



Forth Replacement Crossing

**Employer's Delivery Team
Construction Noise Monitoring Report**

**Principal Contract and M9J1a Contract
(November 2012)**



An agency of  **The Scottish Government**



FORTH REPLACEMENT CROSSING

**EMPLOYER'S DELIVERY TEAM
CONSTRUCTION NOISE MONITORING REPORT
PRINCIPAL CONTRACT AND M9J1A CONTRACT
(November 2012)**

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FORTH REPLACEMENT CROSSING

**EMPLOYER'S DELIVERY TEAM
CONSTRUCTION NOISE MONITORING REPORT**

CONTENTS

1. INTRODUCTION..... 1

2. PRINCIPAL CONTRACT NOISE MONITORING 2

3. M9 J1A CONTRACT NOISE MONITORING 6

**APPENDIX A – PRINCIPAL CONTRACT – CONSTRUCTION NOISE MONITORING
REPORTS**

**APPENDIX B - M9 J1A CONTRACT – CONSTRUCTION NOISE MONITORING
REPORTS**

1. INTRODUCTION

1.1 This report sets out the results of the construction noise monitoring undertaken on the Forth Replacement Crossing project.

1.2 The noise monitoring periods covered in this report are as follows:

- Principal Contract: November 2012 – refer to Section 2 of this report.
- M9 Junction 1a Contract: November 2012 – refer to Section 3 of this report.

1.3 Noise monitoring from the Fife ITS Contract is reported separately.

2. PRINCIPAL CONTRACT NOISE MONITORING

NOISE MONITORING LOCATIONS

2.1 Continuous noise monitoring was carried out at the fixed monitor locations in Table 2.1 below. The main construction activities carried out adjacent to the monitor locations are also listed.

Monitoring Location	Monitoring Period	Main Construction Activities
Whinny Hill (M1)	November 2012	<ul style="list-style-type: none"> • Drilling for blasting • Blasting • Breaking and excavation of rock • Haulage of rock
Tigh-Na-Grian (M3)	November 2012	<ul style="list-style-type: none"> • On-going works at Central Tower • North Tower Caisson Excavation • Installation of Pier N1 platform
Port Edgar (M6)	November 2012	<ul style="list-style-type: none"> • On-going works at Central Tower • South Tower jet grouting • S4 excavation
Butlaw Fisheries (M7)	November 2012	<ul style="list-style-type: none"> • On-going works at CT • ST jet grouting • Pier S4 excavation • Works at Piers S7 & S8 • Pier S6 access track drainage works & earth bund • Verge clearance at Society Road
Inchgarvie Lodge (M10)	November 2012	<ul style="list-style-type: none"> • On-going works at Central Tower • South Tower jet grouting • Pier S4 excavation • Works at piers S7 & S8 • Pier S6 access track drainage works & earth bund • Excavation of material from launch and south abutment • Concreting works • Verge clearance at Society Road
Linn Mill (M11)	November 2012	<ul style="list-style-type: none"> • Excavation of material from launch and south abutment • Concreting works
Clufflat Brae (M13)	November 2012	<ul style="list-style-type: none"> • Excavation of material from launch and south abutment • Concreting works • Drainage connection to SUDS pond

Springfield (M14)	November 2012	• Excavation of material from launch
Echline Field (M15)	November 2012	• Cut/Fill from Queensferry gyratory
Scotstoun (M16)	November 2012	• Import of materials • Utility works
Dundas Home Farm (M17)	November 2012	• Utilities works • Earthworks
Newton (M18)	November 2012	• No works

Table 2.1 Principal Contract – Long Term Monitoring Locations

NOISE MONITORING RESULTS

- 2.2 Monitoring results from the Principal contract are contained in Appendix A of this report. The results are presented in a report containing noise charts using the template contained in the Construction Noise Monitoring Information Note which is available on the project website at [http://www.transportscotland.gov.uk/files/documents/projects/forth-replacement/FRC Construction Noise Monitoring Information Note 2 .pdf](http://www.transportscotland.gov.uk/files/documents/projects/forth-replacement/FRC_Construction_Noise_Monitoring_Information_Note_2_.pdf).
- 2.3 Some exceedances of the maximum noise level thresholds occurred in November, however the majority of these are not considered to be due to construction works being carried out. Exceedances of the maximum noise level threshold at Linn Mill, Clufflat Brae, Tigh-Na-Grian and Butlaw Fisheries were attributed to construction works.
- 2.4 Exceedances of the monthly average threshold were recorded at Scotstoun, Clufflat Brae, Linn Mill and Butlaw Fisheries.
- 2.5 All exceedances were investigated in accordance with the project Code of Construction Practice.
- 2.6 All exceedance reports are available on request from the FRC Team, contactable via email at enquiries@forthreplacementcrossing.info. A summary of the information included in the exceedance reports is provided in Table 2.2 overleaf.

Monitoring Location	Exceedance
Butlaw Fisheries (M7)	During November the maximum noise threshold was exceeded on 37 occasions (daytime, 10; evening, 5; night time, 22). Two daytime exceedances were found to be due to works at the S6 earth bund while 3 night time exceedances were related construction works, including jet grouting and the drone of an engine the estuary. However, a large number of exceedances were attributed to a range of non-construction factors, including waves on the shore, wind, birds (particularly during the early hours of the morning), fireworks and vehicles.
Clufflat Brae (M13)	During November the maximum noise threshold was exceeded on 43 occasions (daytime, 12; evening, 8; night time, 23). Three daytime exceedances were found to be due vehicle horns associated with construction works in close proximity to the meter. Three night time exceedances were also related to construction works, including jet grouting and the drone of an engine the estuary. A large number of the exceedances were also found to be due to birds, adverse weather conditions and fireworks (particularly in the evening period).
Inchgarvie Lodge (M10)	During November the maximum noise threshold was exceeded on 35 occasions (daytime, 13; evening, 9; night time, 13). No exceedances were found to be due to construction works. However, investigations found movements at the property, birds and fireworks to be the main contributing factors to the exceedances at this location.
Linn Mill (M11)	During November the maximum noise threshold was exceeded on 41 occasions (daytime, 16; evening, 9; night time, 16). Two exceedances were due to construction works. However, the majority of exceedances were caused by a number of non-construction factors, notably adverse weather conditions, fireworks and birds.
Tigh-Na-Grian (M3)	During November the maximum noise threshold was exceeded on 23 occasions (daytime, 4; evening, 1; night time, 18). Eleven night time exceedances were found to be due to construction works at the North Tower caisson. However, other exceedances were also due to non-construction factors including birds and fireworks.
Dundas Home Farm (M17)	During November the maximum noise threshold was exceeded on 3 occasions. Exceedances were not attributable to construction works. Exceedances were due to birds and monitor maintenance.
Echline Field (M15)	During November the maximum noise threshold was exceeded on 26 occasions. No exceedances at this location were due to construction activities. Exceedances were largely attributed to vehicles passing by on the adjacent roads.

Monitoring Location	Exceedance
Springfield (M14)	During November the maximum noise threshold was exceeded on 10 occasions. No exceedances at this location were due to construction activities. The majority of non-construction related exceedances were due to residents at the nearby properties, dogs and birds.
Scotstoun (M16)	During November the maximum noise threshold was exceeded on 15 occasions. Exceedances were attributed to vehicles passing by on the adjacent road.
Whinny Hill (M1)	During November the maximum noise threshold was exceeded on 11 occasions. Exceedances were not due to construction activities. A range of factors were found to cause exceedances at this location, including vehicles, dogs and monitor maintenance.

Table 2.2 Principal Contract – Summary of Noise Threshold Exceedances

3. M9 J1A CONTRACT NOISE MONITORING

NOISE MONITORING LOCATIONS

3.1 Continuous noise monitoring was carried out at the fixed monitor locations in Table 3.1 below. The main construction activities carried out adjacent to the monitor locations are also listed.

Monitoring Location	Monitoring Period	Main Construction Activities
93/95 King Edwards Way (CNV02)	November 2012	<ul style="list-style-type: none">• Pavement works on eastbound merge slip• Roadmarking works on eastbound merge slip• Niddry Burn mammal ledge
15-17 Buie Rigg (CNV07)	November 2012	<ul style="list-style-type: none">• Pavement works on eastbound merge slip & southbound M9 Spur• Pavement works on eastbound merge slip & southbound M9 Spur• Erection of traffic signs on eastbound merge slip
8 Kirklands Park Grove (CNV16)	November 2012	<ul style="list-style-type: none">• Pavement works on eastbound merge slip & southbound M9 Spur• Pavement works on eastbound merge slip & southbound M9 Spur• Pavement works on eastbound merge slip & southbound M9 Spur• Pavement works continued on eastbound merge slip & southbound M9 Spur

Table 3.1 M9 J1a Contract – Long Term Monitoring Locations

NOISE MONITORING RESULTS

3.2 Monitoring results from the M9 Junction 1a contract are contained in Appendix B of this report. The results are presented in charts using the template contained in the Construction Noise Monitoring Information Note which is available on the project website at http://www.transportscotland.gov.uk/files/documents/projects/forth-replacement/FRC_Construction_Noise_Monitoring_Information_Note_2_.pdf.

3.3 Some exceedances of the maximum noise level thresholds occurred in November, however the majority of these are not considered to be due to construction works

being carried out. Four exceedances were attributed to construction works at King Edwards Way, three exceedances were attributed to construction works at Buie Rigg and three exceedances were attributed to construction works at Kirklands Park Grove.

- 3.4 All exceedances of the maximum noise level thresholds were investigated in accordance with the project Code of Construction Practice.
- 3.5 An exceedance of the monthly average threshold was recorded at Buie Rigg.
- 3.6 Summary information regarding the exceedances of the maximum noise level thresholds is provided In Table 3.2 below. Copies of the exceedance reports are contained in Appendix B to this report.

Monitoring Location	Contractor's Exceedance Report Reference	Exceedance
93/95 King Edwards Way (CNV02)	NERs 208 - 212	During November the maximum noise threshold was exceeded on 23 occasions (daytime, 3; evening, 5; night, 15) with 4 of the exceedances being attributed to construction works. The construction related exceedances are attributed to plant movements and pavement works (See NERs 208, 209, 210, 211 & 212).
15-17 Buie Rigg (CNV07)	NER 213 - 216	During November the maximum noise threshold was exceeded on 33 occasions (evening, 4; night, 29) with 3 of the exceedances being attributed to construction works. The construction related exceedances are attributed to surfacing works (See NERs 213, 215 & 216).
8 Kirklands Park Grove (CNV16)	NERs 213 - 216	During November the maximum noise threshold was exceeded on 32 occasions (evening, 4; night, 28) with 3 of the exceedances being attributed to construction works. The construction related exceedances are attributed to surfacing works (See NERs 213, 214 & 216).

Table 3.2 M9 J1a Contract – Summary of Noise Threshold Exceedance

APPENDIX A -

**PRINCIPAL CONTRACT - CONSTRUCTION
NOISE MONITORING REPORTS**



Contractor



Forth Crossing Bridge Constructors

HOCHTIEF Solutions
American Bridge International
DRAGADOS
Morrison Construction

Project **FORTH REPLACEMENT CROSSING**

Document title

**CONSTRUCTION NOISE MONITORING REPORT:
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Contents

- 1. Introduction**
- 2. Noise Monitoring Locations**
- 3. Noise Monitoring Results**

1 Introduction

- 1.1** Monitoring of construction noise is being undertaken by FCBC during the construction of the new Forth Crossing and the associated road network. This report covers the month of November 2012. The objective of this report is to detail the monitoring that has been undertaken across the site during this period and to present the construction noise monitoring results acquired for November 2012.
- 1.2** Monitoring of construction noise has been undertaken in accordance with the Code of Construction Practice (CoCP) and the Noise and Vibration Management Plan (NVMP).

2 Noise Monitoring Locations

- 2.1** During November 2012, construction noise was monitored using permanent, continuous noise monitoring devices at the locations listed in Table 1. The majority of the monitors were installed throughout November and December 2011, with additional monitors installed at Scotstoun Park (Arup's Office) and Newton during February and a further sound level meter installed at Whinny Hill during March.
- 2.2** At some monitoring locations, the noise monitoring devices are accompanied by associated weather stations. Weather stations are present at Echline Field, Tigh-Na-Grian, Clufflat Brae, Dundas Home Farm, Butlaw Fisheries, Linn Mill and Whinny Hill.
- 2.3** Various construction works were undertaken across the site during November 2012. The main construction activities undertaken in the locality of each of the noise meters during the period have been listed in Table 1.

Table 1: Monitoring Locations

Ref.	Monitoring Location	Crossing or Network	Main Construction Activities During November 2012
M1	Whinny Hill	Network	Drilling for blasting Blasting Breaking and excavation of rock Haulage of rock N.B. No evening, night time or Sunday daytime construction in vicinity.
M3	Tigh-Na-Grian	Crossing	On-going works at Central Tower North Tower Caisson Excavation Installation of Pier N1 platform
M6	Port Edgar	Crossing	On-going works at Central Tower South Tower jet grouting S4 excavation
M7	Butlaw Fisheries	Crossing	On-going works at CT ST jet grouting Pier S4 excavation Works at Piers S7 & S8 Pier S6 Access Track drainage works & Earth Bund Verge clearance at Society Road
M10	Inchgarvie Lodge	Crossing	On-going works at Central Tower South Tower jet grouting Pier S4 excavation Works at piers S7 & S8 Pier S6 Access Track drainage works & Earth Bund Excavation of material from launch and south abutment Concreting works Verge clearance at Society Road
M11	Linn Mill	Network (close proximity to Crossing)	Excavation of material from launch and south abutment Concreting works
M13	Clufflat Brae	Network (close proximity to Crossing)	Excavation of material from launch and south abutment Concreting works Drainage connection to SUDS pond
M14	Springfield	Network	Excavation of material from launch N.B. No evening, night time or Sunday daytime construction in vicinity.
M15	Echline Field	Network	Cut/Fill from Queensferry gyratory N.B. No evening, night time or Sunday daytime construction in vicinity.

M16	Scotstoun	Network	Import of materials Utility works N.B. No evening, night time or Sunday daytime construction in vicinity.
M17	Dundas Home Farm	Network	Utilities works Earthworks N.B. No evening, night time or Sunday daytime construction in vicinity.
M18	Newton	Network	No works

3 Noise Monitoring Results

3.1 All noise monitoring results for construction days have been presented in charts using the template provided in the Construction Noise Monitoring Information Note, as available on the project website (http://www.transportscotland.gov.uk/files/documents/projects/forth-replacement/FRC_Construction_Noise_Monitoring_Information_Note_2_.pdf). All charts can be found in the appendices of this report.

3.2 With regard to the noise monitoring results charts, the following should be noted:

- All locations are considered as either 'Main Crossing' or 'Network Connections', as set out in Table 1. Main Crossing works are undertaken during the day, evening and night time periods. Network connection works, however, are undertaken during the daytime only. The inclusion of data in the graphs reflects this. Although Linn Mill and Clufflat Brae are considered as network locations, the potential for marine works near the south shore to be heard has been recognised. As a result, evening and night time data has been included for these locations although no network connection construction activities have been undertaken during these periods.
- Noise data for days, evening and nights on which no construction works were conducted have been excluded from the monthly average results presented in the graph. However, noise results (L_{Aeq} and L_{AFmax}) for any days, evenings and nights on which no construction works have been conducted have been presented in the graphs in greyed out areas.
- An average for Sunday construction noise data has been included on the graphs where applicable; in locations where no Sunday works have been undertaken no average is shown.

- As set out in the CoCP, the assessment time for evening, nights and Sunday daytime is 1 hour periods. To present the construction noise results for these periods, therefore, the maximum L_{AFmax} (fast time response) and maximum L_{Aeq} within the overall evening/night time period has been taken. It should be noted, therefore, that the average shown for these periods is an average of only the highest L_{Aeq} results.
- Where noise data is missing for days, evening or nights during which construction works were conducted, this has been indicated. Some device errors were also encountered in November, resulting in loss of data from the following locations for the dates indicated; evening of the 9 November at Tigh-Na-Grian, evening and night time on 18 November at Butlaw Fisheries, evening on 7 and 26 November at Inchgarvie and 24 (L_{max} only) and 25 November at Dundas. Data is also missing from the following locations due to a loss of data associated with an error with the FCBC server; Dundas between 2 and 18 November, Scotstoun between 10 and 22 November, Newton between 1 and 18 November and Springfield between 1 and 11 November.

3.3 Results demonstrate that the monthly average total construction noise results for daytime were within the threshold limits for all monitoring locations for November 2012, with the exception of Scotstoun. For the evening period, the monthly average total construction noise results were within the threshold for all locations throughout November 2012, with the exception of Clufflat Brae. For night-time, results show exceedances of the threshold at Butlaw Fisheries and Linn Mill, with all other monitoring locations within the threshold.

3.4 With regard to the Sunday averages (for applicable monitoring locations), exceedances were noted at the following locations for the periods given; Clufflat Brae for both evening and night time periods, Linn Mill during night-time, Butlaw Fisheries for night time and Inchgarvie for night time. For all other locations and time periods the Sunday averages were found to be within the threshold during November 2012.

3.5 The night time exceedances of both the monthly average and the Sunday average thresholds at Butlaw Fisheries can be attributed to a combination of waves on the shore and birds in the early hours of the morning; as these night time averages are based only on the highest L_{eq} levels for 1 hour periods events such as birds in the early hours can adversely affect the averages.

- 3.6** At Inchgarvie, Linn Mill and Clufflat, the Sunday averages were affected by adverse weather conditions on the night of the 18 November; when the data affected by these conditions is removed then the average is reduced from 50.27 to 45.1 dB at Inchgarvie, 60.5 dB to 46.3 dB at Linn Mill and from 52.9 dB to 49.6 dB. Similarly, the monthly average at Linn Mill was adversely affected by windy conditions and is not, therefore, considered to be related to construction works.
- 3.7** The evening period exceedances at Clufflat of both the monthly and the Sunday averages were found to be due to fireworks. Where the data affected by fireworks is removed the values of the averages drops from 55.7 dB to 41.8 dB for the monthly average and from 56.2 dB to 39 dB for the Sunday average.
- 3.8** The exceedance of the daytime average at Scotstoun is due to increased background noise levels due to the location of the meter directly adjacent to the road. Traffic noise at this location is further increased during periods of wet weather.
- 3.9** During November 2012, some exceedances of the maximum noise thresholds also occurred. Each exceedance of the threshold was investigated using triggered audio recordings, records of construction works (i.e. site programmes and diaries, daily marine reports and dredging reports) and analysis of weather station data, where required. A Noise and Vibration Investigative Report (NVIR) spread sheet has been produced detailing the results of the investigation for each exceedance. Where the exceedances are due to construction works, a detailed NVIR has been completed which details the results of the investigation in addition to any additional mitigation measures required.
- 3.10** Investigations of the exceedances of the maximum noise level thresholds show the majority to have occurred as a result of non-construction related noise. Spells of adverse weather conditions during November were found to result in a number of exceedances. A large number of exceedances at the beginning of November were also attributed to fireworks. Additionally, birds and local noises at nearby properties were also found to be contributing factors to maximum noise level exceedances. At some locations, notably Scotstoun and Echline, existing traffic noise had an effect on maximum noise levels during the period covered in this report.
- 3.11** Where an exceedance due to construction works was identified, the works were investigated as soon as practicably reasonable and a detailed NVIR was completed, within which any additional mitigation measures were recognised. Once identified, mitigation measures were then implemented in line with best practicable means.

- 3.12** The daytime L_{AFmax} threshold was exceeded as a result of land based construction works on a total of seven occasions at three different monitoring locations. Of these, three daytime exceedances at Clufflat Brae were caused by the use of vehicle horns from plant operating in close proximity to the noise meters. Vehicle horns were being used as a means of informing operatives that a task had been completed and/or it was necessary to manoeuvre plant. A further two exceedances at Linn Mill caused by intermittent plant operating in close proximity to the meter. Additionally, two exceedances at Butlaw were associated with the viaducts work at S6.
- 3.13** Some exceedances due to marine works were also recorded. Eleven night time exceedances at Tigh-Na-Grian were found to be caused by works at the North Tower caisson. Further night time exceedances, two at each Butlaw Fisheries and Clufflat Brae, were associated with jet grouting works at the south tower. Additionally, two night time exceedances (one at both Clufflat Brae and Butlaw Fisheries) were caused by an engine done from the estuary. All these have all been investigated and mitigation measures have been implemented where possible; the relevant NVIRs provide more detail with regard to these exceedances.
- 3.14** A summary of the findings for exceedances occurring at each of the locations can be found in Table 2. All construction related exceedances are detailed in Table 3; further information on related remedial actions is detailed in the relevant NVIR.

