Effectively managing local government infrastructure assets using national specifications

Nandini Mehta

AUS-SPEC Manager

Presentation Outline

- Overview of technical specifications
- Asset management and specifications
- Case studies
- Benefits of using the specification system

National State of Assets Report– Key findings

Roads

Poor condition:
$17.8bn
Poor function:
$16.0bn
Poor capacity:
$14.3bn

Bridges

Poor condition:
$1.6bn
Poor function:
$1.8bn
Poor capacity:
$1.9bn

Buildings & Facilities

Poor condition:
$9.2bn
Poor function:
$8.5bn
Poor capacity:
$9.6bn

Parks & Recreation

Poor condition:
$1.3bn
Poor function:
$1.1bn
Poor capacity:
$1.4bn

Stormwater

Poor condition:
$5.3bn
Poor function:
$11bn
Poor capacity:
$12.1bn

Water & Wastewater

Poor condition:
$15.5bn
Poor function:
$7.8bn
Poor capacity:
$8.3bn

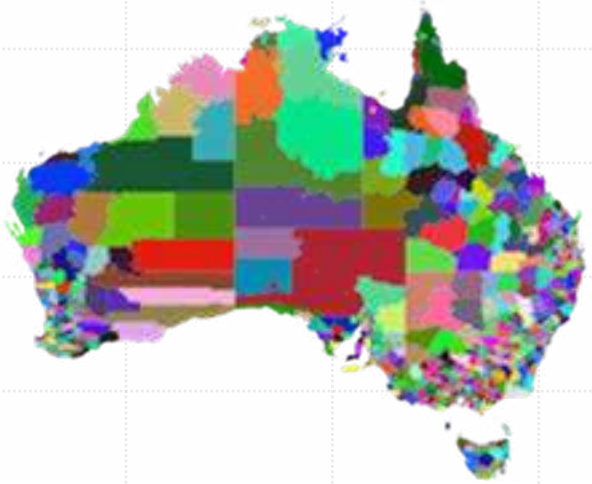
Condition – Quality
Function – Fit for purpose
Capacity – Utilisation

Source: *ALGA, 2021 National State of the Assets Report*

Overview

- **NATSPEC** is a not-for-profit organisation, owned by government and industry, whose objective is to improve the construction and productivity of built environment through leadership of information.
- **AUS-SPEC** is for the life cycle management of assets

Asset life cycle *- Stages involved in the management of an asset (ISO 55000)*

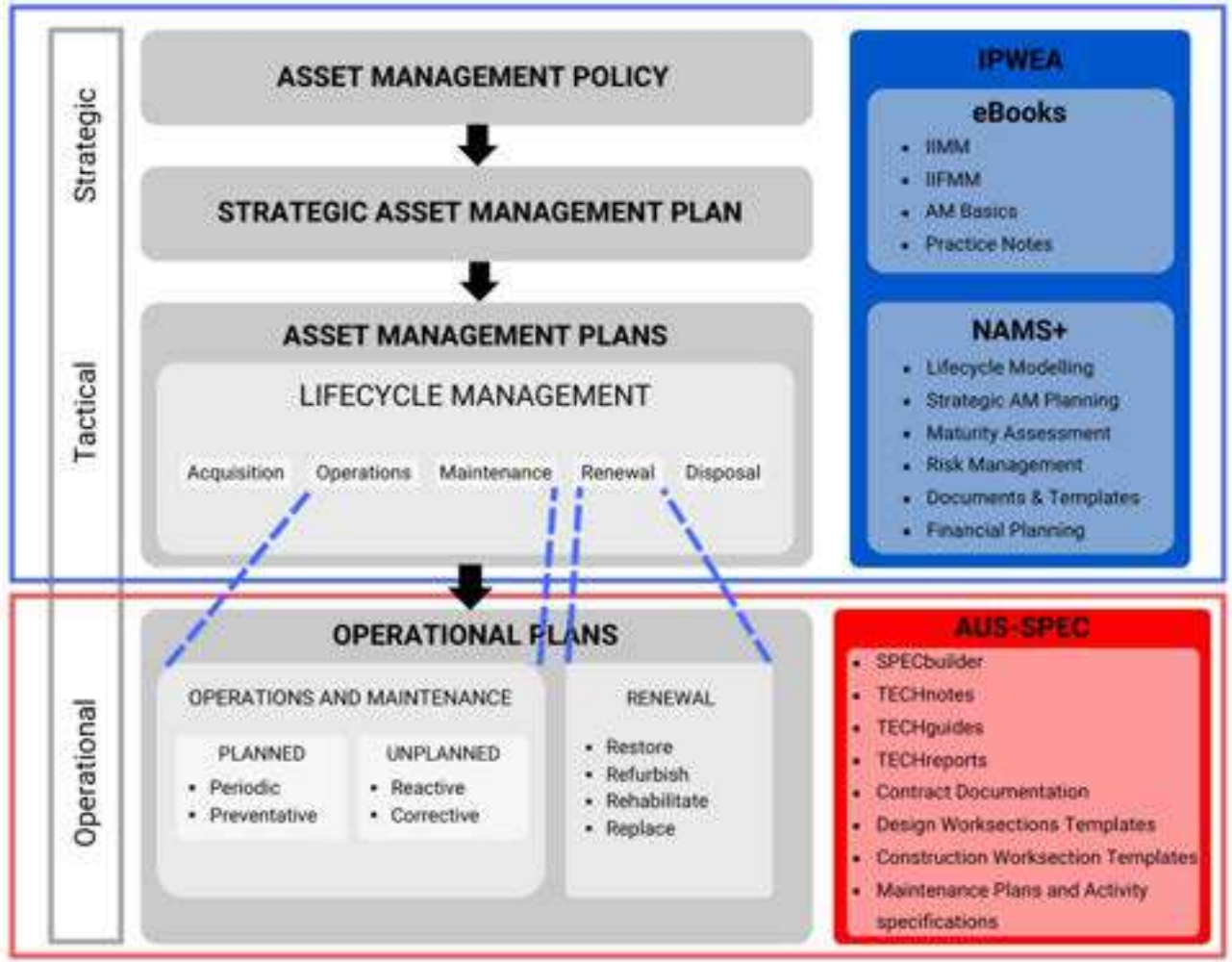


Asset management and specifications

Asset management plan: The documented information that specifies the activities, resources and timescales required for an individual asset or a grouping of assets to achieve the organization's objectives. (ISO 55000)

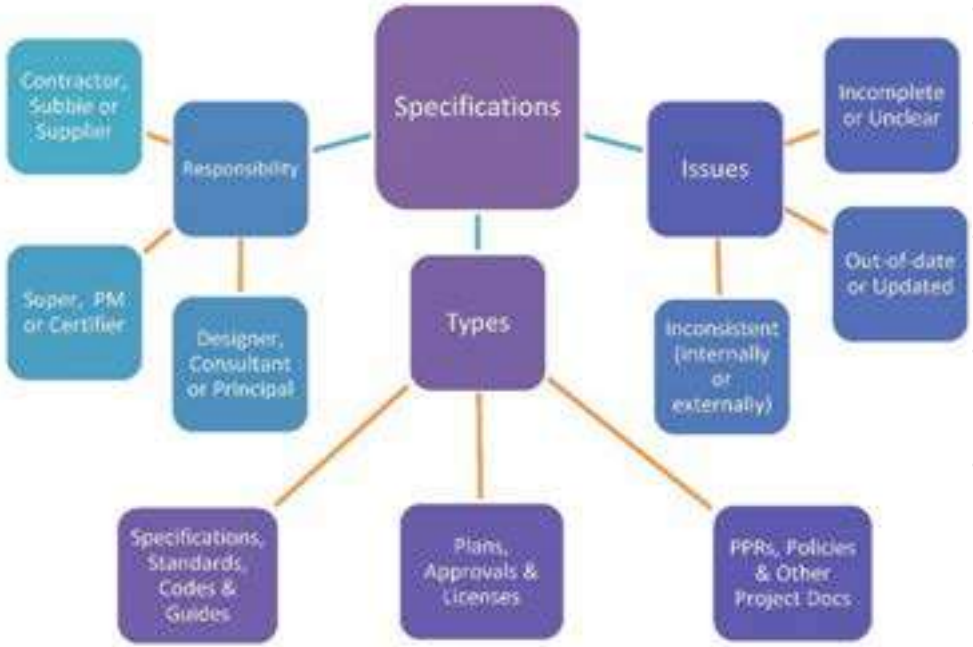
Information on asset management:

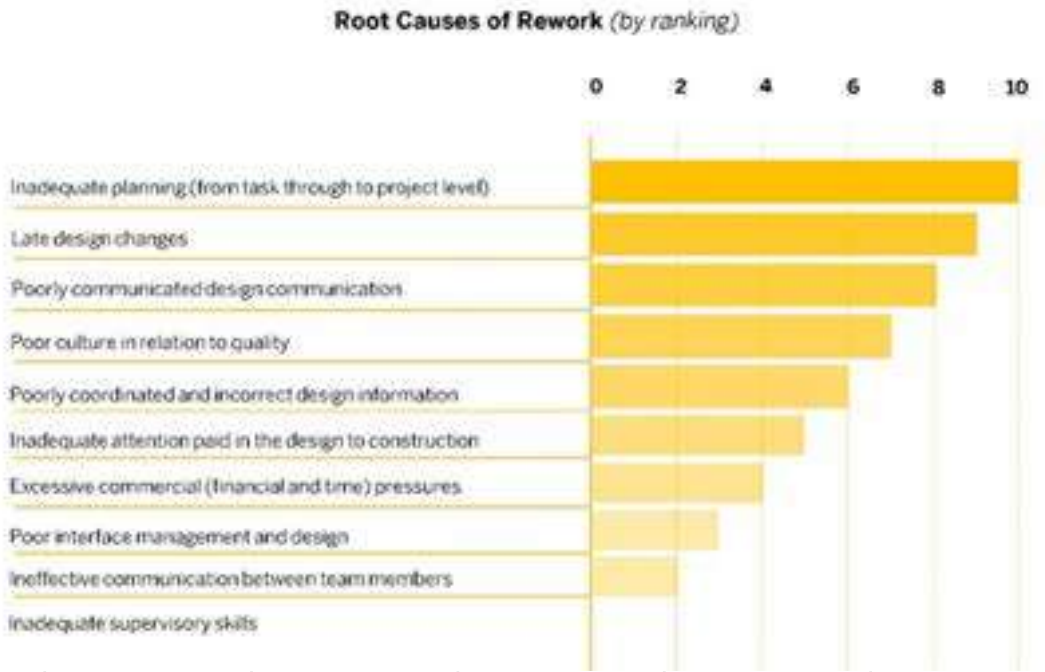
- Condition monitoring
- Risk management
- Quality management
- Environmental management
- Dependability (availability, reliability and maintainability)
- Sustainable development
- Inspection
- Facilities management
- Commissioning process
- Energy management



Why do we need specifications?

- **Specifications** are written descriptions of materials and construction processes for quality of works, performance, properties and installation required
- **Specifiers** must have the ability to make informed decisions and be able to **communicate** those decisions **effectively** and **efficiently**





Resources and industry collaborations

- Australian standards and legislative requirements
- **Additional sources**
- **Australian flexible Pavement Association (AfPA)**
- Australian Road Research Board (ARRB)
- Australian Rural Road Group (ARRG)
- **Australian Society of Concrete Pavements (ASCP)**
- Australasian Society for Trenchless Technology (ASTT)
- **Austroads**
- **AustStab**
- Civil Contractors Federation (CCF)
- Cement Concrete & Aggregates Australia (CCAA)
- International Erosion Control Association (IECA)
- **Infrastructure Sustainability Council (ISC)**
- Plastic Industry Pipe Association (PIPA)
- **State Road Authorities**
- **Streets Opening Coordination Council (SOCC)**
- Water Services Association of Australia (WSAA)

IPWEA Resources

Institute of Public Works Engineering Australasia (IPWEA)

- NAMS+
- IPWEA State Divisions
- IPWEA Roads and Transport Directorate
- IPWEA Water Directorates (NSW and Qld)

IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

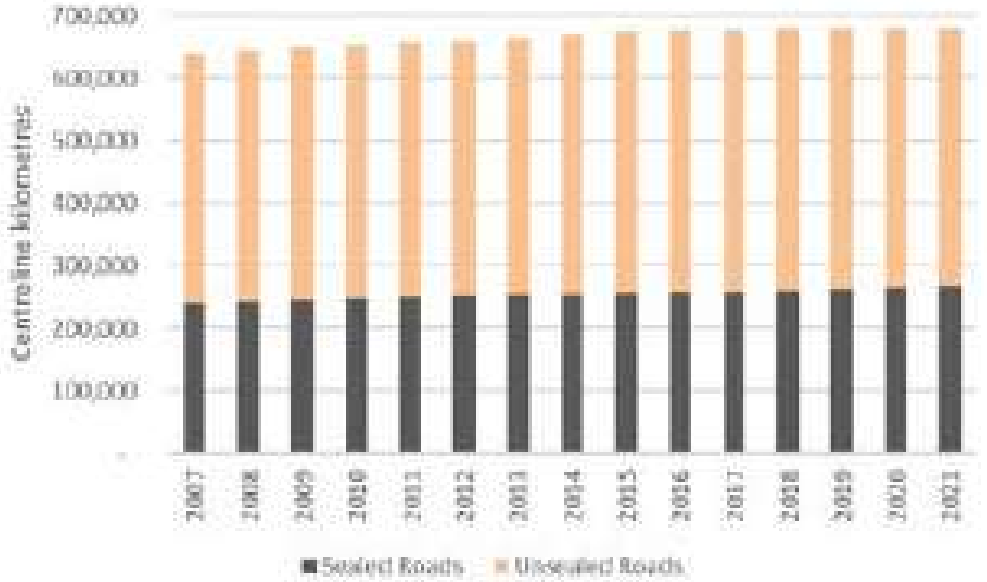
NSW & ACT
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

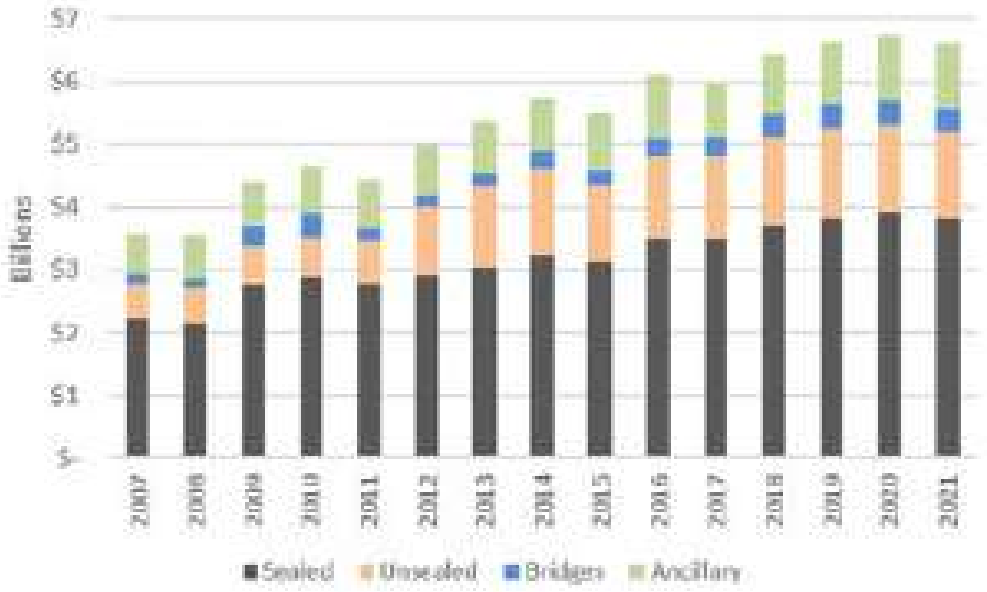
WATER DIRECTORATE

IPWEA knowledge community
Roads & Transport Directorate

Local road length and expenditure

- 678,000 km, 39% are sealed and 61% are unsealed road
- Overall, growing at 0.4% per year (annual average)
- Sealed roads, growing at 0.8%
- Unsealed roads, growing at 0.2%
- Overall, spending 5.0% more per year (annual average, historic dollar values)
- We're spending more on sealed roads than any other road asset
- Unsealed road expenditure is increasing twice the rate of that spent on sealed roads

