

LITECRETE, Inc.



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LITECRETE, Inc.

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Cellular Concrete LLC.

- *Established Mid 40s*
- *First ACI Manual 1954*

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ACI 229

***Controlled low-strength material
(LD-CLSM)***

A cementitious material that is in a flowable state at the time of placement and having a specified compressive strength of 1,200 psi 84.3 kg/cm or less at the age of 28 days. For most applications the compressive does not exceed 300 psi 21kg/cm. This makes it possible for the material to be removed should excavation be necessary

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ACI 523

Guide for Cellular Concrete

Low-density cellular concrete is defined as concrete made with hydraulic cement water and preformed foam to form a hardened material having an oven dry density of 50 pounds 22.7 kg or less. These mixtures may include aggregate and other material components including but not limited to, fly ash and chemical admixtures.

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Types of Foam

- ***Preformed***
ACI 523
Produced by foam generator

- ***Agitated***
ACI 229
***Produced by the mixing action of
the concrete mixer***

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Stable Preformed Foam



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Quality foaming agents are resistant to high carbon fly ashes, do not have any restrictions of placement time of the lightweight concrete, and are well suited for large Geotechnical applications.

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Light Weight Aggregate

ASTM C 332 Group 1

- ***Vermiculite***
- ***Perlite***

Used to reduce slump to achieve steeper roof slopes, and to maintain moisture in dry climates

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- ***Special cements, supplement cementitious material and aggregates may be included as nonstandard materials.***
- ***Lo-density cellular concrete may include commercially available fibers, such as nylon, polypropylene, polyester. Cellular concrete's flexural and tensile strength, impact resistance, fatigue limit can be enhanced with synthetic fibers.***

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- ***Foams are the last ingredient added to the mix and do not expand or contract after addition.***
- ***The combination can withstand vigorous mixing and has been pumped well over a 1000 ft / 305 meters with little loss of density.***
- ***The cement paste, coats each air cells and hardens.***

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ASTM C 796 – 04

***Standard Test Method for
Foaming Agents for Use in Producing Cellular Concrete
Using Preformed Foam***

ASTM: C 495 – 99a

***Standard Test Method for
Compressive Strength of Lightweight Insulating Concrete***

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Correct Cylinder Breaks

Cylinders specimens are 3x6"

50% relative humidity curing

Air dried 3 days Before Test

~~No 3 or 7 day testing~~

28 compressive strength testing



Incorrect

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- ***Economical***
- ***Easily placed by pump or gravity for rapid installation***
- ***Durable and noncorrosive***
- ***Permanent and stable***
- ***Provides 100% compaction***
- ***Broad range of densities***
- ***Absorbs shock***
- ***High freeze-thaw resistance***
- ***Insulating***



CELLULAR CONCRETE STRENGTH / DENSITY CHART

NEAT CEMENT (NO SAND) MIXES (1)

The following chart illustrates the various properties of **Weight Density**(lb./c.f.), **Compressive Strength**, (psi), and **Thermal Conductivity** values attainable with various volumes of preformed foam additions to Neat Cement Mixes.

Wet Density lb/ft³	Dry Density lb/ft³	Compressive Strength(2) lb/in²	"k" Thermal Conductivity Btu in/h ft² °F	Portland Cement lbs/yd³	Foam Volume ft³/yd³	Foam Liquid Concentrate Weight,lb/yd³
20	16	50	0.54	328	22.7	2.17
25	20	80	0.60	420	21.5	2.06
30	25	140	0.67	512	20.3	1.94
35	29	210	0.76	603	19.1	1.83
40	34	330	0.87	695	17.9	1.71
45	38	450	0.98	787	16.7	1.60
50	43	640	1.06	878	15.5	1.48
55	47	790	1.20	970	14.3	1.37
60	51	930	1.33	1062	13.1	1.25

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CELLULAR CONCRETE STRENGTH / DENSITY CHART

SAND / CEMENT GROUT MIXES

The following chart illustrates the various properties of **Weight Density**(lb./c.f.), **Compressive Strength**, (psi), and **Thermal Conductivity** values attainable with various volumes of preformed foam additions to Sand / Cement Mixes.

