A303 Amesbury to Berwick Down

TR010025

6.3 Environmental Statement Appendices

Appendix 9.4 Noise Monitoring

Volume 6

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

October 2018

1 Noise Monitoring

1.1.1 Table 1-1 details the start and end time of the monitoring at each location, plus details of the equipment used and if the monitoring position was free-field (more than 3m from any vertical reflective surface) or façade (1m from a building). All Sound Level Meters (SLM) have been calibrated at a UKAS approved laboratory within the previous two years, and all calibrators within the previous one year.

Table 1-1 Noise Monitoring Equipment

Ref	Location	Start Time	End Time	Sound Level Meter Ref	Sound Level Meter Serial No.	Calibrator Ref	Calibrator Serial No.	Free-field/ Facade
M1	Beacon Close, Amesbury	17/04/2018 16:00	04/05/2018 11:00	SLM20a	00743081	LON CAL3	50541127	Free-field
M2	Lords Croft, Amesbury	16/03/2018 14:00	03/04/2018 11:00	SLM20a	00743081	LON CAL1	34304647	Free-field
M3	Countess Farm, Amesbury	16/03/2018 14:00	03/04/2018 11:00	SLM18	00420764	CAL10	34425538	Free-field
M4	Bowles Hatches, Amesbury	16/03/2018 16:00	03/04/2018 11:00	SLM17	00420763	LON CAL1	34304647	Free-field
M5	Stonehenge Cottages, A303	16/03/2018 16:00	03/04/2018 11:00	SLM19	00420765	CAL10	34425538	Free-field
M6	Hill Farm Cottages,A303	18/04/2018 18:00	04/05/2018 12:00	SLM18	00420764	LON CAL3	50541127	Free-field
M7	Foredown House, Winterbourne Stoke	17/04/2018 15:00	04/05/2018 13:00	SLM19	00420765	LON CAL3	50541127	Free-field
M8	High Street, Winterbourne Stoke	16/03/2018 15:00	03/04/2018 11:00	SLM TOT	542906	LON CAL1	34304647	Free-field
M9	Scotland Lodge, Winterbourne Stoke	17/04/2018 15:00	04/05/2018 12:00	SLM TOT	542906	LON CAL3	50541127	Free-field
M10	Stonehenge	24/04/2018 13:00	25/04/2018 13:00	VLM5	23421	CAL5	2217875	Free-field

1.1.2 Table 1-2 summarises the weather conditions and measured $L_{A10,18h}$ noise levels during the first period of monitoring (M2, M3, M4, M5 and M8). The weather data were collected from a weather station hired from Omni Instruments set up at M5, with the exception of the rainfall data which was purchased from www.speedwellweather.com for a site at Boscombe Down, Amesbury. Graphs of the wind speed, direction and rainfall are provided as Figure 1-1 to Figure 1-3.

1.1.3 Table 1-3 summarises the weather conditions and measured $L_{A10,18h}$ noise levels during the second period of monitoring (M1, M6, M7, M9 and the 24 hour monitoring at M10). The weather data were collected from a weather station hired from Omni Instruments and an AECOM rain gauge set up at M6. Graphs of the wind speed, direction and rainfall are provided as Figure 1-4 to Figure 1-6.

1.1.4 The summary weather data are provided for the 18hr period 06:00-00:00 to correspond with the measured $L_{A10,18h}$ noise levels which have been compared to the predicted traffic noise $L_{A10,18h}$ levels from the noise model. The purpose of the comparison is to demonstrate the traffic noise model is giving reasonable results.

1.1.5 Weekends, bank holidays and the start and end days which are incomplete are identified in italics in Table 1-2 and Table 1-3. These days were not used in the determination of average $L_{A10,18h}$ measured levels for comparison against the predicted traffic noise $L_{A10,18h}$ levels from the noise model. This is because the predicted traffic noise $L_{A10,18h}$ levels are based on annual average weekday traffic noise levels, in accordance with the standard UK traffic noise prediction methodology.

1.1.6 Graphs of the hourly measured noise levels at locations M1-M9, at which monitoring was completed over approximately two weeks are provided in Figure 1-7 to Figure 1-15. The graphs show the maximum hourly levels (L_{AFmax}), the 'average' hourly noise level (L_{Aeq}), the level exceeded 10% of each hour, which is the parameter used to assess traffic noise (L_{A10}), and the level exceeded 90% of each hour, which is the parameter used to define underlying background levels (L_{A90}). The clocks went forward at midnight on 25th March, therefore there are no weather or noise data for the hour 00:00- 01:00 on 26th March 2018.

1.1.7 During the first period of monitoring, weather conditions were good for the first seven weekdays (Monday 19th to Friday 23rd March 2018 and Monday - Tuesday 26-27th March 2018), with almost no rainfall and low hourly wind speeds (less than 5 m/s). However from Wednesday 28th March onwards, including over the Easter bank holiday, significant rainfall occurred and road surfaces were likely to have been wet. Measured noise levels during this period were a little higher, which is likely to be a combination of the rainfall itself, wet road surfaces and potentially higher traffic flows over the Bank Holiday period. This is most noticeable at M8 which is immediately adjacent to the A303 in Winterbourne Stoke. Therefore, in determining the measured $L_{A10,18h}$ levels to compare to the predicted traffic noise $L_{A10,18h}$ levels from the noise model, this period of adverse weather and potentially less typical traffic has not been used. The predicted traffic noise levels are based on annual average traffic conditions and therefore would not be expected to match as well to busy periods such as the Easter bank holiday weekend.

1.1.8 During the second period of monitoring, periods of rainfall occurred overnight Saturday 21st into Sunday 27th April, which while noticeable in the hourly measured levels does not affect the measured weekday $L_{A10,18h}$ levels. Rainfall also occurred on Friday 27th April, high wind speeds occurred from the afternoon of Sunday 29th April through to the evening of Monday 30th April, and both high wind speeds and rainfall on Wednesday 2nd May 2018. Slightly elevated measured noise levels are evident at some of the monitoring locations during these periods.

1.1.9 Occasional localised events are evident in the graphs of measured noise levels, for example at 13:00-14:00 on Thursday 22nd March 2018 a spike in the measured levels is evident at M2, M3 and M4, all of which are located around Countess Roundabout in Amesbury. The dawn chorus is also evident at some locations on some days as a distinct spike in the measured noise levels, for example at M4 at 05:00-06:00 on the 23rd-25th March, moving to 06:00-07:00 on 26-28th March after the clocks go forward. Such local events which are unrelated to road traffic noise have not been used in determining the average measured $L_{A10,18h}$ levels for comparison with the predicted traffic noise $L_{A10,18h}$ levels from the noise model. Other local noise sources are intrinsic to the measured levels, such as the noise from the nearby river and weir at M4. This is unlikely to have significantly affected the measured $L_{A10,18h}$ levels but it does prevent levels from dropping overnight as would otherwise be expected. At M4 the range in noise levels over a 24 hour period is rather smaller than at the other sites due to the constant noise from the nearby river/weir.

Table 1-2 Summary of Weather and Measured Noise Data 16/3/18-3/4/18

Date	Day	Period	Predominant Wind Direction	Average Wind Speed m/s	Average Temperature ^{0}C	Rainfall mm	Measured $L_{A10,18h}$ dB				
							M2	M3	M4	M5	M8
16/03/2018	*Fri*	*16:00-00:00*	*NE,ENE*	*0.7*	*7.4*	*0.0*	*50.4*	*56.3*	*58.2*	*66.0*	*75.2*
17/03/2018	*Sat*	*06:00-00:00*	*ENE*	*1.4*	*-0.3*	*0.2*	*52.9*	*54.0*	*58.4*	*66.0*	*75.6*
18/03/2018	*Sun*	*06:00-00:00*	*ENE*	*1.7*	*-1.4*	*0.0*	*46.8*	*51.3*	*54.1*	*62.9*	*74.8*
19/03/2018	Mon	06:00-00:00	NE	0.8	0.7	0.0	52.8	53.7	57.6	66.4	76.2
20/03/2018	Tue	06:00-00:00	N	1.0	4.0	0.0	52.9	55.7	59.1	66.4	76.3
21/03/2018	Wed	06:00-00:00	SW	0.5	5.0	0.0	53.9	57.2	59.2	66.7	76.5
22/03/2018	Thur	06:00-00:00	S,SSW	1.5	6.8	0.0	52.7	58.1	58.6	67.1	76.7
23/03/2018	Fri	06:00-00:00	SSW	1.5	8.2	0.6	51.4	58.2	58.0	67.6	76.8
24/03/2018	*Sat*	*06:00-00:00*	*ENE*	*0.6*	*7.3*	*1.0*	*53.3*	*56.9*	*58.3*	*67.0*	*75.5*
25/03/2018	*Sun*	*06:00-00:00*	*N*	*0.7*	*7.7*	*0.0*	*53.6*	*54.9*	*57.9*	*65.7*	*75.0*
26/03/2018	Mon	06:00-00:00	SSW	1.1	7.3	0.0	52.7	56.8	58.0	66.8	76.1
27/03/2018	Tue	06:00-00:00	NNW	0.7	8.8	0.8	54.8	58.5	59.9	68.0	76.8
28/03/2018	Wed	06:00-00:00	N	0.6	5.3	13.4	53.6*	58.9*	60.8*	68.9*	78.5*
29/03/2018	Thur	06:00-00:00	SE	1.4	4.9	9.4	51.4*	59.5*	58.9*	70.0*	79.1*
30/03/2018	*Good Fri*	*06:00-00:00*	*ENE*	*0.8*	*4.4*	*13.4*	*53.0*	*57.1*	*57.8*	*67.8*	*78.2*
31/03/2018	*Easter Sat*	*06:00-00:00*	*N*	*0.7*	*4.7*	*4.6*	*54.8*	*56.2*	*60.2*	*67.2*	*76.4*
01/04/2018	*Easter Sun*	*06:00-00:00*	*SE*	*0.9*	*4.5*	*5.8*	*53.6*	*55.9*	*57.8*	*66.8*	*76.3*
02/04/2018	*Easter Mon*	*06:00-00:00*	*S*	*1.6*	*8.8*	*3.6*	*53.5*	*58.1*	*58.3*	*69.5*	*75.5*
03/04/2018	*Tue*	*06:00-11:00*	*S*	*2.0*	*9.7*	*1.8*	*57.2*	*61.5*	*62.1*	*72.5*	*79.9*
Average weekday $L_{A10,18h}$ dB							**53.0**	**56.9**	**58.6**	**67.0**	**76.5**

