TRANSIT NEW ZEALAND
ARARAU AOTEAROA

NOTES TO THE SPECIFICATION FOR SKID RESISTANCE DEFICIENCY INVESTIGATION AND TREATMENT SELECTION.

1. SCOPE

These notes are to provide background information for addressing skid resistance deficiencies and to assist with the understanding required for the prioritisation of treatment.

2. MODIFICATION OF THE INVESTIGATORY LEVELS (IL's)

Sites that have a history of crashes are investigated as part of the regular Safety Management Strategy (SMS). If these crashes involve "loss of control" and "skidding in the wet" and the road surface at the site has a SCRIM value at or above the IL, this could be a valid reason to review the IL. Guidelines are available for the Inspecting Engineer to adjust the IL at these sites. These guidelines will be included in the State Highway Safety Management Guidelines manual which is shortly to be issued.

3. ANALYSIS OF SKID RESISTANCE DEFICIENCIES

A SCRIM machine travels over the highway network at regular intervals to measure the in situ road surface friction which is recorded as Mean Summer SCRIM Coefficient (MSSC) averaged over 10 metre lengths.

A skid resistant deficient site is one identified in the RAMM SCRIM deficiency programme as having an average deficiency over a complete site category or concurrent lengths measured in 10m intervals. The deficiencies are identified after analysis of SCRIM data which is compared against the IL.
Using the latest SCRIM data contained in the RAMM database reports are available showing all the deficient sites with a deficiency greater than 0.1 below the required IL.

Analysis of the deficient sites is considered in 3 stages.

Stage 1 provides the first filter and identifies sites with an average deficiency $\geq$ 0.1 below the required IL over the length of the site category. An example of the SCRIM report identifying these deficient sites is shown in Appendix A along with information to help with analysing the detail within this report.

The report labelled "SCRIM Deficiency by Seal Length and Site Category" is characterised by seal length and identifies Site Categories within a seal length that have an average deficiency over the whole length of the Site Category, greater than or equal

to 0.1 below the required IL.

Stage 2 is the second filter with deficiencies highlighted in another report labelled "SCRIM Sites Where Deficiency >0.1 For One Region"; an example of this report is shown in Appendix B. This report shows deficiencies in 10m lengths and where the deficient length(s) are concurrent the report shows the average deficiency for the entire length. To assist with determining appropriate lengths to treat, the report has break points for each unique seal length.

3.1 Site Categories

The state highway network has been divided into 5 categories which reflect the required level of friction at each location. These site categories have been grouped into two demand categories.
Using Table 1 in the specification, the SCRIM deficiency report shows two site demand categories; High Demand and Low Demand.

HIGH DEMAND — Sites with an Investigatory Level Value in Categories 1, 2 or 3 from Table 1 in the specification. (I.L. ≥ 0.45)

Due to the high demand for skid resistance at these sites, they are considered for treatment as deficient sites of 50m or greater in length.

LOW DEMAND — Sites with an Investigatory Level Value in Categories 4 or 5 from Table 1 in the specification. (I.L. <0.45)

Due to the low demand for skid resistance at these sites, they are considered for treatment as deficient sites of 100m or greater in length.

3.2 Treatment Selection

There are two methods for programming treatment of the deficiencies.

- Area Treatment — Where significant lengths of deficiency are included in the annual resurfacing programme.
- Maintenance Treatment — Where smaller lengths of deficiency are included for treatment during routine highway maintenance.

The Demand Sites are used to determine the minimum length of deficiency to be addressed under Area Treatment. The remaining sites are considered too short for Area Treatment, hence are to be included under Maintenance Treatment and

are treated as soon as practicable as part of the routine highway maintenance.

It is important to note that both Area and Maintenance Treatment may require a higher Polished Stone Value (PSV) chip than has been used in the past.

4. SITE INSPECTION

A field visit is necessary to confirm the deficiency. This site visit requires an inspection to determine the actual deficiency and consider other possible unforeseen contributing factors.

If the deficiency as indicated from the RAMM records is not obvious or in doubt, in exceptional circumstances, confirmation of the required SFC by physical measurement may be necessary. Skid resistance testers such as the Griptester are suitable for performing this evaluation. However, if the Griptester is not available, the British Pendulum Tester (which has questionable accuracy) may be used to compare the recorded deficient site with an adjacent road surface that has a known acceptable level of skid resistance.

The site visit is required to confirm the treatment selection and to determine the treatment length for resurfacing. The reason for the deficiency may be an isolated 'flushed' patch or numerous short intermittent lengths indicating a possibility of chip polishing for the length of the previous reseal. The site visit will confirm the exact cause and assist with determining the appropriate treatment.

