

“Geofoam – A Light Weight Fill Alternative”



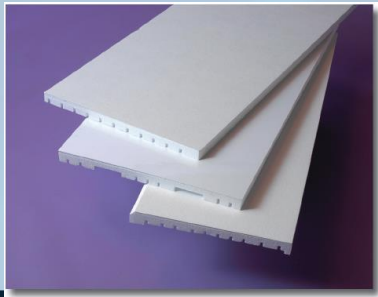
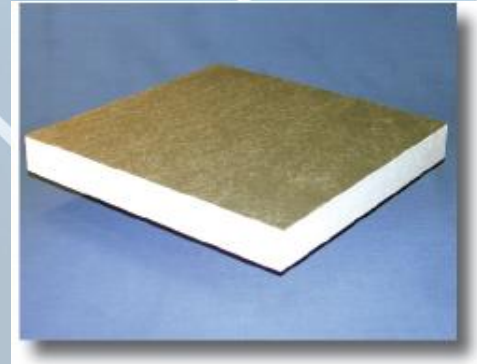
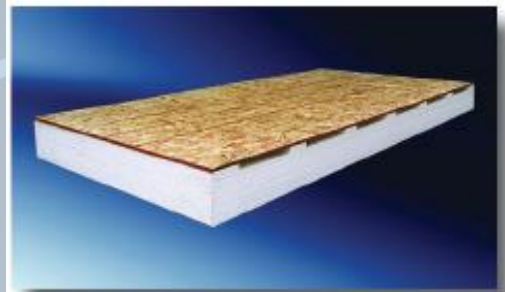
Insulfoam

- A wholly owned subsidiary of Carlisle Construction Materials
- Headquarters in Puyallup, WA
- Producer of expanded polystyrene (EPS) for more than 45 years
- The largest manufacturer of block-molded expanded polystyrene in North America



Insulfoam is the only manufacturer of Expanded Polystyrene (EPS) with the ability to service national customers

Family of Products



Agenda



- Geofoam applications/projects
 - USACE Pump Station
 - Costco
 - Wheatley Elementary
- Recent Trends
- Standards
- Specifications
- Placement/handling/installation

Type- ASTM D6817	Units	EPS12	EPS15	EPS19	EPS22	EPS29	EPS39	EPS46
Density, min.	lb/ft ³ (kg/m ³)	0.70 (11.2)	0.90 (14.4)	1.15 (18.4)	1.35 (21.6)	1.80 (28.8)	2.40 (38.4)	2.85 (45.7)
Compressive Resistance** min. @ 1% deformation	psi psf (kPa)	2.2 316.8 (15)	3.6 518.4 (25)	5.8 835.2 (40)	7.3 1051.2 (50)	10.9 1569.6 (75)	15.0 2160.0 (103)	18.6 2678.4 (128)
Compressive Resistance** min. @ 5% deformation	psi psf (kPa)	5.1 734.4 (35)	8.0 1152.0 (55)	13.1 1886.4 (90)	16.7 2404.8 (115)	24.7 3556.8 (170)	35.0 5040.0 (241)	43.5 6264.0 (300)
Compressive Resistance** min. @ 10% deformation	psi psf (kPa)	5.8 835.2 (40)	10.2 1468.8 (70)	16.0 2304.0 (110)	19.6 2822.4 (135)	29.0 4176.0 (200)	40.0 5760.0 (276)	50.0 7200.0 (345)
Flexural Strength, min.	psi (kPa)	10.0 (69)	25.0 (172)	30.0 (207)	40.0 (276)	50.0 (345)	60.0 (414)	75.0 (517)
Oxygen Index, min.	volume %	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Dimensional Stability	(max. %)	< 2%	< 2%	< 2%	< 2%	< 2%	< 2%	< 2%
Buoyancy Force	lb/ft ³ (kg/m ³)	61.7 (990)	61.5 (980)	61.3 (980)	61.1 (980)	60.6 (970)	60.0 (960)	59.5 (950)
Poisson's Ratio	-	.05	.05	.05	.05	.05	.05	.05
Coefficient of Friction	-	.6	.6	.6	.6	.6	.6	.6
Absorption	volume %	< 4.0	< 4.0	< 3.0	< 3.0	< 2.0	< 2.0	< 2.0
Elastic Modulus, min.	psi (kPa)	220 (1500)	360 (2500)	580 (4000)	730 (5000)	1090 (7500)	1500 (10300)	1860 (12800)

