



Forth Replacement Crossing

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

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



An agency of  The Scottish Government



FORTH REPLACEMENT CROSSING

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

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FORTH REPLACEMENT CROSSING

**EMPLOYER'S DELIVERY TEAM
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: May 2012 – refer to Section 2 of this report.
- M9 Junction 1a Contract: May 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)	May 2012	<ul style="list-style-type: none"> • Overburden Removal • Removal of loose rock
Tigh-Na-Grian (M3)	May 2012	<ul style="list-style-type: none"> • Milling and excavation at Beamer Rock • Dredging at North Shore • Blasting at North Abutment and associated rock removal
Port Edgar (M6)	May 2012	<ul style="list-style-type: none"> • Milling and excavation at Beamer Rock • Dredging at North Shore • Site Clearance and fencing
Butlaw Fisheries (M7)	May 2012	<ul style="list-style-type: none"> • Excavation at Beamer Rock • Dredging at South Shore
Inchgarvie Lodge (M10)	May 2012	<ul style="list-style-type: none"> • Milling and excavation at Beamer Rock • Dredging at North Shore • Utility works • Earthworks • Drainage works • Pavement works
Linn Mill (M11)	May 2012	<ul style="list-style-type: none"> • Utility works • Earthworks • Drainage works
Clufflat Brae (M13)	May 2012	<ul style="list-style-type: none"> • Utility works • Earthworks • Drainage works
Springfield (M14)	May 2012	<ul style="list-style-type: none"> • Works at south compound • Utility works • Earthworks • Drainage works • Topsoil Stripping
Echline Field (M15)	May 2012	<ul style="list-style-type: none"> • Works at south compound • Utility works • Earthworks • Drainage works • Topsoil Stripping

Scotstoun (M16)	May 2012	<ul style="list-style-type: none"> • Fencing • Vegetation mulch and removal
Dundas Home Farm (M17)	May 2012	<ul style="list-style-type: none"> • Utilities works
Newton	May 2012	<ul style="list-style-type: none"> • No works within 1.75 km

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.
- 2.3 Some exceedances of the maximum noise level thresholds occurred in May, 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 Clufflat Brae, Linn Mill, Scotstoun and Tigh-Na-Grian were attributed to construction works.
- 2.4 Exceedances of the monthly average threshold occurred at Scotstoun, Butlaw Fisheries, Clufflat Brae and Linn Mill, however these are not considered to be due to construction works being carried out.
- 2.5 All exceedances were investigated in accordance with the project Code of Construction Practice.
- 2.6 A large quantity of exceedance reports were generated in May, 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. A summary of the information included in the exceedance reports is provided in Table 2.2 overleaf.

Monitoring Location	Contractor's Exceedance Report Reference	Exceedance
Butlaw Fisheries (M7)	NVIRs B.186 - B.228	During May the maximum noise threshold was exceeded on 43 occasions (daytime, 8; evening, 10; night time, 25). No exceedances were due to construction works. 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 (M13)	NVIRs C.181 -C.239	During May the maximum noise threshold was exceeded on 59 occasions (daytime, 17; evening, 13; night time, 29). A number of the exceedances were found to be due to birds and children. Exceedances on 5 days were found to be due to the intermittent noise of plant operating in close proximity to the meter.
Inchgarvie Lodge (M10)	NVIRs I.180 - I.244	During May the maximum noise threshold was exceeded on 66 occasions (daytime, 18; evening, 19; night time, 29). Investigations found birds to be the main contributing factor to the exceedances at this location. The tarring of the driveway was found to cause exceedances during one daytime period.
Linn Mill (M11)	NVIRs L.164 - L.219	During May the maximum noise threshold was exceeded on 56 occasions (daytime, 16; evening, 11; night time, 29). The daytime threshold was exceeded on three occasions due to plant operations. However, the majority of exceedances were due to birds, DIY works at the property and fireworks.
Tigh-Na-Grian (M3)	NVIRs T.147 - T.187	During May the maximum noise threshold was exceeded on 42 occasions (daytime, 11; evening, 2; night time, 29). The night time threshold was exceeded on 6 occasions due to dredging works. However the majority of exceedances were due to birds and others due to ship horns in the estuary.
Dundas Home Farm (M17)	NVIRs D.43 - D.49	During May 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 and birds.
Echline Field (M15)	NVIRs E.79 - E.89	During May the maximum noise threshold was exceeded on 11 occasions. Exceedances were not due to construction activities and were all attributed to vehicle noises.

Monitoring Location	Contractor's Exceedance Report Reference	Exceedance
Springfield (M14)	NVIRs S.35 - S.46	During May the maximum noise threshold was exceeded on 12 occasions. Exceedances were not due to construction activities. Exceedances were attributed to birds, DIY at nearby properties, lawnmower use and monitor maintenance.
Scotstoun (M16)	NVIRs Sc.36 - Sc.58	During May the maximum noise threshold was exceeded on 23 occasions. Exceedances were largely attributed to vehicles passing by on the adjacent road. However, exceedances for a short, intermittent period on 31/05/12 were due to fence construction adjacent to the meter.
Whinny Hill (M1)	NVIRs W.7 - W.15	During May the maximum noise threshold was exceeded on 9 occasions. Exceedances were not attributable to construction activities. Birds and dogs barking were largely 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.

Monitoring Location	Monitoring Period	Main Construction Activities
93/95 King Edwards Way (CNV02)	May 2012	<ul style="list-style-type: none">• Excavation north and south of M9• Installation of drainage• M9 earthworks close to Gateside• M9 pavement works• Structural concrete pours• Piling works
15-17 Buie Rigg (CNV07)	May 2012	<ul style="list-style-type: none">• Earthworks close to Kirklands Park Grove• Drainage works• Piling works• Structural concrete pours• Swine Burn culvert
8 Kirklands Park Grove (CNV16)	May 2012	<ul style="list-style-type: none">• Earthworks close to Kirklands Park Grove• Utilities works

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 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 May 2012 and the investigations identified that the exceedances were not due to construction related factors. 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 57 - 61 and 63 - 66	During May the maximum noise threshold was exceeded on 10 occasions (daytime, 8; evening, 1; night time, 1). However, no exceedances were attributed to construction related activities. The exceedances were attributed to dogs barking, people shouting and traffic noise.
15-17 Buie Rigg (CNV07)	NER 67	During May the maximum noise threshold was exceeded on 1 occasion (daytime). However, the exceedance was not attributed to construction related activities as no works were being carried out on the M9J1a site at the time of the exceedance.
8 Kirklands Park Grove (CNV16)	NERs 62 and 68 - 70	During May the maximum noise threshold was exceeded on 4 occasions (daytime, 1; night time, 3). However, no exceedances were attributed to construction related activities. The daytime exceedance was attributed home repairs being carried out in a neighbouring property and no works were being carried out within 300m of the receptor at the time of the night time exceedances.


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:
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- 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 May 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 May 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 May 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 May 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 May 2012
M1	Whinny Hill	Network	Overburden removal Removal of loose rock N.B. No evening, night time, Saturday or Sunday daytime construction in vicinity.
M3	Tigh-Na-Grian	Crossing	On-going works at Beamer Rock including milling and excavation Dredging at North Shore Blasting at North Abutment and associated rock removal
M6	Port Edgar	Crossing	On-going works at Beamer Rock including milling and excavation Dredging at North Shore Site Clearance and fencing
M7	Butlaw Fisheries	Crossing	On-going works at Beamer Rock including milling and excavation Dredging at North Shore
M10	Inchgarvie Lodge	Crossing	On-going works at Beamer Rock including milling and excavation Dredging at North Shore Utility works including pipe installations Earthworks Drainage works Tarring of track
M11	Linn Mill	Network (close proximity to Crossing)	Utility works including pipe installations Earthworks Drainage works
M13	Clufflat Brae	Network (close proximity to Crossing)	Utility works including pipe installations Earthworks Drainage works
M14	Springfield	Network	Works at Southern Compound Utility works including pipe installations Drainage works Earthworks Soil stripping N.B. No evening, night time or Sunday daytime construction in vicinity.
M15	Echline Field	Network	Works at Southern Compound Utility works including pipe installations

			Drainage works Earthworks Soil stripping N.B. No evening, night time or Sunday daytime construction in vicinity.
M16	Scotstoun	Network	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 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). 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 May 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 May have typically been a result of monitor maintenance and software issues with the sound level meters. FCBC are currently working with the manufacturer and supplier of the sound level meters to resolve the software issues. Data is missing at Newton due to a loss of power supply at this location for a four week period.
- 3.3** Results demonstrate that largely the monthly average total construction noise threshold was within the threshold limits for all monitoring locations during daytime, evening or night time periods throughout May 2012. Exceedances of the threshold occurred at Scotstoun during the day and at Butlaw Fisheries, Clufflat Brae and Linn Mill during the night. The Sunday average (for applicable monitoring locations) was also found to be within the threshold for all monitoring locations during May 2012, with the exception of Inchgarvie Lodge for the daytime Sunday average.
- 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. With regard to the exceedances of the night time averages at Butlaw Fisheries, Clufflat Brae and Linn Mill, 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 to exceed the threshold. The Sunday average at Inchgarvie Lodge was affected by works at the property on 27 May which increased the background noise levels significantly above normal levels. As the Sunday average is also represented by the highest 1 hour periods during the daytime, this further influenced the result obtained for the Sunday average. 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 May 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** 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.
- 3.8** Some exceedances of the daytime threshold at Clufflat Brae during this period occurred as a result of construction works; intermittent noise from plant operating in close proximity to the noise meter was found to cause exceedances on 3 and 4 May 2012 and also on 24, 25 and 28 May 2012. Similarly, plant operating close to a noise monitor was also found to cause exceedances on 23, 24 and 28 May 2012 at Linn Mill.
- 3.9** An additional construction related exceedance was recorded at Scotstoun on 31 May 2012 due to the construction of a boundary fence in close proximity to the sound level meter; however this noise was intermitted and only occurred for a short period of time.
- 3.10** Some exceedances due to marine works were also recorded. Dredging works at the north shore caused intermittent night-time exceedances at Tigh-Na-Grian on 7, 14, 17, 19, 29 and 30 May 2012.
- 3.11** 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

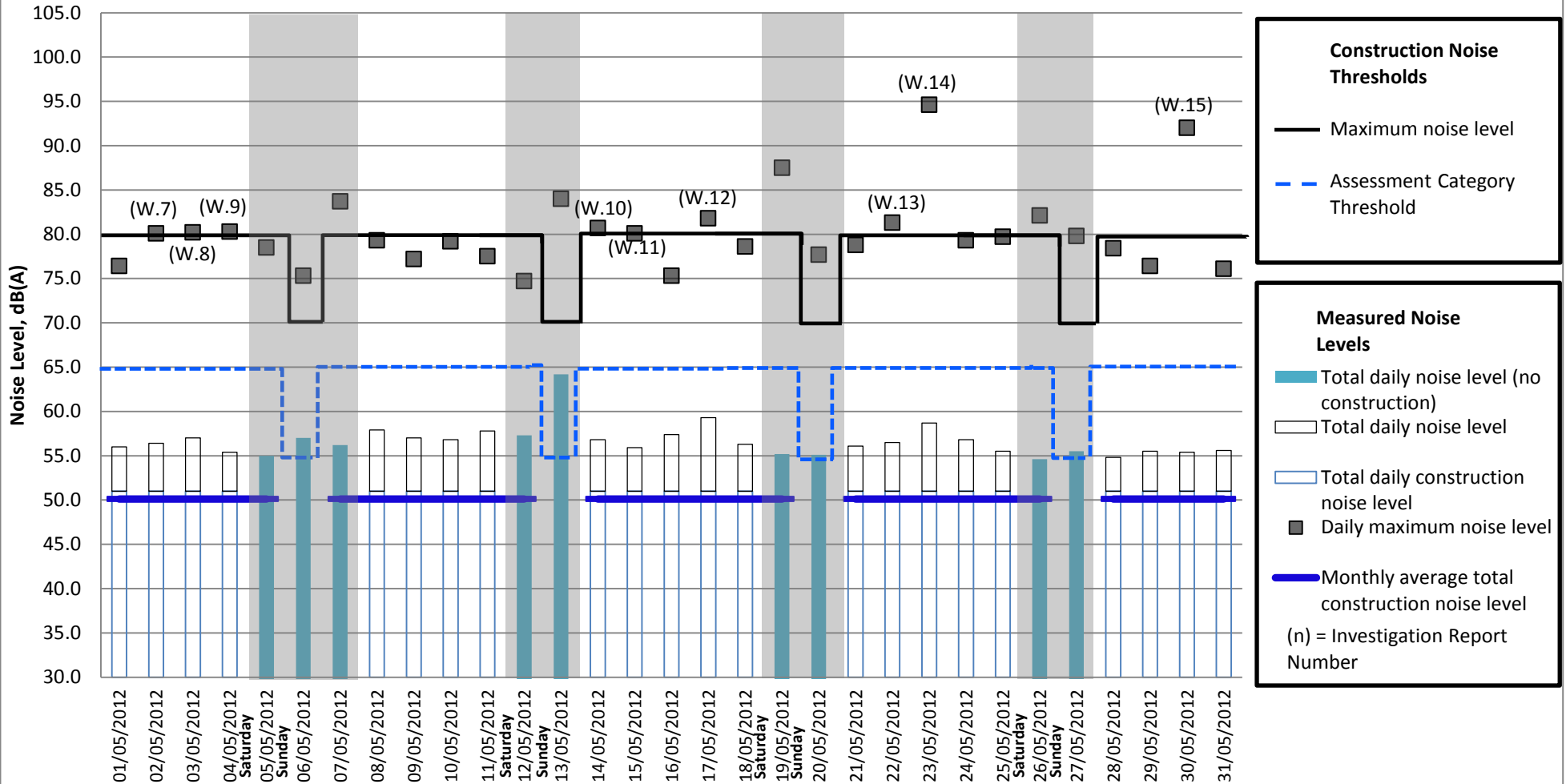
Monitoring Location	Associated NVIR Numbers	Summary of Exceedance Details
Butlaw Fisheries	B.186 – B.228	During May the maximum noise threshold was exceeded on 43 occasions (daytime, 8; evening, 10; night time, 25). No exceedances were due to construction works. Exceedances were attributed to a range of factors, including birds (particularly during the early hours of the morning), strong winds and water on the shore.
Clufflat Brae	C.181 – C.239	During May the maximum noise threshold was exceeded on 59 occasions (daytime, 17; evening, 13; night time, 29). A number of the exceedances were found to be due to birds and children playing. Exceedances on 5 days were found to be due to the intermittent noise of plant operating in close proximity to the meter.
Inchgarvie Lodge	I.180 – I.244	During May the maximum noise threshold was exceeded on 66 occasions (daytime, 18; evening, 19; night time, 29). Investigations found birds to be the main contributing factor to the exceedances at this location. The tarring of the driveway was found to cause exceedances during one daytime period.
Linn Mill	L.164 – L.219	During May the maximum noise threshold was exceeded on 56 occasions (daytime, 16; evening, 11; night time, 29). The daytime threshold was exceeded on three occasions due to plant operations. However, the majority of exceedances were due to birds, DIY works at the property and fireworks.
Tigh-Na-Grian	T.147 – T.187	During May the maximum noise threshold was exceeded on 42 occasions (daytime, 11; evening, 2; night time, 29). The night time threshold was exceeded on 6 occasions due to dredging works. However the majority of exceedances were due to birds and others due to ship horns in the estuary.
Dundas Home Farm	D.43 – D.49	During May 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 and birds.
Echline Field	E.79 – E.89	During May the maximum noise threshold was exceeded on 11 occasions. Exceedances were not due to construction activities and were all attributed to vehicle noises.

Springfield	S.35 – S.46	During May the maximum noise threshold was exceeded on 12 occasions. Exceedances were not due to construction activities. Exceedances were attributed to birds, DIY at nearby properties, lawnmower use and monitor maintenance.
Scotstoun	Sc.36 – Sc.58	During May the maximum noise threshold was exceeded on 23 occasions. Exceedances were largely attributed to vehicles passing by on the adjacent road. However, exceedances for a short, intermittent period on 31/05/12 were due to fence construction adjacent to the meter.
Whinny Hill	W.7 – W.15	During May the maximum noise threshold was exceeded on 9 occasions. Exceedances were not due to construction activities. Birds and dogs barking were largely found to be the cause of exceedances at this location.

