Pre-Construction Road Dilapidation Report for Dapto NSW 2530

Prepared for Geosurv Locating Pty Ltd

JN

N0231235.01A

Revision History

REVISION	DATE	BY	CHECKED	COMMENTS
A	17/11/2023	JT	SMcM	Draft
B	06/12/2023	JT	SMcM	Initial Issue

The recipient of the latest issue as noted above will be responsible for superseding/destroying all previous documents.

Contents

1. Terms of Reference

JN has been engaged by Geosurv Locating Pty Ltd to undertake a pre-construction road dilapidation report for 16 existing roads in Dapto 2530. Acting in accordance with instructions received from Jordan Palleson at Geosurv Locating Pty Ltd, a visual inspection to record the structural condition of multiple roads in Dapto.

Road pavements included for Dilapidation Report:

- Bong Bong Road
- Cleveland Road
- Bridgewater Drive
- Hamilton St
- Ashton Vale Grove
- Galway Ct
- Riverpark Way
- Fairwater Drive
- Benares Ct
- Lucas Drive
- Boddington Way
- Selwyn Grove
- Wholahan Ave
- Stockyard Cres
- Kanahooka Road
- Darkes Road

The inspection was conducted on October 19th to 21st, 2023 by representatives from Rapid Map Services Pty Ltd. Another inspection was then carried out by Janice Tang, Engineer of Jones Nicholson Pty Ltd and took place on November 29th 2023, confirming major defects' locations onsite based on the details provided Rapid Map Services Pty Ltd. The Confirmation inspection areas include parts of Bong Bong Road, Fairwater Drive, most of the Cleveland Road and Hamilton Street. Refer to Figures 1&2 below for extent of inspected roads.

The inspections and the following report are limited to the roads mentioned above. The report does not detail:

- Faults to inaccessible parts of the road,
- Faults concealed behind road/footpath surfaces,
- Non-structural elements,
- Any testing,
- Geotechnical or subsurface investigations,
- Faults not apparent on a visual inspection,
- Faults apparent only in different environmental or weather conditions,
- Latent faults not apparent at the time of inspection,
- Pest inspection report.

2. Introduction

The inspection was carried out by a representative from Rapid Map Services Pty Ltd which is a subconsultant engaged by Jones Nicholson for providing services with a vehicle mounted mobile mapping system comprising a Ladybug 360° camera and 4 high solution Grasshopper cameras, and coupling with an RTK GNSS(GPS) as well as an Applanix inertial system was used capturing geo-referenced imagery every 2m along all the nominated roads, to record and map the assets along the roads in 3D, it took place on October 19th to 21st, 2023.

An inspection was then carried out by Janice Tang, Engineer of Jones Nicholson Pty Ltd, to confirm major defects captured in the videos and report provided by Rapid Map Services Pty Ltd, it took place on November 29th, 2023.

The intention of this report is to assess the current condition of nominated roads in Dapto and provide reasonable and accurate findings as to its current condition. The survey extent can be seen on the plans in Section 4. The written survey included in Section 5 shows details of the cracks found, including the crack position, length and any further comments. Section 6 contains photos for most of these recorded defects.

3. Investigation

The road surfaces were mostly of asphalt construction and were found to be in a generally dilapidated condition with the severity of degradation carrying throughout the length of the roads. Multiple instances of Potholes, cracking, patching and delamination were found as well as some long, meandering cracks. There were also some instances of depressions and seepage in at different points in the roads.

Kerb and gutters, where provided, are of a concrete construction with regular cracks of varying widths throughout.

Signage was found to be in a generally dilapidated condition for some of the roads.