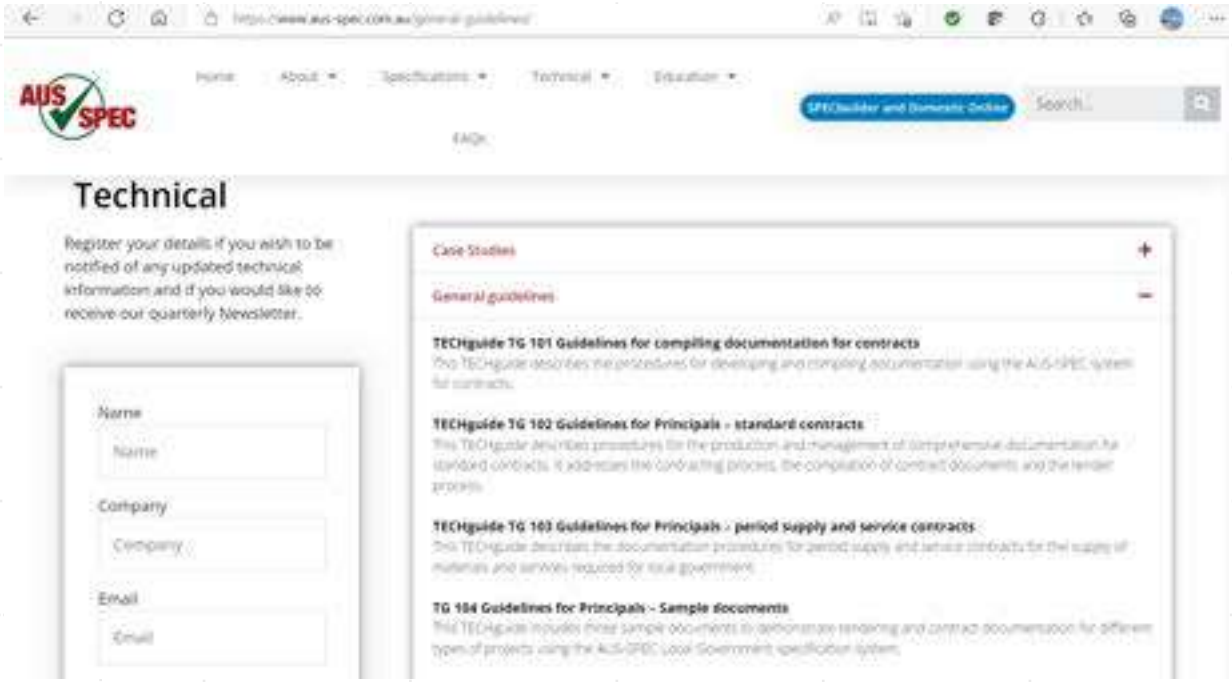


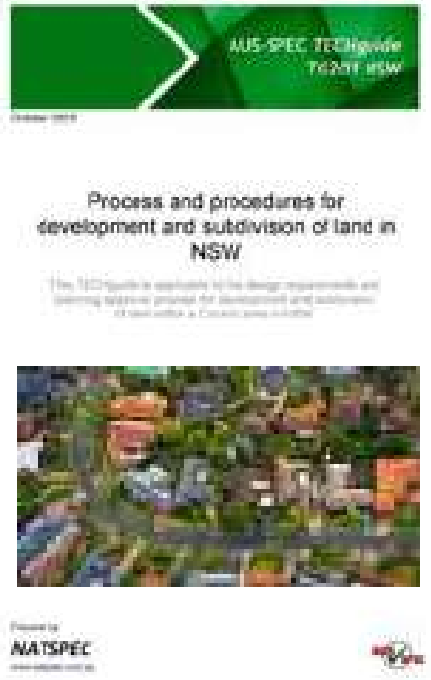


Source: *ALGA, 2021 National State of the Assets Report*

AUS-SPEC TECHguides

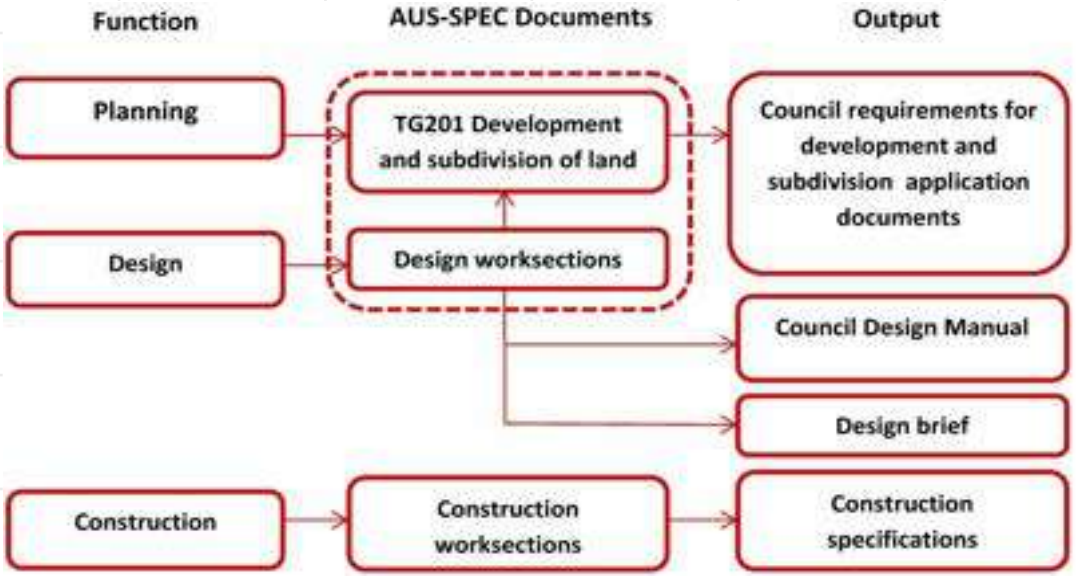
- TECHguides provide roadmaps and examples of compiling the documentations required for local government projects. They include information on contracts, technical specifications and tender submission requirements. All TECHguides and TECHnotes are available at: www.aus-spec.com.au/technical-resources.





- Planning framework
- Application process
- Application requirements
- Engineering requirements
- Completion

Asset planning and design



MIDCOAST council

Development Engineering Handbook

August 2019

This Handbook is not meant to:

- Be applied to works being delivered by public authorities (such as Council or utilities), as the processes to be followed in those cases are covered by different legislation such as Part 5 of the Environmental Planning & Assessment Act (**EP&A Act**). That is unless the public authority needs a DA to perform the work, in which case this Handbook is to be applied in the same way as for private developments.
- Explain the technical requirements for specific types of infrastructure assets or works, such as pipelines, drains, earthworks, landscaping and the like. These are set out in Council's AUS-SPEC engineering specifications. AUS-SPEC forms a set of common specifications for all new assets to be built and maintained by Council or the community, so it applies to both private developers and Council projects.

