

APPENDIX A CONSTRUCTION NOISE ASSESSMENT



A.1 Model Inputs

The inputs used in the acoustic model are provided in Table A 1.

Table A 1 Model Inputs

Input	Details
Constructability information	Provided by RPV
Construction Scenarios	Location / type of equipment provided by RPV
Terrain data	LiDAR 2 m elevation data
Ground Absorption	1.0 for heavily grass area / soft ground area 0.8 for hardground with grass areas 0.4 to 0.6 for residential areas 0.0 to 0.2 for industrial areas
Existing Maribyrnong River Bridge	Ballasted, steel bridge, no side screens
Existing noise walls	Existing noise walls at properties southeast and northwest of Calder Freeway overpass At the rear of houses on Drayton St, Sunshine

A.2 Construction equipment source noise levels

The source noise levels of construction equipment used for construction noise modelling are provided in Table A 2.

Table A 2 Sound Power Levels modelled for construction equipment

Item No.	Plant Item	Sound Power Level (SWL) (dB)								Overall SWL dB(A)	Source
		Octave Band Frequency (Hz)									
		63	125	250	500	1k	2k	4k	8k		
1	Light Tower	106	99	94	90	87	83	84	77	94	BS 5228
2	Tandem Truck	103	99	96	95	94	92	86	80	99	BS 5228
3	12T Vibratory Roller	117	110	104	105	100	102	109	89	112	BS 5228
4	12T to 25T Excavator	123	112	107	101	98	96	92	85	106	BS 5228
5	Excavator in Auger Configuration	112	104	95	92	90	87	81	71	96	BS 5228
6	Tipper truck	116	110	102	102	102	101	98	95	108	BS 5228
7	Non-Destructive Digging Truck	109	100	98	95	98	95	93	88	102	AS 2436 / BS 5228
8	Concrete Truck	111	102	94	97	98	106	88	83	108	BS 5228
9	Concrete Boom Pump	111	105	103	103	102	103	95	91	108	BS 5228
10	Welder	103	104	105	104	105	102	97	92	107	AS 2436 / BS 5228
11	25T Franna Crane	111	105	101	101	100	96	96	96	105	BS5228
12	40T to 60T Crawler Crane	118	109	106	102	105	104	97	89	109	BS 5228
13	100T Crane	101	99	96	98	94	91	82	77	99	BS 5228
14	400T Crane	108	107	101	102	101	101	92	83	106	BS 5228

Item No.	Plant Item	Sound Power Level (SWL) (dB)								Overall SWL dB(A)	Source
		Octave Band Frequency (Hz)									
		63	125	250	500	1k	2k	4k	8k		
15	600T Crane	96	99	96	90	94	94	83	74	99	BS 5228
16	Diesel Elevated Work Platforms	121	115	105	103	96	98	92	83	106	AS 2436 / BS 5228
25	60T to 100T Bored Piling Rig	112	120	109	108	106	104	96	89	111	BS 5228
26	Driven Piling Rig	110	110	110	117	111	106	103	98	117	BS 5228
27	Sonic Drilling Rig	122	123	118	119	115	113	108	101	121	BS 5228 based of tracked mobile drilling rig
28	Horizontal Directional Drill	95	108	102	100	100	100	96	89	106	BS 5228
29	Horizontal Directional Boring	109	111	109	109	106	104	102	95	112	Based on TBM for MM EES
30	Semis	100	97	94	92	88	87	86	84	95	MTP EES
31	Power tools (electric)	61	73	86	93	93	98	101	101	106	AS 2436
32	Jack Hammers	121	114	112	107	102	106	119	108	121	AS 2436
33	Saw Cutting	119	121	113	113	112	113	117	115	122	AS2436 – concrete cutting
34	Generator	103	100	104	98	97	93	84	75	102	BS 5228
35	Water Cart	108	109	103	107	101	102	98	93	109	BS 5228
36	Drill Slurry Mixing Equipment	100	101	107	100	97	95	91	88	104	Large concrete mixer BS 5228
37	Loaders	113	111	104	103	103	100	100	89	108	BS 5228
38	13T Grader	80	89	92	94	102	97	93	93	105	AJM-JV internal database
39	Telehandler	113	107	97	95	92	90	84	75	99	BS 5228
40	Tamper	108	108	98	99	97	101	107	105	111	Note 2 / BS 5228
41	Ballast Regulator	124	125	116	108	109	105	103	99	115	Note 2 / BS 5228
42	Chipper	105	99	102	100	105	110	110	109	116	Note 3 BS 5228 (spectrum)
46	D6 Dozer	113	102	104	101	100	106	90	84	109	BS 5228
36	Driven Piling	110	110	110	117	111	106	103	98	117	BS 5228

Notes:

- 1) DEFRA BS 5228-1 Noise Database 2008
- 2) Edithvale and Bonbeach Level Crossing Removal Project Noise and Vibration Impact Assessment (LXRA-LX31-00-PA-EES-0004)
- 3) GreenMech Woodchipper, Brochure 2017 sourced online

A.3 Project Construction Scenarios

Acoustic modelling has been undertaken for a selection of construction scenarios that are considered representative of the highest noise impacts. These scenarios are presented in Table A 3.

Table A 3 Construction scenarios and equipment

No.	Location / Stage	Working Hours	Unavoidable Works	Indicative Time Period	Key Noise Generating Equipment																				Comments																						
					Ballast Regulator	Ballast Tamper	Concrete Agitator	Concrete Boom Pump	D6 Dozer	Diesel Elevated Work Platform	Drill Mixing Equipment	Driven Piling	12 to 25T Excavator	Excavator in Auger Configuration	Excavator with Boring Rig	25T Franna Crane	Generator	13T Grader	Horizontal Directional Boring	Horizontal Directional Drill	Jack Hammer	Light Tower	Loaders	40 to 60T Mobile/Crawler Crane		100T Mobile/Crawler Crane	400T Mobile/Crawler Crane	600T Mobile/Crawler Crane	Non-Destructive Digging Truck	60 to 100T Bored Piling Rig	Power Tools	12T Roller	Saw Cutting	Semis	Sonic Drilling Rig	Tandem/Truck and Trailer	Telehandler	Tipper Truck	Water Cart	Welder	Wood Chipper						
Sunshine to Albion																																															
1	Sunshine Station / Platform Piling	Day / Night	Y	16 days			9	3						3			2			4	20							1	1	10	2	2	3		6							CH 11850 to CH 12300. Sunshine Station – Platform 2 & 3 piling works.					
2	Chaplin Reserve to Anderson Road / CSR Construction	Day / Night	Y	16 days	1	1	6	2		2				9	2		3	2	1			20	4					2			7	2				12	1	2	1	2				CH 1300 to CH 13550. Abutment FRP work at Anderson Road overpass occurring concurrently to rail construction works between Chaplin Reserve and Anderson Road. Rail construction works include CSR construction, earthworks, and OHW foundations installation.			
3	Anderson Road to Ballarat Road / CSR Trenching	Day / Night	Y	100 days																								4	1	7	1			2	1	24	1	4	1		1			CH 13250 to CH 14650. Site establishment and retaining wall works around Chaplin Reserve HV McKay Memorial Gardens to occur concurrently with rail construction works. Rail construction works include CSR trenching eastern side of Anderson Road to Ballarat Road, OHW foundations and structure for track slew works.			
4	St Albans / ARTC track formation works	Day / Night	Y	13 days	2	2				2				8	2								2					3		2	3		2	1		20		2	2	2	1			CH 13477 to CH 14600. Works include: site establishment, clearing and grubbing, and rail construction works including removal of track, formation, drainage, track slew of ARTC tracks, and CSR works.			
5	St Albans / CSR construction works	Day / Night	Y	16 days				14	3		6			6			2	4	1			2					2	1	1	1		6	1		2		12	1		1					CH 13477 to CH 14600. Works include: CSR, FRP, precast installation of piers, crossheads, beams, formation and drainage.		
M80 Viaduct																																															
6	Airport West / Substructure	Day	N	360 days			6	2			4			2			2	4									2			2	4		2				8								CH20.600 to CH21.200 MAR viaduct substructure works in Airport West area.		
7	Western Ring Rd / Substructure	Day / Night	Y	90 days			6	2			4			2			2	2									2			2	4		2			4										CH21.200 to CH21.300. MAR viaduct substructure works (steel structure) over Western Ring Road (M80).	
8	Tullamarine / Substructure	Day / Night	Y	180 days			6	2			4			2	2			2	4								2			2	4		2			8										CH21.300 to CH22.000 MAR viaduct substructure works in north of M80 area.	
Corridor																																															
9	Sunshine North / CSR trenching works	Day / Night	N	120 days											2												2		2	2							6								CH14500 to CH15200. CSR trenching works, cable pulling, delineation fencing and access path.		
10	Sunshine North / Track formation works	Day / Night	Y	230 days	1	1	2		2	1				2			1		2			2						2			2	1	1			6						1				CH14500 to CH15200. MAR Track formation, track installation, drainage, signalling foundation, noise wall, retaining wall and signalling works.	
11	McIntyre Rd / Bridge Upgrade	Day / Night	Y	100 days				2	1		1			1		1	1	1			1						2					1			4												CH15.200 to CH16.200. Road over rail bridge upgrade works on McIntyre Rd overpass as part of track formation works.
12	Keilor Park Drive / Bridge Upgrade	Day / Night	Y	45 days				4	1		2			2			1	2	2												2		6														CH18.150 to CH19.100. Road over rail bridge upgrade works on Keilor Park Drive overpass as part of track formation works.
13	Calder Freeway / Bridge Upgrade	Day / Night	Y	240 days				1	1		2			2			1	2	1											2			2		4												CH19.100 to CH20.600. Road over rail bridge upgrade works on Calder Freeway overpass as part of track formation works

No.	Location / Stage	Working Hours	Unavoidable Works	Indicative Time Period	Key Noise Generating Equipment																Comments																						
					Ballast Regulator	Ballast Tamper	Concrete Agitator	Concrete Boom Pump	D6 Dozer	Diesel Elevated Work Platform	Drill Mixing Equipment	Driven Piling	12 to 25T Excavator	Excavator in Auger Configuration	Excavator with Boring Rig	25T Franna Crane	Generator	13T Grader	Horizontal Directional Boring	Horizontal Directional Drill		Jack Hammer	Light Tower	Loaders	40 to 60T Mobile/Crawler Crane	100T Mobile/Crawler Crane	400T Mobile/Crawler Crane	600T Mobile/Crawler Crane	Non-Destructive Digging Truck	60 to 100T Bored Piling Rig	Power Tools	12T Roller	Saw Cutting	Semis	Sonic Drilling Rig	Tandem/Truck and Trailer	Teahandler	Tipper Truck	Water Cart	Welder	Wood Chipper		
																																											occurring on M80 (on and off ramp), Calder Freeway inbound and outbound, and Fullarton Road.
Maribyrnong River Bridge																																											
14	Maribyrnong River / Tower Mobilisation	Day / Night	Y	100 days						2											2				1	1			10			10									CH17.335 to CH17.887. Oversized equipment Tower Crane to be delivered at night – setup to commence at night.		
15	Maribyrnong River / Piling and Excavation	Day	N	500 days			6	3	6										5		3	5			3		3	10			12		12							CH17.335 to CH17.887. Piling works and excavation for Maribyrnong River Bridge viaduct works. Piling rigs to be mobilised and demobilised at night.			

A.4 Predicted construction noise levels

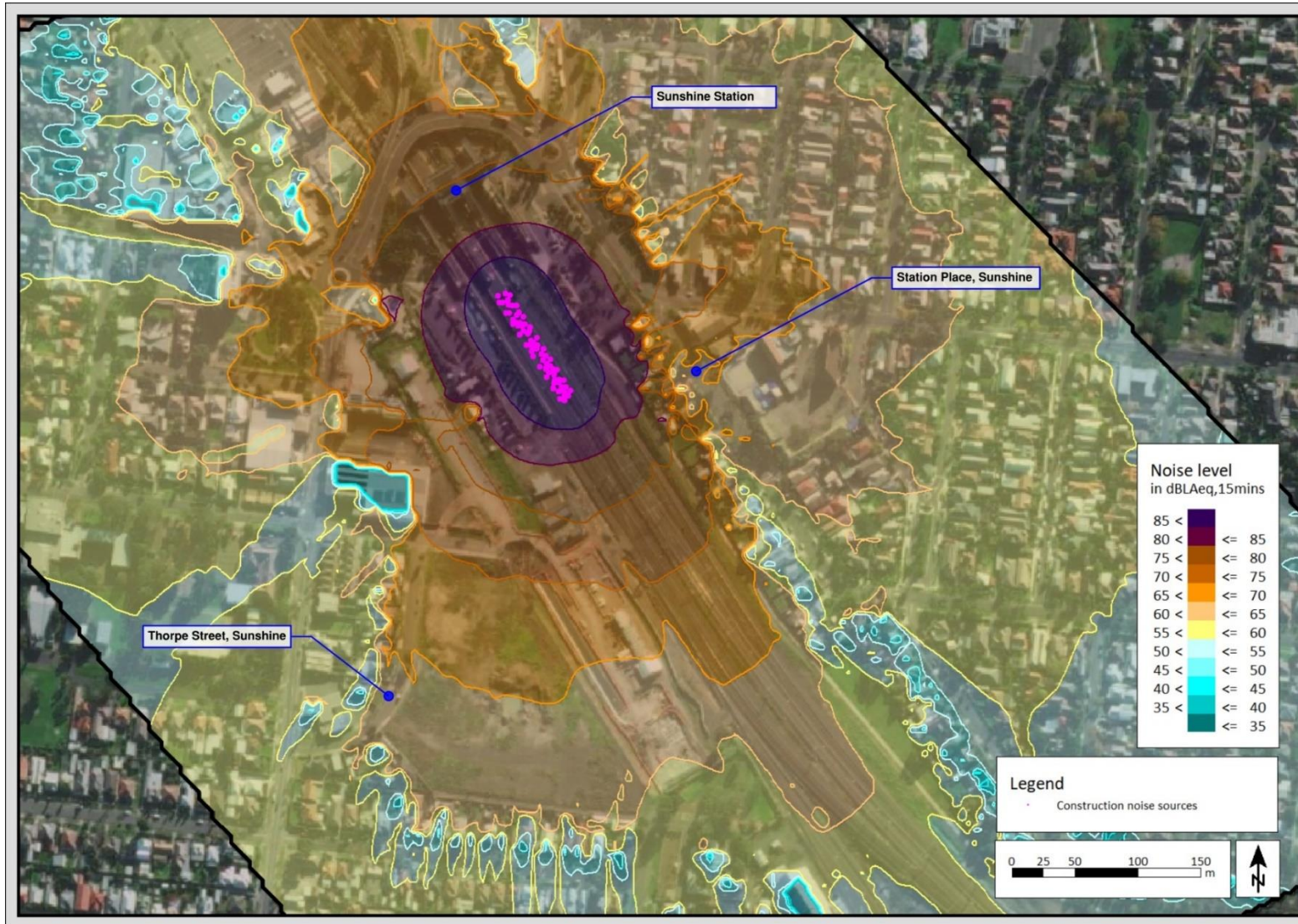


Figure A.1 Predicted Construction Noise levels for Scenario 1 - Sunshine Station platform piling works