APPENDICES

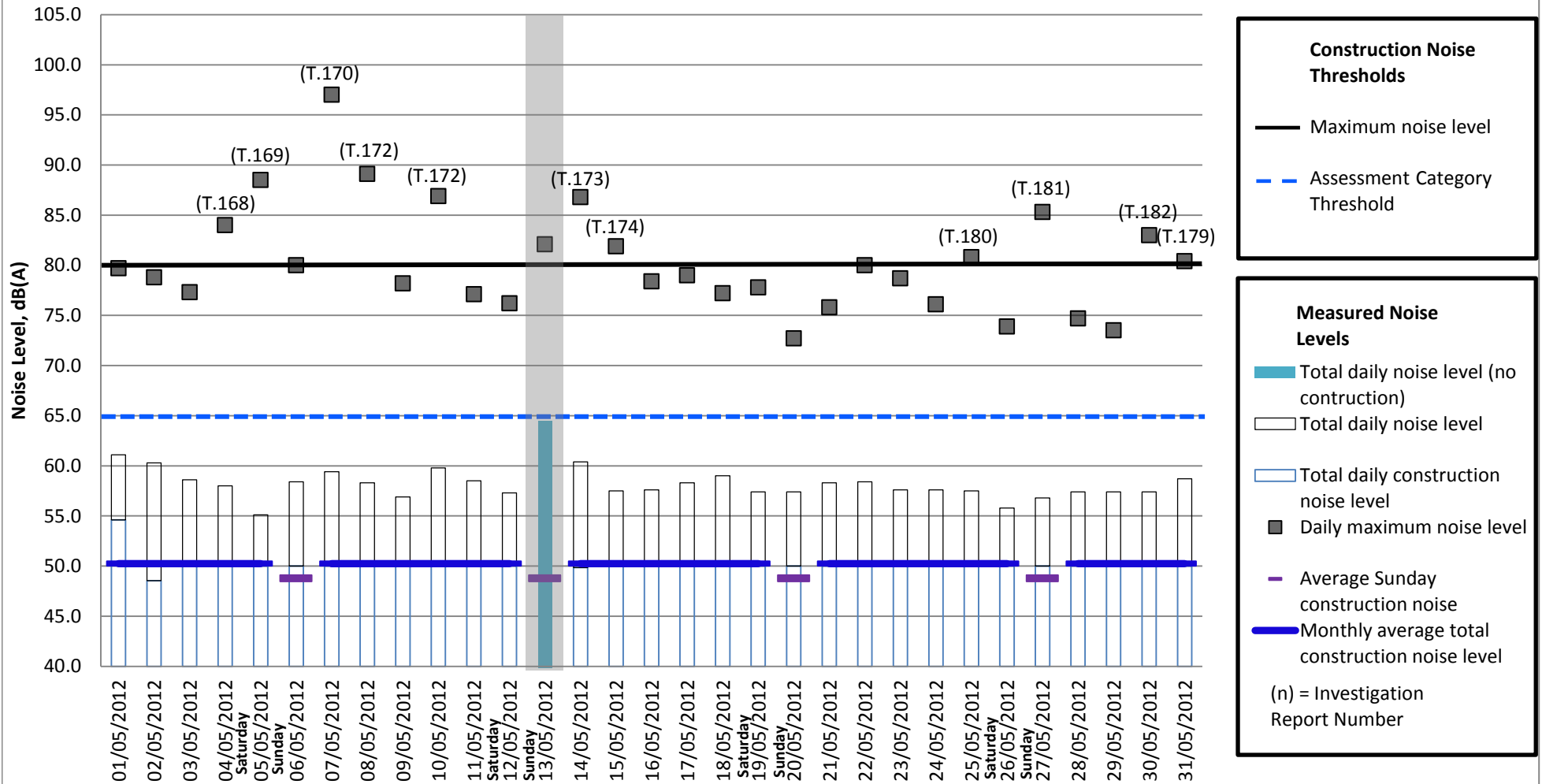
Measured Daytime Noise Levels at Whinny Hill

Measurement period: May 2012



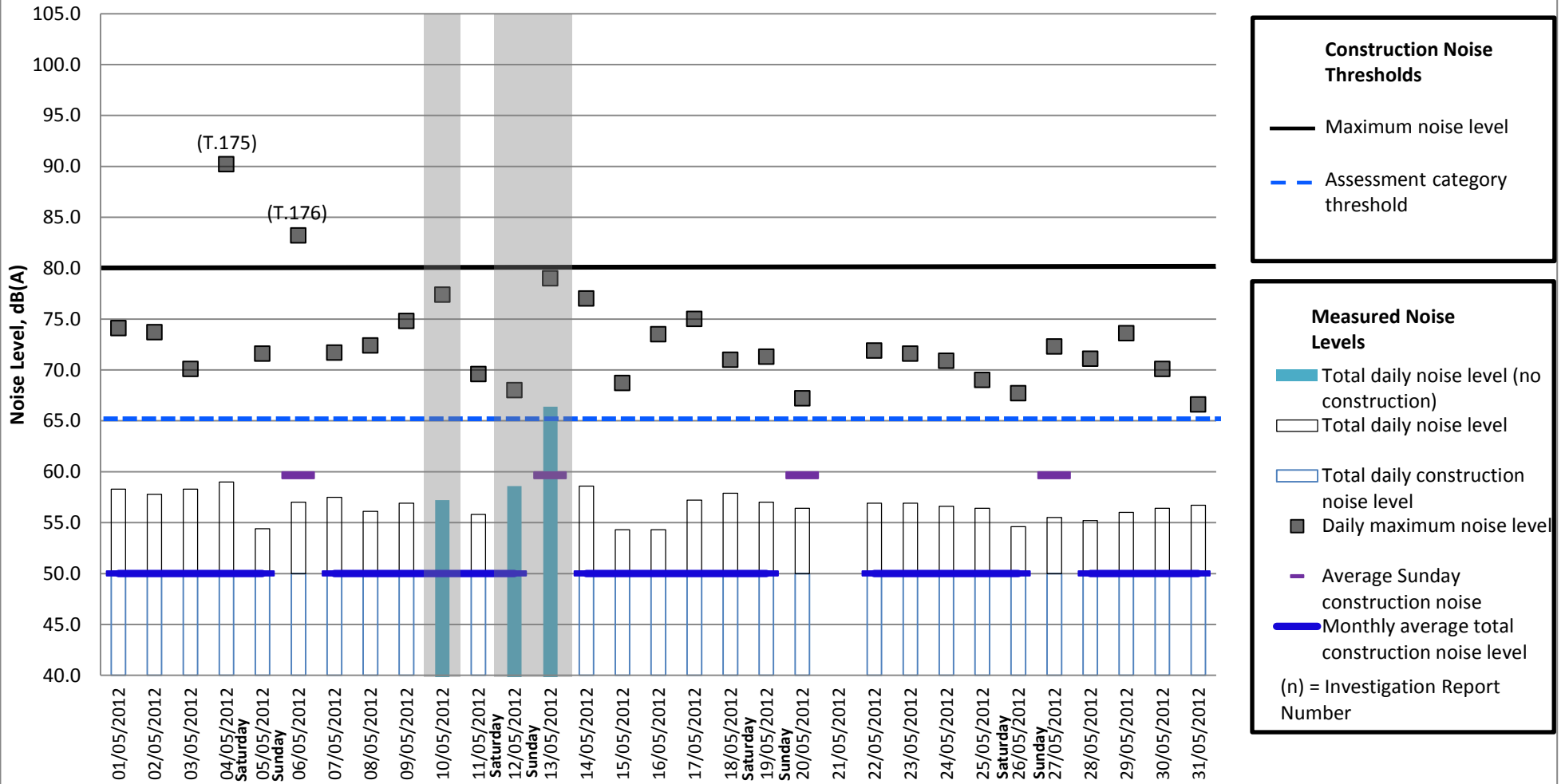
Note: The grey areas of the chart represent days on which no construction works have been conducted; no Saturday or Sunday construction works have been conducted at this location. No works were conducted on 07/05/12. The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location during this period.

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



Note: The grey areas of the chart represent days on which no construction works have been conducted; no construction works were undertaken on 13/05/12 due to adverse weather conditions.

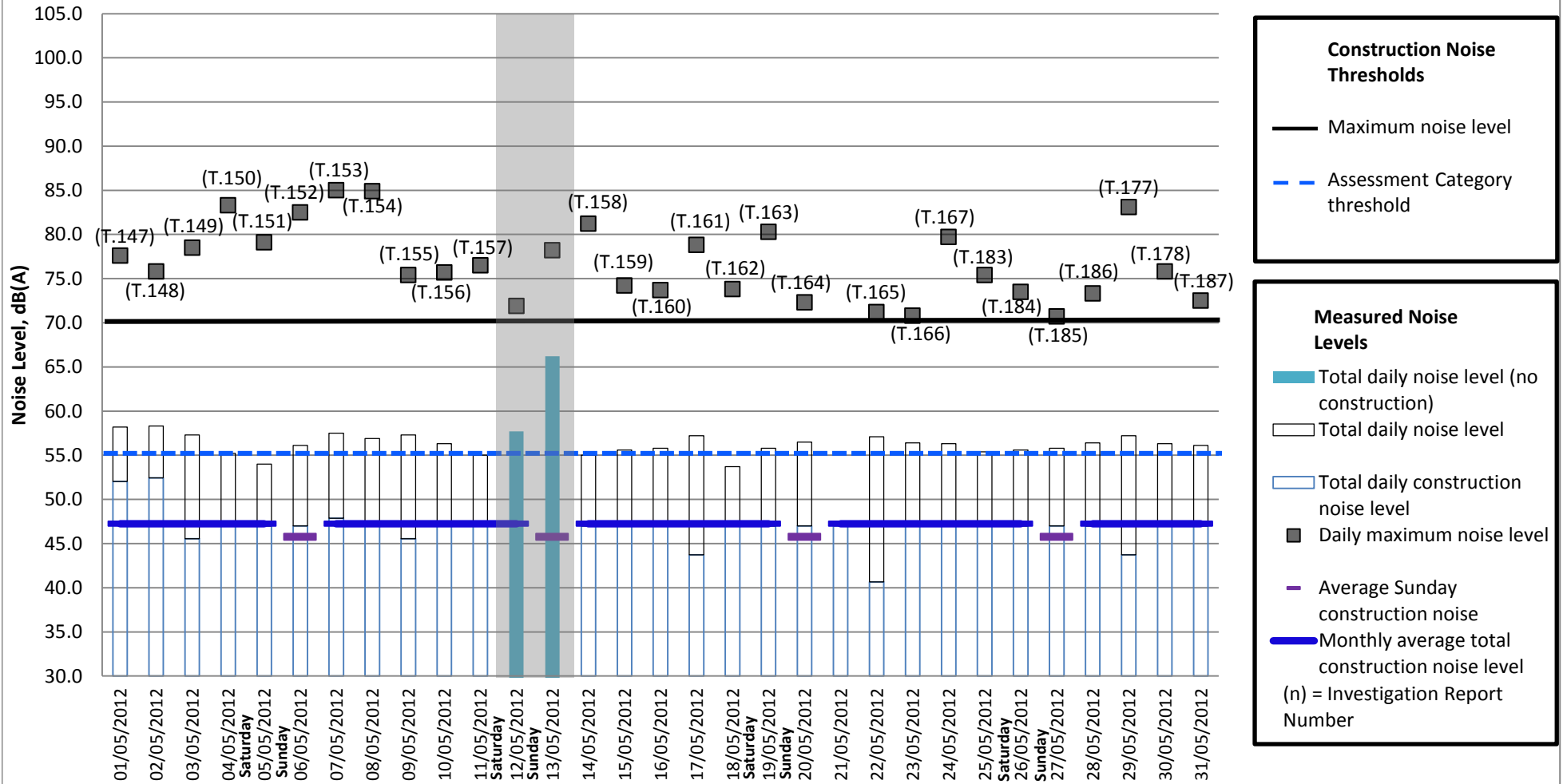
Measured Evening Noise Levels at Tigh-Na-Grian Measurement period: May 2012



Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 10/05/12, 12/05/12, 13/05/12

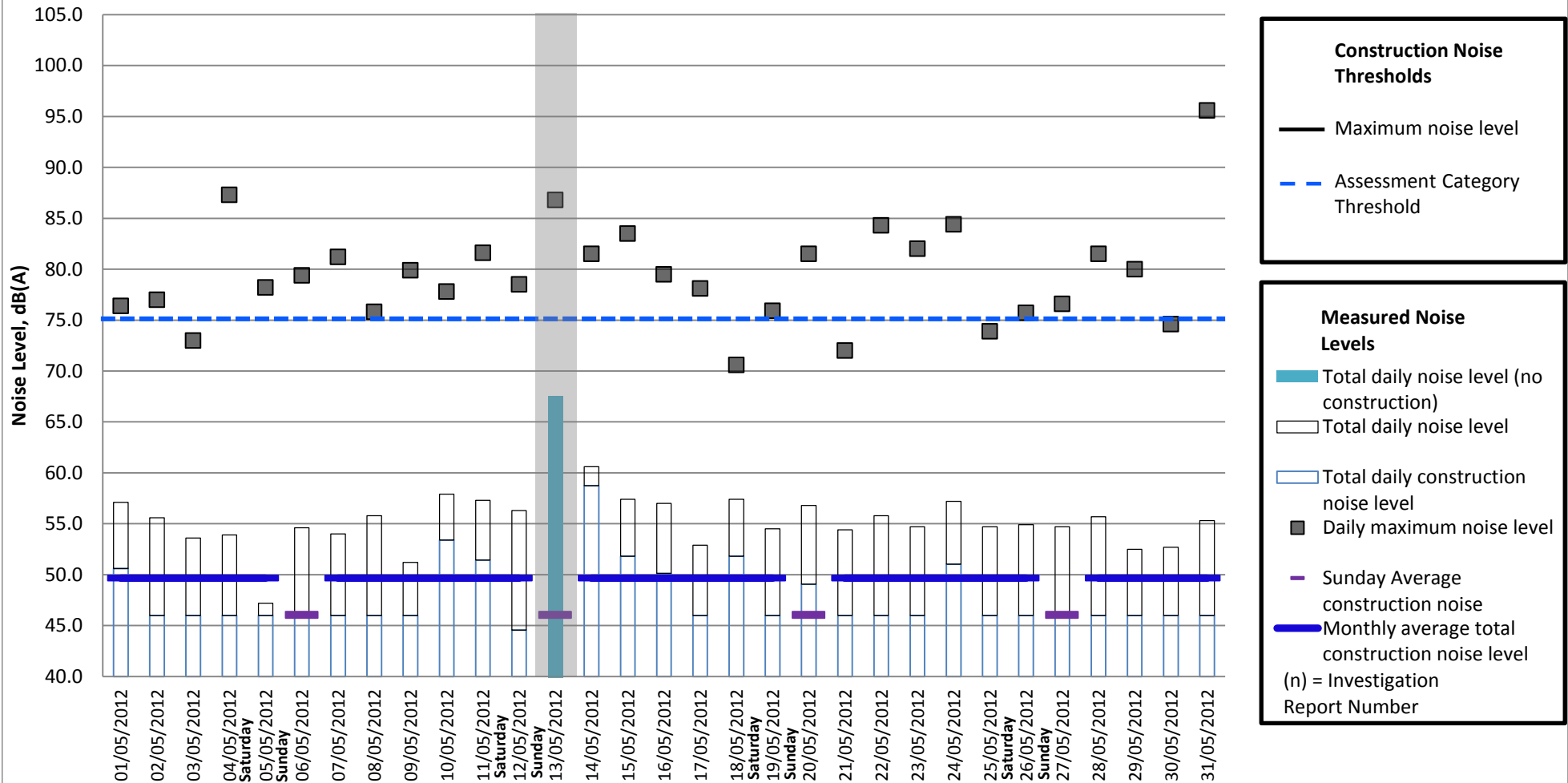
Measured Night-time Noise Levels at Tigh-Na-Grian

Measurement period: May 2012



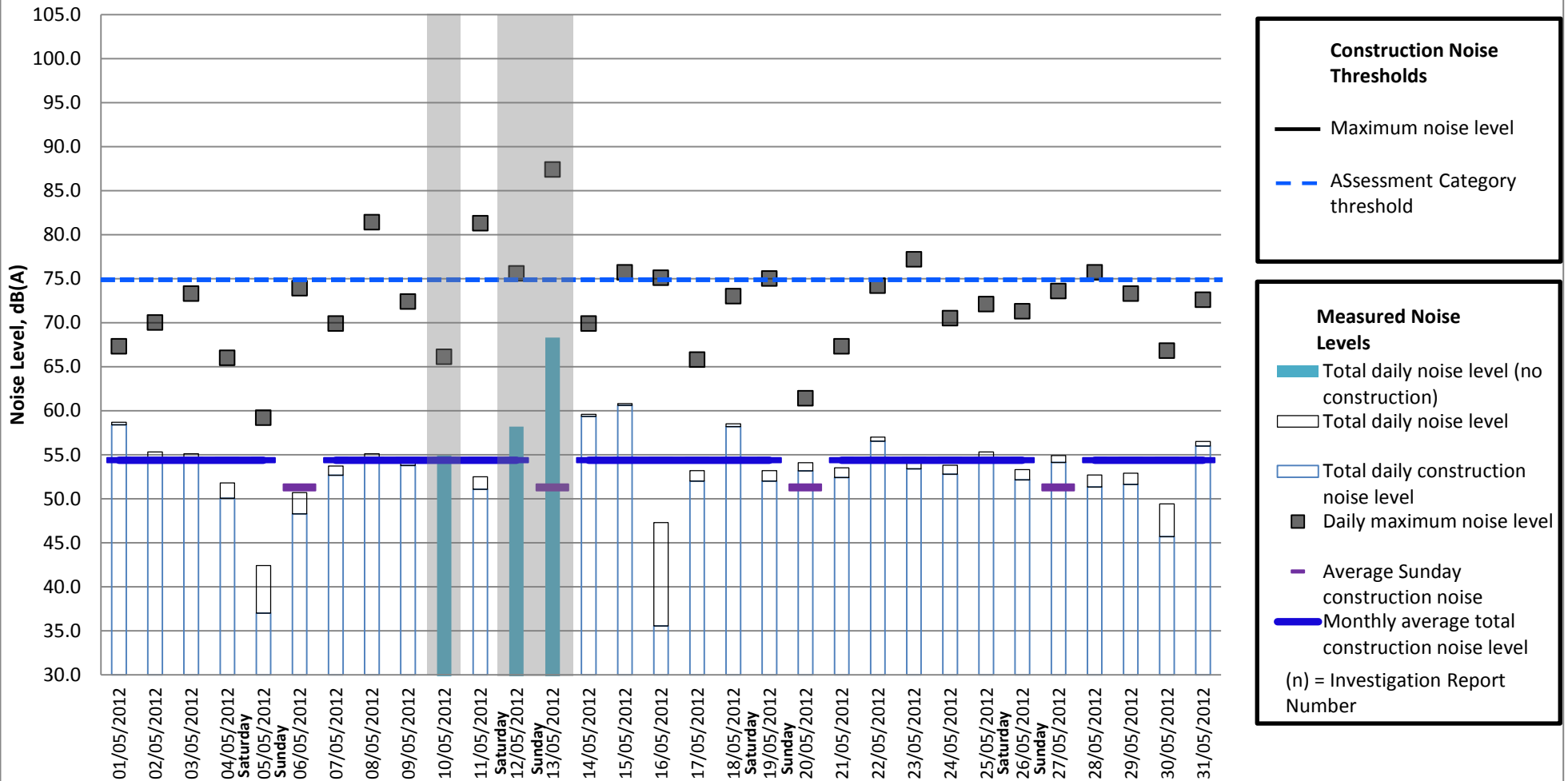
Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 12/05/12, 13/05/12

