



# **Forth Replacement Crossing**

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

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



An agency of  The Scottish Government



**FORTH REPLACEMENT CROSSING**

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

**Revision Status**

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**FORTH REPLACEMENT CROSSING**

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CONSTRUCTION NOISE MONITORING REPORT**

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## **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: April 2012 – refer to Section 2 of this report.
- M9 Junction 1a Contract: April 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)	April 2012	<ul style="list-style-type: none"> <li>Overburden Removal</li> </ul>
Tigh-Na-Grian (M3)	April 2012	<ul style="list-style-type: none"> <li>Milling at Beamer Rock</li> <li>Dredging at South Shore</li> <li>Sub-formation preparation works</li> <li>Blasting at North Abutment</li> </ul>
Port Edgar (M6)	April 2012	<ul style="list-style-type: none"> <li>Milling at Beamer Rock</li> <li>Dredging at South Shore</li> <li>Site Clearance</li> </ul>
Butlaw Fisheries (M7)	April 2012	<ul style="list-style-type: none"> <li>Excavation at Beamer Rock</li> <li>Dredging at South Shore</li> </ul>
Inchgarvie Lodge (M10)	April 2012	<ul style="list-style-type: none"> <li>Milling at Beamer Rock</li> <li>Dredging at South Shore</li> <li>Utility works</li> <li>Trial holes</li> </ul>
Linn Mill (M11)	April 2012	<ul style="list-style-type: none"> <li>Utility works</li> <li>Trial holes</li> </ul>
Clufflat Brae (M13)	April 2012	<ul style="list-style-type: none"> <li>Utility works and topsoil stripping</li> <li>Trial holes</li> </ul>
Springfield (M14)	April 2012	<ul style="list-style-type: none"> <li>Construction of south compound</li> <li>Topsoil Stripping</li> </ul>
Echline Field (M15)	April 2012	<ul style="list-style-type: none"> <li>Construction of south compound</li> <li>Vegetation mulch and removal</li> <li>Topsoil stripping</li> <li>LMA fencing</li> </ul>
Scotstoun (M16)	April 2012	<ul style="list-style-type: none"> <li>Utilities works</li> <li>LMA fencing</li> <li>Vegetation mulch and removal</li> </ul>
Dundas Home Farm (M17)	April 2012	<ul style="list-style-type: none"> <li>Utilities works</li> <li>LMA fencing</li> <li>Vegetation mulch and removal</li> </ul>
Newton	April 2012	<ul style="list-style-type: none"> <li>No works within 1.75 km</li> </ul>

**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 A number of exceedences of the maximum noise level thresholds occurred in April, however the majority of these are not considered to be due to construction works. A total of three exceedences of the daytime maximum noise threshold were attributed to construction works as follows:
- 2 exceedences at Clufflat Brae due to plant operating in close proximity to the sound level meter.
  - 1 exceedance at Scotstoun due to tree felling in close proximity to the sound level meter.
- 2.4 All monthly average total construction noise levels were within the relevant thresholds, with the exception of Butlaw Fisheries and Inchgarvie during the night time periods and Scotstoun during the daytime period.
- 2.5 A large quantity of non-construction related exceedance reports were generated in April, and as such it was considered inappropriate to include them in this report. However, the exceedance reports are available on request from the FRC Team, contactable via email at [enquiries@forthreplacementcrossing.info](mailto:enquiries@forthreplacementcrossing.info). A summary of the information included in the exceedance reports is provided in Table 2.2 below.

<b>Monitoring Location</b>	<b>Contractor's Exceedance Report Reference</b>	<b>Exceedance</b>
Butlaw Fisheries (M7)	NVIRs B.87 – B.130	During April the maximum noise threshold was exceeded on 55 occasions (daytime, 13; evening, 13; night time, 29). The exceedences were attributed to a range of factors, including birds (particularly during the early hours of the morning), strong winds and water on the shore.

<b>Monitoring Location</b>	<b>Contractor's Exceedance Report Reference</b>	<b>Exceedance</b>
Clufflat Brae (M13)	NVIRs C.77 – C.120	During April the maximum noise threshold was exceeded on 60 occasions (daytime, 14; evening, 18; night time, 28). A number of the exceedances were found to be due to birds, strong winds and children playing, particularly during the evening. Two daytime exceedances were due to construction works; on both days intermitted noise due to plant caused exceedances.
Inchgarvie Lodge (M10)	NVIRs I.79 – I.117	During April the maximum noise threshold was exceeded on 62 occasions (daytime, 17; evening, 17; night time, 28). The exceedances were not attributable to construction. Investigations found birds to be the main contributing factor to the exceedances at this location.
Linn Mill (M11)	NVIRs L.64 – L.110	During April the maximum noise threshold was exceeded on 53 occasions (daytime, 13; evening, 12; night time, 28). These exceedances were not attributable to construction. Exceedances were largely due to birds. Other reasons identified include DIY works at the property during the daytime.
Tigh-Na-Grian (M3)	NVIRs T.71 – T.105	During April the maximum noise threshold was exceeded on 41 occasions (daytime, 11; evening, 1; night time, 29). Exceedances were not related to construction and were attributed to non-construction noise sources, particularly birds. Some exceedances were also due to monitor maintenance.
Dundas Home Farm (M17)	NVIRs D.27 – D.35	During April the maximum noise threshold was exceeded on 7 occasions. Exceedances were not attributable to construction works. Exceedances were the result of vehicle noises (car horns) the use of lawnmowers near the monitor.
Echline Field (M15)	NVIRs E.43 – E.60	During April the maximum noise threshold was exceeded on 18 occasions. Exceedances were not due to construction activities and were all attributed to vehicle noises.
Springfield (M14)	NVIRs S.12 – S.20	During April the maximum noise threshold was exceeded on 14 occasions. Exceedances were not due to construction activities. Exceedances were attributed to DIY at nearby properties, lawnmower use and monitor maintenance.

<b>Monitoring Location</b>	<b>Contractor's Exceedance Report Reference</b>	<b>Exceedance</b>
Scotstoun (M16)	NVIRs Sc.1 – Sc.18	During April the maximum noise threshold was exceeded on 17 occasions. Exceedances were largely attributed to vehicles passing by on the adjacent road. However, exceedances for a short, intermittent period on 23/04/12 were due to tree felling close to the monitor.
Whinny Hill (M1)	NVIRs W.1 – W.6	During April the maximum noise threshold was exceeded on 6 occasions. Exceedances were not due to construction activities. Monitor maintenance and other non-construction factors were found to be the cause of exceedances at this location.

**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.

<b>Monitoring Location</b>	<b>Monitoring Period</b>	<b>Main Construction Activities</b>
93/95 King Edwards Way (CNV02)	April 2012	<ul style="list-style-type: none"><li>• Excavation north and south of M9</li><li>• Installation of drainage</li><li>• M9 earthworks at Gateside</li></ul>
15-17 Buie Rigg (CNV07)	April 2012	<ul style="list-style-type: none"><li>• Earthworks at Kirklands Park Grove</li><li>• M9J1a eastbound diverge earthworks</li><li>• Piling at M9 bridge</li><li>• Excavation north and south of M9</li><li>• Demolition of Newmains Bridge</li></ul>
8 Kirklands Park Grove (CNV16)	April 2012	<ul style="list-style-type: none"><li>• Earthworks at Kirklands Park Grove</li><li>• M9J1a eastbound diverge earthworks</li><li>• Utilities works</li><li>• Installation of drainage</li></ul>

**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](http://www.transportscotland.gov.uk/files/documents/projects/forth-replacement/FRC_Construction_Noise_Monitoring_Information_Note_2_.pdf).

3.3 The results of the construction noise monitoring provided in the M9 Junction 1a reports indicate that all construction activities were carried out in accordance with the thresholds set out in the project Code of Construction Practice.

3.4 Some exceedences of the maximum noise level thresholds occurred, although the exceedences are not considered to be due to the construction works being carried out. Formal exceedance reports were prepared by the contractor for April 2012 and the investigations identified that the exceedences were not due to construction related factors. Summary information regarding the exceedences 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.

<b>Monitoring Location</b>	<b>Contractor's Exceedance Report Reference</b>	<b>Exceedance</b>
93/95 King Edwards Way (CNV02)	NERs 53 - 56	During April the maximum noise threshold was exceeded on 5 occasions (daytime, 3; evening, 1; night time, 1). However, no exceedences were attributed to construction related activities. The exceedences were attributed to dogs barking and people shouting.
15-17 Buie Rigg (CNV07)	N/A	No exceedences
8 Kirklands Park Grove (CNV16)	N/A	No exceedences

**Table 3.2 M9 J1a Contract – Summary of Noise Threshold Exceedances**

**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:  
APRIL 2012**

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## **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 April 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 April 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 April 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 two additional monitors installed at Scotstoun Park (Arup's Office) and Newton during February and a further sound level meter was installed at Whinny Hill during March.
- 2.2** At some monitoring locations, the noise monitoring devices are accompanied by an associated weather station. Weather stations are present at Echline Field, Tigh-Na-Grian, Clufflat Brae, Dundas Home Farm, Butlaw Fisheries and Linn Mill. The weather station at Linn Mill was installed during February 2012, with all other weather stations installed during November and December 2011.
- 2.3** Various construction works were undertaken across the site during April 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 April 2012
M1	Whinny Hill	Network	Overburden removal N.B. No evening, night time, Saturday or Sunday daytime construction in vicinity.
M3	Tigh-Na-Grian	Crossing	Milling at Beamer Rock Dredging at South Shore Sub-formation preparation works at Ferry Toll embankment Blasting at North Abutment and associated rock removal
M6	Port Edgar	Crossing	Milling at Beamer Rock Dredging at South Shore Site Clearance and fencing Removal/Demolition
M7	Butlaw Fisheries	Crossing	Milling at Beamer Rock Dredging at South Shore
M10	Inchgarvie Lodge	Crossing	Milling at Beamer Rock Dredging at South Shore Utility works Trial holes
M11	Linn Mill	Network (close proximity to Crossing)	Utility works Trial holes
M13	Clufflat Brae	Network (close proximity to Crossing)	Utility works (Including soil stripping) Trial holes
M14	Springfield	Network	Construction of Southern Compound Soil stripping for utility works N.B. No evening, night time, Saturday or Sunday daytime construction in vicinity.
M15	Echline Field	Network	Vegetation mulch and removal Construction of Southern Compound Soil stripping for utility works LMA Fencing N.B. No evening, night time, Saturday or Sunday daytime construction in vicinity.
M16	Scotstoun	Network	Utilities works LMA fencing Vegetation mulch and removal N.B. No evening, night time, Saturday or Sunday daytime construction in vicinity.

M17	Dundas Home Farm	Network	Utilities works LMA fencing Vegetation mulch and removal  N.B. No evening, night time, Saturday 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](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  $L_{Amax, F}$ ) 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 for April 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  $L_{Amax, F}$  (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. Missing data is typically a result of device error. Device errors during April have typically been a result of monitor maintenance and software issues with the sound level meters. FCBC is currently working with the manufacturer and supplier of the sound level meters to resolve the software issues.
- 3.3** Results demonstrate that the monthly average total construction noise threshold was within the threshold limits for all monitoring locations during daytime, evening or night time periods throughout April 2012, with the exception of Butlaw Fisheries and Inchgarvie during night time and Scotstoun during the day. The Sunday average (for applicable monitoring locations) was also found to be within the threshold for all monitoring locations during April 2012, with the exception of Butlaw Fisheries during the day and at night and both Inchgarvie and Linn Mill at night.
- 3.4** However, the exceedances of the monthly average total construction noise and the Sunday average are not considered to be attributable to construction works. The Sunday  $L_{Aeq}$  average at Butlaw Fisheries, for example, was affected by adverse weather conditions on 8 April 2012 (including strong winds, rain and increased noise levels of the water on the shore, particularly during high tide), which resulted in the background noise levels being significantly higher than normal. With regard to the exceedances of the night time averages, it should be noted that night time averages represent only the highest 1 hour periods recorded within the period. The highest 1 hour  $L_{Aeqs}$  are generally recorded during the early hours of the morning, during which background noise levels are increased due to birds; this has, therefore, caused the monthly average at certain locations to exceed the threshold. The exceedance of the daytime average at Scotstoun is due to increased background noise levels due to the close proximity of the road.
- 3.5** During April 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. Wind speeds greater than 5 meters per second (m/s) are considered to have the potential to affect noise levels (recognised level by the Institute of Acoustics). Therefore, where necessary, wind speed data was assessed in order to determine whether wind speed may have contributed to noise level threshold exceedances. Noise and Vibration Investigative Reports (NVIRs) have been produced for each exceedance, detailing the results of the investigation.

- 3.6** Investigations of the exceedances of the maximum noise level thresholds show the majority to have occurred as a result of non-construction related noise. A significant number of the exceedances, particularly those occurring between dawn and 8 am, were due to bird calls. Adverse weather conditions, in particular wind, were also found to be a contributor to maximum noise level exceedances. Additionally, at some locations, notably Echline Field and Scotstoun, existing traffic noise had an effect on maximum noise levels during the period covered in this report.
- 3.7** Two exceedances of the daytime threshold at Clufflat Brae were found to be due to construction works; intermittent noise from plant operating in close proximity to the noise meter was found to cause exceedances on 28 and 26 April 2012. An additional construction related exceedance was recorded at Scotstoun on 23 April 2012 due to necessary tree felling in close proximity to the sound level meter; however this noise was intermitted and only occurred for a short period of time. A summary of the findings for exceedances occurring at each of the locations can be found in Table 2.

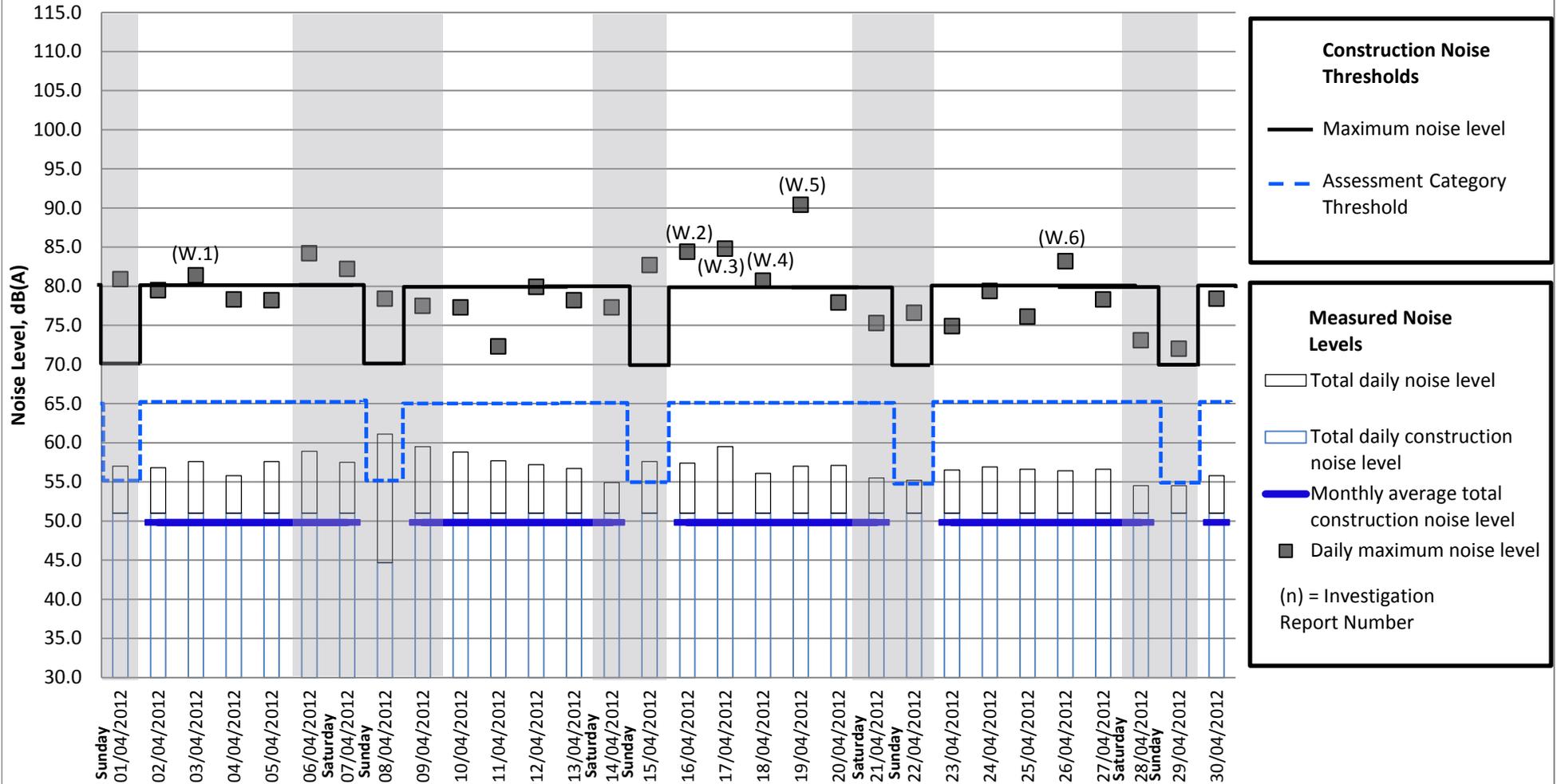
**Table 2: Summary of Exceedances at Monitoring Locations**

<b>Monitoring Location</b>	<b>Associated NVIR Numbers</b>	<b>Summary of Exceedance Details</b>
Butlaw Fisheries	B.131 – B.185	During April the maximum noise threshold was exceeded on 55 occasions (daytime, 13; evening, 13; night time, 29). The exceedances were attributed to a range of factors, including birds (particularly during the early hours of the morning), strong winds and water on the shore.
Clufflat Brae	C.121 – C.180	During April the maximum noise threshold was exceeded on 60 occasions (daytime, 14; evening, 18; night time, 28). A number of the exceedances were found to be due to birds, strong winds and children playing, particularly during the evening. Two daytime exceedances were due to construction works; on both days intermitted noise due to plant caused exceedances.
Inchgarvie Lodge	I.118 – I.179	During April the maximum noise threshold was exceeded on 62 occasions (daytime, 17; evening, 17; night time, 28). The exceedances were not attributable to construction. Investigations found birds to be the main contributing factor to the exceedances at this location.
Linn Mill	L.111 – L.163	During April the maximum noise threshold was exceeded on 53 occasions (daytime, 13; evening, 12; night time, 28). These exceedances were not attributable to construction. Exceedances were largely due to birds. Other reasons identified include DIY works at the property during the daytime.
Tigh-Na-Grian	T.106 – T.153	During April the maximum noise threshold was exceeded on 41 occasions (daytime, 11; evening, 1; night time, 29). Exceedances were not related to construction and were attributed to non-construction noise sources, particularly birds. Some exceedances were also due to monitor maintenance.
Dundas Home Farm	D.36 – D.42	During April the maximum noise threshold was exceeded on 7 occasions. Exceedances were not attributable to construction works. Exceedances were the result of vehicle noises (car horns) the use of lawnmowers near the monitor.
Echline Field	E.61 – E.78	During April the maximum noise threshold was exceeded on 18 occasions. Exceedances were not due to construction activities and were all attributed to vehicle noises.

Springfield	S.21 – S.34	During April the maximum noise threshold was exceeded on 14 occasions. Exceedances were not due to construction activities. Exceedances were attributed to DIY at nearby properties, lawnmower use and monitor maintenance.
Scotstoun	Sc.19 – Sc.35	During April the maximum noise threshold was exceeded on 17 occasions. Exceedances were largely attributed to vehicles passing by on the adjacent road. However, exceedances for a short, intermittent period on 23/04/12 were due to tree felling close to the monitor.
Whinny Hill	W.1 – W.6	During April the maximum noise threshold was exceeded on 6 occasions. Exceedances were not due to construction activities. Monitor maintenance and other non-construction factors were found to be the cause of exceedances at this location.

