

APPENDIX C (PART 2) PREDICTED CONSTRUCTION VIBRATION IMPACTS ON STRUCTURES





Map 9 of 15

- Rail station
 - VicTrack Reserve Boundary
 - Rail Alignment (Baseline)
 - Watercourse
 - Assessment Area
- Construction structural impact predictions: Excavating**
- Predicted exceedance to guideline vibration level at building
 - No predicted exceedance

Data Sources:
 AJM JV 2021
 VicTrack 2021
 Vicmap 2021
 Aerial photo:
 DELWP Apr. 2021



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Melbourne Airport Rail
Project Wide

Construction structural impact predictions - Excavating

Drawing Number: MAR-AJM-PWD-PWD-MAP-XAV-MMN-0490576		Revision: A.1	
Drawn By: J. Rivera	Approved By: D. Larner	Date: 9/08/2021	Map Size: A3

0 110 220

Metres

Coordinate System: GDA 1994 MGA Zone 55



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Map 11 of 15

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Vicmap 2021
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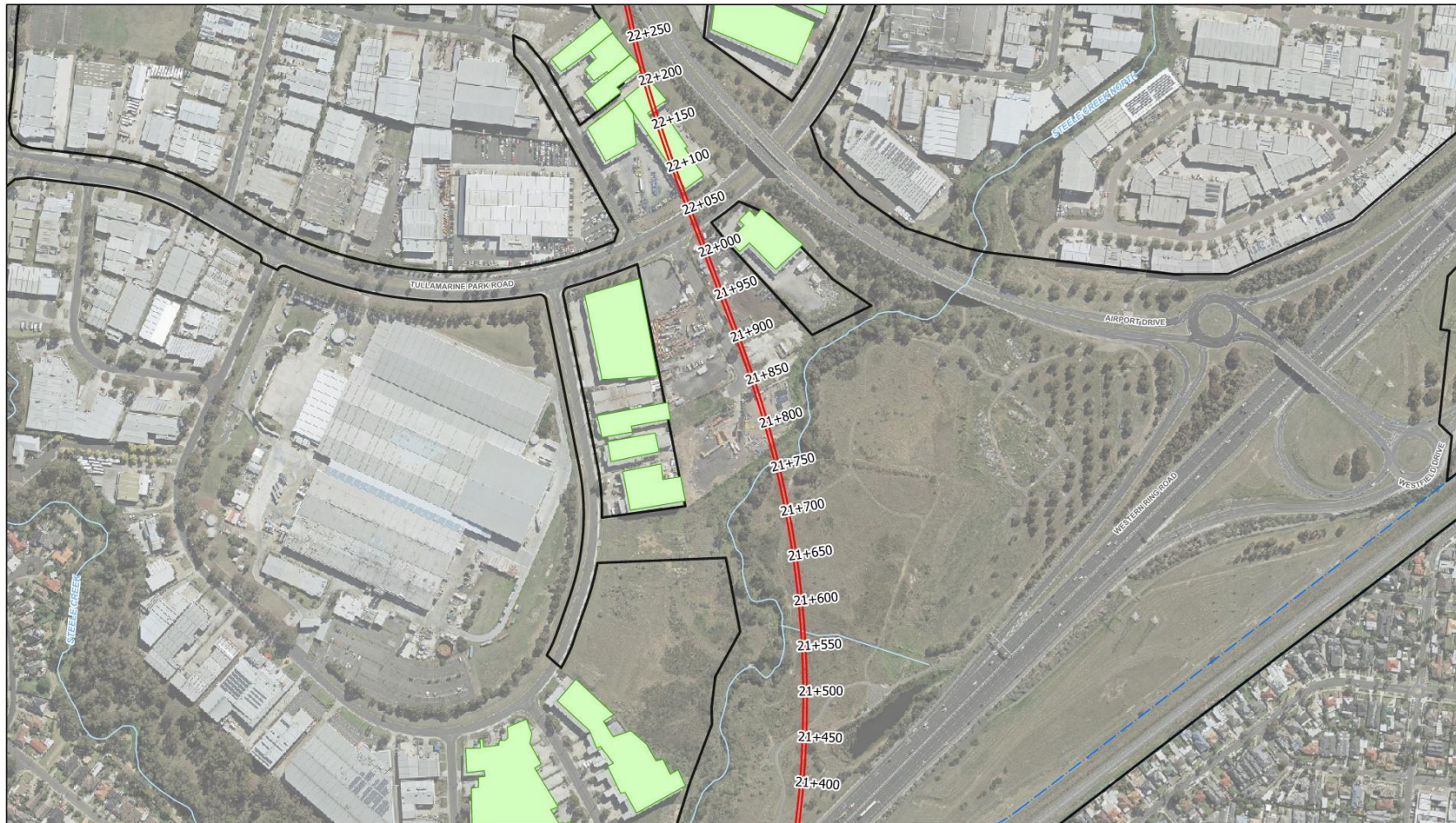
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Map 15 of 15