ELIMINATE OR REDUCE LATERAL LOADING ON
RETAINING STRUCTURES

ZERO NET LOADING FOR
SOFT SOIL REMEDIATION

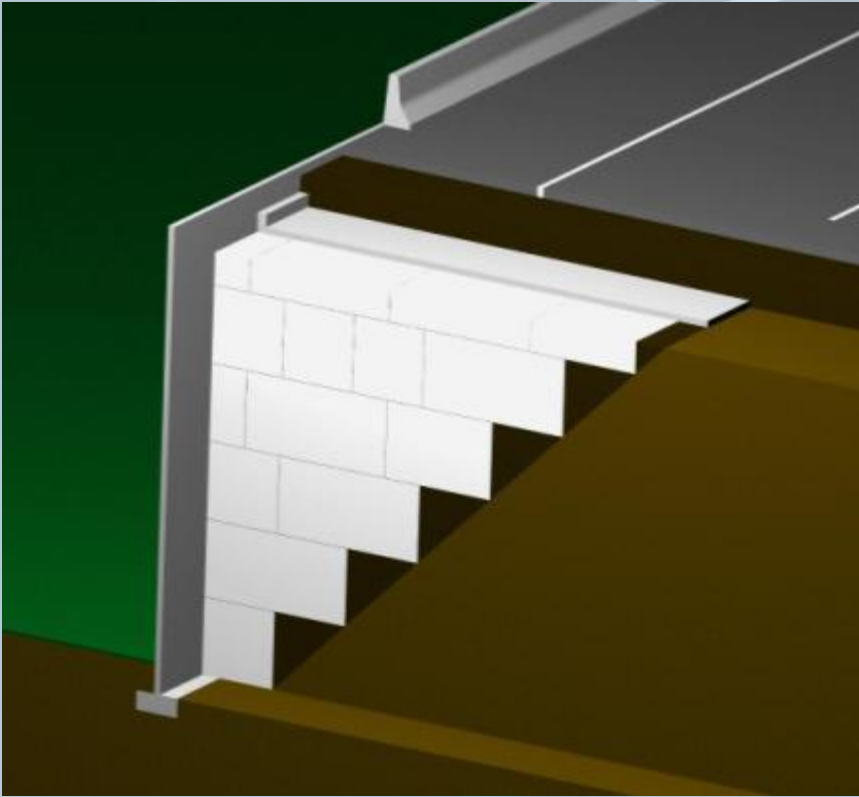
ENGINEERED FOR
SLOPE STABILIZATION

PROTECT AND LIGHTEN THE LOAD ON
BURIED UTILITIES

KEEP IT SIMPLE AND FAST WITH
**STRUCTURAL VOID FILL
CONCRETE APPLICATIONS**

Lighten the Load

**5 MAJOR APPLICATIONS
TO CONSIDER GEOFOAM**



- InsulFoam GF replaces the sliding soil wedge
- Native soils are self supporting when excavated back to the angle of repose
- InsulFoam GF is self supporting
- End result: ZERO lateral load on the retaining structure

Eliminate or Reduce Lateral Loads for

RETAINING STRUCTURES

180 & 148th Street Waverly, NE



Hwy 50 Culvert Overpass Carson City, NV



InsulFoam® GF Benefits for Retaining Structures

- Significantly reduces structural steel, concrete and forming costs/time
- Decreases or Eliminates the need for geo-grids or mechanical tie-backs
- Allows walls to be designed taller and in more narrow rights-of-way
- Eliminates the need for secondary compaction which speeds construction





