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## Slurry Trench Cut-off Walls

### Application

Slurry trench cut-off walls are used to control and contain leachates, gases and ground water.

Normally formed using large tracked hydraulic backacter machines for depths up to 15 metres.

For depths in excess of 15 metres crane based rope operated grabs can be used.

### Advantages

- Allows economic encapsulation of contaminants.
- No need to remove or treat contaminated soils once capped off.



Slurry Trench Cut-off Walls provide barriers to the movement of gas and/or leachates from contaminated sites and refuse dumps etc. They can also be used to control the movement of ground water, where required.

Where they are used to contain contaminants or refuse leachates, they are normally taken down to an impermeable stratum or at least 1 metre below the greatest depth of fill. Cut-off walls are typically 600mm thick and the target permeability of the slurry is less than  $1 \times 10^{-9} \text{m/s}$ . However, due to inherent variability in mixes and testing, at least 80% of results should be less than  $1 \times 10^{-9} \text{m/s}$  and not more than 5% of results should exceed  $1 \times 10^{-8} \text{m/s}$  at 90 days. The minimum

unconfined compressive strength at 28 days age should be 50kPa. (All in accordance with the ICE Specification for Slurry Trench Cut-off Walls).

Where a greater resistance to leachates or the movement of gas is required, a High Density Polyethylene (HDPE) geomembrane with a proprietary jointing system can be incorporated into the cut-off wall.

Slurry walls are normally excavated using either large tracked hydraulic backacter machines for depths up to 15m, or crane based rope operated grabs for depths in excess of 15m, dependent upon ground conditions.

The trench is excavated on a continuous basis under a self setting slurry with a day joint left at the end of each shift. Excavated spoil should be deposited directly into trucks for immediate removal from the working area in order to maintain a clean site and minimise the risk of excessive loading adjacent to the wall which might precipitate localised collapses.

The slurry mixing station comprises bulk powder storage silos for the component materials, mixers, wet storage silos, tanks and pumps. The bentonite powder is mixed with water and pumped to storage silos where it is allowed to fully hydrate. GGBFS and OPC are then blended with the bentonite slurry before being pumped to the trench.

Where an HDPE membrane is required it is delivered to site in sheets of a suitable width and length complete with the interlocking joints welded to the membrane. These sheets are fixed to frames and lowered into the trench, through the slurry. The frames are released and detached from the membrane when a suitable length has been installed. It is not necessary to accurately locate the membrane along the centre of the cut-off wall.

Samples of the slurry are taken from the supply to the trench for strength and permeability testing at regular intervals. On completion it is normal practice to place a capping layer of clay or concrete over the top of the cut-off wall to prevent drying or shrinkage cracking of the surface.

