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APPENDIX G  
ARCHITECTURAL TREATMENT DETAILS

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**ATTENUATION REQUIREMENTS FOR EACH PROPERTY IDENTIFIED FOR ARCHITECTURAL TREATMENT AND NOTIONAL TREATMENT CATEGORY (IN REFERENCE TO THE DEFINITIONS SET OUT SECTION 9)**

Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category (Refer Section 9 of Report)
335	47 Kangaroo Trail Road, Corindi Beach NSW 2456	NW	63	50	Y	Y	Y	Y	13	3
		SW	63	50	Y	Y	Y	Y	13	3
		SE	61	50	Y	Y	N	Y	11	3
		N	54	50	Y	N	N	N	0	0
344	1 Kangaroo Trail Road, Corindi Beach NSW 2456	N	55	50	Y	N	Y	Y	5	1
		E	59	50	Y	N	Y	Y	9	2
		S	63	50	Y	Y	Y	Y	13	3
		W	63	50	Y	Y	Y	Y	13	3
351	31 Kangaroo Trail Road, Corindi Beach NSW 2456	N	58	50	Y	N	Y	Y	8	2
		E	55	50	Y	N	N	N	0	0
		S	61	50	Y	Y	Y	Y	11	3
		W	62	50	Y	Y	Y	Y	12	3
386	34 Kangaroo Trail Road, Corindi Beach NSW 2456	N	66	50	Y	Y	Y	Y	16	3
		E	67	50	Y	Y	Y	Y	17	3
		S	65	50	Y	Y	Y	Y	15	3
		W	57	50	Y	N	Y	Y	7	2

Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category Refer Section 9 of Report)
393	Lot5/DP828411 3507 Pacific Highway, Corindi Beach NSW 2456	N	54	50	Y	N	N	N	0	0
		NE	47	55	N	N	N	N	0	0
		S	54	50	Y	N	N	N	0	0
		W	55	50	Y	N	Y	Y	5	1
396	21 Post Office Lane, Corindi Beach NSW 2456	NE	49	50	N	N	N	N	0	0
		SE	58	50	Y	N	Y	Y	8	2
		SW	59	50	Y	N	Y	Y	9	2
		NW	56	50	Y	N	Y	Y	6	2
399	15 Post Office Lane, Corindi Beach NSW 2456	N	50	50	N	N	N	N	0	0
		E	54	50	Y	N	N	N	0	0
		S	56	50	Y	N	Y	Y	6	2
		W	55	50	Y	N	Y	Y	5	1
402	18 Post Office Lane, Corindi beach NSW 2456	NE	56	50	Y	N	Y	Y	6	2
		E	60	50	Y	Y	Y	Y	10	2
		SW	62	50	Y	Y	Y	Y	12	3
		NW	61	50	Y	Y	Y	Y	11	3
403	13 Post Office Lane, Corindi Beach NSW 2456	NE	50	50	N	N	N	N	0	0
		SE	53	50	Y	N	Y	Y	3	1
		SW	54	50	Y	N	Y	Y	4	1
		NW	53	50	Y	N	N	N	0	0

Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category Refer Section 9 of Report)
404	20 Post Office Lane, Corindi beach NSW 2456	NE	49	50	N	N	N	N	0	0
		SE	58	50	Y	N	Y	Y	8	2
		SW	59	50	Y	N	Y	Y	9	2
		NW	56	50	Y	N	Y	Y	6	2
415	8 Post Office Lane, Corindi Beach NSW 2456	NE	51	50	Y	N	N	N	0	0
		SE	50	50	N	N	N	N	0	0
		SW	54	50	Y	N	Y	Y	4	1
		NW	54	50	Y	N	N	N	0	0
419	10 Post Office Lane, Corindi Beach NSW 2456	N	51	50	Y	N	N	N	0	0
		E	49	55	N	N	N	N	0	0
		S	50	50	N	N	N	N	0	0
		SW	54	50	Y	N	Y	Y	4	1
431	Lot68/DP731384, 13 Alice Close, Dirty Creek NSW 2456	N	54	50	Y	N	Y	Y	4	1
		E	54	50	Y	N	Y	Y	4	1
		S	51	50	Y	N	Y	Y	1	1
		W	46	50	N	N	Y	N	0	0
432	11 Bottle Brush Drive, Corindi Beach NSW 2456	NE	45	55	N	N	Y	N	0	0
		SE	51	50	Y	N	N	N	0	0
		SW	51	50	Y	N	Y	Y	1	1
		NW	51	50	Y	N	N	N	0	0

Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category Refer Section 9 of Report)
434	3723 - 3731 Pacific Highway, Corindi Beach NSW 2456	N	51	50	Y	N	N	N	0	0
		E	51	50	Y	N	N	N	0	0
		S	54	50	Y	N	N	N	0	0
		W	53	50	Y	N	Y	Y	3	1
435	Lot 109 / DP752820 3875 Pacific Highway, Corindi Beach NSW 2456	N	54	50	Y	N	N	N	0	0
		E	47	50	N	N	N	N	0	0
		S	56	50	Y	N	Y	Y	6	2
		W	56	50	Y	N	Y	Y	6	2
439	17 Bonita Drive, Dirty Creek NSW 2456	NE	51	50	Y	N	Y	Y	1	1
		SE	49	50	N	N	Y	N	0	0
		SW	48	50	N	N	Y	N	0	0
		NW	51	50	Y	N	Y	Y	1	1
446	153 Kathleen Drive, Dirty Creek NSW 2456	NE	57	50	Y	N	Y	Y	7	2
		SE	54	50	Y	N	Y	Y	4	1
		SW	51	50	Y	N	Y	Y	1	1
		NW	57	50	Y	N	Y	Y	7	2
449	Lot 1001 Hawthorne Close, Corindi NSW 2456	N	44	50	N	N	N	N	0	0
		E	57	50	Y	N	Y	Y	7	2
		S	56	50	Y	N	Y	Y	6	2
		W	57	50	Y	N	Y	Y	7	2

Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category Refer Section 9 of Report)
453	27 Flinty Road, Dirty Creek NSW 2456	N	52	50	Y	N	N	N	0	0
		E	48	50	N	N	N	N	0	0
		S	53	50	Y	N	Y	Y	3	1
		W	57	50	Y	N	N	N	0	0
455	7 Dirty Creek Road, Dirty Creek NSW 2456	N	55	50	Y	N	N	N	0	0
		E	52	50	Y	N	N	N	0	0
		S	56	50	Y	N	Y	Y	6	2
		W	57	50	Y	N	N	N	0	0
476	1 Dundoo Reach, , Dirty Creek NSW 2456	N	57	55	Y	N	Y	Y	2	1
		E	57	55	Y	N	Y	Y	2	1
		S	54	55	N	N	Y	N	0	0
		W	54	55	N	N	Y	N	0	0
481	319 Dirty Creek Road, Dirty Creek NSW 2460	N	57	55	Y	N	N	N	0	0
		E	62	55	Y	Y	N	Y	7	2
		S	64	55	Y	Y	N	Y	9	2
		W	64	55	Y	Y	N	Y	9	2
495	4470 Pacific Highway, Halfway Creek NSW 2460	NE	65	55	Y	Y	N	Y	10	2
		SE	68	55	Y	Y	N	Y	13	3
		SW	71	55	Y	Y	N	Y	16	3
		NW	70	55	Y	Y	N	Y	15	3

Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category Refer Section 9 of Report)
502	4577 Pacific Highway, Halfway Creek NSW 2460	N	60	55	Y	Y	Y	Y	5	2
		E	59	55	Y	N	Y	Y	4	1
		S	54	55	N	N	Y	N	0	0
		W	59	55	Y	N	Y	Y	4	1
506	17 McPhillips Road, Halfway Creek NSW 2460	N	56	55	Y	N	N	N	0	0
		E	55	55	N	N	N	N	0	0
		S	60	55	Y	Y	N	Y	5	1
		W	60	55	Y	Y	N	Y	5	1
510	4612 Pacific Highway, Halfway Creek NSW 2460	NE	58	55	Y	N	N	N	0	0
		E	59	55	Y	N	Y	Y	4	1
		SW	61	55	Y	Y	Y	Y	6	2
		NW	58	55	Y	N	Y	Y	3	1
512	4614 Pacific Highway, Halfway Creek NSW 2460	N	59	55	Y	N	N	N	0	0
		E	59	55	Y	N	Y	Y	4	1
		S	63	55	Y	Y	N	Y	8	2
		W	63	55	Y	Y	N	Y	8	2
522	4650 Pacific Highway, Halfway Creek NSW 2460	N	62	55	Y	Y	N	Y	7	2
		E	63	55	Y	Y	N	Y	8	2
		S	66	55	Y	Y	N	Y	11	3
		W	65	55	Y	Y	N	Y	10	3

Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category Refer Section 9 of Report)
526	4644 Pacific Highway, Halfway Creek NSW 2460	N	57	55	Y	N	N	N	0	0
		SE	59	55	Y	N	N	N	0	0
		S	60	55	Y	Y	N	Y	5	1
		W	59	55	Y	N	N	N	0	0
529	4688 Pacific Highway, Halfway Creek NSW 2460	N	59	55	Y	N	N	N	0	0
		E	59	55	Y	N	N	N	0	0
		S	61	55	Y	Y	N	Y	6	2
		W	61	55	Y	Y	N	Y	6	2
533	56 Grays Road, Halfway Creek NSW 2460	NE	56	55	Y	N	N	N	0	0
		SE	60	55	Y	Y	N	Y	5	1
		SW	61	55	Y	Y	N	Y	6	2
		NW	60	55	Y	Y	N	Y	5	1
537	4616-4620 Pacific Highway, Halfway Creek NSW 2460	NE	56	55	Y	N	N	N	0	0
		SE	63	55	Y	Y	N	Y	8	2
		SW	64	55	Y	Y	N	Y	9	2
		NW	62	55	Y	Y	N	Y	7	2
564	19 Grays Road, Halfway Creek NSW 2460	N	59	55	Y	N	N	N	0	0
		E	60	55	Y	Y	Y	Y	5	1
		S	64	55	Y	Y	N	Y	9	2
		W	63	55	Y	Y	N	Y	8	2



Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category Refer Section 9 of Report)
575	4925 Pacific Highway, Halfway Creek NSW 2460	NE	63	55	Y	Y	N	Y	8	2
		SE	60	55	Y	Y	N	Y	5	2
		SW	57	55	Y	N	N	N	0	0
		NW	63	55	Y	Y	N	Y	8	2
581	4982 Pacific Highway, Halfway Creek NSW 2460	N	58	55	Y	N	N	N	0	0
		E	59	55	Y	N	N	N	0	0
		S	63	55	Y	Y	N	Y	8	2
		W	63	55	Y	Y	N	Y	8	2
582	9 Lemon Tree Road, Halfway Creek NSW 2460	NE	60	55	Y	Y	N	Y	5	2
		SE	65	55	Y	Y	N	Y	10	3
		SW	66	55	Y	Y	N	Y	11	3
		NW	62	55	Y	Y	N	Y	7	2
588	5062 Pacific Highway, Halfway Creek NSW 2460	NE	51	55	N	N	N	N	0	0
		SE	59	55	Y	N	N	N	0	0
		SW	60	55	Y	Y	N	Y	5	2
		NW	60	55	Y	N	N	N	0	0
597	5092 Pacific Highway, Halfway Creek NSW 2460	N	53	55	N	N	N	N	0	0
		SE	58	55	Y	N	N	N	0	0
		SW	60	55	Y	Y	N	Y	5	1
		NW	58	55	Y	N	N	N	0	0

Receiver	Address	Dwelling Façade	Predicted 2026 Night Time Façade Noise Levels (L <sub>Aeq,9Hr</sub> )	RNP Base Criterion (L <sub>Aeq,9Hr</sub> )	Base Criterion Exceeded?	Is Exceedance Acute?	Relative Increase > 2dB?	Mitigation Required?	Noise Reduction Requirements of Existing or Upgraded Facades (dB)	Treatment Category Refer Section 9 of Report)
616	Lot411 / DP883976 119 Pacific Highway Halfway Creek NSW 2460	NE	69	55	Y	Y	N	Y	14	3
		SE	67	55	Y	Y	N	Y	12	3
		SW	56	55	Y	N	N	N	0	0
		NW	66	55	Y	Y	N	Y	11	3
617	Lot411 / DP883976 24 Luthers Road, Halfway Creek NSW 2460	N	57	55	Y	N	N	N	0	0
		E	55	55	Y	N	Y	Y	0	1
		S	59	55	Y	N	Y	Y	4	1
		W	60	55	Y	Y	N	Y	5	1