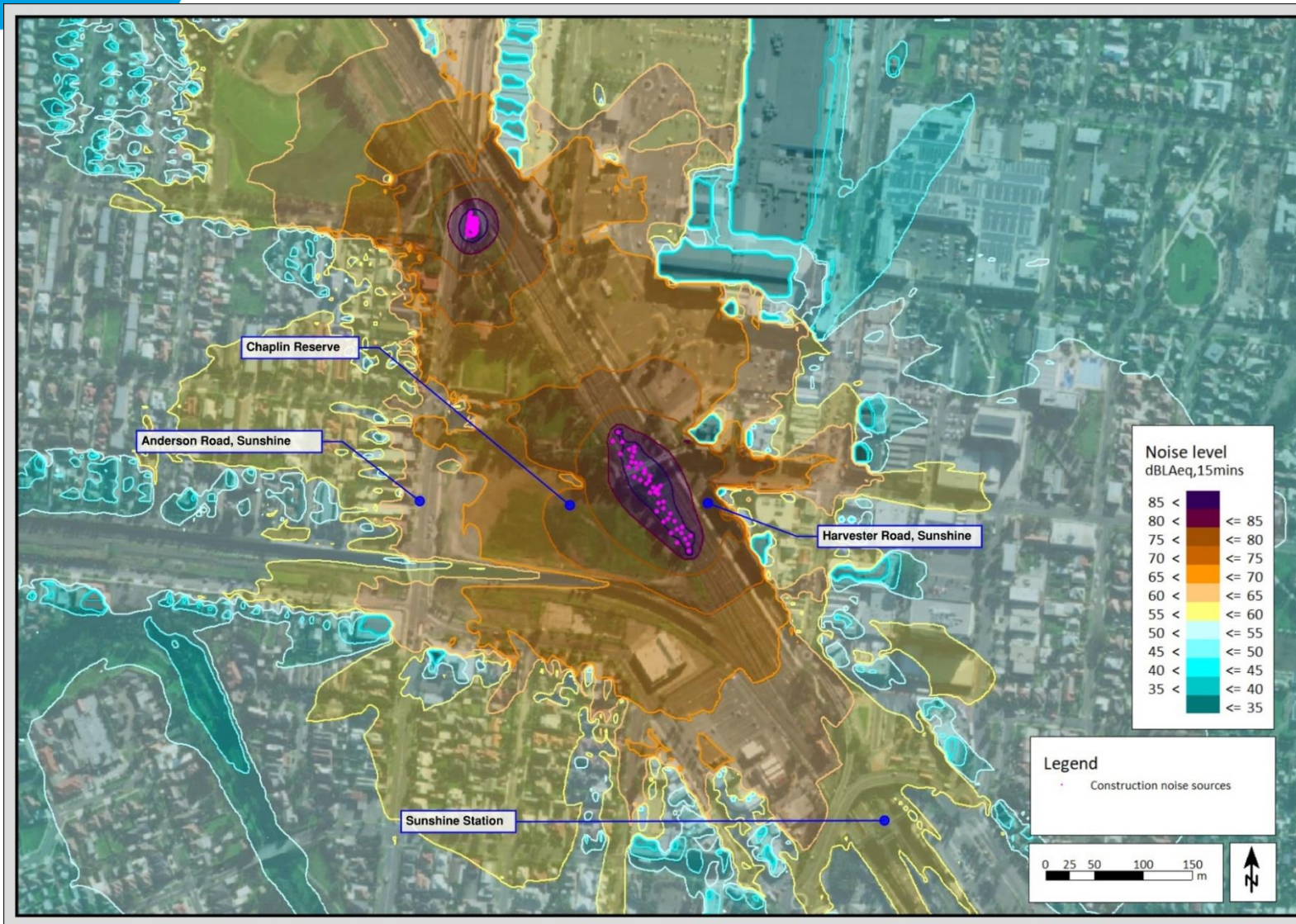


Figure A.2 Predicted Construction Noise levels for Scenario 2 - Chaplin Reserve to Anderson Rd CSR Construction works

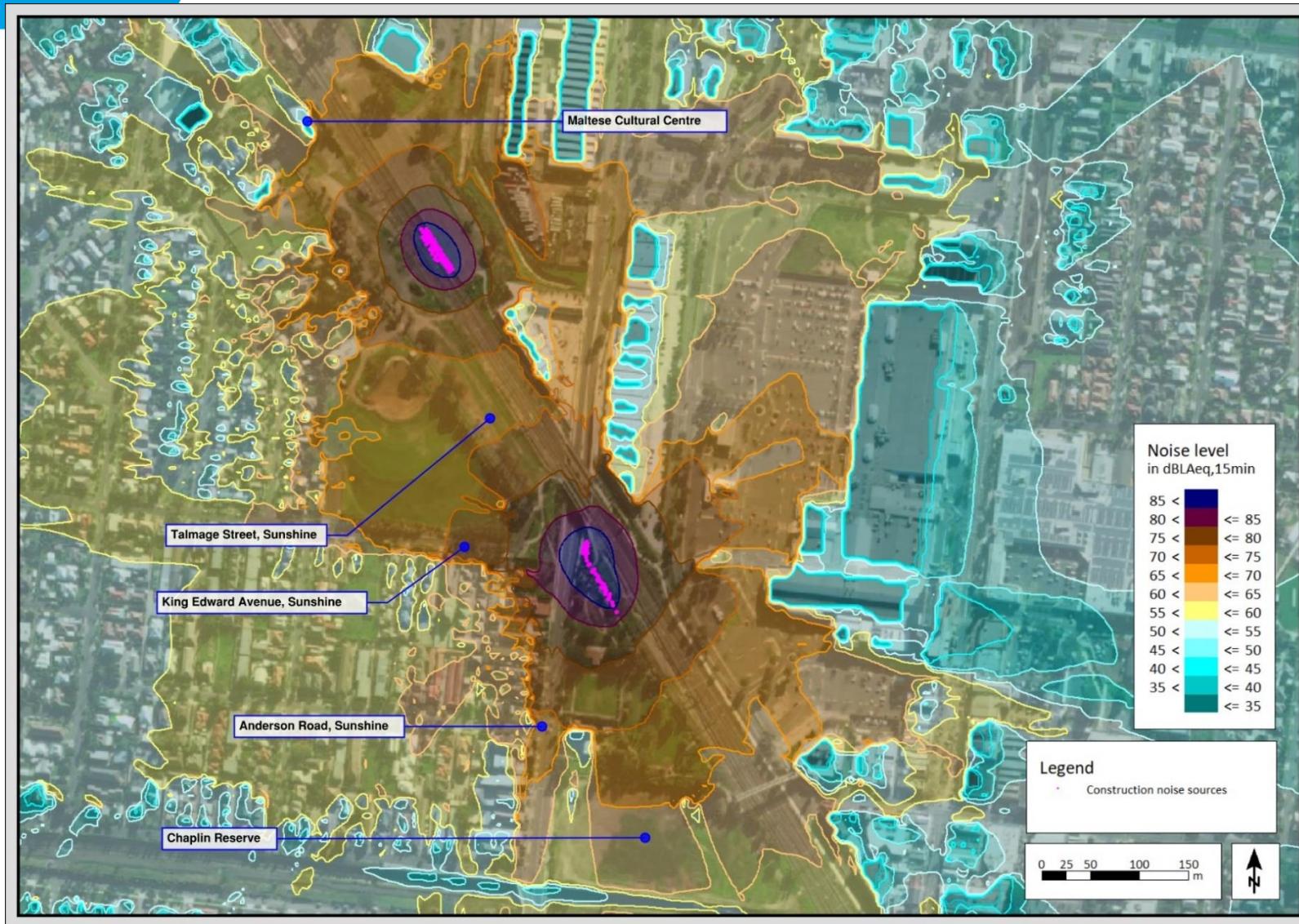


Figure A.3 Predicted Construction Noise levels for Scenario 3 - Anderson Road to Ballarat Road CSR trenching works

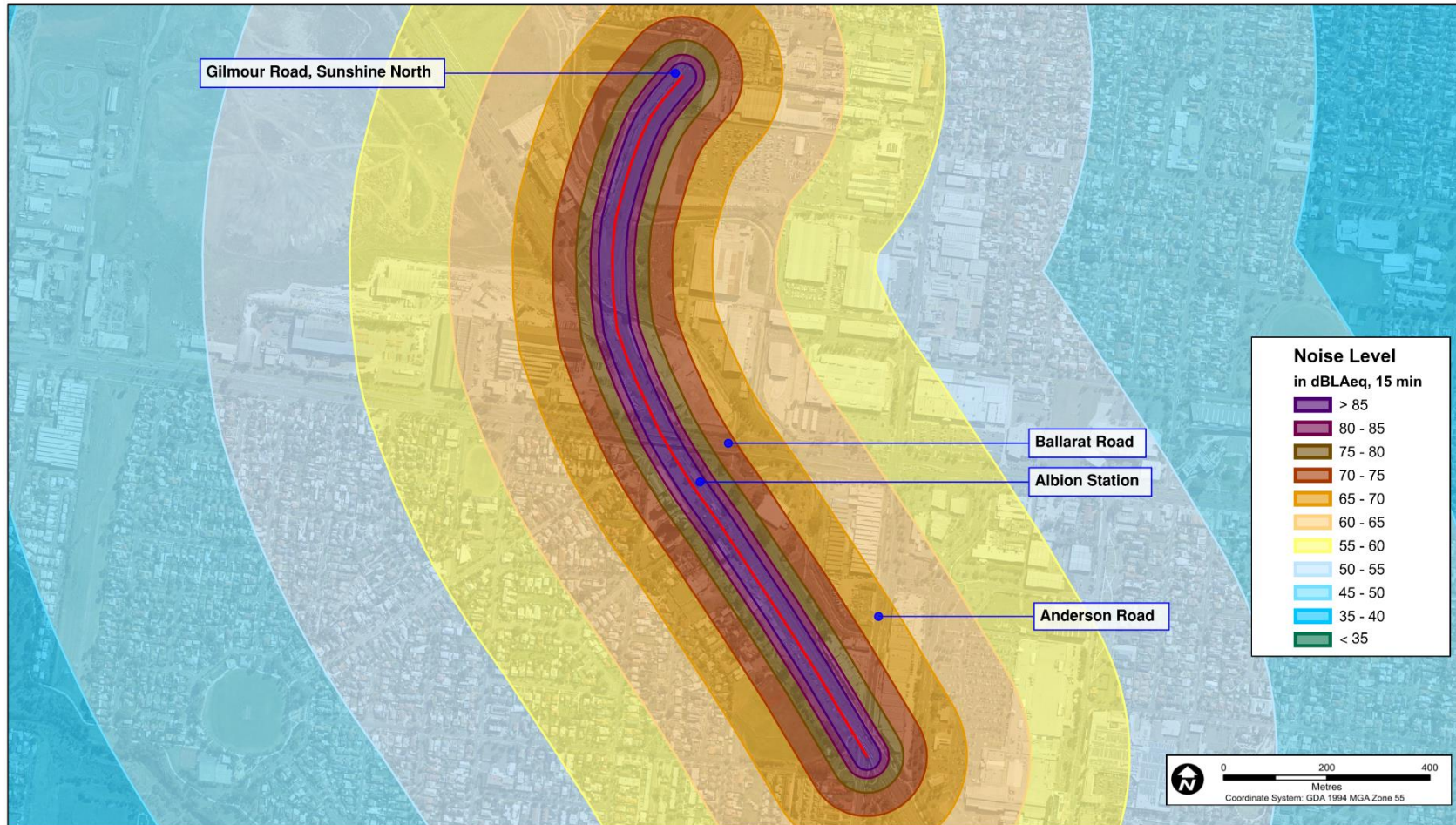


Figure A.4 Predicted Construction Noise levels for Scenario 4 - St Albans ARTC track formation work

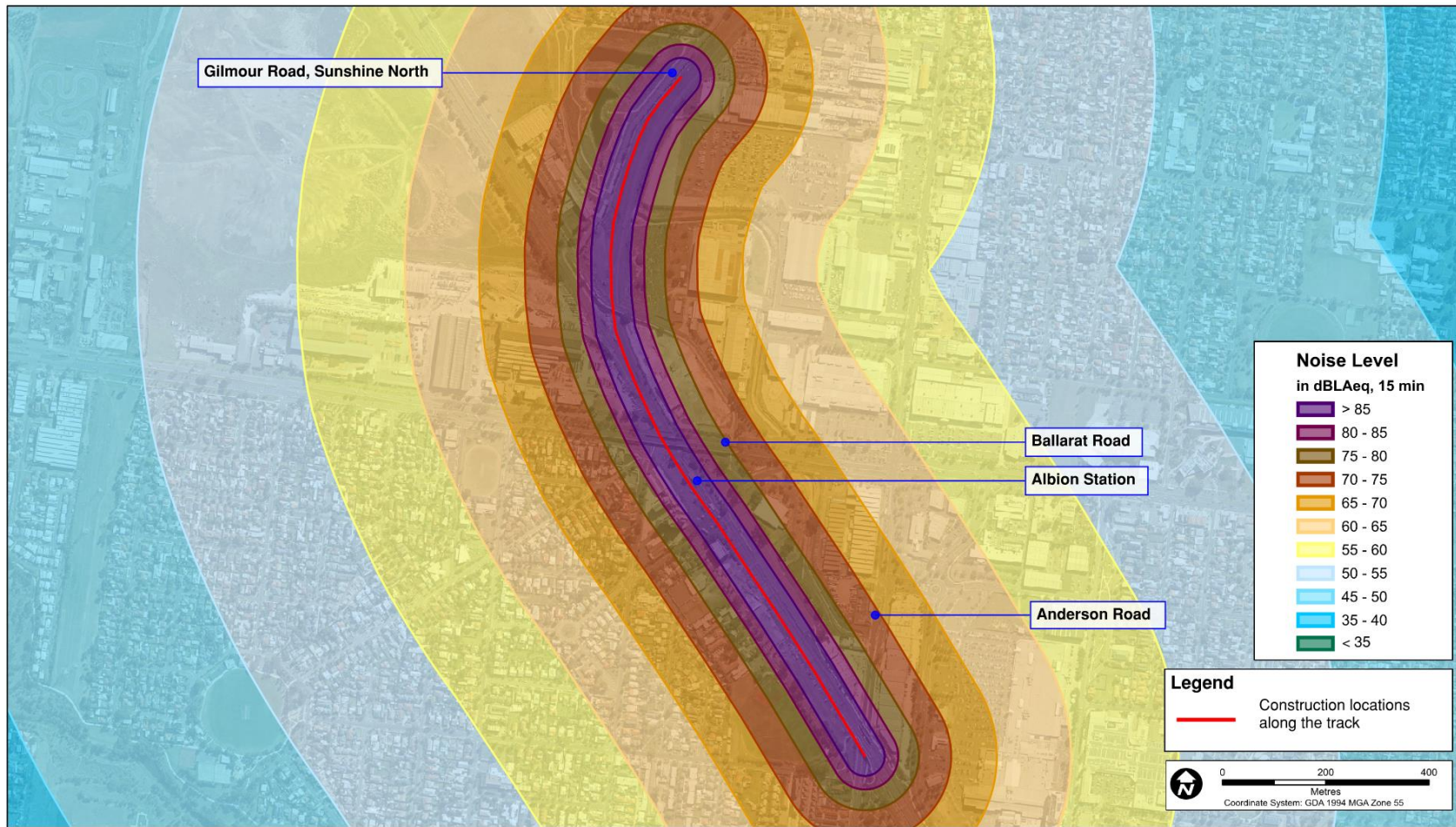


Figure A.5 Predicted Construction Noise levels for Scenario 5 – St Albans CSR construction work

