

Local Road Dilapidation Report

Botany Bay Council

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Signature:						

Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this Report is reviewed and approved. The Construction Manager (Project Wide) is responsible for updating this Report to reflect changes to the Project, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director before being distributed or implemented.

Revision Details

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Local Road Dilapidation Report – Botany Bay Council



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1. Introduction

The CPB Contractors, Dragados and Samsung Joint Venture (CDS-JV) has been selected to deliver the New M5 from St Peters to Beverly Hills.

Condition B59 of the Minister's Condition of Approval (MCoA) requires CDS-JV to determine the access route(s) for heavy and oversized vehicles associated with the construction of the New M5 and site establishment works and prepare a Local Road Dilapidation Report for those local roads within the control of the relevant councils that would be utilised.

In addition, Clause 4.3 of Exhibit A of the SWTC requires CDS-JV to undertake ground and infrastructure condition surveys of all existing infrastructure (including local roads) within 50 meters of the Project Site and Temporary Areas and within a surface corridor which, when viewed in plan, has boundaries set a minimum of 50 meters beyond all excavations.

This is the dilapidation report of the local roads within the control of Sydney City Council.

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2. Dilapidation survey of Local Roads within the control of Botany Bay Council

Ricketty Street between Burrow Road and Kent Road within the control of Botany Bay Council will be utilised for heavy and oversized vehicles associated with the construction of the WestConnex New M5.

As per the Condition B59 of Minister's Condition of Approval a Local Road Dilapidation Report must be prepared for the local roads that will be utilised for project construction traffic. The report must assess the current condition of the road and describe mechanism to restore any damage that may result due to its use by traffic and transport related to the construction of the WestConnex New M5.

Local Road Dilapidation survey was undertaken by Australian Road Research Board (ARRB) and dilapidation survey results and the assessment of the current condition of the local roads is described in the report Pre-construction Road Condition Report WestConnex New M5 Main Works Project by ARRB (Attachment 1).

Mechanisms to restore any damage that may result due to its use by traffic and transport related to the construction of the project

The local roads listed in Table 1 will be maintained by CPBDS-JV during CPBDS-JV's Work as required by 'Appendix C.6 Local Road Maintenance during Project Company's Work'. Any damage that may result due to construction traffic will be restored during the road maintenance work by CPBDS-JV.

Mechanisms to restore any damage that may result due to its use by traffic and transport related to the construction of the project

Ricketty Road will be maintained by CPBDS-JV during CPBDS-JV's Work as required by 'Appendix C.6 Local Road Maintenance during Project Company's Work'. Any damage that may result due to construction traffic will be restored during the road maintenance work by CPBDS-JV.

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Attachment 1 – Pre-construction Road Condition Report for WestConnex New M5 Main Works Project

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Pre-Construction Road Condition
Report for WestConnex New M5 Main
Works Project – City of Botany Bay

for CDS JV

SUMMARY

ARRB was commissioned by CDS JV (CPB Contractors Pty Limited, Dragados Australia Pty Ltd, and Samsung C&T Corporation Joint Venture) to survey and assess the current condition of the nominated roads associated with the construction of the WestConnex New M5 Main Works project.

A surface condition survey of the road network was conducted by ARRB in April 2016 to collect condition distresses including rutting, roughness, texture and cracking information.

The scope of the main report includes:

- collection and processing of pavement condition data into various data categories including roughness (IRI m/km), rut depth (mm), texture depth (mm) and cracking (% area).
- preparation of a report evaluating the overall condition of each road by direction and lane for each of the road authorities involved in the study area.

The study area involves several road authorities and the road conditions are reported in the below road groups for each organisation where applicable.

- Group 1 – Local roads that will be utilised for heavy and oversized vehicles
- Group 2 - Local roads within 50m of the construction works but are not utilised for construction traffic
- Group 3 - Non-haulage maintenance roads
- RMS- Arterial roads within 50m buffer zone

Condition assessments presented are based on current industry practices for the purpose of dilapidation rather than a customised local condition assessment. It should be noted that the condition statement could vary depending on the definition. See Section 1.3 for details.

The results of the condition assessment are presented separately for each road agency.

This report is an extraction from the main report of the sections relevant for City of Botany bay.

City of Botany Bay Council

Condition assessments (based on current industry standards) are represented based on the average condition of road sections owned by City of Botany Bay Council.

