

## *Category 3: Excellence in Sustainability*

# Murrawal Road Upgrade Project – Striving for 100% Recycling

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*(now with Transport for NSW)*



## *2021 AustStab Awards of Excellence*

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# Introduction

Central Coast Council have long been advocates of the advantage of road rehabilitation by way of in situ pavement stabilisation. Since the early 1990's CCC have chosen stabilisation as their preferred treatment of failed road pavements on an annual programmed basis.

The benefits of this progressive adoption of pavement stabilisation have been:

- Cost savings of (on average) 40%
- Massive reduction in the need for consumable quarry materials and landfill sites
- Massive reduction in greenhouse gas emissions

Put simply, it takes a tremendous amount of additional effort (and CO<sub>2</sub> emissions) to remove and replace pavement (i.e. DGB's) and or surfacing materials (Asphalt) compared to treating the existing material in place.

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# Road Construction – Stabilising

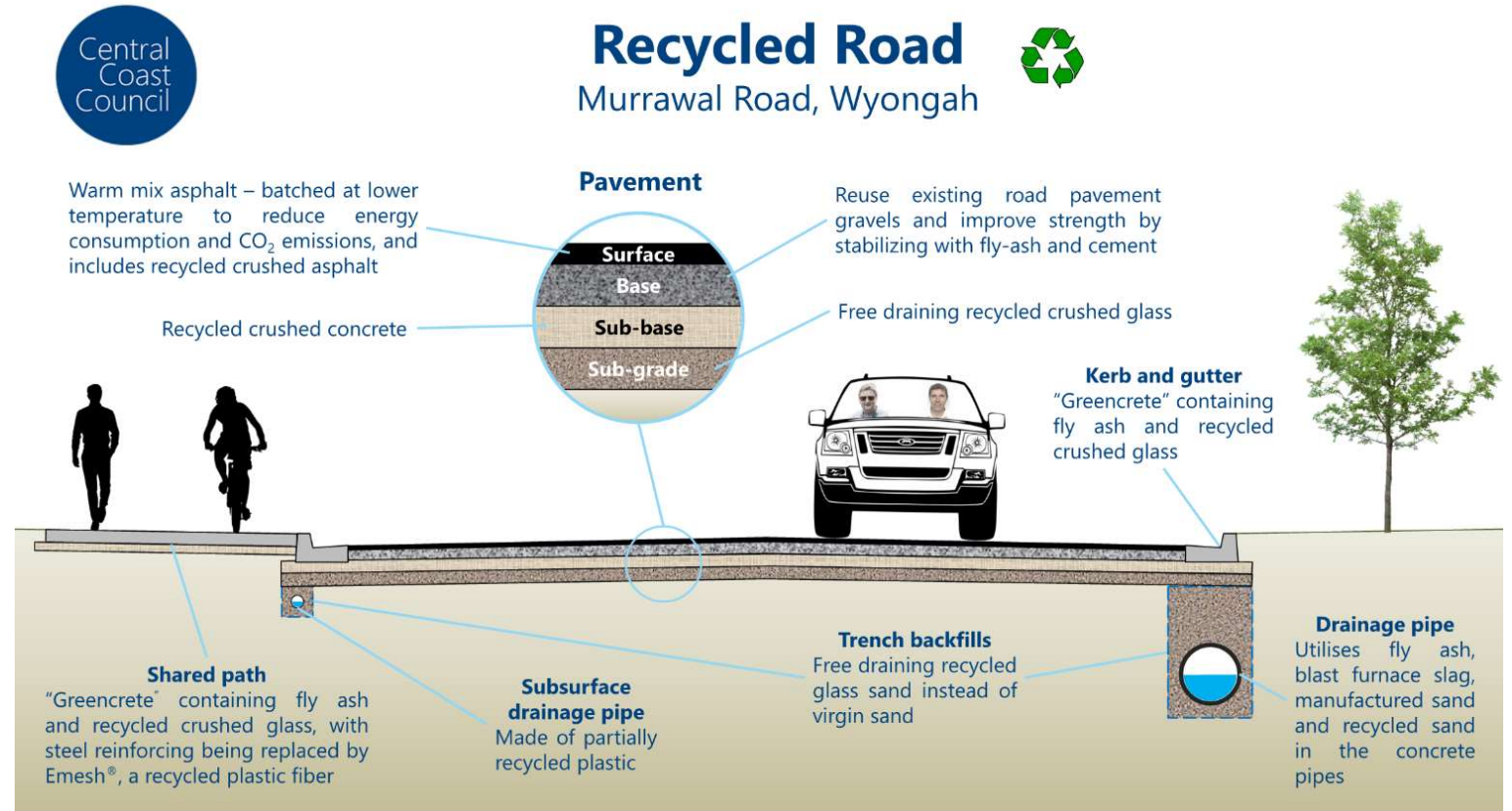
- Reuse of pavement wearing surface and road base with stabilising additives
- Reduces the use of virgin material and haulage costs
- Suitable for use in road reconstruction as the base layer prior to resurfacing



