Illinois Tollway

Illinois Tollway
2700 Ogden Avenue
Downers Grove, Illinois 60515-1703
630-241-6800
Fax 630-241-6105

July 18, 2013

Mr. Nyle Anderson
Area Manager
Super Mix, Inc.
2203 Spring Ridge Drive
Spring Grove, IL 60081

Subject: Tollway Performance Related Ternary Concrete Mix Design for Composite Pavements

Dear Mr. Anderson:

The Tollway has received and reviewed the attached mix design for production by Super Mix. The mix design (your mix number 575F1323) has been developed to meet the Tollway's "Performance-Related Special Provision for Ternary Concrete Mix Designs for Composite Pavements." The mix design was developed by your company and submitted to the Tollway for use in the composite concrete pavement construction on Tollway contract I-12-4073.

The virgin material ingredient sources of the attached concrete mix design are IDOT certified to produce the material classifications and / or grades and the aggregate qualities that are indicated on the Tollway's standard A-30 mix design form. This includes the use of "A" quality virgin coarse aggregates. The coarse fractionated reclaimed asphalt pavement (FRAP) is confirmed to be a Category 1 coarse FRAP, meeting the requirements of the Tollway "Coarse Aggregate for Composite Portland Cement Concrete Pavement." As noted in the testing report conducted for the Tollway by S.T.A.T.E. Testing, the agglomerated particle count in the coarse FRAP samples were between 6 and 8 percent, which is less than the 15 percent required. The coarse FRAP proportion is 15 percent of the coarse aggregate, which is between the 15 to 50 percent allowable range for coarse FRAP in the Tollway's "Performance-Related Special Provision for Ternary Concrete Mix Designs for Composite Pavements." The aggregate proportions of the mix design meet the gradation requirements. The supplementary cementitious materials consist of 35 percent of the total cementitious materials, and are within the 35 to 50 percent range allowed by the same special provision.

A trial batch of the proposed ternary concrete mix design, including on-site quality control testing, was conducted by Super Mix at their Belvidere plant on May 24, 2013 and observed by Tollway representatives. Subsequent performance testing of specimens fabricated during the trial batch was conducted for Super Mix by Terracon. The test results are in the attached reports from Terracon, and are summarized here:

1. The Compressive Strength test results (AASHTO T22) indicate a value of 4,120 psi at 5 days and 6,580 psi at 14 days, which achieves the specification requirement of a minimum of 2,850 psi at 5 days and a minimum of 3,500 psi at 28 days. Compressive strength test results were also presented at 7 days, and will be provided for 28 days.
2. The Flexural Strength test results (AASHTO T97) indicate a value of 705 psi at 5 days and 905 psi at 14 days, which achieves the specification requirement of a minimum of 475 psi at 5 days and a minimum of 650 psi at 28 days. Flexural strength test results were also presented at 7 days, and will be provided for 28 days.
3. The Air Void System analysis (ASTM C457) indicates that sample provided from the trial batch did not achieve the specifications for air content, specific spacing and spacing factor.

A subsequent trial batch of the proposed ternary concrete mix design, including on-site quality control testing, was conducted by Super Mix on July 10, 2013 at their Belvidere portable plant located at the Genoa Road interchange, and observed by Tollway representatives. The trial showed successful plastic concrete properties, and subsequent hardened air testing of specimens fabricated during the trial batch was conducted for Super Mix by CTLGroup. The test results in the attached CTLGroup report indicate that the subsequent trial batch mixture contained the sufficient and properly distributed entrained air required in the specification.

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Based on this information and the results described above, the attached Tollway ternary concrete mix design for production by Super Mix (Super Mix mix number 575F1323) is approved for composite concrete pavements on Tollway contracts containing the "Performance-Related Special Provision for Ternary Concrete Mix Designs for Composite Pavements." The ternary concrete mix design is assigned Tollway mix design number 90PCC1323. Each approved mix design is required to be submitted to the Construction Manager for acceptance on any specific Tollway contract. Note that this mix design can only be produced at Super Mix plants using the identical sources shown in the mix design, and a change in material components to this mix design may require redesign of the mixture.

If you have any questions, contact Ross Bentsen at the Tollway office, extension 3968.

Sincerely,

Gregory R. Stukel, P.E.
Deputy Chief of Program Controls/System Integrity

By: Steven L. Gillen
Materials Manager

GRS:SLG
Attachment

cc Ross A. Bentsen, P.E.
1237M, Materials Inspection, C.09.01
LT_Tollway_SLG_1237-SuperMixTernary-90PCC1323_07182013.doc

Illinois State Toll Highway Authority

A-30

Concrete Mix Design Report

DESIGN DATE: 07-15-13 | ISTHA CONTRACT No.: 4073 & 4074

PROJECT LOC: I-90 | SUPPLIER'S MIX No.: 575F1323

CONTRACTOR: K-Five | SUPPLIER: Super Mix, Inc.

