

High Early



J. P. CARRARA & SONS, INC
CONCRETE CONTRACTORS
ARCHITECTURAL / STRUCTURAL PRECAST CONTRACTORS

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MIDDLEBURY, VT 05753
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CROWN POINT, NY 12928
TEL (518) 597-3680

RT 7 SO.
NO. CLARENDON, VT 05701
TEL (802) 775-2301
FAX (802) 775-1048

CONCRETE MIX DESIGN

DATE :	March 4, 2014		
PROJECT :	Rochester sub-footer	STATE:	VT
ENGINEER :	VAOT		
CONTRACTOR :	Schultz Construction, Inc.		
CONCRETE SUPPLIER :	J.P. Carrara & Sons, Inc., Middlebury, VT		
CEMENT SOURCE & TYPE :	Lafarge Type III		G _{s, SSD} 3.12
FLY ASH SOURCE & CLASS:	Headwaters Resources - Class F - Brayton Point		2.33
COARSE AGGREGATE(1):	J.P. Carrara & Sons, Inc., Middlebury, VT	P-stone (3/4")	ABS = 0.99% 2.585
FINE AGGREGATE :	J.P. Carrara & Sons, Inc., Middlebury, VT	JPC sand	ABS = 1.04% 2.594
AIR ENTRAINING AGENT :	W.R. Grace Darex II		
RETARDING AGENT :	W.R. Grace Daratard		
MID-RANGE WATER REDUCER:	W.R. Grace Adva 405		
HIGH-RANGE WATER REDUCER:	W.R. Grace Adva 405 Extended Slump Life WR		
SELF-CONSOLIDATING ADMIX:	W.R. Grace Adva 405		

any new aggregate properties? if not when?

ABS = 0.99% 2.585
ABS = 1.04% 2.594

QUANTITIES PER CUBIC YARD

Identification #: VT701.04
Mix Description: 2500psi @ 12hrs

7000 psi

SPECIFICATIONS REQUIREMENT,	28	Day Strength (psi)	3,500	750 # Total Cementious (CM)	Yield
Lafarge Type III		(lbs)	600		3.08
Fly Ash, Class F		(lbs)	150	20% by weight of CM	1.03
P-stone (3/4")		(lbs)(SSD)	1460	52% by weight of total agg.	9.05
JPC sand		(lbs)(SSD)	1340	48% by weight of total agg.	8.28
WATER (gallons) : (Maximum Water =	36.0	Gal.)	32.5		4.34
W/C RATIO (lbs/lb) : (Max W/C =	0.40)	0.36		
W.R. Grace Darex II	(2-30 range)	(oz/yd ³)	30.0	7.0% + / -- 1.5%	1.49
W.R. Grace Daratard	(0-6 range)	(oz/cwt)	0.0		
W.R. Grace Adva 405	(6-12 range)	(oz/cwt)	8.0	4" slump + / -- 2"	
W.R. Grace Adva 405	(12-18 range)	(oz/cwt)	15.0	8" slump + / -- 2"	
W.R. Grace Adva 405	(18-24 range)	(oz/cwt)	21.0	24" spread + / -- 4"	

27.3

Mix Properties:

Mix Density (#/ft³)
140.1

specials require shrinkage reducing admixt and your previous testing was done with one

Prepared By:
Benjamin L. Cota, Precast Production Engineer



Cement Mill Test Report

Month of Issue: February 2014

Plant:	St-Constant, Quebec
Product:	Portland Cement Type III
Silo:	1 and 11
Manufactured:	January 2013