	IRI group	Rut group	Texture group	Cracking group
RICKETTY ST_C_1	Good	Good	Fair	Very good
RICKETTY ST_C_2	Fair	Good	Poor	Very good
RICKETTY ST_C_3	Fair	Fair	Fair	Very good
RICKETTY ST_P_1	Good	Good	Fair	Very good
RICKETTY ST_P_2	Good	Good	Fair	Very good
RICKETTY ST_P_3	Good	Good	Fair	Very good

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1 INTRODUCTION

1.1 General

ARRB was commissioned by CDS JV (CPB Contractors Pty Limited, Dragados Australia Pty Ltd, and Samsung C&T Corporation Joint Venture) to survey and assess the current condition of the nominated roads associated with the construction of the WestConnex New M5 Main Works project.

Pavement surface condition survey of the road network was undertaken by ARRB in April 2016 to collect surface condition distresses including rutting, roughness, cracking and texture depth. The survey scope included a series of roads managed by several organisations and the pre and post construction condition report is presented for these roads.

The study area involves several road authorities. The road condition is reported in separate road groups for each organisation where applicable.

- Group 1 – Local roads that will be utilised for heavy and oversized vehicles
- Group 2 - Local roads within 50m of the construction works but are not utilised for construction traffic
- Group 3 - Non-haulage maintenance roads
- RMS- Arterial roads within 50m buffer zone

The report summarises the current surface condition of the affected road sections by lane.

The following sections address road conditions for City of Botany Bay Council.

1.2 Condition Survey

ARRB used Hawkeye 2000 survey vehicle to capture surface condition data of the road pavement network including:

- rut depth (inner, outer and lane)
- roughness (IRI, NAASRA)
- surface texture including sand patch texture depth (SPTD) and sensor measured texture depth (SMTD) for outer and between wheel paths.
- Surface condition including cracking data and other surface defects.



Source: ARRB Group Ltd Figure

Figure 1.1: Network survey vehicle (NSV)

1.3 Assumptions for levels of services

To help communicate between engineers and management teams, condition data is further grouped into “Very Good”, “Good”, “Fair”, “Poor”, and “Very poor” based on current industry practices, see Table 1.1.

Table 1.1: Current industry Level of services

Class name	Very Good	Good	Fair	Poor	Very poor
Rut depth (mm) range	0–2.5	2.5–5	5–10	10–15	>15
Roughness (IRI) range	0–1.5	1.5–3.0	3.0–4.2	4.2–5.33	>5.33
Texture range (mm)	>1.2	1.2–0.8	0.8–0.4	0.4–0.2	0.2–0
Cracking (%) range	0–5	5-10	10-15	15-20	>20

1.4 Scope

The scope of the report is as follows:

- collection and processing of pavement condition data including roughness (IRI m/km), rut depth (mm), cracking (%) and texture depth (mm)
- preparation of a report evaluating the current condition of the road and describe outstanding defects in terms of rutting, roughness, texture depth and cracking

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Table 2.1 shows the average condition of IRI, rutting, texture depth and cracking for the nominated roads of reporting for CoBB (City of Botany Bay Council). Table 2.2 presents the worst condition on each of the analysis segment on Ricketty Street, which is the only road of CoBB’s concern for this project.

Table 2.1: Average road network condition- CoBB

	IRI (m/km)	Rut (mm)	Texture depth (mm)	Cracking (%)
RICKETTY ST_C_1	2.45	3.80	0.44	1.78
RICKETTY ST_C_2	3.13	4.83	0.40	3.26
RICKETTY ST_C_3	3.24	5.42	0.44	2.52
RICKETTY ST_P_1	2.22	5.00	0.47	3.83
RICKETTY ST_P_2	2.47	4.40	0.47	0.00
RICKETTY ST_P_3	2.47	4.57	0.49	0.00

Table 2.2: Worst condition on the network- CoBB

	IRI (m/km)	Rut (mm)	Texture depth (mm)	Cracking (%)
RICKETTY ST_C_1	3.82	4.65	0.32	7.10
RICKETTY ST_C_2	3.59	6.92	0.34	9.80
RICKETTY ST_C_3	3.66	8.89	0.36	8.10
RICKETTY ST_P_1	2.88	6.37	0.36	6.30
RICKETTY ST_P_2	3.54	6.53	0.36	0.00
RICKETTY ST_P_3	3.81	6.77	0.36	0.00

According to the levels of service definition mentioned above (Section 1.3), the following condition statement is presented for each of the surveyed road sections. It should be noted that the condition statement could vary depending on the definition. The following condition categories are for the purpose of the pre and post construction comparison rather than a customised local condition assessment.

