AUS-SPEC
Case Studies and Technical Resources

IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

AUS SPEC

NATSPEC// Construction Information

Celebrating 50 Golden Years of NATSPEC

CONTENTS

NATSPEC

NATSPEC is a national not-for-profit organisation that aims to improve the construction quality and productivity of the sustainable built environment through leadership of information. Founded in 1975, it is owned by the design, build, construct and property industry through professional associations and Government bodies.

NATSPEC maintains the National Building Specification, the only comprehensive, up-to-date national Australian master specification, as well as the National Classification System, which assists specification writers in organising the content of specifications. It is also responsible for the AUS-SPEC local government specification system, the National BIM Guide, and other services. NATSPEC is impartial and is not involved in advocacy or policy development. NATSPEC is proudly celebrating its 50th anniversary this year, marking five decades of supporting quality and consistency in the Australian construction industry.

For more information, visit www.natspec.com.au

IPWEA

The Institute of Public Works Engineering Australasia (IPWEA) is the peak association for infrastructure asset managers and professionals who deliver public works and engineering services in Australia and New Zealand. IPWEA has expanded its traditional focus on local government engineering to include broader public works, thereby covering all tiers of Government as well as the private sector.

IPWEA is committed to developing the capacity and capability of the sector by providing comprehensive educational programs, conferences and technical publications. It offers the chance to network and collaborate with peers both locally and internationally. IPWEA promotes professionalism, education and knowledge sharing in its community.

For more information, visit www.ipwea.org

Front cover image courtesy of MidCoast City Council and back cover image courtesy of Blacktown City Council.

AUS-SPEC Local Government Specifications

AUS-SPEC is the essential technical resource for the life cycle management of civil infrastructure assets. As a national local government specification system, AUS-SPEC addresses the challenges associated with inconsistencies in regulation and processes that can occur between jurisdictions controlled by local government. It is a joint venture between NATSPEC and IPWEA.

NATSPEC began maintaining AUS-SPEC in June 2007 on behalf of IPWEA and Standards Australia. It is the key organisation that updates, develops and distributes AUS-SPEC specifications and their associated library of information. NATSPEC manages the National Building Specification, which is owned by Government and industry bodies.

AUS-SPEC specification documents were first released in 1997. Supported by the Australian Local Government Association (ALGA), this was a joint venture between IPWEA and Statewide Roads through its Technical Management consultancy (SWRTM), part of Sinclair Knight Merz (now Jacobs), in coordination with several Councils. Standards Australia took over as IPWEA's joint venture partner in 2003. AUS-SPEC is now updated and maintained by NATSPEC with regular collaboration with a large number of organisations, including IPWEA national and state divisions, NAMS, Austroads, AfPA, ASCP, AustStab and several other stakeholders to ensure representation of current practices in the construction industry.

AUS-SPEC provides documentation for the design, construction and maintenance of local government assets and assists Councils in providing quality services that are safe for the community and the environment. The information provided in AUS-SPEC documents is updated every October to include changes in standards, regulations, industry practices and technologies. Like the performance-based National Construction Code (NCC), this reflects the dynamic environment of the construction industry by encouraging innovation.

AUS-SPEC is aligned to the NATSPEC National Classification System, which has been widely adopted by the construction industry. This establishes a common language between Governments, organisations and consultants, and improves communication between all parties working on a project. A common language helps prevent misinterpretation and significantly reduces the risk of delays, rework and extra costs.

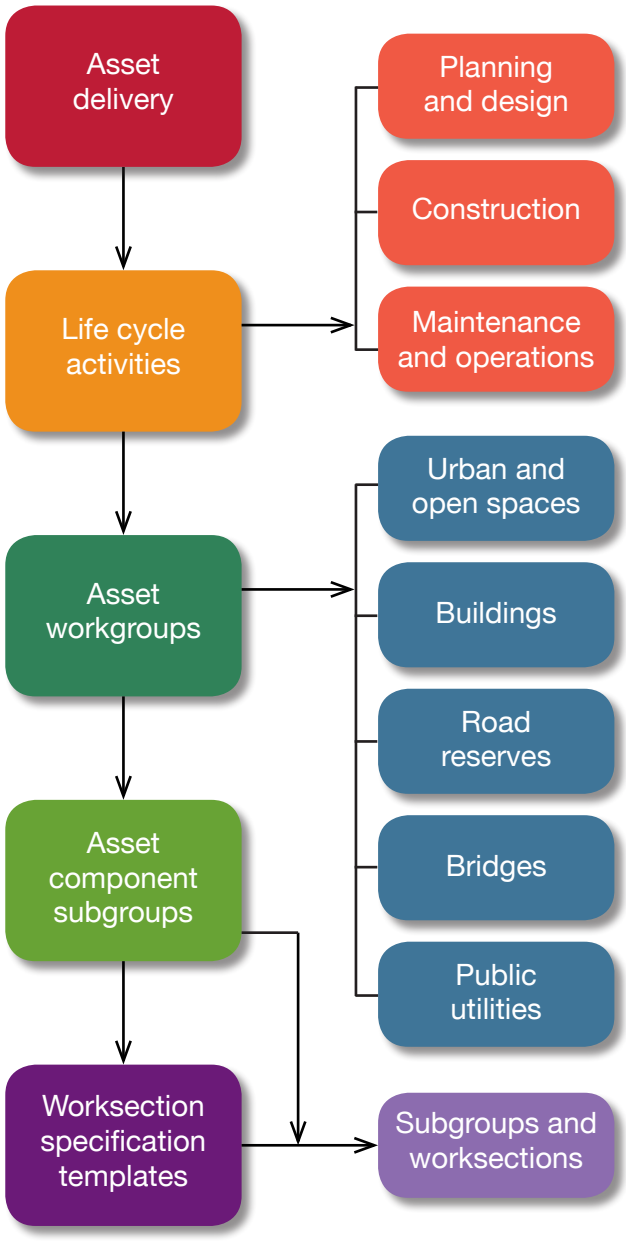
The AUS-SPEC system provides tools, technical specification templates, a framework, and processes to document requirements for various asset life cycle activities. The documents for maintenance and contracts are particularly useful for Councils in allocating budgets for priority projects.

AUS-SPEC specifications are available via a subscription service. The eight available packages are:

- Complete
- Contracts
- Urban and open spaces
- Buildings
- Roadworks and bridges
- Public utilities
- Maintenance
- Rural roads

The system supports technical and contractual consistency between Councils, while allowing flexibility to edit and add project-specific requirements. An essential technical resource, AUS-SPEC documentation underpins Council knowledge.

For more information, including media releases and technical resources, visit www.aus-spec.com.au



AUS-SPEC Asset Classification Structure.

BLACKTOWN CITY COUNCIL
MAINTENANCE ACTIVITY MAPPING

Blacktown City Council conducted a comprehensive review of maintenance activities to enhance the management of its $5 billion infrastructure asset portfolio. The AUS-SPEC maintenance folios provided a strong foundation for defining additional necessary activities identified throughout the review.

Background

Blacktown City Council developed its asset maintenance activities originally from the AUS-SPEC maintenance folios and activity specifications. Its rapid growth has led to many contemporary assets such as Water Sensitive Urban Design facilities. Additionally, at times systems have not been reconfigured to match organisational restructures and procedural changes. In some circumstances this has led to gaps and misunderstandings in maintenance delivery. To improve clarity and support the implementation of the Council's mobility solution, it was essential to resolve these areas both in terms of maintenance decision making and delivery.

Developing a Comprehensive List of Maintenance Activities

Through numerous stakeholder workshops, Council asset management staff conducted a detailed analysis of maintenance failure modes for its entire asset hierarchy. The results aligned well with the AUS-SPEC maintenance folios for buildings, roads and open space. However, a large number of additional activities were identified. Although additional activities were identified in all asset types, larger gaps were present in plant & equipment, water sensitive urban design assets and bridges.

At the conclusion of this mapping the information was distilled into approximately 1,800 maintenance activities/ asset type combinations.

Roles and Responsibilities

Maintenance responsibilities for some assets is not always clear and is largely dependent on the plant and equipment, and skills of the work crew. For example, maintenance of a barbeque in a local reserve may relate to any number of maintenance activities such as:

- Routine servicing (cleaning and safety inspections)
- Structural maintenance (physical repairs)
- Utility maintenance (LPG systems and other operational requirements)

Graffiti removal and pressure washing of paving area by council maintenance crew. Images courtesy of Blacktown City Council.

The above example represents three activity/asset combinations for which Council assigned responsible departments:

- Maintenance decision making
- Maintenance delivery
- Maintenance budget

This extensive mapping ensures all assets—ranging from roads and bridges to specialised urban design facilities—receive tailored maintenance aligned with real-world operational needs.

Future Considerations

The current mapping relates to maintenance activities that result in physical repair of an asset, both reactive and/or programmed. Through this process, Council also mapped activities that do not require physical repair such as asset health monitoring and specialist reports such as fire safety statements for buildings.

Additional activities created in this process are being defined using the AUS-SPEC activity specification. A current collaboration with E2Designlab will see the inclusion of much needed activity definitions for water sensitive design assets by the end of 2025.

We look forward to sharing and working with AUS-SPEC with a view to expand the current folios.

Summary

Thanks to the foundations provided by the AUS-SPEC maintenance activity folios and our comprehensive approach, Council is confident that work allocation is effectively determined, improving operational efficiency, budget management and forecasting.

By establishing this framework, Blacktown City Council has enhanced operational efficiency, streamlined budget forecasting, and built a resilient maintenance structure adaptable to future infrastructure growth and organisational changes.