ASTM C 150-11 and AASHTO M 85-09 Standard Requirements

CHEMICAL REQUIREMENTS			PHYSICAL REQUIREMENTS		
	Spec Limit	Test Result		Spec Limit	Test Result
Rapid Method, X-Ray (C 114)			Air content of mortar (%) (C 188)		
SiO ₂ (%)	---	19.3		12 max	6
Al ₂ O ₃ (%)	---	4.9	Blaine Fineness (m²/kg) (C 204)	---	559
Fe ₂ O ₃ (%)	---	2.4	Retained on a 45 µm sieve (%) (C 430)	---	0.5
CaO (%)	---	61.7	Autoclave expansion (%) (C 151)	0.80 max	0.08
MgO (%)	6.0 max	2.9	Compressive strength (PSI) (C 109)		
SO ₃ (%)	4.5 max	4.3	1 day	1740 min	4385
Insoluble residue (%)	0.75 max	0.80	3 days	3480 min	5685
Loss on Ignition @ 950°C (%)	3.0 max	2.4	28 days	---	7205
CO ₂ (%)	---	1.5	Time of setting (minutes)		
CaCO ₃ in Limestone (%)	---	86.7	Vicat Initial (C 191)	45 - 375	90
Limestone in cement (%)	---	3.1	Mortar Bar Expansion (%) (C 1038)*		
Na ₂ O _{eq} (%)	---	0.88		0.02 max	0.009
Potential Phase Composition (C 150)					
C3S (%)	---	52			
C2S (%)	---	15			
C3A (%)	15 max	9			
C4AF (%)	---	7			

* Current Production run not available - most recent provided.

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of applicable VTAOT Specifications for Type III CEMENT;

ASTM C 150-12 & AASHTO M 85-12 STANDARD SPECIFICATIONS FOR TYPE III CEMENT;

For additional information on this cement test report, please contact our regional technical representative David Johns at (484) 695-5902.

ECAN BU - St-Constant Plant
 1 Chemin Lafarge, St-Constant
 Phone: 450-632-7750 #218

Certified By:

Pascale Poullin

Pascale Poullin - Quality Coordinator
 February 15, 2014



January 1st, 2013

The specific gravity of the Lafarge Type III Portland Cement manufactured at the St-Constant, Quebec, Canada plant is 3.12.

Northeast District
82 Flanders Road, Suite 202
Westborough, MA 01581
Office: (508) 366-9001
Fax: (508) 366-9091



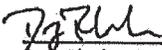
**ASTM C618 / AASHTO M295 Testing of
Brayton Point Fly Ash**

Sample Type: 3200-ton	Report Date: 2/25/2014
Sample Date: 12/23 - 1/16/14	MTRF ID: 166BP
Sample ID:	

<u>Chemical Analysis</u>	ASTM / AASHTO Limits		ASTM Test Method
	Class F	Class C	
Silicon Dioxide (SiO ₂)	59.26 %		
Aluminum Oxide (Al ₂ O ₃)	27.30 %		
Iron Oxide (Fe ₂ O ₃)	5.23 %		
Sum of Constituents	91.79 %	70.0% min 50.0% min	D4326
Sulfur Trioxide (SO ₃)	0.24 %	5.0% max 5.0% max	D4326
Calcium Oxide (CaO)	1.49 %		D4326
Magnesium Oxide (MgO)	1.00 %		
Sodium Oxide (Na ₂ O)	0.79 %		
Potassium Oxide (K ₂ O)	2.61 %		
Moisture	0.04 %	3.0% max 3.0% max	C311
Loss on Ignition	2.17 %	6.0% max 6.0% max 5.0% max 5.0% max	C311 AASHTO M295
Available Alkalies, as Na ₂ O When required by purchaser	0.91 %	not required 1.5% max 1.5% max	C311 AASHTO M295
<u>Physical Analysis</u>			
Fineness, % retained on #325	25.72 %	34% max 34% max	C311, C430
Strength Activity Index - 7 or 28 day requirement			C311, C109
7 day, % of control	78 %	75% min 75% min	
28 day, % of control	84 %	75% min 75% min	
Water Requirement, % control	98 %	105% max 105% max	
Autoclave Soundness	-0.03 %	0.8% max 0.8% max	C311, C151
Density	2.33		C604

The strength activity index is not to be considered a measure of the compressive strength of concrete containing the fly ash.

Headwaters Resources certifies that pursuant to current ASTM C618 protocol for testing, the test data listed herein was generated by applicable ASTM methods and meets the requirements of ASTM C618.


