



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory, Established 1904

Project No.: 38149-1
Laboratory No.: L08-3168

November 19, 2008

Kurt Siggard, Executive Director
Concrete Masonry Association of California and Nevada
6060 Sunrise Vista Drive, Suite 1990
Citrus Heights, CA 95610

RE: Testing for Analysis of Initial Mortar Bed Joint Thickness

Dear Mr. Siggard:

At your request, a series of compression tests were conducted on constructed hollow-block prism samples noted in the submitted test protocol dated July 14, 2008 by the Mansory Institute of America (MIA) and Concrete Mansory Association of California and Nevada (CMACN). The attached Report Number L-08-3168 presents the description of the testing performed, results, and our findings.

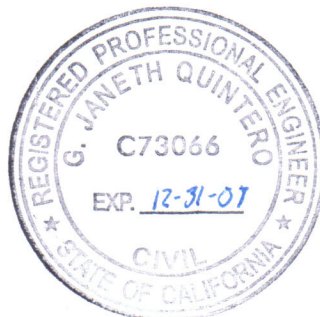
We appreciate this opportunity to be of service to you. If you have any questions regarding this report, please do not hesitate to contact us at your earliest convenience.

Respectfully submitted,
SMITH EMERY LABORATORIES, INC.

Review and approved by,

G. Janeth Quintero
Registered Civil Engineer No. C73066
Registration Expires 12-31-08
Staff Engineer

V. Andrew Tan, P.E.
Director of Laboratories



Attachment: Report No. L-08-3168



SMITH EMERY LABORATORIES

791 E. WASHINGTON BLVD. • LOS ANGELES, CA 90021
PHONE (213) 749-3411 • FAX (213) 741-8626

SUBJECT REPORT:

**TESTING FOR ANALYSIS OF INITIAL MORTAR BED
JOINT THICKNESS**

PREPARED FOR:

**CONCRETE MASONRY ASSOCIATION OF CALIFORNIA AND
NEVADA (CMACN)**
6060 SUNRISE VISTA DRIVE, SUITE 1990
CITRUS HEIGHTS, CA 95610

Date: November 19, 2008

Project No.: 38149-1

Report No.: L-08-3168



TABLE OF CONTENTS

1.00 INTRODUCTION 1

1.01 PURPOSE 1

1.02 SCOPE OF TESTING 1

1.03 PRODUCT DESCRIPTION..... 1

1.04 TEST SET-UP..... 4

1.06 LOADING PROCEDURE 4

2.00 RESULTS AND OBSERVATIONS 5

3.00 FINDINGS AND CLOSURE 6

3.01 FINDINGS 6

3.02 CLOSURE 6

Appendix A – Concrete Block Testing

Appendix B – Concrete Mix Design and Material Information

Appendix C – Construction and Test Set Up Pictures

Appendix D – Compression Test Pictures



1.00 INTRODUCTION

1.01 PURPOSE

The purpose of the testing was to evaluate the compressive strength of the initial bed mortar joint in masonry at various thicknesses.

1.02 SCOPE OF TESTING

Our general scope of this testing program included the following:

- Material purchase and fabrication of 18 concrete pads, 12 in x 12 in x 3 in with a minimum compressive strength of 5,000 psi.
- Mixing of mortar type "S"
- Construct hollow prism specimens with mortar joint thicknesses of $\frac{3}{4}$ in, 1 in, $1\frac{1}{2}$ in, 2 in, $2\frac{1}{2}$ in, and 3 in; three specimen of each mortar thickness.
- Cap each concrete masonry unit and hollow prism specimen as per *ASTM C1552, Standard Practice for Capping Concrete Masonry Units, related Units and Mansory Prisms for Compression testing*
- Perform compression tests on the constructed prism samples noted in the submitted test protocol in general accordance with *ASTM C140, Standard Practice for Sampling and testing Concrete Masonry Units and Related Units*
- Perform compression tests on three concrete masonry unit specimens from the same lot of units used to construct the prism specimens per *ASTM C140, Standard Practice for Sampling and testing Concrete Masonry Units and Related Units*.
- Perform compression tests on mortar specimens sampled from the same batch of mortar used to construct the specimens per *ASTM C109, Compressive Strength of Hydraulic Cement Mortars (using 2-in cube specimens)*
- Preparation of this report detailing the results, observation, any findings and conclusion.

1.03 PRODUCT DESCRIPTION

1.03.1 MANSORY BLOCKS: Consisted of 8x8x8 hollow load bearing masonry units supplied by Angelus Block Co. Inc. The CMU units had a sash in one web. Three concrete masonry units from the same lot of units used to construct the test specimens were tested for compression in accordance with *ASTM C140*. Results of Compression are attached in this report in Appendix A.



1.03.2 CONCRETE PADS: A total of 18 concrete slabs were cast and the dimensions were approximately 12 square inches and 3 inches deep.

The concrete mix design used as specified was a 5,000 PSI, one-inch maximum aggregate mix, with standard water reducing admixture. Concrete cylindrical samples were made during the pads pour to determine representative compressive strength at the time of the prism specimen's compression tests; the concrete compression test results are shown in Table No 1. The mix design is also included in Appendix B.

All concrete pads were poured on September 23, 2008. Forms were stripped 3 days after the pour.

TABLE NO. 1 - CONCRETE CYLINDERS COMPRESSION TEST RESULTS

Age of Sample	Load (lbs)	Compressive Strength (psi)
28 days	177,350	6,270
28 days	180,500	6,380
28 days	175,000	6,190
Average Compressive strength:		6,280

1.03.3 PRISM TEST SPECIMENS: All tests specimens were constructed by Smith-Emery's masonry contractor after 7 days of the concrete pad pour. Each CMU unit was capped before laid with high strength gypsum cement as outlined in *ASTM C155*. One block was laid on a concrete pad (simulating a concrete footing) for six various mortar thicknesses as shown in Table. 2 .The specimens were constructed in plastic bags and were not disturbed for 28 days. Refer to constructions pictures in Appendix C.

Mortar used was Type S using proportions as shown in Table No.3 per submitted test protocol dated July 14, 2008 by the Masonry Institute of America (MIA) and Concrete Masonry Association of California and Nevada (CMACN). The certificates for Portland cement, Type S hydrated Lime, and washed plaster sand are attached in Appendix B. The identification for each specimen is also noted in Table No.2, and the typical test specimen is shown in Figure No.1. Mortar cubes (2" x 2") were taken from the same batch of mortar used to construct the specimens to determine representative compressive strength of the mortar at the time of the prism compression tests; the cube compression test results are shown in Table No 4.

**TABLE NO. 2 - PRISM SPECIMEN IDENTIFICATION**

Sample ID	Mortar Thickness (in)	Sample ID	Mortar Thickness (in)
1- 3/4"	3/4	10-2"	2
2-3/4"	3/4	11-2"	2
3-3/4"	3/4	12-2"	2
4-1"	1	13-2 1/2"	2-1/2
5-1"	1	14-2 1/2"	2-1/2
6-1"	1	15-2 1/2"	2-1/2
7-1 1/2"	1-1/2	16-3"	3
8-1 1/2"	1-1/2	17-3"	3
9-1 1/2"	1-1/2	18-3"	3

TABLE NO. 3 - MORTAR TYPE S PROPORTIONS

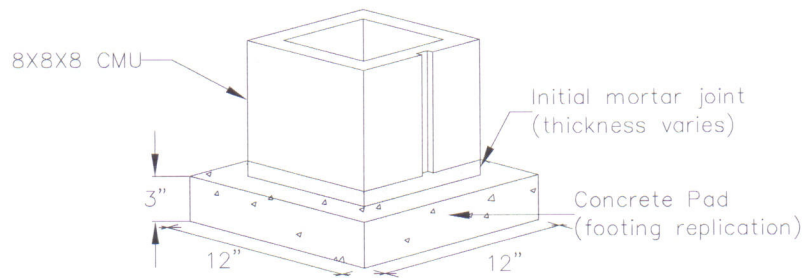
Material	Qty (by Volume)
Type II/V Portland Cement	1.00
Type S Hydated Lime	0.50
Washed Plaster Sand	4.00

TABLE NO. 4 - MORTAR CUBES COMPRESSION TEST (ASTM C 109)

Age of Sample	Load (lbs)	Compressive Strength (psi)
7 days	9,260	2,320
7 days	9,410	2,350
7 days	8,810	2,200
Average Compressive strength:		2,290
28 days	13,310	3,330
28 days	12,320	3,080
28 days	12,930	3,230
Average Compressive strength:		3,213



FIGURE NO. 1 - PRISM TEST SPECIMEN



1.04 PRISM TEST SET-UP

1.04.1 Compression Load Test

Each specimen was placed in Smith-emery's Baldwin testing machine (serial number P16-04011914) with 1.2 million pound capacity and was subjected to vertical compression load tests in accordance with *ASTM C140, Standard Practice for Sampling and testing Concrete Masonry Units and Related Units*. Refer to test set-up picture on Appendix C.

