AtkinsRéalis

Post-Completion Noise Survey Report (Year 5)

Stockport Council

25th January 2024
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A6 TO MANCHESTER AIRPORT RELIEF ROAD

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1. Introduction

AtkinsRéalis has been instructed to conduct post-development noise monitoring for the A6 to Manchester Airport Relief Road (A6MARR) development at Year 5 after opening. This report details the survey methodology and the findings, together with an analysis of the results of the surveys compared to the results of the noise surveys conducted pre-development and Year 1 post-development, and the predicted modelled noise levels as part of the Environmental Statement (ES).

The post-development noise monitoring results presented in this report are from surveys conducted by AtkinsRéalis in October 2023.

The noise monitoring is based on the requirements stated in AtkinsRéalis' report titled 'A6 to Manchester Airport Relief Road Monitoring and Evaluation Plan' dated April 2014. The results of the 5-year post opening noise monitoring are compared against pre-development noise monitoring results detailed in Aecom's report titled 'A6 Manchester Airport Relief Road Pre-Development Noise Monitoring – October 2014' dated March 2015, the 1-year post-opening noise levels detailed in AtkinsRéalis report 'A6 to Manchester Airport Relief Road Post Completion Noise Survey Report (Year 1) dated October 2020, and the pre-development noise modelling results presented in the ES.

A glossary of acoustic terminology is provided in Appendix A.

2. Methodology

2.1 Introduction to Road Traffic Noise

Road traffic noise can be separated into two components. The first is generated by the engine, exhaust system and transmission of vehicles and is the dominant noise source when traffic is not freely flowing. This is particularly apparent in the case of heavy vehicles, when they are accelerating, braking, or changing gears, and this contributes a significant proportion of low frequency noise. The second noise source component is generated from the interaction of tyres with the road surface. This is the dominant noise source under free flow traffic conditions at moderate to high road speeds and contributes a significant proportion of higher frequency noise.

The sound from a stream of traffic at a reception point is an aggregation of noise from a number of vehicles at various distances. The factors that influence the noise level generated include the volume of traffic, vehicle speed, the composition of the traffic (i.e. the percentage of heavy goods vehicles (HGVs)), the gradient and the surface characteristics of the carriageway. In addition to the aforementioned variables, there is the propagation of the sound from the source to the receiver to consider. The propagation is affected by characteristics, such as the distance of the receptor from the source; the topography and characteristics of the ground between the source and receptor; the presence of any screening or barrier effects; reflection effects from buildings and walls in addition to meteorological factors including wind strength and direction.

Noise from traffic on a road will change as traffic flows alter during the day and will also fluctuate within shorter time periods as vehicles pass the reception point. In order to compare situations with different traffic noise levels it is necessary to use an index to produce single figure estimates of overall noise levels. The index used for road traffic noise is $L_{A10,18h}$, which is the arithmetic mean value of the 'A' weighted noise levels, which are exceeded for 10% of the time in each of the 18 one-hour periods between 06:00 hours and 00:00 hours (midnight). A reasonably good correlation has been shown to exist between traffic noise levels expressed in $L_{A10,18h}$ and residents' dissatisfaction with the noise experienced in their homes over a wide range of exposure levels.

The Calculation of Road Traffic Noise (CRTN)[1] advises that, within certain limits, a shortened measurement procedure can be used to calculate $L_{A10,18h}$. Paragraph 43 of CRTN outlines this method:

"Measurements of L_{10} are made over any three consecutive hours between 1000 and 1700 hours. Using $L_{10\ (3\ hour)}$ as the arithmetic mean of the three consecutive values of hourly L_{10}, the current value of $L_{10\ (18\ hour)}$ can be calculated from the relation:

$$L_{10}(18-hour) = L_{10}(3\ hour) - 1dB(A)$$

where $L_{10}(3\ hour) = {}^{1}/_{3} \sum_{10 \le t \ge 14}^{t+2} L_{10}(hourly)$

and t signifies the start time of the individual hourly L_{10} *dB(A) values*."

A measurement period of 15-minutes has been undertaken within each hour at each location in accordance with the guidance set out in paragraph 41.2 of CRTN.

[1] Calculation of Road Traffic Noise - Department of Transport, Welsh Office, (1988)

2.2 Monitoring Method

Noise monitoring has followed the shortened measurement procedure described in CRTN.

Section III of CRTN provides guidance on the measurement methodology, including guidance on weather conditions, equipment requirements, and measurement procedure. Any noise contribution from sources other than road traffic (e.g. aircraft noise) has been excluded from the measurements.

The results of the measurements have been used to calculate the $L_{10\ (18\text{-hour})}$ dB(A) level at that location. The results of the monitoring will be compared against the measurements conducted during the pre-development and Year 1 post-development.

2.3 Survey Equipment

All noise surveys were undertaken using a Class 1 (as defined in the British Standard (BS) EN 61672-1:2013[2]).

Sound Level Meter. The specific equipment used for the surveys was:

- Kit 1:
  - Rion type NL-52 Sound Level Meter, Serial Number 00620854;
  - Rion type NC-74 Acoustical Calibrator, Serial Number 35125802;
- Kit 2:
  - Rion type NL-52 Sound Level Meter, Serial Number 00620855;
  - Rion type NC-74 Acoustical Calibrator, Serial Number 35125803;

The calibration of the equipment was checked before and after each set of measurements and there was no significant drift in calibration levels. Calibration certificates for the equipment are available on request. The noise monitoring was undertaken following the principles of BS 7445-1:20034.

2.4 Survey Dates

Daytime measurements were carried out between 10:00 and 17:00 hours in October 2023. Details of monitoring at each location can found in Section 3 of this report.

