selection of techniques for repairing newly constructed seals

CHIPSEALING IN NEW ZEALAND
CHAPTER 12: PRACTICE NOTE 1

NZ TRANSPORT AGENCY
WAKA KOTAHI

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Introduction

This practice note provides suggestions for seal repairs. It identifies immediate responses and mitigating repair options. It also identifies permanent repair options that will enable the design life of a particular seal coat type to be achieved.

This practice note reinforces the information in chapter 12. It is considered that many failures to chipsealing could be satisfactorily repaired if immediate responses are implemented as per the instructions in chapter 12. Please also refer to seal performance and seal life issues which are covered in chapter 4 or pre-reseal repairs which are covered in chapter 7.

Key points

The aim is that repairs are designed and executed so that the expected life of the seal is not compromised.

It is important to figure out what has gone wrong before deciding on a possible solution.

The most successful repairs are those that:

- are completed promptly and competently, and
- minimise the addition of binder to the seal.

Some repair methods will lead to a shorter seal life and contract negotiations may be necessary. In some cases the only effective treatment to return the seal to its expected life is to remove the seal or to cover it with an appropriate bituminous mix.

This could be achieved by carrying out pavement type treatments such as recycling, applying a granular overlay, removing the seal and re-sealing, or applying a hot mix asphalt overlay.

Overall message for all treatments

Do not apply more bitumen in higher traffic areas (unless the problem is caused by low binder).

However, in some low traffic areas, a small amount of extra binder may be acceptable.

Table of treatment options

The table on the next page gives an indication of the treatments that may be appropriate to address specific failures of the seal.

The table addresses three common symptoms of seal failure (chip loss, flushing and chip roll-over).

Note: Some of these symptoms may not become apparent until the first cold or hot weather event.

The table lists possible causes for each symptom.

In some cases an immediate response is stated. This is the best immediate response for the situation but may not be the only one.

Where it says 'repair small areas...' apply dry chip to the areas of chip loss then use one of the recommended treatments.

The recommended treatment options for each cause are indicated by one of the following symbols:

P	Permanent treatment option which is likely to result in the seal achieving its expected life.
M	Mitigating treatment option which may not result in the seal achieving its expected life.
M/P	Could be a permanent treatment option but, if the expected seal life will be reduced (eg if the target texture is compromised) it is a mitigating treatment option.

There are many variables when dealing with a seal failure. The table provides a good starting point to help identify the best options for treatment.

Talk to your local experts if you are uncertain about the cause of the seal failure or which treatment option is best for the situation.

In some cases the best treatment option is to leave the seal as it is and negotiate reduced contract payment. For example, if the wrong binder has been applied or if dirty chip has been used the life of the seal will be shortened. It may, however, be more economical to renegotiate contract payments rather than replace the seal.

Symptom	Cause	Immediate response	Compact using controlled traffic (refer to Practice note 11.1)	Apply cold water	Apply small chip and sweep	Apply wet locking coat	Apply dry locking coat	Add fog coat of bitumen	Hot or pre-coated chip	Reliven binder	Water cutting	Sandwich seal	Slury seal	Remove seal	Recycle	Granular overlay	Hot mix asphalt overlay
Chip loss	Rain	Reduce traffic speed possibly as low as 20km/h				M/P			P	P		P		P	P	P	P
	Stress	Repair small areas before widespread chip loss occurs					P		P			P		P	P	P	P
	Dirty chip	Reduce traffic speed possibly as low as 30km/h	P			M/P				P				P	P	P	P
	Inadequate rolling	Repair small areas before widespread chip loss occurs	P					P	P	M				P	P	P	P
	Too little binder application	Repair small areas before widespread chip loss occurs				M		P				P	P	P	P	P	P
	Wrong binder too hard	Repair small areas before widespread chip loss occurs	M			M		M	M	M		P	P	P	P	P	P
	Wrong binder too soft	Repair small areas before widespread chip loss occurs	M				M		M			M	P	P	P	P	P
	Over application of chip	Keep sweeping to remove excess chip					M		M								
	Shaded or damp areas	Repair small areas before widespread chip loss occurs				M			M			P	P	P	P	P	P
	Wrong time of year for sealing	Control traffic immediately and repair small areas	M			M			M				P	P	P	P	P
	Absorption of binder into substrate					M		M				P	P	P	P	P	P
Flushing	Too much binder applied				M						M	M/P	P	P	P	P	P
	Inadequate preparation of substrate										M	P	P	P	P	P	P
Chip roll-over	Stress						P		P			P		P	P	P	P
	Incorrect binder choice		M				M		M			M	P	P	P	P	P
	Too hot – high pavement temperature	Consider adding more chip to act as a running course - as long as the design is adequate, this should not affect life of seal		M	M								P	P	P	P	P