Pedestrian and cyclist paths

New subdivisions or multi-dwelling housing (2 or more) DAs are also required to provide dedicated pedestrian and cyclist facilities along their full frontage to any public roads as follows (refer to Council's AUS-SPEC *0041 Geometric road layout* for street classes):

Asset creation – Design worksections

00 PLANNING AND DESIGN

- **Quality requirements**
- 0010 Quality requirements for design
- **Road reserve**
- 0041 Geometric road layout
- 0042 Pavement design
- 0043 Subsurface drainage
- 0044 Pathways and cycleways
- **Road reserve – rural roads**
- 0051 Geometric rural road design – sealed
- 0052 Geometric rural road design - unsealed
- 0053 Rural pavement design – sealed
- 0054 Rural pavement design - unsealed
- **Bridges**
- 0061 Bridges and other structures
- **Public utilities**
- 0074 Stormwater drainage

Asset creation – Construction worksections

Workgroups 01, 02, 03 – 09, 11 & 13

- General
- Urban and open spaces
- Buildings (NATSPEC)
- Road reserve and bridges
- Public utilities

Nancy Millis Building, Parkville, VIC

Gunditj Mirring Keeping Place and Business Centre, Lake Condah Mission, VIC

Kiara College, Kiara WA
Six Seasons Courtyard

Central Courtyard

General Worksections

01 Tendering

013 Generic preliminaries

- 0134 General requirements (Supply)
- 0135 General requirements (Services)
- 0136 General requirements (Construction)

014 Contract preliminaries

- 0147 Conditions of contract

015 Schedule of rates

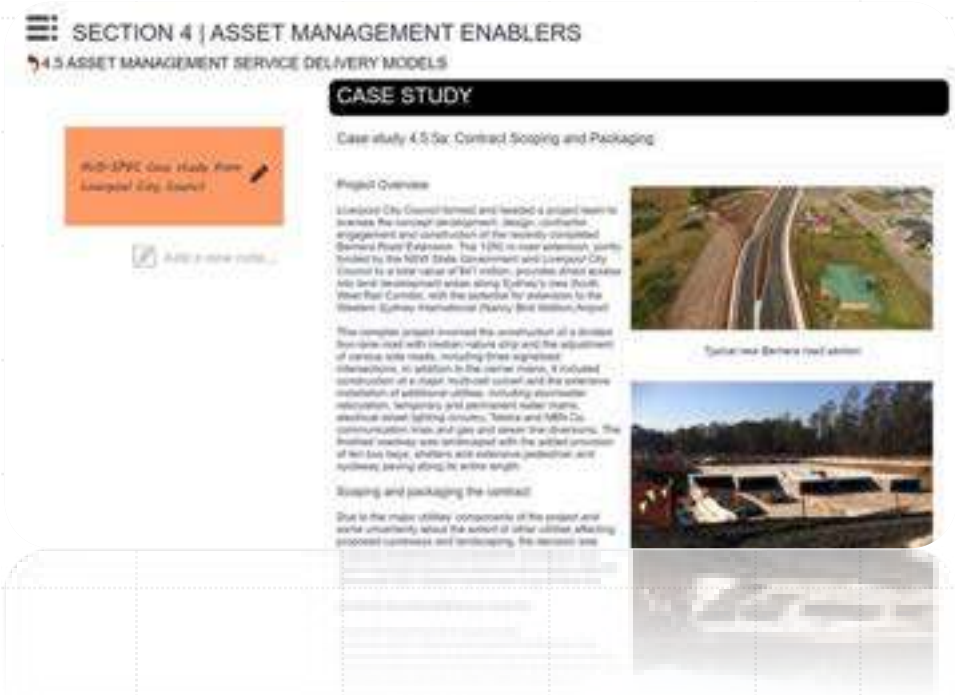
- 0152 Schedule of rates (Construction)
- 0153 Schedules – period supply and service

016 Quality assurance

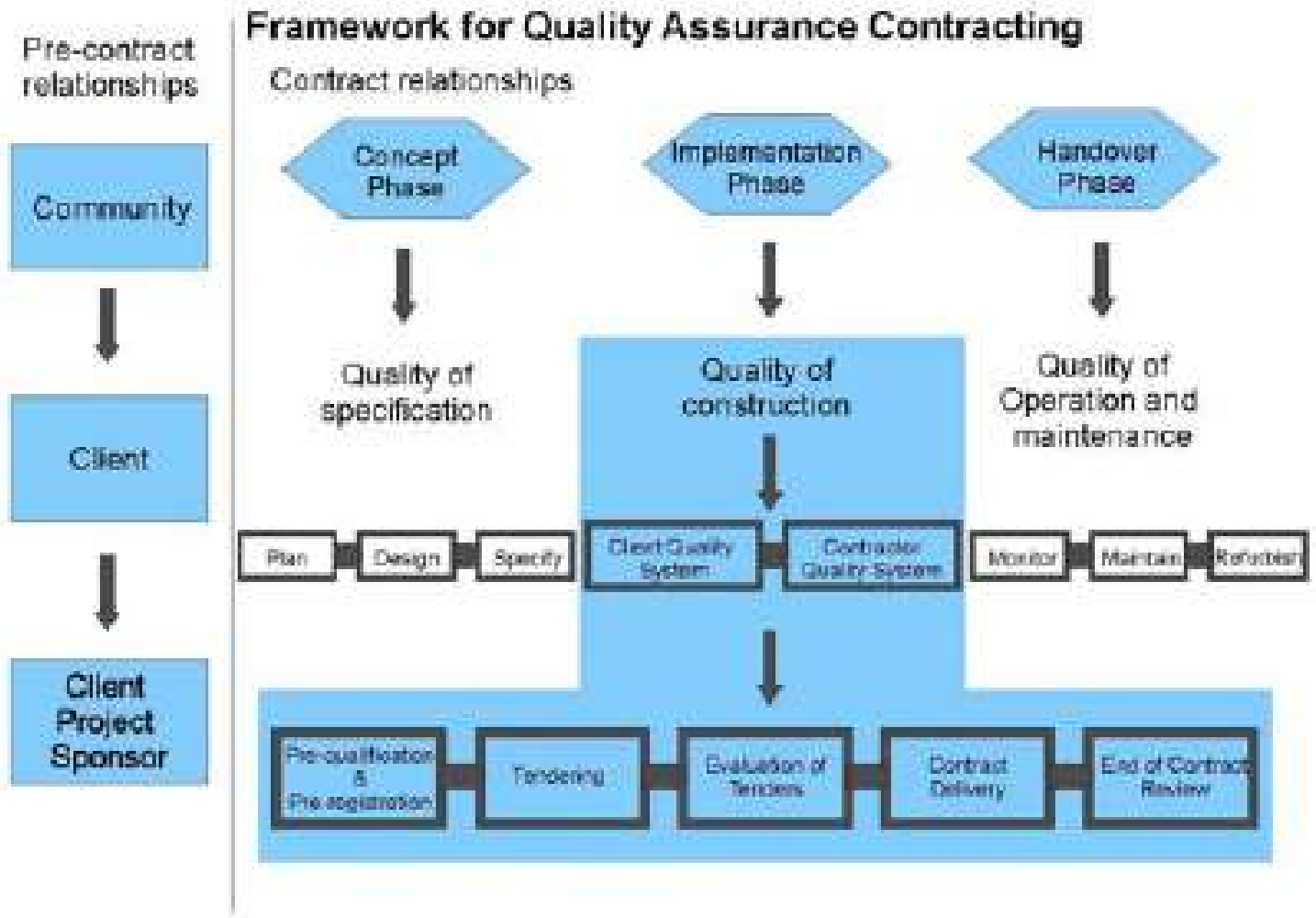
- 0161 Quality management (Construction)
- 0162 Quality (Supply)
- 0163 Quality (Delivery)
- 0167 Integrated management

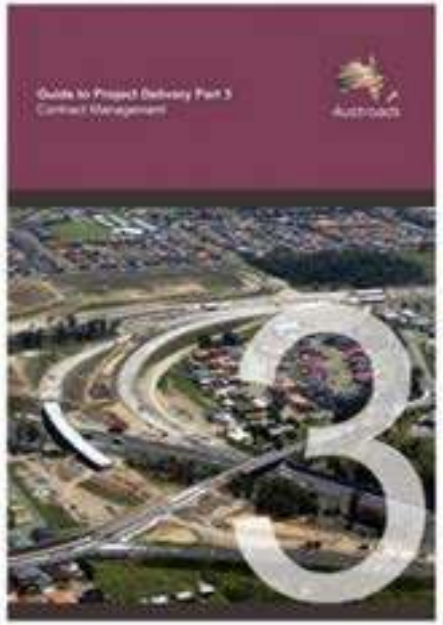
017 General requirements

- 0173 Environmental management



Quality Management





Construction Worksections

Case Study: Keswick residential subdivision

- Keswick Stages 1 – 3 developed from 1995 – 2012, approx. 270 lots
- Keswick Stage 4 developed from 2013 – 2018, approx. 140 lots
- Keswick Stage 5 209 lots designed, 59 lots currently under construction.

