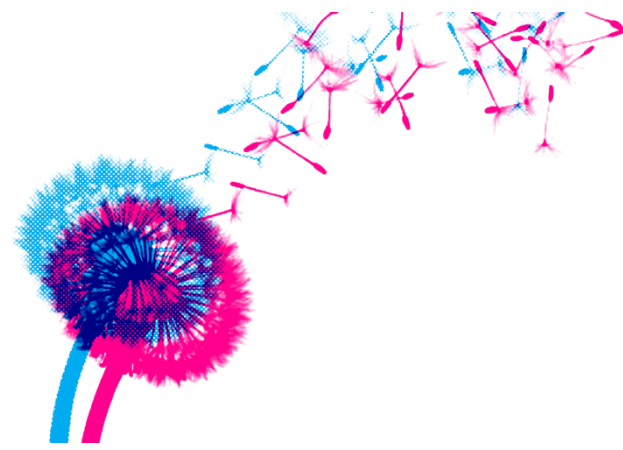


SFS Response to Submissions

(SSD9249)

Attachment 6- Addendum Noise and Vibration Impact Assessment

September 2018



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Project title Noise and Vibration Impact Assessment

Job number

259997

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File reference

AC02-v4_SFSR_NVIA
Addendum

Prepared by Mathew Simon

Date

11 September 2018

Subject Noise and Vibration Impact Assessment Addendum

1 Introduction

The following addresses comments raised in submissions received in relation to the Noise and Vibration Impact Assessment (2018-06-05 - AC01-v5_SFSR_Noise and Vibration Impact Assessment, Arup, June 2018) (NVIA) from the public exhibition of the Sydney Football Stadium State Significant Development (SSD 9294).

This document is intended as an addendum to the NVIA and provides additional information to supplement the original impact assessment.

2 Construction noise impacts at UTS educational spaces

This section addresses the following comments of Attachment 2 to this Response to Submissions:

- EPA3
- EPA19
- EPA35

The Rugby Australia Building located to the north of the MP1 carpark houses both the University of Technology Sydney (UTS) sport science facilities and the Rugby Australia Headquarters. The UTS facilities host lectures and tutorials as well as practical classes and laboratory work within this building.

During semesters, operating times of the facilities vary between 8 am till 9 pm Monday to Friday.

Regarding construction noise, this receiver is most conservatively categorised as an educational institution, with an internal Noise Management Level (NML) of 45 dBA, in accordance with Table 9 of the NVIA.

To determine external noise level which would result in an internal level of 45 dBA within educational spaces, the building envelope and room location have been considered. Considering education spaces along the southern, eastern and western façade which would be exposed to construction noise, acoustic performances of the facades to UTS educational spaces are presented in Table 1.

Table 1: UTS Sports Science educational spaces facade performance

Facade	Glazed façade construction	Sensitive spaces adjacent to façade
South	6mm standard glass / 12mm air gap / 10mm standard glass	Teaching spaces, research spaces, meeting and consulting rooms
East and west	11.5mm laminated glass	Informal learning spaces (no formal teaching spaces)

Internal construction noise levels have been predicted based on predicted external levels, façade constructions, room and façade dimensions, presented in Table 2.

Table 2: Predicted construction noise levels, $L_{Aeq(15min)}$ dBA

Receiver	Internal NML	Construction stage		
		1. Site establishment	2. Ancillary building demolition	3. Stadium demolition
		Predicted internal noise level		
C4 - University of Technology learning spaces along southern façade	45	44	54	51
C4 - University of Technology learning spaces along eastern and western façade	45	42	52	49

Note: Noise levels which exceed external NMLs are shaded in grey.

Results show no exceedances are predicted during site establishment works, and exceedances of up to 9 dB are predicted during demolition works.

Some disturbances to occupants within the affected buildings are predicted during demolition activities. These may include the use of the concrete crusher, rockbreaking and loading and unloading of debris. Noise impacts will be most intrusive during lectures, tutorials or use of the laboratories within the UTS facilities.

The crusher is anticipated to be required for approximately six months of the early works.

