	91	86	103	BS 5228: Tab C.2 #16
	Scaffolding Trucks	1	20	101	106	106	106	102	101	96	94	108	BS 5228: Tab C.2 #34
	MEWP	1	80	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
Existing Bridges Retrofit: Masonry Arch Repair and Repoint	Pressure Washer	1	80	103	103	90	86	83	82	76	68	91	BS 5228: Tab C.3 #13
	Handheld pneumatic breaker	1	80	111	111	109	102	101	104	106	105	111	BS 5228: Tab C.1 #6
	Mortar mixer	1	80	89	93	86	86	85	81	79	77	89	BS 5228: Tab C.4 #23
	Grout Pump	1	80	115	115	105	104	102	101	95	87	108	Overall sound power level from BS 5228: Tab D.5 #49. Spectrum from BS 5228: Tab C.3 #26
Existing Bridges Retrofit: Finishing	Telehandler	1	80	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Paver	1	80	106	105	100	100	99	97	90	84	103	BS 5228: Tab C.5 #30
	Vibratory Roller	1	80	112	112	106	98	98	98	95	89	105	BS 5228: Tab C.5 #26
	Excavator with attachment	1	80	103	103	90	86	83	82	76	68	91	BS 5228: Tab C.3 #13

Activity	Plant	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
				63	125	250	500	1k	2k	4k	8k		
Existing Bridges Retrofit: Masonry Arch Concrete Saddling	Small Excavator	1	80	115	107	104	98	96	92	85	76	102	BS 5228: Tab C.4 #67
	Pressure Washer	1	80	103	103	90	86	83	82	76	68	91	BS 5228: Tab C.3 #13
	Telehandler	1	80	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Concrete Truck	1	80	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
	Dump Trucks	1	80	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	Rollers	1	80	112	112	106	98	98	98	95	89	105	BS 5228: Tab C.5 #26
	Compactors	1	80	104	106	102	105	105	105	101	98	110	BS 5228: Tab C.5 #29
Watercourse Sheet Piling	Sheet Piling Rig	1	80	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8

Table 13-1-2 - Indicative distance band calculations for static activities scheduled in the proposed development (with 10 dB and 5 dB mitigation)

Distance from the works (m)	Predicted façade noise levels (L_{Aeq} , dB)															
	Temporary Site Facilities	Drainage, Culvert and Swale Installation	Bridge Foundation Construction: Excavation for Foundations	Bridge Foundation Construction: Piling Scope River Eske and Finn	Bridge Substructure Base, abutments and piers	Superstructure Construction: Steel Superstructure Installation of Bridge Deck	N56 Underpass Construction: Excavation and Shoring	N56 Underpass Construction: Uplifting and Binding	N56 Underpass Construction: Retaining Wall and Headwall	N56 Underpass Construction: Waterproofing, Backfilling	Car Park Construction	Existing Bridges Retrofit: Site establishment	Existing Bridges Retrofit: Masonry Arch Repair and Repoint	Existing Bridges Retrofit: Finishing	Existing Bridges Retrofit: Masonry Arch Concrete Saddling	Watercourse Sheet Piling
10	73 - 78	72 - 77	73 - 78	77 - 82	77 - 82	68 - 73	71 - 76	74 - 79	71 - 76	77 - 82	72 - 77	70 - 75	77 - 82	74 - 79	79 - 84	80 - 85
50	58 - 63	56 - 61	58 - 63	62 - 67	62 - 67	53 - 58	55 - 60	59 - 64	55 - 60	61 - 66	57 - 62	55 - 60	61 - 66	59 - 64	63 - 68	65 - 70
100	50 - 55	49 - 54	50 - 55	54 - 59	55 - 60	46 - 51	48 - 53	52 - 57	48 - 53	54 - 59	49 - 54	47 - 52	54 - 59	52 - 57	56 - 61	57 - 62
150	46 - 51	45 - 50	46 - 51	50 - 55	50 - 55	41 - 46	44 - 49	47 - 52	44 - 49	49 - 54	45 - 50	43 - 48	50 - 55	47 - 52	52 - 57	53 - 58
200	43 - 48	42 - 47	43 - 48	47 - 52	47 - 52	38 - 43	41 - 46	44 - 49	41 - 46	46 - 51	42 - 47	40 - 45	47 - 52	44 - 49	49 - 54	50 - 55
250	40 - 45	39 - 44	40 - 45	45 - 50	45 - 50	36 - 41	38 - 43	42 - 47	38 - 43	44 - 49	39 - 44	37 - 42	44 - 49	42 - 47	46 - 51	48 - 53
300	39 - 44	37 - 42	39 - 44	43 - 48	43 - 48	34 - 39	36 - 41	40 - 45	36 - 41	42 - 47	38 - 43	36 - 41	42 - 47	40 - 45	44 - 49	46 - 51

Table 13-1-3 - Distance and number of NSRs from static activities

Distance from the works (m)	Number of residential dwelling NSRs within distance band											
	Temporary Site Facilities - Compounds	Temporary Site Facilities - Access	Drainage – Attenuation Areas	Drainage – Ditches/Pipes	Culverts	Bridge Foundation Excavation, Substructure and Deck Installation	Bridge Foundation Piling Scope, Substructure and Deck Installation: River Eske	Bridge Foundation Piling Scope, Substructure and Deck Installation: River Finn	Underpass construction works	Car Parks and Trailheads	Existing Bridges	Watercourse - Sheet Piling Scoping
10	0	0	0	0	0	0	0	0	0	0	0	0
50	14	27	16	71	0	0	0	1	0	2	0	0
100	24	47	81	117	3	1	0	1	1	3	0	0
150	45	64	110	124	5	5	0	2	5	5	8	0
200	49	77	112	121	16	7	0	7	5	6	5	0
250	28	96	126	84	6	5	0	11	1	14	5	0
300	50	132	116	96	12	7	1	21	22	19	10	5

