

SHOP DRAWING REVIEW FORM AND TRANSMITTAL

DATE: October 27, 2021

TO: Carl Hendrickson
Project Manager
Veolia Water
825 West Water Street
Taunton, MA 02780

FROM: Michael Andrus, P.E.
Project Manager
BETA Group, Inc.
701 George Washington Hwy
Lincoln, Rhode Island 02865

RE: City of Taunton, MA
WWTF Phase 1 Improvements
Contract S-2021-1

Shop Drawing No. 03300-01 – Concrete Mix Design (Structural)

BETA COMMENTS:

<u>Item</u>	<u>Action Code</u>	<u>Description/Comments</u>
1	1	Concrete Mix Design – 5,000 psi (Redi-Mix) 1. Acceptable as submitted.

Action Codes

- 1 - No Exception Taken
- 2 - Make Corrections Noted
- 3 - Amend and Resubmit
- 4 - Rejected, See Remarks

- a. Installation shall proceed only when Action Code is '1' or '2'.
- b. Submittals action coded '3' shall be resubmitted within time limit set in Contract.
- c. Review does not relieve Contractor from responsibility of compliance with the Contract Documents.



PROJECT: 9900. - Veolia/Taunton WWTF Phase 1 Improvements

DATE: 10/05/2021

SUBMITTAL: 03300-01 - Concrete Mix Design Structural

REVISION: 0

STATUS: Eng

SPEC #: 03300

TO:
Michael Andrus
 Beta Group Inc.
 6 Blackstone Place
 Lincoln, RI 02865
 MAndrus@BETA-Inc.com

FROM:
Ryan Murphy
 Hart Engineering Corporation
 800 Scenic View Drive
 Cumberland, RI 02864
 rmurphy@hartcompanies.com

Item	Revision	Description	Status	Date Sent	Date Returned
03300-01	0	Concrete Mix Design Structural	Eng	10/05/2021	
Notes:					

SHOP DRAWING REVIEW

1 – Approved
 2 – Approved as Noted
 3 – Revise and Resubmit
 4 - Rejected
 5 – Record File Only – No Action Taken

(Above Check Designates Action Code – See Review Comments)

IMPORTANT NOTE FOR CONTRACTOR

Review is only for general compliance with the design concept and information provided in Contract Documents. Corrections and comments made on the Shop Drawings during review do not relieve the Contractor from compliance with the requirements of the plans and specifications. Review and/or approval of a specific item shall not include review or approval of an assembly of which the item is a component. No approval or correction of a Shop Drawing shall be construed as an order for extra work. The Contractor is responsible for: all quantities and dimensions to be confirmed and correlated; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work with that of all trades and subcontractors; and performing all Work in a safe and satisfactory manner.

BETA GROUP, INC. Checked By: TW

By: BN Date: 10/21/21

Additional Notes:

Status Codes

- 1-APP – No Exceptions Taken
- 2-ANR – Make Corrections Noted
- 3-R&R – Revise and Resubmit
- 4-REJ – Rejected
- 5-IPO – For Information Purposes Only
- 6-NRR – Not Required for Review
- ENG – Submitted to Engineer

Sincerely,
 Hart Engineering Corporation

DATE: 10/05/2021

REDI MIX SERVICES INC

120 Berkley Street
Taunton, Mass. 02780

Phone
Fax

(508) 823-0771
(508) 823-7305

Project: Taunton WWTP

Contractor: Hart Engineering

Presented below is a mix design proportioned to produce one cubic yard of concrete to meet the requirements of Section 033000 of this projects sepcifications.

The mix quantities have been developed in accordance with ACI Standards 301 based upon the specific charectereistics of the material proposed use.

MIX #		50500AE
STRENGTH	PSI	5000
C.A. SIZE	INCH	3/4" Blend
USE		ALL
CEMENT	LBS.	700
FINE AGG	LBS.	1150
COARSE AGG	LBS.	1800
WATER	GAL	36.0
W/C RATIO		0.428
SLUMP	INCHES	4-6" +/-1
AIR CONTENT	%	5-7% +/-1
SIKA 686	OZ	35.25
SIKA AEA 14	OZ	2.20

* Slump at Point Of Placement

Remarks: The mix quantities stated are basic quantities for aggregates in a saturated surface dry condition. These quantities will be adjusted for specific moisture content, workability, slump, and yield at the time of batching.