The learning spaces within UTS facilities are operational for the majority of the year, however the majority of students are not on site during formal exams, which are conducted off-site, and between semesters. Additional mitigation measures are proposed and outlined in Section 3 of this report

3 Construction noise mitigation measures

This section outlines additional mitigation measures proposed for the stage 1 demolition works and responds to the following comments of Attachment 2 to this Response to Submissions:

- EPA20
- EPA21

- EPA27

Recommended construction noise mitigation measures are presented in Section 6.1 of the NVIA, with measures provided under the following headings:

- Noise and vibration management plan
- Staffing
- Plant and equipment
- Scheduling
- Community liaison

In addition to those presented in the NVIA, the following measures are recommended to minimise adverse effects of early works construction noise:

- Unattended construction noise monitoring is recommended to be undertaken during construction works. A noise logger shall be installed and maintained which can be interrogated remotely by the Responsible Person. The logger will be required to automatically send a text message to the Responsible Person on site once construction $L_{Aeq}(15min)$ noise levels exceed 75 dBA, indicating a ‘highly affected’ level in accordance with the Interim Construction Noise Guideline (DECC 2009). It should be noted, setting a noise trigger level lower than 75 dBA will likely be frequently triggered by existing road traffic noise, as demonstrated by unattended noise monitoring results at 256 Moore Park Road.

Unattended construction noise monitoring should be undertaken at Kira Child Care Centre – 230 Moore Park Road, Paddington as well as residences 252 Moore Park Road, Paddington and 5 Poate Road, Paddington.

The data from the noise logger will be used to inform the Contractor on the noise levels being generated so that particularly noisy activities can be identified and practicable options investigated to reduce noise levels further, as well as indicate when consultation with surrounding occupants and residences may be required.

- Consultation with stakeholders of surrounding receiver buildings, including the UTS, Rugby Australia and the NRL, should be sought when developing a construction schedule, with particular focus on noise sensitive periods such as conferences taking place at UTS.

Teaching and informal exams occur throughout the two semesters per year at the UTS facilities, however formal exams, which occur at the end of each semester, do not take place on site. Formal exam periods and holiday periods between semesters are preferable for undertaking loud construction activities as the bulk of the student population would not be on site.

If construction works are required to take place during semesters, some classes may be able to be relocated from the southern side of the building to the north facing away from the construction site. This would require liaison between the construction contractor and the UTS.

- Consider using electric / hydraulic equipment where possible, such as hydraulic pulverisers for demolition
- Use ‘quacker’ style reversing alarms in lieu of tonal beeping alarms.

- Locate loud, stationary plant as far from noise sensitive receivers as possible. The ideal location is identified as the western most corner of the site compound along Driver Avenue, shown in Figure 1.



Figure 1: Recommended location of concrete crusher - pending access requirements to crusher

- An enclosure shall be installed around the concrete crusher. The enclosure shall be made of material with a density above 3 kg/m^3 and shall be lined internally with 25 to 50 mm absorbent material in accordance with AS 2436-2010.
- The arrival of deliveries to site and the idling of trucks on public roads shall not be permitted outside of standard hours of construction.

4 Double header sporting events assessment

This section addresses the following comments of Attachment 1 to the Response to Submissions:

- DPE21
- DPE22

- DPE23

Predicted noise levels during concurrent events at the SCG and SFS in Club Mode (30,000 patrons) are presented in Table 3 below. Results include receivers located to the east of the site, represented by receiver R9 – 5 Poate Road, Paddington.

Table 3: Sporting event noise predictions for SCG and SFS in club mode – $\text{dBL}_{\text{Aeq5min}}$

Receiver	Predicted noise level					
	SCG - Club mode (30,000 patrons)		SFS - Club mode (30,000 patrons)		Double header – events at SCG & SFS together	
	Neutral weather	Worst weather	Neutral weather	Worst weather	Neutral weather	Worst weather
R6 - 252 Moore Park Road, Paddington	44	44	58	58	58	58
R8 - 45 Oatley Road. Paddington	40	41	51	52	51	52
R9 - 5 Poate Road, Paddington	44	46	46	48	48	50

Results of concurrent events at the SCG and SFS in Championship Mode (full capacity) are presented in Table 4.

Table 4: Sporting event noise predictions for SCG and SFS in championship mode – $\text{dBL}_{\text{Aeq5min}}$

Receiver	Predicted noise level					
	SCG - Championship mode (50,000 patrons)		SFS - Championship mode (45,000 patrons)		Double header – events at SCG & SFS together	
	Neutral weather	Worst weather	Neutral weather	Worst weather	Neutral weather	Worst weather
R6 - 252 Moore Park Road, Paddington	49	49	63	63	63	63
R8 - 45 Oatley Road. Paddington	46	47	57	58	57	58
R9 - 5 Poate Road, Paddington	54	55	56	57	58	59

Results show noise levels from the SCG are more than 10 dB below those predicted from SFS at worst affected receivers, R6 - 252 Moore Park Road, Paddington and R8 - 45 Oatley Road. Paddington. The contribution from events at the SCG during a double header are therefore considered negligible.

