



Construction Monitoring Report September 2020 – February 2021

Sydney Metro City & Southwest – Line-wide Works

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1. Introduction

1.1 Project Summary

The Sydney Metro City & Southwest (SMCSW) is the second portion of the new standalone rail network known as the Sydney Metro, which is Australia's largest public transport infrastructure project and a priority rail project for the NSW Government. The project will extend Sydney Metro Northwest to the CBD and beyond to Bankstown. The project is being delivered through a suite of contracts for the tunnels, stations, Line-wide infrastructure and systems. Line-wide is a key component of the SMCSW, with works taking place over the full length of the project as shown in Figure 1 below:

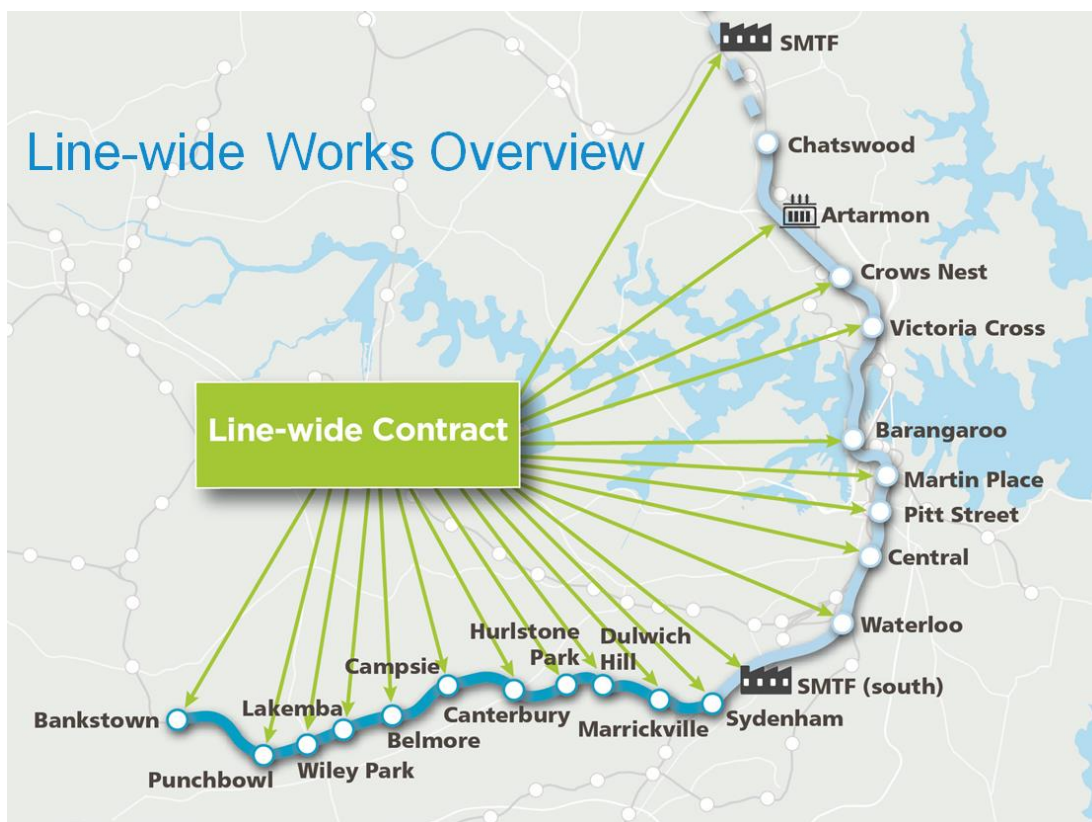


Figure 1: Line-wide Locations

1.2 Planning Approval Requirements

The Sydney Metro Authority received planning approval to construct the project from the Department of Planning, Industry and Environment. The Conditions of Approval CSSI 7400 cover the works from Chatswood to Sydenham and the Conditions of Approval CSSI 8256 cover the works from Marrickville to Bankstown.

A Construction Environmental Management Plan and sub-plans were developed for the project to address all environmental aspects, including construction monitoring. Approval of the plans enabled commencement of construction on 04 March 2020. The plans for the Line-wide works were developed to address the requirements of both planning approvals in each plan or sub-plan. Construction monitoring requirements are detailed in the Soil, Water and Groundwater Management Sub-Plan C2B and the Construction Noise and Vibration Management Plan – C2B. The plans can be accessed at the Systems Connect Project website:

<https://www.sclww.com.au/>

The objectives for this report are to provide construction monitoring results for the second 6 months of works on the Line-wide Project, from the start of September 2020 to the end of February 2021. This report is provided for information to the Department of Planning, Industry and Environment. It is intended to address the requirements of Conditions C16 of CSSI 7400 and C14 of CSSI 8256.

2. Water Quality Monitoring

The Soil, Water and Groundwater Management Sub-Plan C2B requires that water quality monitoring will be undertaken for controlled discharges offsite to watercourses and stormwater drainage to ensure compliance with discharge criteria. The discharge criteria are shown in Table 1 below:

Table 1: Discharge Criteria

Parameter	Measurement and Assessment			Discharge Criteria
	Percentile Concentration Limit	Sample Method & Frequency	Units	
pH	100	Probe/ grab sample Prior to discharge	pH	6.5-8.5
Total Suspended Solids	100	Probe/ grab sample Prior to discharge	mg/L	<50
Oil and Grease	100	Visual Prior to discharge	mg/L	<10 and no visible trace

2.1 Permit to Dewater

Systems Connect have an internal Permit to Dewater system, which ensures compliance with discharge criteria at all times. Monitoring is done prior to each dewatering event. During the reporting period, very small volumes (individual 1000 litre IBCs and skip bins of clean water) were discharged. The Systems Connect Permit to Dewater and Water Quality Monitoring Register is provided in Appendix A. This demonstrates that discharge criteria were met for all discharges.

2.2 Water Treatment Plant

On 1 August 2020, Systems Connect took possession of a portion of the Chatswood Dive site from the Tunneling and Station Excavation Contractor. The portion contains the Chatswood Water Treatment Plant, which is now operated by Systems Connect. It collects surface water from the Chatswood Dive site, station box water from Crows Nest station, and tunnel water from between Victoria Cross Station and the Chatswood Dive.