Notes: Mid Range Water Reducer Included in Mix Deign. Pumpable Mix.

9/17/2021 TJH

LEHIGH

HEIDELBERGCEMENT Group

Mill Test Certificate Report

Type: **I-II ASTM, I-I AASHTO**

Test Period: **02/10/21**
to: **02/10/21**

Grind Number: **Canakkale Import Cement, Lot 2**

Certification

Lehigh Cement Company, LLC certifies that at time of shipment, the portland cement designated as Type I-II manufactured at the Akcansa, Canakkale, Turkey plant conforms to the standard composition and physical requirements of the current Standard Specification for Portland Cement of ASTM C 150 and AASHTO M85 for Type I and Type II portland cement. This certification carries no other express or implied warranties and Lehigh Cement Company LLC, is not responsible for improper use or workmanship of the described cement.

General Information

Supplier: **Lehigh Cement Company LLC**
Address: **55 Field Point Dr
Providence, RI 02905**
Telephone: **800-833-4157**

Source Location: **Canakkale, Turkey**
Contact: **Sales Office**

Test Data on ASTM "Standard" Requirements

Chemical Requirements (ASTM C-150, Table 1)			Physical Requirements (ASTM C-150, Table 3)		
Item	Limit	Results	Item	Limit	Results
SiO ₂	A	19.39	Fineness:		
Al ₂ O ₃	6.0 Max	4.48	% Passing 45µm (No. 325)	A	95.37
Fe ₂ O ₃	6.0 Max	3.26	Blaine Fineness (m ² /Kg)	250 min	364
CaO	A	63.78			
MgO	6.0 max	2.87	Autoclave Expansion (%)	0.8 max	0.01
SO ₃	D	2.60	Vicat Setting Time:		
Loss on Ignition	3.5 max	2.16	Initial Set (minutes)	45 min	125
Na ₂ O	A	0.04			
K ₂ O	A	0.80	Air Content (%)	12 max	7.3
Insoluble Residue	1.5 max	0.58			
CO ₂	A	1.58	Compressive Strengths Mpa:		
Limestone %	5.0 max	3.70	1-Day	A	19.46
CaCO ₃ in Limestone	70% Min	97.0	3-Day	12.0 min	30.05
			7-Day	19.0 min	38.24
Potential Compounds:		Adjusted	28-Day	A	-
C ₂ S	A	62.48			
C ₂ S	A	8.36	Compressive Strengths, PSI:		
C ₃ A	8.0 Max	6.35	1-Day	A	2622
C ₄ AF	A	9.91	3-Day	1450 min	4357
C ₃ S+4.75*C ₃ A	<100	96	7-Day	2470 min	5545
			28-Day	A	-
			Mortar Bar Expansion, C-1038, %	Max 0.020	-

Test Data on ASTM Optional Requirement

Chemical Requirements (ASTM C-150, Table 2)			Physical Requirements (ASTM C-150, Table 4)		
Item	Limit	Results	Item	Limit	Result
Equivalent Alkalies		0.44	False Set	Min 50	95
			Heat of Hydration, 3-day C-1702, cal/g		

Additional Data

Item	Inorganic Processing		Base Cement Phase Composition	Result
	Limestone	Addition		
Amount	3.70	NA	C ₂ S	64.88
SiO ₂	1.45	NA	C ₃ S	8.58
Al ₂ O ₃	0.58	NA	C ₄ A	6.59
Fe ₂ O ₃	0.26	NA	C ₄ AF	10.29
CaO	51.07	NA		
SO ₃	0.04	NA		

Notes

Footnotes: A: no limit applicable
D: if SO₃ exceeds 3.0%, C-1038 shall not be more than 0.020%

February 17, 2021
Date

Quality Control Manager:



PRODUCT DATA SHEET

Sikament®-686

HIGH RANGE WATER REDUCING ADMIXTURE

PRODUCT DESCRIPTION

Sikament®-686 is a high range water reducing admixture utilizing Sika's ViscoCrete® Technology. It's unique formulation is based on polycarboxylate technology. Sikament®-686 meets the requirements for ASTM C-494 Types A and F admixture.