1.06 Loading Procedure

For all tests, the specimen was subjected to a compression load to failure, defined when no more load can be sustained by the specimen. The loading rate was controlled so the failure would occur in not less than 1 nor more than 2 minutes after the application of the 50% of the expected maximum load.

**2.00 RESULTS AND OBSERVATIONS**

The prism test results are summarized in Table 5 below. The average gross and net areas used to calculate the prism compressive strength were obtained from the compression test specimen blocks from the same lot of units used to construct the prism test specimens .

TABLE 5 – SUMMARY OF PRISM COMPRESSION TEST RESULTSAverage Gross Area = 58.45 In²Average Net Area = 33.48 Sq. In²

Test ID	Maximum Load (lb)	Compressive Strength (psi)		Observation
		Gross Area (lb.)	Net Area (lb.)	
1-3/4"	97,100	1,661	2,900	The blocks crushed. The bed joints developed shallow vertical cracks that continued to the concrete pad.
2-3/4"	102,550	1,754	3,063	
3-3/4"	88,150	1,508	2,633	
4-1"	89,100	1,524	2,661	The blocks crushed. The bed joints developed vertical cracks that continued to the concrete pad. Some cracks were between the bottom of the block and top of the bed joint. Concrete pad on sample No. 6 failed by compression.
5-1"	106,050	1,814	3,168	
6-1"	98,350	1,683	2,938	
7-1- 1/2"	88,100	1,507	2,631	Deep cracks on blocks with some spalling. The bed joints developed vertical cracks that continued to the concrete pad; also the mortar had some spalling.
8-1- 1/2"	75,300	1,288	2,249	
9-1- 1/2"	97,900	1,675	2,924	
10-2"	89,950	1,538	2,687	Block from sample No. 10 crushed, the other blocks developed cracks that continued to the bed joint. Only Sample No. 11 had some shallow cracks on the concrete pad.
11-2"	82,800	1,416	2,473	
12-2"	77,550	1,327	2,316	
13-2- 1/2"	87,350	1,494	2,609	Cracks on blocks continued to the bed joint and to the concrete pad. The mortar from the bed joint spalled at some corners.
14-2- 1/2"	77,550	1,327	2,316	
15-2- 1/2"	79,000	1,352	2,360	
16-3"	76,100	1,301	2,273	Cracks on blocks continued to the bed joint and to the concrete pad. The mortar from the bed joint spalled at some corners.
17-3"	83,150	1,422	2,484	
18-3"	47,450	812	1,417	

For clarification of locations and types of failures, refer to the pictures in Appendix D



3.00 FINDINGS AND CLOSURE

3.01 Findings

Based on the information given prior to and during the time of the testing, and results presented in this report, we make no statement of compliance or noncompliance to any standard or specification for the products tested.

3.02 Closure

Any findings noted in this report were prepared in accordance with generally accepted material engineering and testing principles and practices. No other warranty, either expressed or implied, is made. This report has been prepared for **Concrete Masonry Association of California and Nevada** to be used for investigation and/or design purposes only. The use of this report for any other purpose shall be at the users' own discretion, based on their own interpretation of the results contained within.



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory

781 E. Washington Boulevard - 2nd Floor Los Angeles, California 90021 ♦ (213) 745-5333 ♦ Fax (213) 749-7232

Project No.: 38149-1
Lab No.: L-08-3168

APPENDIX A

COMPRESSION TESTS ON CONCRETE MASONRY BLOCKS



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory

781 E. Washington Boulevard - 2nd Floor Los Angeles, California 90021 ♦ (213) 745-5333 ♦ Fax (213) 749-7232

Project No. 38149-1
Lab. No.: L08-3168

November 19, 2008

CLIENT Concrete Masonry Association of California and Nevada
6060 Sunrise Vista Drive, Suite 1990
Citrus Heights, CA 95610

SUBJECT: Testing of Concrete Masonry Units
SPEC.: ASTM C140
SOURCE: Submitted to Smith-Emery Laboratories by Client.

TEST RESULTS

COMPRESSIVE STRENGTH TESTS (ASTM C 140-03)

Sample Number	Actual Size Inches			Gross Area Sq. In.	Net Area Sq. In.	Maximum Load Pounds	Gross Area Compressive Strength, PSI	Net Area Compressive Strength, PSI		
	W	H	L							
1	7.65	x	7.62	x	7.65	58.52	33.83	140,500	2,400	4,150
2	7.65	x	7.63	x	7.64	58.45	33.50	142,300	2,430	4,250
3	7.63	x	7.60	x	7.65	58.37	33.12	137,950	2,360	4,160
Average	7.64	x	7.62	x	7.65	58.45	33.48	140,250	2,400	4,190

NET VOLUME CALCULATION (ASTM C 140-03)

Sample Number	Received Weight, lb W_R	Immersed Weight (lb) W_I	Saturated Weight (lb) W_S	$(W_S - W_I)$	Net Volume (ft ³) V_n
4	18.35	10.05	19.36	9.31	0.1492
5	18.32	10.07	19.30	9.23	0.1479
6	17.93	9.78	18.87	9.09	0.1457
Average	18.20	9.97	19.18	9.21	0.1476

Proj./Job No.: 38149-1
Lab. No.: L-08-2898

Manufacturer: MASONRY INSTITUTE OF AMERICA

Report of Test

A. Compression Units

	Unit # 1	Unit # 2	Unit # 3
Received Weights (W_R), lb.	<u>18.38</u>	<u>18.34</u>	<u>18.02</u>
Max. Compressive Load (P_{MAX}), lb.	<u>140500</u>	<u>142300</u>	<u>137950</u>

Date Received: 10-06-08

Date Tested: 10-23-08

B. Absorption Units

Nominal Width: Length As received		Weight Class			(LW, MW, NW)
		Unit # 4	Unit # 5	Unit # 6	
Width (W), in.	@ Top	<u>7.65</u>	<u>7.64</u>	<u>7.66</u>	8x8x8 CMU
	@ Bottom	<u>7.65</u>	<u>7.62</u>	<u>7.62</u>	
Height (H), in.	@ Face 1	<u>7.66</u>	<u>7.61</u>	<u>7.64</u>	
	@ Face 2	<u>7.65</u>	<u>7.62</u>	<u>7.64</u>	
Length (L), in.	@ Face 1	<u>7.67</u>	<u>7.64</u>	<u>7.64</u>	
	@ Face 2	<u>7.65</u>	<u>7.64</u>	<u>7.65</u>	

Faceshell Thickness (FST), in.

@ Face 1

@ Face 2

Web Thickness (WT), in.

