MITSUBISHI CEMENT CORPORATION

CERTIFICATE OF TEST

Source: Cushenbury Plant **Date: 12/20/2024**

ASTM designation: C – 150 for Type I, II & V low alkali Cement

CALTRANS Specification: Section 90 – 2.01 for Type II modified and V **Lot #: 323 & 326 – Silo 12**

NDOT Specification: Section 701 – 3.01 for Type II and V

Chemical Composition:

	ASTM C-150 Limits				Test
	Type I	Type II	Type V		Results
Silicon Dioxide (SiO_2), %	----	20.0	----	Min.	21.1
Aluminum Oxide (Al_2O_3), %	----	6.0	----	Max.	4.1
Ferric Oxide (Fe_2O_3), %	----	6.0	----	Max.	3.7
Calcium Oxide (CaO), %	----	----	----		63.9
Magnesium Oxide (MgO), %	6.0	6.0	6.0	Max.	2.2
Sulfur Trioxide (SO_3), %	3.0	3.0	2.3	Max.	2.2
Loss on Ignition, %	3.0	3.0	3.0	Max.	0.8
Insoluble Residue, %	0.75	0.75	0.75	Max.	0.0
Total Alkali (%Na_2O + 0.658 * %K_2O), %	0.60	0.60	0.60	Max.	0.57
Tricalcium Silicate (C_3S), %	----	----	----		61
Tricalcium Aluminate (C_3A), %	----	8	5	Max.	5
$C_4AF + 2*C_3A$	----	----	25	Max.	21
$C_3S + 4.75*C_3A$	----	100	----	Max.	83
Limestone, %	5.0	5.0	5.0	Max.	0.0
Free Lime, %	----	----	----		1.1

PHYSICAL RESULTS:

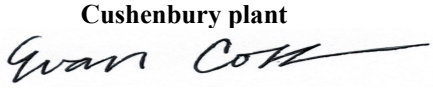
Blaine Fineness (m^2/kg)	280	280	280	Min.	327
325 Mesh (% Passing)	----	----	----		93.6
Autoclave Expansion (%)	0.80	0.80	0.80	Max.	0.08
Time of Set Initial Vicat (minutes)	45 / 375	45 / 375	45 / 375	Min. / Max.	140
Air Entrainment (% by Volume)	12	12	12	Max.	7.0
C1702 Heat of Hydration at 7 Days (kJ/kg)	----	----	----	(a)	282
Early Stiffening (Final Penetration %)	50	50	50	Min.	200

Compressive Strength Test:

		Type I		Type II		Type V			MPA	PSI
		MPA	psi	MPA	psi	MPA	psi			
1 Day		----	----	----	----	----	----		10.6	1530
3 Day		12.0	1740	10.0	1450	8.0	1160	Min.	19.9	2880
7 Day		19.0	2760	17.0	2470	15.0	2180	Min.	26.9	3900
28 Day	Oct 2024	----	----	----	----	21.0	3050	Min.	41.9	6070

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. (a) For information only.

MITSUBISHI CEMENT CORPORATION
Cushenbury plant



Evan Coss
Quality Control Manager