Table 2.3: Categories of condition- CoBB

	IRI group	Rut group	Texture group	Cracking group
RICKETTY ST_C_1	Good	Good	Fair	Very good
RICKETTY ST_C_2	Fair	Good	Poor	Very good
RICKETTY ST_C_3	Fair	Fair	Fair	Very good
RICKETTY ST_P_1	Good	Good	Fair	Very good
RICKETTY ST_P_2	Good	Good	Fair	Very good
RICKETTY ST_P_3	Good	Good	Fair	Very good

Each of the individual physical parameter (rut depth, roughness, texture depth and cracking) is described separately in the following sections.

2.1 Rut Depth

A rut is a pavement defect in the form of a longitudinal depression of the surface, usually in a wheel path (Austroads 2006b).

Rutting is considered as one of the most critical parameters on bituminous pavements in urban environments, as it reflects the deformation of the pavement. Rutting also has implications for road safety due to the potential for water ponding and subsequent loss of skid resistance.

The deformation (rutting), of the asphalt may be functional or structural distress, depending on the pavement's base. Signalised intersections with asphalt pavements are particularly prone to rutting under heavy traffic.

For the current project, rutting data is collected using a 13-point laser system, which measures a 2-metre transverse profile across the lane. A full transverse profile is measured every 20 mm of longitudinal travel and the processing software allows both lane and wheel path rutting to be measured using the string line and straight edge model.

Figure 2.1 presents the average rutting of each road direction per lane and the majority of the sections present rut depth of around 5mm, mostly in 'good' condition.

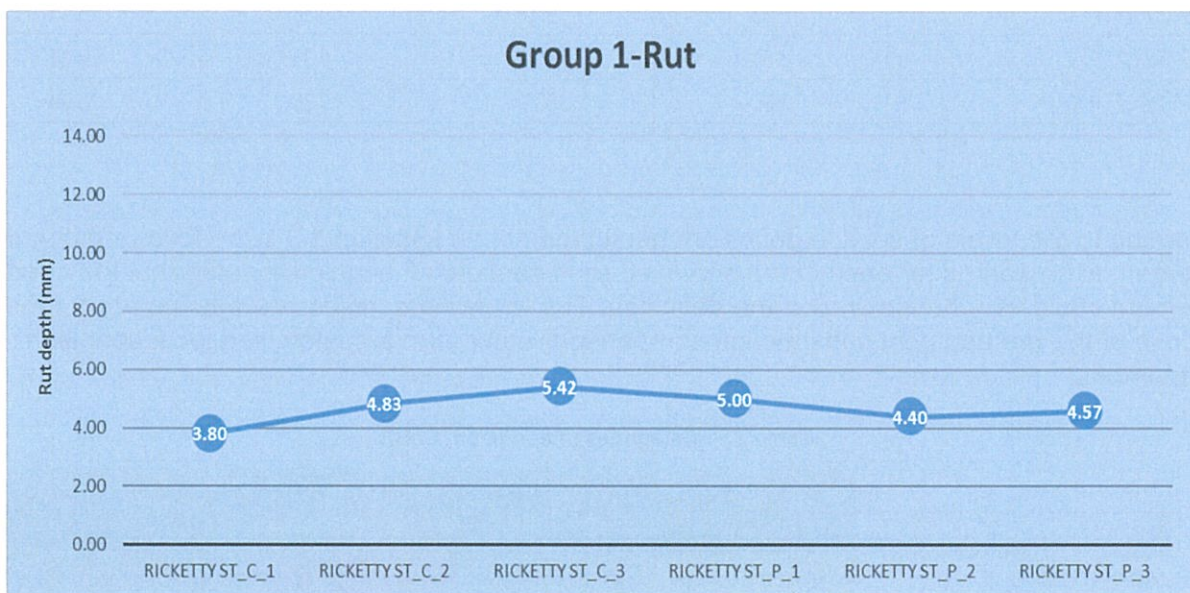


Figure 2.1: Rutting condition- CoBB

2.2 Roughness

Roughness is considered as an important indicator of driver comfort and its change is accepted as an indicator of condition deterioration. Roughness data is presented as the International Roughness Index (IRI), the average of the left and right wheel path values for the surveyed lanes. Austroads has endorsed the International Roughness Index (IRI) as the reporting unit for road roughness in Australasia (Austroads 2006a).

