ALASKA BASIC INDUSTRIES

SUBSIDIARIES:
ANCHORAGE SAND & GRAVEL CO., INC.
FAIRBANKS MATERIALS, INC.

Manufacturer's Certification

Report Date: 11/12/2024

We hereby certify that CalPortland Type I/II Cement meets the standard requirements of ASTM C150 and AASHTO M85 specification for Type I and Type II cements. Reported are the average chemical and physical data for the lot.

Lot #: 24-293

Type I / II Cement

Source: Nghe An, Vietnam

	ASTM C150 and AASHTO M85 Requirements		Analysis	Limestone
Chemical Properties, (ASTM C114)	**Type I**	**Type II**	**Results**	**Analysis**
Silicon dioxide (SiO_2), %	---	---	**20.1**	**0.7**
Aluminum oxide (Al_2O_3), max, %	---	6.0	**4.5**	**0.5**
Ferric oxide (Fe_2O_3), max, %	---	6.0	**3.9**	**0.6**
Calcium oxide (CaO), %	---	---	**62.1**	**52.4**
Magnesium oxide (MgO), max, %	6.0	6.0	**3.5**	**1.8**
Sulfur trioxide (SO_3), max, %	3.0	3.0	**2.7**	**0.2**
Loss on ignition (LOI), max, %	3.5	3.5	**2.1**	
Insoluble residue (IR), max, %	1.5	1.5	**0.6**	**Base**
Alkalies ($Na_2O+0.658*K_2O$), %	---	---	**0.55**	**Cement**
Tricalcium silicate (C_3S), %	---	---	**49**	**51**
Dicalcium silicate (C_2S), %	---	---	**20**	**21**
Tricalcium aluminate (C_3A), max, %	---	8	**5**	**5**
Tetracalcium aluminoferrite (C_4AF), %	---	---	**12**	**12**
CO_2, %	---	---	**1.5**	
Limestone addition, max, %	5.0	5.0	**3.5**	
$CaCO_3$ in Limestone, min, %	70	70	**97**	
Physical Properties				
Air content of mortar, max, volume %, (C185)	12	12	**7**	
Blaine Fineness, min, m^2/kg, (C204)	260	260	**388**	
Autoclave expansion, max, %, (C151)	0.80	0.80	**0.09**	
Compressive Strength, min, (C109)				
1 Day, psi	---	---	**2420**	
3 Day, MPa	12.0	10.0	**24.4**	
3 Day, psi	1740	1450	**3540**	
7 Day, MPa	19.0	17.0	**31.1**	
7 Day, psi	2760	2470	**4520**	
28 Day (from prior lot), MPa	---	---	**44.7**	
28 Day (from prior lot), psi	---	---	**6480**	
Vicat Setting Time, min-max, minutes, (C191)	45 – 375	45 – 375	**125**	
False Set, min, %,(C451) (amended)	50	50	**78**	

Apparatus and methods used in this laboratory have been checked by the Cement and Concrete Reference Laboratory of the National Institute of Standards and Technology. A copy of the report detailing their findings is available upon request. Major oxides are analyzed in accordance with ASTM C114.

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