*Not used in determination of weekday average $L_{A10,18h}$ due to significant rainfall

Table 1-3 Summary of Weather and Measured Noise Data 17/4/18-4/5/18

Date	Day	Period	Predominant Wind Direction	Average Wind Speed m/s	Average Temperature ^{0}C	Rainfall mm	Measured $L_{A10,18h}$ dB				
							M1	M6	M7	M9	M10
17/04/2018	*Tue*	*14:00-00:00*	*SE*	*1.9*	*13.1*	*0.3*	*53.1*	*-**	*48.6*	*56.2*	-
18/04/2018	Wed	06:00-00:00	WNW	0.6	17.3	1.7	58.5	52.6	56.8	57.5	-
19/04/2018	Thur	06:00-00:00	S	0.9	19.6	0.0	56.6	50.9	52.0	54.9	-
20/04/2018	Fri	06:00-00:00	NNW	1.2	15.0	0.0	58.2	51.9	53.6	53.4	-
21/04/2018	*Sat*	*06:00-00:00*	*SSE*	*0.8*	*17.4*	*1.1*	58.5	53.4	54.8	55.0	-
22/04/2018	*Sun*	*06:00-00:00*	*NW*	*1.6*	*14.6*	*0.0*	55.9	52.2	49.8	54.5	-
23/04/2018	Mon	06:00-00:00	NW	1.2	11.7	0.0	53.8	49.6	50.3	55.0	-
24/04/2018	Tue	06:00-00:00	WNW	1.5	12.2	0.2	53.5	50.5	51.9	55.6	61.9[#]
25/04/2018	Wed	06:00-00:00	NW	2.4	9.6	1.8	54.7	54.1	52.9	55.2	
26/04/2018	Thur	06:00-00:00	W,NW	1.6	9.6	1.0	55.0	52.4	53.9	55.6	-
27/04/2018	Fri	06:00-00:00	NE,SE,SSE	1.3	8.4	4.7	62.8	57.2	54.7	56.8	-
28/04/2018	*Sat*	*06:00-00:00*	*NNE*	*2.1*	*7.3*	*0.1*	60.0	58.5	54.2	54.4	-
29/04/2018	*Sun*	*06:00-00:00*	*NNE*	*4.0*	*6.5*	*0.1*	62.1	61.4	53.8	55.6	-
30/04/2018	Mon	06:00-00:00	N	4.9	6.8	0.3	59.4	60.7	51.5	54.4	-
01/05/2018	Tue	06:00-00:00	N,SSW,WNW	1.1	9.2	0.0	54.4	53.0	52.3	55.7	-
02/05/2018	Wed	06:00-00:00	NW	3.2	10.0	5.0	57.0	57.5	53.6	56.3	-
03/05/2018	Thur	06:00-00:00	WNW,NW	1.1	11.9	0.0	55.9	49.4	51.0	54.1	-
04/05/2018	*Fri*	*06:00-11:00*	*S*	*0.8*	*10.2*	*0.0*	*57.6*	*48.5*	*57.3*	*55.2*	-
						Average weekday $L_{A10,18h}$ dB	**56.6**	**53.4**	**52.9**	**55.4**	**61.9**

*Sound Level Meter relocated on 18th April due to interference with the meter by livestock in the adjacent field
[#] Monitoring over 24 hour period 13:00 on 24th April to 13:00 on 25th April