Noise levels at R9 – 5 Poate Road, Paddington during double headers may be up to 2 dB higher than compared with the SFS events alone. An increase of 2 dB in noise levels is considered a ‘minor’ change, barely perceptible to the average person.

The likelihood that cumulative impacts are noticeable during double headers is low, as crowd noise from sporting events is intermittent in nature across a 15-minute period, and loud 15-minute periods do not occur consistently during events. The use of PAs during events is also sporadic and infrequent, therefore the cumulative effect of PA noise is not a significant concern.

In addition, predicted PA noise levels are well below established $\text{L}_{\text{Aeq5min}}$ noise limits at R9 – 5 Poate Road, Paddington, as shown in Table 31 of the NVIA.

Significant cumulative impacts from concurrent events at the SFS and SCG are therefore not expected.

5 Additional noise monitoring data

This section responds to comment EPA41 of Attachment 2 to this Response to Submissions.

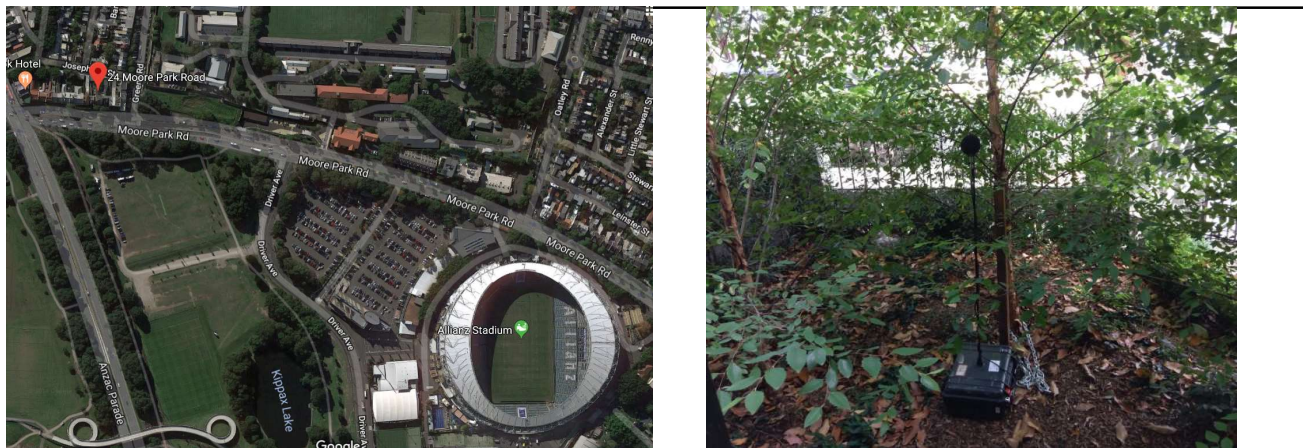
Additional noise monitoring data for location, 24 Moore Park Road, is appended to this document. No change to RBLs or Ambient L_{Aeq} levels established in the NVIA result from the additional data.

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	Mathew Simon	Glenn Wheatley	Glenn Wheatley
Signature			

24 Moore Park Road, Paddington (Free Field)

Additional detail:



Background and ambient noise monitoring results - NSW 'Industrial Noise Policy', 2000

Date	L _{A90} Background noise levels ⁴			L _{Aeq} Ambient noise levels		
	Day ¹	Evening ²	Night ³	Day ¹	Evening ²	Night ³
Wednesday-21-February-2018		52	38		64	61
Thursday-22-February-2018	56	51	39	66	65	61
Friday-23-February-2018	57	52	39	66	64	60
Saturday-24-February-2018	54	52		66	64	
Sunday-25-February-2018						
Monday-26-February-2018	58	52	42	69	67	61
Tuesday-27-February-2018	56			66		
Wednesday-28-February-2018						
Thursday-01-March-2018		54	44		65	63
Friday-02-March-2018	57	51	42	67	64	61
Saturday-03-March-2018	55			66		
Sunday-04-March-2018	56	51	42	66	63	60
Monday-05-March-2018						
Representative Weekday⁵	57	52	41	67	65	61
Representative Weekend⁵	55	52	42	66	63	60
Representative Week⁵	56	52	42	67	65	61

