Intended for
Morgan Sindall Construction & Infrastructure Ltd

Document type
Report

Date
August 2020

FORMER MTL SITE, POP-UP STUDIOS
NOISE ASSESSMENT

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FORMER MTL SITE STUDIOS
NOISE ASSESSMENT

Project name	**Former MTL Site, Pop-up Studios**
Project no.	**1620010459**
Recipient	**Morgan Sindall**
Document ref	**1620010459-RAM-XX-XX-YA-RP-00001**
Revision	**P01**
Date	**04/08/2020**
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Description	**Noise survey and assessment**

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1. INTRODUCTION

This report provides an assessment of the impact of noise associated with two temporary film studio "Stages" and associated facilities located on Digital Way in Liverpool.

The proposed indicative layout for the scheme is shown in Figure 1 and the general location is shown in Figure 2. The site is divided in to 3 plots.

Plot A will be reserved for 24-hour parking of staff and actors' vehicles as well as having HGV access for support vehicles. The plot could also be used to house temporary workshop/storage buildings (which are typically not noisy).

Plot B will contain the two temporary film stages, which are buildings constructed using lightweight metal sandwich panels. These buildings have dimensions of approximately 60m x 30m x 10m high. An access road will serve the buildings from Digital Way.

Plot C will be reserved for potential future use as capacity dictates for car parking, or temporary workshop/storage buildings.

Normal use of the studios will be during the day (typically 07:30 – 23:00). Occasional night time operation is possible and this will be arranged in consultation with the Local Authority (via Liverpool Film Council) and the local residents.

The following has been assessed in this report:

- The impact on the use of the buildings of noise from surrounding roads and other sources
- The impact of noise from normal operation of the studios upon nearby noise sensitive properties