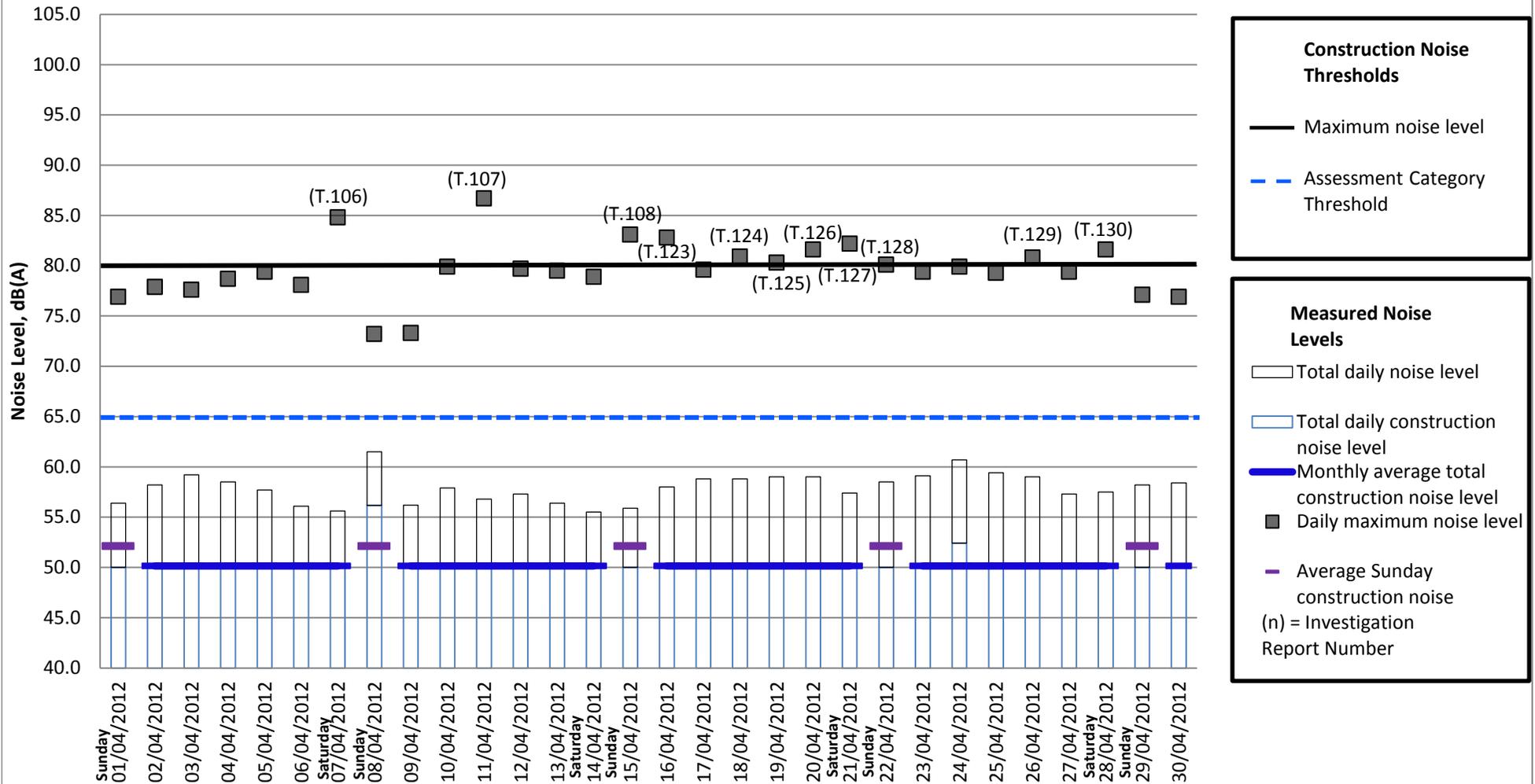
## Measured Daytime Noise Levels at Whinny Hill

### Measurement period: April 2012



**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no Saturday or Sunday construction works have been conducted at this location. No works were conducted over Easter Weekend (06/04/12 to 09/04/12). The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location during this period.

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



**Construction Noise Thresholds**

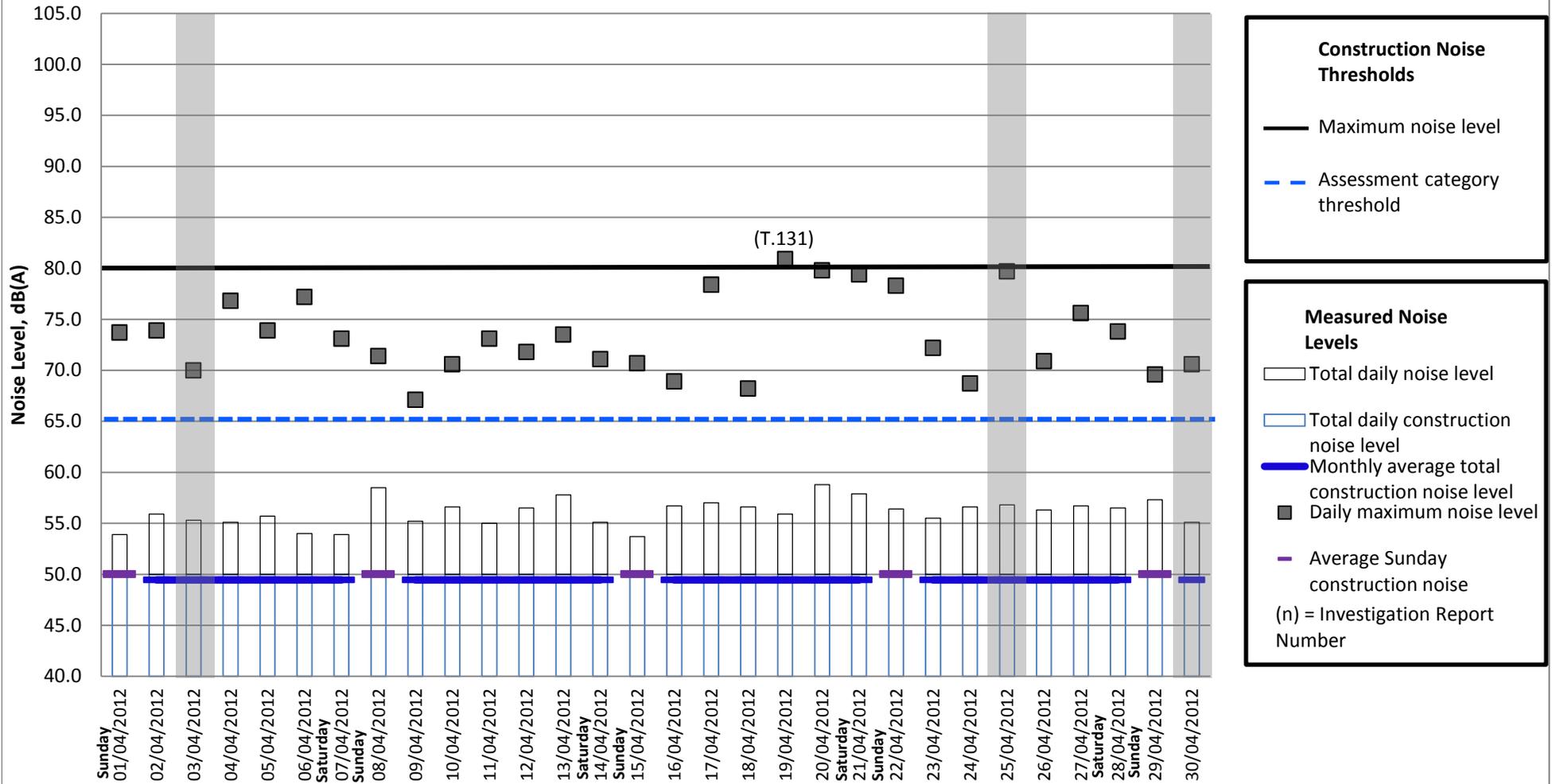
- Maximum noise level
- - - Assessment Category Threshold

**Measured Noise Levels**

- Total daily noise level
- Total daily construction noise level
- Monthly average total construction noise level
- Daily maximum noise level
- Average Sunday construction noise

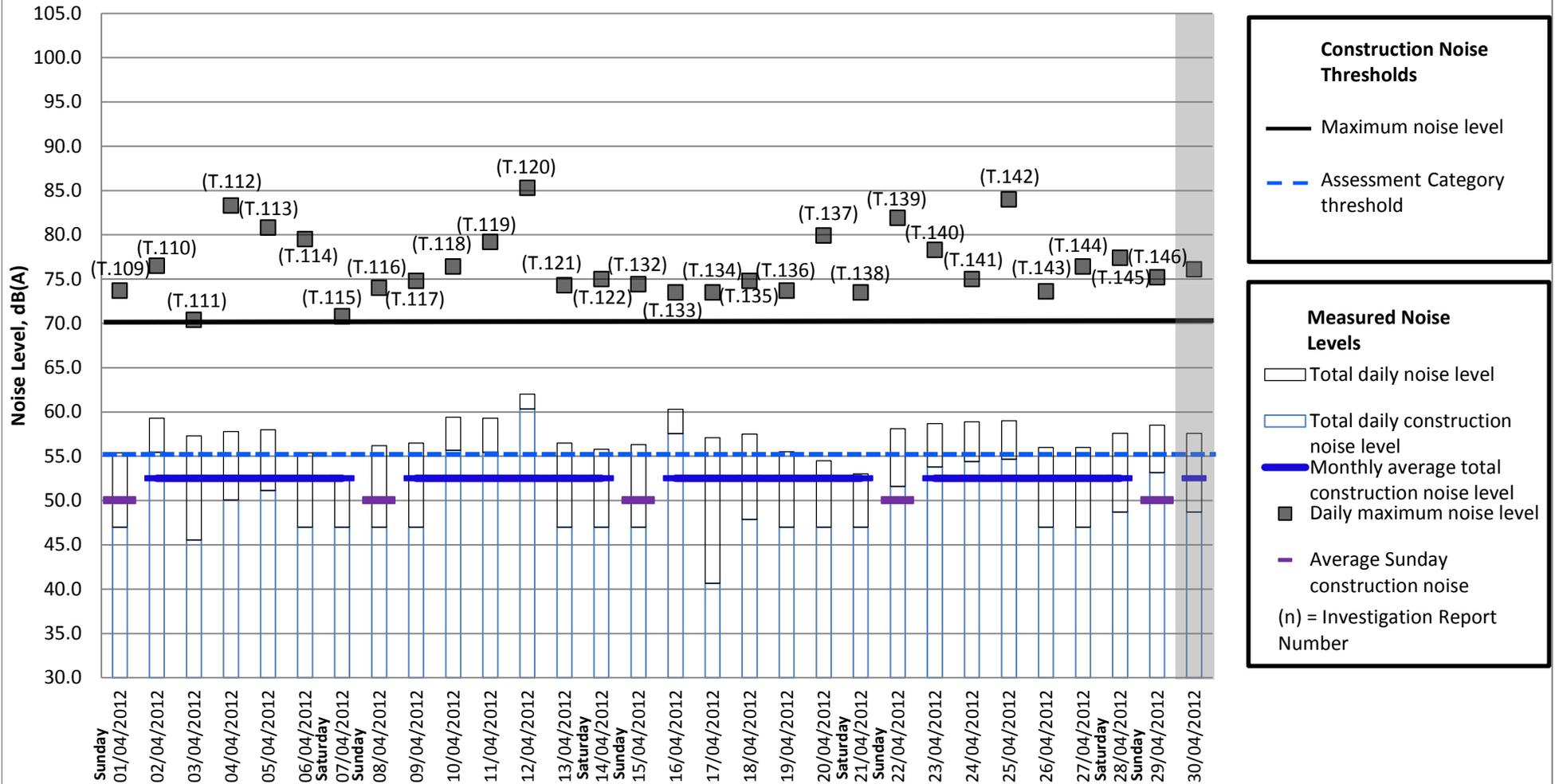
(n) = Investigation Report Number

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



**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 03/04/12, 25/04/12 and 30/04/12.

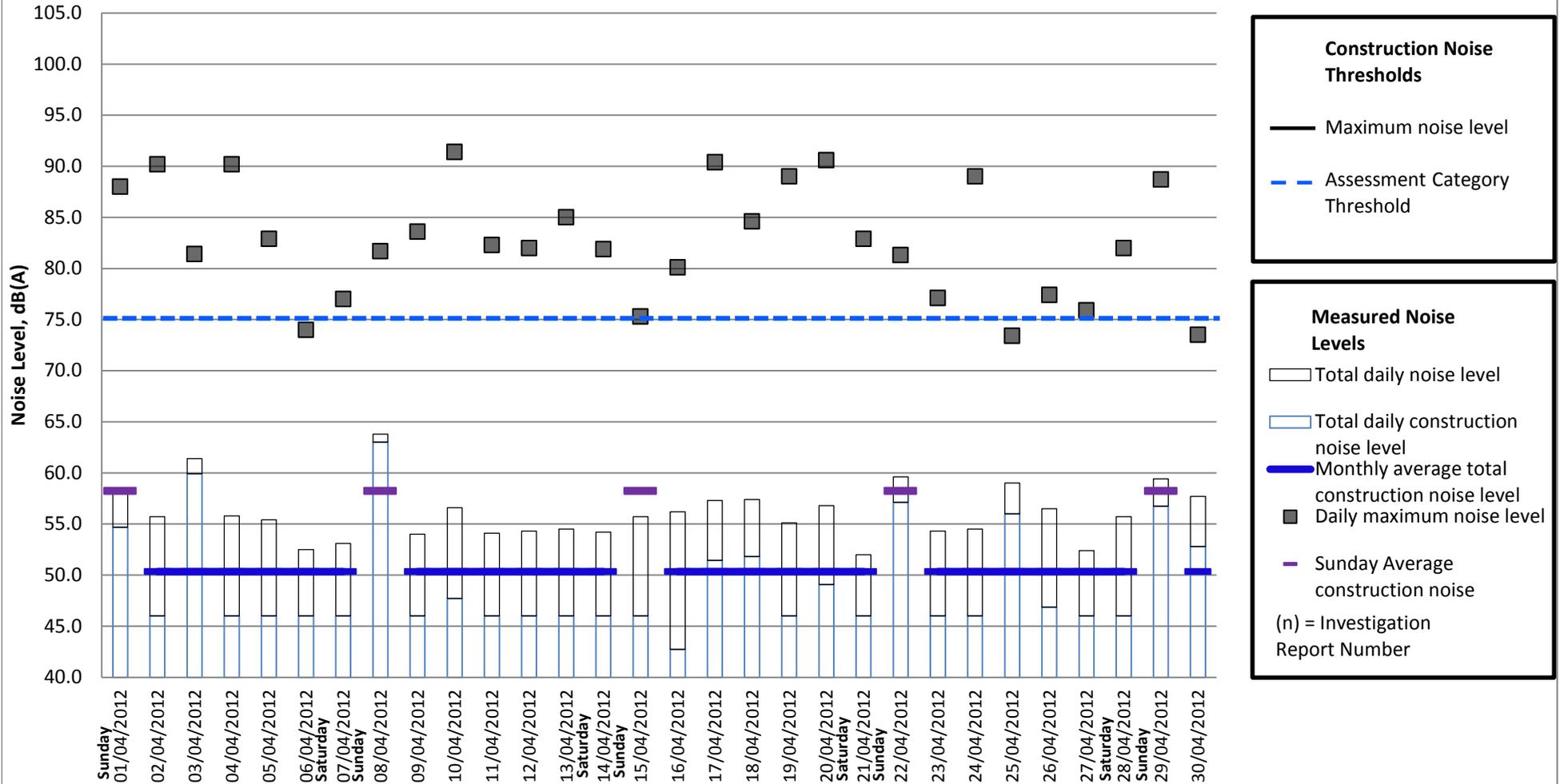
## Measured Night-time Noise Levels at Tigh-Na-Grian Measurement period: April 2012



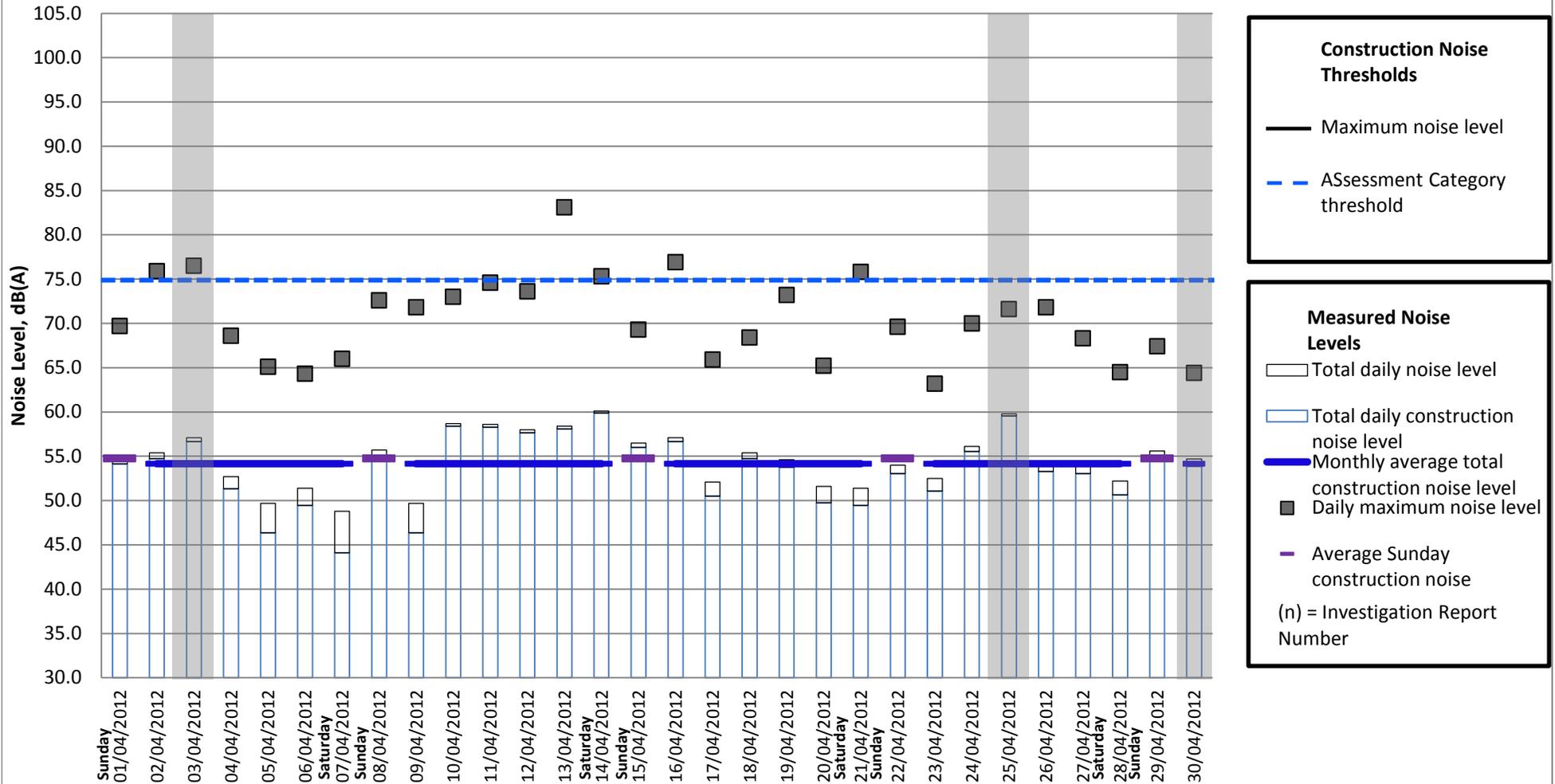
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 30/04/12.