Figure 1-1 M5 Stonehenge Cottages Wind Speed data 16/3/18 to 3/4/18

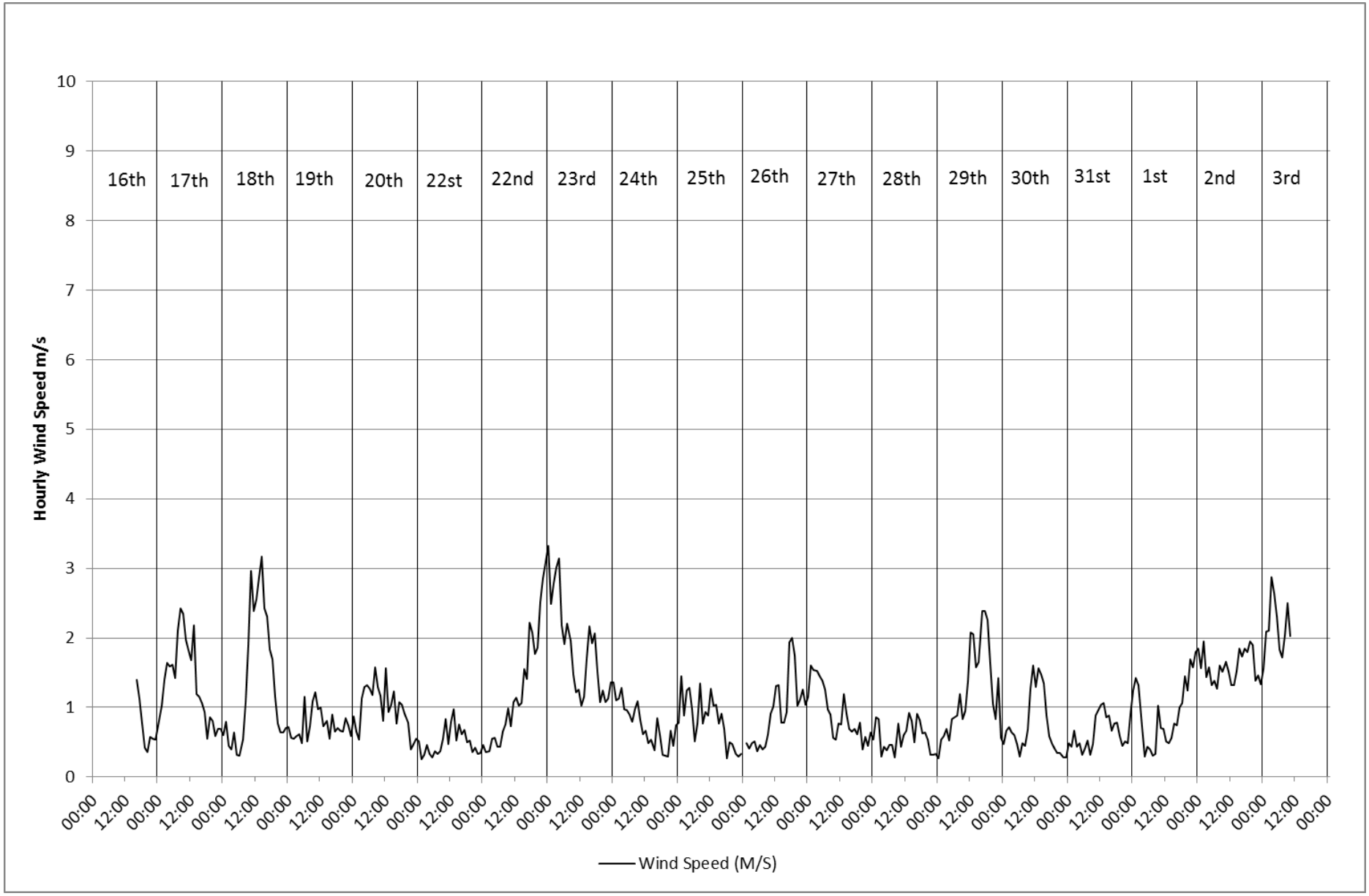


Figure 1-2 M5 Stonehenge Cottages Wind Direction data 16/3/18 to 3/4/18

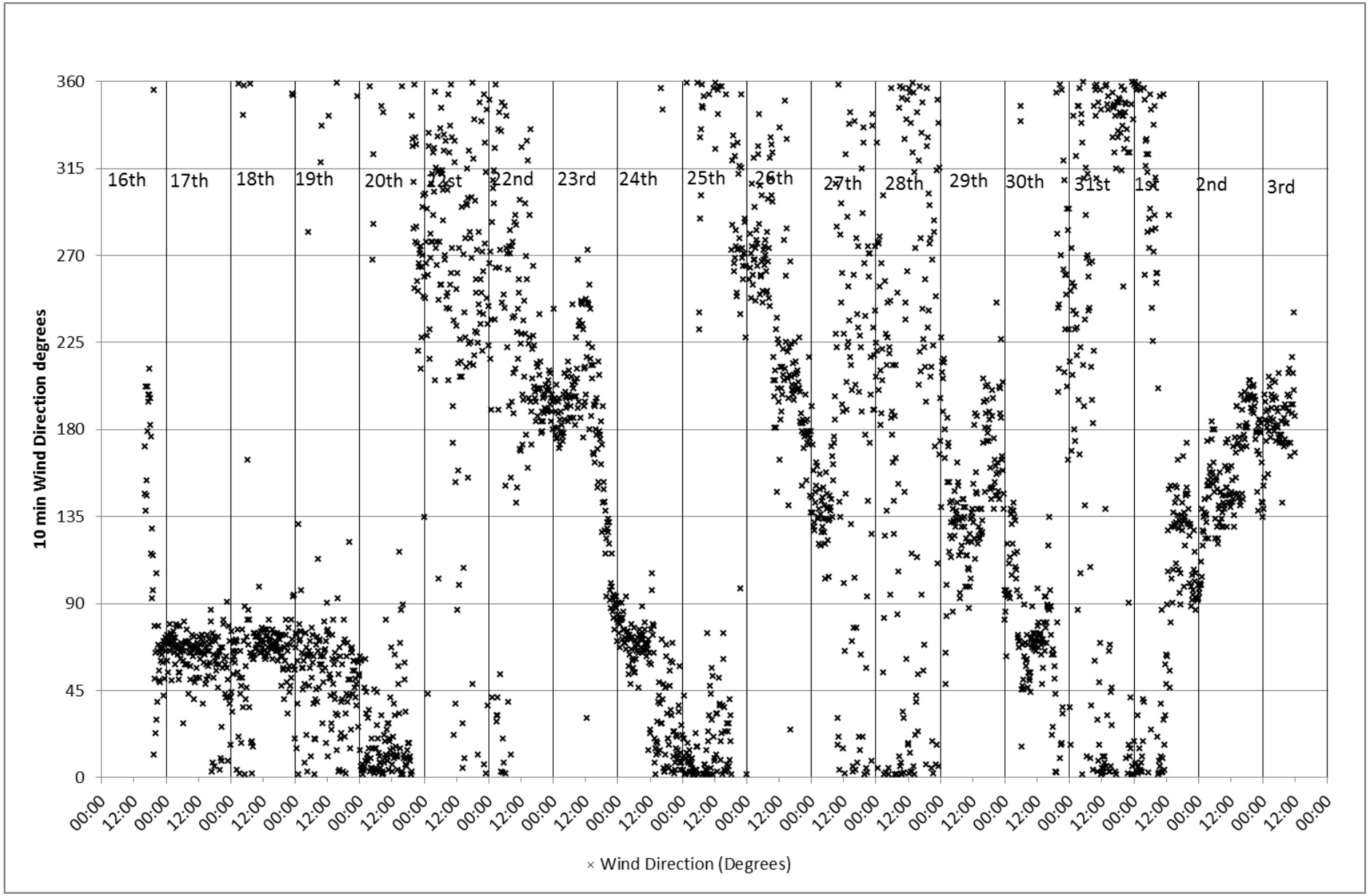


Figure 1-3 M5 Stonehenge Cottages Rainfall data 16/3/18 to 3/4/18

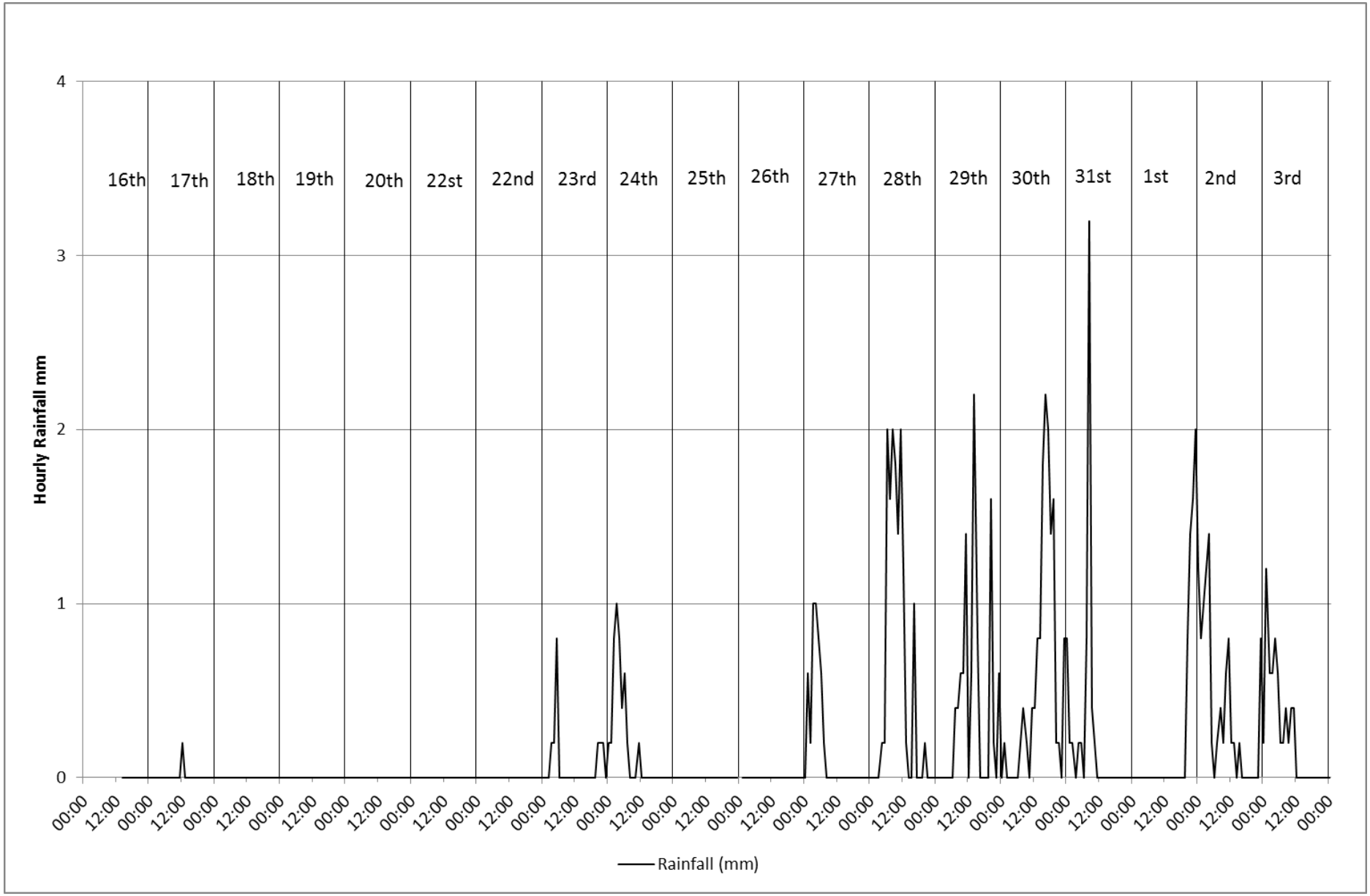


