



Concrete Submittal

Date: 01/12/2024
To: Kevin Vandy
WATKINS SITE DEVELOPMENT INC.
Regarding: 541//ALDI - HILLSBOROUGH BYPASS
Customer Contact: kvandy@watkinssitedevelopment.com

The mixes listed below are submitted for approval on the above referenced project:

Mix	Use	Slump	Air	W/CM
3046c BB3046c 3000 PSI	Sidewalk	4" +/- 1" 5" +/- 1" w/ MRWR	5% +/- 1.5%	0.46

When placing orders for this project, please order by product mix code number and application described above.

It is strongly recommended that a pre-placement conference be held to identify areas of responsibility for all parties. Customer should provide concrete mixer trucks with wash down area.

Carolina Sunrock's concrete mixes are designed in accordance with ASTM C 94 "Standard Specification for Ready-Mixed Concrete" and/or ACI 211.1 and/or ACI 301. Our concrete strength guarantee requires that all field and laboratory tests fully comply with all applicable ASTM and/or ACI standards. Designed mix cementitious content, is stated as a minimum, and Carolina Sunrock LLC reserves the right to increase cementitious content. Chemical admixtures are added in accordance with the manufacturer's recommendations. Carolina Sunrock LLC reserves the right to adjust these dosages to meet the changes in jobsite demands. All samples and testing of samples for acceptance shall be conducted at the point of discharge from the concrete delivery truck. Additionally, all tests must be performed by an ACI Certified Technician.

We do not guarantee strength or performance of concrete which has had water added on the jobsite at the purchaser's request (subject to limitations of ACI 301), or has been subjected to improper placement, consolidation, initial and final curing, or protection after delivery to the purchaser. Customer assumes total responsibility for concrete placement, finishing, initial and final curing, placement of joints at proper spacing, and any aesthetic concerns/issues (such as cracks, discoloration, etc.) that may arise in the plastic and hardened state. Should the Customer choose not to purchase temperature control measures, the Customer shall assume all liability for rejected concrete due to non-compliant concrete temperatures.

As stated in ACI 301-10 (ACI 301-16) 1.6.3.1.c, ACI 318-11 5.6.1 (ACI 318-26 12.1.1.e), ASTM C94 and project specifications, all test results shall be provided to Carolina Sunrock LLC at the address and/or e-mail address below.



Please provide Carolina Sunrock LLC with an approved copy or a copy with the notes for correction of this submittal, at your earliest convenience.

Thank you for your business and cooperation in this matter.

A handwritten signature in black ink, appearing to read 'TKOPEC', with a long horizontal flourish extending to the right.

Timothy Kopec
Manager Concrete Quality Control
8620 Barefoot Industrial Rd
Raleigh, NC 27617
Office: 919-861-1860
Cell: 919-369-4789
Email: tkopec@thesunrockgroup.com

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Durham RMC
 1503 Camden Avenue
 Durham, NC 27704
 919-688-6881

Concrete Mix Submittal

Submittal Information

Submittal Name 541//ALDI - HILLSBOROUGH
 BYPASS_RMC
Date Submitted 01/12/2024
Customer WATKINS SITE DEVELOPMENT INC.
Project Name 541//ALDI - HILLSBOROUGH BYPASS
Contract ID 541
Use Sidewalk

Mix Information

Mix ID 3046c
Mix Name BB3046c 3000 PSI
Compressive Strength (f'c) 3000 psi @ 28 Days
Aggregate Nominal Size 3/4" (19mm)
Air Entrained

Mix Properties

Slump 4" +/- 1" 5" +/- 1" w/ MRWR	Sack Content 5.9	94 lb/sack	Total Mass 4173	lb
Air 5% +/- 1.5%	Total Water 30.4	gal	Total Volume 27.00	ft3
W/CM Ratio 0.46	Water/Sack 5.2	gal	Unit Weight 154.6	lb/ft3

