



Certified to
NSF/ANSI/CAN 61

Cement Mill Test Report

Month of Issue: MARCH 2023

Plant: **Richmond, British Columbia**
 Product: **Portland Cement Type I/II**
 Mill Test Report #: **R-TI-23-03**
 Manufactured: **FEBRUARY 2023**

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	6.4		
SiO2 (%)	---	20.5	Blaine Fineness (m2/kg) (C 204)***	260 - 430	412		
Al2O3 (%)	6.0 max	4.9	Passing 45 um (%) (C 430)	72 min	98.8		
Fe2O3 (%)	6.0 max	3.3	Autoclave expansion (%) (C 151)	0.80 max	0.03		
CaO (%)	---	64.1	Compressive strength (MPa, [PSI]) (C 109)				
MgO (%)	6.0 max	0.8					
SO3 (%)	3.0 max*	3.0					
Loss on ignition (%)	3.5 max	2.4					
Insoluble residue (%)	1.5 max	0.6	3 days	12.0 [1740] min	30.3	4390	
CO2 (%)	---	1.4	7 days	19.0 [2760] min	40.0	5800	
Limestone (%)	5.0 max	3.2	28 days (Reflects previous month's data)	28.0 [4060] min	48.4	7020	
CaCO3 in Limestone (%)	70 min	96					
Adjusted Potential Phase Composition (C 150)			Time of setting (minutes)				
C3S (%)	---	52	Vicat Initial (C 191)	45 - 375	91		
C2S (%)	---	20	False Set (%) (C451)	50 min	88		
C3A (%)	8 max	7	Heat of Hydration (C186)** - 28 day (Kj/Kg)		399		
C4AF (%)	---	10	Colour (L*)		62.595		
C3S+4.75*C3A (%)	100 max	87	Mortar Bar Expansion (%) (C 1038)**	0.020 max	-0.001		
ASTM C 150 and AASHTO M 85 Optional Chemical Requirements:							
NaEq (Alkali) (%)	0.60 max	0.54					

* May exceed 3.0% SO3 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

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

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Certified By:

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 3/16/2023