USES

Sikament®-686 is recommended for use in the production of all high strength concrete products, whenever high plasticity and increased early and ultimate strengths are desired. The superplasticizing action of Sikament®-686 provides excellent workability at low water cementitious ratios.

CHARACTERISTICS / ADVANTAGES

High Range Water Reducing Applications: When used as a high range water reducing admixture, water reduction up to 30 % can be obtained. The superplasticizing action allows for the production of high slump flowing concrete with excellent workability that can be placed with minimum vibration even at a low water/cementitious ratio. The dispersing action of Sikament®-686 maximizes cement hydration efficiency and improves concrete's early and long term compressive strengths.

Mid Range Water Reducing Applications: At a lower dosage, Sikament®-686 can be used as a cost effective mid range water reducing admixture or simply as a water reducing admixture for production of conventional slump concrete. When used as a mid range water reducing admixture, water reduction up to 15 % can be obtained. This application is ideal for use with lean, harsh concrete mixes or concrete containing fly ash. Sikament®-686 will improve workability and finishability. The combined water reducing and superplasticizing action provide the following benefits:

- Higher early and ultimate strengths for cost effective high strength concrete and earlier structural use of concrete.
- Higher early strengths allow faster demolding and more efficient use of forms to precast producers.
- Increased slump improves workability and reduces labor costs.
- Full flow action aids in pumping and reduces need for vibration.
- Greater concrete density reduces permeability and increases durability.

Sikament®-686 does not contain calcium chloride or any other intentionally added chlorides and will not initiate or contribute to corrosion on steel reinforcement present in the concrete.

PRODUCT INFORMATION

Packaging	Sikament®-686 is available in 55 gallon drums (208 liter), 275 gallon totes (1040 liters) and bulk delivery.
Appearance / Color	Brown Liquid
Shelf Life	Shelf life when stored in dry warehouse conditions between 40 °F and 80 °F (5–27 °C) is 1 year.

Storage Conditions

Sikament®-686 should be stored at above 40 °F (5 °C). If frozen, thaw and agitate thoroughly to return to normal state. Protect from direct sunlight.

Specific Gravity

Approx. 1.05

APPLICATION INFORMATION

Recommended Dosage

Dosage rates will vary depending on the material used, ambient conditions and the requirements of a specific project. For general concreting applications, Sika recommends a dosage rate between 3–12 fl.oz. /100 lbs. (195–780 ml/100 kg) cementitious materials. If maximum water reduction is required, dosage up to 18 fl.oz./100 lbs. (1170 ml/100 kg) of cementitious materials may be used. In this case, delayed setting times may occur. Dosage rates outside the recommended range may be used where specialized materials such as microsilica are specified, extreme ambient conditions are encountered or unusual project conditions require special consideration. In this case please contact your local regional Sika office or Sika technical service department at 1-800-933-7452 for further information.

Mixing

For best plasticizing results, Sikament®-686 should be added directly to freshly mixed concrete in the concrete mixer at the end of the batching cycle. Sikament®-686 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: Sikament®-686 is highly effective as a single admixture or in combination with other admixtures in the Sika System. If used in combination with certain Sikament® high range water reducers, it may affect the plastic properties of fresh concrete. Please contact your local regional office or technical service department at 1-800-933-7452 for further information.

Combination with Microsilica: Sikament®-686 is particularly well suited for use with Microsilica because of its water reduction capability.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.



LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.**

Sale of SIKA products are subject to the Terms and Conditions of Sale which are available at <https://usa.sika.com/en/group/SikaCorp/termsandconditions.html> or by calling 201-933-8300.

Sika Corporation
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Fax: 201-933-6225

Sika Canada Inc.
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Pointe Claire
Quebec H9R 4A9
Phone: 514-697-2610
Fax: 514-694-2792

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537



Product Data Sheet
Sikament®-686
November 2018, Version 01.02
021302011000000140

Sikament 686-en-US (11-2018) 1-2.pdf





PRODUCT DATA SHEET

Sika® AEA-14

AIR ENTRAINING ADMIXTURE

PRODUCT DESCRIPTION

Sika® AEA-14 admixture is an aqueous solution of organic materials. Sika® AEA-14 meets the requirements of ASTM C-260 for air entraining admixtures.

