

racked-in seal to minimise traffic delays during resealing

CHIPSEALING IN NEW ZEALAND CHAPTER 11: PRACTICE NOTE 2



April 2011

Introduction

Research in 2008 has demonstrated that racked-in seals (if constructed properly) can be road marked and opened to unrestricted traffic flow within one working day.

In a racked-in seal, the binder is applied followed by a relatively light application of the big chip and then a smaller chip is applied that sits between the larger chips.



A racked-in seal (one application of binder, two of chip).

The smaller chip effectively locks the larger chip in place. As most of the traffic load is carried by the bigger chip the total effect is a stronger seal. A racked-in seal is not so dependent on traffic compaction to obtain strength.

Benefits

The benefits of using racked-in seal are:

- reduction in traffic delays
- construction in an eight-hour working period including sweeping (if required) and road marking
- speed restrictions can be lifted at the completion of the road marking. This will reduce motorists' frustration at the traffic delays caused by chipsealing
- having no bitumen exposed to tyres reduces the chip pick up and flick and minimises the risk of bitumen tracking
- closely controlled chip application rates result in minimal:
 - loose chip on the completed chipseal surface
 - chip being flicked by vehicle tyres
 - sweeping before road marking.

Controlling traffic

Traffic must be controlled to ensure all parts of the lane are compacted and interlocked. Refer to practice note *Chipsealing in New Zealand, chapter 11: Practice note 1*.



Applying bitumen

Normal bitumen application processes apply.



Applying large chip

Once bitumen has been applied, apply the large chip. Ensure this is applied evenly over the surface and that there are good open bitumen windows. The first application rate should be as low as you can get it without getting binder pickup. The chip is rolled with a rubber tyred roller immediately after application.

Good spread



Section 9.11.5 suggests that the application rate for the first chip should be $1050/\text{ALD m}^2/\text{m}^3$.

The trials that are the basis of this practice note used $1600/\text{ALD m}^2/\text{m}^3$.

This is approximately double the coverage that would be used for a single coat chipseal as covered in *Chipsealing in New Zealand*, section 11.3.7.

Application of the second chip



Applying small chip

Once the large chip has been rolled, the small chip is applied. Ensure there is an even spread of small chip over the surface. The small chip should slot straight into the windows between the large chips. Ideally there should be no excess chip. The chip is rolled immediately by a rubber tyred roller.

Even spread



Too much small chip



Too much loose chip on seal surface and on road shoulder



Using traffic to compress

Traffic is directed over the new seal at 30km/h to compact and interlock the chip. Control the traffic to ensure all parts of the seal are compacted and interlocked. Once the seal has interlocked and settled, excess chip can be swept and road marking completed. Temporary speed limits can be removed or raised any time from the completion of road marking. All traffic management equipment can be removed as soon as the temporary speed limit is lifted. This may be as early as the afternoon peak.

Controlled traffic



Compacted and interlocked chip



Success factors

The success of this methodology relies upon:

- planning
- the correct chip application rates (if excess chip is applied the technique will not succeed)
- well trained sealing crew
- coordination of sealing materials supply
- coordination with sweepers and road markers.