Figure 2.2 shows the average roughness condition of each surveyed section. Most sections present roughness value of less than 3 IRI, which are considered to be 'good' according to the assumptions made for this project (Section 1.3).

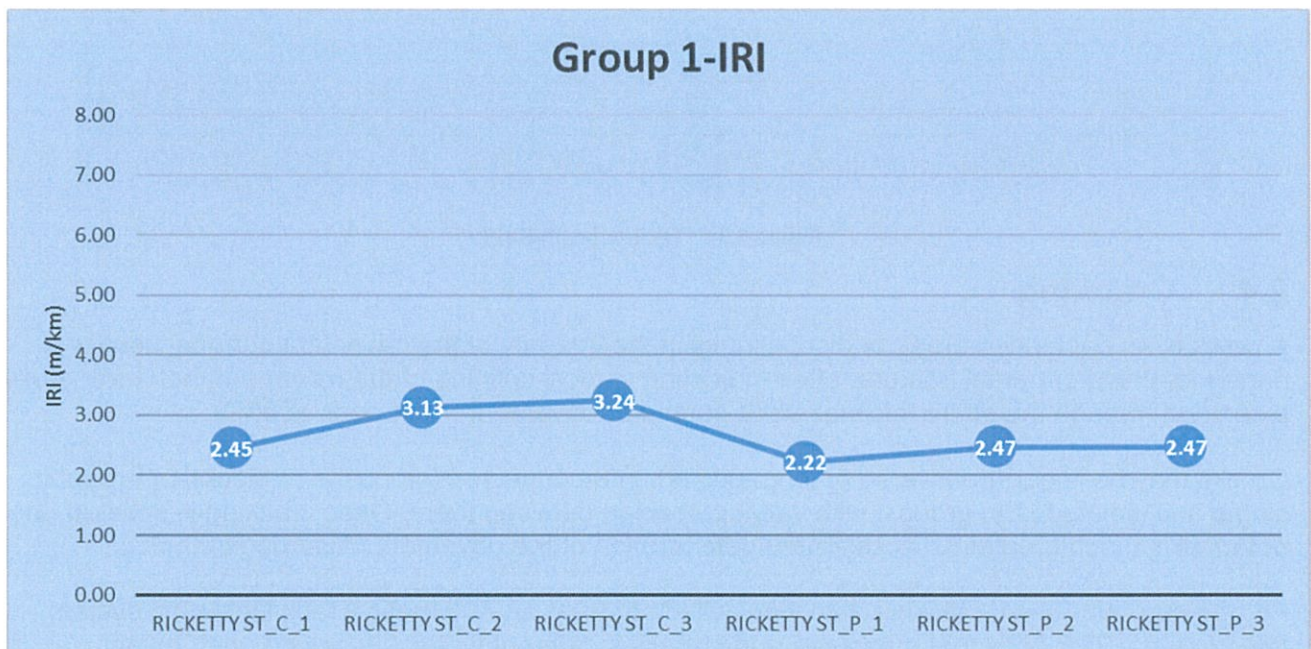


Figure 2.2: Roughness condition-CoBB

2.3 Texture Depth

Texture depth refers to the amplitude of deviations from the surface plane of the road and is influenced by the size, shape and spacing of the aggregate of the surfacing material.

Texture is an important contributor to safety, as adequate texture depth is required to maintain skid resistance, particularly under wet conditions. On bituminous surfaces, it may indicate the loss of texture or appearance of bitumen on the surface. Both the outer (where trafficking is greatest) and inner wheel paths (where trafficking is minimal) were measured. It should be noted that a comparison of both could indicate texture loss, which should be monitored against future measurements to determine the rate and extent of deterioration. In this analysis, texture was taken from the survey data as the minimum of SMTD (mm) of the left wheel path and right wheel path.

As indicated in Figure 2.3, most roads present texture depth of less than 0.5mm, which is considered 'fair' condition for texture depth.