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times

2. Evening is 6:00pm to 10:00pm

3. Night is the remaining periods

4. Assessment Background Level (ABL) for individual days

5. Rating Background Level (RBL) for L_{A90} and logarithmic average for L_{Aeq}

Road / Rail noise monitoring results

Date	L _{Aeq} Noise levels		L _{Aeq} 1hr Noise levels (upper 10th percentile)	
	Day ¹	Night ²	Day	Night
Wednesday-21-February-2018	65	61	66	66
Thursday-22-February-2018	66	61	67	67
Friday-23-February-2018	66	60	67	64

Saturday-24-February-2018	65	62	66	64
Sunday-25-February-2018	69	65	72	69
Monday-26-February-2018	68	61	70	66
Tuesday-27-February-2018	66		67	
Wednesday-28-February-2018				
Thursday-01-March-2018	66	63	66	67
Friday-02-March-2018	66	61	0	65
Saturday-03-March-2018	66	62	67	65
Sunday-04-March-2018	65	60	66	66
Monday-05-March-2018	66		67	
Representative Weekday³	66	61	67	66
Representative Weekend³	67	62	69	66
Representative Week³	66	62	68	66

Notes:

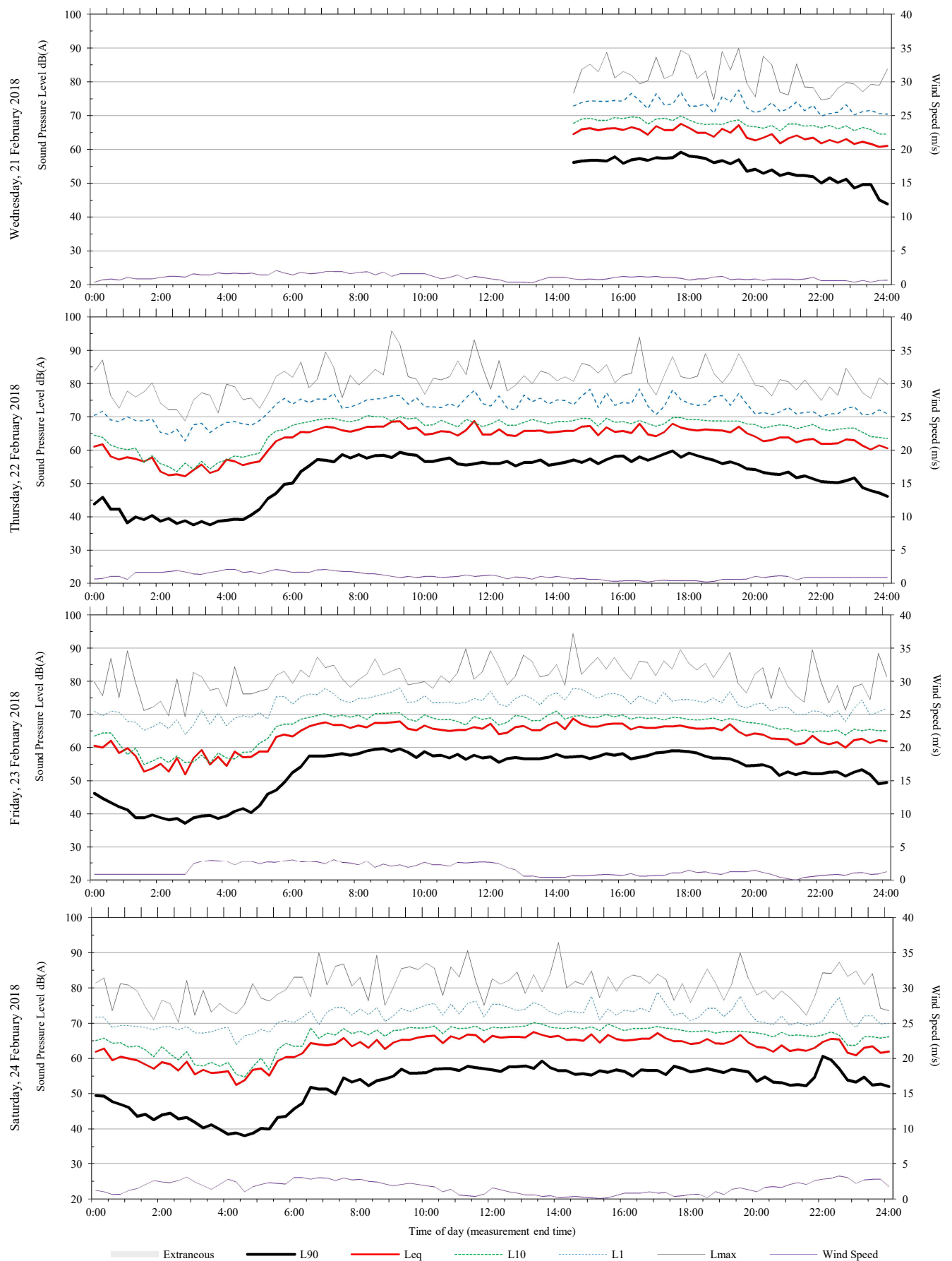
1. Day is 7:00am to 10:00pm

2. Night is 10:00pm to 7:00am

3. Logarithmic average of daily L_{Aeq}

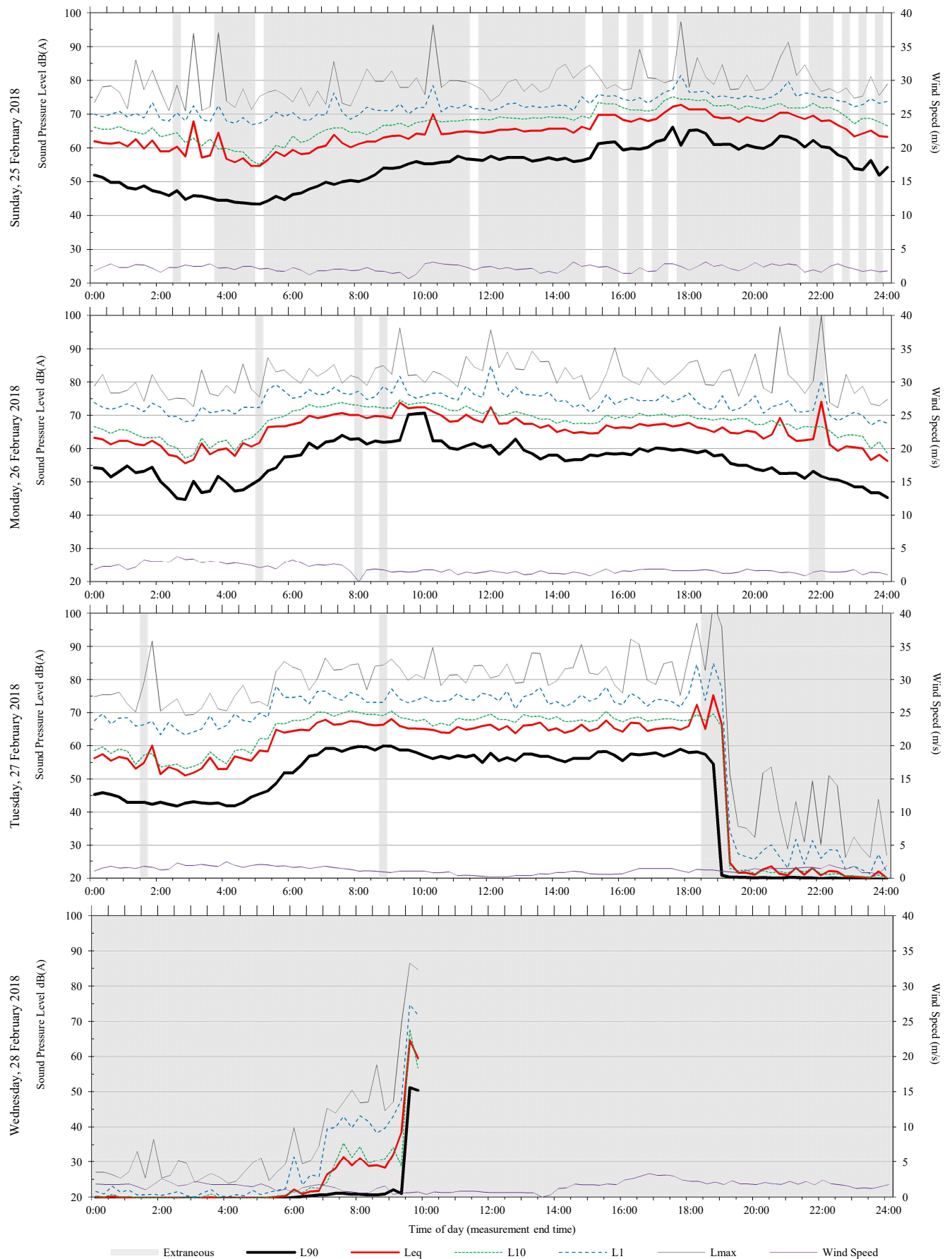
Unattended monitoring: (Free Field)