Blacktown City Council has been delivering quality infrastructure projects for its communities and was the recipient of the IPWEA Engineering Excellence Minister's Award in 2024 and 2025.

One example is the new Blacktown Animal Rehoming Centre, the largest of its kind in the southern hemisphere. Council aims to reduce impounding rates and increase animal adoptions through its innovative design and facilities. This project received the 2024 Engineering excellence Minister's award and is equipped with modern features, transparent spaces that enhance animal welfare and improve community perceptions of adopting impounded animals. The AUS-SPEC maintenance activity folios will assist in maintaining this facility for years ahead.

Blacktown's new Animal Rehoming Centre transforms welfare and adoption outcomes. Image courtesy of Blacktown City Council.

Adam Cowell accepting the 2024 Minister's Award. Image courtesy of Blacktown City Council.

Case study produced in partnership with Blacktown City Council.

Culloden Road, Marsfield. Image courtesy of City of Ryde.

CITY OF RYDE
MAINTAINING COUNCIL ROADS USING AUS-SPEC

City of Ryde
Lifestyle and opportunity at your doorstep

The City of Ryde primarily undertakes works on asphalt roads, with a focus on asphalt resurfacing and reconstruction. In the 2024/25 financial year, 25 road related projects worth a combined total of $5 million were completed. All these projects were delivered using AUS-SPEC specifications, which have become an integral part of the Council's approach to infrastructure delivery.

City of Ryde is maintaining most of the flexible pavements located throughout its Local Government Area (LGA). New road infrastructure is typically focused on emerging developments, rather than within already established residential areas.

> *"AUS-SPEC has become a core part of how Council delivers road infrastructure at the City of Ryde. Its structured approach has improved contractor communication and ensured projects are delivered to a high standard."*
>
> Amandeep Singh, Senior Civil Infrastructure Engineer, City of Ryde

The use of AUS-SPEC has provided significant benefits to the City of Ryde. The specifications offered a consistent and compliant framework that aligned with best-practice design and construction standards. This consistency helped streamline project delivery by saving time and resources, as the documents were clear, easy to navigate, and effective in guiding both design and construction teams.

From a contractual standpoint, AUS-SPEC provides clarity and structure that supports better communication with contractors. The Council finds the documentation particularly valuable for compliance checking, which reduces risk, rework, disputes, variations, and misinterpretations during project execution.

Khartoum Road, Macquarie Park. Image courtesy of City of Ryde.

To date, the City of Ryde has not encountered highly complex projects that require extensive customisation of AUS-SPEC documents. The standard AUS-SPEC specifications have so far proven sufficient for the nature and scale of work undertaken by the Council.

The AUS-SPEC Update summary document is of benefit to understand the key annual updates. Future AUS-SPEC improvements have been discussed and when implemented will be valuable for on-site works outlining key requirements. This will help further bridge the gap between technical specifications and day-to-day construction activities, supporting greater efficiency and compliance on site.

Westminster Road, Gladesville. Image courtesy of City of Ryde.

Case study produced in partnership with City of Ryde.

Beautification of Wingham streetscape, conversion of the Bent/Farquhar intersection to an offset T layout with enhancements to streetscape through increased sidewalk areas, specialty asphalt treatment and the undergrounding of power. Image courtesy of MidCoast Council.

MIDCOAST COUNCIL STREAMLINING PANEL CONTRACTS WITH AUS-SPEC

Scope of the Project: MidCoast Council used AUS-SPEC documentation to create their panel contracts. The Council has been running asphalt and stabilising panels using AUS-SPEC specifications for more than 10 years, and for the bitumen panel for more than 20 years. The panels run across multiple years with options for extensions (typically 2 yrs + 1yr). The General Conditions of Contract is AS 2124 and works/projects are conducted as separable portions.

AUS-SPEC documentation: AUS-SPEC information is used for the following panel contracts documentation:

- Tendering and contracts – The Council has uploaded Council's edited template for General Conditions of Contract. The template includes critical information to conform with the royalty agreement that is in place. There are office edited templates for cover sheets, technical specifications, information for tenderers, conditions of tendering, Appendix 1 – Statement of business ethics and a customised version of Tender Submission package.
- Asphalt – Relevant umbrella worksections are selected including general requirements for supply, quality management, environmental management, traffic management, control of erosion and sedimentation, cold milling of asphalt, flexible pavement base and subbase and asphalt. There is a trigger at 1000 tons of asphalt for doing a request for quotation (RFQ) with the panel with existing pricing acting as a ceiling.
- Bitumen – Relevant umbrella worksections are selected as referenced in asphalt and sprayed bituminous surfacing.
- Stabilisation work – Relevant umbrella worksections are selected as referenced in the asphalt, flexible pavement base and subbase, and appropriate stabilisation worksections for the works required. It is set up as a full or part service and has the capability of implementing preparatory works. A subpanel is linked to asphalt capping of stabilised gravel patches where these works are delivered by the same contractor.

"By having the AUS-SPEC specifications at the core of Council's panel contracts, the panel renewal process every few years goes smoothly because of the efforts of NATSPEC to keep the technical specifications up to date with industry standards."

Stuart Small, Senior Project Manager Transport, MidCoast Council

- Major and minor civil works – Council uses published development specifications and customised worksections included in the Roadworks package for RFQs and minor works. The RFQs detail specific changes to the published specifications that are relevant for the project, along with a detail scope of works package.

Benefits: Pay items and their descriptions are customised to clearly place risk on the party that can best manage the risk, and have been componentised (through adjustment factors) to support working in the large area managed by MidCoast Council (roughly 10,000km^2). The structure of the pay items enables over 95% of works to be delivered using the pay items on a do-and-charge basis. Some unique works require an upfront variation through creation of a special pay item for that separable portion. The AUS-SPEC documentation helps save time, is very productive, has less administration burden for the extended team to utilise the available information and reduces risks. Most of the preparatory work is done using the appropriate templates and the system allows to identify where companies have weaknesses. The contractors also benefit from the quality of documentation as it makes it easier for them compared to other panel contract setup for Councils.

Customising specifications to reflect sustainability: The approach to sustainability for each Council will vary depending on availability of resources and the capability of suppliers. Each Council needs to determine the capability of its contractors and suppliers so that the specifications can be updated to suit local conditions and capabilities. Through the gradual refinement of the specifications each time they are updated and reviewed, the standard of the work delivered to the community will be raised.

The regional road, Stroud Hill Road, is crossed by the North Coast Rail Line and links Stroud with Dungog. MidCoast Council used special grant funding to uplift the level of service at this location. Image courtesy of MidCoast Council.

Case study produced in partnership with MidCoast Council.

Images show the renewal of Clarence Street in Sydney. Images courtesy of City of Sydney.

SSROC PROCURE RECYCLED: PAVING THE WAY

Paving the way stage 1 - Recycled Crushed Glass
Southern Sydney Regional Organisation of Councils (SSROC) Paving the way initiative is a collaboration between local government engineers and civil works industry to support and prioritise the use of recycled materials in procurement, aligning with both local and federal strategic policies.

In late 2019, SSROC launched *Procure recycled: Paving the way* initiative. In 2020, Stage 1 of this initiative, sixteen Sydney metropolitan councils joined forces to recycle nearly 100 million glass containers per year into local roads, through the largest local government led procurement of recycled road-making materials in NSW history. SSROC worked closely with TfNSW, EPA, Department of Planning and Environment and AUS-SPEC to refine specifications and align policies on recycled civil works materials.

Paving the Way is supporting the development of local recycling infrastructure, supporting local jobs, and increasing the value of recyclable glass. It is also hoped that the initiative will increase community confidence in recycling. As recognised by the Greater Cities Commission, *Paving the Way* provides a scalable and replicable model for using Council procurement to promote markets for recovered materials in the future.

AUS-SPEC documentation
The Councils use TfNSW and AUS-SPEC specifications for recycled crushed glass (RCG) in roads and footpaths. AUS-SPEC specifications, which include the use of RCG, crumb rubber, reclaimed asphalt pavement (RAP) and other recycled materials in asphalt, assure stakeholders of safety and performance. AUS-SPEC worksection 1144 Asphalt (Roadways) provides the maximum percentage allowances, types of glass, nominal size, properties, limits of contamination, and testing specifications for granulated glass aggregate in dense graded asphalt.

The collaborative approach between SSROC and NATSPEC has encouraged a large number of Councils to join the procurement. Councils have saved 20% in costs and created a closed-loop market for one-third of domestic glass collections. With local government actively promoting sustainability, AUS-SPEC adds value through specifications and stakeholder engagement.

Paving the way stage 1 – City of Sydney

The Paving the Way stage 1 initiative has been demonstrated by City of Sydney, where 1 km stretch of Clarence street in the Sydney city centre was refreshed. Nearly one-quarter of the materials used were recycled – a mix of crushed glass and asphalt ripped up from other Sydney streets. City of Sydney, as a member of SSROC, is leading by using recycled materials and is paving a new future for their roads. Around 120,000 glass jars and more than 200 tons of reclaimed asphalt were used in the project. This work was undertaken between Druitt and Jamison streets at night to minimise disruption, using the recycled materials to renew more than 8,000m^2 of road surface. According to City of Sydney, "What was once considered waste is now being seen as a resource. This shift away from linear thinking is vitally important to tackling climate change and improving circular economy outcomes". Since July 2021, City of Sydney has used around 1.5 million recycled glass jars and more than 6,000 tons of reclaimed asphalt in road renewal. AUS-SPEC specifications, especially for recycled content, provide critical confidence and buy-in for stakeholders.