A WTP Checklist is completed by the WTP operator daily (working days), where a range of WTP observations, parameters and chemical levels are noted. This includes water discharge parameters required for regulatory compliance. The compliance results from the checklists completed during the reporting period are described in Table 2 below:

Table 2: WTP Compliance Results

Date	pH	Turbidity (NTU)	Oil and Grease
01/09/20 to 28/02/2021	7.1 – 8.0	0.1 – 3.0	None visible

2.3 Receiving Water Monitoring

The Soil, Water and Groundwater Management Sub-Plan C2B requires that monitoring of receiving waters will occur three-monthly, while WTPs are active and in SC control. Monitoring parameters are provided in Table 3 below:

Table 3: Surface Water Quality Parameters

Parameter	Sample Method	Analytical method	ANZECC ^{1, 2} Criteria (freshwater) ⁷	ANZECC ^{1, 3} Criteria (marine water) ⁸	EPL 21423	Trigger Values	Action
Temperature (°C)	Probe	Field Analysis	>80%ile ⁴ <20%ile ⁴			Results are > than the baseline 80th percentile	Environment Coordinators to re-test to confirm results. Environment Coordinator is to undertake an inspection of the Works and propose actions where required Note: There is a delay in receiving the results from grab samples. Environment Coordinator to obtain further grab samples for testing to confirm results. Environment Coordinator to undertake an inspection once results received and establish what activities had been undertaken prior to the tests being undertaken and propose actions where required.
Dissolved Oxygen (%Sat)	Probe	Field Analysis	Lower Limit: 85 Upper Limit: 110	Lower Limit: 90 Upper Limit: 110			
Turbidity (NTU)	Probe	Field Analysis	6-50	0.5-10			
Oil and Grease	Visual analysis, then grab sample if required	Visual Assessment Lab Analysis	-	-	No visible sign of oil and grease	Visible oil and grease	
Conductivity (µS/cm) ⁶	Grab Sample and Probe	Field Analysis Lab Analysis	125 – 2200	-		Results are > than the baseline 80th percentile	
Total Suspended Solids (TSS: mg/L)	Grab Sample	Lab Analysis	-	-	50mg/L		
Iron (mg/L)			0.3 ⁵	-			
Manganese(mg/L)			1.7	0.8			
pH	Grab Sample and Probe	Field Analysis Lab Analysis	Lower Limit: 6.5 Upper Limit: 8.0	Lower Limit: 8.0 Upper Limit: 8.4	6.5 -8.5		

Notes:

¹ 95% protection level – most commonly applied to ecosystems that could be classified as slightly to moderately disturbed.

² ANZECC (2000) guidelines for the protection of freshwater aquatic ecosystems

³ ANZECC (2000) guidelines for the protection of marine aquatic ecosystems

⁴ Default trigger value for each ecosystem-type

⁵ There is insufficient data at this stage to derive a reliable value for iron. The current Canadian guideline has been used.

⁶ Conductivity will not be tested at monitoring points at estuarine/marine catchments.

- No data available

⁷ Applicable to monitoring locations SW-SC-01, SW-FR-02, SW-EC-01

⁸ Applicable to monitoring locations SW-SC-01, SW-FR-02, SW-MP-01, SW-BP-01, SW-B-01, SW-FC-01, SW-AC-01

Only the receiving waters downstream of the Chatswood WTP are applicable for monitoring during this period. All other WTPs are being operated by other Sydney Metro contractors. The two monitoring sites are both in the Scotts Creek/Middle Harbour Catchment. Sampling points are described in Table 4 below:

Table 4: Sampling Point Information

Site ID	Site interaction	Relative location	Catchment	Sampling address	Easting	Northing	Type
SW-SC-01	Receiving waters from Chatswood worksite discharges.	Downstream	Scotts Creek / Middle Harbour	Muston Park, access via Eden Street, Chatswood	330586	6245923	Freshwater
SW-SC-02	Monitoring location active while the Chatswood WTP is active and in SC control.			Access via North Arm Track, North Arm Road, Chatswood	332788	6246304	Estuarine / Marine

The results of the receiving water monitoring are provided in Appendix B. More sampling was undertaken during this period than quarterly as required by the sampling plan in the Soil, Water and Groundwater Management Sub-Plan C2B. This was due to additional sampling to support a Water Discharge Impact Assessment. The results are included here for completeness. The only result of note is the lab result of 153 mg/L for TSS at SW-SC-02 collected on 17/02/2021. This is suspected to be a lab error, as the turbidity field measurement taken in-situ using the Horiba probe at the time of sample collection was 5.3 NTU. Also, a photograph taken at the time of sampling shows water looking very clear on the day.

3. Noise and Vibration

The Construction Noise and Vibration Management Plan – C2B includes the Construction Noise and Vibration Monitoring Program. This program requires that the results of construction noise and vibration monitoring will be reported every six months. The results for this monitoring period are included in this report.

3.1 Noise Monitoring

Section 8.1.4 of the CNVMP states that: “Attended monitoring of construction noise levels will be undertaken as follows:

- At the first opportunity following the commencement of construction activity to confirm the effectiveness of actions and measures determined in CNVIS process
- Repeated as described in the CNVIS, as part of the audit cycle to ensure that noise and vibration levels in the adjacent community remain consistent with the predicted levels in the CNVIS
- Where appropriate in response to a noise related complaint(s) (determined on a case-by-case basis)
- During sensitive periods (i.e. night works)
- As directed by an authorised officer of the EPA.

Monitoring would be undertaken at the potentially most exposed receivers in proximity to construction activities. Noise monitoring locations should be consistent with the distances/ locations identified in the CNVIS and will consider factors including:

- The location of previous monitoring sites
- The proximity of the receiver to a worksite
- The sensitivity of the receiver to noise
- Background noise levels
- The expected duration of the impact.”

Summary results of attended noise monitoring conducted by Systems Connect in the reporting period are provided in Appendix C (Systems Connect Noise Monitoring Register), demonstrating compliance with project requirements, including the above extract from the management plan.

Noise monitoring equipment details, including make, model, serial number, last calibration date and NATA testing facility, are provided in Appendix D.

Further details are collected for each field reading, including time, duration, meteorological conditions and extraneous noise sources during reading. Samples of Noise Monitoring Record Sheets are provided in Appendix E. Others are available on request.

3.2 Vibration Monitoring

The Construction Noise and Vibration Management Plan – C2B explains that: “the requirement for real time vibration monitoring will be determined on a site by site basis and identified in the CNVIS for LW worksites between Chatswood and Sydenham. Real time vibration monitoring will be deployed to manage vibration impacts from ‘high risk’ sites, where the CNVIS vibration predictions identify there is a high risk of annoyance (or potential building damage) from construction vibration.”

During the reporting period, there were numerous locations and work campaigns where vibration monitoring was done. Summary results demonstrating compliance with vibration criteria are included in Appendix F (Systems Connect Vibration Monitoring Register).

Samples of Vibration Monitoring Reports are provided in Appendix G. Others are available on request.