Group	Material Description	Supplier	Specific Gravity	Mass lb	Volume ft3
Cement	Portland Type I/II - ASTM C150 Giant Harleyville, SC GCEMENT	Giant	3.15	422	2.147
Additive	Fly Ash - ASTM C618 HF Lee Goldsboro NC Fly Ash	SEFA HF Lee	2.25	129	0.919
Aggregate	Coarse Aggregate - ASTM C33 Butner, NC 67	Carolina Sunrock	2.974	1950	10.508
	Fine Aggregate - ASTM C33 Butner,NC SAND	Carolina Sunrock	2.95	1416	7.690
Water	Potable Water - ASTM C1602 City Water, City Water Potable Water		1	254	4.071
Admixture	Air Entrainer - ASTM C260 GCP Applied Technologies Inc DarexII Range: 1-4 fl oz/100 lb CM	GCP Applied Technologies Inc	1	0.718	0.01151
	Water Reducer - ASTM C494/ C494M GCP Applied Technologies Inc Zyla 640 Range: 3-7 fl oz/100 lb CM	GCP Applied Technologies Inc	1	2.154	0.03453
Air	Air				1.620

Submittal Notes kvandy@watkinssitedevelopment.com

Contact Timothy Kopec
Phone 919-861-1860
Email tkopec@thesunrockgroup.com



Durham RMC
 1503 Camden Avenue
 Durham, NC 27704
 919-688-6881

Concrete Mix Evaluation Report

ACI 318 Required Average Strength

Mix ID 3046c
 Mix Name BB3046c 3000 PSI
 Design Strength (f'c) 3000 psi @ 28 Days
 Required Strength (f'cr) 3510 psi @ 28 Days

Number Of Tests 18
 Average Strength 3746 psi
 St Dev 340 psi
 St Dev (Modified) 377 psi

Test Date	Mix	Lab	Temp (Concrete) (°F)	Slump (in)	Air Content (%)	Unit Weight (lb/ft3)	Comp Strength (7-Day) (psi)	Acceptance Strength (28-Day) (psi)	Moving Average (psi)
07/12/2023	3046c		85	5.8	6.6	148.64	2500	3300	
07/13/2023	3046c		79	5	4.5	156.97	2680	3510	
07/14/2023	3046c		80	5	5.9	151.4	3070	3920	3577
07/14/2023	3046c		80	4.5	5		2520	3410	3613
08/03/2023	3046c		81	5	5.9	151.5	3050	3990	3773
08/10/2023	3046c		82	4.8	5	152.68	3100	4330	3910
08/16/2023	3046c		84	4.8	6.8	148.5	2680	3660	3993
08/18/2023	3046c		83	5.2	4.8	153.18	2630	3690	3893
08/30/2023	3046c		80	4.5	5.7	154.36	3180	3840	3730
09/11/2023	3046c		84	6	6.9	147.32	2200	3040	3523
09/13/2023	3046c		80	4	4.5		2980	4060	3647
09/19/2023	3046c		84	4	4.6	155.76	3060	4090	3730
09/20/2023	3046c		78	4.2	5.5	150.8	2880	3800	3983
09/20/2023	3046c		84	4.8	5.2	150.94	2740	3950	3947
11/02/2023	3046c		73	5.2	5.9	151.7	2860	3820	3857
11/03/2023	3046c		78	4	5.6	153.44	3240	4110	3960
11/08/2023	3046c		75		6.3	156.14	2800	3660	3863
12/27/2023	3046c		65	4.8	7.3	150.34	2150	3250	3673

