Contractor

FCBC
Queensferry Crossing
DRAGADOS | AMERICAN BRIDGE INTERNATIONAL
HOCHTIEF | MORRISON CONSTRUCTION

Project

FORTH REPLACEMENT CROSSING

Document title

CONSTRUCTION NOISE MONITORING REPORT: OCTOBER 2016

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Contents

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 October 2016. The objective of this report is to detail the monitoring that was undertaken across the site during this reporting period and to present the construction noise monitoring results.

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 October 2016, construction noise was monitored using permanent, continuous noise monitoring devices (01db DUOs) at locations listed in **Table 1**. These monitors were installed during November and December 2011, with additional monitors installed at Scotstoun Park (Arup's Office) and Newton during March 2012, a further sound level meter was installed at Whinny Hill during April 2012.

2.2 Weather stations accompany the noise monitors at Linn Mill and Whinny Hill.

2.3 Various construction works were undertaken across the site during October 2016. **Table 1** outlines the main construction activities in the location of each monitor.

Table 1: Monitoring Locations

Ref.	Monitoring Location	Crossing or Network	Main Construction Activities During October 2016
M1	Whinny Hill	Network	• Earth Works/Fill Placement • Park and Ride works • FT03 & FT04 Bridge Works • Main carriageway roadworks • Rock breaking / crushing • FT06 Demolition
M3	Tigh-Na-Grian	Crossing	• Central Tower rebar, formwork, concreting works, deck lifting & stay cable installation works • North Tower rebar, formwork, concreting works, deck lifting and stay cable installation works • AVN Rebar and concrete works
M7	Butlaw Fisheries	Crossing	• Central Tower rebar, formwork, concreting works, deck section lifts and stay cable installation works • South Tower rebar, formwork, concreting works, deck section lifts and stay cable installation works • AVS rebar & concrete deck works
M10	Inchgarvie Lodge	Crossing	• AVS rebar & concrete deck works • Central Tower rebar, formwork, concreting works , deck section lifts and stay cable installation works. • South Tower rebar, formwork, concreting works, deck section lifts and stay cable installation works. • Main carriageway roadworks • South Abutment works • Excavating SUDS detention basin
M11	Linn Mill	Network (close proximity to Crossing)	• AVS rebar & concrete deck works • Excavating SUDS detention basin
M13	Clufflat Brae	Crossing / Network	• AVS rebar and concrete deck works • South Abutment works • Main carriageway roadworks • Excavating SUDS detention basin
M14	Springfield	Network	• AVS rebar and concrete deck works • South Abutment works • Main carriageway roadworks
M15	Echline	Network	• AVS rebar and concrete deck works • South Abutment works • Main carriageway roadworks

			• Access track to AVS
M16	Scotstoun	Network	• Utility works • B800 roadworks including bridge works (these works are directly in the location of the meter which sits within the construction boundary). • Main carriageway roadworks • Ferrymuir Roundabout surfacing
M17	Dundas Home Farm	Network	• Utility works • Main carriageway roadworks • B800 roadworks
M18	Newton	Network	• No works

Noise Monitoring Results

Overview

2.4 Noise monitoring results are presented in graphs (**Appendix A**) using the template provided in the *Construction Noise Monitoring Information Note* (www.transportscotland.gov.uk).

2.5 With regard to the noise monitoring graphs, 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 are generally undertaken during the daytime only.
- Linn Mill is considered as a network location which has the potential to receive noise from the marine works near the south shore. As a result, evening and night time data has been included for this location.
- Noise data for day, evening and night on which no construction works were conducted have been excluded from the monthly average results presented in the graph. L_{AFmax} exceedances during these periods would have been caused by non-construction related factors and do not require investigation. Noise results (L_{Aeq} and L_{AFmax}) for any day, evening and night on which no construction works have been conducted have been presented in the graphs as greyed out areas.
- An average for Sunday construction noise data has been included where applicable; in locations where no Sunday works were conducted no average is shown.
- As set out in the CoCP, the assessment time for evening, night and Sunday daytime is in one hour periods. To present the construction noise results for these periods, therefore, the maximum L_{AFmax} (fast time response) and maximum L_{Aeq} within the overall evening/night time period has been taken. It should be noted, therefore, that the average shown for these periods is an average of only the highest L_{Aeq} results.

Results

2.6 Results demonstrate that the monthly average total of construction noise results for daytime are within the threshold levels for all monitoring locations during October 2016. For evening and night time periods, there were exceedances of monthly average at Butlaw and Tigh-Na-Grian during the night-time period. There were no exceedances of Sunday during this period.

2.7 Most exceedances noted were not caused by construction activities. Each exceedance was found to be influenced by increased noise levels due to periods of adverse weather, traffic, residential noise or birdsong. Audio recordings demonstrate that the increased levels were caused by sea waves and birdsong at Butlaw Fisheries, and birdsong at Tigh-Na-Grian. With regard to the averages reported for evening and night-time periods, it should be noted that these averages are based only on the highest L_{Aeq} levels for 1 hour periods which can affect the averages.

2.8 Each exceedance of the threshold was investigated using triggered audio recordings, records of construction works (i.e. site programmes, diaries and daily marine reports) and analysis of weather station data, where required. A Noise and Vibration Investigative Report (NVIR) spread sheet has been produced detailing the results of the investigation for each construction exceedance. There were some exceedances this month that were due to construction work.

2.9 Construction related noise at Butlaw on the 6th, 7th, 10th and 11th October were caused by hammering from the AVS works. The relevant site team was contacted and asked to brief site staff on the requirements of working at night. The environmental team also carried out attended monitoring at night. Exceedances recorded on the Linn mill monitor during the daytime period on the 3rd, 10th, 11th, 12th, 13th, 20th, 26th October were caused by the excavation work nearby at the western SUDs pond. Site teams were made aware of these exceedances. Exceedances recorded on the Clufflat monitor during the daytime period on the 18th, 19th and 26th October were caused by the excavation work nearby at the eastern SUDs pond. Site teams were made aware of these exceedances. Exceedance recorded on the Echline monitor on the 27th October during the day was caused by breaker carrying out drainage work tying in the last section between the south abutment cycle track and the B924

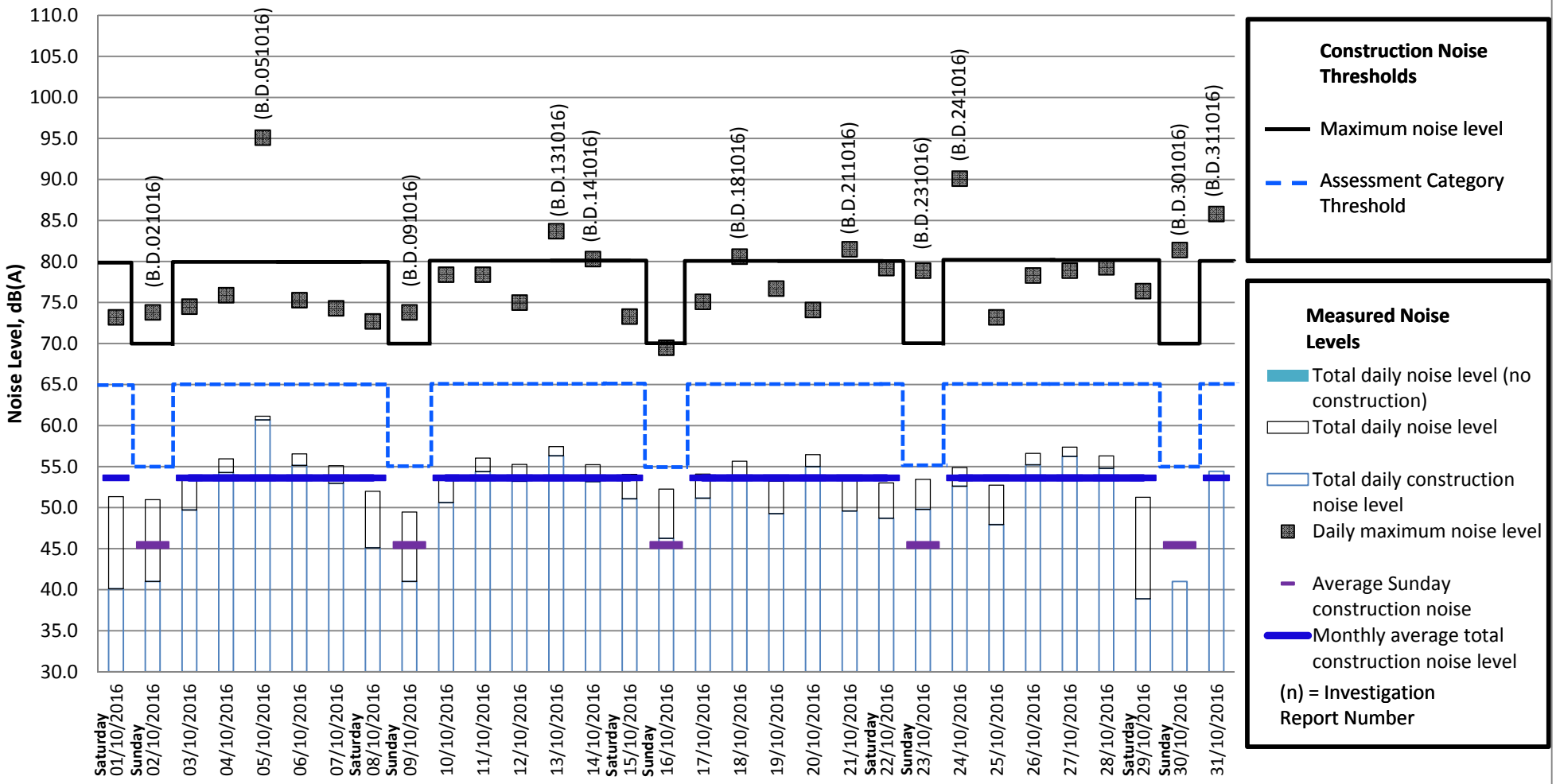
2.10 A summary of the findings for exceedances occurring at each of the locations can be found in Table 2.