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Map 1 of 15

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Melbourne Airport Rail Project Wide

Construction structural impact predictions - Rolling

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Metres
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Map 4 of 15

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Map 5 of 15

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 Vicmap 2021
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Map 6 of 15

Legend:

- Rail station
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VicTrack 2021
Vicmap 2021
Aerial photo:
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Project Wide

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MAR-AJM-PWD-PWD-MAP-XAV-MMN-0490577	A.1		
Drawn By:	Approved By:	Date:	Map Size:
J. Rivera	D. Larner	9/08/2021	A3

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Drawn By:	Approved By:
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Map 10 of 15

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Melbourne Airport Rail Project Wide

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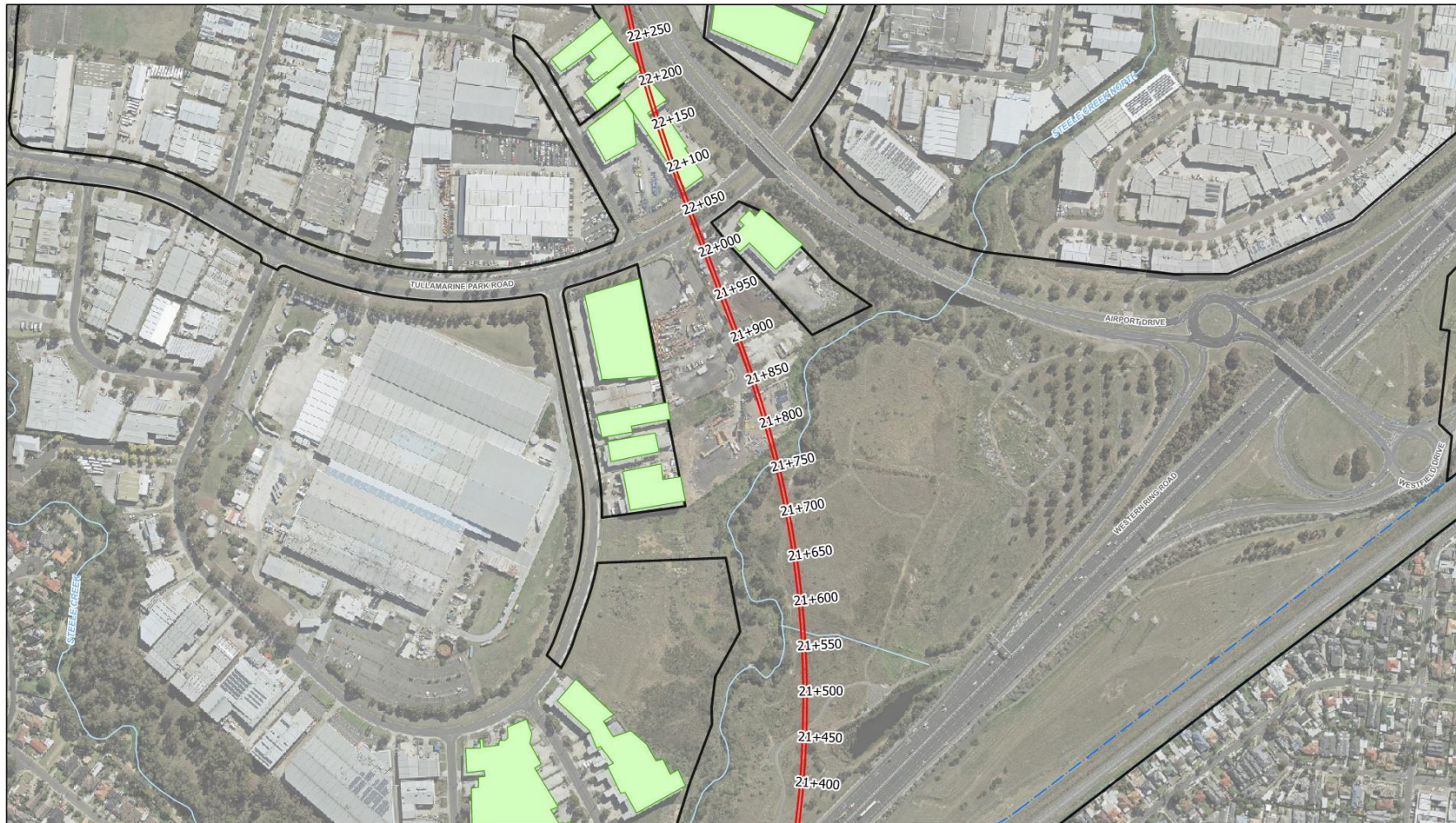
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APPENDIX D