Figure 1-4 M6 Hill Farm Cottages Wind Speed data 17/4/18 to 4/5/18

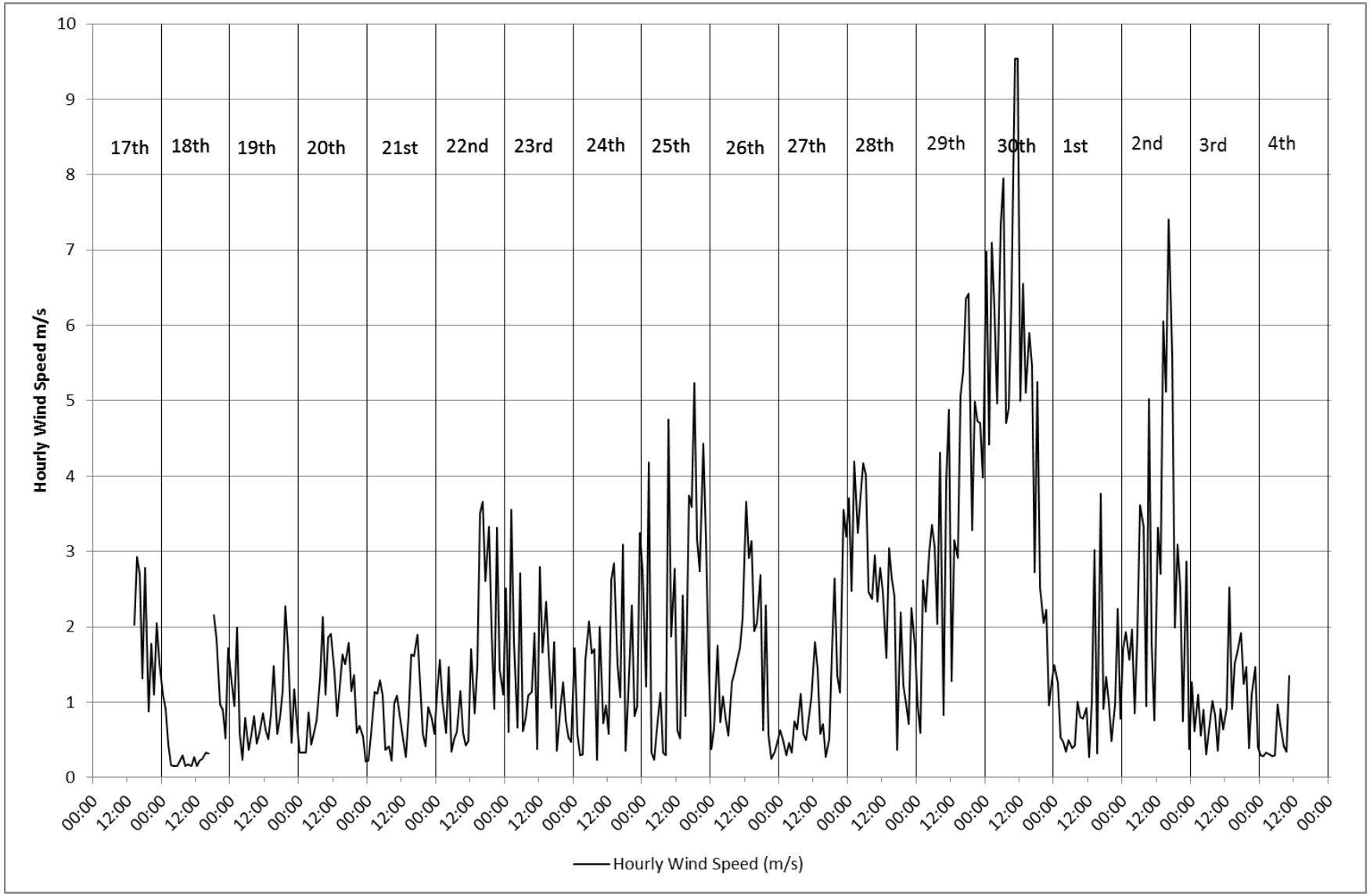


Figure 1-5 M6 Hill Farm Cottages Wind Direction data 17/4/18 to 4/5/18

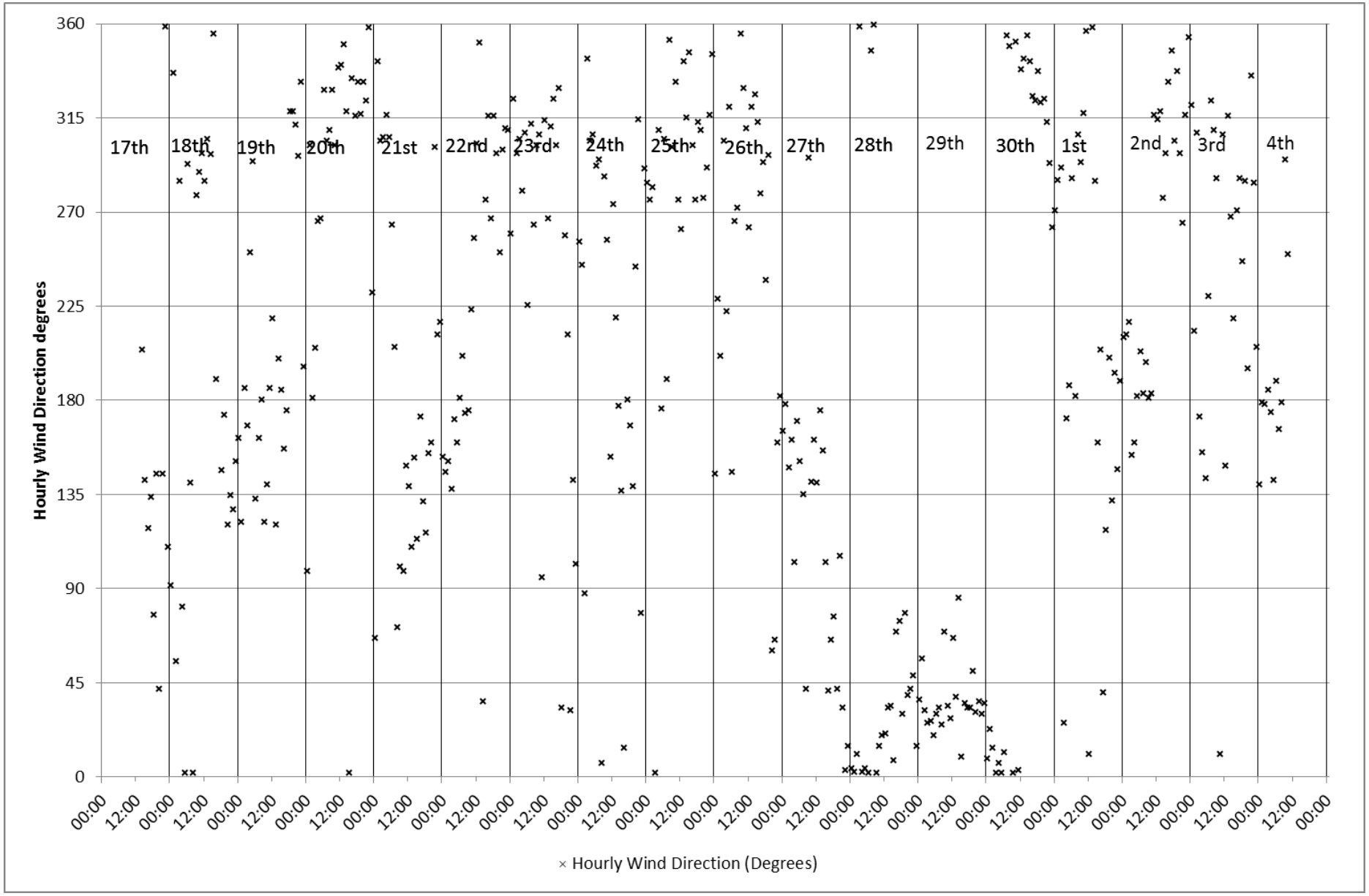


Figure 1-6 M6 Hill Farm Cottages Rainfall data 17/4/18 to 4/5/18