Doug Rhodes, CET
Facility Manager



Materials Testing & Research Facility
2650 Old State Highway 113
Taylorsville, Georgia 30178
P: 770.684.0102
F: 770.684.5114
www.headwaters.com



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Avon, MA 02322

149 Wayside Ave., Rear
W. Springfield, MA 01089

Phone +1 508 588 0886
Fax +1 508 588 2414

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Fax +1 413 736 1870
www.cardno.com

April 23, 2013

Report No. 25.30620.0003-1

Mr. Ben Cota
JP Carrara & Sons
2464 Case Street
Middlebury, VT 05753

Re: Aggregate Test Results

Gentlemen:

The following are test results of samples of aggregate as delivered to this laboratory on April 5, 2013.

1. Sample Description

<u>Sample No.</u>	<u>Description</u>	<u>Source</u>
C-161a	3/4" Stone	JP Carrara
C-161b	Concrete Sand	JP Carrara

2. Specific Gravity and Absorption Test Results (ASTM C127, ASTM C128)

<u>Sample No.</u>	<u>Specific Gravity</u>	<u>Absorption (%)</u>
C-161a	2.585	0.99
C-161b	2.594	1.04

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Kevin Caine
Laboratory Manager

KC/sjm

J.P. CARRARA & SONS, INC.
 2464 Case St.
 Middlebury, VT 05753
 Ph. 388-6363 Fax 388-9010

Fine Aggregate Sieve Analysis

Material Source: **JPC Middlebury Concrete Sand** **2.94** **Graph A** Date: **2/26/2014**

Material Quantity: 997.0 grams Min = 500 grams

Sieve Size	Cumulative Wt. Retained (g)	Cumulative % Retained	% Passing		Select Applicable Specification: VAOT	Evaluation performed by:		Additional information pertinent to material sample:
			low	high		Consecutive Sieve % Retention	M.C.	
3/8"	0.0	0.0	100.0	100	100	0		ASTM C 566
No. 4	49.0	4.9	95.1	100	100	4.9		sample wet weight, W: 1049.00
No. 8	222.0	22.3	77.7	100	100	22.3		sample dry weight, D: 997.00
No. 16	389.0	39.0	61.0	80	80	34.1		total moisture, p: 5.22%
No. 30	552.0	55.4	44.6	60	60	33.1		material absorption: 1.04%
No. 50	767.0	76.9	23.1	30	30	37.9		surface moisture: 4.18%
No. 100	917.0	92.0	8.0	10	10	36.6		
No. 200	969.0	97.2	2.8	100	100	20.3		
Pan	997.0							
FM =			2.90		FM Range		FM Variance, Base FM = 2.94	
			2.6	3.1	2.74		3.14	

2012



RMS 905
AASHTO T303
(Modified)

DATE RECEIVED:

LAB NUMBER:

CEMENT	FLY ASH	SLAG	SILICA
80.0%	20.0%	0.0%	0.0%

PLANT, LABORATORY, AGGREGATE, AND MITIGATION SOURCES

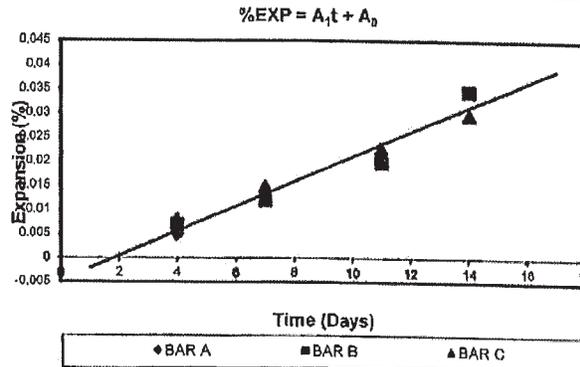
Plant:	J. P. CARRARA & SONS	Location:	MIDDLEBURY, VT		
Laboratory:	ATC ASSOCIATES	Location:	AVON, MA		
Aggregate:	J. P. CARRARA & SONS	Location:	MIDDLEBURY, VT	Type:	FINE
Cement:	LAFARGE	Location:	ST. CONSTANT, QC, CA	Type:	III
Fly Ash:	HEADWATERS RESOURCES	Location:	SOMERSET, MA	Type:	F
Slag:		Location:		Type:	
Silica Fume:		Location:			
Identification No.:		Year used:	2012		
Date Sampled:	5/14/2012	Sampler:	CONTRACTOR		

