

# LEHIGH

## HEIDELBERGCEMENT Group

**TECHNICAL SERVICES**  
**SALES & MARKETING**  
 12667 Alcosta Blvd, Suite 400  
 San Ramon, CA 94583  
 Telephone (925) 244-6562  
 FAX (925) 244-6586

**PLANT LOCATION**  
 15390 Wonderland I  
 Redding, CA 96003  
 Telephone (530) 275-1581  
 FAX (530) 275-2525

### CEMENT TEST REPORT

**Cement:** AASHTO M85 Type I, Low Alkali  
 ASTM C150-09 Type I-II, Low Alkali

**Report Date:** 8/12/2010

**Date Shipped:** July 2010

**Lot #1187**

STANDARD CHEMICAL REQUIREMENTS ASTM C 114	TEST RESULTS	ASTM C 150		AASHTO
		TYPE I	TYPE II	TYPE I
Silicon Dioxide (SiO <sub>2</sub> ), %	21.2	----	20.0 Min	----
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ), %	4.2	----	6.0 Max	----
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ), %	4.0	----	6.0 Max	----
Calcium Oxide (CaO), %	65.1	----	----	----
Magnesium Oxide (MgO), %	1.3	6.0 Max	6.0 Max	6.0 Max
Sulfur Trioxide (SO <sub>3</sub> ), %	2.6	3.0 Max	3.0 Max	3.0 Max
Loss on Ignition (LOI), %	1.2	3.0 Max	3.0 Max	3.0 Max
Insoluble Residue, %	0.29	0.75 Max	0.75 Max	0.75 Max
Alkalies (Na <sub>2</sub> O equivalent), %	0.24	0.60 Max	0.60 Max	0.60 Max
Tricalcium Silicate (C <sub>3</sub> S), % <sup>a</sup>	63	----	----	----
Dicalcium Silicate (C <sub>2</sub> S), % <sup>a</sup>	13	----	----	----
Tricalcium Aluminate (C <sub>3</sub> A), % <sup>a</sup>	4	----	8 Max	----
Tetracalcium Aluminoferrite (C <sub>4</sub> AF), % <sup>a</sup>	12	----	----	----
C <sub>3</sub> S + 4.75*C <sub>3</sub> A, %	83	----	100 Max	----
2 (C <sub>3</sub> A) + C <sub>4</sub> AF, %	21	----	25 Max	----
<b>PHYSICAL REQUIREMENTS</b>				
(ASTM C 1038) Expansion @ 14 days, %	0.010	0.020 Max	0.020 Max	0.020 Max
(ASTM C 204) Blaine Fineness, m <sup>2</sup> /kg	402	280 Min	280 Min	400 Max
(ASTM C 430) -325 Mesh, %	96.4	----	----	----
(ASTM C 114) Limestone, %	0.0	5 Max	5 Max	----
(ASTM C 191) Time of Setting - Initial (Vicat)	96	45 Min	45 Min	45 Min
(ASTM C 191) Time of Setting - Final (Vicat)	205	375 Max	375 Max	375 Max
(ASTM C 451) False Set, %	85	50 Min	50 Min	50 Min
(ASTM C 185) Air Content, %	7.0	12 Max	12 Max	12 Max
(ASTM C 151) Autoclave Expansion, %	0.00	0.80 Max	0.80 Max	0.80 Max
(ASTM C 187) Normal Consistency, %	25.9	----	----	----
(ASTM C 109) Compressive Strength, psi (MPa)				
1 Day	2212 (15.2)	----	----	----
3 Day	3915 (27)	1800 (12.4) Min	1500 (10.3) Min	1800 (12.4) Min
7 Day	5023 (34.6)	2800 (19.3) Min	2500 (17.2) Min	2800 (19.3) Min
28 Day (Previous Month)	6713 (46.3)	----	----	----

This cement meets the requirements of specification:

*Albert J. Cornibe, Jr.*

Albert J. Cornibe  
 Quality Manager

ASTM C150-09 Type I-II, Low Alkali  
 AASHTO M85 - Type I  
 ASTM C 1157 Portland Cement Type HS  
<sup>a</sup> per ASTM C-150-09 Section A1.6