Table 2: Summary of Exceedances at Monitoring Locations

Monitoring Location	Summary of Exceedance Details
Butlaw Fisheries	During November the maximum noise threshold was exceeded on 37 occasions (daytime, 10; evening, 5; night time, 22). Two daytime exceedances were found to be due to works at the S6 earth bund while 3 night time exceedances were related construction works, including jet grouting and the drone of an engine the estuary. However, a large number of exceedances were attributed to a range of non-construction factors, including waves on the shore, wind, birds (particularly during the early hours of the morning), fireworks and vehicles.
Clufflat Brae	During November the maximum noise threshold was exceeded on 43 occasions (daytime, 12; evening, 8; night time, 23). Three daytime exceedances were found to be due vehicle horns associated with construction works in close proximity to the meter. Three night time exceedances were also related to construction works, including jet grouting and the drone of an engine the estuary. A large number of the exceedances were also found to be due to birds, adverse weather conditions and fireworks (particularly in the evening period).
Inchgarvie Lodge	During November the maximum noise threshold was exceeded on 35 occasions (daytime, 13; evening, 9; night time, 13). No exceedances were found to be due to construction works. However, investigations found movements at the property, birds and fireworks to be the main contributing factors to the exceedances at this location.
Linn Mill	During November the maximum noise threshold was exceeded on 41 occasions (daytime, 16; evening, 9; night time, 16). Two exceedances were due to construction works. However, the majority of exceedances were caused by a number of non-construction factors, notably adverse weather conditions, fireworks and birds.
Tigh-Na-Grian	During November the maximum noise threshold was exceeded on 23 occasions (daytime, 4; evening, 1; night time, 18). Eleven night time exceedances were found to be due to construction works at the North Tower caisson. However, other exceedances were also due to non-construction factors including birds and fireworks.
Dundas Home Farm	During November the maximum noise threshold was exceeded on 3 occasions. Exceedances were not attributable to construction works. Exceedances were due to birds and monitor maintenance.
Echline	During November the maximum noise threshold was exceeded on 26 occasions. No exceedances at this location were due to construction activities. Exceedances were largely attributed to vehicles passing by on the adjacent roads.
Springfield	During November the maximum noise threshold was exceeded on 10 occasions. No exceedances at this location were due to construction activities. The majority of non-construction related exceedances were due to residents at the nearby properties, dogs and birds.

Scotstoun	During November the maximum noise threshold was exceeded on 15 occasions. Exceedances were attributed to vehicles passing by on the adjacent road.
Whinny Hill	During November the maximum noise threshold was exceeded on 11 occasions. Exceedances were not due to construction activities. A range of factors were found to cause exceedances at this location, including vehicles, dogs and monitor maintenance.

Table 3: Summary of Construction Exceedances at Monitoring Locations

Monitor	Date	Period	Description	NVIR No.
Clufflat Brae	15/11/12	Day	Vehicle horns	C.D.151112
	16/11/12			C.D.161112
	17/11/12			C.D.171112
	28/11/12	Night	Jet grouting	C.N.281112
	29/11/12			C.N.291112
Linn Mill	27/11/12	Day	Plant	L.D.271112
	28/11/12			L.D.281112
Tigh-Na-Grian	02/11/12	Night	Works at North Tower Caisson	T.N.021112
	04/11/12			T.N.041112
	19/11/12			T.N.191112
	20/11/12			T.N.201112
	21/11/12			T.N.211112
	22/11/12			T.N.221112
	24/11/12			T.N.241112
	26/11/12			T.N.261112
	28/11/12			T.N.281112
	29/11/12			T.N.291112
30/11/12	T.N.301112			
Butlaw Fisheries	29/11/12	Day	Works at Pier S6 earthbund	B.D.291112
	30/11/12			B.D.301112
	27/11/12	Night	Jet grouting	B.N.271112
	30/11/12			B.N.301112



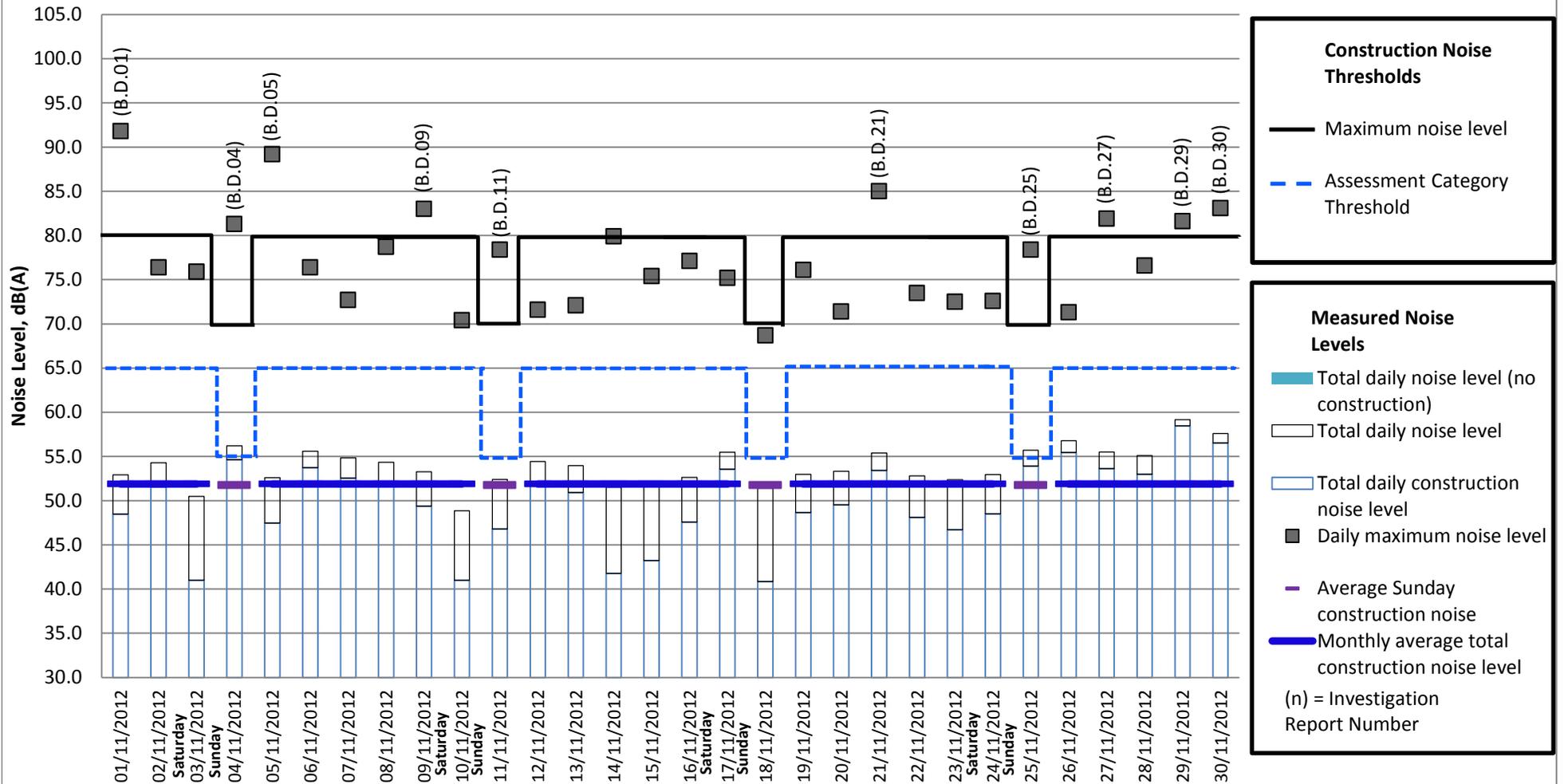
Forth Crossing Bridge Constructors

HOCHTIEF Solutions
American Bridge International
DRAGADOS
Morrison Construction

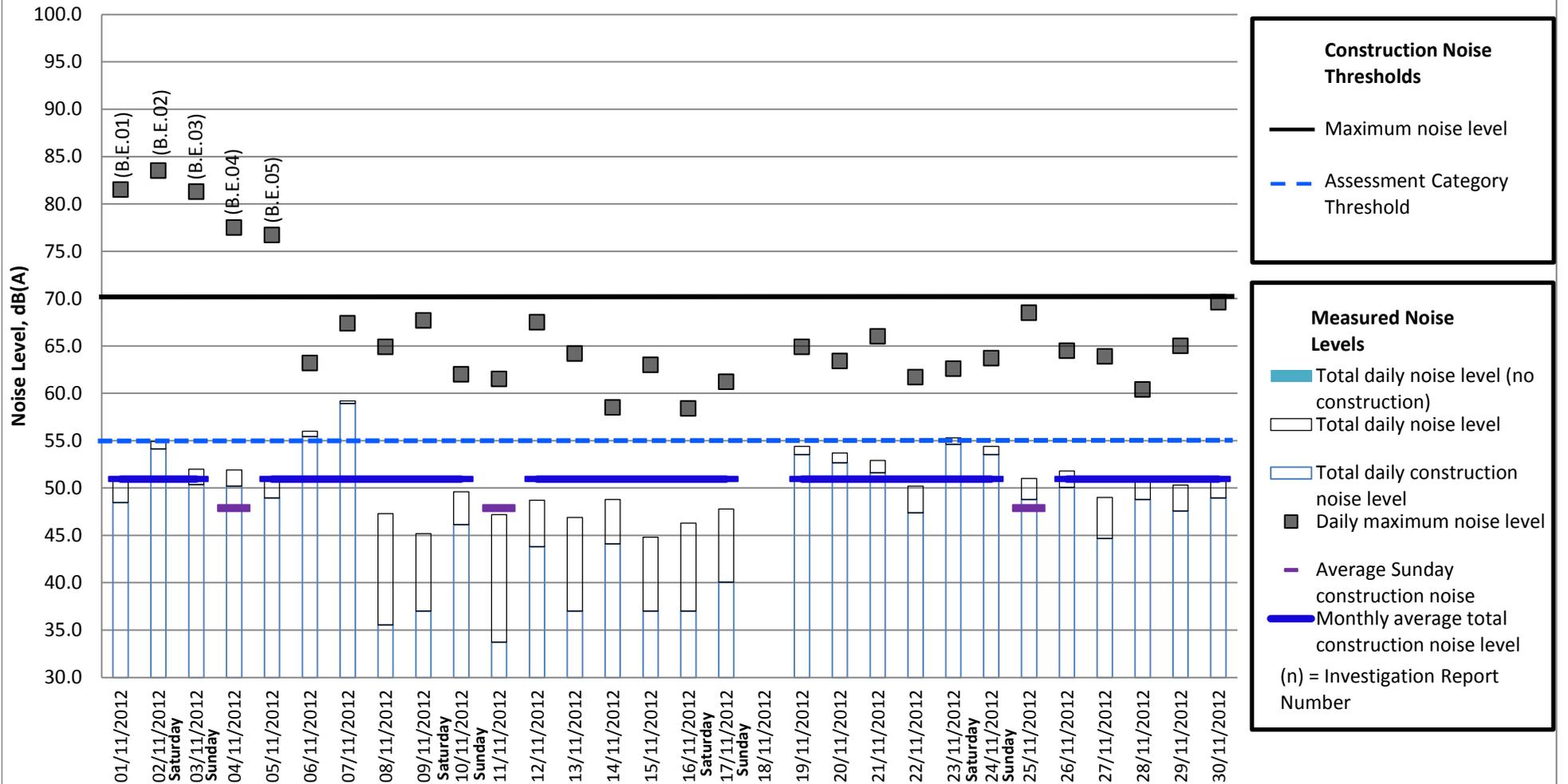
APPENDIX A

Measured Daytime Noise Levels at Butlaw Fisheries

Measurement period: November 2012

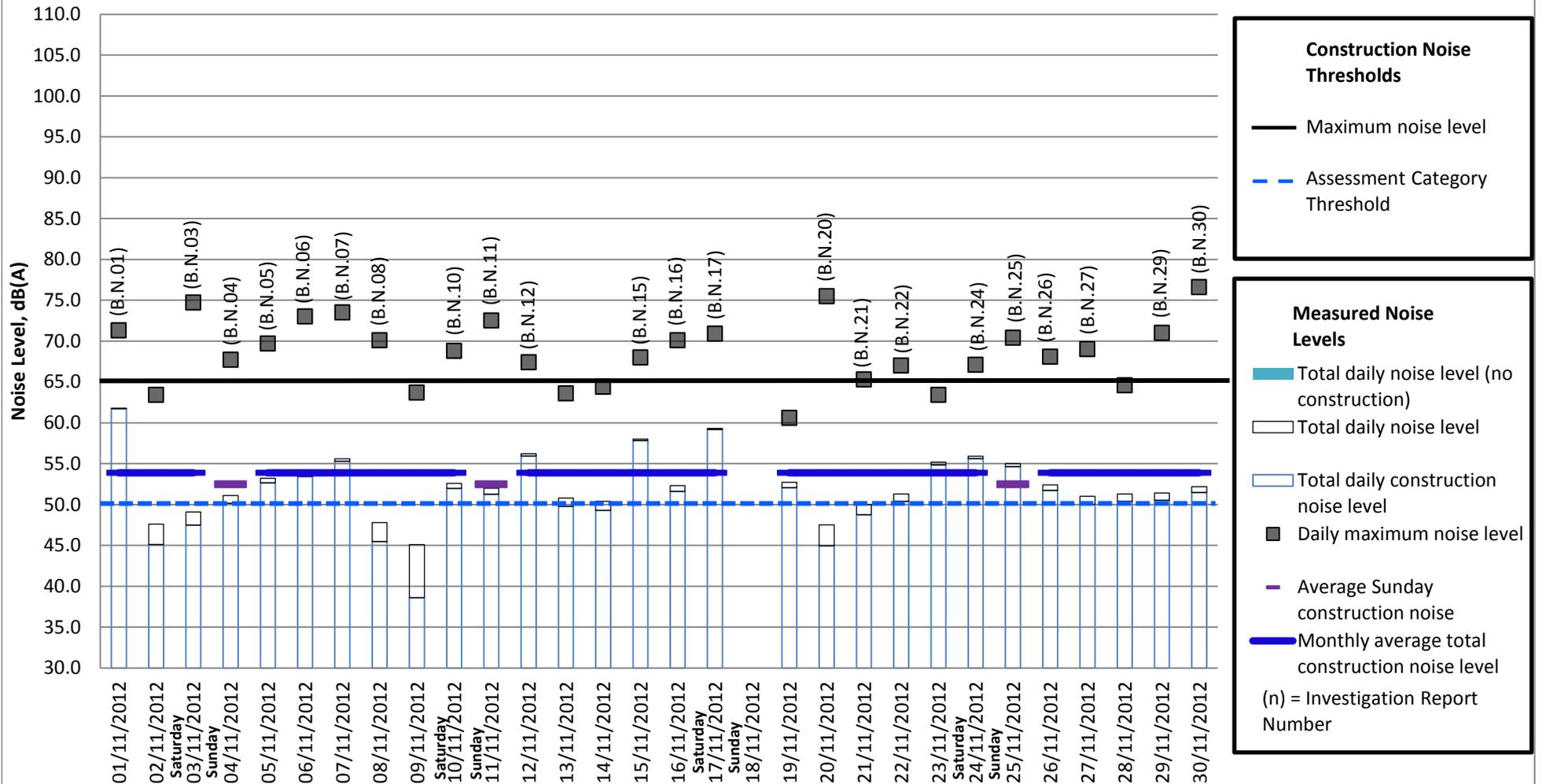


Measured Evening Noise Levels at Butlaw Fisheries Measurement period: November 2012



Note: Data is missing on 18/11/12 due to device error.

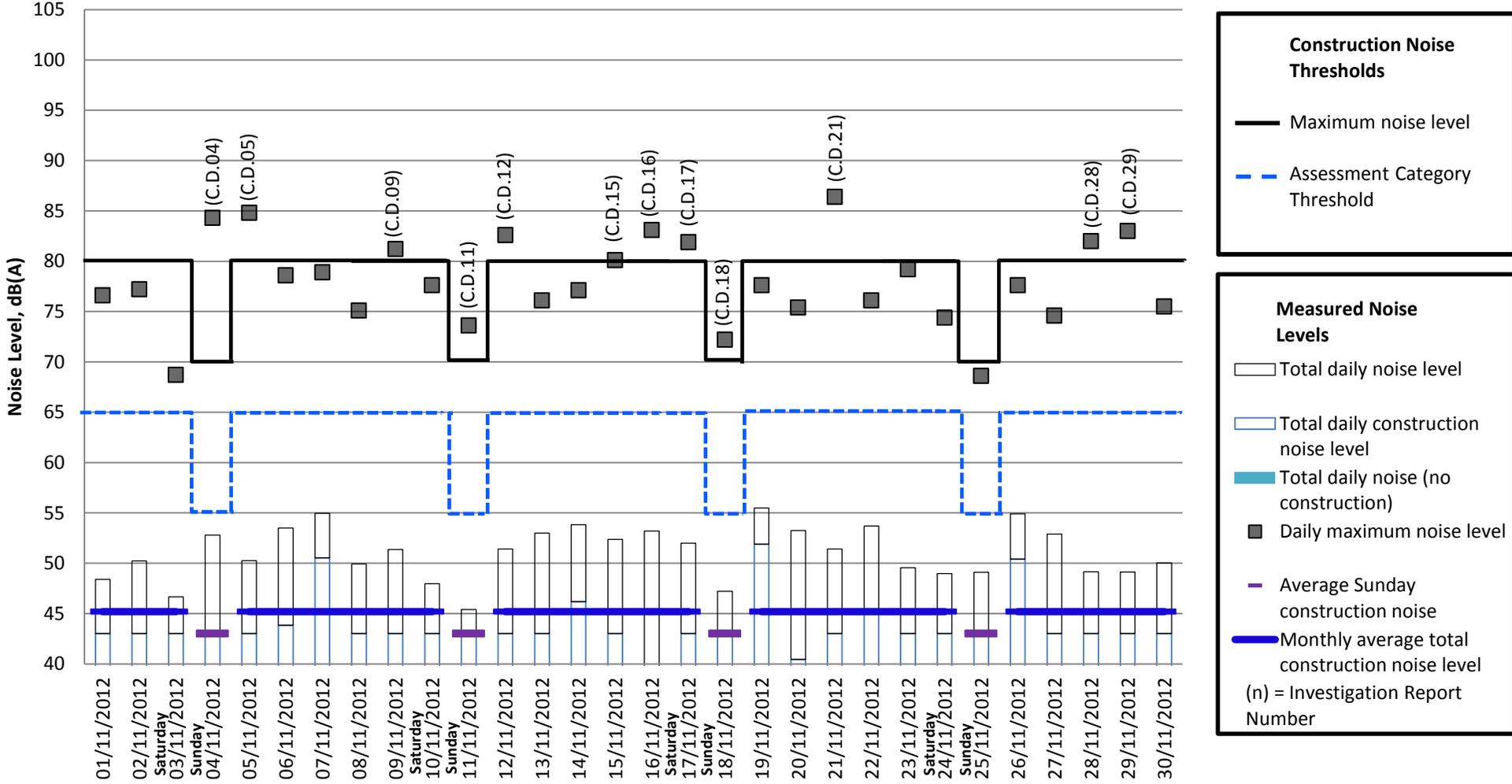
Measured Night time Noise Levels at Butlaw Fisheries Measurement period: November 2012



Note: Data is missing on 18/11/12 due to device error.

