

VOLUME CONCRETE LLC

Ready Mix Concrete • Greater Portland Metro Area • Family Owned and Operated

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

May 14, 2026

Re: Mix Design Packet — LP4500

Thank you for choosing Volume Concrete. Please find attached the complete technical packet for mix design LP4500.

Attached Documentation

This packet for mix design **LP4500** includes:

- Detailed Mix Design specifications
- Current Cement Mill Certificate (Ash Grove – Durkee, Oregon)
- Technical Data Sheets for all admixtures used in this mix
- Volume Concrete Line Card

Standards & Compliance

Our mix designs are developed in accordance with:

- ASTM C94 – Standard Specification for Ready-Mixed Concrete
- ASTM C595 – Blended Hydraulic Cements (Type IL)
- ACI 301 – Specifications for Concrete Construction
- ACI 318 – Building Code Requirements for Structural Concrete

Strength Guarantee & Conditions of Use

Volume Concrete guarantees that this concrete mix will achieve the specified compressive strength when placed by qualified contractors using current best-known methods and procedures, with proper consolidation, finishing, curing, and weather protection.

- **Adding water on site without prior approval may reduce strength and long-term durability.**
- Any addition of color pigments or other cementitious materials on site should be pre-approved.

TEST RESULTS AGREEMENT

If this concrete is tested, please send 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.

VOLUME CONCRETE LLC

www.volumeconcrete.com

MIX DESIGN: LP4500

LP4500 CONCRETE — STANDARD WITH AIR ENTRAINMENT

2.5" Line Pump Mix • Estacada Plant • Designed by: Ben Weber — Ash Grove

STRENGTH	SLUMP	W/C	UNIT WT	CWT
4,500 psi	5 ± 1"	0.43	142 pcf	6.7

MATERIALS

Material	Source	SG	lbs/yd ³	% of Mix
Type IL Cement	Durkee, Oregon Ash Grove	3.12	670	17.4%
Water	Municipal Well Source	1.00	286	7.4%
3/4" Agg	Estacada Pit	2.87	760	19.7%
3/8" Agg	Estacada Pit	2.65	760	19.7%
Fine Agg	Estacada Pit (ASTM C33)	2.52	1378	35.8%
Air (entrained)	% ± 1.5	5.0	—	—

ADMIXTURES (per CWT of Cement)

Admixture	Product	Dosage (oz/cwt)
Air Entrainment	Euclid AEA 92S	0.67 oz/cwt
Water Reducer	Euclid Econ WR91	5.04 oz/cwt

TYPICAL STRENGTH DEVELOPMENT — 4,500 psi @ 28 Days

1 Day ≈ 900–1,600 psi • 3 Day ≈ 2,000–2,700 psi • 7 Day ≈ 2,900–3,600 psi • 28 Day = 4,500 psi

**Values shown represent typical performance under ideal conditions (low w/c, warm temperatures, proper curing).*

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.

Standard LP4500 with air entrainment. Higher cement for 4,500 psi.

DISCLAIMER: This mix is designed to meet the specified compressive strength at slumps of 6" or less. Volume Concrete LLC warrants that this concrete mix, as batched and delivered, meets the specified design strength when properly placed, consolidated, finished, and cured. Volume Concrete does not warrant in-place strength or long-term performance, as these are dependent on factors outside our control, including placement, finishing, curing, weather conditions, and any addition of water or other materials after batching. Adding water on site without prior approval may reduce strength and durability. The contractor is solely responsible for proper handling, placement, and curing. 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 from the customer. Volume Concrete LLC accepts no responsibility for any damage, stuck vehicles, or incidents resulting from off-curb or off-road delivery. We strongly recommend using a concrete pump for difficult jobsites or challenging terrain. Slumps exceeding 6" can be achieved using **Plastol 6420** high-range water reducer at an additional charge. Fresh concrete is caustic and may cause skin burns or eye damage — 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)**

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
ASTM C595/C595M
REQUIREMENTS

Date: May 12, 2026

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 ₂ O _{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 ₂ O _{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 SO₃ 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: 
Name: Lucky Mclean

Title: Quality Manager

WATER REDUCING, SET RETARDING ADMIXTURE (ASTM C494 Type A & D)**DESCRIPTION**

EUCON WR 91 is a liquid water reducing and set retarding admixture. It improves setting and finishing characteristics compared to standard Type A water reducers. Contains no added chlorides.

KEY BENEFITS

- Improves finishability and workability
- Reduces water requirement and segregation
- Increases strength at all ages
- Improves finished appearance and durability
- Reduces cracking

DOSAGE

Typical: 2 – 10 fl oz per 100 lbs cementitious (130 – 650 mL/100 kg). Higher dosages acceptable with testing. Tested at 4 oz/cwt (Type A) and 7 oz/cwt (Type B/D). Add to initial batch water.

PRIMARY APPLICATIONS

Flatwork, general ready mix, architectural concrete, mass concrete, bridge decks, hot weather concrete.

PRECAUTIONS: Maintain above freezing. Do not agitate with air. Add independently of other admixtures. Consult SDS before use.

AIR ENTRAINING AGENT FOR CONCRETE (ASTM C260)

DESCRIPTION

EUCON AEA-92 is an air entraining admixture formulated for uniform and precise performance. It produces a stable air void system with proper bubble size and spacing for freeze/thaw protection. Contains no added chlorides.

KEY BENEFITS

- Provides stable air void system for freeze/thaw durability
- Improves resistance to de-icing salts and sulfate attack
- Improves placeability and workability
- Reduces bleeding and segregation
- Allows reduced mixing water

DOSAGE

Typical: 0.1 – 4 fl oz per 100 lbs total cementitious to achieve 3–6% air. Varies with cement, sand fineness, temperature, and other admixtures. Add directly to sand for best performance. Test regularly to confirm air content.

PRIMARY APPLICATIONS

Ready mix, structural concrete, mass concrete, paving, and all exterior concrete exposed to freeze/thaw or de-icing salts.

PRECAUTIONS: Maintain above freezing. Do not agitate with air. Consult local Euclid rep for dosage adjustments when using fly ash, slag, or HRWRs. Add independently of other admixtures.

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.