

May 15, 2026

Re: Mix Design Packet — CLSM 100 (Flowable Fill / CDF)

Thank you for choosing Volume Concrete. Please find attached the complete technical packet for **CLSM 100**, our Controlled Low Strength Material (CLSM) / Controlled Density Fill (CDF) designed for pipe abandonment, trench backfill, utility excavations, and void filling applications.

Product Overview

CLSM 100 is a high-flow, self-compacting, non-structural flowable fill material that produces 100–150 psi compressive strength at 28 days. It is ideal for Public Utility District (PUD) work, pipe decommissioning, and any application where future excavation may be required. The mix is designed with a target air content of **18% ± 5%** to achieve excellent flowability while maintaining stability and ease of excavation.

Attached Documentation

This packet includes:

- Detailed CLSM 100 Mix Design specifications
- Current Cement Mill Certificate (Ash Grove – Durkee, Oregon)
- Technical Data Sheet for Eucon Easy Fill (air-entraining admixture for flowable fill)
- Actual 28-Day Independent Test Report (Diamond E Testing) — Average **140 psi**
- Volume Concrete Line Card

Standards & Compliance

Our CLSM mixes are developed in accordance with ACI 229R – Controlled Low-Strength Materials, ASTM C94 for ready-mixed concrete production, and ASTM C260 for air-entraining admixtures. All materials are sourced from approved suppliers with current mill certificates.

Strength & Performance

CLSM 100 is designed to achieve 100–150 psi at 28 days under standard curing conditions. Included in this packet is a recent independent laboratory test report showing an average compressive strength of **140 psi** at 28 days, confirming reliable performance within the specified range. Actual results may vary depending on placement conditions, curing, and material variability.

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 CLSM 100 mix design packet.

Jobsite Address: _____

Date: _____

Printed Name: _____

Title: _____

Signature: _____

Sincerely,

Volume Concrete LLC

Locally Owned. Locally Made in Oregon.

VOLUME CONCRETE LLC

www.volumeconcrete.com

MIX DESIGN: CLSM 100

CLSM 100-150 CDF — CONTROLLED LOW STRENGTH MATERIAL (FLOWABLE FILL)

Flowable Fill / CDF • Pump / Tailgate / Chute • Estacada Plant

STRENGTH	SLUMP	W/C	UNIT WT	CWT
100-150 psi	8 ± 2"	1.58	114 pcf	2.0

MATERIALS

Material	Source	SG	lbs/yd ³	% of Mix
Type IL Cement	Durkee, Oregon Ash Grove	3.12	200	6.5%
Water	Municipal Well Source	1.00	310	10.1%
3/8" Agg	Estacada Pit	2.65	550	17.9%
Fine Agg	Estacada Pit (ASTM C33)	2.52	1994	64.9%
Air (entrained)	Target 18% ± 5%	—	—	—

ADMIXTURES (per CWT of Cement)

Admixture	Product	Dosage (oz/cwt)
Air Entrainment	Euclid AEA 92S / Eucon Easy Fill	Target 18% ± 5% air

TYPICAL APPLICATIONS

- Pipe abandonment & decommissioning
- Trench backfill & utility trenches
- Void filling (tanks, cisterns, vaults)
- Public Utility District (PUD) approved applications
- Non-structural flowable fill where future excavation may be required

FEATURED ADDITIVES AVAILABLE

- Euclid Micro Fiber 150 — Micro fibers (medium duty)
- Fiberforce Macro Fibers — Macro fibers (industrial)
- Plastol 6420 — Mid/high-range plasticizer
- Accelguard NCA — Non-chloride accelerator
- Eucon Stasis — Extended slump retention for hot weather & long hauls (available)

Must confirm with Dispatch for availability prior to delivery.

High-flow CLSM / CDF designed for pipe abandonment, trench backfill, and void filling. Target air content: 18% ± 5%. Public Utility District (PUD) approved applications.

DISCLAIMER: This CLSM / CDF mix is designed as a non-structural flowable fill material. Volume Concrete LLC warrants that this material, as batched and delivered, meets the specified design strength range when properly placed. This product is not intended for structural applications. Volume Concrete does not warrant in-place performance, long-term durability, or future excavatability, as these depend on placement, curing, site conditions, and other factors outside our control. The contractor is solely responsible for proper handling and placement. Test results should be forwarded to billing@volumeconcrete.com. **Delivery Limitations:** Volume Concrete drivers will not drive beyond the curb line, off-road, in mud, or on newly placed roads. Delivery beyond the curb line requires a signed waiver. Volume Concrete LLC accepts no responsibility for damage or incidents resulting from off-curb delivery. We strongly recommend using a pump for difficult jobsites. Fresh concrete is caustic — use appropriate PPE. This document is for informational purposes only.

