



ROLLER COMPACTED CONCRETE (RCC)

Use of Fly Ash in Roller Compacted Concrete

Engineers and road builders requiring an exceptional concrete for road work will realize significant advantages with Roller Compacted Concrete (RCC).

RCC is a zero slump concrete mix with a very low water content.

A key component of RCC's exceptional quality is the use of Fly Ash which allows complete compaction. Fly Ash, besides providing the critical size of fines needed to manufacture superior concrete, brings other chemical benefits and advantages to the mix design of concrete.

Since the 1980's, use of Roller Compacted Concrete utilizing Fly Ash, has increased as a replacement for conventional concrete mixes, providing significant savings and better roads.

Replacement of Portland Cement with Fly Ash has the following benefits:

- Lower installed and life cycle costs versus conventional pavements.
- Provides higher strengths (50 Mpa at 56 days), and greater long term durability.
- Improves workability & place-ability due to the spherical structure of Fly Ash.
- Significantly reduces Alkali Aggregate Reaction (AAR), preventing cracks.
- Improves Sulfate Attack Resistance, preventing expansion cracks, and loss of strength.
- Reduces the Heat of Hydration (by 60%) preventing thermal cracking.
- CO₂ is a significant by-product in the manufacture of Portland Cement. Every tonne of Portland Cement that is replaced with Fly Ash in a concrete mixture, prevents one tonne of CO₂ being released into the atmosphere.

Appropriate production and handling of Fly Ash complements the environmental objectives of utilities and cement manufacturers. This presents an opportunity for collaboration between the utility and cement industries to "green" their respective operations and reduce costs. And as the value,

allocation and trading of CO₂ emission credits evolve over the next several years, the recycling and responsible use of Fly Ash will contribute substantially to the environmental sustainability of industry operations.

Projects Utilizing Fly Ash

RCC Pavement

- NSP Point Tupper
- 55% replacement, 50 Mpa
- 1995

RCC Dam

- NS Power
- 3500 M³
- 56% replacement, 30 Mpa – 1997

RCC Highway Sub base Demo

- PEI
- 60% replacement
- 1998

RCC Pavement

- McGill Transport, Montreal
- 30% replacement
- 1998

RCC Pavement

- Lafarge Cement Terminal Yard and TransAlta Compost Facility
- Up to 55% replacement
- 2000

More detailed technical information on the benefits of using Fly Ash in Roller Compacted Concrete is available from CIRCA.

CIRCA

www.circainfo.ca

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