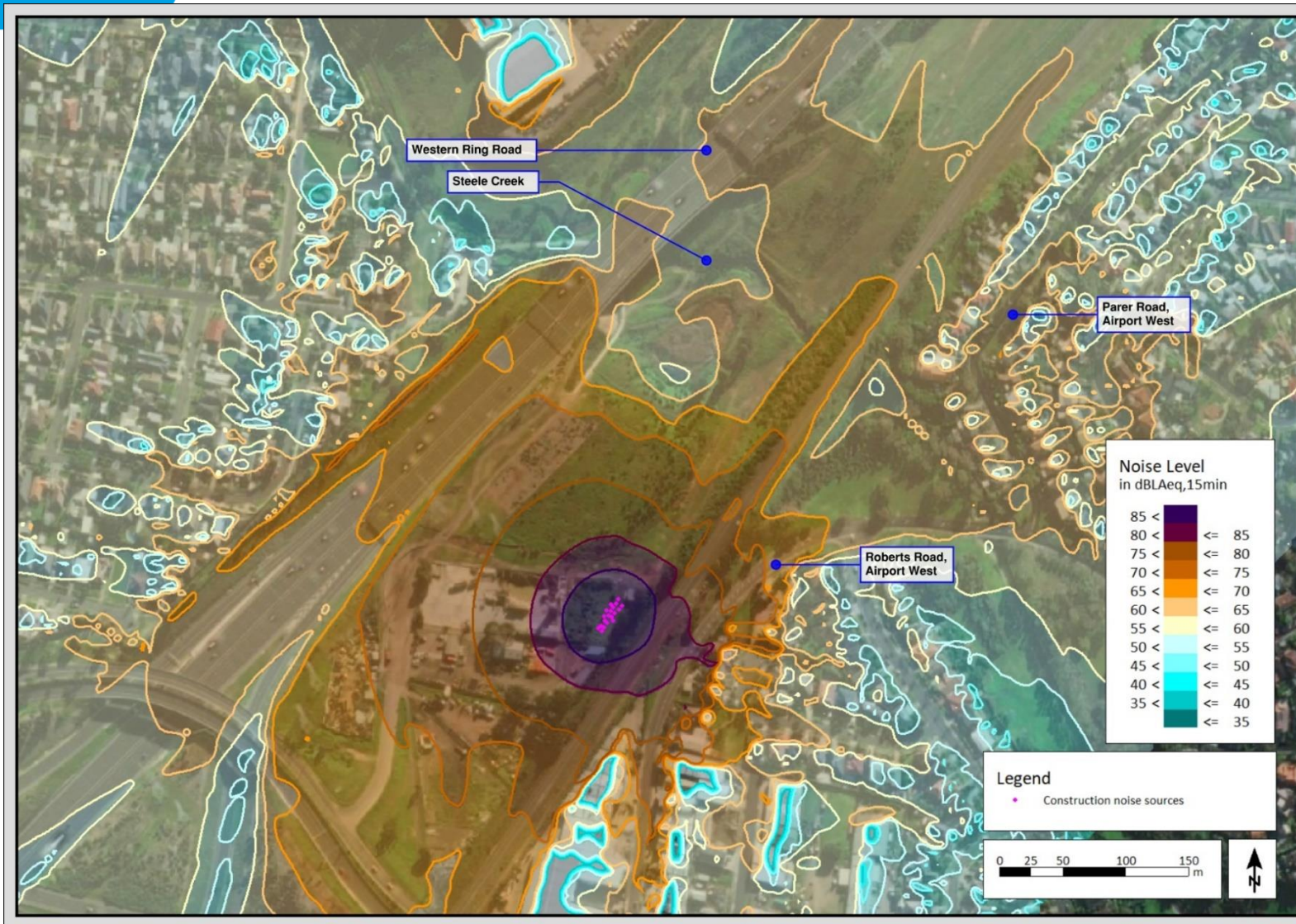


Figure A.6 Predicted construction noise levels for Scenario 6 – MAR viaduct substructure works along Airport West (south)

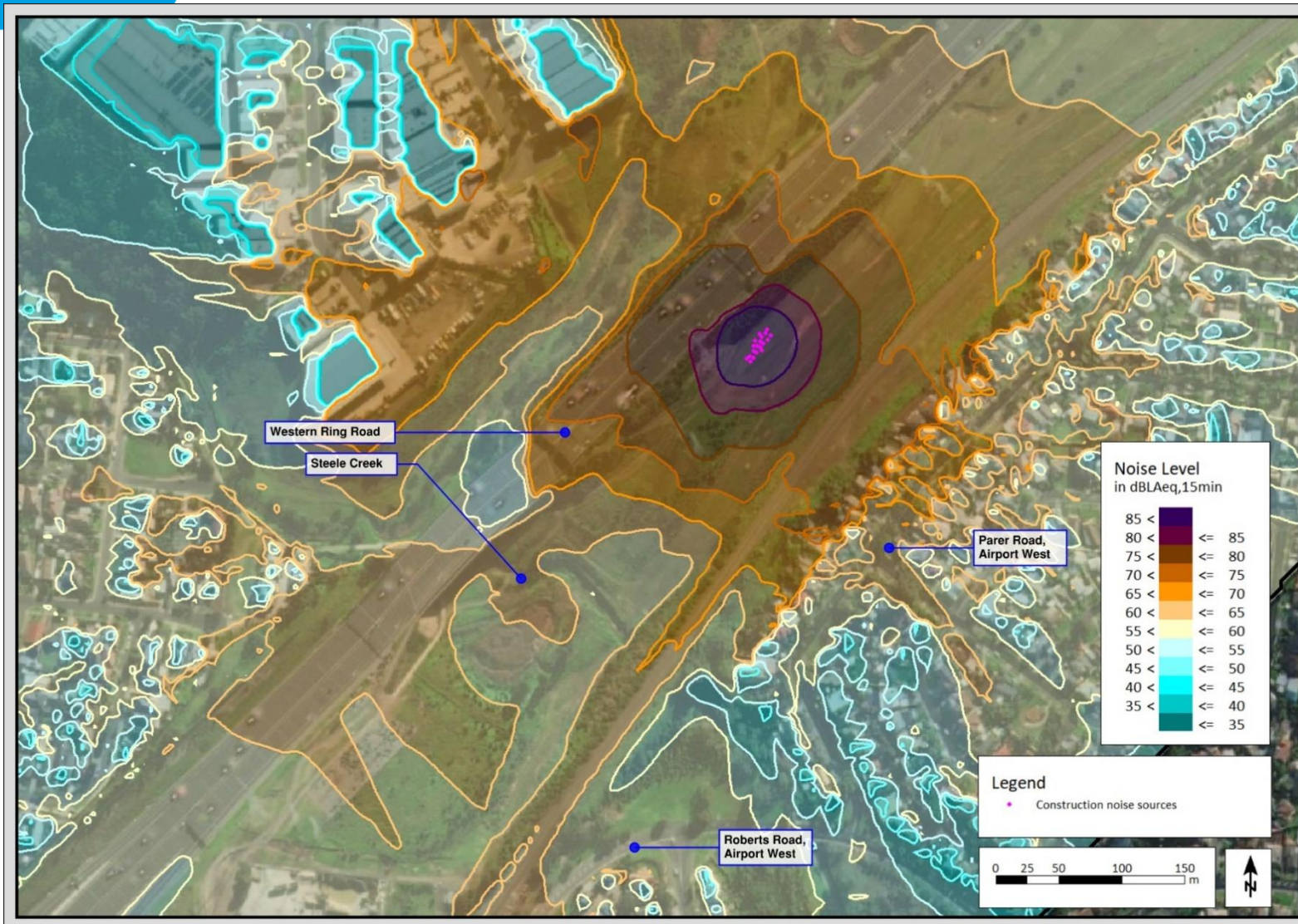


Figure A.7 Predicted construction noise levels for Scenario 6 - MAR viaduct substructure works along Airport West (north)

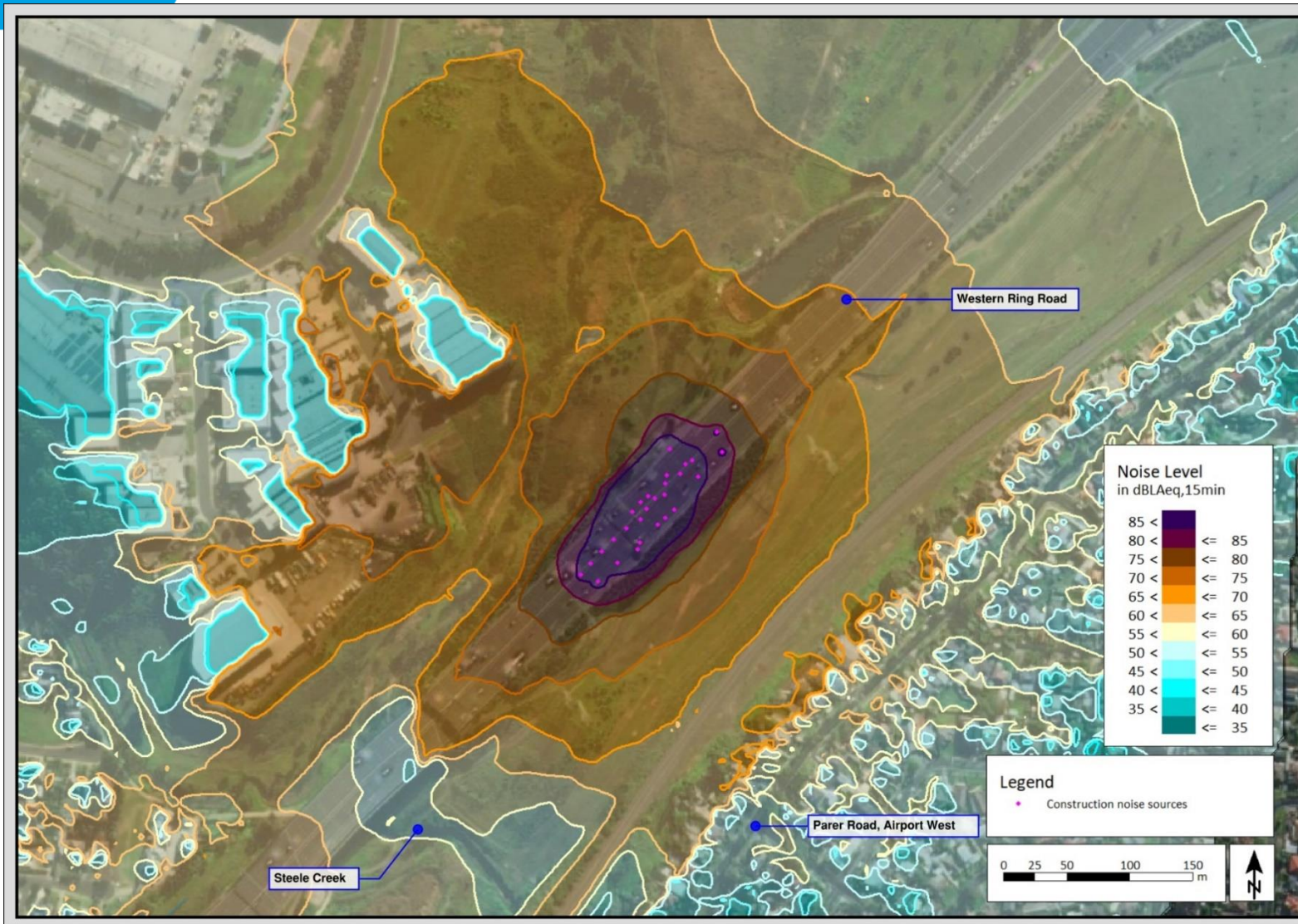


Figure A.8 Predicted construction noise levels for Scenario 7 - MAR viaduct substructure works along the Western Ring Road.

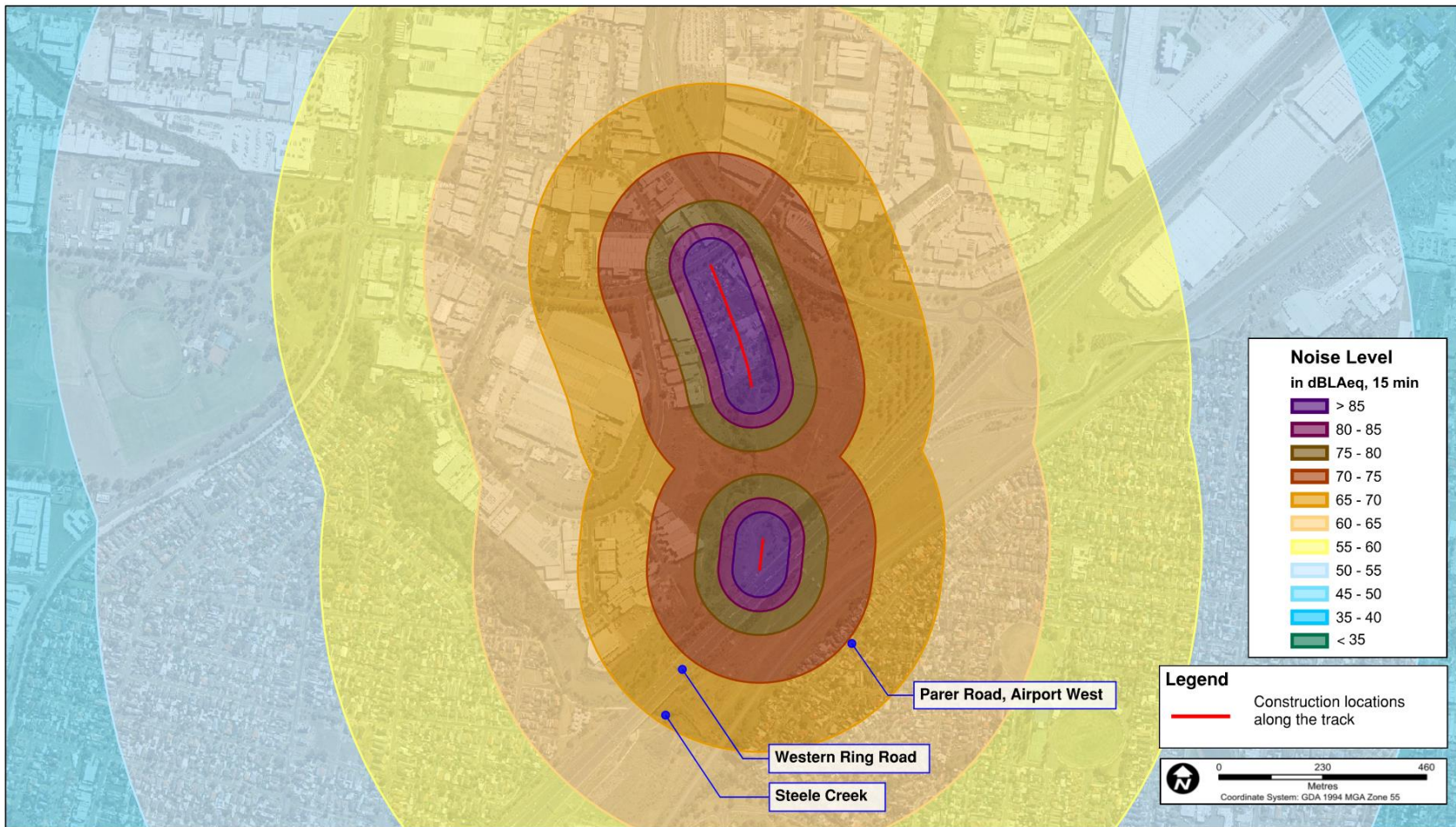


Figure A.9A Predicted construction noise levels for Scenario 8 - MAR viaduct superstructure works along Tullamarine – bored piling