EXPANSION LENGTHS				% EXPANSION RESULTS					
TIME (Days)	MORTAR BAR (UNIT OF LENGTH)				TIME (Days)	MORTAR BAR (%)			
	A	B	C	G		A	B	C	AVERAGE
2	0.0916	0.1002	0.0925	10	0				
6	0.0921	0.1009	0.0933		4	0.005	0.007	0.008	0.01
9	0.0928	0.1014	0.0940		7	0.012	0.012	0.015	0.01
13	0.0938	0.1022	0.0948		11	0.022	0.020	0.023	0.02
16	0.0951	0.1037	0.0955		14	0.035	0.035	0.030	0.03

REGRESSION ANALYSIS

TIME (Days)	EXP. (%)	BEST FIT (%)	SSE	SST
4	0.005	0.006	4.494E-07	0.0001832
4	0.007	0.006	1.705E-06	0.0001337
4	0.008	0.006	5.298E-06	0.0001116
7	0.012	0.013	2.113E-06	4.357E-05
7	0.012	0.013	2.143E-06	4.37E-05
7	0.015	0.013	2.303E-06	1.317E-05
11	0.022	0.024	3.377E-06	1.095E-05
11	0.020	0.024	1.472E-05	1.716E-06
11	0.023	0.024	7.206E-07	1.847E-05
14	0.035	0.031	1.105E-05	0.0002621
14	0.035	0.031	1.086E-05	0.0002612
14	0.030	0.031	2.666E-06	0.0001262

$A_1 = 0.0025733$ $A_0 = -0.004668$ $R^2 = 0.95$



RESULTS

PASS

Note: Pass/Fail determination is based on MassDOT's expansion criteria of 0.08% maximum expansion for metamorphic aggregate or 0.10% maximum expansion for all other aggregates. A "12 Point Linear Regression" of 4, 7, 11, and 14 days is used to determine reliability of results and to develop $\%Expansion = A_1 t + A_0$ plot. Repeat AASHTO T303 (Modified) if r^2 value is less than 0.95.

Comments:

Tested by: ANTONIO RODRIGUES

Reviewed by: KEVIN CAINE

Signature: *Antonio Rodrigues*

Signature: *Kevin Caine*

Date: 6/11/2012

Date:

J.P. CARRARA & SONS, INC.
 2464 Case St.
 Middlebury, VT 05753
 Ph. 388-6363 Fax 388-9010

Coarse Aggregate Sieve Analysis

Material Source: **JPC Middlebury P - Stone (3/4)** 3/4 **Graph A** Date: 2/26/2014

if "other", note source:

Material Quantity: **12.03** Lbs; minimum: **11.0**

Sieve Size	Cumulative Wt. Retained (#)	Cumulative % Retained	% Passing	Select Applicable Specification: VAOT		Select Size Designation 19.0mm (3/4")	Material evaluation performed by: M.C. B.C.
				low	high		
2"	0.00	0.0	100.0	100	100		sample wet weight, W: 12.29
1-1/2"	0.00	0.0	100.0	100	100		sample dry weight, D: 12.03
1"	0.00	0.0	100.0	100	100		total moisture, p: 2.16%
3/4"	1.13	9.4	90.6	90	100		material absorption: 0.99%
1/2"	6.80	56.5	43.5	0	100		surface moisture: 1.17%
3/8"	8.90	74.0	26.0	20	55		
No. 4	11.56	96.1	3.9	0	10		
No. 8	11.80	98.1	1.9	0	5		
No. 16	11.82	98.3	1.7	0	5		
PAN	12.03	100.0	0.0	0	5		

ASTM
C 566

additional information pertinent to material sample:

2012		RMS 905 AASHTO T303 (Modified)	DATE RECEIVED:	LAB NUMBER:
-------------	---	--	-----------------------	--------------------