Paving the way stage 2 – Recycling tyres for roads

SSROC led one of Australia's largest multi-council demonstration projects as part of the *Paving the Way Stage 2 – recycling tyres for roads* initiative using rubber recovered from end-of-life tyres blended into bitumen to enhance asphalt durability, performance, and environmental sustainability of road pavements.

"Using crumb rubber in asphalt pavement construction and maintenance operations makes a substantial contribution to low-carbon infrastructure, minimising long-term maintenance costs, maximising performance, and promoting a more sustainable approach."

Helen Sloan, Chief Executive Officer, SSROC

Conducted by RMIT University, a life cycle assessment titled *Life Cycle Assessment and Potential Environmental Benefits of Crumb Rubber Asphalt using Field Data* studied the environmental impacts associated with incorporating recycled rubber from end-of-life tyres into bitumen for asphalt pavement construction. It found that recycled rubber extends pavement service life, enhances its performance and durability, leading to reduced maintenance needs and longer lasting infrastructure, reduces demand for raw materials, and lowers environmental impacts.

Further, the use of warm mix asphalt additives alongside crumb rubber offers dual environmental benefits: it reduces fumes and odours during manufacturing and paving, while also lowering energy consumption at the plant requiring energy to heat aggregates and bitumen. The use of other recycled materials such as recycled crushed glass and RAP, alongside crumb rubber helps reduce environmental impacts by decreasing the need for natural resources.

Carlton, Bayside Council during operation.
Images courtesy of SSROC.

Carlton, Bayside Council finished surface.
Images courtesy of SSROC.

PROCURE RECYCLED: PAVING THE WAY DEMONSTRATION PROJECT

This project was led by SSROC with the support of Tyre Stewardship Australia (TSA), and in partnership with the Australian Flexible Pavement Association (AfPA), the *Paving the Way: Recycling Tyres for Roads* project involved: Bayside, Burwood, Canada Bay, Canterbury-Bankstown, City of Sydney, Georges River, Inner West, Randwick, Sutherland, Waverley, Woollahra and Northern Beaches councils.

The study found that incorporating recycled rubber into asphalt mixes using the wet method (crumb rubber assimilated into bitumen at high temperature to produce a modified polymer) can reduce environmental impacts during the production and construction phase compared to conventional asphalt. SSROC councils have demonstrated that incorporating crumb rubber into asphalt roads using the wet method holds significant promise for reducing the total carbon footprint of these roads by up to 30% throughout their service life. This can potentially offset the environmental impacts generated by new road construction and ongoing maintenance operations, therefore contributing to the decarbonization of the road infrastructure. Using crumb rubber in roads is a key way Australia can derive value from end-of-life tyres in the circular economy.

The 12 member Councils of SSROC.

In collaboration with SSROC member councils, AfPA and RMIT, AUS-SPEC specifications will now include a minimum percentage of crumb rubber content for dense graded asphalt, which will be most suitable for local government applications.

With local government playing an increasingly active role in the sustainability supply chain, AUS-SPEC creates additional value by promoting sustainability through its specifications and stakeholder engagement. This Stage 3 SSROC led project demonstrates that crumb rubber-modified asphalt (wet method) is an effective way to improve recycling practices, helps councils achieve their sustainability targets and improve the quality and performance of their road network. Australia's performance-based building regulations encourage innovation.

AUS-SPEC provides local governments with the technical expertise they need to maximise infrastructure sustainability while enhancing the wellbeing of their communities now and in the future.

SSROC:

The Southern Sydney Regional Organisation of Councils Inc (SSROC) is an association of 12 Councils in the area south of Sydney Harbour, covering central, inner west, eastern and southern Sydney. SSROC provides a forum for Councils to collaborate on issues of common interest. Together, the member Councils cover a population of about 1.8 million, one-third of the population of Sydney. SSROC seeks to advocate for the needs of member Councils and bring a regional perspective to the issues raised.

Councils that participated in *Procure Recycled: Paving the Way* include Bayside, Burwood, Canada Bay, Canterbury-Bankstown, City of Sydney, Fairfield City Council, Georges River, Hornsby, Inner West, Northern Beaches, Randwick, Ryde, Sutherland, Waverley, Willoughby and Woollahra.

Installation of utilities in the road reserve. Image courtesy of SOCC.

SOCC
BUILDING A BETTER FUTURE THROUGH COLLABORATION

A Century of Coordination
Established in 1909, the Streets Opening Coordination Council (SOCC) evolved from public frustration over frequent road and footpath disruptions in Sydney. As the Daily Telegraph noted at the time:

"The trouble lies in the fact the City Council, the Gas Company, the Tramway Department, and the Postal Department do not arrange to do all their work simultaneously. If such a scheme could be carried out there would be a minimum of annoyance to the public."

Originally formed as the Sydney Streets Opening Conference by the Lord Mayor of the City of Sydney, the group brought together stakeholders managing underground services, roads and other public spaces. In 1995, it expanded, to become the NSW Streets Opening Conference and in 2013, it was formally incorporated as SOCC to become the peak industry association for the coordination of street works and collaboration between stakeholders who have an interest in managing infrastructure assets in roadway corridors and public spaces.

Since its inception, SOCC has been focussed on improving collaboration and developing best-practice guidelines to deliver optimum outcomes for the community. The experience has been enhanced by the collaboration between SOCC, IPWEA and NATSPEC/AUS-SPEC.

In recent years, there have been significant changes in the operational environments of both utility/service providers and local councils. Corporatisation and the introduction of competitive tendering, together with community service obligations, have sharpened the focus on achieving cooperative and efficient practices.

"Bringing SOCC and NATSPEC together has been a game-changer for our strategic operations. By aligning SOCC's deep expertise in collaboration and best-practice guidelines with NATSPEC's resources and coverage of stakeholders nationwide, we've created a synergy that enhances both resilience and agility across our infrastructure. The combined force of SOCC and NATSPEC ensures that our systems are not only robust and secure but also optimised for performance and scalability. It's a partnership that truly exemplifies the power of integrated strategy."

Nabil Issa, CEO, Streets Opening Coordination Council

SOCC's Role and Collaboration with AUS-SPEC
SOCC facilitates coordination among utility providers, road authorities, and other agencies who undertake design and/or construction work in road reserves and public spaces. It sets guidelines and codes of practice to ensure efficient, safe, and minimally disruptive infrastructure work. In response to evolving industry needs, SOCC has developed the following key resources alongside IPWEA and AUS-SPEC:

- *Model Agreement for Local Councils and Utility/Service Providers*
- *AUS-SPEC 1151 – Road openings and restoration*
- *AUS-SPEC 1152 – Road openings and restoration (Utilities)*
- *Guide to Codes and Practices for Streets Opening*

These documents are regularly updated to reflect modern practices and promote collaboration, cost-efficiency, and quality restorations.

The ***Model Agreement for Local Councils and Utility/Service Providers*** is intended as a practical tool to promote cooperation and good practice in the interaction between Local Councils and utility/service providers.

AUS-SPEC *1151 Road openings and restoration* was developed primarily to reflect the requirements of Councils in their management of road openings and restorations and customised to suit Council's specific requirements.

Following release of the Model Agreement and in view of significant developments in contractual arrangements for providing utility services, AUS-SPEC *1152 Road openings and restoration (Utilities)* was developed to reflect the utility/service provider's needs for contracted road restorations. This is a standalone document that covers the clearing, excavation, backfilling and restoration activities associated with the installation of utility services within road reserves. This document is referred to in the SOCC Guide as the specification applicable to utility/service provider streets opening works.

The Model Agreement recognises that Road Authorities have responsibility for the management of road reserves, and utility service providers have an obligation to restore disturbed roads surfaces to an agreed standard. It recommends restoration works to be carried out in accordance with *AUS-SPEC 1151* and *1152* as appropriate.

The ***SOCC Guide to Codes and Practices for Streets Opening*** supports the following objectives:

- Foster coordination of underground utility works, avoid damage to other underground services, and minimise the impact of those activities on the natural and built environment and the community that use the road reserve space.
- Establish agreed footway allocations for the provision of utility services.
- Minimise interference to traffic and pedestrian flow caused by road openings for the installation, operation and maintenance of utility services.
- Encourage the use of agreed codes and practices for the excavation, back filling and reinstatement of roadways and footways.
- Encourage the use of new and innovative technologies to minimise damage to utility and road infrastructure assets.

Several Councils have successfully customised *AUS-SPEC 1151* to meet their local needs. One such example is from Northern Beaches Council.

"The AUS-SPEC document is well laid-out. The restoration specification is very involved because it's a specification to restore everything. The simplicity of it is such that you can do it yourself."

Matthew Holt, Senior Engineer, Northern Beaches Council

This in-house customisation saved time and costs and improved coordination with contractors and utility groups, particularly around noise, night works, and restoration quality.

Transforming Infrastructure Coordination With iWORCS™

Every day, utilities across Australia need to dig up roads to construct or replace critical infrastructure that delivers essential services. At the same time, Councils and other road authorities are conducting vital road re-surfacing, re-paving and beautification works to ensure that our road network is fit for purpose. Uncoordinated street works present several critical challenges among various stakeholders:

- Roads are dug up just after being resurfaced. Proper sequencing of road works is achievable if visibility is provided.
- Financial waste resulting from multiple excavations and restorations impacting the same footprint.
- Public inconvenience for commuters and excessive disruptions due to extended road closures.
- Asset integrity is compromised by the repeated excavation and repairs of existing assets.

