PERFORMANCE OF HIGH SKID RESISTANT TREATMENTS

INTRODUCTION

Since 1999, VicRoads has placed high skid resistant treatments at various locations to provide more effective skid resistant surfaces for motorists in an effort to reduce the number of traffic incidents. The VicRoads Road Safety Skid Resistance Policy has resulted in the treatment of an increasing number of sites. These treatments were placed with the expectation that the increased skid resistance of road surfacings would produce a reduction in traffic incidents and rear-end collisions, with some expectation of reducing the severity of incidents.

Subsequently, in 2004/2005, VicRoads undertook a research project (Simpson, 2004) to investigate the skid resistance performance of high skid resistant treatments, and to determine if a relationship exists between placement of these treatments and traffic incident trends.

The objective of this Technical Note is to outline the outcomes of the research project and to provide guidance for use and placement of high skid resistant treatments.

HIGH SKID RESISTANT TREATMENTS

High skid resistant treatments are road surfacing treatments that typically comprise hard, polish resistant aggregates and resin based binder systems. High skid resistant treatments are expected to provide increased skid resistance, in comparison with conventional asphalt and sprayed seals.

There are various high skid resistant surfacing treatments available; however VicRoads data was only available for calcined bauxite aggregate. Therefore, taking this into consideration and VicRoads’ increasing use of calcined bauxite surfacing, the research project only focused on the performance of calcined bauxite treatments.

CALCINED BAUXITE

Calcined bauxite comprises aggregate that typically has a Polished Stone Value (PSV) of approximately 75, in comparison with values of around 48 to 60 for most naturally occurring aggregate sources. The resin based binder acts to hold the calcined bauxite aggregate in place, without the embedment of aggregates. The retention of good macrotexture of the calcined bauxite surfacing can be attributed to resistance to embedment and resistance to wear.

Calcined bauxite surfacings have been applied at various locations including intersections, approaches to pedestrian crossings, slip lanes, tight radius curves, and roundabouts. Figure 1 illustrates a typical application of calcined bauxite at the approach to an intersection.

Figure 1  Typical application of calcined bauxite

Typical defects associated with or that affect calcined bauxite treatments include:

- Delamination;
- Cracking;
- Stripping; and
- Condition of the underlying pavement.

PRINCIPAL FINDINGS & CONCLUSIONS

The research project involved investigating a total of twenty-nine sites, within Melbourne and Geelong, which have been treated with high skid resistant treatments. The sites included only calcined bauxite treatments as information for other specialised skid resistant treatments was unavailable. A number of criteria were taken into consideration when selecting the investigatory sites, including material, age of treatment and traffic volume. Skid resistance was measured using the Sideways Force Co-efficient Routine Investigation Machine (SCRIM). Figure 2 shows a typical skid resistance result for the calcined bauxite treatment.
In general, the research project found that:

- Calcined bauxite treatments provide a uniformly high level of skid resistance for at least 5 years after placement (note: no older sites were available for review as part of this project);

- The skid resistance of the calcined bauxite treatment appeared to be independent of the visual condition of the surface, age of the treatment, traffic volumes and surface texture. It was found, however, that skid resistant was affected by large areas of defects;

- The traffic incident data for the sites involved was reviewed prior to and following placement of the calcined bauxite surfacing. This data shows that approximately 46% of the total sites reviewed had a reduction in the number of traffic incidents on the treated area;

- The relationship between placement of the calcined bauxite treatment and a reduction in the number of traffic incidents is unclear. A review of the traffic incident data for the sites associated with the research project was undertaken, for ‘before’ and ‘after’ placement of the calcined bauxite treatments. This review found that the effectiveness of these treatments on traffic incident trends was inconclusive. The results suggest that improved selection and targeting of potential sites for high skid resistant treatments would further enhance the benefits from these treatments; and

- Results indicated that some yellow material (products that are not calcined bauxite) used for yellow pedestrian crossings at various locations provide low skid resistance. As such, it appears inappropriate to locate a low skid resistant surfacing within or at the end (potentially within the braking zone) of a high skid resistant treatment. It is preferred that calcined bauxite yellow pedestrian crossings be used at calcined bauxite areas for consistent results.

**USE & PLACEMENT OF HIGH SKID RESISTANT TREATMENTS**

The method for site selection is important in order to maximise the benefits of placing high skid resistant treatments. Part of the site selection process should involve a review of traffic incident data for the proposed site. Evaluating all available traffic incident data facilitates in maximising the potential and effectiveness of high skid resistant treatments in reducing traffic incidents. Selecting sites that would provide a reduction in traffic incidents should result in improved cost effectiveness of high skid resistant treatments.

To improve the process of targeting and identifying sites for treatment, it is recommended that traffic incident data (individual Victorian Police Reports, formerly referred to as Road Crash Statistics: Victorian Crash Details) be reviewed for each proposed site. Reviewing this data and assessing the possibility of a potential reduction in traffic incidents will provide guidance as to which sites will benefit from calcined bauxite treatments. Reviewing the data for the types of incidents would provide better choices for the extent of the calcined bauxite treatment areas e.g. left and right turn lanes. Therefore, traffic incident movement data should be investigated for the current sites to provide guidance for any future sites.

VicRoads Standard Specification Section 430, High Friction Surface Treatments, is now available. The specification is based on achieving performance criteria rather than providing prescriptive measures.

**REFERENCES**


VicRoads Technical Note No. 60 – Skid Resistant Surfacing

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