

# SHOP DRAWING REVIEW FORM AND TRANSMITTAL

**DATE:** November 4, 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. 03300-02 – REV 0 – Concrete Mix Design Ductbank

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## **BETA COMMENTS:**

<u>Item</u>	<u>Action Code</u>	<u>Description/Comments</u>
1	1	<b>Concrete Mix Design Ductbank (Redi Mix Services, Inc.) 1. Acceptable as Submitted</b>

### 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.



# Hart Engineering Corporation

**SUBMITTAL:**  
03300-02

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

**DATE:** 10/05/2021

**SUBMITTAL:** 03300-02 - Concrete Mix Design Ductbank

**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
03300-02	0	Concrete Mix Design Ductbank	Eng	10/05/2021	
Notes:					

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

SHOP DRAWING REVIEW	
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<b>BETA GROUP, INC.</b>	Checked By: <u>TW</u>
By: <u>DW</u>	Date: <u>11/3/21</u>

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 specifications.

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

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BETA GROUP, INC.	Checked By: <b>TW</b>
By: <u>Derek Wong</u>	Date: <u>2021.11.03</u>

<b>MIX #</b>		<b>25500AE</b>
<b>STRENGTH</b>	<b>PSI</b>	<b>2500</b>
<b>C.A. SIZE</b>	<b>INCH</b>	<b>3/4" Blend</b>
<b>USE</b>		<b>Ductbank</b>
<b>CEMENT</b>	<b>LBS.</b>	<b>400</b>
<b>FINE AGG</b>	<b>LBS.</b>	<b>1559</b>
<b>COARSE AGG</b>	<b>LBS.</b>	<b>1620</b>
<b>WATER</b>	<b>GAL</b>	<b>32.0</b>
<b>W/C RATIO</b>		<b>0.666</b>
<b>SLUMP</b>	<b>INCHES</b>	<b>4-6" +/- 1</b>
<b>AIR CONTENT</b>	<b>%</b>	<b>5-7 +/- 1</b>
<b>SIKA 686</b>	<b>OZ</b>	<b>14.0</b>
<b>SIKA AEA 14</b>	<b>OZ</b>	<b>1.20</b>

\* 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.

10/1/2021 TJH



# LEHIGH

## HEIDELBERGCEMENT Group

### Mill Test Certificate Report

Type: **HI ASTM, HI 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 Alkansa, 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 <sub>2</sub>	A	19.39	Fineness:		
Al <sub>2</sub> O <sub>3</sub>	6.0 Max	4.46	% Passing 45µm (No. 325)	A	95.37
Fe <sub>2</sub> O <sub>3</sub>	6.0 Max	3.26	Blaine Fineness (m <sup>2</sup> /Kg)	260 min	364
CaO	A	63.76			
MgO	6.0 max	2.87	Autoclave Expansion (%)	0.8 max	0.01
SO <sub>3</sub>	D	2.60	Vicat Setting Time:		
Loss on Ignition	3.5 max	2.16	Initial Set (minutes)	45 min	125
Na <sub>2</sub> O	A	0.04			
K <sub>2</sub> O	A	0.60	Air Content (%)	12 max	7.3
Insoluble Residue	1.5 max	0.58			
CO <sub>2</sub>	A	1.58	Compressive Strengths Mpa:		
Limestone %	5.0 max	3.70	1-Day	A	19.46
CaCO <sub>3</sub> 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 <sub>2</sub> S	A	62.48			
C <sub>3</sub> S	A	8.36	Compressive Strength, PSI:		
C <sub>4</sub> A	8.0 Max	6.35	1-Day	A	2622
C <sub>4</sub> AF	A	9.91	3-Day	1450 min	4357
C <sub>3</sub> S+4.75*C <sub>4</sub> 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	86
			Heat of Hydration, 3-day C-1702, cal/g		

#### Additional Data

Item	Limestone	Inorganic Processing Addition	Base Cement Phase Composition	Result
Amount	3.70	NA	C <sub>2</sub> S	64.88
SiO <sub>2</sub>	1.45	NA	C <sub>3</sub> S	6.59
Al <sub>2</sub> O <sub>3</sub>	0.58	NA	C <sub>4</sub> A	10.28
Fe <sub>2</sub> O <sub>3</sub>	0.26	NA	C <sub>4</sub> AF	
CaO	51.07	NA		
SO <sub>3</sub>	0.04	NA		

Footnotes:

A: no limit applicable  
D: if SO<sub>3</sub> exceeds 3.0%, C-1038 shall not be more than 0.020%