@ Web 1

@ Web 2

@ Web 3

@ Web 4

Received Weight (W_R), lb.	<u>18.35</u>	<u>18.32</u>	<u>17.93</u>
Immersed Weight (W_I), lb.	<u>10.05</u>	<u>10.07</u>	<u>9.78</u>
Saturated Weight (W_S), lb.	<u>19.36</u>	<u>19.30</u>	<u>18.87</u>
Final Oven-Dry Weight (W_D), lb.	<u>-</u>	<u>-</u>	<u>-</u>

COMPRESSION TEST
ONLY

Immediate Drying Weights (first reading after at least 24 hours drying, successive readings at 2 hours interval)

1st	<u> </u>	<u> </u>	<u> </u>
2nd	<u> </u>	<u> </u>	<u> </u>
3rd	<u> </u>	<u> </u>	<u> </u>



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory, Established 1904

781 East Washington Boulevard • Los Angeles, California 90021 • Tel. (213) 749-3411 • Fax (213) 741-8636

ASTM C 140-99 : Sampling and Testing Concrete Masonry Units

Proj./Job No.: 3849-1
Lab. No.: L-08-2898

Date Received: 10-06-08
Date Tested: 10-23-08

Client: MASONRY INSTITUTE OF AMERICA

Equipment Used: BALDWIN: S/N - PIC-0112211

Project: 8x8x8 CMU
Subject: Testing Concrete Masonry Units and Related Units
Standard: ASTM C 140-99b
Source: Submitted to Laboratory by Client

COMPRESSION TEST

Report of Test

A. Thickness of Face Shells and Webs

Sample Number	Face Shell Thickness, In.		Web Thickness, In.			Web Thickness In. per Linear Ft.
	Face	Opposite Face	End	Center	End	
1						
2						
3						
Average						

B. Compressive Strength Test

Sample Number	Actual Size, In.			Area, Sq. In.		Max. Load	Compressive Strength, PSI	
	Width	Height	Length	Gross	Net	Pounds	Gross Area	Net Area
1	7.65	7.62	7.65	58.52	33.83	140500	2400	4150
2	7.65	7.63	7.64	58.45	33.50	142300	2430	4250
3	7.63	7.60	7.65	58.37	33.12	137950	2360	4170
Average				58.45	33.48	140250	2400	4190

C. Absorption and Moisture Content Test

Sample Number	Moisture Content As Received, %	Absorption, PCF	Unit Weight PCF	Dry Weight Lbs	Remarks
4					
5					
6					
Average					

D. Absorption Test after 24 hours Immersion

Sample No.	As Received, Lbs.	Wet, Lbs.	Suspended, Lbs.	Oven Dry, Lbs.
4	18.35	19.36	10.05	
5	18.32	19.30	10.07	
6	17.93	18.87	9.78	
Average				

E. Calculation

19.36	19.30	18.87	NET VOLUME (FT ³)	
10.05	10.07	9.78	0.1492	0.1479
9.31	9.23	9.09	0.1457	0.1476

Tested by: [Signature]
Date: 10-23-08



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory

781 E. Washington Boulevard - 2nd Floor Los Angeles, California 90021 ♦ (213) 745-5333 ♦ Fax (213) 749-7232

Project No.: 38149-1

Lab No.: L-08-3168

APPENDIX B

MIX DESIGN AND MATERIAL INFORMATION

STANDARD CONCRETE PRODUCTS, INC.

IRWINDALE, VERNON & SUN VALLEY

Mix No. 1185

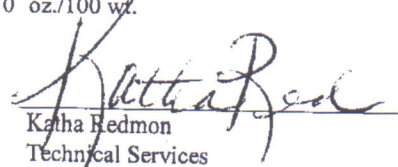
Date: 09/23/2008

Project Name:	In-House Testing	Mix No.:	1185
Project Address:	781 E. Washington Blvd. Los Angeles	Spec:	5,500 psi @ 28 days
General Contractor:		Agg Size:	1"
Sub Contractor:	Smith-Emery Laboratories	Slump:	4.0" +/- 1.0"
Description:	8.0 Admix Control 1" For: Test Concrete	Cement Type:	II / V
		W/C Ratio:	0.40

		Weight per Cubic Yard (S.S.D.)		Absolute Volume	
	Cement	752 lbs		3.83	C.F.
Aggregate Ratios:	Fly Ash	0 lbs		0.00	C.F.
0 %	1.5" Rock	0 lbs		0.00	C.F.
48 %	1 Rock	1426 lbs		8.62	C.F.
10 %	3/8" Rock	296 lbs	17.96	1.80	C.F.
42 %	#1 Sand	1233 lbs		7.54	C.F.
0 %	#2 Sand	0 lbs		0.00	C.F.
Admixtures:					
	1. WRDA-64	30.1 fl.oz.			
1.5 % Air	2. Entrapped	0.0 fl.oz.		0.41	C.F.
	Slump:	4.0"			
Allowable Water:	36 Gallons	299.88 lbs		4.81	C.F.
Total:		4007 lbs		27.00	C.F.
Unit Weight:		148.4 pcf			

Material	Source	Sp.Gr.	Sp.Wt.
Cement	Portland Type II / V	3.15	196.56
Fly Ash	Type F	2.33	145.39
1.5"	Hanson Aggregates, Irwindale	2.66	165.98
1"	Hanson Aggregates, Irwindale	2.65	165.36
3/8"	Hanson Aggregates, Irwindale	2.64	164.74
Sand	Hanson Aggregates, Irwindale	2.62	163.49
Sand	Peck Road Sand & Gravel	2.62	163.49
WRDA-64	W. R. Grace Company	4 oz./100 wt.	
Daravair	W. R. Grace Company	0 oz./100 wt.	

Approved By: _____


 Katha Redmon
 Technical Services



TEMP: 880 For MONSIEUR Y & UNITS M U N A Testing SLABS!
STANDARD CONCRETE PRODUCTS, INC
Serving Southern California Since 1949

CUSTOMER SERVICE CENTER
1-(800)-CONCRETE

41 Irwindale Plant
13550 Live Oak St.
Irwindale, CA 91706
42 Santa Monica Plant
1620 19th St.
Santa Monica, CA 90404
43 Vernon Plant
2822 S. Soto St.
Vernon, CA 90058
44 Sun Valley Plant
11462 Penrose St.
Sun Valley, CA 91352

45 Long Beach Plant
2521 E. Artesia Blvd.
Long Beach, CA 90805
49 Palos Verdes Plant
26311 Palos Verdes Dr. E.
Rolling Hills Estates, CA 90274
54 Westminster Plant
7591 Hazard St.
Westminster, CA 92683
55 Santa Ana Plant
2130 S. Grand Ave.
Santa Ana, CA 92705

PLANT #
43
TICKET #
43088521

DATE 23-Sep-08	ORDER NO. 65	CUSTOMER NO. 7108	CUSTOMER NAME SMITH EMERY LABORATORIES	PAYMENT FORM SMIT	PROJECT #
PROJECT ADDRESS 781 E WASHINGTON BLVD				MAP PAGE 634	ZONE 19634
SPECIAL INSTRUCTIONS / TYPE OF POUR / ORDERED BY 634*-E7 TEST POUR T/G JANET213-745-5333 EXT 351				CUSTOMER JOB #	
				PO. #	
MIX DESIGN # 1105	DESCRIPTION 8.0 SACK ADMIX 1"		MAX SIZE AGG. 1"	PSI/MPa 5500	SLUMP/PENETRATION 4.0"
				CEMENT TYPE II / V	

SEP 23 AM 8:24

COUNTER START
COUNTER ARRIVE
COUNTER UNLOAD

WEIGHMASTER CERTIFICATE: THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weighmaster, whose signature is on this certificate, who is a recognized authority of accuracy, as prescribed by Chapter 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agriculture.