# Measured Daytime Noise Levels at Port Edgar

## Measurement period: April 2012

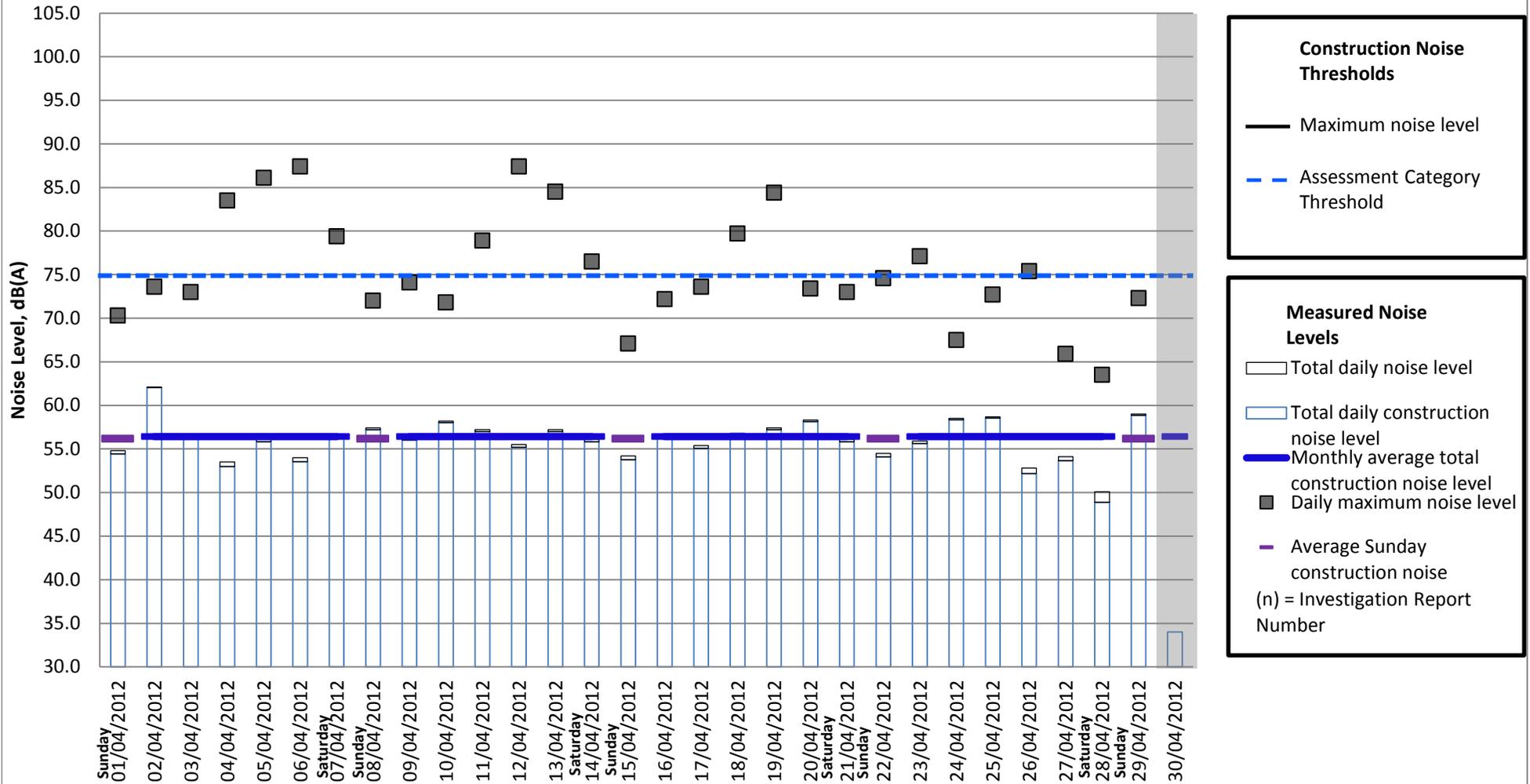


## Measured Evening Noise Levels at Port Edgar Measurement period: April 2012



**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 03/04/12, 25/04/12 and 30/04/12

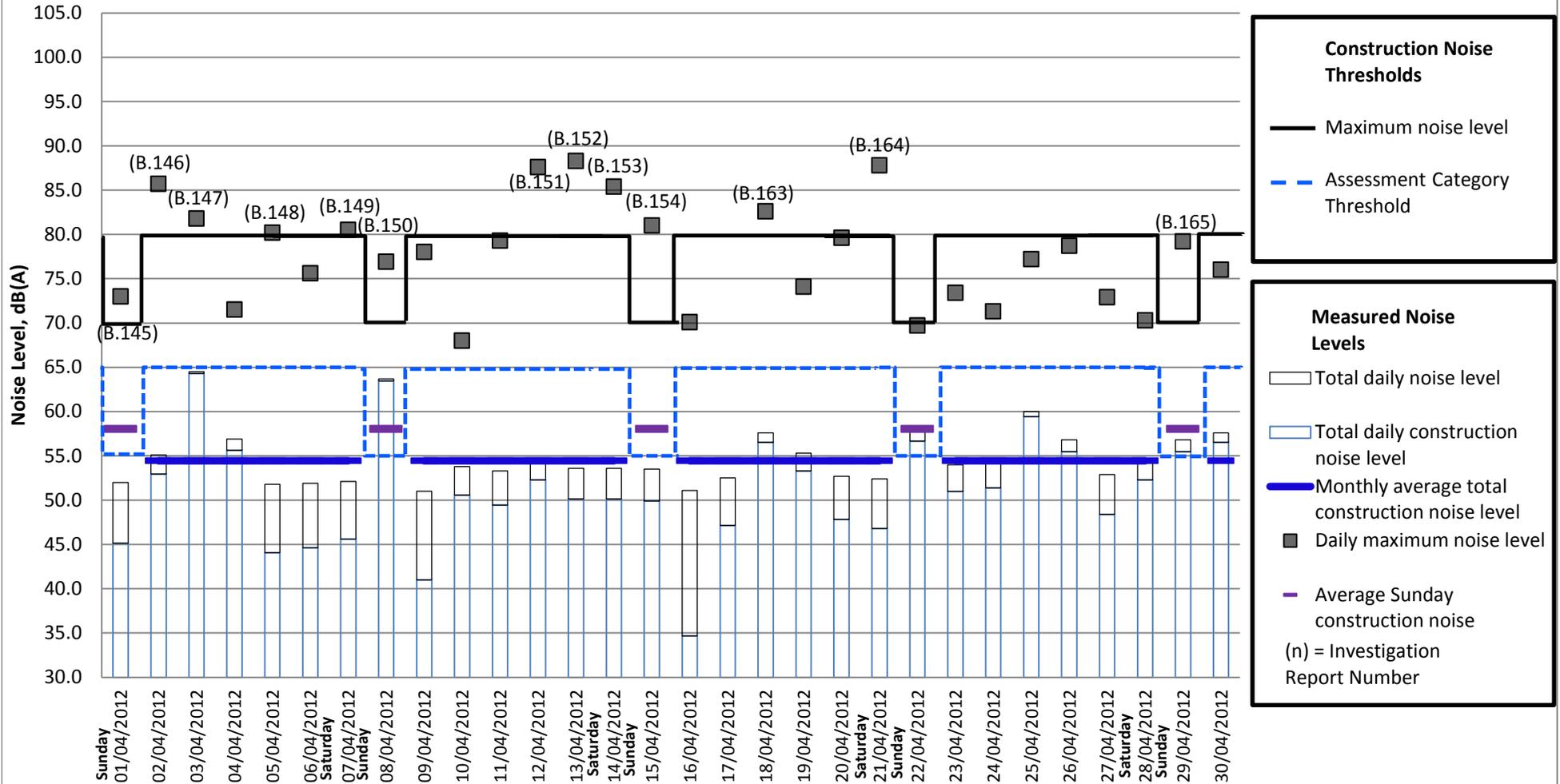
## Measured Night-time Noise Levels at Port Edgar Measurement period: April 2012



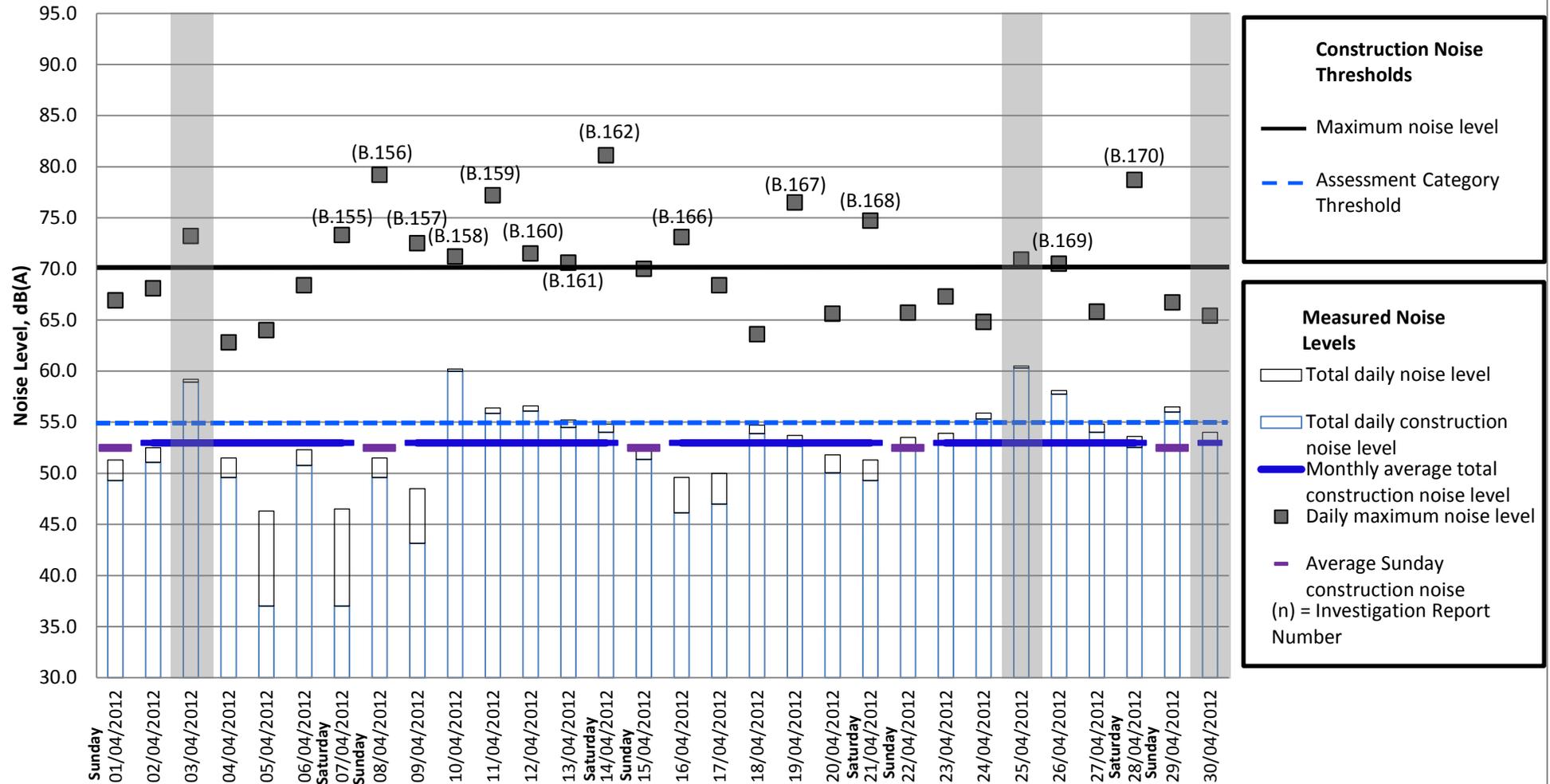
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 30/04/12

# Measured Daytime Noise Levels at Butlaw Fisheries

## Measurement period: April 2012

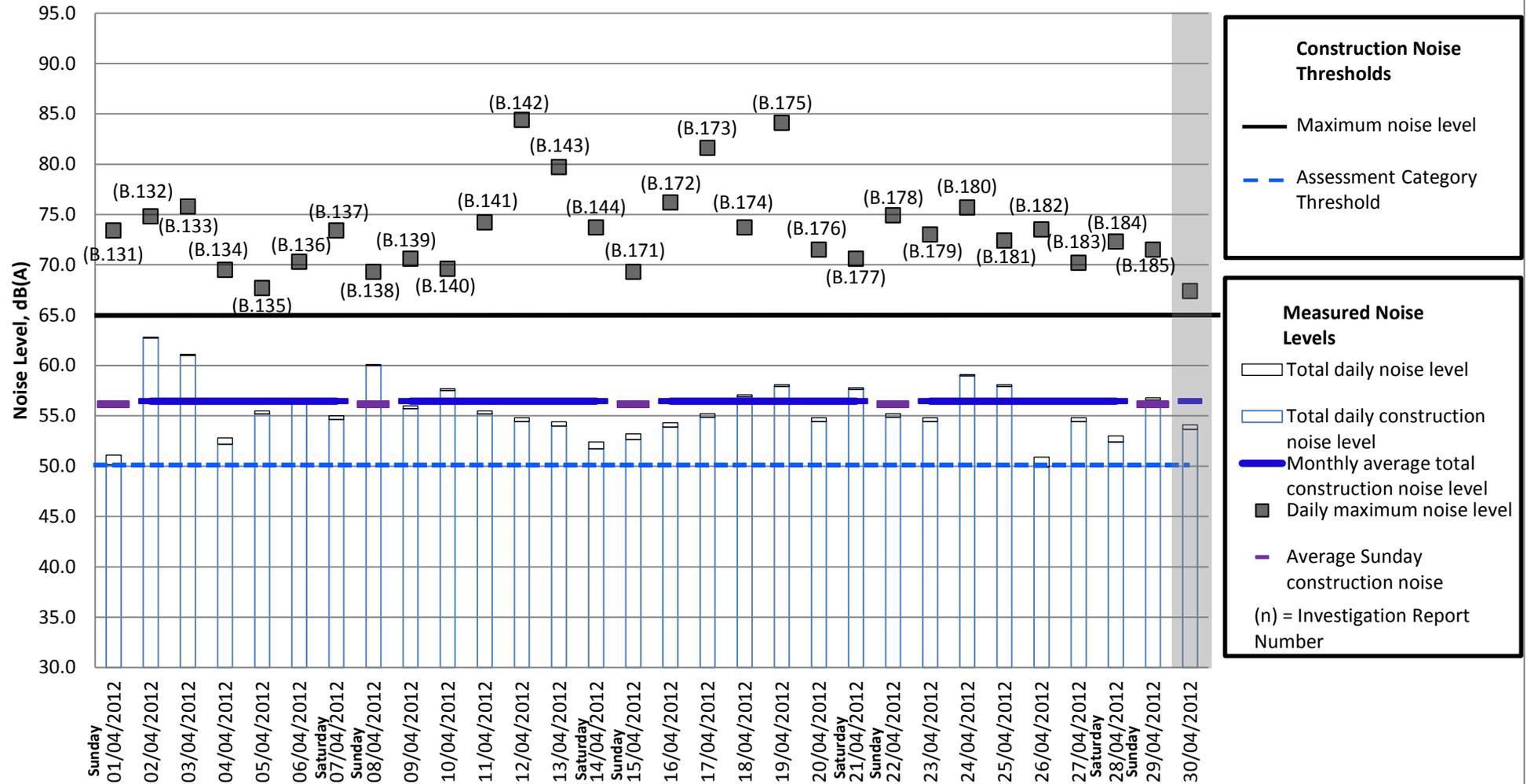


## Measured Evening Noise Levels at Butlaw Fisheries Measurement period: April 2012



**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 03/04/12, 25/04/12 and 30/04/12.

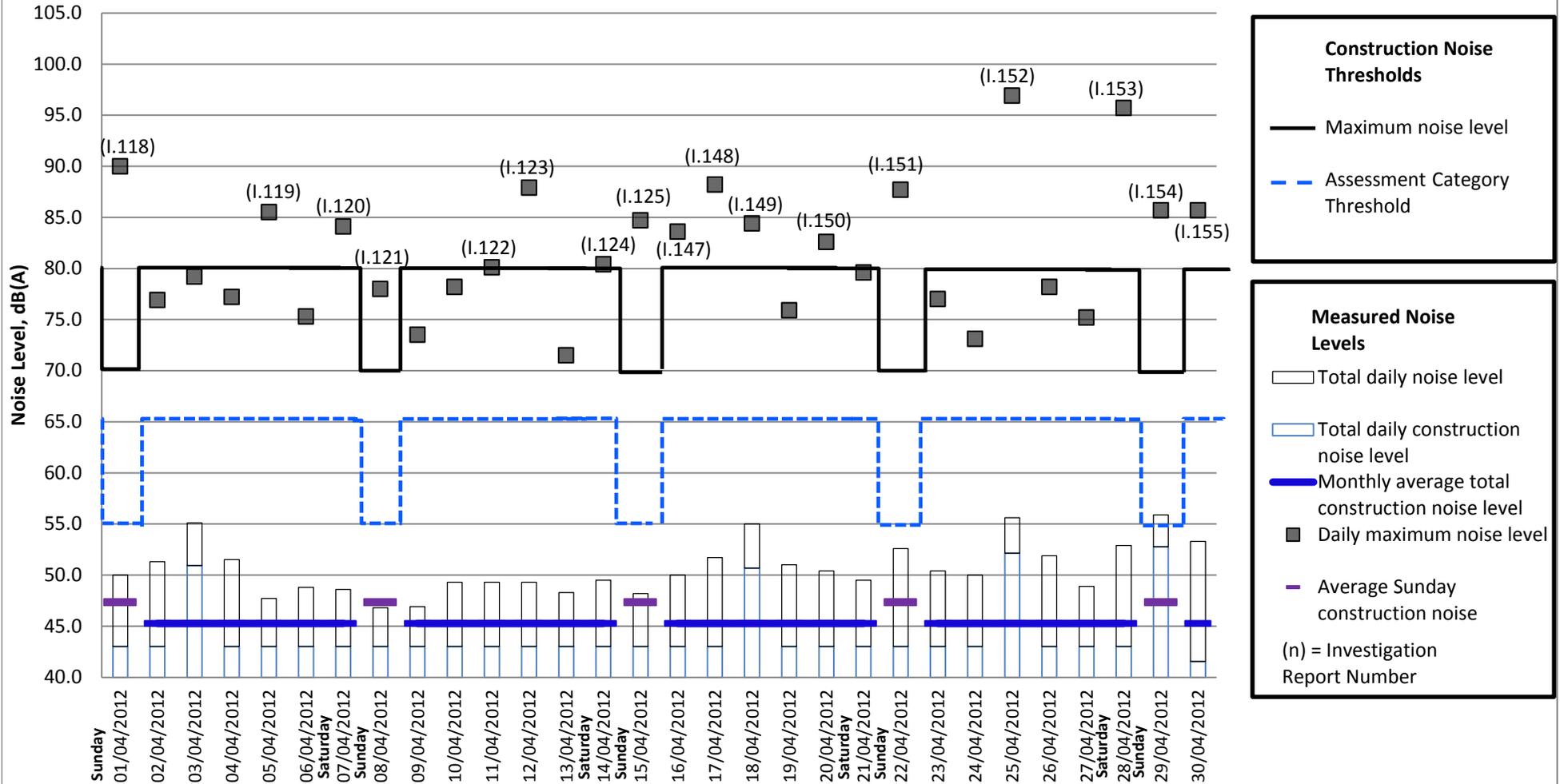
## Measured Night time Noise Levels at Butlaw Fisheries Measurement period: April 2012