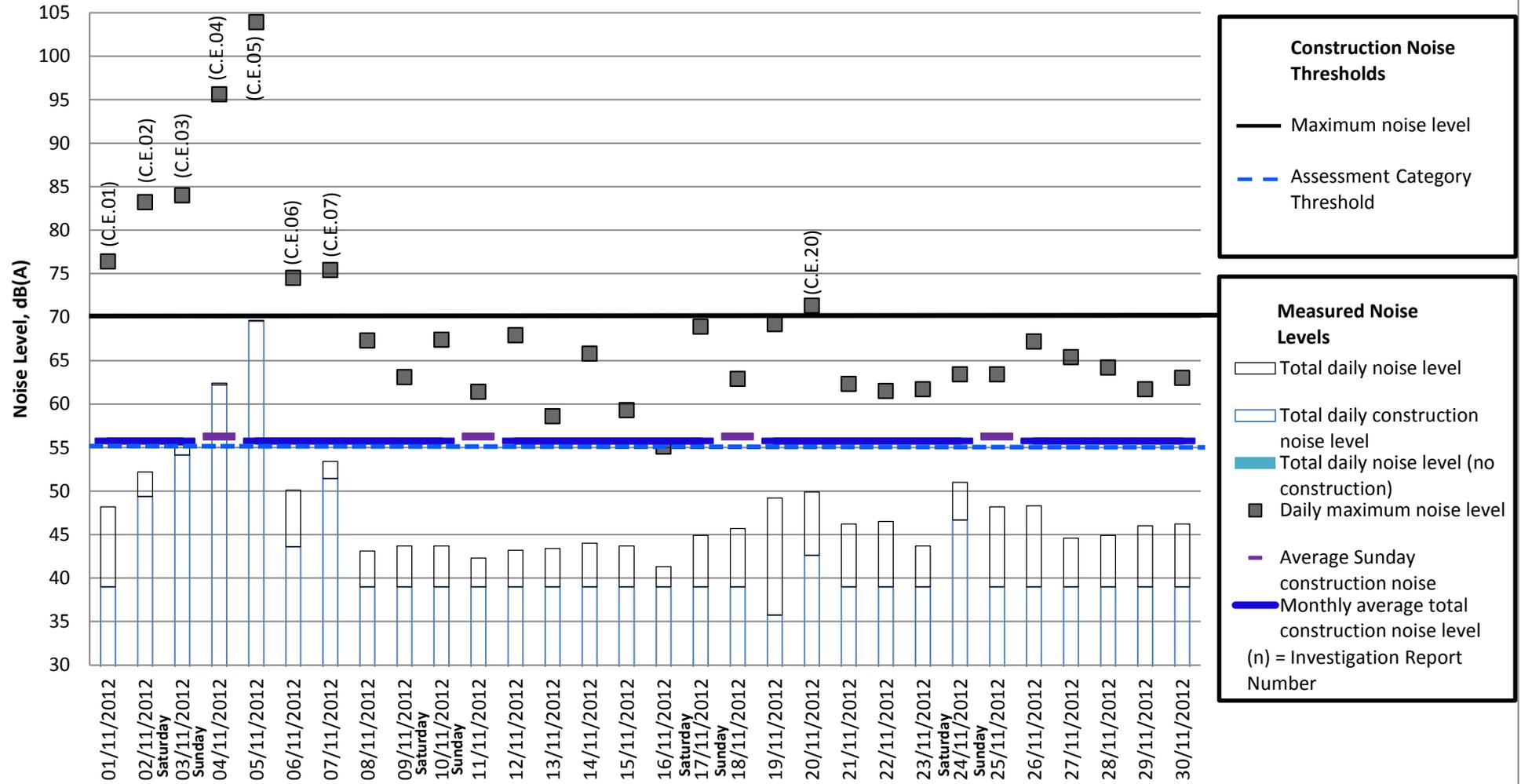
Measured Daytime Noise Levels at Clufflat Brae

Measurement period: November 2012



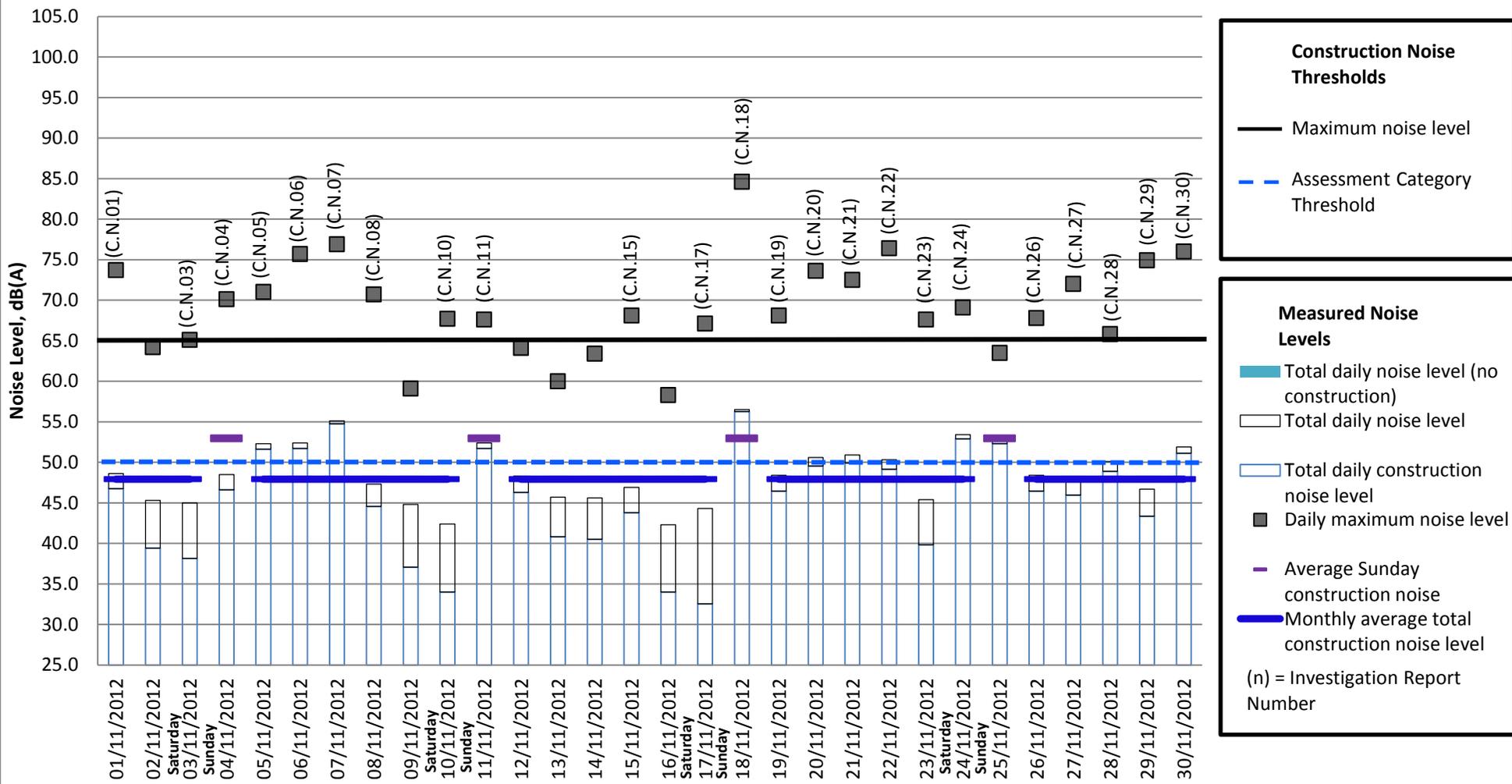
Measured Evening Noise Levels at Clufflat Brae

Measurement period: November 2012

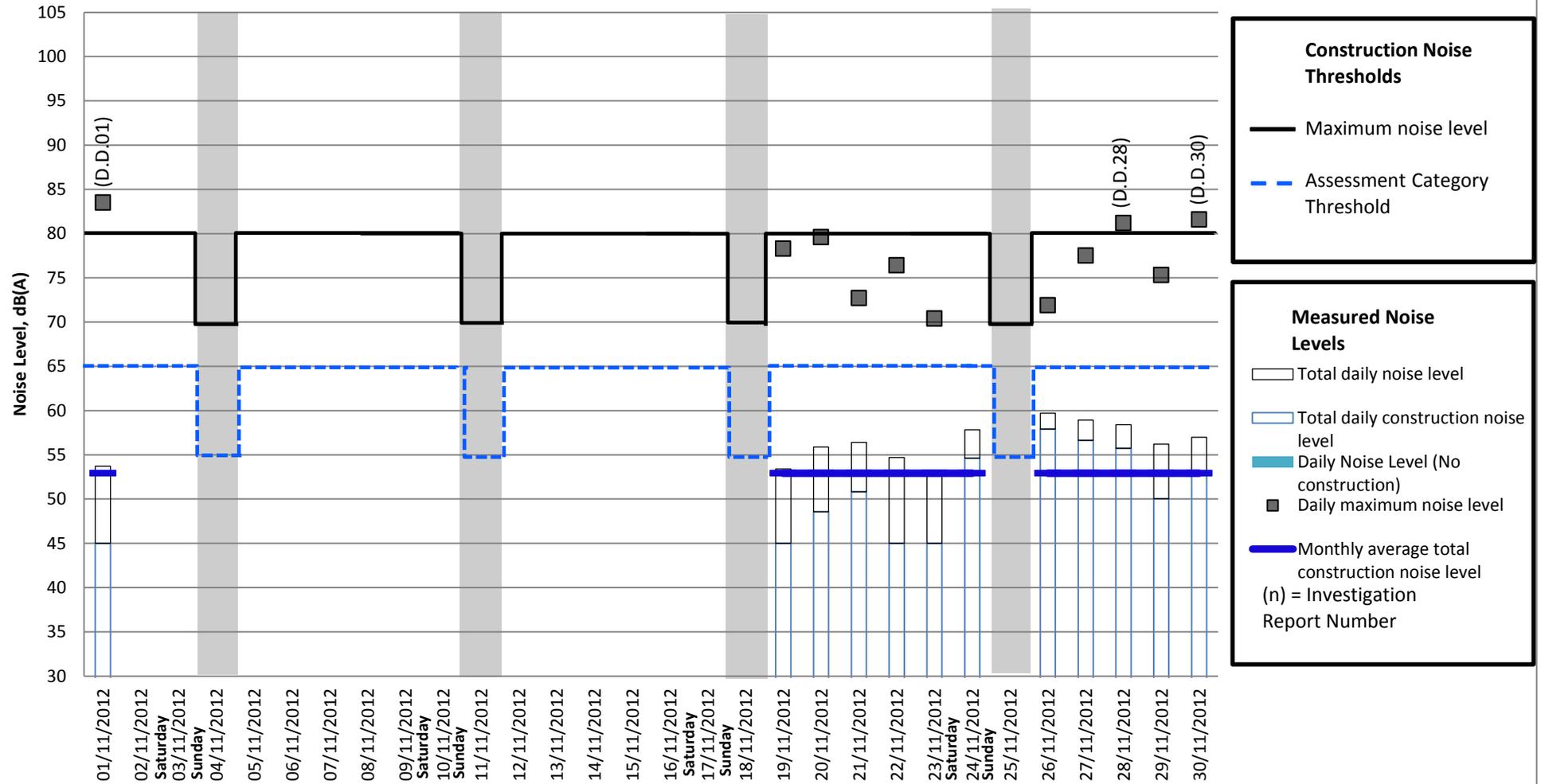


Measured Night-time Noise Levels at Clufflat Brae

Measurement period: November 2012

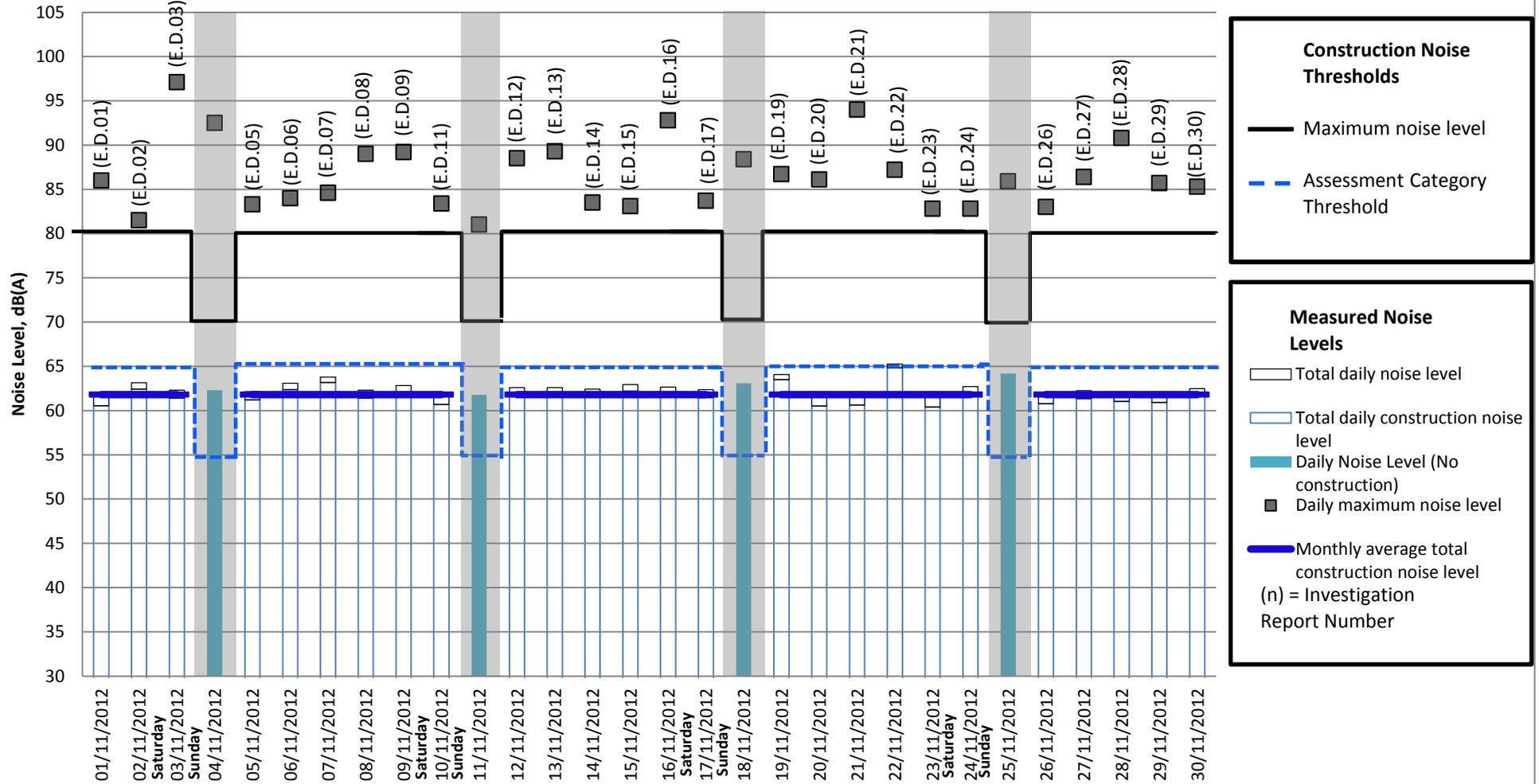


Measured Daytime Noise Levels at Dundas Home Farm Measurement period: November 2012



Note: The grey areas of the chart represent days on which no construction works have been undertaken at this location; no Sunday works have been undertaken at this location. Data is missing for 02/11/12 to 18/11/12 due to a failure with the FCBC server. Data is also missing for 25/11/12 with the Lmax missing for 24/11/12 due to device error

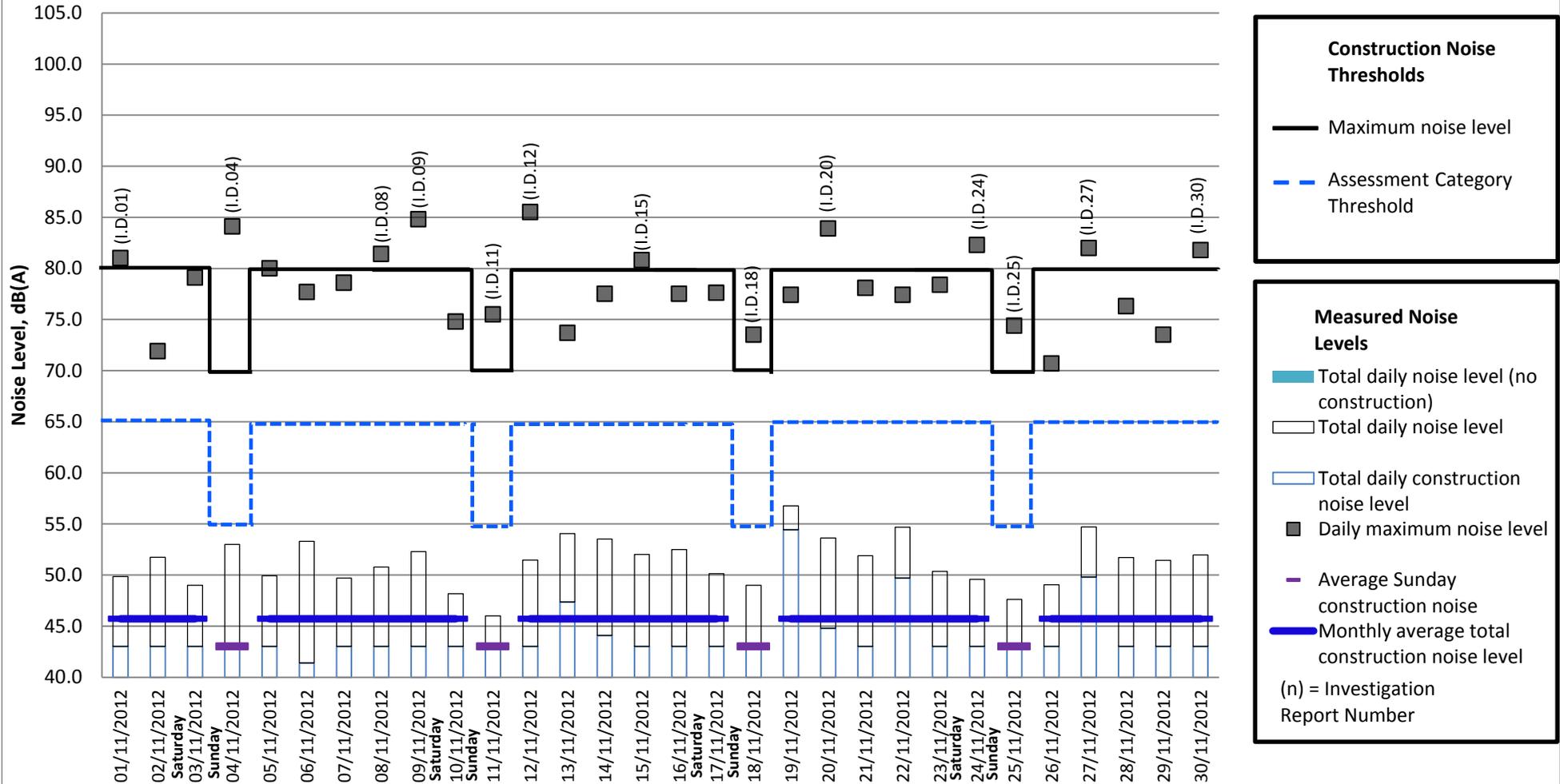
Measured Daytime Noise Levels at Echline Measurement period: November 2012



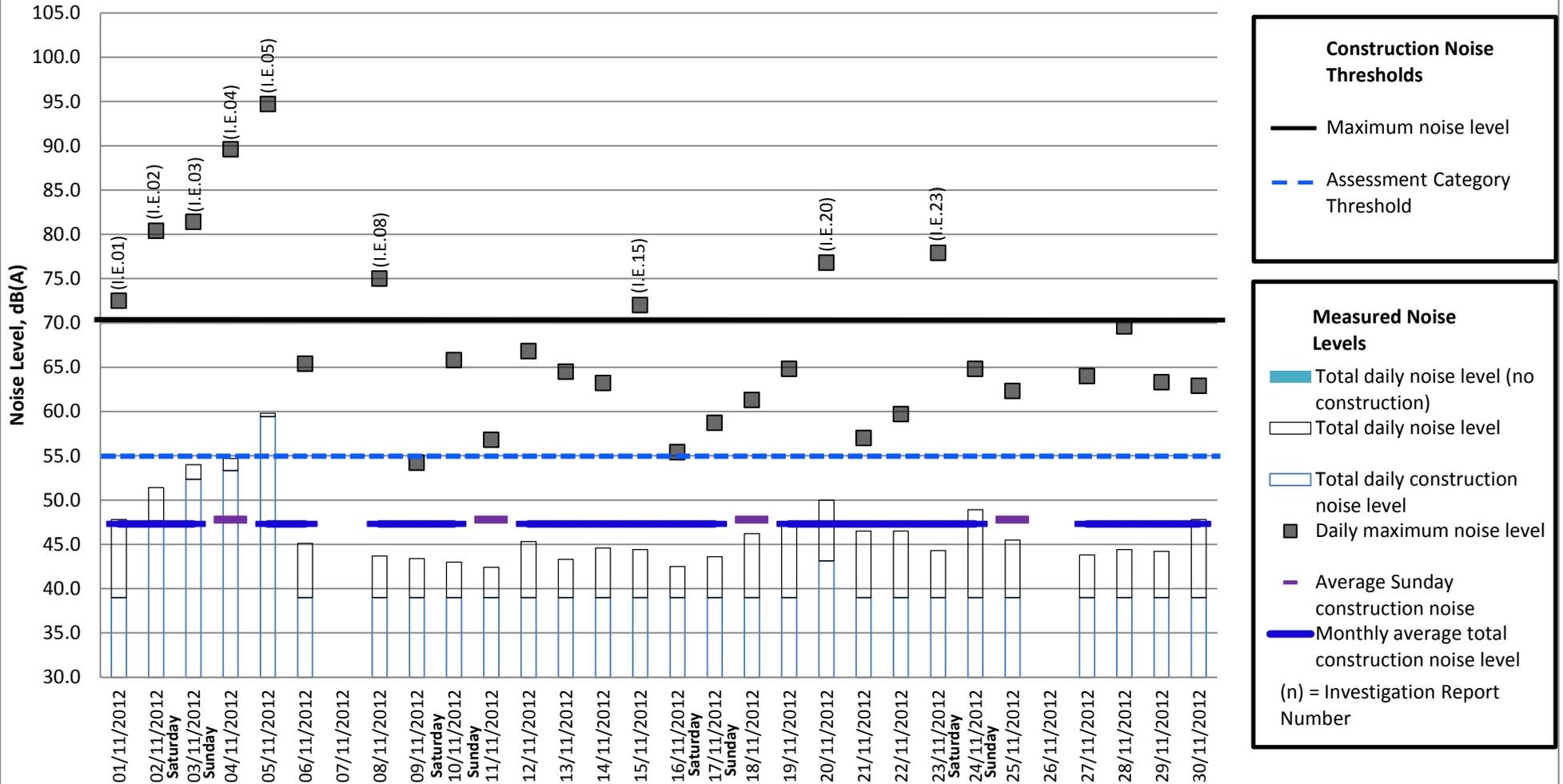
Note: The grey areas of the chart represent days on which no construction works have been conducted. The Sunday average has not been included as no Sunday works have been conducted at this location.