These issues underscore the need for a robust solution that can streamline coordination and improve overall efficiency in infrastructure delivery projects.

SOCC has developed a solution, known as iWORCS™ (infrastructure WORks Coordination System) for road authorities and utility asset owners in NSW in 2017, to identify opportunities for coordination of planned works and notify the parties concerned. iWORCS™ is a web-based GIS-enabled platform. It is a simple low-cost solution, yet extremely effective in identifying opportunities for better coordination of design and construction works that impact roadway corridors and public spaces. It offers early visibility of planned works, identifies common areas of interest, and notifies stakeholders of collaboration opportunities or challenges. SOCC has now teamed up with PelicanCorp and rolled out an enhanced platform (iWORCS™) to the national market in 2024.

iWORCS™ addresses the traditional problems with uncoordinated works through several innovative features:

- Early visibility and notifications: The platform provides early alerts to planners, designers, and project managers about upcoming works enabling better planning and coordination.
- Enhanced communication helps in identifying potential conflicts and opportunities early in the project lifecycle.
- Cost savings and efficiency by minimizing uncoordinated efforts.
- Reduced disruptions to road users by minimising social and environmental costs.
- Extended road asset lifespan by preventing unnecessary excavation and repairs.
- Overall cost savings due to minimised social, environmental and build costs.

Looking Forward: A New Era of Infrastructure Coordination

The enhanced iWORCS™ platform is not just a solution; it marks the beginning of a new era in infrastructure coordination on a national basis. As SOCC continues to introduce integrated services, the goal is to minimize asset damage, streamline road works processes, and promote best practices across the industry. This proactive approach will lead to better-coordinated, cost-effective, and community-friendly infrastructure projects.

The long-standing partnership between SOCC and AUS-SPEC is one of the key pillars that supports the delivery of integrated solutions to Councils, utility asset owners and transport authorities by way of best practice standards that enable the delivery of enhanced services to the community. More information on iWORCS™ is available at www.streetsopening.com.au

Case study produced in partnership with SOCC.

AUS-SPEC'S
INDUSTRY COLLABORATIONS

AUS-SPEC maintains multiple long-term collaborations with industry organisations. This ensures that the national specification system for local government infrastructure assets meets the current standards of best practice and helps Councils provide effective services to their community.

AUSTRALIAN FLEXIBLE PAVEMENT ASSOCIATION (AfPA)

"For over 50 years the Australian Flexible Pavement Association (AfPA) has been the peak body representing the multi- billion-dollar Flexible Pavement Industry in Australia. AfPA represents our members and serves as a source of technical and reference information for both the industry and governments at a national level, as well as advocating for safety, sustainability, innovation, knowledge, and collaboration. The partnership with AUS-SPEC aims to improve consistency and harmonisation of all local government road works whilst ensuring best industry practice through fit -for purpose specifications. AfPA strongly supports the use of AUS-SPEC sprayed seal and asphalt specifications."

Melissa Lyons, Executive Director Technology, AfPA

AUS-SPEC and AfPA have been working together for several years to ensure that AUS-SPEC asphalt specifications reflect current industry knowledge and practices. AfPA endorses the worksections *1143 Sprayed bituminous surfacing* and *1144 Asphalt (Roadways)* and reviews them prior to each October update. The reviews focus in particular on sustainability and the availability of new materials, for which Councils need accurate specifications to ensure road safety and performance. Through collaboration, AUS-SPEC and AfPA provide Councils with fit for purpose specifications to effectively construct and maintain their road network.

AUSTRALIAN SOCIETY FOR CONRETE PAVEMENTS (ASCP)

"The Australian Society for Concrete Pavements (ASCP) aims to facilitate improvements in the design, construction and quality of concrete pavements in Australia through education, technology transfer and research. ASCP has been working collaboratively with AUS-SPEC since 2008. Together, we have conducted joint workshops for local government and AUS-SPEC has proactively participated in various ASCP events and online forums for many years. AUS-SPEC specifications are regularly reviewed by ASCP members to ensure that the documents are accurate and current as per industry standards. NATSPEC is a supporting partner of ASCP. We continue to collaborate to assist local government in effectively managing their rigid pavements."

Craig Heidrich, Executive Director, ASCP

AUSTROADS

"Austroads develops and maintains technical guides and tools to promote a nationally consistent approach to the design, maintenance and operation of road networks supporting all levels of government in Australia and New Zealand. We help transport agencies and local governments address current and emerging issues. Austroads has supported AUS-SPEC local government specifications since 2007. This longstanding collaboration involves sharing each other's expertise to achieve the best outcomes for local government. We routinely provide feedback on AUS-SPEC worksections and we have worked together on joint presentations for managing local roads. AUS-SPEC currently cites more than 250 Austroads publications in their specifications. Austroads is a strong believer in the benefits of collaboration to ensure our research is widely implemented, and we are proud to collaborate with AUS-SPEC."

Ross Guppy, Transport Infrastructure Program Manager, Austroads

AUSTSTAB PAVEMENT RECYCLING AND STABILISATION ASSOCIATION

AustStab is the Australian Pavement Recycling and Stabilisation Association, representing a unified industry approach to pavement recycling and stabilisation. We work collaboratively with industry partners to promote nationally consistent and regularly updated specifications. Our collaboration with NATSPEC to co-develop pavement stabilisation specifications plays a vital role in advancing this goal.

A key outcome of this partnership has been the development of tailored stabilisation specifications for local government under the AUS-SPEC national specification system—an important initiative to support Councils in effectively managing their road networks.

The partnership between AustStab and AUS-SPEC was formalised in June 2022. As part of the October 2022 AUS-SPEC update, four new pavement stabilisation worksections were released:

- *1161 In situ pavement stabilisation using cementitious binders*
- *1162 In situ pavement stabilisation using bituminous binders*
- *1163 Ex situ (plant mix) pavement stabilisation*
- *1164 In situ pavement stabilisation of unsealed roads*

These build upon and clarify the content in *1113 Subgrade and formation stabilisation* (formerly *1113 Stabilisation*).

"Through close collaboration with AustStab, AUS-SPEC has been able to draw on specialised industry knowledge to accurately and practically differentiate specifications based on stabilisation method. These worksections are aligned with state road authority requirements and Austroads guidelines, ensuring consistency with broader national frameworks."

Tanja Connors, Chief Executive Officer, AustStab

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA (IPWEA)

"Our communities demand the utmost in professional competency from the practitioners who deliver public works infrastructure and services. A key objective of AUS-SPEC specification documents is to foster a scalable and consistent approach to the delivery of operational plans agreed to in the strategic asset management planning process. Many of our members have become increasingly aware of the value AUS-SPEC local government specifications provide to the public works sector. They guide infrastructure project managers in all areas to develop, adapt and operate sustainable asset networks at the agreed level of service while managing risk and cost."

Steve Verity, Principal Advisor Asset Management, IPWEA Australasia

WATER SERVICES ASSOCIATION OF AUSTRALIA (WSAA)

WSAA is a peak industry body representing the water industry. WSAA delivers value to our members and their customers and communities by:

- *Connecting and collaborating with members, and within and beyond the water sector.*
- *Supporting our members to create value for their customers and communities, and lift performance.*
- *Leading the water sector through our advocacy.*
- *Championing a diverse, inclusive, safe and sustainable organisation and sector.*

Carl Radford, Program Manager Asset Creation, WSAA

For the last two decades, WSAA has been working collaboratively with AUS-SPEC to ensure that local government is aware of WSAA codes and practices for the design and construction of water supply and sewerage reticulation and pump stations. AUS-SPEC cites around 20 WSAA publications and has recently aligned their information with the WSAA regional codes for water supply and sewerage. This helps regional utilities authorities manage their utility assets effectively.

USING AUS-SPEC FOR **ASSET MANAGEMENT**

Ongoing planned maintenance of physical assets reduces life cycle costs and increases asset life. A series of nationally consistent frameworks was developed by the Local Government and Planning Ministers' Council (LGPMC) to provide minimum requirements for asset and financial management and planning by local government across Australia. This development supports improved management of assets such as roads, water and sewerage, drains, footpaths, public buildings and the like, which local government provides for the community.

