



CONCRETE PRODUCTS

Fly Ash in Concrete Products

Today's high performance concrete projects utilize Fly Ash for increased strength, durability and ROI. Widely used the world over for the past several decades, Fly Ash has a proven track record of enhancing the properties of concrete. Considering cost and environmental benefits, Fly Ash is now a key ingredient in modern concrete production.

The Canadian Standards Association A 3000 "Cementitious Materials Compendium" A 23.5 Supplementary Cementing Materials defines Fly Ash as the "finely divided residue that results from the combustion of pulverized coal and which is carried from the combustion chamber of a furnace by exhaust gases".

Fly Ash in Concrete Provides the Following Benefits:

- Water Reduction
- Improved Workability/finish-ability eases handling and placement of Plastic concrete
- High Ultimate Strengths
- Improved Pumpability/ Less Segregation
- Mitigation of Alkali-Silica Reaction*
- Reduced instances and severity of Alkali-Aggregate Reaction*
- Reduced Heat of Hydration*
- Improved Sulphate Resistance*
- Greater Economy

*Some restrictions apply to Type CI and CH Fly Ashes

Applications

- Ready mix concrete (footings, walls, slab on grade)
- Bridge decks and support footings
- Precast structures
- Blocks and bricks
- Pipes

Producing Quality Concrete with Fly Ash

To achieve the desired physical properties in the finished concrete, the engineering materials and mix proportions shall be in accordance with CSA A23.1. It is imperative to use the appropriate Type of Fly Ash (Type F, Type CI or Type CH) and understand the corresponding properties that each will produce in concrete. As with placement of any concrete product, care should be taken to use proper procedures for finishing and curing operations.

In concrete, Fly Ash reacts with the free lime generated by cement hydration to form additional calcium silicate hydrate, which fills the voids normally associated with a cement pour. The permeability of the concrete is therefore reduced.

Cost and Environmental Factors

Concrete utilizing Fly Ash produces a superior final product. Life cycle costs are lower, the concrete lasts longer, has greater strength and may have an initial lower cost than concrete using only Portland Cement.

As Fly Ash use in concrete increases, it leads to greater environmental sustainability through both the avoidance of landfill and the reduction of natural resource consumption, saving precious resources for future use. Incorporating Fly Ash in a concrete mix design also enables cement and concrete producers to reduce the GHG emissions associated with the manufacture of Portland Cement and concrete.

CIRCA

www.circainfo.ca

For more information,

contact: Anne Weir
Executive Director

email: aweir@circainfo.ca



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