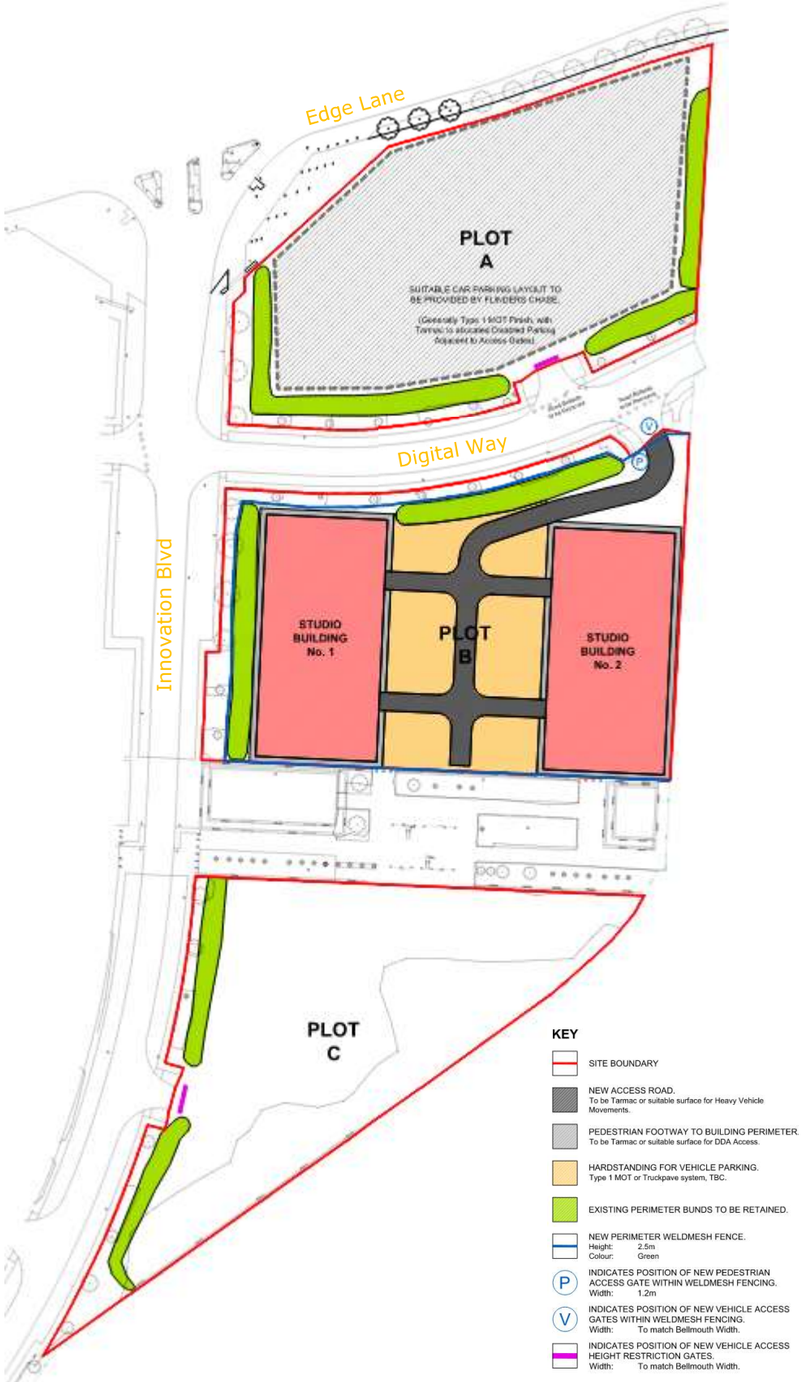

Figure 1 – Proposed indicative site layout

1.1 Noise Criteria

There are no specific criteria for internal levels in the temporary film studios. There is some flexibility in modern filming because of techniques such as post-editing and ADR (Additional Dialogue Replacement) which can remove or replace extraneous sounds captured during filming.

Nevertheless a reasonably quiet environment is required and we propose that a practical limit for the purposes of gauging site suitability is no more than 35dB L_{Aeq} inside the studios. Any additional reductions if required beyond this can be achieved by improvements to the building fabric, screening of noise sources etc.

1.2 Liverpool City Council Requirements

Policy CC21 of Liverpool City Council's Local Plan[1] gives noise limits for "night time economy uses" including from amplified music and other entertainment sources and from fixed plant.

Although the studios are not considered to be an entertainment source or to have amplified music, the criteria have been referenced as a robust guide to the likely impact of the scheme, given the potential for night time use.

Policy CC21 is reproduced below

Policy CC21 - The Night Time Economy
1. Planning permission for night time economy uses within the City Centre will be granted if it is clearly demonstrated that:

a) there would be no adverse impact on the residential amenity of nearby residents in terms of noise, customer activity, vibrations, odours, traffic disturbance and litter;
b) there would be no adverse impact on the operation of nearby businesses;
c) there would be no adverse impact on the overall character and function of the area;
d) the following noise targets are met:

i. Noise from amplified music and other entertainment sources should not exceed a Noise Rating of 30 [0700 to 2300 hours] or 25 [2300 to 0700 hours] within any nearby residential unit;
ii. The rating noise from fixed plant should not exceed the existing background noise levels outside any habitable room window; and

e) All noise control/ sound insulation measures have been designed and implemented to ensure that the noise level requirements are met.

2. The hours of operation of late night uses will be managed through the use of planning conditions to ensure that residential amenity is appropriately protected.

3. Noise sensitive uses which are likely to adversely impact on the continued operation of existing night time economy uses will not be permitted unless appropriate mitigation measures can be provided that will ensure it will not harm the continued operation of existing uses.

[1] Liverpool Local Plan Submission Draft January 2018

2. MEASURED NOISE LEVELS

2.1 Noise Survey

Noise levels were measured at locations representative of the proposed site and representative of the background noise levels experienced at the nearest noise sensitive properties.

Measurements were made on Wednesday 22 July 2020 during the following periods:

- 06:30-07:00 – the last hour of the night time period (07:00-23:00) and the earliest the studios are expected to be in operation under normal conditions.
- 07:00 – 11:00 – to represent the morning rush hour and the noisiest levels affecting the site
- 22:00 – 23:00 – to represent the last hour of the day and the latest the studios are expected to be in operation under normal conditions
- 23:00 – 01:00 – representative of the night time

Measurements were made close to the main sources of noise affecting the site (Edge Lane and Innovation Boulevard) and the data used to produce a noise map showing noise levels across the whole site (Figure 3).

Position 1 is a similar distance from Edge Lane as the houses on the opposite side of the road, which are the nearest noise sensitive properties to the site. As traffic on Edge Lane is the primary source of noise affecting those houses, Position 1 is representative of the background noise level at the houses. A further measurement was made at the Premier Inn at Position 4, which is the next closest noise sensitive property.