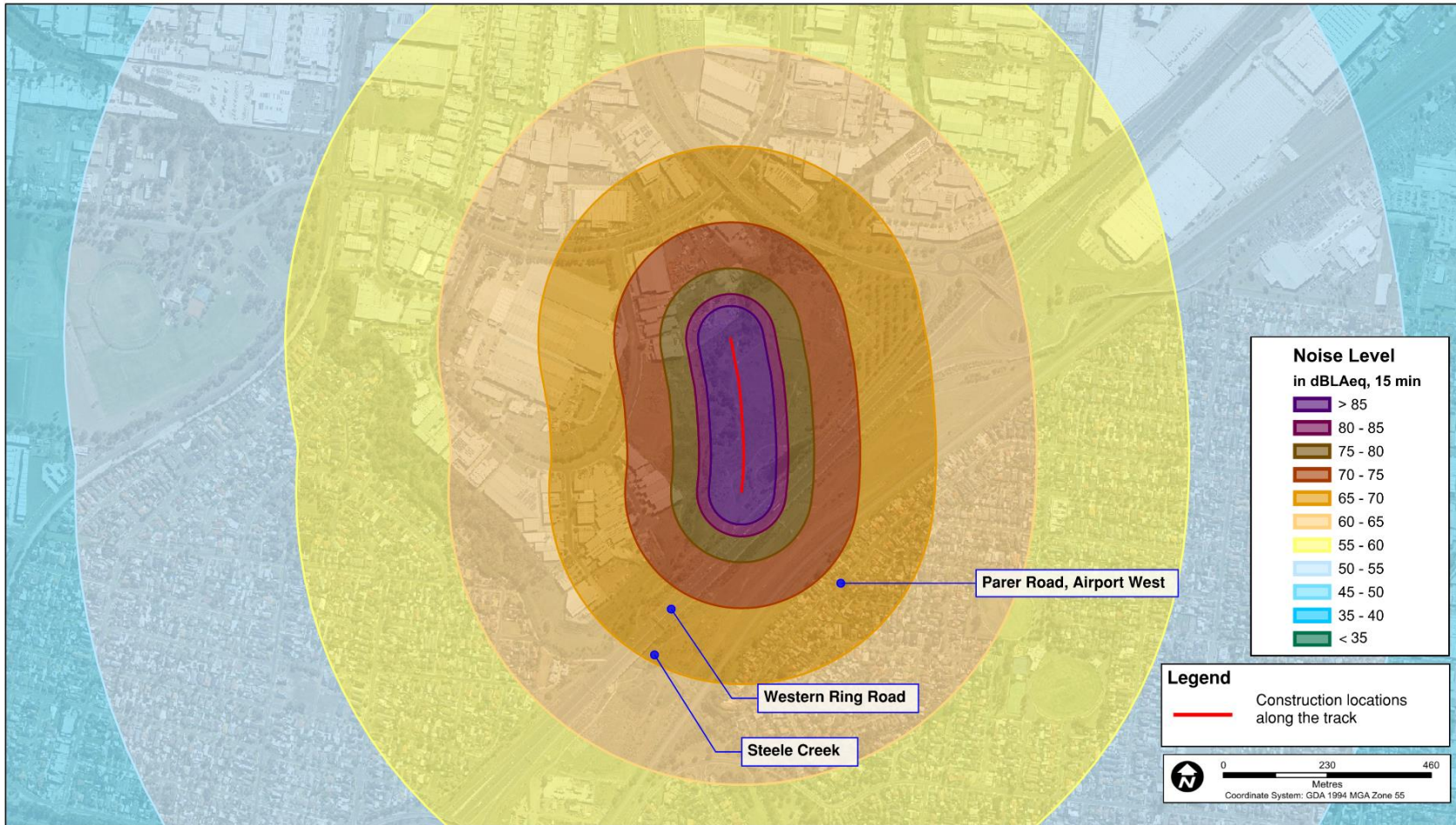


Figure A. 9B Predicted construction noise levels for Scenario 8 - MAR viaduct superstructure works along Tullamarine – driven piling

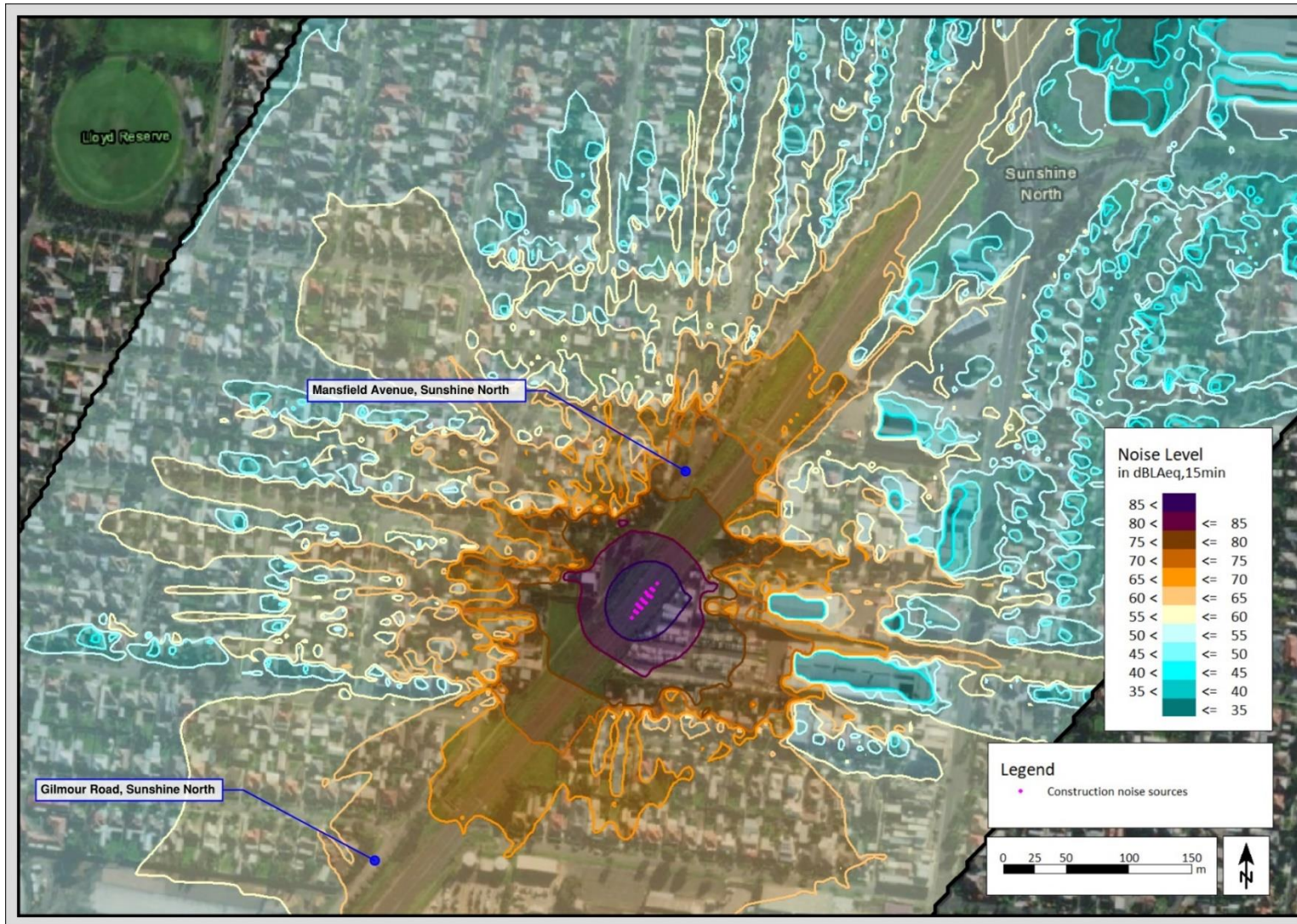


Figure A.10 Predicted construction noise levels for Scenario 9 – ACP CSR trenching works (south)

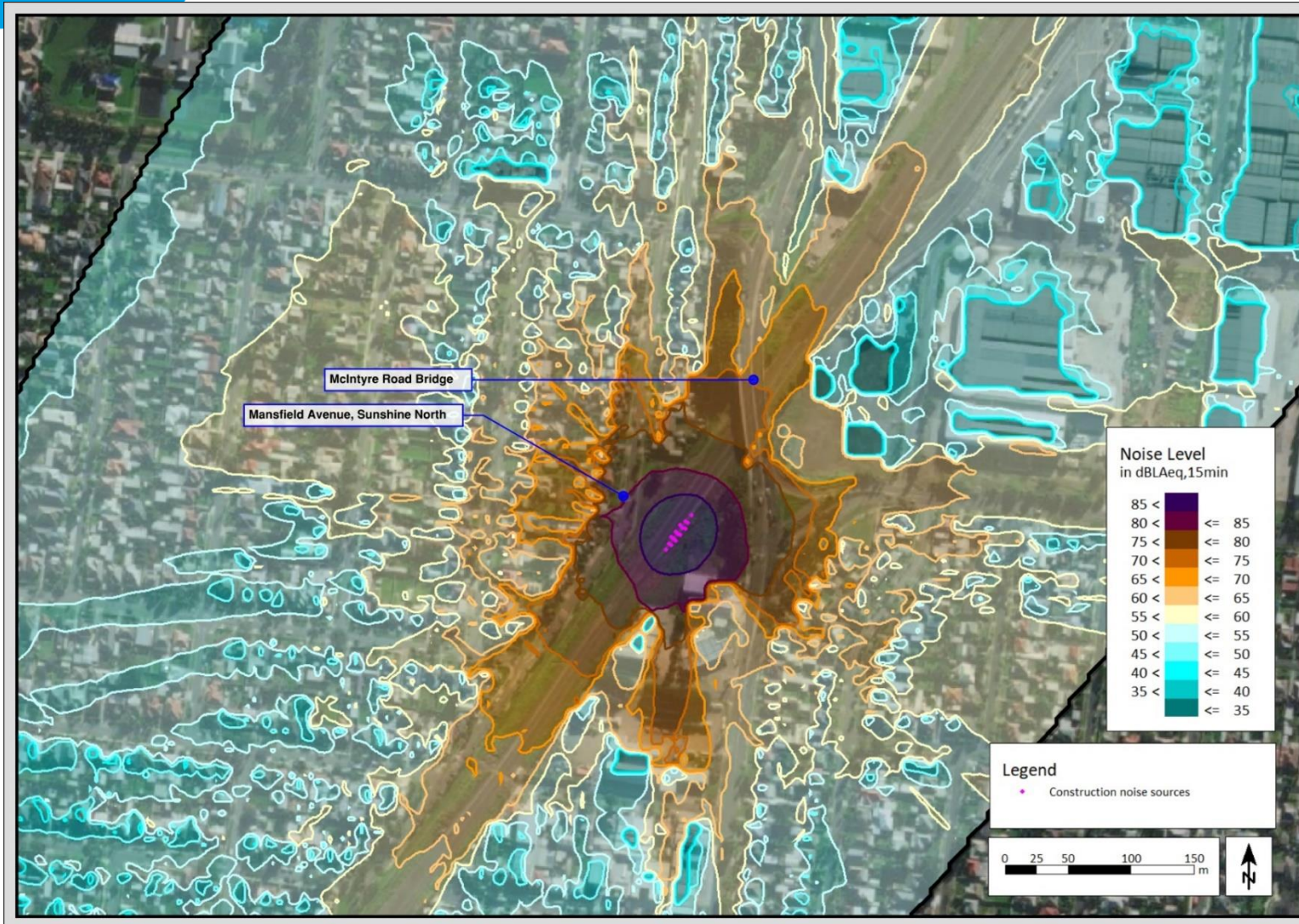


Figure A.11 Predicted construction noise levels for Scenario 9 - ACP CSR trenching works (north)

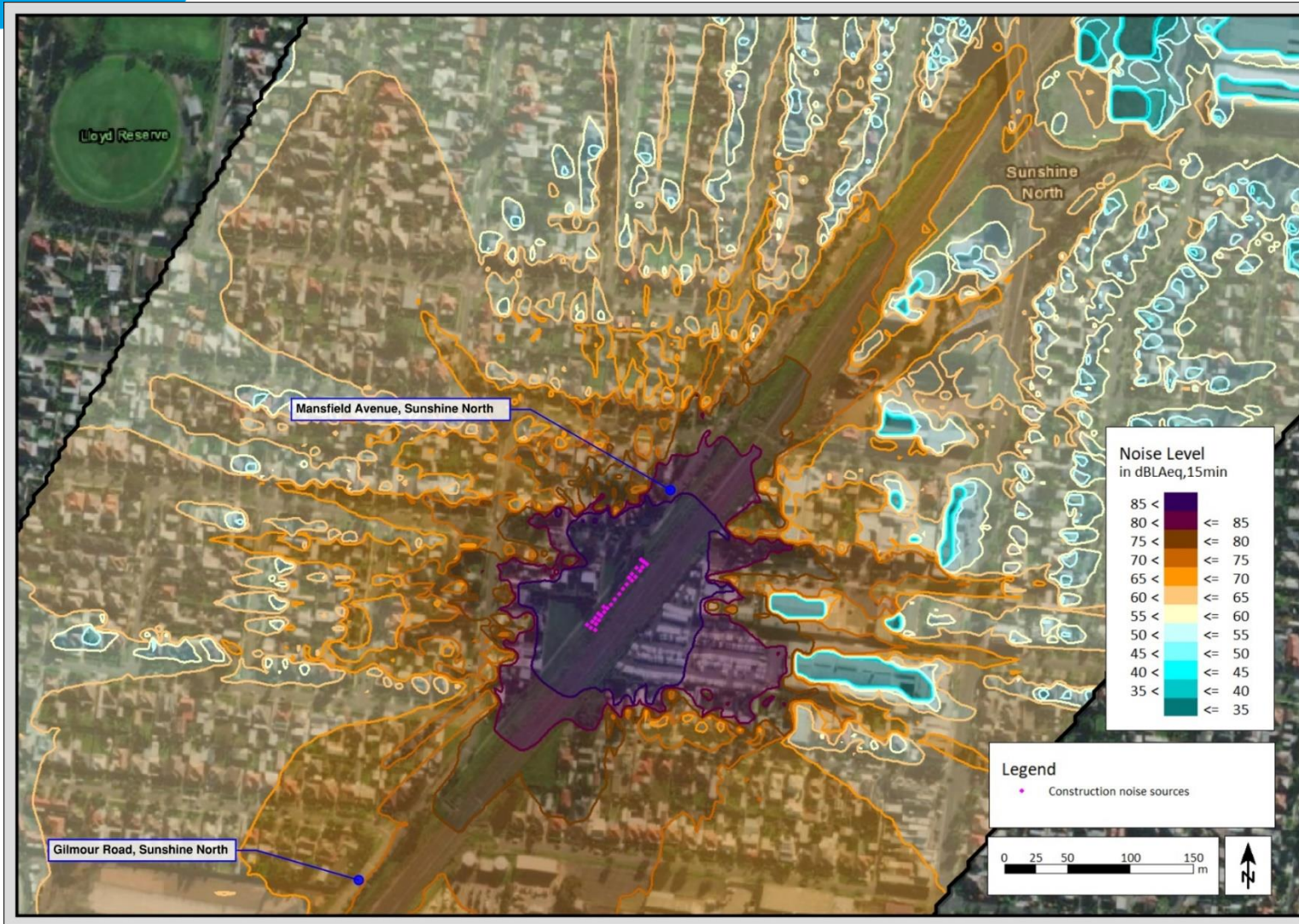


Figure A.12 Predicted construction noise levels for Scenario 10 - ACP Track formation works (south)



Figure A.13 Predicted construction noise levels for Scenario 10 - ACP Track formation works (north)

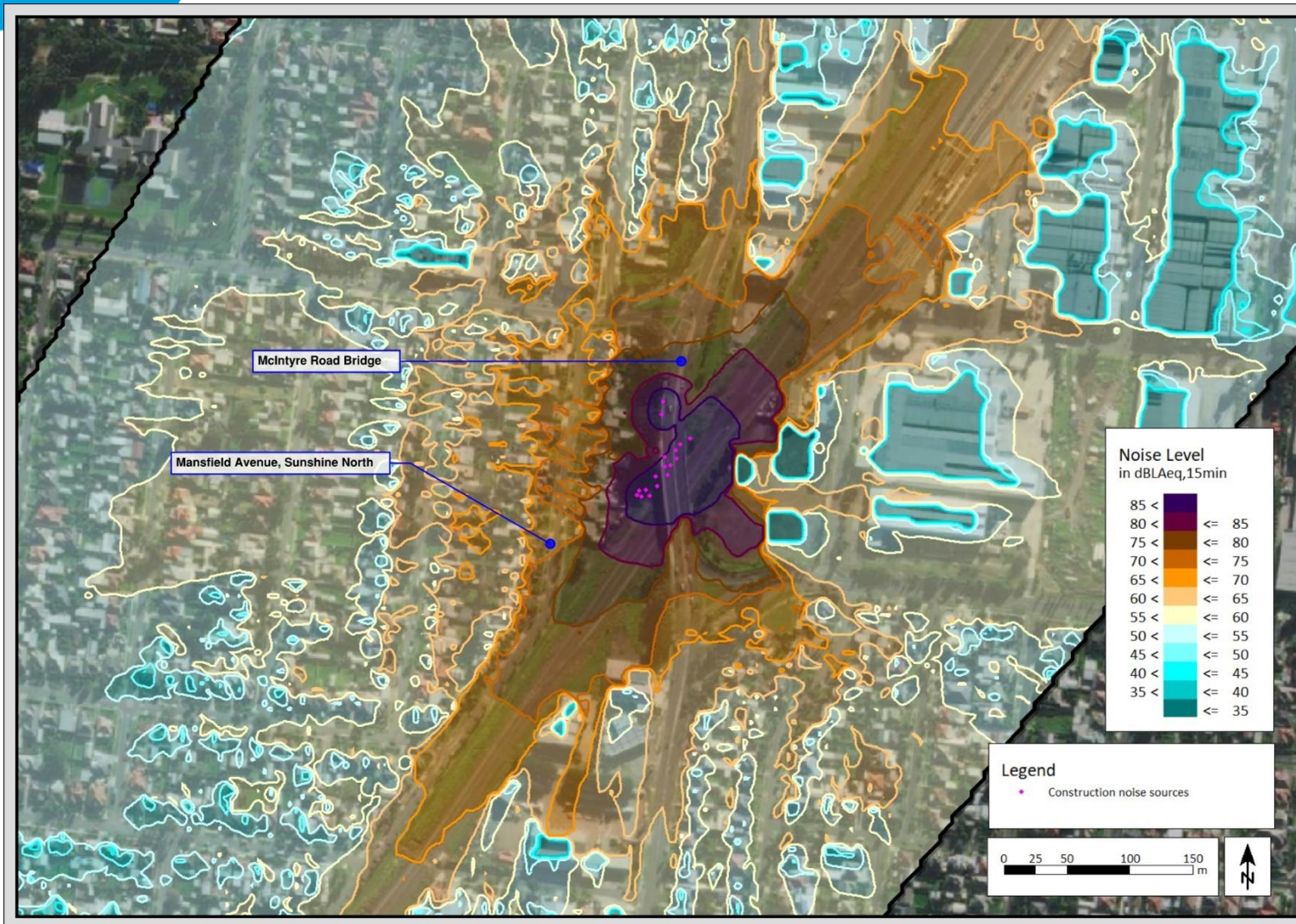


Figure A.14 Predicted Construction Noise levels for Scenario 11 - McIntyre Road Bridge Works

