September 11, 2026

Re: Mix Design Packet — Cellular Grout 27PCF + Base Slurry 108PCF

Thank you for choosing Volume Concrete. Please find attached the complete technical packet containing two related mix designs used for cellular concrete / lightweight grout applications:

Included Mix Designs

1. Base Slurry 108PCF — Neat cement slurry (base for foaming into cellular concrete)
2. Cellular Grout 27PCF — Low-density non-permeating cellular concrete for slip liner / underground pipe decommissioning, void filling, and backfill applications

Key Recommendation

Cellular Grout 27PCF is the lightest published Volume cellular fill — highest foam fraction, lowest unit weight, lowest lateral pressure on foundations and abandoned pipe.

Attached Documentation

- Detailed Mix Design specifications for both Base Slurry 108PCF and Cellular 27PCF
- Current Cement Mill Certificate (Ash Grove – Durkee, Oregon)
- Aerix Industries AERLITE™ & AERLITE-iX™ Cellular Concrete for Geotech Applications
- Volume Concrete Line Card

Standards & Compliance

These mixes are developed in accordance with ACI 301, ASTM C685, ASTM C1602, ASTM C150, ASTM C1600, and related industry guidelines for cellular concrete and neat cement slurries.

Strength & Performance

Cellular Grout 27PCF is designed for approximately 107 psi at 28 days (typical maturity).
Base Slurry 108PCF is the high-density neat cement slurry used as the carrier for foam generation.
28-day psi is scaled from the 38.2 pcf / ~180 psi reference: 180 × (density/38.2)^1.5.

TEST RESULTS AGREEMENT

If this material is tested, please forward results to billing@volumeconcrete.com in a timely manner.

PACKET ACCEPTANCE

By signing below, I acknowledge receipt and review of this mix design packet.

Jobsite Address: _____ Date: _____

Printed Name: _____ Title: _____

Signature: _____

Sincerely,
Volume Concrete LLC
Locally Owned. Locally Made in Oregon. Dispatch (971) 219-8604.

MIX DESIGN: BASE SLURRY 108PCF

NEAT CEMENT SLURRY — 108 PCF (BASE FOR CELLULAR CONCRETE)

Neat Cement Slurry · Base for Cellular Concrete · Pumpable · Estacada Plant

UNIT WT	SLUMP	W/C	CWT
108.4 pcf	7 ± 2"	0.60	18.30

MATERIALS

Material	Source	SG	lbs/yd³	% of Mix
Type IL Cement	Durkee, Oregon Ash Grove	3.12	1830	62.5%
Water	Municipal Well Source	1.00	1096	37.5%

TYPICAL APPLICATIONS

- Base slurry for Cellular Concrete / Foam Grout production
- Void filling and abandonment (pipes, tanks, cisterns)
- Lightweight structural backfill
- Annular space grouting and permeation applications

NOTES

High cement content neat slurry designed as the carrier for on-site foam generation.
Typical base density ~108 pcf before expansion with Aerix or equivalent foam.
Expansion factors and final cellular density are determined by foam addition rate on site.
No water reducer required for cellular concrete production.
This 108.4 pcf / W/C 0.60 / 1830 lbs cement / 1096 lbs water recipe is unchanged across the 27, 33, 38, and 45 PCF cellular packets. Only foam volume fraction changes.

MIX DESIGN: CELLULAR GROUT 27PCF

CELLULAR CONCRETE — 27 PCF NON-PERMEATING (SLIP LINER / PIPE DECOMMISSIONING)

Low-Density Cellular Concrete · Underground / Void Filling · Pumpable · Estacada Plant

UNIT WT	SLUMP	W/C	FOAM	STRENGTH
27.0 pcf	11 ± 1"	0.68	81.6% ± 2.5	~107 psi

MATERIALS (per cubic yard)

Material	Source	SG	lbs/yd³	Notes
Type IL Cement	Durkee, Oregon Ash Grove	3.12	266	
Water	Municipal / ASTM C1602	1.00	172	
Fine Agg (Sand)	Estacada / ASTM C33	2.58	283	
Aerix Foam	Aerix Industries	—	—	81.6% ± 2.5 by volume

STRENGTH MATURITY (typical)

7 Day ≈ 62 psi · 14 Day ≈ 86 psi · 28 Day ≈ 107 psi

28-day psi is scaled from the 38.2 pcf / ~180 psi reference: 180 × (density/38.2)^1.5.