PRIVATE WEIGHMASTER BY:

TIME LOADED	LEAVE PLANT	ARRIVE JOB	START POUR	END POUR	LEAVE JOB	ARRIVE PLANT
	835	850	915	1005		
TRUCK NO. 283	DRIVER LOYA, DANIEL	TIME DUE 08:59	ORDER SIZE 3.00	PREVIOUS TRUCK #	LOAD # 1	LOAD SIZE YD ³ / M ³ 3.00
				CUMULATIVE YD ³ / M ³ 3.00		

WATER ADDED ON SITE

3 Gals. To full load
Gals. to 2/3 load
Gals. to 1/3 load

NOTE: 1 gal. / 4.9 liters per YD³ / M³ will increase slump by 1" / 25.4 mm and reduce the 28 day strength by approximately 200 PSI / 1.4 MPa

Not responsible for color variations or surface discoloration in ANY concrete mix.

CAUTION: Portland cement is injurious to eyes, causes skin irritation. Read warning on reverse side of this form for detailed instructions.

WATER IN AGG.
PLANT WATER
ALLOWABLE JOB WATER
MAX ALLOWABLE WATER

AUTHORIZED BY:

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
3.00 1.00	3.00	3.00	1105 E	8.0 SACK ADMIX 1" ENV FEE R/M	CYDS EA		
MINLOAD							

MAX 4 MINUTES PER CUBIC YD³ / M³ UNLOADING TIME ALLOWED.
STANDING TIME WILL BE CALCULATED BASED ON SPACING REQUESTED.
ADDITIONAL UNLOADING TIME CHARGED AT CURRENT HOURLY TRUCK RATE.

LIABILITY WAIVER Standard Concrete Products will not assume liability of any property damage or any equipment damage for any deliveries beyond the curb line.

ACKNOWLEDGEMENT Signature acknowledges receipt of concrete, color (if applicable), water addition, hazardous warnings, and acceptance of all terms and conditions printed on the back of this document.

AUTHORIZED BY:

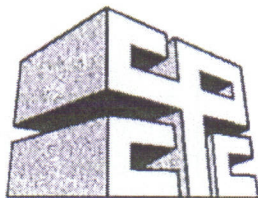
JOB ADDED MATERIAL ☒ YES ☒ NO ENVIROGUARD USED ☐ YES ☒ NO

COMMENTS:

SUBTOTAL
SALES TAX
BALANCE
STANDING TIME MINUTES
GRAND TOTAL

CONTROL # 2246936

INSPECTOR'S COPY



California Portland Cement Company

695 South Rancho Ave, Colton, California 92324 / Tel. (909) 430-2757 Fax (909) 430-2788

Manufacturer's Certificate

MILL TEST REPORT

Following are the average chemical and physical data for the period :

CHEMICAL REQUIREMENTS (ASTM C 114)	8/8/08	to	8/28/08	COLTON Type II/V
	ASTM C 150 SPECIFICATIONS	Type II Requirement	Type V Requirement	
Silicon Dioxide (SiO ₂), %	Not Applicable	---	---	21.4
Aluminum Oxide (Al ₂ O ₃), %	Maximum	6.0	---	3.5
Ferric Oxide (Fe ₂ O ₃), %	Maximum	6.0	---	3.5
Magnesium Oxide (MgO), %	Maximum	6.0	6.0	3.7
Sulfur Trioxide (SO ₃), % (Table 1: Note D)	Maximum	3.0	2.3	2.6
Loss on Ignition (LOI), %	Maximum	3.0	3.0	1.5
Insoluble Residue, %	Maximum	0.75	0.75	0.27
Equivalent Alkalies, % (For Informational Purposes)	Maximum	0.60	0.60	0.49
Tricalcium Silicate (C ₃ S), %	Not Applicable	---	---	55
Dicalcium Silicate (C ₂ S), %	Not Applicable	---	---	20
Tricalcium Aluminate (C ₃ A), %	Maximum	8	5 ^(1C)	3
Tetracalcium Aluminoferrite (C ₄ AF), %	Not Applicable	---	---	11
C ₄ AF + 2(C ₃ A)**	Maximum	---	25 ^(1C)	18
C ₃ S + 4.75(C ₃ A)**	Maximum	100	---	72
CO ₂ %	Not Applicable	---	---	0.65
Limestone %***	Maximum	5	5	1.8
CaCO ₃ in Limestone %***	Minimum	70	70	91
PHYSICAL REQUIREMENTS				
(ASTM C 185) Air Content of Mortar, %	Maximum	12	12	4
(ASTM C 191) Vicat, set time, min-max, minutes		45-375	45-375	115
(ASTM C 204) Blaine Fineness, min/max, m ² /kg		280/440 ^(3F)	280/440	424
Average Blaine Fineness (last 5 samples) m ² /kg	Maximum	420 ^(3F)	---	82
(ASTM C 186) Heat of Hydration, cal/g (For Informational Purposes)				
7 days		70.0	---	82.0
(ASTM C 151) Autoclave Expansion	Maximum	0.80	0.80	0.13
(ASTM C 109) Compressive Strength, psi (MPa)				
1 day		---	---	NA
3 day	Minimum	1450(10.0)	1160(8.0)	3640
7 day	Minimum	2470(17.0)	2180(15.0)	4560
28 day(includes previous data)	Minimum		3050(21.0)	6320
(ASTM C 451) False Set, final penetration, %	Minimum	50	50	71

Apparatus and methods used in this laboratory have been checked by the Cement and Concrete Reference Laboratory of the National Institute of Standards and Technology. A copy of the report detailing their findings is available upon request. Major oxides are analyzed by X-ray Fluorescence Spectrometry.

Applicable Notes Using ASTM C 150-07 Annexes and Tables 1, 3 and 4

Table 1: Note D It has been demonstrated by C 1038, this cement will not develop expansion in water exceeding 0.02% at 14 days.

Table 1: Note C Does not apply when the sulfate resistance limit in Table 4 is specified.

** As per Annex A1.

*** As per Annex A2.

Table 3: Note F Maximum average and maximum single sample fineness limits do not apply if the sum of C₃S + 4.75C₃A is less than or equal to 90.

We certify that Colton IIV Low Alkali Cement designated herein has been manufactured in accordance with and meets the standard requirements of the current ATSM C150-07 specification for Type IIV cement.

Jung Fan

J.W. Farr, Director of Quality Control

9/8/2008



Chemical Lime

A Lhoist Group Company

To David Adams
Company : E-Z Mix Inc.
3355 S Industrial Dr
Rialto, CA 92377

e-mail dadams@ezmixinc.com
From : Margaret Thomson, Ph.D.
Technical Manager – Type S Sales
Date : September 30, 2008
Cc Ray Tygenhof
Subject : Certification of Conformance Letter

Chemical Lime Company
8000 West Lake Mead Pkwy
BMI Complex
Henderson, Nevada 89015
Phone: (702) 565-3833 ext. 105
Fax: (702) 565-7473

Dear Valued Customer,

Chemstar Type S Hydrated Lime, manufactured by Chemical Lime Company at Grantsville, Utah conforms in every respect to the following specifications.

1. ASTM C206-03 (Type S) Standard Specification for Finishing Hydrated Lime.
2. ASTM C207-05 (Type S) Standard Specification for Hydrated Lime for Masonry Purposes.
3. UBC Standard No. 21-13-97: Hydrated Lime for Masonry Purposes.
4. IBC – 2000, 2003, 2006 by reference to ASTM C 270.
5. ASTM C926 Standard Specification for Application of Portland Cement-Based Plaster, by reference to C206 and C207.

This certification letter is valid for one year (September 30, 2009)

The LEED – NC rating system divided into five categories, which recognize sustainable building practices. LEED certification is for the project, not the material, however materials can contribute to the ability of the project to achieve the desired certification. The categories, which apply to the use Chemstar Type S Hydrated Lime in masonry mortar and therefore, masonry, are:

Sustainable Sites

SS Credit 3: Brownfield Redevelopment. Chemstar Type S hydrated lime may used if soil stabilization is required.

