

Concrete Mix Design — Volume Concrete — Dispatch (971) 219-8604 — [www.volumeconcrete.com](http://www.volumeconcrete.com)

Mix ID Number:	BP3500 (boom pump)	Date:	1/16/24		
Design Strength:	3500 psi	Plant:	Estacada		
	24.13 MPa	Designed By:	Ben Weber - Ash Grove		
<b>MIX DESIGN QUANTITIES</b>		English Units			
Material	Product/Source	Spec Grav	Weight lb	Volume (ft <sup>3</sup> )	
Cement	Ash Grove Durkee Type IL	3.12	550	2.82	
GGBFS	Ash Grove Dura Slag FHS100	2.90	0	0.00	
Silica Fume	Basf	2.20	0	0.00	
Water (Total)	Municipal Well Source	1.00	280	4.49	
3/4" - #4	Estacada Pit	2.68*	1150	6.88	
3/8" - #4	Estacada Pit	2.65*	390	2.36	
Fine Aggregate	Estacada Pit	2.52*	1432	9.11	
	Total Mix Weight		3802		
	Air (Entrap/Entrain)	5%		1.35	
	Total Mix Volume			27.00	
<b>ADMIXTURES</b>					
Product	Product Name / Type	Dosage Rates	Dosage (English)		
Air Entrainment	Euclid AEA 92S	0.55 oz/cwt**	2.5 oz/cy**		
Water Reducer	Euclid Econ WR91	4.00 oz/cwt**	22.0 oz/cy**		
Superplasticizer	Euclid Plastol 6400	0.00 oz/cwt**	0.0 oz/cy**		
Waterproofing		0.00 oz/cwt**	0.0 oz/cy**		
Hydration Stabilizer		0.00 oz/cwt**	0.0 oz/cy**		
Fibers		0 lb/cy**	0.0 lb/cy**		
<b>MIX DESIGN PROPERTIES</b>					
Aggregate Properties:		SG	Abs	FM	Dry Rodded Unit Wt
	3/4" - #4	2.87	3.1%	n/a	104.5 pcf
	3/8" - #4	2.65	3.8%	n/a	99.0 pcf
	Fine Aggregate	2.52	6.0%	2.90	n/a
Plastic Properties:		Slump:	5.0 ±	1.0"	
		Air Content:	5.0 ±	1.0%	
		Unit Weight:	140.81 pcf	2253.04 kg/m <sup>3</sup>	
Design Properties:		Total Cementitious:	550 lb	327 kg	
		Slag Replacement:	0.00 %	W/C Ratio:	0.51 (Incl Admix)
Project:					
Contractor:					
Comments:	This mix design will exceed the required laboratory strength when slumps 6.0" or less.				
Footnotes:	*SSD Weights and Spec Gravities. **Admixture dosage rates will be adjusted according to manufacturers recommendations to accommodate varying field conditions.				

This mix design is predicated on the specific information and/or materials provided by the customer and therefore, Ash Grove makes no representation or warranties concerning their application to general field use where other variables may occur. Change in design components or proportions, material gradations and/or field placement and curing practices will all strongly affect the ultimate quality of the concrete. User should confirm each laboratory design with concrete batched on site and then routinely run quality control checks to verify yield, air content and compressive strength because the physical and chemical characteristics of materials may vary.

Visit [www.volumeconcrete.com](http://www.volumeconcrete.com) to learn more (i.e., policies, MSDS, about us, and additional mix designs. Now offering LDCC Low density Cellular Concrete for pipe abandonment, sewer abandonment and excellent for backfill thanks to a low lateral pressure and weight. LDCC is available in 27 lbs. per cubic foot & up to 100 lbs. per cubic foot. Permeable and non-permeable LDCC depending on application.

# ASH GROVE CEMENT COMPANY



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

Blended Cement Type: IL(8) (HS)

Production Period February 1, 2024 - February 29, 2024  
ASTM C595/C595M  
REQUIREMENTS

Date: March 11, 2024

Lot: 224

CHEMICAL			PHYSICAL		
Item	Spec. Limit	Test Result	Item	Spec. Limit	Test Result
Sulfate as SO <sub>3</sub> (%)	3.0 max <sup>A</sup>	3.0	Air content of mortar (volume %)	12 max	2.6
Loss on ignition (%)	10.0 max	4.2	Blaine Fineness (m <sup>2</sup> /kg)	<sup>B</sup>	407
Equivalent alkali content of Portland Cement (Na <sub>2</sub> O <sub>eq</sub> %) <sup>F</sup>	<sup>B</sup>	0.49	Fineness, No. 325 sieve (% retained)	<sup>B</sup>	1.8
Limestone (%)	>5 and ≤15	7.9	Density (g/cm <sup>3</sup> )	<sup>B</sup>	3.12
CaCO <sub>3</sub> in limestone (%)	70 min	97	Compressive strength (psi)		
			1 day	<sup>B</sup>	2,169
			3 days	1,890 min	4,347
			7 days	2,900 min	5,376
			28 days <sup>E</sup>	3,620 min	6,712
			Time of initial setting (Vicat)		
			Not less than (minutes)	45	112
			Not more than (minutes)	420	
			Heat of hydration, C1702/1702M, (kJ/kg) <sup>C</sup>		
			3 days	<sup>B</sup>	291
Optional information			Mortar Bar Expansion, C1038/C1038M, (%) <sup>C</sup>	0.020 max <sup>D</sup>	0.020
Equivalent alkali content of finished cement (Na <sub>2</sub> O <sub>eq</sub> %)	<sup>B</sup>	0.49	Sulfate resistance, C1012/1012M, (%) <sup>C</sup>		
			Expansion at 180 days	0.05 max	0.03

<sup>A</sup> Default table maximum may be exceeded if Test Method ASTM C1038/C1038M limit is met.

<sup>B</sup> Not applicable.

<sup>C</sup> Test results for this production period not available. Most recent test result provided.


<sup>D</sup> Required only if percent SO<sub>3</sub> exceeds the limit in Table 1.

<sup>E</sup> Test result based on most recent monthly production time period.

<sup>F</sup> 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: Laboratory Supervisor