Appendix A: Systems Connect Permit to Dewater and Water Quality Monitoring Register

Systems Connect LWW Permit to Dewater and Water Quality Monitoring Register

Permit to Dewater	Date	Location	Detailed Monitoring Location	Single or Continuous	Reason	Discharge Point	Water Quality Analyser	pH	Turbidity NTU	Oil & Grease
Permit to Dewater LWW-024	3/09/20 - 3/10/20	Chatswood Dive	Chatswood WTP	Continuous	For discharge approval	Stormwater pit - CD-2	WTP	NA	NA	NA
Permit to Dewater LWW-026	21/09/2020	BPS Campsie	Pat O'Connor Reserve	Single	For re-use on site	Re-use on site	Horiba U-52	8.38		None visible
Permit to Dewater LWW-027	3/10/20 - 3/11/20	Chatswood Dive	Chatswood WTP	Continuous	For discharge approval	Stormwater pit - CD-2	WTP	NA	NA	NA
Permit to Dewater LWW-028	1/10/2020	BPS Campsie	Pat O'Connor Reserve	Single	For re-use on site	Re-use on site	Horiba U-52	7.56		None visible
Permit to Dewater LWW-033	2/11/2020	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52 P70M24N9	8.26	10.7	None visible
Permit to Dewater LWW-034	3/11/20-3/12/20	Chatswood Dive	Chatswood WTP	Continuous	For discharge approval	Stormwater pit - CD-2	WTP	NA	NA	NA
Permit to Dewater LWW-035	4/11/2020	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52 P70M24N9	7.68	7.2	None visible
Permit to Dewater LWW-037	10/11/2020	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52 P70M24N9	8.49	16.6	None visible
Permit to Dewater LWW-038	10/11/2020	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52 P70M24N9	8.36	17.7	None visible
Permit to Dewater LWW-040	12/11/2020	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52 P70M24N9	7.44	17.5	None visible
Permit to Dewater LWW-041	12/11/2020	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52 P70M24N9	7.5	4.9	None visible
Permit to Dewater LWW-042	13/11/2020	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52 P70M24N9	8.25	6.3	None visible
Permit to Dewater LWW-043	19/11/2020	BPS Campsie	IBC 1. Pat O'Connor Reserve	Single	For re-use on site	Re-use on site	Horiba U-52 P70M24N9	8.14	48.4	None visible
Permit to Dewater LWW-043	19/11/2020	BPS Campsie	IBC 2. Pat O'Connor Reserve	Single	For re-use on site	Re-use on site	Horiba U-52 P70M24N9	6.68	3.9	None visible
Permit to Dewater LWW-045	3/12/20 - 3/02/21	Chatswood Dive	Chatswood WTP	Continuous	For discharge approval	Stormwater pit - CD-2	WTP	NA	NA	NA
Permit to Dewater LWW-049	16/12/2020	BPS Campsie	IBC 1. Pat O'Connor Reserve	Single	For re-use on site	Re-use on site	Horiba U-52	8.04	45.4	None visible
Permit to Dewater LWW-050	15/01/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	7.2	8.3	None visible
Permit to Dewater LWW-051	15/01/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	6.72	2.2	None visible
Permit to Dewater LWW-052	18/01/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.08	1.6	None visible
Permit to Dewater LWW-053	18/01/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.03	0.9	None visible
Permit to Dewater LWW-054	18/01/2021	BPS Campsie	IBC 1. Pat O'Connor Reserve	Single	For re-use on site	Re-use on site	Horiba U-52			
Permit to Dewater LWW-055	29/01/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.46	23.6	None visible
Permit to Dewater LWW-056	29/01/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	7.85	10	None visible
Permit to Dewater LWW-057	1/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	7.74	3.7	None visible
Permit to Dewater LWW-058	1/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	6.91	4.7	None visible
Permit to Dewater LWW-059	3/02/2021	Chatswood Dive	Chatswood WTP	Continuous	For discharge approval	Stormwater pit - CD-2	WTP	NA	NA	NA
Permit to Dewater LWW-060	4/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	7.66	17.4	None visible
Permit to Dewater LWW-062	4/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-53	7.66	22.6	None visible
Permit to Dewater LWW-064	11/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.25	29.9	None visible
Permit to Dewater LWW-067	17/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	7.51	8.5	None visible
Permit to Dewater LWW-068	17/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.33	15	None visible
Permit to Dewater LWW-070	19/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.28	8.4	None visible
Permit to Dewater LWW-071	23/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.3	11.6	None visible
Permit to Dewater LWW-072	24/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	7.47	10	None visible
Permit to Dewater LWW-073	24/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.34	31.3	None visible
Permit to Dewater LWW-074	25/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	6.86	10	None visible
Permit to Dewater LWW-075	26/02/2021	Artarmon TSS	1000L skip	Single	For discharge approval	Whiting Street stormwater drain	Horiba U-52	8.1	11.3	None visible

Appendix B: Receiving Water Monitoring Results

Quarterly Surface Water Quality Monitoring

Date	Time	Sample ID	Field Results						Lab Results				
			Temperature (C)	Dissolved Oxygen (%)	Turbidity (NTU)	Cond (µS/cm)	pH	Oil & Grease (Y/N)	TSS (mg/L)	Iron (Fe)	Manganese (Mn)	pH	Oil & Grease (mg/L)
24/09/2020	11:16:00 AM	SW-SC-01	18.07	102.9	10.6	643	7.61	Y	6	0.11	0.012	7.69	<5
24/09/2020	10:30:00 AM	SW-SC-02	15.85	180.4	1.7		8.28	N	4	0.2	0.011	7.73	<5
10/12/2020	10:55:00 AM	SW-SC-01	21.71	109.8	0.6	608	7.79	N	2	0.09	0.01	7.76	<5
10/12/2020	11:45:00 AM	SW-SC-02	23.73	113.8	2.2		7.61	N	5	0.09	0.031	7.66	<5
25/01/2021	9:00:00 AM	SW-SC-01	22.27	89.4	0.00	1810	6.99	N	3	<0.05	0.016	7.71	<5
25/01/2021	9:45:00 AM	SW-SC-02	24.48	63.5	0.6		7.09	N	<1	0.07	0.026	7.76	<5
17/02/2021	1:30:00 PM	SW-SC-01	22.61	160.3	3.2	1750	8.4	N	10	0.05	0.017	7.59	<5
17/02/2021	2:14:00 PM	SW-SC-02	21.55	119.7	5.3		7.89	N	153	0.08	0.006	7.45	<5