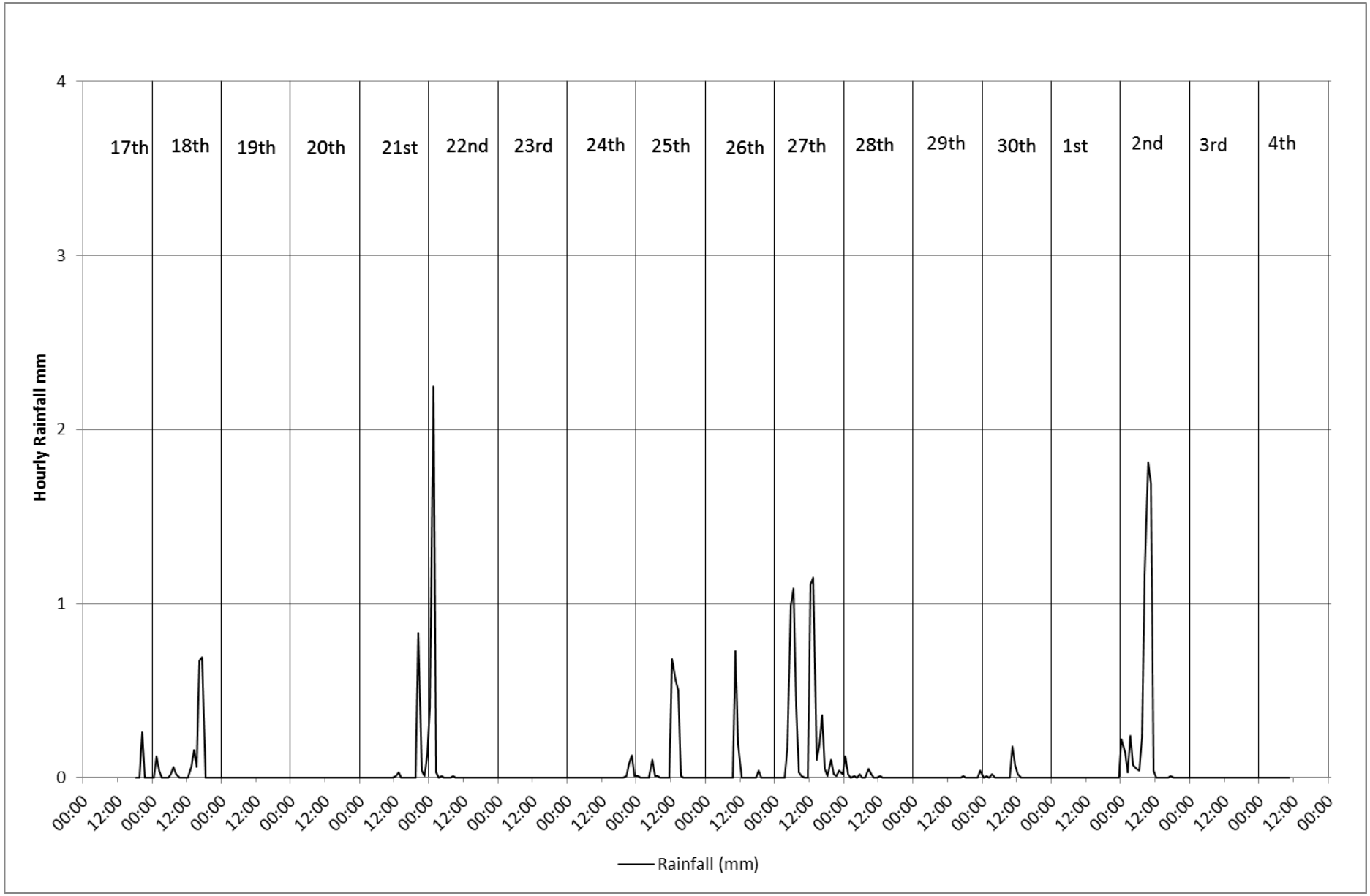


Figure 1-7 M1 Beacon Close Amesbury Measured Noise Levels 17/4/18-4/5/18

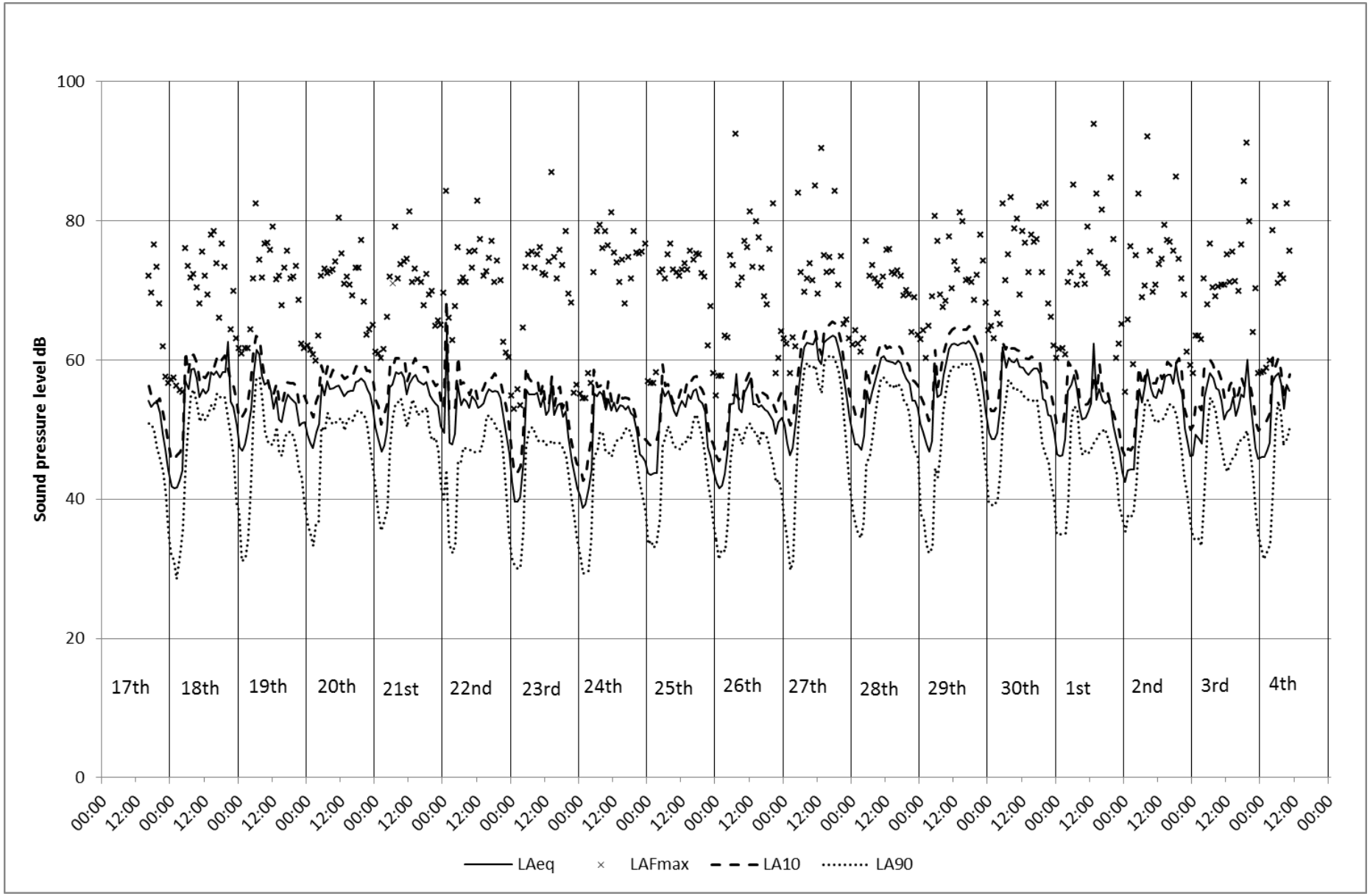


Figure 1-8 M2 Lords Cross Amesbury Measured Noise Levels 16/3/18-3/4/18

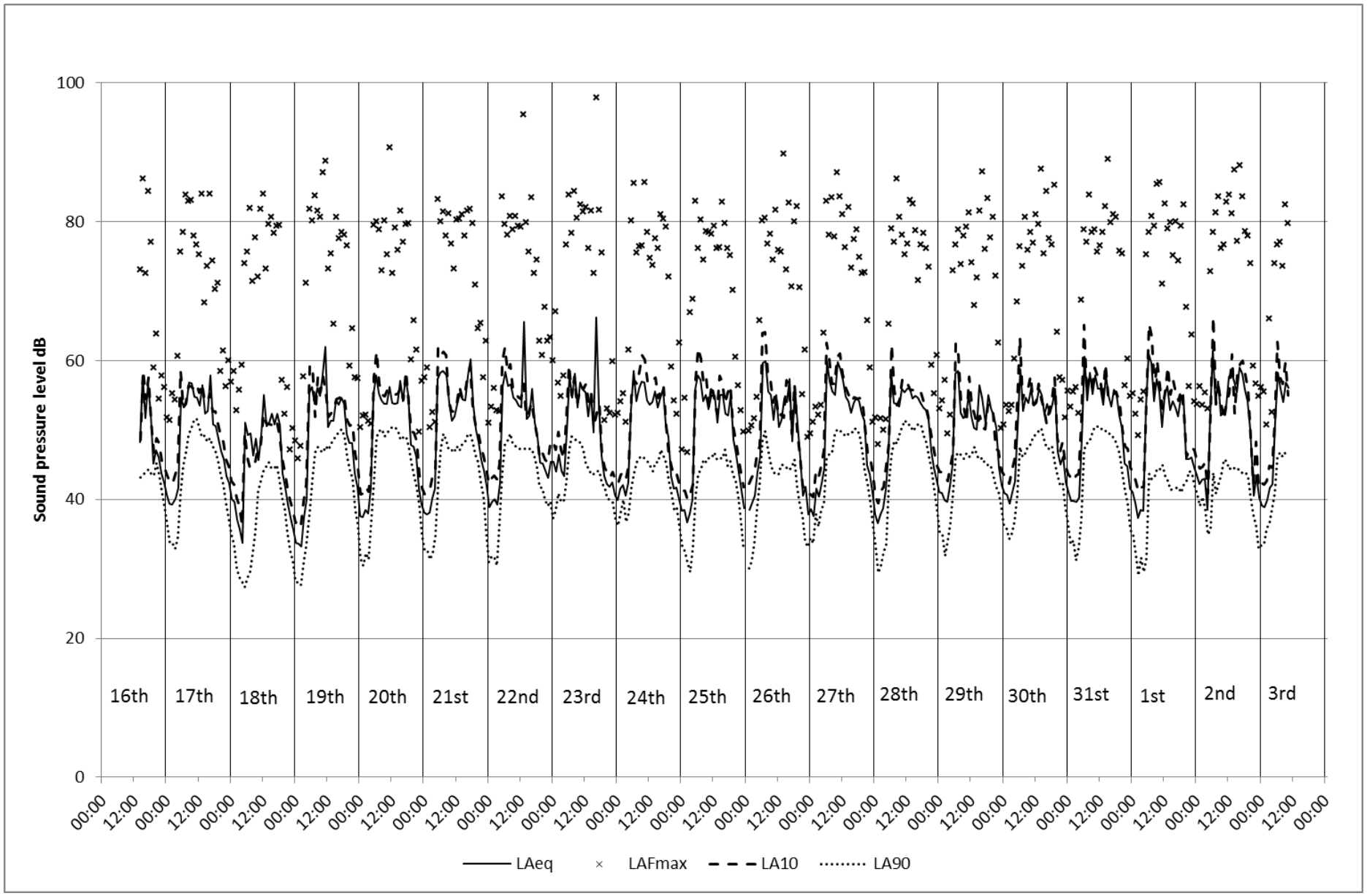


Figure 1-9 M3 Countess Farm Amesbury Measured Noise Levels 16/3/18-3/4/18