4. Layout

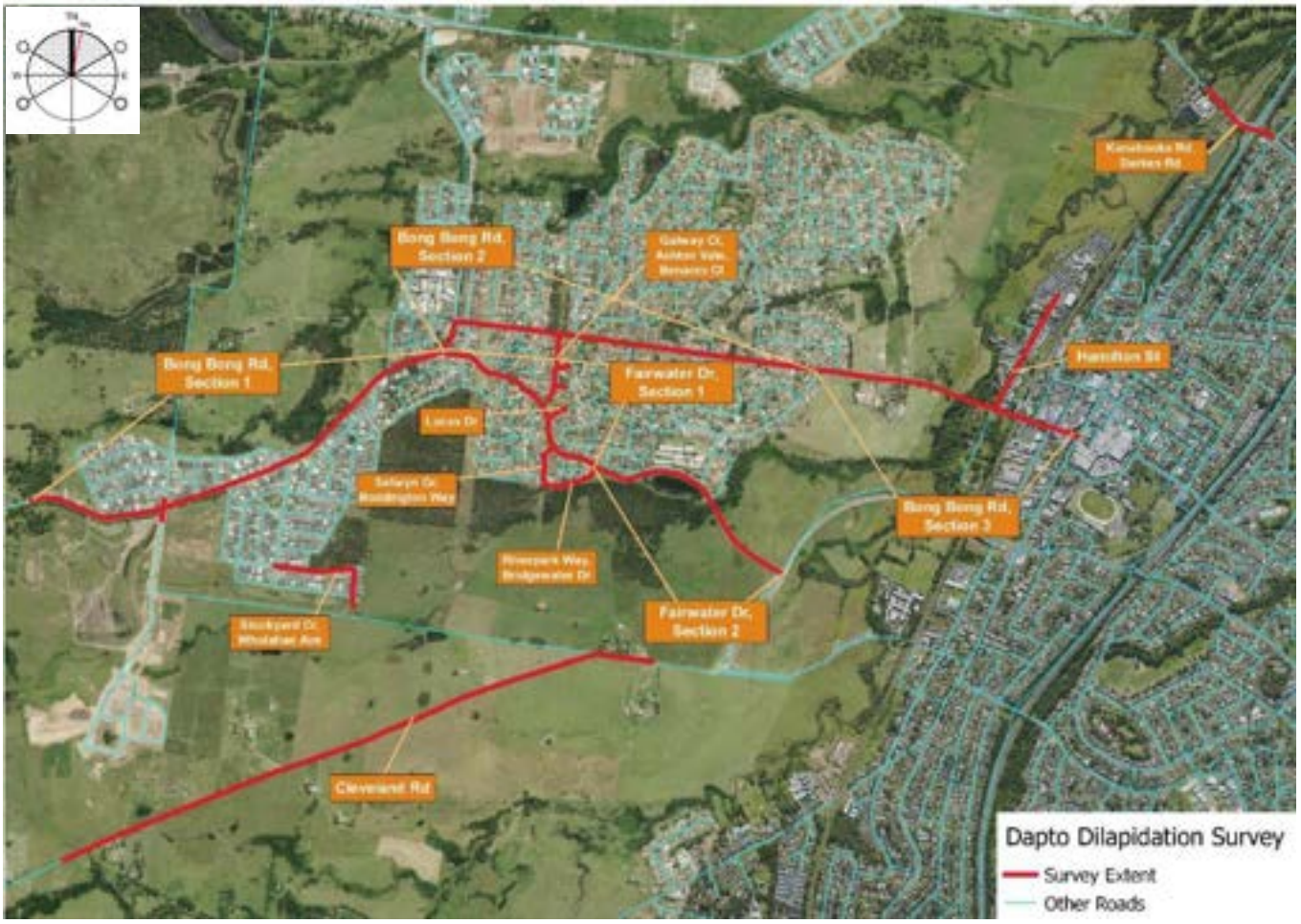


Figure 1: Survey extent from Rapid Map Services Pty Ltd

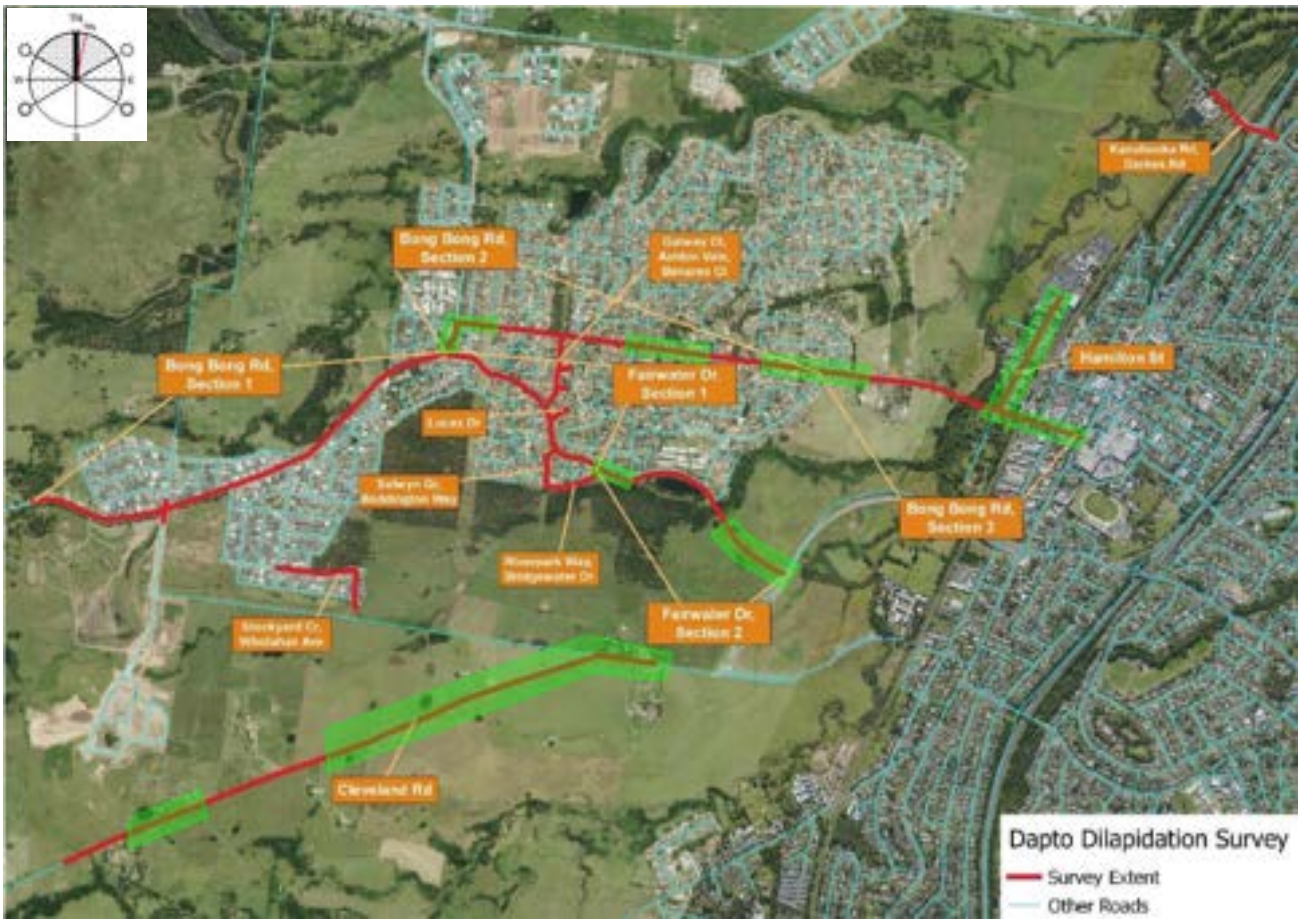


Figure 2: Inspection extent carried out by JN's representative (Green shows the inspected areas)

Figure 3: Defects markup plan (Legend 1 = Number/Location of Defects, Green shows approximate location of defects from Rapid Map Services Pty Ltd)