Appendix C: Systems Connect Noise Monitoring Register

Systems Connect LWW Noise Monitoring Register

Date	Location	Detailed Monitoring Location	NCA	Predicted Noise Level	Measured L _{Aeq}	Comments
1/09/2020	BPS Campsie	352-356 Canterbury Rd, Canterbury	BPS_01	81	73.0	LW Works compliant
1/09/2020	Crows Nest Station	22 Clarke Street	CN_01	60	58.8	LW Works compliant
1/09/2020	Crows Nest Station	400 Pacific Highway	CN_04	59	66.8	LW Works compliant, traffic dominant noise source
1/09/2020	Crows Nest Station	378 Pacific Highway	CN_04	57	63.8	LW Works compliant, traffic dominant noise source
1/09/2020	Crows Nest Station	39 Hume Street	CN_02	57	56.8	LW Works compliant
7/09/2020	BPS Campsie	1 Cooks Avenue, Canterbury	BPS_01	78	63.5	LW Works compliant, traffic dominant noise source
7/09/2020	BPS Campsie	344-350 Canterbury Rd, Canterbury	BPS_01	78	70.7	LW Works compliant, traffic dominant noise source
7/09/2020	BPS Campsie	2 Cooks Avenue, Canterbury	BPS_01	78	57.4	LW Works compliant
15/09/2020	Northern Connection	14 Raleigh Street, Artarmon	CDS-05	64	66.6	Investigation into exceedance completed. Details about investigation into works and corrective action provided to AA.
15/09/2020	Northern Connection	13 Drake Street, Artarmon	CDS-05	69	59.2	LW Works compliant
15/09/2020	Northern Connection	4 Chapman Avenue, Chatswood	CCDS-04	62	44.7	LW Works compliant
16/09/2020	BPS Campsie	45 South Parade, Campsie	S2B_06	71	63.2	LW Works compliant
16/09/2020	BPS Campsie	203 Beamish Street, Campsie (Station House Hotel)	S2B_06	83	76.2	LW Works compliant
22/09/2020	BPS Campsie	13 - 15 Anglo Road, Campsie	S2B_06	60	50.4	LW Works compliant
22/09/2020	BPS Campsie	203 Beamish Street, Campsie (Station House Hotel)	S2B_06	83	72.5	LW Works compliant
22/09/2020	BPS Campsie	45 South Parade, Campsie	S2B_06	71	71.2	LW Works compliant, aged idling beside monitoring location.
29/09/2020	BPS Campsie	203 Beamish Street, Campsie (Station House Hotel)	S2B_06	83	67.6	LW Works compliant
29/09/2020	BPS Campsie	45 South Parade, Campsie	S2B_06	71	59.4	LW Works compliant
29/09/2020	BPS Campsie	13 - 15 Anglo Road, Campsie	S2B_06	60	55	LW Works compliant
2/10/2020	Southern Dive	65 Edinburgh Road, Marrickville	MDS_01	45	57.7	LW Works compliant, traffic dominant noise source
2/10/2020	Southern Dive	98 Unwins Bridge Road, Marrickville	MDS_04	51	57.6	LW Works compliant, traffic and other non-project works dominant noise source
17/10/2020	Northern Connection	14 Raleigh Street, Artarmon	CDS-05	74	57.1	LW Works compliant
17/10/2020	Northern Connection	2 Berkeley Court, Artarmon	CDS-03	61	44.7	LW Works compliant
17/10/2020	Northern Connection	7 Hopetoun Avenue, Chatswood	CDS-04	64	65	LW Works compliant, exceedance caused by nearby yelling.
24/10/2020	Campsie TSS	13-15 Anglo Rd, Campsie (measured on Lillian Lane)	S2B_06	58	59.5	LW Works compliant, traffic and rail dominant noise source
24/10/2020	Campsie TSS	54 Lillian St, Campsie (directly opposite gate to TSS)	S2B_06	69	60.2	LW Works compliant
2/11/2020	Northern Connection	14 Raleigh Street, Artarmon	CDS-05	59	50.1	LW Works compliant
2/11/2020	Northern Connection	12 Drake Street, Artarmon	CDS-05	47	42.1	LW Works compliant
2/11/2020	Northern Connection	342 Mowbray Road, Artarmon	CDS-06	68	61.1	LW Works compliant
10/11/2020	BPS Campsie	41 South Parade, Campsie	S2B_06	69	70.1	Noise mats installed during reading.
10/11/2020	BPS Campsie	42 South Parade, Campsie	S2B_06	69	72.2	LW Works compliant, rail dominant noise source
10/11/2020	BPS Campsie	45 South Parade, Campsie	S2B_06	68	55.6	LW Works compliant
10/11/2020	BPS Campsie	42 South Parade, Campsie	S2B_06	69	72.1	LW Works compliant, traffic and rail dominant noise source
19/11/2020	Crows Nest Station	22 Clarke Street	CN_01	55	58.6	LW Works compliant, traffic dominant noise source

27/11/2020	Victoria Cross Station	237 Miller Street; footpath on McLaren St	VC_04	55	57.9	LW Works compliant, traffic dominant noise source
1/12/2020	BPS Surry Hills	242 - 254 Elizabeth Street, Surry Hills	CS_G	70	68.7	LW Works compliant
1/12/2020	BPS Surry Hills	28 Albion Street, Surry Hills (Rydges Hotel)	CS_G	70	69.9	LW Works compliant
1/12/2020	BPS Surry Hills	242 - 254 Elizabeth Street, Surry Hills	CS_G	70	70.8	LW Works compliant, traffic dominant noise source
1/12/2020	BPS Surry Hills	242 - 254 Elizabeth Street, Surry Hills	CS_G	70	67.2	LW Works compliant
8/02/2020	Northern Connection	14 Raleigh Street, Artarmon	CDS_05	64	50.2	LW Works compliant
8/12/2020	Northern Connection	12 Drake Steet, Artarmon	CDS_05	71	48.9	LW Works compliant
8/12/2020	Northern Connection	11 Hawkins Street, Artarmon	CDS_05	64	44.2	LW Works compliant
9/12/2020	Crows Nest Station	374 Pacific Highway	CN_04	71	69.3	LW Works compliant, traffic dominant noise source
14/12/2020	Crows Nest Station	374 Pacific Highway	CN_04	71	71	LW Works compliant, traffic dominant noise source
15/12/2020	BPS Surry Hills	302-306 Elizabeth Street, Surry Hills	CS_G	98	83	LW Works compliant
15/12/2020	BPS Surry Hills	302-306 Elizabeth Street, Surry Hills	CS_G	81	79.3	LW Works compliant
15/12/2020	BPS Surry Hills	328-342 Elizabeth Street, Surry Hills	CS_G	63	73.2	Exceedance due to rain and constant traffic
15/12/2020	BPS Surry Hills	2-18 Chalmers Street, Surry Hills	CS_G	70	70.2	LW Works compliant, traffic dominant noise source
19/12/2020	BPS Campsie	13-15 Anglo Rd, Campsie	S2B_06	86	73.2	LW Works compliant
19/12/2020	BPS Campsie	5-9 London Street, Campsie	S2B_06	60	56.3	LW Works compliant
20/12/2020	Campsie TSS	62 Lilian Street, Campsie	S2B_06	62	55.3	LW Works compliant
27/12/2020	BPS Surry Hills	328-342 Elizabeth Street, Surry Hills	CS_G	91	67.9	LW Works compliant
27/12/2020	BPS Surry Hills	1-5 Randle Street, Surry Hills	CS_G	89	71.2	LW Works compliant
27/12/2020	BPS Surry Hills	328-342 Elizabeth Street, Surry Hills	CS_G	91	76.3	LW Works compliant
27/12/2020	BPS Surry Hills	328-342 Elizabeth Street, Surry Hills	CS_G	74.5	73.6	LW Works compliant
30/12/2020	BPS Surry Hills	328-343 Elizabeth Street, Surry Hills	CS_G	74.5	72.5	LW Works compliant
30/12/2020	BPS Surry Hills	401 Elizabeth Street, Surry Hills	CS_G	90	74.3	LW Works compliant
27/01/2021	Northern Connection	12 Drake Steet, Artarmon	CDS_05	79	61.9	LW Works compliant
27/01/2021	Northern Connection	12 Raleigh Street, Artarmon	CDS_05	78	59	LW Works compliant
27/01/2021	Northern Connection	14 Hawkins Street, Artarmon	CDS_05	64	61.2	LW Works compliant
31/01/2021	BPS Surry Hills	328-342 Elizabeth Street, Surry Hills	CS_G	81	74.9	LW Works compliant
31/01/2021	BPS Surry Hills	1-5 Randle Street, Surry Hills	CS_G	73	68.9	LW Works compliant
2/02/2021	BPS Surry Hills	28-36 Foveaux Street, Surry Hills	OSR	92	77.8	LW Works compliant
2/02/2021	BPS Surry Hills	229 Commonwealth Street, Surry Hills	CS_G	79	64.3	LW Works compliant
5/02/2021	Blues Point	14 Blues Point Road	BP_02	48	55.6	LW Works compliant, traffic and pedestrians dominant noise source
12/02/2021	BPS Surry Hills	15 Terry Street Surry Hills	CS_G	90	70.6	LW Works compliant
12/02/2021	BPS Surry Hills	15 Terry Street Surry Hills	CS_G	90	76.9	LW Works compliant
12/02/2021	BPS Surry Hills	84 - 86 Mary Street Surry Hills	CS_G	79	71.0	LW Works compliant
19/02/2021	BPS Surry Hills	229 Commonwealth Street, Surry Hills	CS_G	79	65.4	LW Works compliant
19/02/2021	BPS Surry Hills	15 Terry Street, Surry Hills	CS_G	90	65.3	LW Works compliant
22/02/2021	Martin Place + Pitt Street	64-66 Pitt Street, Sydney	OSR	67	61	LW Works compliant