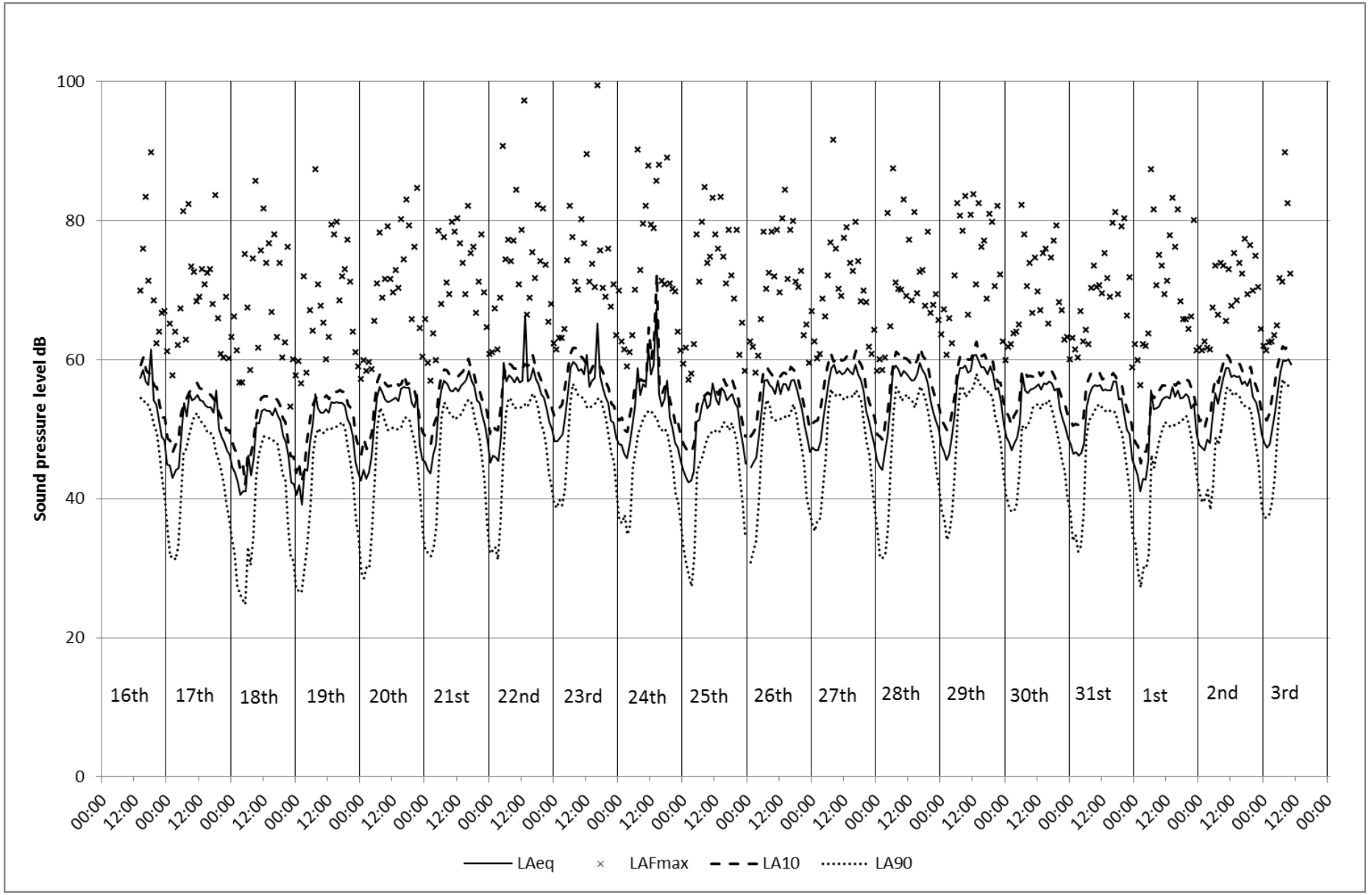


Figure 1-10 M4 Bowles Hatches Amesbury Measured Noise Levels 16/3/18-3/4/18

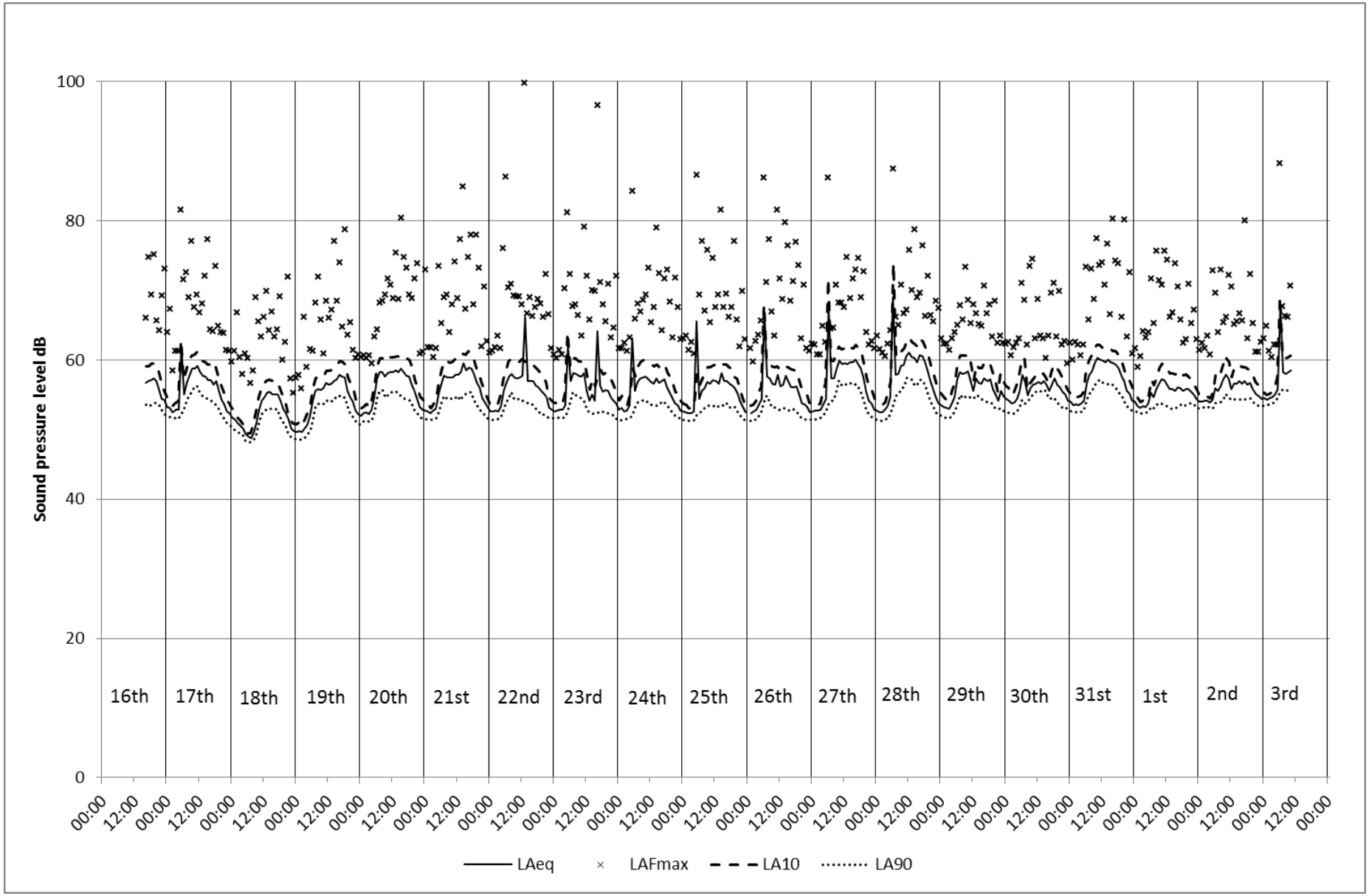


Figure 1-11 M5 Stonehenge Cottages Measured Noise Levels 16/3/18-3/4/18

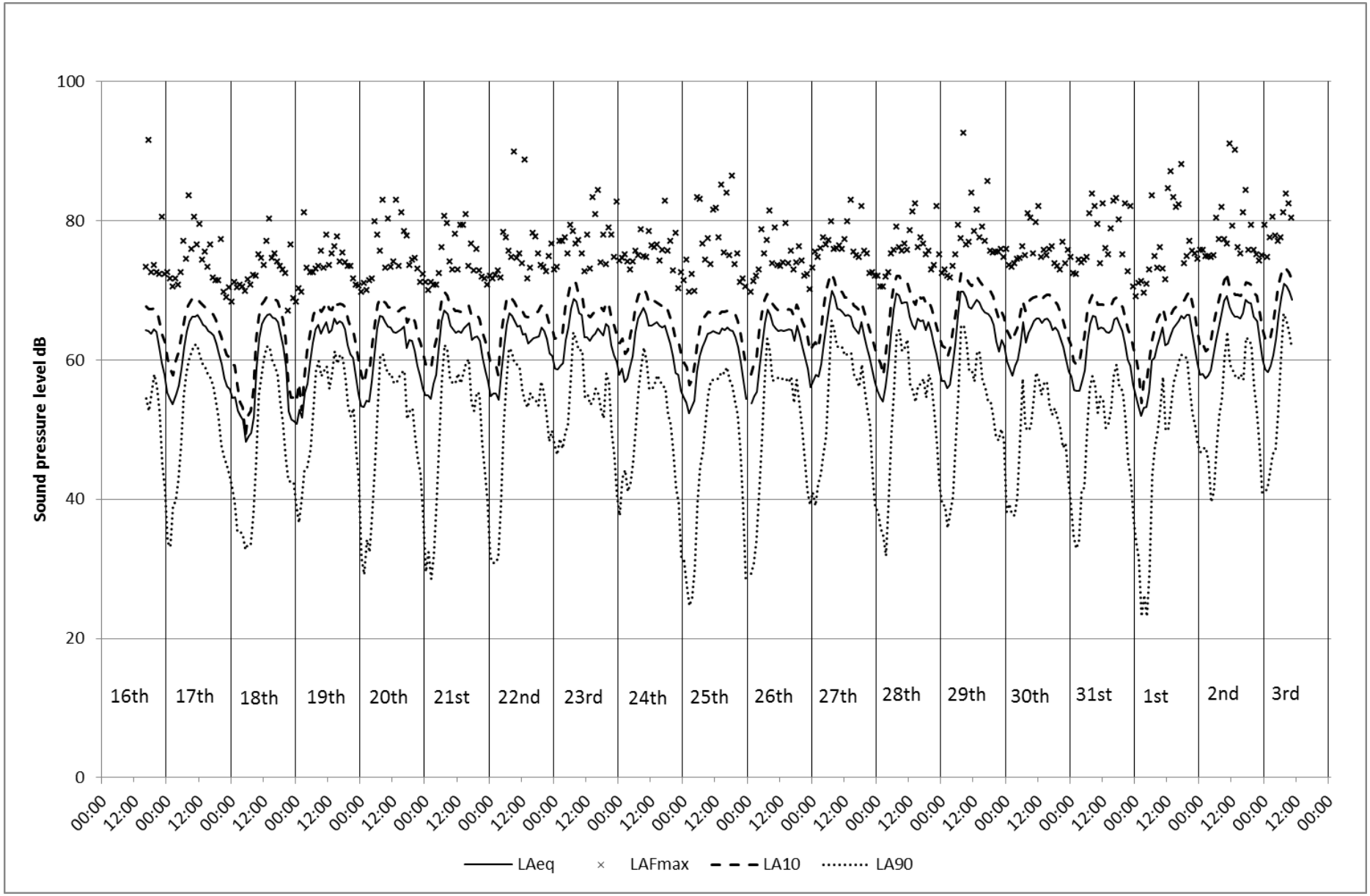


