



# ENVIRONMENTAL MONITORING REPORT, APRIL 2020

## PARRAMATTA LIGHT RAIL INFRASTRUCTURE WORKS

25 April 2020

**Parramatta**  
Connect

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<b>Project number</b>	<b>N81080</b>
<b>Document number</b>	PLR1INF-CPBD-ALL-EN-RPT-0000010
<b>Revision date</b>	24 April 2020
<b>Revision</b>	Rev A

<b>Rev.</b>	<b>Date</b>	<b>Prepared By</b>	<b>Reviewed By</b>	<b>Approved By</b>	<b>Remarks</b>
A	24 Apr 2020	O. Cooper	D. Corish	D. Corish	Monthly Environmental Monitoring Report for April 2020



# 1. Introduction

## 1.1. Background

Parramatta Light Rail Stage 1 ('Stage 1') will connect Westmead to Carlingford via Parramatta Central Business District (CBD) and Camellia. Stage 1 is expected to be operational in 2023.

Stage 1 will create new communities, connect great places and help both local residents and visitors move around and explore what the region has to offer. The route will link Parramatta's CBD and train station to a number of key locations, including the Westmead Precinct, the Parramatta North Growth Centre, the new Western Sydney Stadium, the Camellia Town Centre, the new Powerhouse Museum and Riverside Theatre arts and cultural precinct, the private and social housing redevelopment at Telopea, the Rosehill Gardens Racecourse and the three Western Sydney University campuses.

Key features of Stage 1 include:

- A new dual track light rail network of approximately twelve (12) kilometres in length, including approximately seven (7) kilometres within the existing road corridor and approximately five (5) kilometres within the existing Carlingford Line and Sandown Line, replacing current heavy rail services
- Sixteen (16) stops that are fully accessible and integrated into the urban environment including a terminus stop at each end of Westmead and Carlingford
- High frequency 'turn-up-and-go' services operating seven days a week from 5am to 1am. Weekday services will operate approximately every 7.5 minutes in the peak period between 7am and 7pm
- Modern and comfortable air-conditioned light rail vehicles, nominally 45 metres long and driver-operated, each carrying up to 300 passengers.
- Intermodal interchanges with existing public transport services at Westmead terminus, Parramatta CBD and the Carlingford terminus
- Creation of two light rail and pedestrian zones (no general vehicle access) within the Parramatta CBD along Church Street (generally between Market Street and Macquarie Street) and along Macquarie Street (generally between Horwood Place and Smith Street)
- A Stabling and Maintenance (SaM) Facility located in Camellia for light rail vehicles to be stabled, cleaned and maintained
- New bridge structures along the alignment including over James Ruse Drive and Clay Cliff Creek, Parramatta River (near the Cumberland Hospital), Kissing Point Road and Vineyard Creek, Rydalmere
- Alterations to the existing road network including line marking, additional traffic lanes and turning lanes, new traffic signals, and changes to traffic flows
- Relocation and protection of existing utilities
- Public domain and urban design works along the corridor and at Stop precincts
- Closure of the heavy rail line between Carlingford and Clyde
- Active transport corridors and additional urban design features along sections of the alignment and within Stop precincts
- Integration with the Opal Electronic Ticketing System (ETS)
- Real time information in light rail vehicles and at Stops via visual displays and audio.



### 1.1.1. Statutory Context

The Parramatta Light Rail is classified as Critical State Significant Infrastructure (CSSI) and was subject to environmental impact assessment under the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EIS assessed impacts for Parramatta Light Rail Stage 1 (Westmead to Carlingford) including the light rail and associated road enabling works.

Stage 1 received Infrastructure Approval from the Minister for Planning under Section 5.19 of the EP&A Act on 29 May 2018 (Critical State Significant Infrastructure Application SSI-8285), subject to the conditions provided in the Instrument of Approval, specifically Schedule B – Ministerial Conditions of Approval.

The Infrastructure Approval was subsequently modified under Section 5.25 of the EP&A Act on 21 December 2018 and 25 January 2019.

The planning approval, modifications and related environmental assessment documents are located at: [http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8285](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8285).

A Construction Environmental Management Plan (CEMP) has been prepared for the Parramatta Light Rail Package 4 – Infrastructure Works (Infrastructure Works). The purpose of the CEMP and associated Sub-plans is to address the requirements of the:

- Minister’s Conditions of Approval (CoA) SSI-8285
- Revised Environmental Mitigation and Management Measures (REMMMs)
- Environmental Performance Outcomes (EPOs)
- Applicable legislation and contractual requirements, including the PLR Stage 1 Infrastructure Contract Project Deed (ISD-17-6721).

