

Paving the Way to Sustainable Roads

Driving a circular economy through
government procurement



SSROC

Southern Sydney Regional
Organisation of Councils, Inc



Southern Sydney Regional Organisation of Councils (SSROC)

- Association of 11 councils spanning Sydney's southern suburbs, eastern suburbs, CBD, and inner west, covering a third of the Greater Sydney's population, or 1.7m people.
- Collectively manage about 20% of the waste in NSW.



Overview

- 15 council led procurement of asphalt with recycled crushed glass (RCG)
- Aggregate demand to drive supply, investment in infrastructure/jobs
- Create closed-loop market for kerbside glass
- Reduce CO₂
- Sustainable procurement / contract model
- Aligns with state/federal policy objectives
- EPA grant and Waste Less Recycle More funded



SSROC policy driver

We are responsible for all
our own waste and
managing it throughout
its lifecycle as close as
possible to where it was
created.



Recycling under threat

- National Sword / COAG export bans
- Lack of Sydney glass markets and infrastructure
- Councils can drive demand, investment and jobs

Why glass?

- Only 65% of kerbside glass has a local market
- 30% by weight of all recycling
- Heavy = expensive
- RCG tested and proven for a decade





Barriers

- Misperception that RCG not proven/no specifications
- Limited local markets/infrastructure
- RCG price uncertainty
- Individual councils insufficient to move market
- Poor data
- Coordination gap between engineers/waste/sustainability teams
- Change brings risk

Solutions

- Forums/align local & state specifications
- Demonstrate significant demand
- No premium on RCG
- Joint procurement/align with TfNSW
- Be resourceful/make best assumptions
- Working groups/
Patient, organised outreach
- Communicate: BAU is riskier

A person is standing on a large, rounded rock formation in the foreground, looking out over a vast, hazy mountain range. The mountains are covered in dense green forests and are shrouded in a soft, golden light, suggesting either sunrise or sunset. The overall scene is serene and majestic, with a sense of scale and grandeur.

ALL CHANGE IS HARD AT FIRST,
MESSY IN THE MIDDLE
AND
GORGEOUS AT THE END

- ROBIN SHARMA

Specifications

Recycled products and relevant specifications - recycled materials NSW

(As of August 2020)

Recycled Materials	NSW SPECIFICATIONS
Recycled Crushed Glass (RCG)	<p>Allowed in TfNSW/RMS asphalt, concrete for pavements and non-structural concrete and road base specifications.</p> <p>Asphalt: 2.5% Wearing Course in asphalt, 10% base and subbase layers in asphalt (increased from 2.5% to 10% in mid-2019)</p> <p>Concrete: 15% of the fines in the concrete mix</p> <p>Road base: 10% allowed</p> <p>The following specifications were amended accordingly:</p> <ul style="list-style-type: none"> R116 Heavy Duty Dense Graded Asphalt R117 light Duty Dense Graded Asphalt R118 Crumb Rubber Asphalt R121 Stone Mastic Asphalt
Reclaimed Asphalt Pavement (RAP)	<p>Allowed in TfNSW/RMS asphalt specifications.</p> <p>Wearing course: Maximum 20% RAP</p> <p>Base and subbase layers: maximum 40% RAP (typically 5 to 30% used)</p> <p>TfNSW/RMS is undertaking a study into the NSW RAP supply to be completed in 2020</p> <ul style="list-style-type: none"> Laboratory results from this investigation will then be used to review use of higher RAP content asphalt mixtures in NSW. <p>The current QA specification is R 3153 and will be reviewed in 2020 together with associated asphalt specifications following the study.</p>
Crumb Rubber	<p>Allowed in TfNSW/RMS spray seals (for over 40 years) and asphalt (over 30 years).</p> <p>Spray seals: 25% of sprayed sealed roads contain crumb rubber.</p> <p>Asphalt: 5% of asphalt roads contain crumb rubber.</p> <p>The current RMS specifications are:</p> <ul style="list-style-type: none"> R107 Sprayed Bituminous Surfacing (with PMB) R118 Crumb Rubber Asphalt QA Specification 3256 Crumb Rubber
Construction / Demolition Waste	<p>Allowed in TfNSW/RMS road base specifications.</p> <p>Used extensively in NSW for over 20 years, particularly Sydney. TfNSW/RMS allow 100% crushed concrete and max 20% crushed brick to be blended to be used as road base aggregates.</p> <p>The following specifications relate to:</p> <ul style="list-style-type: none"> R82 Lean Mix Concrete Subbase R83 Concrete Pavement Base QA Spec 3211 Cements, Binders and Fillers

NATSPEC TECHnote guidance for consideration

SPECIFYING RECYCLED MATERIALS FOR ROAD WORKS USING AUS-SPEC

INTRODUCTION

The objective of this TECHnote is to assist local road authorities implement the use of recycled materials by including it in their policies, construction specifications and approval processes.