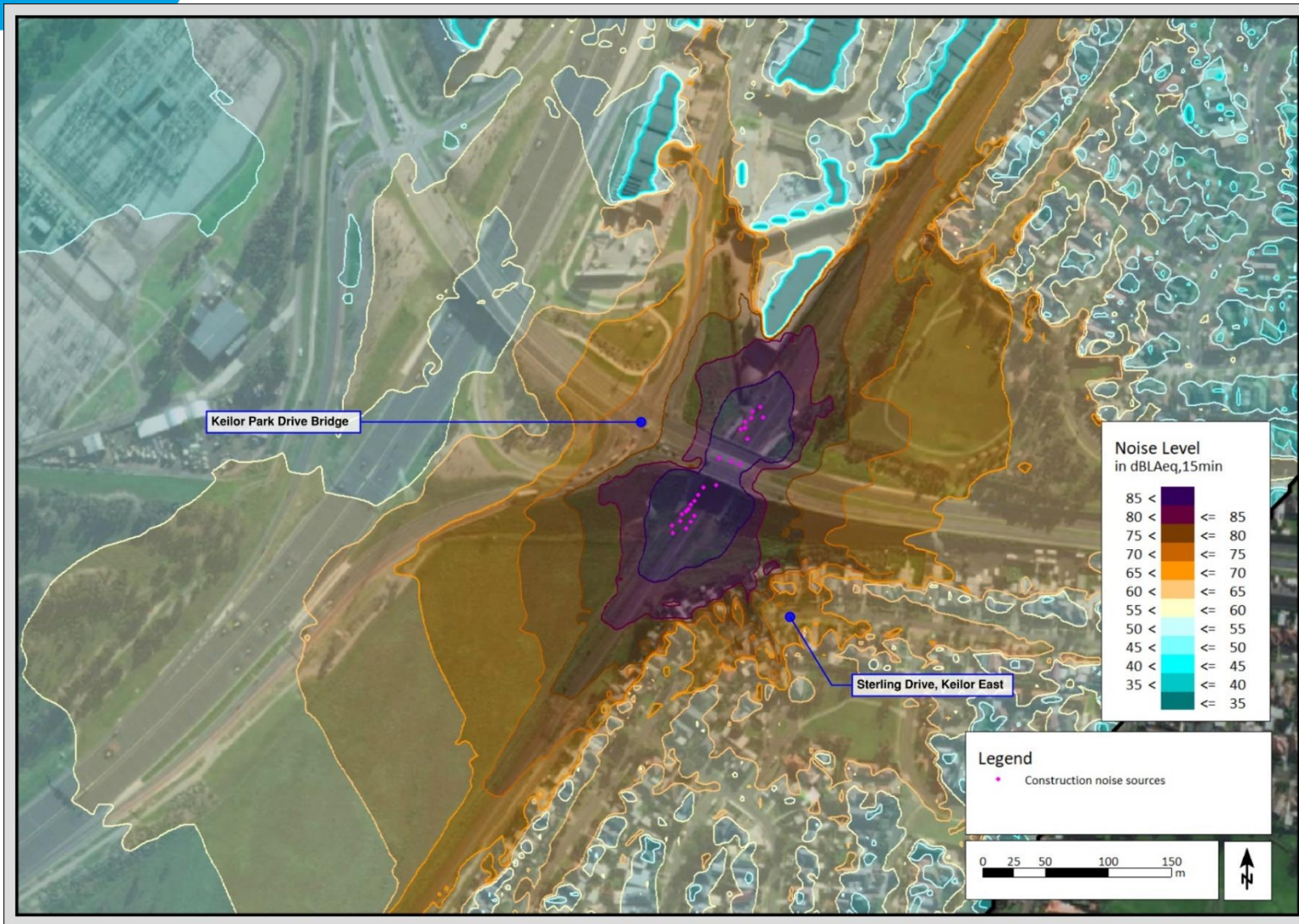


Figure A.15 Predicted construction noise levels for Scenario 12 - Keilor Park Drive bridge works

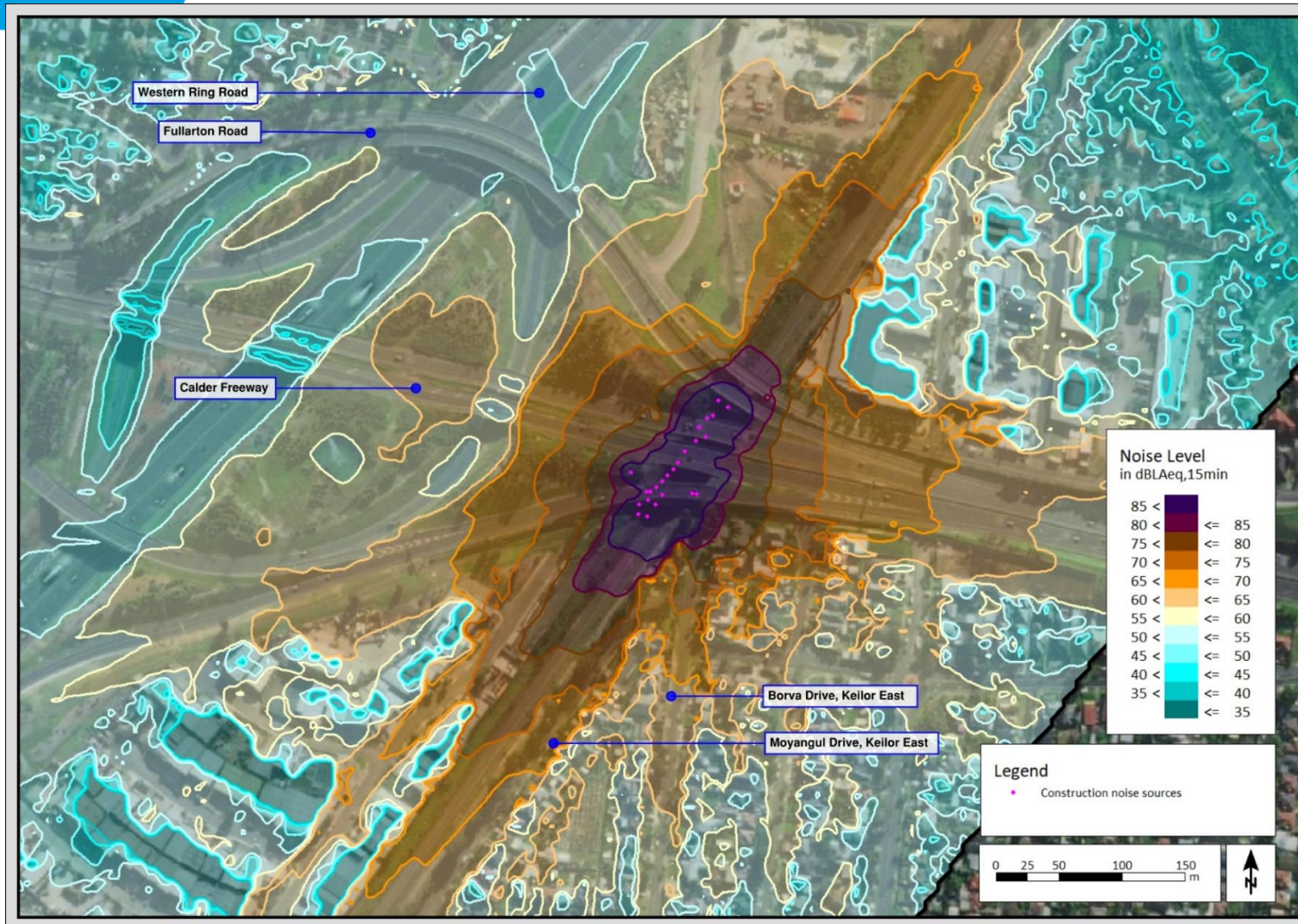


Figure A.16 Predicted construction noise levels for Scenario 13 - Calder Freeway bridge works



Figure A.17 Predicted construction noise levels for Scenario 14 - Maribyrnong River Bridge Tower Mobilisation

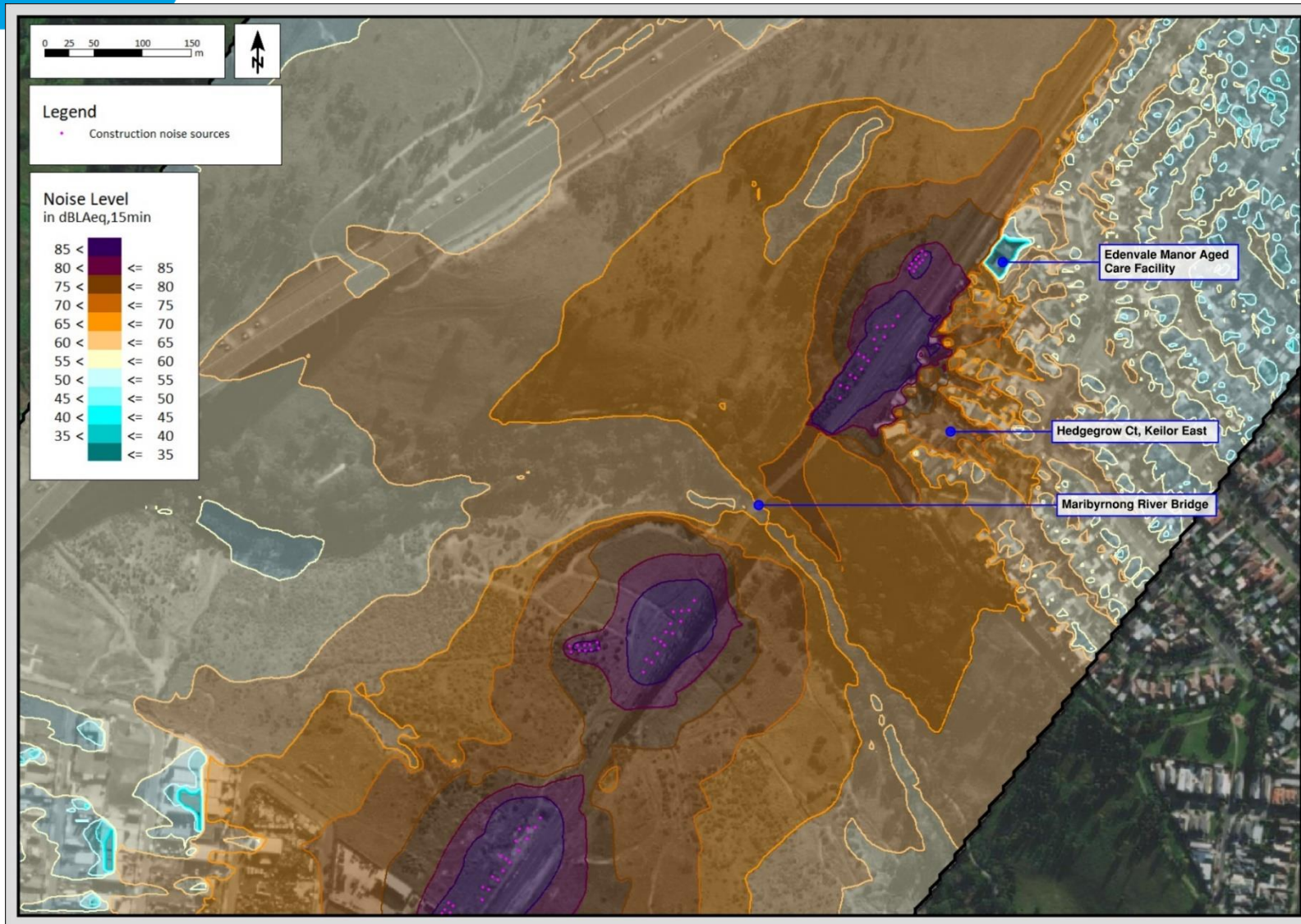


Figure A.18 Predicted construction noise levels for Scenario 15 - MAR Maribyrnong River Bridge piling and excavation works

A.5 With Temporary Noise Walls

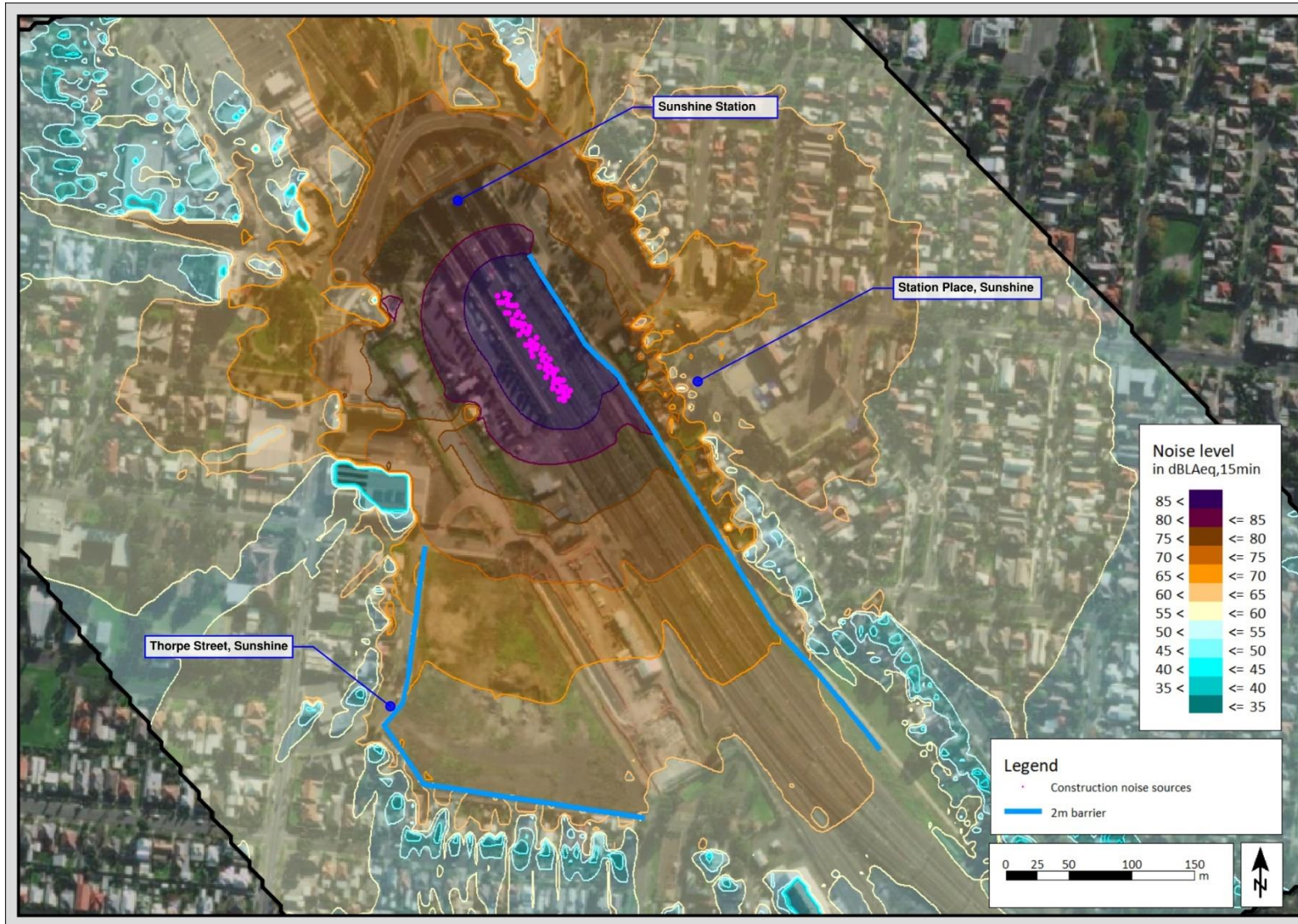


Figure A.19 Predicted Construction Noise levels for Scenario 1 - Sunshine to Albion platform piling works with 2 m high noise barriers