Measured Daytime Noise Levels at Port Edgar Measurement period: May 2012



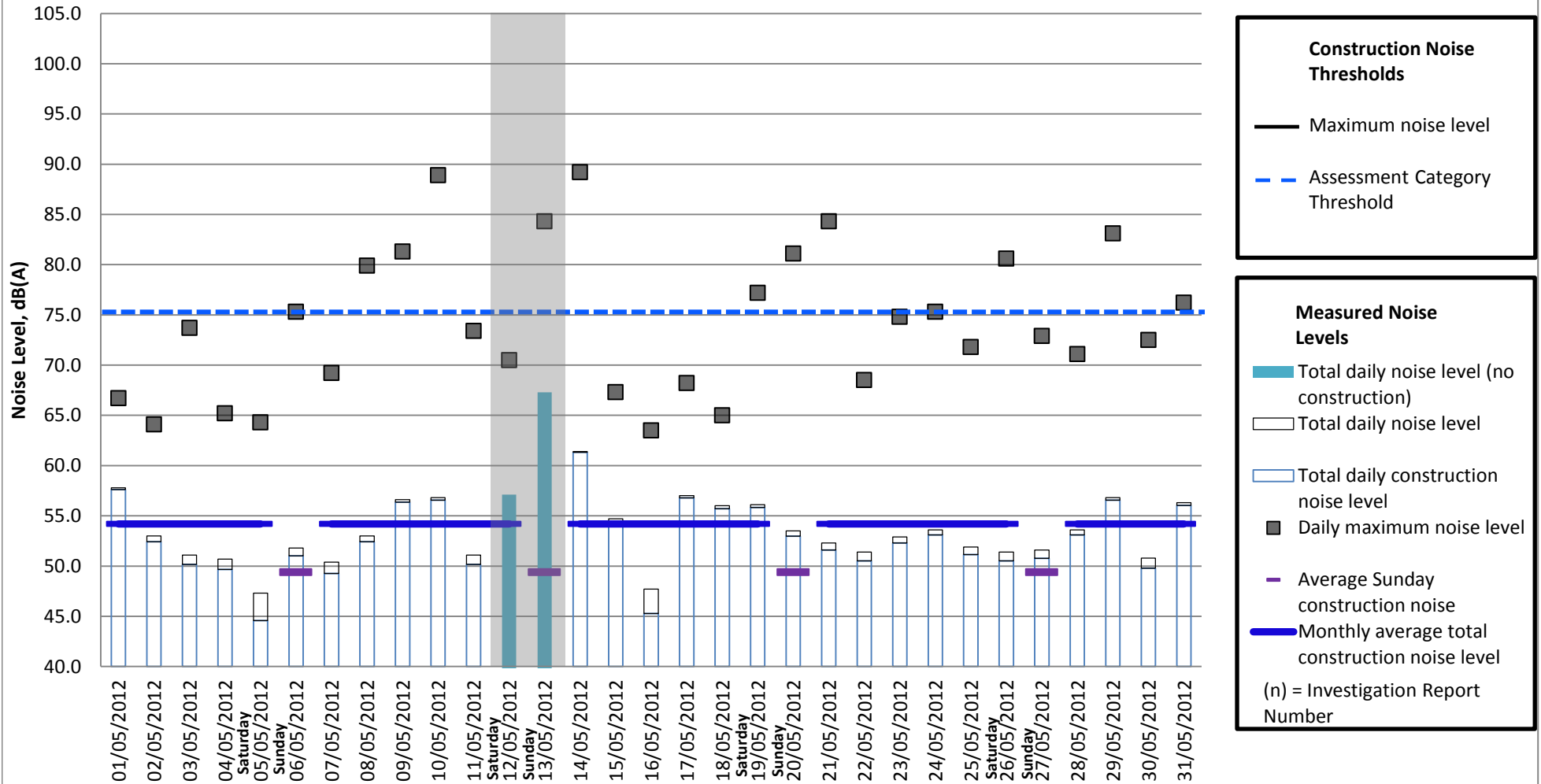
Note: The grey areas of the chart represent days on which no construction works have been conducted; no construction works were conducted on 13/05/12 due to adverse weather conditions

Measured Evening Noise Levels at Port Edgar Measurement period: May 2012



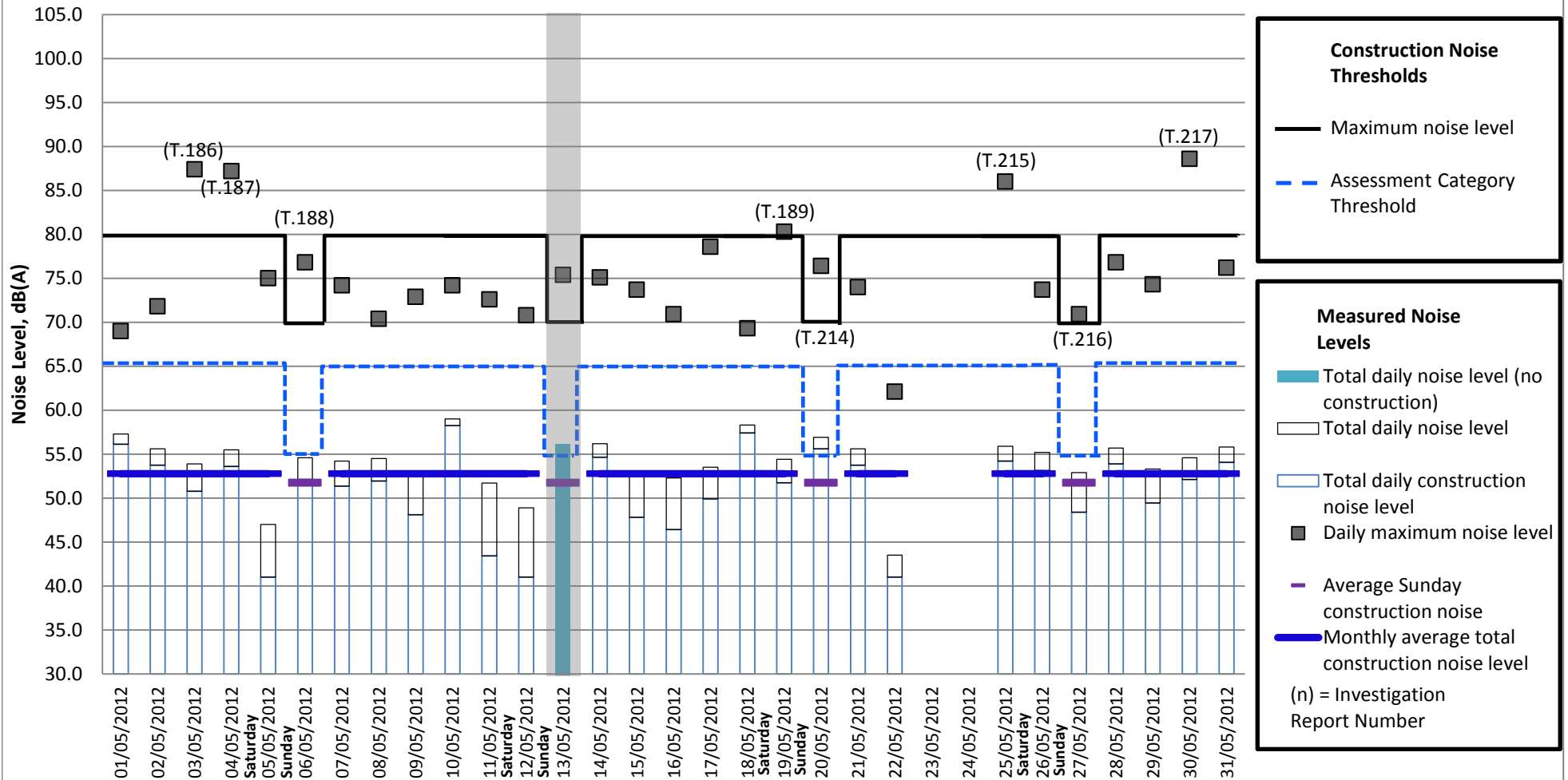
Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 10/05/12, 12/05/12 or 13/05/12.

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



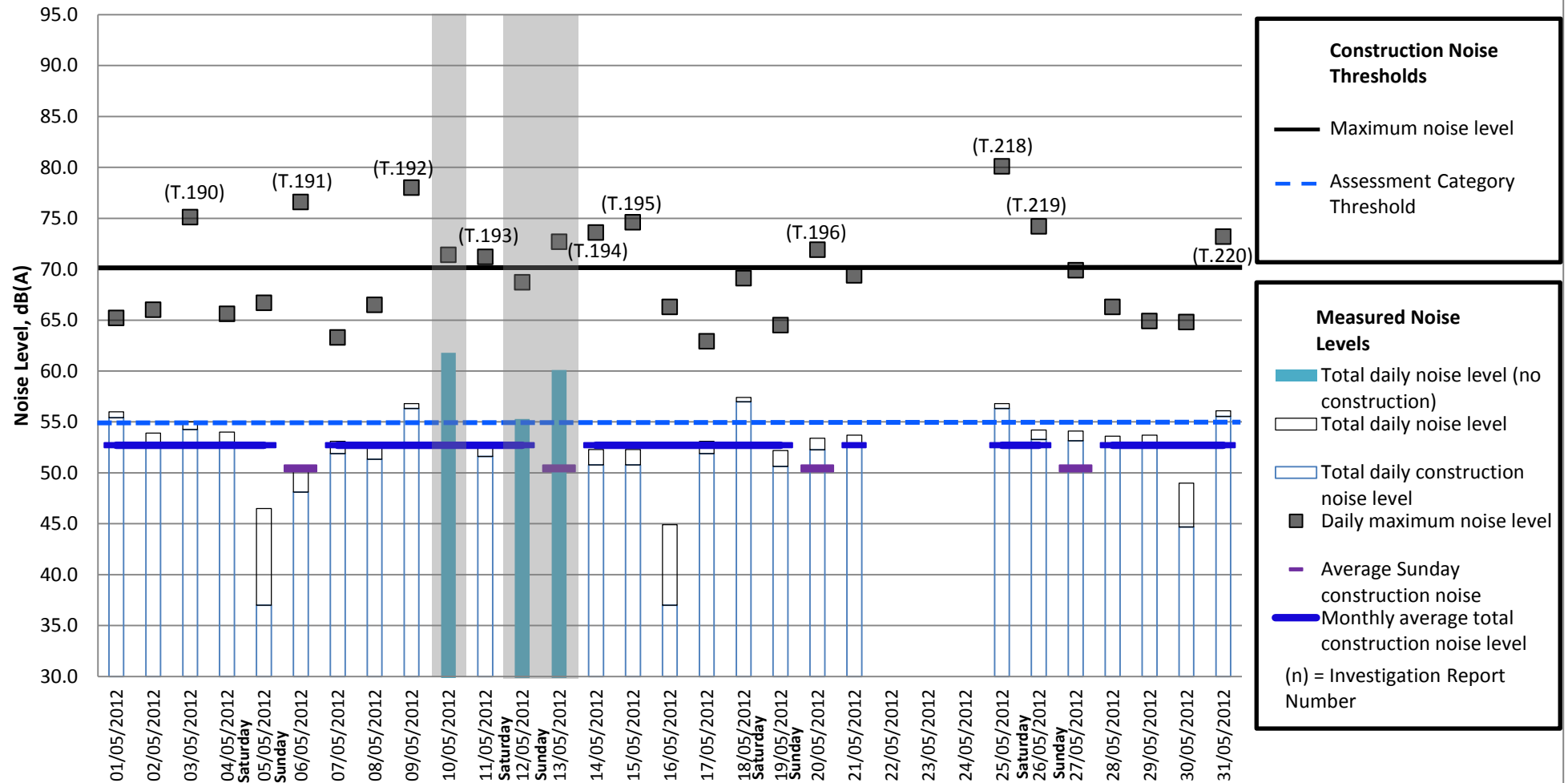
Note: The grey areas of the chart represent days on which no construction works have been conducted; no night time construction works were conducted on 12/05/12, 13/05/12

Measured Daytime Noise Levels at Butlaw Fisheries Measurement period: May 2012



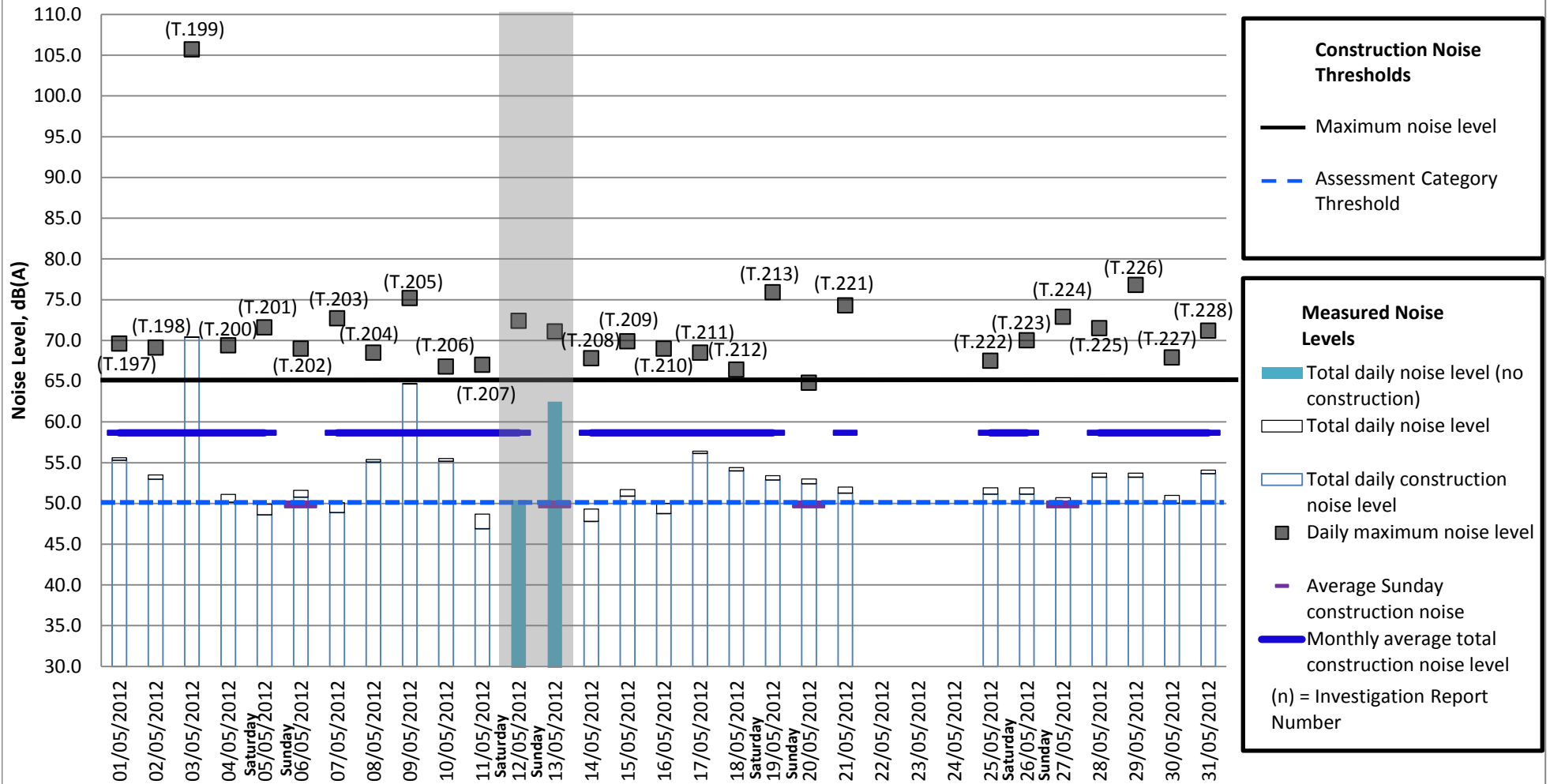
Note: The grey areas of the chart represent days on which no construction works have been conducted; no works were conducted on 13/05/12 due to adverse weather conditions. Data is missing for 23/05/12 and 24/05/12 due to device error.

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



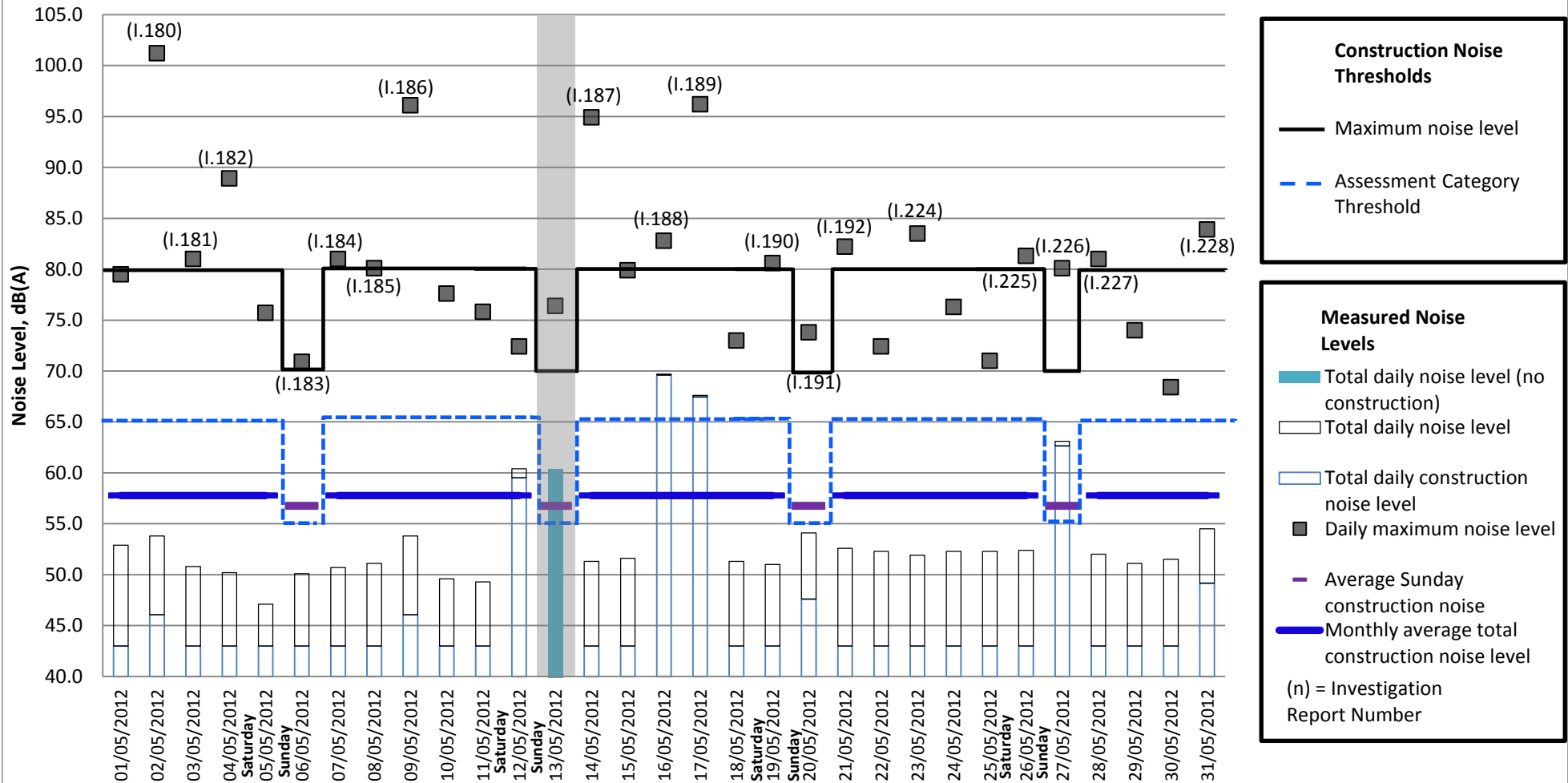
Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 10/05/12, 12/05/12 or 13/05/12. Data is missing from 22/05/12 to 24/05/12 due to device error.

