

Technical Note

Selection of Rehabilitation Treatments for Granular Pavements

TN 108

Introduction

This Technical Note provides general guidance on the selection of rehabilitation treatments for granular pavements. Reference to other VicRoads and Austroads publications are provided where more detailed advice can be obtained.

Rehabilitation is considered as any activity that improves the structural condition of a pavement while using some or all of its existing structure.

Treatments such as patching and resurfacing are not covered in this Technical Note.

Granular Pavements

The majority of Victoria's roads are granular pavements. A granular pavement consists of a thin bituminous surfacing (usually sprayed seal) placed over unbound granular materials of varying thickness and quality.

Granular pavements built in appropriate environments and taking into consideration traffic loadings provide a cost effective pavement solution. Through design, material specification and construction practices, VicRoads has demonstrated that granular pavements provide good long term performance.

Granular pavements are relatively low cost to construct, but do require regular maintenance.

Pavement Distress

The main types of pavement distress in granular pavements include deformation, cracking, loss of surface texture, edge breaks and potholes.

Pavement distress is identified through visual assessments, condition surveys, community feedback and increased maintenance costs.

Rehabilitation Process

The process of assessment, selection and design of suitable rehabilitation options is described in the following steps:

1. Site information
2. Investigative testing

3. Selection of treatment types
4. Treatment selection

1. Site Information

Site information can be obtained from visual inspections which helps identify the type and severity of distress. In addition, the following historical data can provide important information:

- Original pavement design
- Construction details
- Maintenance and rehabilitation records
- Climate conditions
- Effect of traffic on performance.

2. Investigative Testing

Investigative testing helps identify the cause(s) of the pavement distress. This assists in the selection of the most effective rehabilitation treatment for each site. Testing can be undertaken to determine pavement:

- Roughness
- Rutting
- Skid resistance/ surface texture
- Surface deflection
- Composition and material quality.

Austroads Guide to Pavement Technology Part 5, VicRoads Technical Bulletin TB40 and VicRoads Technical Note TN66 provide further detailed information about pavement investigations including identifying the relevant tests to be used in the investigation.

3. Selection of Treatment Types

The main types of rehabilitation treatments are:

- Structural overlay
- Stabilisation
- Reconstruction

Structural overlay, stabilisation and reconstruction are rehabilitation treatments and can provide improved service for greater than 20 years.

Structural Overlay is an additional pavement layer placed over the existing pavement. This treatment provides increased structural capacity as a result of the thicker pavement.

Structural overlay treatments (granular or asphalt) are determined using the design process in Austroads Guide to Pavement Technology Part 5 and with the requirements of VicRoads Code of Practice RC500.22.

Granular overlays (also called granular resheets) consist of crushed rock layers normally between 100mm to 300mm depth, with the addition of a wearing course.

Asphalt overlays consist of asphalt layers normally between 40mm to 200mm depth. This type of overlay has the advantage of very fast construction and the disadvantages of higher cost.

As structural overlays require raising the road surface level, consideration needs to be given to potential level controls such as kerb and channel, overpasses, bridges etc.

Stabilisation is the 'process of improving material to achieve a long term increase in its load bearing properties' (Austroads Guide to Pavement Technology Part 5). Stabilisation includes ripping and mixing the existing pavement layer and adding one or more of the following additives:

- Cementitious binders
- Lime
- Bitumen
- Granular materials
- Polymers

The choice of additive depends on the characteristics and quality of the existing pavement material and construction requirements. Past performance of additives in the pavement material is an important consideration.

Stabilisation is normally undertaken between 150mm to 250mm depth. Thicker layers of stabilisation require specialised compaction equipment to ensure adequate density is achieved. Stabilisation can be supplemented by a structural overlay.

Refer to Technical Notes TN8, TN21 and TN39 for more information.

Reconstruction includes the removal of all pavement material and replacing it with new material. The treatment can include replacement or stabilisation of the subgrade.

Reconstruction is usually the most expensive type of road repair and involves the most disruption to traffic.

4. Treatment Selection

The most appropriate rehabilitation treatment is selected after taking into account the following:

- the initial cost and whole of life costing
- traffic management for access to the site (limited hours for repair activities) and managing traffic through a worksite
- time of year for the works (sprayed seal works should not be undertaken during wet or cold periods)
- impacts on the community with reduced access (speed zones, detours etc.)
- community expectations of levels of service provided by the rehabilitation
- service life of the repairs
- local knowledge of successful previous treatments
- the importance of the section of road in the transport network.

References

1. Austroads Guide to Pavement Technology: Part 5: Pavement Evaluation and Treatment Design, 2011
2. VicRoads Code of Practice RC500.22, Selection and Design of Pavements and Surfacing
3. VicRoads Technical Note TN8 Foam Bitumen Stabilised Pavement
4. VicRoads Technical Note TN21 In situ Stabilisation of Pavements Using Cementitious Binders
5. VicRoads Technical Note TN39 Selection of Cementitious Binders for Stabilisation of Pavement Materials
6. VicRoads Technical Note TN64 Pavement Rehabilitation with Bituminous Surfacing Treatments
7. VicRoads Technical Note TN66 Guide for Pavement Investigations
8. VicRoads Technical Bulletin 40 Pavement Investigation - Guide to Field Inspection and Testing

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