PREDICTED CONSTRUCTION VIBRATION IMPACTS ON EJP





In this section, the following colour coding was implemented:

- Red highlighted cells denote where predicted vibration is greater 20 mm/s (Cease activity threshold)
- Yellow highlighted cells denote where predicted vibration is 15 mm/s – 20 mm/s (Proceed with caution trigger)
- Green highlighted cells denote where predicted vibration is 10 mm/s – 15 mm/s (Acceptable (monitor for changes) trigger)
- Non-highlighted cells denote where predicted vibration is to be less than 10 mm/s



Table D-1 Predicted construction vibration levels – Sunshine trackworks

Chainages	Distance from piles to pipeline (m)	Distance from track construction to pipeline (m)	PPV from activities (mm/s)													
			Bored Piling	Excavator with ripper attachment	30 tonne Rockbreaker	20 tonne Rockbreaker	14 tonne Rockbreaker	8 tonne Rockbreaker	5 tonne Rockbreaker	32 tonne Excavator Travelling	20 tonne Excavator Travelling	30 - 45 tonne Dozer	25 tonne Grader	18 tonne Vibratory Roller	10 tonne Vibratory Roller	18 tonne Static Roller
11500 - 11600	-	1.1	-	10	>20	>20	>20	20	16	>20	5.3	14	10	>20	>20	15
11600 - 11650	-	1.7	-	6.2	>20	>20	18	13	10	>20	3.4	8.5	6.4	>20	>20	10
11650 - 11700	-	1.7	-	6.2	>20	>20	18	13	10	>20	3.4	8.5	6.4	>20	>20	10
11700 - 11900	-	46.1	-	0.1	0.6	0.4	0.3	0.2	0.2	0.4	0.1	0.2	0.2	2.6	1.9	0.4
11900 - 11950	-	73	-	0.0	0.2	0.2	0.1	0.1	0.1	0.2	0.0	0.1	0.1	1.6	1.1	0.2
11950 - 12200	-	39.4	-	0.1	0.7	0.5	0.4	0.3	0.2	0.6	0.1	0.3	0.2	3.0	2.2	0.4
12200 - 12350	-	0.8	-	13	>20	>20	>20	>20	>20	>20	7.4	20	15	>20	>20	>20
12350 - 12400	-	2.8	-	3.7	19	14	11	7.5	5.9	15	2.0	4.9	3.7	>20	>20	6.0
12400 - 12500	-	1.3	-	8.2	>20	>20	>20	17	13	>20	4.5	11	8.6	>20	>20	13
12500 - 12750	0.9	2.6	>20	4.0	>20	15	12	8.1	6.4	16	2.2	5.3	4.0	>20	>20	6.4
12750 - 13000	2.3	1.6	6.0	6.6	>20	>20	19	13	11	>20	3.6	9.1	6.9	>20	>20	10
13000 - 13250	4.2	2.1	2.4	5.0	>20	19	14	10	8.0	>20	2.8	6.8	5.1	>20	>20	8.0
13250 - 13251	11.5	1.4	0.5	7.6	>20	>20	>20	15	12	>20	4.2	11	7.9	>20	>20	12
13251 - 13300	45	16.8	0.1	0.5	2.5	1.8	1.4	1.0	0.8	1.9	0.3	0.7	0.5	7.1	5.2	1.0
13300 - 13545	56	36.9	0.0	0.2	0.8	0.6	0.4	0.3	0.2	0.6	0.1	0.3	0.2	3.3	2.3	0.5
13545 - 13650	65	37.9	0.0	0.1	0.8	0.6	0.4	0.3	0.2	0.6	0.1	0.3	0.2	3.2	2.3	0.4
13650 - 14100	30.2	43.3	0.1	0.1	0.6	0.4	0.3	0.2	0.2	0.5	0.1	0.2	0.2	2.8	2.0	0.4
14100 - 14125	30.2	12.9	0.1	0.7	3.5	2.5	1.9	1.4	1.1	2.7	0.4	0.9	0.7	9.3	6.8	1.3
14125 - 14200	3.5	3	3.2	3.5	18	13	10	7.0	5.5	14	1.9	4.6	3.4	>20	>20	5.6
14200 - 14450	3.5	2	3.2	5.3	>20	20	15	11	8.4	>20	2.9	7.1	5.4	>20	>20	8.3
14450 - 14500	4.7	3	2.1	3.5	18	13	10	7.0	5.5	14	1.9	4.6	3.4	>20	>20	5.6