Materials & Resources

MR Credit 2.1. Construction Waste Management. Recycle and/or salvage at least 50% of non-hazardous contraction and demolition debris.

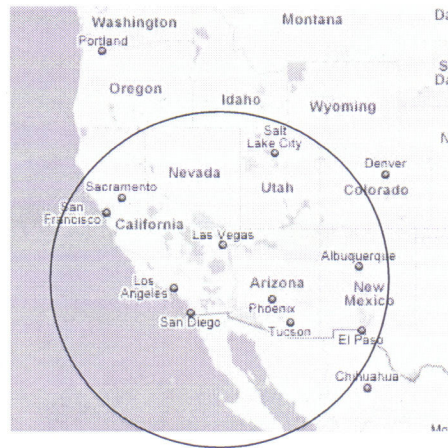
Chemstar Type S Hydrated Lime is bagged in a biodegradable brown kraft paper. Unused hydrated lime from opened bags can be used to dry up a work site. Closed and undamaged bags (no rips or rain damage) of hydrated lime can be used at another project by the mason or contractor.



MR Credit 5.1: Regional Materials: 10% Extracted, Process and Manufactured Regionally.

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured within 500 miles by truck or 1200 miles by rail of the project site.

Chemstar Type S Hydrated Lime manufactured (hydrated) at the Chemical Lime Company Henderson, Nevada plant is transported by truck to Rialto, California 3 and is within the 500-mile trucking distance to qualify as a regional material.



Innovation & Design Process:

To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED for New Construction Green Building rating system, and/or innovative performance in Green Building categories not specifically addressed by the LEED for New Construction Green Building Durable Building.

EQ Credit: Low-Emitting Materials: **Chemstar Type S Hydrated Lime** emits no VOC.

EQ Credit: Indoor Chemical and Pollutant Source Control. Resistance to water penetration is a critical aspect of ensuring a healthy work and living environment.

Chemstar Type S Hydrated Lime in a masonry mortar and exterior stucco provides a high level of water penetration resistance.

MR Credit: Building Reuse. The historic building inventory is dominated by stone and brick masonry and these building are obviously highly reusable. Historic masonry built using lime mortars attest to the durability of the material. In addition, when a building is de-constructed, mortars with higher contents of lime are more readily removed from masonry units allowing them to be reused.

Carbon Dioxide sink. The use of **Chemstar Type S Hydrated Lime** in masonry mortar and plaster provides a carbon dioxide gas sink of up to 80% of the weight of the hydrated lime used in the mortar.

Very truly yours,

Margaret Thomson, Ph. D.,

VULCAN MATERIALS COMPANY - Western Division

Contractor: **E - Z Mix Inc.**

July 11, 2008


Plant: **Vulcan Materials / Sun Valley**

Material: **Washed Plaster Sand**

This is to certify that Vulcan Materials Company, Western Division, **Sun Valley**, will supply Washed Plaster Sand to the above listed customer.

Sieve Size	ASTM C-897 Specification	Percent Passing			
50.0mm (2")	100	100			
37.5mm (1 1/2")	100	100			
25.0mm (1")	100	100			
19.0mm (3/4")	100	100			
12.5mm (1/2")	100	100			
9.50mm (3/8")	100	100			
4.75mm (No. 4)	100	100			
2.36mm (No. 8)	90-100	99			
1.18mm (No. 16)	60-90	80			
600um (No. 30)	35-70	53			
300um (No. 50)	10-30	25	Sand Equivalent	80	75 min.
150um (No. 100)	0-5	7	Bulk Sp. Gr. (SSD)	2.73	
75um (No. 200)	0-3	3.0	Absorption	1.1	Wt. %
Fineness Modulus		2.36	Durability	81	60 min.
			Dry Loose	97.7	pcf
			Dry Rodded	106.2	pcf

Submitted by:


Tim Reed
Laboratory Supervisor


**INDUSTRY LEADING
PRODUCT LINES:**

Concrete Masonry Products

Proto Plus Wall Systems

Concrete Interlocking Paving
StonesKeystone® Retaining Wall
Systems

Pre-Insulated Mortars

Pittsburgh Corning
GlassBlock®Tronwyth Acini-Glass-SW™
Glazed CMUTronwyth Translucite®
Grouted face and
Monumental CMU
E-mail
info@angelusblock.com
Web
www.angelusblock.com
Corporate Office
 11374 Tuxland St.
San Valley, CA 91362
 (818) 707-0678
 FAX (818) 780-3174

 1706 N. Main St.
Orange, CA 92666
 (714) 837-0604
 FAX (714) 821-0281

 11740 Sheldon St.
San Valley, CA 91362
 (818) 700-0316
 FAX (818) 504-9274

 14516 Whitman Ave.
Fontana, CA 92335
 (909) 360-0244
 FAX (909) 022-8171

 262 E. Huntington Bch. Bl.
Gardena, CA 90248
 (310) 329-8841
 FAX (310) 327-7281

 3436 S. Placentia Ave.
Rialto, CA 92570
 (951) 328-8116
 FAX (951) 321-0116

 4576 E. Vineyard Ave.
Oxnard, CA 93036
 (805) 406-1137
 FAX (805) 883-7807

 60-101 Empire Canyon Rd.
Indio, CA 92202
 (760) 347-3246
 FAX (760) 342-0700

March 14, 2007

SUBJECT: Letter of Certification**GENERAL CONTRACTOR:****MASON CONTRACTOR:** Ramirez Masonry, Inc.**PROJECT:** SMITH EMERY LAB TESTS**Masonry Units:** ***ALL UNITS***

We certify that all the hollow load bearing masonry units, supplied by Angelus Block Co., Inc. for the above mentioned project, conform to the UBC Standard 21-4 (1997) and ASTM C-90, Type I. Aggregates used conform to ASTM C-33 and C-331, linear shrinkage not exceeding 0.065%. All units will comply with the quality control test of the C.M.A. Units are ***medium weight***, in accordance with ASTM designation.

This letter is subject to and incorporates by this reference the Terms and Conditions of Sale applicable to all Angelus products, including the Limited Warranty. The Limited Warranty is printed on the reverse of this letter. No salesperson or other Angelus personnel has the authority to vary the Terms and Conditions of Sale.

Angelus Block Co., Inc. masonry units are steam-cured in a fully saturated atmosphere, with a minimum of 28 days air-curing before delivery to the job site.

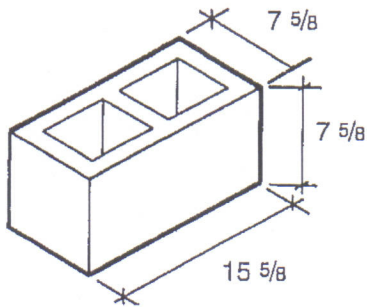
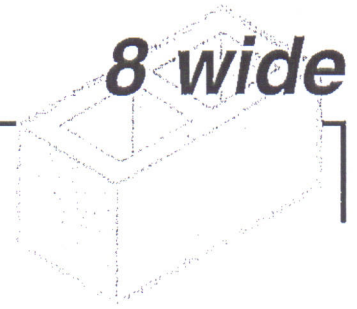
Yours truly,
 Angelus Block Co., Inc.