The REMMMs and EPOs are listed in Parramatta Light Rail Stage 1 Westmead to Carlingford via Parramatta CBD and Camellia Environmental Impact Statement (the EIS), as amended by the Parramatta Light Rail (Stage 1) Westmead to Carlingford via Parramatta CBD and Camellia Submissions Report (incorporating Preferred Infrastructure Report) (March 2018) (the SPIR). The CEMP and associated Sub-plans were approved the Secretary on the 21 November 2019.

## 1.2. Scope

The scope of this report is to present monthly results of the inspection and monitoring programs outlined in the Infrastructure Works CEMP and associated Sub-plans, including the results of the construction monitoring programs referred to in Condition C9 of the Planning Infrastructure Approval.

Environmental inspections and monitoring are undertaken to:

- Validate the predicted impacts of the Infrastructure Works
- Measure the effectiveness of environmental controls
- Track progress against targets and objectives of the CEMP.

The monitoring requirements for nominated aspects are included in the relevant environmental management sub plans and summarised in **Table 1-1**.

Where relevant, data will be presented on a progressive basis (i.e. monthly summary) to identify trends.

The data of the monitoring programs will also be reviewed annually in the Annual Environment Reports.



**Table 1-1 Monthly Environmental Monitoring Reporting Requirements**

<b>CEMP or Sub-plan</b>	<b>Monitoring program</b>	<b>Distribution</b>
Noise and Vibration Management Sub-plan	<ul style="list-style-type: none"> <li>- Locations and descriptions of monitoring undertaken</li> <li>- Noise monitoring results</li> <li>- Summary of any exceedance of the nominated criteria</li> <li>- Corrective actions</li> </ul>	<ul style="list-style-type: none"> <li>- City of Paramatta Council</li> <li>- Cumberland Council</li> <li>- EPA</li> <li>- NSW Health</li> <li>- TfNSW</li> <li>- IC</li> <li>- ER</li> <li>- AA</li> <li>- Made publicly available</li> </ul>
Soil and Water Management Sub-plan	<ul style="list-style-type: none"> <li>- Weather forecasts and observations</li> <li>- Water Quality (Turbidity) monitoring</li> <li>- Discharge and dewatering monitoring</li> </ul>	<ul style="list-style-type: none"> <li>- City of Paramatta Council</li> <li>- Cumberland Council</li> <li>- EPA</li> <li>- DOI Water</li> <li>- TfNSW</li> <li>- IC</li> <li>- Made publicly available</li> </ul>
Air Quality and Dust Management Sub-plan	<ul style="list-style-type: none"> <li>- Weather observations</li> <li>- Dust deposition monitoring</li> <li>- Real time aerosol dust monitors</li> <li>- Asbestos fibre air monitoring</li> </ul>	<ul style="list-style-type: none"> <li>- EPA</li> <li>- TfNSW</li> <li>- IC</li> <li>- Made publicly available</li> </ul>



## 2. Site Activities

Table 2-1 provides a summary of the site activities for April 2020.

Table 2-1 Monthly Environmental Monitoring Reporting Requirements

Precinct	Site Activities
Westmead and North Parramatta	<b><u>Westmead</u></b>
	<ul style="list-style-type: none"><li>- Demolition completed at 28 Railway Parade including tree removal</li><li>- Demolition commenced late April 2020 at 149 Hawkesbury Road</li></ul>
	<b><u>Cumberland Hospital</u></b>
	<ul style="list-style-type: none"><li>- Archaeological salvage completed in 2 areas</li></ul>
Parramatta CBD	<b><u>North Parramatta</u></b>
	<ul style="list-style-type: none"><li>- Jemena condition assessment works completed at the intersection of Fleet and Factory Street</li><li>- Night works for utility investigations commenced on Church Street (Factory Street to Market Street) late April 2020</li><li>- Demolition of 519 Church Street commenced late April 2020</li><li>- Demolition works at 435 Church Street commenced in late April 2020</li></ul>
	<b><u>UTC-005 (Telstra)</u></b>
	<ul style="list-style-type: none"><li>- Church Street (Market to Macquarie Street), George Street and Smith Street: continued investigations of existing in-ground utilities for Telstra space proofing (such as potholing, slot trenching, locating, surveying)</li><li>- Church Street (Lennox to Macquarie Street), Centenary Square, George Street and Smith Street: continued excavation of trenches along footpaths and roadway, as well as installation of new Telstra conduits (including removal of lighting and street furniture within Centenary Square)</li></ul>
<b><u>UTC-007 (Temporary watermain)</u></b>	
<ul style="list-style-type: none"><li>- Macquarie Street (Church to Charles Street): continued investigations of existing in-ground utilities for temporary watermain (such as potholing, slot trenching, locating, surveying), on roadway</li><li>- Macquarie Street (Church to Charles Street): commenced excavation of trenches along Macquarie Street within road reserve and installation of new temporary assets</li></ul>	
<b><u>UTC-008 – Investigation and relocations</u></b>	
<ul style="list-style-type: none"><li>- Church Street (Market to Macquarie Street): continued investigations of existing in-ground utilities for relocation of Jemena network (such as potholing, slot trenching, locating, surveying)</li></ul>	
<b><u>UTC-008b (Sydney Water watermain)</u></b>	