Appendix D: Noise Monitoring Equipment Details

RION Tracking and Calibration Records

Make	Model	Device Serial Number	Portable Calibrator Serial Number	Location	External Calibration Date	Place of Calibration
RION	NL-42	00509242		PDO	15/07/2020	Acoustic Research Lab
	NC-75 - Portable Calibrator		34202225		13/07/2021	Acoustic Research Lab
RION	NL-42	01000278		PDO	18/03/2021	Acoustic Research Lab
	NC-75 - Portable Calibrator		34212953		18/03/2021	Acoustic Research Lab
RION	NL-42	00269685		PDO	24/07/2020	Acu-Fib Electronics
	NC-75 - Portable Calibrator		00970021		24/07/2020	Acu-Fib Electronics
RION	NL-42	00469907		C. Riley	24/07/2020	Acu-Fib Electronics
	NC-75 - Portable Calibrator		34502426		15/07/2020	Acoustic Research Lab

Appendix E: Noise Monitoring Record Sheet Samples

Noise Monitoring Record Sheet

DATE:	01-September-2020	MAIN ACTIVITY	Campsie BPS construction
CONDUCTED BY:	Chris Riley	LOCATION OF WORKS:	Canterbury Road, near Cooks Ave intersection
METEROLOGICAL CONDITIONS:	Fine, calm, clear		
DAY, EVENING OR NIGHT PERIOD?	Night		
MAKE / MODEL:	Rion NL-42	SERIAL NUMBER:	469907
TIME WEIGHTING:	FAST / SLOW	FREQUENCY WEIGHTING:	A / C / FLAT
FIELD CALIBRATION:	94.0	POST CALIBRATION CHECK:	94.0
COMMUNITY NOTIFICATIONS GONE OUT FOR THE WORKS?		Yes	
LIGHT SPILL into residences?		No	

MONITORING LOCATION 1				
LOCATION:	352-356 Canterbury Road, on footpath outside on Nando's			
ACTIVITIES:	Backfilling and compaction of trench, traffic control			
PLANT:	Tipper truck, 13T excavator with bucket, whacker-packer			
START TIME	END TIME	RBL (dBA)	E41/E42 NML (dBA)	NCA
22:52	23:07	35	N/A	BPS_01
L_{aeq}	L_{max}	L_{min}	L_{A10}	L_{A90}
73.0	85.0	65.8	75.2	69.8
PREDICTED NOISE LEVEL (dBA):		81.0		
L_{aeq} ABOVE PREDICTED NOISE LEVEL:		Nil		
Measured Construction Contribution (dBA)		75		
Measured Construction Contribution Above Predicted Noise Level			Nil	
MONITORING COMMENTS	Whacker-packer: 74-75 dBA (6 minutes operation) Tipper truck idling and excavator with bucket: 69-70 dBA (9 minutes operation) Source of maximum noise level: passing truck on Canterbury Road Constant, moderate level traffic on two lanes of Canterbury Rd between monitoring point and construction works Distance from monitoring point to construction works: 10m			

Noise Monitoring Record Sheet

DATE:	01-September-2020	MAIN ACTIVITY	Flash butt welding and deliveries	
CONDUCTED BY:	Nadia Eisenlohr	LOCATION OF WORKS:	Crows Nest Station Box and Gantry Shed	
METEROLOGICAL CONDITIONS:	Cloudy, light wind			
DAY, EVENING OR NIGHT PERIOD?	Night			
MAKE / MODEL:	Rion NL-42	SERIAL NUMBER:	269685	
TIME WEIGHTING:	FAST / SLOW	FREQUENCY WEIGHTING:	A / C / FLAT	
FIELD CALIBRATION:	94	POST CALIBRATION CHECK:	94	
COMMUNITY NOTIFICATIONS GONE OUT FOR THE WORKS?			YES	
LIGHT SPILL into residences?		No		
Are noise mitigation measures installed?		Covered acoustic shed, hoarding surrounding the site.		