Volume Concrete LLC • Proudly Serving the Greater Portland Metro • **Celebrating America's 250th Anniversary (1776–2026)**

EUCON™ EASY FILL

Admixture for Flowable Fill / CLSM

Euclid Chemical

DESCRIPTION

EUCON EASY FILL is a ready-to-use liquid admixture designed to increase the air content of Controlled Low Strength Material (CLSM) and flowable fill. It produces high-flow, self-compacting, non-bleeding material that remains easy to excavate. Contains no added chlorides or chemicals known to promote corrosion of steel.

FEATURES & BENEFITS

- Controlled low strength – easy to excavate when required
- Non-bleeding with reduced settlement for volume stability
- High flowability – significantly reduces labor costs
- Self-compacting – no vibration or consolidation needed
- Economical solution for backfill and abandonment projects

PRIMARY APPLICATIONS

- Pipe abandonment and decommissioning
- Utility trench backfill and street/highway surfaces
- Building excavations and void filling (tanks, cisterns, vaults)
- Pipe bedding and road base applications

DOSAGE & USAGE

Recommended dosage: 3 oz per cubic yard (115 ml/m³). Add to mixes with an initial slump of 1–2". Target final slump: 7–9". Expected air content: 25–35% (material dependent). Mix for a minimum of 5 minutes after addition. Best results when added on-site directly to the material.

TECHNICAL INFORMATION

- Appearance: Amber colored liquid
- Complies with: ASTM C260
- Shelf Life: 2 years in original, unopened container
- Packaging: 4×1 gallon cases, 12×1 quart cases
- Storage: Keep above 32°F (0°C). Do not allow to freeze.

PRECAUTIONS

Do not use in conventional structural concrete. Add independently of other admixtures. Consult your Euclid representative for dosage adjustments when using fly ash, slag, or high-range water reducers. Always review the Safety Data Sheet (SDS) before use.



**DIAMOND
E Testing**

Concrete Test Report

2553 NW Division St
Gresham, OR 97030
Phone: 503-719-5848

Client: Volume Concrete		Date: 3/9/2026		Report #: 24597- 0309						
Project: -		Material and Specimen Type								
		X Concrete Cylinder (ASTM C39 AASHTO T22)								
Contract: -		Concrete Beam (ASTM C78)								
		Grout Prism (ASTM C1019)		Mortar Cylinders (ASTM 780)						
Bid Item: -		Grout/Mortar Cubes (ASTM C109/C109M)								
		Grouted	Ungrouted	CMU/Brick Prisms (ASTM C1314)						
Field Data										
Placement Location: -										
Tested By: Peyton Stumpf		Supplier Volume Concrete		Delivery Ticket # -	Mix # CLSM100					
Date Placed 3/9/2026	Batched 1 yd ³	Quantity Represented 1 yd ³	Cement (lbs) 230	Slag (lbs) 0						
Batch Time 1:54 PM	Ambient 45 °F	Time Cast 2:30 PM	Sample Temperature 59 °F	Coarse Aggregate (lbs.) 580	Moisture % 0.00					
Fine Aggregate (lbs.) 2210		Moisture % 9.00								
Slump (in) 8.50	Air Content (%) 18.0	Cement Content (lb/yd ³) 231	Water Batched (lbs.) 142	Water added @ jobsite (lbs.) 0						
Unit Weight 117.4 lb/ft ³	Water Cement Ratio 1.48	Yield 1.00 yd ³	Admixtures (oz) 0	Aggregate 3 0	Moisture % 0.00					
Aggregate 4 (lbs.) 0		Moisture % 0.00								
Note: Applicable ASTM Standards unless otherwise indicated: Sampling C172 AASHTO R60; Temperature C1064 AASHTO T309; Slump C143 AASHTO T119; Air Content C231 AASHTO T121; Unit Weight C138 AASHTO T121; Concrete Test Specimens C31 AASHTO T23										
Laboratory Data										
Set Number	Specimen ID	Test Age (Days)	Test Date	Total Load (lbs.)	Specimen Area (Sq. in.)	Compressive Strength (psi)	Size (in.)	Pad Duro	Comments	Break Type
24597- 0309	1	7	3/16/2026	1,100	12.57	90		60		3
24597- 0309	2	28	4/6/2026	1,640	12.57	130		60		3
24597- 0309	3	28	4/6/2026	1,800	12.57	140		60		3
24597- 0309	4	28	4/6/2026	1,700	12.57	140		60		3
24597- 0309	5	H								
CSTT: Marcello O'Neil #52780				Average 28 Day		140	Signature: <i>Marcello O'Neil</i>			
Capping Method				X Pad Caps (ASTM C1231 AASHTO T231)		Sulfur Caps (ASTM C617)				
Set # (x of y): 1 of 1		Mix Design Strength (psi) 100-150				Specified Structural Strength (psi) 100				
Cure Method Cure Box	Low Temp °F 54	High Temp °F 59	Check one:		☒ Test results comply with specifications ☐ Test results do not comply with specifications					
Technician: Peyton Stumpf #53013				Signature: <i>Peyton Stumpf</i>				Date Received in Lab: 3/10/2026		

Remarks:

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.