Combined Aggregate Blend Report

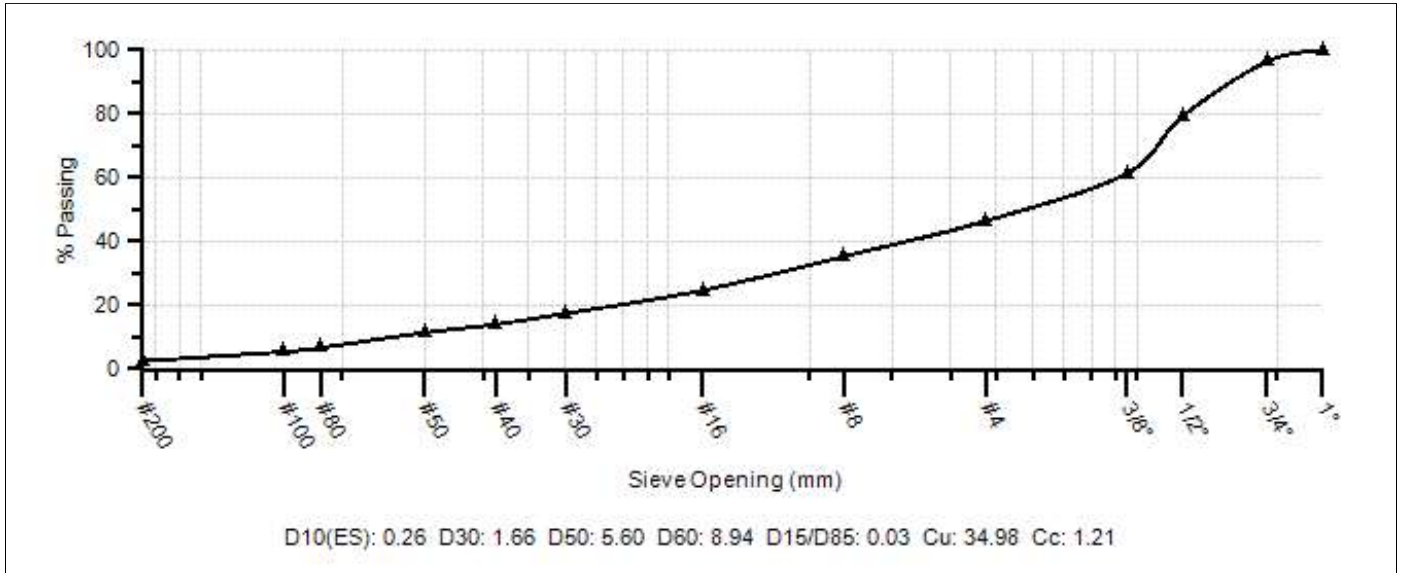
Mix ID 3046c
Mix Name BB3046c 3000 PSI
Design Strength (f'c) 3000 psi @ 28 Days
Specification

Nominal Max Size 3/4" (19mm)
Aggregate Volume 18.2
Coarse Aggregate % 57.7
Fine Aggregate % 42.3

% Passing Gradations

Aggregate Type	Coarse	Fine
% Contribution	58	42

Sieve/Test	Spec	Result	67	SAND
1" (25mm)		100.0	100	100
3/4" (19mm)		96.5	94	100
1/2" (12.5mm)		79.2	64	100
3/8" (9.5mm)		61.3	33	100
#4 (4.75mm)		46.5	8	99
#8 (2.36mm)		35.4	2	81
#16 (1.18mm)		24.7	2	56
#30 (.6mm)		17.5	2	39
#40 (.425mm)		14.1	2	31
#50 (.3mm)		11.5	2	25
#80 (.18mm)		6.8	1	14
#100 (.15mm)		5.5	1	11
#200 (75µm)		2.58	1.3	4.3
Pan		0.00	0.0	0.0





January 5, 2024

CAROLINA SUNROCK

To Whom It May Concern:

We certify Giant Cement Type I-II Portland meets the requirements of ASTM C-150 for Type I and Type II cement. This includes the requirements for low-alkali cement and AASHTO M-85 Portland cement. It is approved for use by the Department of Transportation for NC, SC, VA, and GA.

Sincerely,

Yonn Barrick
VP of Sales and Marketing

STATE OF SOUTH CAROLINA

COUNTY OF DORCHESTER

Sworn to and subscribed before me

This 5th day of January, 2024

NOTARY PUBLIC OF SOUTH CAROLINA

My Commission Expires 3/22/2028





GIANT CEMENT COMPANY

654 Judge Street
Harleyville, South Carolina 29448
Contact: Hermanus Potgieter
803.496.5033

Type I-II

Date: November 1- 30, 2023

This cement is certified to meet the requirements of ASTM C-150 for Type I and II and AASHTO M-85 for Type I and II.

The following information is based on average test data during the test period. The data is typical of cement shipped by Giant; individual shipments may vary.