Table 2: Summary of Exceedances at Monitoring Locations

Monitoring Location	Summary of Exceedance Details
Butlaw Fisheries	During October the maximum noise threshold was exceeded on 41 occasions (11 day time, 6 evening and 24 night time). Most exceedances were attributed to non-construction factors, notably birdsong, waves and wind. Four exceedance were related to construction work (see 2.9)
Clufflat Brae	During October the maximum noise threshold was exceeded on 35 occasions (14 daytime, 7 evening and 14 night time). Exceedances were mainly found to be due to birdsong and residents. Three exceedance were related to construction work (see 2.9)
Inchgarvie Lodge	During October the maximum noise threshold was exceeded on 52 occasions (25 day time, 7 evening and 20 night time). Residential work to the property was found to be the main contributing factors to the exceedances in this location. Other factors included birdsong and wind.
Linn Mill	During October the maximum noise threshold was exceeded on 41 occasions (21 daytime, 8 evening and 12 night time). The majority of exceedances at this location were due to birdsong. There were seven instances of construction noise exceeding the threshold (see 2.9)
Tigh-Na-Grian	During October the maximum noise threshold was exceeded on 44 occasions (21 daytime, 6 evening and 17 night time). Exceedances were mainly due to birdsong.
Dundas Home Farm	During October the maximum noise threshold was exceeded on 14 occasions. The main exceedances were due to residents and birdsong.
Echline	During October the maximum noise threshold was exceeded on 29 occasions. one exceedance at this location was due to construction activities (see 2.9). Most exceedances were attributed to vehicles passing by on the adjacent roads.
Springfield	During October the maximum noise threshold was exceeded on 15 occasions. These exceedances were due to local residents.
Scotstoun	During October the maximum noise threshold was exceeded on 30 occasions. These exceedances were attributed to general traffic noise on the adjacent road.
Whinny Hill	During October the maximum noise threshold was exceeded on 20 occasions during the daytime. No exceedances at this location were attributed to construction activities. Most exceedances were due to birdsong and residents
Newton	Recordings taken for data record purposes

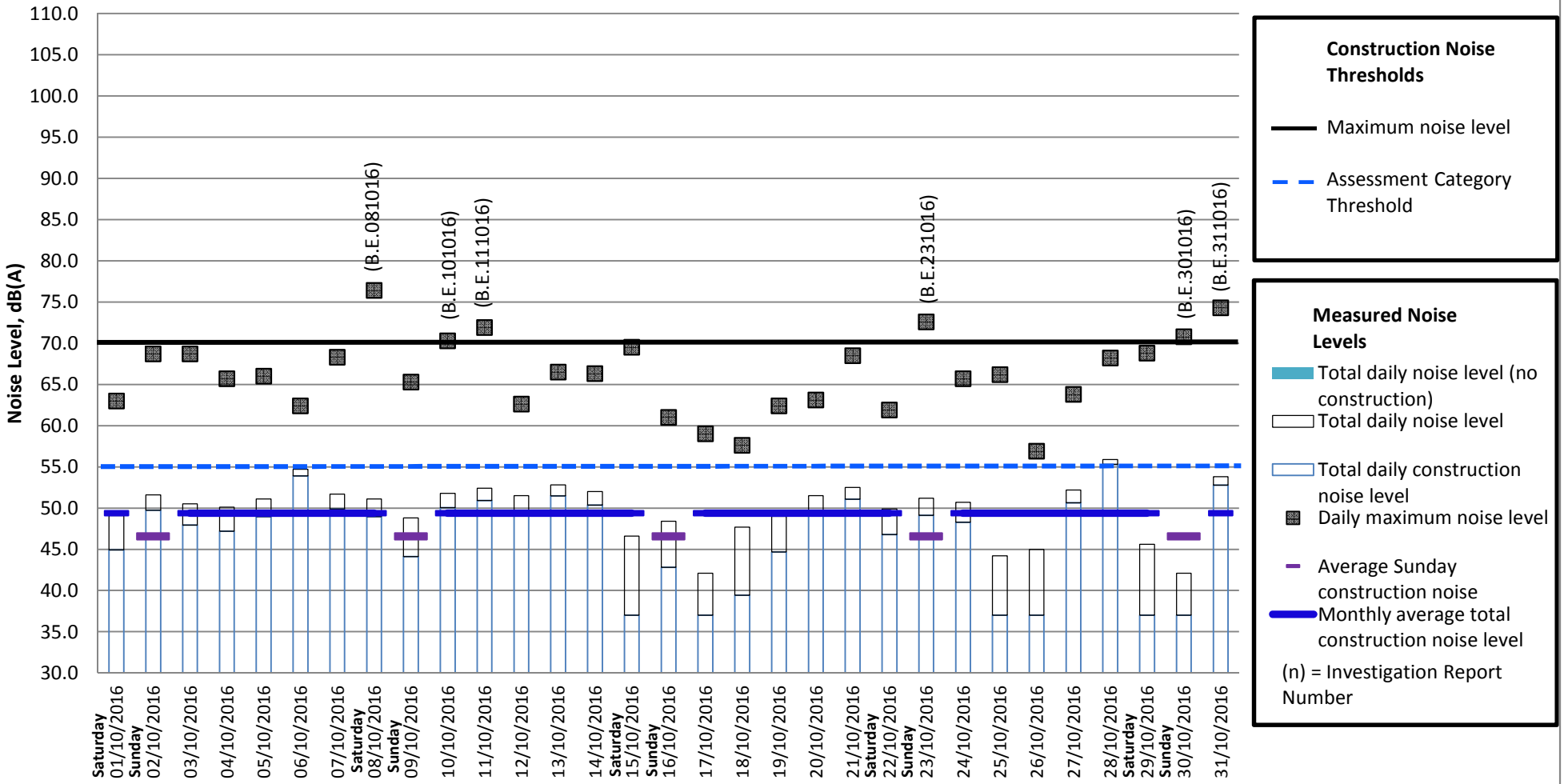
APPENDIX A

Measured Daytime Noise Levels at Butlaw Fisheries
Measurement period: October 2016



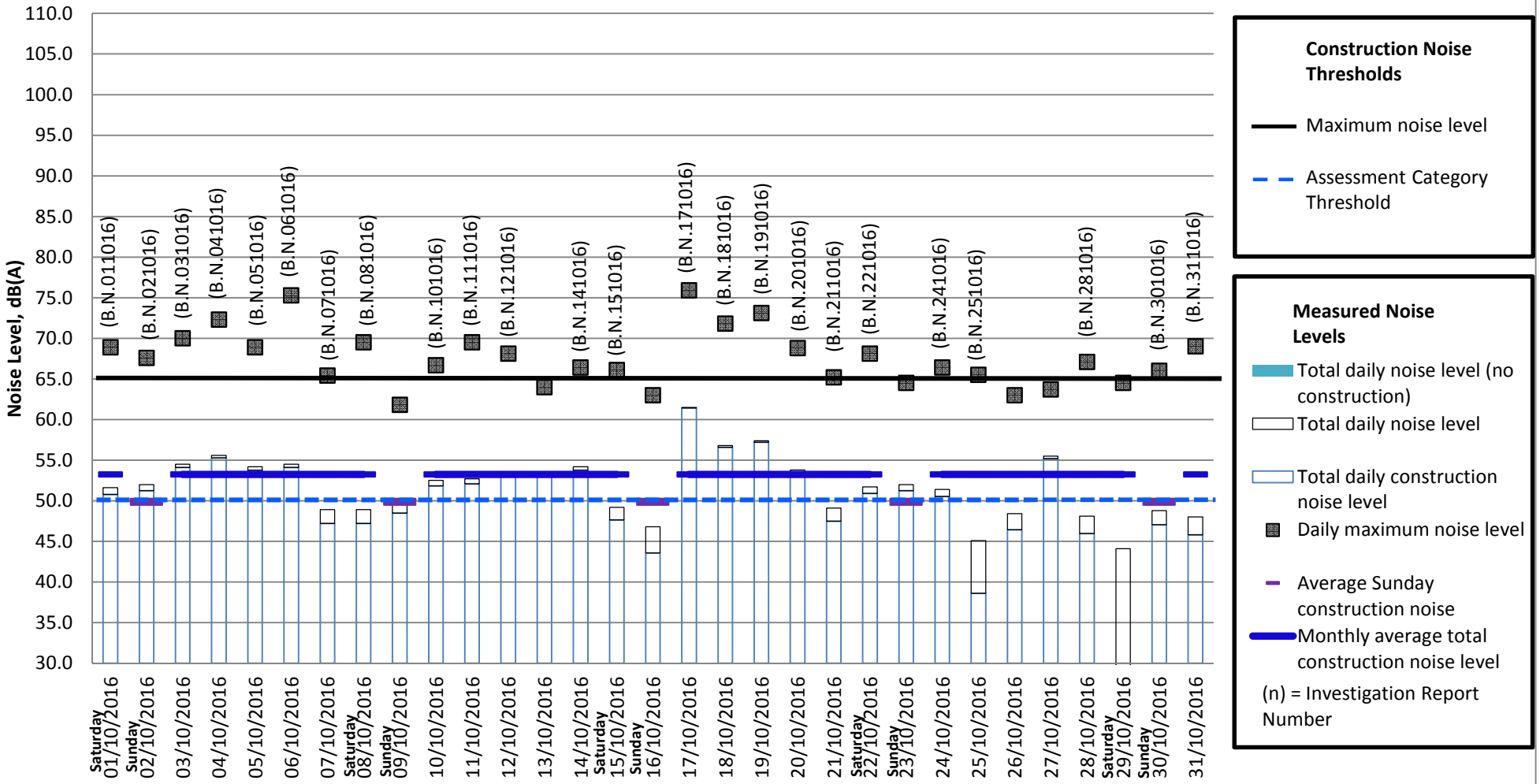
Note:

Measured Evening Noise Levels at Butlaw Fisheries
Measurement period: October 2016



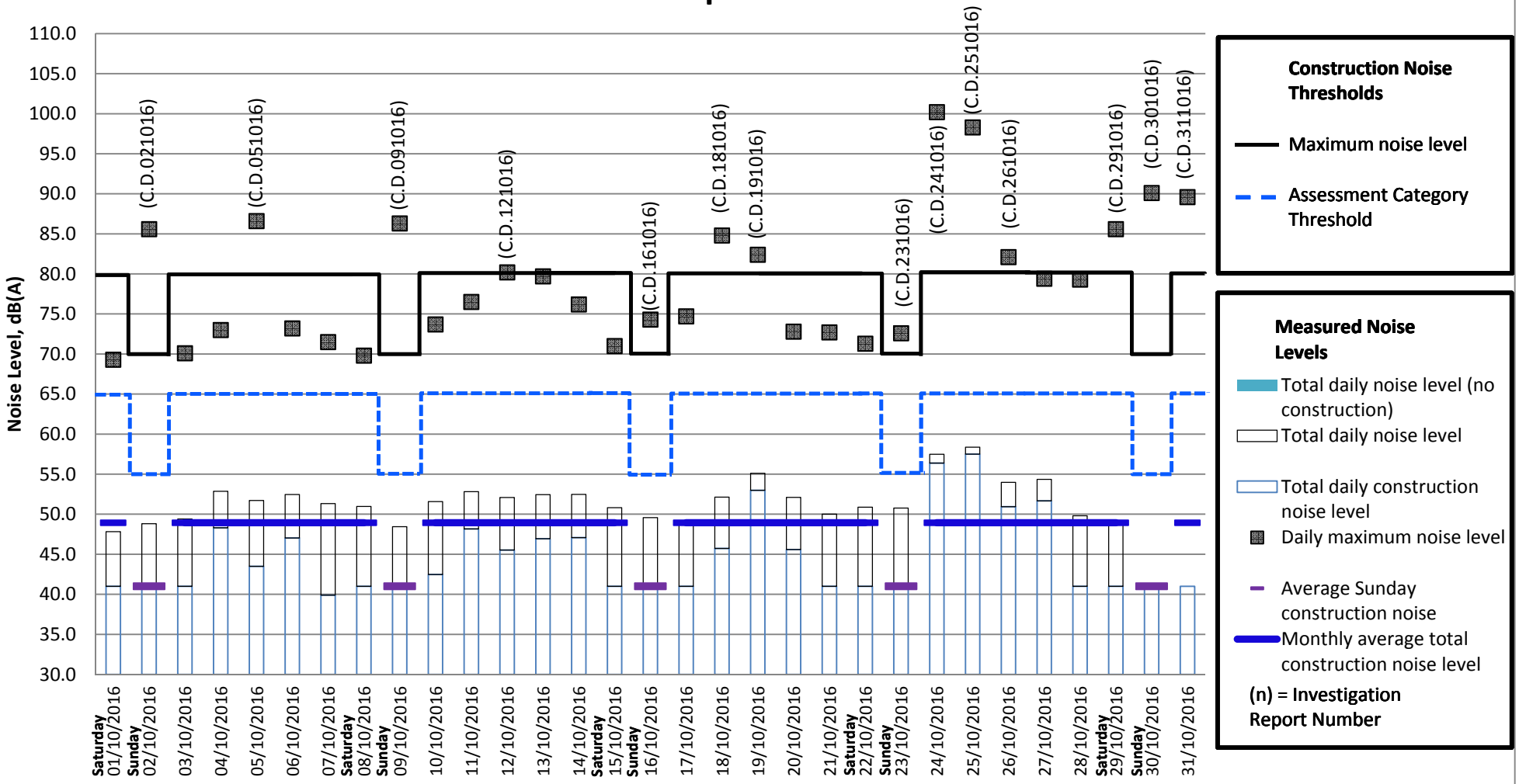
Note:

Measured Night time Noise Levels at Butlaw Fisheries
Measurement period: October 2016



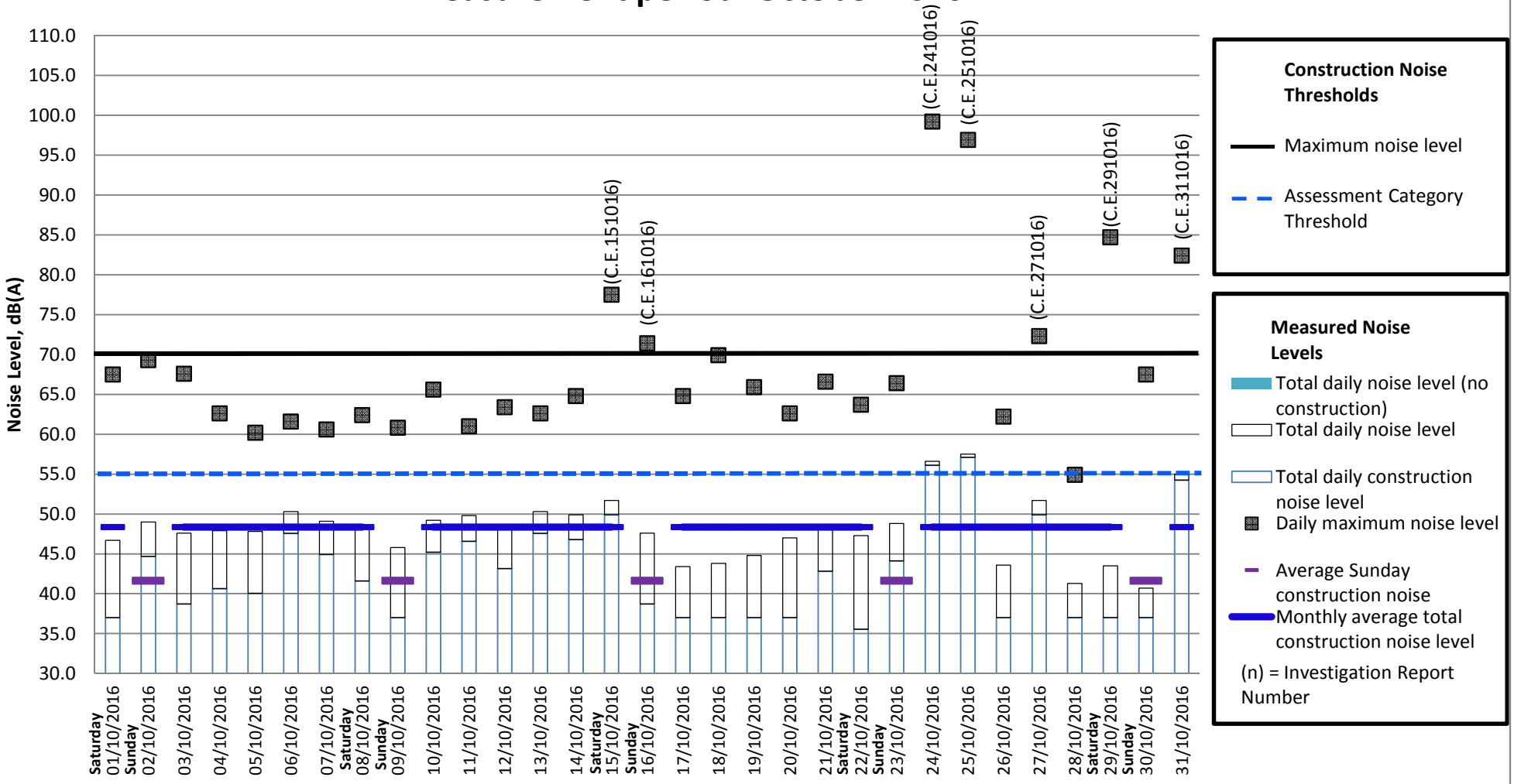
Note: After investigation, it was concluded that the exceedance of the LAeq ' Total Daily Construction' throughout the month were caused by birds and waves

Measured Daytime Noise Levels at Clufflat
Measurement period: October 2016



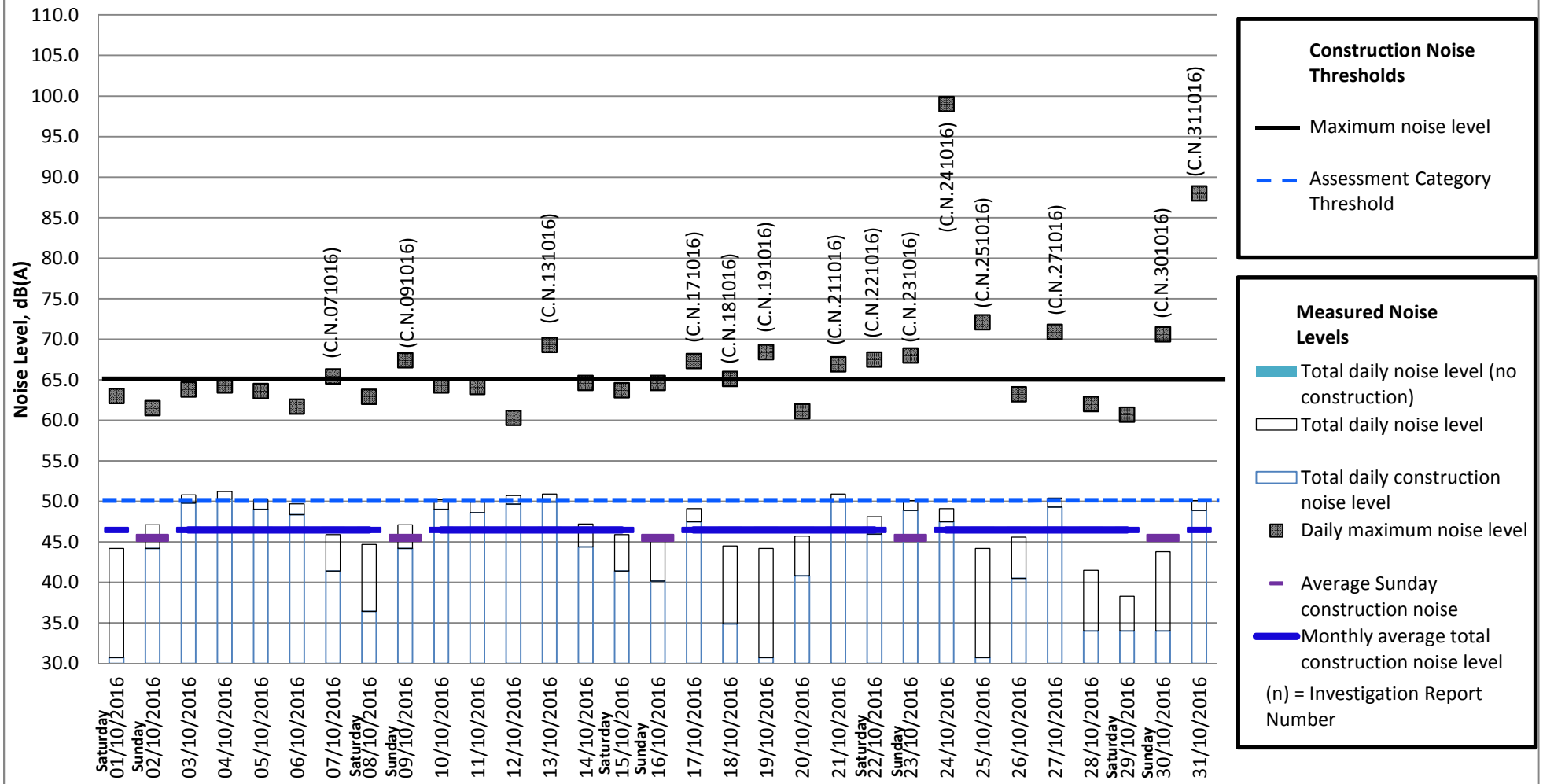
Note:

Measured Evening Noise Levels at Clufflat
Measurement period: October 2016

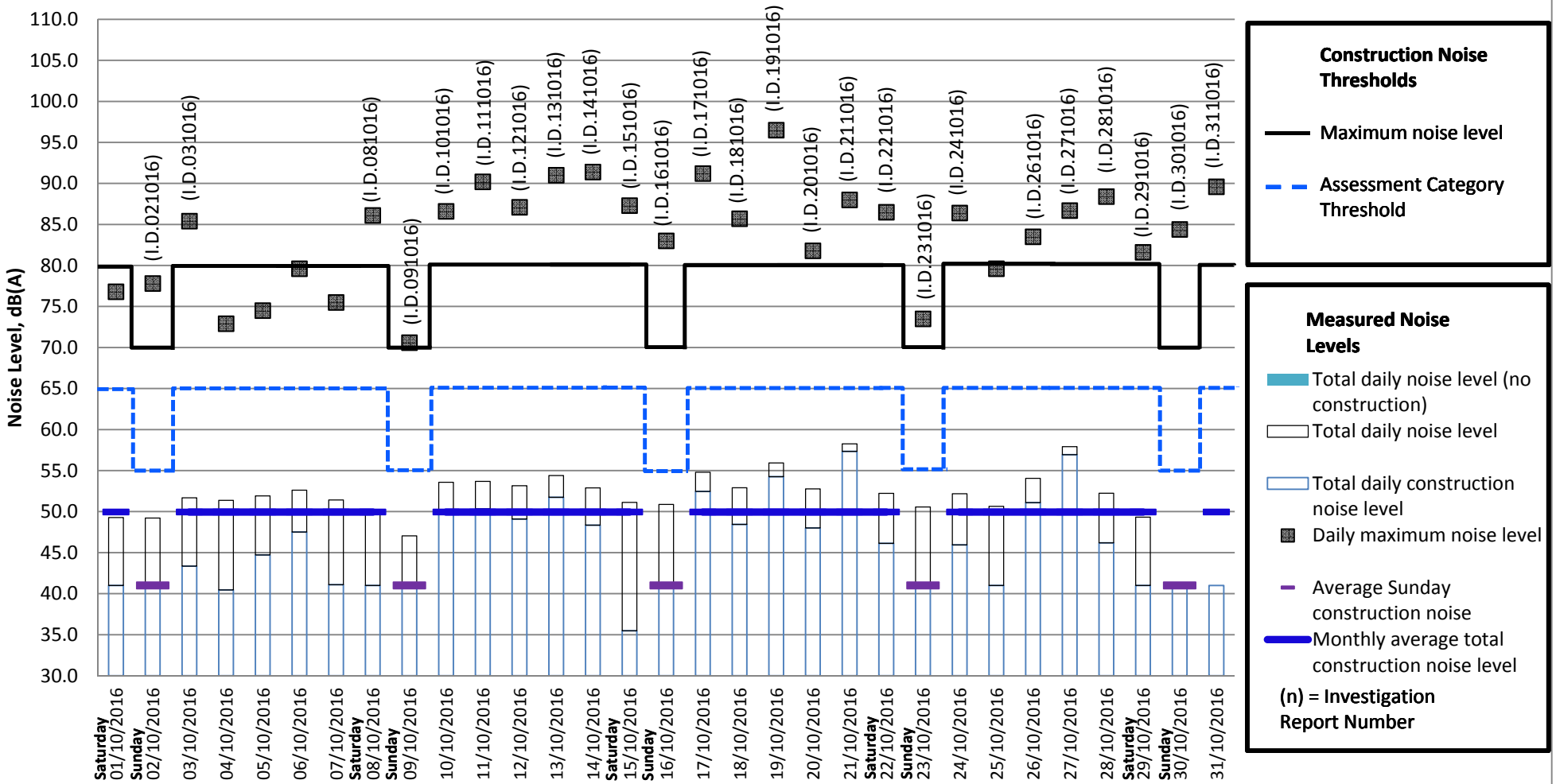


Note:

Measured Night time Noise Levels at Clufflat
Measurement period: October 2016

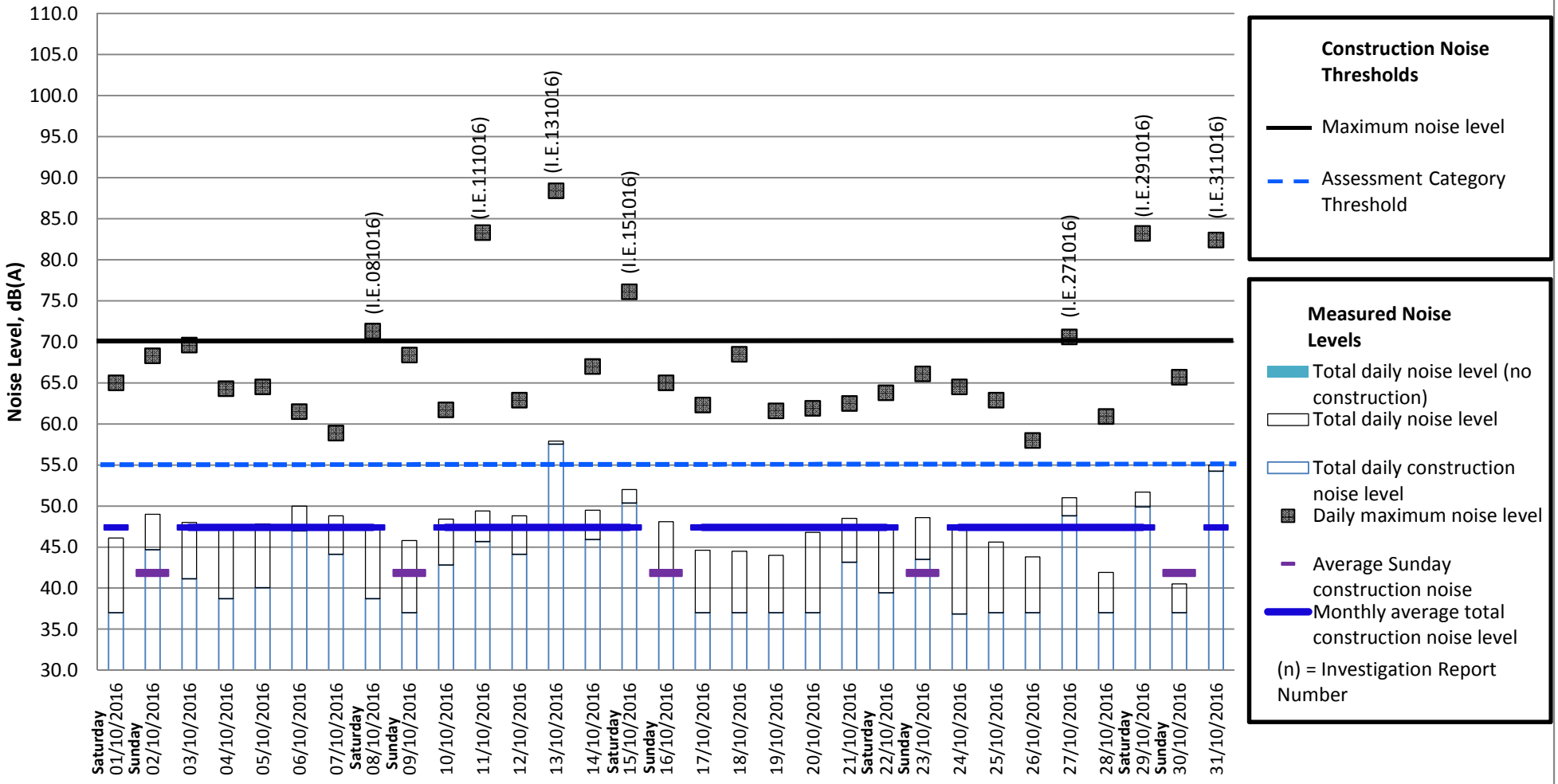


Measured Daytime Noise Levels at Inchgarvie
Measurement period: October 2016



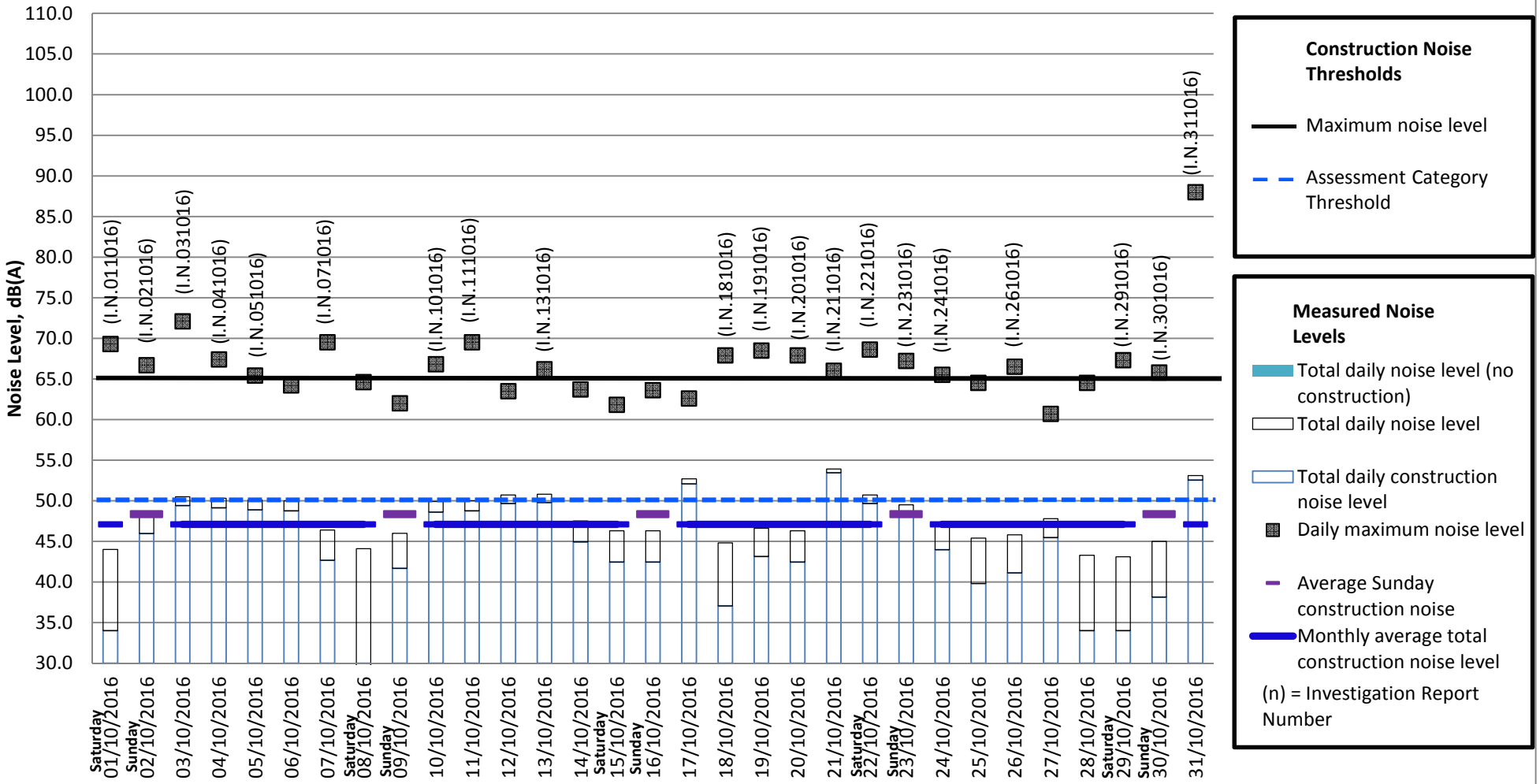
Note:

Measured Evening Noise Levels at Inchgarvie
Measurement period: October 2016

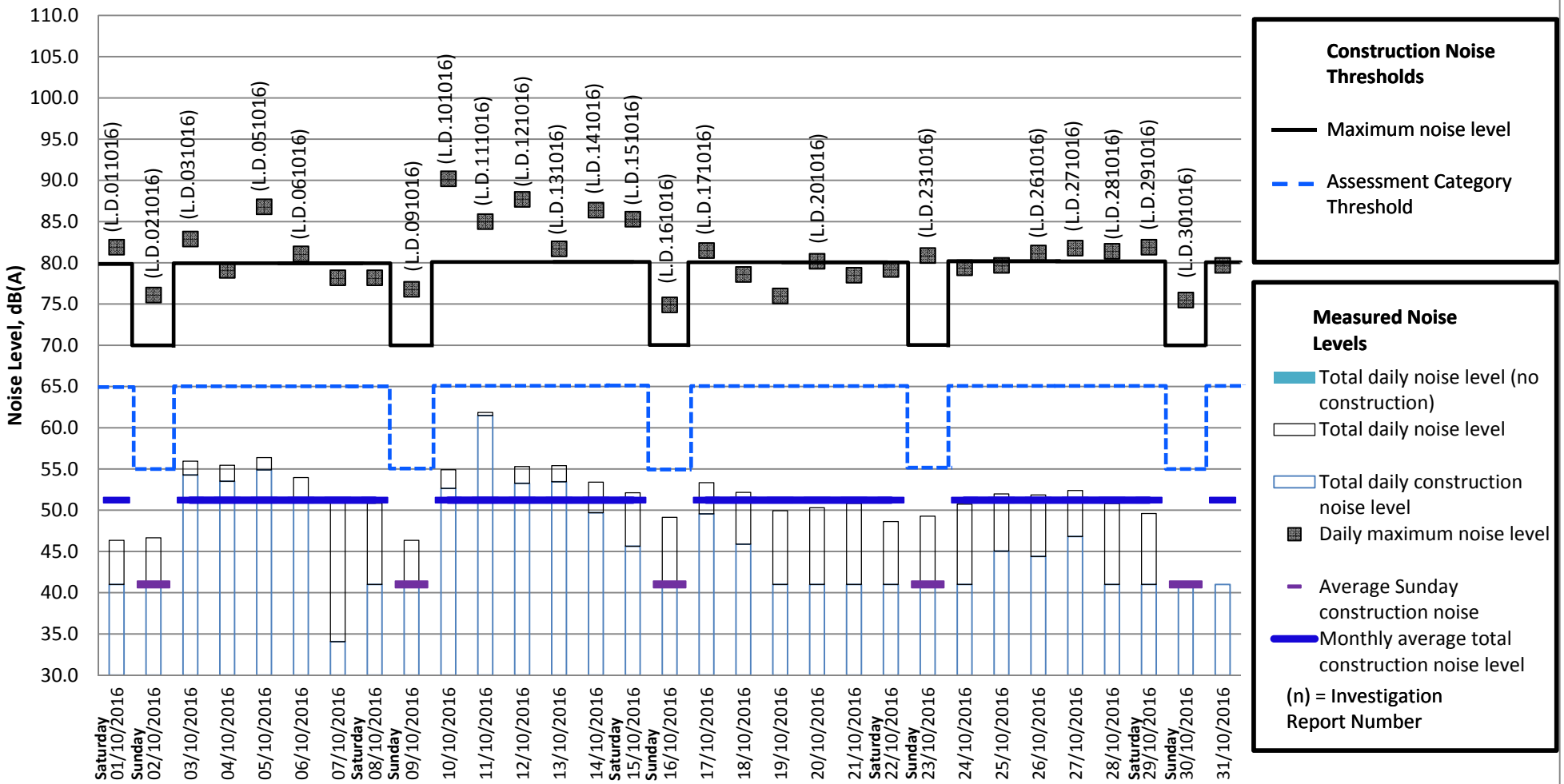


Note:

Measured Night time Noise Levels at Inchgarvie
Measurement period: October 2016

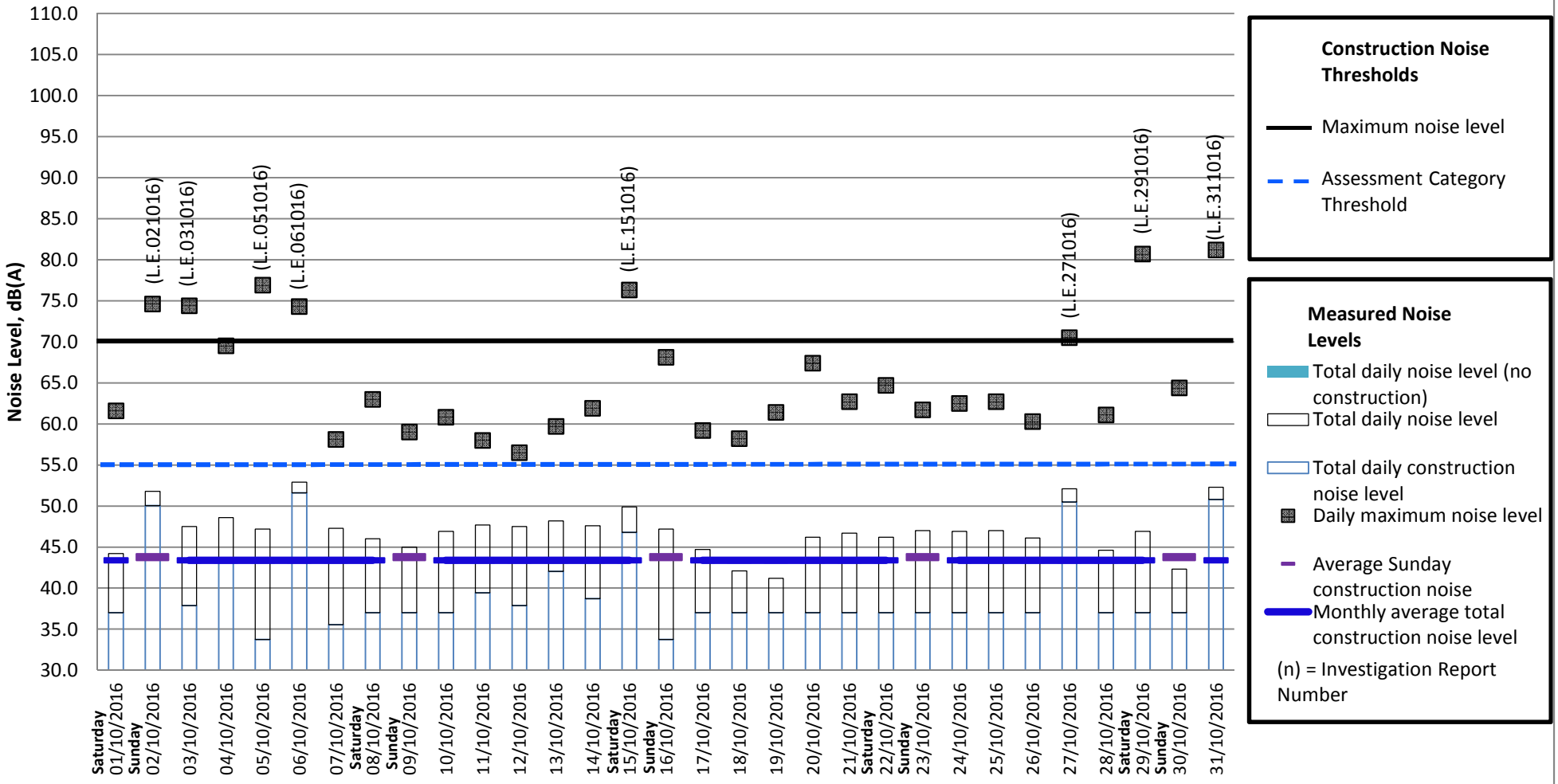


Measured Daytime Noise Levels at Linn Mill
Measurement period: October 2016



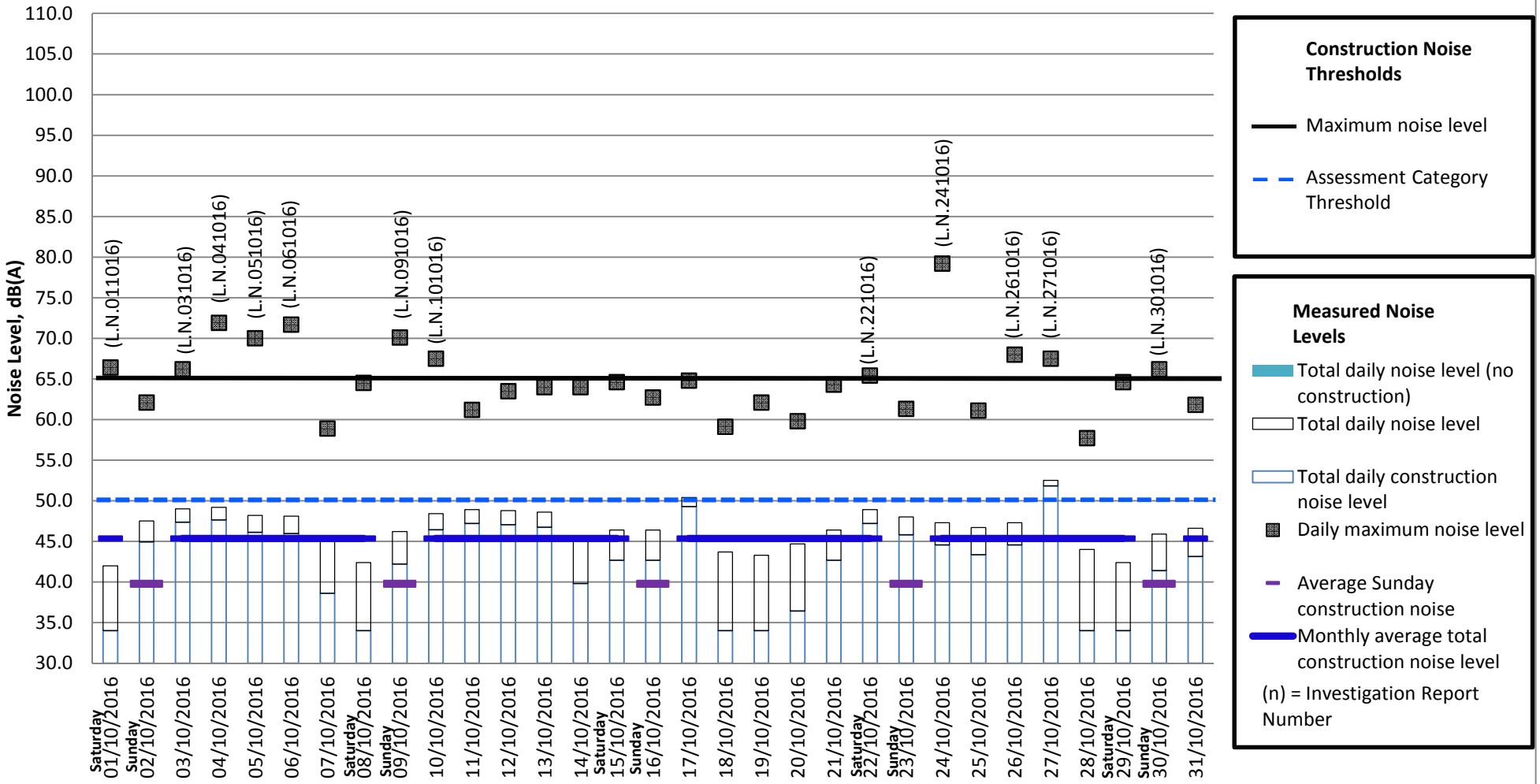
Note:

Measured Evening Noise Levels at Linn Mill
Measurement period: October 2016

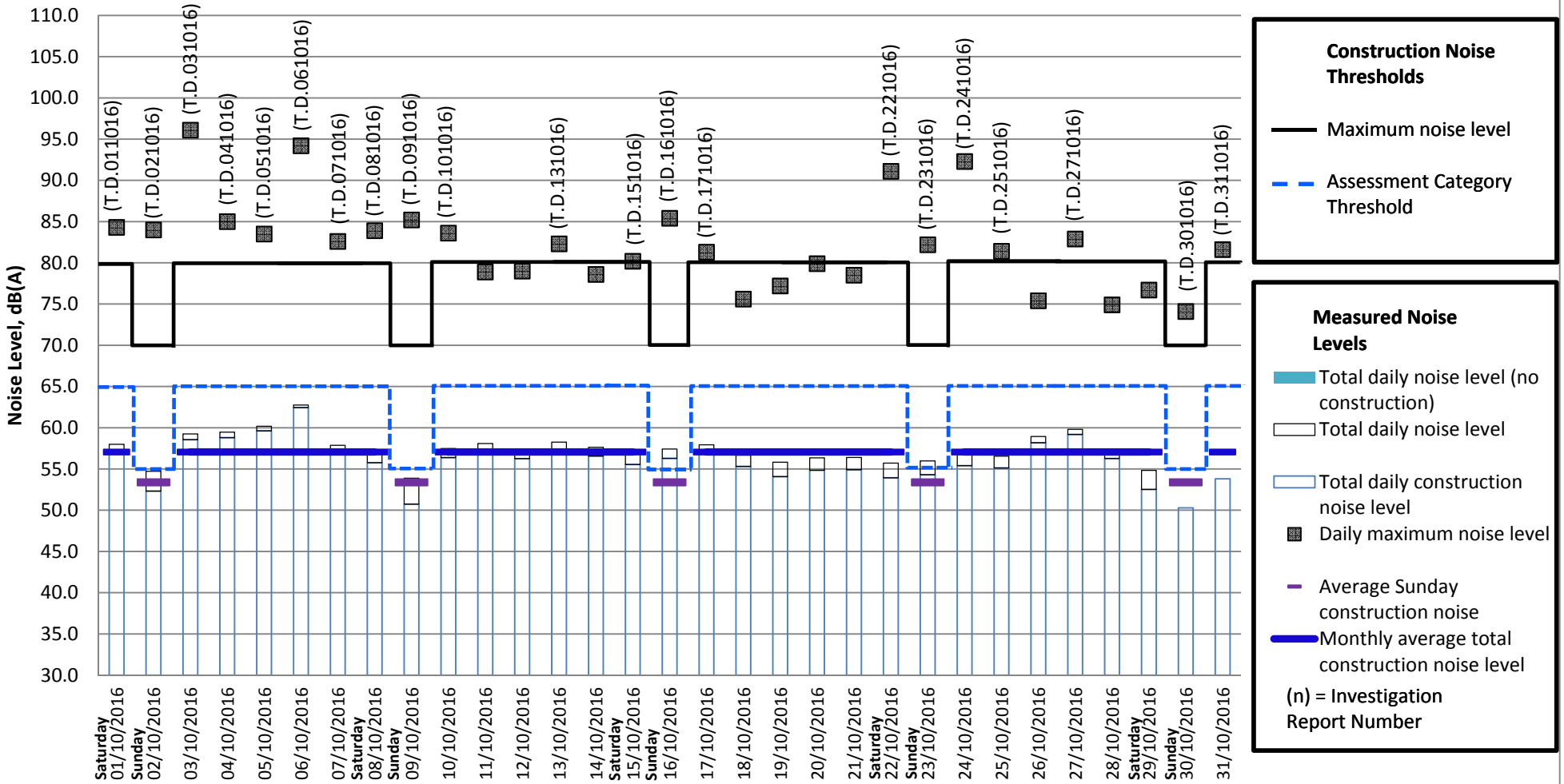


Note:

Measured Night time Noise Levels at Linn Mill
Measurement period: October 2016

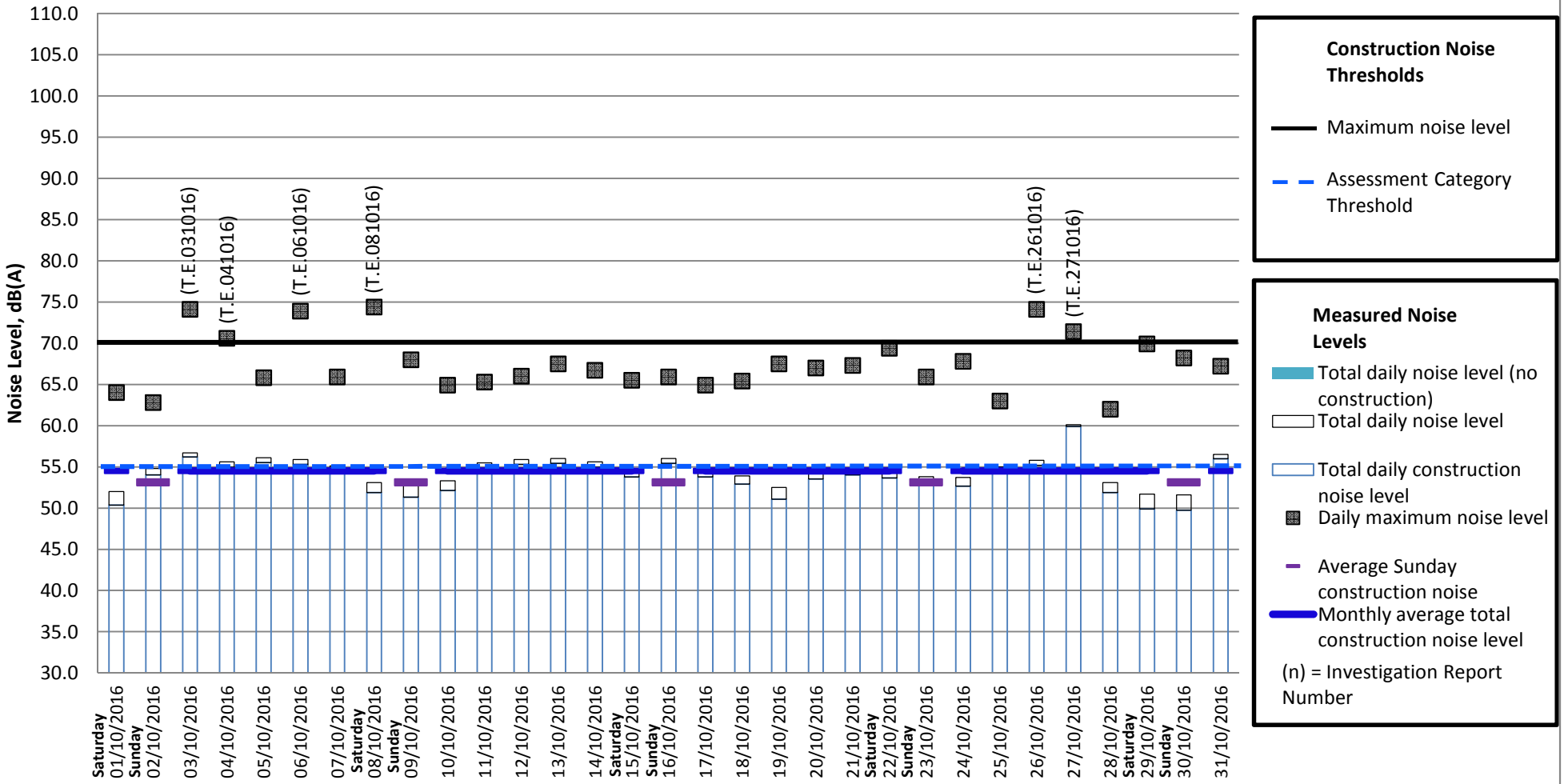


Measured Daytime Noise Levels at Tigh-Na-Grian
Measurement period: October 2016



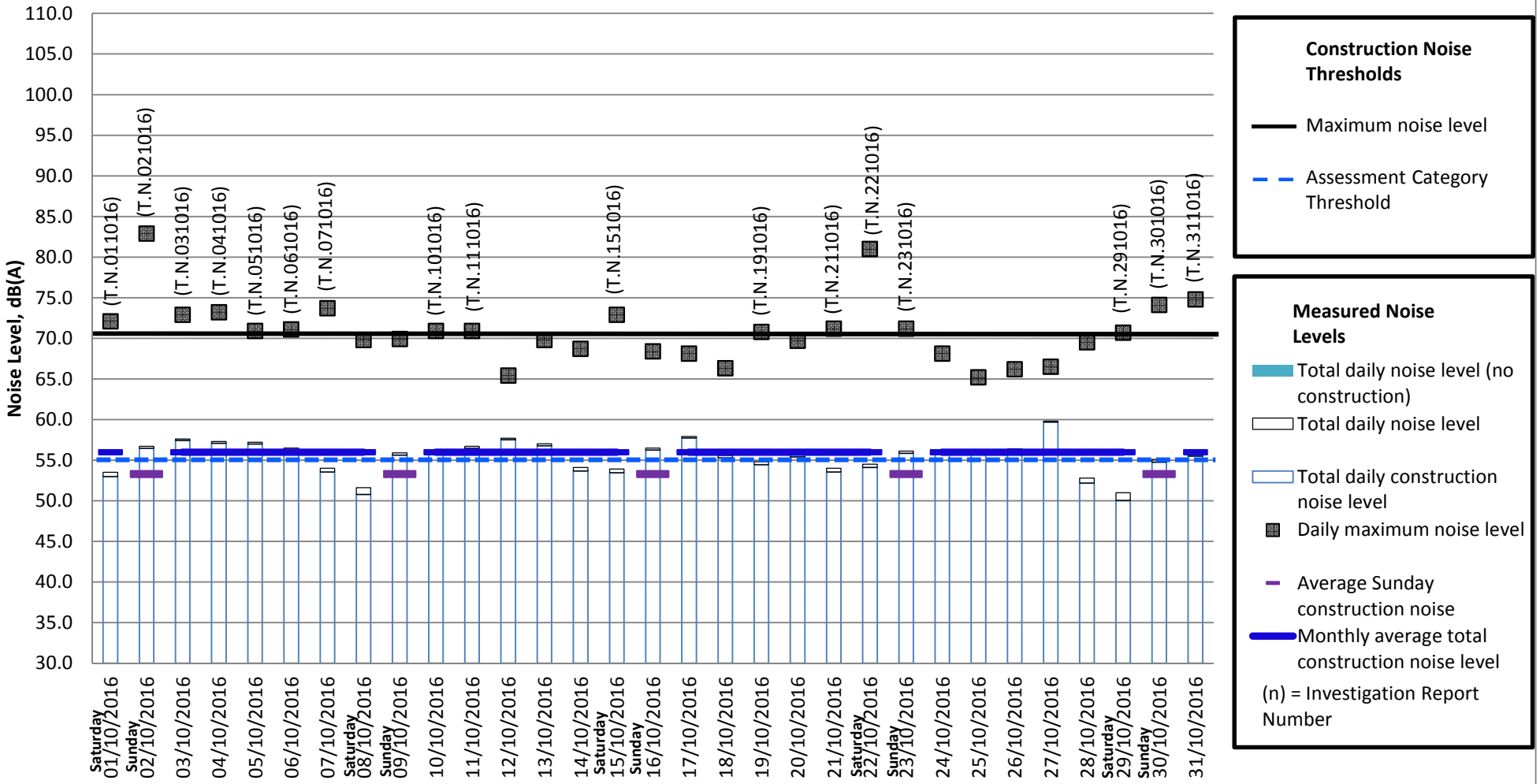
Note:

Measured Evening Noise Levels at Tigh-Na-Grian
Measurement period: October 2016



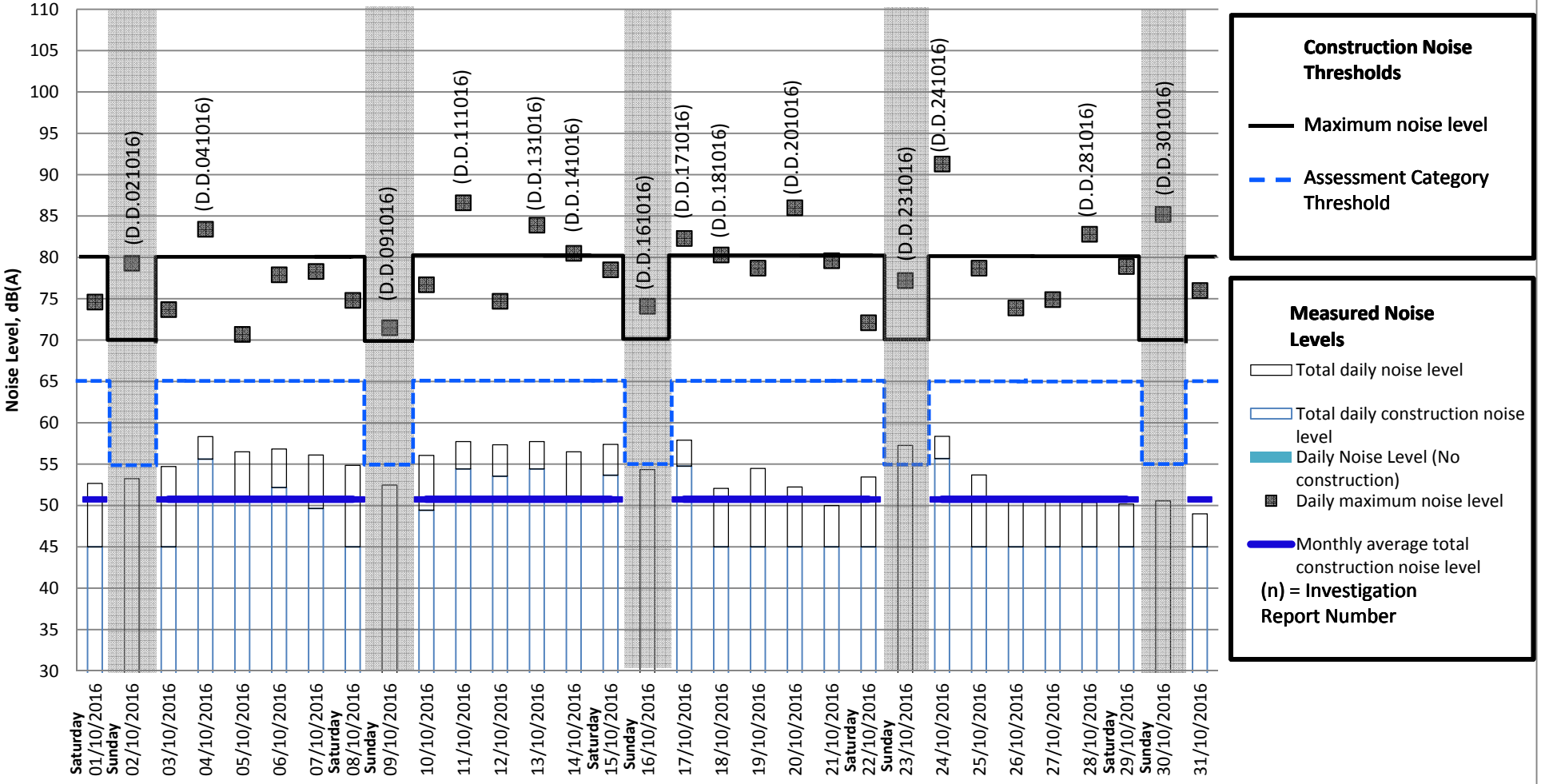
Note:

Measured Night time Noise Levels at Tigh-Na-Grian
Measurement period: October 2016



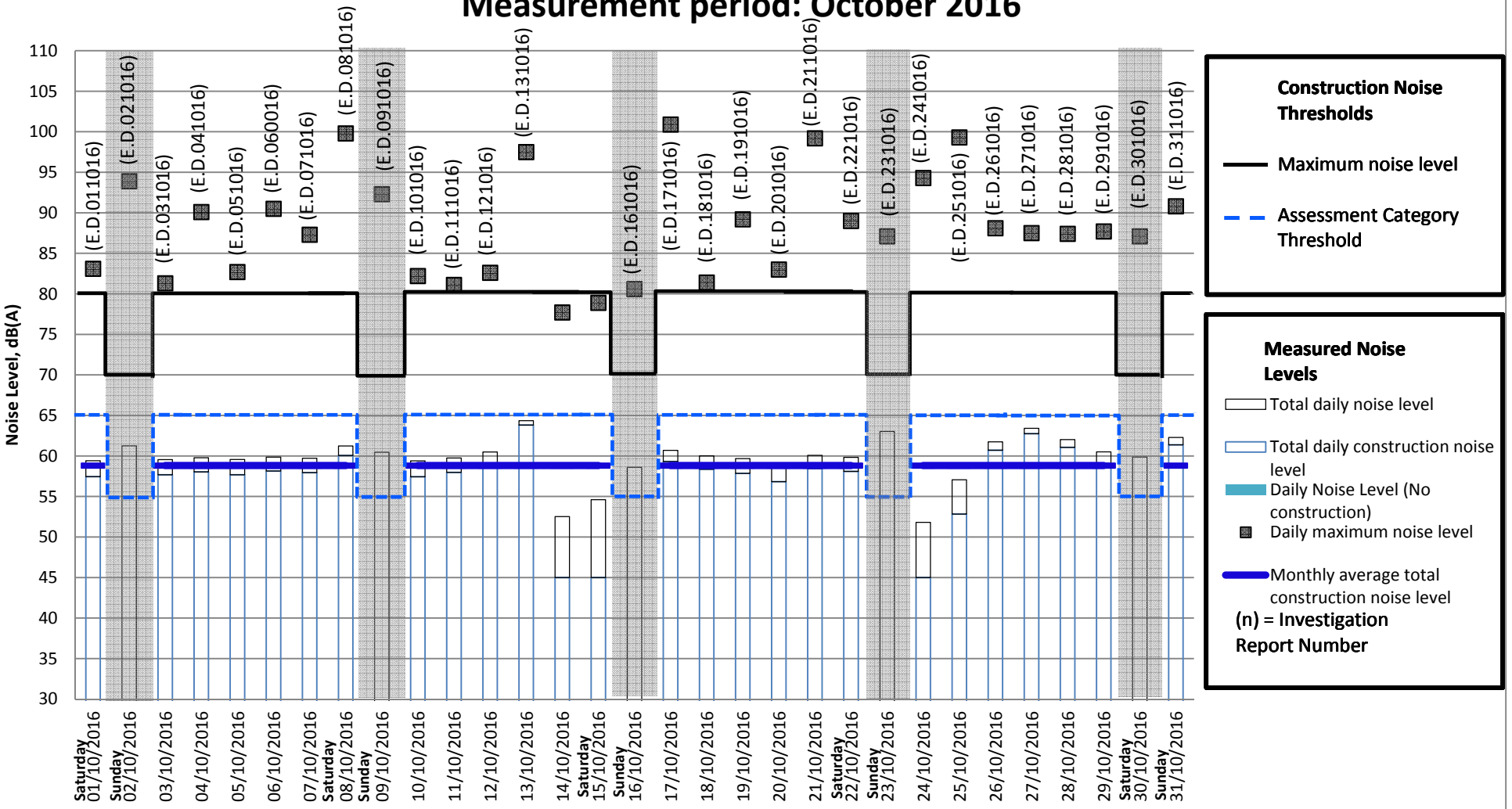
Note: After investigation, it was concluded that the exceedance of the LAeq ' Total Daily Construction' throughout the month were caused by birds.

Measured Daytime Noise Levels at Dundas Home Farm
Measurement period: October 2016



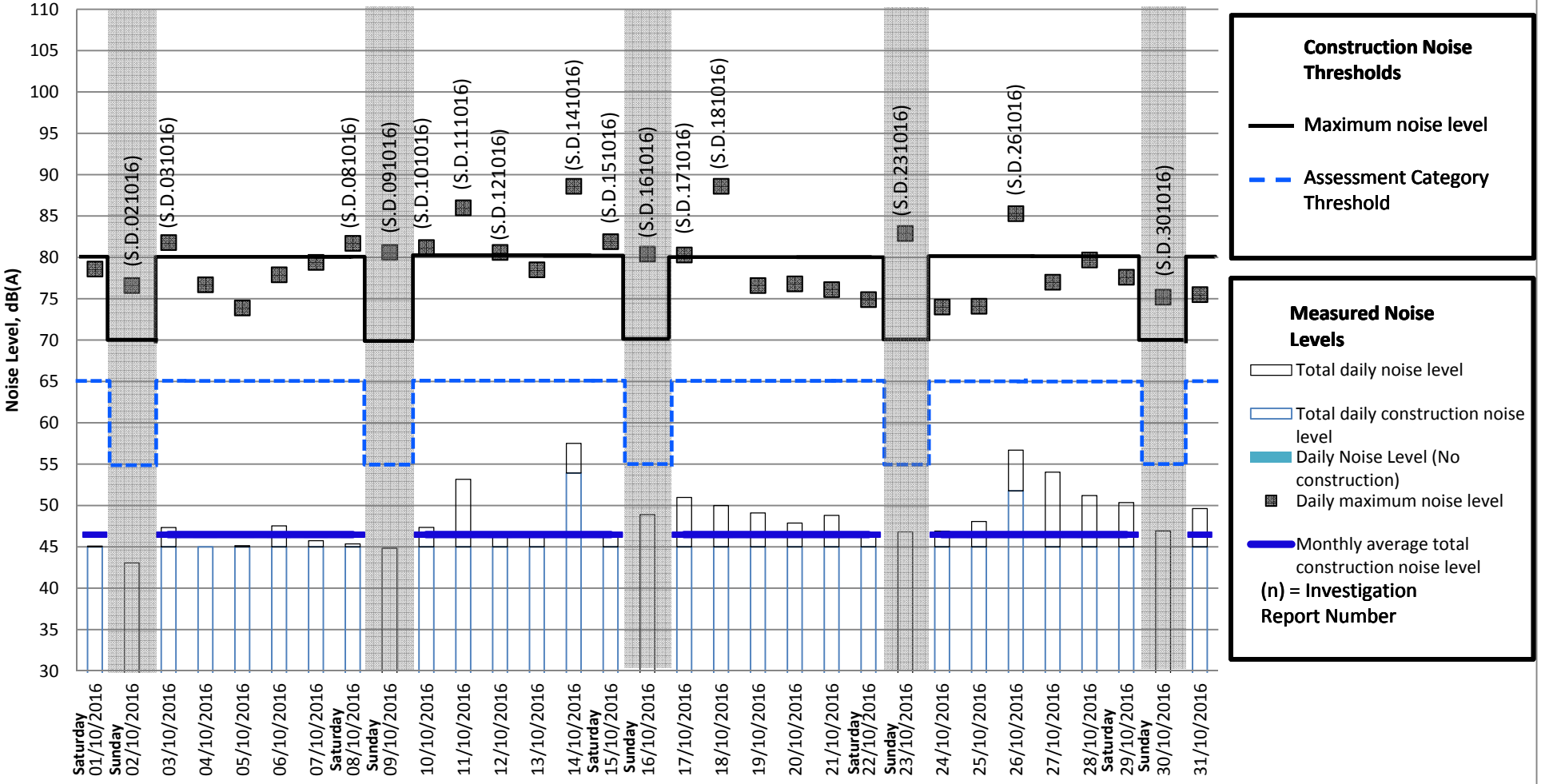
Note: The grey areas of the chart represent days on which no construction works have been conducted;