PLANT LOC: Genoa Road, Belvidere | PLANT IDOT CODE No.: 5456-09

ISTHA MIX NO.: 90PCC1323 | ISTHA CLASS OF CONCRETE: PV

SPECIFIED COMPRESSIVE STRENGTH (psi): 2850/3200/3500 AT 5/14/28 DAYS AGE

SPECIFIED SLUMP RANGE (Inches): 4" Max. | SPECIFIED AIR CONTENT (%): 5 - 8%

☒ ACCEPTED
☐ ACCEPTED AS NOTED
☐ REJECTED AS NOTED

NAME: _____ ISTHA MATERIALS ENGINEER

DATE: 7/18/13

MATERIAL DESCRIPTION AND SPECIFICATION		WEIGHT PER ONE CUBIC YARD (SSD)
CEMENT Type:	Type I	
CEMENT Source & Code No.:	Illinois Cement - 935-01	
CEMENT Proportion (lbs.):		375
FLY ASH Class:	Class "C"	
FLY ASH Source & Code No.:	MRT - Labadie, MO - 544-07	
FLY ASH Proportion (lbs.):		145
Additional Pozzolan Type:	Ground Granulated Blast Furnace Slag Cement	
Pozzolan Source & Code No.:	Holcim - Skyway - 544-07	
Additional Pozzolan Proportion (lbs.):		60
Additional Pozzolan Type:		
Pozzolan Source & Code No.:		
Additional Pozzolan Proportion (lbs.):		
FINE AGGREGATE Grade/Desription:	027FA02	
FINE AGGREGATE Quality Class:	Absorption: 1.3	
FINE AGGREGATE Source & Code No.:	Spruce Lake S&G - Clear Lake Pit - 50070-13	
FINE AGGREGATE Proportion (lbs.):		1198
COARSE AGG. #1 Grade/Desription:	022CA1101	
COARSE AGG. #1 Quality Class:	Absorption: 1.7	
COARSE AGG. #1 Source & Code No.:	Lee Quarry, Inc. - 50072-02	
COARSE AGGREGATE #1 Proportion (lbs.):		1575
COARSE AGG. #2 Grade/Desription:	PCI FRA02	
COARSE AGG. #2 Quality Class:	Absorption:	
COARSE AGG. #2 Source & Code No.:	Spruce Lake S&G - Clear Lake Pit	
COARSE AGGREGATE #2 Proportion (lbs.):		273
ADDED WATER Quality Description:		
TOTAL WATER Proportion (lbs.):		226
WATER REDUCER ADMIXTURE ASTM Designation:	C494 - Type A	
WATER REDUCER ADMIXTURE Source:	Sika - Plastocrete 100 - #43932	
WATER REDUCER ADMIXTURE Proportion (Fl. Oz.):		23.2
AIR ENTRAINING ADMIXTURE ASTM Designation:	C260	
AIR ENTRAINING ADMIXTURE Source:	Sika - Air 360 - #42185	
AIR ENTRAINING ADMIXTURE Proportion (Fl. Oz.):		4.0
ADDITIONAL ADMIXTURE Description:		
ADDITIONAL ADMIXTURE ASTM Designation:		
ADDITIONAL ADMIXTURE Source:		
ADDITONAL ADMIXTURE Proportion (Unit ____):		
ADDITIONAL ADMIXTURE Description:		
ADDITIONAL ADMIXTURE ASTM Designation:		
ADDITIONAL ADMIXTURE Source:		
ADDITONAL ADMIXTURE Proportion (Unit ____):		

*Attach any trial mix or trial batch test data

REMARKS:

This submittal certifies that the materials to be used conform to the indicated specifications and are of the quality and gradation specified.

Designed by: Nyle Anderson
(Signature)

Title: QC Manager

REV. 8/02

ILLINOIS CEMENT COMPANY
1601 Rockwell Road LaSalle, IL 61301
(815)224-2112

MILL TEST REPORT

Cement Type: I
Production Period: May 1 - 31, 2013
Report Date: July 8, 2013

Chemical Data		Test Result
Al_2O_3 (C 114)	%	5.5
Fe_2O_3 (C 114)	%	2.26
MgO (C 114)	%	2.5
SO_3 (C 114)	%	4.00
Na_2O (C 114)	%	0.39
Ignition Loss (LOI) (C 114)	%	1.9
Equivalent Alkalies (C 150)	%	1.04
Insoluble Residue (C 114)	%	0.50
Limestone (C 150)	%	3.1
$CaCO_3$ in Limestone (C 150)	%	76
CO_2 (C 114)	%	1.1
Potential Cement Phase Composition (C 150-09)		
C_3S	%	55
C_2S	%	13
C_4AF	%	7
C_3A	%	10

Physical Data		Test Result
Air Content (C185)	%	6.5
Blaine Fineness (C204)	cm^2/g	3635
325 Fineness (C430)	% <	94.9
Expansion, Autoclave (C 151)	%	0.13
Expansion, Mortar Bar (C 1038)	%	0.008
Compressive Strength (C109)		
1 day	psi	2718
3 days	psi	4008
7 days	psi	4616
28 days	psi	5526
Time of Setting (Vicat) (C191)		
Initial	min	91
Final	min	210

Notes:

We certify that the above described cement at the time of shipment meets the chemical and physical requirements of the ASTM C 150, and AASHTO M 85 specifications. The above data represents the average for above stated production period.

AASHTO R18

7/8/2013

Kevin Jensen — Date
Chief Chemist

We are an AASHTO accredited laboratory

Analytical Testing Service Laboratories, Inc.

P.O. Box 1118, Joplin, Missouri 64802
(417) 782-6573

Mineral Resource Tech. Inc., A CEMEX Co.
929 Gessner, Suite 1900 Houston
Houston, Texas 77024
1-813-671-2266 ext.114

May 29, 2013

Attn: Oscar Jaramillo

Re: 05805 - Labadie Fly Ash Sample - 3200 Ton Composite - Silo D- 4/10-19/2013

	AASHTO-M295 Class "C" Requirements	ASTM C-618 Class "C" Requirements	Actual
Fineness (+325 Mesh)	34% Max	34% Max	14.00%
Fineness Variation	5.0% Max	5.0% Max	0.30%
Moisture Content	3.0% Max	3% Max	0.15%
Density g/cm^3 C188	****	****	2.75
Density Variation	5.0% Max	5.0% Max	1.09%
Loss on Ignition	5.0% Max	6% Max	0.50%
Soundness	0.8% Max	0.8% Max	0.01%
S.A.I., 7 Days	75% Min	75% Min	100.80%
S.A.I., 28 Days	75% Min	75% Min	103.90%
Water Req. % Control	105% Max	105% Max	94.20%
Silica SiO_2	****	****	32.63%
Aluminum Oxide Al_2O_3	****	****	22.74%
Ferric Oxide Fe_2O_3	****	****	6.01%
Total	50% Min	50% Min	61.38%
Sulfur Trioxide SO_3	5% Max	5.0% Max	1.87%
Calcium Oxide CaO	****	****	26.31%
Magnesium Oxide MgO	****	****	5.80%
Available Alkalies Na_2O	1.50%	****	1.37%

We certify the above was tested in accordance with ASTM C-618 & AASHTO M295.

Analytical Testing Service Laboratories, Inc.