USES

Sika® AEA-14 is recommended for use whenever air entrained concrete is desired. Ready-mix, precast and block producers can achieve predictable and uniform entrained air contents in concrete, even where harsh lean mixes are used or fly-ash is added to the concrete.

CHARACTERISTICS / ADVANTAGES

Durability:

- Air entrainment is recognized as the most effective prevention against concrete scaling in exposed environments. Air entrained concrete delivers particular benefits in the form of increased concrete durability. This is important in colder climates where frost and freeze-thaw cycles can cause scaling and damage to the concrete surface.
- Air entraining agents help to prevent scaling by creating microscopic air voids that water trapped in the concrete can expand into when the concrete freezes, thus preventing cracks caused by the natural expansion. Entrained air voids in the concrete will also increase durability in harsh environments where concrete is exposed to deicing salts, marine salts and sulfates.
- Workability and placeability are also improved by the lubricating action of the microscopic bubbles in the concrete. Concrete flows better, and bleeding and shrinkage is reduced because less water is needed to obtain the desired workability.

PRODUCT INFORMATION

Packaging	Sika® AEA-14 is available in 55 gallon drums (208 liters), 275 gallon totes (1040 liters) and bulk delivery.
Appearance / Color	Dark Brown Liquid The presence of cloudiness/turbidity is a natural occurrence and does not affect the performance of Sika® AEA-14.
Shelf Life	Shelf life when stored in dry warehouse conditions between 50 °F and 80 °F (10–27 °C) is 1 year.
Storage Conditions	Sika® AEA-14 should be stored at above 40 °F (5 °C). If frozen, thaw and agitate thoroughly to return to normal state.
Specific Gravity	Approx. 1.01

APPLICATION INFORMATION

Recommended Dosage

Dosage rates for Sika® AEA-14 will typically fall between 1 and 3 fl. oz. per 100 lbs. (65–195 ml/100 kg) of cement to entrain between 4 and 6 percent air. Higher air contents may be obtained by increasing the dosage rate. Dosage rates will vary depending on the air content required for a particular project. Typically air contents will be specified in the range of 4 to 8 percent by volume.

Other factors that may affect the amount of air entrained into the concrete include, but are not limited to: total cementitious content, type of pozzolanic materials, sand gradation, temperature and water content. Sika recommends that trial mixes be performed whenever material or any other changes are made that may affect the amount of entrained air.

Mixing

Measure the required quantity per batch manually or with automatic dispenser equipment. Add Sika® AEA-14 to mixing water or sand. Do not mix with dry cement. 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, particularly water reducers and retarders, may increase the amount of entrained air in the mix. Air contents should be checked with an air-meter after batching and dosage adjustments made at the concrete plant.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

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SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT**

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Sika Canada Inc.
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Fax: 514-694-2792

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537



Product Data Sheet
Sika™ AEA-14
November 2018, Version 01.02
02140302100000079

SikaAEA-14-en-US-(11-2018)-1-2.pdf





5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Compressive Strength Report - Concrete

Distribution Copy

Report Date 06-19-2019
Report No. 37
Job Number 23158
Project Middleborough High School Project 71
 East Grove St., Middleborough, MA
Contractor Fontaine Brothers, Inc
Concrete Co. Ready Mix Services

ALL FIELD TESTS DONE ACCORDING TO ASTM: C-172 C-31 C-143 C-1064 C-231

ALL COMPRESSIVE STRENGTH TESTS DONE ACCORDING TO ASTM: C-39 C-1231

CLASS CONCRETE: 5000# 3/4" **No. Of Sets:** 1 **CUBIC YARDS:** 6

SET 1 LOCATION: Footing: Stadium; West Side Curb

Lab No.	Size (in.)	Area (sq. in.)	Condition	Date Cast	Date Tested	Age Days	Total Load (lbs.)	Unit Load (psi.)	Fracture Type
G897	4.00 x 8.00	12.57	Good	06/19/19	06/26/19	7	53,500	4,260	1
G898	4.00 x 8.00	12.57	Good	06/19/19	07/03/19	14	72,000	5,730	2
G899	4.00 x 8.00	12.57	Good	06/19/19	07/17/19	28	83,000	6,600	2
G900	4.00 x 8.00	12.57	Good	06/19/19	07/17/19	28	85,000	6,760	1
G901	4.00 x 8.00	12.57	Good	06/19/19	07/17/19	28	85,500	6,800	1