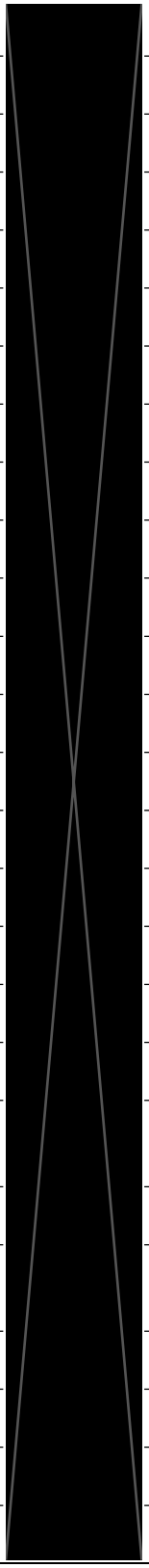
5. Descriptive Record

FW= Full Width, V= Various, H= Hairline

DEFECT/PHOTO NO.	LOCATION	LENGTH (mm)	WIDTH (max, mm)	COMMENTS
1	[redacted]	V	10 -15	Crocodile Cracks in Asphalt Concrete (AC) road surface
2		V	10 -15	Crocodile Cracks in AC road surface and evidence of guard rail damage
3		V	10 -15	Crocodile Cracks near previously repaired section of AC road surface
4		V	10 -15	Crocodile Cracks near patching
5		V	10 -15	Extensive crocodile cracks throughout AC road surface and kerb & gutter
6		V	10 -15	Extensive crocodile cracks throughout AC road surface
7		V	10 -15	Crocodile Cracks near previously repaired section of AC road surface
8		V	10 -15	Crocodile Cracks near patching
9		V	10 -15	Extensive crocodile cracks throughout AC road surface, evidence of kerb damage and ponding
10		3000	1500	Pothole
11		V	10 -15	Various cracks near intersection of unsealed road and AC road
12		V	V	Various potholes in unsealed road
13		V	V	Various potholes in unsealed road
14		V	10 -15	Various cracks in AC road surface
15		V	10 -15	Various cracks in AC road surface
16		V	V	Various Potholes
17		V	V	Extensive crocodile cracks throughout AC road surface and evidence of kerb damage
18		V	10 -15	Crocodile Cracks in AC road surface
19		V	5 -10	Crocodile Cracks near previously repaired section of AC road surface
20		V	5 -15	Extensive crocodile cracks throughout AC road surface
21		2000	1500	Pothole
22		V	10 -15	Various cracks near patching
23		V	10 -15	Linear and transverse cracks throughout AC road surface
24		V	10 -15	Various cracks in AC road surface
25		V	10 -15	Various cracks in AC road surface
26		V	V	Extensive crocodile cracks throughout AC road surface and evidence of patching

DEFECT/PHOTO NO.	LOCATION	LENGTH (mm)	WIDTH (max, mm)	COMMENTS
27	[redacted]	V	10 -15	Extensive cracks throughout AC road surface parking lane
28		V	10 -15	Extensive crocodile cracks near delamination of AC road surface
29		V	10 -15	Various cracks in AC road surface parking lane
30		V	5 -10	Various cracks in AC road surface
31		V	5 -10	Extensive crocodile cracks throughout AC road surface parking lane
32		V	10 -15	Various cracks and evidence of delamination in AC road surface
33		V	10 -15	Linear and transverse cracks in AC road surface
34		6000	10 -15	Transverse crack in AC road surface
35		2500	10 -15	Transverse crack in AC road surface
36		3000	10 -15	Transverse crack in AC road surface
37		5000	10 -15	Linear crack in AC road surface and evidence of ponding/seepage
38		V	10 -15	Various cracks in AC road surface
39		V	5 -10	Crocodile cracks in AC road surface
40		V	5 -15	Crocodile cracks in AC road surface
41		V	10 -15	Crocodile cracks in AC road surface and evidence of delamination
42		V	5 -10	Extensive crocodile cracks throughout AC road surface
43		V	5 -10	Various cracks in AC road surface
44		V	10 -15	Various cracks in AC road surface along previous repaired length against gutter
45		V	5 -10	Crocodile cracks in AC road surface and ponding along edge of pavement
46		V	5 -10	Crocodile cracks and evidence of delamination in AC road surface
47		6000	10 -15	Linear crack in AC road surface
48		V	10 -15	Various transverse cracks in AC road surface
49		6000	5 -15	Various transverse cracks in AC road surface
50		6000	10 -15	Linear crack in AC road surface
51		V	10 -15	Various cracks in AC road surface
52		V	10 - 20	Various cracks in AC road surface
53		V	10 -15	Various cracks in AC road surface
54		V	10 -15	Linear cracks and crocodile cracks in AC road surface
55		V	5 -10	Various cracks in AC road surface
56		V	5 -10	Various cracks in AC road surface

DEFECT/PHOTO NO.	LOCATION	LENGTH (mm)	WIDTH (max, mm)	COMMENTS
57		V	5 -15	Various cracks in AC road surface
58		V	10 -15	Extensive crocodile cracks throughout AC road surface
59		V	10 -15	Extensive crocodile cracks throughout AC road surface
60		V	10 -15	Extensive crocodile cracks throughout AC road surface
61		-	-	Raveling in AC road surface
62		1500	1500	Pothole and crocodile cracks throughout AC road surface
63		V	10 -15	Extensive crocodile cracks throughout AC road surface
64		V	10 -15	Extensive crocodile cracks throughout AC road surface
65		3000	5 -15	Transverse cracks in AC road surface
66		V	5 -15	Various extensive cracks in AC road surface
67		V	5 -10	Various cracks in AC road surface
68		300	150	Delamination with crocodile crack in AC road surface
69		150	100	Pothole with crocodile crack in AC road surface
70		V	150	Various cracks near patching and evidence of raveling
71		V	10 -15	Extensive crocodile cracks throughout AC road surface and near patching
72		V	V	Various potholes with crocodile crack in AC road surface
73		V	5 -15	Extensive crocodile cracks throughout AC road surface and near patching
74		V	5 -15	Extensive crocodile cracks throughout AC road surface and near patching
75		V	5 -15	Extensive crocodile cracks throughout AC road surface and near previously repaired section of AC road surface
76		V	5 -20	Extensive crocodile cracks throughout AC road surface and near patching
77		200	150	Delamination with small pothole in AC road surface
78		-	-	Evidence of weathering
79		200	150	Delamination of AC road surface
80		800	5 -15	Various cracks in AC road surface adjacent previous repairs
81		1000	5 -10	Meandering cracks in AC road surface
82		100	80	Small Pothole
83		5000	5 -10	Linear crack in AC road surface
84		7000	5 -15	Extensive block cracking in AC road surface
85		V	5 -15	Various extensive cracks in AC road surface
86		V	5 -10	Various extensive cracks in AC road surface