CEMENT	FLY ASH	SLAG	SILICA
80.0%	20.0%	0.0%	0.0%

PLANT, LABORATORY, AGGREGATE, AND MITIGATION SOURCES

Plant:	J. P. CARRARA & SONS	Location:	MIDDLEBURY, VT
Laboratory:	ATC ASSOCIATES	Location:	AVON, MA
Aggregate:	J. P. CARRARA & SONS	Location:	MIDDLEBURY, VT
Cement:	LAFARGE	Location:	ST. CONSTANT, QC, CA
Fly Ash:	HEADWATERS RESOURCES	Location:	SOMERSET, MA
Slag:		Location:	
Silica Fume:		Location:	
Identification No.:		Year used:	2012
Date Sampled:	5/14/2012	Sampler:	Contractor

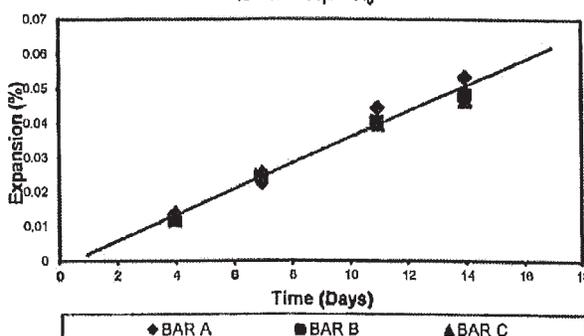
EXPANSION LENGTHS					% EXPANSION RESULTS				
TIME (Days)	MORTAR BAR (UNIT OF LENGTH)				TIME (Days)	MORTAR BAR (%)			
	A	B	C	G		A	B	C	AVERAGE
2	0.0975	0.0923	0.0768	10	0				
6	0.0989	0.0935	0.0781		4	0.014	0.012	0.013	0.01
9	0.0998	0.0948	0.0794		7	0.023	0.025	0.026	0.02
13	0.1020	0.0964	0.0808		11	0.045	0.041	0.040	0.04
16	0.1029	0.0972	0.0815		14	0.053	0.049	0.047	0.05

REGRESSION ANALYSIS

TIME (Days)	EXP. (%)	BEST FIT (%)	SSE	SST
4	0.014	0.013	2.531E-07	0.0003336
4	0.012	0.013	2.165E-06	0.0004097
4	0.013	0.013	2.123E-07	0.0003698
7	0.023	0.025	3.404E-06	8.747E-05
7	0.025	0.025	2.203E-08	5.416E-05
7	0.026	0.025	1.39E-06	4.005E-05
11	0.045	0.040	2.428E-05	0.0001546
11	0.041	0.040	9.744E-07	7.218E-05
11	0.040	0.040	3.277E-09	5.723E-05
14	0.053	0.051	6.654E-06	0.0004557
14	0.049	0.051	5.51E-06	0.0002697
14	0.047	0.051	1.812E-05	0.0002106

$A_1 = 0.0037537 \quad A_0 = -0.001653 \quad R^2 = 0.97$

$\%EXP = A_1t + A_0$

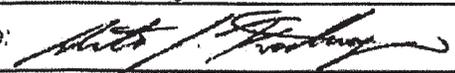
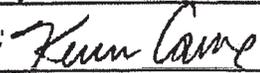


RESULTS

PASS

Note: Pass/Fail determination is based on MassDOT's expansion criteria of 0.08% maximum expansion for metamorphic aggregate or 0.10% maximum expansion for all other aggregates. A "12 Point Linear Regression" of 4, 7, 11, and 14 days is used to determine reliability of results and to develop %Expansion = A₁t + A₀ plot. Repeat AASHTO T303 (Modified) if r² value is less than 0.95.

Comments:

Tested by: Antonio Rodrigues	Reviewed by: Kevin Caine
Signature: 	Signature: 
Date: 5/16/2012	Date:

WR Grace Company

W. R. Grace & Co.-Conn.
62 Whittemore Avenue
Cambridge, MA 02140

T 617-498-4555
F 617-234-7576
E Denise.I.white@grace.com
W www.graceconstruction.com

April 6, 2011

didn't see any data
sheet for Eclipse
4500

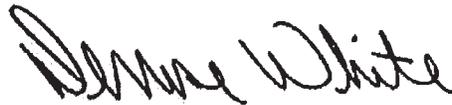
J P Carrara & Sons
2464 Case Street, Rte. 116
Middlebury, Vermont 05753

Project Name: All

This is to certify that DAREX® II AEA, an air-entraining admixture, as manufactured and supplied by Grace Construction Products, W. R. Grace & Co.-Conn., is formulated to comply with the Standard Specification for Air-Entraining Admixtures for Concrete, ASTM C 260 (AASHTO M 154).