Slump (in.)	6
Air Temp. (F.)	73
Conc Temp (F)	69
Truck No.	49
Ticket No.	9256
Time	2:39
Unit Wt lbs/cu ft	
Air Content (%)	6.2

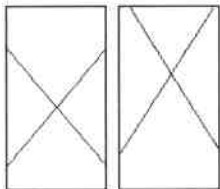
GENERAL REMARKS: Cylinders Received 6-26-19

Inspector Name	Premium Time	Hours	Travel Time
Lamont Penn	No	6.00	

REVIEWED BY: Bryan M. Crabtree

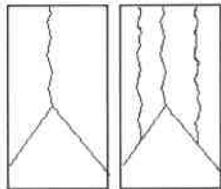
BMC

FRACTURE TYPES



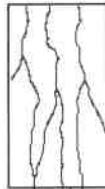
Type 1

Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps



Type 2

Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end



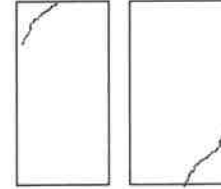
Type 3

Columnar vertical cracking through both ends, no well-formed cones



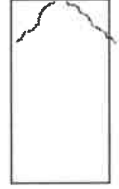
Type 4

Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5

Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6

Similar to Type 5 but end of cylinder is pointed



5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Compressive Strength Report - Concrete

Distribution Copy

Report Date 06-26-2019
Report No. 39
Job Number 23158
Project Middleborough High School Project 71
 East Grove St., Middleborough, MA
Contractor Fontaine Brothers, Inc
Concrete Co. Ready Mix Services

ALL FIELD TESTS DONE ACCORDING TO ASTM: C-172 C-31 C-143 C-1064 C-231

ALL COMPRESSIVE STRENGTH TESTS DONE ACCORDING TO ASTM: C-39 C-1231

CLASS CONCRETE: 5000# 3/4" **No. Of Sets:** 1 **CUBIC YARDS:** 13

SET 1 LOCATION: Football stadium East curb, North of curb

Lab No.	Size (in.)	Area (sq. in.)	Condition	Date Cast	Date Tested	Age Days	Total Load (lbs.)	Unit Load (psi.)	Fracture Type
H862	4.00 x 8.00	12.57	Good	06/26/19	07/03/19	7	53,500	4,260	1
H863	4.00 x 8.00	12.57	Good	06/26/19	07/10/19	14	62,000	4,930	3
H864	4.00 x 8.00	12.57	Good	06/26/19	07/24/19	28	78,000	6,210	2
H865	4.00 x 8.00	12.57	Good	06/26/19	07/24/19	28	81,000	6,440	1
H866	4.00 x 8.00	12.57	Good	06/26/19	07/24/19	28	77,000	6,130	1

Slump (in.)	6 1/2
Air Temp. (F.)	75
Conc Temp (F)	80
Truck No.	56
Ticket No.	9371
Time	10:00
Unit Wt lbs/cu ft	
Air Content (%)	5.2

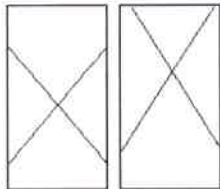
GENERAL REMARKS: Cylinders received on 06/28/2019.