Precinct	Site Activities
	<ul style="list-style-type: none"><li>- Phillip Street/Church Street intersection: continued investigations of existing in-ground utilities for relocation of Sydney Water watermain (such as potholing, slot trenching, locating, surveying)</li><li>- Phillip Street/Church Street intersection: Sydney Water watermain shutdown completed including installation of the new watermain</li></ul> <p><b><u>Harris Street TMP Implementation</u></b></p> <ul style="list-style-type: none"><li>- Harris Street (Harris to Marsden Street) and connecting streets: commencement of investigations of existing in-ground utilities and tree roots within roadway and footpaths</li><li>- Installation and replacement of traffic signs in accordance with approved TMP</li><li>- Partial road closure (concluding 25/04/20)</li></ul> <p><b><u>Area 2 East - Jemena works @ Harris Street – investigation and relocations</u></b></p> <ul style="list-style-type: none"><li>- Harris Street (Hassall to Macquarie Street): commencement of investigations of existing in-ground utilities for relocation of Jemena network (such as potholing, slot trenching, locating, surveying)</li><li>- Church Street (Market to Macquarie Street): commencement of the excavation of trenches along Church Street within road reserve and footpaths and installation of new Jemena assets</li></ul> <p><b><u>Area 2 East – Demolition of Houses at Arthur / Tramway Avenue</u></b></p> <ul style="list-style-type: none"><li>- Commencement of site preparation works for demolition of three houses</li></ul>
Camellia and Carlingford line	<p><b><u>Grand Avenue &amp; Tramway Avenue UTC-003</u></b></p> <ul style="list-style-type: none"><li>- Excavation and trenching works at Arthur Street, Tramway Avenue and Grand Avenue North for the installation of utilities</li><li>- Under-boring at James Ruse Drive for the installation of utilities</li><li>- Deep excavation at Tramway Avenue for sewer manhole</li><li>- Tree removal at corner of James Ruse Drive and Tramway Avenue</li><li>- Installation of protection sleeve at Grand Avenue for the Caltex pipeline</li></ul> <p><b><u>Sandown Line</u></b></p> <ul style="list-style-type: none"><li>- Tree removal along Sandown Line</li></ul> <p><b><u>Carlingford Line</u></b></p> <ul style="list-style-type: none"><li>- Completion of piling pad at James Hardie Culvert Bridge</li><li>- Demolition of Rydalmere Station and 2 Brodie St structure</li><li>- Demolition of Camelia Station</li><li>- Establishment of Brodie St (Rydalmere) ancillary facility</li><li>- Tree removal from Camelia to Carlingford</li></ul>





Precinct	Site Activities
	<ul style="list-style-type: none"><li>- Rock hammering and excavation between Rydalmere and Dundas Station</li><li>- Top soil stripping and removal from Camelia to Carlingford</li></ul>

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## 3. Monitoring Results

Section 3 presents a summary of the environmental inspection and monitoring programs completed in during the reporting period (26 March 2020 to 25 April 2020). Detailed monitoring results for each program are presented in the appendices to this report.

### 3.1. Inspections

A total of three inspections were completed in April 2020. **Table 3-1** provides a summary of the number of actions raised and closed within the agreed timeframe.

**Table 3-1 Inspections for Arpil 2020**

Date	Type	Actions	Closed in time
31/03/2020	ER Inspection	0	N/A
14/04/2020	ER Inspection	3	YES
23/04/2020	ER Inspection	1	YES
<b>Total</b>	<b>3</b>	<b>4</b>	<b>YES</b>

### 3.2. Weather

The total rainfall during the reporting period was 53.4 mm with 8 rain day (days with >1mm of rain). No rain days exceeded the 80<sup>th</sup> percentile (25.8mm) and the 85<sup>th</sup> percentile (33.1mm).

During the reporting period there were 18 days (28 days in the reporting period) where the maximum wind gust recorded was greater than 25km/hr, and 2 days where the maximum wind gust recorded was greater than 50km/hr. 7 days of wind greater than 25km/hr were forecast and on each of those days notifications were issued to the construction team to alert them of the strong winds forecast. This month there was minimal ground disturbance works and as such, the risk of dust generation was low. There were no complaints received in relation to dust generation.