Figure 1-12 M6 Hill Farm Cottages Measured Noise Levels 18/4/18-4/5/18

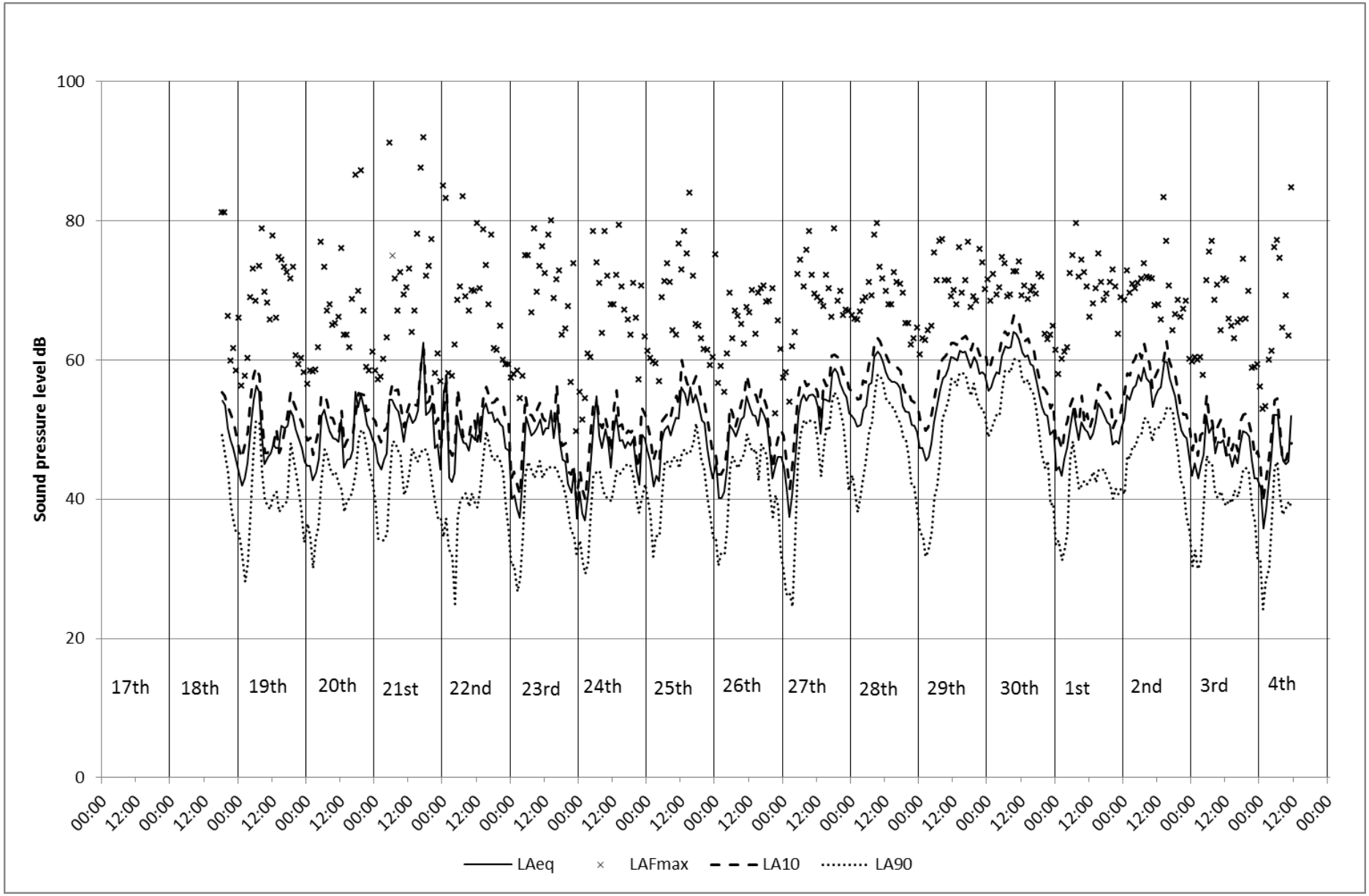


Figure 1-13 M7 Foredown House Winterbourne Stoke Measured Noise Levels 17/4/18-4/5/18

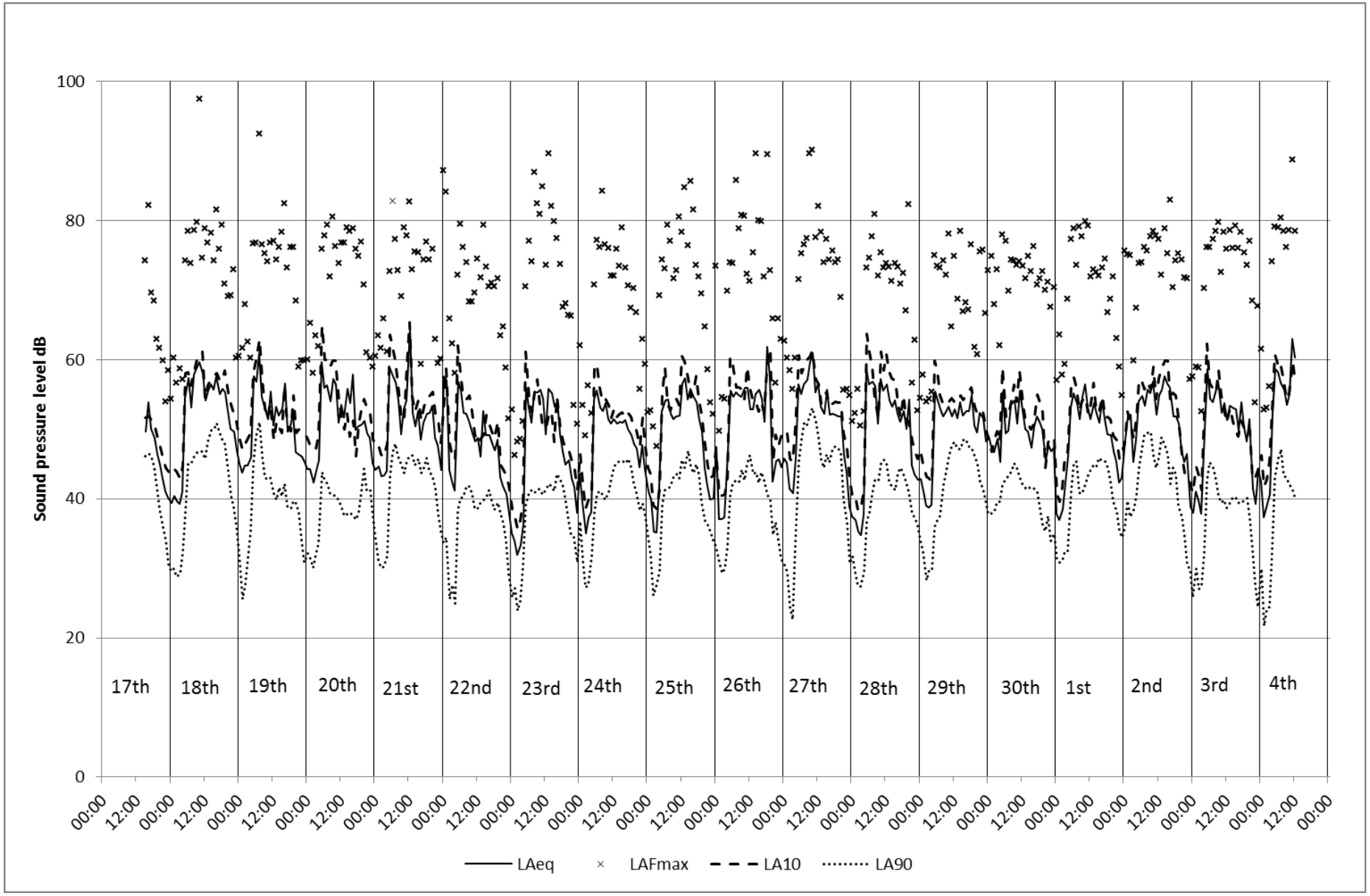


Figure 1-14 M8 High Street Winterbourne Stoke Measured Noise Levels 16/3/18-3/4/18

