

Gautrain

World class fly ash concrete for Gautrain

One of the largest rail projects in the world to be constructed in recent years, Gautrain has changed the face of public transport in Gauteng. Main contractor, Bombela Civils Joint Venture (BCJV), used Ash Resources' DuraPozz® Pro in virtually all of the project's concrete mix designs.

The project required approximately 800 000m³ of concrete (with the unusual durability specification of a 100 year lifespan) and 116 000m³ of grouts. BCJV created the largest precast yard in the southern hemisphere at Allandale in Midrand to deliver the high volume of large concrete castings required predominantly for the above ground work. The yard produced a wide variety of castings, the most striking of which were huge viaduct segments weighing between 45 and 65 tons each.

Traditionally, such a precast yard would use a 52,5 CEM I or a 42,5R cement. However, after extensive trials, a cementitious mix incorporating 30-35% DuraPozz® Pro was selected. A fly ash mix does not generally give high early strength but, by optimising the other materials, an accelerated mix was achieved that allowed the casting moulds to be turned around within 12–18hours, obviating the need for steam curing. The success in optimising the performance of the mixes owed much to the excellent reactivity of DuraPozz® Pro.

The above ground Pretoria route mainly crosses unstable dolomitic limestone. Meeting the challenge to create stable foundations required over 100 000m³ of grouting using a CEM I cement and fly ash mix for good pumpability, together with bentonite.

DuraPozz Pro made a significant cost-effective contribution in all the key parameters of the concrete work including:

- Durability
- Excellent workability
- Reduced heat of hydration
- Denser, more impermeable concrete, which helps to protect against acidic water
- The aesthetics of this prestigious and very visible project: the flowability and reduced bleeding with fly ash contributed to
- good off-shutter finishes that required minimal rubdown

"Vitaly important raw material considerations on this enormous undertaking were Ash Resources' guaranteed product availability and reliability," said BCJV's Cyril Attwell, Chief Concrete Technologist and Research Scientist. "DuraPozz® Pro proved to be the most consistent in quality out of all the materials supplied on the Gautrain project and that included water!".

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