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Wastewater

Expanded polystyrene (EPS) geofoam vs. traditional fill

Relative cost, weight, constructability, and other considerations for stabilizing soil.

By [Nico Suttmoller](#) [Be the first to comment](#) [Share](#)

Expanded polystyrene (EPS) geofoam has performed well in numerous applications internationally since it was developed in the 1960s as an engineered geotechnical material. Designated by the Federal Highway Administration (FHWA) as a "priority, market-ready technology" in 2006, this alternative to cellular concrete, pumice, shredded tires, soil, and wood chips is emerging in a range of geotechnical uses throughout the U.S.

Defining EPS geofoam

EPS geofoam is similar to the EPS commonly used as insulation in building walls, roofs, foundations, and under slabs, but it is specifically engineered for civil applications. It is 100% recyclable and non-toxic. It's a lightweight fill used to reduce vertical stresses beneath embankments and lateral stresses on retaining walls, abutments, or foundations.

Manufacturers produce EPS by expanding small polystyrene beads to many times their original size using steam and specialized "blowing agents." The expanded beads are then fused together and molded into large blocks, which are cut to size. Blocks are commonly available up to 4 feet by 4 feet and up to 24 feet in length.





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EPS geofoam's extremely low density can lower the cost of adjacent structures to the point where the cost savings of a retaining wall more than pay for the material's higher initial cost. Table: Insulfoam

| Fill | General Unit cost | Notes |
|-------------------|-------------------|--|
| Soil | \$ | |
| Cellular concrete | \$\$ - \$\$\$ | |
| Shredded tires | \$\$ | |
| Pumice | \$\$\$ | |
| Wood chips | \$\$ | |
| EPS geofoam | \$\$ - \$\$\$\$ | Depending on density specified and total imposed dead/live loads on top of the geofoam |

Although these dimensions suit most projects, manufacturers can also cut the material into project-specific dimensions and produce curved pieces and complex shapes. Some help with professional layout shop drawings, delivery scheduling, field fabrication tools, and job start installation training.

EPS geofoam is easy to place by hand. Crews also can easily trim the pieces or cut holes using saws or hot-wire cutting tools.

Placement doesn't require heavy equipment, which makes EPS geofoam good for tight jobsites or on hard-to-reach slopes. In applications requiring multiple layers of blocks, 4-inch by 4-inch metal grip plates with barbs minimize movement between blocks.

Public works applications

- Soft soil remediation, slope stabilization, lateral load reduction on retaining structures, and as a lightweight structural void fill in applications such as levees and stadiums.
- Sub-base under pavement sections can support locomotives and wide-body aircraft. It is available with compressive resistance values from 316 to 2,678 psf at 1% deformation (the conservative elastic limit stress). If combined dead/live loads are under this threshold, the material won't creep or experience plastic yielding.



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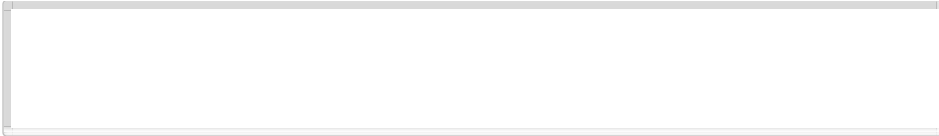


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