



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

Manufacturer's Certification

Report Date: 6/20/2024

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 #: 24-153

Type I / II Cement

Source: Nghe An, Vietnam

Chemical Properties	ASTM C150 and AASHTO M85 Requirements		Analysis	Limestone
	Type I	Type II	Results	Analysis
Silicon dioxide (SiO ₂), %	---	---	19.8	2.6
Aluminum oxide (Al ₂ O ₃), max, %	---	6.0	4.4	0.9
Ferric oxide (Fe ₂ O ₃), max, %	---	6.0	4.4	0.7
Calcium oxide (CaO), %	---	---	62.5	45.2
Magnesium oxide (MgO), max, %	6.0	6.0	3.7	6.9
Sulfur trioxide (SO ₃), max, %	3.0	3.0	2.7	0.2
Loss on ignition (LOI), max, %	3.5	3.5	1.8	
Insoluble residue (IR), max, %	1.5	1.5	0.5	Base
Alkalies (Na ₂ O+0.658*K ₂ O), %	---	---	0.57	Cement
Tricalcium silicate (C ₃ S), %	---	---	55	57
Dicalcium silicate (C ₂ S), %	---	---	15	15
Tricalcium aluminate (C ₃ A), max, %	---	8	4	4
Tetracalcium aluminoferrite (C ₄ AF), %	---	---	13	14
CO ₂ , %	---	---	1.6	
Limestone addition, max, %	5.0	5.0	3.7	
CaCO ₃ in Limestone, min, %	70	70	97	
Physical Properties				
Air content of mortar, max, volume %	12	12	7	
Blaine Fineness, min, m ² /kg	260	260	418	
Autoclave expansion, max, %	0.80	0.80	0.07	
Compressive Strength, min				
1 Day, psi	---	---	2600	
3 Day, MPa	12.0	10.0	27.9	
3 Day, psi	1740	1450	4050	
7 Day, MPa	19.0	17.0	32.2	
7 Day, psi	2760	2470	4670	
28 Day, MPa	---	---		
28 Day, psi	---	---		
Vicat Setting Time, min-max, minutes	45 - 375	45 - 375	135	

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.


X. Schlee
Quality Control Manager