(Based on dry sand/cement ration of 300 lb. sack and 8.75 sacks cement/ yd³ of unfoamed grout)

Wet Density lb/ft ³	Dry Density lb/ft ³	Compressive Strength(2) lb/in ²	"k" Thermal Conductivity Btu in/h ft ² °F	Portland Cement lbs/yd ³	Sand dry (lbs)	Water (US Gal)	Foam Volume ft ³ /yd ³	Liquid Concentrate Weight, lb/yd ³
90	85	500	3.30	512	1640	32.8	10.10	.88
95	90	1,000	3.70	542	1730	34.6	9.10	.79
100	95	1,500	4.10	570	1815	36.5	8.20	.71
105	100	2,000	4.50	600	1915	38.3	7.30	.63
110	105	2,500	5.00	630	2010	40.2	6.40	.56
115	110	3,000	5.50	658	2100	42.0	5.40	.47
120	115	3,500	6.00	688	2190	43.8	4.50	.39
125	120	4,000	6.60	714	2280	45.7	3.50	.31

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***Cellular concrete has been pumped over 500'
vertically and over 5000' horizontally***



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Flexible

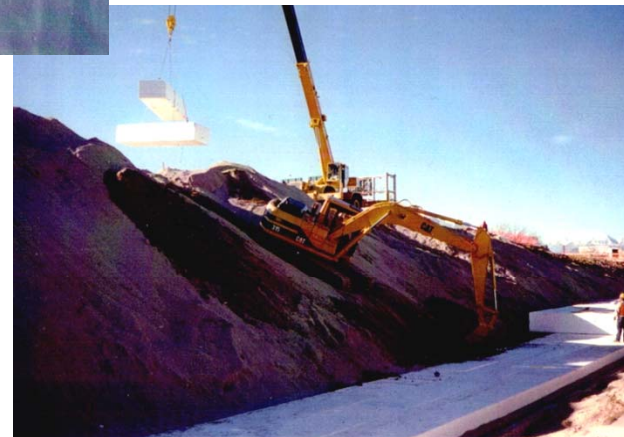
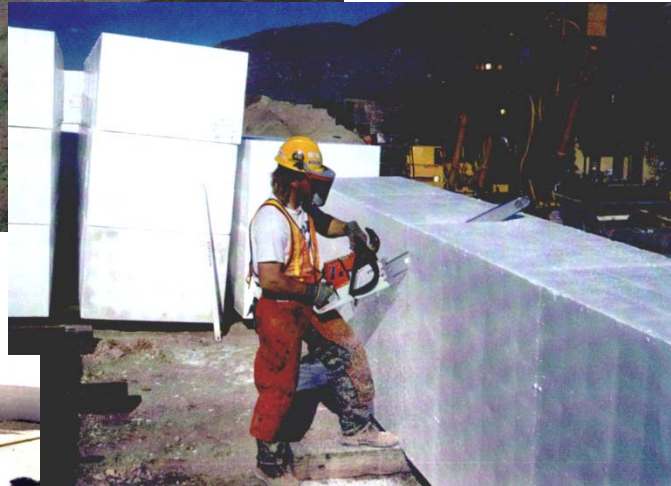


Flowable



Difficult/Expensive EPS

Chemical Degradation
Flammability
Ultraviolet Radiation
Insects
Buoyancy
Water Absorption
Differential Icing
Design Life