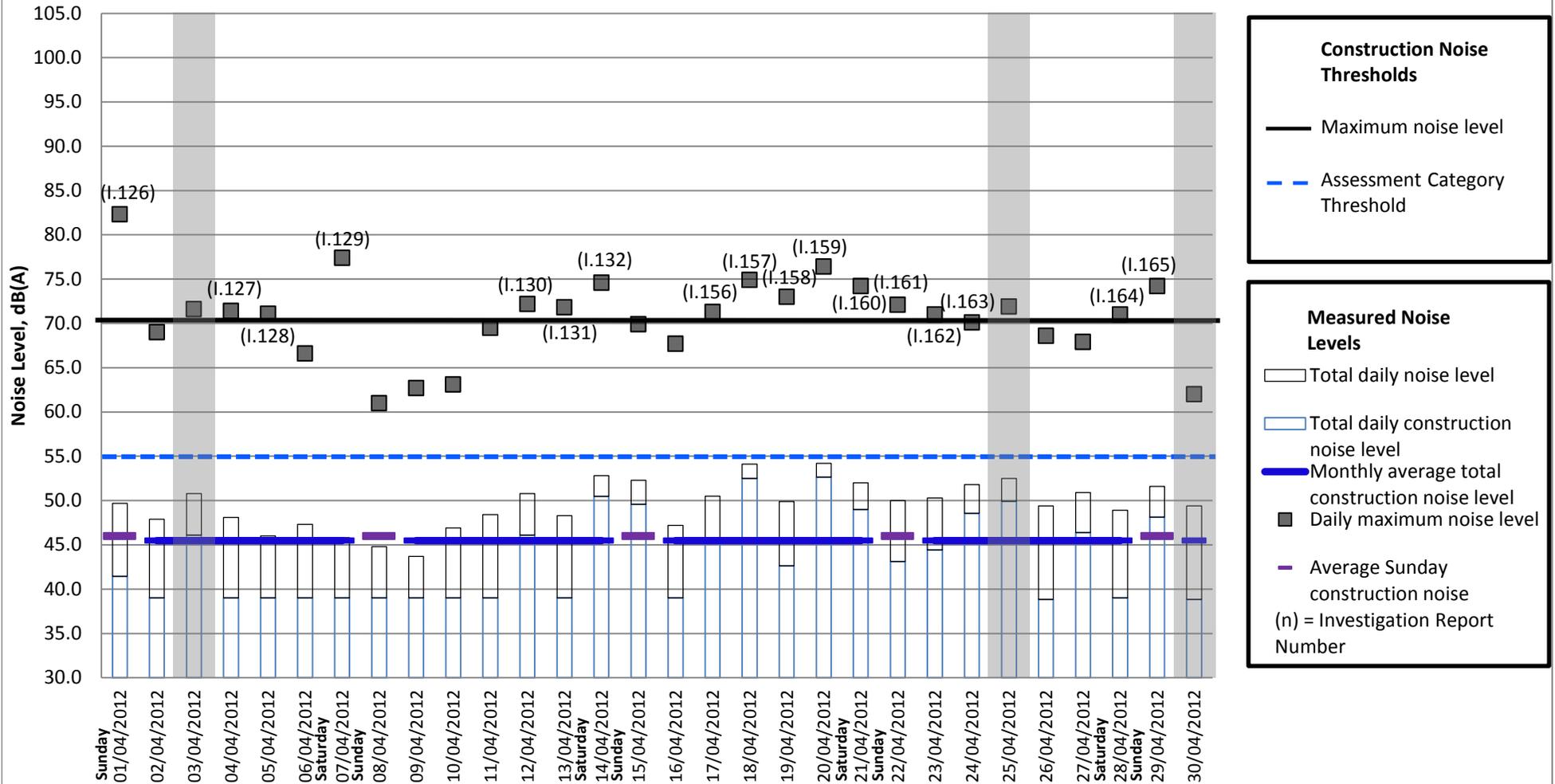
**Note:** : The grey areas of the chart represent nights on which no construction works have been conducted; no night time construction works were undertaken on 30/04/12.

# Measured Daytime Noise Levels at Inchgarvie

## Measurement period: April 2012



## Measured Evening Noise Levels at Inchgarvie Measurement period: April 2012



**Construction Noise Thresholds**

- Maximum noise level
- - - Assessment Category Threshold

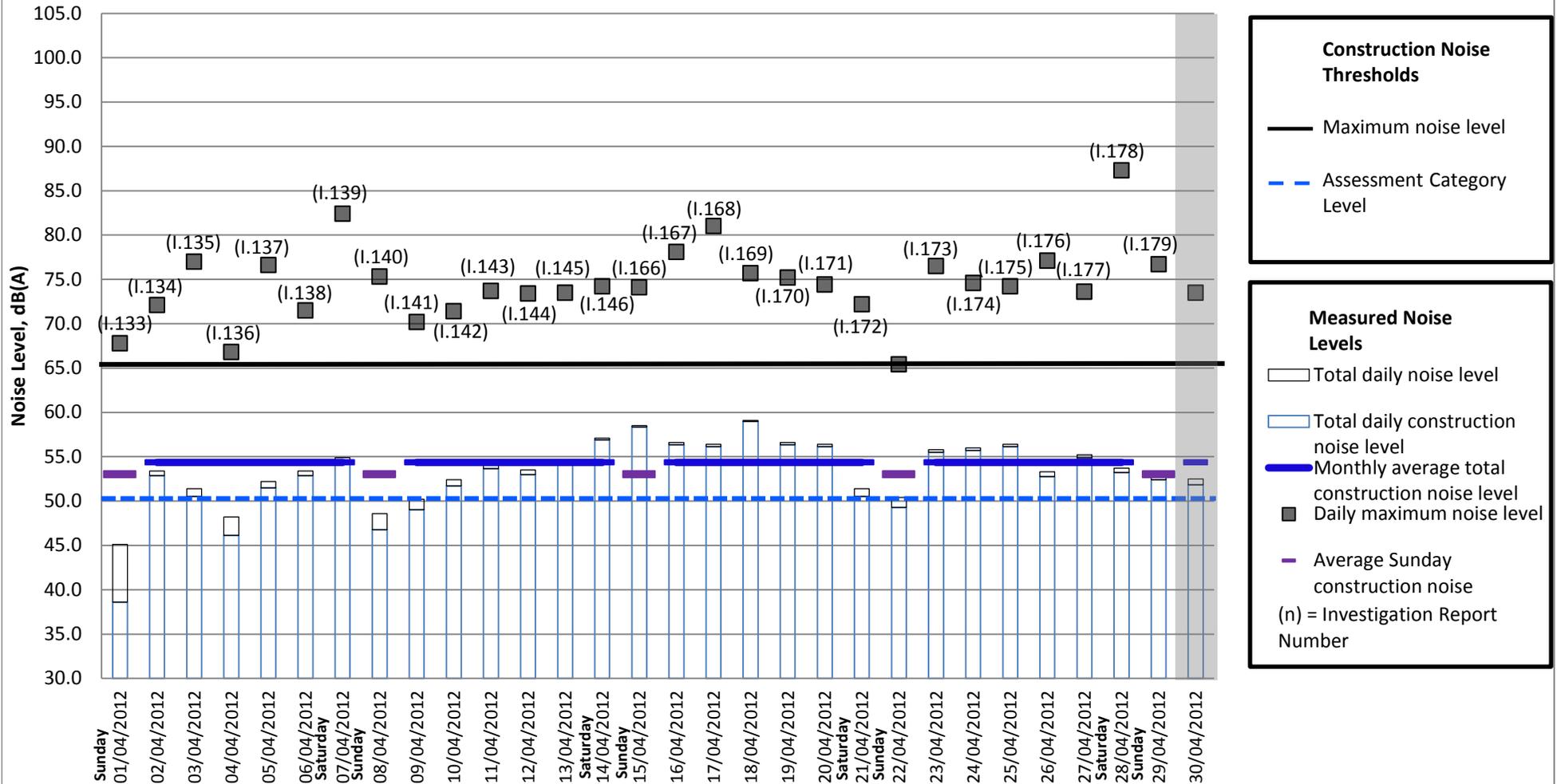
**Measured Noise Levels**

- Total daily noise level
- Total daily construction noise level
- Monthly average total construction noise level
- Daily maximum noise level
- Average Sunday construction noise

(n) = Investigation Report Number

**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works have been undertaken on 03/04/12, 25/04/12 and 30/04/12

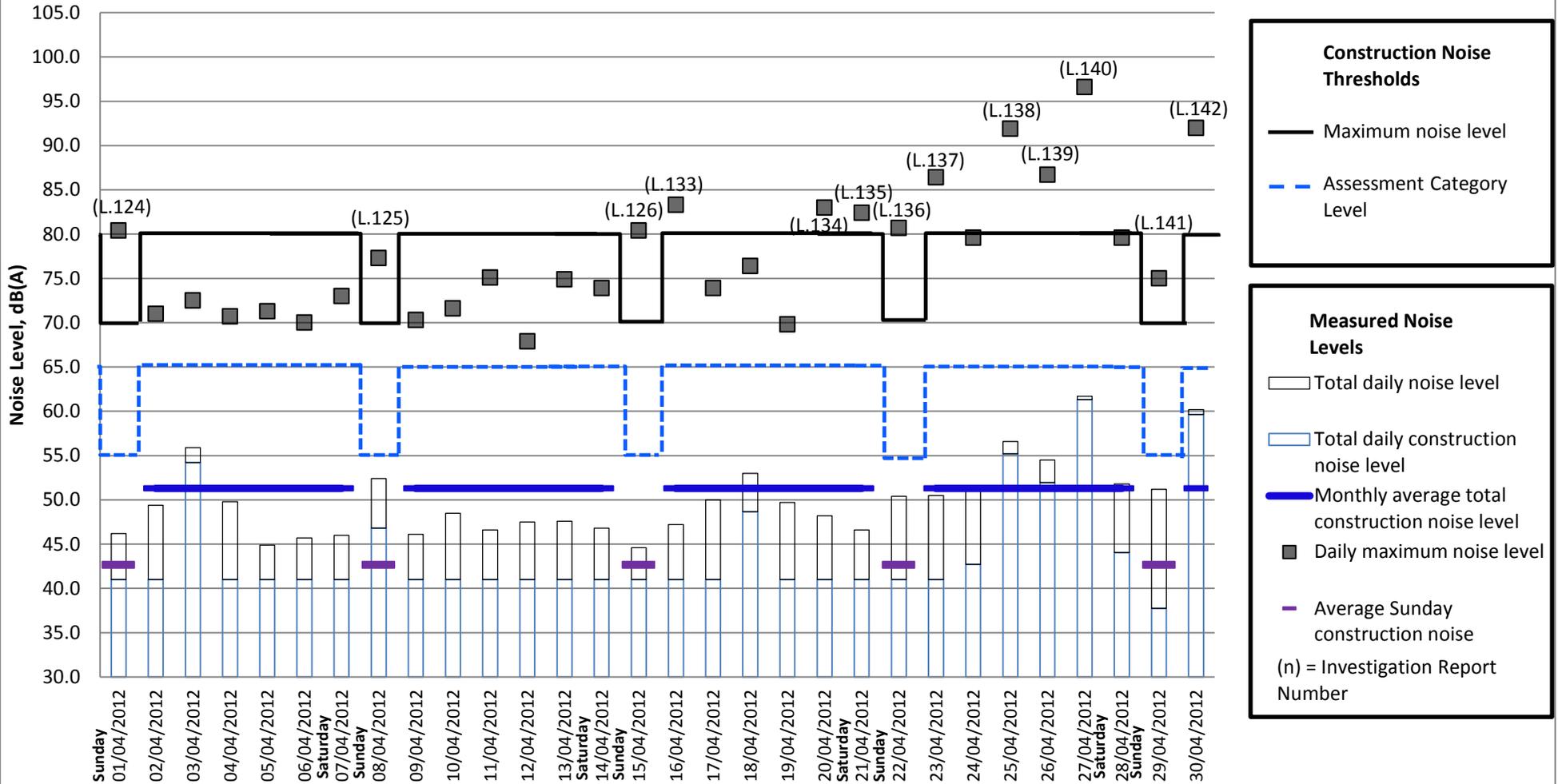
## Measured Night-time Noise Levels at Inchgarvie Measurement period: April 2012



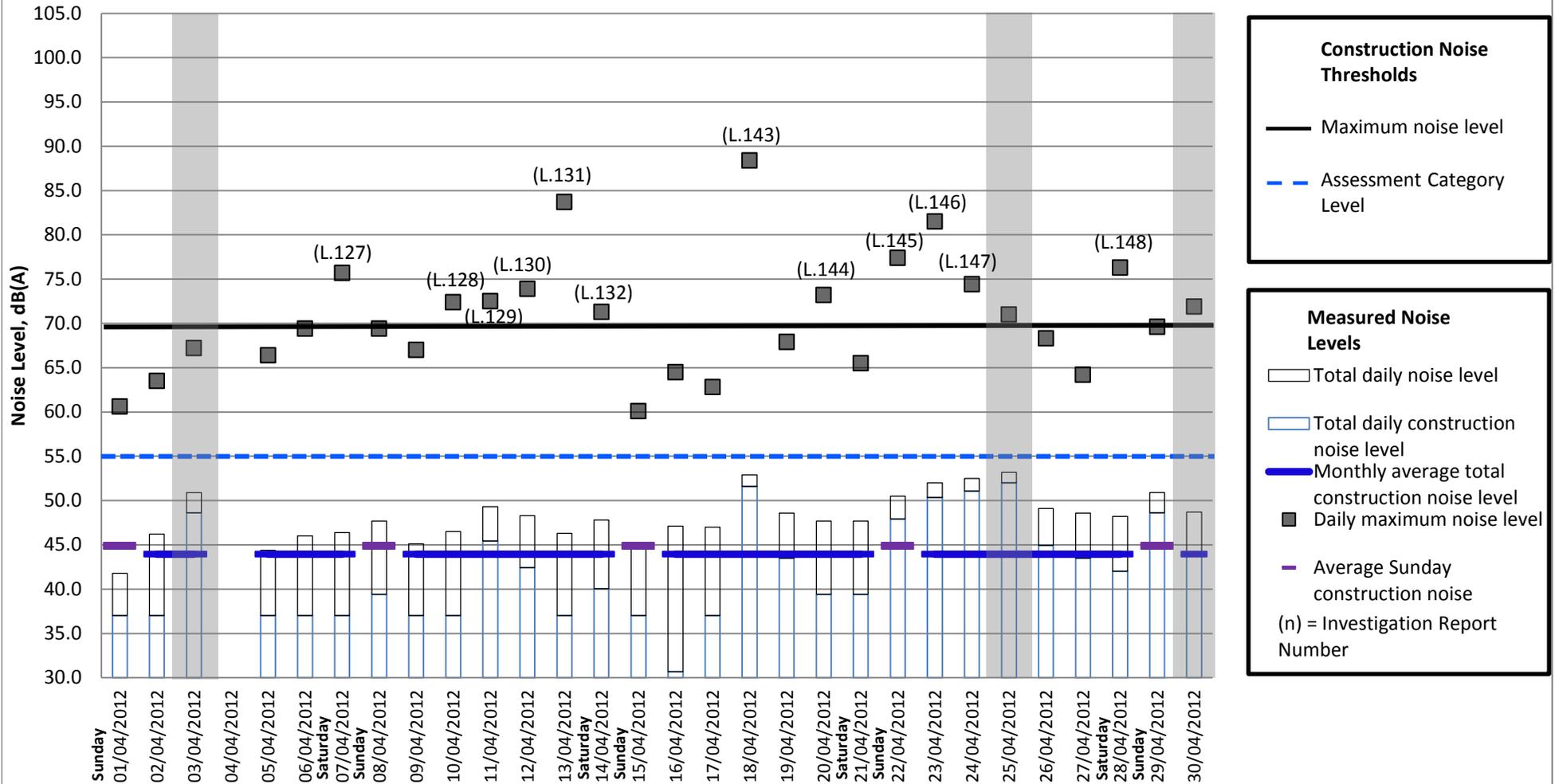
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works have been undertaken on 30/04/12

# Measured Daytime Noise levels at Linn Mill

## Measurement period: April 2012

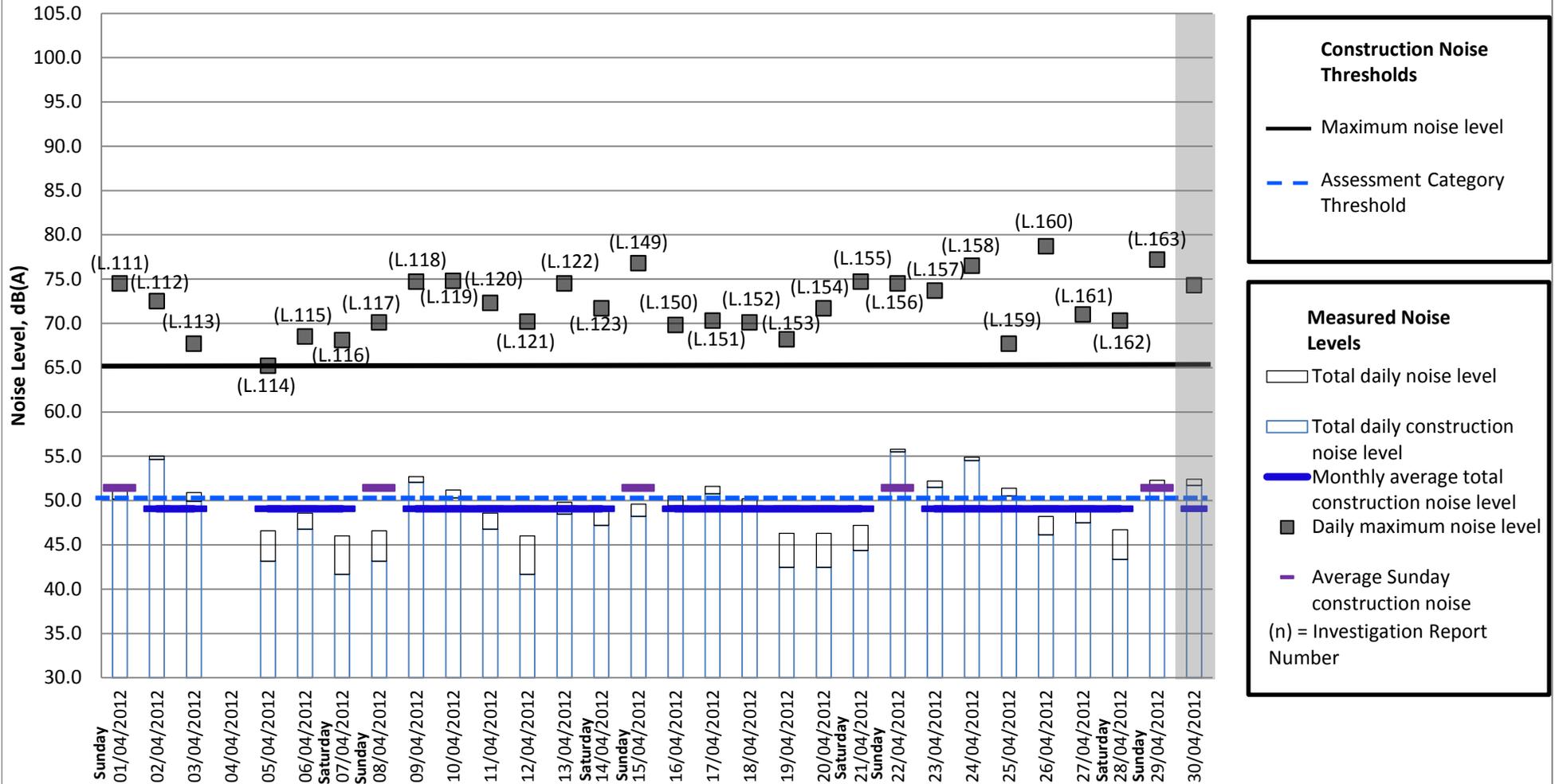


## Measured Evening Noise Levels at Linn Mill Measurement period: April 2012



**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 03/04/12, 25/04/12 and 30/04/12. Evening noise data is missing for 04/04/12 due to device error.