Albert Estrada
 Sales Representative

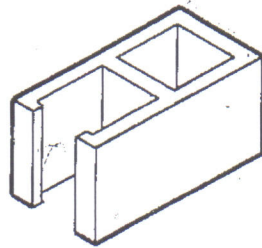
Precision

8 wide

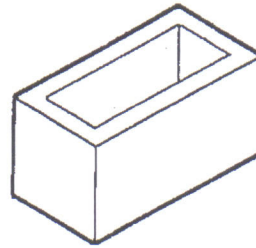
8 high



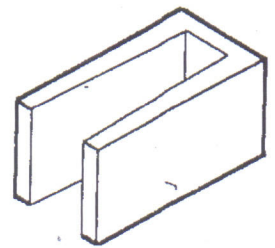
8 x 8 x 16
Standard



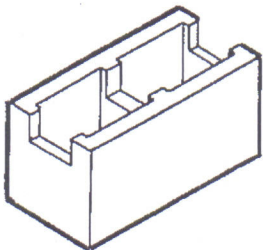
8 x 8 x 16
Open End Standard



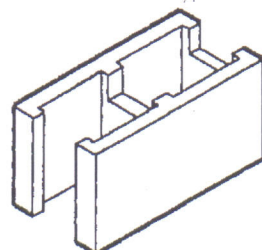
8 x 8 x 16
Standard
No Center Web



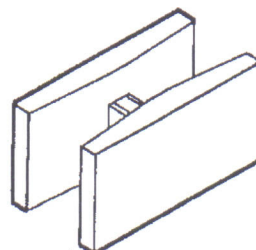
8 x 8 x 16
U-Lintel



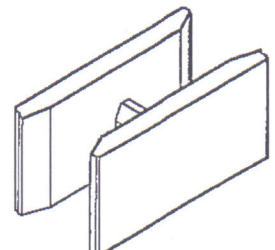
8 x 8 x 16
Bond Beam



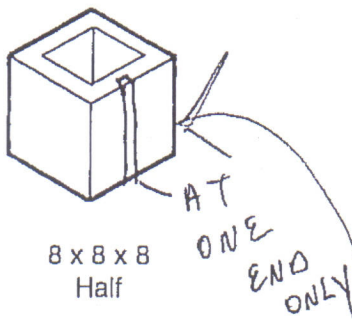
8 x 8 x 16
Open End Bond Beam



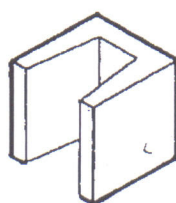
8 x 8 x 16
Double Open End
Bond Beam



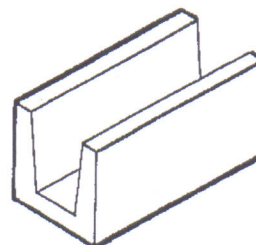
8 x 8 x 16
Grout Lock



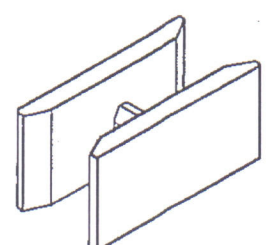
8 x 8 x 8
Half



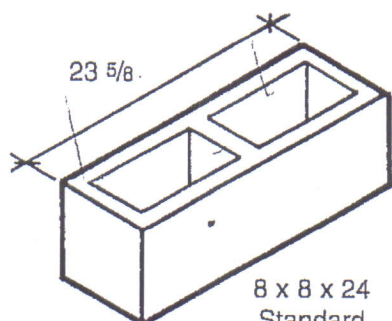
8 x 8 x 8
U-Lintel



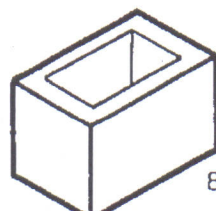
8 x 8 x 16
U-Lintel Solid Bottom
SPECIAL ORDER ONLY



8 x 8 x 16
Speed Block

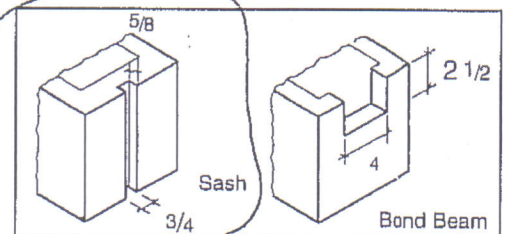


8 x 8 x 24
Standard
SPECIAL ORDER ONLY



8 x 8 x 12
Half
SPECIAL ORDER ONLY

U-Lintel
Also Available



Note: Open Ends and Bond Beam channels as shown are representational; actual configurations may differ.

Angelus
BLOCK CO., INC.
A DIVISION OF DILLON & SUTHER



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory, Established 1904

781 E. Washington Boulevard Los Angeles, California 90021 ♦ (213) 749-3411 ♦ Fax (213) 741-8626

Proj/Job No.: 30930-1
Lab. No.: L-06-1159

June 09, 2006

CLIENT: TOM REED
ANGELUS BLOCK
11374 TUXFORD ST
SUN VALLEY, CA 91352

PROJECT: **ANGELUS BLOCK IN-HOUSE**
MATERIALS TESTING

SUBJECT: 8" x 8" x 16" Open End Standard Medium Weight Gray Block
SOURCE: Delivered to Smith-Emery Laboratories by client on April 19, 2006

REPORT of TESTS

Sample No.:				Average	ASTM C90 Requirements
	1	2	3		
Actual Size, Ins.:	7.70 x 8.80	7.70 x 8.70	7.70 x 8.80		
Date Received:	4/19/06	4/19/06	4/19/06		
Date Tested:	5/15/06	5/15/06	5/15/06		
Age, Days:	-	-	-		
Gross Area, Sq. Ins.:	67.76	66.99	67.76		
Net Area, Sq. Ins.:	40.70	40.02	40.02		
Total Load, Lbs.:	141,950	135,550	128,350		
Compressive Strength,					
Gross Area, PSI:	2,090	2,020	1,890	2,000	
Net Area, PSI:	3,490	3,390	3,210	3,363	1,900 Min.
Absorption (24 hrs.)					
Lbs. Per cu. Ft.:	9.17	9.54	10.13	9.61	15 Max.
Moisture content as rec'd., %:	-	-	-		
Weight per cu. Ft.:	121.05	120.26	118.82	120.04	105 to less than 125
Shrinkage %:	0.042	0.038	0.041	0.040	0.065 Max.

Respectfully submitted,
SMITH-EMERY LABORATORIES


P. John Latolait
Registered Civil Engineer No. C60312
Registration Expires: 06-30-06



- ☒ Materials Tested Comply With Specifications.
☐ Materials Tested Did Not Comply With Specifications.
☐ No Established Criteria For Acceptable Limits.

ss

CC: ANGELUS BLOCK; SMITH-EMERY LABORATORIES



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory

781 E. Washington Boulevard - 2nd Floor Los Angeles, California 90021 ♦ (213) 745-5333 ♦ Fax (213) 749-7232

Project No.: 38149-1
Lab No.: L-08-3168

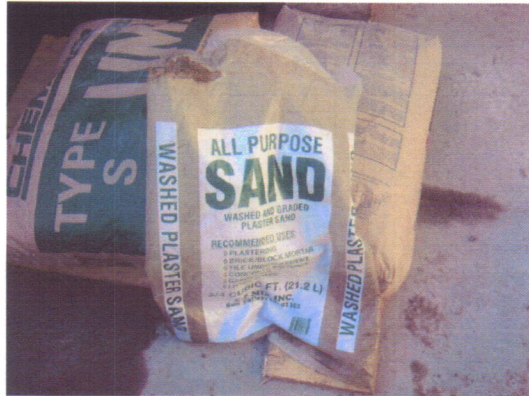
APPENDIX C

CONSTRUCTIONS AND TEST SET UP PICTURES

CONSTRUCTION PICTURES



Picture No. 1 Mixing by volumetric method



Picture No. 2 Washed Plaster Sand used



Picture No. 3 Cement type II / V used



Picture No. 4 Type S Lime used



Picture No. 5 building test specimens



Picture No. 5 specimens were in the plastic bags for 28 days

TEST SET-UP



Picture No.1 Baldwin Universal Testing Machine with 1.1 million pounds of capacity