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## APPENDIX H

AT-ROAD NOISE TREATMENT ANALYSIS FOR  
RECEIVERS 396, 399, 402, 403, 404, 415, 419

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## AT-ROAD NOISE MITIGATION MEASURES

'At-Road' noise mitigation has been considered for a group of residences located between chainage 5000 - 5250 (Receivers 396, 399, 402, 403, 404, 415 and 419). Consideration has been given to these receivers as they are relatively closely co-located and have been identified as requiring mitigation.

The predicted 2026 traffic noise levels show the greatest exceedances for these receivers would be expected to occur during the night-time period. The highest exceedance of 12 dB above the night-time criterion is predicted at Receiver 402, the closest receiver to the new road.

Table 1 summarises the predicted levels without the application of noise barrier, low noise pavement or architectural treatment options.

**Table 1: Predicted Night Time Traffic Noise Levels**

Receivers	Noise Exposure Range (dBA)	Highest Noise Level at any Dwelling (dBA)
396, 399, 402, 403, 404 415, 419	51 – 62	62

### Architectural Treatment Cost Analysis

The identified exceedances are within 10dB of the *RNP* target of 50dBA. It is estimated, based on the ENMM guidance (Practice Note IV(b)) that to mitigate exceedances of this order with architectural treatments may require a spend of up to \$15,000 for each receiver, totalling \$105,000 for the seven receivers.

### Noise Barrier Cost Analysis

The ENMM recommends that a minimum barrier length should be determined based on a subtended angle of 160° at the receiver, to provide adequate shielding in terms of horizontal view of the road. With consideration to this and the road design features, a barrier design has been considered between chainage 4450 and 5230 adjacent the outermost southbound lane.

Table 2 summarises various parameters required for assessing the feasibility of any proposed noise barrier (See ENMM for definitions).

**Table 2: Noise Benefits for Various Barrier Heights**

Barrier Height (m)	Road Traffic Noise Level (dBA)	Representative Barrier Insertion Loss (dB)	Total Noise Benefit	Marginal Benefit Value (x10)
0	58.1	0	0	
1.2	57.9	0.2	0.4	3.3
1.8	57.4	0.7	1.4	16.7
2.4	56.6	1.5	3	26.7

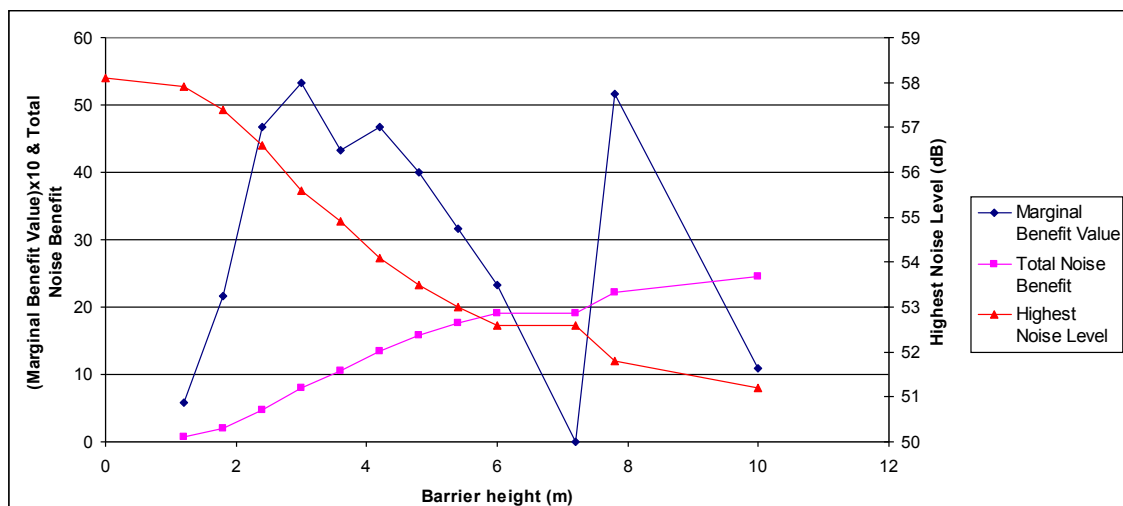
Barrier Height (m)	Road Traffic Noise Level (dBA)	Representative Barrier Insertion Loss (dB)	Total Noise Benefit	Marginal Benefit Value (x10)
3	55.6	2.5	5	33.3
3.6	54.9	3.2	6.4	23.3
4.2	54.1	4	8	26.7
4.8	53.5	4.6	9.2	20
5.4	53	5.1	10.2	16.7
6	52.6	5.5	11	13.3
7.2	52.6	5.5	11	0
7.8	51.8	6.3	12.6	26.7
10	51.2	6.9	13.8	5.5