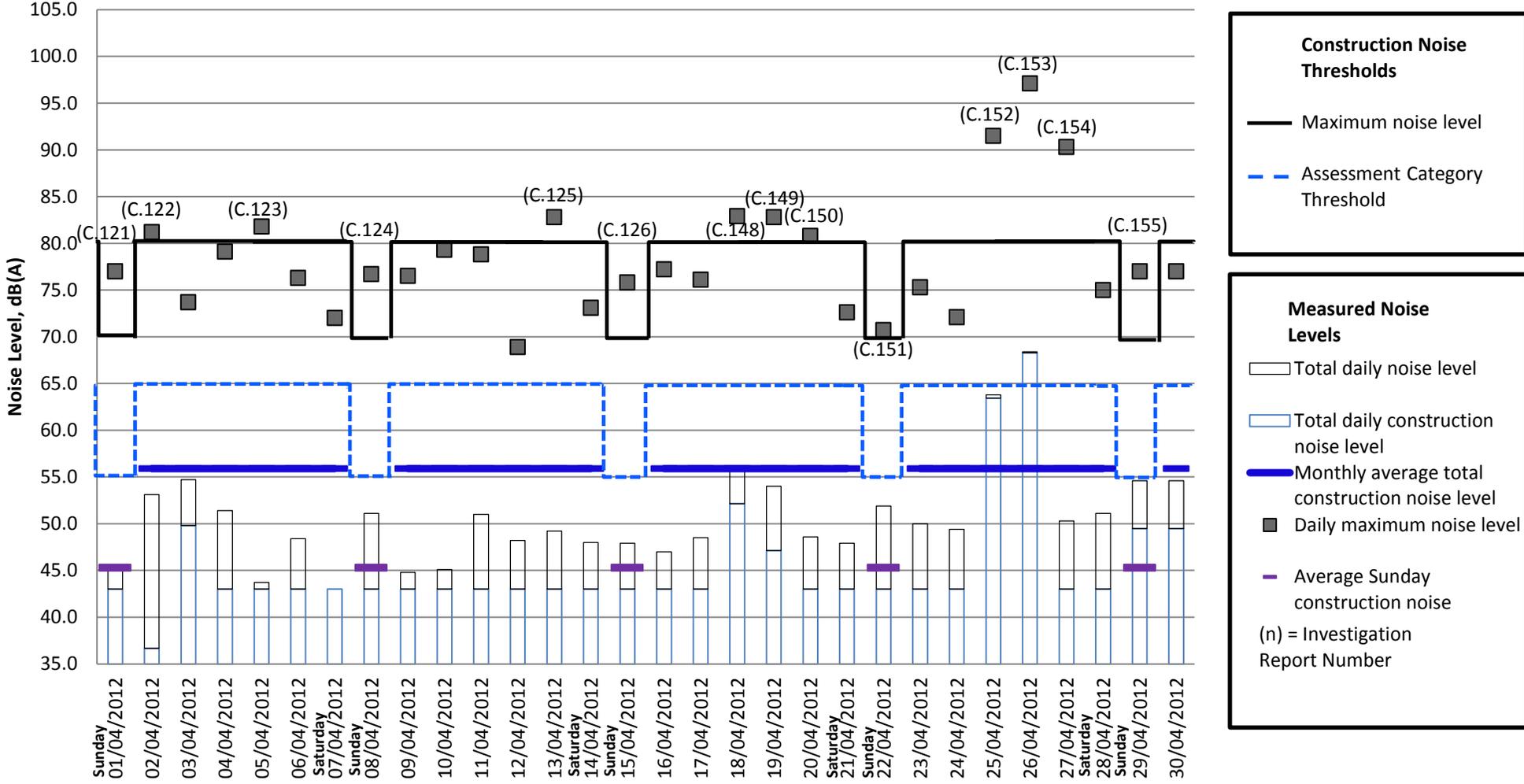
## Measured Night-time Noise Levels at Linn Mill Measurement period: April 2012



**Note:** Dates affected by adverse weather include 02/04/12 and 03/04/12. The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 30/04/12. Night time noise data is missing for 04/04/12 due to device error.

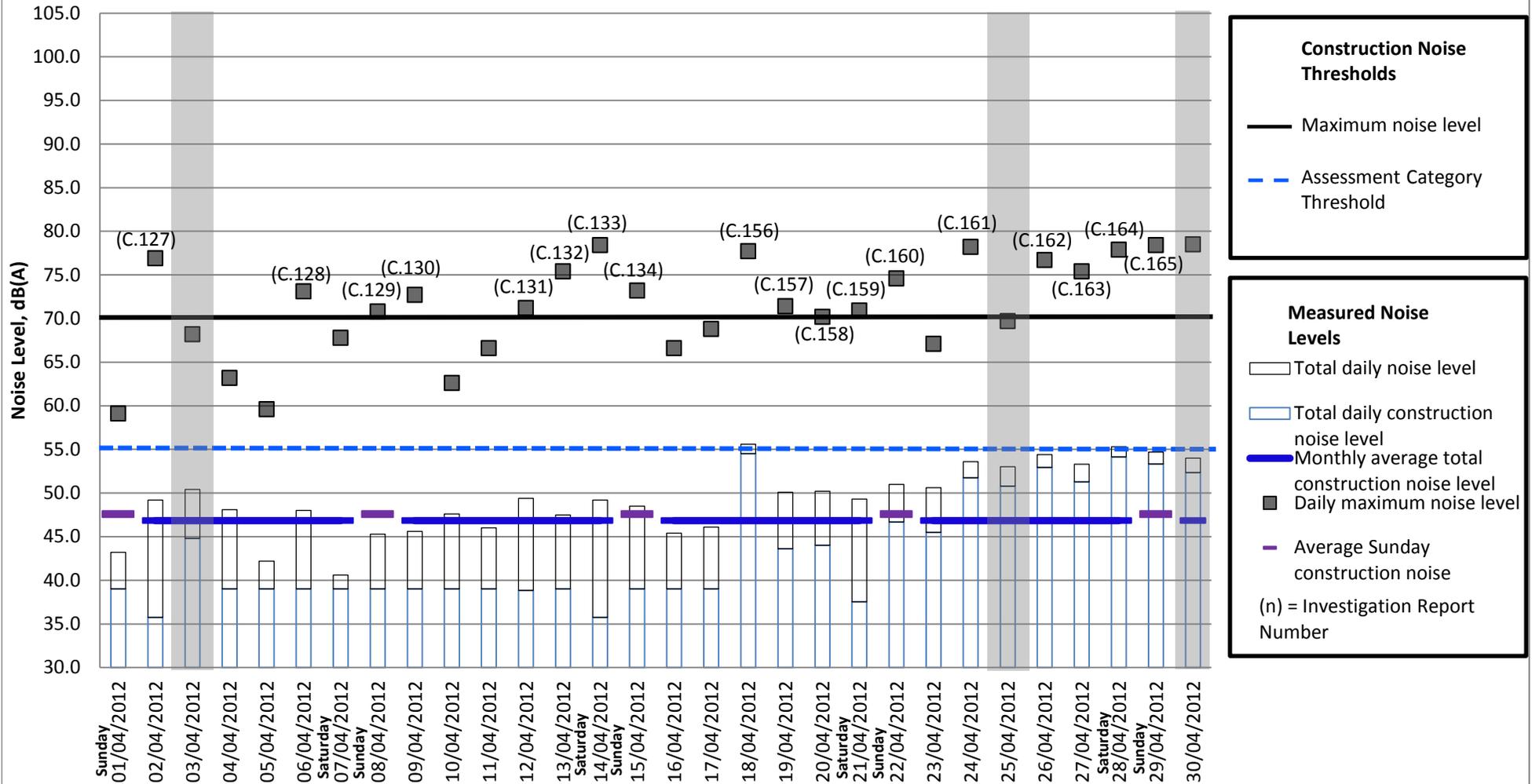
# Measured Daytime Noise Levels at Clufflat Brae

## Measurement period: April 2012



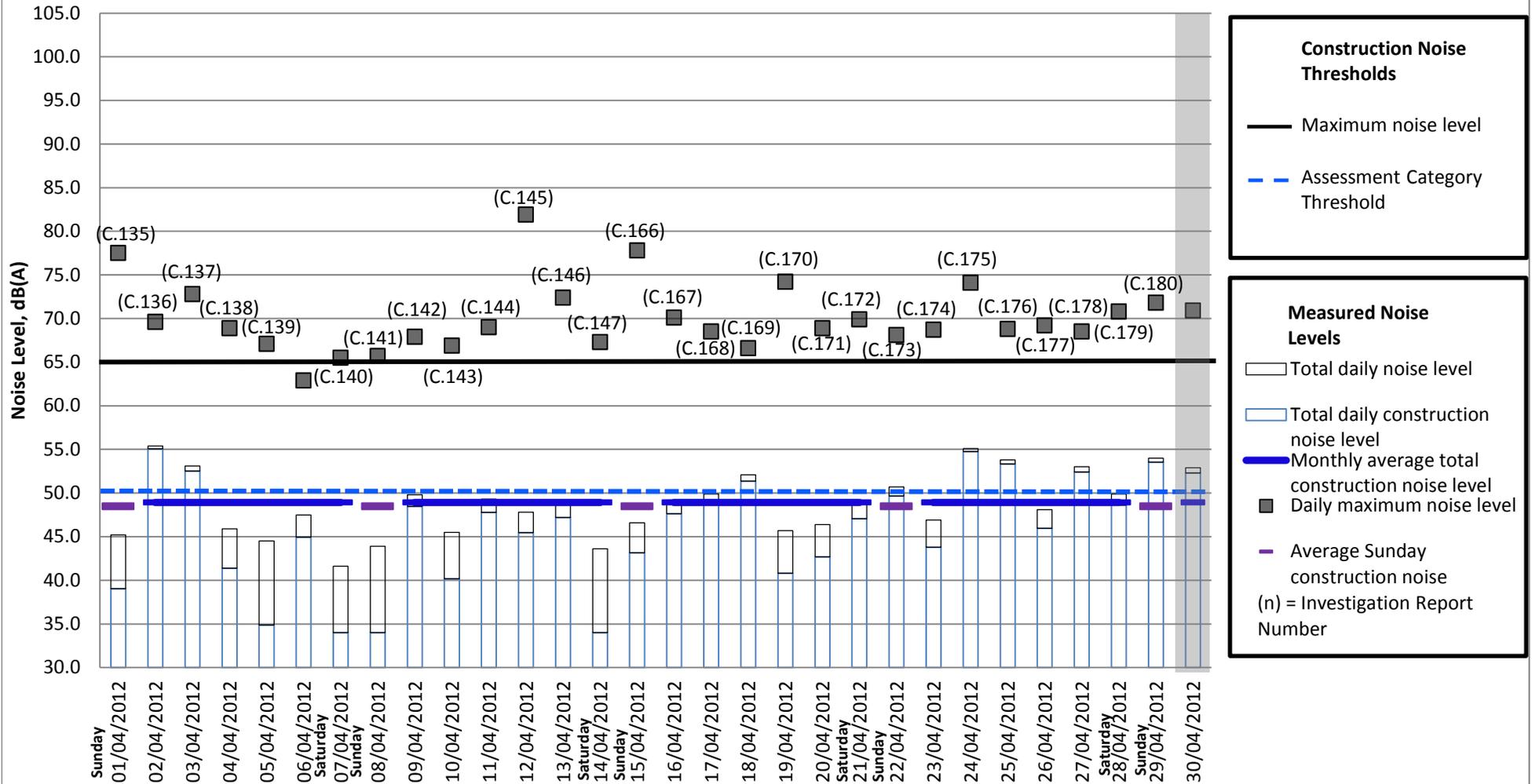
Note:

## Measured Evening Noise Levels at Clufflat Brae Measurement period: April 2012



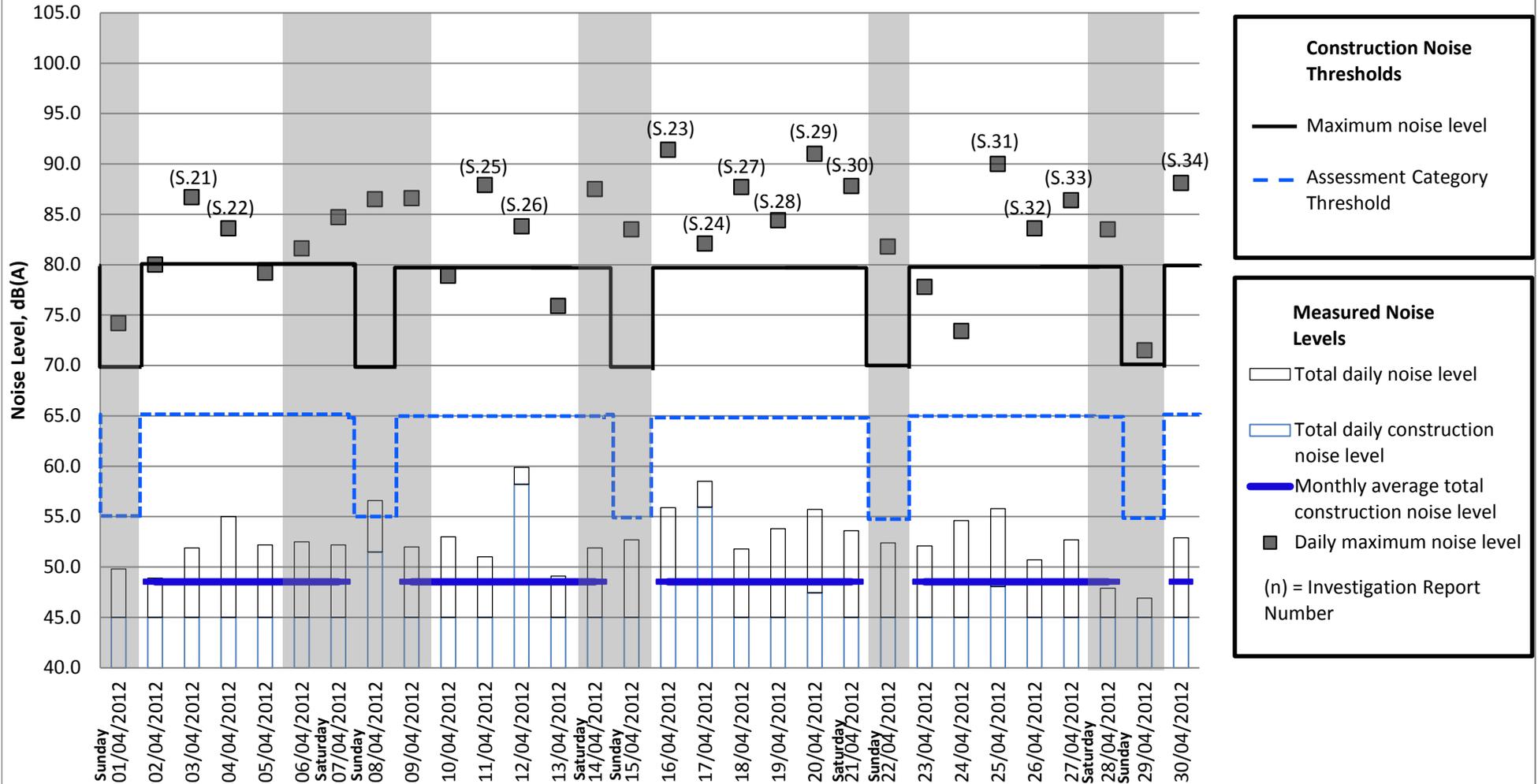
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works have been undertaken on 03/04/12, 25/04/12 and 30/04/12.

## Measured Night-time Noise Levels at Clufflat Brae Measurement period: April 2012



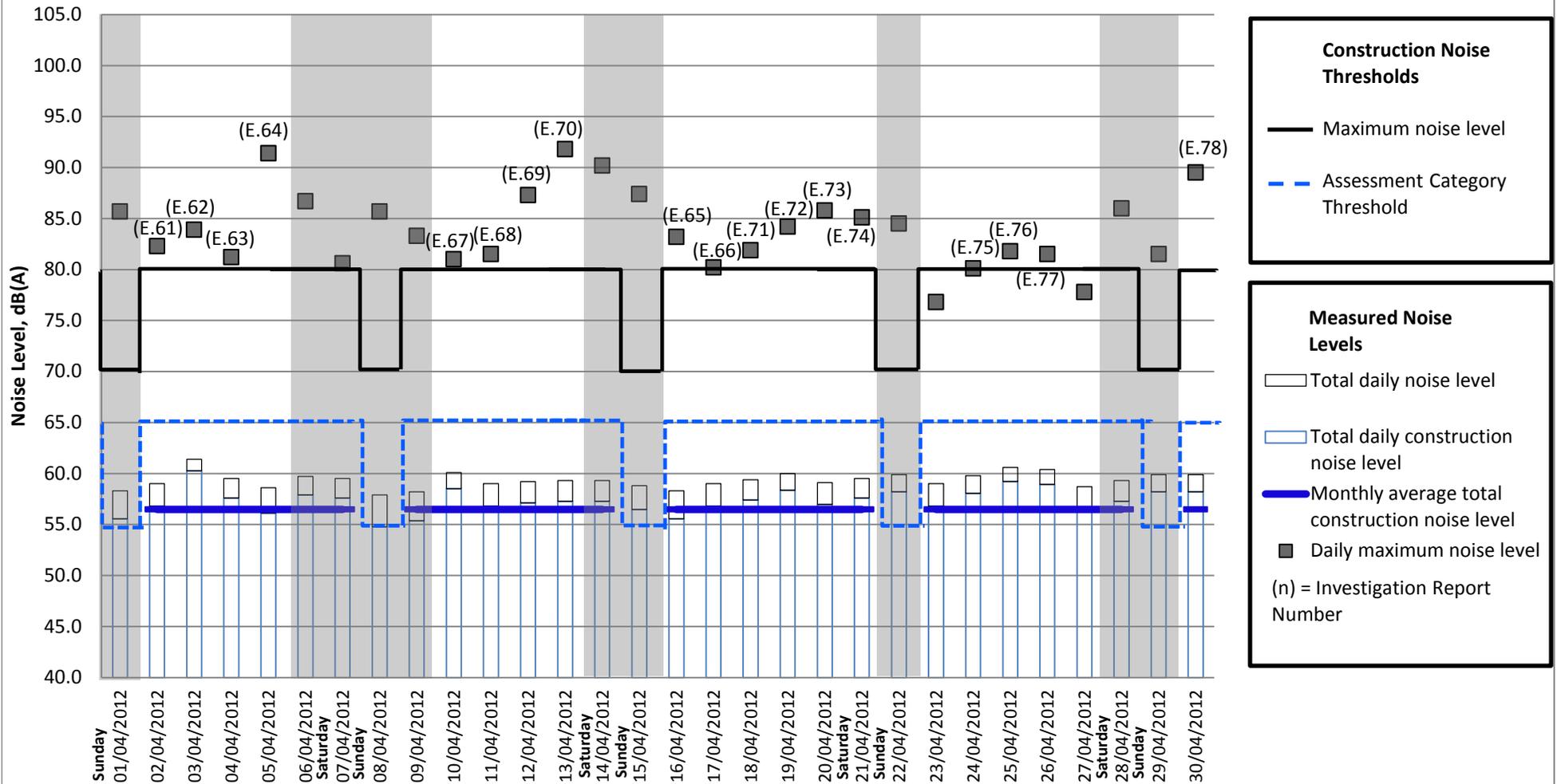
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works have been undertaken on 30/04/12.