MONITORING LOCATION 1				
LOCATION:	22 Clarke St			
ACTIVITIES:	Flash butt welding in station box and rail delivery truck getting unloaded in the gantry shed.			
PLANT:	Flash butt welder, rubber tyre excavator, 20t tracked excavator, grinders, rail delivery truck, gantry crane			
START TIME	END TIME	RBL (dBA)	E41/E42 NML (dBA)	NCA
22:32	22:47	40	65	CN_01
L_{aeq}	L_{max}	L_{min}	L_{A10}	L_{A90}
58.8	67.1	56.6	59.6	58.0
PREDICTED NOISE LEVEL (dBA):		60		
Laeq ABOVE PREDICTED NOISE LEVEL:		-1.2		
Measured Construction Contribution (dBA)		57-58		
Measured Construction Contribution Above Predicted Noise Level			-2.0	
MONITORING COMMENTS	No traffic + welding+gantry crane: 57-58 Constant traffic on Pacific Highway: 58-59 Bus/truck on Pacific Highway: 58-59 Loud car or motorbike on Pacific Highway: 63-67			

Noise Monitoring Record Sheet

DATE:	07-September-2020	MAIN ACTIVITY	Loading of spoil into tipper truck	
CONDUCTED BY:	R. Thompson	LOCATION OF WORKS:	Cooks Avenue & Canterbury Road intersection	
METEROLOGICAL CONDITIONS:	Fine, light breeze, cool but not cold temperature			
DAY, EVENING OR NIGHT PERIOD?	End of evening/ Night			
MAKE / MODEL:	Rion NL-42	SERIAL NUMBER:	509242	
TIME WEIGHTING:	FAST / SLOW	FREQUENCY WEIGHTING:	A / C / FLAT	
FIELD CALIBRATION:	93.8	POST CALIBRATION CHECK:	93.9	
COMMUNITY NOTIFICATIONS GONE OUT FOR THE WORKS?			YES / NO	
LIGHT SPILL into residences?		No, lighting towers angled down towards work site.		
Are noise mitigation measures installed?		Yes, screens in front of residential building at 350 Canterbury Rd and RO and AA offered to affected residents.		

MONITORING LOCATION 1				
LOCATION:	1 Cooks Avenue, in front of Tokyo Table restaurant			
ACTIVITIES:	Loading into tipper truck, relocation (dragging) of traffic barrier, diesel-powered lighting tower operating			
PLANT:	Tipper truck, 14T excavator and diesel-powered lighting tower			
START TIME	END TIME	RBL (dBA)	E41/E42 NML (dBA)	NCA
21:50	22:05	35		BPS_01
L_{aeq}	L_{max}	L_{min}	L_{A10}	L_{A90}
63.5	78.0	56.0	68.4	57.7
PREDICTED NOISE LEVEL (dBA):		70		
L_{aeq} ABOVE PREDICTED NOISE LEVEL:		N/A		
Measured Construction Contribution (dBA)		28.5		
Measured Construction Contribution Above Predicted Noise Level			N/A	
MONITORING COMMENTS	Car horn - 73 Background traffic with just lighting tower operating - 63 No traffic , just lighting tower - 53 Dragging of traffic barrier - 72 Speeding truck - 70 Crying child in apartment above monitoring location - 65 Dropping of safety glasses - 67			

Appendix F: Systems Connect Vibration Monitoring Register

Systems Connect Vibration Monitoring Register

Start Date	End Date	Location	Detailed Monitoring Location	Attended or Continuous	Vibration Criteria mm/s	Compliant with Vibration Criteria or Monitoring Protocol Y/N
5/08/2020	14/08/2020	BPS Campsie	High Street and Anzac Street, Canterbury	Attended	7.5	Y
6/10/2020	16/10/2020	BPS Campsie	Anzac Street, Canterbury	Attended	7.5	Y
14/10/2020	14/10/2020	Crows Nest	22 Clarke Street, Crows Nest	Attended	0.025 mm/s for eye surgery 0.1 mm/s for other surgery	Y
20/12/2020	30/12/2020	BPS Surry Hills	2-18 Chalmers St, Surry Hills	Attended	25	Y
14/01/2021	14/01/2021	Northern Connection	Unit 31, 9-11 Nelson Street, Chatswood	Attended	7.5	Y
8/02/2021	9/02/2021	BPS Surry Hills	Bellevue Street, Surry Hills	Attended	7.5	Y
8/02/2021	9/02/2021	BPS Surry Hills	87 Albion Street Surry Hills	Attended	7.5	Y
12/02/2021	14/02/2021	BPS Surry Hills	1-15 Foveaux Street, Surry Hills	Attended	25	Y
19/02/2021	20/02/2021	BPS Surry Hills	1-15 Foveaux Street, Surry Hills	Attended	25	Y

Appendix G: Vibration Monitoring Report Samples

3 September 2020

TK685-26 F01 BPS Campsie_Anzac St VIB MON (r2)

Systems Connect

Level 3, 116 Miller Street

North Sydney NSW 2060

Sydney Metro Line Wide Works - BPS Campsie Anzac Street Vibration Monitoring Results

1 Introduction

Systems Connect was required to undertake vibration monitoring during construction works at Anzac Street, Canterbury where works were within the minimum working distances for cosmetic damage to buildings or structures.

The purpose of this report is to summarise the vibration monitoring results and determine compliance with vibration criteria established in the report *BPS Campsie Vibration Monitoring Plan (Campsie VMP)*¹.

The *Campsie VMP* was prepared prior to the construction activities to establish the basis of the vibration monitoring including monitoring locations, equipment, installation methodology, vibration criteria and monitoring protocol.

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

¹ TK685-26 05F01 BPS Campsie monitoring plan, dated: 20 July 2020, revision 1

2 Vibration monitoring

Attended vibration monitoring was undertaken on the 5th, 6th, 7th, 11th, 12th, 13th and 14th of August 2020 at Anzac Street, Canterbury. Vibration monitoring was conducted with a Sigicom INFRA C12 vibration monitor (s/n 66890) with SMS alerts set up in accordance with the vibration monitoring plan.

Figure 1 - Monitoring location during BPS works



Note: Top: aerial photo of monitoring locations and work areas; Bottom: site photo of monitoring location

3 Vibration criteria

The established vibration criteria in the *Campsie VMP* are given below:

A conservative vibration damage screening level per receiver type, assuming vibration predominantly has a frequency of 20 Hz:

- Reinforced or framed structures: 25.0 mm/s
- Unreinforced or light framed structures: 7.5 mm/s
- Heritage structures: 2.5 mm/s

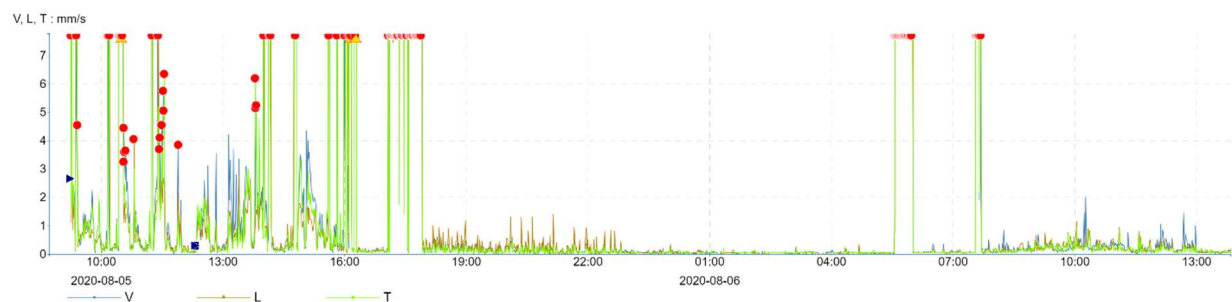
4 Vibration monitoring results

Following the construction vibration management procedures established in Section 4 of the *Campsie VMP*, amber and red trigger levels were set up based on the monitoring locations. When measured levels were above one of the trigger levels, an SMS alert was sent to a site supervisor who promptly confirmed:

- Whether the incident was related to the BPS construction activities.

