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Glass Diaphragm Walls

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EMERGING CONSTRUCTION TECHNOLOGIES

Other Technologies – Soil Remediation

GLASS DIAPHRAGM WALLS

THE NEED

The high cost of digging and hauling contaminated soil has made its enclosure an alternative to prevent contamination of ground water and adjacent sites. The materials currently applied to confine contaminated soils are not the best solution (ex. slurry walls). A new contaminant confining material is presented where the costs of digging and hauling the contaminated soil are eliminated.

THE TECHNOLOGY

For contaminant enclosure, the new technology incorporates a diaphragm wall system consisting of special glass panels with a sealing made out of glass. The panels are 50 cm. wide and up to 15 m. long. Because of its specific features, glass is currently offering the highest grade of security to enclose hazardous deposits, due to the following reasons:

- Glass is to a high degree corrosion-resistant and impermeable.
- Glass is resistant to chemical attacks of potential seepage water.
- Glass can be manufactured variably as far as shape, quality and elasticity are concerned.
- Glass can be equipped with wires. As glass is a perfect isolator, the wires allow permanent control of the sealing via electrical measurements.
- Low maintenance costs are encountered with glass.

FIGURE 1 SITE INSTALLATION

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The arrangement of the glass panels is done in the same way as for common diaphragm walls. First, trenches are excavated continuously or intermittently and filled up with a suspension of cement and bentonite. Then, the glass panels are transported horizontally to the site, where they are carefully lifted by an excavator, transported to the trench and lowered into the suspension. Two days later the joints are sealed. The joints can be sealed with special profiles made out of plastic. Another alternative to this is filling up the hollow space with special sealing material (silicate gel).

The Benefits

The benefits of this technology lie in cost reductions due to the elimination of soil digging and hauling, and the low maintenance cost of the glass system.

Status

This technology is currently being implemented in Germany.

Barriers

One barrier lies in the need for specialized labor. Another disadvantage is in the plastic profiles that have not yet proved their practicality for the sealing. However, they still can be used as guidings during the lowering of the panels.

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REVIEWERS

Peer reviewed as an emerging construction technology

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