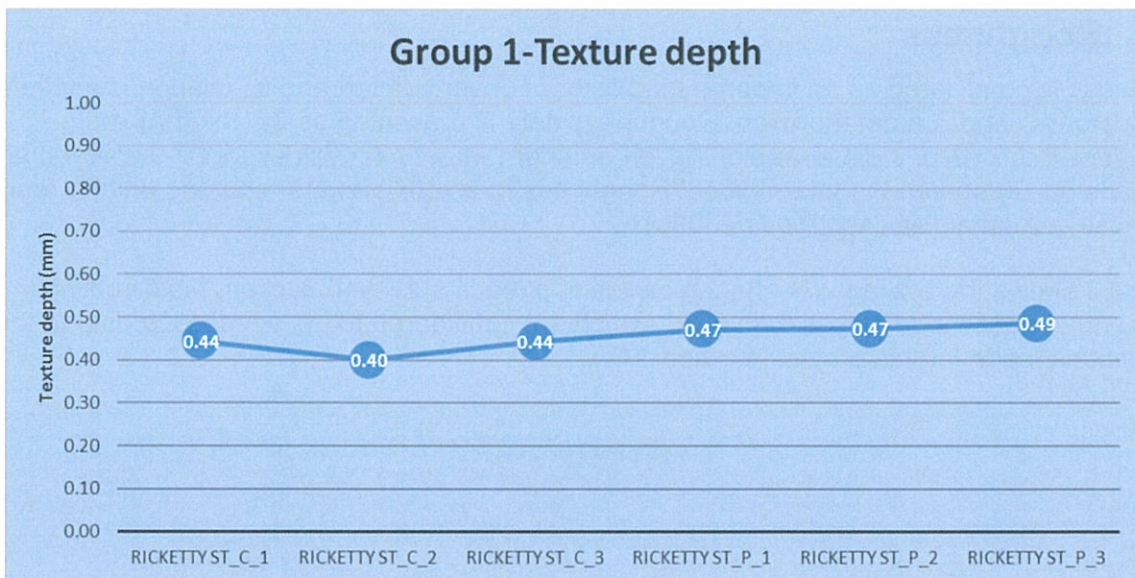


Figure 2.3: Texture depth-CoBB

2.4 Cracking

A crack is an unplanned break or discontinuity in the integrity of the pavement surface, usually a narrow opening or partial fracture, often indicating vertical splitting of the pavement, not necessarily extending through the entire thickness of a course or pavement (Austroads 2006C).

Cracks may be linear (transverse or longitudinal), interconnected (crocodile or block), or irregular, single and isolated or in groups, with varying spacing between them. Once cracking is initiated, the potential is much greater for accelerated deterioration of the pavement (Austroads 2006C).

For the current project, cracking data was collected using an Automatic Crack Detection system fitted to the ARRB NSV that measures and classifies different types of cracking, their extent, severity etc. While analysing the network condition, percent of area cracked, which is an aggregation of values for all types of cracking, was used as a reference for analysis from the surveyed data.

Most sections of Ricketty Street present cracking percent of less than 4% and it is considered as 'very good'.

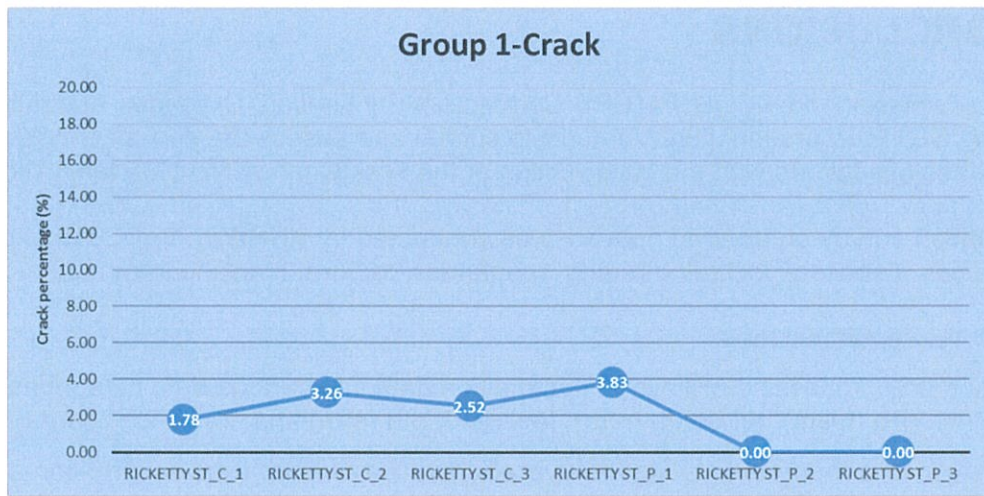


Figure 2.4: Cracking condition-CoBB

3 CONCLUSIONS

ARRB was commissioned by CDS JV (CPB Contractors Pty Limited, Dragados Australia Pty Ltd, and Samsung C&T Corporation Joint Venture) to survey and assess the current condition of the nominated roads associated with the construction of the WestConnex New M5 Main Works project.

