OPE-24-01.1

The Commercial Appeal, Memphis, Thursday, May 1, 1975

Slurry Construction Method Isn't First Mid-South Venture

By MICHAEL CLARK

The slurry construction technique, which is under study for use in building a proposed expressway tunnel through Overton Park, is somewhat uncommon, but definitely not new in the Mid-South, local engineers say.

In fact, according to the U.S. Engineers, John W. Black, retired chief of the foundations and materials branch of U.S. Army Engineer District, Memphis, experimented with quite similar methods about 1945 in a levee trenching project near Trotters Point, Miss.

Still, slurry method technology has advanced significantly since then and has come into common usage in Europe, particularly in Italy.

The engineers used the slurry method to construct a clay gravel water break wall 5 feet wide and 80 feet deep around the W. G. Huxtable Pumping Plant near Marianna, Ark., in 1971.

Slurry methods were recently used to lay a concrete foundation for a large machinery building at Chicago Bridge & Iron Company on Presidents Island and the technique was also used in some construction at Methodist Hospital, said O. Clarke Mann, a consulting engineer who worked on both projects.

Slurry has been proposed for use in constructing a cut-and-cover tunnel to carry Interstate 40 through Overton Park.

Slurry is generally a mixture of bentonite clay and water which forms a slick, heavier than water fluid, engineers say.

Joe Keithley, project engineer for the Huxtable plant, said the substance is "about like Jergens lotion, only uglier."

Bentonite clay is a fine, gray powder, commonly found in Wyoming and other areas, and is also used as a base for rouges and face powders, said Kenneth Akers, current chief of the foundations and materials branch for the Engineers here.

When mechanically mixed with water, the clay makes a jell-like substance that will not set up or harden, he said.

The slurry method is under study for use in excavating the proposed Overton Park tunnel because it allows the construction of straight, rather than gradually sloping walls, and therefore decreases the width of the tunnel.

The specific method of the possible use of slurry in building the tunnel would depend on the design used, spokesmen for the engineers said. However, they were able to describe the basic process.

The first step in the actual construction would probably be the excavation of guide post holes, they said. As the cylindrical holes are bored in the ground, the slurry mixture would flow into the hole behind the boring equipment.

When all the dirt has been excavated, the hole will then be full of slurry, which stabilizes the dirt walls and prevents cave-ins. Steel reinforcements are then placed into the hole.

Next, a backfill material, concrete in the case of the park tunnel, is forced into the bottom of the hole through tubes and, because the concrete is heavier than the slurry, the slurry is forced out the top of the hole.

After the guide holes have been filled at intervals along the tunnel route, the method is repeated on the sections of earth between the guide columns.

The process of digging, slurrying, reinforcing and concreting is repeated until a concrete wall exists. Excavation can then begin on the earth between the walls.

To build a tunnel using conventional excavation methods would necessitate first digging a gradually sloping section of earth perhaps twice as wide as that required by the slurry method.

Transportation Secretary William T. Coleman Jr. has urged that the proposed tunnel be confined to 80 feet in width—60 feet if possible. However, Coleman said if this proves unfeasible he will reconsider the possibility of allowing the tunnel to be as wide as 120 feet.

Federal Highway Administration engineers were in Sweden and other countries in Europe Wednesday where the slurry wall method is often used, to discuss the method with engineers.

"It's not anything especially new," said Keithley of the technique. "It has been around since the late 1930s or early '40s."

However, equipment capable of effectively performing the slurry work has been developed more recently, he said.

Akers said the Engineers plan to use the method to build a cut-off trench beneath a floodwall in Caruthersville, Mo. It has also been used by the Engineers' Vicksburg, Miss., District in a project at Lake Chicot, Ark., he said.

Robert Hume, public affairs officer for the Engineers, said the use of slurry at the Huxtable site saved the Engineers about $1 million, primarily because the effectiveness of the wall reduced from about 40 to 4 the number of pumps necessary to keep the site dry.

"We went into this because we thought it would be a money saver," Hume said. "The slurry itself is a very good engineering technique."

He said that, partially because of the slurry use, the Huxtable plant, which is said to be the largest plant of its kind in the world, attracted attention from engineers from all over the United States.

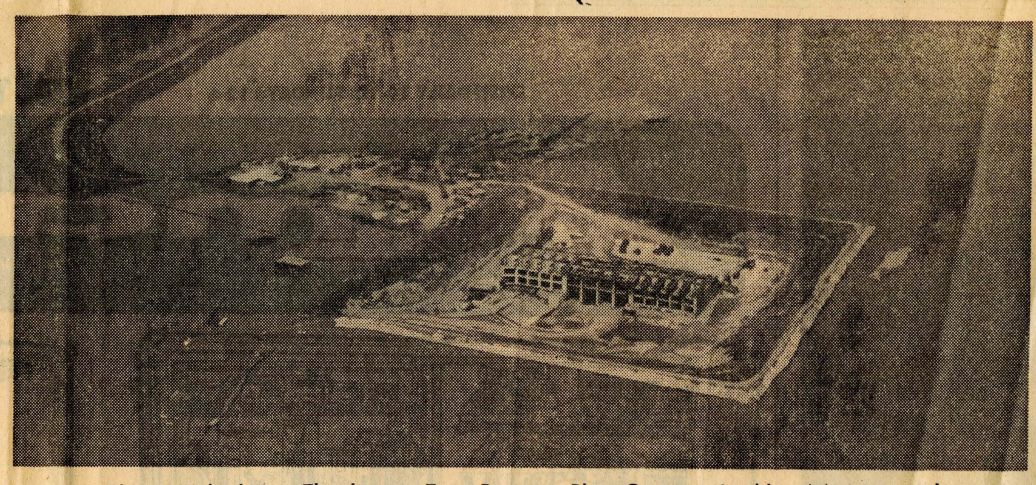
However, Mann, who has had experience with slurry and similar methods at CB&I, Methodist Hospital and other sites, said the method does have its disadvantages.

"You can't see what you're doing (with slurry)," Mann said. "If you want to form any notches or place steel at a given position, you have no way of doing that.

"It's a very treacherous system to use. It's like painting around a corner and not being able to see what you are painting. Consequently, it takes a great deal of skill and planning."

Although the method saved the Engineers money at Huxtable, they generally agreed with Mann that whether the costs of using the technique are more, less or equal to conventional methods depends upon the specific project.

Too, spokesmen for the Engineers said using slurry can be "pretty messy," but no more so than conventional methods. In addition, the slurry can be reused, although filtering between uses may be necessary.



Slurry Method Kept Floodwaters From Pumping Plant Construction Near Marianna, Ark.
Clay And Gravel Walls Were 5 Feet Wide, 80 Deep Around U.S. Engineers' Facility