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory

781 E. Washington Boulevard - 2nd Floor Los Angeles, California 90021 ♦ (213) 745-5333 ♦ Fax (213) 749-7232

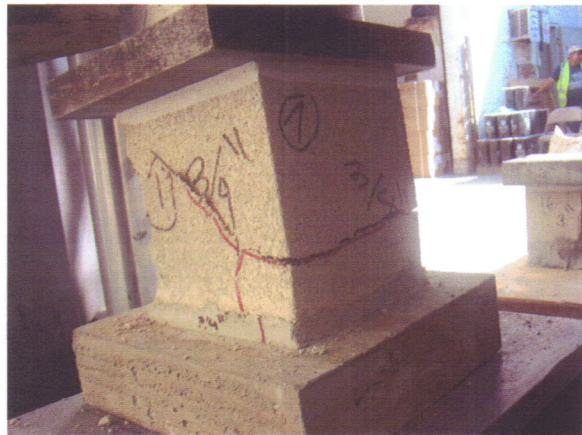
Project No.: 38149-1

Lab No.: L-08-3168

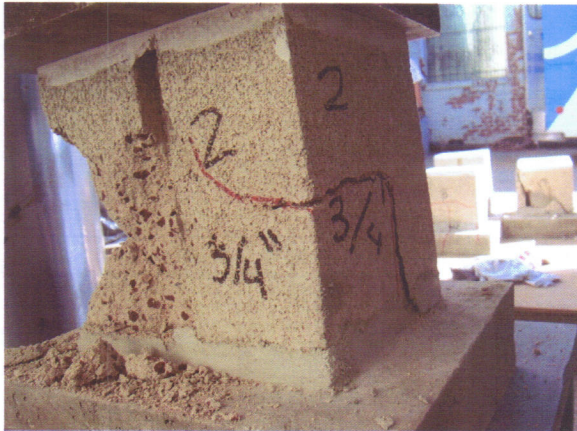
APPENDIX D

TESTING PICTURES

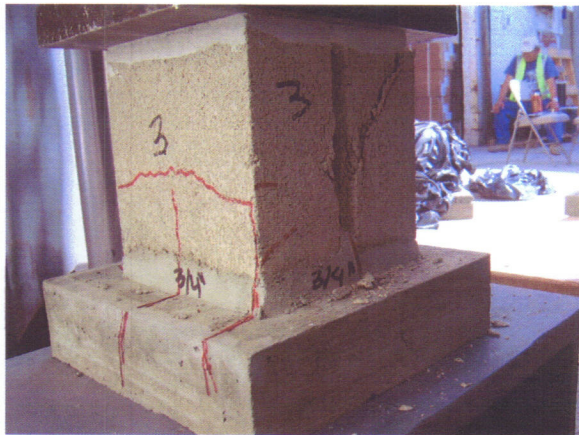
GROUP OF PICTURES NO. 1_ – Specimen ID : 1- $\frac{3}{4}$ "



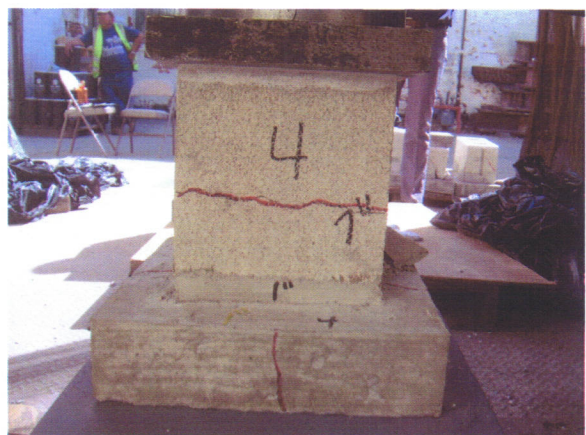
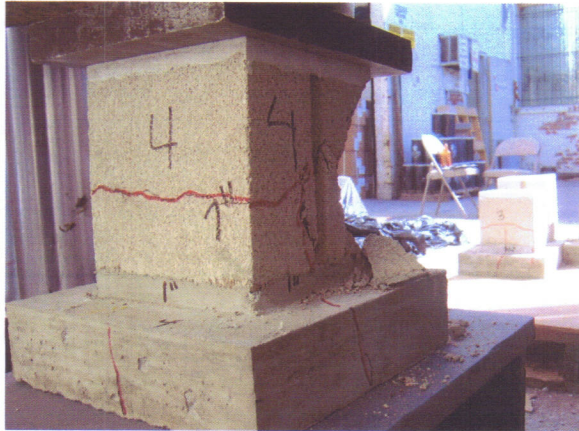
GROUP OF PICTURES NO. 2 – Specimen ID: 2- $\frac{3}{4}$ "



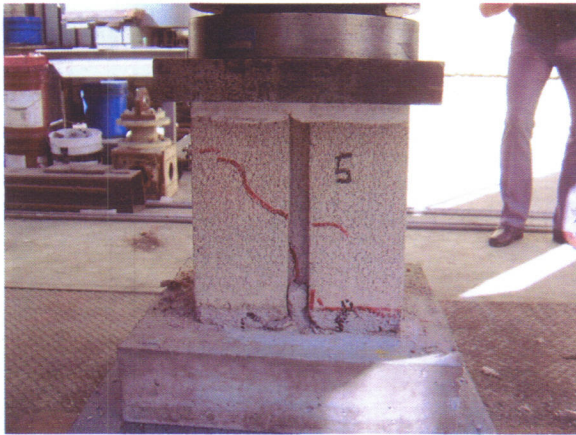
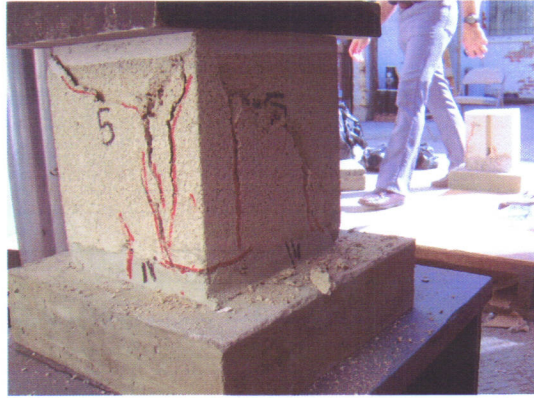
GROUP OF PICTURES NO 3 – Specimen ID: 3- ¾"



GROUP OF PICTURES NO 4 – Specimen ID: 4- 1”



GROUP OF PICTURES NO.5 – Specimen ID: 5- 1”



GROUP OF PICTURES NO.6 – Specimen ID: 6- 1''



GROUP OF PICTURES NO.7 – Specimen ID: 7- 1 ½”



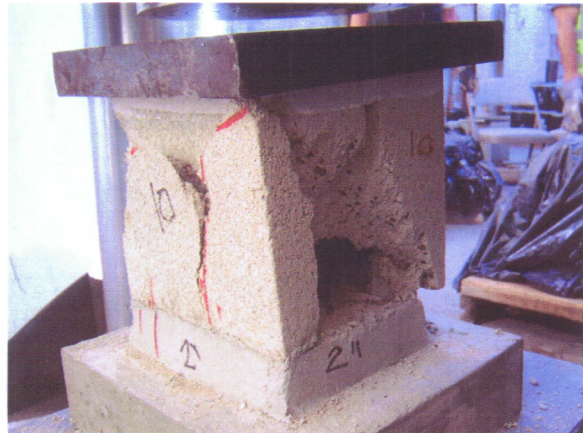
GROUP OF PICTURES NO. 8 – Specimen ID: 8- 1 ½”



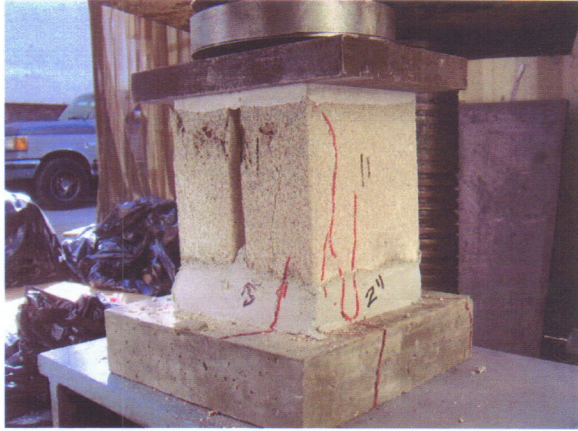
GROUP OF PICTURES NO. 9 – Specimen ID: 9- 1 ½”