During the night time (after 23:00) measurements were affected by noise from fireworks due to Liverpool winning the Premier League. Measurements where these fireworks affected the average level (L_{Aeq}) are highlighted in red in Figure 1. The background level (L_{A90}) was not significantly affected by the intermittent fireworks.

During the measurement periods the weather was generally dry with low average wind speeds. Road surfaces were dry. The equipment was calibrated before and after each survey with no significant drift noted.

The locations of the measurements are shown in Figure 2. The survey data is shown in Appendix 1.

Figure 2 – Noise measurement locations (timings approximate, see Appendix 1)

2.2 Modelled Noise Levels

Noise levels affecting the site are shown in Figure 3 calculated from the measurements made close to the main roads. Figure 4 shows the highest levels affecting each facade of the proposed studio buildings on Plot 2.

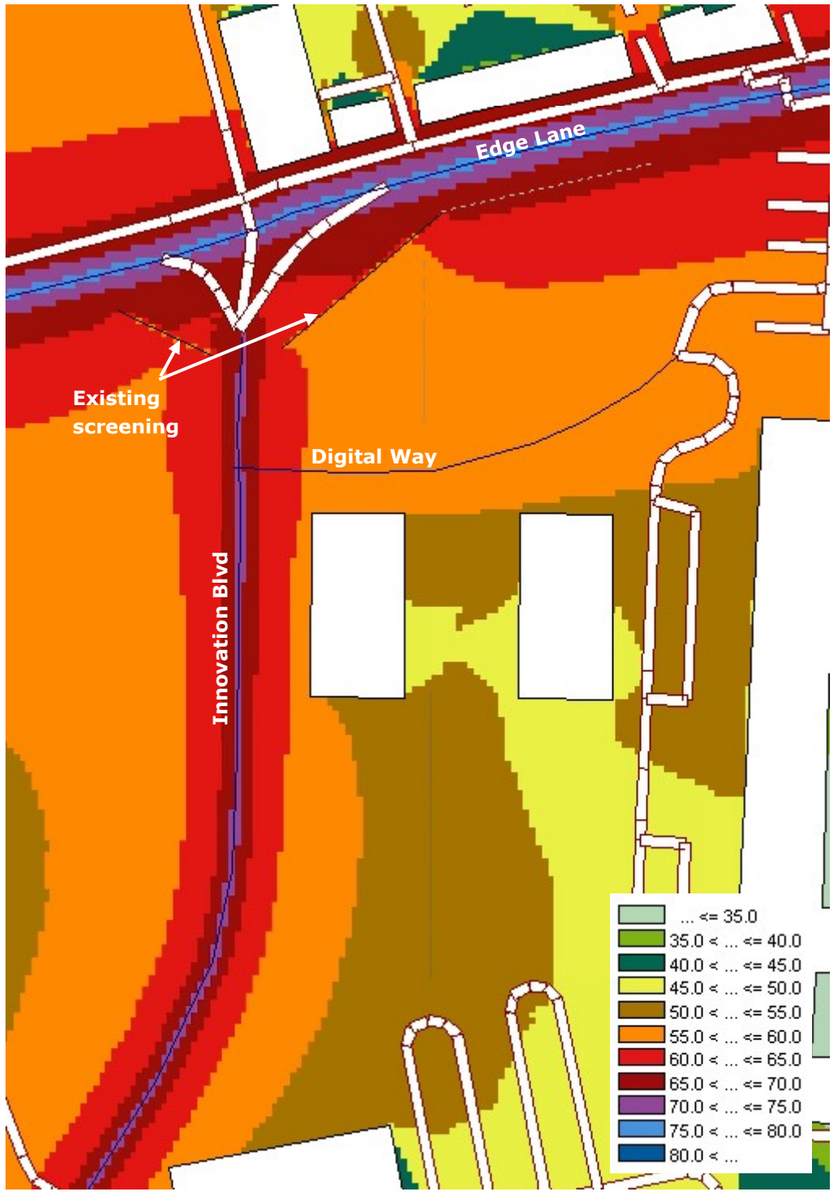

Figure 3 – Daytime site noise levels (L_{Aeq}) calculated from measurements

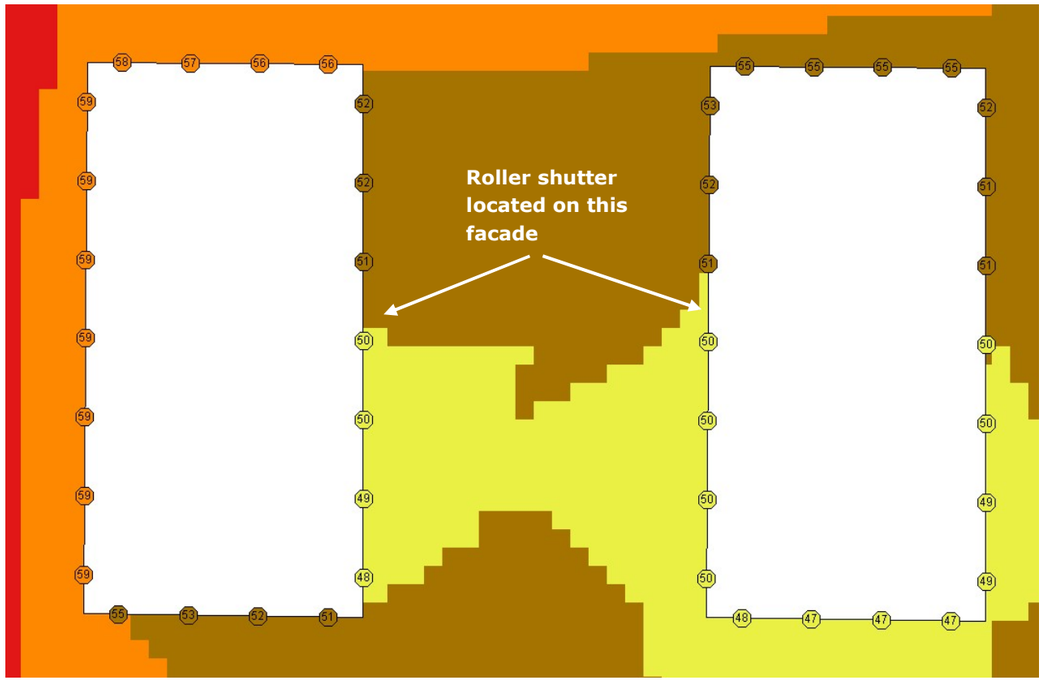

Figure 4 – Noise levels (L_{Aeq}) at the studio building facades

3. NOISE BREAK-IN

The proposed studio buildings will be constructed from lightweight metal sandwich panels, including the roof. A roller shutter door will be provided, located on the façades of the buildings that face each other and the central access road (see Figure 4), and therefore are perpendicular to Edge Lane. Personnel/escape doors are assumed to be solid metal/timber with weather seals. It is assumed that when quiet conditions are required for filming all doors will be closed.

Internal noise levels have been calculated based on the noise levels shown in Figure 4 and the typical sound insulation performance of a composite sandwich panel, 25dB R_w (Kingspan AWP/60 or KS1000RW/30, with no internal linings), for the walls and roof. In practice there is likely to be internal linings to a large proportion of the facades (from ground level up to a certain height) consisting of plasterboard with mineral wool insulation behind. This will further increase the sound insulation of the facades.