ASSET MANAGEMENT FRAMEWORK

An asset management (AM) framework drives the implementation of asset management and aligns with the Council's strategic objectives. It consists of:

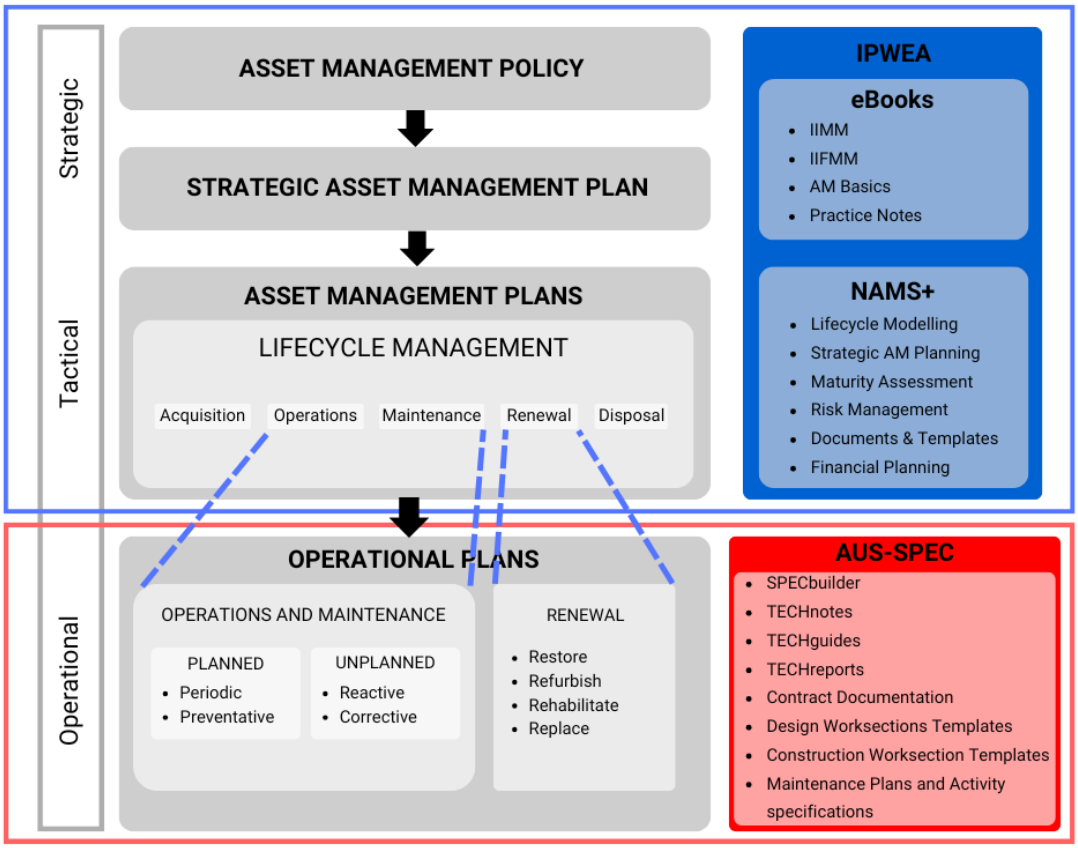
- **AM policy**: Outlines principles, requirements and responsibilities for AM and is linked to the Council's strategic objectives.
- **AM strategy**: Outlines AM objectives, practices, action plans, and audit and review processes.
- **AM plan**: Outlines asset description, levels of service, demand forecast and life cycle activities.

LIFE CYCLE ACTIVITIES

The life cycle activity of an asset is defined as the activity commencing with the identification of the need and terminating with the disposal of the asset. AUS-SPEC is a specification system for the life cycle management of assets. It is aligned to the NATSPEC National Classification System, which has been widely adopted by the construction industry. AUS-SPEC can be used for the following life cycle activities, as defined in International Infrastructure Management Manual (IIMM):

- **Asset Planning**: Defines the most effective solution to meet the services required by the community. Use Workgroup *00 PLANNING AND DESIGN*, which covers development and subdivision of land, design of waterfront development, bushfire protection, design of roadways and design of public utilities.
- **Asset Creation/Acquisition**: Includes works that create a new asset, or works that upgrade or improve an existing asset beyond its existing capacity using capital expenditure. This may result from growth, or social or environmental needs. Assets may also be acquired at no direct cost to the Council, e.g. donated assets. AUS-SPEC focuses on the technical aspects and processes of how to plan, design and construct new assets using the following:
  - **Design worksection templates** provide guidance and procedures for those involved in the design of civil infrastructure for local government, both internally (Council staff) and externally (consultants and developers). The worksections support uniform design practices for civil infrastructure works. For Design, use Workgroup *00 PLANNING AND DESIGN*.
  - **Construction worksection templates** are suitable for both quality control and integrated management contracts associated with most Councils' engineering activities. These worksections have been developed to assist local government to control the quality of works performed by contractors and developers. For Construction, use Workgroups *01*, *02*, *03*, *11* and *13*.
- **Maintenance and Operations**: Operations are active processes of utilising an asset that will consume resources such as manpower, energy, chemicals and/or materials (e.g. cleaning, mowing, etc.). Maintenance is the actions necessary for retaining an asset as near as practicable to its original condition. It excludes major capital rehabilitation and renewal works. Over time, the AUS-SPEC asset maintenance system provides Councils with records of asset inspections, defects, programmed and prioritised works, and monthly works completed reports, which improve a Council's maintenance history and asset inventory. AUS-SPEC maintenance activity specifications cover both planned and unplanned maintenance. For Maintenance and Operations, use Workgroups *14* to *18*.

- **Asset Monitoring/Condition/Performance**: AUS-SPEC provides a framework for performance requirements of Council assets, defines the technical level of service, response times, and compulsory intervention levels to systematically program asset maintenance. AUS-SPEC covers most of the maintenance activities of local government assets. Management strategies for planned and unplanned maintenance of various assets provide a proactive approach to maintenance. For asset monitoring/performance, use Workgroups *14* to *18*.
- **Renewal/Rehabilitation/Replacement**: Renewal is major work to replace existing assets or facilities with assets or facilities of equivalent capacity or performance capability. For asset renewal and rehabilitation, a combination of AUS-SPEC construction and maintenance worksections may be required. Use Workgroups *01*, *02*, *03*, *11* and *13* to *18*.



The above diagram shows the relationship between the asset management functions, the hierarchy of documents in the asset management system, and the IPWEA eBook Library, NAMS+ and AUS-SPEC resources.

RELATIONSHIP BETWEEN AUS-SPEC AND IPWEA

IPWEA resources such as the eBook Library, NAMS+ and AUS-SPEC are designed to work together. Each fosters a scalable and consistent approach to the effective life cycle management of public works infrastructure assets.

The suite of Manuals and Practice Notes in the eBook Library focuses on how to apply the principles documented in the ISO 55000 and 31000 series of standards.

At the strategic and tactical levels, NAMS+ is the online asset management planning toolkit that assists organisations in writing and maintaining their asset management policy, strategy and plans, aligned to their financial strategy and plan.

AUS-SPEC, on the other hand, provides a library of operational civil design, construction and maintenance specification templates for local government engineering projects. AUS-SPEC promotes standardisation and consistency in documentation across all local government infrastructure works to increase competition, productivity and efficient use of resources.

Combined, the IPWEA resources help any asset-intensive entity realise the best possible value from their investment in infrastructure assets.

The joint IPWEA and AUS-SPEC brochure is available at www.aus-spec.com.au/case-studies

USING AUS-SPEC FOR **ASSET DESIGN AND DELIVERY**

Local government plays an important role in land use planning, development approval, and construction of infrastructure in all Australian states and territories. AUS-SPEC assists Councils in this role by providing documentation templates and guidance material for a systematic approach to the planning, design and construction of new infrastructure assets. AUS-SPEC also provides documentation related to the maintenance of existing assets.

BENEFITS OF USING AUS-SPEC FOR ASSET DELIVERY

AUS-SPEC provides a documentation system for the delivery of assets to meet the essential services required by the community. The system provides the following benefits:

- **Local government focus**:
  - Planning, design, construction and maintenance contract documentation requirements for local government assets.
  - Simple and easy to use.
- **For minor civil works**:
  - Specification requirements are limited to the standard of minor civil works.
  - Addresses minimum best practice requirements.
- **A national document**:
  - Applicable across all Australian jurisdictions.
  - Accommodates variations for metropolitan and regional locations, climate zones or locally available materials.
- **A reference type specification**:
  - Minimal customisation required.
  - Addresses the shortage of in-house technical expertise and reduces the need for outsourcing.
  - Consistency for contractors specialising in local government work.
  - Performance and technical requirements are separated from contract management requirements.
- **An industry standard**:
  - Improved productivity and quality.
  - Good quality outcomes at project level.

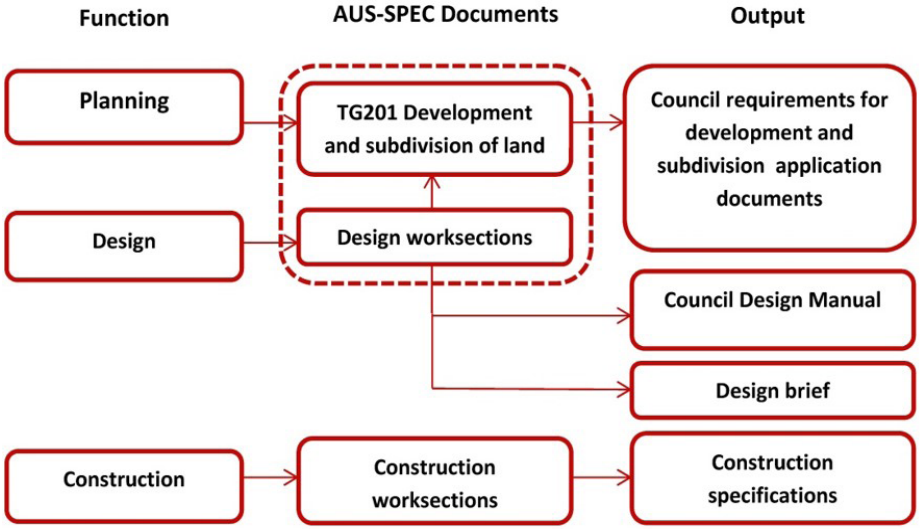
USING AUS-SPEC FOR PLANNING

AUS-SPEC TECHguide *TG 201 Process and procedures for the development and subdivision of land* is applicable to the planning approval process and design requirements for the development and subdivision of land within a Council area. *TECHguide TG 201 NSW Process and procedures for developement and subdivision of land in NSW* includes the information and requirements specifically for NSW and has been developed in collaboration with the IPWEA NSW and ACT Development Engineering Panel. It provides guidance on the infrastructure requirements for subdivision and development in urban residential, rural residential, rural and industrial commercial areas, including development applications, assessment and determination criteria, the appeal process, development application submission documentation requirements, developer contributions and fees, certificates, bonds, and environmental considerations.