"We definitely refer to AUS-SPEC specifications heavily throughout the design phase and use them to help formulate a practical design that is going to be workable, efficient and effective."

Mark Johnston, Senior Design Engineer, Dubbo Regional Council

Keswick residential subdivision

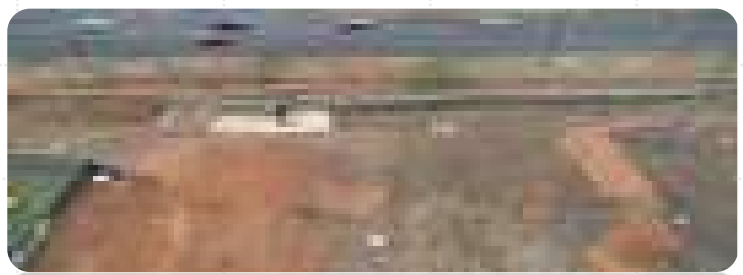
Challenges

➢ Shallow basalt rock

- Box out of roads
- Trenching of water, sewer, stormwater, power, telecom & gas
- Little investigation of rock at design stage
- Rock strength varied significantly across the site
- Various methods were tried including 50t excavator with rock hammer, rock saws, drilling and hammering, ripping with dozers (resulted in busted water main).
- Best method so far was using a 100t Track Trencher.

➢ Poor level control on stormwater for contractors, resulting in issues with road construction.

➢ Poor control of stormwater pit set out, resulting in misalignments with the K&G.



Lessons learnt and applied to Stage 5

➢ Shallow basalt rock

- ✓ Investigation of rock with 50m grid using test holes to obtain 3d rock layer
- ✓ Design the site for fill where possible (where fill is easy to access)
- ✓ Cause all lots to drain to road corridor if possible (eliminates interallotment drainage)
- ✓ Fill allows for services to be lifted up out of the rock
- ✓ Design road boxing out of the rock where possible
- ✓ Use Track Trencher where possible to excavate rock, about half the cost of conventional methods

➢ Regular PCG meetings and hold points created for Stage 5 for level control.

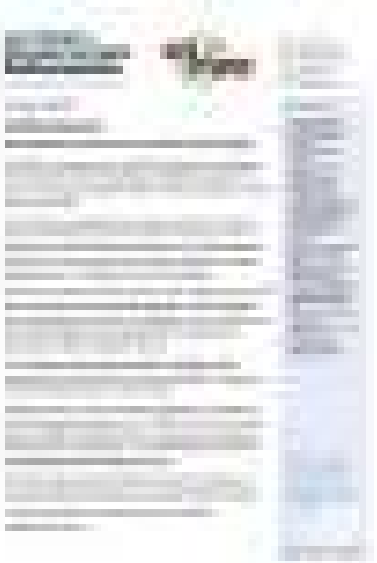
➢ Better communication for set out requirements for stormwater pits and there alignments.

Collaboration with AustStab

- **Existing worksection in 2021** – 1113 Stabilisation
- **New workgroup and worksections for 2022**

  Formation preparation
  - 1113 Subgrade and formation stabilisation

  Pavement stabilisation
  - 1161 In situ pavement stabilisation using cementitious binders
  - 1162 In situ pavement stabilisation using bituminous binders
  - 1163 Ex situ pavement stabilisation
  - 1164 In situ stabilisation of unsealed roads



Collaboration with AfPA

AUS-SPEC documents	2022 - 2023 Updates
1143 Sprayed bituminous surfacing	*Citation of Flux oil removed* *1. More citations of Austroads AGPT04K added as appropriate.* *2. Requirements of 14mm aggregate added.* *3. Requirements for standard bitumen binders updated.* *4. Citations of Austroads ATS 3110 Supply of polymer modified binders, ATS 3120 Supply of aggregate for sprayed seals, ATS 3460 Sprayed bituminous surfacing and ATS 3470 Bituminous pavement crack sealing added.*
1144 Asphalt (Roadways)	*1. Mixes incorporating RAP changed from 20% to 30%.* *2. LTA5 mix recommended for lightly trafficked roads.* *3. Mix design tables of DGA, OGA, SMA and FGGA updated.* *4. Austroads ATS 3110 Supply of PMBs and ATS 3050 Supply of recycled crushed glass sand added.*

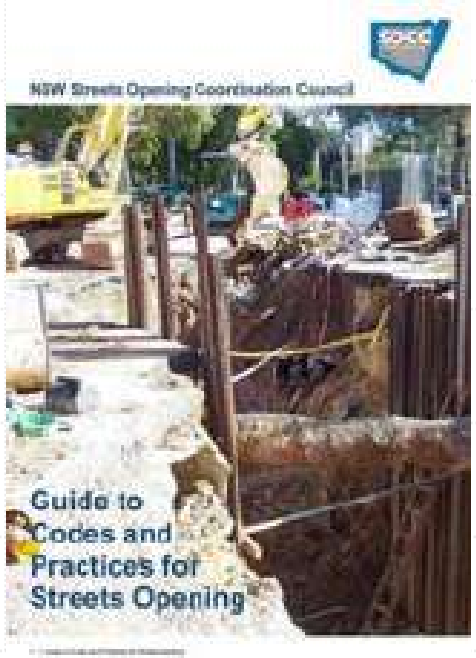
Restoration works

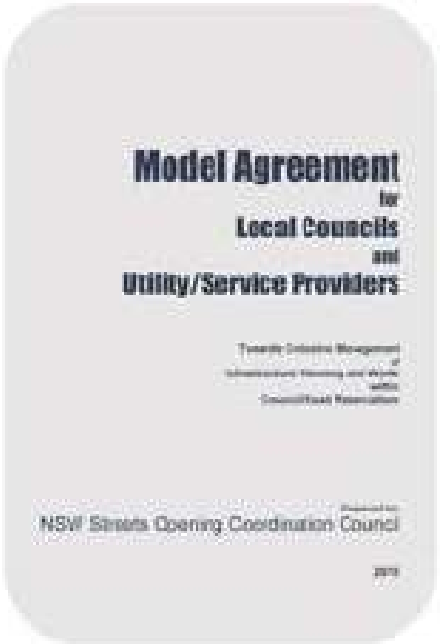
STREETS OPENING COORDINATION COUNCIL

www.streetsopening.com.au

115 Road openings and restorations

- 1151 Road opening and restoration
- 1152 Road opening and restorations (Utilities)





Case Study: Northern Beaches Council

NORTHERN BEACHES COUNCIL
ADAPTING AN AUS-SPEC WORKSECTION

northern beaches council

HOW AUS-SPEC DOCUMENTATION HELPED NORTHERN BEACHES COUNCIL

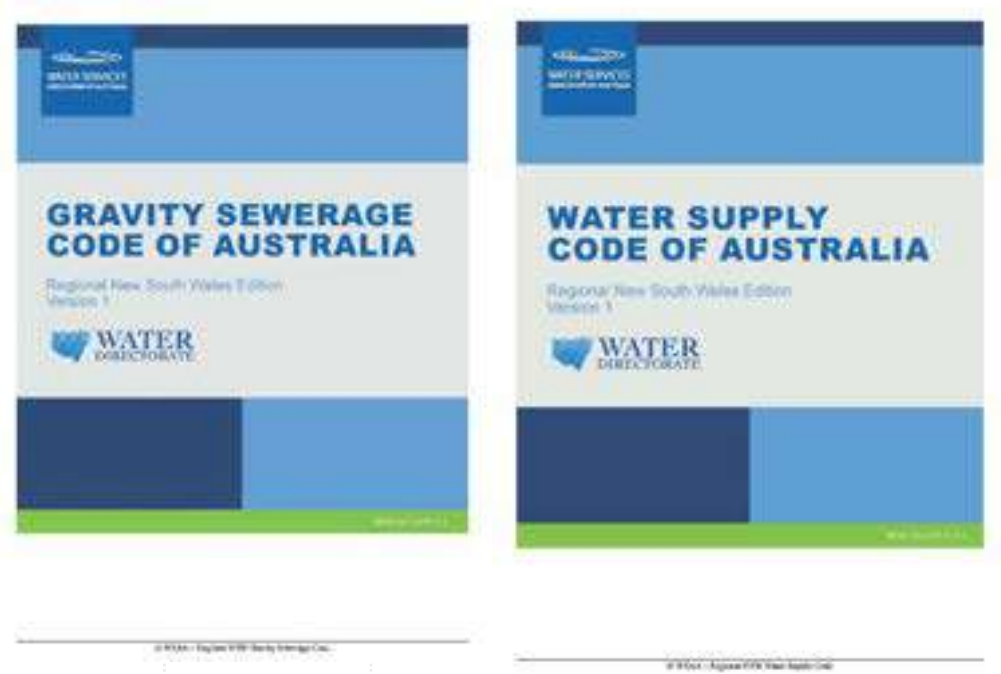
CUSTOMISABLE WORKSECTION REQUIREMENTS

"The simplicity of it is such that you can do it yourself," says Matthew Holt, Senior Engineer.