Measured Daytime Noise Levels at Inchgarvie

Measurement period: November 2012



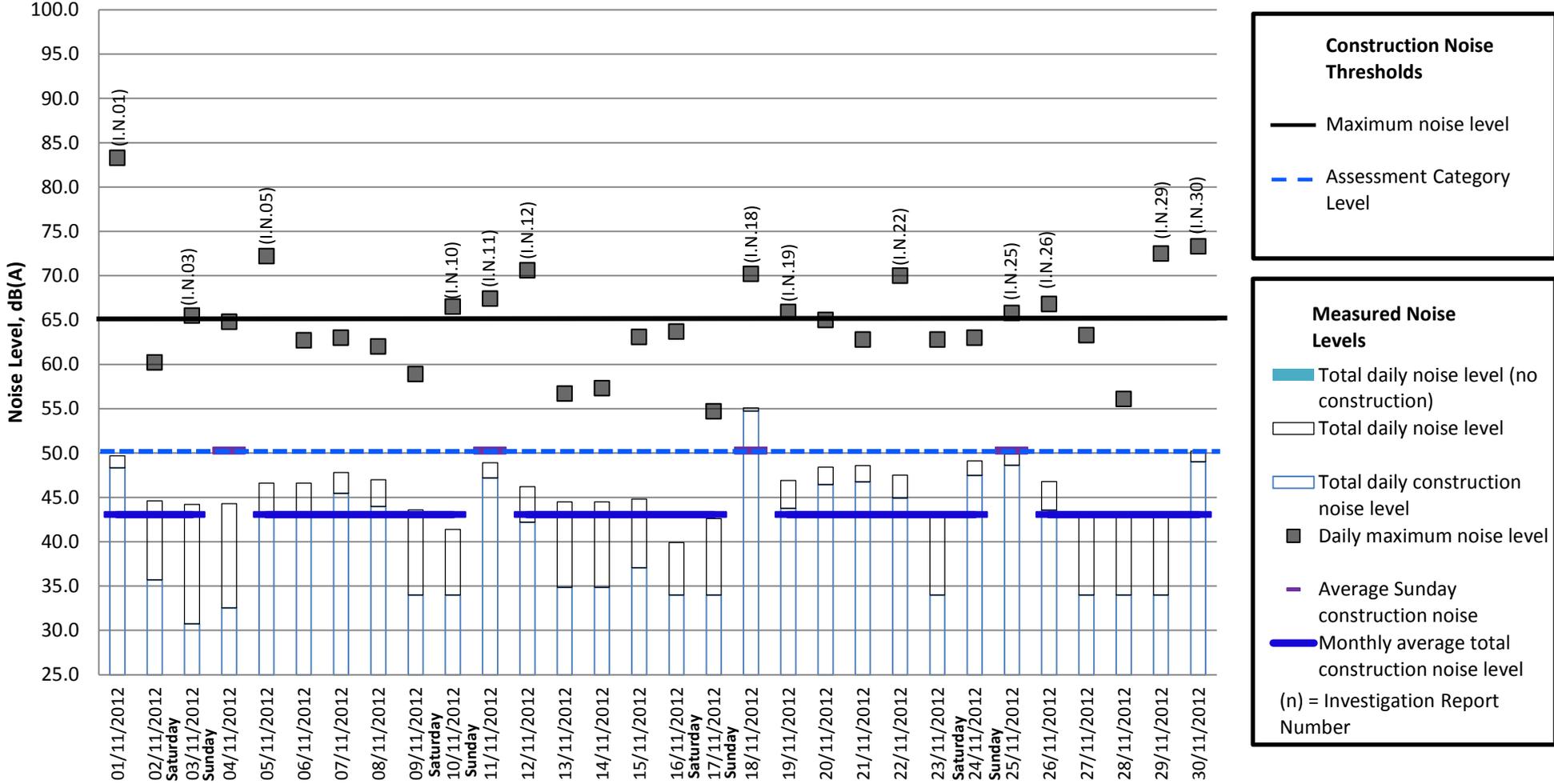
Measured Evening Noise Levels at Inchgarvie Measurement period: November 2012



Note: Data is missing for 07/11/12 and 26/11/12 due to device error.

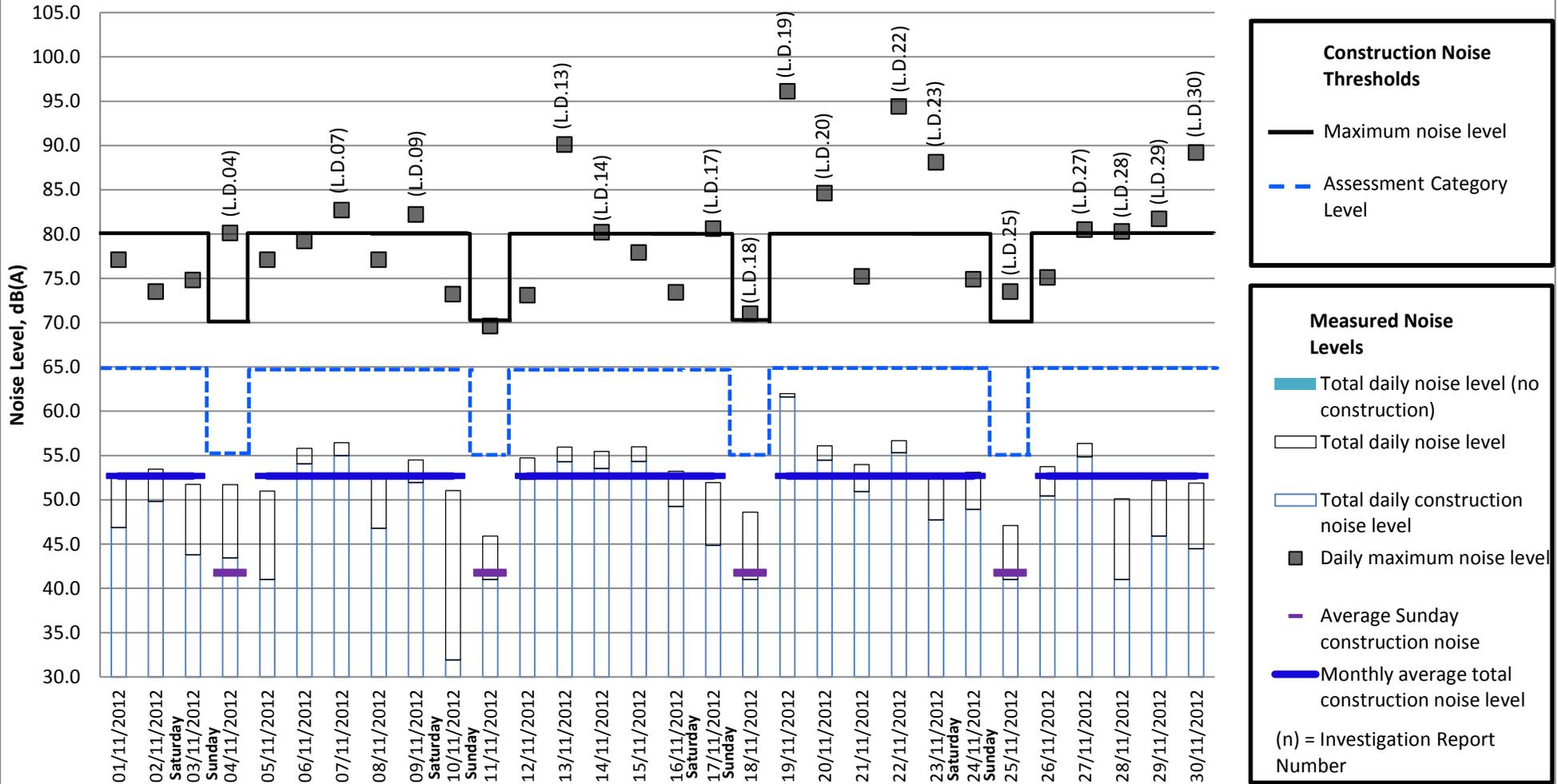
Measured Night-time Noise Levels at Inchgarvie

Measurement period: November 2012



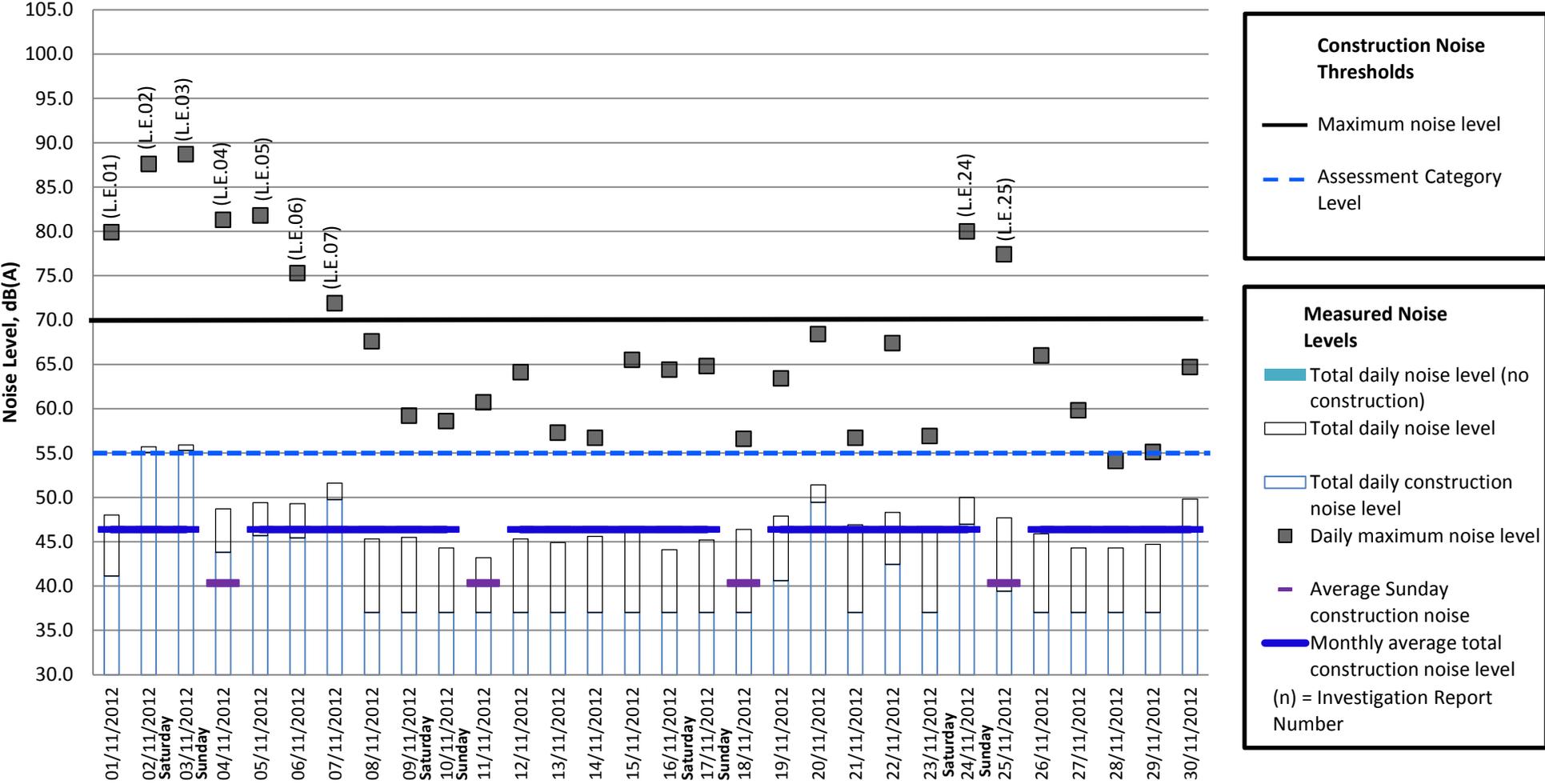
Measured Daytime Noise levels at Linn Mill

Measurement period: November 2012



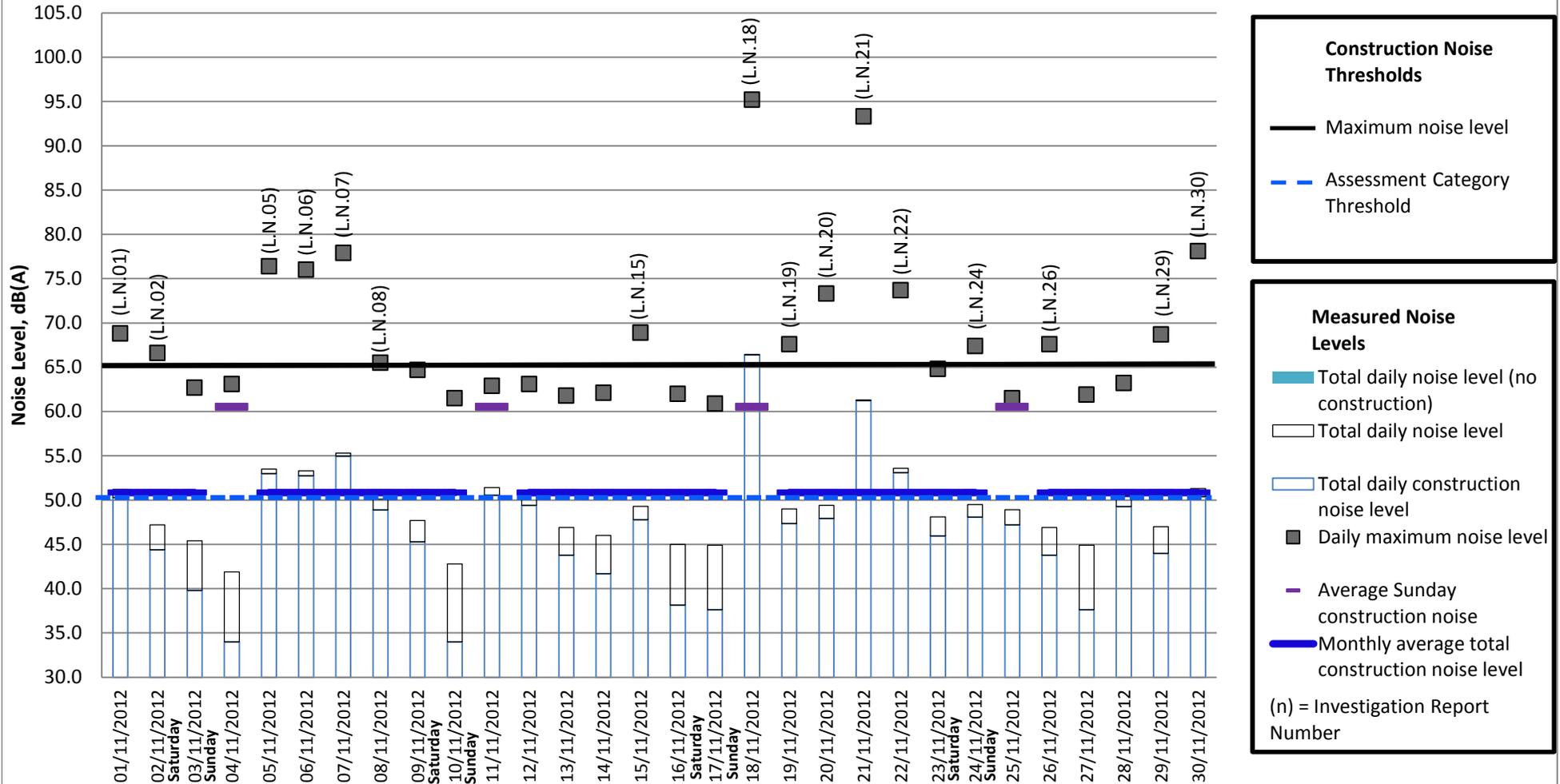
Measured Evening Noise Levels at Linn Mill

Measurement period: November 2012



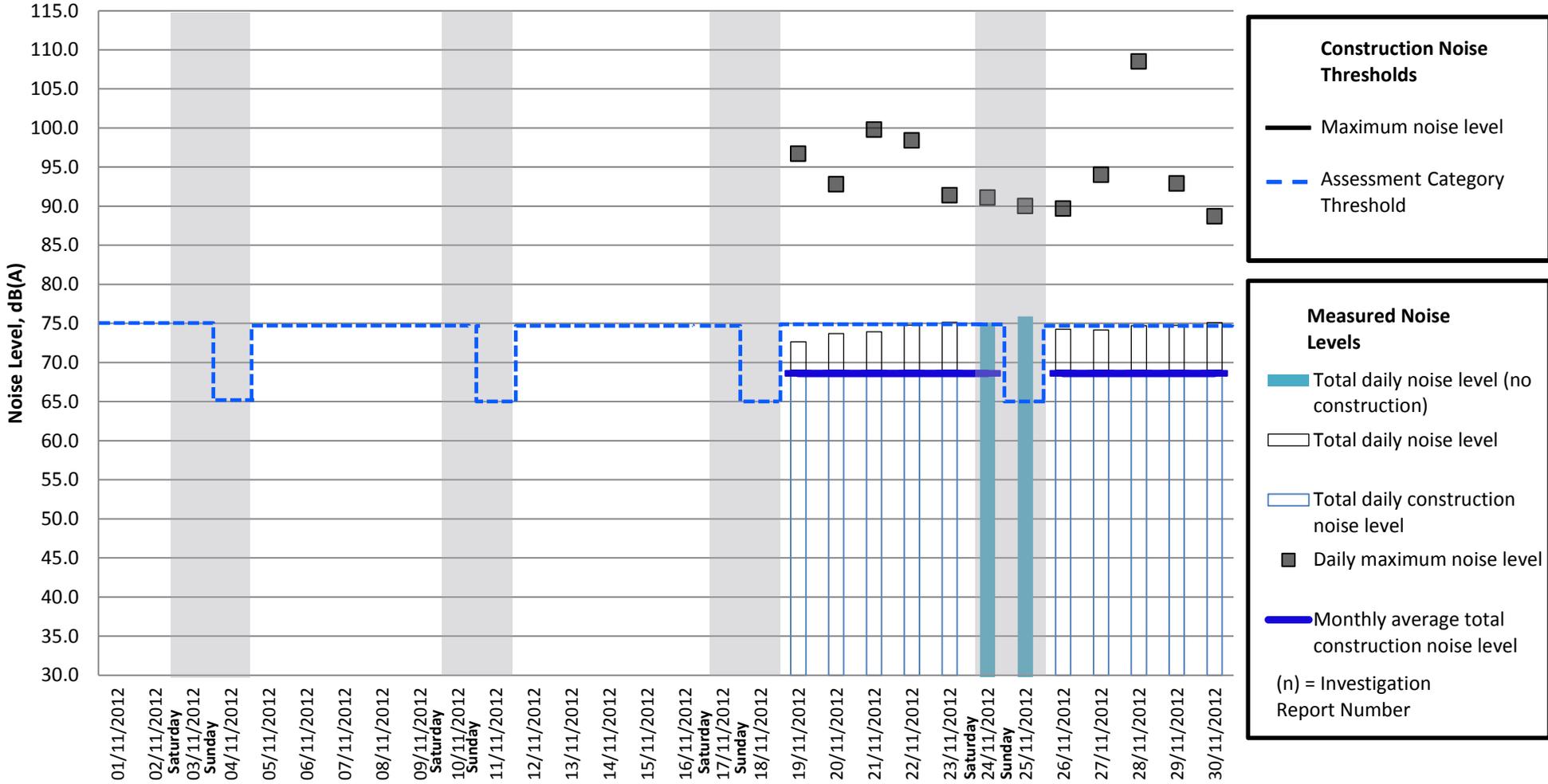
Measured Night-time Noise Levels at Linn Mill