This TECHguide is a reference document for the development or updating of documents and forms that set out Council requirements for development and subdivision of land. The guidelines are intended to assist Councils to achieve the following objectives:

- To provide a functional, attractive and safe environment for residents that is consistent with community standards and needs.
- To minimise adverse effects on the natural environment.

- To provide for the needs of future users of the land with respect to building requirements, vehicular and pedestrian access, provision of services and amenities appropriate to the zoning of the land.
- To use the land resource of the area economically.
- To achieve a balance between the development or subdivision of residential, commercial and industrial land and the lifestyle of existing residents and occupants.
- To provide for an equitable and efficient distribution of public amenities and services.
- To minimise Council's future maintenance costs for roads, services and open spaces.



Infrastructure asset delivery using AUS-SPEC.

USING AUS-SPEC FOR DESIGN

The AUS-SPEC Design worksection *Templates* provide guidance, design criteria and documentation requirements for the execution and recording of the design process for local government infrastructure, including open space, road reserves, bridges and public utilities. They complement the AUS-SPEC Construction worksection *Templates*.

The *Templates* should be customised to reflect the Council's particular requirements. The customised *Templates* can then be used to document Council subdivisional guidelines for internal use (Council design staff) or as a design reference document/design manual for developers and external consultants.

This uniform approach provides the following benefits:

- Infrastructure associated with any Council works is designed to be fit for purpose and of a standard maintainable by the Council.
- Clear records of key design processes are documented.
- Data relevant to asset maintenance is available for future use by the Council.
- Specification requirements for development by external developers are the same as the specifications used for construction of the Council's own contract works.
- Quality requirements at the design stage are covered in *0010 Quality requirements for design*. The checklists included in this worksection provide a valuable tool to achieve the following objectives:
    - Remind designers of design criteria.
    - Provide a quality record of the design process.
    - Allow additional criteria to be integrated into the Council's design process.

USING AUS-SPEC FOR CONSTRUCTION

The AUS-SPEC specification system includes specification *Templates* for the construction of local government roads, public utilities, buildings and landscape works.

For construction of minor civil works, use selected worksections from Workgroups *01*, *02*, *03*, *11* and *13*. For construction of building works, use Workgroups *01* to *10* and Workgroup *20*.

TECHguides *TG 101*, *TG 102* and *TG 103* provide guidance on the compilation of tender and contract documentation for either quality control or integrated management contracts. *TG 104* provides information and guidance on sample contract documentation.

USING AUS-SPEC FOR **CONTRACT DOCUMENTATION**

> *"The Australian economy spends approximately $7 billion per annum to resolve disputes in the construction industry. Concerns exist regarding the cost of tendering, lack of clarity of documentation, and unequal allocation of risk."*
>
> CRC Construction Innovation,
> *Guide to leading practice for dispute avoidance and resolution: An overview*

The AUS-SPEC specification system can be used for standard and period supply and service contract documentation for the life cycle management of assets. The AUS-SPEC system assists users to manage each stage of the contract cycle: project initiation; project delivery; compilation of contract documents; contract management and administration; operation; and maintenance and asset management.

PROJECT DELIVERY AND PROCUREMENT

Local government typically procures the following:

- **Building and construction services** involving major works (e.g. construction of an aquatic centre or construction of a road) or minor works (e.g. repairs to a footpath or resurfacing a car park).
- **Supply of services** including supply of equipment or material.
- **Period supply and services** including construction or non-construction services over a fixed period of time (e.g. linemarking of roads, security surveillance, bituminous surfacing, or weed treatment).
- **Consultancy services** including design and documentation.

The Local Government Acts of the various states and territories underpin the detailed tendering process and procurement procedures for Councils. AUS-SPEC provides for the incorporation of state-based requirements into contract documentation and references AS 4120 *Code of Tendering*, which sets out the ethics and obligations of the principal and tenderers in the tendering process in the construction industry.

THE IMPORTANCE OF SPECIFICATIONS

Preparing the specification is a core process in tendering and contracting. It is an essential contract management document that sets out the Council's requirements to prospective suppliers and/or contractors. A clear, concise and unambiguous specification results in more accurate tender bids and fewer variation claims.

The AUS-SPEC specification *Templates* and associated guidance documents provide a framework for developing quality documentation for different procurement methods and types of contracts. They can be used to define:

- Outputs.
- Quality standards and standards of compliance.
- Method of payment.
- Risk identification and management.
- Procedures, roles, and responsibilities.
- Dispute resolution processes.
- Requirements for the Council's economic, social and environmental objectives.

River Torrens footbridge, Adelaide.

COMPILATION OF CONTRACT DOCUMENTS

The AUS-SPEC contract document system is suitable for all Council services related to asset management, including design, construction, maintenance and operations of urban and open spaces, buildings and facilities, road reserves and public utilities.

Reference Documents

Before compiling the documentation, refer to the following AUS-SPEC TECHguides for detailed guidance on contracts, technical specifications, tender submission requirements and sample documents.

- *TG 102 Guidelines for Principals – standard contracts.*
- *TG 103 Guidelines for Principals – period supply and service contracts.*
- *TG 104 Guidelines for Principals – sample documents.*

Standard Contracts

Identify the following contract requirements for the project:

- Conditions of tendering: Required for tender documentation only.
- Conditions of Contract: General conditions, Annexures and Special conditions of contract.
- Quality management system: Quality assurance or Integrated management.
- Method of payment: Schedule of rates, lump sum or a combination of both.

Period Supply and Service Contracts

In addition, for period supply and service contracts, define the following contract requirements:

- Extent of service: Supply only, supply and deliver, or supply, deliver and install/lay/place.
- Type of quality control: Quality control or Quality management system.
- Period of contract: e.g. 12 months with optional extension for 3 to 5 years, or a longer term.
- Method of payment: Monthly payment, proportional payment, payment upon delivery.

Upper Coomera Community Centre, Gold Coast.

SPECbuilder

Using SPECbuilder, NATSPEC's online specification compilation software, select the appropriate AUS-SPEC worksections and Office edited worksections to create a project specification. Edit standard clauses where necessary and customise the worksections to include project-specific information. Complete any checklists and annexures to suit the needs of a particular project.

Project Documentation

Assemble the project-specific documentation in two sections:

- Section A – Tender documents. Assemble separately. For electronic tendering, a PDF file with all the information can be issued to the tenderers.
- Section B – Contract documents. Assemble contract documentation in four volumes: conditions of contract, technical specifications, drawings and schedules (not covered by AUS-SPEC), and tender submission documents and additional information.

LIVERPOOL CITY COUNCIL
PROCUREMENT AND MANAGEMENT OF OUTSOURCED ACTIVITIES

Liverpool City Council formed a project team to oversee the concept development, design, contractor engagement and construction of the Bernera Road Extension, from the existing intersection at Camden Valley Way, Prestons, through to Edmondson Park Rail Station. This 1350 m road extension, jointly funded by the NSW State Government and Liverpool City Council to a value of $41 million, provides direct access into land development areas along Sydney's new South West Rail Corridor, with the potential for extension to the Western Sydney International (Nancy-Bird Walton) Airport.

The project involved the construction of a divided four-lane road with median nature strip and adjustment of side roads, including three signalised intersections. In addition to the carrier mains, it included construction of a major multi-cell culvert and the installation of utilities, including stormwater reticulation, temporary and permanent water mains, electrical street lighting circuitry, Telstra and NBN Co. communication lines, and gas and sewer line diversions. The finished roadway was landscaped with the provision of ten bus bays, shelters and pedestrian and cycleway paving along its entire length.

TENDER AND CONTRACT DOCUMENTATION

Council contracted the works as a Separable Portions, Lump Sum Contract, using the AS 2124 General Conditions of Contract with amendments. Five separable portions were defined in the Request for Tender (RFT) and Formal Instrument of Agreement (FIOA). This provided flexibility in the staged awarding of Separable Portions, with Portions B and C relating to major utility installations, Portion D to paths and cycleways construction with landscaping, and Portion E to the laying of the final asphalt wearing course. The RFT stated that all Separable Portions could only be awarded to the successful tenderer.

Liverpool City Council prepared documentation for the RFT and FIOA based on AUS-SPEC. AUS-SPEC provided technical construction specifications and a Capital Works contract shell that were appropriate and adaptable to the production of documentation for the selected contracting option. To facilitate electronic publishing and distribution, the documentation incorporated hyperlinks for easy navigation.

Extensive property acquisitions and a greenfield site presented the opportunity for joint installation of major utility carrier mains along the full road length to build capacity for Sydney's newest land release areas. This was carried out on behalf of Endeavour Energy and Sydney Water. Council maintained the overall Superintendent function, with the operational provisions of the agreement between Liverpool City Council, Sydney Water and Endeavour Energy formalised in separate Deeds of Agreement.

New Bernera Road section.