DAREX II AEA does not contain calcium chloride or chloride containing compounds as a functional ingredient. Chloride ions may be present in trace amounts contributed from the process water used in the manufacturing.

GRACE



Denise White
Technical Service Support

WR Grace Company

W. R. Grace & Co.-Conn.
62 Whittemore Avenue
Cambridge, MA 02140

T 617-498-4555
F 617-234-7578
E Denise.l.white@grace.com
W www.graceconstruction.com

April 6, 2011

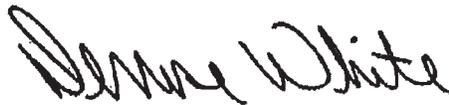
J P Carrara & Sons
2464 Case Street, Rte. 116
Middlebury, Vermont 05753

Project Name: All

This is to certify that DARATARD[®] 17, a Water-Reducing and Retarding, as manufactured and supplied by Grace Construction Products, W. R. Grace & Co.-Conn., is formulated to comply with the Standard Specification for Chemical Admixtures for Concrete, ASTM C 494, Type D (AASHTO M 194, Type D).

DARATARD 17 does not contain calcium chloride or chloride containing compounds as a functional ingredient. Chloride ions may be present in trace amounts contributed from the process water used in the manufacturing.

GRACE



Denise White
Technical Service Support

Grace Construction Products

W.R. GRACE & CO. - Conn.
82 North Main Avenue
Concord, MA 01742-1032

T 817-816-1400
www.graceconstruction.com

5/13/2013

Chuck French
JP Carrara & Sons, Inc.
2464 Case St
Middlebury, Vermont 05753

Project Name: VT HES 701.04 - Hancock
Product Selected: ADVA® 405

GRACE

This is to certify that the ADVA 405, a High Range Water Reducer, as manufactured and supplied by Grace Construction Products, W.R. Grace & Co. - Conn., is formulated to comply with the Specifications for Chemical Admixtures for Concrete, ASTM: C494, Type A, F, AASHTO: M194, Type A, F and complies with the Specification for Chemical Admixtures for Use in Producing Flowing Concrete, ASTM C 1017.

ADVA 405 does not contain calcium chloride or chloride containing compounds as a functional ingredient. Chloride ions may be present in trace amounts contributed from the process water used in manufacturing.

The foregoing is in addition to and not in substitution for our standard Conditions of Sale attached.



G. Terry Harris
Technical Services Manager

Grace Analytical
Cambridge Center

W R Grace & Co.-Conn.
62 Whittemore Ave.
Cambridge, MA 02140-1692

Tel (617) 498-4899
Fax (617) 498-4360

NVLAP Lab Code 200258-0

CONFIDENTIAL

Rapid Chloride Permeability

J. P. Carrera, Middlebury, VT

13-0105

4/29/2013

ecc: Bill Brooks
Terry Harris
Terry Roberie
Ted Sibbick
Stephen Garrity
Tim Durning

CONFIDENTIAL

Rapid Chloride Permeability

J. P. Carrera, Middlebury, VT

13-0105

4/29/2013

Background Information/Problem Details

Customer is looking to get mix a design approved for VT DOT production. It is for High Early closure mix. The cylinders were cast on February 19th 2013. It was requested that the samples be tested for Rapid Chloride Permeability at 56 days of age on April 16th 2013. Shrinkage measurements were also required.

Scope of this Project

Run Shrinkage testing on three beams and Rapid Chloride Permeability testing on three cylinders at 56 days of age.