Measurement period: November 2012



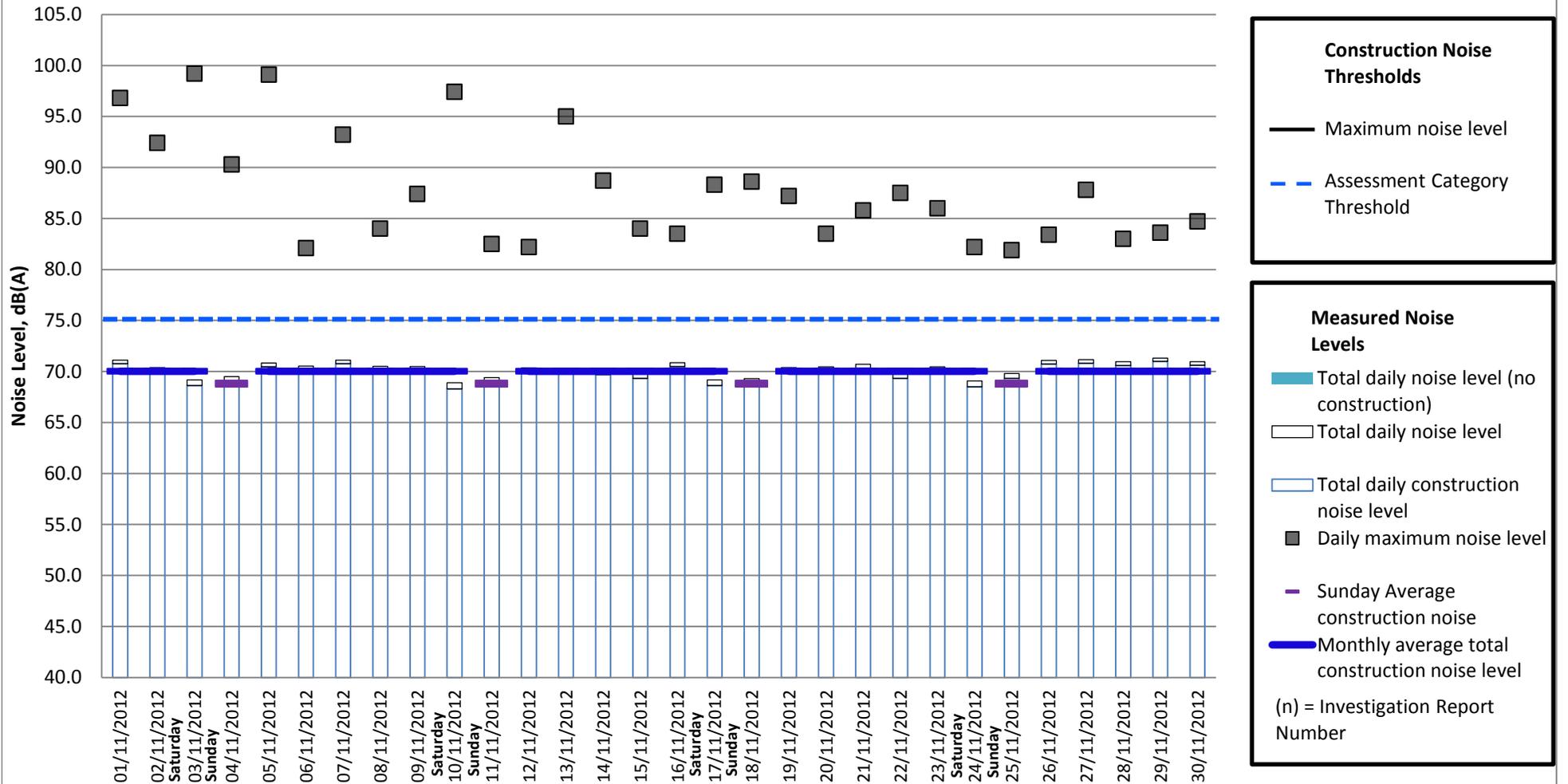
Measured Daytime Noise Levels at Newton

Measurement period: November 2012

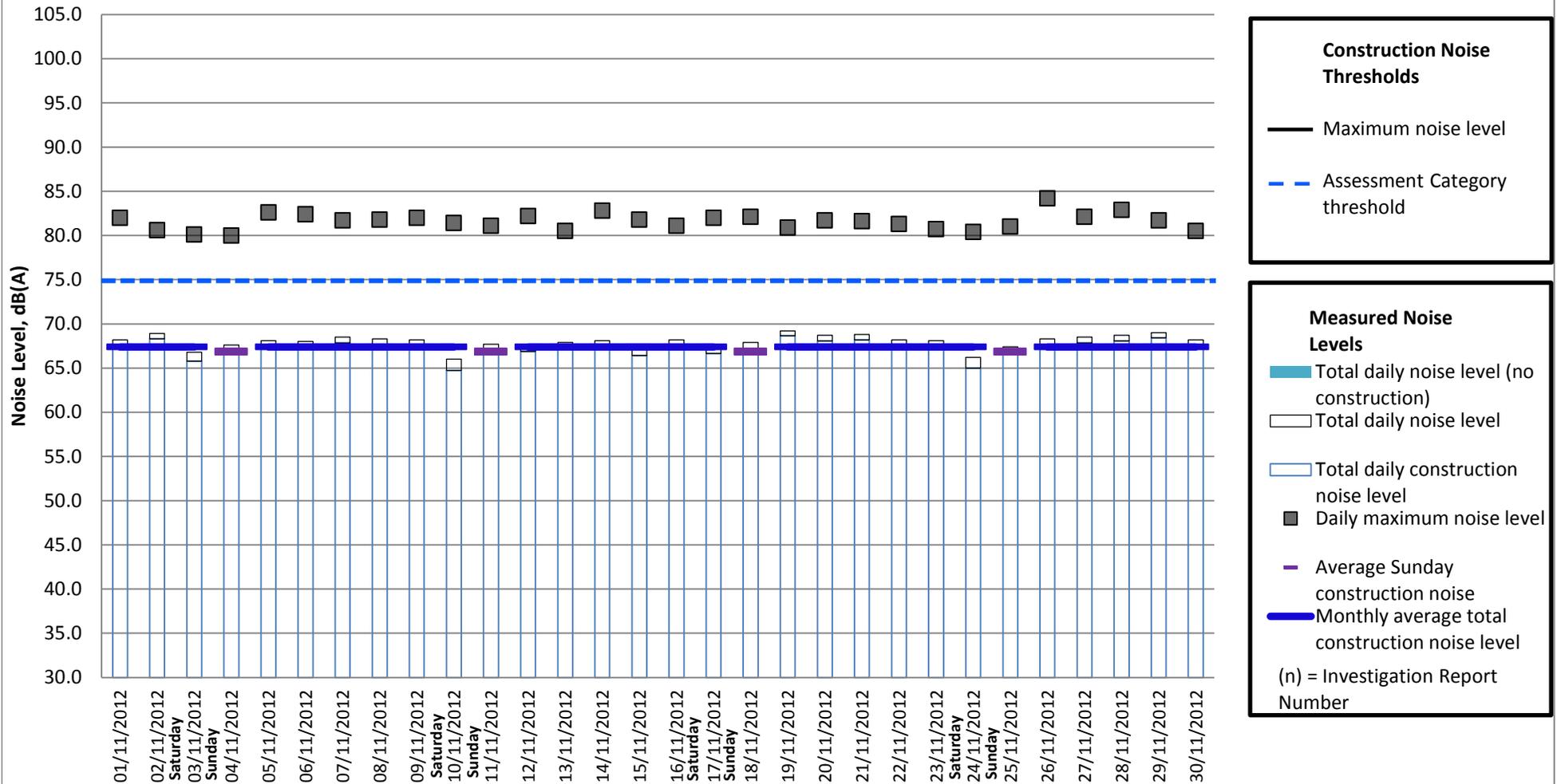


Note: The grey areas of the chart represent days on which no construction works have been conducted; no works have been conducted near this location on Saturday or Sunday. It should be noted that the measured noise levels Mon - Fri can not be attributed to construction works due to the considerable distance (1.75 kilometers) between this monitoring location and the closest construction works. Data is missing for 01/11/12 to 18/11/12 due to a failure with the FCBC server.

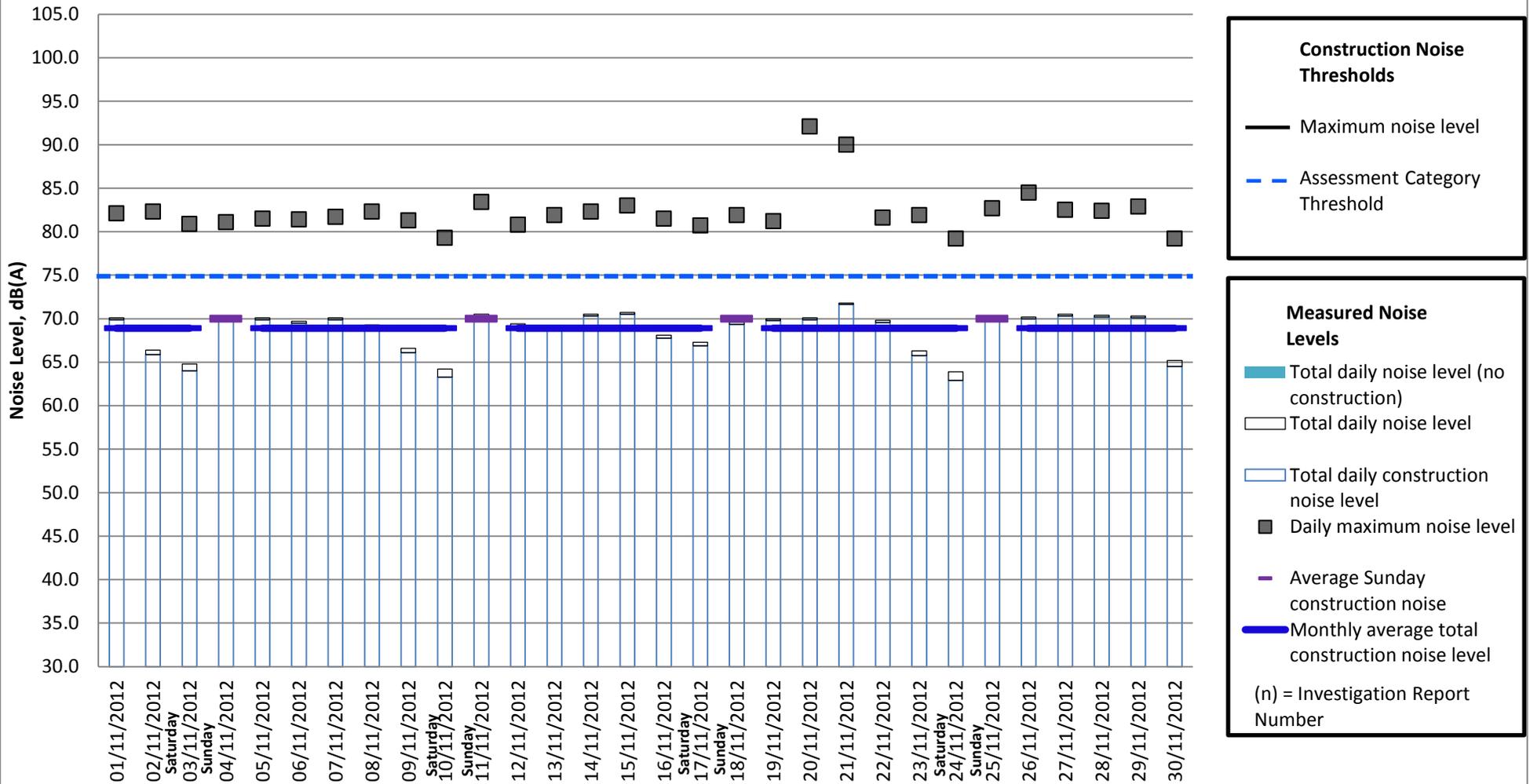
Measured Daytime Noise Levels at North Leg Measurement period: November 2012



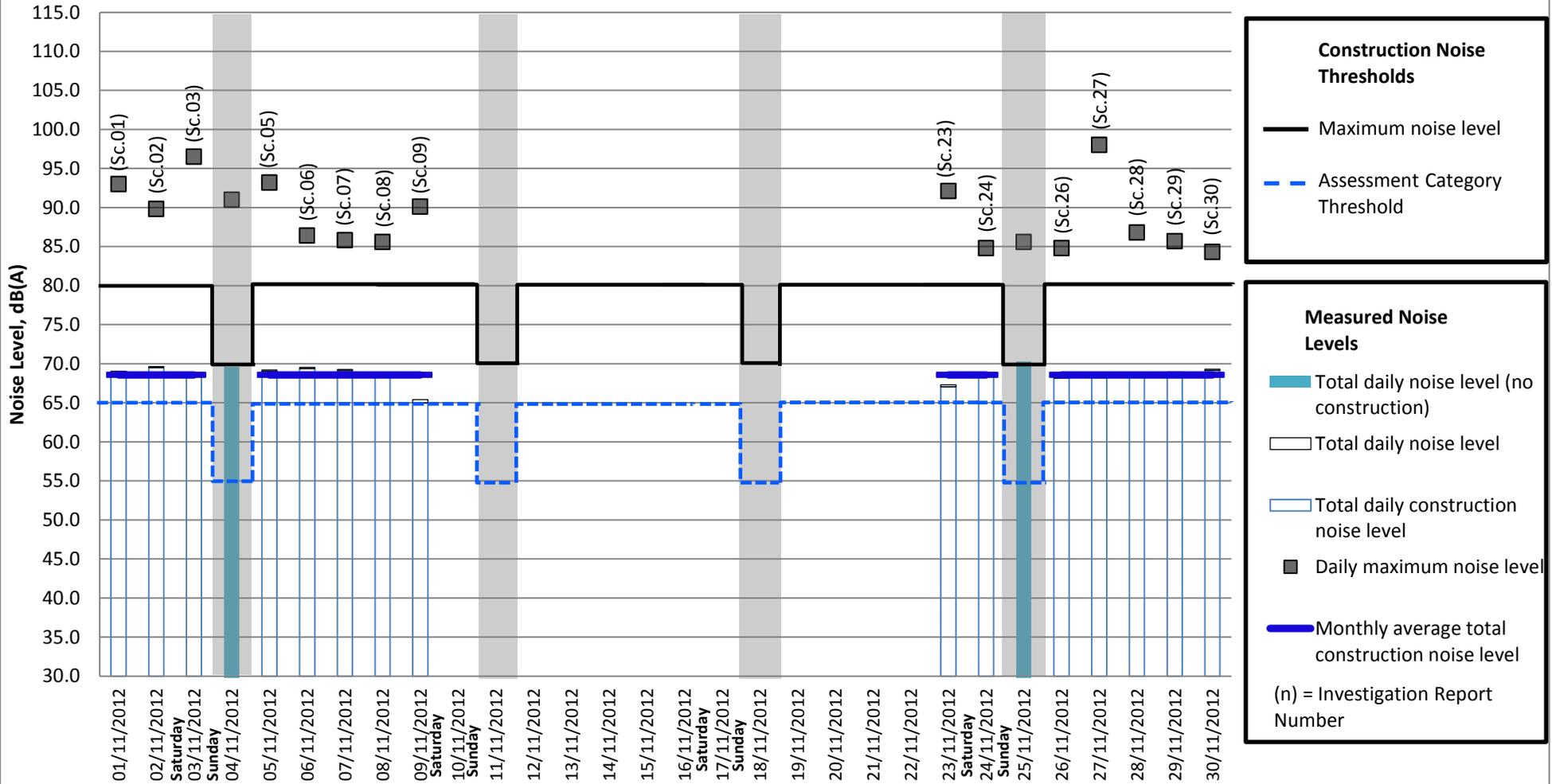
Measured Evening Noise Levels at North Leg Measurement period: November 2012