Monitoring has been carried out during normal working weekdays (e.g. outside of school holidays).

2.5 Weather Conditions

All surveys were conducted during suitable weather conditions (wind speeds less than 5 metres per second, no precipitation) and the conditions were monitored during the surveys using a handheld anemometer. Weather conditions are detailed for each location in Section 3 of this report.

[2] British Standards Institute, (2013); BS EN 61672-1 Electroacoustics. Sound level meters Specifications, BSI, London.

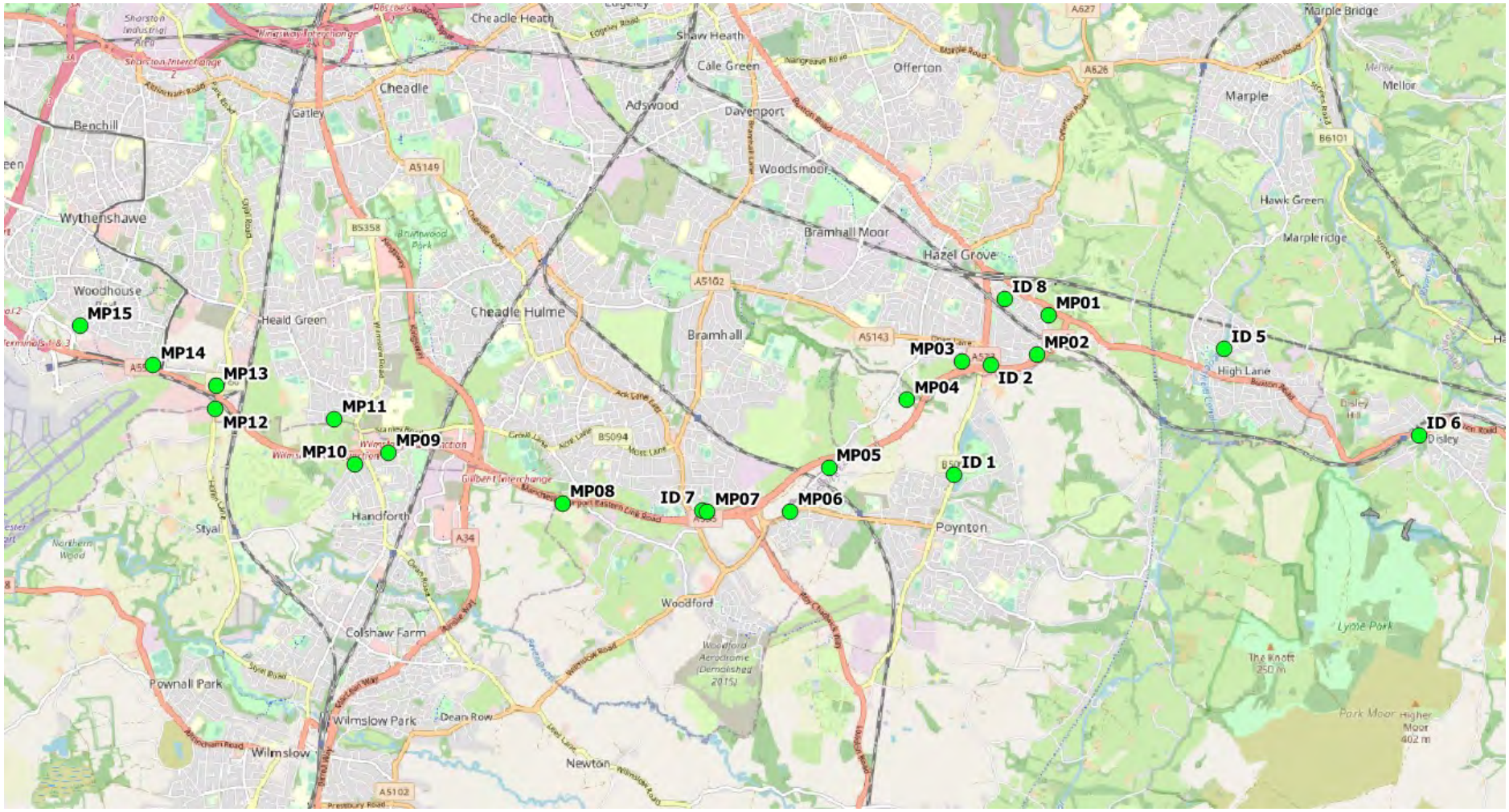
2.6 Sound Level Indicators

The measurements consisted of ambient ($L_{Aeq,T}$), maximum (L_{Amax}), and statistical ($L_{A10,T}$, $L_{A90,T}$) sound level indicators over three consecutive 1 hour periods. The sample period was 15-minutes.

2.7 Monitoring Locations

The noise monitoring locations replicate those used during Year 1 post-development noise monitoring in 2019. These locations are the same as the pre-development noise monitoring in October 2019, detailed in Aecom's report titled 'A6 Manchester Airport Relief Road Pre-Development Noise Monitoring – October 2014'. The monitoring locations are shown graphically in Figure 1.

Figure 1: Noise Monitoring Locations



3. Monitoring Results

3.1 Monitoring Location: ID 1 (Glastonbury Drive, Poynton)

- Date: 10th October 2023
- Easting/Northing: 392196/384191
- Monitoring equipment: Kit 2
- Weather conditions: Wind:0m/s, 14°C, dry, four oktas cloud cover, 70% humidity, 1014 millibars atmospheric pressure.

Figure 2: ID 1 Monitoring Location (Glastonbury Drive, Poynton)

The results of the monitoring at this location are provided below.

