SUSTAINABLE INFRASTRUCTURE SPOTLIGHT: THE ENDURING BENEFITS OF STEEL REINFORCED CONCRETE PIPE IN NZ AND AUSTRALIA

Concrete Pipe and Precast
Association of Australasia

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Steel reinforced concrete pipe (SRCP) is a sustainable and continuously evolving solution for essential infrastructure development in New Zealand and Australia. Its inherent characteristics, and ongoing evolving industry practices and innovations, contribute to environmental responsibility throughout the lifecycle of the pipe.

KEY PILLARS OF SRCP SUSTAINABILITY ARE:

Optimised manufacture through smart design:

The performance-based design principles of AS/NZS 4058:2007 empower manufacturers to precisely balance concrete and steel requirements to suit their individual manufacturing processes. This optimised approach maximises material efficiency and minimises material usage and embodied energy of the pipes.

Minimising Installation Footprint:

Appropriate installation specifications minimise the need for imported select fill and encourage the use of suitable site-won materials. This reduces transportation emissions, and the environmental impact associated with material extraction.

Designed for Longevity:

Tailoring designs and specifications to specific site conditions, loads, and durability requirements ensures performance and a long service life, exceeding 100 years. This longevity eliminates the need for early replacement and associated environmental burdens.

Driving Further Sustainability Through Innovation:

The SRCP industry is committed to continuous improvement and the adoption of innovative practices to further enhance sustainability:

1. **Lowering the Carbon Footprint of Concrete by:**
   a. **Use of Supplementary Cementitious Materials (SCMs):** Incorporating materials like fly ash, slag, and silica fume as partial replacements for Portland cement significantly reduces the embodied carbon of concrete mixes.
   b. **Optimisation of Concrete Mix Designs:** Employing advanced mix designs minimises overall cement and binder content while maintaining performance requirements.
   c. **Adopting Lower Carbon Cements:** Ongoing research and development of cements with reduced clinker content are targeting the most energy-intensive aspect of traditional cement production.
   d. **Considering Carbon Capture and Utilisation (CCU) Technologies:** While still in development, these technologies offer potential future reductions in concrete's carbon footprint.

2. **Sourcing Lower GWP Steel:** Prioritising the use of steel manufactured with a lower Global Warming Potential.

3. **Promoting Sustainable Material Sourcing:**
   a. **Local Sourcing:** Utilising locally sourced aggregates and other materials reduces transportation distances and supports regional economies.
   b. **Recycled Aggregates:** Incorporating recycled concrete and other recycled materials as aggregates conserves natural resources and reduces waste.

4. **Enhancing Water Efficiency in Production:** Implementing water-efficient manufacturing processes and recycling water minimises consumption.

5. **Reducing Manufacturing Waste:** Employing efficient production techniques and robust quality control measures minimises waste generation, with a focus on recycling any production byproducts.

6. **Advancements in Pipe Design:** Exploring innovative designs that optimise material use without compromising structural integrity or performance, leading to further resource efficiency.

By focusing on these core principles and actively embracing innovation, steel reinforced concrete pipe remains a sustainable, durable, and responsible choice for essential infrastructure development in New Zealand and Australia, contributing to a more environmentally conscious future.