John K. Cupp, Manager

Construction

Product Data Sheet
Edition 5.15.2012
Identification no. 429793
Sika Air-360

Sika® AIR-360

Air Entraining Admixture

Description	Sika AIR-360 is an aqueous solution of a unique, synthetically manufactured surfactant for the air entrainment of concrete. Sika AIR-360 meets or exceeds the requirements of ASTM C 260 and AASHTO M 154.
Applications	Sika AIR-360 increases concrete's durability, making it more resistant to the damaging effects of freezing and thawing, while improving workability and reducing bleeding.
Advantages	Sika AIR-360 is specifically designed for low or no slump concrete. It allows for air entrainment in low slump concrete mixes. ■ Improves resistance to freeze thaw cycles and scaling. ■ Improves workability. ■ Reduces bleeding. ■ Reduces size and number of capillary channels increasing impermeability. ■ Substantially increases durability. ■ Increases moisture retention for cement hydration. ■ Improves air void system.

How to Use

Dosage	The recommended dosage range for Sika AIR-360 is 0.1 to 6.0 ounces per 100 lbs. (7 to 400 ml/100kg) of cementitious material. Various concrete materials, slump, ambient air temperature, additions of pozzolanic materials, mixing time, and type and brand of cement will affect dosage rates. It is suggested that trial mixes be conducted in order to determine the optimum dosage to obtain the required percentage of entrained air. In addition, a regular air test should be performed in order to adjust the dosage to changing conditions. Please consult your local Sika Representative for more information and assistance.
Mixing	Measure the required quantity per batch manually or with automatic dispenser equipment. Add Sika AIR-360 to mixing water or sand. Do not mix with dry cement or other cementitious materials. When used in combination with other admixtures, care must be taken to dispense each admixture separately into the mix. **Combination with other Admixtures:** Combination with other admixtures, may affect the amount of entrained air in the mix. If multiple admixtures are used, actual air content should be verified as per applicable ASTM standards to ensure desired level of air entrainment is achieved. Sika Air-360 is compatible with other Sika admixtures. All admixtures must be added to the concrete mix separately.
Packaging	Sika AIR-360 is available in 55 gallon drum (208 liter), 275 gallon totes (1040 liters) drums and bulk delivery.
Storage and Shelf Life	Sika AIR-360 should be stored at above 40°F (5°C). If frozen, thaw and agitate thoroughly to return to normal state before use. Shelf life when stored in original packaging in dry warehouse conditions between 50°F and 80°F (10°C - 27°C) is 1 year.

Construction

Typical Data

Appearance	Light Yellow Liquid.
Specific Gravity	Approx. 1.01
Caution	**WARNING: IRRITANT.** Contains Sulfonic-acids,-C14-16-alkane-hydroxy-and-C14-16-alkene, -sodium-salts (CAS: 68439-57-6). Causes eye irritation. May cause skin/respiratory tract irritation. May cause gastrointestinal disturbance if swallowed.
Handling and Storage	Avoid direct contact. Wear personal protective equipment (chemical resistant goggles/gloves/clothing) to prevent direct contact with skin and eyes. Use only in well ventilated areas. Open doors and windows during use. Use a properly fitted NIOSH respirator if ventilation is poor. Wash thoroughly with soap and water after use. Remove contaminated clothing and launder before reuse.
First Aid	**Eyes** – Hold eyelids apart and flush thoroughly with water for 15 minutes. **Skin** – Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. **Inhalation** – Remove to fresh air. **Ingestion** – Do not induce vomiting. Dilute with water. Contact physician. **In all cases contact a physician immediately if symptoms persist.**
Clean Up	Use personal protective equipment (chemical resistant gloves/ goggles/clothing). Without direct contact, sweep up spilled or excess product and place in suitable sealed container. Dispose of excess product and container in accordance with applicable local, state, and federal regulations.

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1-800-933-SIKA

Regional Information and Sales Centers. For the location of your nearest Sika representative, contact your regional center.

U.S.: **North East Region:** Fairless Hills, PA, Phone: (215) 295-8600 **North Central Region:** Marion, OH, Phone: (800) 851-1545
South East Region: Conyers, GA, Phone: (770) 760-1300 **South Central Region:** Mesquite, TX, Phone: (972) 289-8480
Western Region: Santa Fe Springs, CA, Phone: (562) 903-3650

Canada: **Ontario:** Mississauga, ON, Phone: (905) 795-3177, **Alberta:** Edmonton, AB, Phone: (780) 486-8111

Quality Certification Numbers: Lyndhurst: FM 59711 (ISO 9000), FM 70421 (QS 9000), Marion: FM 66715, Kansas City: FM 68107, Santa Fe Springs: FM 69468

Construction

Product Data Sheet
Edition 4.9.2012
Identification no.
Plastocrete 100

Plastocrete® 100

Water Reducing Admixture

Description

Plastocrete 100 is a lignosulphonate based water-reducing admixture. Plastocrete 100 meets the requirements of ASTM C-494 Type A.

Applications

Plastocrete 100 is recommended for use in the production of conventional ready mixed concrete, whenever increased plasticity and higher ultimate strengths are desired.

Plastocrete 100 offers economical solutions in applications such as :

- Concrete slabs
- Concrete footings
- Concrete paving
- Harsh mix designs with low cement content

Benefits

Plastocrete 100 water reducing admixture provides a highly economical reduction of mixing water required to produce concrete of a desired slump. Dispersing action of the admixture increases surface area of the cement particles available for hydration. Plastocrete 100 is formulated as a Type A water reducer .

- Reduced water content required to achieve desired slump, increases compressive and flexural strengths and allows the use of more economical mixes.
- Improved paste quality makes concrete easier to pump and finish.
- Lower water cement ratios provide decreased permeability and increased durability.
- Plastocrete 100 does not contain intentionally added chlorides and will not initiate nor promote the corrosion of steel in the concrete.

How to Use

Dosage

Addition rates of 2-6 fl. oz./100 lbs.(130 - 390 ml/100 kg) of cementitious are recommended for general concrete applications.

Mixing

For best plasticizing results, Plastocrete 100 should be added directly to freshly mixed concrete in the concrete mixer at the end of the batching cycle. Plastocrete 100 may also be dispensed as an integral material during the regular admixture batching cycle, or into freshly mixed concrete in a Ready-Mix truck at the concrete plant or job site. To optimize the superplasticizing effect, Sika recommends that the combined materials be mixed for 80-100 revolutions, either in the concrete mixer or in the Ready-Mix truck.