Mix Proportions

The samples received reportedly had the following mix design proportions:

Component	No Mix I.D
Cement: Lafarge Type III	600
Fly Ash: Brayton Pt	150
Total Cementitious:	750
Coarse Aggregate: 3/4" Stone	1460
Fine Aggregate: Sand	1340
<i>Admixtures:</i>	
ADVA 405	20 oz/cwt (added manually)
Eclipse 4500	1.25 gal/yd ³ (added manually)
Darex II	8 oz/yd ³
Water: Plant Water	250
w/c Ratio	0.33
Designed Air:	7%

Components are given as pcy, unless otherwise stated.

Sample Description

Three cylinders were submitted for ASTM C1202 testing. It was requested that the cylinders be tested at 56 days of age. One 2" x 4" slices was cut from each of the cylinders and tested for Chloride Permeability at 56 days of age.

Six 3" x 3" x 11" beams were also submitted for ASTM C157 Length change of Hardened Concrete. Of the three beams originally submitted, two of them (sample 1, & 3) were not able to be read due to the pins not being properly spaced. Three additional beams were later submitted and one of those (sample 9) also could not be read due to pin spacing.

<u>Sample #</u>	<u>Identification</u>	<u>Tests Performed</u>
13-0105-2	3" x 3" x 11" beam No I.D.	Length Change
13-0105-4	4" x 8" cylinder labeled No I.D "d"	Rapid Chloride Permeability
13-0105-5	4" x 8" cylinder labeled No I.D "e"	Rapid Chloride Permeability
13-0105-6	4" x 8" cylinder labeled No I.D "f"	Rapid Chloride Permeability
13-0105-7	3" x 3" x 11" beam No I.D.	Length Change
13-0105-8	3" x 3" x 11" beam No I.D.	Length Change

Results

Rapid Chloride Permeability AASHTO T277 / ASTM C1202

Sample ID	Date Cast	Date Tested	Sample Age	Coulombs
13-0105-4 "d"	2/19/2013	4/16/2013	56 Days	1194
13-0105-5 "e"	2/19/2013	4/16/2013	56 Days	802
13-0105-6 "f"	2/19/2013	4/16/2013	56 Days	906

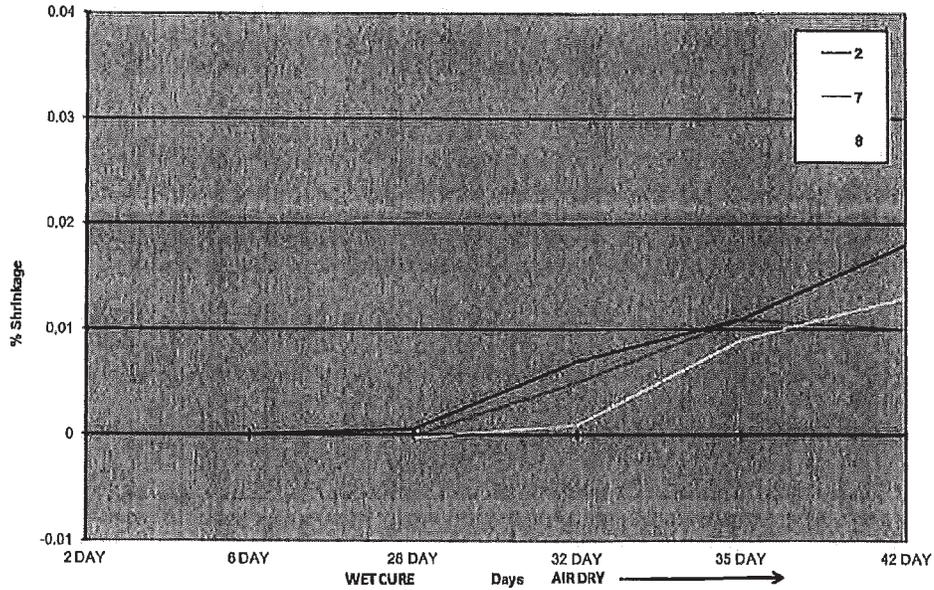
**Rapid Chloride Permeability AASHTO T277 / ASTM C1202
Result Interpretation Table**

Charge Passed Coulombs	Chloride Permeability
> 4000	High
2000 - 4000	Moderate
1000 - 2000	Low
100 - 1000	Very Low
< 100	Negligible

