A Unique Solution





Brougham Way Seattle WA

Roads, Runways, Utility Protection, Ramps, Retaining walls...

Unique Solutions

Light-weight structural fill

Bothell, WA Levee

Geofoam...what is it?

A lightweight geo-synthetic structural fill Closed-cell expanded polystyrene (EPS)





Insulfoam EPS - Made In Alaska

Step 3: Molded Foam

Step 1: EPS Resin

Step 2: Expanded Beads

EPS

EPS Environment

• 100% recyclable

• Contains no HCFCs, dyes or formaldehyde



Manufacturing option: resist insects and mold Manufacturing option: can contain up to 25% recycled material

Where and Why?- InsulFoam GF

Retaining Structures
 Soft Soil Remediation
 Slope Stabilization
 Utility Protection
 Structural Void Fill

Juneau, AK Wharf parking

Geofoam as Insulation

A long history of success in Alaska

Ship Creek C Street





Thermal Protection



Tunnels & Utilidors





Ted Stevens International Airport Missile Defense





Structural Void Fill and Concrete



- Reduce separate concrete pours vertical walls
- Reduce quantity of concrete or other heavy fill
- Reduce dead loads on underlying structures
- Easy fabrication of shapes and slope on site



Anchorage Museum Fill Over Garage



Bayshore Manhole Rehab



Reduce dead loads Reduce lateral loads Added protection during seismic activity Freeze protection

Buried Utility Protection

AWWU Utility, Anchorage AK



Sliding Hillside

Alternative to other fill materials - soil, shredded tires, waste, cellular concrete, wood chips, pumice, basalt and porcelain chips

Crescent, CA – Slope Stabilization

US 101 Pacific Coast Highway Land Slide Correction

InsulFoam[®] GF Physical Properties

ASTM D6817 Standard Specification for Rigid Cellular Polystyrene Geofoam. Onramp, I-90, Issaquah, WA

I-15 Salt Lake Savings

Olympic preparation to expand traffic capacity.

Avoid costly utility relocation.

Minimize expanding footprint.

Earlier traffic restoration.

Decrease construction schedule risk.

"Cheaper than dirt?"

ASTM D 6817

TYPICAL PHYSICAL PROPERTIES OF INSULFOAM GF*

TYPE - ASTM D6817	UNITS	EPS12	EPS15	EPS19	EPS22	EPS29	EPS39	EPS46
Doncity Minimum	lb/ft ²	0.70	0.90	1.15	1.35	1.80	2.40	2.85
Density . Williamum	kg/m ²	(11.2)	(14.4)	(18.4)	(21.6)	(28.8)	(34.4)	(45.7)
Communicative Desistance**	psf	2.2	3.6	5.8	7.3	10.9	15.0	18.6
Compressive Resistance**	psi	316.8	518.4	835.2	1051.2	1560.6	2160.0	2678.4
min. @ 1% Deformation	(kPa)	(15)	(25)	(40)	(50)	975)	(103)	(128)
Comproseivo Posistanco**	psf	5.1	8.0	13.1	16.7	24.7	35.0	43.5
min @ F% Deformation	psi	734.4	1152.0	1886.4	2404.8	3556.8	5040.0	6264.0
min. @ 3% Deformation	(kPa)	(35)	(55)	(90)	(115)	(170)	(241)	(300)
Compressive Resistance** min. @ 10% Deformation	psf	5.8	10.2	16.0	19.6	29.0	40.0	50.0
	psi	835.2	1468.8	2304.0	2822.4	4176.0	5760.0	7200.0
	(kPa)	(40)	(70)	(110)	(135)	(200)	(276)	(345)
Flexural Strength, min.	psi	10.0	25.0	30.0	40.0	50.0	60.0	75.0
	(kPa)	(59)	(172)	(207)	(276)	(345)	(414)	(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%
Buovancy Force	lb/ft ²	61.7	61.5	61.3	61.1	60.5	60.0	59.5
buoyancy rorce	kg/m ²	(990)	(980)	(980)	(980)	(970)	(960)	(950)
Poisons Ration		0.05	0.05	0.05	0.05	0.05	0.05	0.05
Coefficient of Friction		0.6	0.6	0.6	0.6	0.6	0.6	0.6
Absorption	volume %	< 4.0	< 4.1	< 3.0	< 3.1	< 2.0	< 2.0	< 2.0
Elastic Modulus, min.	psi (kPa)	220	360	580	730	1090	1500	1850
		(1500)	(2500)	(4000)	(5000)	(7500)	(10300)	(12800)

* Properties are based on data provided by resin manufacturers, independent test agencies and Insulfoam.

** For Insulfoam GF applications the design load stress should not exceed 1% strain for combined live and dead loads.

Reduce Construction Traffic Increase Jobsite Safety

1 = 12





1 truckload of Geofoam = 12 dump trucks of fill ≥3,500 pounds vs. 380,000 pounds for 120 yd³



Restoring Access

Time of surcharge? Easement cost? Utility relocation?

Soft Soil Remediation

Port of Longview, WA

Soft Soil Remediation

Net Zero Load Design



- Continual settlement?
 - Remove existing weight
 - Replace with Geofoam
- Goal: Net ZERO loading

Decrease Bridge Spans



Build over soft soil
Retaining Structures
Slope Stabilization
Buried Utility Protection
Structural Lightweight Void Fill

Slope Stabilization





Slope Stabilization



Create space for additional traffic Decrease landslide/erosion issues

Hillside Restoration in Japan

Retaining Structures



- Reduce structural steel, concrete & forming costs
- Less geo-grid and mechanical tie-backs
- Increase wall height in narrow rights-of-way
- Speed construction



Children's Hospital - Seattle, WA







On Site Fabrication



Where and Why??



