

 **MITSUBISHI CEMENT CORPORATION**
CERTIFICATE OF TEST

Source: Cushenbury Plant

Portland Cement – Type III

Date: 09/08/2021

ASTM designation: C 150 – 16 for Type III low alkali cement	Production Period
CALTRANS Specification: Section 90 – 1.02B(2) for Type III	From: 08/02/2021
NDOT Specification: Section 701 – 3.01 for Type III	To: 08/02/2021
AZDOT Specifications Subsection 1006-2.01 for Type III	

Chemical Composition:

	ASTM C-150 Limits Type III	Test Results
Silicon Dioxide (SiO ₂), %	---	20.0
Aluminum Oxide (Al ₂ O ₃), %	---	5.3
Ferric Oxide (Fe ₂ O ₃), %	---	1.2
Calcium Oxide (CaO), %	---	63.4
Magnesium Oxide (MgO), %	6.0 Max.	2.3
Sulfur Trioxide (SO ₃), %	4.5 Max.	3.6
Loss on Ignition, %	3.0 Max.	2.9
Insoluble Residue, %	1.5 Max.	0.10
Total Alkali (%Na ₂ O + 0.658 * %K ₂ O), %	0.60 Max.	0.37
Tricalcium Silicate (C ₃ S), %	---	59
Tricalcium Aluminate (C ₃ A), %	15 Max.	12
Limestone, %	5.0 Max.	0.0
Free Lime, %	---	0.7

PHYSICAL RESULTS:

Blaine Fineness Average (m ² /kg)	---	546
325 Mesh (% Passing)	---	98.9
Autoclave Expansion (%) July 2021	0.80 Max.	0.08
Time of Set Initial Vicat (minutes)	45 / 375 Min. / Max.	45
Air Entrainment (% by Volume)	12 Max.	8.1
C-1702 Heat of Hydration at 7 Days (J/g)	--- (a)	441
False Set (%)	50 Min.	65
Color (L value)	--- (a)	77

Compressive Strength Test:

	Type III		MPA	PSI
	MPA	psi		
1 Day	12.0	1740	Min.	21.4 3110
3 Day	24.0	3480	Min.	28.3 4110
7 Day	---	---		31.3 4540
28 Day Aug 2021	---	---		38.0 5510

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