DEFECT/PHOTO NO.	LOCATION	LENGTH (mm)	WIDTH (max, mm)	COMMENTS
87		V	5 -10	Crocodile cracks in AC road surface
88		200	150	Delamination of AC road surface
89		V	5 -10	Various cracks near previously repaired section of AC road surface
90		2500	5 -10	Transverse crack in AC road surface
91		V	5 -15	Various cracks in AC road surface and ponding along edge of pavement
92		V	5 -15	Various cracks in AC road surface and ponding along edge of pavement
93		V	80	Various cracks and delamination near patching
94		V	10 -20	Meandering cracks in AC road surface
95		V	5 -10	Crocodile cracks in AC road surface
96		300	200	Delamination and pothole with crocodile crack in AC road surface
97		2000	150	Delamination with edge crack in AC road surface
98		300	200	Delamination and pothole with crocodile crack in AC road surface
99		250	100	Pothole
100		250	100	Pothole/delamination in AC road surface
101		3000	5 -10	Linear crack in AC road surface
102		-	-	Evidence of ponding and patching
103		V	5 -10	Crocodile cracks in AC road surface and evidence of delamination
104		250	300	Delamination in AC road surface
105		300	150	Delamination with crocodile crack in AC road surface
106		150	100	Pothole with crocodile crack in AC road surface and evidence of patching
107		2000	150	Delamination in AC road surface
108		V	5 -10	Various cracks and evidence of patching and delamination in AC road surface
109		V	5 -15	Various cracks in AC road surface and previous patchwork
110		1000	100	Delamination and evidence of patching in AC road surface
111		V	5 -15	Various cracks and evidence of patching in AC road surface
112		V	5 -15	Various cracks and evidence of patching in AC road surface

6. Photographs

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

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Photo 14

Photo 15

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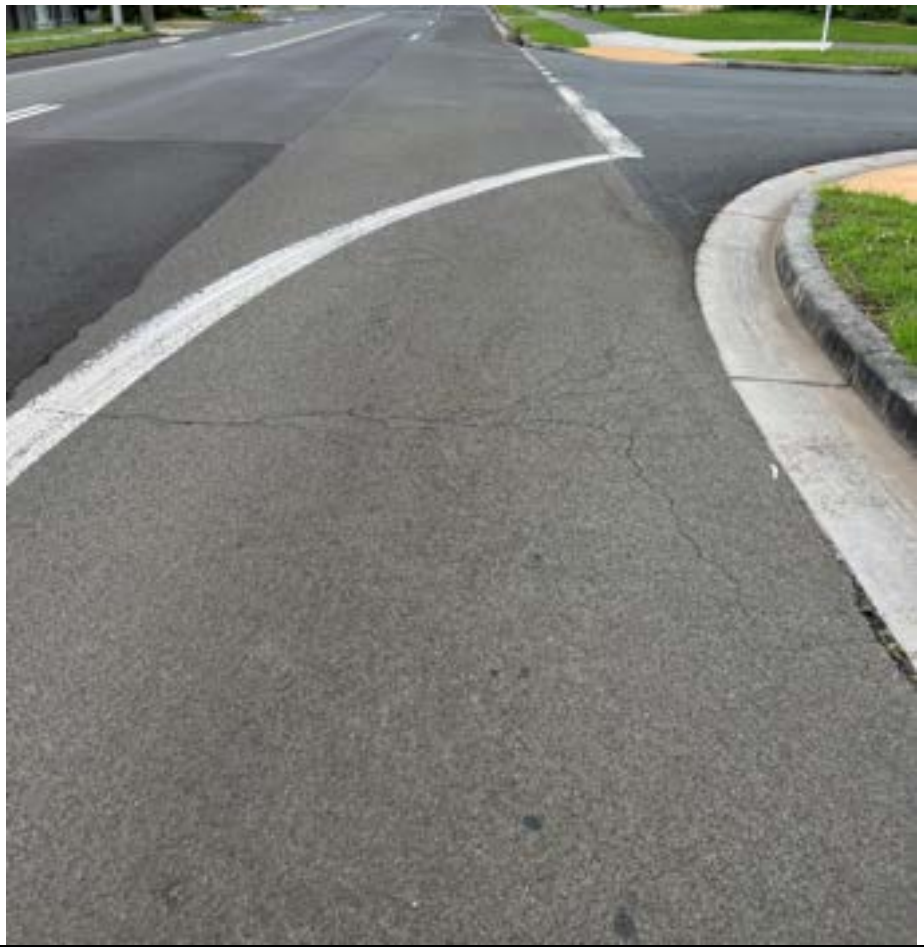

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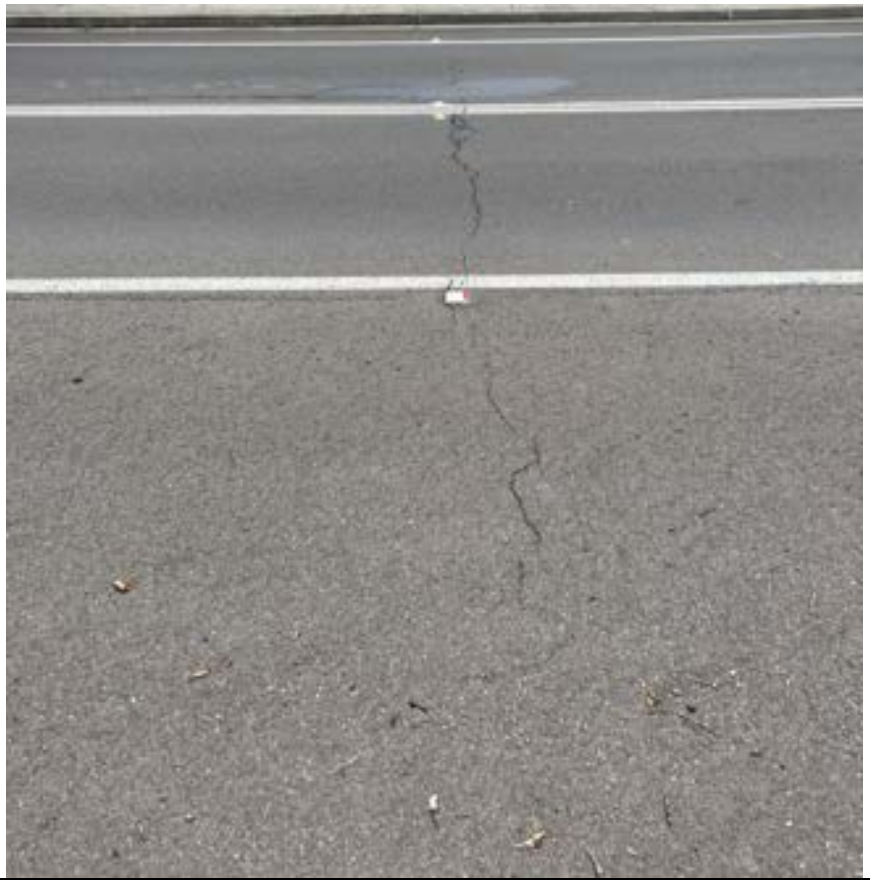