The results indicate that the target noise level of 50 dBA would not be met at the most affected residence even if a 10 m high barrier was adopted.

The maximum barrier cost estimates for noise barriers are \$300 per square meter according to the ENMM. An “assessed barrier” option is the 4.2 m high barrier, as this would maximise the Total Noise Benefit per Unit Area and Marginal Benefit Value (as explained in ENMM Practice Note IV(c) and illustrated in Figure 1).

The “assessed barrier” option would be expected to achieve a Barrier Insertion Loss of approximately 4 dB, which is below the minimum value of 5dB for noise walls to be a viable option.

**Figure 1: Barrier Height Effectiveness**



The cost to construct a 4.2 m noise barrier from chainage 4450 to chainage 5230 on the basis of \$300 per square meter would be approximately \$980,000.

In addition, further low noise pavement or architectural treatments would still be required to reduce noise levels at Receivers 396, 399, 402 and 404 to acceptable levels. This is significantly greater than the \$105,000 expected when considering architectural treatment alone.

### Low Noise Pavement Cost Analysis

Implementing additional low noise pavement between chainage 4450 and 5230 would not be expected to reduce noise at the most affected residence to an acceptable level. Applying SMA type low noise pavement over chainage 4450 and 5230 would be expected to result in a reduction of less than 4 dB.

On a square meter basis, APBJV estimates the whole of life costs associated with low noise pavement (CRCP/with SMA) to be \$262.03/m<sup>2</sup>. Compared with standard pavement costs (PCP type at \$209.47/m<sup>2</sup>), this represents an incremental cost of \$52.56 per square meter.

An estimated area of 16,300 m<sup>2</sup> has been considered for the low noise pavement treatment (i.e. 815 m length section x 10 m width x 2 directions = 16,300 m<sup>2</sup>). Based on this area and the identified incremental square meter costs, it is estimated that the low noise pavement would result in an increased cost of approximately \$857,000.

In addition, further architectural treatments would still be required to reduce noise levels at Receivers 396, 399, 402 and 404 to acceptable levels. This is significantly greater than the \$105,000 expected when considering architectural treatment alone.

### Summary

In summary, the implementation of low noise pavement or noise barrier would still require further architectural treatments to reduce noise levels at Receivers 396, 399, 402 and 404 to acceptable levels. At a significantly greater cost, it is predicted that external noise levels may be reduced to acceptable levels at all receivers through the use of both low noise pavement and noise barrier. Accordingly, on the basis of the cost-effectiveness alone, the architectural treatment option would be preferred over the combination of low noise pavement and noise barrier or low noise pavement / noise barrier with architectural treatment.

Table 3 sets out the comparative noise benefits and costs for the three mitigation options.

**Table 3: Estimated Cost Comparison between Mitigation Treatments**

<b>Estimated Noise Reduction and Cost</b>	<b>Architectural Treatments</b>	<b>Barrier between Chainage 4450 to 5230</b>	<b>Low Noise Pavement between Chainage 4450 to 5230</b>
Noise Reduction	0 dB External	Up to 4 dB External	Up to 3.6 dB External
	Compliant Internal	Up to 4 dB Internal	Up to 3.6 dB Internal
Estimated Cost	\$105,000	\$980,000	\$857,000



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