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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 I/II Low Alkali

Date Shipped: June 25, 2018

Meets: ASTM C150-11 AASHTO M85-11

Lot # / Ship: #000062518 MV Indigo Lake

| <u>Chemical Composition:</u> | <u>Results:</u> | <u>Type I Requirements</u> | <u>Type II Requirements</u> |
|--|-----------------|----------------------------|-----------------------------|
| Silicon Dioxide (SiO ₂): | 20.3% | --- | --- |
| Aluminum Oxide (Al ₂ O ₃): %Max | 4.7% | --- | 6.0% |
| Ferric Oxide (Fe ₂ O ₃):% Max | 3.2% | --- | 6.0% |
| Calcium Oxide (CaO): | 62.0% | --- | -- |
| Magnesium Oxide (MgO): % Max | 3.9% | 6.0% | 6.0% |
| Sulfur Trioxide (SO ₃): | 2.9% | 3.0% | 3.0% |
| Loss On Ignition% Max: | 1.8% | 3.0% | 3.0% |
| Insoluble Residue:% Max | 0.40% | 0.75% | 0.75% |
| Tricalcium Silicate (C ₃ S): | 51 | -- | -- |
| Dicalcium Silicate (C ₂ S): | 19 | -- | -- |
| Tricalcium Aluminate (C ₃ A):% Max | 7.0% | -- | -- |
| Tetracalcium Aluminoferrite (C ₄ AF): | 23.00% | -- | -- |
| Total Alkali as NaEq:% Max | 0.58% | 0.60% | 0.60% |
| Limestone, 5 % max | 2.5% | 5.0% | 5.0% |
| CaCO ₃ in Limestone, 70% min | 86% | 70% | 70% |

Physical Properties:

| | | | |
|-----------------------------------|-------|--------|--------|
| Blaine (min m ² /kg.): | 387 | 260 | 260 |
| Vicat, Initial Set (mins.): | 100 | -- | -- |
| Vicat, Final Set (mins.): | 245 | 45-375 | 45-375 |
| Autoclave Expansion:% Max | 0.00% | 0.80% | 0.80% |
| False Set: | 85% | -- | -- |
| Air Content (% Max by vol.): | 9.00% | 12.00% | 12.00% |

Mortar Cube Breaks:

| | | | |
|-----------------------------|------|----------|----------|
| Compressive Strength (PSI): | | | |
| 1 Day | 1880 | -- | -- |
| 3 Days | 3610 | 1740 min | 1450 min |
| 7 Days | 4870 | 2760 min | 2470 min |

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

Type I/II

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Terminals in
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