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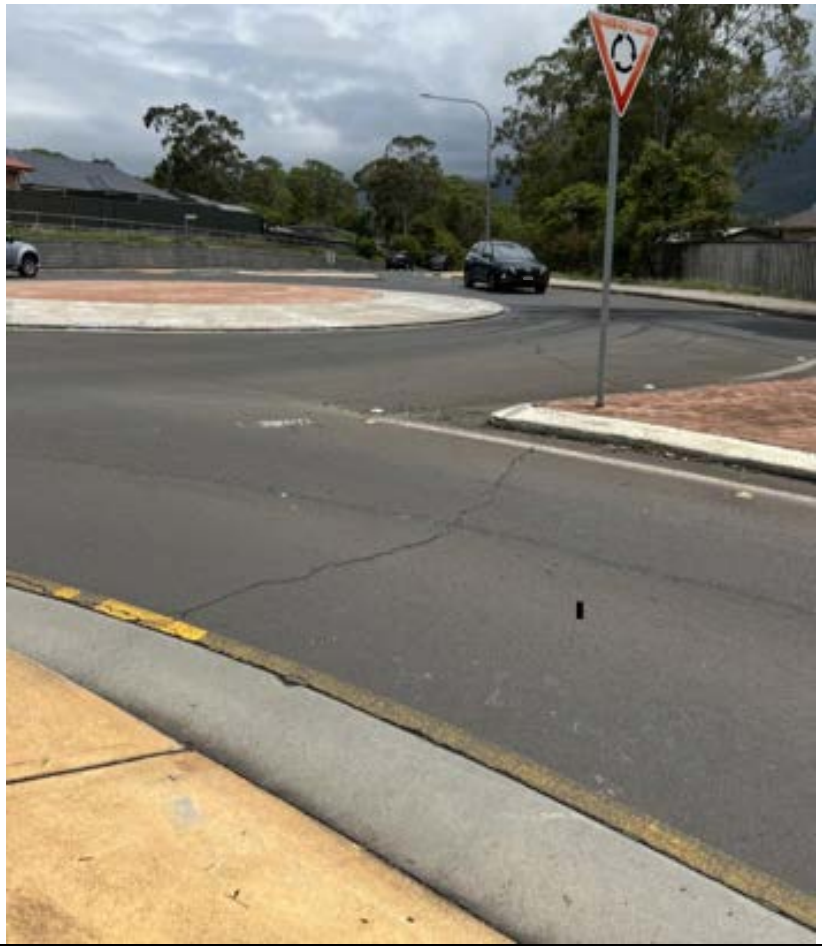

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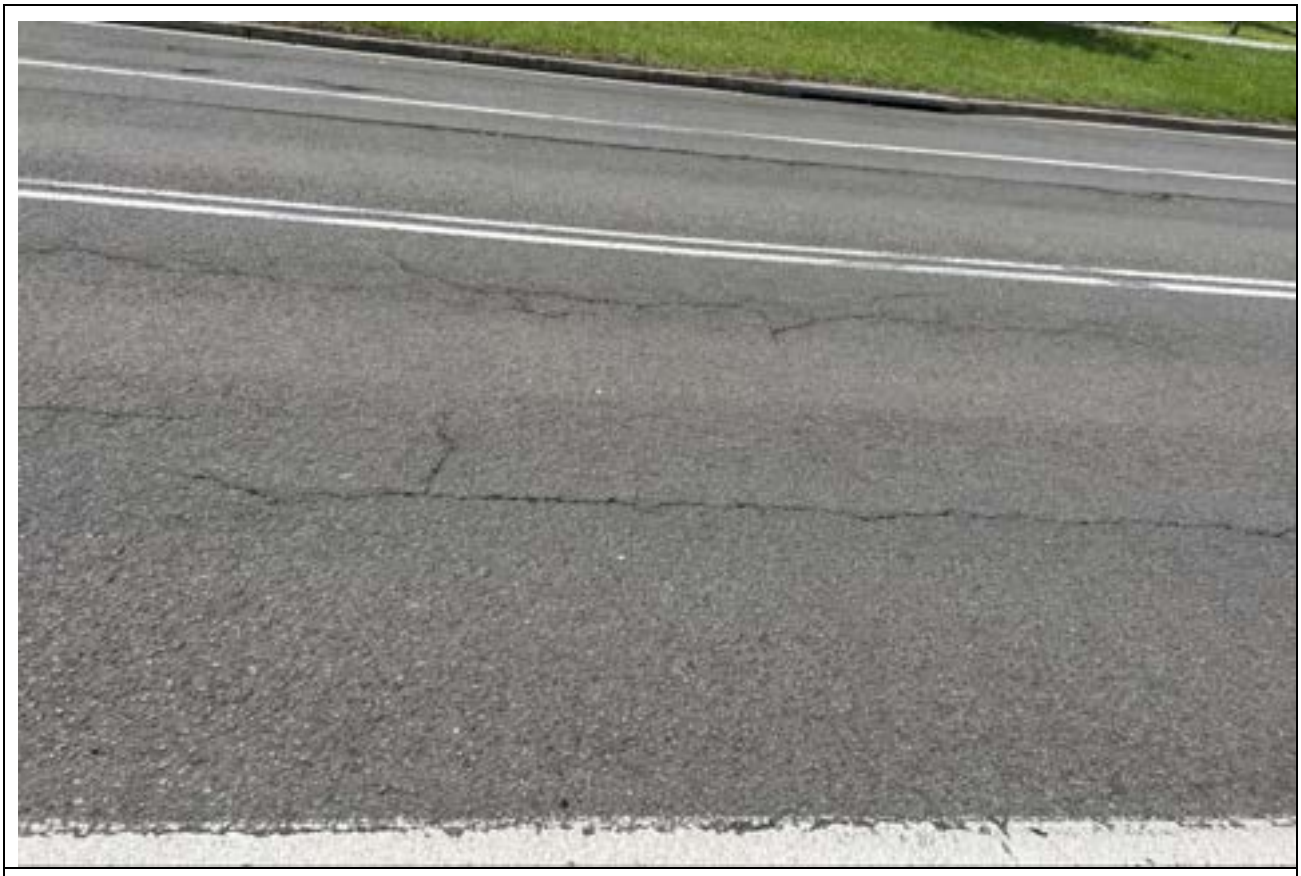

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Photo 112

7. Conclusion

This report has recorded the condition of the road surface, kerb, gutter and laybacks of nominated roads in Dapto, as well as signage and guard rail around the area, by using a vehicle mounted mobile mapping system comprising a Ladybug 360° camera and 4 high solution Grasshopper cameras and coupling with an RTK GNSS(GPS) as well as an Applanix inertial system was used capturing geo-referenced imagery every 2m along all the nominated roads. Structural defects have been noted & photographed.