Measured Night-time Noise Levels at North Leg Measurement period: November 2012

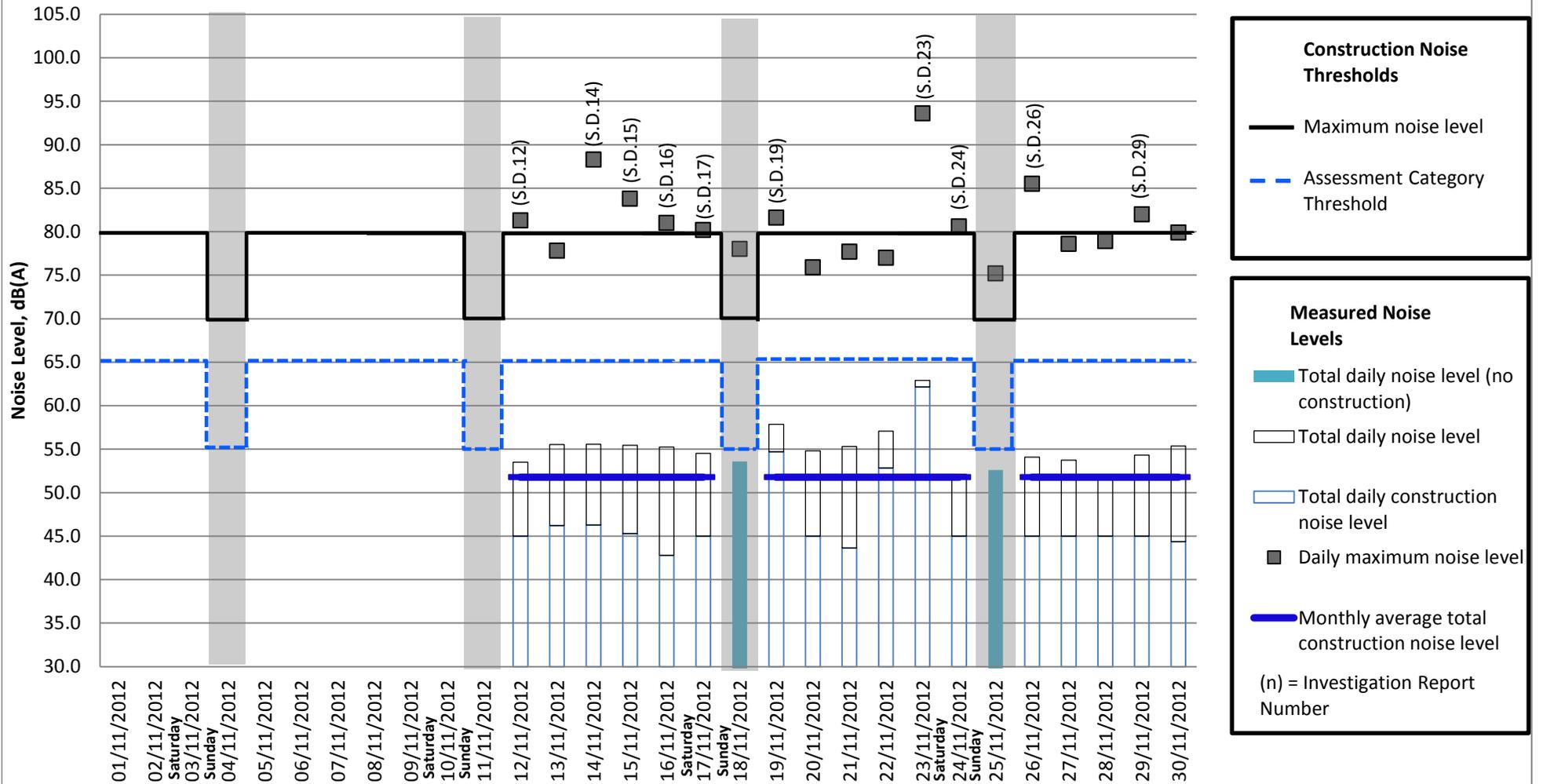


Measured Daytime Noise Levels at Scotstoun Measurement period: November 2012



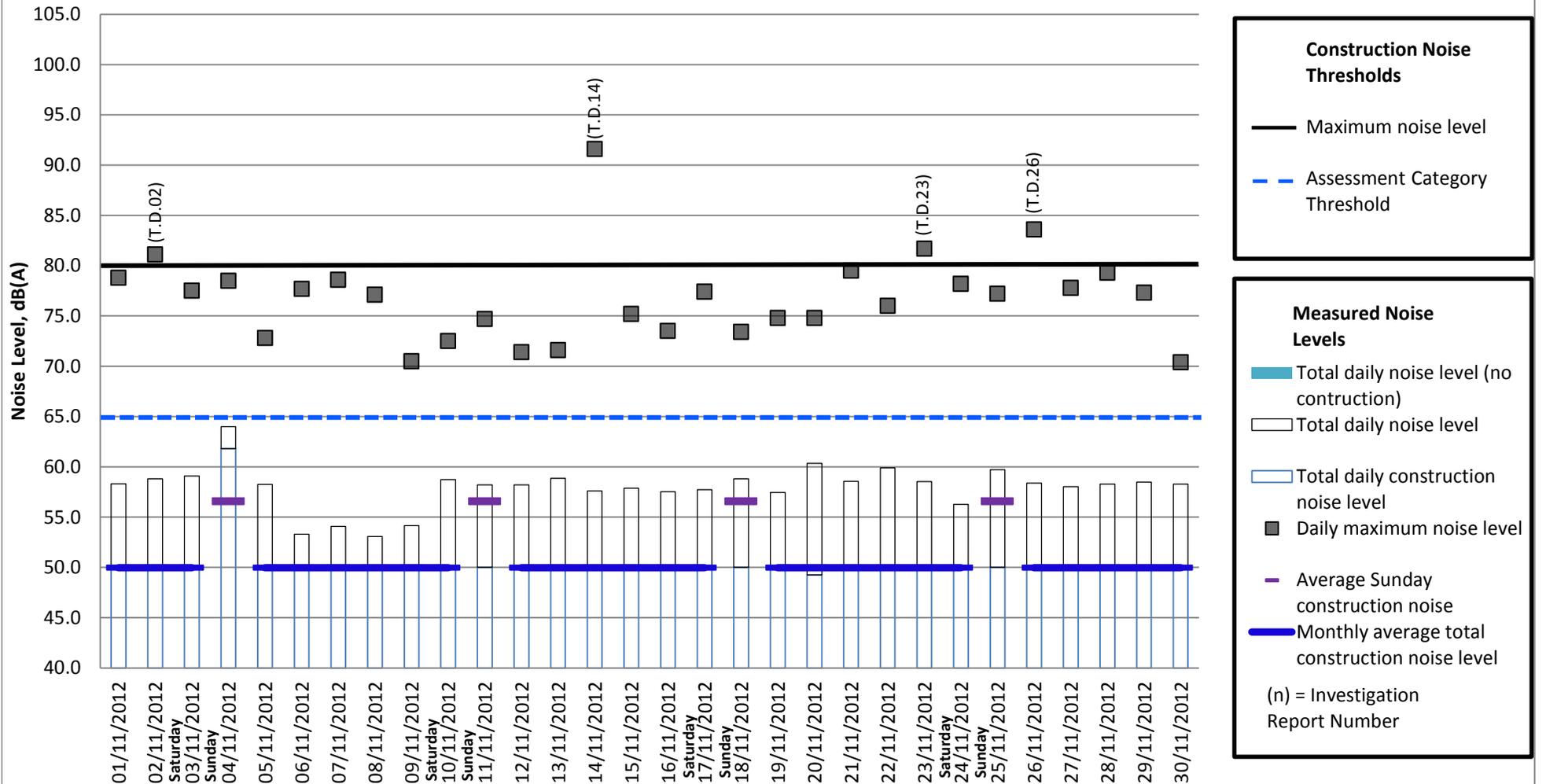
Note: The grey areas of the chart represent days on which no construction works have been conducted. The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location. Data is missing for 10/11/12 to 22/11/12 due to a failure with the FCBC server.

Measured Daytime Noise Levels at Springfield Measurement period: November 2012

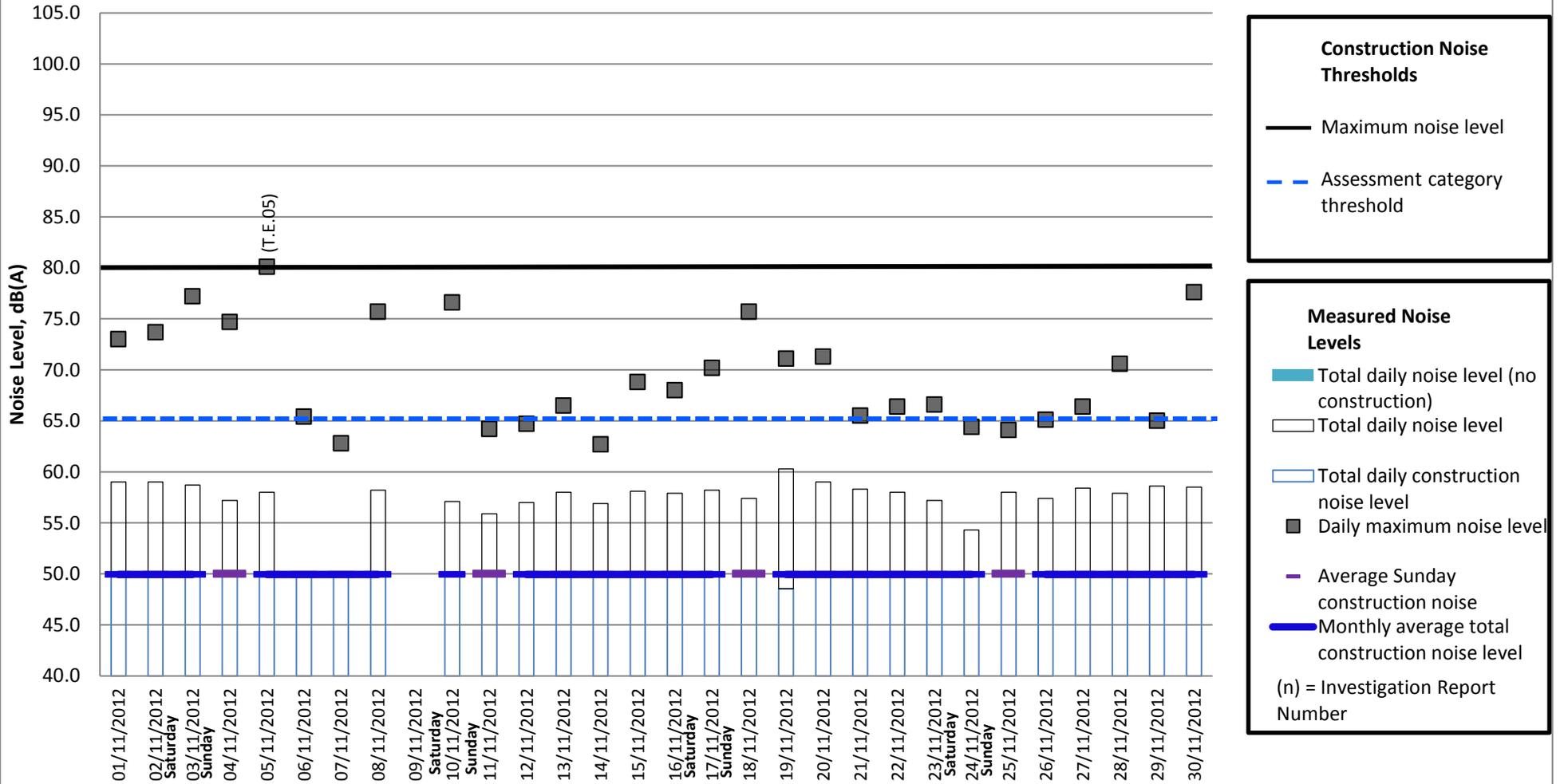


Note: Data is missing from 01/11/2012 to 11/11/2012 due to a failure of the FCBC server.

Measured Daytime Noise Levels at Tigh-Na-Grian Measurement period: November 2012



Measured Evening Noise Levels at Tigh-Na-Grian Measurement period: November 2012



Construction Noise Thresholds

- Maximum noise level
- - - Assessment category threshold

Measured Noise Levels

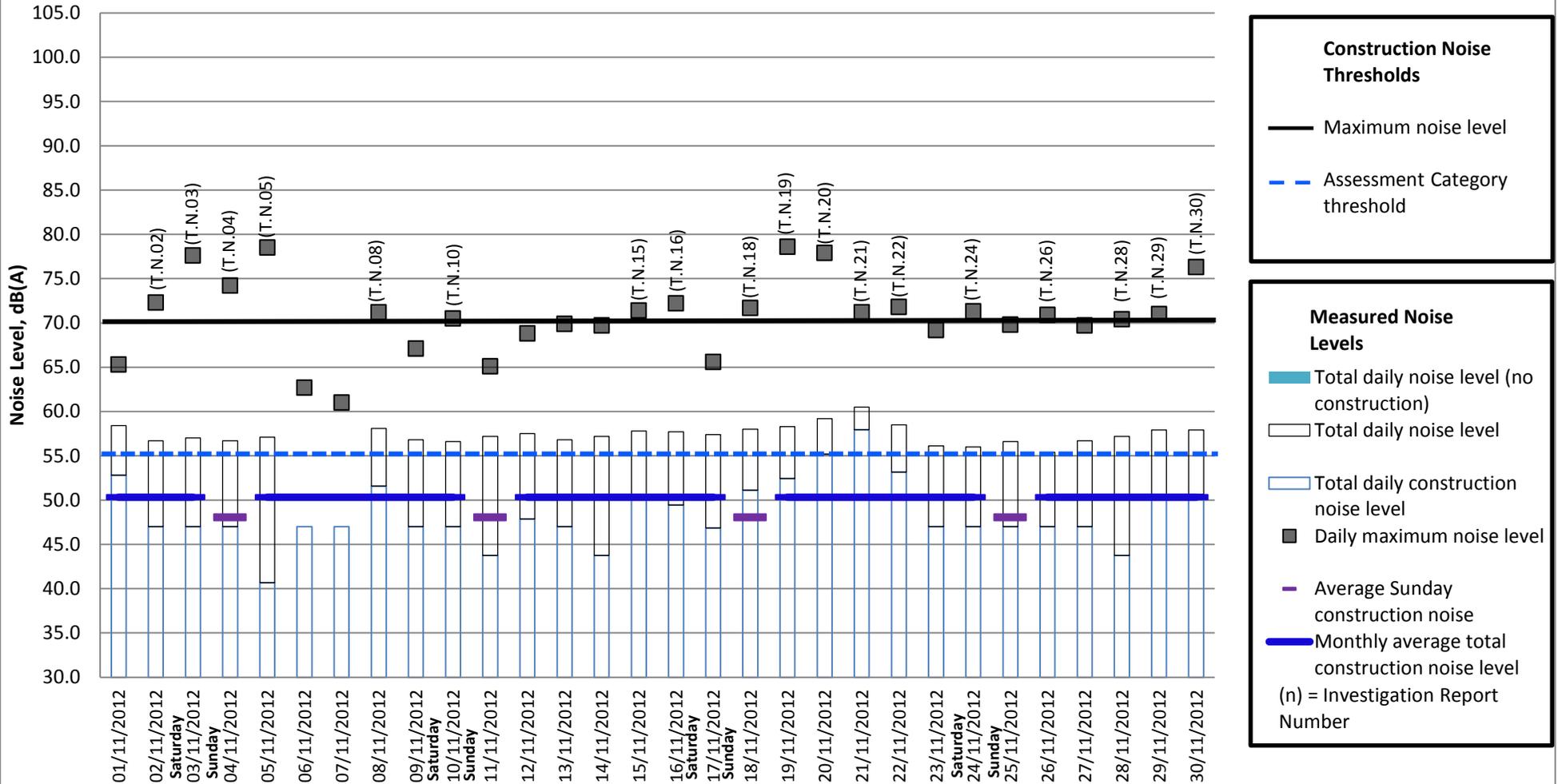
- █ Total daily noise level (no construction)
- ▭ Total daily noise level
- ▭ Total daily construction noise level
- █ Daily maximum noise level
- - - Average Sunday construction noise
- Monthly average total construction noise level

(n) = Investigation Report Number

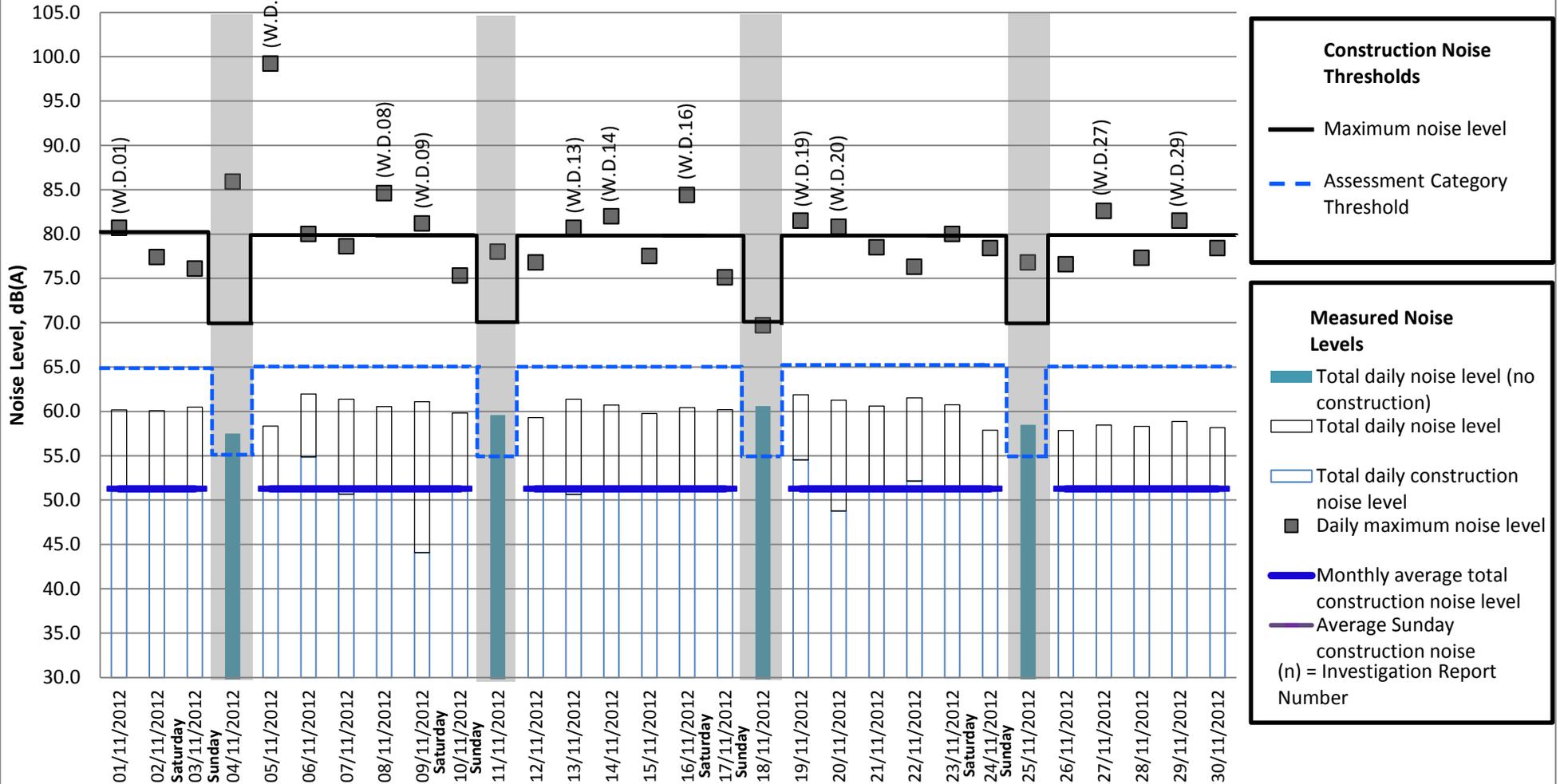
Note: Data is missing on 09/11/12 due to device error.

Measured Night-time Noise Levels at Tigh-Na-Grian

Measurement period: November 2012



Measured Daytime Noise Levels at Whinny Hill Measurement period: November 2012

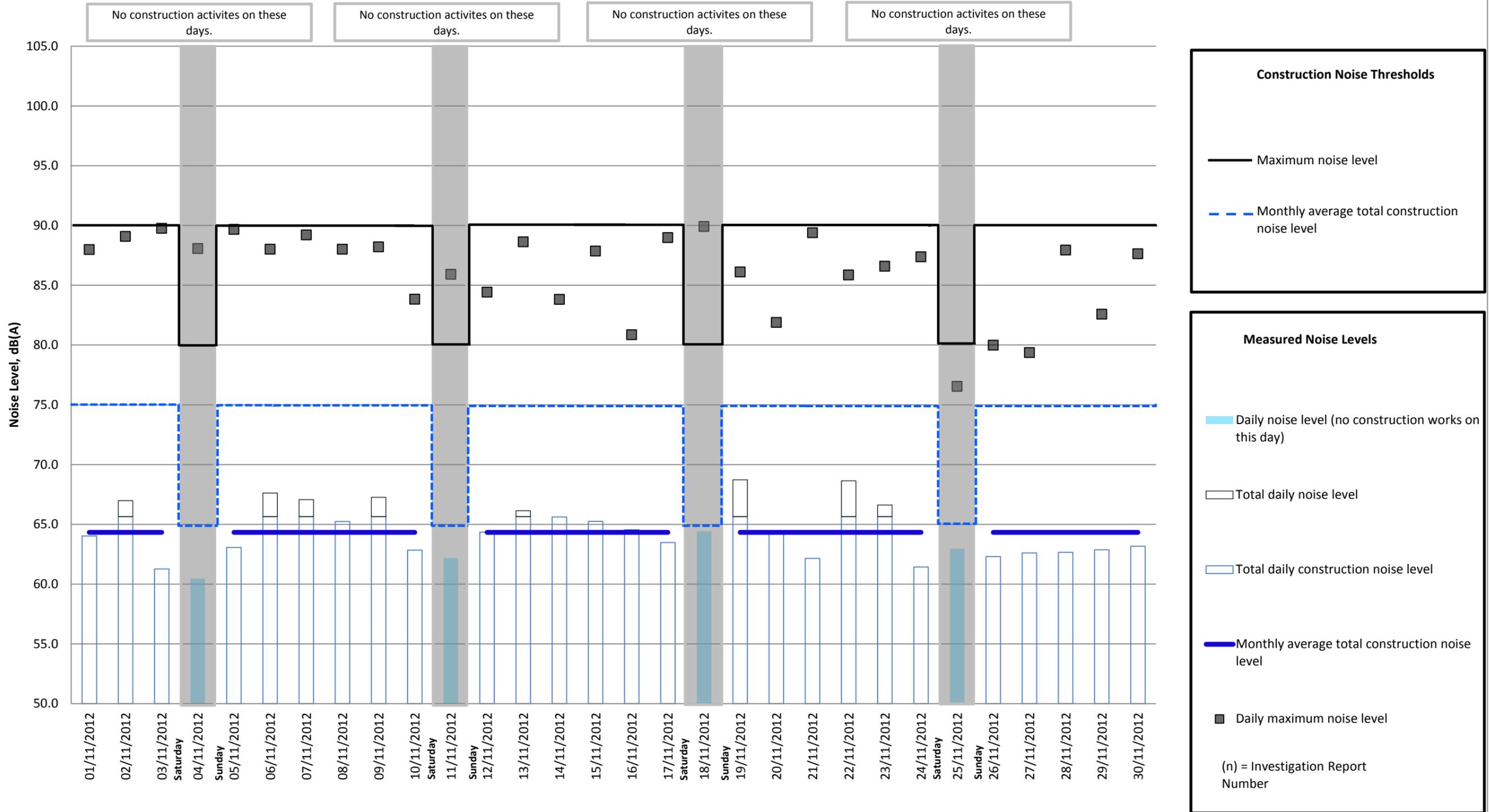


Note: The grey areas of the chart represent days on which no construction works have been conducted.