A summary of the weather observations and weather events during the reporting period of relevance to the Soil and Water Management Sub-plan and Air Quality Management Sub-Plan Trigger Action Response Plans (TARPs) are summarised in **Table 3-2**. A comparison between long term monthly means and recorded values can be found in **Figure 3-1** for rainfall and **Figure 3-2** for rain days >1mm.

Detailed weather observation records for April 2020 are presented in **Appendix A-1**.

**Table 3-2 Weather Summary and Trigger Weather Events for April<sup>1</sup> 2020**

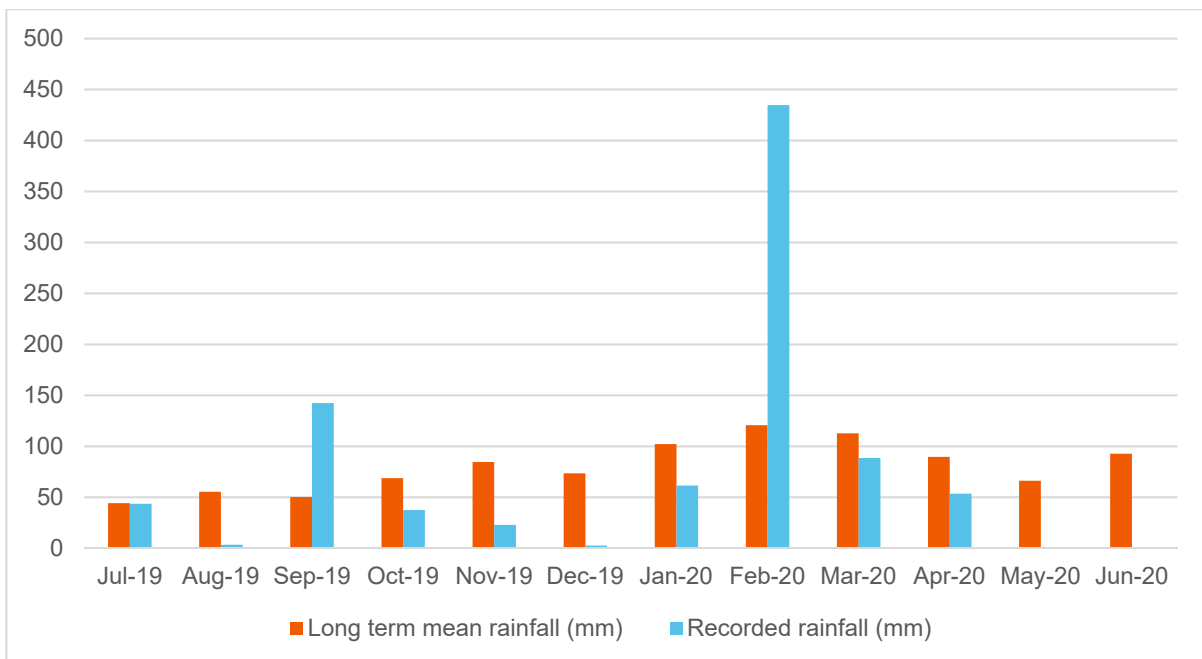
Weather event	Forecast	Observation
Minimum temperature	9°C	7.5 °C
Maximum temperature	29°C	30 °C
Total rainfall	66.8mm	53.4mm
Number of days with rain (>1mm)	6 days	8 days