I-680 Interchange – Martinez, CA

- Soft soils only settle when more weight is added on top
- Calculate the weight of the Geofoam and all other loads
- Excavate an equivalent weight of native soil
- End Result: Net ZERO loading

Net Zero Load Designs for

SOFT SOIL REMEDIATION

Wheatley Elementary School New Orleans, LA



Costco New Orleans, LA



Louis Armstrong Int'l Airport New Orleans, LA



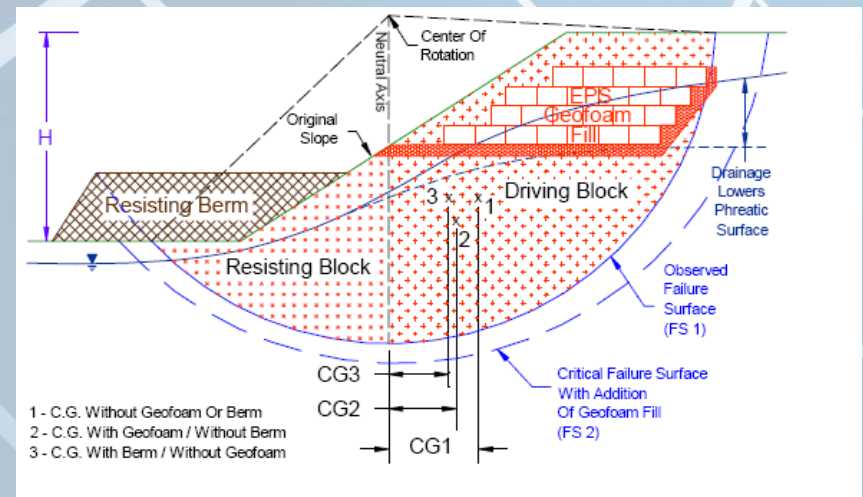
InsulFoam® GF Benefits for Soft Soil Remediation

- Increases -
 - Speed of installation
 - Productivity
- Decreases -
 - Rights-of-way concerns
 - Traffic closures
 - Heavy equipment costs
 - Soil removal costs
 - Borrow-fill placement
- Eliminates -
 - Surcharging time/cost
 - Soil Settlement
 - Secondary compaction



Port of Longview, WA

- Heavy Soils + Gravity + H₂O = High Landslide Potential
- Geof foam is up to 100 times lighter than soil
- Using Geof foam reduces the weight and the risk



Lighten the driving block for

SLOPE STABILIZATION

US 101 - Willits, CA



USACE Lake Cataouatche Pump Station Avondale, LA



USACE Lake Cataouatche Pump Station Avondale, LA



InsulFoam® GF Benefits for Slope Stabilization

- Increases -
 - Speed of installation
 - Productivity
 - Space for additional traffic lanes
- Decreases -
 - Traffic closures
 - Heavy equipment costs
 - Borrow-fill placement
 - Concerns about future landslide/erosion issues
 - Environmental impact on sensitive hillside jobsites
 - Long-term maintenance and slope failure costs



Hillside Restoration in Japan

- Reduces dead and lateral loads on underground pipes, culverts and tunnels
- Protects utility during seismic activity by reducing axial strain
- Provides high thermal insulation values that protect against severe temperature fluctuations



Protect and lighten the load on top of

BURIED UTILITY PROTECTION

Royal Brougham Way - Seattle, WA



Maggie Daley Park Chicago, IL



Maggie Daley Park Chicago, IL



Maggie Daley Park Chicago, IL



InsulFoam® GF Benefits for Buried Utility Protection

- Allows construction directly on top of buried utilities
- Eliminates right-of-way or eminent domain claims to move the utility
- Allows designers to specify less expensive structural utilities such as box culverts and pipes
- Reduced dead loads prolongs the life of structure