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



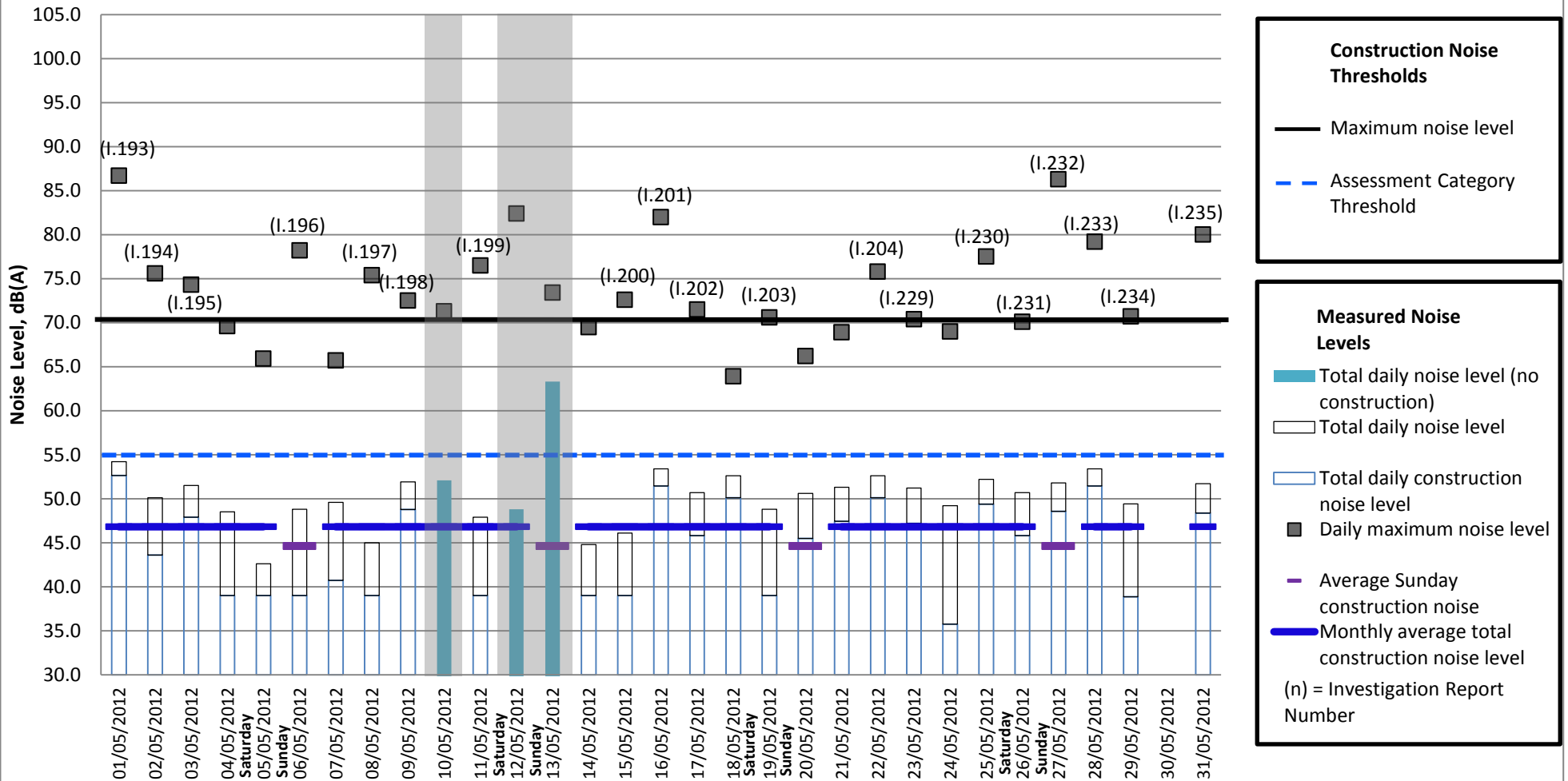
Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 12/05/12 or 13/05/12. Data is missing from 22/05/12 to 24/05/12 due to device error.

Measured Daytime Noise Levels at Inchgarvie Measurement period: May 2012



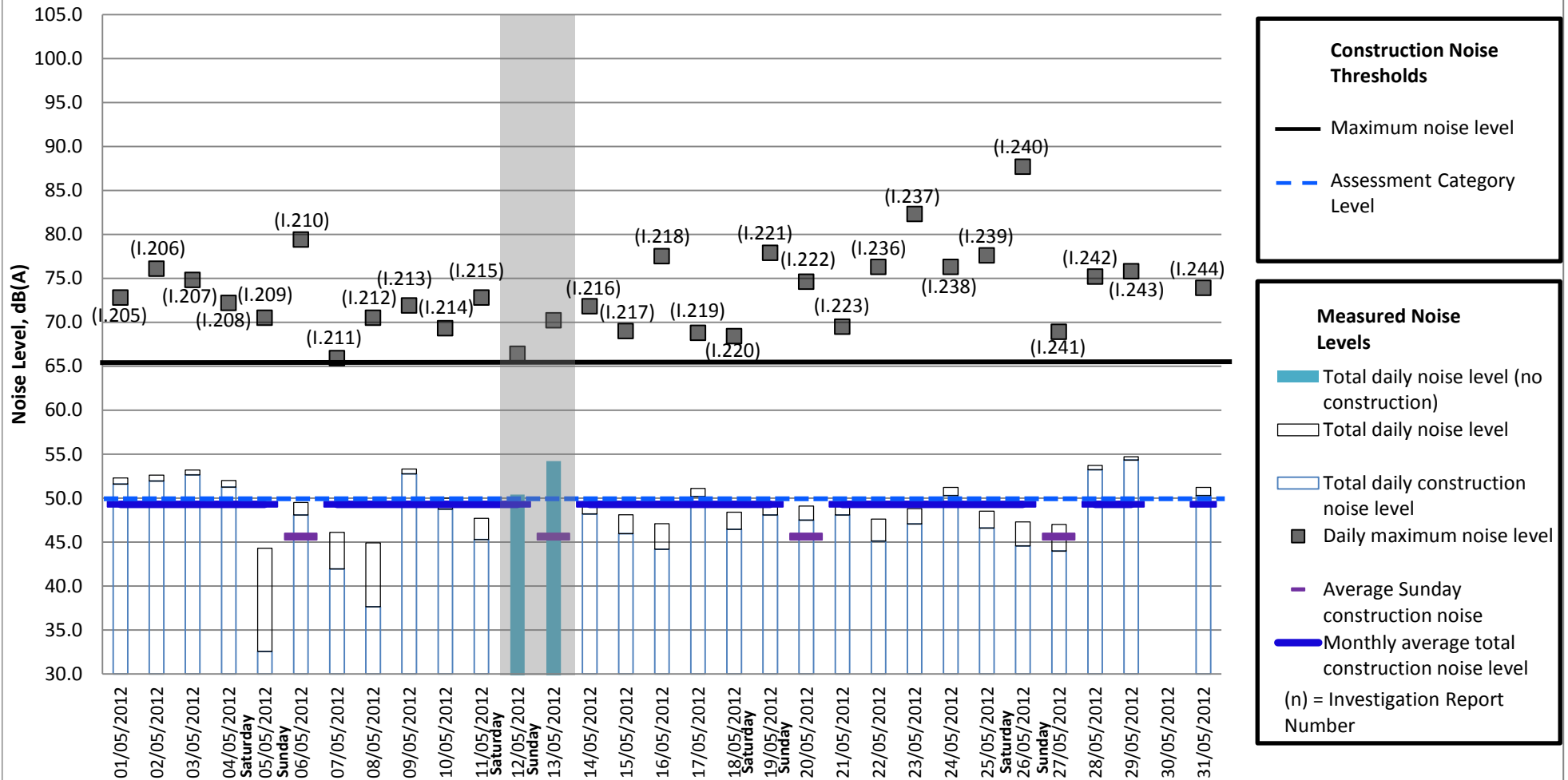
Note: The grey areas of the chart represent days on which no construction works have been conducted; no construction works were undertaken on 13/05/12 due to adverse weather conditions.

Measured Evening Noise Levels at Inchgarvie Measurement period: May 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 10/05/12, 12/05/12 or 13/05/12. Evening data is missing for 30/05/12 due to device error.

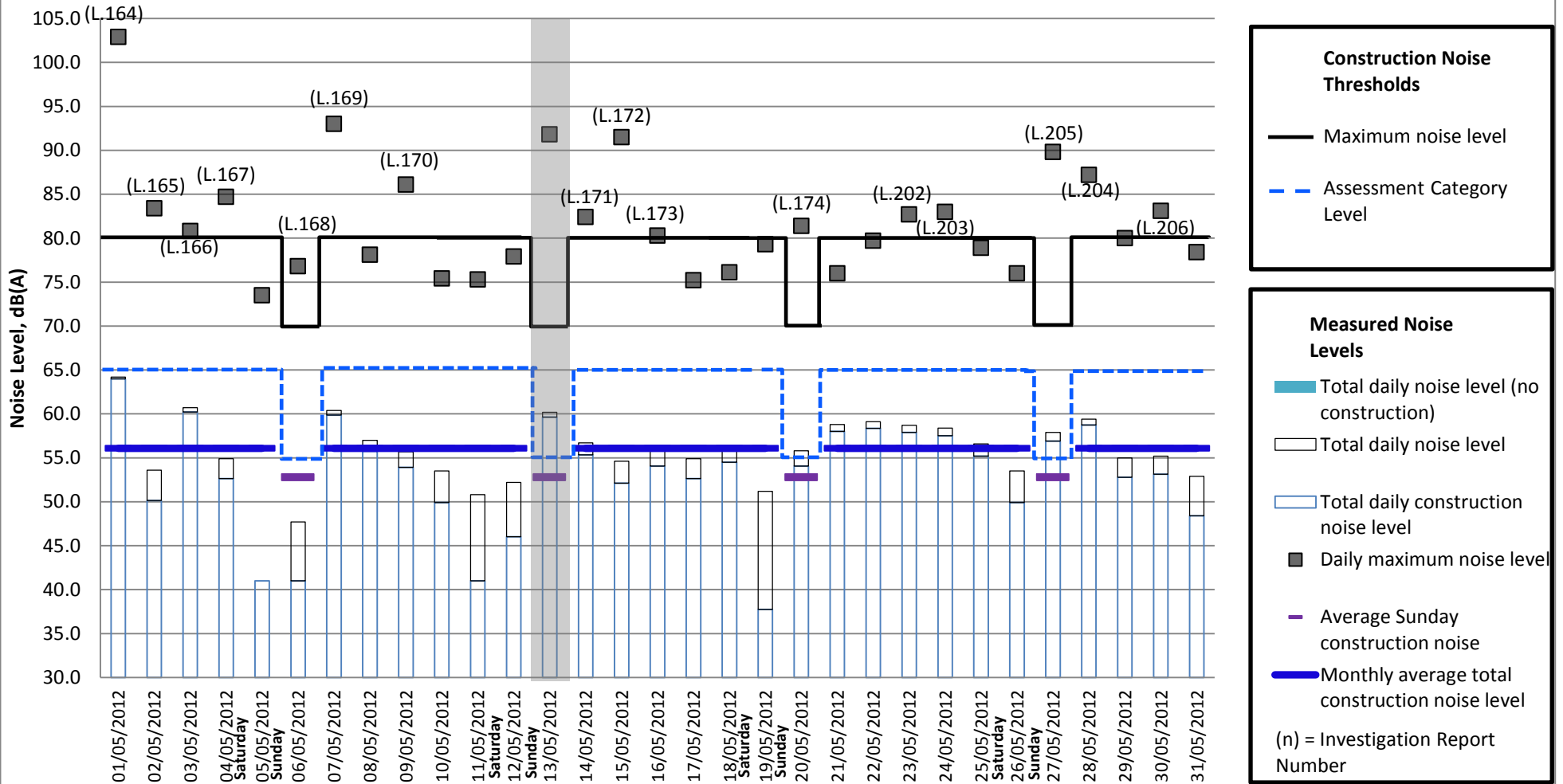
Measured Night-time Noise Levels at Inchgarvie Measurement period: May 2012



Note: The grey areas of the chart represent days on which no construction works have been conducted; no night time construction works were undertaken on 12/05/12 or 13/05/12. Night time data is missing for 30/05/12 due to device error.

Measured Daytime Noise levels at Linn Mill

Measurement period: May 2012



Construction Noise Thresholds

- Maximum noise level
- - - Assessment Category Level

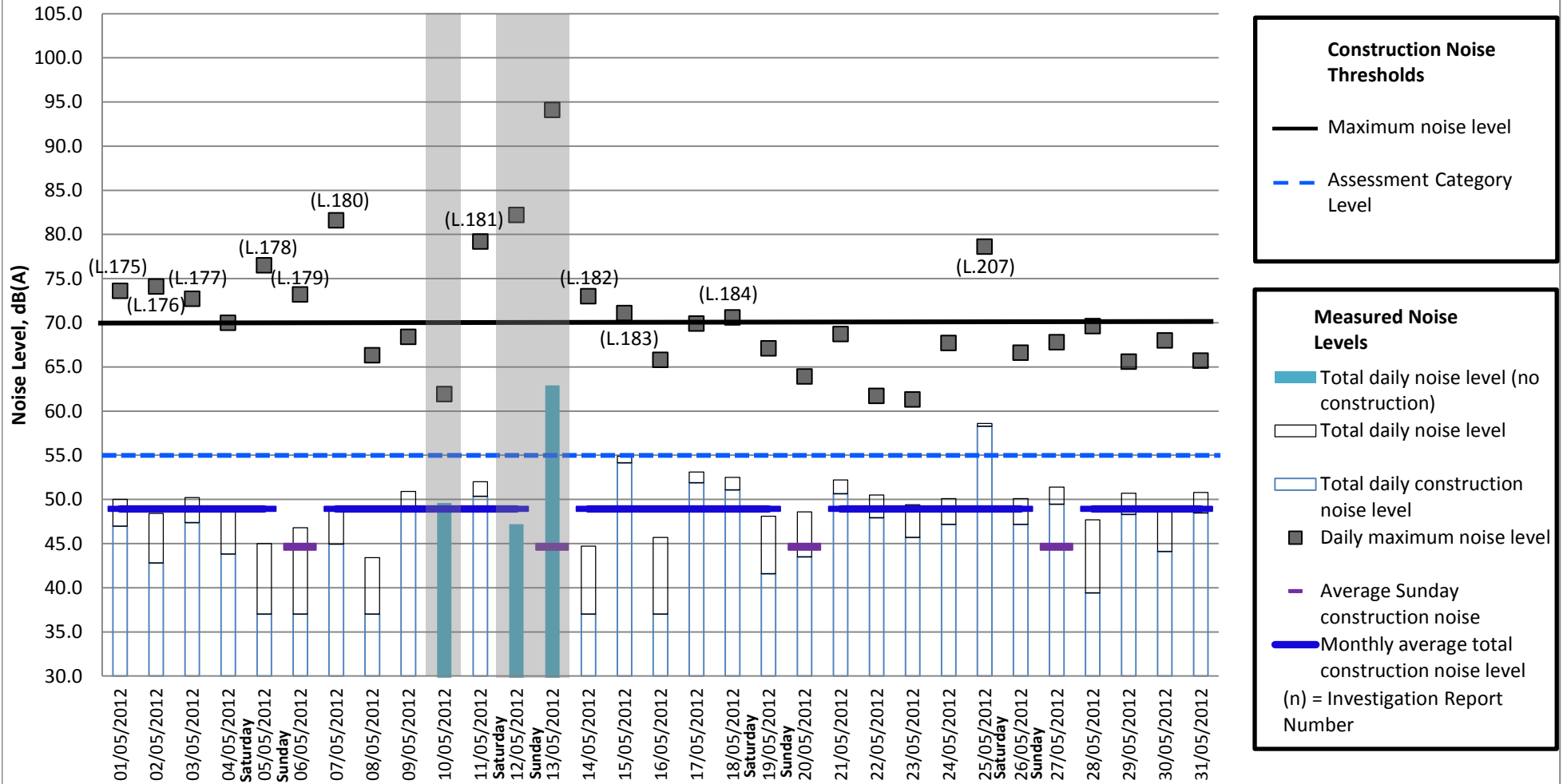
Measured Noise Levels

- 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: The grey areas of the chart represent days on which no construction works have been conducted; no construction works were conducted on 13/05/12

