**Use of Low Lime Fly Ash in Concrete**

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The use of fly ash in concrete is one of its main applications and has a history that can be traced to at least the 1920’s, however, the material came to wider prominence in the 1930’s with the construction of large dams in the USA. Somewhat dormant until the 1980’s, fly ash use rapidly took off worldwide when its role to improve durability became recognised, rather than something just to control heat. The marketing campaign “fly ash makes good concrete better” was successful and in many countries, the majority of concrete is now supplied with either fly ash or slag. Most countries have now developed mature national standard for fly ash, which can be added directly to concrete as a separate ingredient at the mixer or as a component of a blended cement.

Most engineers are now familiar with the use of fly ash and there are few limitations to its application in concrete and in this talk use of fly ash as a pozzolan in concrete and how it affects the properties of concrete will be discussed. The specific topic areas that will be addressed are as below

1. Properties of Fly Ash Concrete
   1. Fresh properties
   2. Heat of hydration and mix temperatures
   3. Consistence
   4. Bleeding
   5. Engineering properties
      1. E-value/stiffness
      2. Creep strains
      3. Shrinkage
   6. Strength Development
      1. Early strength
      2. 28 day standard strength
      3. Long-term strength
   7. Durability Characteristics
      1. Carbonation resistance
      2. Chloride ingress
      3. Sulfate resistance
      4. Air Entrainment/Freeze-thaw resistance
      5. Surface Absorption
      6. Alkali-Silica Reaction (ASR)