Measured Daytime Noise Levels at Echline
Measurement period: October 2016



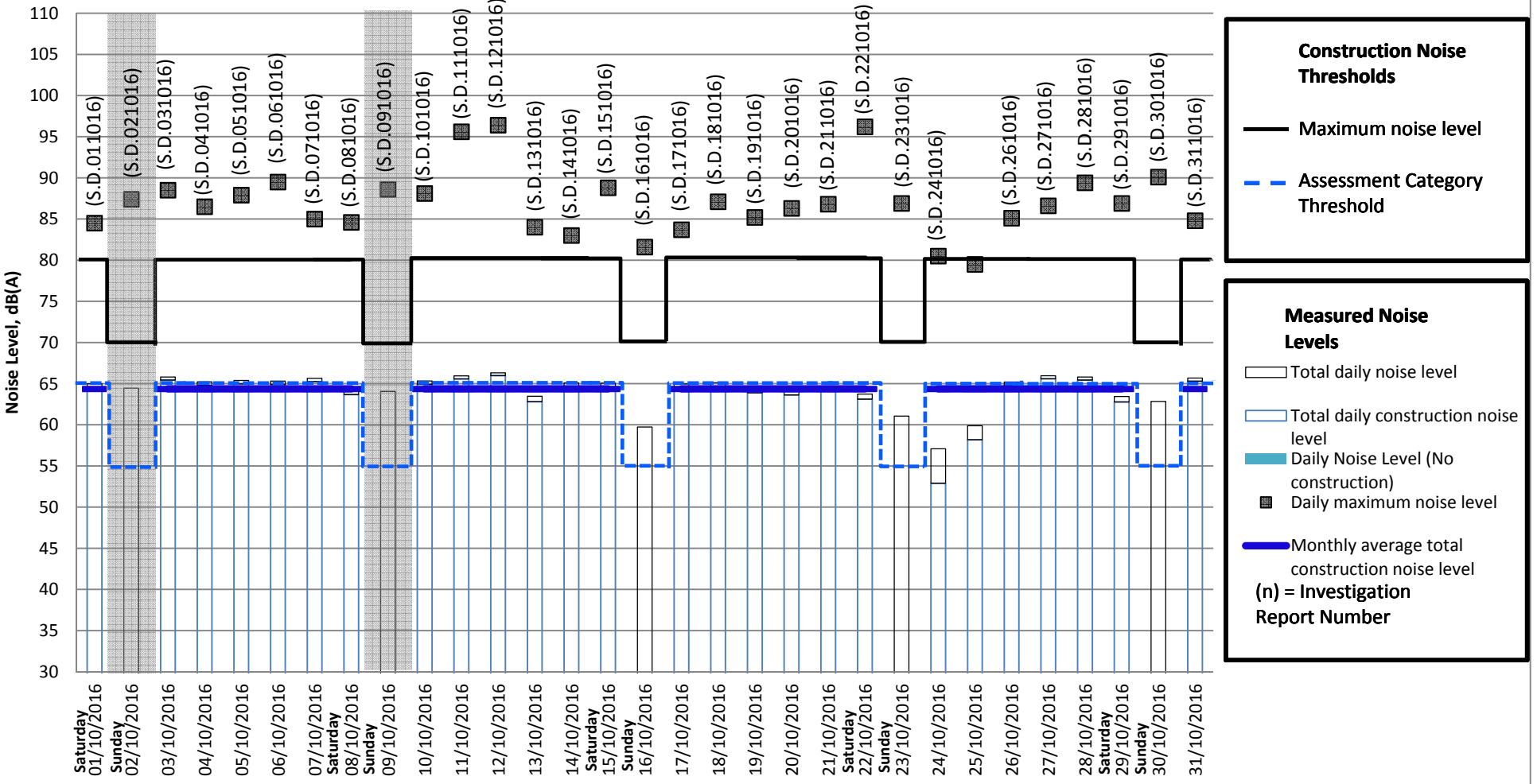
Note: The grey areas of the chart represent days on which no construction works have been conducted;

Measured Daytime Noise Levels at Springfield
Measurement period: October 2016



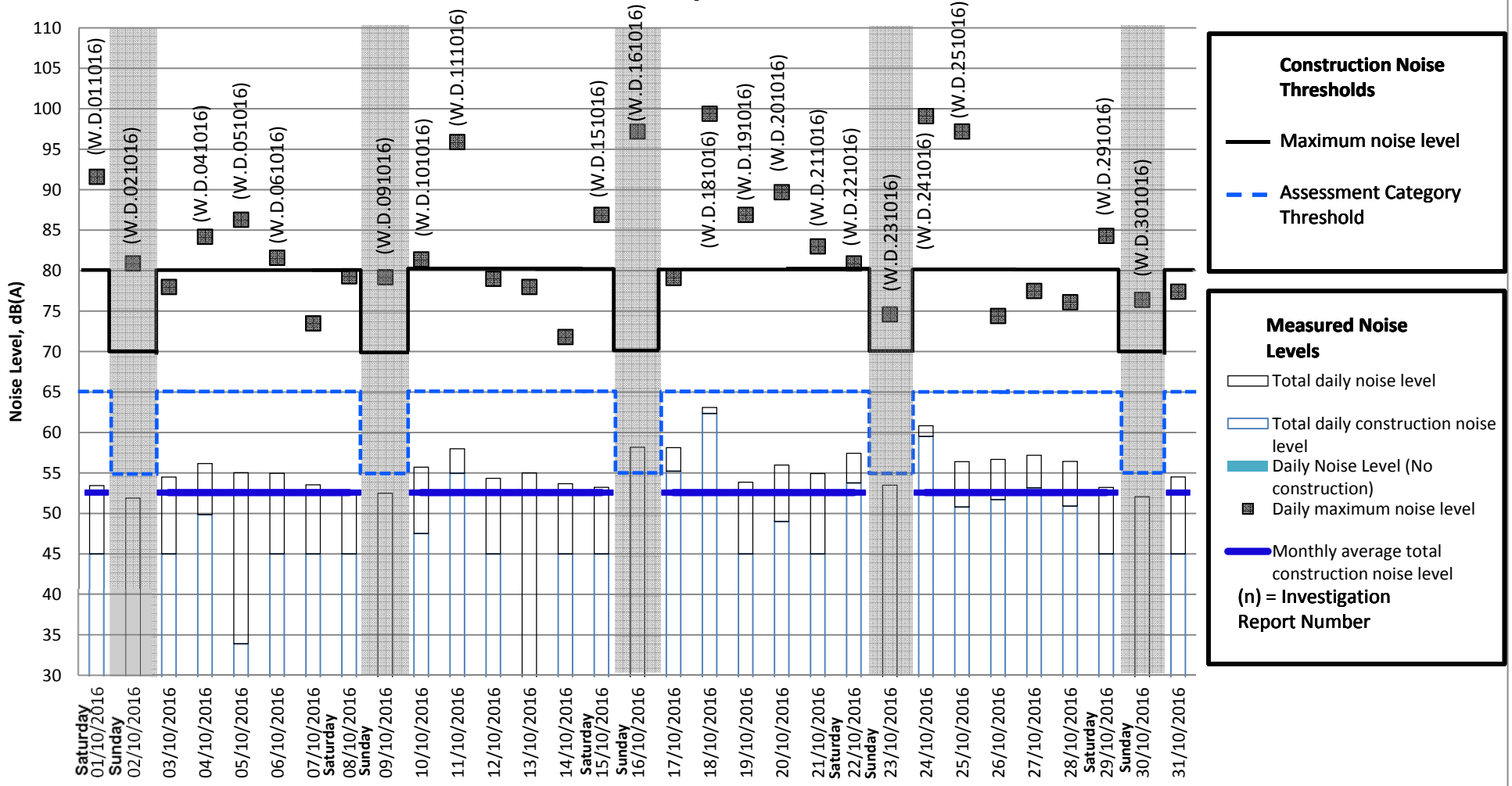
Note: The grey areas of the chart represent days on which no construction works have been conducted;

Measured Daytime Noise Levels at Scotstoun
Measurement period: October 2016



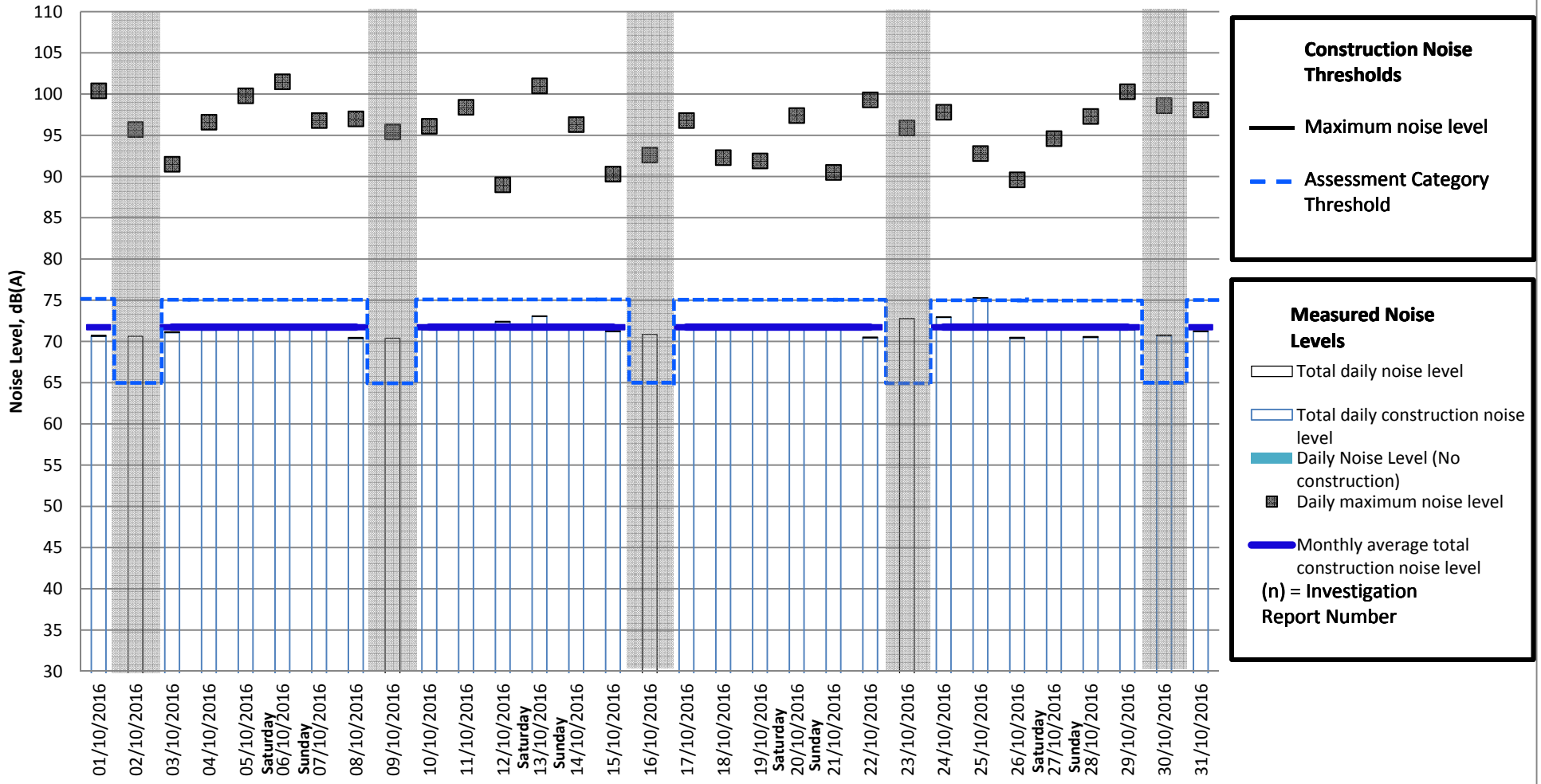
Note: The grey areas of the chart represent days on which no construction works have been conducted;

Measured Daytime Noise Levels at Whinnyhill
Measurement period: October 2016



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

Measured Daytime Noise Levels at Newton
Measurement period: October 2016



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