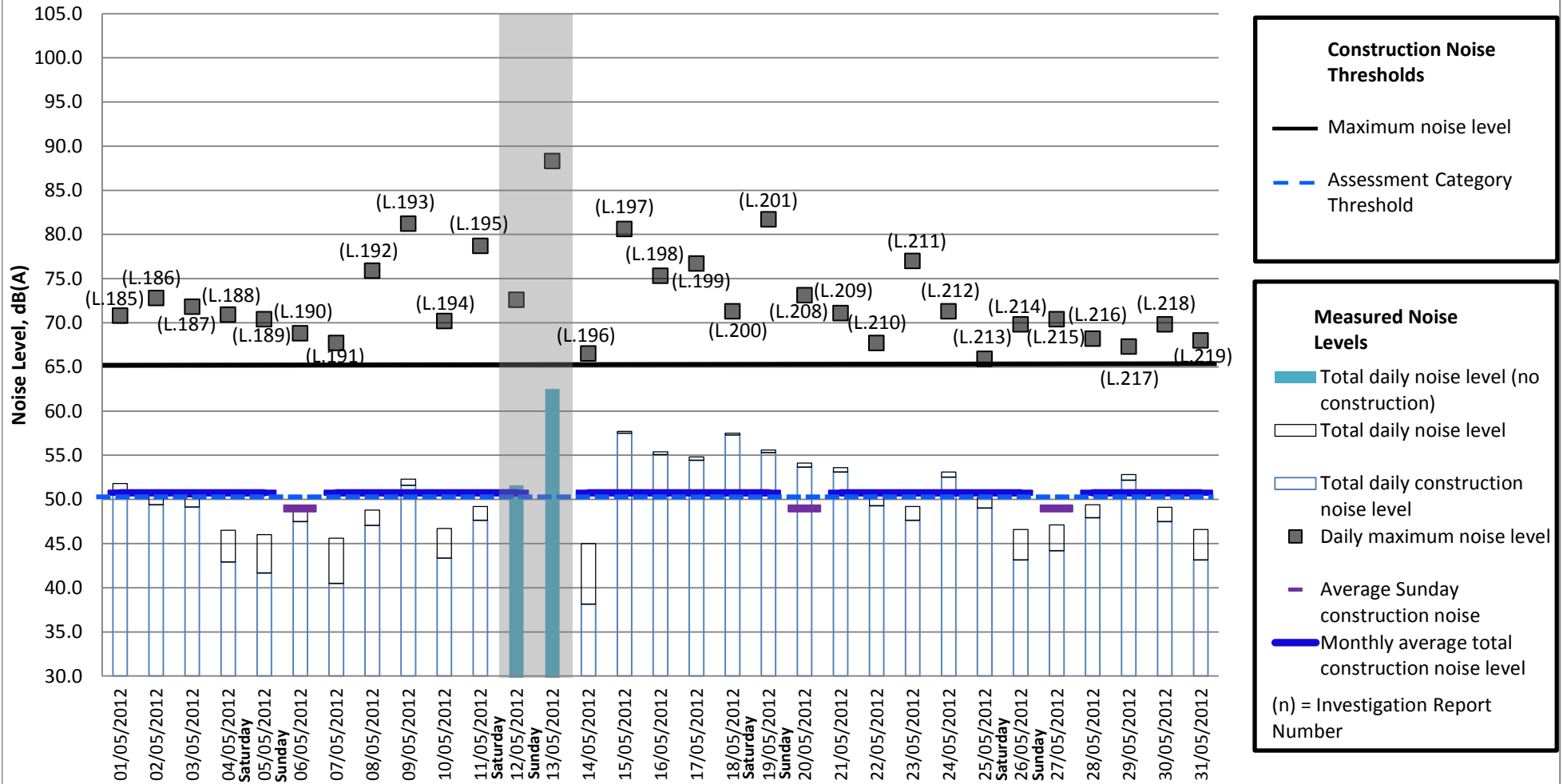
Measured Evening Noise Levels at Linn Mill Measurement period: May 2012



Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 10/05/12, 12/05/12 or 13/05/12

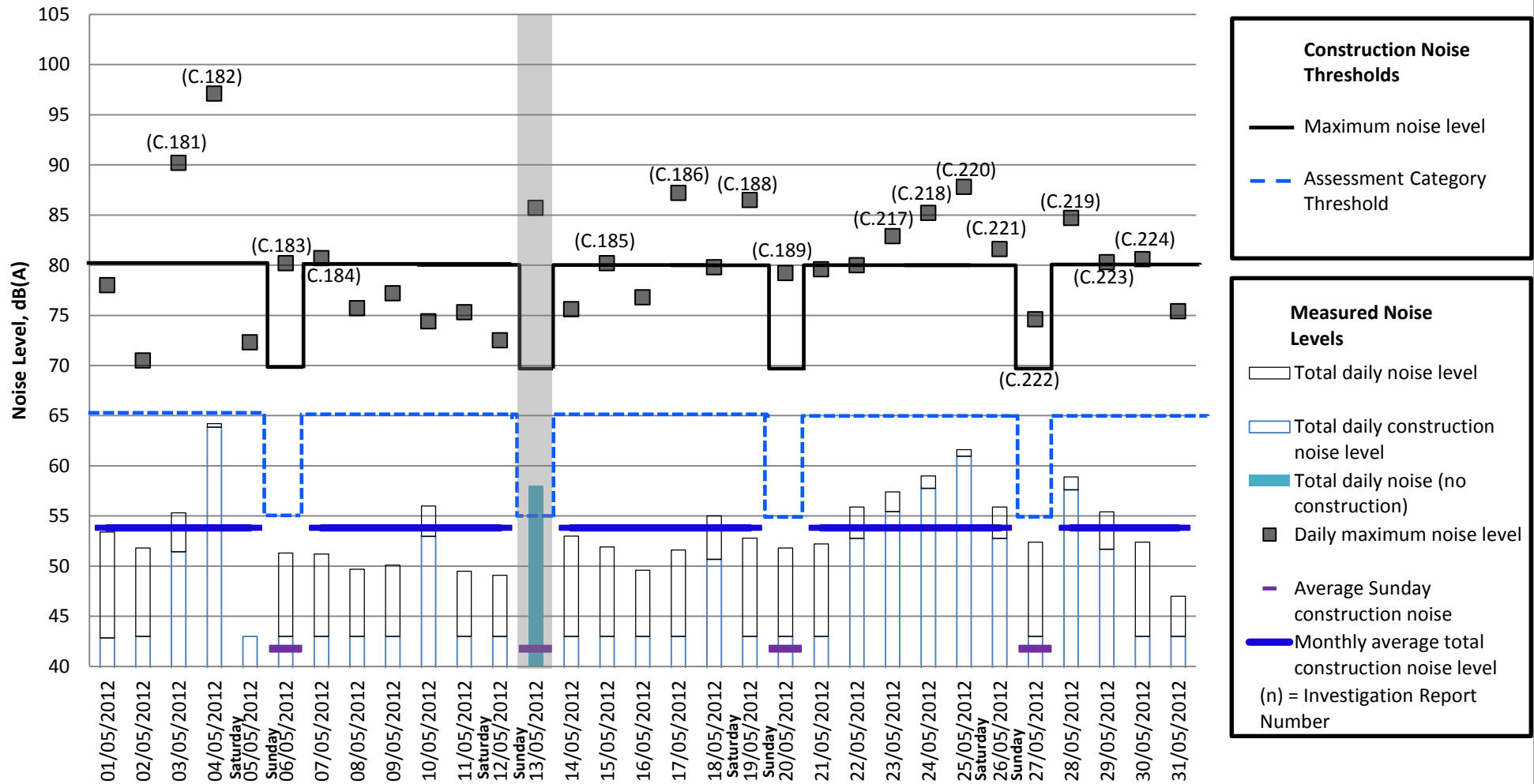
Measured Night-time Noise Levels at Linn Mill

Measurement period: May 2012



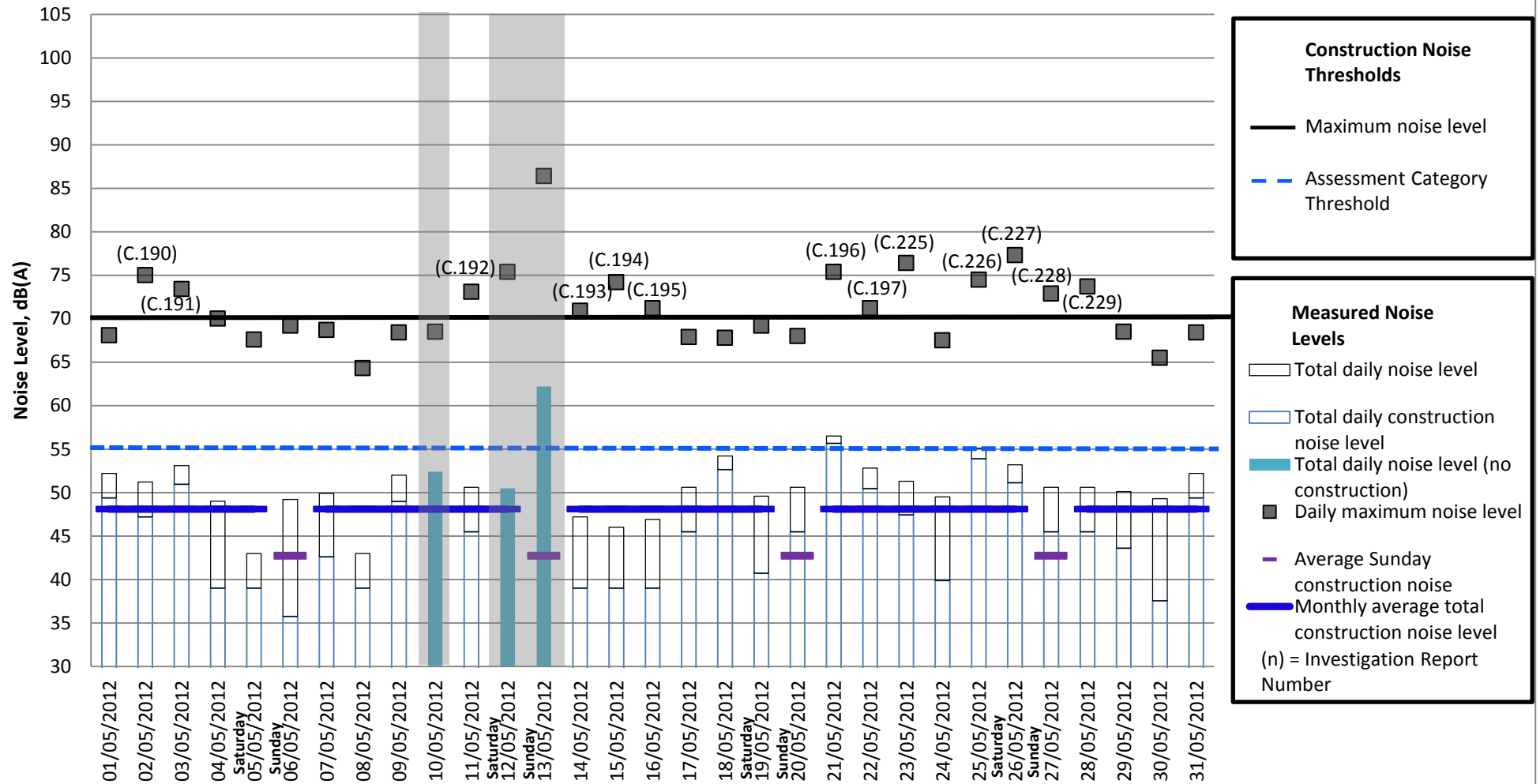
Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were conducted on 12/05/12 or 13/05/12

Measured Daytime Noise Levels at Clufflat Brae Measurement period: May 2012



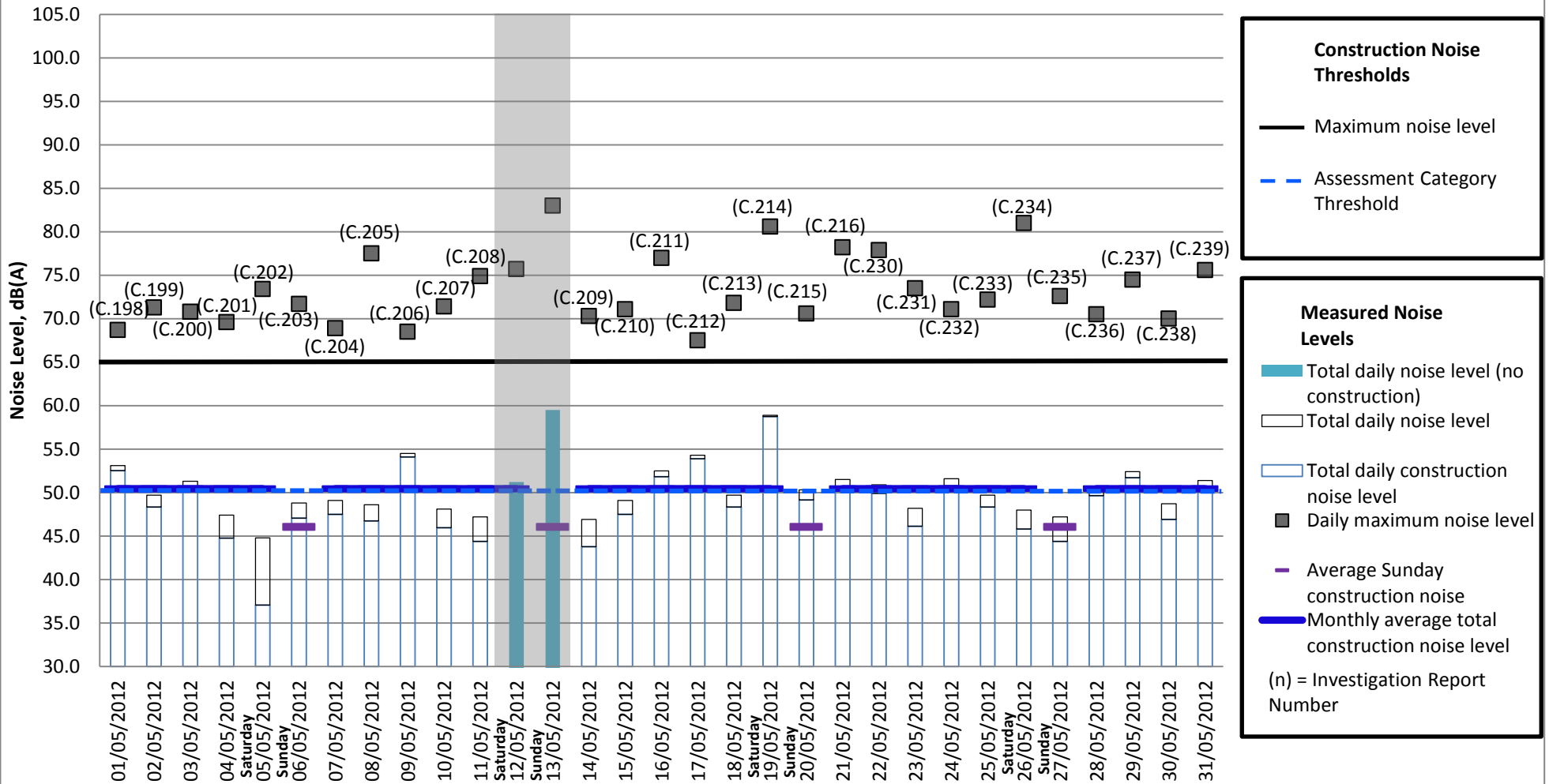
Note: The grey areas of the chart represent days on which no construction works have been conducted; no construction works were undertaken on 13/05/12 due to adverse weather conditions.

Measured Evening Noise Levels at Clufflat Brae Measurement period: May 2012



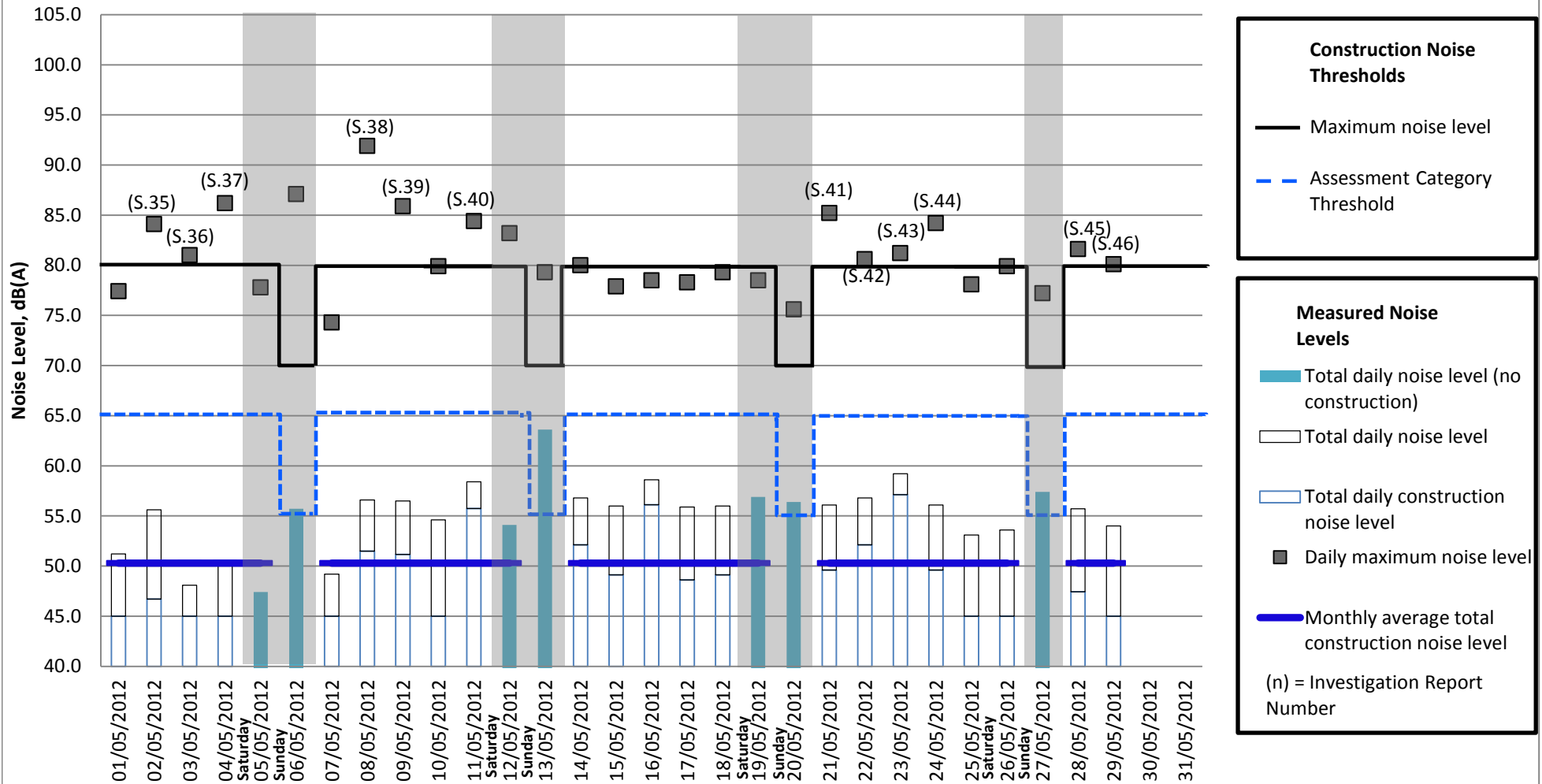
Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 10/05/12, 12/05/12 or 13/05/12.