Inspector Name	Premium Time	Hours	Travel Time
Lamont Penn	No		

REVIEWED BY: Bryan M. Crabtree

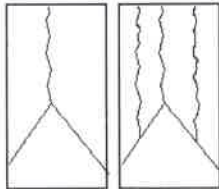
BMC

FRACTURE TYPES



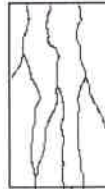
Type 1

Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps



Type 2

Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end



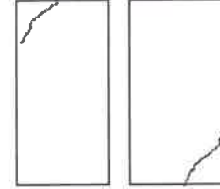
Type 3

Columnar vertical cracking through both ends, no well-formed cones



Type 4

Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5

Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6

Similar to Type 5 but end of cylinder is pointed



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Compressive Strength Report - Concrete

Distribution Copy

Report Date 06-24-2019
Report No. 41
Job Number 23158
Project Middleborough High School Project 71
 East Grove St., Middleborough, MA
Contractor Fontaine Brothers, Inc
Concrete Co. Ready Mix Services

ALL FIELD TESTS DONE ACCORDING TO ASTM: C-172 C-31 C-143 C-1064 C-231

ALL COMPRESSIVE STRENGTH TESTS DONE ACCORDING TO ASTM: C-39 C-1231

CLASS CONCRETE: 5000# 3/4"* **No. Of Sets:** 1 **CUBIC YARDS:** 8

SET 1 LOCATION: Football stadium curb, South of West curb

Lab No.	Size (in.)	Area (sq. in.)	Condition	Date Cast	Date Tested	Age Days	Total Load (lbs.)	Unit Load (psi.)	Fracture Type
H822	4.00 x 8.00	12.57	Good	06/24/19	07/01/19	7	51,000	4,060	3
H823	4.00 x 8.00	12.57	Good	06/24/19	07/08/19	14	71,000	5,650	1
H824	4.00 x 8.00	12.57	Good	06/24/19	07/22/19	28	83,000	6,600	1
H825	4.00 x 8.00	12.57	Good	06/24/19	07/22/19	28	85,000	6,760	2
H826	4.00 x 8.00	12.57	Good	06/24/19	07/22/19	28	82,500	6,560	1

Slump (in.)	6 1/2
Air Temp. (F.)	84
Conc Temp (F)	85
Truck No.	44
Ticket No.	9326
Time	12:51
Unit Wt lbs/cu ft	
Air Content (%)	5.9

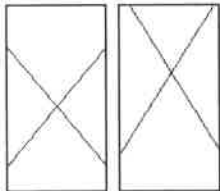
GENERAL REMARKS: *with fibers; cylinders received on 06/28/2019.

Inspector Name	Premium Time	Hours	Travel Time
Lamont Penn	No	6.00	

REVIEWED BY: Bryan M. Crabtree

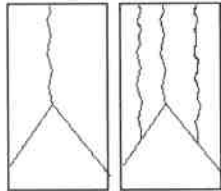
BMC

FRACTURE TYPES



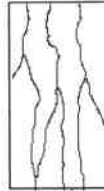
Type 1

Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps



Type 2

Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end



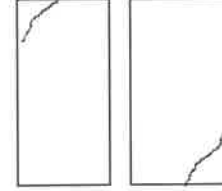
Type 3

Columnar vertical cracking through both ends, no well-formed cones



Type 4

Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5

Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6

Similar to Type 5 but end of cylinder is pointed



5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Compressive Strength Report - Concrete

Distribution Copy

Report Date 07-10-2019
Report No. 48
Job Number 23158
Project Middleborough High School Project 71
 East Grove St., Middleborough, MA
Contractor Fontaine Brothers, Inc
Concrete Co. Ready Mix Services

ALL FIELD TESTS DONE ACCORDING TO ASTM: C-172 C-31 C-143 C-1064 C-231

ALL COMPRESSIVE STRENGTH TESTS DONE ACCORDING TO ASTM: C-39 C-1231

CLASS CONCRETE: 5000# 3/4" **No. Of Sets:** 1 **CUBIC YARDS:** 30

SET 1 LOCATION: Southwest wall footing at concession stand

Lab No.	Size (in.)	Area (sq. in.)	Condition	Date Cast	Date Tested	Age Days	Total Load (lbs.)	Unit Load (psi.)	Fracture Type
P383	4.00 x 8.00	12.57	Good	07/10/19	07/17/19	7	65,000	5,170	1
P384	4.00 x 8.00	12.57	Good	07/10/19	07/24/19	14	72,500	5,770	2
P385	4.00 x 8.00	12.57	Good	07/10/19	08/07/19	28	83,000	6,600	1
P386	4.00 x 8.00	12.57	Good	07/10/19	08/07/19	28	85,500	6,800	2
P387	4.00 x 8.00	12.57	Good	07/10/19	08/07/19	28	82,000	6,520	1

