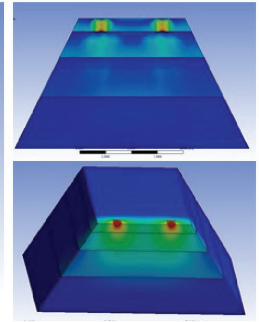
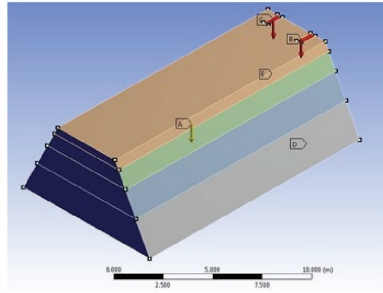


Fly ash utilisation in haul road construction in open cast coal mines by using polymeric fly ash composite



Haul roads being the life lines of mines are an important factor for smooth and continuous working of mine. Traditional ways of building haul roads lead to frequent ruptures and breakdown in these roads due to erosion of material, water slurry formation, huge dust generation, etc. This leads to production halts and productivity decline and ultimately economic losses. Using Pozzolanic property of fly ash, with hardening and water-resistant nature of certain polymers, these problems can be mitigated to significant extent, reducing average maintenance costs, and improving productivity of mines. Our study aims to achieve the following:

- Making use of polymeric resin's water resistant nature in combination with fly ash to focus on geo-environmental and hydrogeological aspects of haul roads.
- To find an optimum mixture of fly ash, overburden waste and polymer resin additives, that will strengthen the haul road

significantly, making it additionally water resistive and reduce the dusting problem.

- To conduct numerical simulations for optimising haul road design considering the fly ash composite's enhanced properties.
- To implement this construction mixture in haul roads practically and study the applicability and economics.

A viable construction material made of fly ash composite, induced with polymeric resin, has been formulated based on rigorous lab testing, mathematical modeling and numerical simulations have proven the fly ash composite's effectiveness in application in haul roads, reducing deformation and damage to haul roads by more than 80% as compared to traditional haul roads. The result of this research is a cleaner, commercially viable, and economic construction material of superior characteristics with far reaching applications.