Table 1: ID 1 Noise Monitoring Results (Glastonbury Drive, Poynton)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
10/10/2023 10:41	71.6	89.5	75.7	56.6
10/10/2023 11:00	71.4	90.0	75.2	54.7
10/10/2023 12:42	70.9	90.3	74.7	53.8
		Average L_{A10}	75.2	
		$L_{A10,18h}$	74.2	

The dominant source of noise at this location was road traffic on the A523.

3.2 Monitoring Location: ID 2, 3 and 4 (Macclesfield Road Residential Areas)

- Date: 17th October 2023
- Easting/Northing: 392609/385434
- Monitoring equipment: Kit 2
- Weather conditions: Wind:1m/s, 7°C, dry, 2 oktas cloud cover, 80% humidity, 1017 millibars atmospheric pressure.

Figure 3: ID 2, 3, 4 Monitoring Location (Macclesfield Road Residential Areas)

The results of the monitoring at this location are provided below.

Table 2: ID 2, 3, 4 Noise Monitoring Results (Macclesfield Road Residential Areas)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
17/10/2023 10:28	52.4	65.0	55.2	46.2
17/10/2023 11:00	52.9	66.1	55.8	45.7
17/10/2023 12:00	54.3	64.8	57.8	48.0
		Average L_{A10}	56.3	
		$L_{A10,18h}$	55.3	

The dominant noise source at this location was road traffic on the A555 to the south and Macclesfield Road to the west. Noise from other roads is not distinguishable. When traffic lights stop the traffic on A555, the sound environment was much quieter. This location is sheltered from these roads by an embankment and roadside barriers.

3.3 Monitoring Location: ID 5 (High Lane)

- Date: 16th October 2023
- Easting/Northing: 395243/385609
- Monitoring equipment: Kit 2
- Weather conditions: Wind:1m/s, 4°C, dry, 2 oktas cloud cover, 90% humidity, 1023 millibars atmospheric pressure.

Figure 4: ID 5 Monitoring Location (High Lane)

The results of the monitoring at this location are provided below.

Table 3: ID 5 Noise Monitoring Results (High Lane)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
16/10/2023 10:00	49.1	71.4	49.2	39.0
16/10/2023 11:33	48.4	71.0	46.1	40.3
16/10/2023 12:12	52.4	74.4	48.9	40.6
		Average L_{A10}	48.1	
		$L_{A10,18h}$	47.1	

The dominant noise source at this location was distant traffic noise, predominately the A6 to the south, with occasional traffic movements on local roads. Birds, dogs and church bells were occasionally audible.

3.4 Monitoring Location: ID 6 (Disley)

- Date: 16th October 2023
- Easting/Northing: 397445/384635
- Monitoring equipment: Kit 2
- Weather conditions: Wind:0m/s, 4°C, dry, 2 oktas cloud cover, 90% humidity, 1023 millibars atmospheric pressure.

Figure 5: ID 6 Monitoring Location (Disley)

The results of the monitoring at this location are provided below.

Table 4: ID 6 Noise Monitoring Results (Disley)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
16/10/2023 10:36	68.1	82.5	71.3	59.2
16/10/2023 11:00	68.4	83.0	71.6	59.3
16/10/2023 12:36	70.1	92.8	70.8	58.9
		Average L_{A10}	71.2	
		$L_{A10,18h}$	70.2	

The dominant noise source at this location was traffic road on the A6 to the north of the measurement location. Occasionally crossing alert from the traffic light was audible.

3.5 Monitoring Location: ID 7 (Queensgate Primary School)

- Date: 17th October 2023
- Easting/Northing: 389352/383794
- Monitoring equipment: Kit 1
- Weather conditions: Wind:0m/s, 7°C, dry, 2 oktas cloud cover, 80% humidity, 1017 millibars atmospheric pressure.

Figure 6: ID 7 Monitoring Location (Queensgate Primary School)

The results of the monitoring at this location are provided below.

Table 5: ID 7 Noise Monitoring Results (Queensgate Primary School)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
17/10/2023 10:25	60.0	84.3	61.8	57.2
17/10/2023 11:15	60.7	79.8	62.6	57.8
17/10/2023 12:14	59.9	75.7	61.6	57.1
		Average L_{A10}	62.0	
		$L_{A10,18h}$	61.0	

The main noise at this location was road traffic from the A555 to the south. The traffic noise is clearly audible at the measurement location. The sound level meter was left unattended between approximately 9:50 and 13:50. Samples were selected for each hour between 10:00 and 13:00 which contained the least noise contribution from children (e.g. during break-times).

3.6 Monitoring Location: ID 8 (Macclesfield Road A6 Junction – Kyle Road)

- Date: 12th October 2023
- Easting/Northing: 392767/386172
- Monitoring equipment: Kit 2
- Weather conditions: Wind:1m/s, 7°C, dry, two oktas cloud cover, 80% humidity, 1014 millibars atmospheric pressure.

Figure 7: ID 8 Monitoring Location (Macclesfield Road A6 Junction – Kyle Road)

The results of the monitoring at this location are provided below.

Table 6: ID 8 Noise Monitoring Results (Macclesfield Road A6 Junction – Kyle Road)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
12/10/2023 10:23	48.9	70.1	51.7	43.1
12/10/2023 11:19	47.8	70.7	49.9	42.3
12/10/2023 12:21	59.9	84.1	60.8	51.1
		Average L_{A10}	54.1	
		$L_{A10,18h}$	53.1	

The dominant noise source at this location was distant traffic from all directions. There was construction work underway affecting the measurement starting from 12:21. Consideration may be given to reassessing this location once construction activity to the north has ceased.