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Field Production



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As Cast / Wet Density



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Applications

Poor Soil Replacement



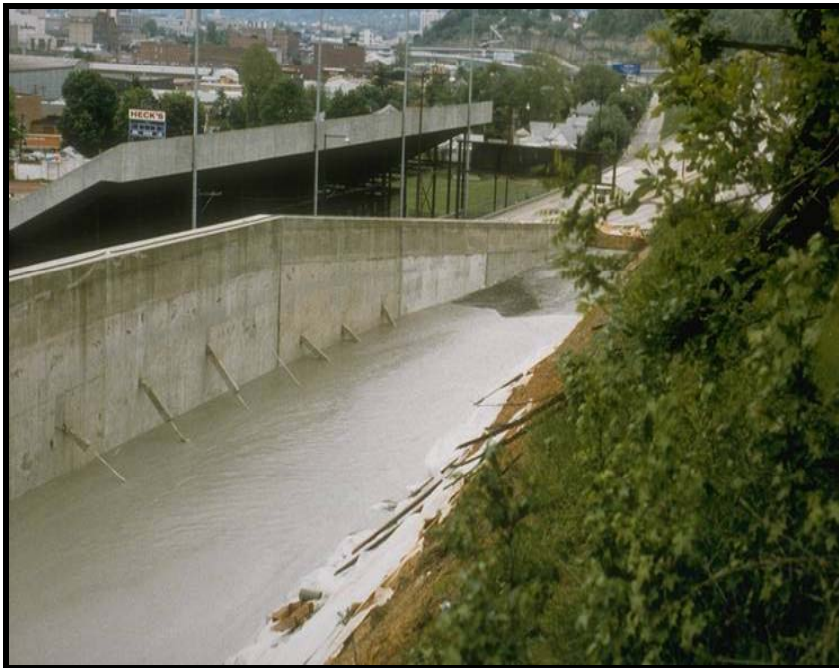
- ***Load Reduction***
- ***100% Compaction***
- ***Seismic Stability***
- ***Site Utilization***

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Applications

Retaining walls - backfill



- ***Reduced Lateral Load***
- ***Reduced Dead Load***
- ***100% Compaction***
- ***Rapid Installation***

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Applications

Bridge Approach



- ***100% Compaction***
- ***Will Not Liquefy***
- ***Fast Installation***
- ***Very Stable***

