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Cement Mill Certificate of Analysis

Alaska Basic Industries hereby certify that cement represented by this analysis complies with the current requirements for Type I and Type II of ASTM C150-11 specifications, and AASHTO M85-11.

Portland Cement: Type III Low Alkali

Date Shipped: September 16, 2017

Meets: ASTM C150-11 AASHTO M85-11

Lot # / Ship: #III091617 MV Shikoku Island

| Chemical Composition: | Results: | Type III Requirements |
|--|----------|-----------------------|
| Silicon Dioxide (SiO ₂): | 20.3% | --- |
| Aluminum Oxide (Al ₂ O ₃): %Max | 4.6% | --- |
| Ferric Oxide (Fe ₂ O ₃):% Max | 3.3% | --- |
| Calcium Oxide (CaO): | 62.9% | --- |
| Magnesium Oxide (MgO): % Max | 3.4% | 6.0% |
| Sulfur Trioxide (SO ₃):% Max | 3.2% | 3.5% |
| Loss On Ignition% Max: | 1.1% | 3.0% |
| Insoluble Residue:% Max | 0.14% | 0.75% |
| Tricalcium Silicate (C ₃ S): | 55 | -- |
| Dicalcium Silicate (C ₂ S): | 16 | -- |
| Tricalcium Aluminate (C ₃ A):% Max | 6.4% | 15.0% |
| Tetracalcium Aluminoferrite (C ₄ AF): | 10.00% | -- |
| Total Alkali as NaEq:% Max | 0.54% | 0.60% |
| Limestone, 5 % max | 1.3% | 5.0% |
| CaCO ₃ in Limestone, 70% min | 86% | 70% |

Physical Properties:

| | | |
|---------------------------------------|-------|--------|
| Blaine (min m ² /kg.): | 539 | 260 |
| Vicat, Initial Set (mins.) Min | 130 | 45 |
| Vicat, Final Set (mins.): Max | 290 | 375 |
| Autoclave Expansion:% Max | 0.02% | 0.80% |
| False Set: | 79% | -- |
| Air Content (% Max by vol.): | 3.30% | 12.00% |

Mortar Cube Breaks:

| | | |
|-----------------------------|------|------|
| Compressive Strength (PSI): | | |
| 1 Day _____ | 3015 | 1740 |
| 3 Days _____ | 5049 | 3480 |
| 7 Days _____ | 6110 | 0 |

Notes

1. **Test Results:** This mill test represents typical data.
2. The percent of Limestone is slowly being increased, which has no effect on the performance of concrete
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Patrick Walter

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Type III