

 **MITSUBISHI CEMENT CORPORATION**
CERTIFICATE OF TEST

Source: Cushenbury Plant

Portland Cement – Type III

Date: 7/18/2024

| | |
|---|-------------------|
| ASTM designation: C 150 – 16 for Type III low alkali cement | Production Period |
| CALTRANS Specification: Section 90 – 1.02B(2) for Type III | From: 06/18/2024 |
| NDOT Specification: Section 701 – 3.01 for Type III | To: 06/18/2024 |
| AZDOT Specifications Subsection 1006-2.01 for Type III | |

Chemical Composition:

| | ASTM C-150 Limits Type III | Test Results |
|--|-------------------------------|-----------------|
| Silicon Dioxide (SiO ₂), % | ---- | 20.1 |
| Aluminum Oxide (Al ₂ O ₃), % | ---- | 5.6 |
| Ferric Oxide (Fe ₂ O ₃), % | ---- | 1.3 |
| Calcium Oxide (CaO), % | ---- | 62.9 |
| Magnesium Oxide (MgO), % | 6.0 Max. | 2.4 |
| Sulfur Trioxide (SO ₃), % | 4.5 Max. | 3.6 |
| Loss on Ignition, % | 3.0 Max. | 2.0 |
| Insoluble Residue, % | 1.5 Max. | 0.4 |
| Total Alkali (%Na ₂ O + 0.658 * %K ₂ O), % | 0.60 Max. | 0.40 |
| Tricalcium Silicate (C ₃ S), % | ---- | 54 |
| Tricalcium Aluminate (C ₃ A), % | 15 Max. | 13 |
| Limestone, % | 5.0 Max. | 0.0 |
| Free Lime, % | ---- | 1.0 |

PHYSICAL RESULTS:

| | | |
|--|----------------------|------|
| Blaine Fineness Average (m ² /kg) | ---- | 550 |
| 325 Mesh (% Passing) | ---- | 98.6 |
| Autoclave Expansion (%) | 0.80 Max. | 0.10 |
| Time of Set Initial Vicat (minutes) | 45 / 375 Min. / Max. | 55 |
| Air Entrainment (% by Volume) | 12 Max. | 8.1 |
| C-1702 Heat of Hydration at 7 Days (J/g) | ---- (a) | 416 |
| False Set (%) | 50 Min. | 66 |
| Color (L value) | ---- (a) | 75 |

Compressive Strength Test:

| | Type III | | MPA | PSI |
|--------|----------|------|-----------|------|
| | MPA | psi | | |
| 1 Day | 12.0 | 1740 | Min. 22.5 | 3260 |
| 3 Day | 24.0 | 3480 | Min. 31.9 | 4630 |
| 7 Day | ---- | ---- | 37.0 | 5370 |
| 28 Day | ---- | ---- | 44.5 | 6460 |

This cement has been sampled and tested in accordance with ASTM standard methods and procedures. All test 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
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