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Applications

Tremie Applications



- ***Very Fluid***
- ***Full Encasement***

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Applications

Annulars Grouting



Tunnel Backfill



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Applications

Underground Pipes

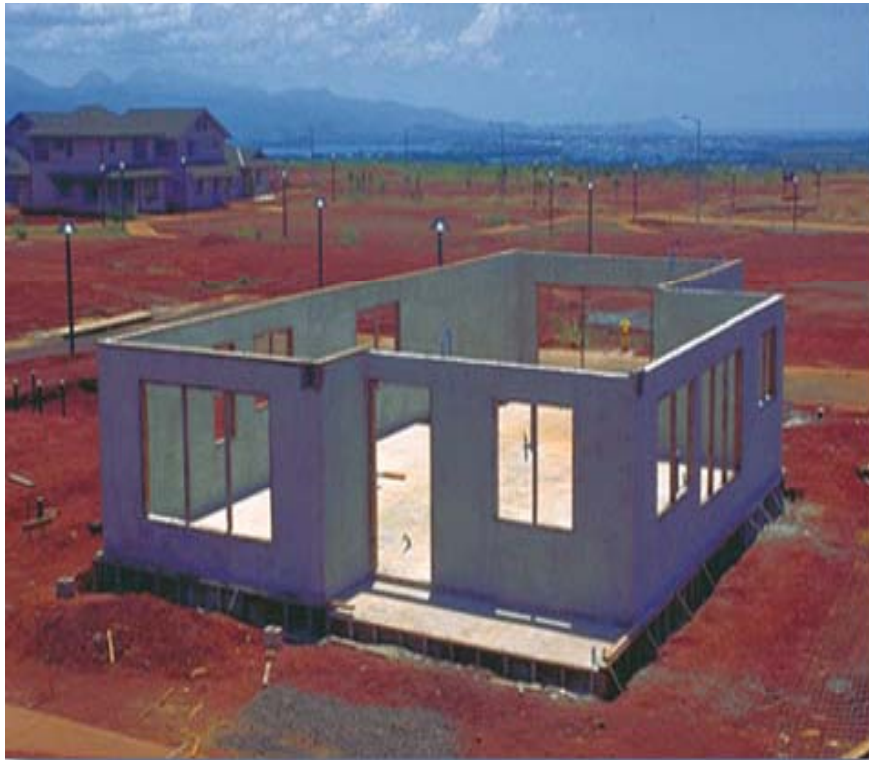


- ***Pipe Beds***
- ***Easy to Place***
- ***Easy to Remove***
- ***Stable***

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Housing



Applications

- *Fast Construction*
- *Vermin Proof*
- *Fire Proof*

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Applications

Sound Walls



- ***Light Weight***
- ***Sound Absorption***
 - ***Ideal for highways and airports***

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Applications

Mining

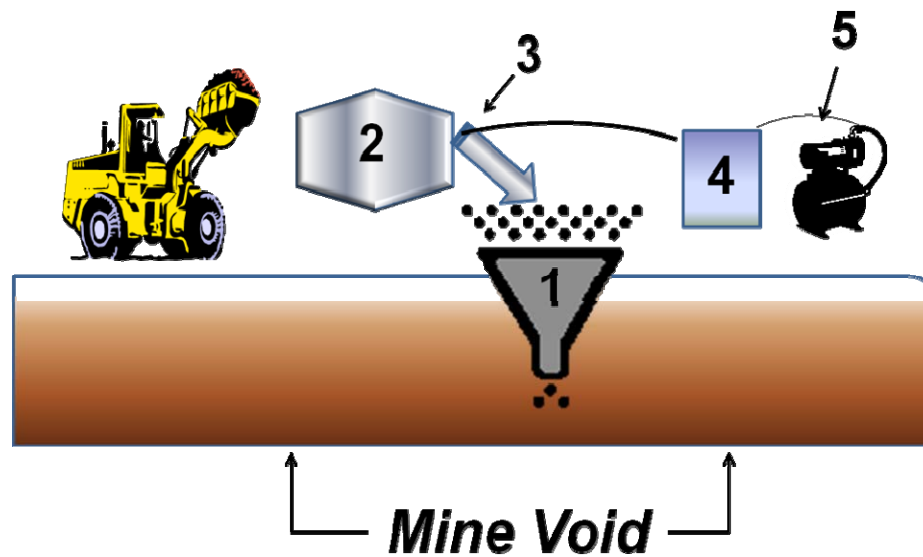


- ***Mine Fires***
- ***Mine Closures***

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Material Transportation



➤ ***Tailing Disposal***

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Engineered Material Arresting System



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Roof Decks



- ***Insulation***
- ***Fire Rating***
- ***Wind Uplift***
- ***Custom Slope***
- ***Economical***

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Pervious Cellular Concrete.wmv

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Cellular Concrete won the award for most innovative permeable concrete in last year's "World of Concrete."

Attendees and Experts Choice

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- ***Pervious cellular concrete***
- ***Open cell technology***
- ***Permeability drainage of .007 cm/sec to .7 cm/sec***
- ***Density of 20pcf – 40pcf***

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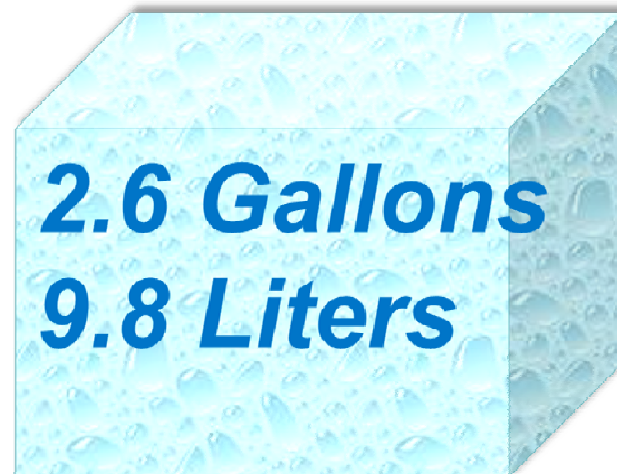
**Reduce Carbon
Emissions**

