Vertical Barrier Systems

GSE Vertical Barrier Systems are designed to block lateral migration of subsurface fluids. These subsurface fluids include fresh water, salt water, methane gas, and contaminated leachates from waste piles or leaking containments. A vertical membrane barrier blocks the lateral migration of these items to allow for containment, exclusion, treatment or removal of the hazard. GSE manufactures two high density polyethylene (HDPE) Vertical Barrier Systems – GSE CurtainWall and GSE GundWall. A major benefit of a HDPE Vertical Barrier Systems is its flexibility, which allows it to conform to subsurface soil movement. Plus, unlike slurry, steel or PVC, a HDPE geomembrane is an excellent barrier to liquid and gases, and has a long service life. Both systems can be installed quickly and economically.

GSE CURTAINWALL INTERLOCK
The GSE CurtainWall Interlock is a reversible HDPE profile designed with multiple sealant chambers. The GSE HyperTite hydrophilic rubber seal is inserted into one or for extra security, multiple chambers.

The GSE CurtainWall Interlock is ideal for trenched applications due to its ease of installation. When installing wide panels into a trench, the GSE CurtainWall Interlock profile can be manipulated easily to ensure successful alignment of the panels.

GSE GUNDWALL INTERLOCK
The GSE GundWall Interlock consists of male and female HDPE profiles, and works much like a dovetail joint. This interlock is tight and creates a mechanical seal by using the GSE HyperBlok hydrophilic sealant in the key cavity. For added security, the GSE HyperBlok swells in water to fill in around the seal, using the GSE HyperBlok hydrophilic sealant in the key cavity.
The GSE GundWall Interlock configuration allows for panels to be vibrated into place using an insertion plate in loose to medium dense, non-cohesive soils without prior excavation. Installers have achieved insertion rates as fast as 30 vertical feet per minute. Trenchless installation saves time and excavation expense.

THE INTERLOCKS
Interlocks ensure leak free panel connections. The interlocks are sealed during installation using an extruded, hydrophilic gasket or in the case of GSE Gundwall a hydrophilic sealant. The hydrophilic gasket, called GSE HyperTite, Swells up to five times its dry volume when exposed to water. This swelling action fills the seam cavity to prevent fluid migration through the strong interlock, even after soil settlement and deformation. The extruded GSE HyperTite gasket is installed in one continuous section as the interlocking joints are joined thus assuring an uninterrupted seal. In addition, GSE offers an optional patented procedure for electrical confirmation assuring full-length makeup of the joint. GSE HyperTite has superior physical and chemical resistance.

The interlock is fusion welded to the HDPE panel at the factory to ensure the highest quality sheet-to-interlock connections. By design, the welded connection is stronger than the HDPE geomembrane itself, and the interlock is stronger than the welded connection.

ENVIRONMENTAL
Superfund legislation arose from the need for extensive cleanup of contaminated industrial facilities around the United States. Much of the cleanup effort has focused on removing the contaminants and remediating sites to pristine conditions. Such cleanup methods are often technically or economically unattainable. The result is a lack of effective remedial action. Containment is a proven, effective alternative remedial action. A GSE Vertical Barrier System is the fastest and most secure method for containing a hazardous subsurface fluid plume. GSE Vertical Barrier System provides immediate protection and long-term containment assurance.

COMPLETE CONTAINMENT
Installation of a GSE geomembrane cap in conjunction with a vertical barrier will provide complete containment. The “Cap and Contain” arrangement will prevent the intrusion of precipitation and contain any volatile components or gas emissions. This not only provides more complete containment where necessary, but also minimizes the amount of fluid that may require removal and treatment as the final step in remediation. This type of system can be permanent, or utilized to allow for complete development of effective and economical remediation techniques as well as funding.

WETLANDS
GSE Vertical Barrier System is also used for a wide range of environmental application including protection and creation of wetlands.

CIVIL
Changes of subsurface water levels can cause soil stability problems for manmade structures. One way to mitigate the damaging effects of subsurface water flow is through the use of an economical HDPE Vertical Barrier System.

[Vertical Barrier in Landfill Application]
One innovative project utilized a GSE Vertical Barrier System in the construction of a 110 foot foundation wall. To reduce construction risk and control costs, the Vertical Barrier System was installed along with the interlocking rebar cages in a bentonite slurry mix. Concrete was then poured to displace the slurry to create the foundation wall. The vertical membrane barrier allowed for dewatering during excavation and acts as a long-term waterproofing membrane. Most projects that require dewatering can benefit from a HDPE vertical barrier. The largest single installation of a vertical barrier is a 12.5 mile system installed along a flood control dike in Arizona. The GSE Vertical Barrier System is designed to prevent degradation of the earthen dike caused by floodwater saturation, and washout resulting from seepage.

Engineering Support
The GSE Engineering Support Staff is comprised of multidisciplinary product professionals to support you across a range of project requirements. This includes knowledge in geomembrane, geosynthetic clay liners, geonet, geocomposite, nonwoven geotextile and concrete protection products and application solutions. Rely on our technical staff to help you solve your project issues.