Combination with other Admixtures: Plastocrete 100 is highly effective as a single admixture or in combination with other admixtures. When used in combination with other admixtures, dispense each admixture separately into the concrete. Do not mix with dry cement. Please contact your local regional office or Technical Service Department at 1-800 933 7452 for further information.

Combination with Puzzolanic Materials: Plastocrete 100 can be successfully used in mix designs utilizing pozzolanic materials such as fly ash and GGBFS.

Construction

Packaging	Plastocrete 100 is available in 55 gallon drum (208 liter), 275 gallon totes (1040 liters) and bulk delivery.
Storage and Shelf Life	Plastocrete 100 should be stored at above 40°F (5°C). If frozen, thaw and agitate thoroughly to return to normal state. Shelf life when stored in dry warehouse conditions between 50°F and 80°F (10°C - 27°C) is one year.

Typical Data

Appearance	Dark Brown Liquid
Specific Gravity	Approximately 1.10
Caution	**IRRITANT.** May cause eye/skin/respiratory irritation. May be harmful if swallowed.
Handling and Storage	Avoid direct contact. Wear personal protective equipment (chemical resistant goggles/gloves/clothing) to prevent direct contact with skin and eyes. Use only in well ventilated areas. Open doors and windows during use. Use a properly fitted NIOSH respirator if ventilation is poor. Wash thoroughly with soap and water after use. Remove contaminated clothing and launder before reuse.
First Aid	**Eyes** – Hold eyelids apart and flush thoroughly with water for 15 minutes. **Skin** – Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. **Inhalation** – Remove to fresh air. **Ingestion** – Do not induce vomiting. Dilute with water. Contact physician. **In all cases contact a physician immediately if symptoms persist.**
Clean Up	Use personal protective equipment (chemical resistant gloves/goggles/clothing). Without direct contact, sweep up spilled or excess product and place in suitable sealed container. Dispose of excess product and container in accordance with applicable local, state, and federal regulations.

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Quality Certification Numbers: Lyndhurst: FM 69711 (ISO 9000), FM 70421 (QS 9000), Marion: FM 66716, Kansas City: FM 66107, Santa Fe Springs: FM 69409

Super Mix, Inc.

Field / Lab Gradations

ID Number

Inspector No. 920000000 | Inspector Name: Nyle Anderson | Date Sampled: 04/01/13 | Seq. No.

Mix Plant No. 5456-03 | Mix Plant Name: Super Mix - Belvidere | Contract No. | Job No.

Responsible Loc. 91 | Lab. PP | Lab Name: Super Mix, Inc. | Source Name: Lee Quarry, Inc.

Source	Material Code	Type Insp.	Orig I.D. #	Insp.Qty.	Spec.	Article	Sample From	Wash/Dry
50072-02	020CM11	PRO					SP	W

CA	3"	2.5"	2"	1.75"	1.5"	1"	3/4"	5/8"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200
						100	94	75	44	13	4		4				2.4

Wash 0.075 | PI Ratio | Test Results: Fail | Remarks

Sieve FA	Indv. Wt. Retained	Cumul. Wt. Retained	Cumul. % Retained	Percent % Passing	Spec. Range % Passing
3"					
2.5"					
2"					
1.75"					
1.5"					
1"	0	0.0	0	100.0	100
3/4"	309	309.1	6	94.3	100 - 84
5/8"	1050	1358.8	25	75.1	
1/2"	1704	3062.3	56	43.9	47 - 31
3/8"	1667.6	4729.9	87	13.3	
1/4"	484	5214.3	96	4.4	
#4	9.3	5223.6	96	4.2	12 - 0
#8					
#16	38.0	5261.6	96	3.5	6 - 0
#30					
#40					
#50					
#100					
#200	58.8	5320.4	98	2.4	0 - 2.5
Pan	9.2	5329.6			
Total Dry Wt.	5453.9				
Total Washed Wt.	5329.6				
Diff. -0.0075 (-200)	124.3	% Washed - 0075		2.3%	

Wet Weight 5639

Sampled From Codes			
BR	Barge	RD	Road
BE	Belt Stream	SI	Silo / Bin
CF	Cold Feed	SP	Stockpile
HB	Hot Bin	TD	Truck Dump
OB	On Belt	TK	Truck
PR	Production	WB	Weigh Belt
CR	Rail Car		

0.075
0.425

(Mix Plant Only)

Lot
Bin

Copies: Tester

Agency

MISTIC INPUT

Date Entered
Initials

Super Mix, Inc.

Field / Lab Gradations

ID Number

Inspector No. 920000000 | Inspector Name: Nyle Anderson | Date Sampled: 04/03/13 | Seq. No.

Mix Plant No. 5456-03 | Mix Plant Name: Super Mix - Belvidere | Contract No. | Job No.

Responsible Loc. 91 | Lab. PP | Lab Name: Super Mix, Inc. | Source Name: Curran - DeKalb

Source	Material Code	Type Insp.	Orig I.D. #	Insp.Qty.	Spec.	Article	Sample From	Wash/Dry
Curran - Dekalb	FRAP	PRO					SP	W

CA	3"	2.5"	2"	1.75"	1.5"	1"	3/4"	5/8"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200
										87	15	7	7	0	0	0	6.5

Wash 0.075 | PI Ratio | Test Results | Remarks

Sieve FA	Indiv. Wt. Retained	Cumul. Wt. Retained	Cumul. % Retained	Percent % Passing	Spec. Range % Passing
3"					
2.5"					
2"					
1.75"					
1.5"					
1"					
3/4"					
5/8"					
1/2"	0	0.0	0	100.0	
3/8"	295.5	295.5	13	86.9	
1/4"	1171.4	1466.9	65	34.9	
#4	443.8	1910.7	85	15.1	
#8	194.2	2104.9	93	6.5	
#16	0.0	2104.9	93	6.5	
#30					
#40					
#50					
#100					
#200	0.0	2104.9	93	6.5	
Pan	147.1	2252.0			
Total Dry Wt.	2251.8				
Total Washed Wt.	0				
Diff. -0.0075 (-200)	2251.8	% Washed - .0075		100.0%	