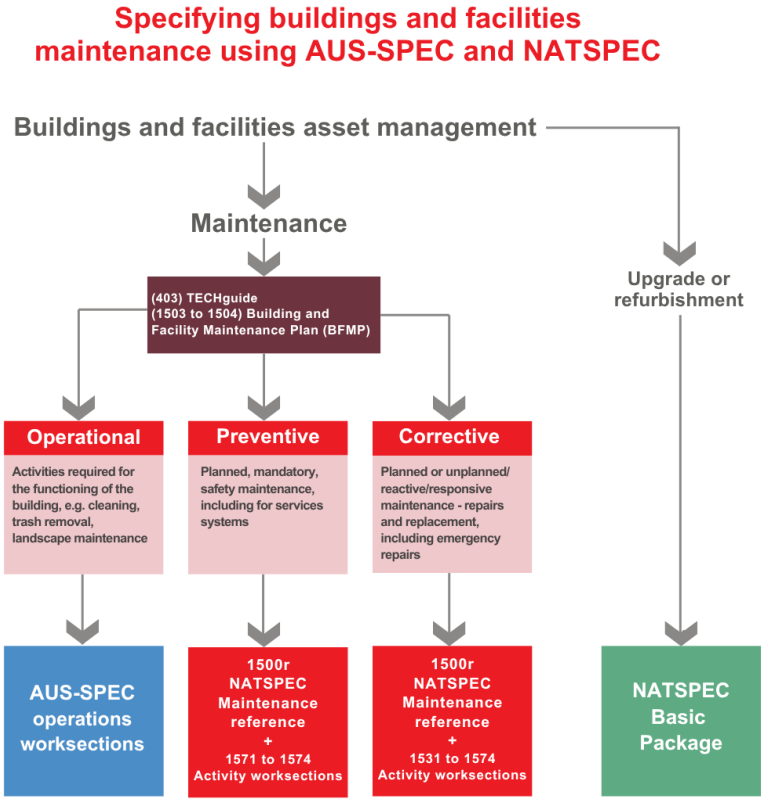
This case study is included in the International Infrastructure Management Manual – Case study 4.5.5a Contract Scoping and Packaging.

USING AUS-SPEC TO **SPECIFY BUILDING AND FACILITY MAINTENANCE**

Good maintenance, like good design, can be difficult to define. Part of the uncertainty is that maintenance may refer to the whole system as well as its components. For example, maintaining an air conditioning system may involve inspections (e.g. to *AS 1851 Routine service of fire protection systems and equipment*) without having to change anything, while maintaining a building may involve repairing and replacing parts, such as defective windows.

The AUS-SPEC system uses the International Infrastructure Management Manual (IIMM) definition of building and facility maintenance: “All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal.”

Maintenance includes actions such as regular inspections, repairs and minor replacement of components to eliminate the cause of defects and to avoid excessive repetition of maintenance effort, but does not include upgrading the asset.



AUS-SPEC MAINTENANCE SYSTEM

Effective maintenance of buildings and facilities involves maintenance strategies and maintenance management systems, captured in the maintenance plan. The AUS-SPEC Maintenance System can be used to compile documentation for a maintenance contract, as shown in the figure above, and includes the following:

- TECHguide *TG 403 Guide to the building and facility maintenance management system and documentation*.
- 1500r NATSPEC Maintenance Reference, which covers corrective maintenance works and preventive maintenance works for services systems.
- AUS-SPEC Building and Facilities Maintenance includes General requirements, Contract schedules and Building and facility maintenance plan templates, which can be used to define the scope of work and project-specific requirements.
- AUS-SPEC Activity specifications defining performance criteria and repair and replacement criteria.

USING AUS-SPEC FOR **ASSET MAINTENANCE**

The AUS-SPEC system supports a proactive approach to maintenance based on programmed maintenance, quality management and competitive principles.

The specification system can be adapted for documenting routine, periodic and urgent maintenance, using in-house service agreements or external contracts, or a combination of both.

ROLES AND RESPONSIBILITIES

Under the AUS-SPEC maintenance system, the roles and responsibilities are allocated as follows:

- The Principal (Council) specifies the maintenance requirements and assesses the quality capability of the Contractor/Service provider.
- The Contractor/Service provider controls the processes and methods, verifies conformance and provides the products and services. Quality inspection is a separate activity to verify the performance of the completed maintenance work.
- The Principal's Superintendent audits the maintenance system, methods and end product during the course of the Contract.

AUS-SPEC MAINTENANCE SYSTEM

The AUS-SPEC maintenance system includes reference documents and a series of *Templates*, known as worksections, classified according to the NATSPEC National Classification System. The *Templates* can be edited to suit a particular project, reflecting the asset maintenance management policy of the Council. They include:

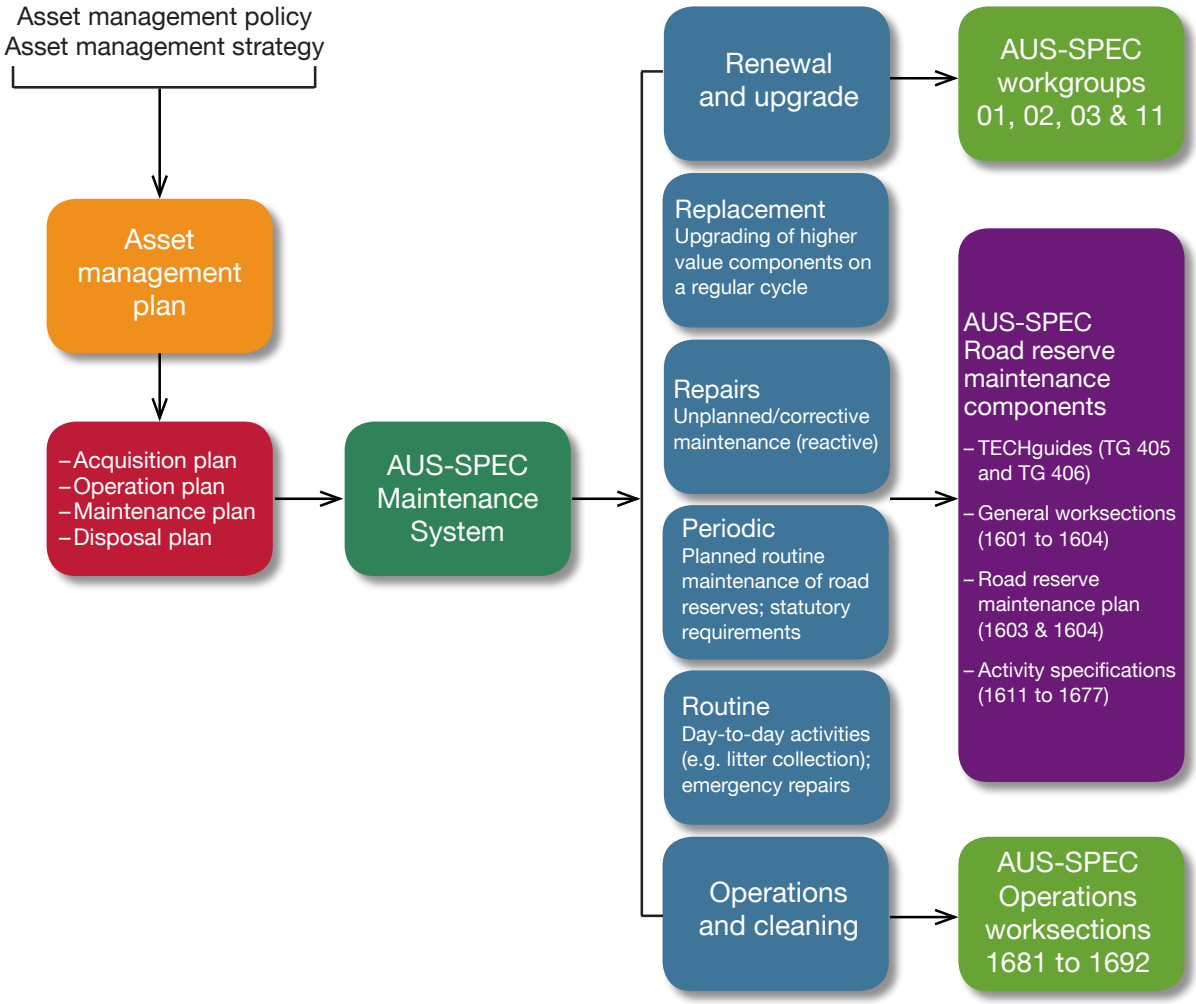
- **Reference documents:** Including TECHguides, which assist in the preparation of maintenance contract documentation.
- **General requirements (Maintenance):** Outlines the work and defines the measurement and payment.
- **Maintenance schedules:** Includes schedule of asset network, facility data sheets, maintenance frequency, schedule of rates and dayworks rates, lump sum components, etc.
- **Maintenance Plan:** Nominates anticipated activities and confirms agreement with the principal's requirements and the method of operation by the Contractor. The plan is prepared by the principal and completed with input from the Contractor/Service provider. It consists of two parts:
  - **Part 1:** Outlines the maintenance performance policy, maintenance organisation and activity specifications. Part 1 is to be included with the Tender documentation and is to be read in conjunction with the General requirements included in the Tender documentation.
  - **Part 2:** Includes management procedures and maintenance planning. This part of the plan is based on the structure of a Quality manual and Quality plan; however, the simplified format does not require third-party verification or extensive documentation by the Contractor/Service provider.
- **Proformas:** Non-conformance management forms, Maintenance Defect Register, Work Order form, Hold Point release form, Damage report and repair form, etc.

- **Maintenance Worksections**:
  - **Inspection requirements:** Includes activity definition and conditional assessment.
  - **Performance requirements:** Includes performance criteria and performance standards.
  - **Activity specification:** Sets out the requirements for a particular activity including work method, test requirements, special requirements and hold points.
  - **Activity contract requirements:** Sets out the performance/level of service requirements (recording level, response time, intervention levels, MMS reporting units and method of payment for a particular activity (Lump Sum/Schedule of rates/Day Works). The AUS-SPEC defaults should be revised by Council, in line with the Council Asset Management policy.
  - **Contractor proforma –** Includes checklists and work locations.