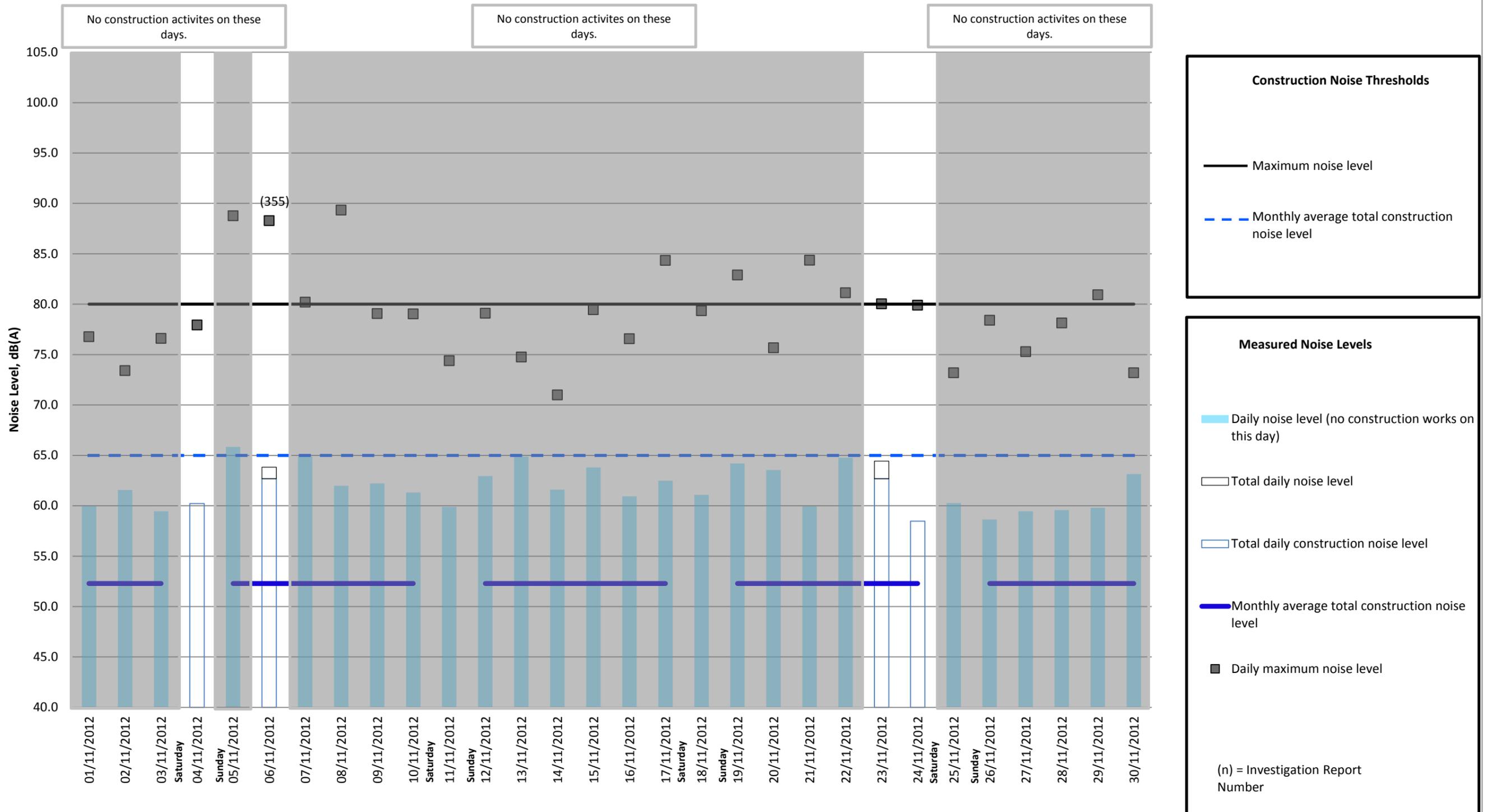
APPENDIX B -

**M9 J1A CONTRACT - CONSTRUCTION
NOISE MONITORING REPORTS**

Measured daytime noise levels, 93/95 King Edwards Way (CNV02) Measurement period 1st November to 30th November 2012



Measured evening noise levels, 93/95 King Edwards Way (CNV02) Measurement period 1st November to 30th November 2012



Construction Noise Thresholds

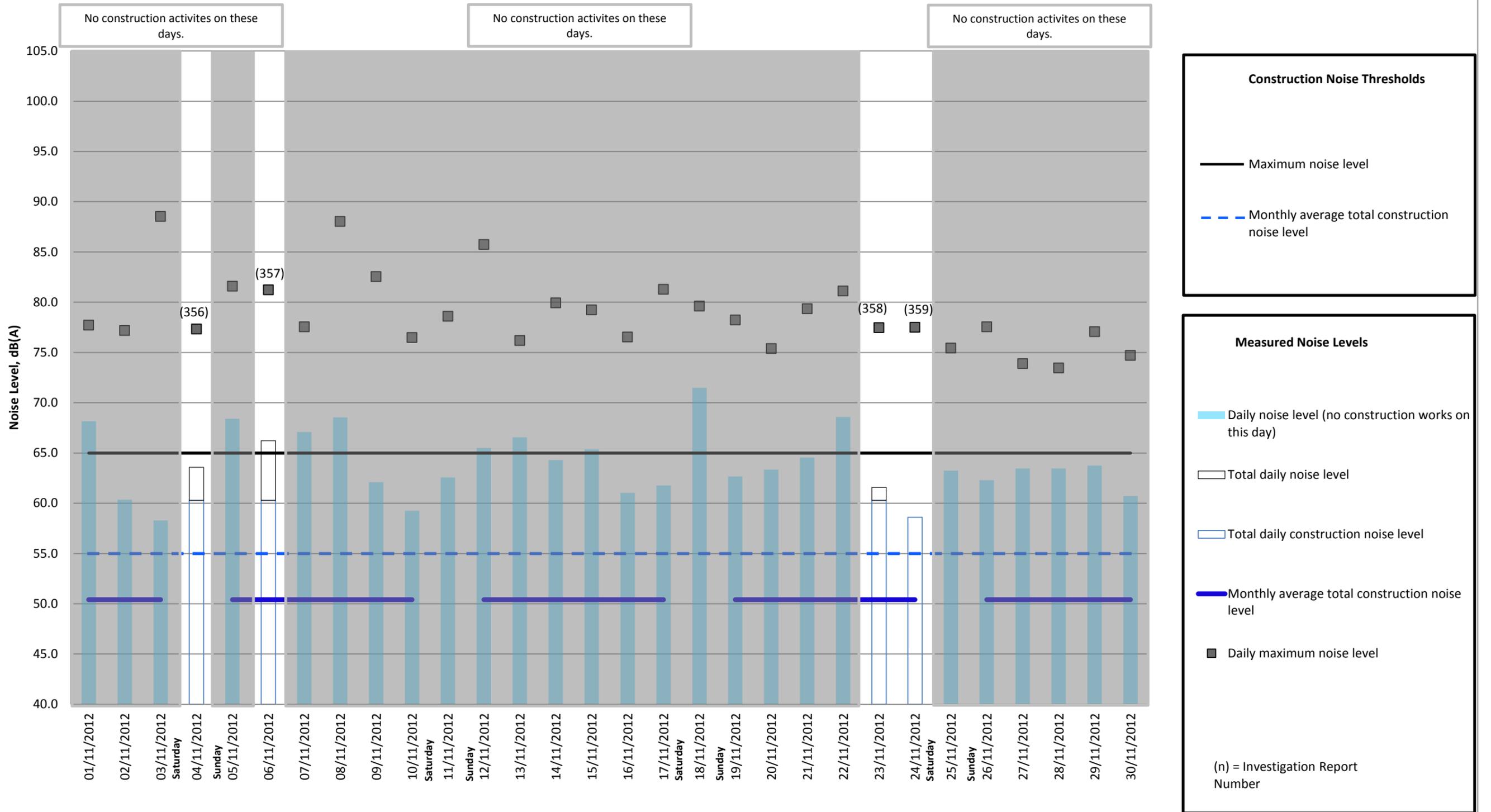
- Maximum noise level
- Monthly average total construction noise level

Measured Noise Levels

- Daily noise level (no construction works on this day)
- Total daily noise level
- Total daily construction noise level
- Monthly average total construction noise level
- Daily maximum noise level

(n) = Investigation Report Number

Measured night-time noise levels, 93/95 King Edwards Way (CNV02) Measurement period 1st November to 30th November 2012



Construction Noise Thresholds

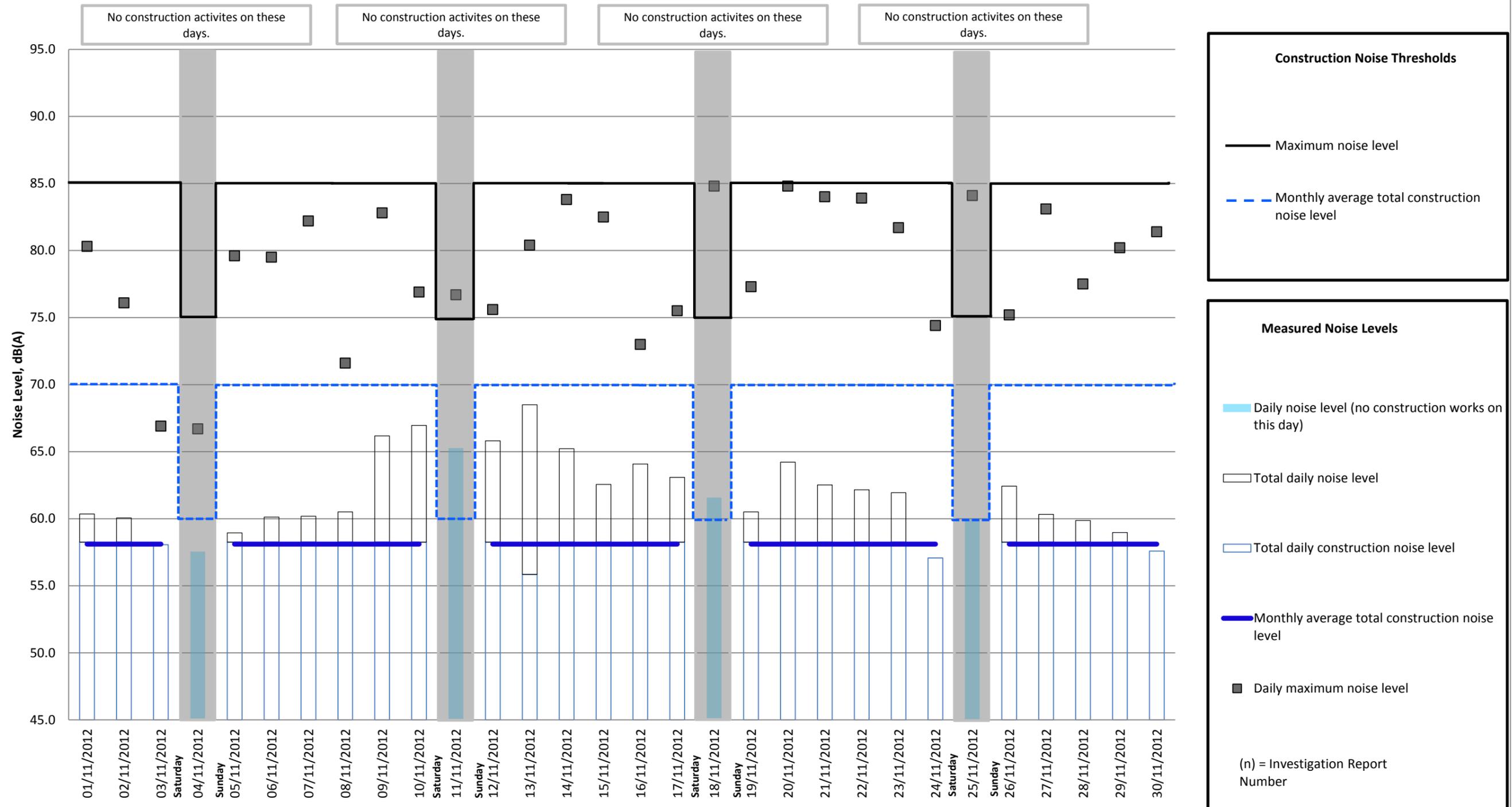
- Maximum noise level
- Monthly average total construction noise level

Measured Noise Levels

- Daily noise level (no construction works on this day)
- Total daily noise level
- Total daily construction noise level
- Monthly average total construction noise level
- Daily maximum noise level

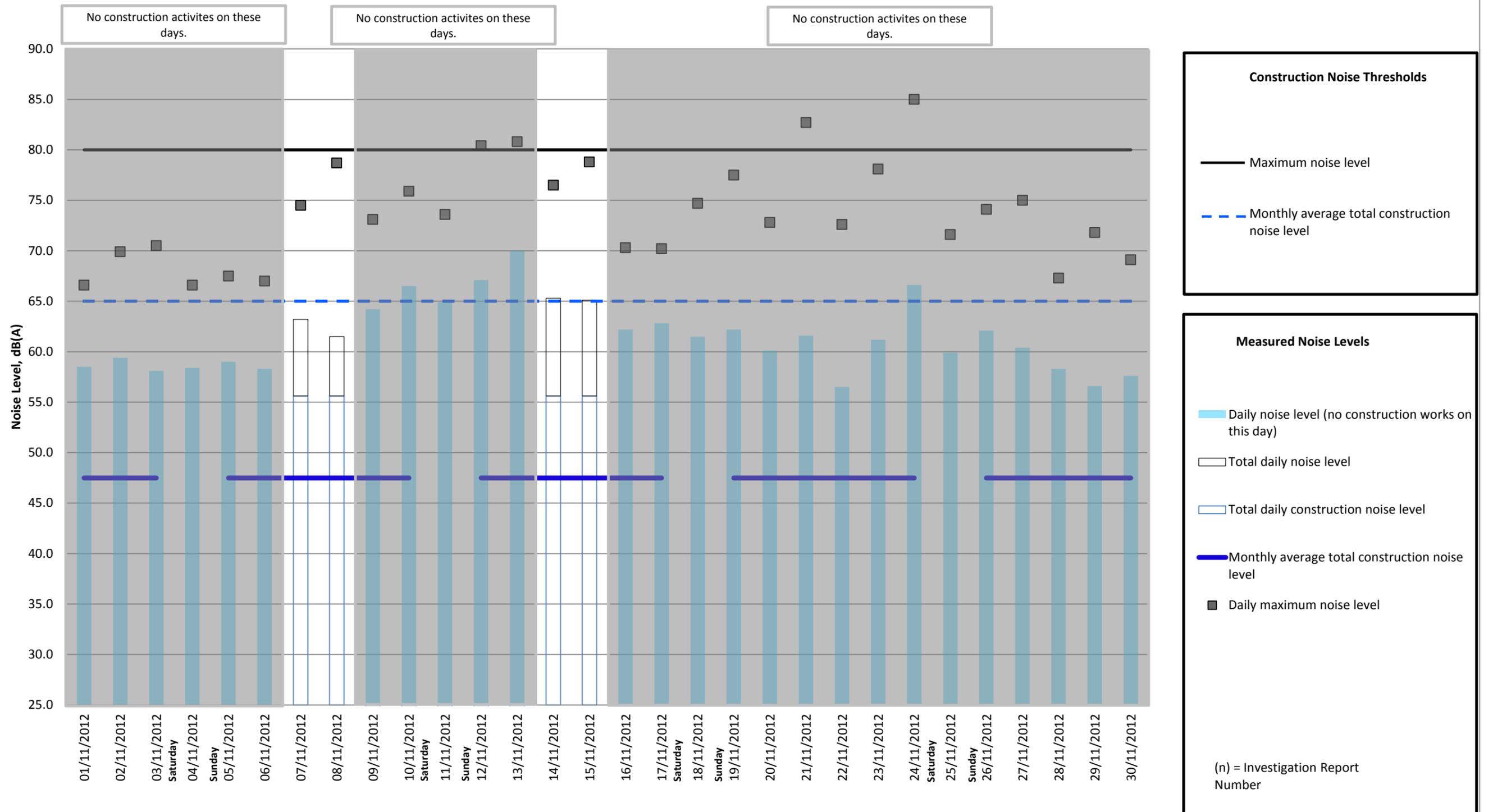
(n) = Investigation Report Number

Measured daytime noise levels, Buie Rigg (CNV07) Measurement period 1st November to 30th November 2012

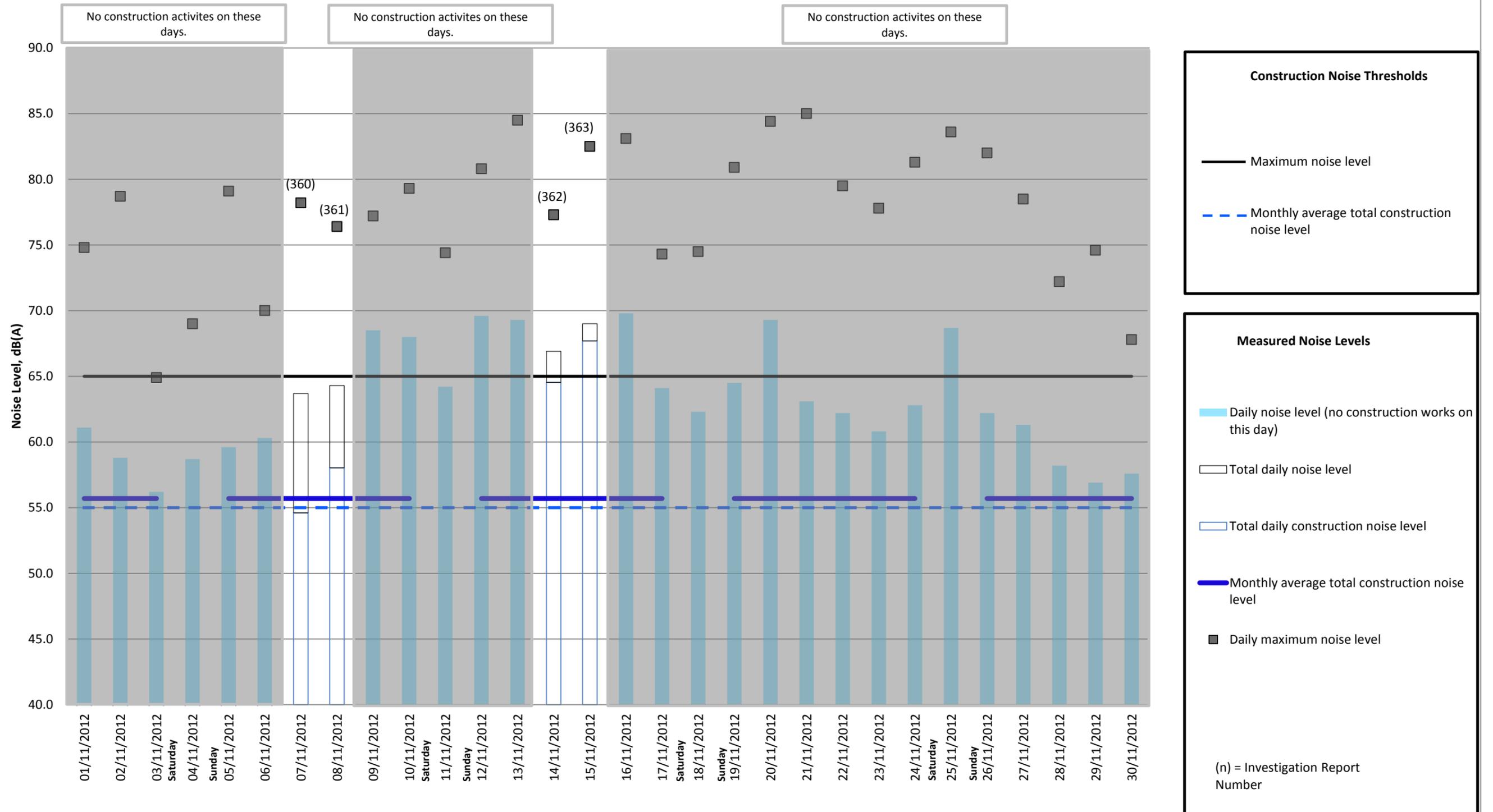


Measured evening noise levels, Buie Rigg (CNV07)