AUS-SPEC saved Council time and costs as they were able to adapt the worksection in house.

Construction:
Public utilities

- *1341 Water supply – reticulation*
- *1342 Water supply – pump stations*
- *1351 Stormwater drainage*
- *1352 Pipe drainage*
- *1353 Precast box culverts*
- *1354 Drainage structures*
- *1361 Sewerage systems – reticulation*
- *1362 Water supply – pump stations*
- *1391 Service conduits*
- *1392 Trenchless conduit installation*



Regional Approach

SHOALHAVEN AND SHELLHARBOUR CITY COUNCILS

A REGIONAL APPROACH TO DEVELOPMENT AND CAPITAL WORKS PROJECTS

AUS-SPEC Specifications for Development and Capital Works are a contemporary set of documents for local government that provide a uniform and precise approach to setting parameters for the creation of high-quality civil infrastructure.

Shoalhaven City Council and Shellharbour City Council utilise the most current version of AUS-SPEC specifications (AUS-SPEC Complete) for the design and construction of their development and capital works programs.

The Councils made the switch to the upgraded version to access up-to-date Australian Standards, codes and terminology. The upgrade has led to many improvements, including access to the latest Australian Rainfall and Runoff 2019 (ARR 2019). It also provides access to Asset Design As Constructed (ADAC), a data specification platform that enables the efficient capture and storage of civil infrastructure asset data. This allows councils to update their asset management system and include new works.

"The introduction of our updated AUS-SPEC-based specification has allowed for a streamlined and more efficient specification process. One of the big benefits is the standardised pay items, allowing rates for cost estimates to be quickly updated based on market rates."

Micaela Parkes, Manager Design Services, Shoalhaven City Council

"AUS-SPEC promotes standardised and transparent design, construction and management of local government infrastructure works. Shellharbour City Council has found AUS-SPEC to be an excellent resource that aligns with our core values of integrity, accountability and sustainability. It has enhanced resource efficiency and increased productivity, as well as minimised risk through clear safety, quality and environmental compliance requirements."

Luke Preston, Manager Subdivision Development, Shellharbour City Council

AUS-SPEC Manager Nandini Mehta presenting awards to Trevor Gandy of Shoalhaven City Council (above left) and Sue Stewart of Shellharbour City Council (above right) at the IPWEA NSW & ACT Engineering Excellence Awards 2020. Images courtesy IPWEA.

All new works at Shoalhaven City Council and Shellharbour City Council now follow the amended AUS-SPEC specifications to meet their local requirements. Adjacent Councils may adopt this or a similar version to unify documents on a regional basis, with the potential to create a regional Illawarra version of the documents. Benefits would include economies of scale for developers, constructors and Councils, as all parties work with the same set of requirements.

At the IPWEA NSW & ACT Engineering Excellence Awards 2020, Shellharbour City Council won the category award for their Services Depot Building Project. Shoalhaven City Council was Highly Commended for their project Boongaree Rotary Nature Play Park.

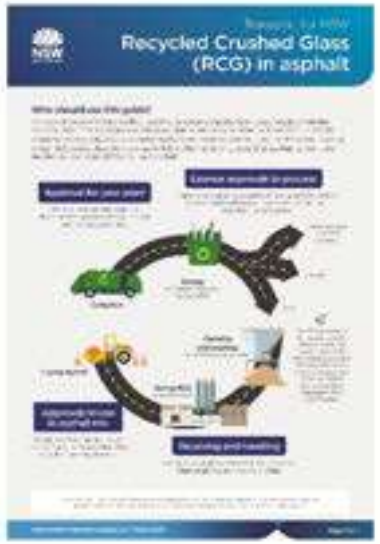
Far North Collector Road Project, currently underway in Shoalhaven City Council. Image courtesy Shoalhaven City Council.

Shellharbour City Council's award-winning Services Depot Building Project. Image courtesy Shellharbour City Council.

Case study produced in partnership with Shoalhaven City Council, Shellharbour City Council and Complete Group.

Use of recycled materials

The collaborative approach between SSROC and NATSPEC has encouraged a large number of Councils to join the procurement. They achieve up to 20% of cost savings.