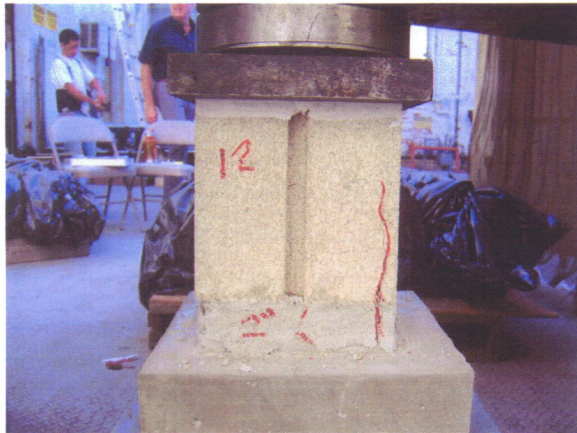
GROUP OF PICTURES NO. 10 Secimen ID: 10- 2''



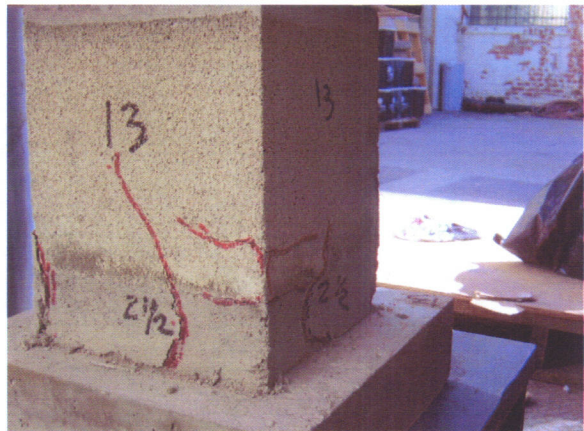
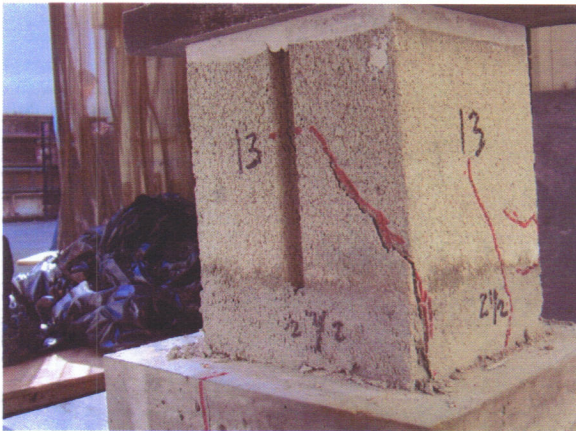
GROUP OF PICTURES NO. 11 Specimen ID: 11- 2''



GROUP OF PICTURES NO. 12 – Specimen ID: 12- 2”



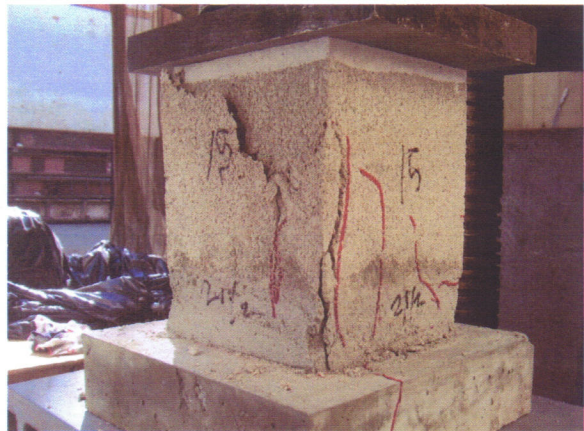
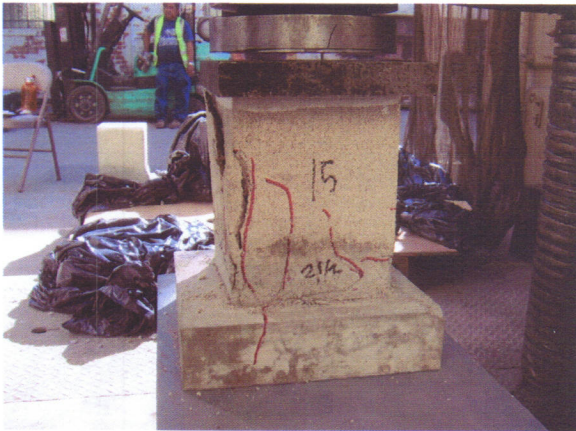
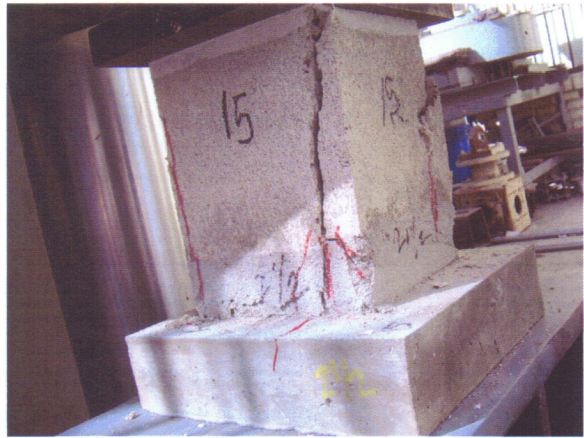
GROUP OF PICTURES NO. 13— Specimen ID: 13- 2 ½"



GROUP OF PICTURES NO. 14 Specimen ID: 14- 2 ½"



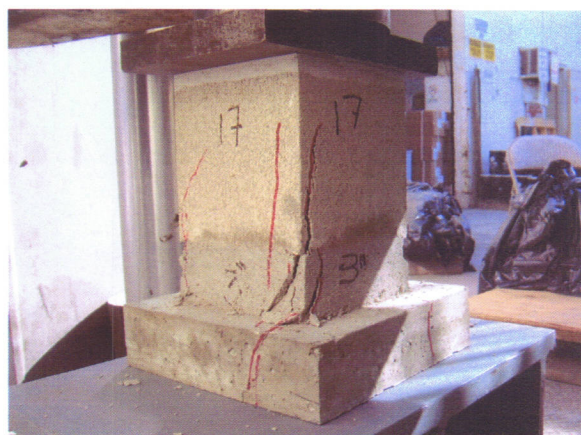
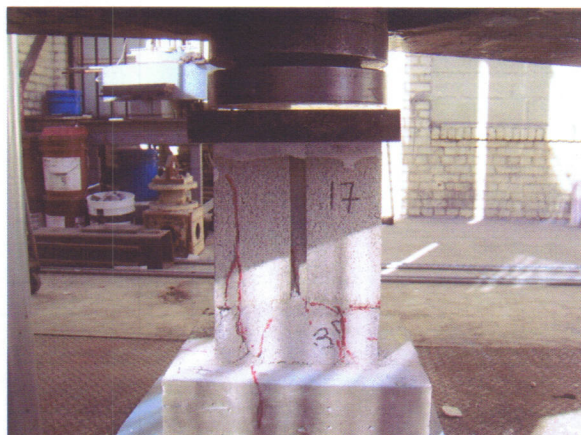
GROUP OF PICTURES NO. 15— Specimen ID: 15- 2 ½"



GROUP OF PICTURES NO. 16 Specimen ID: 16- 3"



GROUP OF PICTURES NO. 17— Specimen ID: 17-3”



GROUP OF PICTURES NO. 18 Specimen ID: 18- 3"



