# Open-Cell Bulkheads for Cofferdams-Docks 1998 NOVA Award Nomination 28

## 1998 NOVA AWARD WINNER

### Open-Cell Bulkheads for Cofferdams and Docks

Cellular structures made of flat sheet piles have been successfully used for many years for a wide variety of structures including cofferdams and docks. The positive aspects of this type of structure are often offset by high costs associated with their construction. The Open-Cell Bulkhead is a modification of the typical closed-cell shape. It is a cellular flat sheet pile structure in which each cell's sheet piles are driven in the shape of a U when seen from above. The sea side of each cell is typically circular, while the tail walls forming the uprights of the U shape are unconnected. These tail walls act as soil/friction anchors for the curved sheet pile cell faces. By not connecting tail walls at the landward side, several savings are immediately realized, including less sheet pile area, greater construction tolerance and adjustment capability, minimal pile penetration, and much easier backfilling. In seismic regions, the tail walls can be extended as required to guarantee fill mass stability. The open cell system is envisioned to function as a horizontally tied membrane. It relies solely on the vertical soil/friction flat sheet pile anchor wall to restrain a curved flat sheet pile arch face. Embedment of the face sheet piles is not a factor in wall strength either in overturning or shear. In effect, the bulkhead becomes a series of U-shaped horizontal membrane structures that need no toe embedment for stability. The system is a modern combination of two old ideas; reinforced earth and cellular sheet pile construction. This combination has led to a versatile structure capable of wide adoption.


| | |
|---|---|
| Contact: | Dennis Nottingham |
| Organization: | Peratrovich, Nottingham & Drage, Inc. |
| Address: | 1506 West 36th Avenue |
| City: | Anchorage |
| State/Province: | AK |
| Postal Code: | 99503 |
| Country: | USA |
| Phone No: | 907-561-1011 |
| FAX: | 907-563-4220 |
| URL: | |
| Email: | |