3.7 Monitoring Location: MP01 (Cranleigh Drive)

- Date: 12th October 2023
- Easting/Northing: 393261/385990
- Monitoring equipment: Kit 2
- Weather conditions: Wind:0m/s, 7°C, dry, 2 oktas cloud cover, 80% humidity, 1014 millibars atmospheric pressure.

Figure 8: MP01 Monitoring Location (Cranleigh Drive)

The results of the monitoring at this location are provided below.

Table 7: MP01 Noise Monitoring Results (Cranleigh Drive)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
12/10/2023 10:44	45.4	65.0	46.6	38.6
12/10/2023 11:00	44.3	66.2	46.7	39.6
12/10/2023 12:41	43.8	67.1	45.1	38.3
		Average L_{A10}	46.1	
		$L_{A10,18h}$	45.1	

The dominant noise source at this location was road traffic on the realigned A6 to the northeast of the monitoring location. The realigned A6 to the north is screened at this location by an earth bund. HGV noise could be distinguished from the background but was not intrusive. Occasionally trains and aeroplanes were audible.

3.8 Monitoring Location: MP02 (Old Mill Lane)

- Date: 12th October 2023
- Easting/Northing: 393128/385539
- Monitoring equipment: Kit 2
- Weather conditions: Wind:0m/s, 7°C, dry, 2 oktas cloud cover, 80% humidity, 1014 millibars atmospheric pressure.

Figure 9: MP02 Monitoring Location (Old Mill Lane)

The results of the monitoring at this location are provided below.

Table 8: MP02 Monitoring Location (Old Mill Lane)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
12/10/2023 10:01	52.5	64.5	55.5	44.2
12/10/2023 11:41	52.2	67.6	54.9	44.8
12/10/2023 12:00	52.2	72.1	54.9	43.9
		Average L_{A10}	55.1	
		$L_{A10,18h}$	54.1	

The dominant source of noise at this location was road traffic on the A555 to the south. Road traffic on other distant roads was not discernible.

3.9 Monitoring Location: MP03 (Sheldon Road)

- Date: 16th October 2023
- Easting/Northing: 392286/385472
- Monitoring equipment: Kit 1
- Weather conditions: Wind:1m/s, 6°C, dry, two oktas cloud cover, 90% humidity, 1023 millibars atmospheric pressure.

Figure 10: MP03 Monitoring Location (Sheldon Road)

The results of the monitoring at this location are provided below.

Table 9: MP03 Noise Monitoring Results (Sheldon Road)

Date and time	$L_{Aeq,\ 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90,\ 15min}$, dB
16/10/2023 10:00	50.7	65.5	53.0	42.6
16/10/2023 11:26	50.5	62.1	53.4	44.6
16/10/2023 12:01	49.6	64.1	53.1	42.4
		Average L_{A10}	53.2	
		$L_{A10,18h}$	52.2	

The dominant noise source at this location was road traffic noise from the A555 to the south. There were also contributions from local road network. Occasional construction noise from 4 Sheldon Road was audible.

3.10 Monitoring Location: MP04 (Mill Hill Hollow)

- Date: 16th October 2023
- Easting/Northing: 391662/385035
- Monitoring equipment: Kit 1
- Weather conditions: Wind:1m/s, 6°C, dry, two oktas cloud cover, 90% humidity, 1023 millibars atmospheric pressure.

Figure 11: MP04 Monitoring Location (Mill Hill Hollow)

The results of the monitoring at this location are provided below.

Table 10: MP04 Noise Monitoring Results (Mill Hill Hollow)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
16/10/2023 10:25	44.9	54.1	47.1	41.4
16/10/2023 11:03	45.1	69.4	46.9	42.5
16/10/2023 12:25	47.2	56.1	49.3	43.9
		Average L_{A10}	47.8	
		$L_{A10,18h}$	46.8	

The dominant noise source at this location was distant road traffic from the A555 to the east. New fences have been built along the driveway and the noise was shielded at the measurement location.

3.11 Monitoring Location: MP05 (Woodford Road)

- Date: 10th October 2023
- Easting/Northing: 390781/384271
- Monitoring equipment: Kit 2
- Weather conditions: Wind:0m/s, 14°C, dry, four oktas cloud cover, 80% humidity, 1014 millibars atmospheric pressure.

Figure 12: MP05 Monitoring Location (Woodford Road)

The results of the monitoring at this location are provided below.

Table 11: MP05 Noise Monitoring Results (Woodford Road)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
10/10/2023 10:18	65.2	82.2	69.5	48.0
10/10/2023 11:41	65.6	84.5	69.7	46.7
10/10/2023 12:00	65.7	82.5	69.9	48.0
		Average L_{A10}	69.7	
		$L_{A10,18h}$	68.7	

The main source of noise at this location was road traffic on Woodford Road. Road traffic noise on A555 formed the background. It was relatively quiet when there was no local traffic on Woodford Road.

3.12 Monitoring Location: MP06 (Chester Road)

- Date: 10th October 2023
- Easting/Northing: 390346/383777
- Monitoring equipment: Kit 2
- Weather conditions: Wind:0m/s, 13°C, dry, four oktas cloud cover, 80% humidity, 1014 millibars atmospheric pressure.

Figure 13: MP06 Monitoring Location (Chester Road)

The results of the monitoring at this location are provided below.

Table 12: MP06 Noise Monitoring Results (Chester Road)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
10/10/2023 10:00	71.9	83.7	76.1	57.6
10/10/2023 11:22	71.8	82.8	75.5	59.5
10/10/2023 12:19	71.8	80.6	75.4	59.8
		Average L_{A10}	75.7	
		$L_{A10,18h}$	74.7	

The main source of noise at this location was road traffic on Chester Road. Noise levels fluctuated significantly due to the close distance to the road and non-stable traffic flow. When no local vehicles passed by, it was much quieter.

