

# LEHIGH

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### CEMENT TEST REPORT

**Cement:** ASTM C150-04a, ASTM C150-09, Type II/V, Low Alkali

**Date Shipped:** May 2010

**Report Date:** 6/14/2010

**Destination:** Lot 2010-05

STANDARD CHEMICAL REQUIREMENTS ASTM C 114	TEST RESULTS	ASTM C 150 SPECIFICATIONS	
		TYPE II	TYPE V
Silicon Dioxide (SiO <sub>2</sub> ), %	20.4	20.0 Min	----
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ), %	4.7	6.0 Max	----
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ), %	4.5	6.0 Max	----
Calcium Oxide (CaO), %	63.8	----	----
Magnesium Oxide (MgO), %	1.1	6.0 Max	6.0 Max
Sulfur Trioxide (SO <sub>3</sub> ), %	2.8	3.0 Max	2.3 Max *
Loss on Ignition (LOI), %	1.6	3.0 Max	3.0 Max
Insoluble Residue, %	0.56	0.75 Max	0.75 Max
CO <sub>2</sub> (%)	1.20	N/A	N/A
CaCO <sub>3</sub> in limestone (%)	91	70 Min	70 Min
Limestone (%)	2.9	5 Max	5 Max
Total Alkalies (Na <sub>2</sub> O equivalent), %	0.52	0.60 Max	0.60 Max
Tricalcium Silicate (C <sub>3</sub> S), % <sup>a</sup>	56	----	----
Dicalcium Silicate (C <sub>2</sub> S), % <sup>a</sup>	14	----	----
Tricalcium Aluminate (C <sub>3</sub> A), % <sup>a</sup>	5	8 Max	5 Max
Tetracalcium Aluminoferrite (C <sub>4</sub> AF), % <sup>a</sup>	13	----	----
Heat of Hydration (cal/g)	78	----	----
C <sub>3</sub> S + 4.75*C <sub>3</sub> A	79	100	----
2 (C <sub>3</sub> A) + C <sub>4</sub> AF	23	----	25 Max

PHYSICAL REQUIREMENTS			
(ASTM C 1038) Expansion @ 14 days, %	0.015	0.020 Max	0.020 Max
(ASTM C 204) Blaine Fineness, m <sup>2</sup> /gm	372	280 Min	280 Min
(ASTM C 430) -325 Mesh, %	97.5	----	----
(ASTM C 191) Time of Setting - Initial (Vicat)	89	45 Min	45 Min
(ASTM C 191) Time of Setting - Final (Vicat)	165	375 Max	375 Max
(ASTM C 451) False Set, %	91	50 Min	50 Min
(ASTM C 185) Air Content, %	6.9	12 Max	12 Max
(ASTM C 151) Autoclave Expansion, %	0.03	0.80 Max	0.80 Max
(ASTM C 187) Normal Consistency, %	27.1	----	----
(ASTM C 109) Compressive Strength, psi (MPa)			
1 Day	2560 (17.6)	----	----
3 Day	4230 (29.1)	1500 (10.3) Min	1160 (8.0) Min
7 Day	5120 (35.3)	2500 (17.2) Min	2180 (15.0) Min
28 Day (Previous Month)	6330 (43.6)	----	3050 (21.0) Min

This cement meets the requirements of specification: ASTM C150-04a Type II/V, Low Alkali



<sup>a</sup> Adjusted per ASTM C150-09 Section A 1.6  
 ASTM 1157 Portland Cement Type HS  
 Caltrans Section 90 - Type II/V Modified  
 \* See ASTM 1038 result

Steve Cooley - Quality Control Manager