LABORATORY ANALYSES

CHEMICAL ANALYSIS (C-114)

Silicon Dioxide(SiO ₂)	20.4 %
Aluminum Oxide(Al ₂ O ₃)	4.8 %
Ferric Oxide(Fe ₂ O ₃)	3.4 %
Calcium Oxide(CaO)	63.9 %
Magnesium Oxide(MgO)	1.3 %
Sulfur Trioxide(SO ₃)	2.7 %
Ignition Loss	1.5 %
Insoluble Residue	0.26 %
Alkalies(Na ₂ O eqv.)	0.51 %
POTENTIAL COMPOUNDS	
C3S	61 %
C2S	13 %
C3A	7 %
C4AF	10 %

PHYSICAL ANALYSIS

FINENESS			
(C-430)	325 Mesh	95.6 %	Passing
		4.4 %	Retained
(C-204)	Blaine	3947	cm ² /g
SETTING TIME(Vicat) (C-191)			
	Initial	110	minutes
	Final	227	minutes
Air content	9 %	(C-185)	
Auto. Exp.	0.08 %	(C-151)	
Exp.in water	#DIV/0!	%	(C-1038)
COMPRESSIVE STRENGTH (C-109)			
		MPa	PSI
	1 Day	15.5	2249
	3 Days	26.1	3781
	7 Days	32.1	4653
	October 28 Days	43.7	6334

This data may have been reported on previous mill certificates.

Manufactured in Harleyville, South Carolina
USA

Hermanus Potgieter
Quality Control Manager





January 3, 2024

Attention: SEFA Customer

Re: 2024 Certification

The SEFA Group certifies through this letter that the fly ash from the HF Lee Station thermal beneficiation facility located 1594 Blackjack Church Road, Goldsboro, NC complies with the requirements set forth in ASTM C 618, Class F, when sampled and tested in accordance with ASTM C 311. Unless you receive written notification regarding a change in status from The SEFA Group, this certification will apply to any and all phases on construction projects.

Fly ash is a 100% recycled material, made in the USA. It is the by-product of burning pulverized coal in an electrical generating station. The Environmental Protection Agency (EPA) under Section 6002 (e) of the Resource Conservation and Recovery Act (RCRA) of 1976 targeted a number of recovered materials, including fly ash. The EPA recognizes that fly ash can be used in concrete to lessen the solid waste problem and that fly ash has technical advantages in cementitious materials. Fly ash is considered a Post- Industrial, Pre-Consumer recycled product.

The SEFA Group offers full field service with the purchases of our product. Our technical representatives are available to aid you with field-testing and quality control.

Thank you for your interest in our product. If you need further assistance, please call our administrative office at (888) 339-7332.

Sincerely,

A handwritten signature in blue ink that reads "Bert Nunn". The signature is written in a cursive style and is set against a light yellow background.