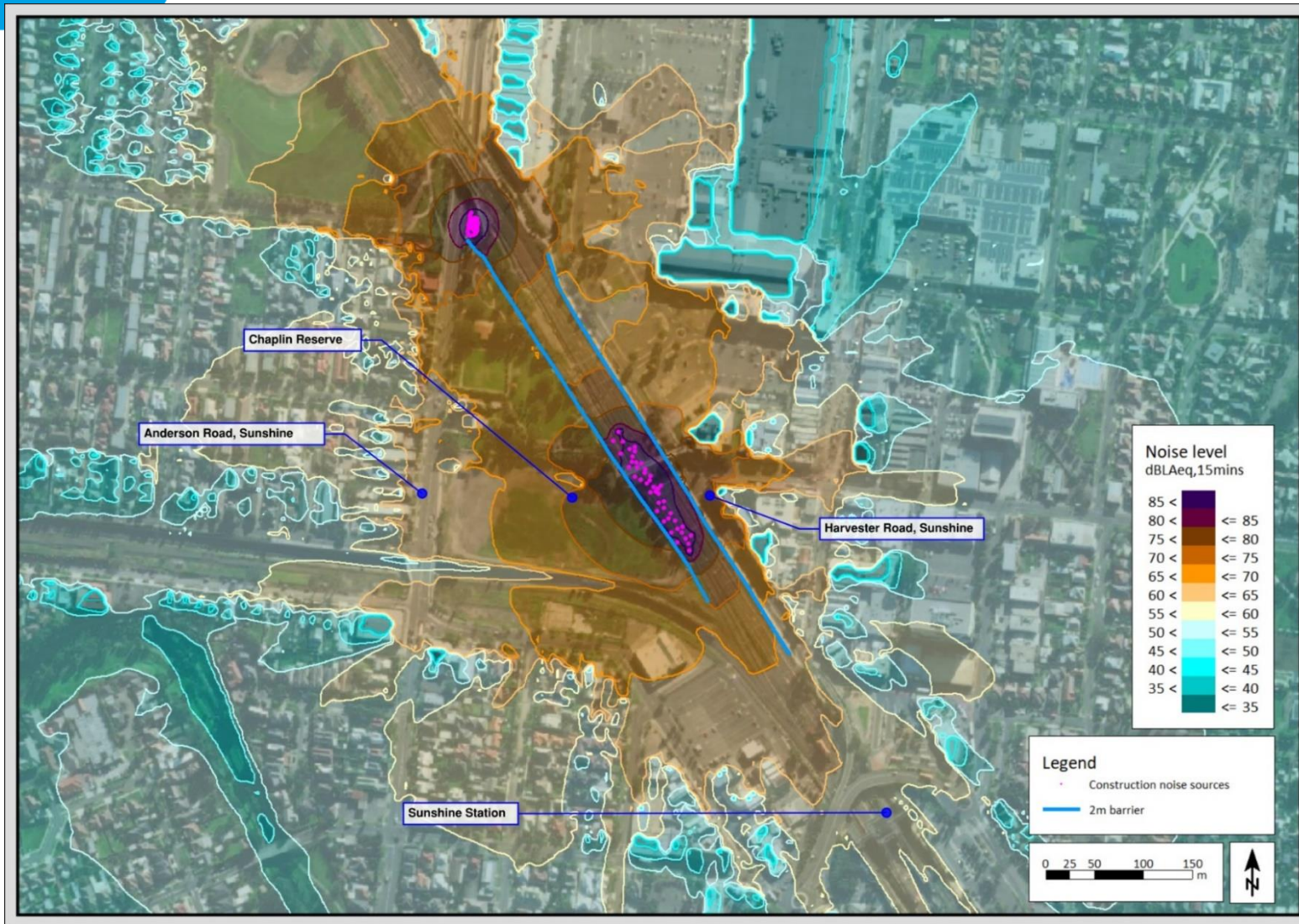


Figure A.20 Predicted Construction Noise levels for Scenario 2 - Chaplin Reserve to Anderson Rd CSR Construction works with 2 m high noise barriers

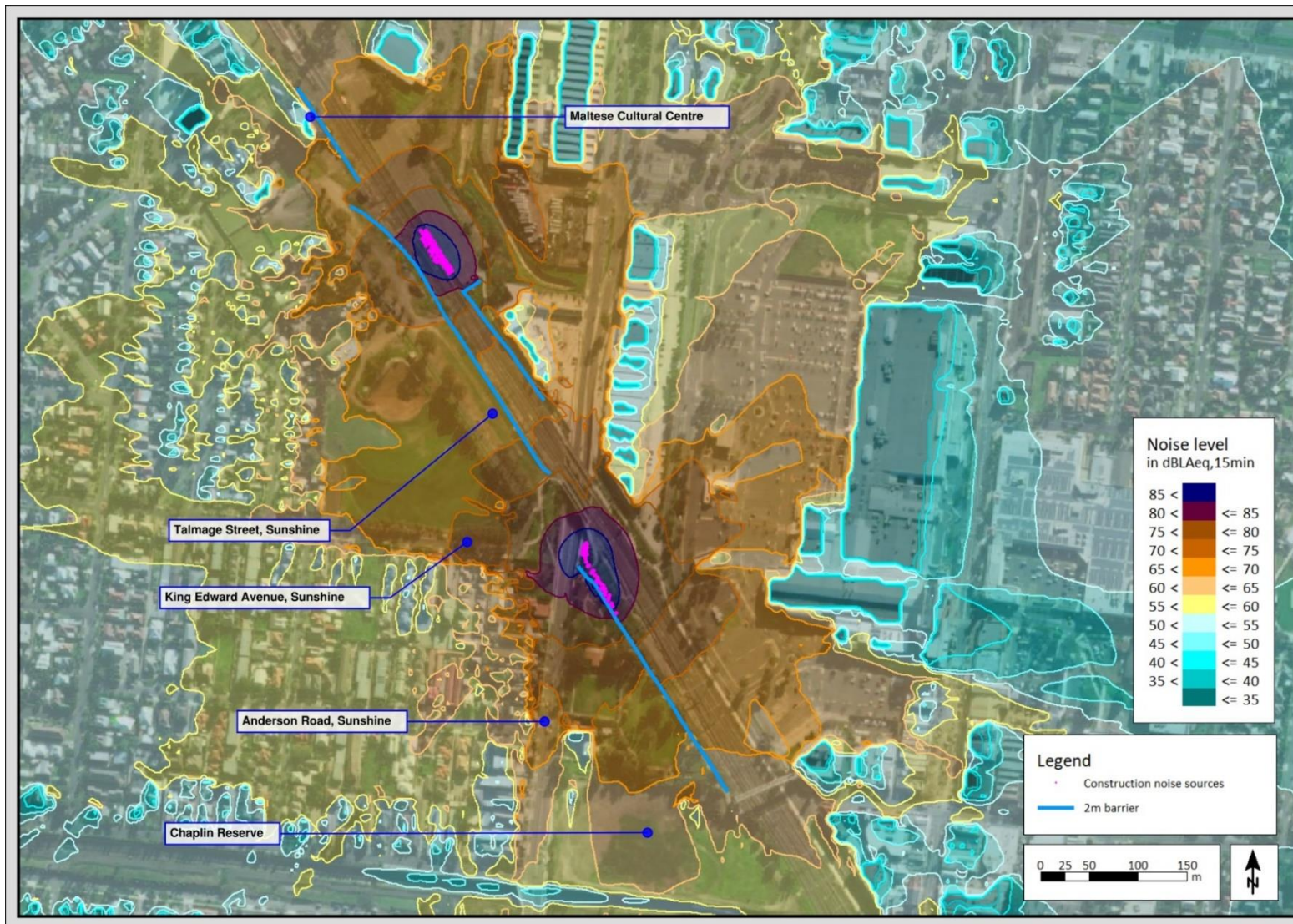


Figure A.21 Predicted Construction Noise levels for Scenario 3 - Anderson Road to Ballarat Road CSR trenching works with 2 m high noise barriers

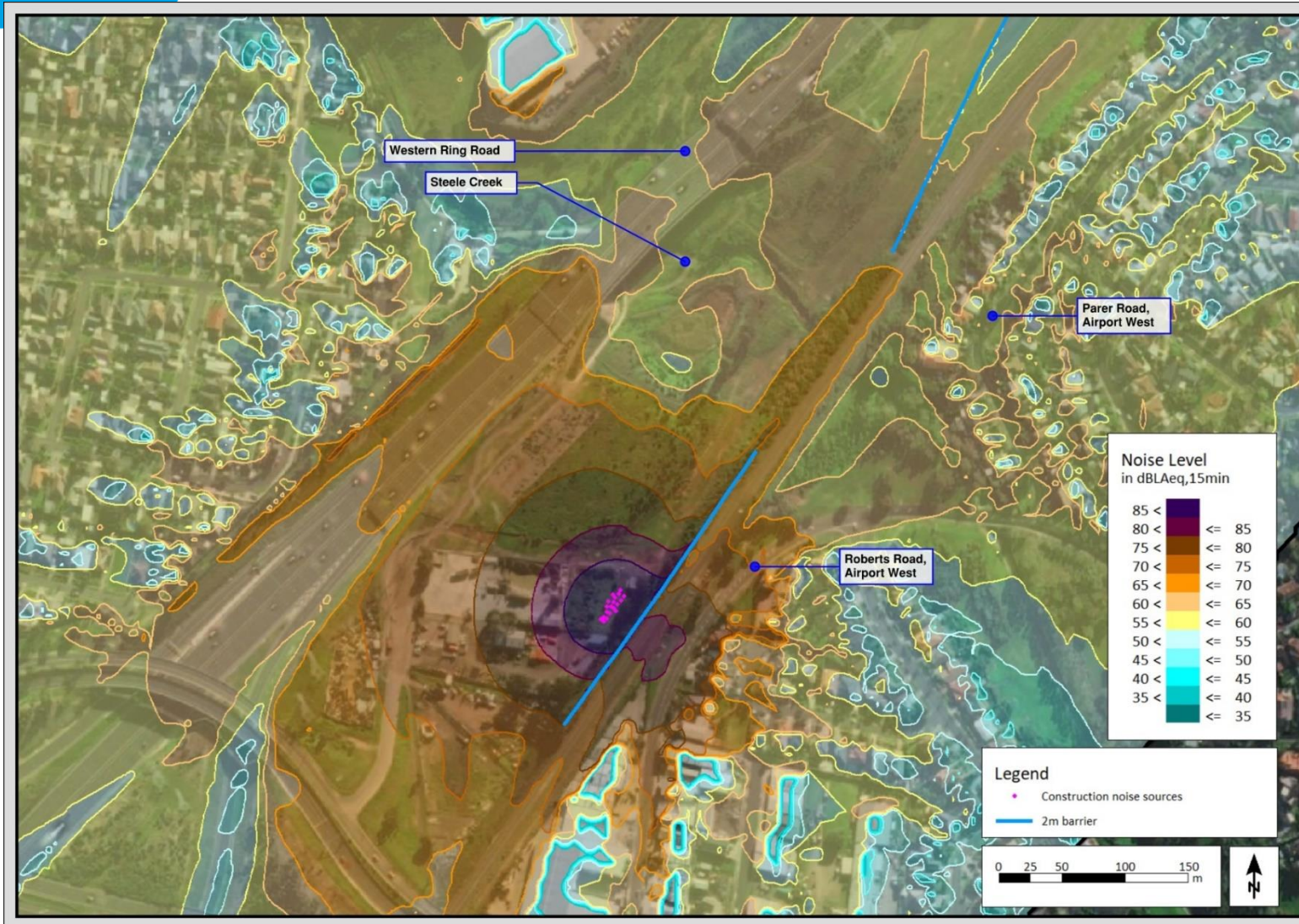


Figure A.22 Predicted construction noise levels for Scenario 6 - MAR viaduct substructure works along Airport West (south) with 2 m high noise barriers

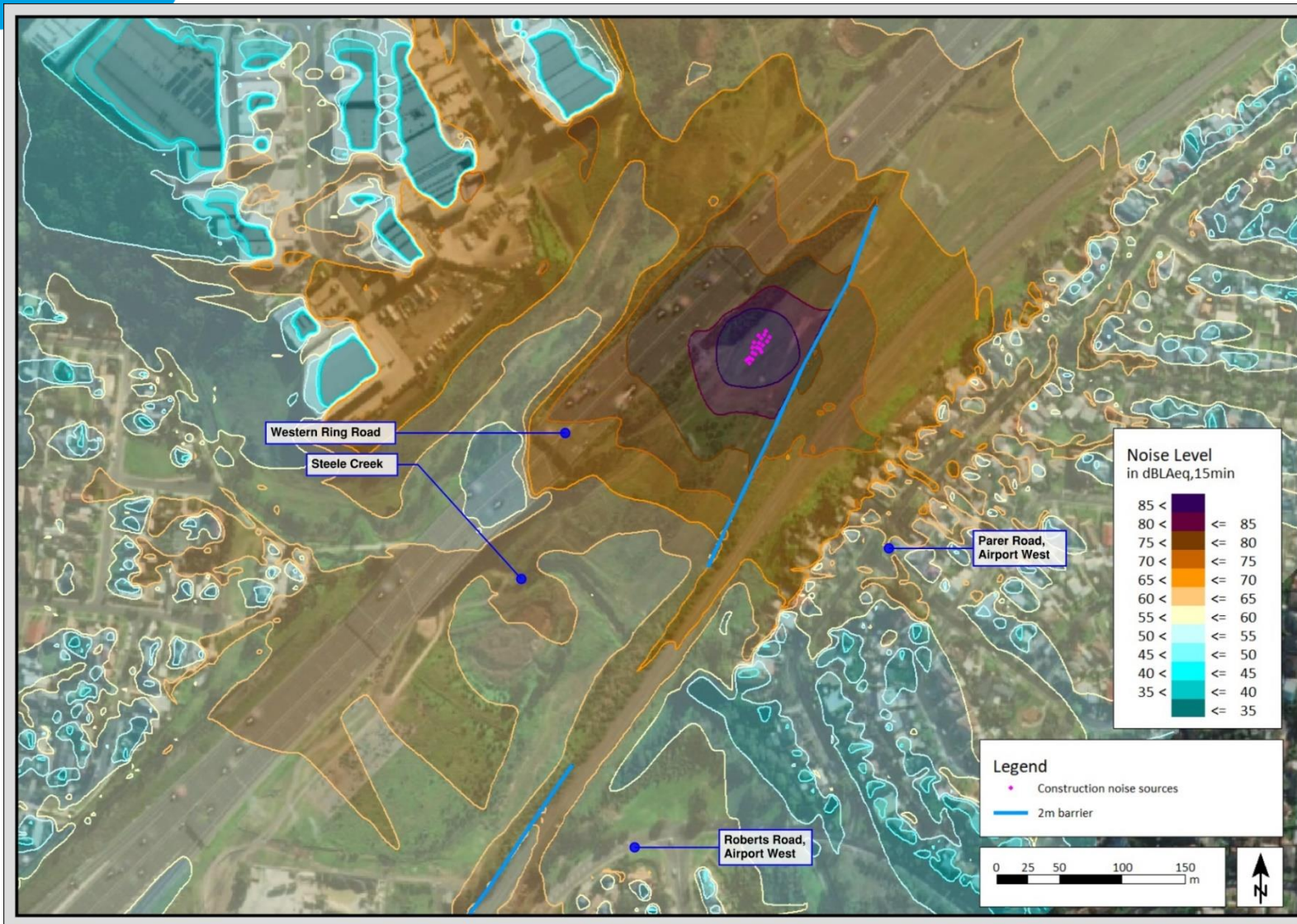


Figure A.23 Predicted construction noise levels for Scenario 6 - MAR viaduct substructure works along Airport West (north) with 2 m high noise barriers

