

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 413,000 km of a total 678,000 km of Australia's local road network. They provide access to rural and remote areas for passenger and commercial vehicles, haulage vehicle routes and emergency services access. They are constructed from 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 or 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, 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:

- Improving road safety through quality design.
- Providing a high-density impervious gravel pavement to deflect rainfall away from the weaker subgrade.
- Reducing road maintenance costs by using mechanical blending and chemical stabilisation to minimise defects such as potholes, ravelling, corrugating and rutting.
- Testing of materials sourced from quarries to ensure better serviceability 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 *Rural Roads Package* will assist rural and regional councils to effectively manage their road assets.

Design

The **00 PLANNING AND DESIGN** workgroup covers quality requirements, bushfire protection, site regrading, and control of erosion and sedimentation. It also covers the design of roads, pavements, pathways and cycleways and stormwater drainage. These *Templates* can be used to document design requirements such as stage of construction, design life, pavement materials and construction documentation requirements. Alternatively, use the AUS-SPEC Design Reference and associated checklists.

Construction, rehabilitation and renewal

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

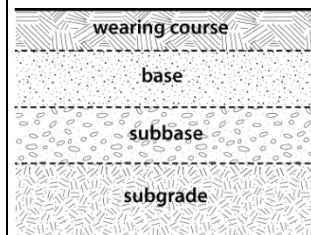
01 GENERAL: For tendering requirements, quality assurance, schedule of rates, integrated management, environmental management and standard contract checklists.

02 SITE, URBAN AND OPEN SPACES: For construction of (fire access and fire trails), 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 traffic management, control of erosion and sedimentation, clearing and grubbing, earthworks, stabilisation, pavement base and subbase, road openings; subsurface drainage and various ancillary items.

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.



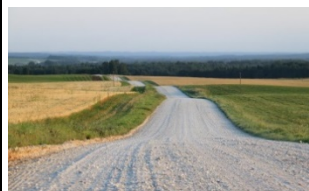
Layers associated with unsealed roads



Unformed road



Formed road



Formed and gravelled road

Stages of construction in unsealed roads

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Alternatively use the AUS-SPEC Construction Reference and schedules to document the construction requirements.

Maintenance

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

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 a work team and links to the financial system for budget allocation.

In smaller country councils the Customer Request Management (CRM) forms are sent to an 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 managed by the experience of the overseer.



Key factors affecting maintenance of unsealed roads

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

11 CONSTRUCTION – ROAD RESERVE: For traffic management, control of erosion and sedimentation, stabilisation, wearing course, base and subbase, subsoil drains; signposting 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 and 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 structural integrity, safety and performance. Using the *Rural Roads Package* to effectively manage these extensive assets, will assist Councils to better serve their communities.

Relevant publications

Austrorads

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 *AUS-SPEC for asset management*

NTN GEN 018 *AUS-SPEC for asset maintenance*

NTN GEN 019 *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

Further information

For further information see the following,

www.aus-spec.com.au

and refer to the

[National Worksection Matrix](#)

for selection of worksections.