Sitka, AK

Retaining Structures
 Soft Soil Remediation
 Utility Protection

Sitka Moller Field Rehab



Juneau AK Wharf Rehab

Wrap and Cover InsulFoam GF



Juneau, AK

Geofoam Fosters Alaska Tourism



South Anchorage Home



Retaining Structures

Eliminate or Reduce Lateral Loads Excavated to angle of repose Replace concentional fill with self supporting Geofoam



Hillside Residence, Anchorage AK



Buried Utility Protection



Build over utilities

Avoid relocation cost to move utility

Save on structural cost-box culverts and pipes

Reduced loads prolong life of structure

Glacier Highway - Auke Creek



Geofoam Protects Salmon







Layer 4 7996.72 st

Auke Creek Geofoam Layers



Auke Creek, Juneau Alaska

E.

170





Glacier Highway at Auke Creek- Juneau, Alaska

Auke Creek-Juneau Alaska





Auke Creek Geofoam Elevation



Glacier Highway at Auke Creek- Juneau, Alaska

Benefits

- Cost-effective -
 - Reduces other structural costs
- Labor Savings
 - Less surcharging or staged construction
 - Less utility relocation
 - Installation not weather-dependent
 - Less heavy equipment needed
 - Ease of installation and jobsite fabrication
- Product attributes
 - Project-specific block sizes
 - Project-specific strengths of engineered EPS



EPS Geofoam solutions

Retaining Structures
 Soft Soil Remediation
 Slope Stabilization
 Buried Utility Protection
 Structural Void Fill

EPS and Environment



- 100% recyclable
- Contains no HCFCs, dyes or formaldehyde
- Up to 25% recycled content



InsulFoam[®] GF Physical Properties



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	psi	316.8	518.4	835.2	1051.2	1560.6	2160.0	2678.4	
	(kPa)	(15)	(25)	(40)	(50)	975)	(103)	(128)	
Compressive Resistance** min. @ 5% Deformation	psf	5.1	8.0	13.1	16.7	24.7	35.0	43.5	
	psi	734.4	1152.0	1886.4	2404.8	3556.8	5040.0	6264.0	
	(kPa)	(35)	(55)	(90)	(115)	(170)	(241)	(300)	
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	(kPa)	(59)	(172)	(207)	(276)	(345)	(414)	(517)	

QC & Testing



ASTM D1621 on 2"cube

Invalform-Technical Center Comportaine ASTM D1621 SR 819 - S. Seattle Intermedial Access

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InsulFoam[®] GF Specifications

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FHWA Approved

ASTM D 6817

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Insulfoam GF Geofoam







Made In Alaska

Insulfoam 628 Western Drive Anchorage, Alaska

907-279-9407 www.insulfoam.com

Thoroughly Tested!

Insulfoam

B 907-279-9407 **Steve Francis** Steve.francis@insulfoam.com 40 Years in Alaska www.Insulfoam.com

Solving Below Grade Problems



Trans-Alaska Pipeline - Atigun Pass: Original below grade design boxed with Extruded (XPS)





2008 Winners of AGC's Excellence in Construction Awards

AGC members^{*} projects

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Brice was awarded North Slope Borough Point Lay Airport Improvement Project the fall of 2006. The project was finished in August of 2008. Brice provided the community of Point Lay an improved airport by overcoming a difficult mobilization of equipment and materials, producing a quality product with limited locally available resources, and using local hire to complete the project. The result was a fully functional airport for the needs of the village of Point Lay. The community and North Slope Borough can be proud of their newly created civil project.



Contractors that wen 2008 ACC Excellence in Construction Awards are Davis Constructors and Engineers Inc. of Anchorage, Unit Company of Anchorage, Roger Hickel Contracting Inc. of Anchorage, Brice Inc. of Fairbenis, American Marine Corp., Anchorage and The Superior Group Inc. of Anchorage.

Davis Constructors and Engineers Inc. and Roger Hickel Contracting Inc. each won two 2008 AGC Encellence in Construction Awards, These are the final Your winning projects. The first four winning projects were featured in The Nessa Connector's Winter 2009 issue.

Point Lay Airport

Cold Climate Performance of EPS

SUBJECT: INSULFOAM EPS in COLD TEMPERATURE APPLICATIONS

Insulfoam EPS is used in many different environments including very cold applications. Insulfoam EPS does not become brittle in subzero applications and unlike some other insulating materials the insulative value (R-Value) increases as the temperature decreases. The following chart is provided as an R-Value guide for Insulfoam EPS used in below 55° F applications:

Туре	Temperatures									
Insulfoam EPS	-100° F (-73.3° C)	-75° F (-59.4° C)	-50° F (-45.6° C)	-25° F (-31.7° C)	0° F (-17.8° C)	20° F (-6.66° C)	55° F (12.77°C)			
Ι	5.9	5.3	5	4.8	4.5	4.4	4.15			
VIII	6.0	5.6	5.3	5.0	4.7	4.6	4.25			
II	6.3	5.9	5.4	5.1	4.85	4.8	4.5			
IX	6.7	6.3	5.6	5.3	5.1	4.9	4.7			
XIV	6.9	6.5	5.8	5.6	5.25	4.95	4.75			
XV	7.0	6.6	5.9	5.75	5.3	5.05	4.85			

Design R-Values*

*Values based on "ASHRAE Handbook Fundamentals 2001" and resin supplier data

Further questions pertaining to the R-Value of Insulfoam EPS can be made to Insulfoam-Technical Center at 1/800-469-8870.