Why the use of recycled materials?

The 2018 National Waste Policy sets a roadmap for collective action by governments, businesses and communities to improve waste management, recycling and resource recovery in Australia. It also highlights sustainable procurement by all levels of government, as one of the important strategies to better manage waste in Australia.

Use of recycled materials in road/civil construction

With the shortage and rising cost associated with the sourcing of traditional natural aggregates and sand from quarries and increased haulage distances for the placement of these materials, the road authorities are seeking alternative solutions. The best ways to prevent valuable waste going to landfill is to consider the waste hierarchy, to reduce, recover, reuse and recycle materials for use in road construction for the following:

- Road base and subbase for flexible and rigid pavements.
- Select fill for use on road subgrades or raising site levels for road or building construction.
- Bedding material for paving blocks in pedestrian areas, car parks, etc.
- Drainage medium for drainage lines and drainage structures.

Recycled materials such as crushed concrete, bricks, reclaimed asphalt, crushed glass, plastics, printer toner cartridges, asphalt millings, slag and crumb rubber can be used for new construction or rehabilitation and reconstruction to improve the performance of existing pavements.

To jointly develop appropriate specification for the industry NATSPEC is currently working with SSROC, Sustainability Victoria, the Office of Projects Victoria, the Institute of Public Works Australasia, and the Civil Contractors Federation to determine opportunities for utilising recycled material for the construction of new roads, road maintenance and replacement to further reduce our landfill.

Use of recycled materials in AUS-SPEC

Currently AUS-SPEC includes the use of various recycled materials in design, construction and maintenance worksections for the benefit of the designers and specifiers.

Design worksections

AUS-SPEC Design worksections include the use of recycled materials in Template to encourage the designers to recommend these materials at the design stage in 0042 Pavement design, 0043 Subsurface drainage, 0044 Pathways and cycleways, 0053 Rural pavement design - sealed, 0054 Rural pavement design - unsealed roads and 0074 Stormwater drainage and in Guidance text in 0072 Waterfront development and 0022 Control of erosion and sedimentation.

Construction worksections

AUS-SPEC Construction worksections permit and promote the use of recycled materials in road construction in Template and Guidance text in the following worksections:

- General worksections: 0173 Environmental management includes the use of recycled materials in the Waste Management Plan and includes the methods of disposal of construction waste that can be reused and recycled.
- Site urban and open spaces: The use of mulch is specified in all landscaping worksections. The use of recycled materials is recommended in the base and subbase construction of 0282 Pathways and cycleways.
- Structure: Suggests specifying recycled concrete aggregate, reinforcement with recycled steel and recycled plastic in fibre reinforced concrete in 0319 Auxiliary concrete works.
- Construction - road reserve
 - Stabilisation: Specifies materials including ground granulated blast furnace slag, fly ash, cementitious blend proportion in mix design, in situ stabilisation, pre-pulverisation of existing pavement and foamed bitumen stabilisation in 1113 Stabilisation.

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Rigid pavement base and subbase: Specifies recycled concrete aggregate, geopolymers cement, percentage of crushed glass content for fine aggregates and refers to the IPWEA, Greenspec and Ausroads AGPT04E in 1131 Roller compacted subbase, 1132 Lean mix concrete subbase, 1133 Plain and reinforced concrete base, 1134 Steel fibre reinforced concrete and 1135 Continuously reinforced concrete base.

Flexible pavements: Specifies different classes of crushed rock, crushed concrete and recycled materials for base and subbase construction manufactured from crushed concrete, bricks, terracotta tiles, glass or reclaimed asphalt millings. Includes properties of recycled materials and specifies limits for iron and steel slag, crushed concrete, bricks, recycled asphalt, fly ash and crushed glass fines. Includes percentage of undesirable material e.g. metal, glass, stone and slag, plaster, clay lumps, rubber, plastic, paper, cloth, paint, wood and other vegetable matter. Recommends blending of locally available materials to enhance material properties as discussed in the TECHreport TR08.