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



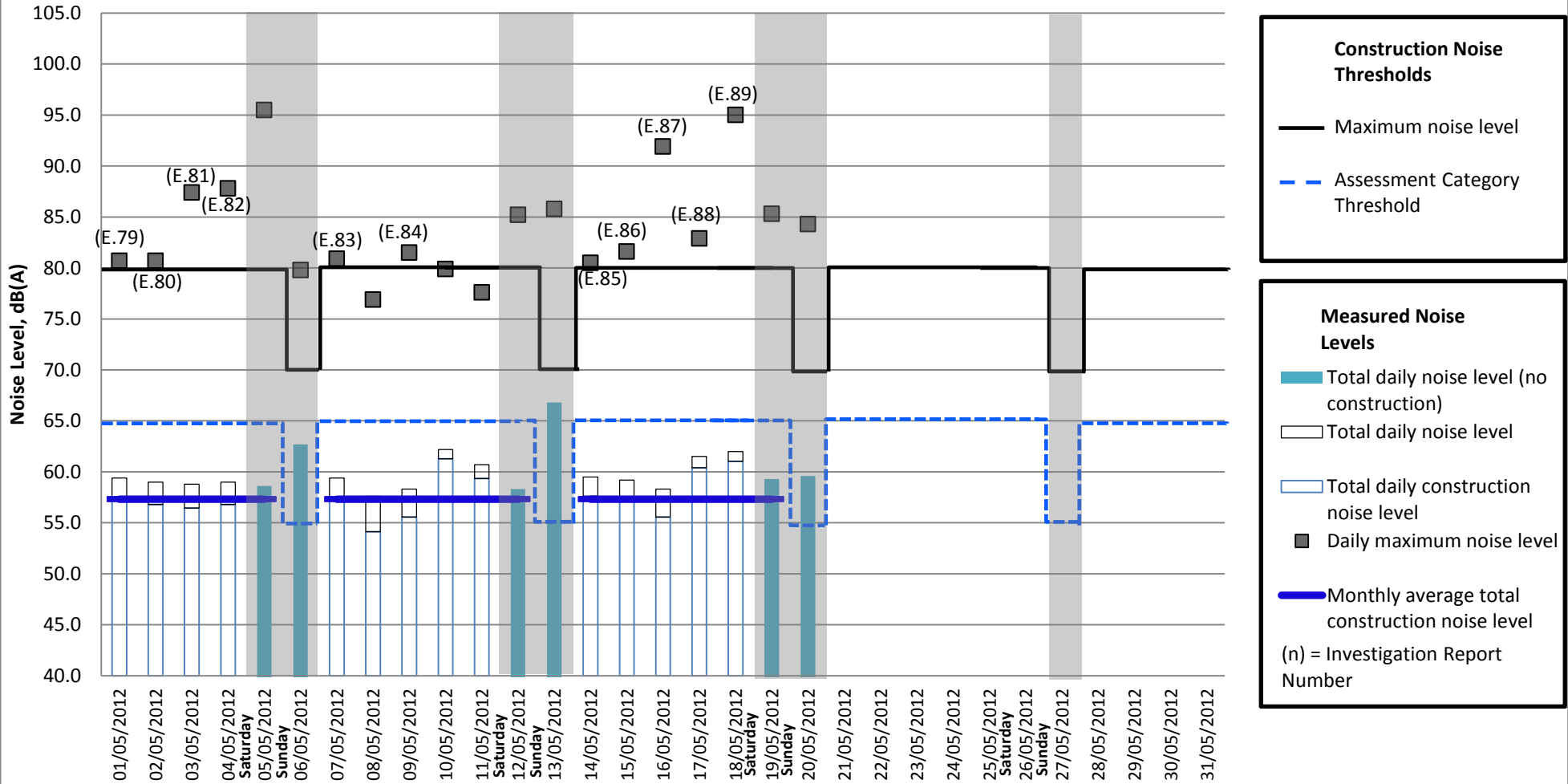
Note: The grey areas of the chart represent days on which no construction works have been conducted; no evening construction works were undertaken on 12/05/12 or 13/05/12

Measured Daytime Noise Levels at Springfield Measurement period: May 2012



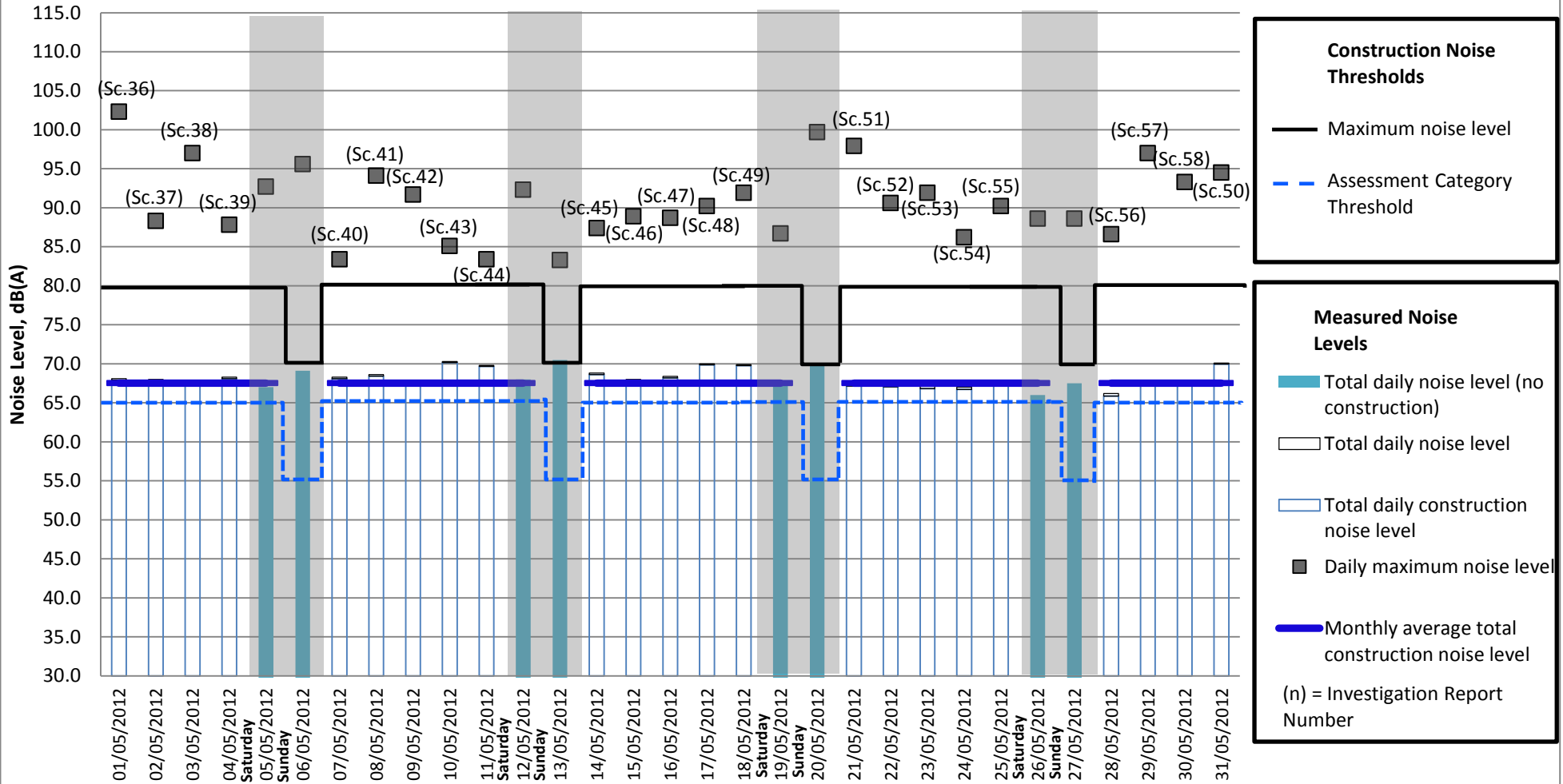
Note: The grey areas of the chart represent days on which no construction works have been conducted. The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location. Data is missing for 30/05/12 and 31/05/12 due to device error.

Measured Daytime Noise Levels at Echline Field Measurement period: May 2012



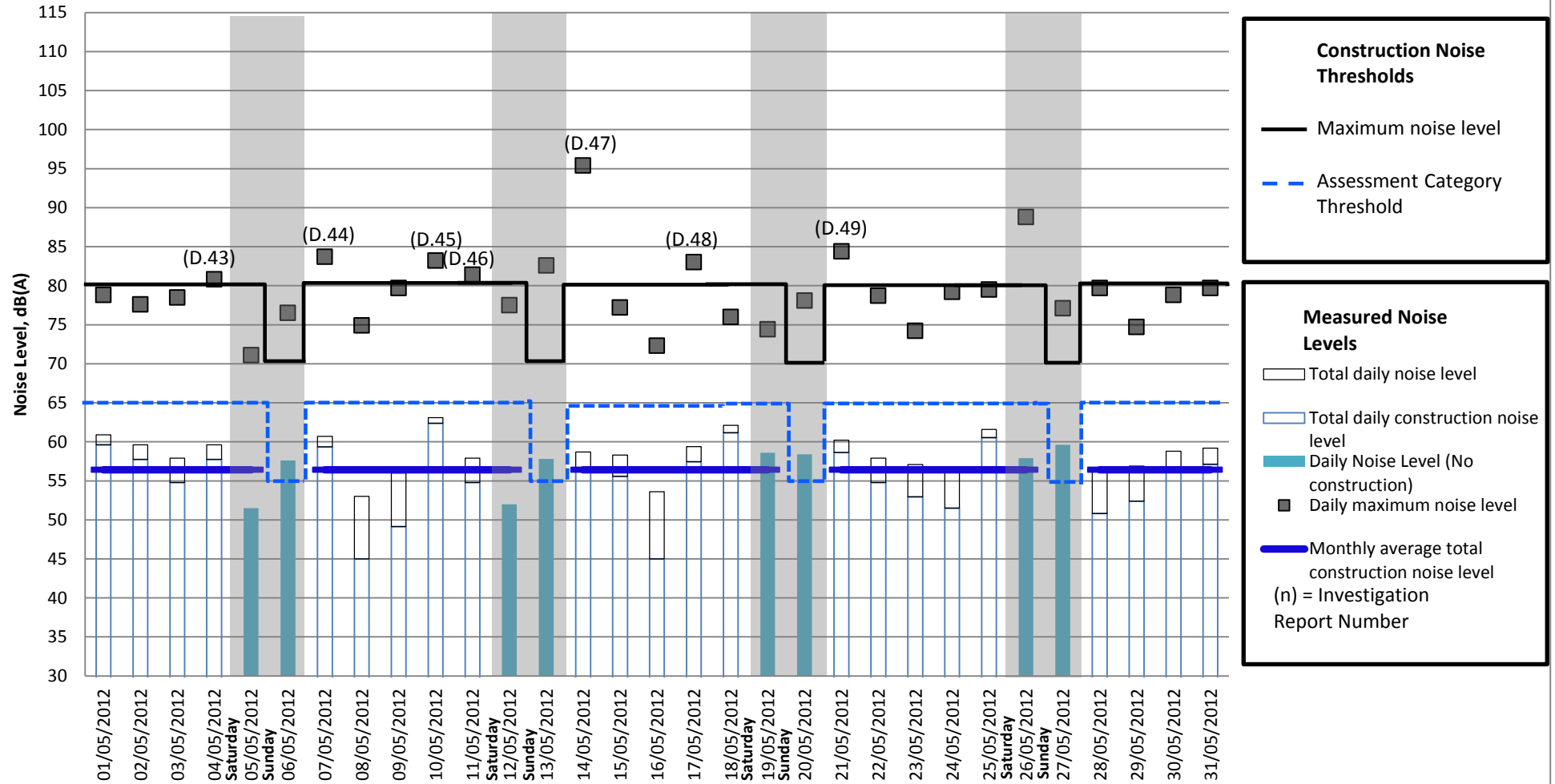
Note: The grey areas of the chart represent days on which no construction works have been conducted. Due to a power loss, no data is available for this monitoring location from 21/03/12 to 31/05/12.

Measured Daytime Noise Levels at Scotstoun Measurement period: May 2012



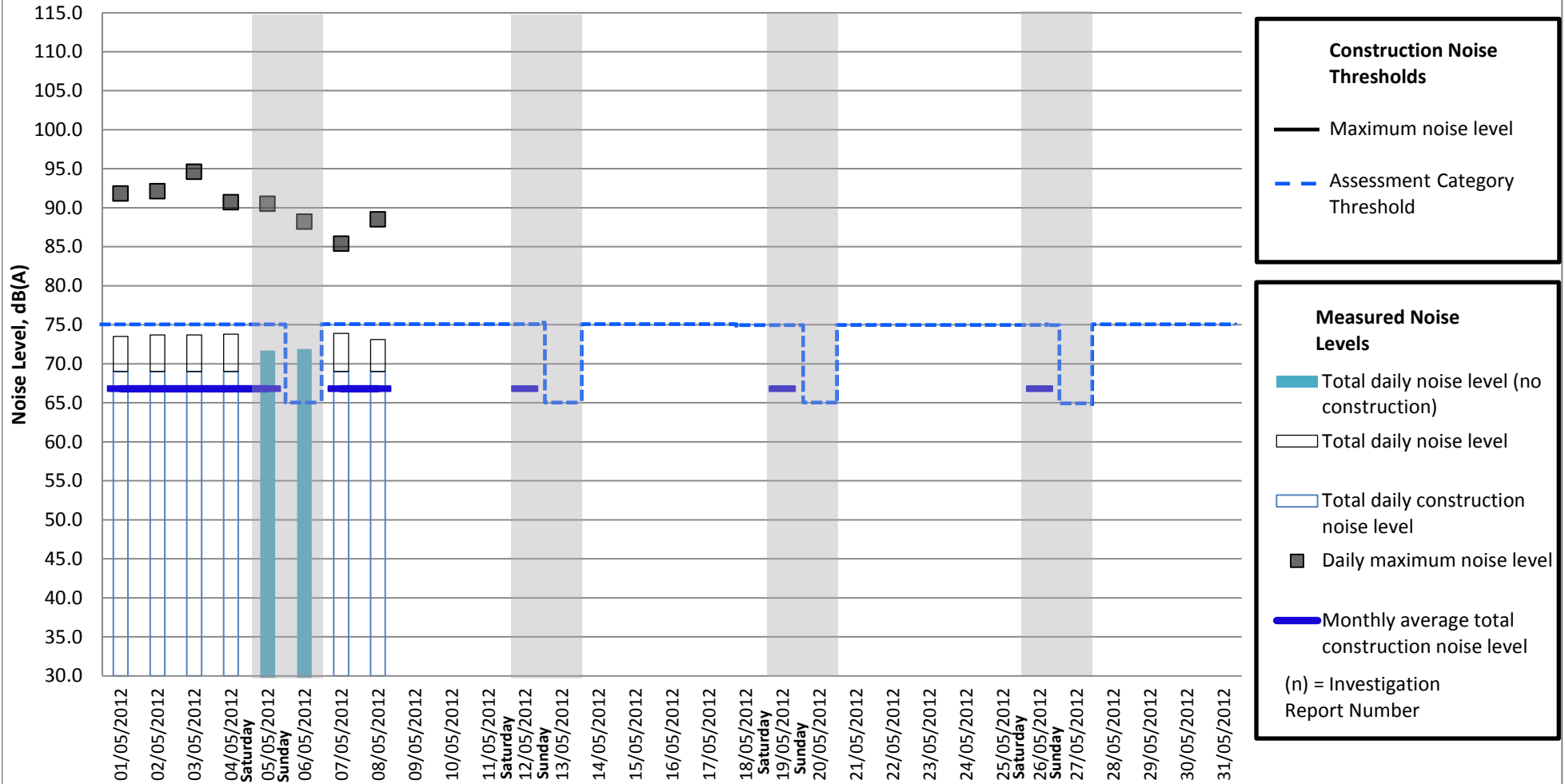
Note: The grey areas of the chart represent days on which no construction works have been conducted; no Saturday or Sunday construction works have been conducted at this location. The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location.

Measured Daytime Noise Levels at Dundas Home Farm Measurement period: May 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 May. The monthly average construction noise for Sunday has not been included as no Sunday works have been conducted at this location during May.