Bert Nunn
Vice President, Sales

Client: Mr. Ross Gorman
SEFA
217 Cedar Road
Lexington, SC 29073

Date: December 8, 2023
TEC Services I.D.: TEC 06-0509
Lab No.: 23-1808-HF

REPORT OF FLY ASH TESTS				
Client ID: <u>HF093023</u>		Date Sampled: <u>September 30, 2023</u>		
Manufacturer: <u>HF Lee</u>		Date Received: <u>October 9, 2023</u>		
Material Type: <u>Harvested Coal Ash from a Commingled Source</u>				
Chemical Analysis	Results (wt%)	Specification (Class F)		
		ASTM C618-23e1	AASHTO M295-21	
Silicon Dioxide (SiO ₂)	56.3	----	----	
Aluminum Oxide (Al ₂ O ₃)	28.2	---	----	
Iron Oxide (Fe ₂ O ₃)	7.83	----	----	
Sum of Silicon Dioxide, Iron Oxide & Aluminum Oxide (SiO ₂ +Al ₂ O ₃ +Fe ₂ O ₃)	92.3	50.0 % min.	50.0 % min.	
Calcium Oxide (CaO)	0.9	18.0 % max.	18.0 % max.	
Magnesium Oxide (MgO)	1.1	----	----	
Sodium Oxide (Na ₂ O)	0.39	----	----	
Potassium Oxide (K ₂ O)	2.64	---	----	
"Sodium Oxide Equivalent (Na ₂ O+0.658K ₂ O)"	2.13	----	----	
Sulfur Trioxide (SO ₃)	0.04	5.0 % max.	5.0 % max.	
Loss on Ignition	0.9	6.0 % max.	5.0 % max.	
Moisture Content	0.0	3.0 % max.	3.0 % max.	
Total Chlorides	0.011	----	----	
Available Alkalies				
Sodium Oxide (Na ₂ O) as Available Alkalies	0.09	----	----	
Potassium Oxide (K ₂ O) as Available Alkalies	0.75	----	----	
Available Alkalies as "Sodium Oxide Equivalent (Na ₂ O+0.658K ₂ O)"	0.59	----	1.5 % max.*	
Physical Analysis				
Fineness (Amount Retained on #100 Sieve)	3.1%	10 % max.	----	
Fineness (Amount Retained on #325 Sieve)	24.3%	34 % max.	34 % max.	
Strength Activity Index (Using Lehigh Leeds Alabama Portland Cement)				
At 7 Days:		80%	75 % min. [†]	75 % min. [†]
Control Average, psi: 5040	Test Average, psi: 4050		(of control)	(of control)
At 28 Days:		80%	75 % min. [†]	75 % min. [†]
Control Average, psi: 6280	Test Average, psi: 5030		(of control)	(of control)
Water Requirements (Test H ₂ O/Control H ₂ O)		98%	105% max. [†]	105% max. [†]
Control, mls: 242	Test, mls: 236		(of control)	(of control)
Autoclave Expansion:		-0.04%	----	± 0.8 % max.
Uniformity Requirements			Variation	
Specific Gravity:	2.33	Average: 2.30	1.4%	5 % max. from average
% Retained #325 Sieve:	24.3	Average: 20.6	3.7%	5 % max. from average

† Meeting the 7 day or 28 day strength activity index will indicate specification compliance

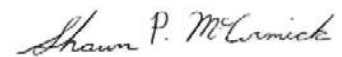
* Optional

The results of our testing indicate that this sample complies with both ASTM C618-23e1 and AASHTO M295-21 specifications for Class F pozzolans.

Respectfully Submitted,
SGS TEC Services



Dean Roosa
Project Manager



Shawn McCormick
Laboratory Principal



CAROLINA SUNROCK LLC

Vasyl "Basil" Shymonyak, P.E.

Director Quality Control

8620 Barefoot Industrial Rd. Raleigh, NC 27617

SUPPLIER'S CERTIFICATION

1/4/2024

67 Stone

This is to certify that the # 67 crushed stone shipped from Carolina Sunrock LLC located in Butner Quarry @ Butner, North Carolina (NCDOT Plant ID # CA 178) meets or exceeds the following specifications:

NCDOT Standard Specifications for Roads and Structures
Section 1005, General Requirements for Aggregate
Section 1012, Aggregate for Asphalt Pavements and Surface Treatments
Section 1014, Aggregate for Portland Cement Concrete

AASHTO Standard Specifications for Transportation Materials
M 43-88 Sizes of Aggregate for Road and Bridge Construction

AASHTO Standard Specifications for Transportation Materials
M 80-87, Coarse Aggregate for Portland Cement Concrete

ASTM D 448-98 Standard Specification for Sizes of
Aggregates for Road and Bridge Construction

ASTM D 692-00 Standard Specification for Coarse Aggregate
for Bituminous Paving Mixtures

ASTM C 33 Standard Specification for Concrete Aggregates
Coarse Aggregate #67

Carolina Sunrock LLC

By:



Vasyl "Basil" Shymonyak, P.E.
Director Quality Control

vsymonyak@thesunrockgroup.com

Phone: 919.868.5659

Fax: 919.688.1936

www.thesunrockgroup.com

ASPHALT CONCRETE AGGREGATES



CAROLINA SUNROCK LLC

Vasyl "Basil" Shymonyak, P.E.
Director Quality Control

8620 Barefoot Industrial Rd. Raleigh, NC 27617

SUPPLIER'S CERTIFICATION

1/4/2024

2MS Sand (Concrete Sand)

This is to certify that the 2MS Sand shipped from Carolina Sunrock LLC located in Butner Quarry, @Butner North Carolina (NCDOT Plant ID # FA 171) meets or exceeds the following specifications:

NCDOT Standard Specifications for Roads and Structures
Section 1005, General Requirements for Aggregate