Measurement period 1st November to 30th November 2012



Measured night-time noise levels, Buie Rigg (CNV07) Measurement period 1st November to 30th November 2012



Construction Noise Thresholds

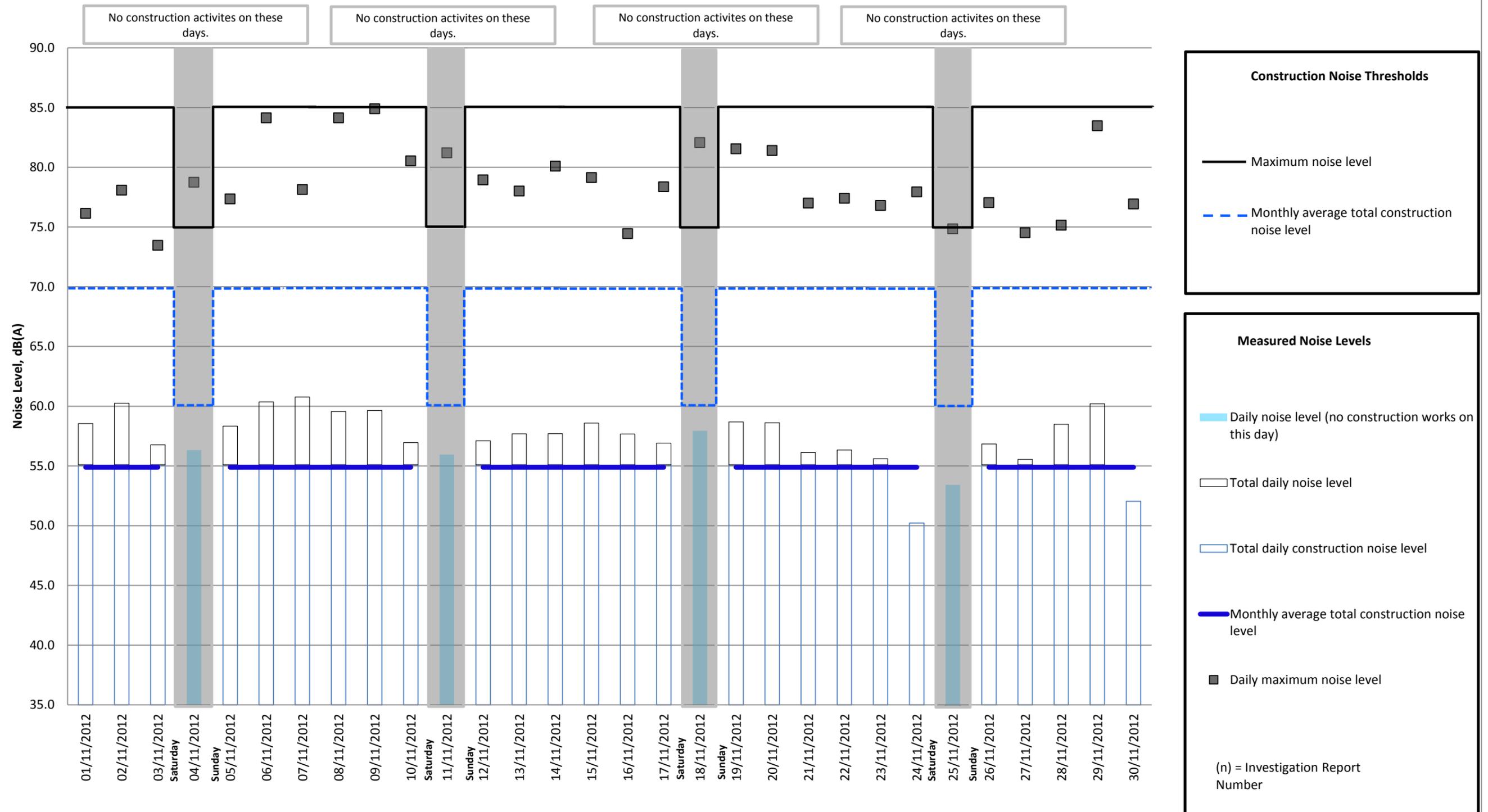
- Maximum noise level
- Monthly average total construction noise level

Measured Noise Levels

- Daily noise level (no construction works on this day)
- Total daily noise level
- Total daily construction noise level
- Monthly average total construction noise level
- Daily maximum noise level

(n) = Investigation Report Number

Measured daytime noise levels, 8 Kirklands Park Grove (CNV16) Measurement period 1st November to 30th November 2012



Construction Noise Thresholds

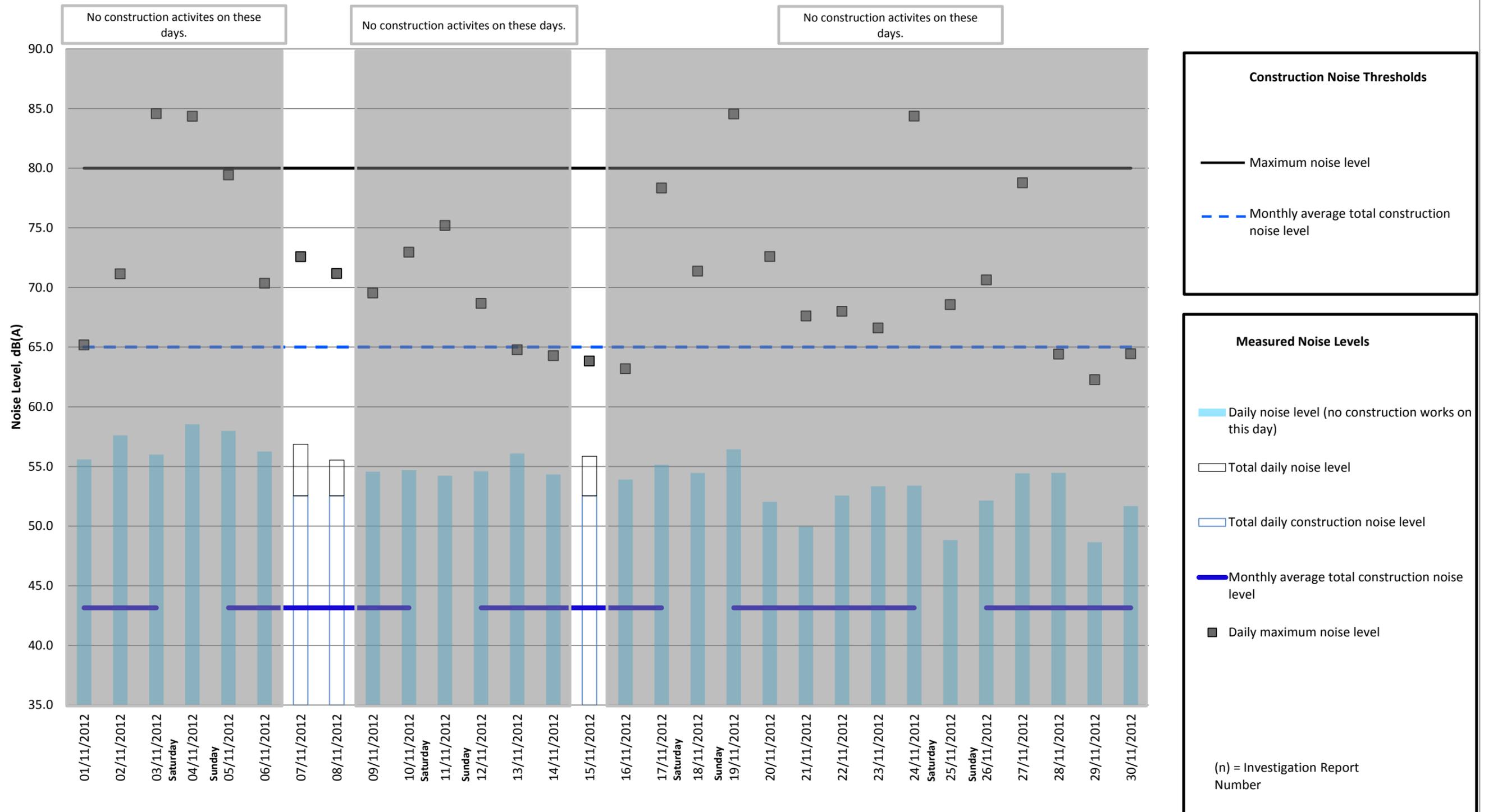
- Maximum noise level
- Monthly average total construction noise level

Measured Noise Levels

- Daily noise level (no construction works on this day)
- Total daily noise level
- Total daily construction noise level
- Monthly average total construction noise level
- Daily maximum noise level

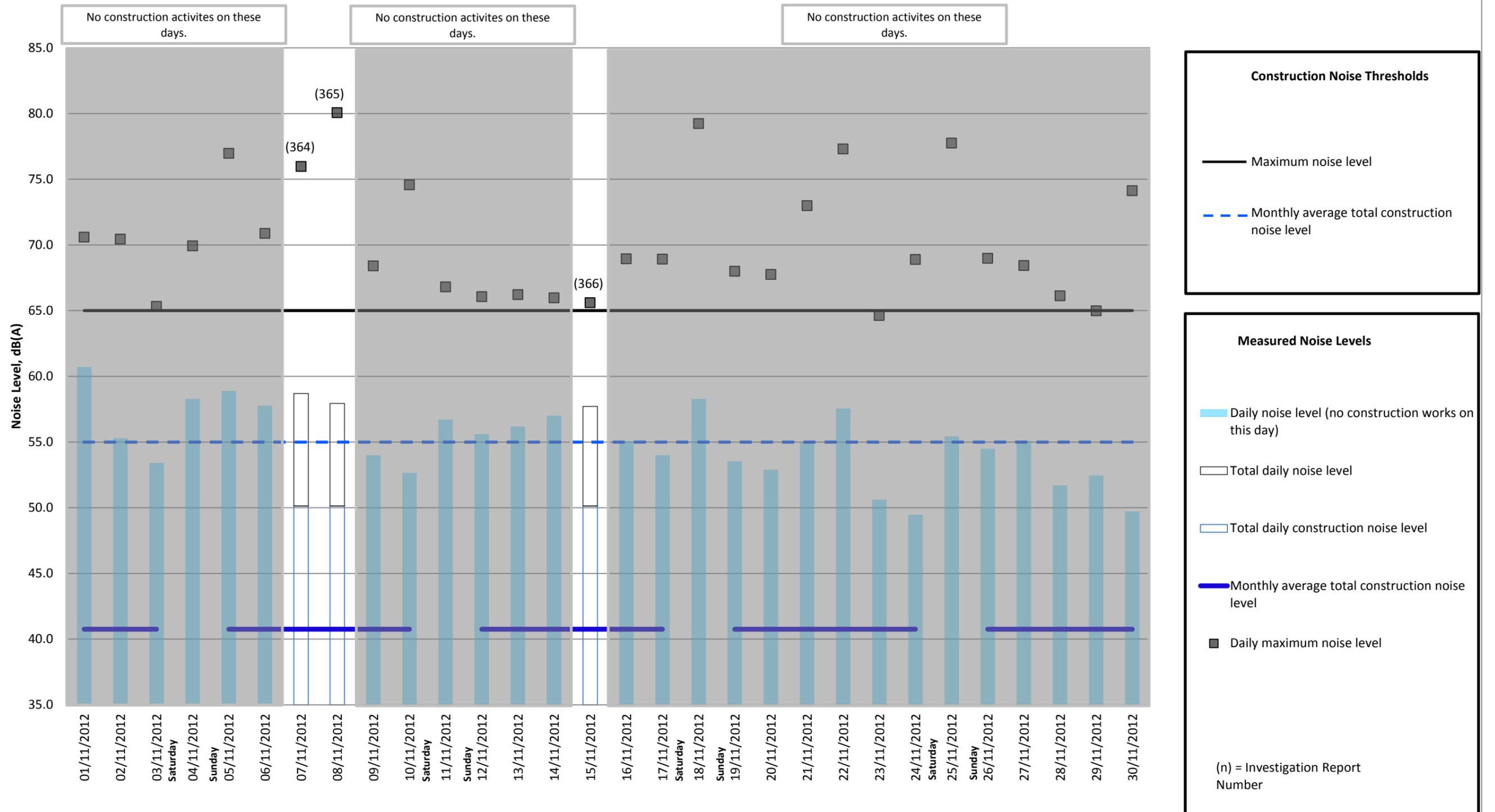
(n) = Investigation Report Number

Measured evening noise levels, 8 Kirklands Park Grove (CNV16) Measurement period 1st November to 30th November 2012



(n) = Investigation Report Number

Measured night-time noise levels, 8 Kirklands Park Grove (CNV16) Measurement period 1st November to 30th November 2012



Construction Noise Thresholds

- Maximum noise level
- Monthly average total construction noise level

Measured Noise Levels

- Daily noise level (no construction works on this day)
- Total daily noise level
- Total daily construction noise level
- Monthly average total construction noise level
- Daily maximum noise level

(n) = Investigation Report Number

 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 06-11-12	NER. 208
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>November 06th – CNV02</u> Exceedences 355: Maximum Noise Level: 88.3 dB (A) at 20.00 06 th November An analysis was carried out using the following data: <ul style="list-style-type: none"> Recorded Noise Logs and Noise Data Noise type Site Diaries / Weather Data Inspections by Senior Engineer (Roland Tarrant) Findings: Analysis of the site diaries indicate that works were carried out overnight in this area. These included: <ul style="list-style-type: none"> Lining works to M9 Westbound lanes Therefore it is considered possible for these works to have resulted in the noise exceedence recorded. Corrective Action Required: SRB are to maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date07-11-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date07-11-12... Project Manager / Assist Project Manager			

 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 04-11-12	NER. 209
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>November 04th – CNV02</u> Exceedences 356: Maximum Noise Level: 77.3 dB (A) at 07.00 05 th November An analysis was carried out using the following data: <ul style="list-style-type: none"> Recorded Noise Logs and Noise Data Noise type Site Diaries / Weather Data Inspections by Senior Engineer (Roland Tarrant) Findings: Analysis of the site diaries indicate that works were carried out overnight in this area. These included: <ul style="list-style-type: none"> Surfacing M9 Westbound lanes Therefore it is considered possible for these works to have resulted in the noise exceedence recorded. Corrective Action Required: SRB are to maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date07-11-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date07-11-12... Project Manager / Assist Project Manager			

 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 07-11-12	NER. 210
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>November 06th – CNV02</u> Exceedences 357: Maximum Noise Level: 81.2 dB (A) at 07.00 07 th November An analysis was carried out using the following data: <ul style="list-style-type: none"> Recorded Noise Logs and Noise Data Noise type Site Diaries / Weather Data Inspections by Senior Engineer (Roland Tarrant) Findings: Analysis of the site diaries indicate that works were carried out overnight in this area. These included: <ul style="list-style-type: none"> Lining works to M9 Westbound lanes However, these works were completed before the time period in question Therefore it is considered unlikely for these works to have resulted in the noise exceedence recorded. <p>Corrective Action Required: SRB are to maintain current monitoring and surveillance levels</p> SignatureRoland Tarrant..... Date07-11-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date07-11-12... Project Manager / Assist Project Manager			

 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 23-11-12	NER. 211
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>November 23rd – CNV02</u> Exceedences 358: Maximum Noise Level: 77.5 dB (A) at 23.00 23 rd November An analysis was carried out using the following data: <ul style="list-style-type: none"> Recorded Noise Logs and Noise Data Noise type Site Diaries / Weather Data Inspections by Senior Engineer (Roland Tarrant) Findings: Analysis of the site diaries indicate that works were carried out overnight in this area. These included: <ul style="list-style-type: none"> Surfacing M9 Westbound lanes Therefore it is considered possible for these works to have resulted in the noise exceedence recorded. Corrective Action Required: SRB are to maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date24-11-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date24-11-12... Project Manager / Assist Project Manager			

 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 24-11-12	NER. 212
	NOISE EXCEEDENCE REPORT		
<p>Summary of Finding(s): <u>November 24th – CNV02</u></p> <p>Exceedences 359: Maximum Noise Level: 77.5 dB (A) at 07.00 25th November</p> <p>An analysis was carried out using the following data:</p> <ul style="list-style-type: none"> Recorded Noise Logs and Noise Data Noise type Site Diaries / Weather Data Inspections by Senior Engineer (Roland Tarrant) <p>Findings:</p> <p>Analysis of the site diaries indicate that works were carried out overnight in this area. These included:</p> <ul style="list-style-type: none"> Surfacing M9 Westbound lanes <p>Therefore it is considered possible for these works to have resulted in the noise exceedence recorded.</p> <p>Corrective Action Required:</p> <p>SRB are to maintain current monitoring and surveillance levels</p> <p>SignatureRoland Tarrant..... Date25-11-12.....</p>			
<p>NER Closed</p> <p>Works have been inspected and completed as described above.</p> <p>SignatureSeamus O'Brien.....Date25-11-12...</p> <p style="text-align: center;">Project Manager / Assist Project Manager</p>			

 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 08-11-12	NER. 213
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>November 7th – CNV07 and CNV 016</u> Exceedences 360: CNV 07 Maximum Noise Level: 78.2dB (A) at 22.00 07 th November 364: CNV 16 Maximum Noise Level: 76.0 dB (A) at 05.00 08 th November An analysis was carried out using the following data: <ul style="list-style-type: none"> Recorded Noise Logs and Noise Data Noise type Site Diaries / Weather Data Inspections by Senior Engineer (Roland Tarrant) Findings: Analysis of the site diaries indicate that works were carried out overnight in this area. These included: <ul style="list-style-type: none"> Surfacing M9 Spur Southbound lanes Therefore it is considered possible for these works to have resulted in the noise exceedence recorded. <p>Corrective Action Required: SRB are to maintain current monitoring and surveillance levels</p> SignatureRoland Tarrant..... Date08-11-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date08-11-12... Project Manager / Assist Project Manager			

 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 08-11-12	NER. 214
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>November 8th – CNV07 and CNV 016</u> Exceedences 361: CNV 07 Maximum Noise Level: 76.4dB (A) at 22.00 08 th November 365: CNV 16 Maximum Noise Level: 80.1 dB (A) at 05.00 09 th November An analysis was carried out using the following data: <ul style="list-style-type: none"> Recorded Noise Logs and Noise Data Noise type Site Diaries / Weather Data Inspections by Senior Engineer (Roland Tarrant) Findings: Analysis of the site diaries indicate that works were carried out overnight in this area. These included: <ul style="list-style-type: none"> Surfacing M9 Spur Southbound lanes Therefore it is considered possible for these works to have resulted in the noise exceedence recorded. <p>Corrective Action Required: SRB are to maintain current monitoring and surveillance levels</p> SignatureRoland Tarrant..... Date09-11-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date09-11-12... Project Manager / Assist Project Manager			

 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 11-11-12	NER. 215
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>November 11th – CNV07</u> Exceedences 362: CNV 07 Maximum Noise Level: 76.9 dB (A) at 00.00 14 th November An analysis was carried out using the following data: <ul style="list-style-type: none"> • Recorded Noise Logs and Noise Data • Noise type • Site Diaries / Weather Data • Inspections by Senior Engineer (Roland Tarrant) Findings: There were no works on-going in this area during this period. Therefore it is considered unlikely for these works to have resulted in the noise exceedence recorded. Corrective Action Required: SRB are to maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date12-11-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date12-11-12... Project Manager / Assist Project Manager			

 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 15-11-12	NER. 216
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>November 15th – CNV07 and CNV 016</u> Exceedences 363: CNV 07 Maximum Noise Level: 82.5dB (A) at 07.00 16 th November 366: CNV 16 Maximum Noise Level: 65.6 dB (A) at 05.00 16 th November In addition the LAEQ Total Daily Construction Noise level was also exceeded for this period. An analysis was carried out using the following data: <ul style="list-style-type: none"> Recorded Noise Logs and Noise Data Noise type Site Diaries / Weather Data Inspections by Senior Engineer (Roland Tarrant) Findings: Analysis of the site diaries indicate that works were carried out overnight in this area. These included: <ul style="list-style-type: none"> Spur Southbound closed for cutting of loops to eastbound merge Therefore it is considered possible for these works to have resulted in the noise exceedence recorded. Corrective Action Required: SRB are to maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date15-11-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date15-11-12... Project Manager / Assist Project Manager			