Water Detention/Retention Per Cu Ft

***Geofoam
Permeable***



***Typical
Pervious Fill***



45% More Detention/Retention

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Reduce Carbon Emissions

Cubic Yards Needed to Detain 1000 Gallons 3784 liters Water

Geofoam Permeable



Typical Pervious Fill



45 % Less Excavation

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Reduce Carbon Emissions

Truck Loads / 1000 Cu Yards / 765 cu Meters

***Geofoam
10 Trucks***

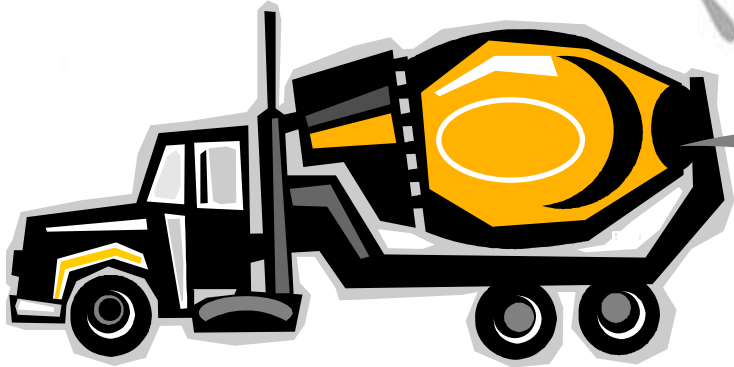
***Typical Pervious Fill
80 Trucks (20 yd³)***



***87% Less Trucking
87% Less Fuel
87% Less Carbon Emissions***

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**Cellular
Lightweight Concrete**

