

LEHIGH

HEIDELBERGCEMENT Group

TECHNICAL SERVICES SALES & MARKETING

12667 Alcosta Blvd., Suite 400
 San Ramon, CA 94583
 Telephone (925) 244 6500
 FAX (925) 244 6586

PERMANENTE PLANT

24001 Stevens Creek Blvd.
 Cupertino, CA 95014-5659
 Telephone (408) 996-4033
 FAX (408) 996-4033

CEMENT TEST REPORT

Cement: Permanente Pronto Type II-V

Production Period: July 2010

Report Date: 8/12/2010

Standard Chemical Requirements ASTM C114	TEST RESULTS
Silicon Dioxide (SiO ₂), %	21.7
Aluminum Oxide (Al ₂ O ₃), %	3.8
Ferric Oxide (Fe ₂ O ₃), %	3.8
Calcium Oxide (CaO), %	65.3
Magnesium Oxide (MgO), %	1.3
Sulfur Trioxide (SO ₃), %	3.1
Loss on Ignition (LOI), %	0.8
Insoluble Residue, %	0.4
Alkalies (Na ₂ O equivalent), %	0.26
Tricalcium Silicate (C ₃ S), % ^a	60
Dicalcium Silicate (C ₂ S), % ^a	16
Tricalcium Aluminate (C ₃ A), % ^a	4
Tetracalcium Aluminoferrite (C ₄ AF), % ^a	11
2 (C ₃ A) + C ₄ AF, %	18
PHYSICAL REQUIREMENTS	
(ASTM C 1038) Expansion @ 14 days, %	0.007
(ASTM C 452) Expansion @ 14 days, %	0.032
(ASTM C 204) Blaine Fineness, m ² /gm	515
(ASTM C 430) -325 Mesh, %	99.9
(ASTM C114) Limestone, % (max)	2.5
(ASTM C 191) Time of Setting - Initial (Vicat)	83
(ASTM C 191) Time of Setting - Final (Vicat)	190
(ASTM C 451) False Set, %	89
(ASTM C 185) Air Content, %	8.4
(ASTM C 151) Autoclave Expansion, %	-0.021
(ASTM C 187) Normal Consistency, %	29.0
(ASTM C 109) Compressive Strength, psi (MPa)	
1 Day	2931
3 Day	4478
7 Day	5579
28 Day (previous month)	8380

This cement meets the requirements of specification:



Alan Sabawi, Quality Control Manager

ASTM C150-09 Type II-V, Low Alkali

^a Adjusted per ASTM C-150-09 Section A1.6

Federal Specification SS-C190/3 for Type II-V low alkali Portland Cement

Caltrans Section 90-2.01 for Type III Portland cement

ASTM C 1157 Portland Cement Type HE (MS)