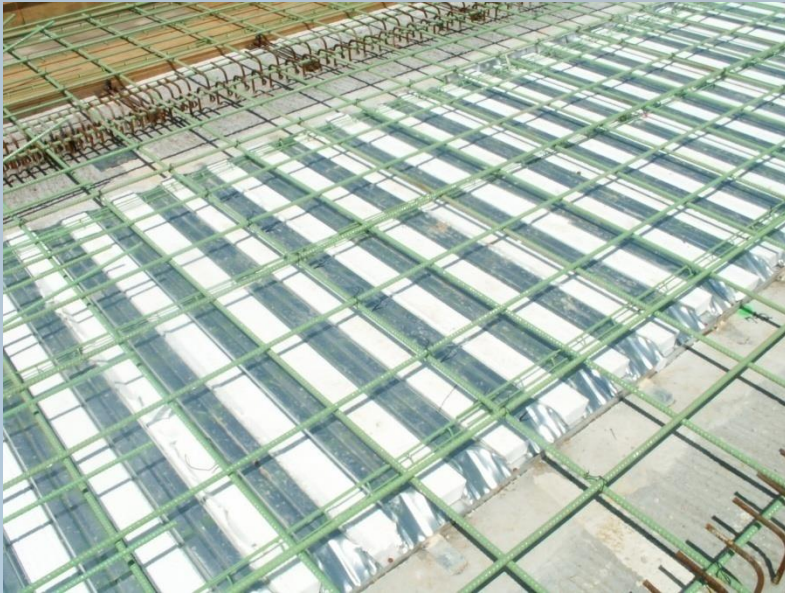


- Eliminates separate concrete pours for vertical wall sections
- Reduces overall amount of concrete or other heavy fills
- Reduces dead loads on underlying structures
- Any shape or slope can be easily fabricated on site

Keep it Simple and Fast with

STRUCTURAL VOID FILL CONCRETE APPLICATIONS

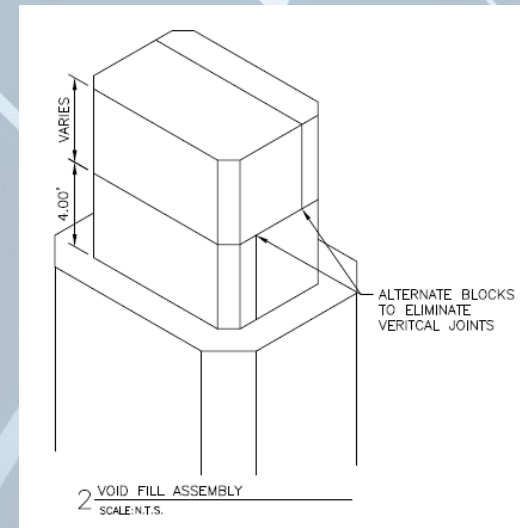
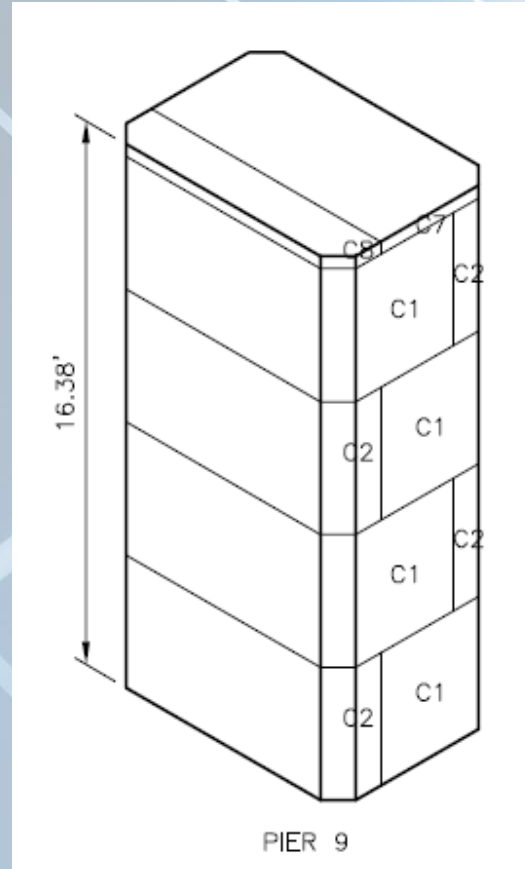
Pacific Street Bridge Omaha, NE