#### Notes

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1 - Approved  2 - Approved as Noted  
 3 - Review and Resubmit  4 - Rejected  
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BETA GROUP, INC. Checked By: **TW**  
By: **Derek Wong** Date: **2021.11.03**

February 17, 2021  
Date

Quality Control Manager:

**SHOP DRAWING REVIEW**

1 - Approved       2 - Approval required

3 - Revision Required       4 - Rejected

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(Above Check Designates Action Code - See Review Comments)

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BETA GROUP, INC.      Checked By: **TW**

By: **Derek Wong**      Date: **2021.11.03**

# 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

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

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

**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.

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

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TW	
BETA GROUP, INC. Checked By: _____	
By: <u>Derek Wong</u>	Date: <u>2021.11.03</u>



## 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](http://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  
201 Polito Avenue  
Lyndhurst, NJ 07071  
Phone: 800-933-7452  
Fax: 201-933-6225

Sika Canada Inc.  
601 Delmar Avenue  
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

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# PRODUCT DATA SHEET

## Sika® AEA-14

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BETA GROUP, INC.	Checked By: TW
By: Derek Wong	Date: 2021.11.03

BUILDING TRUST



## 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

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

Product Data Sheet  
Sika® AEA-14  
November 2018, Version 01.02  
021403021000000079

## 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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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](http://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**

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BETA GROUP, INC.	Checked By: TW
By: Derek Wong	Date: 2021.11.03

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



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SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> 1 – Approved	<input type="checkbox"/> 2 – Approved as Noted
<input type="checkbox"/> 3 – Revise and Resubmit	<input type="checkbox"/> 4 – Rejected
<input type="checkbox"/> 5 – Record File Only – No Action Taken	
<small>(Above Check Designates Action Code – See Review Comments)</small>	
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<b>BETA GROUP, INC.</b>	Checked By: <b>TW</b>
By: <b>Derek Wong</b>	Date: <b>2021.11.03</b>

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Fax: 52 442 2250537



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## Report of Concrete Compressive Strength

ASTM C-31/ C-39 / C-1231

**Project Name:** Taunton MA - 2019 Quality Control Laboratory Testing Services

**Project Number:** 19-1439

**Client:** Redi Mix Services (A Lopes Comany)

**Report Date:** 12/2/2019

**General**
**Contractor:** Redi Mix Services (A Lopes Comany)

**Client Contract Number:**
**Concrete Supplier:** REDI MIX SERVICES

### PLACEMENT INFORMATION

**Date Cast:** 10/4/2019      **Time Cast:**      **Date Received:** 10/7/2019

**Placement Location:** MIX DESIGN TESTING

**Placement Method:**
**Placement Vol. (yd<sup>3</sup>):**
**Cylinders Made By:** Roland Desrosiers

**Aggregate Size (in):** 3/4

### INITIAL CURING CONDITIONS

**Temperatures**
**Minimum (°F)** 61      **Maximum (°F)** 84

### DELIVERY INFORMATION

**Admixtures:** 25500 AE / TYPE A WATER REDUCER / AIR

### TEST RESULTS

**Slump (in) (C-143):** 3

**Load Number:**      **Batch**
**Air Content (%) (C-231)** 7.8

**Mixer Number:** 15

**Air Temp (°F):** 61

**Ticket Number** 219561      **Arrive**
**Conc. Temp (°F) (C-1064):** 61

**Cubic Yards:**      **Depart**
**Design (psi):** 2500

Cylinder Designation	Cylinder Weight (lbs)	Cylinder Diameter (in)	Cross Sectional Area(In <sup>2</sup> )	Date Of Test	Cure Type	Cap Type	Age (days)	Fracture Type	Load (kips)	Strength (psi)
224-3A	8.20	4.03	12.72	10/9/2019	Lab		5	5	31.4	2470
224-3B	8.15	4.01	12.60	10/11/2019	Lab		7	3	35.5	2820
224-3C	8.05	4.01	12.60	10/18/2019	Lab		14	5	41.0	3250
224-3D	8.10	4.00	12.57	11/1/2019	Lab	Unbonded	28	3	48.3	3840
224-3E	8.15	4.00	12.57	11/1/2019	Lab	Unbonded	28	3	49.0	3900
224-3F	8.15	4.00	12.57	12/2/2019	Lab	Unbonded	59	5	51.4	4090

### SHOP DRAWING REVIEW

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**Remarks:**

TW

BETA GROUP, INC. Checked By:

By: Derek Wong, 2021.11.03

### Fracture Types



Cone both ends



Cone one end w/ split



Columnar



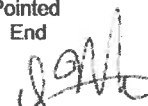
Diagonal



Side at top or bottom



Pointed End



Reviewed By