Sampled From Codes			
BR	Barge	RD	Road
BE	Belt Stream	SI	Silo / Bin
CF	Cold Feed	SP	Stockpile
HB	Hot Bin	TD	Truck Dump
OB	On Belt	TK	Truck
PR	Production	WB	Weigh Belt
CR	Rail Car		

0.075
0.425

(Mix Plant Only)

Lot
Bin

Copies: Tester

Agency

MISTIC INPUT

Date Entered

Initials

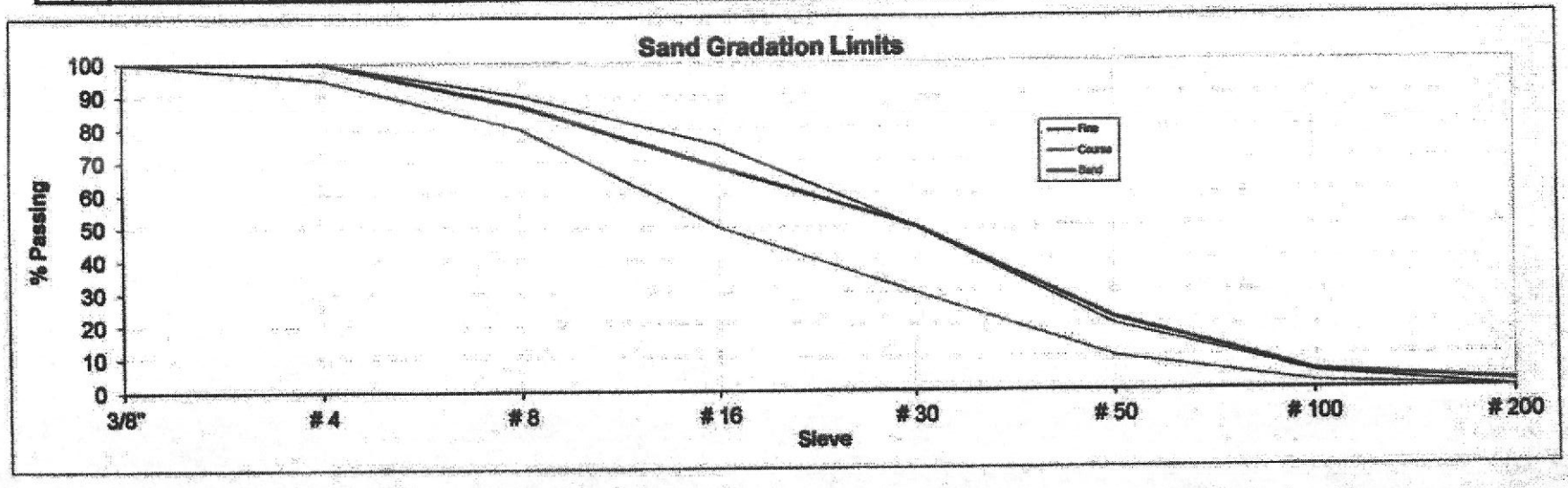
Wet Weight 0

Moisture -2252 ##### - 1.2% Abs. -101.20%

	lb			1575 lb			273 lb			1166 lb			608 lb			
	% Passing															
	Clear Lake CA5	Lb. Ret.	Vol. Ret.	Lee CA11	Lb. Ret.	Vol. Ret.	FRAP	Lb. Ret.	Vol. Ret.	Clear Lake FA2	Lb. Ret.	Vol. Ret.	Paste	Lb. Ret.	Vol. Ret.	Total Agg. Lb. Ret.
1 1/2"	95.5	0	0.00	100.0	0	0.00	100.0	0	0.00	100.0	0	0.00	100.0	0	0.00	0.0
1"	58.9	0	0.00	100.0	0	0.00	100.0	0	0.00	100.0	0	0.00	100.0	0	0.00	0.0
3/4"	6.8	0	0.00	94.3	90	0.54	100.0	0	0.00	100.0	0	0.00	100.0	0	0.00	89.8
1/2"	2.0	0	0.00	34.3	1035	6.28	100.0	0	0.00	100.0	0	0.00	100.0	0	0.00	1034.8
3/8"	2.0	0	0.00	8.1	1447	8.79	86.9	36	0.22	100.0	0	0.00	100.0	0	0.00	1483.2
# 4	1.1	0	0.00	3.0	1528	9.27	15.1	232	1.43	100.0	0	0.00	100.0	0	0.00	1759.5
# 8	1.1	0	0.00	3.0	1528	9.27	8.5	255	1.58	87.0	156	0.94	100.0	0	0.00	1938.7
# 16	1.1	0	0.00	2.7	1532	9.30	8.5	255	1.58	66.3	360	2.30	100.0	0	0.00	2167.5
# 30	1.1	0	0.00	2.7	1532	9.30	8.5	255	1.58	50.1	596	3.82	100.0	0	0.00	2385.5
# 50	1.1	0	0.00	2.7	1532	9.30	8.5	255	1.58	32.0	934	5.88	100.0	0	0.00	2722.2
# 100	1.1	0	0.00	2.7	1532	9.30	8.5	255	1.58	5.3	1135	6.88	100.0	0	0.00	2922.2
# 200	0.5	0	0.00	2.1	1542	9.36	8.5	256	1.58	2.0	1174	7.12	100.0	0	0.00	2971.2
# 325		0	0.00		1575	9.56		273	1.69		1166	7.26	94.6	44	0.22	3046.0
Liquid		0	0.00		1575	9.56		273	1.69		1166	7.26	72.0	226	1.15	3046.0

100.0%
27.0 3046.0

Comb % Passing			Comb % Retained		ACI 302 Sand Gradations	
Mix	Aggr's	Tollway Limits	Cumul.	Individ.		
100.0%	100.0%	100.0%	0.0%	0.0%		
100.0%	100.0%	100.0%	0.0%	0.0%		
98.0%	97.1%	85-98%	2.9%	2.9%		
70.7%	66.0%	60-80%	34.0%			
66.6%	51.3%	50-75%	48.7%	14.7%	100	100
60.3%	42.2%	40-52%	57.8%	9.1%	95	100
56.3%	36.4%	33-43%	63.6%	5.9%	80	90
51.2%	28.8%	25-36%	71.2%	7.5%	50	75
48.3%	21.7%	15-25%	78.3%	7.2%	30	50
39.7%	10.6%	5-15%	89.4%	11.1%	10	20
34.2%	4.1%	1-8%	95.9%	6.6%		5
33.1%	2.5%	1-6%	97.5%	1.6%	0	0
30.6%	0.0%		100.0%	2.5%		
27.2%	0.0%		100.0%	0.0%		



S.T.A.T.E. TESTING, L.L.C.