3.13 Monitoring Location: MP07 (Albany Road)

- Date: 10th October 2023
- Easting/Northing: 389410/383776
- Monitoring equipment: Kit 1
- Weather conditions: Wind:0m/s, 13°C, dry, four oktas cloud cover, 80% humidity, 1014 millibars atmospheric pressure.

Figure 14: MP07 Monitoring Location (Albany Road)

The results of the monitoring at this location are provided below.

Table 13: MP07 Noise Monitoring Results (Albany Road)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
10/10/2023 10:00	51.4	72.4	53.1	49.3
10/10/2023 11:32	52.1	70.5	54.2	48.5
10/10/2023 12:01	52.0	66.4	54.0	49.2
		Average L_{A10}	53.8	
		$L_{A10,18h}$	52.8	

The dominant source of noise at the location was road traffic on the A555. There were also occasional local traffic movements. Noise from the school was audible occasionally.

3.14 Monitoring Location: MP08 (Dairy House Lane)

- Date: 10th October 2023
- Easting/Northing: 387772/383865
- Monitoring equipment: Kit 1
- Weather conditions: Wind:0m/s, 13°C, dry, four oktas cloud cover, 80% humidity, 1014 millibars atmospheric pressure.

Figure 15: MP08 Monitoring Location (Dairy House Lane)

The results of the monitoring at this location are provided below.

Table 14: MP08 Noise Monitoring Results (Dairy House Lane)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
10/10/2023 10:30	66.0	80.3	68.2	61.5
10/10/2023 11:00	64.7	77.7	66.9	60.1
10/10/2023 12:32	64.9	77.1	66.9	60.7
		Average L_{A10}	67.3	
		$L_{A10,18h}$	66.3	

The main source of noise at this location was road traffic on the A555 to the south. There were also occasional traffic movements on Dairy House Lane.

3.15 Monitoring Location: MP09 (Swettenham Road)

- Date: 9th October 2023
- Easting/Northing: 385806/384439
- Monitoring equipment: Kit 1
- Weather conditions: Wind:1m/s, 16°C, dry, four 8 oktas cloud cover, 80% humidity, 1020 millibars atmospheric pressure.

Figure 16: MP09 Monitoring Location (Swettenham Road)

The results of the monitoring at this location are provided below.

Table 15: MP09 Noise Monitoring Results (Swettenham Road)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
09/10/2023 11:20	51.3	64.3	53.6	47.2
09/10/2023 12:21	52.5	80.0	54.0	47.0
09/10/2023 13:19	51.5	64.1	53.4	48.4
		Average L_{A10}	53.7	
		$L_{A10,18h}$	52.7	

The main source of noise at this location was road traffic noise on the A555 to the north. Bird chirping was in the background. Dog barking was audible occasionally. A new fence has been built, although it was unlikely to affect the measurement location.

3.16 Monitoring Location: MP10 (Clay Lane)

- Date: 9th October 2023
- Easting/Northing: 385423/384308
- Monitoring equipment: Kit 1
- Weather conditions: Wind:0 m/s, 16°C, dry, eight oktas cloud cover, 80% humidity, 1020 millibars atmospheric pressure.

Figure 17: MP10 Monitoring Location (Clay Lane)

The results of the monitoring at this location are provided below.

Table 16: MP10 Noise Monitoring Results (Clay Lane)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
09/10/2023 11:00	57.5	78.2	59.2	50.7
09/10/2023 12:39	54.4	69.7	57.7	48.2
09/10/2023 13:00	58.9	79.3	61.4	47.6
		Average L_{A10}	59.4	
		$L_{A10,18h}$	58.4	

The main source of noise at this location was road traffic noise on the A555 to the north and Wallingford Road. The local traffic on Wallingford Road generated pass-by noise events, whilst the traffic on A555 formed the background.

3.17 Monitoring Location: MP11 (Bolshaw Farm Lane)

- Date: 9th October 2023
- Easting/Northing: 385198/384821
- Monitoring equipment: Kit 1
- Weather conditions: Wind:0 m/s, 11°C, dry, four oktas cloud cover, 80% humidity, 995 millibars atmospheric pressure.

Figure 18: MP11 Monitoring Location (Bolshaw Farm Lane)

The results of the monitoring at this location are provided below.

Table 17: MP11 Noise Monitoring Results (Bolshaw Farm Lane)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
09/10/2023 11:42	48.6	66.2	51.6	41.0
09/10/2023 12:00	46.3	64.3	49.1	38.9
09/10/2023 13:40	47.3	66.3	50.2	38.4
		Average L_{A10}	50.3	
		$L_{A10,18h}$	49.3	

The main source of noise at this location was distant road traffic on the A555 to the south and Bolshaw Road to the north. Aircraft were occasionally audible and birds' chirping was in the background.

3.18 Monitoring Location: MP12 (Styal Road)

- Date: 9th October 2023
- Easting/Northing: 383854/384932
- Monitoring equipment: Kit 2
- Weather conditions: Wind:0 m/s, 11°C, dry, four oktas cloud cover, 80% humidity, 995 millibars atmospheric pressure.

Figure 19: MP12 Monitoring Location (Styal Road)

The results of the monitoring at this location are provided below.

Table 18: MP12 Noise Monitoring Results (Styal Road)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
09/10/2023 10:30	65.4	77.0	69.7	54.0
09/10/2023 11:00	65.7	81.3	69.5	55.1
09/10/2023 12:00	65.8	76.1	70.1	54.8
		Average L_{A10}	69.8	
		$L_{A10,18h}$	68.8	

The main source of noise at this location was road traffic on Styal Road and distant road traffic on the A555 to the north. Aircrafts were also occasionally audible, but not intrusive due to the masking effect of the road traffic.