On this basis the unit closest to Innovation Boulevard would have internal levels of around 33dB L_{Aeq} during the noisiest parts of the day (assessed with rush hour levels). Noise levels outside of busy traffic times would be lower and are expected to be at least 10dB lower at night.

The second studio would be screened from Innovation Boulevard by the first studio and façade noise levels will be lower. Internal levels would be around 25dB L_{Aeq} during peak traffic times.

Any additional development of Plot 1, such as with bunding along the Edge Lane boundary, or erection of workshop buildings, would further reduce traffic noise levels across the site and internal noise levels are likely to be lower as a result.

Noise from vehicles or activity associated with the studios themselves would be managed by the studio and filming timed accordingly.

On this basis, the proposed location of the studio buildings and the form of construction are suitable to allow reasonable internal noise levels to be achieved which are suitable for the operation of the temporary studios.

4. NOISE BREAK-OUT

Noise levels that will be generated by activity inside the studios are not well defined and are expected to vary, however we are advised that given the nature of the activity in the buildings, they are normally relatively quiet. This includes activity both inside and around the outside of the studio buildings where quiet is required for filming. A lot of the particularly noisy scenes or sound effects are likely to be added in post-production rather than recorded live on set, so loud noises are expected to be infrequent. Note that for health and safety very loud noises such as gunshots or explosions are likely to be added off set to protect hearing.