570 Rock Road, Unit K
East Dundee, IL 60118

Tele: 847-836-600
Fax: 847-836-634

Agglomerated particles (Bitumen)

Producer	Clear Lake
Date	061313
Material Code	

	Sample A	Sample B
Total weight of sample:	1083.7	1051.1
Clean rock/solid particles:	1015.5	969.1
Agglomerated bitumen particles:	68.2	82
% of total agglomerated bitumen particles:	6.3	7.8

Notes / Remarks

ISTHA TRIAL BATCH WORK FORM

PLANT: Super Mix **PLANT LOCATION:** Belvidere **DATE:** 5/24/2013

MIX NUMBER: 575F1323 **CLASS:** PV **FILE NAME:**

CUBIC YARD (BATCHED): 4 **DESIGN W/C RATIO:** 0.39

MATERIAL	BATCHED	MIX DESIGN	ACTUAL / CY	DIFFERENCE
CEMENT:	1485	375	371	-4
COMP= 1 CLASS C - FLY ASH:	575	145	144	-1
SILICA FUME (MICRO SILICA):			0	0
GROUND GRANULATED BLAST FURNACE SLAG:	240	60	60	0
FINE AGGREGATE: FA 02	4960	1198	1185	-13
FINE AGGREGATE: FA				
COARSE AGGREGATE: FRAP	1120	273	278	5
COARSE AGGREGATE: CA 11	6240	1575	1560	-15
WATER:	74.9 gals	226 lbs	221 lbs	-5 lbs
AIR:	14.0 fl.oz	3.5 fl.oz	3.5 fl.oz	0 fl.oz
WATER REDUCER:	92.0 fl.oz	23.0 fl.oz	23.0 fl.oz	0 fl.oz
RETARDER:	fl.oz	fl.oz	fl.oz	fl.oz
SUPER PLASTICIZER:	fl.oz	fl.oz	fl.oz	fl.oz
ACCELERATOR:	fl.oz	fl.oz	fl.oz	fl.oz

MATERIAL	TOTAL AGG. MOISTURE	ABSORPTION	FREE MOISTURE
FINE AGGREGATE: FA 02	5.73%	1.30%	4.43%
FINE AGGREGATE: FA			
COARSE AGGREGATE: FRAP	0.60%	0.00%	0.60%
COARSE AGGREGATE: CA 11	1.70%	1.70%	0.00%

MATERIAL	MIX'S TOTAL WATER CONTENT	
	WEIGHT / YD	GAL. WATER / YD
FINE AGGREGATE: FA 02	54.93	6.59
FINE AGGREGATE: FA		
COARSE AGGREGATE: CA	1.68	0.20
COARSE AGGREGATE: CA 11	0.00	0.00
MINERAL ADMIXTURE WATER:	fl.oz	
CHEMICAL ADMIXTURE WATER:	fl.oz	
BATCHED WATER:	156.08	18.73
WATER ADDED:	8.34	4.00
TOTAL WATER:	221.03 lbs	26.52 gals

DESIGN W/C RATIO: 0.390

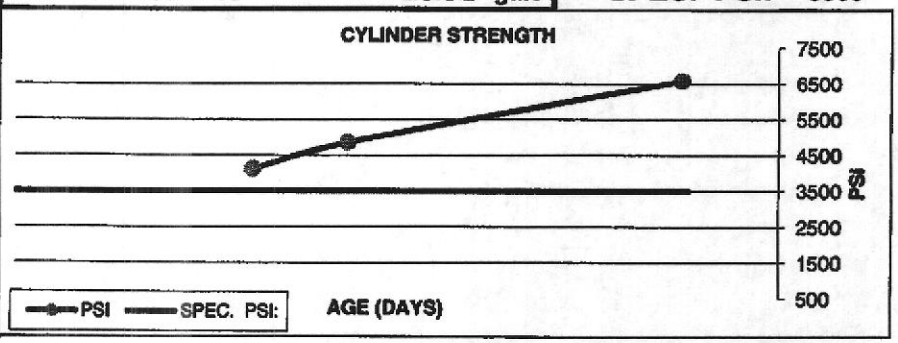
MIX'S W/C RATIO: 0.384

W/C RATIO DIFFERENCE: -0.006

(Gallons is the total batch)

SPEC. PSI: 3500

CYLINDER STRENGTH			% AIR
AGE (DAYS)	PSI		5.1%
5	4120	117.7%	SLUMP
7	4860	138.9%	2.00
14	6580	188.0%	AIR TEMP
			52.0 F
			CONC
			TEMP
			68.0 F



REMARKS: No absorption info provided for FRAP; 0% absorption value used to reflect free moisture in calculations

CONCRETE COMPRESSIVE STRENGTH TEST REPORT

Report Number: 19136301.0003
Service Date; 05/24/13
Report Date: 06/07/13 Revision 2 - 14-day results
Task:

Terracon
4836 Colt Road
Rockford, IL 61109
815-873-0990

Client

Super Mix Inc
Attn: Nyle Anderson
5435 Bull Valley Road
Suite 103
McHenry, IL 60050

Project

Super Mix Laboratory Testing
6825 Irene Road
Belvidere, IL

Project Number: 19136301

Material Information

Specified Strength:

Mix ID:
Supplier:
Batch Time: **Plant:**
Truck No.: **Ticket No.:**

Sample Information

Sample Date: 05/24/13 **Sample Time:**
Sampled By: Contractor Made
Weather Conditions:
Accumulative Yards: **Batch Size (cy):**
Placement Method:
Water Added Before (gal):
Water Added After (gal):
Sample Location:
Placement Location: Mix design

Field Test Data

Test	Result	Specification
Slump (in):		
Air Content (%):		
Concrete Temp. (F):		
Ambient Temp. (F):		
Plastic Unit Wt. (pcf):		
Yield (Cu. Yds.):		