City of Ryde

northern beaches council

CIVIL CONTRACTORS FEDERATION

Victoria IPWEA

OPV OFFICE OF PROJECTS VICTORIA

Sustainability Victoria

NSW EPA

IPWEA (NSW) Roads & Transport Directorate

LOCAL GOVERNMENT NSW

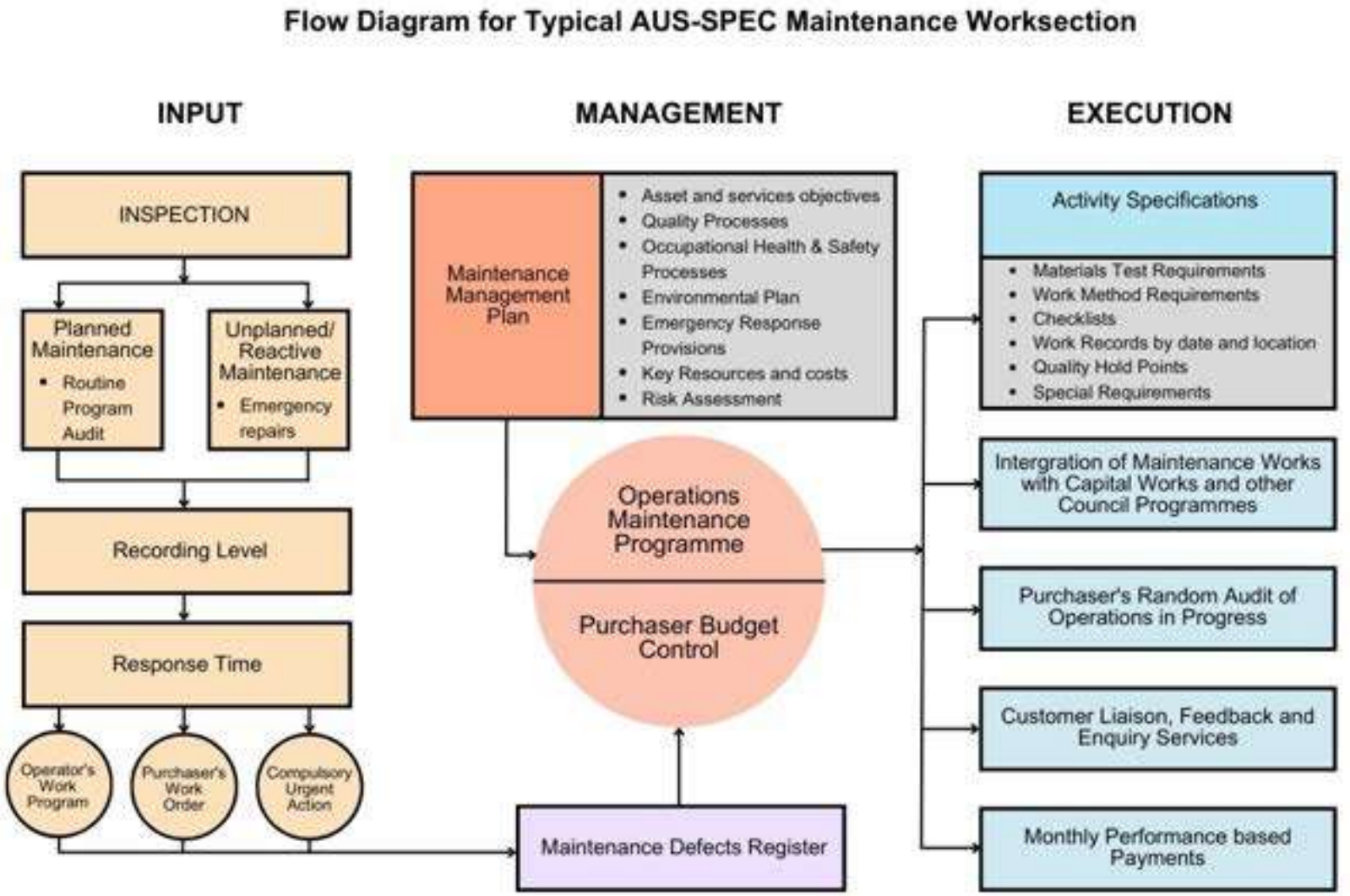
SSROC

WSROC Western Sydney Regional Organisation of Council

Case Study:
City of Sydney

AUS-SPEC maintenance system

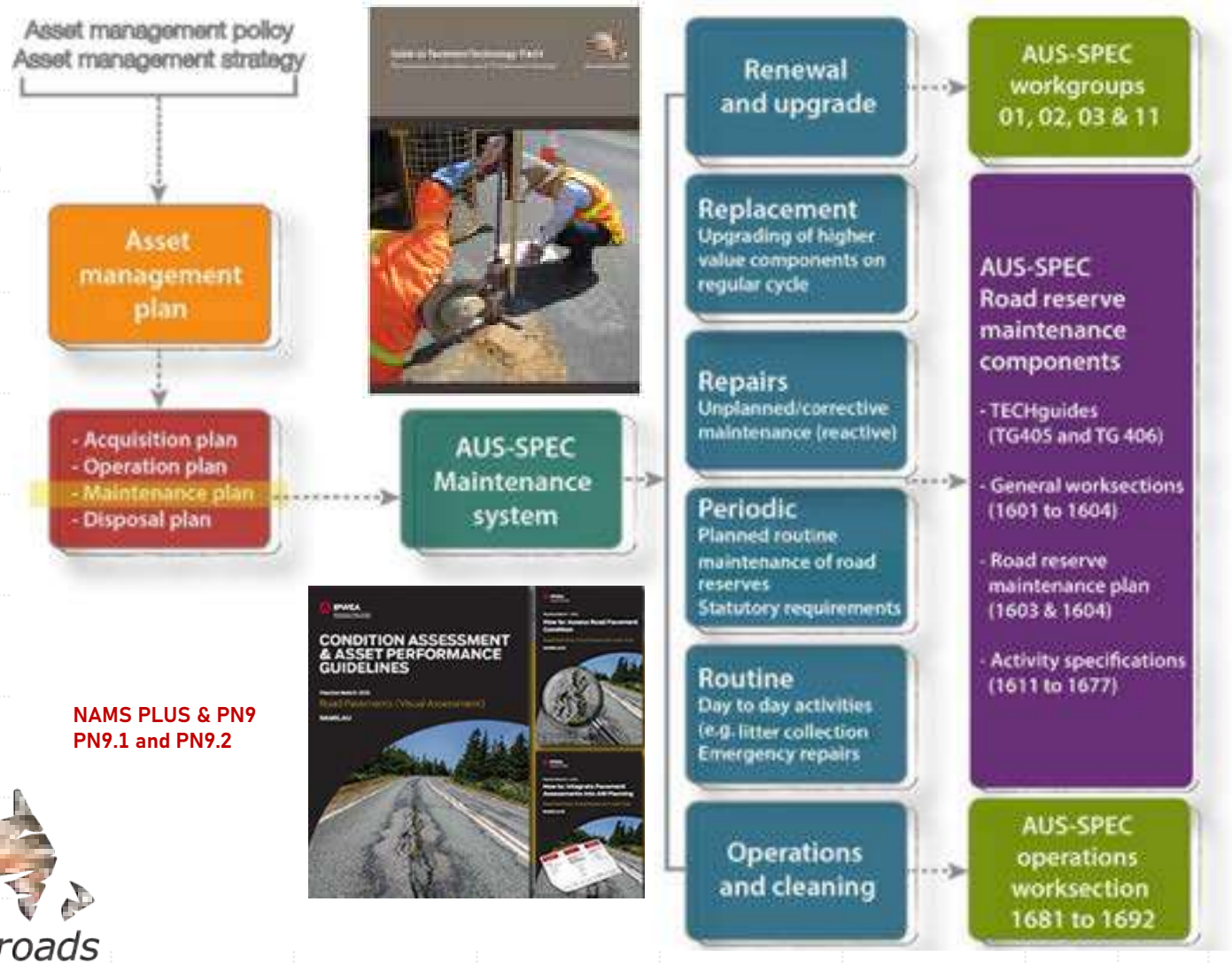
- Benefits
  - Calibrate service level with maintenance and operations budgets.
  - Prepare documentation for in-house and private maintenance contracts.
  - Collect records of asset inspections, defects, programmed and prioritised works.
  - Progressively improve the management of asset maintenance.
  - Manage risks through a systematic approach to maintenance of council assets.



Road reserve maintenance system

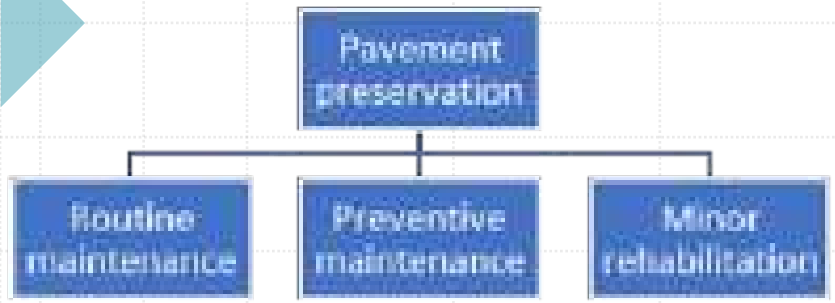
- Routine maintenance:
  - Surfacing repairs of minor localised areas of flushing, ravelling or stripping
  - Crack sealing (Longitudinal, transverse, diagonal, meandering etc.)
  - Repair of edge breaks
  - Pothole repairs
  - Shoulder grading
  - Vegetation control
  - Cleaning of table drains and culverts
- Periodic maintenance:
  - Resurfacing of significant areas suffering from defects
  - Pavement preservation treatments
  - Special reseals using crumb rubber, PMB etc.
  - Gravel resheeting of unsealed pavements
  - Regravelling of shoulders or shoulder resealing