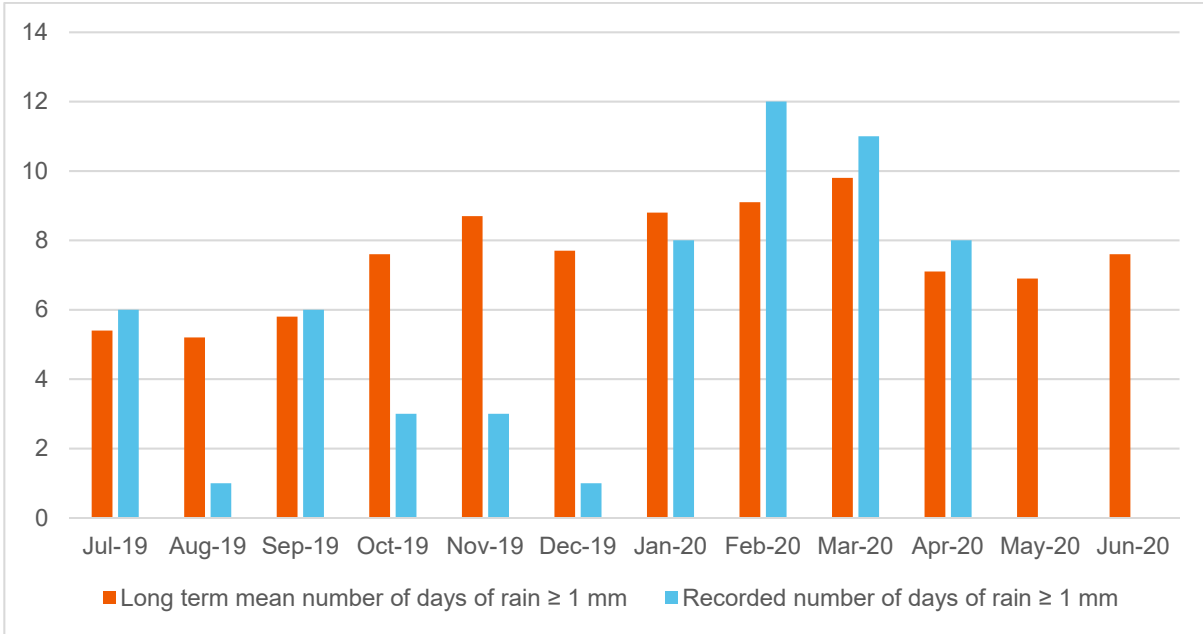
Weather event	Forecast	Observation
>80 <sup>th</sup> percentile (25.8mm) rain events	0	0 events
>85 <sup>th</sup> percentile (33.1mm) rain events	0	0 events
Flood warning / events	-	-
>25km/hr wind <sup>2</sup>	7 days	18 days
>50km/hr wind	0 days	2 days

1. Weather summary based on data from the 26 March to 25 April (28 days).
2. Wind data from Sydney Olympic Park AWS (Archery Centre) {station 066212}. Weather data from Parramatta North (Masons Drive) {station 066124}.

Note: Red text in Observation column indicates observation greater than forecast.



**Figure 3-1 Monthly rainfall comparison**



**Figure 3-2 Monthly rain days comparison**

### 3.3. Noise and Vibration

**Table 3-3** provides a summary of noise monitoring events completed in during the reporting period. Detailed noise monitoring results and comments are presented in **Appendix A-2**. It is noted that recorded noise levels (Leq, 15min) during the reporting period were consistently below the predicted noise levels.

Additional information on the hours of works, respite requirements and alternative accommodation are provided in the Noise and Vibration Management Sub-plan (Section 11.3).

Vibration monitoring events completed in during the reporting period are summarised in **Table 3-4** and detailed results and comments are presented in **Appendix A-2**. All monitoring events were compliant with vibration targets.

All noise and vibration monitors used during the reporting period, together with current NATA calibration data, is provided in **Table 3-5**.

**Table 3-3 Summary of noise monitoring April 2020**

Date	Monitoring Location	Description
03/04/2020	Museum Gardens	OOHW Period 1: Hammering pavement
03/04/2020	Museum Gardens	OOHW Period 1: Hammering and spoil removal
03/04/2020	Meriton	OOHW Period 1: Hammering
10/04/2020	Meriton	OOHW Period 1: Sheet Piling
10/04/2020	Meriton	OOHW Period 1: Concrete saw and hammering
21/04/2020	16 Harris Street	OOHW Period 1: Hammering
21/04/2020	Meriton	OOHW Period 2: Mobile crane



**Note:** The calibration of the monitoring equipment is checked in the field before and after the noise measurement period in accordance with Standards Australia AS/IEC 60942:2004/IEC 60942:2003–Electroacoustic – Sound Calibrators.

**Table 3-4 Summary of vibration monitoring April 2020**

Date	Monitoring Location	Description
09/04/2020	Phillip/Church Street	OOHW Period 2: Baseline testing
09/04/2020	Phillip/Church Street	OOHW Period 2: Sheet piling
10/04/2020	Phillip/Church Street	OOHW Period 2: Excavation/rock breaking
03/04/2020	Phillip/Church Street	OOHW Period 1: Concrete saw and excavation

**Table 3-5 Noise and Vibration Monitors and NATA Calibration**

Equipment	Serial Number	Calibration Date
Noise Level Meter	00973277	4/12/2020
Noise Level Meter	00973275	26/11/2020
Vibration Monitor	BE15042	19/07/2020
Vibration Monitor	BE14639	5/12/2020

## 3.4. Soil and Water

### 3.4.1. Water quality (turbidity) in receiving waters

There were no rainfall events over 20mm and as such water quality monitoring in the receiving waters was not required during the reporting period.

### 3.4.2. Discharge and dewatering

There was one discharge event during the reporting period.