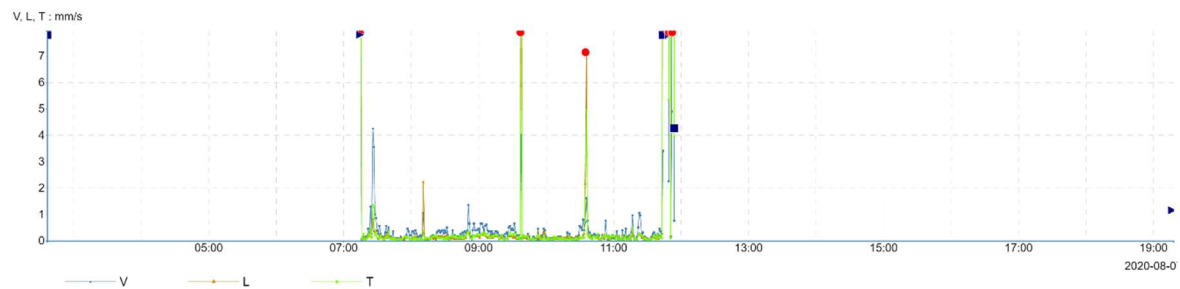
Monitoring results are summarised in **Figure 2**, **Figure 3**, **Figure 4** and **Figure 5** below.

Figure 2 - Monitoring results on the 5th and 6th of August during Anzac Street BPS construction works

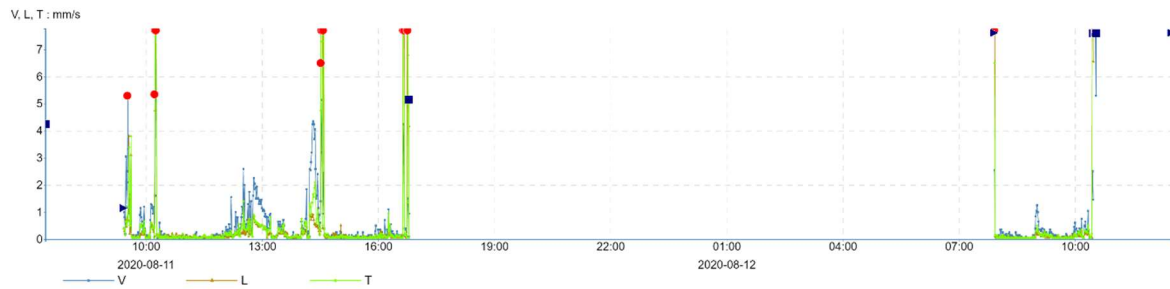


Note: Red dot ● indicates SMS alert sent based on trigger set at 7.5 mm/s

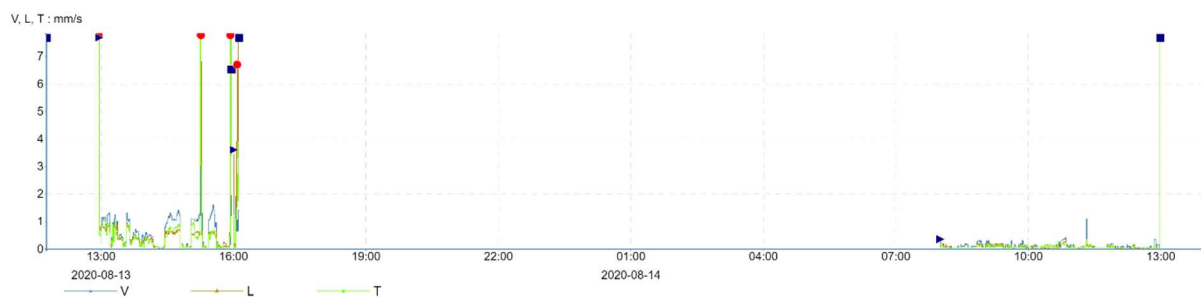
Figure 3 - Monitoring results on the 7th of August during Anzac Street BPS construction works



Note: Red dot ● indicates SMS alert sent based on trigger set at 7.5 mm/s

Figure 4 - Monitoring results on the 11th and 12th of August during Anzac Street construction works

Note: Red dot ● indicates SMS alert sent based on trigger set at 7.5 mm/s

Figure 5 - Monitoring results on the 13th and 14th of August during Anzac Street construction works

Note: Red dot ● indicates SMS alert sent based on trigger set at 7.5 mm/s

The red dots in the figures above represent exceedance of the trigger levels for SMS alerts. All incidents were promptly investigated. It was found that all were not related to the construction activities (e.g. someone nudging the monitor by mistake, a surveyor dropping books near the monitor by mistake or removing/ installing the monitor at the beginning or end of the shift without turning the monitor off).

Therefore, results of the vibration monitoring indicated that vibration generated by construction activities was below the relevant vibration criteria that was established in the *Campsie CVMP*.

5 Conclusion

Systems Connect was required to undertake vibration monitoring during construction works at Anzac Street, Canterbury where works were within the minimum working distances for cosmetic damage to buildings or structures.

Attended vibration monitoring was undertaken on 5th, 6th, 7th, 11th, 12th, 13th and 14th of August 2020. Warning and stop work trigger levels were set up based on the *Campsie VMP*. The results of the vibration monitoring indicated that vibration generated by construction activities was below the relevant vibration criteria that was established in the *Campsie VMP*.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed
25.08.2020	First issue	0	1	R. Zhafranata	T. Gowen	T. Gowen
03.09.2020	Updated Figure 1 and Figure 3	-	2	R. Zhafranata	T. Gowen	T. Gowen

Important Disclaimer:

The work presented in this document was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

This document is issued subject to review and authorisation by the Team Leader noted by the initials printed in the last column above. If no initials appear, this document shall be considered as preliminary or draft only and no reliance shall be placed upon it other than for information to be verified later.

This document is prepared for the particular requirements of our Client which are based on a specific brief with limitations as agreed to with the Client. It is not intended for and should not be relied upon by a third party and no responsibility is undertaken to any third party without prior consent provided by Renzo Tonin & Associates. The information herein should not be reproduced, presented or reviewed except in full. Prior to passing on to a third party, the Client is to fully inform the third party of the specific brief and limitations associated with the commission.

