



Certified to  
NSF/ANSI/CAN 61

## Cement Mill Test Report

Month of Issue: **DECEMBER 2021**

Plant: **Richmond, British Columbia**  
 Product: **Portland Cement Type I/II**  
 Mill Test Report #: **R-TI-21-12**  
 Manufactured: **NOVEMBER 2021**

### ASTM C 150-21 and AASHTO M 85-21 Standard Requirements

CHEMICAL ANALYSIS			PHYSICAL ANALYSIS			
Item	Spec limit	Test Result	Item	Spec limit	Test Result	
Rapid Method, X-Ray (C 114)			Air content of mortar (%) (C 185)	12 max	5.9	
SiO <sub>2</sub> (%)	---	20.4	Blaine Fineness (m <sup>2</sup> /kg) (C 204)***	260 - 430	352	
Al <sub>2</sub> O <sub>3</sub> (%)	6.0 max	4.9	Passing 45 um (%) (C 430)	72 min	98.1	
Fe <sub>2</sub> O <sub>3</sub> (%)	6.0 max	3.3	Autoclave expansion (%) (C 151)	0.80 max	0.04	
CaO (%)	---	63.8	Compressive strength (MPa, [PSI]) (C 109)			
MgO (%)	6.0 max	0.9				
SO <sub>3</sub> (%)	3.0 max*	3.0				
Loss on ignition (%)	3.5 max	2.4				
Insoluble residue (%)	1.5 max	0.5				
CO <sub>2</sub> (%)	---	1.4				
Limestone (%)	5.0 max	3.3				
CaCO <sub>3</sub> in Limestone (%)	70 min	98				
Adjusted Potential Phase Composition (C 150)						
C3S (%)	---	52	3 days	12.0 [1740] min	26.1	3780
C2S (%)	---	19	7 days	19.0 [2760] min	33.5	4850
C3A (%)	8 max	7	28 days (Reflects previous month's data)	28.0 [4060] min	45.3	6570
C4AF (%)	---	10				
C3S+4.75*C3A (%)	100 max	87				
			Time of setting (minutes)			
			Vicat Initial (C 191)	45 - 375	90	
			False Set (%) (C451)	50 min	97	
			Heat of Hydration (C186)** - 28 day (Kj/Kg)		349	
			Colour (L*)		56.503	
			Mortar Bar Expansion (%) (C 1038)**	0.020 max	0.002	

#### ASTM C 150 and AASHTO M 85 Optional Chemical Requirements:

NaEq (Alkali) (%) 0.60 max 0.55

\* May exceed 3.0% SO<sub>3</sub> maximum based on our C 1038 results of <0.02% expansion at 14 days.

\*\* Current Production run not available - most recent provided, \*\*\* Maximum Blaine can be exceeded if C3S + 4.75\*C3A(%) meets limit

Note: Specific gravity for Portland cement is considered to be 3.15

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of applicable DOT Specifications for Type I and Type II;

ASTM C 150-21 & AASHTO M 85-21 STANDARD SPECIFICATIONS FOR TYPE I AND TYPE II CEMENT;

ASTM C 150-21 & AASHTO M 85-21 OPTIONAL CHEMICAL REQUIREMENTS FOR TYPES I & II LOW ALKALI CEMENT.

Cement complies with NSF 61

Certified By:

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11/30/2021

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