

# Recent Trends in Design and Construction of Slurry Trench Cut-off Walls

by

Umesh Dayal\*

A.K. Goel\*

## Introduction

In projects involving seepage cut-offs, dewatering and pollution control etc. slurry trench cut-off walls have become almost an integral part of the construction. Usually cut-off walls are cheaper, more efficient and simple in construction than other systems used for the same purposes.

The history of slurry cut-off wall construction in geotechnical engineering is not very old. The first reported use of slurry cut-off wall is in early 1940's in the United States and since then thousands of slurry cut-off walls have been constructed for various applications of temporary and permanent nature. Many buildings have been made by using this technique which otherwise would not have been possible because of prohibitive construction costs and technical difficulties. This technique has now gained importance in almost all parts of the world and rapidly it is replacing the traditional techniques of grouted cut-off, sheet piles, diaphragm walls etc.

Before development of slurry cut-off wall technique, diaphragm walls were used to serve the same purpose. In diaphragm wall construction a narrow trench is excavated using bentonite slurry to provide lateral support of the trench. After completion of the excavation of the segment of the trench either cast in situ concrete (tremmie process) or precast panels are installed by replacing the slurry. These walls serve either as a cut-off walls or load bearing walls. The slurry cut-off walls are different from diaphragm wall construction as in this case reinforced concrete is replaced with either soil-Bentonite (*S-B*) slurry or cement-Bentonite (*C-B*) slurry. Further experience and research have indicated various new compositions of ingredients which optimize the construction and give best results. Nevertheless the data for different field conditions concerning the engineering properties of cut-off materials and its performance in long run is scarce. The greatest contribution to this technique came from the American constructors who thought of technique's versatility and found its merits. They used *S-B* slurry for the purpose. Thereafter European constructors followed suit and they adapted the technique in somewhat different manner. They used *C-B* slurry as the final ingredients of the wall.

This paper addresses the critical design issues, reviews the current construction practice of *S-B* and *C-B* slurry walls.

---

\* Civil Engineering Department, I.I.T. Kanpur, Kanpur-208016, INDIA.

*This paper was received in May 1982, and is open for discussion till the end of February 1983.*