Shrinkage Testing

ASTM C157 Length Change of Hardened Concrete states that the testing should begin $24 \pm \frac{1}{2}$ hour from the addition of water to cement during the mixing operation. Samples were tested as soon as they were received. Sample #2 testing began 2 days after the concrete was made. Samples #7 and #8 testing began 6 days after the concrete was made.

batch # 13-0105



Sample #	Initial Reading Wet Cure		Wet Cure		Air Dry Cure		Air Dry Cure	
	2 Day	6 Day	28 Day	% Change	32 Day	% Change	35 Day	% Change
2	-	-0.0394	-0.0400	0.006	-0.0401	0.0007	-0.0405	0.0011
7	-0.0974	-	-0.0973	-0.0001	-0.0979	0.0005	-0.0985	0.0011
8	-0.0702	-	-0.0699	-0.0003	-0.0703	0.0001	-0.0711	0.0009

Sample #	Air Dry		Air Dry	
	42 Day	% Change	56 Day	% Change
2	-0.0412	0.0018	-0.0427	0.0033
7	-0.0984	0.0010	Due 5/6	
8	-0.0715	0.0013	Due 5/6	

Acknowledgements

ASTM C-1202 done by: Z. Alhussaini

ASTM C-157 done by: S. Garrity

Reviewed By

Ted Sibbick – Senior Petrographer

Stephen C. Garrity

Stephen C. Garrity
Grace Analytical
Cambridge Center



PRECAST / READY-MIX CONCRETE

J. P. CARRARA & SONS, INC
CONCRETE CONTRACTORS
ARCHITECTURAL / STRUCTURAL PRECAST CONTRACTORS

2464 Case Street
 MIDDLEBURY, VT 05753
 TEL (802) 388-6383
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CROWN POINT, NY 12928
 TEL (518) 597-3680

RT 7 SO.
 NO. CLARENDON, VT 05701
 TEL (802) 775-2301
 FAX (802) 775-1048

CONCRETE MIX DESIGN - Strength Test Records

Mix Specification: 5000 PSI ← 7000 needed
 28" Max Spread
 7.0% +/- 1.5% Air
 Max W/C = 0.40

Record No.	28 Day Break	Record No.	28 Day Break
1	8,058	16	
2	7,541	17	
3	7,661	18	
4	8,376	19	
5	6,983	20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	

need 12 hour and
1 day breaks

Average = 7,724 PSI

# of Tests: 5						
Std. Dev., S_s (ACI 318 - 5.3.1)	Mod. Factor Table 5.3.1.2	Required Avg Strength (T5.3.2.1)			Mix Avg	Pass?
530	$1.1f_c + 700$	(5-1)	(5-2)	f_{cr}	7,724	√
		N/A	N/A	6,200		



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Ready-Mix Concrete Placement Report

Date Submitted: 6/3/2013

Project Name, Location: Hancock Bridge Closure Pour; Rt 125 Hancock, VT

Contractor/Owner: Parent Construction

Mix ID, Description: VT701.04 - High Performance, High Early Strength

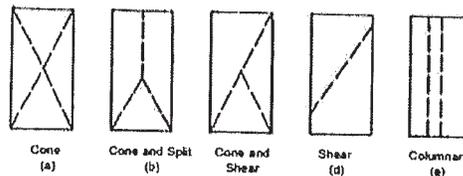


FIG. 2 Sketches of Types of Fracture

Pour Date	Load Sampled	Spread	Air Content	Concrete Temperature	Cylinders Cast	Compressive Strength Results - Avg of (2)			
						24hr	Break Type	28 Day	Break Type
5/30/2013	Single Load, 6.5 yds, M42	26"	5.5%	76°	7	4,755	Cone (a)	7,660	
6/25/2013	Single Load, 8 yds, M57	26"	5.3	77	6	5,272	Cone/split (b)	8,304	
6/26/2013	Single Load, 8 yds, M57	28"	7.1	72	6	4,158	shear (d)	7,190	

Prepared By: _____

Benjamin L. Cota, Production Engineer