The road surface was of asphalt construction and was found to be in a generally dilapidated condition with the severity of degradation carrying throughout the length of the roads. Multiple instances of Potholes, cracking, patching and delamination were found as well as some long, meandering cracks. There were also some instances of depressions and seepage in at different points in the roads.

Kerb and gutters, where provided, are of a concrete construction with regular cracks of varying widths throughout.

Signage was found to be in a generally dilapidated condition for some of the roads.

Areas with significant road pavement dilapidation that likely requires remediation:

- Western end of Section 2 of Bong Bong Road, section 2 refers to road starts at the roundabout with Fairwater Drive and ends at the roundabouts with Sierra Drive
- Section 3 of Bong Bong Road, section 3 refers to road afters roundabouts with Sierra Drive
- Fairwater Drive, especially Section 2 which refers to road starts at the intersection with Riverpark Way
- Eastern end of Cleveland Road

Areas with a moderate road pavement dilapidation that could possibly need remediation:

- Cleveland Road
- Hamilton Street
- The rest of Section 2 of Bong Bong Road

Areas that do not require immediate and pressing need for remediation:

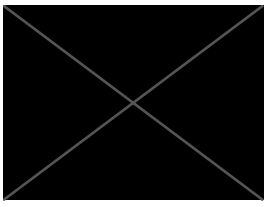
- Section 1 of Bong Bong Road, section 1 refers to the area west if the roundabout intersection with Fairwater Drive
- Aston Vale Grove
- Benares Court
- Galway Court
- Boddington Way
- Wholahan Avenue
- Stockyard Crescent
- Selwyn Grove
- Lucas Drive
- Riverpark Way
- Bridgewater Drive
- Kanahooka Road
- Darkes Road

This report should be retained as a record of the existing condition of the road reserve at the time of the inspections.

This dilapidation report dated 29th November 2023, is a true and fair indication of the existing condition of the road reserve.

Following are relevant signatures of agreement to the details contained in the report.

Prepared by:



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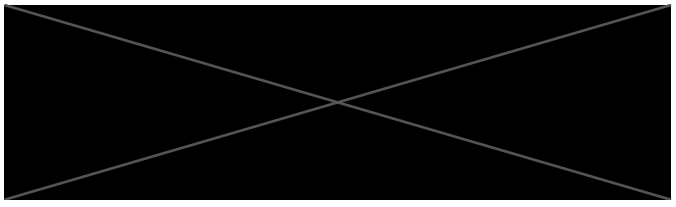
[redacted]

Graduate Civil Engineer

BE (Hons)Civil GradIEAust

Reviewed by:



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[redacted]

Civil Manager

BE (Hons) DipEngPrac MIEAust CPEng NER

8. Appendix – Dilapidation survey from Rapid Map Services Pty Ltd

JN Engineering

West Dapto Dilapidation Survey

Rapid Map Services Pty Ltd

November 2023

Suite 22, 2 Enterprise Drive
Bundoora, VIC, 3083

T: (03) 9466 5200
F: (03) 9466 5222

E: info@rapidmap.com.au
W: www.rapidmap.com.au

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Suite 22, 2 Enterprise Drive
Bundoora, VIC, 3083

T: (03) 9466 5200
F: (03) 9466 5222

E: info@rapidmap.com.au
W: www.rapidmap.com.au

Overview

A review of road conditions and dilapidation in Dapto, NSW was undertaken on the 19th to 21st of October 2023 at the request of JN Engineering. The purpose of this was to ascertain the pre-construction condition of nominated roads.

To conduct this survey, a vehicle mounted mobile mapping system comprising a Ladybug 360˚ camera, 4 high resolution Grasshopper cameras, coupled with an RTK GNSS (GPS) and an Applanix inertial system was used capturing geo-referenced imagery every 2m along all nominated roads.

The images were later processed against the spatial data to improve their accuracy and perform any required cleanup.

As a separate exercise, our field surveyor captured the location of visible significant road defects using GIS based field software and GNSS locations.

Road conditions and road surfaces have been divided into four broad categories: excellent, good, moderate, poor.

This report has been written after reviewing the geo-referenced imagery and captured defect data to summarise the current road and dilapidation conditions within the survey extent.

Extent of Survey

The required extent of the requested survey was provided by JN Engineering. It covers the following roads: Bong Bong Rd, Fairwater Dr, Riverpark Way, Bridgewater Dr, Hamilton St, Cleveland Rd, Ashton Vale Gr, Galway Ct.

It also covers a smaller portion of the following roads: Stockyard Cr, Wholahan Ave, Lucas Dr, Kanahooka Rd, Darkes Road, Selwyn Gr, Boddington Way and Benares Ct.

See map in Appendix 1.

Dilapidation Survey Summary

Cleveland Road

Cleveland Rd is in moderate condition. The primary issues are edge damage, potholes and patching and delamination.

Edge damage is found along the entire length, though most common in the south. Often it is fairly minor but it is extensive. More highly damaged sections can be found in various locations.

Potholes are found the length of Cleveland Rd. The majority are quite small, <10cm in diameter, though there are a very small number which are up to ~30cm in diameter. They are usually found in conjunction with other defects such as patching.

Patching is endemic to Cleveland Rd. Patching varies from small sections ~15cm across to an entire 50m length of road. While the patching itself is not necessarily a defect, there is usually cracking or deformation associated with it.

Delamination can be found at various points and is also quite common.

The overall road surface is in moderate condition, with a rough surface.

Suite 22, 2 Enterprise Drive
Bundoora, VIC, 3083
T: (03) 9466 5200
F: (03) 9466 5222
E: info@rapidmap.com.au
W: www.rapidmap.com.au

Cleveland Rd also contains examples of deformation and line cracking. Deformation is common where older and newer road surface meet. Line cracking is found in the central and northern sections of Cleveland Rd but is not as common as other defects.

