

A SUSTAINABLE MILESTONE

Koo Wee Rup is a small town located in the Shire of Cardinia, about 60 kilometres southeast of Melbourne. The town has experienced significant population growth over the years, leading to increased traffic flow through its narrow roads, particularly during peak periods. This traffic congestion has not only affected local residents but also impacted the movement of freight and goods through the region.

To address these issues, the Victorian Government and VicRoads embarked on the construction of a \$66 million bypass road that would divert traffic away from the town centre. A new 3.4-kilometre two-lane arterial road link between Healesville-Koo Wee Rup Road and the South Gippsland Highway will provide a safer and more efficient route for commuters and freight transport.

SUSTAINABILITY MILESTONE WITH INNOVATIVE SLEEPER DESIGN

The Koo Wee Rup Bypass project has set the scene for sustainable road infrastructure construction, using sleepers that reduce environmental impact while ensuring long-lasting durability.

1053 purpose built concrete sleepers manufactured by National Precast Precaster Sunset Sleepers have taken sleeper sustainability innovation to the next level. The company set out to pioneer a greener approach and turned to glass fibre reinforced polymer (GFRP) as a replacement for traditional steel reinforcement.

According to National Precast CEO Sarah Bachmann, GFRP as reinforcement offers several advantages, including high strength-to-weight ratio, corrosion resistance and longevity.

As well, the company has used a lower carbon concrete mix to manufacture the sleepers, to further reduce the carbon footprint. The mix incorporates recycled and waste raw materials. A 50MPa mix was selected to deliver enhanced durability.



PROJECT: Koo Wee Rup Bypass
CLIENT: VicRoads
HEAD CONTRACTOR: Lend Lease Engineering
PRECASTER: Sunset Sleepers

"By reducing the reliance on steel in the sleepers and using a high strength, lower carbon mix, carbon emissions have been significantly reduced. The sleepers will last more than a lifetime," Bachmann says.

ENVIRONMENTALLY FRIENDLY CHOICE

Bachmann believes that these innovations, combined with the inherent benefits of offsite precast concrete manufacturing, make these sleepers an environmentally friendly choice.

The sustainability and environmental benefits of using factory-made precast concrete elements are well known. Manufactured in a controlled environment, there is minimal waste, and any waste is recycled. Local employment is supported and workers enjoy a controlled, safe environment.

Meticulous quality control measures were implemented throughout the entire manufacturing process to deliver impressive results.

Every concrete delivery underwent thorough testing to confirm the correct slump and strength. A comprehensive inspection and test plan (ITP) was engaged with regular inspections and

tests conducted to verify quality.

The sleepers were cast after a suitable curing period and left wrapped in plastic for a minimum of seven days, promoting proper hydration and strength development.

All manufacturing processes and materials adhered to regulatory requirements and met the project's stringent specified longevity and performance criteria.

100 YEAR LIFE

Sunset Sleepers' commitment to innovation and quality has set a new precedent for road infrastructure construction in Australia. With an expected lifespan of 100 years, these sleepers offer remarkable durability that can withstand the demands of heavy traffic and adverse weather conditions, which will contribute to reducing maintenance costs and environmental impact.

Their success paves the way for wider adoption of sustainable construction practices and materials, inspiring other infrastructure projects to prioritise longevity and sustainability. ■