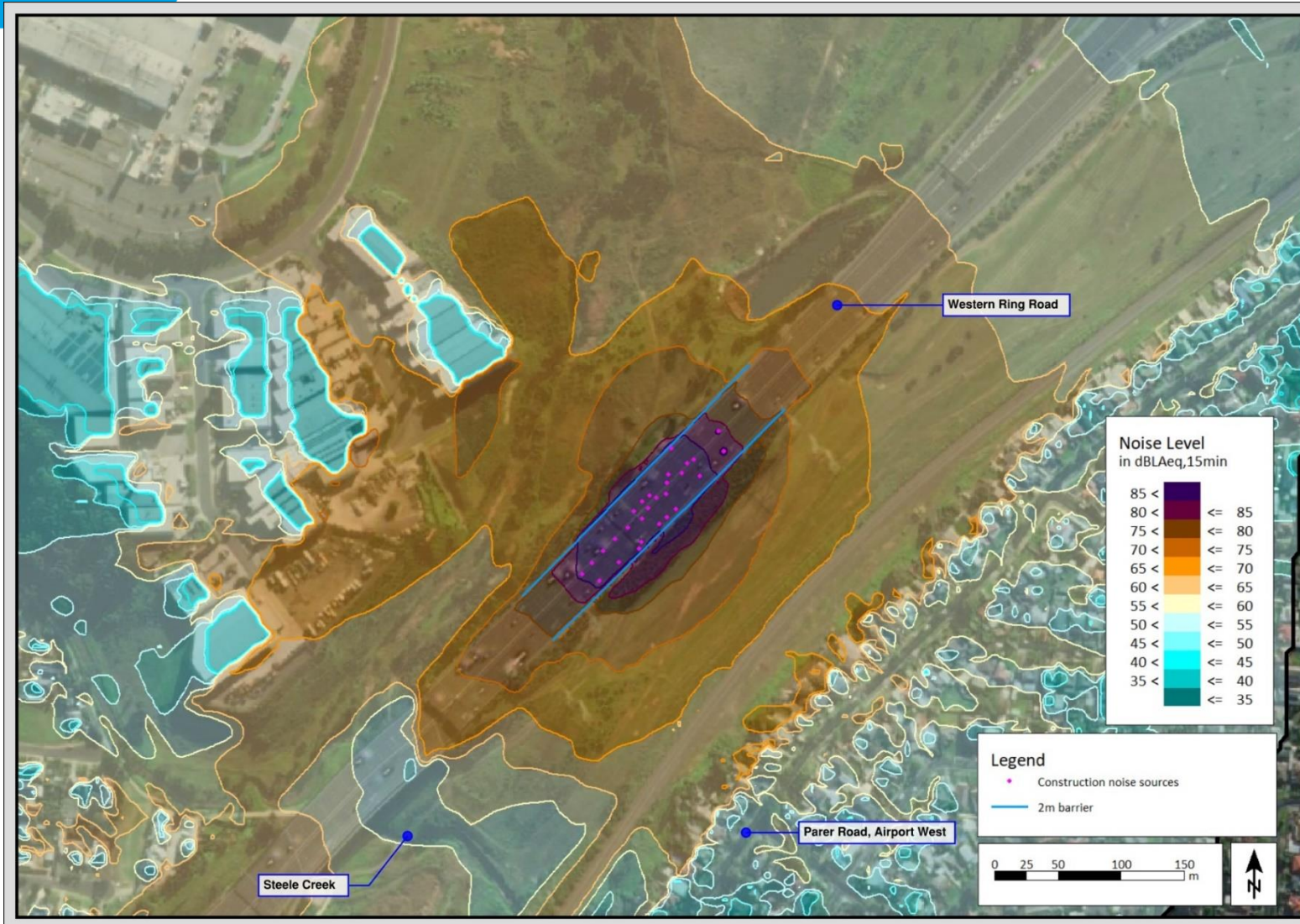


Figure A.24 Predicted construction noise levels for Scenario 7 - MAR viaduct substructure works along Western Ring Rd with 2 m high noise barriers

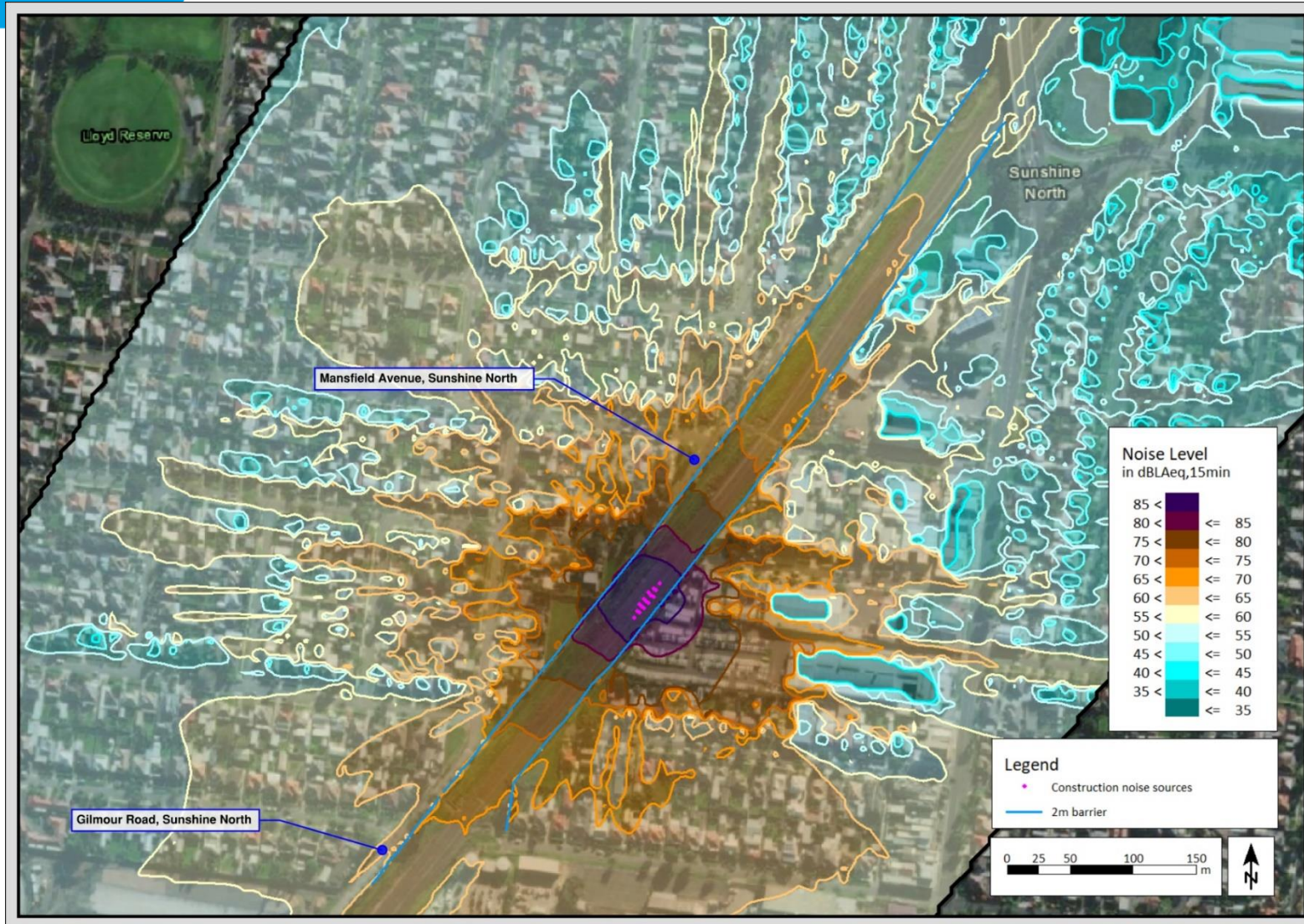


Figure A.25 Predicted construction noise levels for Scenario 9 – ACP CSR trenching works with 2 m high noise barriers (south)

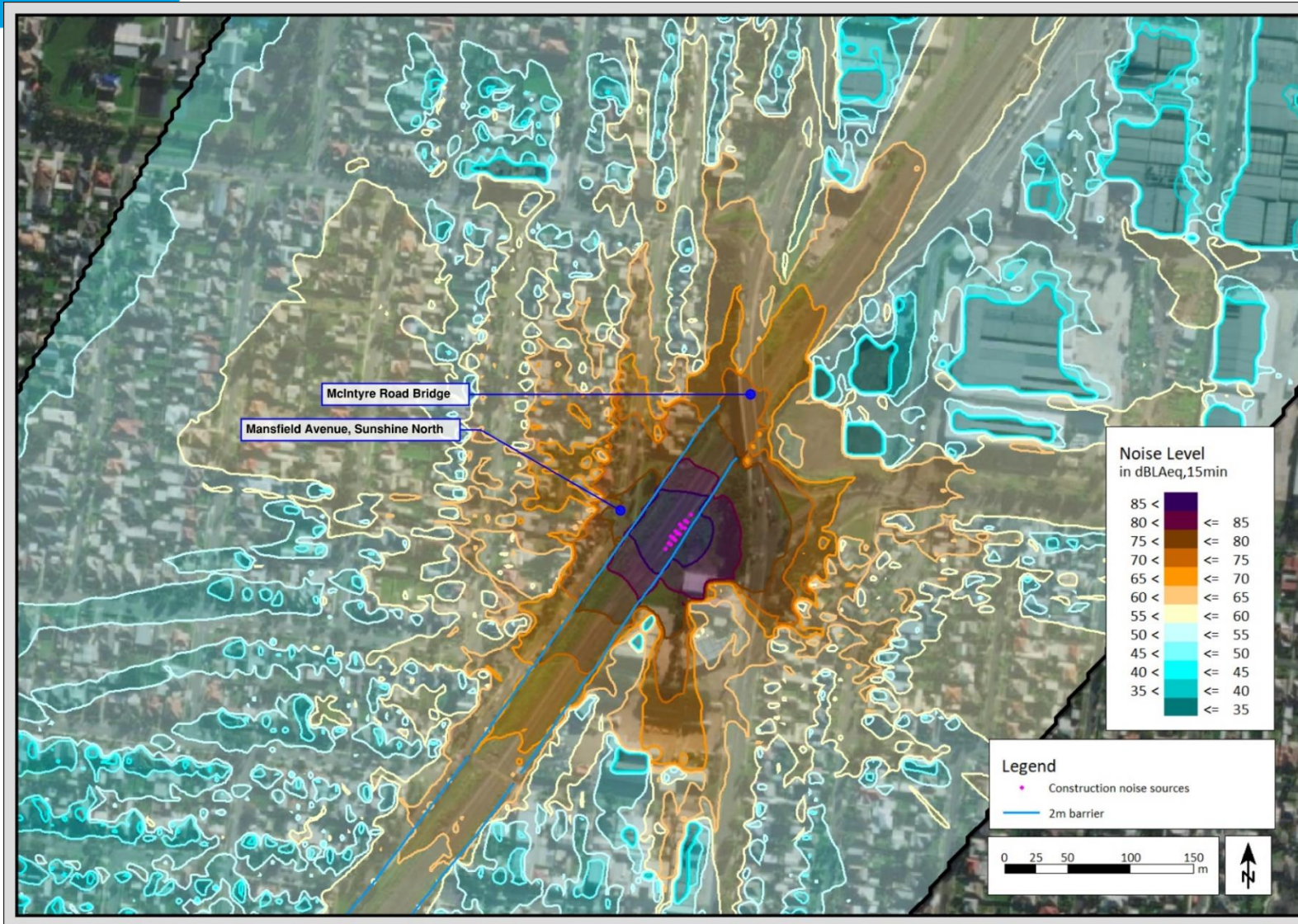


Figure A.26 Predicted construction noise levels for Scenario 9 – ACP CSR trenching works with 2 m high noise barriers (north)

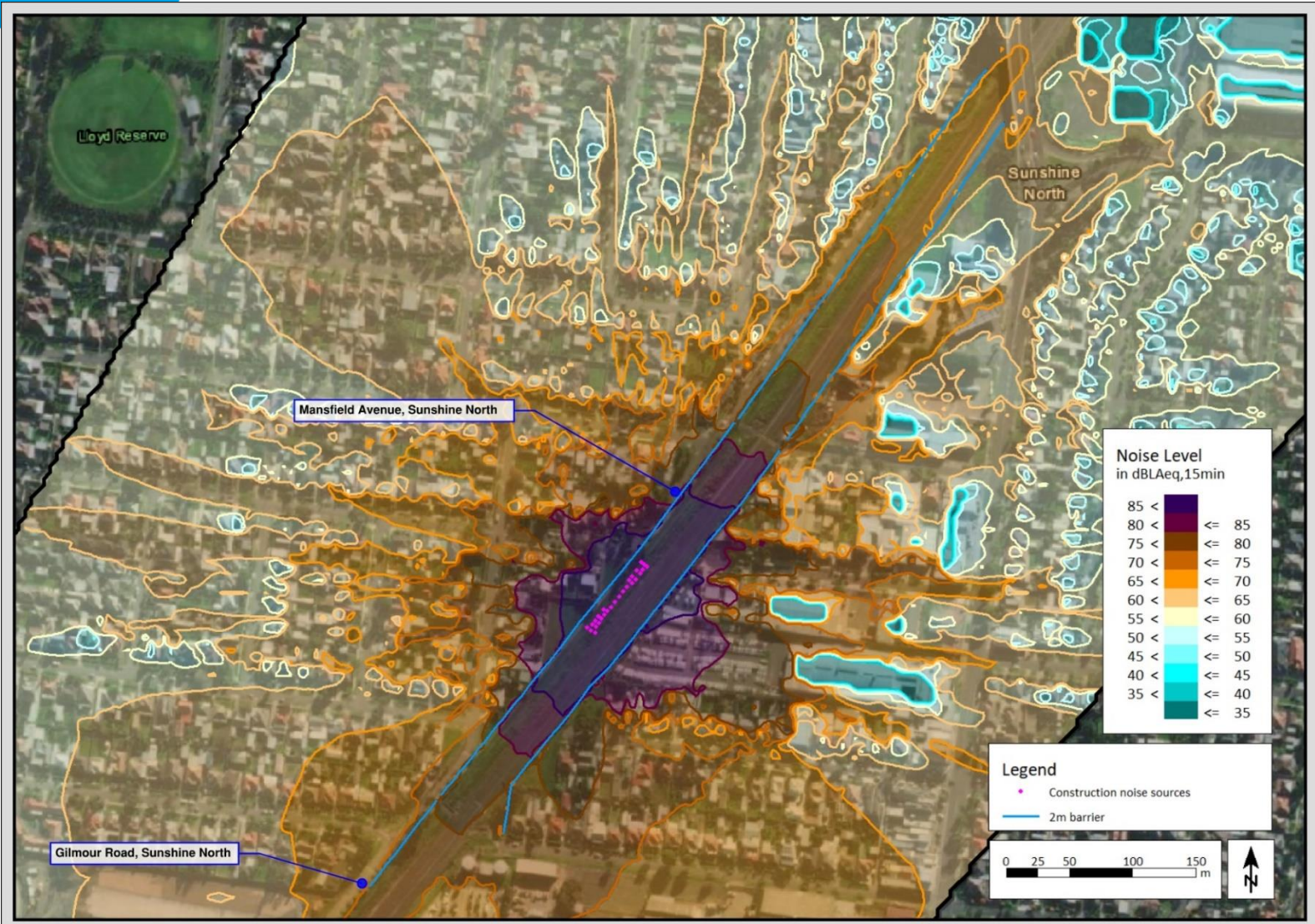


Figure A.27 Predicted construction noise levels for Scenario 10 – ACP Track formation works with 2 m high noise barriers (south)