There are also a number of signage defects.

At the eastern end of the survey extent, at the bend on Cleveland Rd the road is in poor condition. There is extensive deformation, patching, edge damage and potholes around this bend. Note that immediately east of this bend is also in fairly poor condition, except for a ~60m section of new road surface.

Stockyard Crescent and Wholahan Avenue

Stockyard Cr and Wholahan Av are in good condition. These are relatively new roads, and there is little damage outside of a few isolated examples of minor line cracking, kerb damage, edge damage, deformation and some delamination.

Part of the review requested a section of undeveloped road to be checked at the south-east corner of Stockyard Cr. This section has been marked as deformation, as it is an unsealed gravel access road.

Kanahooka Road and Darkes Road

Kanahooka Rd is in good condition, except for the roundabout intersection with Princes Hwy. Kanahooka Rd generally has a good road surface condition, however there are several isolated instances of significant line cracking and crocodile cracking.

The roundabout with Princes Hwy is in poor-moderate condition, having significant levels of line cracking throughout the roundabout. There is also a signage defect present near the intersection with Prince Edward Dr.

Kanahooka Rd becomes Darkes Rd after passing through the intersection. Darkes Rd is in excellent condition. There are no real defects with the road surface itself, however there are a small number of minor edge drop-offs found along this section.

Bong Bong Road, Section 1

Due to its length, Bong Bong Rd will be summarised by breaking it into three sections.

Section 1 of Bong Bong Rd is defined as the area west of the roundabout intersection with Fairwater Dr.

Section 1 is in good-excellent condition. There are few defects, and the road surface is generally in overall excellent quality. The western segment has very few defects: a pothole, slight curb damage, minor line cracking and deformation.

At the intersection with Hayes Ln, there are some line-marking defects and deformation, probably resulting from development and construction in the area.

Travelling east until Brooks Reach Rd the trafficable road surface is in good-excellent condition but shows extensive line cracking where the road seals meet in the centre, though it is mostly fairly shallow. There are also some minor isolated instances of crocodile cracking, delamination and deformation.

Continuing east, the road surface is in good-excellent condition with only a few minor and isolated instances of line cracking, crocodile cracking, patching and kerb defect until the new road surface ends, ~100m from the roundabout with Fairwater Dr and the start of Section 2 of Bong Bong Rd.

Suite 22, 2 Enterprise Drive
Bundoora, VIC, 3083
T: (03) 9466 5200
F: (03) 9466 5222
E: info@rapidmap.com.au
W: www.rapidmap.com.au

The new road surface ends with a section of deformation. Line cracking increases on the approach to the roundabout, which itself has extensive cracking.

Bong Bong Road, Section 2

Section 2 of Bong Bong Rd starts at the roundabout with Fairwater Dr and ends at the roundabout with Sierra Dr.

It varies in condition; the west end is in poor condition, the east end is in moderate to good condition, while the central section is in moderate to excellent condition.

From the roundabout at Fairwater Dr to the intersection at Shone Av and Iredell Rd, there is extensive and significant cracking. The intersection itself is in poor condition, with a lot of crocodile cracking, deformation, patching and a pothole of ~30cm diameter. Patching and cracking continues up until the intersection with Glenlee Rd. This entire section is in poor condition.

From this point up until about ~170m from the roundabout with Sierra Drive, Bong Bong Rd is in good-excellent condition and defects are limited to a few isolated spots of line cracking, crocodile cracking, delamination or patching.

The intersections with Lucas Dr and Denham Dr show higher amounts of defects with delamination, crocodile cracking and line cracking, but these are isolated.

Section 2 of Bong Bong Rd deteriorates again ~170m from the roundabout intersection with Sierra Dr. While the overall surface condition remains moderate-good, a significant amount of line cracking and crocodile cracking can be found, though it is usually minor and shallow.

Bong Bong Road, Section 3

Section 3 of Bong Bong Rd is in poor condition. There is extensive and significant crocodile cracking and line cracking throughout, with a number of potholes, kerb defects, deformation and delamination, as well as instances of potholes, signage defects, guard rail damage and edge damage, especially in the eastern section, between the train line and Princes Hwy.

The defects found in the western segment of Section 3 are related to patching. The overall surface condition of Section 3 is poor-moderate.

The exception to this is a ~330m stretch of road starting just before the bridge over Mullet Creek up until the trainline. This road condition is excellent with little to no defects.

Galway Court, Ashton Vale Grove, Benares Court

The section comprised of Galway Ct, Ashton Vale Gr and Benares Ct is in good condition. Though there are a number of line cracking and delamination instances, they are minor and shallow.

Previous line cracking in these roads has been tarred over due to their limited nature. Delamination is also quite shallow and unobtrusive in the area. The overall road surface is in good condition.

Hamilton Street

Hamilton St is in good condition, except for the northern end. Similar to the Galway/Ashton Vale/Benares Ct, there are a number of examples of line cracking and delamination but these are fairly minor and shallow. And while there are a few minor and isolated instances of kerb defects, edge damage and crocodile cracking, the road is overall in good condition.

Suite 22, 2 Enterprise Drive
Bundoora, VIC, 3083
T: (03) 9466 5200
F: (03) 9466 5222
E: info@rapidmap.com.au
W: www.rapidmap.com.au

The northern end of Hamilton St is unsealed gravel and has been listed as a large section of deformation and many potholes have formed in the unsealed surface. This section of road is in very poor condition.

Fairwater Drive, Section 1

Due to its length, Fairwater Dr will be summarised by dividing it into two sections.

Section 1 starts at the roundabout with Bong Bong Rd and continues until the intersection with Riverpark Way.

Section 1 of Fairwater Dr is in good-excellent condition. The overall road surface is in good-excellent condition.

The first ~200m from the roundabout with Bong Bong Rd has numerous instances of line-cracking, these are mostly quite shallow. A large proportion of these perpendicular across the road, rather than parallel to it.

The final ~130m of Section 1, just before Riverpark Way, also shows some parallel line cracking, however these are mostly quite minor and shallow where the road seals meet in the centre. Besides the start and end segments, Section 1 of Fairwater Dr road is in good-excellent condition.

There a few other minor defects found along Section 1, including kerb defects, line cracking and delamination, as well as moderate crocodile cracking at the intersection with Boddington Way.