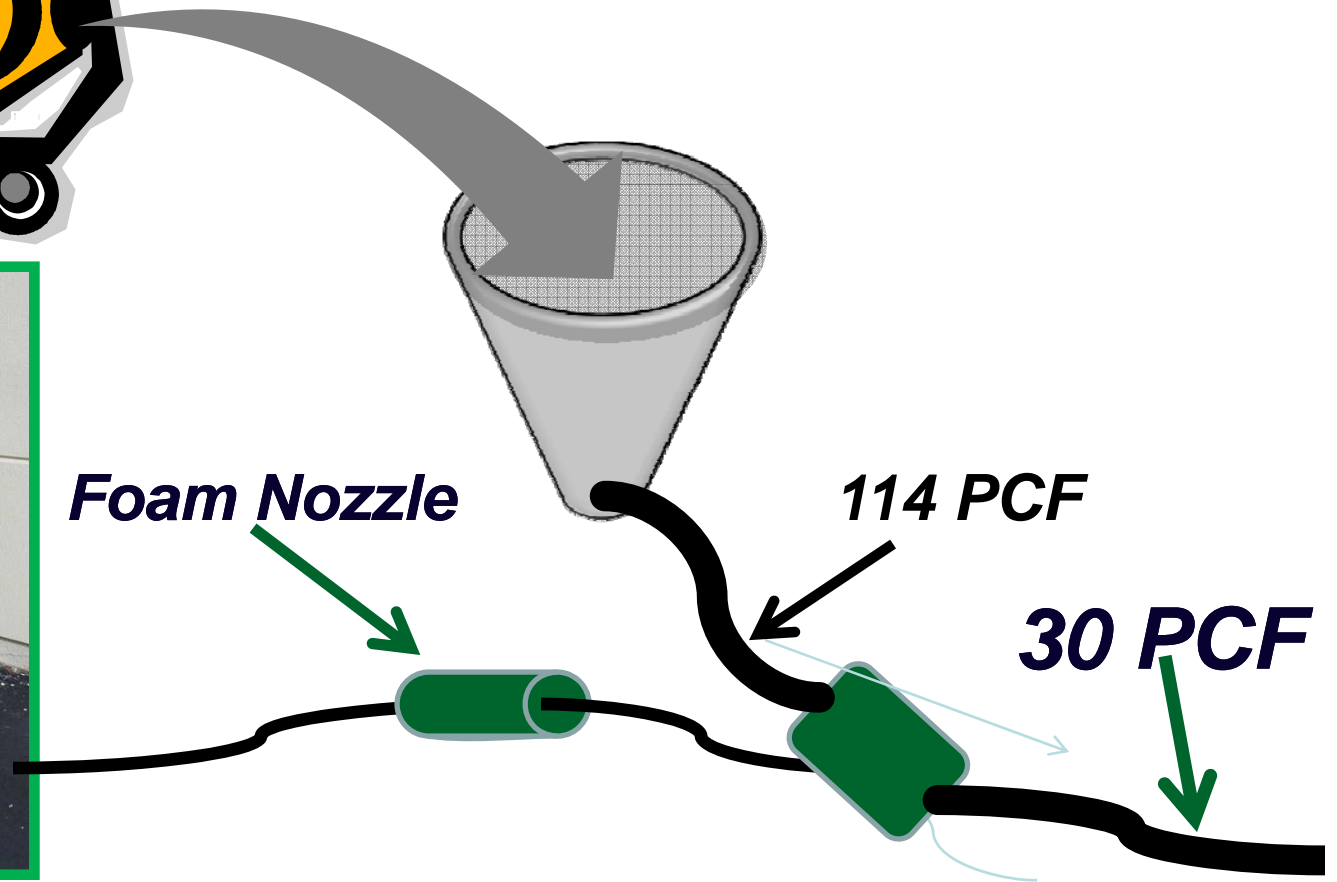


Foam Nozzle

114 PCF

30 PCF

Auto Foam Generator



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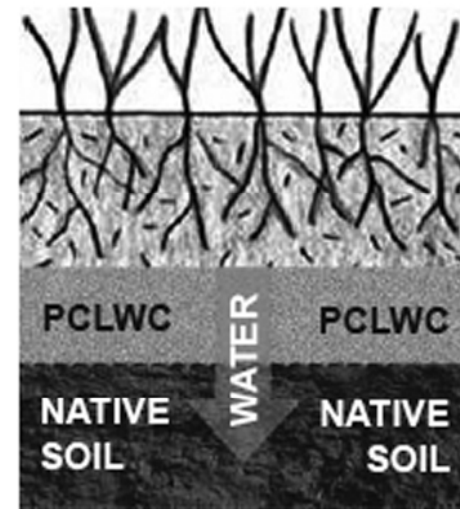
***Reduce Carbon
Emissions***

45% Less Excavation

55% Less Trucks

***45% More
Detention/Retention***

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Reduce Carbon Emissions

**The new Met Stadium
New York**



- ***45% Less Excavation***
- ***2000 Less Trucks***
- ***87% Less Dead Load***
- ***100% Compaction***

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Applications

Sports complex - drainage

Retaining walls - backfill

Pervious pavement – sub-base filtration

Foundation drainage

Pipeline bedding / Culvert Fill

Greenhouse Floors

Landscaping

Pool Backfill

Mine Fires / Mine Closures Tailings Disposal

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Applications

- ***Tunnel Backfill & Annular Fill***
- ***Replacement for Unstable Soils***
- ***Load Reducing Engineered Fill***
- ***Fill Underground Tanks***
- ***Bridge Approach & Landslip Repair***
- ***Impact Absorption***
- ***Tremie Applications***
- ***Fill Abandon Pipelines***
- ***Roadway Fill***
- ***Reduce Carbon Emissions***

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Any Questions?