3.19 Monitoring Location: MP13 (Tedder Drive)

- Date: 4th October 2023
- Easting/Northing: 383858/385191
- Monitoring equipment: Kit 1
- Weather conditions: Wind:3m/s, 13°C, dry, eight oktas cloud cover, 90% humidity, 1023 millibars atmospheric pressure.

Figure 20: MP13 Monitoring Location (Tedder Drive)

The results of the monitoring at this location are provided below.

Table 19: MP13 Noise Monitoring Results (Tedder Drive)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
04/10/2023 10:44	60.8	74.8	63.1	57.5
04/10/2023 11:00	59.7	78.0	61.4	54.7
04/10/2023 12:44	57.6	74.8	59.6	52.9
		Average L_{A10}	61.4	
		$L_{A10,18h}$	60.4	

The main source of noise at this location was road traffic noise on the A555 to the south and the B5166 to the east. The road traffic constantly formed the ambient sound environment. Aircrafts were occasionally audible, and birds' songs were also in the background.

3.20 Monitoring Location: MP14 (Carsdale Road)

- Date: 4th October 2023
- Easting/Northing: 383150/385424
- Monitoring equipment: Kit 1
- Weather conditions: Wind:4m/s, 13°C, dry, eight oktas cloud cover, 90% humidity, 1023 millibars atmospheric pressure.

Figure 21: MP14 Monitoring Location (Carsdale Road)

The results of the monitoring at this location are provided below.

Table 20: MP14 Noise Monitoring Results (Carsdale Road)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
04/10/2023 10:22	65.7	84.6	67.3	63.7
04/10/2023 11:21	63.2	96.6	65.4	59.9
04/10/2023 12:21	63.5	90.7	65.9	59.0
		Average L_{A10}	66.2	
		$L_{A10,18h}$	65.2	

The main noise source at this location was road traffic on the A555 and aircraft landing into Manchester Airport. The aircraft movements have been excluded from the data. Other sources included occasional local road traffic, Metrolink trams to the south, and train movements to the south. After 11:00am, the number of aircraft movements reduced significantly, and the road traffic on A555 was the only dominant source.

3.21 Monitoring Location: MP15 (Felskirk Road/Thaxted Walk)

- Date: 4th October 2023
- Easting/Northing: 382322/385869
- Monitoring equipment: Kit 1
- Weather conditions: Wind:1m/s, 12°C, dry, eight oktas cloud cover, 90% humidity, 1023 millibars atmospheric pressure.

Figure 22: MP15 Monitoring Location (Felskirk Road/Thaxted Walk)

The results of the monitoring at this location are provided below.

Table 21: MP15 Noise Monitoring Results (Felskirk Road/Thaxted Walk)

Date and time	$L_{Aeq, 15min}$, dB	$L_{Amax,15min}$, dB	$L_{A10,15min}$, dB	$L_{A90, 15min}$, dB
04/10/2023 10:00	51.4	84.0	53.1	49.4
04/10/2023 11:43	51.2	88.4	52.4	49.8
04/10/2023 12:00	51.9	100.4	53.3	50.2
		Average L_{A10}	52.9	
		$L_{A10,18h}$	51.9	

The main noise source at this location was road traffic on the A555 and aircraft landing into Manchester Airport. The aircraft movements have been excluded from the data. After 11:00am, the number of aircraft movements reduced significantly, and the road traffic on A555 was the only dominant source. It is noted that a new barrier to the southwest of the Thaxted Walk has been built separating the residential properties and the A555 link road, as well as a new car parking area on the other side of the barrier.

4. Summary of Survey Results

The finding of the 5-year post-development noise survey are provided in Table 22. The results are compared against the 2014 pre-development noise levels and 1-year post-development noise surveys. The monitoring locations which have been modified/ subject to some change since the 1 Year surveys are summarised as follows:

- MP04 – new fences at rear, relative to A555. May have a marginal effect on noise levels at measurement location.
- MP09 – new fence at tangent to A555 but not close to measurement location. Not likely ot have an effect on measured noise levels.
- MP15 – new fence between dwellings on new car park with A555 beyond. Likey to have an effect on noise levels at measurement location.

These are shown in Appendix B.

Table 22: Summary of Measured Noise Levels

Location ID	Location Description	Measured Pre-Development Noise Level, dB $L_{A10,18h}$	Measured Post-Development Noise Level, dB $L_{A10,18h}$		Change Post-Development Year 5 Compared to Pre-Development, dB	Change Post-Development Year 5 Compared to Post-Development, Year 1, dB
			Year 1	Year 5		
ID 1[(1)]	Glastonbury Drive	77.2	77.9	74.2	-3.0	-3.7
ID 2, 3, 4	Residential Areas backing onto A555 near Macclesfield Road	58.8	52.9	55.3	-3.5	+2.4
ID 5[(2)]	High Lane	51.6	50.6	47.1	-4.5	-3.5
ID 6	Disley	69.9	69.6	70.2	+0.3	+0.6
ID 7[(3)]	Queensgate Primary School	59.5	58.5	61.0	+1.5	+2.5
ID 8[(4)]	Kyle Road	56.1	60.5	53.1	-3.0	-7.4
MP01	Cranleigh Drive	53.7	49.6	45.1	-8.6	-4.5
MP02[(5)]	Old Mill Lane	53.4	61.0	54.1	+0.7	-6.9