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# Overview

To go a step further and strive to achieve a COMPLETELY recycled road upgrade using a combination of materials and techniques including pavement stabilising. These are the components adopted in the Murrawal Road project.



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Concrete reinforcing fibres made of 100% Recycled plastic



Crushed glass being sieved to achieve desired grading



Road pavement base layers of crushed glass and concrete



Original road

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# Achievement



% recycled material in total project:

**92.7%**

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# Summary of Recycled Materials

- Crushed glass 1,600 te – 6,700,000 bottles
- Concrete recycled material 62 tonnes
- Crushed concrete 1,500 tonnes
- Road pavement gravels 1,150 tonnes
- Plastic recycled 270 kg – 51,000 plastic bags
- CO<sub>2</sub> saved 6,500 kg



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# Challenges

In order to upgrade a road with completely recycled products, new and innovative materials and techniques were required. This necessitated extensive research into available materials and working with suppliers to obtain the suitable products.

Every element of the road was investigated for a potential recycled replacement. With the exception of the already established pavement stabilisation processes which (in isolation) have potential to achieve up to 100% recycling, it was challenging to find equivalent recycling options for the other components of the rehabilitation process (i.e. concrete, drainage aggregate, ag drain, asphalt).

Where it was accepted that other elements were not available as a fully recycled product, efforts were made to reduce the carbon footprint of the product (i.e. warm mix asphalt has lower CO<sub>2</sub> emissions).

CCC worked with a local concrete contractor to produce what was finally branded “Greencrete”. Similarly, CCC utilised the local glass recycling contractor to replace conventional drainage aggregate with a recycled glass equivalent.

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# Lessons Learnt

- A lot of legwork is required up front, but it pays off later with ongoing adoption through Council's works programs
- Upfront legwork gives credibility to the process, which leads to confidence from the field staff
- Main research required;
  - Investigation of every element for performance – aim for similar or better
  - Performance and life span compared to virgin materials
  - Work with your local manufacturers
  - Bring your staff along for the ride
- The media exposure is a bonus – the real winners are the environment and our industry



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# Long-term Benefits

By striving for this whole of road cross section approach to sustainable practices CCC had to necessarily engage with industry to innovate in line with the project goals of maximising recycling and minimising the emission of greenhouse gasses.

The benefit of pushing the boundaries of sustainable road rehabilitation practice for this project has been the establishment of both the required product plus a lasting supply lines capability for future projects.

## Drone Footage

[www.youtube.com/watch?v=BOrj2ZcUc88](http://www.youtube.com/watch?v=BOrj2ZcUc88)

## Virtual Tour

<https://360.goterest.com/sphere/murrawal-rd?scene=5e1029e7ffd0e1ca6ea5c4a2>

Our vision: “A vibrant and sustainable Central Coast”

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