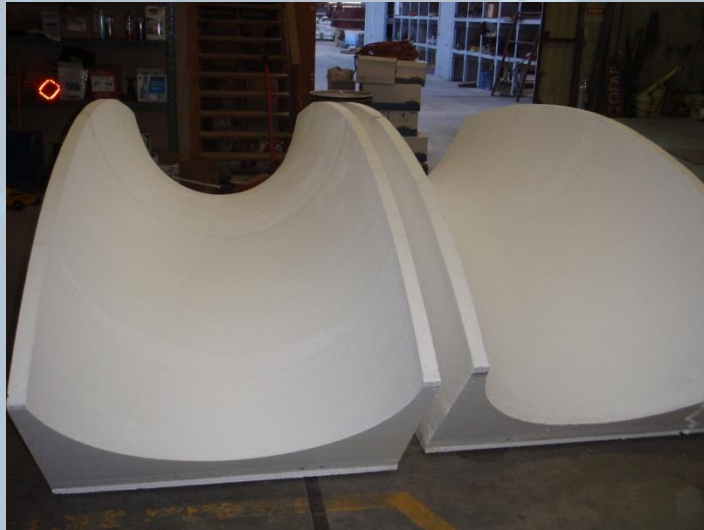
Box Beam Bridge Girders



Bridge Column Voids



Bridge Column Custom Forms



InsulFoam® GF Benefits

as a Structural Lightweight Void Fill



Community College, Scottsdale, AZ

- Eliminates the need to pour the walls separately from the topping slab
- Decreases labor costs versus heavy soil backfill
- Decreases forming time and material costs
- Easily supports the weight of concrete slabs