TYPICAL APPLICATIONS

- Underground pipe decommissioning (sewer, water, storm)
- Slip liner annular space grouting
- Tank, cistern, and vault abandonment
- Void filling and lightweight flowable fill
- Backfilling up to concrete foundations (low-pressure option)
- Long-distance pump placements with reduced line pressure

NOTES

Non-permeating low-density cellular concrete produced by combining the 108 PCF base slurry with Aerix foam. Paste recipe scales with density from the 38.2 pcf / 74% foam / ~180 psi reference. Only foam volume changes.
Slump 11±1", W/C 0.68, Aerix foam, Type IL Ash Grove Durkee, Estacada sand — same constants as 38 PCF. Foam percentage and final density are controlled on-site. Compliant with ACI 301 / ASTM C685.
Call Dispatch at (971) 219-8604 to schedule or price a load.

ASH GROVE CEMENT COMPANY

Durkee Plant
33060 Shirttail Creek Rd
Durkee, Oregon 97905
Phone #: (541)-877-2607

Blended Cement Type: IL(10) (HS)

Production Period: April 1, 2026 - April 30, 2026 Date: May 12, 2026

ASTM C595/C595M
REQUIREMENTS

Lot #: DK0526 TIL 10

CHEMICAL

Item	Spec. Limit	Test Result
Sulfate as SO_3 (%)	3.0 max[A]	2.9
Loss on ignition (%)	10.0 max	4.6
Equivalent alkali content of portland cement (Na_2O_{eq} %)[E]	[B]	0.62
Limestone (%)	>5 and ≤15	9.6
$CaCO_3$ + $MgCO_3$ in limestone (%)	70 min	98
Optional information		
Equivalent alkali content of finished cement (Na_2O_{eq} %)	[B]	0.56

PHYSICAL

Item	Spec. Limit	Test Result
Air content of mortar (volume %)	12 max	4.5
Blaine fineness (m^2/kg)	[B]	409
Fineness, No. 325 sieve (% retained)	[B]	1.1
Density (g/cm^3)	[B]	3.12
Compressive strength (psi)		
1 day	[B]	2,130
3 days	1,890 min	4,120
7 days	2,900 min	5,840
28 days[C]	3,620 min	7,830
Time of initial setting (Vicat)		
Not less than (minutes)	45	133
Not more than (minutes)	420	
Heat of hydration, C1702/C1702M, (kJ/kg)[C]		
3 days	[B]	287
Mortar bar expansion, C1038/C1038M, (%)[C]	0.020 max[D]	0.007
Sulfate resistance, C1012/C1012M, (%)[C]		
Expansion at 180 days	0.05 max	0.03

[A] Default table maximum may be exceeded if Test Method ASTM C1038/C1038M limit is met.

[B] Not applicable.

[C] Test results for this production period may not be available and most recent test results provided (some data may be for information only).

[D] Required only if percent SO_3 exceeds the limit in Table 1.

[E] As per ASTM C1778, Portland Cement is defined as "Clinker + Gypsum" constituents and is to be used for calculating equivalent alkalis in the base cement.

We certify that the above described blended cement, at the time of shipment, meets the chemical and physical requirements of the ASTM C595/C595M Type IL(HS) and AASHTO M240 Blended Hydraulic Cement specifications.

Signature: _____ Title: Quality Manager

Name: Lucky Mclean

AERLITE™
AERLITE-iX™

Our AERLITE™ family of products produces the most advanced stable performed foam, allowing for major advancements in the application of cellular concrete.

AERLITE™ & AERLITE-iX™ Produced Celluar Concrete Features & Benefits

- Lightweight
- Insulating; freeze thaw resistant
- High Slump; virtually self leveling
- Rapid Installation by pump or gravity
- Load reducing engineered fill
- Absorbs shock waves
- Broad spectrum of densities and compressive strengths
- Low water absorbtion and low permeability
- Reduces hydrostatic pressure on retaining walls

The AERLITE™ family of products produces cellular concretes that comply with the standard specifications of ASTM C 869 when tested in accordance with ASTM C 796

CELLULAR CONCRETE FOR GEOTECH APPLICATIONS

Cellular lightweight concrete (CLWC) is used to solve a wide vairety of challenges in the geotechnical construction and mining industries. CLWC is an engineered fill material containing uniformly distributed air voids generated by mixing a cement slurry with a stable preformed foam. In it's rigid form, it can be thought of as concrete having air as the aggregate.

Aerix Industries™ engineers and manufactures a dynamic product line of foam liquid concentrates that produces the most advanced preformed foam in the industry. The AERLITE™ family of hybrid and synthetic foaming agents produce a closed-cell, non premeable light-weight concrete, when combined with a cement slurry.

CLWC produced using the AERLITE™ family of products, can be engineered with wet cast densities ranging from 20 to 120 pcf and compressive strengths of 20 to 3000 psi.