## 3.5. Air Quality

### 3.5.1. Dust Deposition Monitoring

A dust deposition gauge has been established at 13A Grand Avenue in Camellia. This gauge was installed at the end of December 2019. It is noted that the data for the February 2020 reporting period is not available due to inadvertent damage to the monitoring gauge.

The dust monitoring results for the Month of April marginally exceeds the trigger criteria of 4 g/m<sup>2</sup>/month for the dust deposition data. In response to this, environmental controls are being reviewed and revised where necessary.



**Table 3-4 Summary of dust disposition data**

<b>Date</b>	<b>Monitoring Location</b>	<b>Total Insoluble Matter g/m<sup>2</sup>/month</b>
20/01/2020	13 Grand Avenue	3.9
24/03/2020	13 Grand Avenue	4
27/04/2020	13 Grand Avenue	4.1

# Appendices

## A-1 Weather Observations

Table A-1-1 Weather observations: Parramatta North (Masons Drive) {station 066124}.

Date	Temps		Rain	Temp	RH	9:00 AM		
	Min	Max				Cld	Dir	Spd
	°C	°C	mm	%	8th			
26/03/2020	15.7	21.3	12	17	82	8	SSW	2
27/03/2020	13.8	22.2	5	18.5	95	7	S	2
28/03/2020	12.3	23.8	0	17.6	84	0	SE	2
29/03/2020	16.2	25.2	3.2	18.2	98	5	E	2
30/03/2020	17.2	25.2	2.2	18.6	94	8	W	2
31/03/2020	14.8	26.8	0	20	81	3	W	2
1/04/2020	16.7	24	0.2	19.6	96	7	E	2
2/04/2020	16	24.3	13	19.7	97	7	NE	2
3/04/2020	15.5	26	5	22	74	5	W	7
4/04/2020	19	25.7	7.4	21	76	8	NW	9
5/04/2020	12.8	24.2	0	19	46	2	W	19
6/04/2020	13	24	0	19.4	54	2	W	6
7/04/2020	14.8	20.8	0	17.6	70	7	SW	6
8/04/2020	12.8	18.8	0	17.2	82	8	SE	2
9/04/2020	14.5	22.2	0.4	18.3	77	6	SW	2
10/04/2020	15.5	22.5	1	17.6	97	8	NNE	2
11/04/2020	13.2	24.8	4	21.5	50	2	NW	15
12/04/2020	7.5	21.8	0	17.5	44	0	W	6
13/04/2020	7.8	23	0	15.5	74	5	ESE	2
14/04/2020	10.3	27.2	0	17	75	0	W	6
15/04/2020	12	30	0	20	72	4	W	2
16/04/2020	15.5	26	0	22.5	59	7	N	9
17/04/2020	14.8	27	0	21.5	50	2	W	11
18/04/2020	11	24	0	15.5	59	3	W	6
19/04/2020	9	22.2	0	16.4	70	3	W	2
20/04/2020	11.2	20	0	15.7	80	8	NE	4
21/04/2020	10.5	25.6	0	19.2	61	3	NW	2
22/04/2020	12.3	25.5	0	20	56	1	SW	4



23/04/2020	9.8	24.8	0	18	58	3	NW	6
24/04/2020	13.7	28	0	22.5	51	0	W	2
25/04/2020	11.2	27.2	0	18.6	75	0	NW	2

**Table A-1-2 Wind observations: Sydney Olympic Park AWS (Archery Centre) {station 066212}.**

Date	Max Wind Gust			9:00 AM		3:00 PM	
	Dir	Spd	Time	Dir	Spd	Dir	Spd
		km/h	local		km/h		km/h
26/03/2020	S	35	1:16	SSW	13	S	19
27/03/2020	ESE	24	10:32		Calm	ESE	15
28/03/2020	E	28	17:02	NW	7	E	13
29/03/2020	ESE	24	14:23		Calm	NE	9
30/03/2020	NW	24	14:08	WSW	6	NW	13
31/03/2020	ESE	28	15:24	NW	6	SE	17
1/04/2020	ENE	28	16:49		Calm	S	7
2/04/2020	NNW	20	22:36		Calm		Calm
3/04/2020	N	22	15:04	WNW	9	N	6
4/04/2020	WNW	67	11:12	NNW	17	WNW	31
5/04/2020	WNW	39	13:35	NW	17	WNW	19
6/04/2020	SSW	30	13:19	NW	4	SE	17
7/04/2020	SE	30	13:45	SW	7	SE	13
8/04/2020	SE	26	14:20	SE	9	SSE	13
9/04/2020	ESE	20	11:55	WSW	4	ESE	9
10/04/2020	SW	44	17:14		Calm	NNW	13
11/04/2020	WNW	61	14:23	NNW	11	WNW	24
12/04/2020	W	22	1:13	W	13	N	7
13/04/2020	ESE	20	14:19	WNW	6	ENE	11
14/04/2020	E	20	14:25	NW	9	E	13
15/04/2020	SE	20	15:08	NW	7	ESE	13
16/04/2020	NNW	28	12:42	NNW	2	NNW	15
17/04/2020	WNW	30	13:53	W	9	SW	11
18/04/2020	W	24	4:57	WNW	9	ESE	15
19/04/2020	SSE	22	14:23	WSW	7	SE	13
20/04/2020	NW	26	14:49	WNW	7	NNW	13
21/04/2020	E	22	16:12		Calm	E	13
22/04/2020	WSW	30	10:39	W	7	WSW	9
23/04/2020	N	26	12:26	WNW	9	N	11
24/04/2020	WSW	28	13:26	WNW	13	SW	13
25/04/2020	NNW	26	13:17	WNW	4	NNW	13