## Measured Daytime Noise Levels at Springfield Measurement period: April 2012



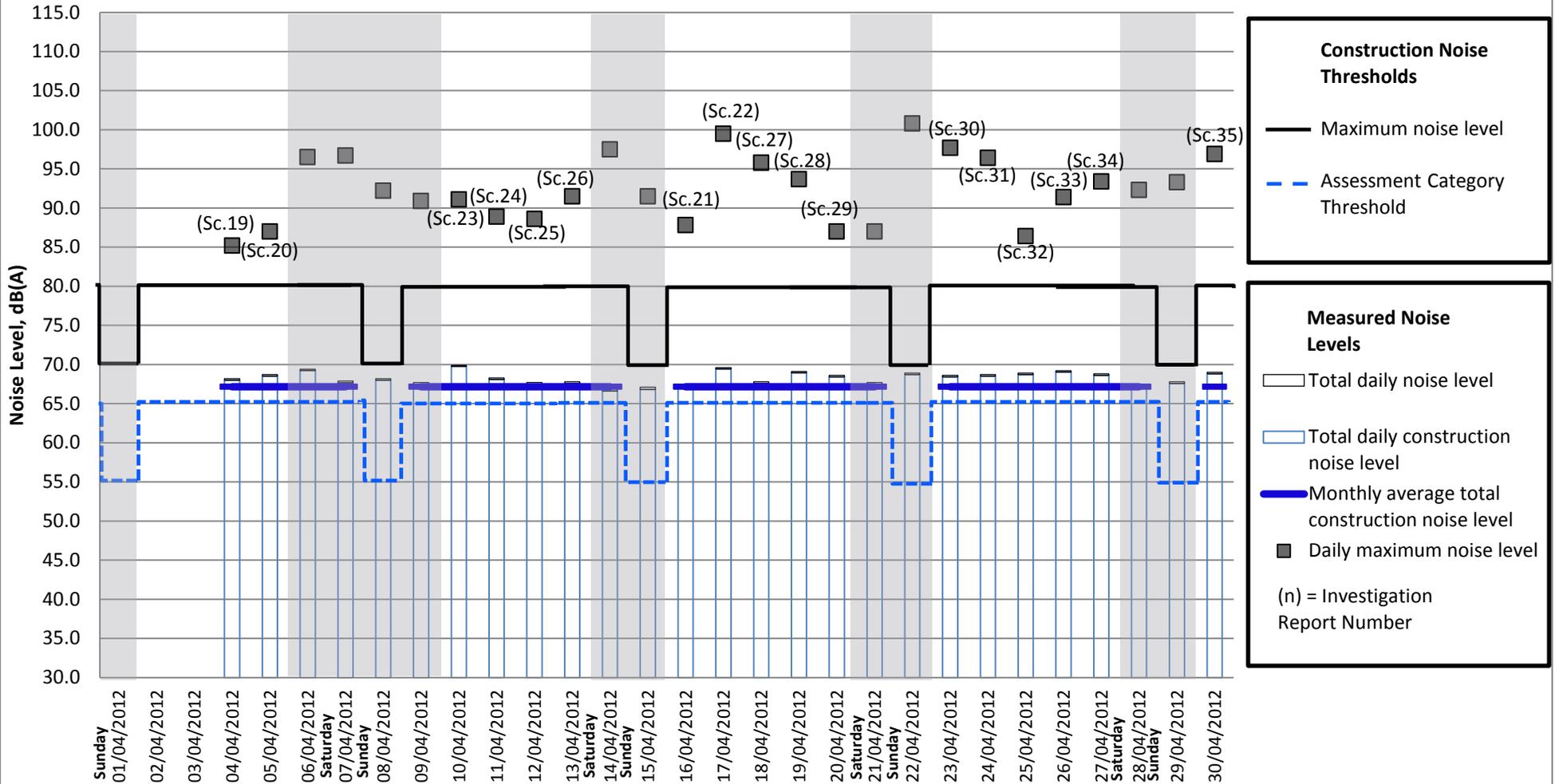
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; Sunday construction works have been conducted at this location and construction works were conducted on over the Easter Weekend (06/04/12 to 09/04/12), 14/04/12 or 28/04/12. The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location during this period

## Measured Daytime Noise Levels at Echline Field Measurement period: April 2012



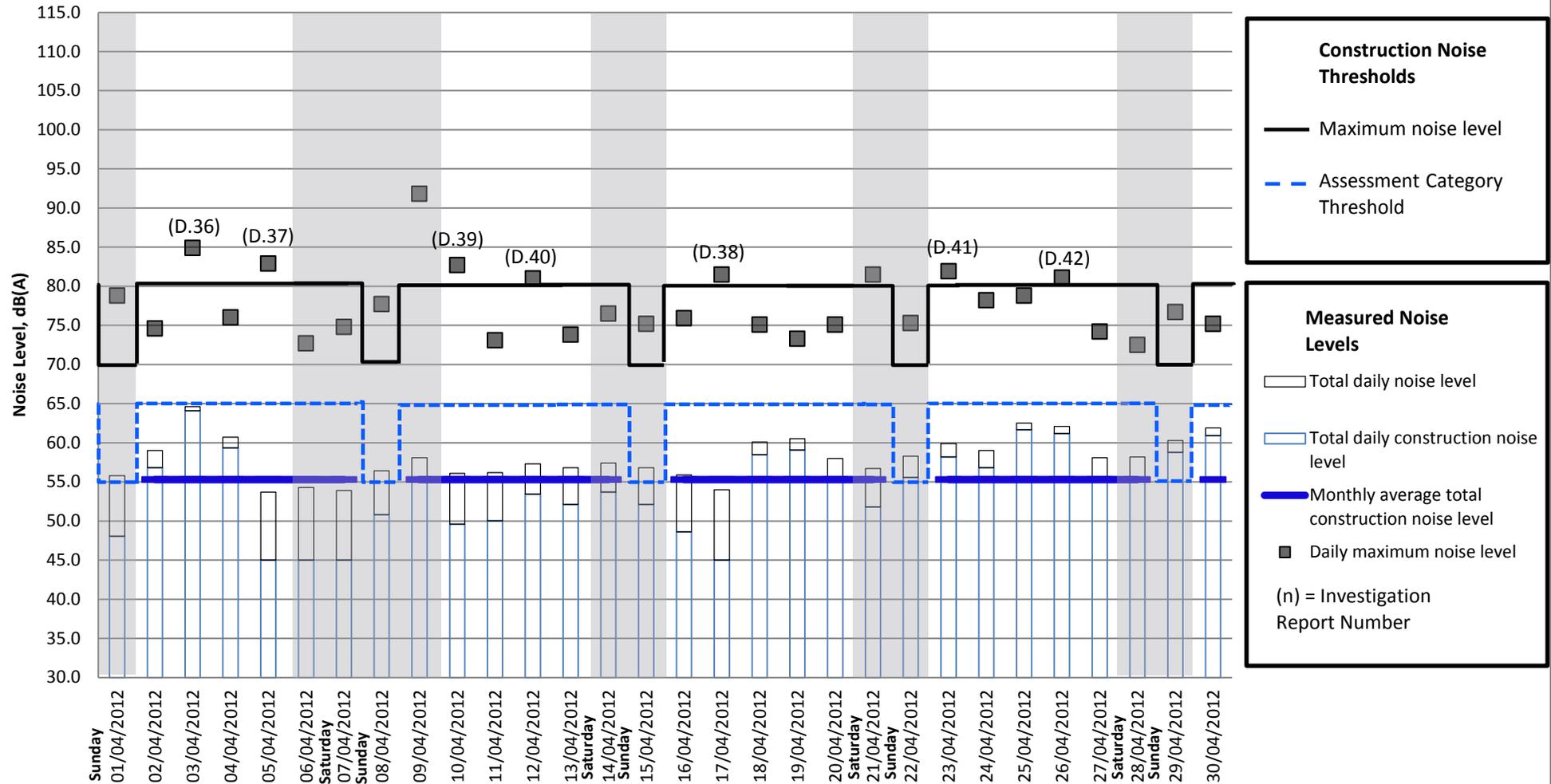
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; Sunday construction works have been conducted at this location during this period and no Saturday construction works were conducted on 07/04/12, 14/04/12 and 28/04/12. Monthly average construction noise has not been included for Sundays as no works have been conducted at this location.

## Measured Daytime Noise Levels at Scotstoun Measurement period: April 2012



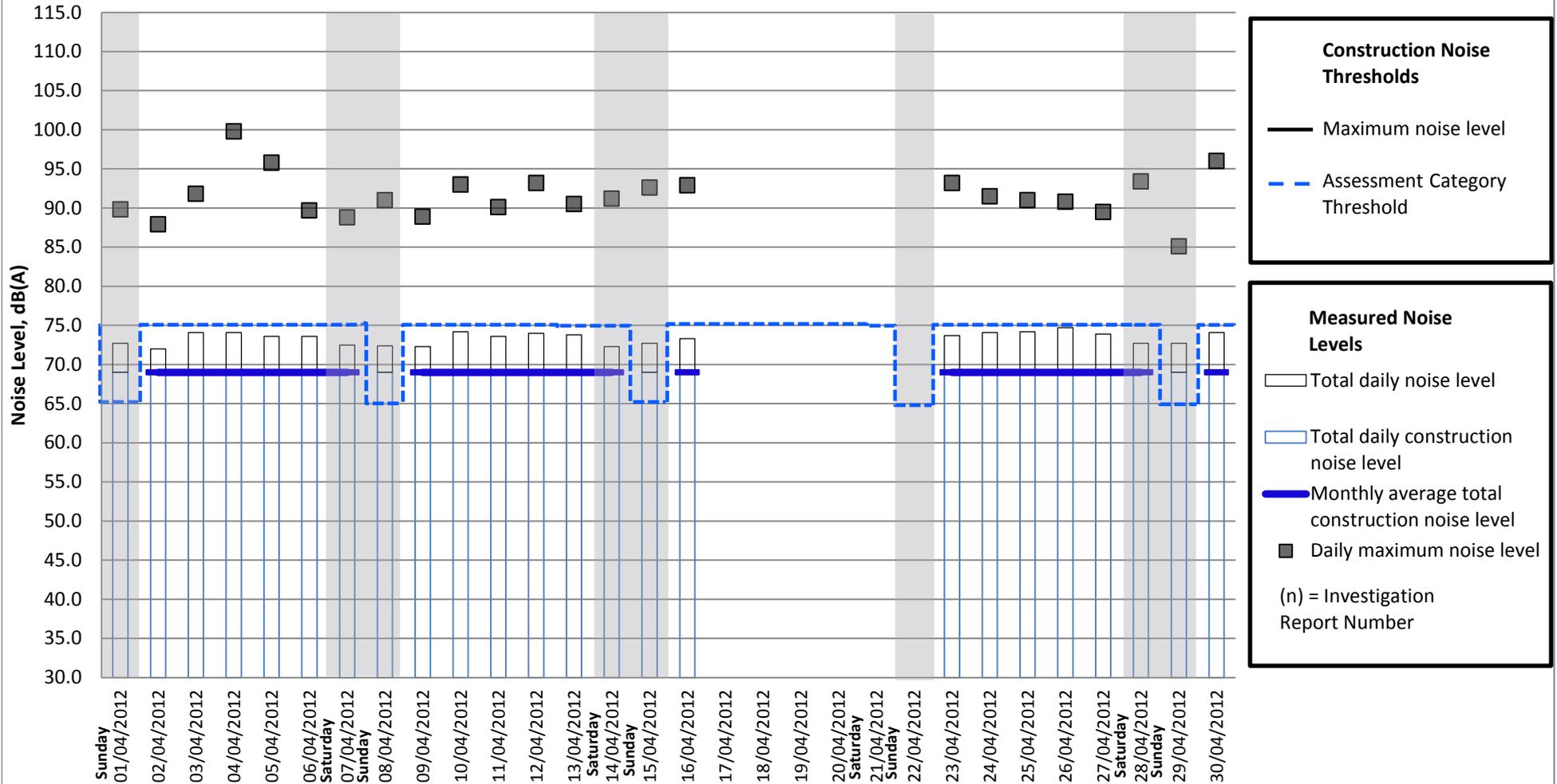
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no Saturday or Sunday construction works have been conducted at this location. No works were undertaken over Easter Weekend (06/04/12 to 09/04/12). The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location during this period. Data is missing for the period 01/04/12 to 03/04/12 due to device error.

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



**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no Saturday or Sunday construction works have been conducted at this location during this period. The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location during this period. No works were undertaken over Easter Weekend (06/04/12 to 09/04/12)

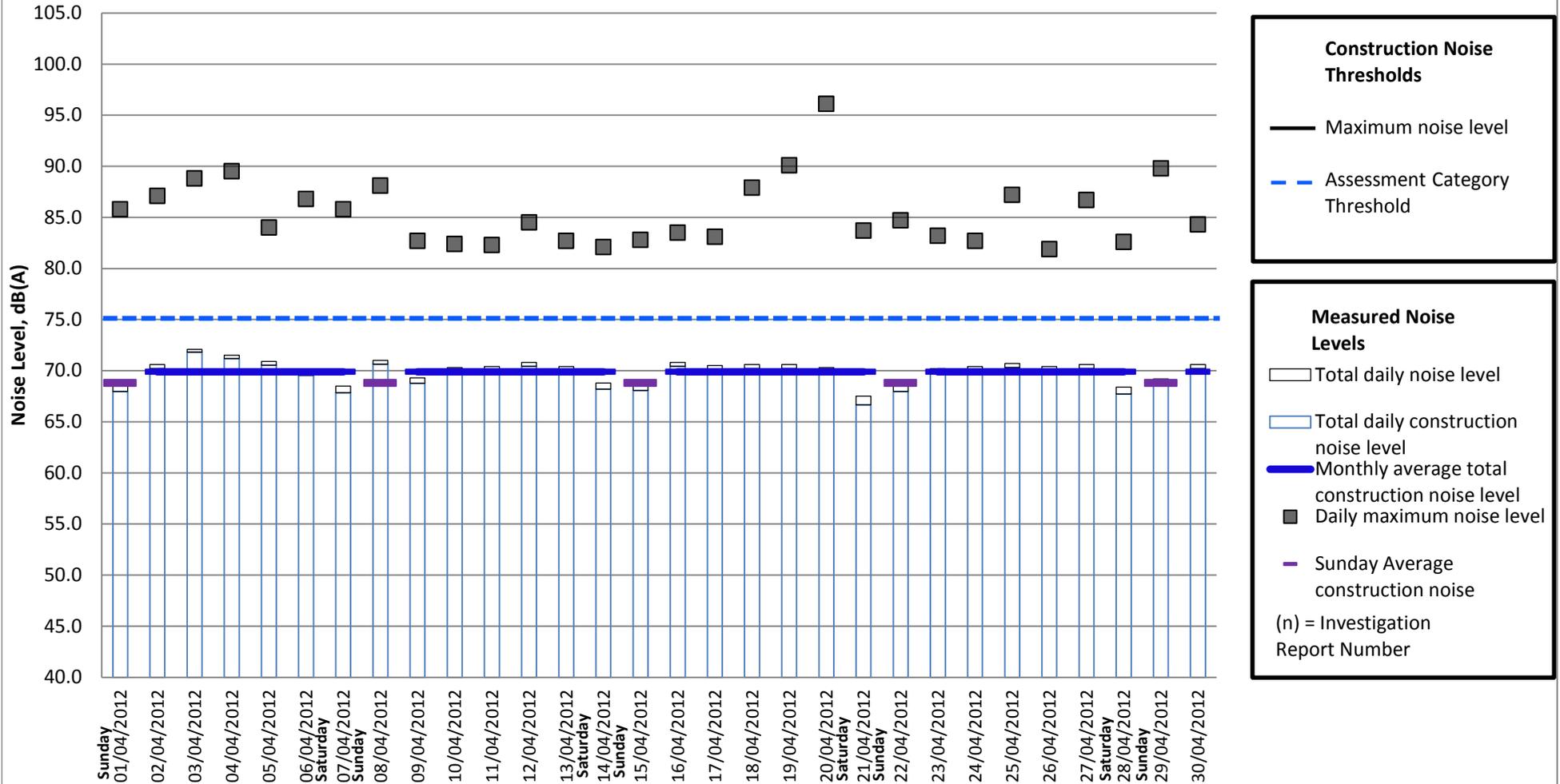
## Measured Daytime Noise Levels at Newton Measurement period: April 2012



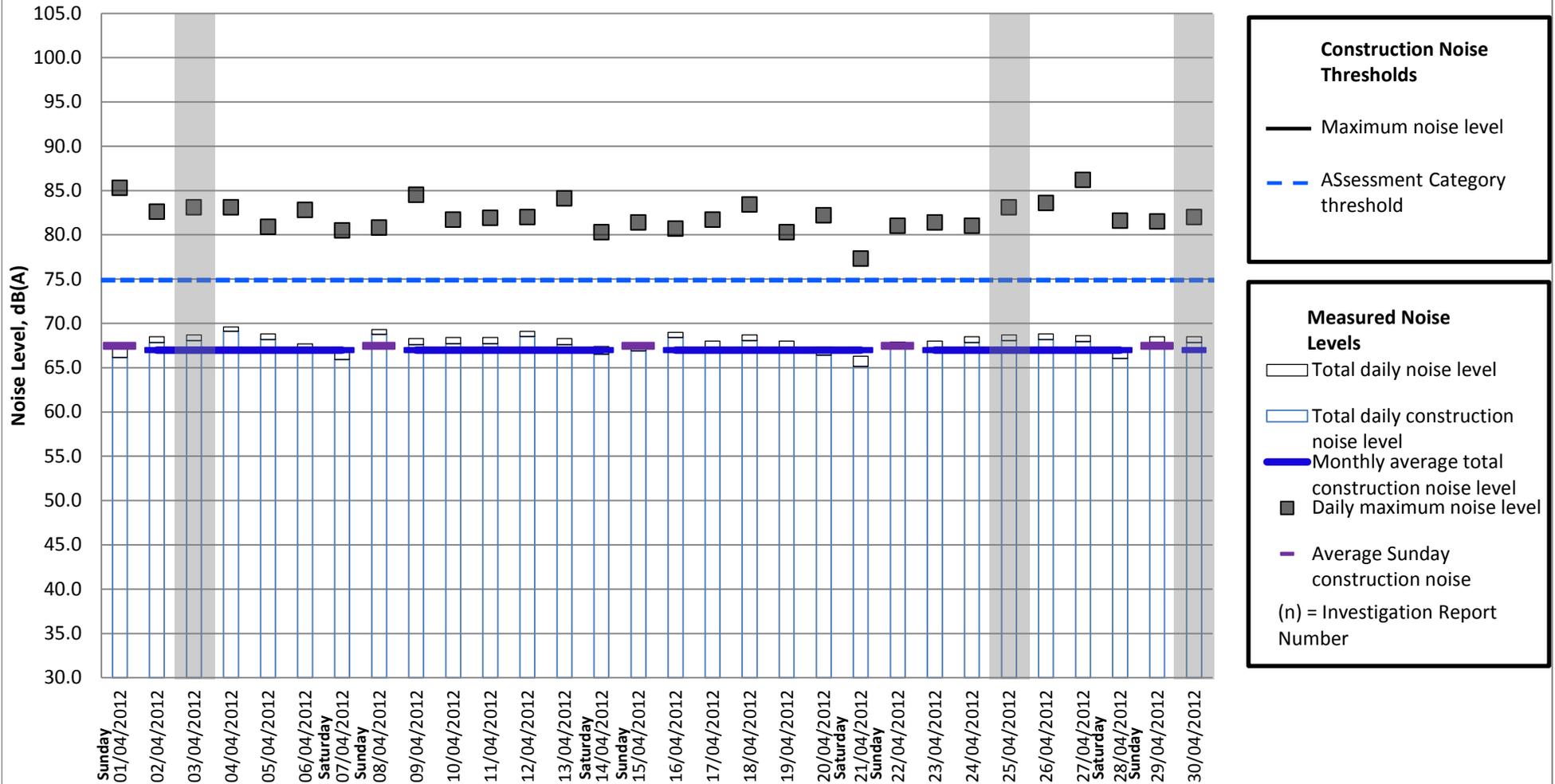
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no works have been conducted in the Southern areas on Saturday or Sunday. It should be noted that the measured noise levels Mon - Fri can not be attributed to construction works due to the considerable distance (1.75 kilometers) between this monitoring location and the closest construction works.