Surface condition survey of the road network was conducted by ARRB in April 2016 to collect surface condition distresses including rutting, roughness, texture, cracking information.

The scope of the report includes:

- collection and processing of pavement condition data into various data categories including roughness (IRI m/km), rut depth (mm), texture depth (mm) and cracking (% area).
- preparation of a report evaluating the overall condition of each road by direction and lane for each of the road authorities involved in the study area.

The study area involves several road authorities and the conditions were reported in road groups for each organisation, where applicable, as per the below.

- Group 1 - Local Roads that will be utilised for heavy and oversized vehicles
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- Group 3 - Non-haulage maintenance roads
- RMS- Arterial roads within 50m buffer zone

Condition assessments were presented based on current industry practices for the purpose of dilapidation, rather than a customised local condition assessment. Please be mindful that the condition statement could vary depending on the definition. See Section 1.3.

The findings from the condition assessments are presented for Botany Bay Council.

Botany Bay Council

Condition assessment based on current industry standards, presented utilising the average condition of road sections owned by Botany Bay Council.

	IRI group	Rut group	Texture group	Cracking group
RICKETTY ST_C_1	Good	Good	Fair	Very good
RICKETTY ST_C_2	Fair	Good	Poor	Very good
RICKETTY ST_C_3	Fair	Fair	Fair	Very good
RICKETTY ST_P_1	Good	Good	Fair	Very good
RICKETTY ST_P_2	Good	Good	Fair	Very good
RICKETTY ST_P_3	Good	Good	Fair	Very good

4 SURVEY RESULTS

Surface condition survey processed data results are supplied to CDS JV separately in electronic format. The file names and contents are as follows (Table 4.1):

Table 4.1: Files with survey results

File Name	Content
PSS16084 - NSV_MS_WestConnex Laser Data	Roughness, rut depth and Texture depth data
PSS16084 - NSV_MS_WestConnex Visual Assessment	Cracking and other surface defects data

REFERENCES

Austrroads 2006a, *Guide to Asset Management Part 5B: Roughness*, AGAM05B/07, Austrroads, Sydney, NSW.

Austrroads 2006b, *Guide to Asset Management Part 5C: Rutting*, AGAM05C/07, Austrroads, Sydney, NSW

Austrroads 2006C, *Guide to Asset Management Part 5C: Cracking*, AGAM05E/07, Austrroads, Sydney, NSW.

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Attachment 2 - Clause 3.2 Pavement Repairs of SWTC Appendix C.6 Local Road Maintenance during Project Company's Work

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3.2 Pavement Repairs

Element	Requirement
1.Safe conditions	Repair to ensure road remains open to traffic providing safe conditions under the prevailing weather conditions, traffic volume, and speed zone.
2.Integrity of materials	All repairs, unless otherwise specified, shall comprise materials that are compatible with, or of better quality than the existing pavement. Asphalt may be used to alleviate stepping at joint.
3.Unsound material	For permanent repairs, the Project Company must remove enough of the underlying unsound material to ensure sound repair is achieved.
4.Compaction	Compaction shall achieve a uniformly dense, free from segregation and well bonded repair sufficient to ensure that it is not displaced, shoved, deformed, or picked up by traffic.
5.Ride quality	The deviation both within the repair and between the existing pavement and the repair when measured with a 1.5 m straight edge shall not be greater than 10 mm with a maximum surface level difference of 5 mm at the perimeter of the repair
6.Surface Finish	The surface shall provide a uniform water resistance layer to protect the pavement layers from surface infiltration of moisture. The skid resistance of the surface shall not be lower than that apparent immediately in front of and beyond the work area. Where surfacing aggregate is used it shall remain proud of the binder so that: <ul style="list-style-type: none"> ▪ binder is not picked up by the tyres of traffic, and ▪ the surface repair shall have no exposed bituminous material.
7.Lateral drainage	Ensure completed repair does not adversely affect lateral drainage across shoulder.

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Code of Maintenance Standards for Service Centre Access Roads

Element	Requirement
8.Excess material	Excavated material and debris shall not be left on the roadside or placed so as to impede surface drainage. Excess material shall be swept from the traffic lanes and bicycle lanes and disposed of legally and responsibly at the Project Company's expense.
9.Avoid damage to existing surface	Repair material and binding agents used shall not cause damage to the integrity of the existing bituminous surfacing.