Laboratory Test Data

Set No.	Specimen ID	Avg Diam. (in)	Area (sq in)	Date Received	Date Tested	Age at Test (days)	Maximum Load (lbs)	Compressive Strength (psi)	Fracture Type
3	A	6.00	28.27		05/29/13	5	112,950	4,000	2
3	B	6.00	28.27		05/29/13	5	119,490	4,230	3
						Average (5 days)		4,120	
3	C	6.00	28.27		05/31/13	7	129,430	4,580	3
3	D	6.00	28.27		05/31/13	7	144,910	5,130	2
						Average (7 days)		4,860	
3	E	6.00	28.27		06/07/13	14	182,180	6,440	5
3	F	6.00	28.27		06/07/13	14	189,940	6,720	3
						Average (14 days)		6,580	
3	G	6.00	28.27		06/21/13	28			
3	H	6.00	28.27		06/21/13	28			

Comments: Not tested for plastic unit weight.

CONCRETE COMPRESSIVE STRENGTH TEST REPORT

Report Number: 19136301.0003
Service Date: 05/24/13
Report Date: 06/07/13 Revision 2 - 14-day results
Task:

Terracon
4836 Colt Road
Rockford, IL 61109
815-873-0990

Client

Super Mix Inc
Attn: Nyle Anderson
5435 Bull Valley Road
Suite 103
McHenry, IL 60050

Project

Super Mix Laboratory Testing
6825 Irene Road
Belvidere, IL

Project Number: 19136301

Services:

Terracon Rep.: Contractor Made
Reported To:
Contractor:
Report Distribution:
(1) Super Mix Inc, nyles@supermixinc.com

Reviewed By:
Douglas A. Waldeier
Construction Manager

Test Methods:

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

CONCRETE BEAM FLEXURAL STRENGTH TEST REPORT

Report Number: 19136301.0002
Service Date: 05/24/13
Report Date: 06/07/13 Revision 2 - 14-day breaks
Task:

Terracon
4836 Colt Road
Rockford, IL 61109
815-873-0990

Client

Super Mix Inc
Attn: Nyle Anderson
5435 Bull Valley Road
Suite 103
McHenry, IL 60050

Project

Super Mix Laboratory Testing
6825 Irene Road
Belvidere, IL

Project Number: 19136301

Material Information

Specified Strength:

Mix ID:
Supplier:
Batch Time: **Plant:**
Truck No.: **Ticket No.:**

Sample Information

Sample Date: 05/24/13 **Sample Time:**
Sampled By: Contractor Made
Weather Conditions:
Accumulative Yards: **Batch Size (cy):**
Placement Method:
Water Added Before (gal):
Water Added After (gal):
Samples Were: Molded
Sample Location:
Placement Location: Mix design

Field Test Data

Test	Result	Specification
Slump (in):		
Air Content (%):		
Concrete Temp. (F):		
Ambient Temp. (F):		
Plastic Unit Wt. (pcf):		

Laboratory Test Data (Third-Point Loading)

Set No.	Specimen ID	Average Width (in)	Average Depth (in)	Span Length (in)	Date Received	Date Tested	Age at Test (days)	Max Load (lbs)	Modulus of Rupture (psi)
2	A	6.00	6.00	18		05/29/13	5	6,450	715
2	B	6.10	6.05	18		05/29/13	5	6,250	695
								Average (5 days)	**705**
2	C	6.10	6.05	18		05/31/13	7	6,600	730
2	D	6.10	6.15	18		05/31/13	7	6,200	670
								Average (7 days)	**700**
2	E	6.05	6.00	18		06/07/13	14	8,700	885
2	F	6.00	6.05	18		06/07/13	14	9,000	920
								Average (14 days)	**905**
2	G			18		06/21/13	28		
2	H			18		06/21/13	28		

Curing Method: Samples cured in humid-controlled environment **Bearing Surface:** Leather Shims Used
Comments: **Not tested for plastic unit weight.**

CONCRETE BEAM FLEXURAL STRENGTH TEST REPORT

Report Number: 19136301.0002
Service Date: 05/24/13
Report Date: 06/07/13 Revision 2 - 14-day breaks
Task:

Terracon
4836 Colt Road
Rockford, IL 61109
815-873-0990

Client

Super Mix Inc
Attn: Nyle Anderson
5435 Bull Valley Road
Suite 103
McHenry, IL 60050

Project

Super Mix Laboratory Testing
6825 Irene Road
Belvidere, IL

Project Number: 19136301

Services:

Terracon Rep.: Contractor Made
Reported To:
Contractor:
Report Distribution:
(1) Super Mix Inc, nyles@supermixinc.com

Reviewed By:
Douglas A. Waldeier
Construction Manager

Test Methods:
The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

Terracon

June 10, 2013

Mr. Nyle Anderson
QC Manager
Super Mix Inc.
5435 Bull Valley road, suite 103
McHenry, IL 60050

Re: Results of Air Void System Analyses of One Concrete Cylinder
Project: Super Mix Laboratory Testing
Terracon Project No. 19136301
Terracon Lab No. 3387

Dear Mr. Anderson,

The writer has completed air void system analyses on one 6" diameter x 12" concrete cylinder in accordance with ASTM Method C-457. The cylinder was obtained by Terracon, Rockford, Illinois personnel and was received at the Terracon, Cincinnati, Ohio, materials laboratory on June 3, 2013.

The cylinder bore no identification and was assigned Lab No. 3387. Results of the analysis are tabulated below.

TABLE
AIR VOID SYSTEM ANALYSES
(ASTM C-457)

Terracon Lab #	Length of Traverse, (in)	Air Content (%)	Void Frequency (Voids/in)	Average Chord Length, (in)	Specific Surface (in^2/in^3)	Void Spacing Factor (in)
3387	134.7	1.78	2.64	0.0067	597.0	0.0141

The sample does not comply with Tollway requirements with respect to any of the parameters. The sample does not meet minimum air content (1.78% actual vs. 4.0% required); specific surface (597.0 in^2in^3 actual vs. 630 in^2in^3 required); and spacing factor (0.0141 in. actual vs. 0.008 in. required).