Table D-2 Predicted construction vibration levels – Sunshine carpark and platform extension works

Chainage	Activity	Min. Distance of activity to pipeline (m)	PPV from activities (mm/s)				
			Piling	Grader	18 tonne Vibratory Roller	10 tonne Vibratory Roller	18 tonne Static Roller
11900 - 12200	Carpark construction	2	-	5.4	60	44	8.3
11950 - 12200	Platform extension	39	0.1	-	-	-	-

Table D-3 Predicted construction vibration levels – Corridor Section

Chainages	Distance from construction to pipeline (m)	PPV from activities (mm/s)													Distance from pipeline to piles (m)			Bored Piling PPV (mm/s)		
		Bored Piling	30 tonne Rockbreaker	20 tonne Rockbreaker	14 tonne Rockbreaker	8 tonne Rockbreaker	5 tonne Rockbreaker	32 tonne Excavator Travelling	20 tonne Excavator Travelling	30 - 45 tonne Dozer	25 tonne Grader	18 tonne Vibratory Roller	10 tonne Vibratory Roller	18 tonne Static Roller	Min. Separation distance	Drawn piles	Pipeline underground barrier protection (as drawn)	Min. Separation distance	Drawn piles	Pipeline underground barrier protection (as drawn)
14500 - 17000	2.8	See right	19	14	11	7.5	5.9	15	2.0	4.9	3.7	>20	>20	6.0	0.6	1.2	-	>20	16	-
17000 - 17400	7.6		6.5	4.7	3.6	2.5	2.0	5.0	0.7	1.6	1.2	16	12	2.2	0.6	1.2	-	>20	16	-
17400 - 17900	7.6		6.5	4.7	3.6	2.5	2.0	5.0	0.7	1.6	1.2	16	12	2.2	-	0	-	-	-	-
17900 - 18400	0.6		>20	>20	>20	>20	>20	>20	10	>20	>20	>20	>20	>20	0.6	1.2	-	>20	16	-
18400 - 18900	7.0		7.1	5.1	4.0	2.8	2.2	5.5	0.8	1.8	1.4	17	13	2.4	1.2	5.4	1.9	16	1.8	8.7
18900 - 19900	5.2		10	7.1	5.5	3.9	3.1	7.7	1.1	2.5	1.9	>20	17	3.2	1.2	5.4	1.9	16	1.8	8.7
19900	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19900 - 20200	9.6		5.0	3.6	2.8	1.9	1.5	3.8	0.5	1.3	1.0	13	9.2	1.7	0.6	3	-	>20	4.0	-
20200 - 20700	12.7	3.6	2.6	2.0	1.4	1.1	2.8	0.4	0.9	0.7	9.5	6.9	1.3	-	-	-	-	-	-	

For context, the following items regarding piling have been reviewed:

- The minimum separation distance as denoted on cross-section drawings
- The separation distance between drawn piles (OLE/noise barrier) and pipeline as shown on cross-section drawings
- The separation distance between underground protection barrier and pipeline as drawn in the cross-section drawings

The distances for other construction equipment are based on the minimum distance between the pipeline and works.