There is also an area of deformation on the western side of the roundabout with Lucas Dr. The road slopes away sharply so that the 2-3 feet before the gutter is at a different angle to the rest of the road.

Fairwater Drive, Section 2

Section 2 of Fairwater Dr is in very poor condition. Starting at the intersection with Riverpark Way, the new road seal meets the old road seal. Except for the bridge next to Reed Park Pl which is in excellent condition, Section 2 has significant and extensive line cracking and crocodile cracking throughout.

There are also instances of kerb defects, several potholes, as well as edge damage and a signage defect at the far eastern end, near the intersection with Daisy Bank Dr and Fowlers Rd.

It is also interesting to note that a significant amount of the line cracking is perpendicular to the road, rather than parallel, especially between the Riverpark Way intersection and the roundabout with Sierra Dr.

Lucas Drive

Lucas Dr is in good condition, though only a small portion was surveyed. There is a small amount of line cracking though it is quite minor.

Just beyond the survey extent, heavy delamination can be found outside 35 Lucas Dr, Horsley. The overall road surface condition is good.

Riverpark Way

Riverpark Way is in good condition. Outside of a small edge drop off and a small line crack, the road has no other defects. Previous examples of line cracking have been tarred over. The overall road surface condition is good.

Bridgewater Drive

Suite 22, 2 Enterprise Drive
Bundoora, VIC, 3083
T: (03) 9466 5200
F: (03) 9466 5222
E: info@rapidmap.com.au
W: www.rapidmap.com.au

Bridgewater Dr is in moderate-good condition. The north and southern ends have a significant amount of line cracking while the central section is in good condition, outside of a small pothole and a line crack. The overall road surface condition is good.

Selwyn Grove, Boddington Way

Selwyn Gr and Boddington Way are in good condition. There are a small number of isolated instances of line cracking, edge damage, delamination and crocodile cracking but they are relatively minor. Overall road surface condition is good.

Final Observations

The state of road conditions within the survey extent was varied, both across the extent, and in local areas.

The most pressing areas requiring remediation, due to having the most dilapidated roads, are Section 3 of Bong Bong Rd, the western end of Section 2 of Bong Bong Rd, Fairwater Dr, especially Section 2, and the eastern end of Cleveland Rd.

Areas with a moderate need to address the dilapidation are Cleveland Rd, Hamilton St and the rest of Section 2 of Bong Bong Rd.

The rest of the roads surveyed do not have an immediate and pressing need for remediation.

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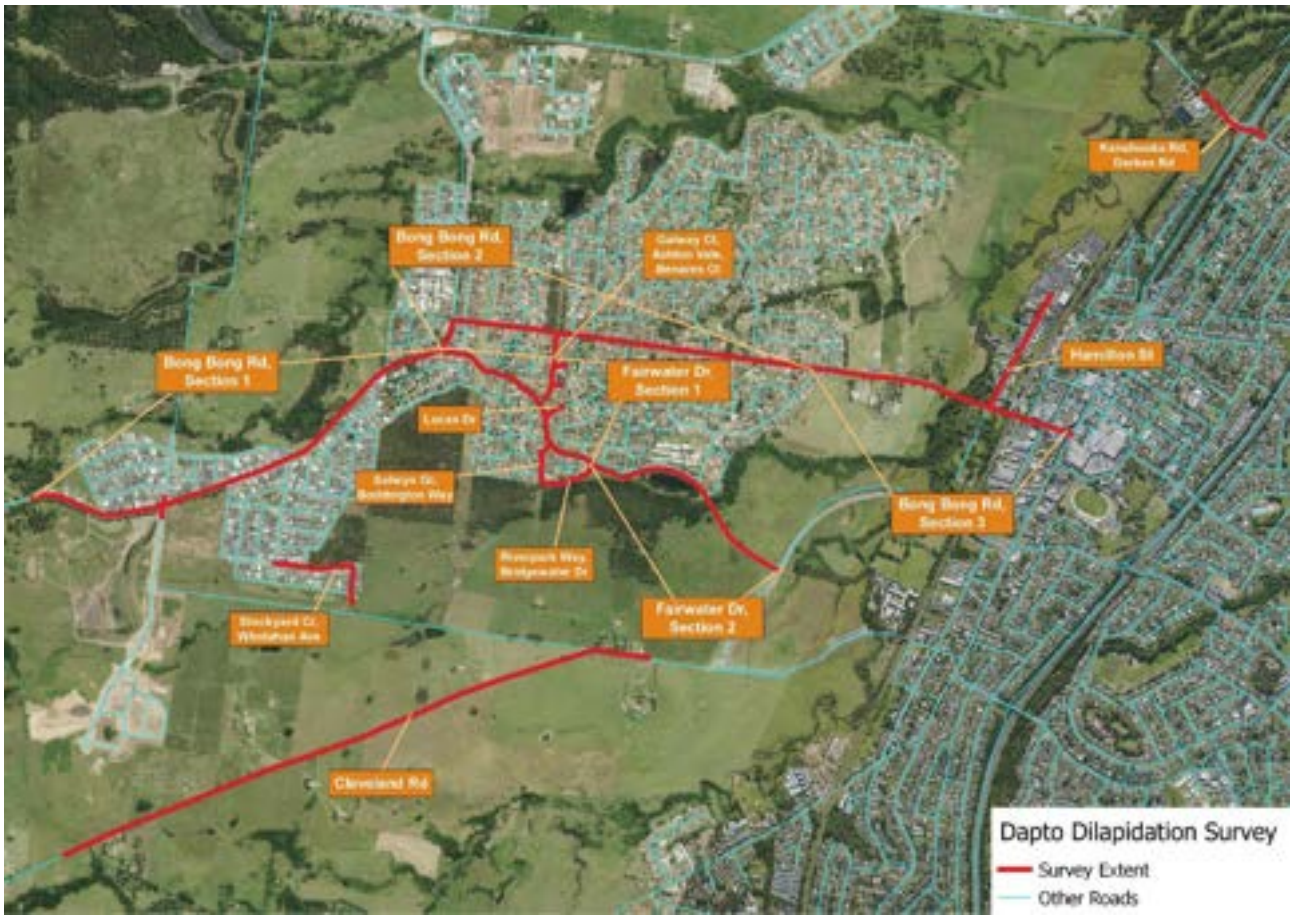
Appendix 1



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F: (03) 9466 5222
E: info@rapidmap.com.au
W: www.rapidmap.com.au

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