In preparing this report, we have relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, we have not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

We have derived data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination and re-evaluation of the data, findings, observations and conclusions expressed in this report.

We have prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

The information contained herein is for the purpose of acoustics only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

14 October 2020

TK685-03-09F03 C2S_P3 CST Vib Mon Report (r1)

Systems Connect

Level 3, 116 Miller Street

North Sydney NSW 2060

Sydney Metro Line Wide Works - Crows Nest Early Access Works - Vibration Monitoring Results

1 Introduction

The Construction Noise and Vibration Impact Statement (CNVIS) ¹ for the Crows Nest Early Access Works identified that break out of the northern crane pad using an excavator with rock hammer (20-30t) would be within the minimum working distances for vibration sensitive equipment. The CNVIS recommended that Systems Connect undertake attended vibration monitoring during these works at the following locations:

- Crows Nest Day Surgery (22 Clarke Street)
- Crows Nest Cosmetic and Vein Clinic (10-12 Clarke Street)
- Sydney Vasectomy (10-12 Clarke Street)
- 20 Clark Street (SomnoMed)

The purpose of this report is to summarise the vibration monitoring results and determine compliance with vibration criteria established in the CNVIS.

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

2 Methodology

The instrumentation used for these vibration measurements are summarised in Table 1. The monitoring location and instrumentation set up is shown in Figure 1 and Figure 2 respectively.

¹ TK685-03-09F01 CNVIS C2S_P3 CST Early Access, dated: 9 July 2020, revision 5

Table 1 – Instrumentation

Type	Make / Model
Type 1 Signal Analyser	Soundbook-1
Accelerometer	PCB 393B12

The accelerometers used in the measurements have current calibration certificates.

Figure 1 - Monitoring location – Crows Nest Early Access Works**Figure 2: Instrumentation set up – Day surgery theatre, 22 Clarke Street, Crows Nest**

3 Vibration criteria

The established vibration criteria in the *Campsie VMP* are given below:

Proposed works will take place in proximity to Crows Nest Day Surgery (22 Clarke Street), which is used for dental and eye surgery. Operating hours are 7am to 5pm, Monday to Friday, and operations are generally confirmed three days in advance. Consultation with the surgery was undertaken to allow monitoring to be conducted at the commencement of rockbreaking works at the northern crane pad to determine the site specific vibration impact prior to the operating theatres being in use.

A draft property assessment commissioned by Transport for NSW adopted a screening criterion of 0.025 mm/s (VC-B criterion from ASHRAE) for eye surgery procedures and 0.1 mm/s for other surgery procedures.

4 Vibration monitoring results

The vibration measurements were conducted at the following locations:

Table 2 – Measurement locations

ID	Date (from)	Date (to)	Plant	Address	Location
M1	14.10.2020 8:45 am	14.10.2020 9:15 am	20 T Excavator with rock breaker	22 Clarke Street, Crows Nest	Day surgery theatre

The results of the vibration measurements are summarised in the table below.

Table 3 – Summary results

ID	Location	Maximum Peak Component Particle Velocity (rms)	Monitoring Outcome	Comment
M1	Day surgery theatre	0.0206 mm/s	Measured levels <u>below</u> adopted screening criterion of - 0.025 mm/s for eye surgery - 0.1 mm/s for other surgery procedures.	No further action required

5 Conclusion

Renzo Tonin & Associates was engaged to undertake vibration monitoring on behalf of Systems Connect to verify that vibration resulting from crane pad excavation works are below the requirements for sensitive scientific and medical equipment.

Attended vibration monitoring was undertaken on 14th of October 2020. The results of the vibration monitoring indicated that vibration generated by the works were below the relevant vibration criteria that was established in the *CNVIS*. Further monitoring is not required, except in the event of complaint related to vibration as noted in Table 6-7 of the *CNVIS*.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed
14.10.2020	First issue	0	1	R. Zhafranata	T. Gowen	T. Gowen

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Vibration Monitoring Record Sheet

START DATE:	6/10/2020	PROJECT AREA:	Campsie BPS
FINISH DATE:	16/10/2020	MAIN ACTIVITY	BPS Trenching
CONDUCTED BY:	Dean Kellet	LOCATION OF WORKS:	Anzac Street Canterbury
DAY, EVENING OR NIGHT PERIOD:	Day		
MONITORING EQUIPMENT:	Sigicom INFRA C12 vibration monitor (supplied by Renzo Tonin)		
VIBRATION MONITORING PLAN:	TK685-26 05F01 BPS Campsie monitoring plan, dated: 20 July 2020, revision 1		

MONITORING LOCATION 1					
LOCATION:	12 Anzac Street Canterbury				
DATES:	6/10/2020				
ACTIVITIES:	Trench excavation with rock hammering				
PLANT:	13T excavator with hammer				
STRUCTURE TYPE:	Residential				
VIBRATION CRITERIA:	Unreinforced or light framed structures: 7.5 mm/s				
APPLICABLE MWD:	10m	ACTUAL WORKING DISTANCE:	10.5m		
VIBRATION MONITOR MOUNTING METHOD:	Steel ground spike hammered into the ground				
EXCEEDENCES OF VIBRATION CRITERIA (Refer to monitoring data for all results)					
Date	Time	V (mm/s)	T (mm/s)	L (mm/s)	Reason
6/10/2020	8:20	12.9	15.2	23.5	Monitor setup / start up
6/10/2020	16:39		18.8	13.4	Monitor shutdown
COMPLIANT WITH VIBRATION CRITERIA:		Yes			
MONITORING COMMENTS OR ACTIONS TAKEN TO ADDRESS EXCEEDENCES OF VIBRATION CRITERIA					

MONITORING LOCATION 2					
LOCATION:	10 Anzac Street Canterbury				
DATES:	12/10/2020	15/10/2020	16/10/2020		
ACTIVITIES:	Trench excavation with rock hammering				
PLANT:	13T excavator with hammer				
STRUCTURE TYPE:	Residential				
VIBRATION CRITERIA:	Unreinforced or light framed structures: 7.5 mm/s				
APPLICABLE MWD:	10m	ACTUAL WORKING DISTANCE:		10.5m	
VIBRATION MONITOR MOUNTING METHOD:			Steel ground spike hammered into the ground		
EXCEEDENCES OF VIBRATION CRITERIA (Refer to monitoring data for all results)					
Date	Time	V (mm/s)	T (mm/s)	L (mm/s)	Reason
12/10/2020	17:10	11.1			Monitor shutdown
15/10/2020	16:01		19	11.9	Monitor shutdown
16/10/2020	16:24		20.2	12.7	Monitor shutdown
COMPLIANT WITH VIBRATION CRITERIA:			Yes		
MONITORING COMMENTS OR ACTIONS TAKEN TO ADDRESS EXCEEDENCES OF VIBRATION CRITERIA					