Measured Daytime Noise Levels at Newton Measurement period: May 2012

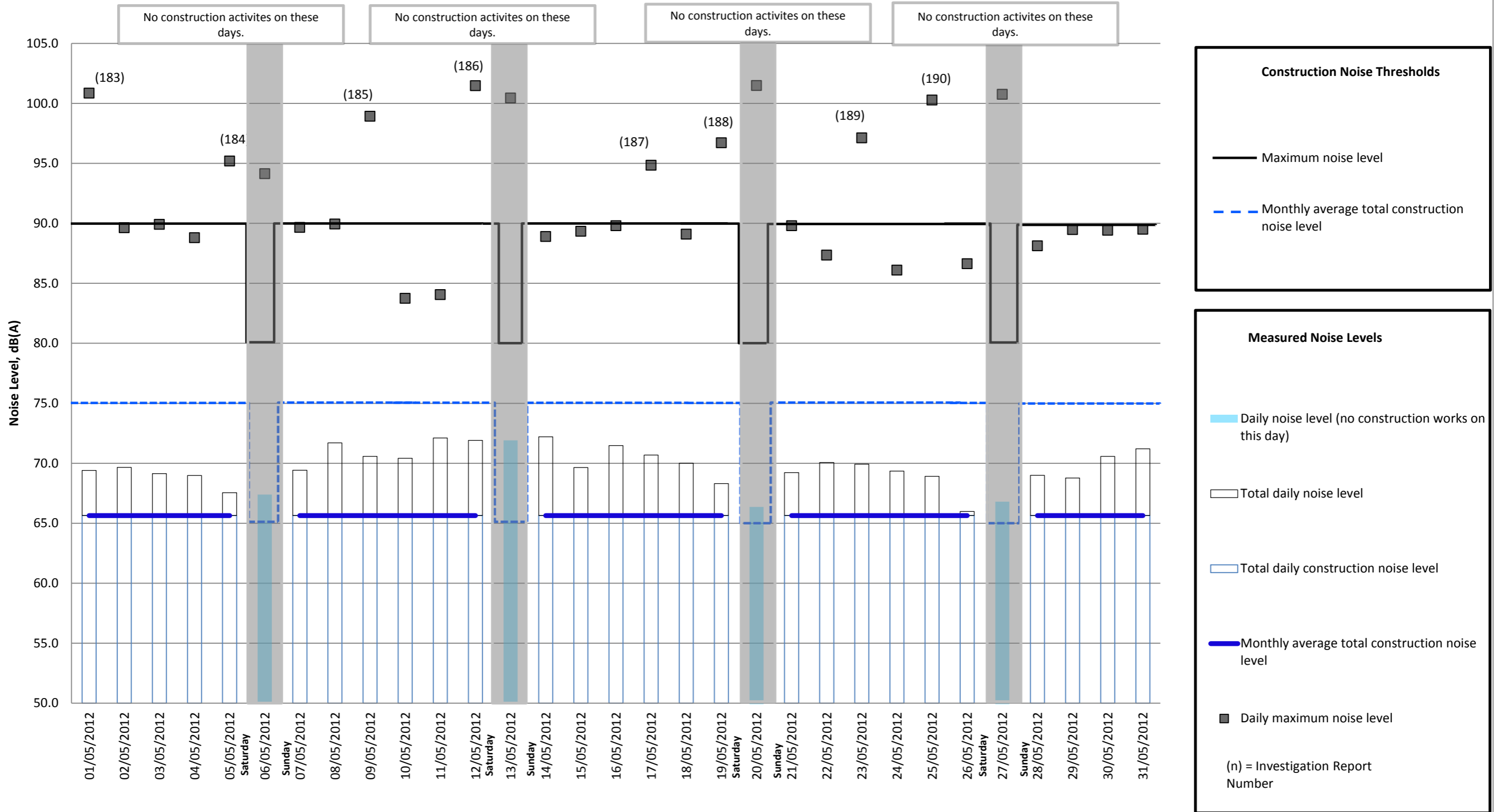


Note: The grey areas of the chart represent days on which no construction works have been conducted; no works have been conducted near this location on Saturday or Sunday. It should be noted that the measured noise levels Mon - Fri can not be attributed to construction works due to the considerable distance (1.75 kilometers) between this monitoring location and the closest construction works. Data is missing for this location from 09/05/12 to 31/05/12 due to a loss of power supply to the meter.

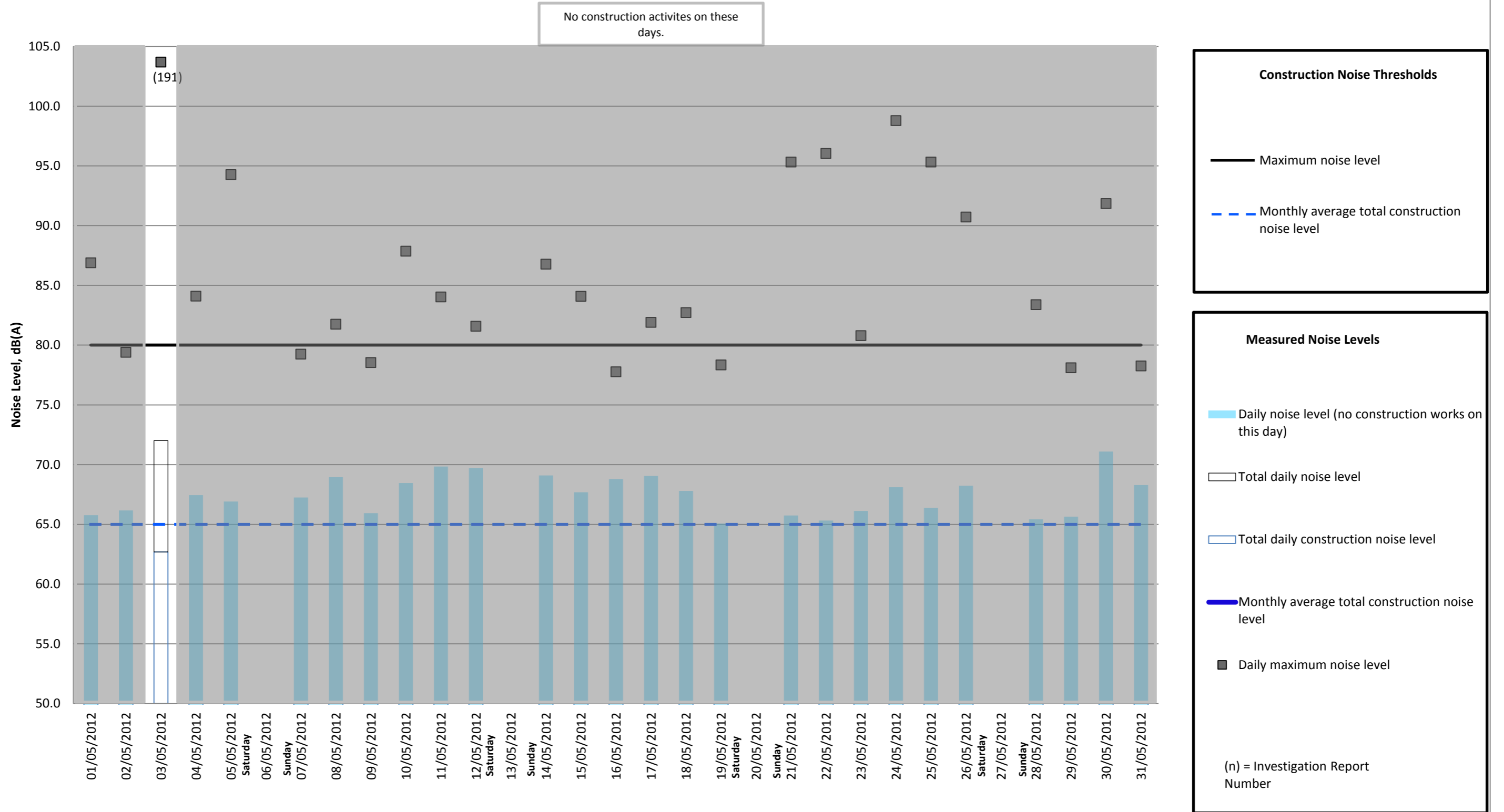
APPENDIX B -

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

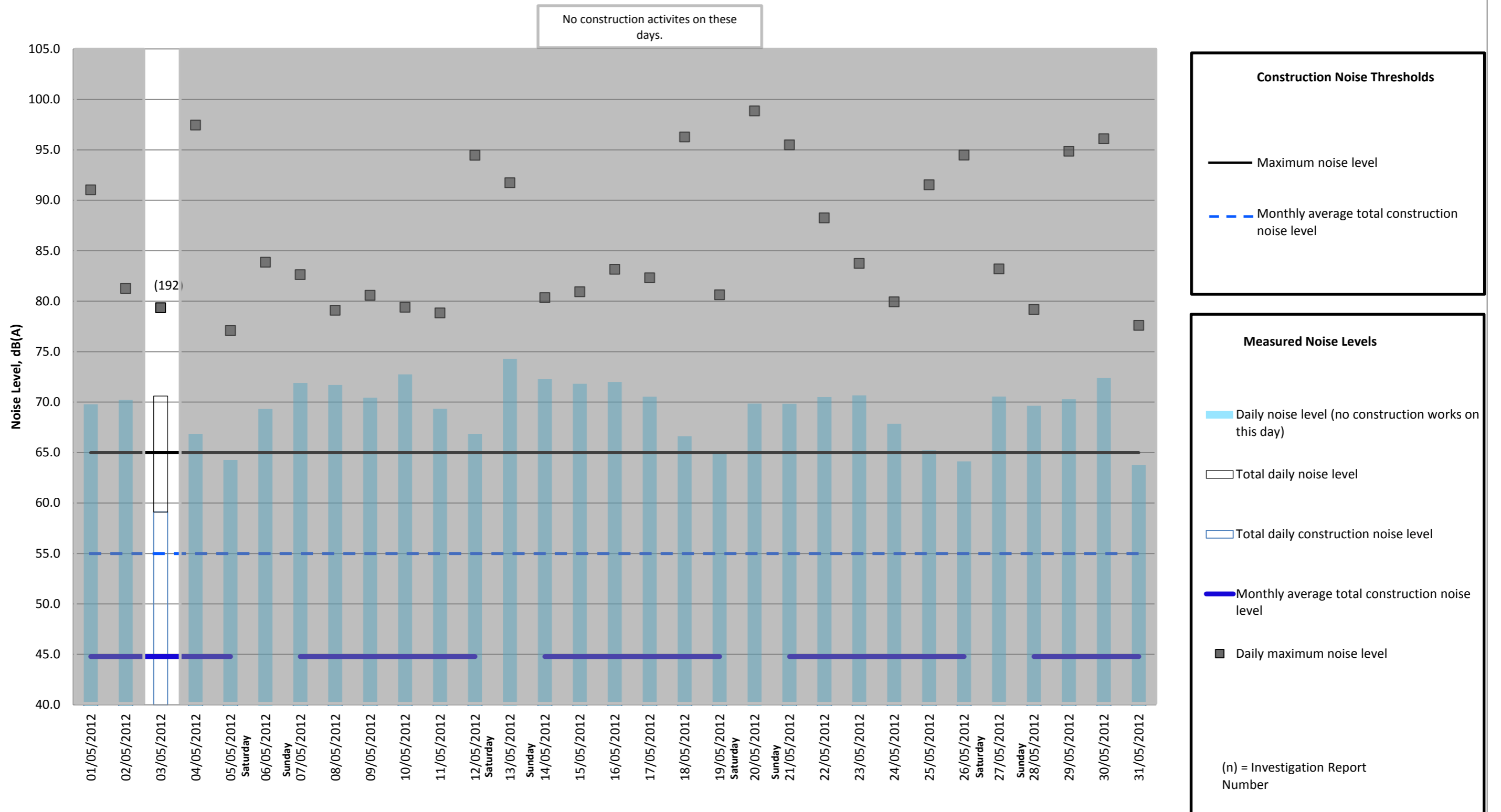
Measured daytime noise levels, 93/95 King Edwards Way (CNV02) Measurement period 1st May to 31st May 2012



Measured evening noise levels, 93/95 King Edwards Way (CNV02) Measurement period 1st May to 31st May 2012



Measured night-time noise levels, 93/95 King Edwards Way (CNV02) Measurement period 1st May to 31st May 2012



Construction Noise Thresholds

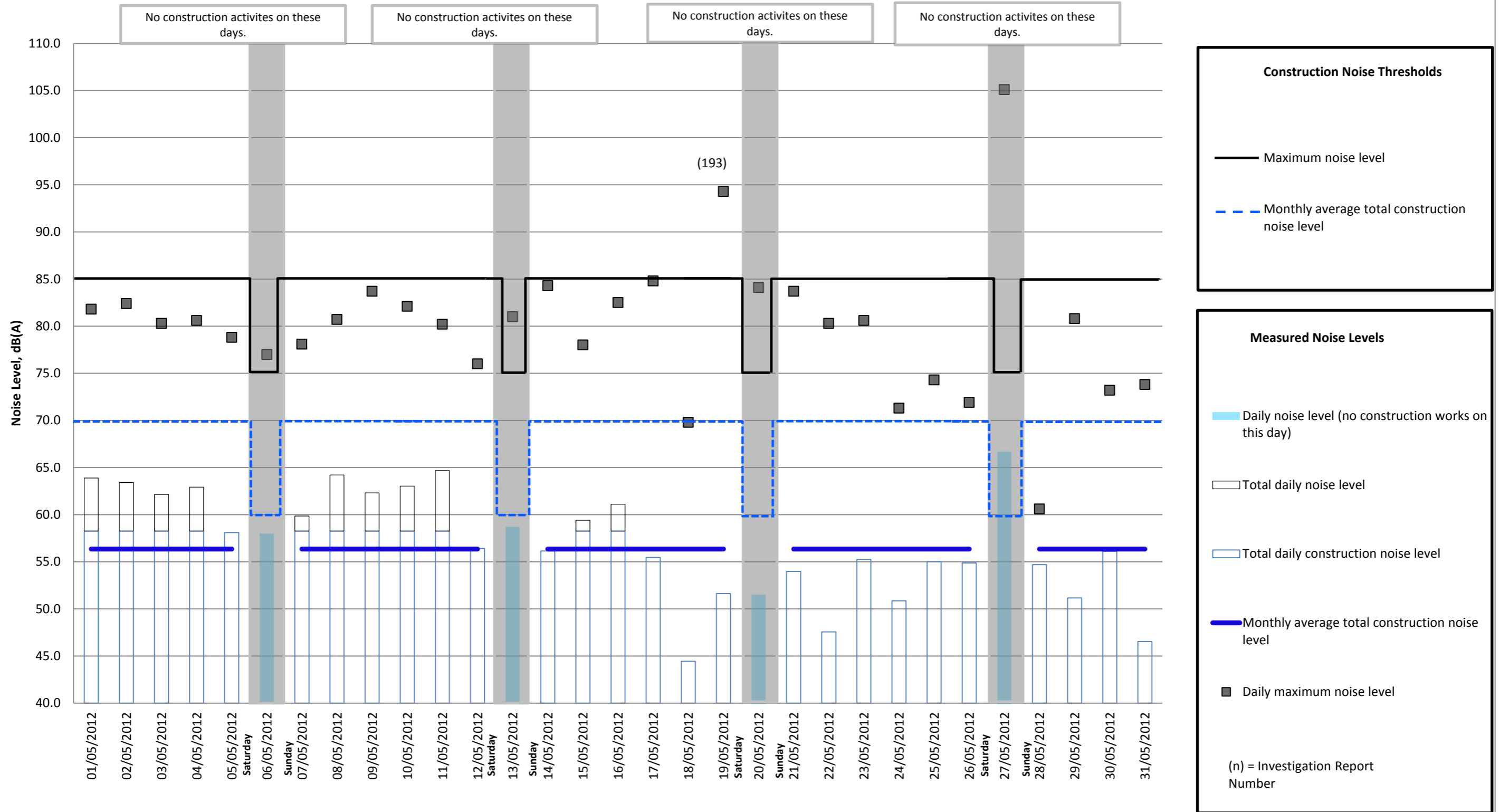
- Maximum noise level
- Monthly average total construction noise level

Measured Noise Levels

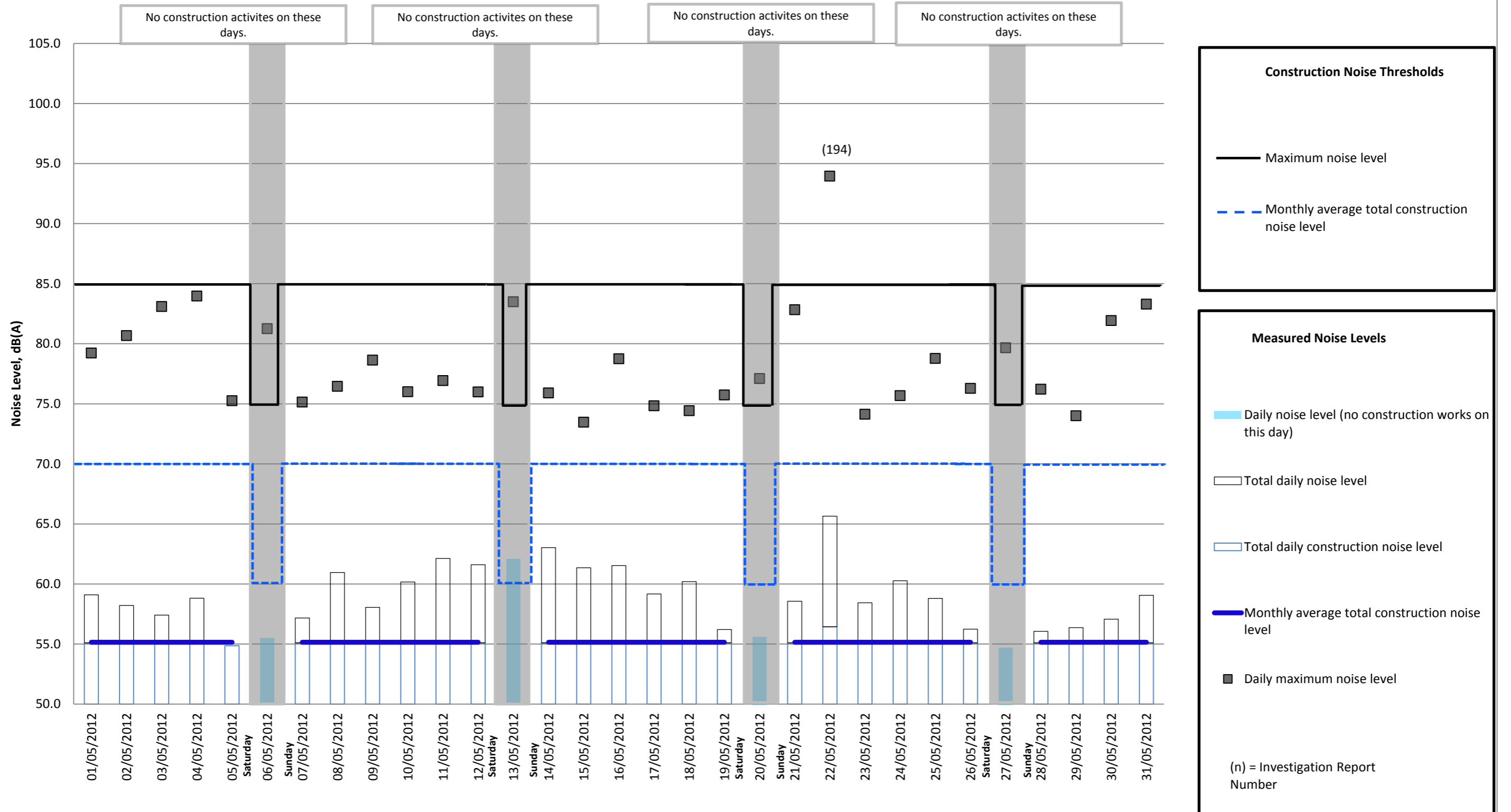
- Daily noise level (no construction works on this day)
- Total daily noise level
- Total daily construction noise level
- Monthly average total construction noise level
- Daily maximum noise level