Figure A.28 Predicted construction noise levels for Scenario 10 – ACP Track formation works with 2 m high noise barriers (north)

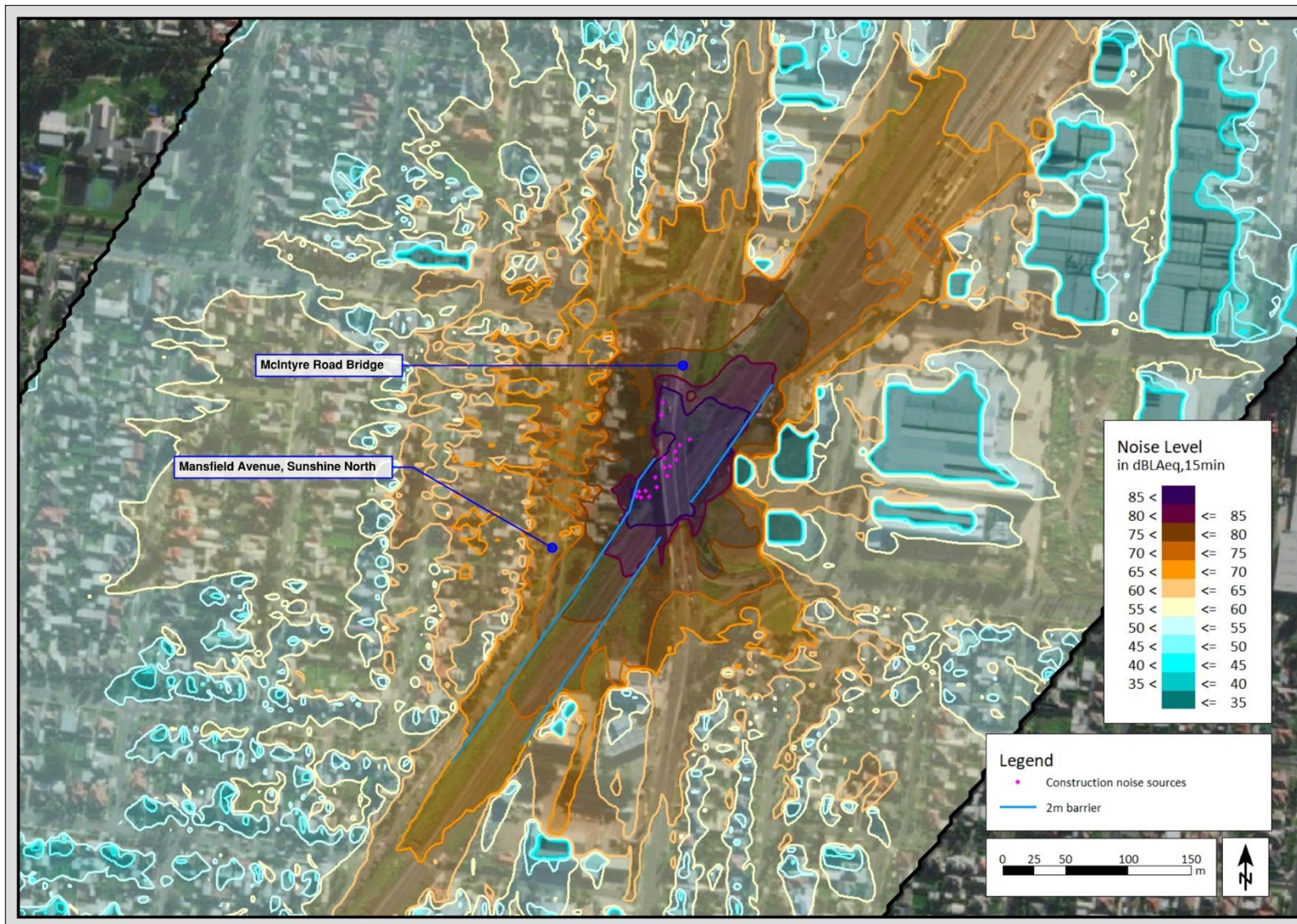


Figure A.29 Predicted construction noise levels for Scenario 11 - McIntyre Road Bridge works with 2 m high noise barriers

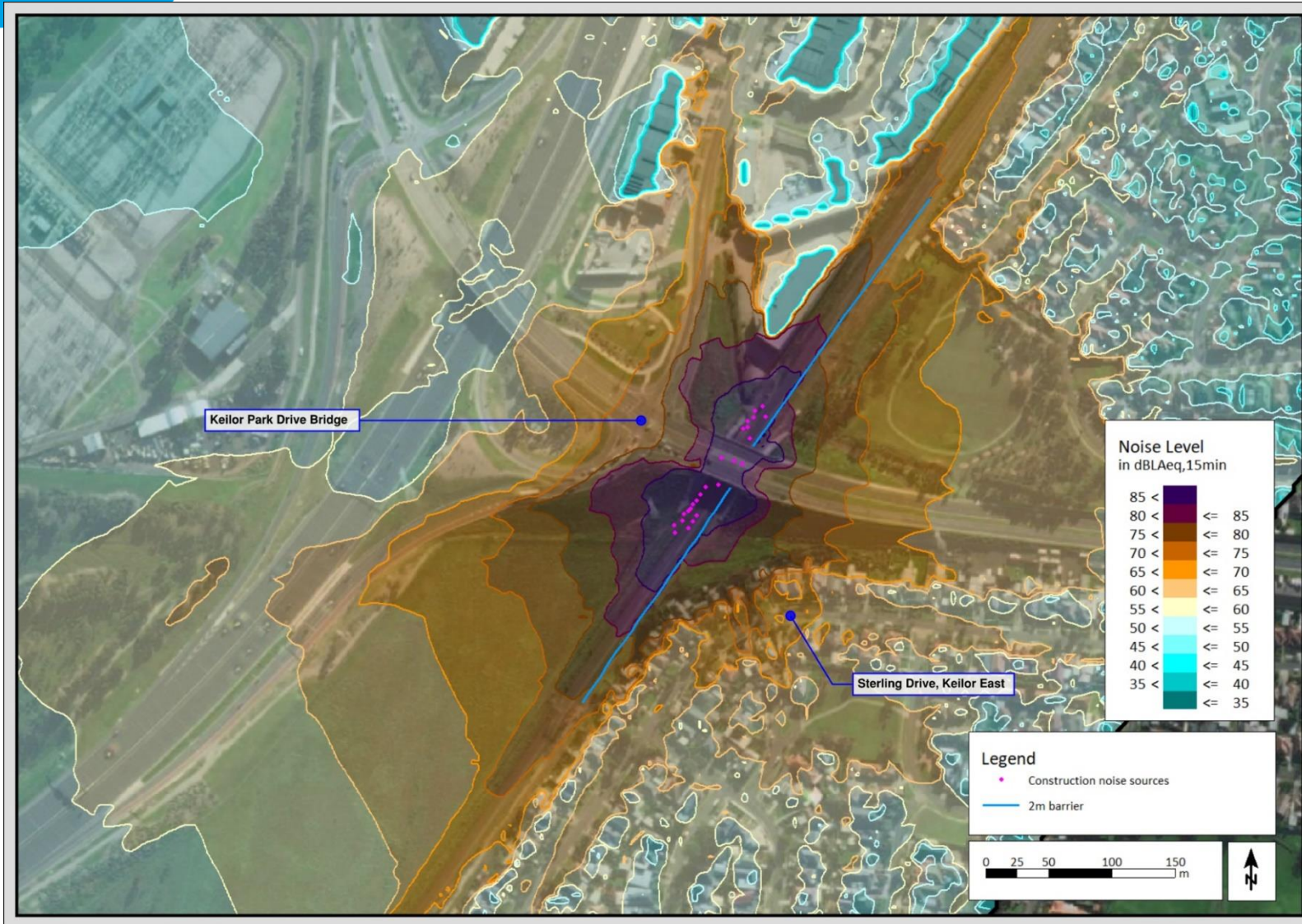


Figure A.30 Predicted construction noise levels for Scenario 12 - Keilor Park Dr bridge works with 2 m high noise barriers

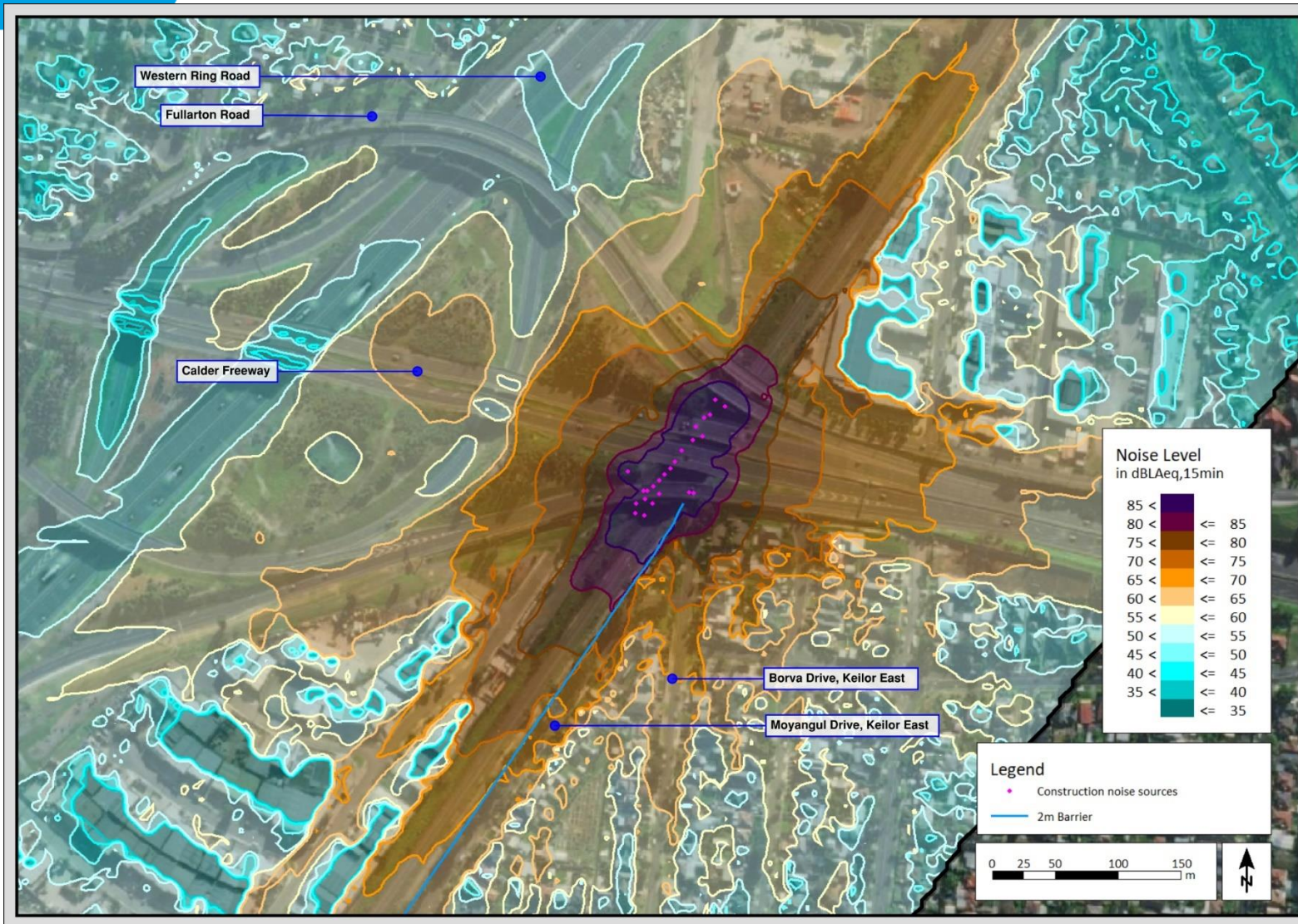


Figure A.31 Predicted construction noise levels for Scenario 13 - Calder Park Freeway bridge works with 2 m high noise barriers



Figure A.32 Predicted construction noise levels for Scenario 14 - MAR Maribyrnong River Bridge Tower Mobilisation with 2 m high noise barriers

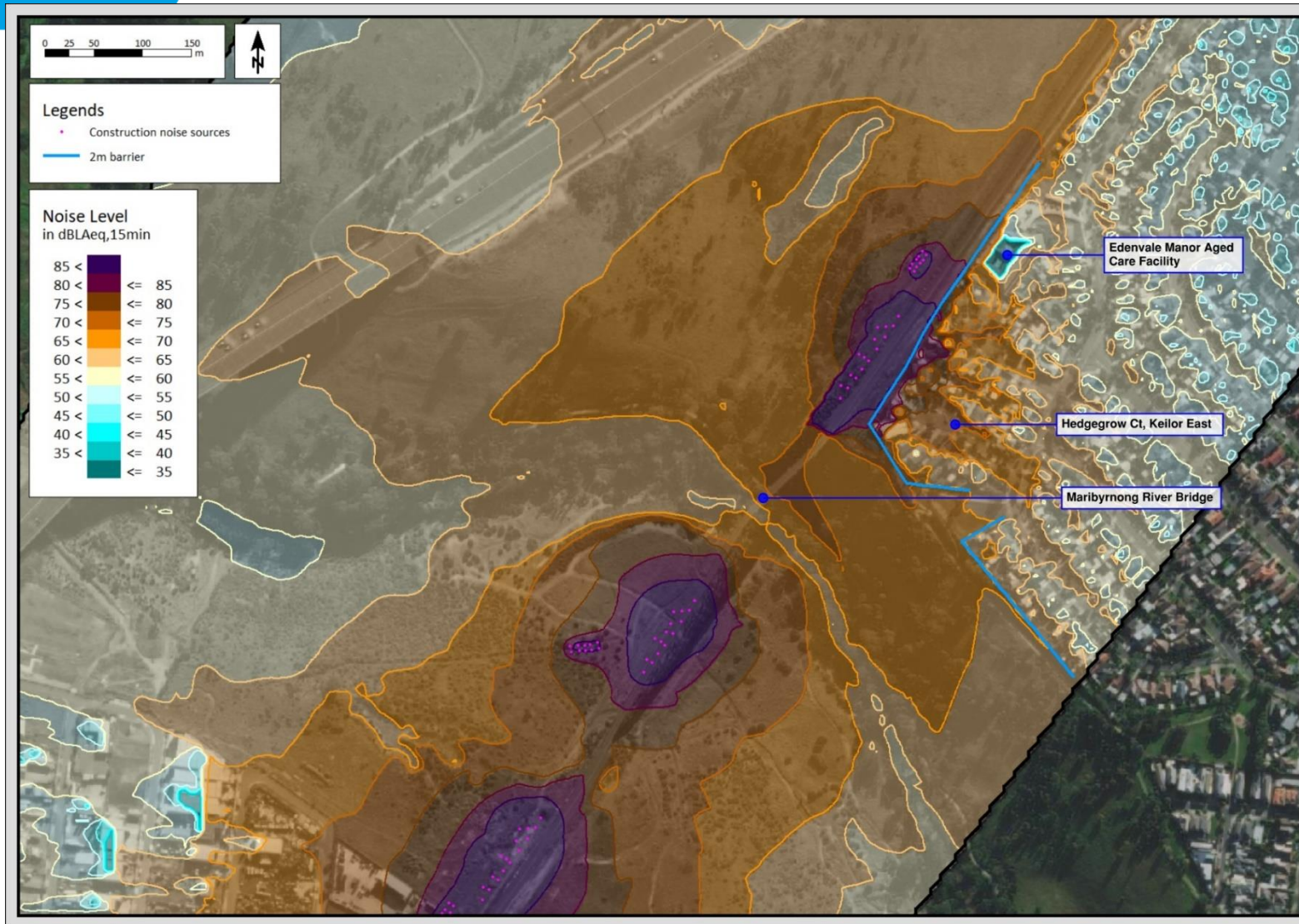


Figure A.33 Predicted construction noise levels for Scenario 15 - MAR Maribyrnong River Bridge piling and excavation works with 2 m high noise barrier