

USING AUS-SPEC FOR MANAGEMENT OF UNSEALED ROADS

INTRODUCTION

This TECHnote provides guidance on using the AUS-SPEC specification system for the design, construction and maintenance of unsealed roads. Unsealed roads account for approximately 484,000 km from a total of 810,000 km of Australia's road network and provide access to rural and remote areas for passenger and commercial vehicles, haulage vehicles routes and emergency services access. They comprise either natural material or gravel and do not have a permanent water-resistant surface like bitumen spray seal, asphalt or concrete.

TYPES OF UNSEALED ROADS

Unsealed roads can be classified in two ways:

- Stage of construction: e.g. unformed, formed and formed and gravelled.
- Traffic volume: Austroads AGPT06 Table 2.1 classifies unsealed roads as Class U1 to U5, with U1 having the highest traffic volume. Similarly, Australian Road Research Board (ARRB) identifies unsealed road Classes 4A to 4D, with 4A having the highest traffic volume.

Pavement selection is based on consideration of the following:

- Traffic volume and type.
- Desired speed.
- Importance of the pavement for all weather access.
- Availability of local materials.
- Available funds.

MANAGEMENT OF UNSEALED ROADS

Unsealed roads can deteriorate rapidly due to weather conditions, traffic volume, construction quality, lack of availability of materials, poor drainage provisions and inadequate maintenance. Effective and efficient life cycle management of unsealed roads is a significant issue faced by most regional, rural and remote councils. The guiding principles of unsealed road management include:

- Maintenance of road safety through quality design
- Providing a high-density impervious gravel pavement to deflect rainfall away from the weaker subgrade.
- Reduction of road maintenance costs by using mechanical blending and chemical stabilisation to reduce defects such as potholes, slippery, dusty, ravelling, corrugating and rutting.
- Testing of materials crushed and screened in each quarry to ensure better service and extended resheeting life.

The AUS-SPEC specification system of *Templates* and procedures can be used for the design, construction and maintenance of unsealed roads and the *new Rural Roads Package* will assist local government to effectively manage these extensive assets.

Design

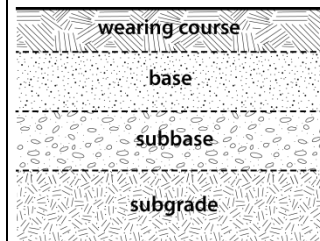
The *00 PLANNING AND DESIGN* workgroup covers quality requirements, bushfire protection, site regrading, control of erosion and sedimentation, geometric road design, pavement design, pathways and cycleways, design of stormwater drainage. These *Templates* can be used to document design requirements such as stage of construction, design life, pavement materials, construction documentation requirements.

Construction, rehabilitation and renewal

The following AUS-SPEC workgroups can be used to document the construction, rehabilitation and renewal requirements for unsealed roads:

- 01 GENERAL:* For tendering requirements, quality assurance, schedule of rates, integrated management, environmental management and standard contract checklists.
- 02 SITE, URBAN AND OPEN SPACES:* For construction of bushfire perimeter tracks, pathways, masonry walls, crib retaining walls, gabions and rock mattresses.
- 03 STRUCTURE:* For auxiliary concrete works.

11 CONSTRUCTION – ROAD RESERVE: For construction requirements of various elements relating to unsealed roads including control of traffic, control of erosion and sedimentation, clearing and grubbing, earthworks, stabilisation, pavement base and subbase, road openings, drainage elements such as subsoil and formation drains, pavement drains and various ancillary items like signposting and boundary fences.



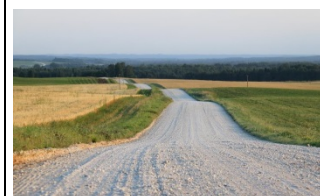
Layers associated with unsealed roads



Unformed road



Formed road



Formed and gravelled road

Stages of construction in unsealed roads

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13 CONSTRUCTION – PUBLIC UTILITIES: For construction of drainage elements relating to unsealed road construction including stormwater drainage, pipe drainage, precast box culverts and drainage structures.

