Climate Action Case Study:
ESD Sustainable Concrete Footpath

MORNINGTON PENINSULA Shire

Background

The Shire currently manages around 713 km of sealed and unsealed footpaths on the Peninsula, with a significant amount made from concrete. Approximately 3-6km of this is renewed each year, using around 1,000 tonnes of concrete annually. Currently, emissions from construction are not recorded and can only be estimated, but this is a key part of our carbon footprint and a huge opportunity to act.

Problem

- Concrete production releases a large amount of carbon dioxide
- Cement, a critical part of concrete third-largest industrial energy consumer and second-largest industrial CO_2 emitter globally, accountable for up to 8% of the world's emissions
- Mining raw materials for concrete such as sand and rock, has a significant impact on the natural environment

Opportunities

The Shire is looking at practical and scalable solutions to improve sustainability in our concrete footpaths, focusing on reducing emissions, and delivering circular economy outcomes. Replas' Polyrok is a product made from recycled plastic from the Redcycle program collected at supermarkets. Polyrok can replace 5-10% of the virgin rock aggregate in concrete, reducing raw materials required and avoiding landfill for our problematic plastics.

Fly ash, a by-product from coal production, can be used to reduce up to 40% of the normal cement content in concrete, changing the chemical reactions and reducing the carbon emissions.
Research into using new materials and technologies is quickly shifting the industry, and the Shire is committed to supporting a rapid transition towards zero carbon economy.

Planned for 2022 is a trial of a concrete mix using crumb rubber from recycled tyres and recycled plastic, hoping to establish viability in the future.

Image: Replas Polyroc footpath and fly ash substitute

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Image': Councillor Race and Councillor O Connor, pointing to a new footpath made with Replas' Polyroc

Outcomes

In the last two years, the Shire has laid approximately 1.5km of footpath using sustainable materials, using approximately 7 tonnes of recycled plastic and 20 tonnes of fly ash, and reducing carbon emissions. By updating our standard specifications, we can have a significant impact on our carbon footprint every year, as well as supporting our suppliers, contractors and community to increase knowledge and capacity

Next Steps/Future

A review of the case studies and trials conducted is required to determine the best path forward. The review will consider key issues such as cost, performance, maintenance, potential environmental impacts, end-of-life recyclability, supply chain capacity and other factors.