

LEHIGH

HEIDELBERGCEMENT Group

TECHNICAL SERVICES
SALES & MARKETING
 12667 Alcosta Blvd., Suite 400
 San Ramon, CA 94583
 Telephone (925) 244 6500
 FAX (925) 244 6586

PLANT LOCATION
 5402 W. Buchanan
 Phoenix, AZ 85043
 Telephone (602) 442-5216
 FAX (602) 442-2124

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 ₂), %	20.4	20.0 Min	----
Aluminum Oxide (Al ₂ O ₃), %	4.7	6.0 Max	----
Ferric Oxide (Fe ₂ O ₃), %	4.5	6.0 Max	----
Calcium Oxide (CaO), %	63.9	----	----
Magnesium Oxide (MgO), %	1.1	6.0 Max	6.0 Max
Sulfur Trioxide (SO ₃), %	2.8	3.0 Max	2.3 Max *
Loss on Ignition (LOI), %	1.8	3.0 Max	3.0 Max
Insoluble Residue, %	0.63	0.75 Max	0.75 Max
CO ₂ (%)	1.21	N/A	N/A
CaCO ₃ in limestone (%)	94	70 Min	70 Min
Limestone (%)	2.9	5 Max	5 Max
Total Alkalies (Na ₂ O equivalent), %	0.52	0.60 Max	0.60 Max
Tricalcium Silicate (C ₃ S), % ^a	58	----	----
Dicalcium Silicate (C ₂ S), % ^a	13	----	----
Tricalcium Aluminate (C ₃ A), % ^a	5	8 Max	5 Max
Tetracalcium Aluminoferrite (C ₄ AF), % ^a	13	----	----
Heat of Hydration (cal/g)	78	----	----
C3S + 4.75*C3A	80	100	----
2 (C ₃ A) + C ₄ 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 ² /gm	378	280 Min	280 Min
(ASTM C 430) -325 Mesh, %	99.1	----	----
(ASTM C 191) Time of Setting - Initial (Vicat)	91	45 Min	45 Min
(ASTM C 191) Time of Setting - Final (Vicat)	168	375 Max	375 Max
(ASTM C 451) False Set, %	97	50 Min	50 Min
(ASTM C 185) Air Content, %	7.0	12 Max	12 Max
(ASTM C 151) Autoclave Expansion, %	0.012	0.80 Max	0.80 Max
(ASTM C 187) Normal Consistency, %	27.7	----	----
(ASTM C 109) Compressive Strength, psi (MPa)			
1 Day	2590 (17.8)	----	----
3 Day	4430 (30.5)	1500 (10.3) Min	1160 (8.0) Min
7 Day	5290 (36.4)	2500 (17.2) Min	2180 (15.0) Min
28 Day (Previous Month)	6430 (44.3)	----	3050 (21.0) Min

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

ASTM C-1157 Portland Cement HS

^a Adjusted per ASTM C-150-09 Section A1.6
 Caltrans Section 90 - Type II/V Modified

* See ASTM 1038 result



Steve Cooley - Quality Control Manager