As a worst case assessment of noise break out we have assumed:

- An average internal level at the limit of permissible noise at work limits (without hearing protection), 80dB L_{Aeq}. It is very unlikely that even short term average noise levels would approach this kind of level inside the buildings.
- Maximum noise levels of up to 90dB L_{AFmax} occurring on set (this is very unlikely in practice)
- Roller shutter door 3m x 5m, open
- Walls and roof achieving 25dB R_w (Kingspan AWP/60 or KS1000RW/30). In practice there will be additional internal linings at least part height to the facades.
- No intervening structures between the studios and houses providing screening. Any structures or bunding on Plot 1 will provide a degree of further noise reduction.

With the assumptions above the average noise level at the nearest properties would be around 35dB L_{Aeq}. This is more than 20dB lower than the lowest background level (L_{A90}) measured at the nearest sensitive properties at night (Figure 2). With the roller shutter door closed (which it would typically need to be for filming), levels would be lower still. For the vast majority of the time internal levels would be much lower than 80dB(A) and activity is unlikely to be audible at the nearest properties, even at night.

Assuming an open window providing a sound reduction of around 13dB(A), maximum noise levels inside the nearest sensitive properties would be around NR25 or lower and would meet the Liverpool City Council requirements for music/entertainment venues during the day or night. In practice loud maximum noise events during filming are expected to be rare and typically levels inside the nearest houses would be much lower than this.

Noise levels at the Liverpool Innovation Park offices approximately 45m to the east would be around 44dB L_{Aeq} (if internal levels in the studio were as high as 80dBA) and this is lower than traffic noise levels currently affecting this building (see Figure 3). Windows to these offices are normally closed and noise affecting the offices is not likely to be an issue.

Any night time filming (defined as between 23:00 – 07:30) will require Liverpool Film Council to be informed and any liaison with the Council will be made beforehand. Nearby residents will be consulted before any night time filming during the filming planning stages, typically via letter drops.

Crew and staff will be reminded to respect the local community when filming and will be encouraged to locate staff amenities and meeting areas away from sensitive receptors. Moving of technical and support vehicles will also be done in a manner that considers the impact on the surrounding properties, this may include vehicles remaining on site until the next morning before moving.

4.1 Vehicle Noise

Plot 1 is likely to be used primarily for car parking. Given the high volumes of traffic on Edge Lane, it is unlikely that vehicle movements on Plot 1 will increase the noise levels affecting the properties on the opposite side of Edge Lane. Though there will be 24 hour access for vehicles to the site, car park movements at night are expected to be limited and normal operation of the studios would be during daytime hours only (07:00 – 23:00).

There will be HGV access to the studios on Plot 2 and to Plot 1. The number of HGVs however will be low and HGV movements will be infrequent – typically they will remain at the site for the duration of filming. HGV movements will be done at times that consider the impact on the surrounding properties.

An example of the type of technical and support vehicles used during productions is shown below.

Figure 5 – Typical support vehicles

4.2 Workshops

Plot 1 or Plot 3 may be used to house workshops. These would be temporary marquee or rigid buildings. These are typically used by the costume or prop departments primarily for storage. They would not normally be used for heavy construction or noisy workshop machinery, and any noisy activity can be limited to daytime hours. An example of a prop workshop is shown below. Given the high background noise levels during the day from road traffic, noise from activity inside the workshops is not expected to cause disturbance at the nearest sensitive properties.

Figure 6 – Typical prop workshop

5. PLANT NOISE

Liverpool City Council guidance[2] requires that the "*rating noise from fixed plant should not exceed the existing background noise levels outside and habitable room window…"*. Assessments are to be in accordance with BS4142:2014[3].

Plant associated with the scheme may vary depending on the use of the buildings and the temporary equipment bought in by the users, but typically a primary source of noise would be external mobile generators. Low noise (or "super silent") generators are used as these are often located in urban areas close to residential properties during filming. It is usual practice to locate generators away from sensitive properties and to use other static vehicles to provide screening.

Specifications for example generators are shown below.

