

Coal Combustion Product Type

Fly Ash, Bottom Ash, Flue Gas Desulfurization Material

Project Name

Fort Mandan Visitor Center

Project Location

Washburn, North Dakota

Project Participants

Great River Energy, ISG Resources, Headwaters Resources (now part of Eco Material Technologies), Lloyd E. Platt and Associates, Rolac Contracting

Project Completion Date

2002

Project Summary

When Lewis and Clark began their historic expedition over two centuries ago, President Thomas Jefferson specifically instructed them to seek out “...mineral productions of every kind, but more particularly metals, limestone, pit coal...” In North Dakota, they found abundant lignite coal. In the lead-up to the expedition’s 200-year anniversary, the North Dakota Lewis and Clark Bicentennial Foundation created at Fort Mandan—where the pair spent the winter of 1804-05—a facility that stands as a showcase for the coal combustion products that would become an important part of the regional economy.

Project Description

The Fort Mandan Visitor Center was built to accommodate the thousands of people anticipated to visit during the bicentennial anniversary of the expedition. Conveniently, the fort lies only a few miles from Great River Energy’s Coal Creek Power Station, which worked with ISG and Headwaters Resources (now part of Eco Material Technologies) to provide materials and leadership for the project.

Fly ash, bottom ash, and flue gas desulfurization (FGD) material were all used in the construction of the visitor center and surrounding grounds to ensure adherence to sustainable building standards. Specifically, the complex incorporates the following coal combustion products:

- **Exterior Walls**—constructed from FlexCrete aerated concrete, which comprises nearly 70 percent fly ash by volume. FlexCrete is filled with tiny air bubbles that provide outstanding sound and thermal insulation.
- **Interior Walls**—covered with MagnaWall stucco. Fly ash replaces more than 50 percent of the cement that is typically used in stucco to improve both the durability and workability of the product.
- **Flooring, Sidewalks, Driveway, and Parking Lot**—made from fly ash concrete with a sub-base of bottom ash.
- **Walls and Ceilings**—manufactured from FGD gypsum, a byproduct of coal power plant emissions control equipment.
- **Shingles, Cultured Stone, Ceiling Tiles, Carpeting, and Fireplace**—that all contain fly ash.



- **Walking Trails**—throughout the Fort and Visitor Center area constructed with a soil cement mixture containing 50 percent fly ash.

The unique construction of the Fort Mandan visitor services center provides guests an opportunity to learn how modern technology is allowing for novel ways of utilizing coal combustion products to create useful building materials. Visitors gain an appreciation for natural resources, recycling, coal mines, power plants, their by-products, and their collective contribution to the American way of life—as well as learning about Native American life and customs and Lewis & Clark’s own experience at Fort Mandan.