Maintenance

Maintenance practices aim to slow down the rate of deterioration by ensuring the key factors affecting maintenance of unsealed roads as shown in the figure are adequately managed. Proactive maintenance and inspection programs aim to provide continued structural integrity, safety, minimise erosion and sedimentation and provide a free draining surface to the formation. Maintenance normally includes reshaping pavement cross-sections, replacing lost wearing course material, adding material where weaknesses occur, cleaning of table drains, and extending roadside drainage, and removal of surface defects. Details on improving materials and maintenance are provided in *TECHreport TR 08* and *TECHnote GEN 027*.

The larger City Councils have introduced integrated proactive and reactive maintenance systems based on priority response rankings determined by inspections. This information is converted by the works engineer into job instructions for the selected work team and links to the financial system for budget allocation.

In smaller country councils the Customer Request Management (CRM) forms are sent to the overseer who sorts the complaints into work team instructions. The overseer may inspect the defect prior to giving the CRM to the relevant team leader. The concept of reactive and proactive maintenance is sorted by the experience of the overseer.



Factors affecting maintenance of unsealed roads

Councils can use the AUS-SPEC maintenance system to collect records and prepare documentation relating to asset inspections, program and prioritise works, align service levels to maintenance and operations budgets, and manage risks relating to unsealed roads through a systematic set of processes. The following AUS-SPEC workgroups can be used for effective unsealed roads maintenance:

11 CONSTRUCTION – ROAD RESERVE: For control of traffic, control of erosion and sedimentation, stabilisation, wearing course, base and subbase, subsoil drains, signposting and guide posts related to rehabilitation and renewal of unsealed roads.

14 MAINTENANCE AND OPERATIONS – URBAN AND OPEN SPACES: For tree and vegetation control in road reserves, and boundary fence repairs.

16 MAINTENANCE AND OPERATIONS – ROAD RESERVE: For general requirements relating to road reserve maintenance, maintenance schedules and road reserve maintenance plan. Activity specifications include Templates for local shape correction, grading and resheeting of unsealed roads, grading and resheeting of unsealed shoulders, pothole repairs, stabilisation, ancillary works such as signage, road traffic control and storm damage response for road safety.

18 MAINTENANCE AND OPERATIONS – PUBLIC UTILITIES: For procedures on general maintenance of drainage elements and structures, including pits, culverts and drains located in the road reserve.

CONCLUSION

Unsealed road networks represent a significant portion of Australia's infrastructure. Rural and remote Councils using the AUS-SPEC specification system to document the design, construction and maintenance of unsealed roads may significantly improve the structural integrity, safety and performance of unsealed roads and better serve their rural and remote communities using the AUS-SPEC Rural roads package.

Relevant publications

Austrroads

AGPT01 *Guide to pavement technology Part 1: Introduction to pavement technology.*

AGPT04 *Guide to pavement technology Part 4: Pavement materials.*

AGPT06 *Guide to pavement technology Part 6: Unsealed pavements.*

Australian Road Research Board

ARRB Group 2020, *Best Practice Guide 2 – Unsealed roads.*

Australian Rural Road Group

Juturna Consulting for Australian Rural Road Group 2010, *Going nowhere - the rural local roads crisis, its national significance and proposed reforms.*

Juturna Consulting for Australian Rural Road Group 2011, *Worth Feeding - case studies of rural local road efficiency and reform of Australia's road pricing and investment systems.*

Relevant NATSPEC TECHreport

TECHreport TR 08 Management of Council gravel pits in country areas – A case study

Relevant NATSPEC TECHnotes for unsealed roads

NTN GEN 017 Using AUS-SPEC for asset management

NTN GEN 018 Using AUS-SPEC for asset maintenance

NTN GEN 019 Using AUS-SPEC for contract documentation

NTN GEN 026 Otta seal - A different approach to road sealing

NTN GEN 027 Maintenance of unsealed roads

Relevant AUS-SPEC workgroups for unsealed roads

00 PLANNING AND DESIGN
01 GENERAL
11 CONSTRUCTION - ROAD RESERVE

13 CONSTRUCTION - PUBLIC UTILITIES

14 MAINTENANCE AND OPERATIONS - URBAN AND OPEN SPACES

16 MAINTENANCE AND OPERATIONS - ROAD RESERVE

18 MAINTENANCE AND OPERATIONS - PUBLIC UTILITIES