Notes:

Blue text indicates a rain event greater than 1mm of rain.

Orange text indicates a rain event greater than the 80<sup>th</sup> percentile of 25.8mm, and a wind speed of greater than 25km/hr

Red text indicates a rain event greater than the 85<sup>th</sup> percentile of 33.1mm, and a wind speed greater than 50km/hr.



## **A-2 Noise and Vibration Monitoring Results**

Table A-2-1 Noise monitoring results

Date	Time	Out of Hours Works Period	Construction Activity	Activity Location	Monitoring Location	NML (dBA)	Predicted (dBA)	Additional Mitigation Measures	Specified Noise Limit	Recorded Leq, 15min (dBA)	Exceedance of Specified Noise Limit (dBA)	Construction noise exceedance	Comments
03/04/2020	21:14	OOHW Period 1	Hammering Pavement	Riverside/Novotel	Museum Gardens	62	92	PN, V, RP, SN, DR	92	75	-17	No	<b>Construction Moderately Intrusive:</b> Hammering occurring on the road Works stopped at 14.00 minutes into monitoring – LAeq at this time was 75.2 dB which was below the predicted level
03/04/2020	21:31	OOHW Period 1	Hammering Pavement	Riverside/Novotel	Museum Gardens	62	92	PN, V, RP, SN, DR	92	71.7	-20.3	No	<b>Construction Moderately Intrusive:</b> Hammering stopped 3:45 into monitoring – LAeq at this time was 76.5dB which represents a worst case scenario and below the predicted level.
03/04/2020	21:50	OOHW Period 1	Hammering + spoil removal	Riverside/Novotel	Museum Gardens	51	92	PN, V, RP, SN, DR	92	72.4	-19.6	No	<b>Construction Moderately Intrusive:</b> 2:30 minutes into monitoring, the angle of the hammer was changed 4 minutes into monitoring, hammering stops 7:30 minutes into monitoring, started removing spoil and the bucket scraped the pavement (65dB-76dB) 11 minutes into monitoring, spoil transferred to truck 12 minutes into monitoring, excavator engine at 61dB 14:10 minutes into monitoring, road plates were lifted
03/04/2020	22:54	OOHW Period 2	Hammering	Meriton	Meriton	48	91	PN, V, RP, SN, DR	91	87	-4	No	<b>Construction Moderately Intrusive:</b> 1 minute into monitoring, panel dropped 1:45 minute into monitoring, stopped to install additional noise blankets
10/04/2020	20:17	OOHW Period 1	Sheet Piling	Phillip Street	Meriton	48	76	PN, V, RP, SN, DR	76	56.7	-19.3	No	<b>Construction Moderately Intrusive:</b> People walking Background noise – no construction at 54dB 9:50 minutes into monitoring, sheet piling occurred at 56dB Pedestrians talking nearby 12:00 minutes into monitoring, excavator reversing at 56dB
10/04/2020	20:33	OOHW Period 1	Concrete saw + hammering	Phillip/Church Street	Meriton	48	76	PN, V, RP, AA, SN, DR	76	62.9	-13.1	No	<b>Construction Moderately Intrusive:</b> No pedestrian or construction noise at 52dB Concrete saw at 57-58dB 1:55 minutes into monitoring, people walking past at 59dB 2:40 minutes into monitoring, workers walking past 10m away 3:13 minutes into monitoring, truck start up at 7m away at 65dB, at drive site 4:10 minutes into monitoring, concrete saw starts up at 57dB 4:10 minutes into monitoring, people walking past at 61dB, 10m away 5:40 minutes into monitoring, concrete saw stopped, and people walked past at 65dB 7 minutes into monitoring, saw moved to compound – no hammering 70dB 9:10 minutes into monitoring, gate opening at 71dB, 7m away. Concrete saw stopped 10:45 minutes into monitoring, hammering started and was 65dB 12:42 minutes into monitoring, metal dropped in compound, 20m away at 80dB
21/04/2020	20:59	OOHW Period 1	Hammering	Harris Street/Hassle Street	16 Harris Street	58	90	PN, V, RP, SN, DR	90	66.2	-23.8	No	<b>Construction Moderately Intrusive:</b> 1 minute into monitoring, works paused 3:50 minutes into monitoring, cars passing at 65.66dB 5 minutes into monitoring, trucks passing at 73dB 7 minutes into monitoring, started up again after dust suppression implemented. Hammering at 71dB 11:50 minutes into monitoring, stopped for further set up at Harris Street next to island
21/04/2020	21:21	OOHW Period 1	Hammering	Harris Street/Hassle Street	16 Harris Street	58	90	PN, V, RP, SN, DR	90	67.6	-22.4	No	<b>Construction Moderately Intrusive:</b> Hammering at intersection of Harris at Hassle Street Live traffic passing by Trucks and vehicles passing at 65-71dB Hammering at 67-70dB (no traffic at this time)