SPECIFICATION	EVENTA 20	EVENTA 37	NEW EVENTA 50	NEW EVENTA 60	EVENTA 100
AUXILIARY OUTPUT - CONTINUOUS (kVA)	20	37	50	60	100
AUXILIARY OUTPUT - STANDBY (kVA)	22	40.7	55	66	110
SOUND POWER LEVEL (dBLWA)	80	81	83	84	88
AVERAGE SOUND PRESSURE LEVEL @ 7MTRS	55dB(A)	56dB(A)	58dB(A)	59dB(A)	61dB(A)
ENGINE TYPE	Isuzu 4LE2 4 cylinder water cooled direct injection	Kubota V3800 4 cylinder water cooled direct injection turbocharged with after-cooler	Kubota V3800 4 cylinder water cooled direct injection turbocharged with after-cooler	Isuzu 4JJ1 4 cylinder water cooled direct injection turbocharged with after-cooler	Isuzu 4HK1 4 cylinder water cooled direct injection turbocharged with after-cooler
FUEL TANK CAPACITY	92 litres	170 litres	125 litres	150 litres	250 litres
FUEL CONSUMPTION LITRES PER HOUR @75% LOAD	3.5	6.7	8.7	8.6	16.7
RUNNING TIME	26 hours	25 hours	14 hours	17 hours	15 hours
DIMENSIONS LxWxH (mm)	1770 x 790 x 1170	2090 x 950 x 1470	2400 x 1000 x 1550	2500 x 1000 x 1605	3050 x 1240 x 1800
WET WEIGHT	885kg	1380kg	1700kg	1850kg	2720kg

Figure 7 – Example generator specifications

A 5dB penalty has been assumed for noise from generators and other plant to allow for any tonal, or intermittent qualities to the noise.

5.1 Nearest Noise Sensitive Properties

The nearest properties to the site are:

- The houses on Edge Lane
- Liverpool Innovation Park offices

Other properties are more distant or more screened from the scheme.

5.2 Measured Background Noise Levels

The noise levels measured are shown in Figure 2. The typical background noise level during the day and night, and the corresponding plant noise limits at each sensitive property are given below.

Location	Typical existing background noise level	Plant noise limit at the property (assuming a 5dB penalty)
Houses on Edge Lane	Day (07:00 – 23:00): 51 dB L_{A90} Night (23:00 – 07:00): 47 dB L_{A90}	Day: 46 dB L_{Aeq} Night: 42 dB L_{Aeq}
Liverpool Innovation Park	Day (07:00 – 23:00): 46 dB L_{A90} (at the southern end of the building) Night (23:00 – 07:00): n/a, non-residential	Day: 41 dB L_{Aeq} -

Table 1 – Plant noise limits at the nearest sensitive properties

As a guide, based on the noisiest generator in Figure 7, Eventa 100, producing 61dB(A) at 7m, the noise level at the houses on Edge Lane when the generator is located 100m away at the nearest part of Plot 2, would be around 38dB(A) and would meet the proposed noise limit. Screening from studio buildings, bunds or vehicles will reduce noise levels further.

[2] Policy CC21, d. ii., Liverpool Local Plan, January 2018

[3] British Standard 4142 Methods for rating and assessing industrial and commercial sound, +A1 2019 BSI, 2014

APPENDIX 1 – Noise Survey Details

Date of survey: Wednesday 22 July 2020
Personnel: Matthew Bull (Ramboll)
Equipment:

- Norsonic Nor140 s/n 1404236

During the measurement periods the weather was generally dry with low average wind speeds. Road surfaces were dry. The equipment was calibrated before and after each survey with no significant drift noted.

Position (ref. Fig 2)	Start Time	Duration (mins)	LAeq	LA90*
1	06:26	15	62.0	50.7
1	07:28	30	63.2	50.7
1	08:20	15	61.7	51.4
1	10:10	40	61.1	52.8
1	11:32	30	59.0	51.6
1	22:12	15	59.2	49.2
1	22:51	20	58.8	47.2
1	00:01	20	59.8	46.6
2	08:06	10	60.5	45.9
2	09:56	10	62.0	45.3
2	11:18	10	60.7	44.7
2	00:25	20	56.4	41.3
2	00:50	10	50.5	46.6
3	07:44	20	47.9	45.2
3	09:34	20	47.7	43.5
3	10:54	20	47.9	41.4
3	23:15	20	58.8	43.7
4	06:49	15	57.3	48.7
4	22:31	15	53.2	48.0
4	23:47	10	53.7	46.2

*measurement duration split into 5 minute periods, lowest LA90 shown