# Measured Daytime Noise Levels at North Leg

## Measurement period: April 2012

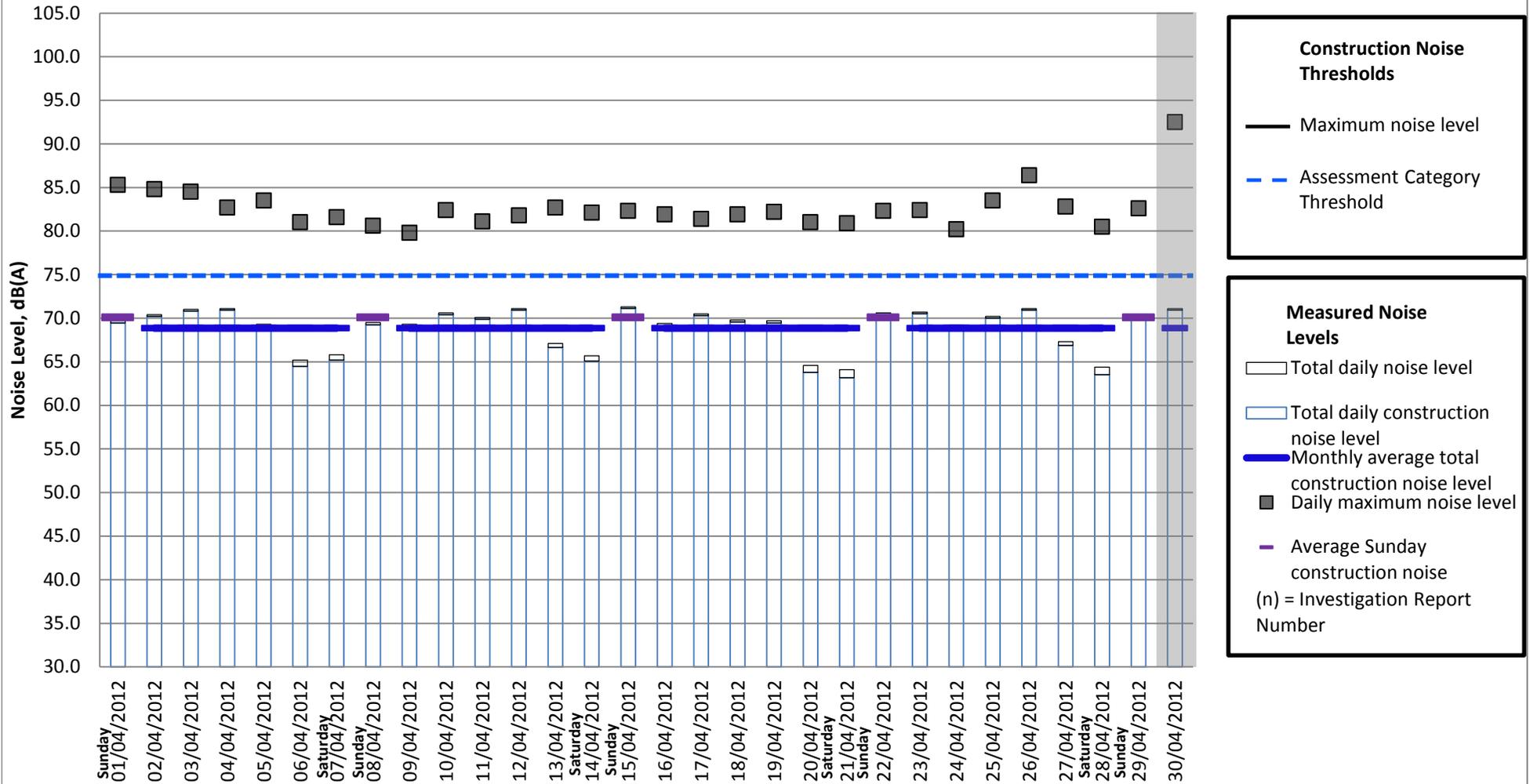


## Measured Evening Noise Levels at North Leg Measurement period: April 2012



**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 03/04/12, 25/04/12 and 30/04/12.

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



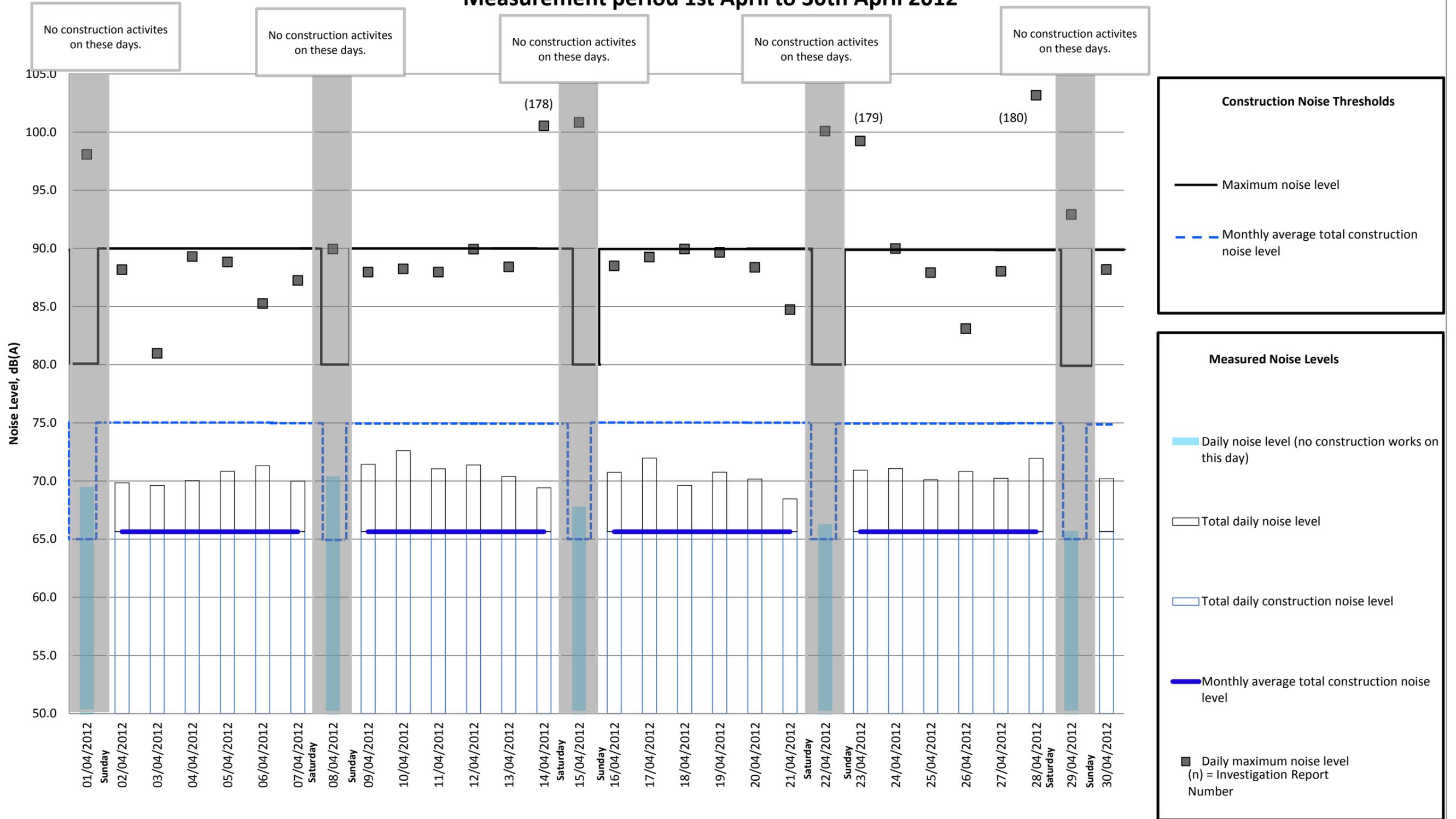
**Note:** The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 30/04/12.

**APPENDIX B -**

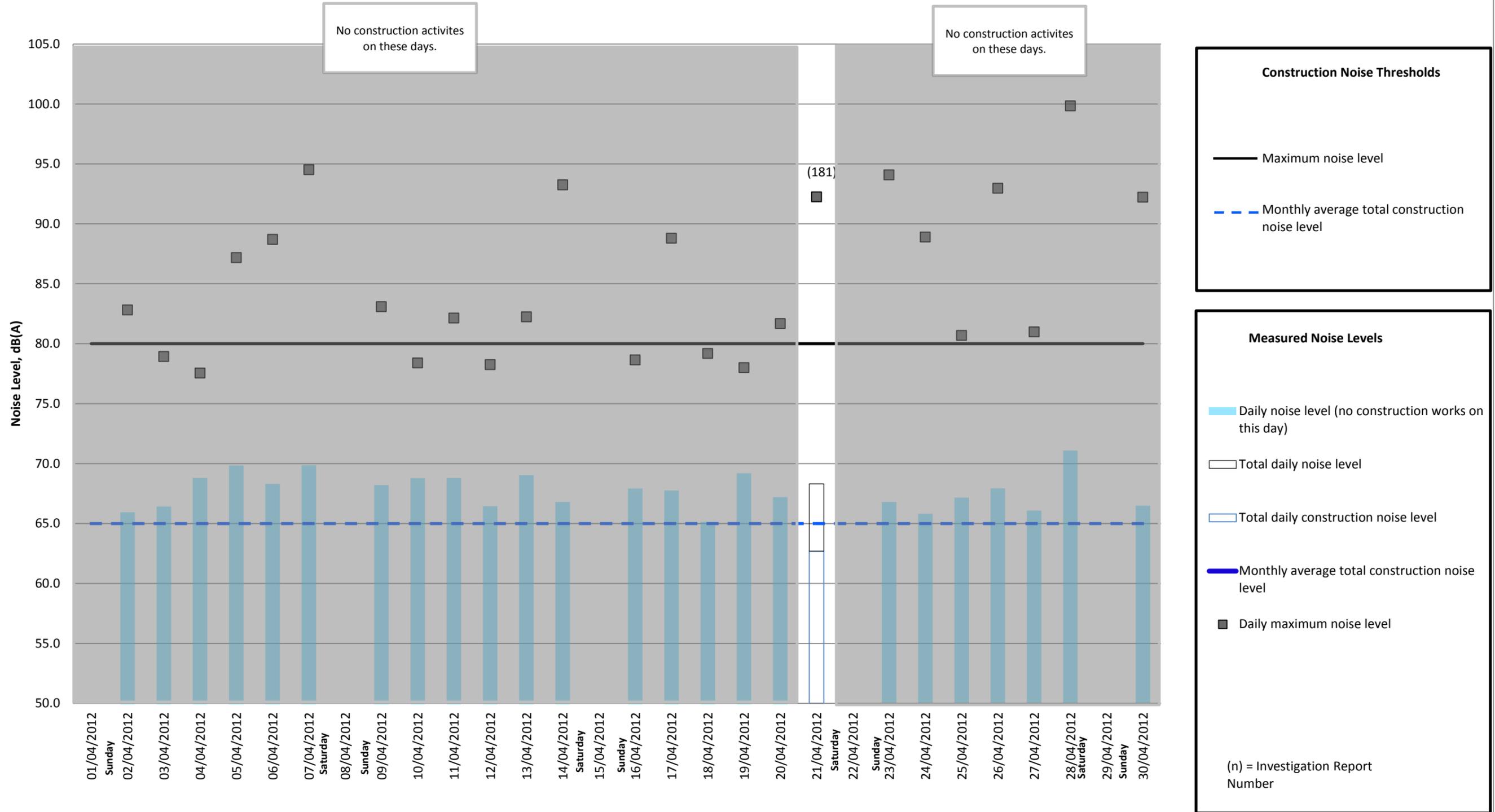
**M9 J1A CONTRACT - CONSTRUCTION  
NOISE MONITORING REPORTS**

## Measured daytime noise levels, 93/95 King Edwards Way (CNV02)

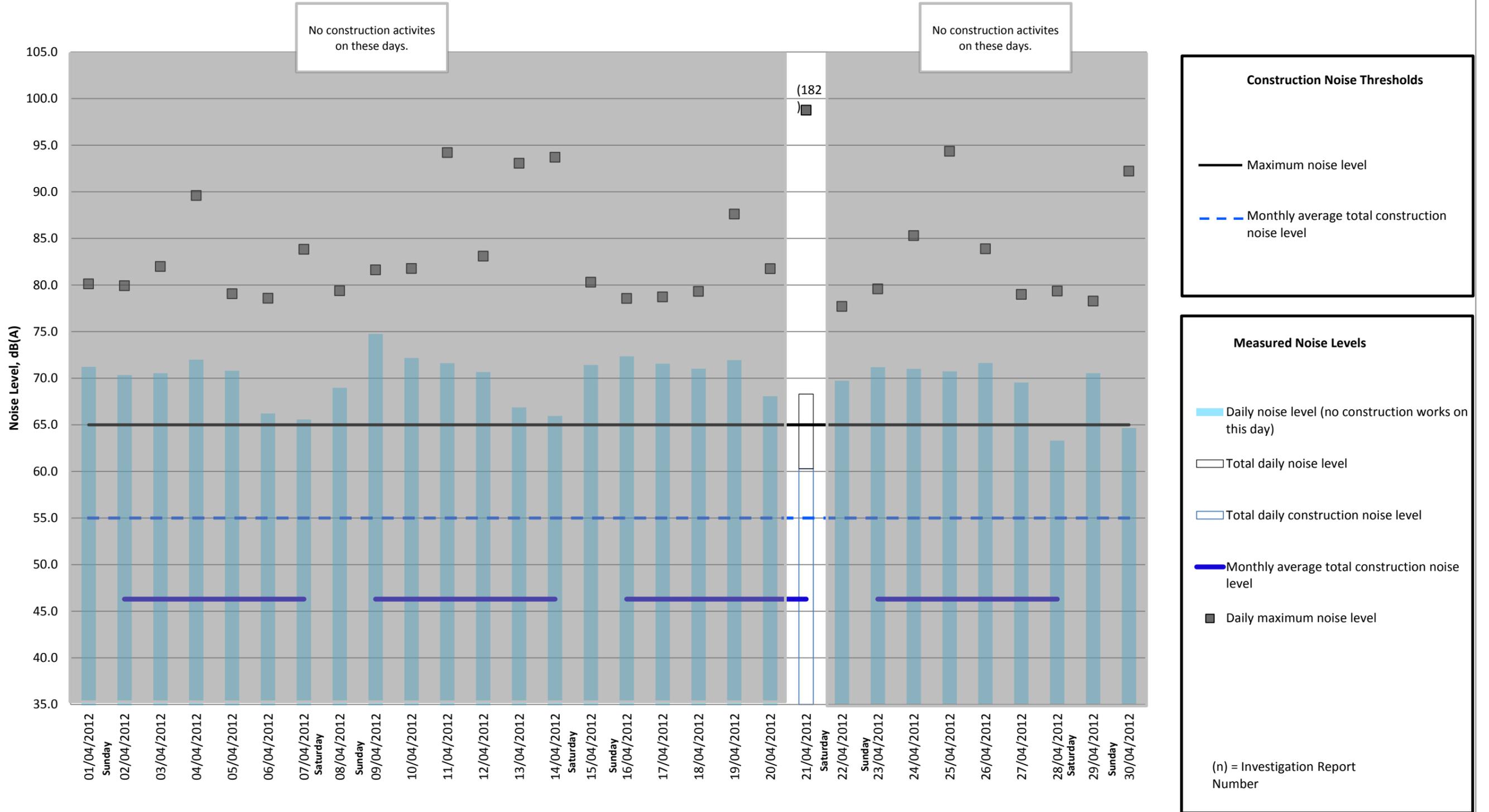
### Measurement period 1st April to 30th April 2012



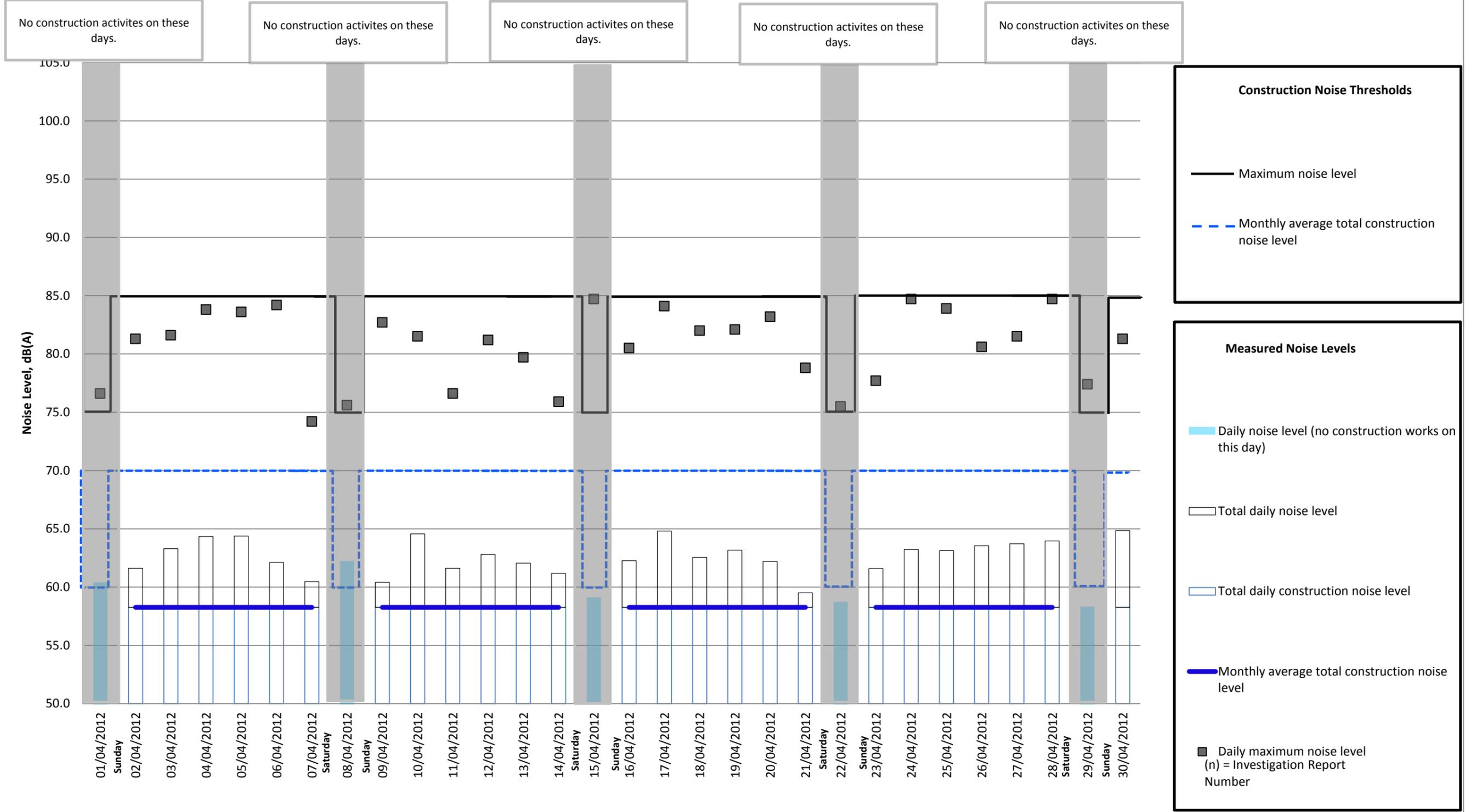
## Measured evening noise levels, 93/95 King Edwards Way (CNV02) Measurement period 1st April to 30th April 2012