(n) = Investigation Report Number

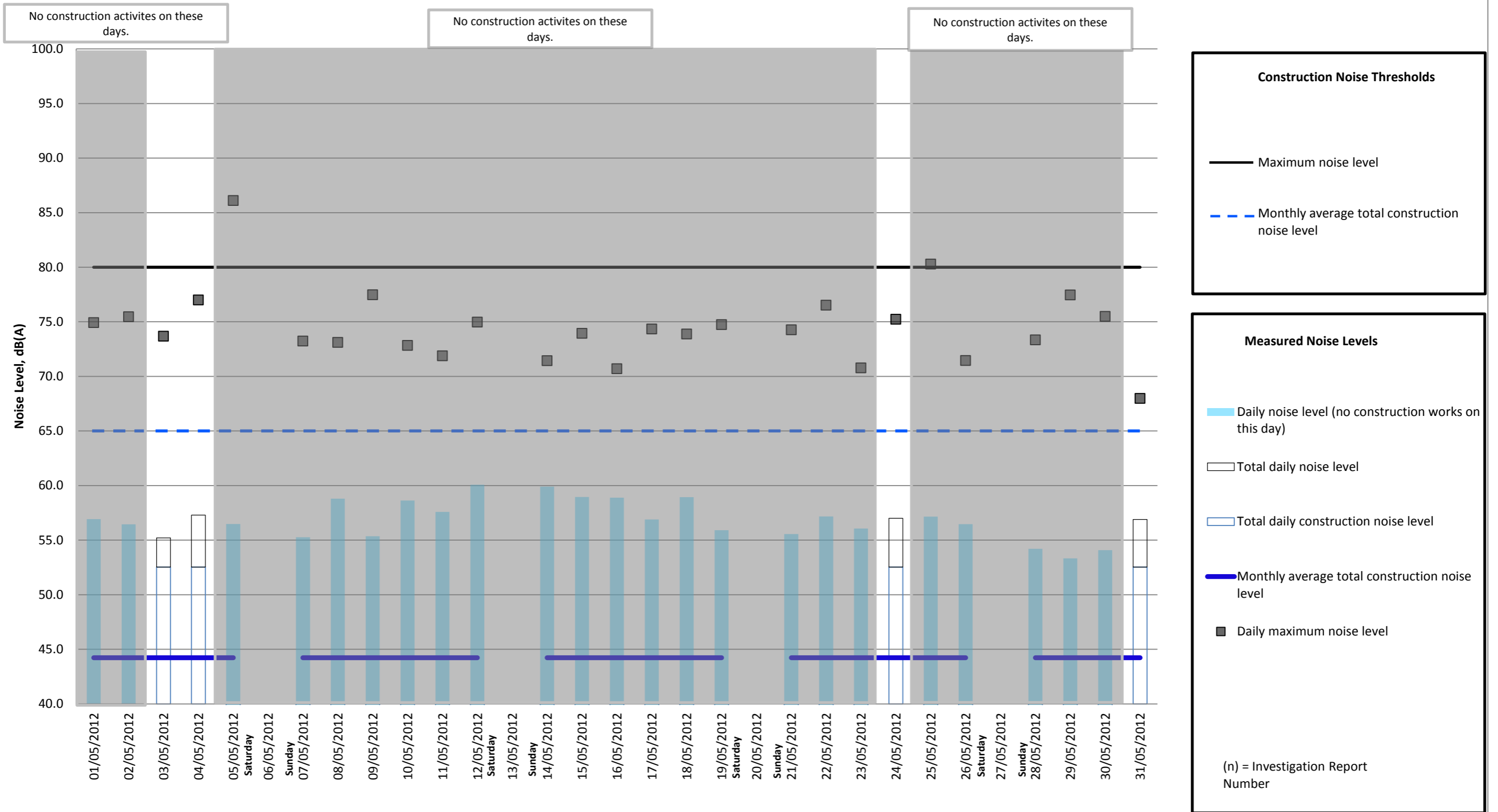
Measured daytime noise levels, Buie Rigg (CNV07) Measurement period 1st May to 31st May 2012



Measured daytime noise levels, 8 Kirklands Park Grove (CNV16) Measurement period 1st May to 31st May 2012

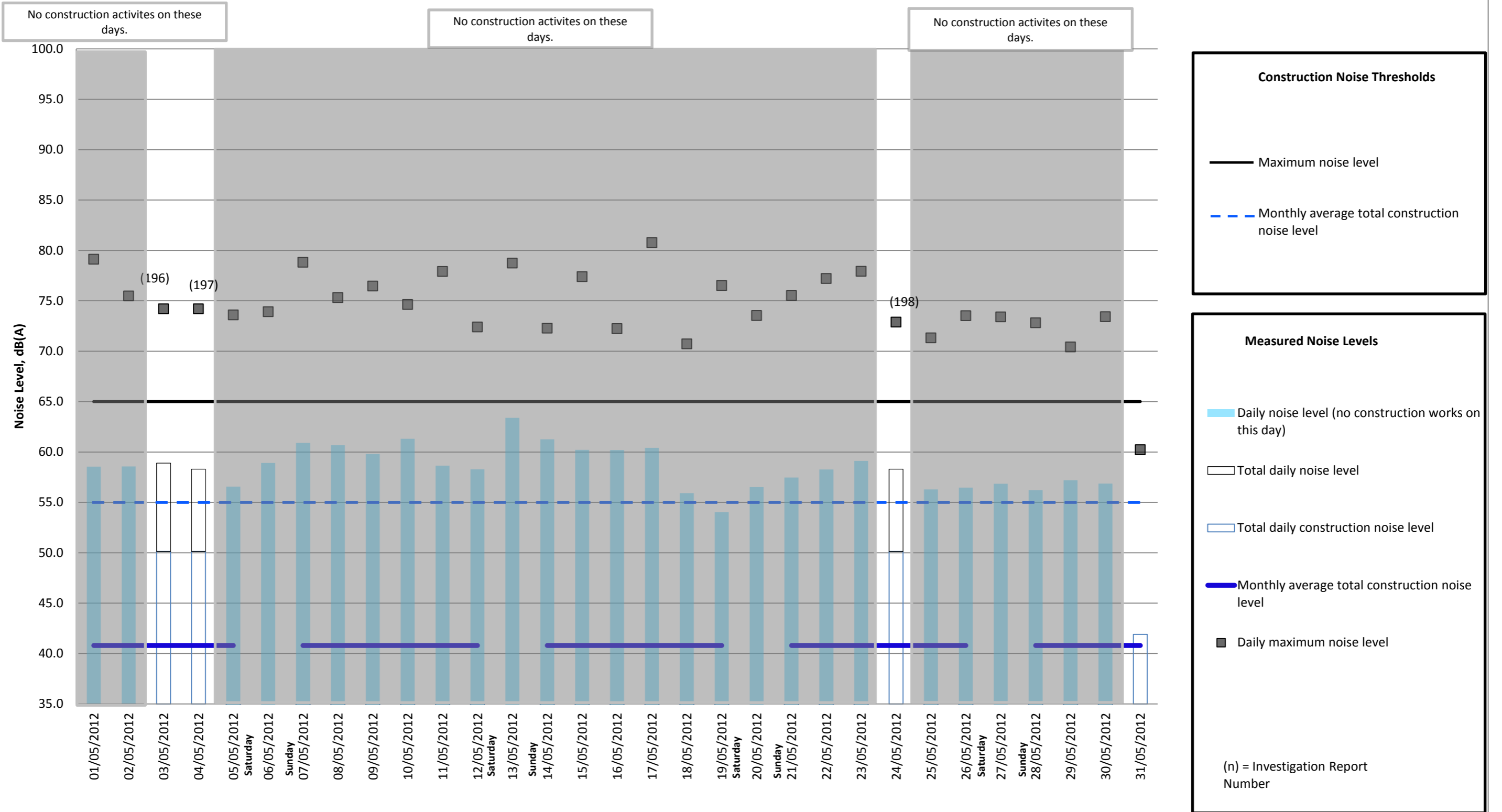



Measured evening noise levels, 8 Kirklands Park Grove (CNV16) Measurement period 1st May to 31st May 2012



(n) = Investigation Report Number

Measured night-time noise levels, 8 Kirklands Park Grove (CNV16) Measurement period 1st May to 31st May 2012



 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 02-05-12	NER. 57
	NOISE EXCEEDENCE REPORT		

Summary of Finding(s): May 1st 2012 Tuesday – CNV02

Exceedence 183: Maximum Noise Level: 100.9 dB (A) at 3.11pm

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 both noise exceedences were caused by a dog barking.

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

Noise Files are attached.

Corrective Action Required:

Maintain current monitoring and surveillance levels

SignatureRoland Tarrant.....

Date02-05-12.....

NER Closed

Works have been inspected and completed as described above.

SignatureSeamus O'Brien.....Date02-05-12...


Project Manager / ~~Assist Project Manager~~



May 01 001.wav




May 01 002.wav

 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 10-05-12	NER. 58
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 9th 2012 Tuesday – CNV02</u> Exceedence 185: Maximum Noise Level: 98.9 dB (A) at 8.04am Analysis: 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 Noise log concludes that this noise exceedence was caused by a dog barking and general traffic It is unlikely that this was caused by the construction activities. Noise File is attached. Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date10-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date10-05-12... Project Manager / Assist Project Manager			



May 09 003.wav


 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 14-05-12	NER. 59
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 12th 2012 Saturday – CNV02</u> Exceedence 186: Maximum Noise Level: 101.5 dB (A) at 1.48pm Analysis: 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 Noise log concludes that both noise exceedences were caused by dogs barking and general traffic It is unlikely that this caused by the construction activities. Noise Files are attached. Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date14-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date14-05-12... Project Manager / Assist Project Manager			



May 12 004.wav




May 12 005.wav

 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 18-05-12	NER. 60
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 17th 2012 Thurs – CNV02</u> Exceedence 187: Maximum Noise Level: 94.8 dB (A) at 08.27am Analysis: 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 Noise log concludes that these noise exceedence was caused by a truck horn on the M9 Motorway. It is unlikely that this caused by the construction activities. Noise File is attached. Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date18-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date18-05-12... Project Manager / Assist Project Manager			



Noise Exced 187.wav

 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 23-05-12	NER. 61
	NOISE EXCEEDENCE REPORT		

Summary of Finding(s): May 23rd 2012 Wednesday – CNV02

Exceedence 189: Maximum Noise Level: 94.8 dB (A) to 97.1db (A) from 10am to 16.27pm

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 these noise exceedences were caused by dogs barking and persons shouting in the proximity of the property.

It is unlikely that these were caused by the construction activities.

Noise Files are attached.

Corrective Action Required:

Maintain current monitoring and surveillance levels

SignatureRoland Tarrant.....

Date23-05-12.....


NER Closed


Works have been inspected and completed as described above.


SignatureSeamus O'Brien.....Date23-05-12...


Project Manager / Assist Project Manager

-  May 23 007.wav
  May 23 011.wav
  May 23 010.wav
  May 23 009.wav
  May 23 008.wav

 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 22-05-12	NER. 62
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 22nd 2012 Tuesday – CNV16</u> Exceedence 194: Maximum Noise Level: 87.2 dB (A) to 94.0 db (A) from 9am to 7.00pm And also exceedence of daytime assessment level at 12pm on the same day: (71.2 dB)			
Analysis: 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 Noise log concludes that these noise exceedences were caused by persons carrying out home repairs in the neighbouring property. It is unlikely that these were caused by the construction activities. Noise Files are attached.			
Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date23-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date23-05-12... Project Manager / Assist Project Manager			


 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 05-05-12	NER. 63
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 5th 2012 Saturday – CNV02</u> Exceedence 184: Maximum Noise Level: 95.2 dB (A) at 5.08pm Analysis: 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 Diary confirms that works were completed in this area at 1pm on the Saturday. Therefore it is considered that it is unlikely that construction activities caused this exceedence Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date05-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date05-05-12... Project Manager / Assist Project Manager			

 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 21-05-12	NER. 64
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 19th 2012 Saturday – CNV02</u> Exceedence 188: Maximum Noise Level: 96.7 dB (A) at 17.56pm Analysis: 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 Diary confirms that works were completed in this area at 1pm on the Saturday. Therefore it is considered that it is unlikely that construction activities caused this exceedence Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date21-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date21-05-12... Project Manager / Assist Project Manager			

 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 28-05-12	NER. 65
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 25th 2012 Friday – CNV02</u> Exceedence 190: Maximum Noise Level: 100.3dB (A) at 06.35pm Analysis: 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 Diary confirms that the exceedence is due to dogs barking in this area. See attached noise file. It is considered unlikely that the exceedence is caused by construction activities in this area. Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date28-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date28-05-12... Project Manager / Assist Project Manager			





Noise Exced 190.wav


 QUALITY MANAGEMENT SYSTEM	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 04-05-12	NER. 66
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 03rd 2012 Thursday – CNV02</u> Exceedence 191: Maximum Noise Level: 103.7dB (A) at 08.39pm Exceedence 192: Maximum Noise Level: 79.3dB (A) at 01:52am Analysis: 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 Diary confirms that the exceedence 191 is due to dogs barking in this area. See attached noise file. It is considered unlikely that the exceedence is caused by construction activities in this area. Analysis of the site diary in relation to exceedence 192 confirms that works in this area were finished at approximately 12 midnight and therefore it is considered unlikely that this exceedence was caused by construction activities in this area. Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date04-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date04-05-12... Project Manager / Assist Project Manager			



Noise Exced 191.wav

 <p>QUALITY MANAGEMENT SYSTEM</p>	Project Title: FORTH REPLACEMENT CROSSING M9 Junction 1A		Project Number: 208
	Contractor: SRB	Date: 19-05-12	NER. 67
	NOISE EXCEEDENCE REPORT		
<p>Summary of Finding(s): <u>May 19th 2012 Saturday – CNV07</u></p> <p>Exceedence 193: Maximum Noise Level: 94.3 dB (A) at 4pm to 5pm</p> <p>Analysis:</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 Diary confirms that there were no works carried out on site at this time. Therefore it is considered that it is unlikely that construction activities caused this exceedence</p> <p>Corrective Action Required:</p> <p>Maintain current monitoring and surveillance levels</p> <p>SignatureRoland Tarrant..... Date21-05-12.....</p>			
<p>NER Closed</p> <p>Works have been inspected and completed as described above.</p> <p>SignatureSeamus O'Brien.....Date21-05-12...</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: 07-05-12	NER. 68
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 24th 2012 Thursday – CNV16</u> <p>Exceedence 198: Maximum Noise Level: 72.9 dB (A) at 07.58am on the morning of the 25th (overnight period of the 24th)</p> <p>Analysis:</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 Diary confirms that the rolling block took place overnight on the M9 Spur N/B to facilitate works on Gantries 13, 15 and 16, however these works were finished well before the time period in question</p> <p>Therefore it is considered that it is unlikely that construction activities caused this exceedence</p> <p>Corrective Action Required:</p> <p>Maintain current monitoring and surveillance levels</p> <p>SignatureRoland Tarrant..... Date21-05-12.....</p>			
<p>NER Closed</p> <p>Works have been inspected and completed as described above.</p> <p>SignatureSeamus O'Brien.....Date21-05-12...</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: 04-05-12	NER. 69
	NOISE EXCEEDENCE REPORT		
Summary of Finding(s): <u>May 03rd 2012 Thursday – CNV16</u> Exceedence 196: Maximum Noise Level: 73.7 dB (A) at 7.57pm Analysis: 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 Diary confirms that there were no works within 300m of the sensitive receptor at this time. The only works scheduled for this period were a rolling road block to allow erection of CCTV masts further up the spur and these did not mobilise until after 9.30pm. Therefore it is considered that it is unlikely that construction activities caused this exceedence Corrective Action Required: Maintain current monitoring and surveillance levels SignatureRoland Tarrant..... Date04-05-12.....			
NER Closed Works have been inspected and completed as described above. SignatureSeamus O'Brien.....Date04-05-12... Project Manager / Assist Project Manager			



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

Project
 Number:

208

Contractor:
SRB

Date:
07-05-12

NER. 70

**QUALITY MANAGEMENT
 SYSTEM**

NOISE EXCEEDENCE REPORT

Summary of Finding(s): May 03rd 2012 Thursday – CNV16

Exceedence 197: Maximum Noise Level: 74.2 dB (A) at 7.23pm

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 Site Diary confirms that works took place overnight on the M9 Spur N/B to facilitate the removal of the Varioguard, however these works did not mobilise on the spur until 9.30pm. At 7-8pm there were no operations being carried out near this receptor.

Therefore it is considered that it is unlikely that construction activities caused this exceedence

Corrective Action Required:

Maintain current monitoring and surveillance levels

SignatureRoland Tarrant.....

Date07-05-12.....

NER Closed

Works have been inspected and completed as described above.

SignatureSeamus O'Brien.....Date07-05-12...

Project Manager / ~~Assist Project Manager~~