Location ID	Location Description	Measured Pre-Development Noise Level, dB $L_{A10,18h}$	Measured Post-Development Noise Level, dB $L_{A10,18h}$		Change Post-Development Year 5 Compared to Pre-Development, dB	Change Post-Development Year 5 Compared to Post-Development, Year 1, dB
			Year 1	Year 5		
MP03	Sheldon Road	51.3	53.5	52.2	+0.9	-1.3
MP04[6]	Mill Hill Hollow	46.0	51.9	46.8	+0.8	-5.1
MP05	Woodford Road	74.3	70.3	68.7	-5.6	-1.6
MP06	Chester Road	76.8	75.8	74.7	-2.1	-1.1
MP07	Albany Road	53.5	54.0	52.8	-0.7	-1.2
MP08	Dairy House Lane	66.7	66.7	66.3	-0.4	-0.4
MP09	Swettenham Road	54.9	52.4	52.7	-2.2	+0.3
MP10[7]	Clay Lane	56.5	53.7	58.4	+1.9	+4.7
MP11	Bolshaw Farm Lane	53.7	51.0	49.3	-4.4	-1.7
MP12	Styal Road	73.1	67.5	68.8	-4.3	+1.3
MP13[8]	Tedder Drive	59.5	55.1	60.4	+0.9	+5.3
MP14[9]	Carsdale Road	64.3	59.7	65.2	+0.9	+5.5
MP15	Felskirk Road/Thaxted Walk	56.4	51.5	51.9	-4.5	+0.4

Note (1): this position is within 10 m to the main noise source London Road and is not significantly affected by other sources. The changes are likely caused by changes in traffic flow, heavy good vehicle (HGV) composition and vehicle speed.

Note (2): this position is relative far from A6 and a dense residential area is between the measurement position and A6 which reduce the noise from A6. In this case, the road traffic on local roads may cause the noise level to fluctuate in a larger range.

Note (3): this position is mainly affected by A555 and is not significantly affected by other sources. The increase is likely caused by traffic flow, HGV percentage and vehicle speed on A555.

Note (4): this position was affected by construction noise in the post-development Year 1 survey. In the post-development Year 5 survey, only the measurement during the third hour was affected by construction noise.

Note (5): the measurement position is within 50 m to the main noise source A555 and is not significantly affected by other sources. No significant changes between post-development Year 1 and Year 5, except the ground condition has been covered by dense green grass which may provide extra ground absorption to noise.

Note (6): two new timber fences have been built compared to post-development Year 1 which provides noise reduction.

Note (7): this position is within 50 m to the main noise source A555 and is not significantly affected by other sources. The change is likely due to traffic flow, HGV percentage and vehicle speed on A555.

Note (8): the position is within 100 m to the main noise source A555 and B5166. The survey position is not significantly affected by other sources. The change is likely due to traffic flow, HGV percentage and vehicle speed on A555.

Note (9): the position is within 40 m to the main source A555. Other local traffic may affect the noise level, but unlikely significant. The increase is likely caused by traffic flow, HGV percentage and vehicle speed on A555.

5. Analysis

This section provides an analysis of the results of the noise surveys as a comparison with modelled data. Where possible, comparative data is taken from the most appropriate representative receptor from the modelling conducted for the noise insulation regulations assessment[3]. Alternatively, reference is made to the predicted change in noise level from the modelling conducted as part of the ES for the scheme.

The results of the comparative assessment are shown in Table 23.

In summary, the measured noise levels broadly correlate with the results of the noise modelling exercises. Where there is divergence, the modelling is shown to have been generally conservative, as would be expected, with the measured change in noise level generally being lower than predicted. It is also noted that the measured noise levels, particularly during the pre-development surveys away from the A6MARR route corridor or other pre-existing major roads, would include contributions from extraneous noise sources (such as traffic on minor roads, etc) which would not be present in the model. The model would therefore under-predict the noise levels in these areas compared to the measured levels.

[3] The computer noise modelling conducted for the Noise Insulation Regulations assessment is based on predicted traffic flows in the year 2032. As such, comparison with measured levels in 2023 should be regarded as indicative only.

Table 23: Comparison of Modelled and Measured Noise Levels

Location ID	Location Description	Measured Post-Development Noise Level, dB $L_{A10,18h}$			Modelled Noise Level, dB $L_{A10,18h}$			Analysis
		Pre-Development	Post-Development (5-year)	Change, dB	Pre-Development	Post-Development	Change, dB	
ID 1	Glastonbury Drive	77.2	74.2	-3.0	-	-	0[4]	Measured impact lower than predicted in ES
ID 2, 3, 4	Residential Areas backing onto A555 near Macclesfield Road	58.8	55.3	-3.5	50.6	54.6	+4.0	Measured impact lower than predicted in ES
ID 5	High Lane	51.6	47.1	-4.5	-	-	0[4]	Measured impact lower than predicted in ES
ID 6	Disley	69.9	70.2	+0.3	-	-	0[4]	Measured impact comparable to that predicted in ES
ID 7	Queensgate Primary School	59.5	61.0	+1.5	-	-	-1[4]	Measured impact marginally higher than predicted in ES. However, there was some contamination from children playing. Comparable nearby measurement location MP07 shows reduction in noise level.