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

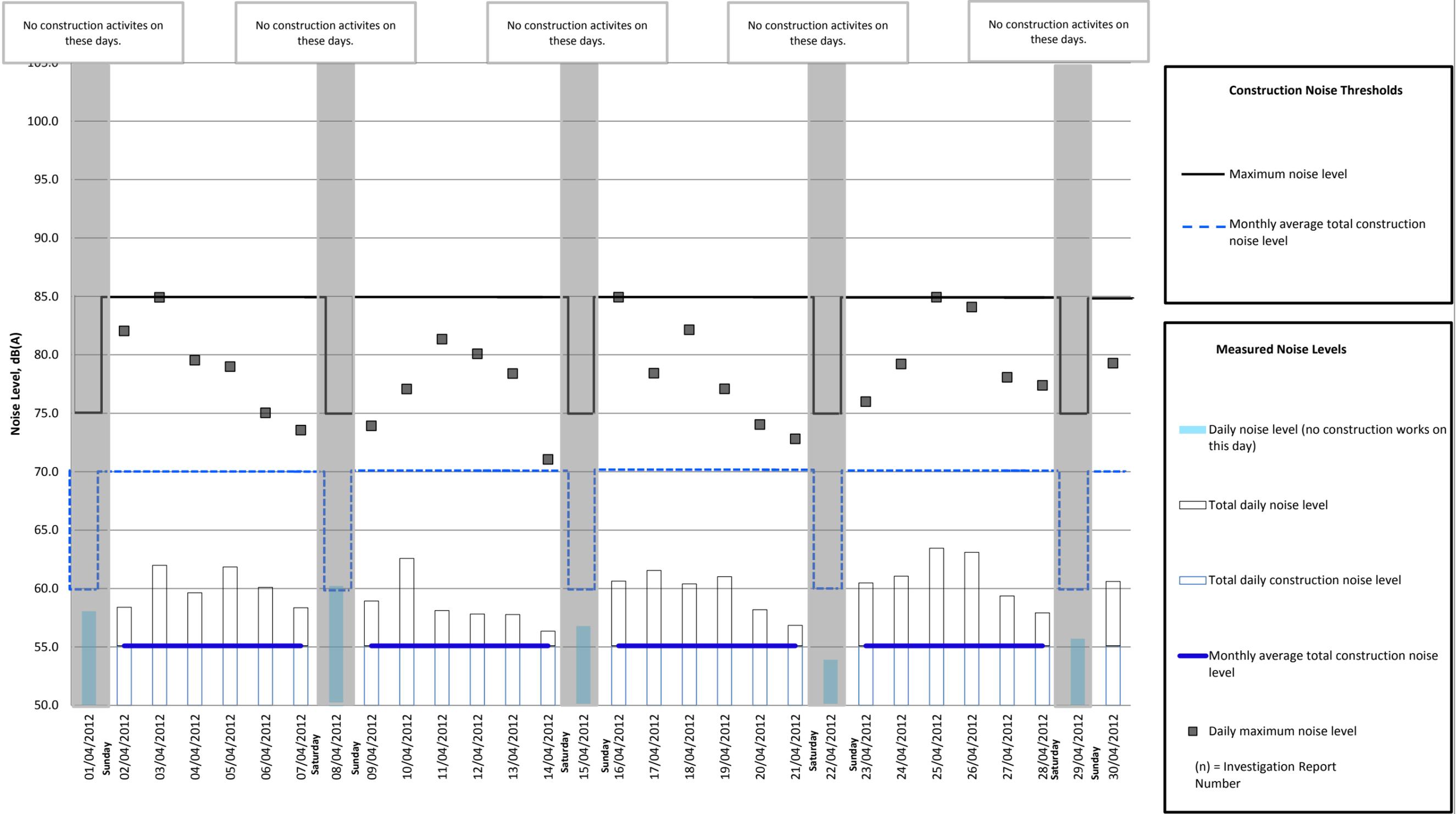


## Measured daytime noise levels, Buie Rigg (CNV07) Measurement period 1st April to 30th April 2012

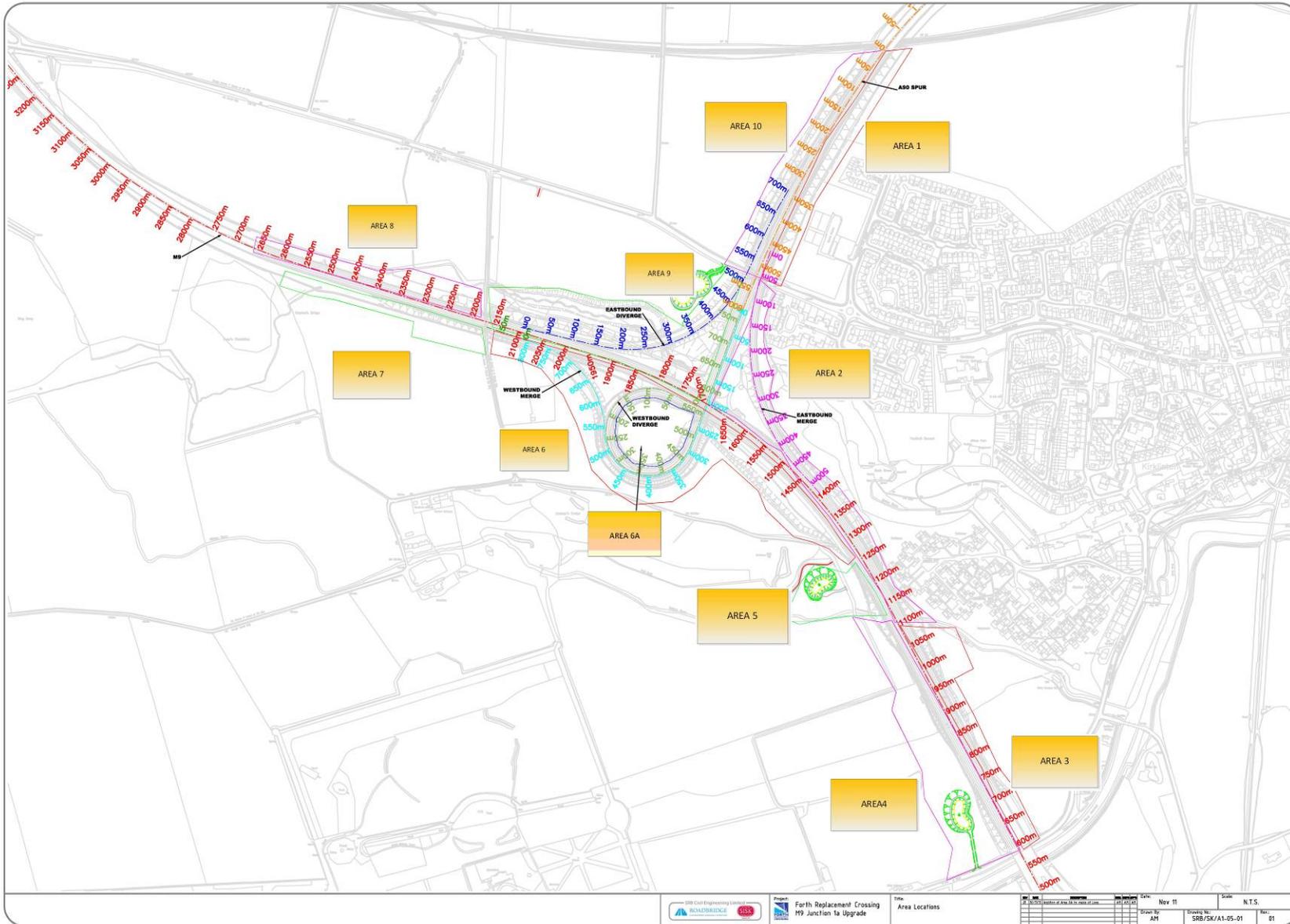


## Measured daytime noise levels, 8 Kirklands Park Grove (CNV16)

### Measurement period 1st April to 30th April 2012



 <p><b>QUALITY MANAGEMENT SYSTEM</b></p>	<b>Project Title:</b> <b>FORTH REPLACEMENT CROSSING</b> <b>M9 Junction 1A</b>		<b>Project Number:</b>  <b>208</b>
	<b>Contractor:</b> <b>SRB</b>	<b>Date:</b> <b>14-04-12</b>	<b>NER. 53</b>
	<b>NOISE EXCEEDENCE REPORT</b>		
<b>Summary of Finding(s): <u>April 14<sup>th</sup> 2012 Saturday – CNV02</u></b> Exceedence 178: Maximum Noise Level: 100.5 dB (A) at 17.01pm <b>Analysis:</b> An analysis was carried out using the following data: <ul style="list-style-type: none"> <li>• Recorded Noise Logs and Noise Data</li> <li>• Noise type</li> <li>• Site Diaries / Weather Data</li> <li>• Inspections by Senior Engineer (Roland Tarrant)</li> </ul> <b>Findings:</b> There were no works in Area 2 or 3 on this date. There were some works ongoing at M906E on this date but these were finished before this time.  <b>Corrective Action Required:</b> Maintain current monitoring and surveillance levels Signature .....Roland Tarrant..... Date .....14-04-12.....			
<b>NER Closed</b> Works have been inspected and completed as described above.  Signature .....Seamus O'Brien.....Date .....14-04-12... Project Manager / <del>Assist Project Manager</del>			





Project Title:  
**FORTH REPLACEMENT  
 CROSSING  
 M9 Junction 1A**

Project  
 Number:  
  
**208**

Contractor:  
**SRB**

Date:  
**23-04-12**

NER. **54**

**QUALITY MANAGEMENT  
 SYSTEM**

**NOISE EXCEEDENCE REPORT**

**Summary of Finding(s): April 23<sup>rd</sup> 2012 Monday – CNV02**

Exceedence 179: Maximum Noise Level: 98.8 dB (A) at 14.59pm

**Analysis:**

An analysis was carried out using the following data:

- Recorded Noise Logs and Noise Data
- Noise type
- Site Diaries / Weather Data
- Inspections by Senior Engineer (Roland Tarrant)

**Findings:**

Analysis of the Noise log concludes that it was caused by a dog barking.

It is unlikely that this was caused by the construction activities.

Noise File is attached.

**Corrective Action Required:**

Maintain current monitoring and surveillance levels

Signature .....Roland Tarrant.....

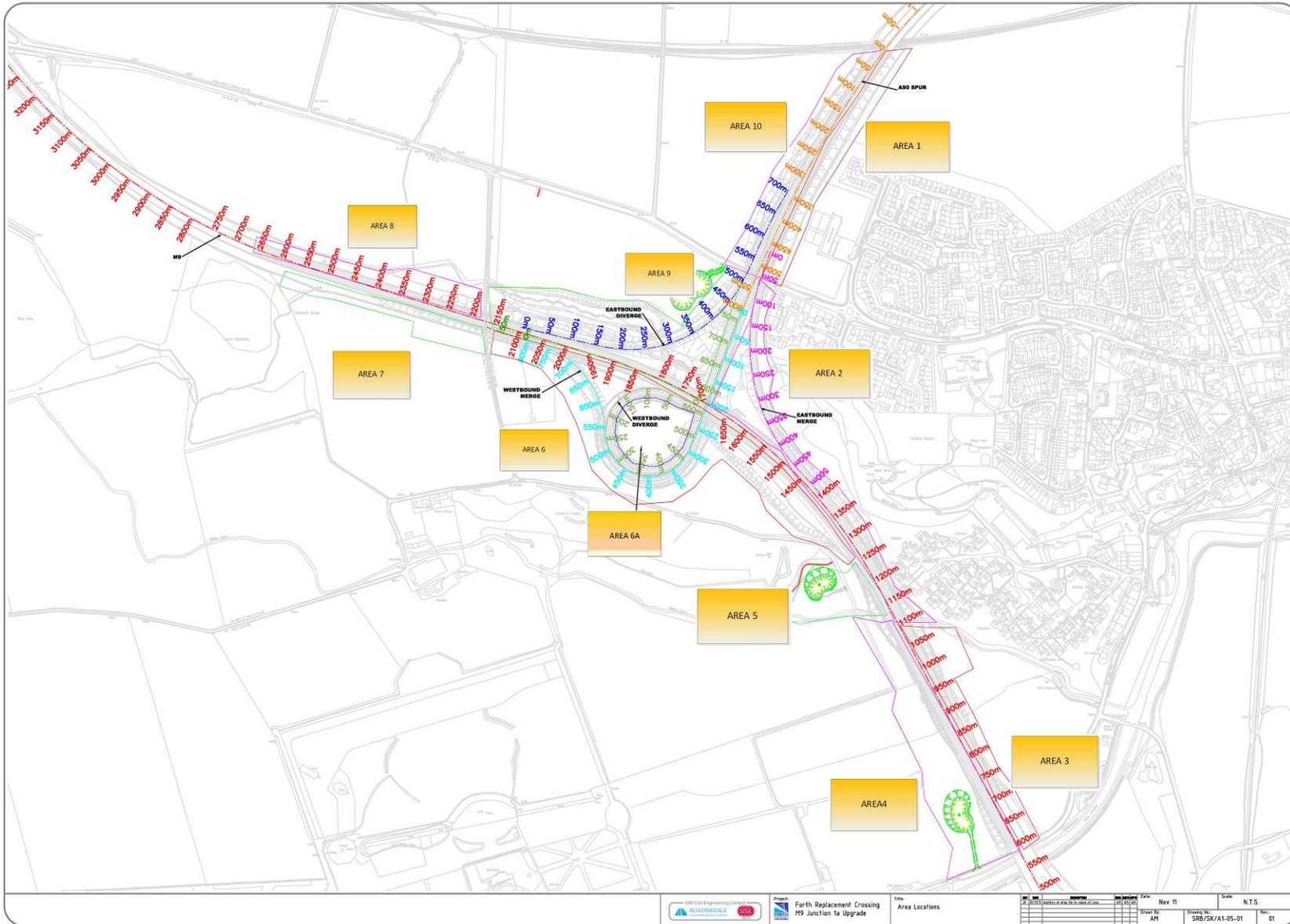
Date .....23-04-12.....

**NER Closed**

Works have been inspected and completed as described above.

Signature .....Seamus O'Brien.....Date .....23-04-12...

Project Manager / Assist Project Manager





Project Title:  
**FORTH REPLACEMENT  
 CROSSING  
 M9 Junction 1A**

Project  
 Number:  
  
**208**

Contractor:  
**SRB**

Date:  
**28-04-12**

NER. **55**

**QUALITY MANAGEMENT  
 SYSTEM**

**NOISE EXCEEDENCE REPORT**

**Summary of Finding(s): April 28<sup>th</sup> 2012 Saturday- CNV02**

Exceedence 180: Maximum Noise Level: 103.2 dB (A) at 15.52pm

**Analysis:**

An analysis was carried out using the following data:

- Recorded Noise Logs and Noise Data
- Noise type
- Site Diaries / Weather Data
- Inspections by Senior Engineer (Roland Tarrant)

**Findings:**

Analysis of the Noise log concludes that the noise event was caused by a dog barking and shouting from a group of local residents.

It is unlikely that this was caused by the construction activities.

Noise File is attached.

**Corrective Action Required:**

Maintain current monitoring and surveillance levels

Signature .....Roland Tarrant.....

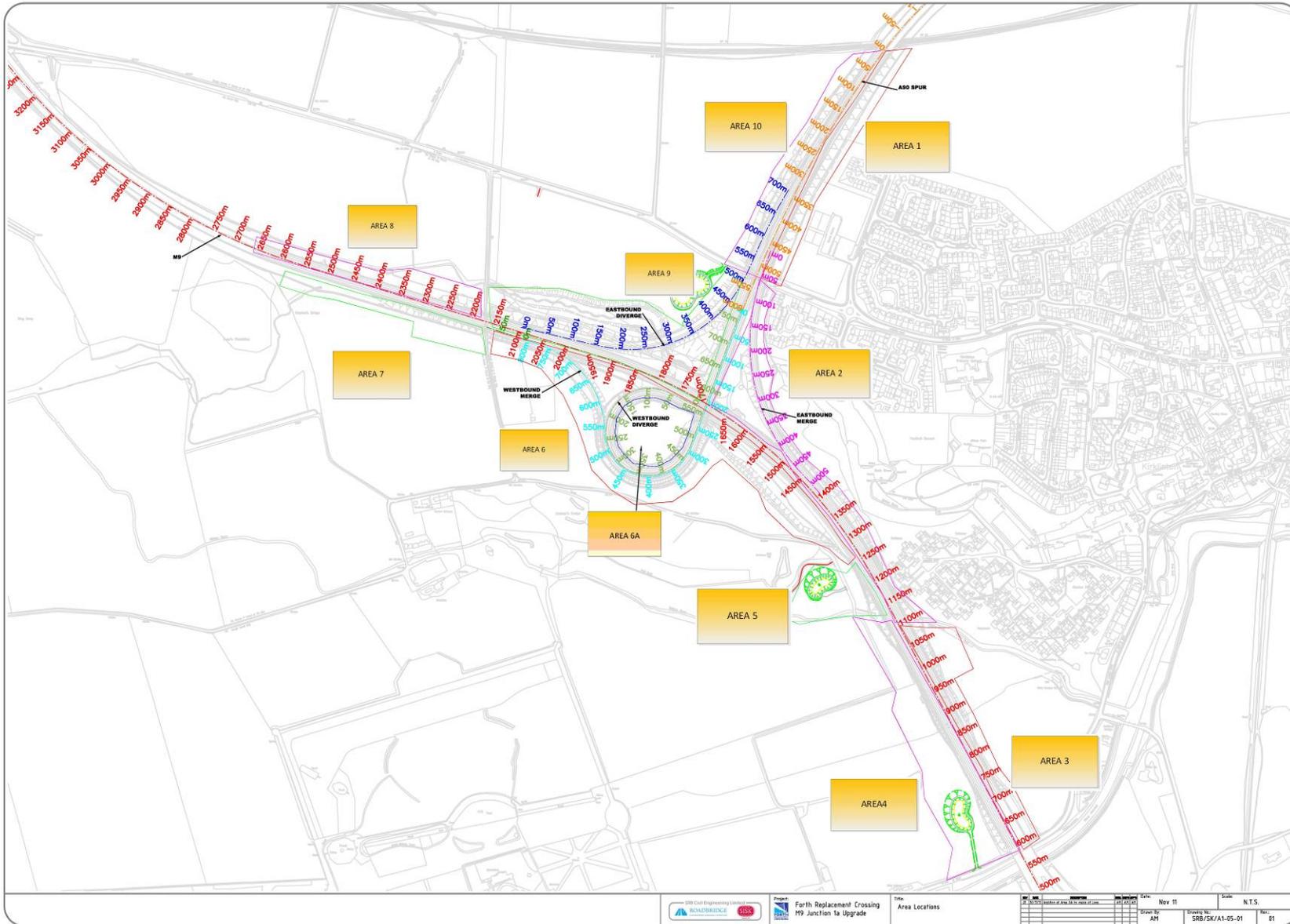
Date .....28-04-12.....

**NER Closed**

Works have been inspected and completed as described above.

Signature .....Seamus O'Brien.....Date .....28-04-12...

Project Manager / ~~Assist Project Manager~~



 <p><b>QUALITY MANAGEMENT SYSTEM</b></p>	<b>Project Title:</b> <b>FORTH REPLACEMENT CROSSING</b> <b>M9 Junction 1A</b>		<b>Project Number:</b>  <b>208</b>
	<b>Contractor:</b> <b>SRB</b>	<b>Date:</b> <b>22-04-12</b>	<b>NER. 56</b>
	<b>NOISE EXCEEDENCE REPORT</b>		
<b>Summary of Finding(s): <u>April 21<sup>st</sup> 2012 Saturday and Sunday – CNV02</u></b> Exceedence 181: Maximum Noise Level: 92.3 dB (A) at 20.36pm Exceedence 182: Maximum Noise Level: 98.8 dB (A) at 00.42am <b>Analysis:</b> An analysis was carried out using the following data: <ul style="list-style-type: none"> <li>• Recorded Noise Logs and Noise Data</li> <li>• Noise type</li> <li>• Site Diaries / Weather Data</li> <li>• Inspections by Senior Engineer (Roland Tarrant)</li> </ul> <b>Findings:</b> Analysis of the Noise log concludes that the noise event at 00.42am was caused by a dog barking.. It is unlikely that this was caused by the construction activities. Noise File is attached.			
<b>Corrective Action Required:</b> Maintain current monitoring and surveillance levels Signature .....Roland Tarrant..... Date .....22-04-12.....			
<b>NER Closed</b> Works have been inspected and completed as described above.  Signature .....Seamus O'Brien.....Date .....22-04-12... Project Manager / <del>Assist Project Manager</del>			