Recent Trends



UTA TRAX, Salt lake City, UT

Load Distribution Slab within Assemblage



Shotcrete over Geofabric



Topaz Bridge, McCammon, ID

Bridge Abutments



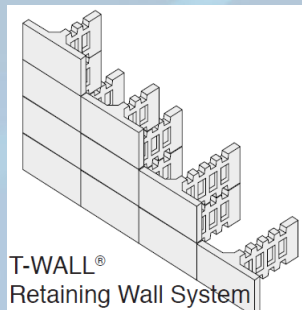
Grimsøyveien, Norway



T-Wall with Geof foam

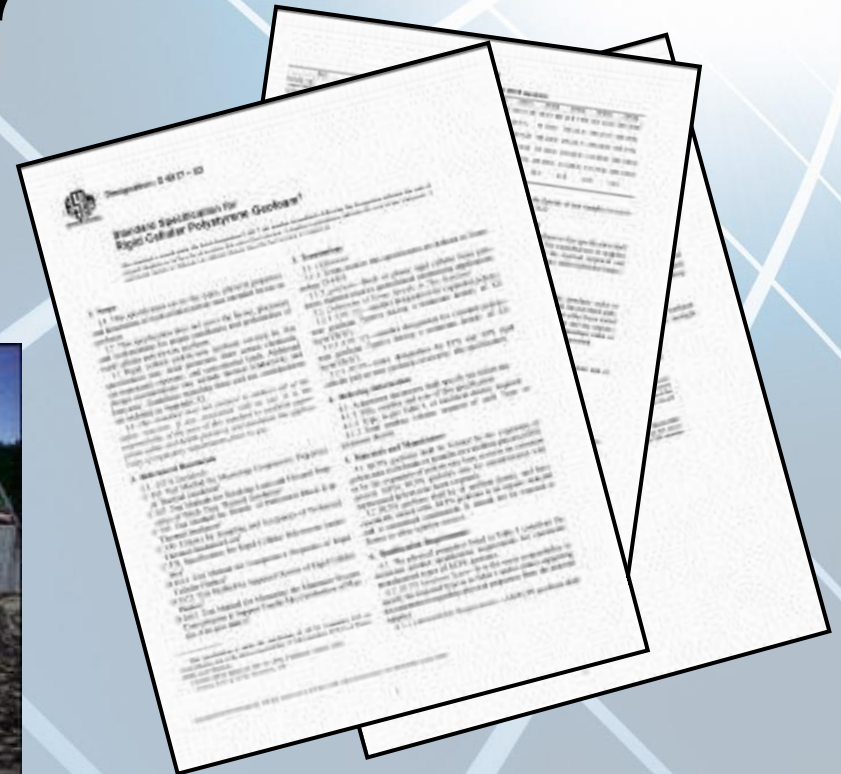


Tappan Zee Approach, Tarrytown, NY



ASTM D6817

Understanding ASTM D6817
(different than ASTM C578)



ASTM D6817 vs. C578

↑
Geotechnical

↑
Insulation

Density lb/ft³,
min.

Compressive
Resistance,
min. psi @
10%
deformation

Flexural
Strength, Min.,
psi

ASTM D6817	EPS 15	.90	10.2	25
ASTM C578	Type I	.90	10.0	25
ASTM D6817	EPS 19	1.15	16.0	30
ASTM C578	Type VIII	1.15	13.0	30
ASTM D6817	EPS 22	1.35	19.6	40
ASTM C578	Type II	1.35	15.0	35
ASTM D6817	EPS 29	1.80	29.0	50
ASTM C578	Type IX	1.80	25.0	50

Reduce Your Carbon Footprint

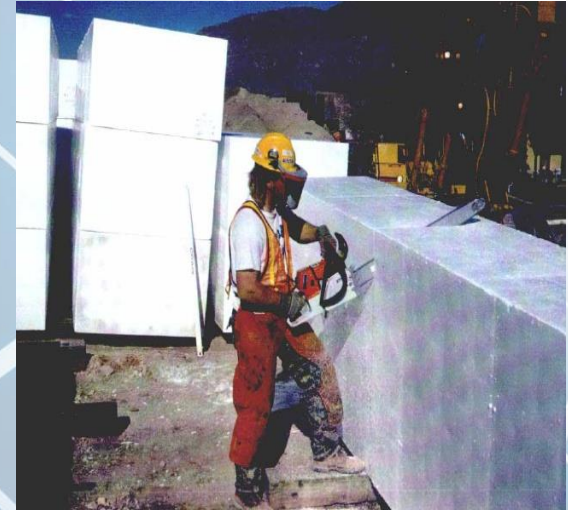


1 truckload of Geoflex = 12 dump trucks of fill

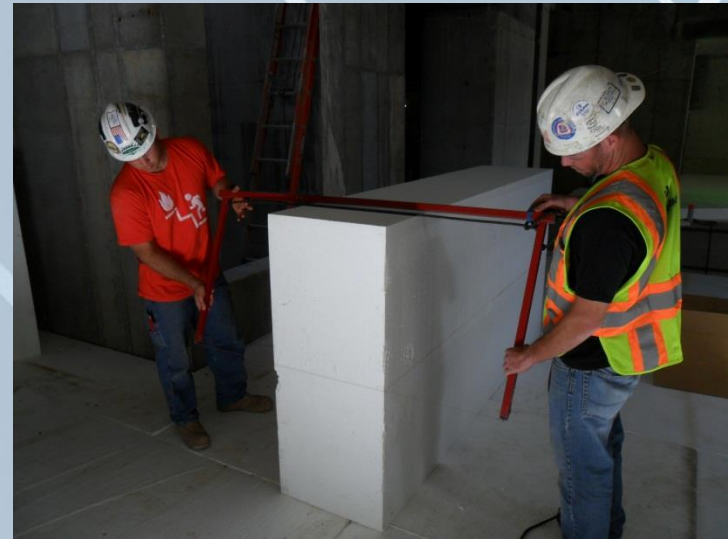
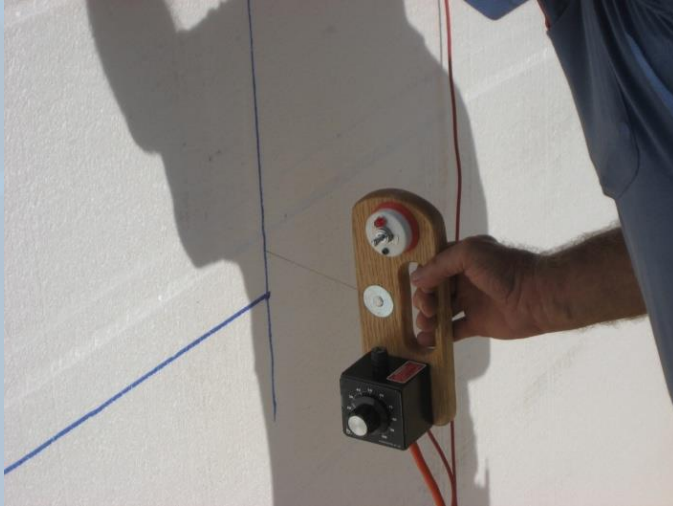
Handling