Asphalt pavements: Specifies the use of Reclaimed Asphalt Pavement (RAP) in RAP Management plan and asphalt mixes in 1144 Asphalt. The use of crumb rubber, granulated glass aggregate and clauses on the use of RAP for wearing course and base course have been updated.

Road openings and restorations: Recommends waste disposal and recycling and specifies the use of recycled concrete and crushed rock for backfill material for pathways and carriageways.

Pavement marking: Specifies the use of crushed quartz and crushed glass for increased retro reflectivity.

Guide posts: Specifies the use of plastic, rubber or similar for flexible guide posts and semi flexible guide posts and metal for rigid guide posts. Recommends to recycle existing guide posts.

Boundary fencing for road reserves: Recommends to recycle and re-use any surplus material after completion.

Construction -Public utilities: Specifies the use of approved recycled material for bedding embedment and backfill material in water supply, stormwater drainage and sewerage reticulation.

Maintenance worksections

AUS-SPEC Maintenance worksections recommends sorting and sending waste materials for recycling from litter collection, cleaning and sweeping operations to the recycling centre for recycling back into roads. 1601 General requirements - road reserve (maintenance) recommends including waste minimisation management techniques in the Environmental Management Plan. 1633 Resheeting unsealed shoulders recommends improving unsealed shoulders by stabilisation, by blending of gravel to enhance the properties of natural materials and the use of Recycled Asphalt Millings. 1674 Carriageway delineators recommends reusing and using recycled rubber posts. Most of the maintenance worksections for pavement repairs, maintenance, rehabilitation and reconstruction refer to the construction worksections for the use of recycled materials for road works.

Additional resources: TECHNotes DES 034 and DES 035 provide more information on pavement stabilisation and TECHreport TR 08 provides information for councils to build and maintain better sealed and unsealed roads by blending materials from different gravel pits to meet higher required performance standards.

Benefits of using recycled materials

- Long term benefits of using recycled products in civil construction.
- Reduced impact on the environment through efficient use of available resources.
- Reduced waste to landfill.
- Reduced energy required to produce pavement construction materials. Recycled materials are less energy intensive to produce than quarry materials.

CONCLUSION

AUS-SPEC embeds the use of recycled materials in its road design, construction and maintenance worksections. However, it is up to councils to source appropriate recycled materials based on availability, transportation costs and approved sources for the optimum performance of the pavements. Use of recycled materials should be included in Councils' policies, procurement strategies and tender processes to utilise materials that would otherwise go to the landfill.

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Example of the use of recycled materials for pavement construction and rehabilitation



In situ Stabilisation



Use of crushed glass for pavements by Waverley Council



Crushed glass sand produced by Lismore City Council



Use of Crumb rubber



Crumb rubber asphalt



Use of Toner pave by City of Sydney



Recycled local road in Sydney

Procure recycled MoU

- Prioritise recycled materials in procurement
- Shared policy position
- Collaborate to develop common framework
- Non-binding
- Media release with ministers



**Memorandum of Understanding to Prioritise
Recycled Materials in Procurement**
between
Southern Sydney Regional Organisation of Councils, Inc (SSROC)
and
City of Awesome

1 Background

Widely-recognised standards now enable the safe and cost-effective adoption of a range of recycled materials across various applications, including, for example, civil works materials. With Coalition of Australian Governments (COAG) environment ministers set to ban the export of recyclable materials contingent on the development of domestic secondary markets, councils need to act to ensure the continuity of recycling services. SSROC's Regional Waste and Resource Recovery Strategy recognises that local governments are in a strategic position to support state and federal circular economy policy, drive end markets for recycled materials, and stimulate regional infrastructural investment by prioritising recycled materials in procurement.

Joint regional procurement by a significant number of councils is expected to create sufficient demand to influence market development beyond the capabilities of individual councils and allow councils to cost-effectively procure safe, high-quality materials that meet specifications and resource recovery targets.