21/04/2020	21:42	OOHW Period 1	Hammering	Harris Street/Hassle Street	16 Harris Street	58	101	PN, V, RP, SN, DR	101	60.9	-40.1	No	<b>Construction Moderately Intrusive:</b> 5:40 to 5:47 minutes into monitoring, hammering was at 65dB When construction was occurring, ambient noises were minimal
21/04/2020	22:22	OOHW Period 2	Mobile crane	Phillip Street Watermain	Meriton	48	58	PN, V, RP, SN, DR	58	57.7	-0.3	No	<b>Construction Moderately Intrusive:</b> Music from Bayfish can be heard in the background 3:30 minutes into monitoring, pipe lifted at 59-60dB 4:20 into monitoring, reverse alarm at 75dB 4:40 minutes into monitoring, board trench driven off at 65dB in the clearing 8:45 minutes into monitoring, tipper starts up at 50m behind works and reverses away at 55-58dB 10:55 minutes into monitoring, crane lowers cage into trench at 53dB and is on idle 52dB 12 minutes into monitoring, pedestrians walking past at 56dB

Notes:

**Standard hours:**

- All areas excluding Eat Street and Camellia – Monday to Friday 7:00 am to 7:00 pm. Saturday 8:00 am to 6:00 pm
- Eat Street (Church Street between Palmer Street and George Street) – Monday to Friday 7:00 am to 6:00 pm. Saturday 8:00 am to 12:00 pm)
- Camellia, Rosehill and Rydalmere (east of James Ruse Drive to Victoria Road) – 24 hours a day and seven days a week provided that sensitive receivers are not affected by noise levels of greater than 5 dBA above the rating background level at any residence

**Additional Mitigation Measures**

- PN = Project Notification
- V = Verification Monitoring
- RP = Respite Period
- AA = Alternate Accommodation
- SN = Specific Notification / individual briefing or phone call
- DR = Duration Reduction
- RO = Project Specific Respite Offer

**OOHW Period 1** is defined as:

- 6:00pm to 10:00pm (evenings) Monday to Saturday
- 7:00am to 8:00am and 1:00pm to 10:00pm (day & evening) Saturday and
- 8:00am to 6:00pm Sunday and public holidays (days).

**OOHW Period 2** is defined as:

- 10:00pm to 7:00am (nights) Monday to Saturday and  
6:00pm to 8:00am (nights) Sundays and public holidays.

**Table A-2-2 Vibration monitoring results**

Date	Time	Out of Hours Works Period	Construction Activity	Activity Location	Monitoring Location	Target	Recorded PVS (Max values)	Exceedance of Target	Construction vibration exceedance	Comments
09/04/2020	20:15-20:45	OOHW Period 2	Baseline testing Traffic control set-up	Phillip/Church St	306 Church St	7.5 mm/s	0.163 mm/s	No	No	No construction vibration exceedance
10/04/2020	23:01-23:16	OOHW Period 2	Excavating/rock breaking	Corner Phillip and Church St	Phillip Street at entry steps of building	7.5 mm/s	0.163 mm/s	No	No	No construction vibration exceedance
10/04/2020	16:28-21:10	OOHW Period 2	Concrete saw/excavation	Phillip/Church St intersection	Mad Max Restaurant	7.5 mm/s	2.752 mm/s	No	No	No construction vibration exceedance 16:50 sheet piling started (1.19mm/s)
09/04/2020	21:15	OOHW Period 2	Sheet piling/concrete saw/hammering/scraping soil with excavator	Phillip/Church	Mad Mex	7.5 mm/s	-	-	-	Issue with the sensor check