Handling



Hot Wire Cutters



- Geof foam works best when used to reduce naturally occurring forces such as from gravity rather than to strengthen or stiffen a structure to resist these forces
- Philosophy of load reduction as opposed to strength increase
- Success of geof foam is due to working with the forces of nature rather than resisting natural forces as construction materials are traditionally designed to do

5 MAJOR APPLICATIONS TO CONSIDER GEOFOAM

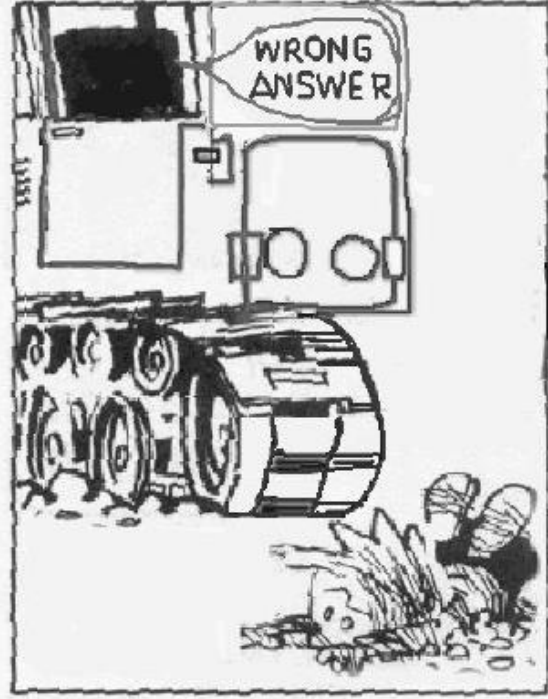
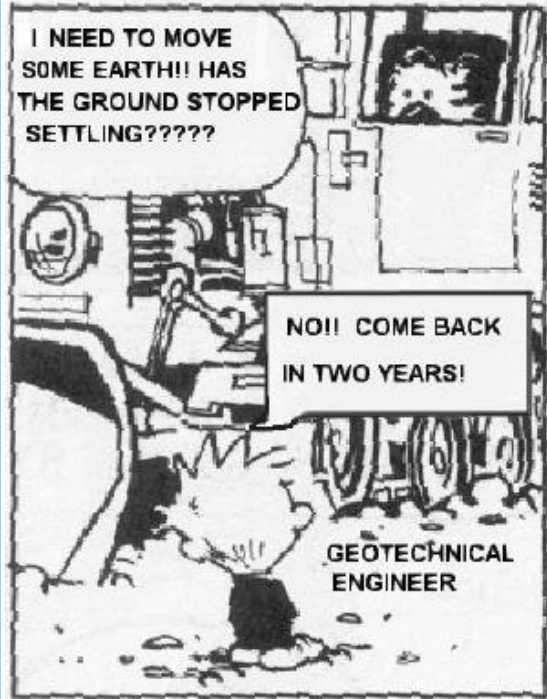
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Nico Sutmoller
Geofoam Specialist



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A CARLISLE Company

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ENGINEERED EPS
Versatile - Durable - Recyclable

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