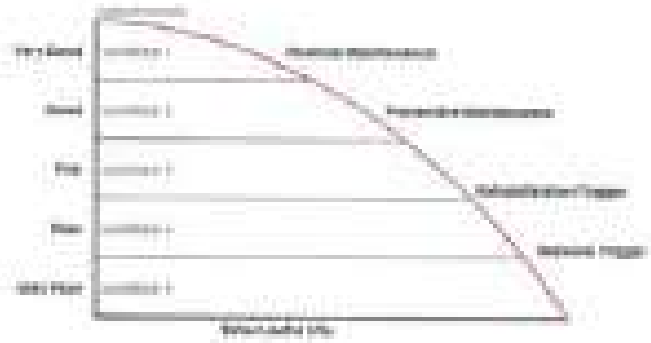
Collaboration with Austroads



NAMS PLUS & PN9
PN9.1 and PN9.2

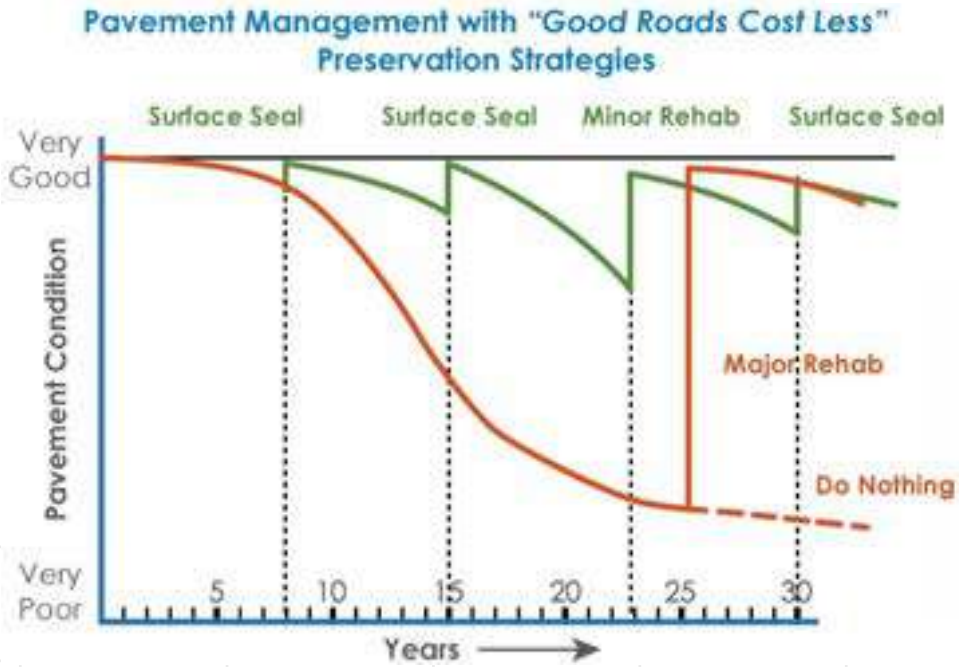
Pavement management strategies



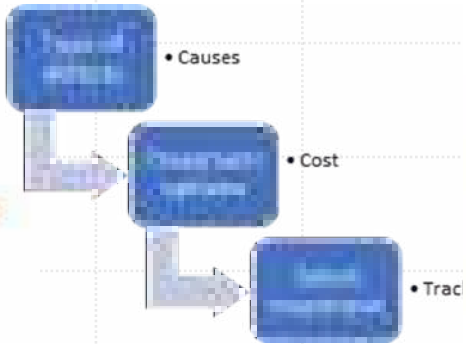


PME applied to stripping seal

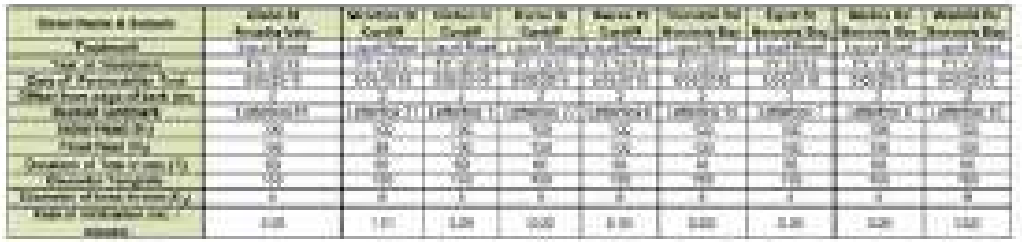
Permeability testing RTA T168



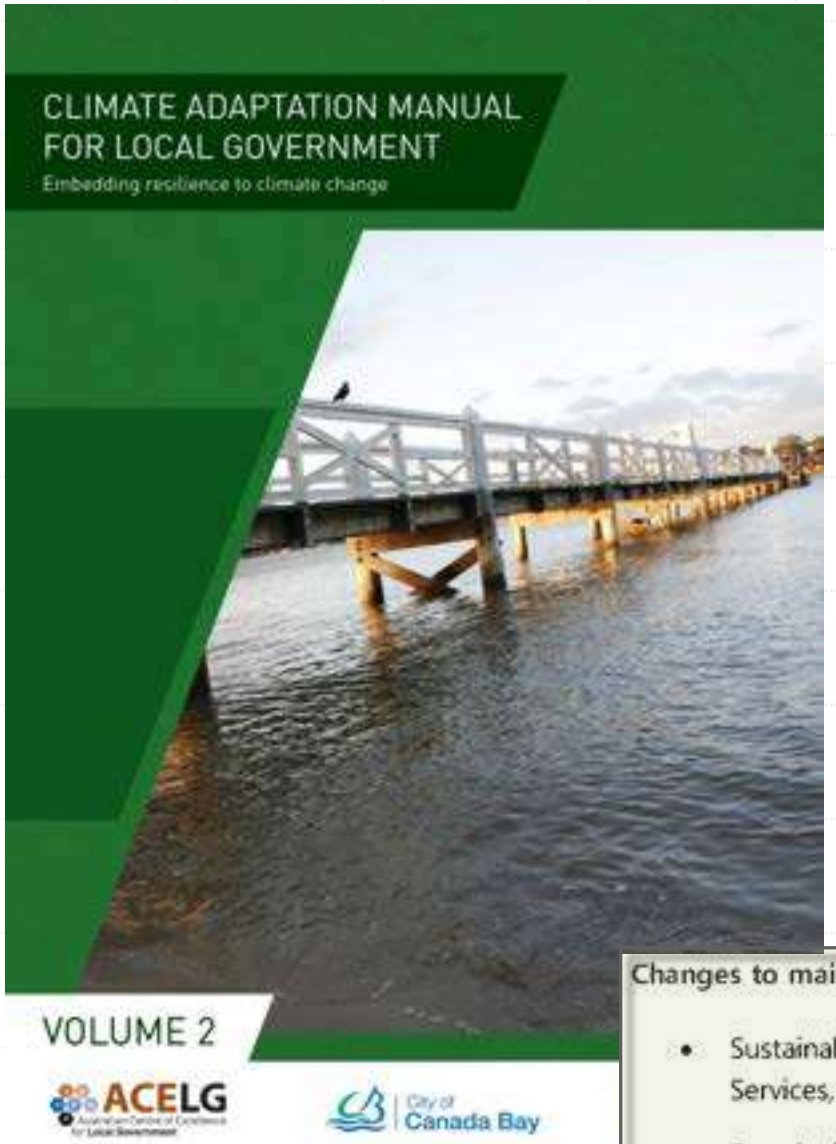
Selection of Treatments



Downer



Climate change adaptation



FULL CASE STUDY

CS6.1 CHANGES TO MAINTENANCE CONTRACTS TO ACCOUNT FOR CLIMATE CHANGE – MORNINGTON PENINSULA SHIRE COUNCIL, VIC

Changes to maintenance contracts: Two key maintenance contracts have changed:

- Sustainable Infrastructure Maintenance Services 2 (SIMS2) – Cleansing & Drainage Cleaning Services, and
- Sustainable Infrastructure Maintenance Services 2 (SIMS2) – Building Services

Both are 10-year contracts which commenced in April 2013.

AUS-SPEC case studies in IIMM

Benefits of national specifications

- **Local government focus** for the **life cycle management of assets**
- **Ensures technical and contractual consistency**
- **Reduces risk and improves productivity and quality outcomes**
- **Flexibility to add specific requirements to create fit for purpose specifications**
- **Content peer reviewed** for accuracy, comprehensiveness, and appropriateness
- **Minimum best practice requirements**
- **Provides a proactive approach to maintenance management**
- **Embeds sustainability requirements**
- **Regularly updated with industry collaboration.**

IPWEA is renowned for its best practice, industry-leading publications and training. Our solutions management approach is highly valued by Councils, Government and the private sector. AUS-SPEC was developed by IPWEA Australasia to provide nationally consistent civil specifications for Councils. This prevents duplication of effort and reduces costs.

The AUS-SPEC library of civil engineering design, construction and maintenance templates brings a shared professional language and process to engineering projects. In the current environment of increasing pressure on resource allocation, these publications are a tool to streamline asset life cycle planning and maintenance, while maintaining the essential focus on community safety and risk prevention.

IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

David Jenkins
CEO, IPWEA

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AUS SPEC