Use of RKF in Concrete

Description and Benefit
The Construction and Materials Division was approached about devising a way of lowering the amount of carbon dioxide (CO2) incorporated in concrete. The concrete industry, especially cement manufacturers, have started this trend by adopting Type IL as the new universal cement, replacing Type I/II. This change reduces the amount of greenhouse gases released at the plant and assists in reducing the carbon footprint. For decades, MoDOT has utilized fly ash as a mineral admixture to produce durable concrete. Unfortunately, quality of fly ash is becoming less and less available as the EPA has placed stringent restrictions on coal-fired power generating stations since large amounts of CO2 are released at these plants. As an option to fly ash, MoDOT has discovered a viable option in RKF. RKF is the by-product of the production of calcined clay. It’s a mineral admixture that provides longer hydration periods in concrete than fly ash, better overall compressive strength, and enhanced durability. On the negative side, Metakaolin is extremely expensive since it’s a process-controlled product. On the plus side, RKF is the by-product and a less expensive option. It provides the same properties as metakaolin at a much lower cost and available since this product is produced in Missouri. The most important aspect is no CO2 is released into the environment when metakaolin/RKF is produced at the plant. MoDOT can reduce CO2 in concrete by approximately 50% by adding Type IL cement, RKF, naturally occurring gypsum and limestone as an aggregate, sand, water, and chemical admixtures.

For More Information Contact
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