

 **MITSUBISHI CEMENT CORPORATION**  
**CERTIFICATE OF TEST**

Source: Cushenbury Plant

Portland Cement – Type III

Date: 07/09/2021

ASTM designation: C 150 – 16 for Type III low alkali cement

Production Period

CALTRANS Specification: Section 90 – 1.02B(2) for Type III

From: 06/02/2021

NDOT Specification: Section 701 – 3.01 for Type III

To: 06/17/2021

AZDOT Specifications Subsection 1006-2.01 for Type III

**Chemical Composition:**

	ASTM C-150 Limits Type III		Test Results
Silicon Dioxide (SiO <sub>2</sub> ), %	----		20.4
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ), %	----		5.3
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ), %	----		1.2
Calcium Oxide (CaO), %	----		63.5
Magnesium Oxide (MgO), %	6.0	Max.	2.3
Sulfur Trioxide (SO <sub>3</sub> ), %	4.5	Max.	3.6
Loss on Ignition, %	3.0	Max.	2.6
Insoluble Residue, %	1.5	Max.	0.10
Total Alkali (%Na <sub>2</sub> O + 0.658 * %K <sub>2</sub> O), %	0.60	Max.	0.36
Tricalcium Silicate (C <sub>3</sub> S), %	----		56
Tricalcium Aluminate (C <sub>3</sub> A), %	15	Max.	12
Limestone, %	5.0	Max.	0.0
Free Lime, %	----		1.0

**PHYSICAL RESULTS:**

Blaine Fineness Average (m <sup>2</sup> /kg)	----		555
325 Mesh (% Passing)	----		98.9
Autoclave Expansion (%)	0.80	Max.	0.04
Time of Set Initial Vicat (minutes)	45 / 375	Min. / Max.	45
Air Entrainment (% by Volume)	12	Max.	8.3
C-1702 Heat of Hydration at 7 Days (J/g)	---- (a)		441
False Set (%)	50	Min.	55
Color (L value)	---- (a)		76

**Compressive Strength Test:**

	Type III		MPA	PSI
	MPA	psi		
1 Day	12.0	1740	Min.	21.8 3170
3 Day	24.0	3480	Min.	28.2 4090
7 Day	----	----		32.9 4770
28 Day	----	----		37.2 5400

This cement has been sampled and tested in accordance with ASTM standard methods and procedures. All tests results are certified to comply with the type specification designated above. No other warranty is made or implied. We are not responsible for improper use or workmanship. The MCC laboratory is AASHTO accredited. (a) For information only.

MITSUBISHI CEMENT CORPORATION  
 Cushenbury plant



Evan Coss  
 Quality Control Superintendent