BENEFITS OF THE AUS-SPEC MAINTENANCE SYSTEM

The AUS-SPEC maintenance system is a professional, best practice approach to maintenance that allows Councils to:

- Calibrate service levels within their maintenance and operations budgets.
- Prepare documentation for in-house and private maintenance contracts.
- Collect records of asset inspections, defects, programmed and prioritised works, and monthly works completed reports.
- Progressively improve management of asset maintenance, with control and historical data.
- Benchmark with other organisations using AUS-SPEC as work processes and outcomes are essentially the same.
- Manage risk through a systematic approach to maintenance of Council assets.
- Select AUS-SPEC worksections using SPECbuilder, NATSPEC's online specification compilation software, and customise them for specific projects.



A typical example of using the AUS-SPEC Maintenance system for road reserve maintenance.

CITY OF PARRAMATTA
DEVELOPING A MAINTENANCE PLAN

In 2003, City of Parramatta, assisted by external consultants, developed a detailed Road Maintenance Plan using AUS-SPEC. The Maintenance Plan was part of a new, asset-centric approach to road reserve management to improve efficiency and cost-effectiveness.

A PROACTIVE MAINTENANCE SYSTEM

The City of Parramatta proactive maintenance system is based on the AUS-SPEC maintenance system suite of documents and conforms to a quality management model focusing on a systematic approach, inspection and test plans, clear checklists, hold points, and conformance.

THE MAINTENANCE PLAN AS PART OF A MAINTENANCE SYSTEM

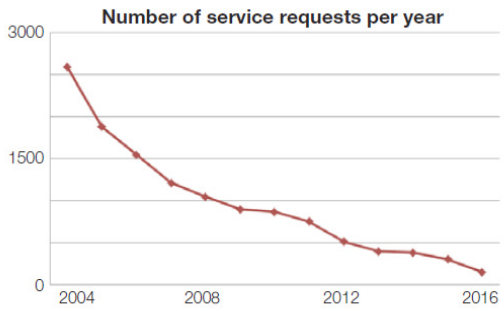
The road maintenance plan (RMP) outlines the procedures in place to provide assurance that the materials and processes conform or will lead to performance conforming with the documented requirements. It provides the Principal with information regarding day-to-day execution of the maintenance works and the ways in which the Contractor or Council in-house service provider will record and report information to the Superintendent.

DEVELOPING THE ROAD MAINTENANCE PLAN

The City of Parramatta developed the original RMP from the AUS-SPEC maintenance documentation and Activity Specification template defaults, customising to the Council requirements. The AUS-SPEC RMP template is based on the structure of a Quality manual and Quality plan; however, the simplified format does not require third-party verification or extensive documentation by the service provider.

The council moved from a reactive to a proactive approach to maintenance activities. The road reserve network was regularly inspected by Council inspectors. Inspections were recorded on a Maintenance Defect Register, which formed part of the plan and was used to prioritise and allocate maintenance work and record completed work.

Over time, the asset data collected as required by the RMP has assisted the strategic management of the road reserve network. Council regularly reviews the RMP in line with changes to the organisational objectives, asset requirements, regulation/legislation, and community views.



BENEFITS

A proactive system based on quality management, competitive principles and programmed maintenance enabled City of Parramatta over time to balance the level of service and the maintenance and operations budget. This resulted in significant cost savings, a reduction in the number of reactive complaints and a reduction in incident claims arising from defective road pavement, line markings, kerb and gutter, and associated street signage and furniture.

CITY OF PARRAMATTA

This case study is included in the International Infrastructure Management Manual – Case study 3.3.3d.

PENRITH CITY COUNCIL
DEFINING TECHNICAL LEVELS OF SERVICE

Penrith City Council adopted a proactive inspection and intervention approach to road reserve maintenance based on AUS-SPEC.

TECHNICAL SERVICE LEVELS IN PROACTIVE ROAD RESERVE MAINTENANCE

Previously, Council relied heavily on the community to report road and footpath failures before carrying out maintenance work. As part of the new system, Service Levels were developed to drive the frequency of maintenance and the intervention level at which the maintenance is required.

Activity Specifications and associated Activity Contract Requirements setting out the Service Levels for that activity, and inspection frequencies, were documented in a Road Reserve Maintenance Plan. Maintenance work is undertaken by roughly 40% in-house business units and 60% outsourced. Defined Service Levels ensure consistent quality outcomes regardless of who provides the service.

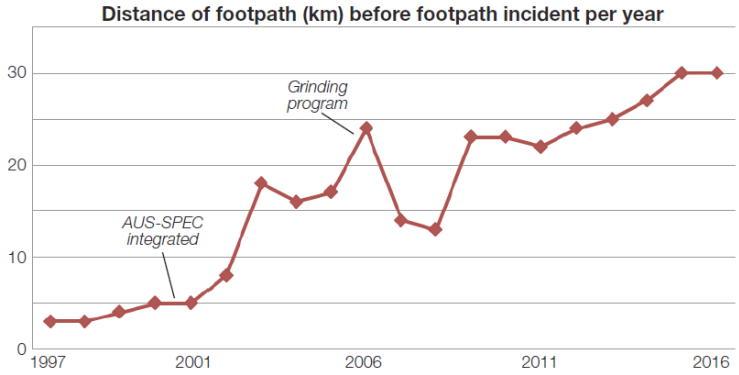
DETERMINING TECHNICAL SERVICE LEVELS

Penrith City Council allocated existing maintenance funds to the activities identified in the AUS-SPEC documentation, and month-by-month costs associated with pre-determined intervention levels for defects were plotted to better prioritise defect maintenance. Progress was monitored monthly and data was used to refine the plan. Service levels were amended to better align with the allocated budget. There have been several revisions over the years to make sure that the management system is safe and efficient. With this system in place, the comprehensive data collected makes it easier to attract the right level of funding from Council for ongoing maintenance to meet performance targets.

Council asset management staff now conduct schedules infrastructure condition surveys up to three times a year, depending on the asset type and location. Intervention and response times for Activity Specifications are reviewed annually after budget allocations to City Works.

EXAMPLE: FOOTPATH MAINTENANCE

Footpath incidents arising from tripping points are the most common claim on Council from the community. After implementing a proactive system for road reserve maintenance with clearly defined technical levels of service, Penrith City Council saw a substantial decrease in the number of footpath incidents, lowering the risk of litigation and damages costs as demonstrated by the graph.



In 1997, a footpath incident occurred every 3km. The year after the AUS-SPEC system was integrated, there was an incident every 8km. A grinding program introduced by the Council was undertaken in 2006, and the distance of footpath per footpath incident has increased since.

Data courtesy of Penrith City Council.

The graph shows that the benefits of a proactive approach continue years after implementing the AUS-SPEC Maintenance system. Records of asset inspections, defects, programmed and prioritised works, and monthly works completed reports continue to improve the maintenance history and asset inventory and provide a defence against possible litigation.

PENRITH CITY COUNCIL

This case study is included in the International Infrastructure Management Manual – Case study 2.4.7c.

USING AUS-SPEC FOR **MANAGEMENT OF UNSEALED ROADS**

Local government is responsible for approximately 678,000 km (77%) of the total road length in Australia. Rural and regional Councils manage 585,000 km (86%) of this road length, about two-thirds of which is unsealed.

These roads provide access to rural and remote communities, movement of passenger and commercial vehicles, and haulage vehicle routes for different industries as well as for emergency services. Unsealed roads comprise either natural material or gravel and do not have a permanent water-resistant surface like bitumen spray seal, asphalt or concrete.

Councils are facing ever-increasing challenges to ensure service levels for unsealed roads are fit for purpose. Substandard roads can be detrimental to these communities. In 2024, the ALGA National State of the Assets report found that only 50% of unsealed roads were at an acceptable standard.

When Councils collaborate at a regional level using AUS-SPEC resources, they create a consistent approach to infrastructure delivery and maintenance. Effective maintenance plans are crucial to slow down deterioration and increase efficiency and performance outcomes.

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, slipperiness, dust, 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. The Rural Roads package assists local governments to effectively manage these extensive assets.

Design

The Workgroup *00 PLANNING AND DESIGN* covers quality requirements, bushfire protection, site regrading, control of erosion and sedimentation, geometric road design, pavement design, pathways and cycleways, and design of stormwater and subsurface 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 of 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 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.
- *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.

Factors affecting maintenance of unsealed roads.

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

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 above right, are adequately managed. Proactive maintenance and inspection programs aim to provide continued structural integrity and 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 table drains, extending roadside drainage, and removing surface defects. Details on improving materials and maintenance are provided in TECHreport *TR 08 Management of Council gravel pits in country areas — A case study* and TECHnote *GEN 027 Maintenance of unsealed roads*.

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 rural 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.

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.
- *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 plans. Activity specifications include *Templates* for local shape correction, grading and resheeting of unsealed roads and 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.

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

Image courtesy of Blacktown City Council.

David Jenkins
CEO, IPWEA Australasia

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Developed by IPWEA Australasia, AUS-SPEC delivers nationally consistent civil specifications that help Councils reduce duplication, lower costs, and improve efficiency.

The AUS-SPEC library provides comprehensive templates for the design, construction, and maintenance of civil infrastructure. In an environment of increasing pressure on resources, these tools support streamlined asset lifecycle planning and maintenance—while keeping community safety and risk management at the forefront.

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