2 Purpose

The purpose of this Memorandum of Understanding (MoU) is to record that [enter council name] agrees to work together towards prioritising recycled materials in procurement, where cost and quality requirements are met, and collaborating to develop a common framework for regional procurement of these materials to support and drive the development of a circular economy.

3 Scope

This MoU will be effective until [enter council name] chooses to withdraw from it, or the MoU is superseded by another agreement.

4 Understanding

We agree to work together towards:

- Prioritising recycled materials in council procurement, where cost and quality requirements are met;
- Identifying as a participating council in a regional initiative to increase the use of recycled materials in local government procurement;
- Collaborating with SSROC and other participating councils to develop a common framework for regional procurement of recycled materials.

Signed on behalf of [enter council name]
[Enter name and title]

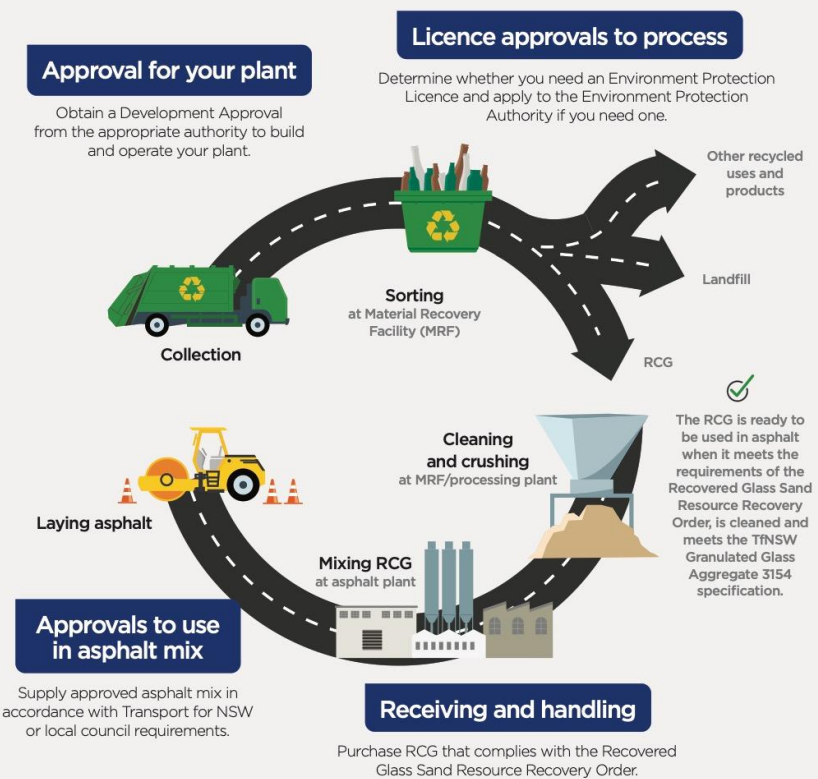
Signed on behalf of SSROC
Helen Sloan, A/ General Manager

Date:

Date:

Who should use this guide?

All levels of government are working together to increase opportunities to use recycled materials in construction. This promotes innovation and greater efficiency, enables our transition to a circular economy and leverages better environmental and economic outcomes. If you're in the glass recycling or asphalt business, these are the steps to follow when producing, supplying, purchasing and using recycled crushed glass (RCG) for use in asphalt.



Transport for NSW would like to acknowledge the Southern Sydney Regional Organisation of Councils and the NSW Environment Protection Authority for their valuable contribution to this guide.

- Guide on RCG in asphalt
- Jointly developed by TfNSW, SSROC, EPA and DPIE
- FAQs for industry/councils
- Signals coordinated support for RCG and upcoming demand

Timeline



Initial outcomes

- With TfNSW, doubled RCG demand across NSW
- Increased local recycling rate by 15%, reduce GHG emissions
- **Recycles all remaining council glass: ~70 million glass bottles/year**
- Increased regional infrastructural investment
- Up to 20% cost savings for participating councils
- Effective procurement framework and contract model – open to other councils
- Innovation clause facilitates more sustainable materials

Next steps

- Digital communication assets
- Triple bottom line cost-benefit analysis with DPIE
- Contract commences in July 2021
- Use contract innovation clause to drive other key recycling streams
 - Asphalt with plastics in dry/wet mixes and bitumen
 - Concrete with RCG, low-carbon concrete

Thank you!

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