[4] Indicative predicted change from the ES modelling

Location ID	Location Description	Measured Post-Development Noise Level, dB $L_{A10,18h}$			Modelled Noise Level, dB $L_{A10,18h}$			Analysis
		Pre-Development	Post-Development (5-year)	Change, dB	Pre-Development	Post-Development	Change, dB	
ID 8	Kyle Road	56.1	53.1	-3.0	-	-	0[4]	Measured impact lower than predicted in ES
MP01	Cranleigh Drive	53.7	45.1	-8.6	49.6	46.6	-3.0	Measured impact lower than predicted in ES
MP02	Old Mill Lane	53.4	54.1	+0.7	54.1	61.6	+7.5	Measured impact lower than predicted in ES. Reduction due to construction of noise barrier in this location.
MP03	Sheldon Road	51.3	52.2	+0.9	46.9	54.3	+7.4	Measured impact lower than predicted in ES, but comparable post-development level.
MP04	Mill Hill Hollow	46.0	46.8	+0.8	41.8	52.5	+10.7	Measured impact lower than predicted in ES. Reduction may be due to new fencing at this location.
MP05	Woodford Road	74.3	68.7	-5.6	62.3	63.5	+1.2	Measured impact lower than predicted in ES. However, absolute noise level higher than predicted. This is due to traffic on Woodford Road rather than traffic on the A555.
MP06	Chester Road	76.8	74.7	-2.1	-	-	0[4]	Measured impact lower than predicted in ES

Location ID	Location Description	Measured Post-Development Noise Level, dB $L_{A10,18h}$			Modelled Noise Level, dB $L_{A10,18h}$			Analysis
		Pre-Development	Post-Development (5-year)	Change, dB	Pre-Development	Post-Development	Change, dB	
MP07	Albany Road	53.5	52.8	-0.7	45.1	53.7	+8.6	Measured impact lower than predicted in ES. However, absolute noise level comparable to predicted level.
MP08	Dairy House Lane	66.7	66.3	-0.4	62.0	65.4	+3.4	Measured impact lower than predicted in ES. However, absolute noise level comparable to predicted level.
MP09	Swettenham Road	54.9	52.7	-2.2	53.6	57.4	+5.5	Measured impact lower than predicted in ES
MP10	Clay Lane	56.5	58.4	+1.9	47.9	53.4	+5.5	Measured impact lower than predicted in ES. However, absolute noise level higher than predicted.
MP11	Bolshaw Farm Lane	53.7	49.3	-4.4	-	-	0[4]	Measured impact lower than predicted in ES
MP12	Styal Road	73.1	68.8	-4.3	-	-	0[4]	Measured impact lower than predicted in ES
MP13	Tedder Drive	59.5	60.4	+0.9	-	-	>+5dB[4]	Measured impact lower than predicted in ES
MP14	Carsdale Road	64.3	65.2	+0.9	60.4	61.3	+0.9	Measured impact comparable to that predicted in ES. However, absolute noise level higher than

Location ID	Location Description	Measured Post-Development Noise Level, dB $L_{A10,18h}$			Modelled Noise Level, dB $L_{A10,18h}$			Analysis
		Pre-Development	Post-Development (5-year)	Change, dB	Pre-Development	Post-Development	Change, dB	
								predicted. However, this is partially due to local road traffic close to the measurement location (aircraft and trams excluded)
MP15	Felskirk Road/Thaxted Walk	56.4	51.9	-4.5	-	-	+2	Measured impact lower than predicted in ES

6. Conclusions

AtkinsRéalis has been instructed to conduct post-development noise monitoring for the A6MARR development at Year 5 after opening. This report details the survey methodology and the findings, together with an analysis of the results of the surveys compared to the results of the noise surveys conducted pre-development and Year 1 post-development, and the predicted modelled noise levels as part of the ES.

The results indicate that the noise modelling is broadly comparable to the measured noise levels. Where there is divergence, the modelling is shown to have been generally conservative, as would be expected.

APPENDICES

Appendix A. Glossary

Decibel (dB)

The unit of measurement used for sound pressure levels. The scale is logarithmic rather than linear. The threshold of hearing is 0 dB and the threshold of pain is 120 dB. In practical terms these limits are seldom experienced and typical levels lie within the range 30 dB (a quiet night-time level in a bedroom) to 90 dB (at the kerbside of a busy city street).

A-weighting:

An electrical frequency weighting used to represent the response of the human hearing mechanism to sound. A-weighted sound level is indicated either by placing the capital letter A after the letters dB to get dB(A) or it may be added as a subscript to the sound level parameter as in LAeq,T.

Percentile Level (Statistical Sound Level Indices, L_{AN}, L_{A10}, L_{A90})

LAN is the dB(A) level exceeded N% of the time measured on a sound level meter with Fast(F) time weighting, e.g. LA90 the dB(A) level exceeded for 90% of the time, is commonly used to estimate background sound level. LA10, the level exceeded for 10% of the time, is commonly used in the assessment of road traffic noise.

Research has shown that the arithmetic average of the 18, 1-hour LA10 levels (depicted as LA10,18h) between 0600 and 2400 hours shows a reasonably good correlation with community responses to traffic noise. This unit is used in the UK for the assessment of road traffic noise.

Equivalent Continuous A-Weighted Sound Pressure Level ($L_{Aeq,T}$):

Equivalent continuous A-weighted sound pressure level is the steady sound level that has the same sound energy as the fluctuating A-weighted sound pressure level occurring over the same time period and at the same location.

Ambient Sound Level ($L_{Aeq,T}$):

Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

Background Sound level ($L_{AF90,T}$):

The A-weighted sound pressure level of the existing ambient sound level that is exceed for 90% of a given time period, T, measured using time weighting ‘Fast’.

Free-Field (acoustical):

Free-field means a position far away from any reflecting surfaces other than the ground. Several standards and guidelines recommend that to achieve free-field conditions the microphone should be positioned at least 3.5 metres from any reflecting surfaces.

Facade position:

A façade position is located one metre from a building façade or large vertical structure.

Appendix B. Positions with Change Conditions

The measurement positions at MP04, MP09 and MP15 have been changed in post-development Year 5 (2023) compared to post-development Year 1 (2019). The site photos are shown below.

MP04

MP09

MP15

2019

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