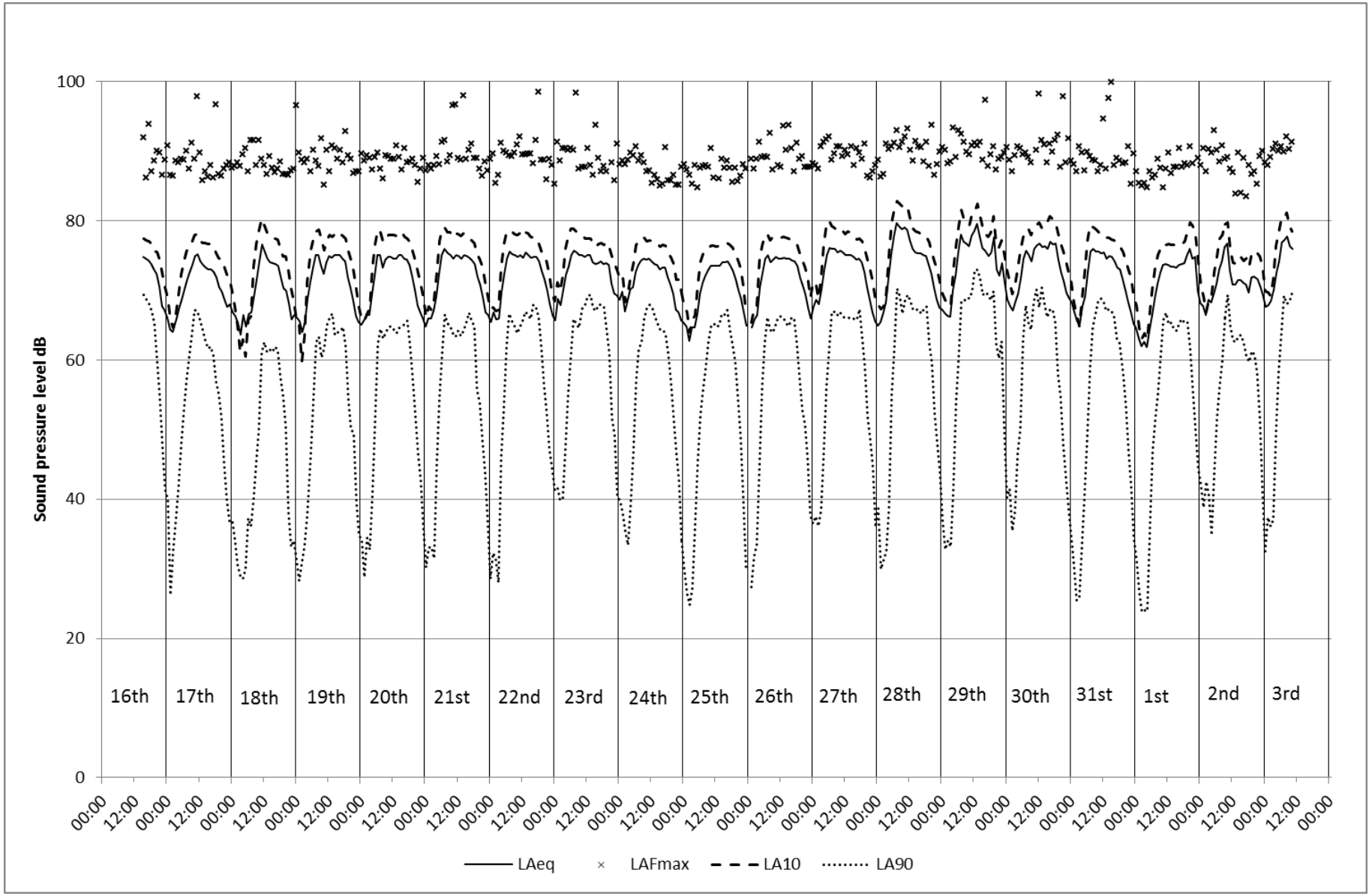
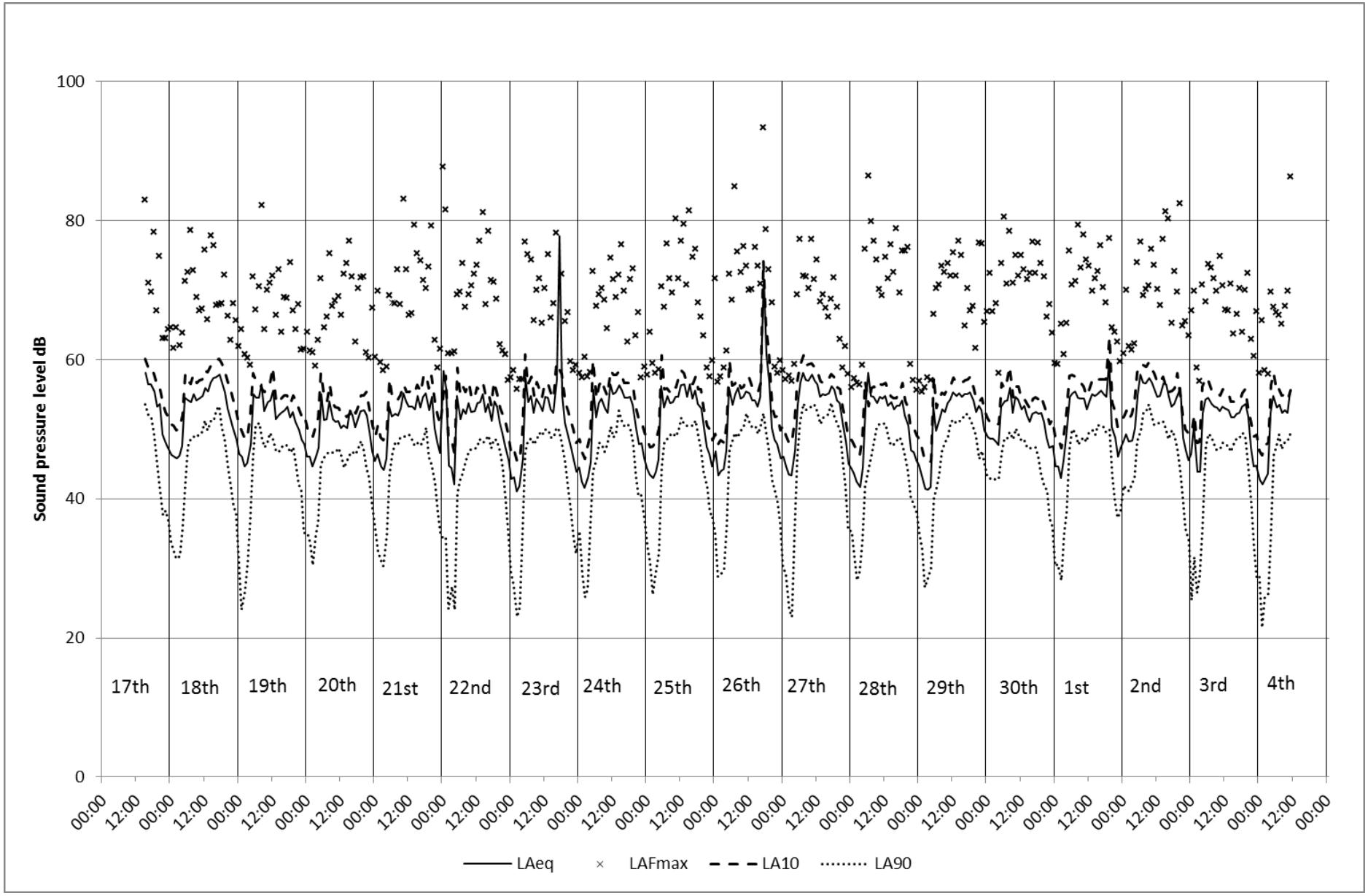


Figure 1-15 M9 Scotland Lodge Winterbourne Stoke Measured Noise Levels 17/4/18-4/5/18



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