5. TREATMENT SELECTION

Clause 5.1 of the specification provides a formula to determine the appropriate PSV for the chip to be used.

Where a higher PSV chip is required than can be provided from natural aggregate, processed synthetic chip such as "calcined bauxite" may be appropriate.

Where chip is unavailable locally and the cost of importing the appropriate chip is exorbitant, consideration should be given to alternative treatment solutions. These may include alignment or geometric improvements or more frequent resurfacing. The analysis may include benefit/cost comparisons for each option.

6. CONTINUING INVESTIGATION

Further investigation is necessary to determine the extent of deficient sites that are less than or equal to 0.1 below the required IL.

It is anticipated that SCRIM readings will be recorded annually, providing a more up to date picture of the extent of deficiencies.

A RAMM SCRIM deficiency report will be developed in due course to identify sites that are deficient ≤ 0.1 below the IL.

Although these deficiencies are less critical, the sites are included in a ranking procedure for determining the need to resurface, along with other candidates for resurfacing such as chiploss, cracking, etc. A 'weighting' is to be assigned to determine the priority for treatment based on the degree of deficiency, using the modified Maintenance Allocation Review Group (MARG) formula.

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SCRIM Deficiency by Seal Length and Site Category

Average Deficiency: less than or equal to -0.1

Start m	End m	Length m	Width m	Offset m	Urb/Rur Lanes	Traffic Adt	Est % HV	Load	Surface Material	Surface Date	Chip Size	Chip Source	Surveyed Length m	% Length Deficient Tot	% Length Deficient Inc	% Length Deficient Dec	Average Deficiency Net	Average Deficiency Inc	Average Deficiency Dec	Texture mm Avg	Texture mm Min	Texture mm Max	Accidents Total	Accidents Wet	Accidents Skid
002-0772 (424)																									
4280	6730	2450	16.2	0.0	R 2	6059	12	TWORS	20.04.199		4	PAHIATUA											0	0	0
Approaches to road junctions													120	100	100	100	-0.09	-0.17	-0.02	1.04	0.29	1.80			
Total Deficiencies													120	100	100	100	-0.09	-0.17	-0.02	1.04	0.29	1.80	0	0	0
002-0802 (430)																									
0	49	49	12.2	0.0	U 2	4545	12	AC	15.04.199		20	P/NTH HIGG											0	0	0
Normal roads													60	50	0	75	-0.04	0.10	-0.11	0.73	0.22	1.27			
Highest priority													20	100	100	0	-0.11	-0.11		0.29	0.25	0.32			
49	250	201	10.5	0.0	U 2	4545	12	RSEAL	28.04.199		3	LONGBURN											0	0	0
Highest priority													70	100	0	100	-0.14		-0.14	0.74	0.46	0.98			
250	1060	810	10.5	0.0	U 2	4545	12	RSEAL	25.12.198		3												0	0	0
Highest priority													120	100	100	100	-0.17	-0.20	-0.14	0.74	0.47	1.21			
1060	3660	2600	7.7	0.0	R 2	3732	12	COAT2	25.12.197		2												0	0	0
Highest priority													120	100	100	100	-0.12	-0.06	-0.19	1.47	1.19	1.80			
4360	5150	790	7.5	0.0	R 2	3732	12	TEXT	28.02.199		5	PRENTERS											0	0	0
Curve <250m rad. Gradient>10%													10	100	100	0	-0.14	-0.14		0.93	0.84	1.02			
Total Deficiencies													400	92	88	96	-0.13	-0.10	-0.15	0.94	0.22	1.80	0	0	0
002-0808 (468)																									
5260	5315	55	8.5	0.0	U 2	3333	12	TWO	17.12.1991		3	CHILD METAL											0	0	0
Approaches to road junctions													30	100	100	0	-0.12	-0.12		0.60	0.42	0.98			
5315	5490	175	8.5	0.0	U 2	3333	12	TEXT	11.03.199		5	MAMA RIVER											0	0	0
Approaches to road junctions													100	100	100	100	-0.10	-0.10	-0.10	0.56	0.21	0.85			
8460	8510	50	15.1	0.0	U 2	3939	12	VFILL	24.01.1987		6												0	0	0
Normal roads													50	100	0	100	-0.14		-0.14	0.31	0.19	0.48			
Total Deficiencies													180	100	100	100	-0.11	-0.11	-0.12	0.50	0.19	0.98	0	0	0