ARUP



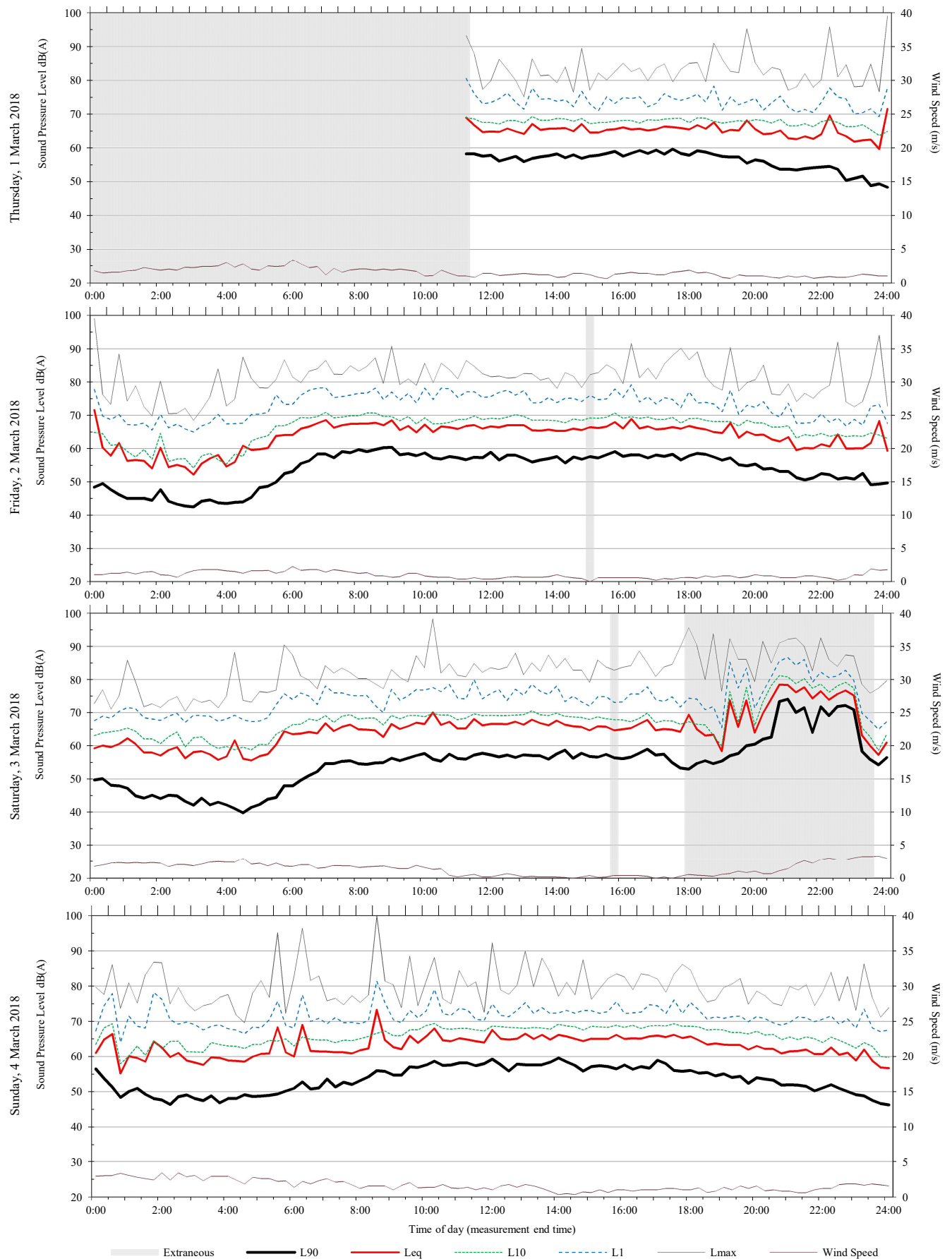
Unattended monitoring: (Free Field)

ARUP



Unattended monitoring: (Free Field)

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Unattended monitoring: (Free Field)

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