Multiple production methods and engineered material properties create a diverse index of practical CLWC applications. The ability to precisely control density, slump, and strength position CLWC as an ideal alternative to traditional fill methods in many construction applications.

Aerix Industries™
Advanced Engineered Foam Solutions

WWW.AERIXINDUSTRIES.COM
303-271-1773 info@aerixindustries.com 5902 McIntyre St. Golden, CO 80403 USA

AERLITE™
AERLITE-iX™

Our AERLITE™ family of products can be engineered to produce CLWC of specific densities, strengths, and slumps providing solutions to a wide range of geotechnical construction challenges

AERLITE™ & AERLITE-iX™ Geotechnical Applications

- Virtually Self-Leveling Fill
- Tunnel Backfill
- Underground Tanks and Piplines
- Soil Stabilization
- Annular Grouting / Backfill
- Load-Reducing Engineered Fill
- Pipeline Beds
- Fill for Abandoned Mines
- Impact Absorption
- Bridge Approach & Landslip Repair
- Retaining Wall Backfill
- Tremie Applications

CELLULAR CONCRETE FOR GEOTECH APPLICATIONS

CLWC engineered fill has a long track record of success providing value-engineered solutions when granular fills or lightweight aggregate material options are too heavy, site access is limited, or project schedules are tight. CLWC material is highly flowable and easily placed, does not require pre-loading for settlement mitigation, and provides a 2 to 1 point-load distribution edge. The fluid material will completely fill annular spaces and exhibits shrinkage of less than 0.3%. CLWC produced with the AERLITE™ family of products is environmentally safe and cost competitive.

ADVANCEMENTS IN CLWC TECHNOLOGY

The Aerix™ team is continually working to make advancements in CLWC technology. The ability to engineer the material to specific densities, compressive strengths and slumps has enabled us to customize the performance of our products to meet project specific requirements. Typical foams produce CLWC with an 8-9 inch slump which can be placed in 3 foot lifts and pumped a maximum of 5,000 feet. Our advanced engineered foam technology has allowed our technical team to engineer material with a 2-9 inch slump range, increasing lift thickness to 8-20 feet and increasing pumping distance to over 15,000 feet. Our advanced hybrid and synthetic foaming agents increase the stability of the bubble, allow for higher flyash usage and are continuing to advance the CLWC industry.

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VOLUME CONCRETE LLC

Specialty Concrete Pumping & Placement Solutions

OUR FLEET & CAPABILITIES

We operate a modern fleet of **seven barrel trucks** and **five on-site volumetric trucks**, giving us excellent flexibility for both standard and specialty placements. We specialize in developing **custom mix designs** for tricky, challenging, or out-of-the-box project requirements and maintain pre-approved mix designs for various jurisdictions, including City of Portland PBOT.

LINE PUMPING SERVICES

We operate a modern fleet of concrete line pumps capable of placing concrete in difficult-to-reach locations through 2" and 2.5" lines. Our experienced operators and well-maintained equipment ensure reliable performance on every job.

UNDERGROUND DECOMMISSIONING

We specialize in the safe and efficient decommissioning of:

- Pipes and pipelines
- Cisterns and tanks
- Swimming pools
- Voids and abandoned structures

CELLULAR GROUT & LIGHTWEIGHT STRUCTURAL BACKFILL

Our cellular concrete/grout solutions provide excellent lightweight structural backfill with superior flowability and reduced density. Ideal for utility trenches, annular space grouting, and void filling where weight reduction is critical.

SHOTCRETE SERVICES

We provide high-quality shotcrete placement for:

- Swimming pool construction and rehabilitation
- Bank stabilization and slope reinforcement
- Structural repair and rehabilitation projects

ADMIXTURES & FIBER SOLUTIONS

We use high-performance Euclid admixtures to optimize every mix:

- **Accelguard NCA** — Non-chloride accelerator for faster set times and early strength, especially valuable in cooler weather.
- **Eucon WR 91 / Plastol 6420** — Water reducers and mid/high-range plasticizers that improve workability, reduce water demand, and enhance strength and finishability.
- **Eucon AEA-92** — Air entrainment for improved freeze/thaw durability and workability.

Fiber Reinforcement

- **Euclid Micro Fiber 150** — Excellent for medium-duty slabs, residential, and light commercial applications. Provides crack control and improved durability.
- **Fiberforce Macro Fibers** — Designed for industrial floors, heavy traffic areas, and structural applications. Delivers enhanced toughness, impact resistance, and load transfer capabilities.

Volume Concrete LLC • (971) 219-8604 • billing@volumeconcrete.com • www.volumeconcrete.com