Terracon appreciates the opportunity to have provided these services. Please contact either of the undersigned with any questions.

Respectfully submitted,
Terracon

Terry Stransky, P.G.
Senior Geologist / Petrographer

Tim Goodall,
Laboratory Manager

ISTHA TRIAL BATCH WORK FORM

PLANT: Super Mix **PLANT LOCATION:** Genoa Road **DATE:** 7/10/2013

MIX NUMBER: 575F1323 **CLASS:** Black Rock **FILE NAME:**

CUBIC YARD (BATCHED): 8.25 **DESIGN W/C RATIO:** 0.39

MATERIAL	BATCHED	MIX DESIGN	ACTUAL / CY	DIFFERENCE
CEMENT:	3080	375	373	-2
COMP= 1 CLASS C - FLY ASH:	1200	145	145	0
SILICA FUME (MICRO SILICA):			0	0
GROUND GRANULATED BLAST FURNACE SLAG:	495	60	60	0
FINE AGGREGATE: FA 02	10140	1198	1204	6
FINE AGGREGATE: FA				
COARSE AGGREGATE: CA 11	13000	1575	1574	-1
COARSE AGGREGATE: CA 16	2360	273	286	13
WATER:	195 gals	226 lbs	224 lbs	-2 lbs
AIR:	38 fl.oz	2 fl.oz	2 fl.oz	0 fl.oz
WATER REDUCER:	191 fl.oz	23.2 fl.oz	23 fl.oz	0 fl.oz
RETARDER:	fl.oz	fl.oz	fl.oz	fl.oz
SUPER PLASTICIZER:	fl.oz	fl.oz	fl.oz	fl.oz
ACCELERATOR:	fl.oz	fl.oz	fl.oz	fl.oz

MATERIAL	TOTAL AGG. MOISTURE	ABSORPTION	FREE MOISTURE
FINE AGGREGATE: FA 02	3.31%	1.30%	2.01%
FINE AGGREGATE: FA			
COARSE AGGREGATE: CA 11	1.83%	1.70%	0.13%
COARSE AGGREGATE: CA 16	0.00%	0.00%	0.00%

MATERIAL	MIX'S TOTAL WATER CONTENT	
	WEIGHT / YD	GAL. WATER / YD
FINE AGGREGATE: FA 02	24.70	2.96
FINE AGGREGATE: FA		
COARSE AGGREGATE: CA 11	2.05	0.25
COARSE AGGREGATE: CA 16	0.00	0.00
MINERAL ADMIXTURE WATER:	fl.oz	
CHEMICAL ADMIXTURE WATER:	fl.oz	
BATCHED WATER:	197.02	23.64
WATER ADDED:		0.00
TOTAL WATER:	223.78 lbs	26.85 gals

DESIGN W/C RATIO: 0.390

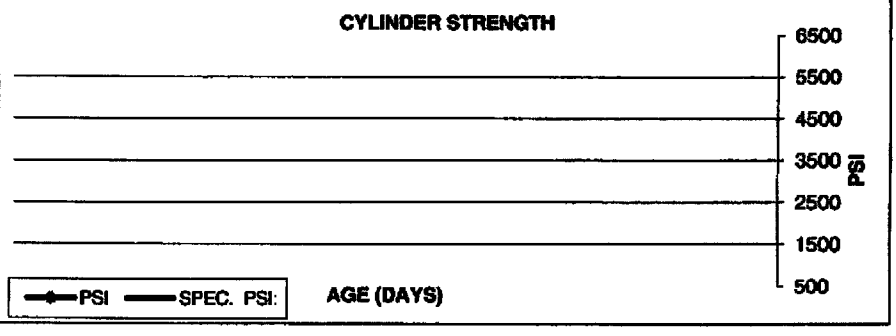
MIX'S W/C RATIO: 0.387

W/C RATIO DIFFERENCE: -0.003

(Gallons is the total batch)

SPEC. PSI: 6000

CYLINDER STRENGTH			%AIR
AGE (DAYS)	PSI		
			SLUMP
			AIR TEMP
			CONC TEMP



REMARKS:

July 17, 2013

Nyle Anderson
Super Mix Inc.
5435 Bull Valley Road #130
McHenry, IL 60050

Phone: 847-815-6366
E-mail: nylea@supermixinc.com

Tollway Qualification – C457 Testing
CTLGroup Project No. 057168

Dear Mr. Anderson:

Attached are the results of qualification testing for the submitted concrete cylinder tested in accordance with hardened air-void system analysis (ASTM C457). The cylinder was submitted to CTLGroup on July 11, 2013 for testing. The results are enclosed.

We appreciate the opportunity to work with you on this project. Please let us know if you have any questions or concerns.

Sincerely,

CTLGroup - *An AASHTO Accredited Laboratory – Aggregates, Cement & Concrete*

Matthew D'Ambrosia, PhD, PE (IL)
Senior Engineer
MDambrosia@CTLGroup.com
Phone: (847) 972-3264

Jessica Slater
Materials Consulting
JSlater@CTLGroup.com
Phone: (847) 972-3320

REPORT OF AIR-VOID SYSTEM ANALYSIS
ASTM C457 Modified Point-Count Method (Procedure B)

CTLGroup Project No.: 057168
Client: Super Mix
Client Project: Tollway Qualification
Maximum Size Aggregate: N/A

Report Date: 7/15/13
Sample Received: 7/11/13
Tested By: Qiang Li
Approved By: A. Bentivegna

Client Sample ID	CTLGroup Sample ID	Total Air Content (%)	Spacing Factor (in.)	Specific Surface ($in.^2/in.^3$)	No. Voids/ Inch	Paste Content (%)	Paste-Air Ratio
Frap I	N/A	6.95	0.0031	960	16.7	20.7	3.0

Area Tested ($in.^2$): 12 Length of Traverse (in.): 95 Number of Points: 1425

Sample Location & Orientation: Concrete cylinder.

Orientation and Position of Cut Surfaces: The concrete cylinder was cut in half longitudinally and one of the halves was lapped for testing.

Magnification during Test: 100X.

Notes: 1. Results refer specifically to the sample submitted.
2 For additional information consult ASTM C457-10, Appendix (X1. Interpretation of Results).
3. This report may not be reproduced except in its entirety.