Slump (in.)	5 1/2
Air Temp. (F.)	85
Conc Temp (F)	83
Truck No.	49
Ticket No.	8951
Time	10:45
Unit Wt lbs/cu ft	
Air Content (%)	4.5

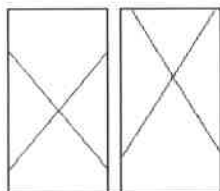
GENERAL REMARKS: Cylinders received on 07/16/2019.

Inspector Name	Premium Time	Hours	Travel Time
Lamont Penn	No	6.00	

REVIEWED BY: Bryan M. Crabtree

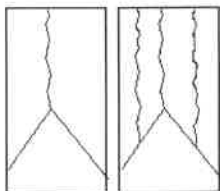
BMC

FRACTURE TYPES



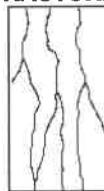
Type 1

Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps



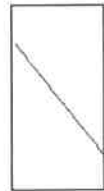
Type 2

Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end



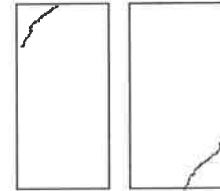
Type 3

Columnar vertical cracking through both ends, no well-formed cones



Type 4

Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



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Side fractures at top or bottom (occur commonly with unbonded caps)



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5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Compressive Strength Report - Concrete

Distribution Copy

Report Date 07-19-2019
 Report No. 51
 Job Number 23158
 Project Middleborough High School Project 71
 East Grove St., Middleborough, MA
 Contractor Fontaine Brothers, Inc
 Concrete Co. Ready Mix Services

ALL FIELD TESTS DONE ACCORDING TO ASTM: C-172 C-31 C-143 C-1064 C-231

ALL COMPRESSIVE STRENGTH TESTS DONE ACCORDING TO ASTM: C-39 C-1231

CLASS CONCRETE: 5000# 3/4"

No. Of Sets: 1

CUBIC YARDS: 33

SET 1 LOCATION: SOG; Softball Field Dugout

Lab No.	Size (in.)	Area (sq. in.)	Condition	Date Cast	Date Tested	Age Days	Total Load (lbs.)	Unit Load (psi.)	Fracture Type
S585	4.00 x 8.00	12.57	Good	07/19/19	07/26/19	7	66,500	5,290	1
S586	4.00 x 8.00	12.57	Good	07/19/19	08/02/19	14	78,000	6,210	2
S587	4.00 x 8.00	12.57	Good	07/19/19	08/16/19	28	100,000	7,960	1
S588	4.00 x 8.00	12.57	Good	07/19/19	08/16/19	28	101,000	8,040	2
S589	4.00 x 8.00	12.57	Good	07/19/19	08/16/19	28	99,000	7,880	1

Slump (in.)	5 1/2
Air Temp. (F.)	66
Conc Temp (F)	84
Truck No.	49
Ticket No.	9776
Time	7:30
Unit Wt lbs/cu ft	
Air Content (%)	4.6

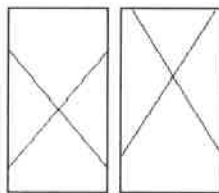
GENERAL REMARKS: Cylinders Received 7-24-19

Inspector Name	Premium Time	Hours	Travel Time
Lamont Penn	No		

REVIEWED BY: Bryan M. Crabtree

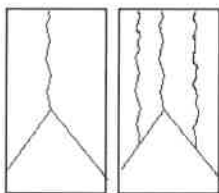
BMC

FRACTURE TYPES



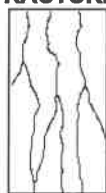
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Type 2

Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end



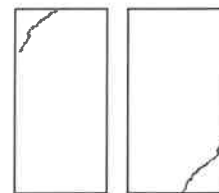
Type 3

Columnar vertical cracking through both ends, no well-formed cones



Type 4

Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



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