NCDOT Standard Specifications for Roads and Structures
Section 1014, Aggregate for Portland Cement Concrete

AASHTO Standard Specifications for Transportation Materials
M 6, Fine Aggregate for Portland Cement Concrete

ASTM C 33 Standard Specification for Concrete Aggregates
Fine Aggregate

ASTM C 404 Standard Specification for Aggregates
For Masonry Grout

Carolina Sunrock LLC



By:

Vasyl "Basil" Shymonyak, P.E.
Director Quality Control

vsymonyak@thesunrockgroup.com

Phone: 919.868.5659

Fax: 919.688.1936

www.thesunrockgroup.com

ASPHALT CONCRETE AGGREGATES



GCP Inc.
2325 Lakeview Pkwy
Suite 450
Alpharetta, GA 30009

SCC Customer Service:
1-877- 423-6491

gcpat.com

Tim Kopec
Carolina Sunrock LLC
200 Horizon Dr. Ste 100
Raleigh, North Carolina 27617
Project Name: General Production

January 03, 2024

This is to certify that **Darex® II AEA**, a **Air Entraining Agent**, as manufactured and supplied by GCP Applied Technologies Inc., is formulated to comply with the Specifications for Chemical Admixtures for Concrete, ASTM: **C260**, AASHTO: **M154**.

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

Yours sincerely

A handwritten signature in black ink, appearing to read 'Robert J. Hoopes', written in a cursive style.

Robert J. Hoopes

Product Development Engineer

GCP Applied Technologies

DAREX[®] II AEA

Air-entraining admixture

ASTM C260

Product Description

Darex[®] II AEA is an air-entraining admixture which generates a highly stable air void system for increased protection against damage from freezing and thawing, severe weathering, or de-icer chemicals. Darex II AEA is a complex mixture of organic acid salts in an aqueous solution specifically formulated for use as an air-entraining admixture for concrete and is manufactured under rigid control which provides uniform, predictable performance. It is supplied ready to-use and does not require pre-mixing with water. Darex II AEA is a dark brown liquid. One gallon weighs 8.7 lbs (1.04 kg/L). Darex II AEA complies to ASTM C260 *Standard Specifications for Air-Entraining Admixtures for Concrete*.

Uses

Darex II AEA is used in ready-mix and concrete products plants to improve air entrainment stability. It is particularly effective in maintaining air content during longer haul times. Darex II AEA performs well in conventional concrete and is effective in plasticizing mixes and with slag, lightweight, or manufactured aggregates which tend to produce harsh concrete.

Darex II AEA entrains air effectively with microsilica concrete and with fly ash concrete.

Performance

Darex II AEA disperses and generates millions of discrete semi-microscopic bubbles throughout the concrete composite. Once thoroughly mixed, the concrete contains a stable network of bubbles which act much like ball bearings increasing mobility, or plasticity, of the concrete. This adds workability to the mix and permits a reduction of water with no loss of slump. Placeability is improved. Bleeding, segregation and green shrinkage are minimized.

Through the purposeful entrainment of air, Darex II AEA markedly increases the durability of concrete to all exposures.

Product Advantages

- Air stability makes it particularly useful for longer transit times
- Produces excellent air void systems in concretes that are traditionally difficult to air entrain

Addition Rates

There is no standard addition rate for Darex II AEA. The amount to be used will depend upon the amount of air required under job conditions, usually in the range of 4% to 7%. Typical factors which might influence the amount of air entrained are temperature, cement, sand gradation and use of extra fine materials such as fly ash. Typical Darex II AEA addition rates generally range from 1/2 to 5 fl oz/100 lbs (30 to 320 mL/100 kg) of cement.

The air-entraining efficiency of Darex II AEA becomes even greater when used with water-reducing and set-retarding agents. This may allow a reduction of up to 2/3 in the amount of Darex II AEA required for the specified air content.

Concrete Mix Adjustment

Entrained air results in increased yields with a consequent decrease in the cement content of the placed concrete. This condition calls for a mix adjustment, usually accomplished by reducing the fine aggregate content. This is in addition to the reduction in water content brought about by the increase in plasticity.

Compatibility with Other Admixtures and Batch Sequencing

Darex II AEA is compatible with most GCP admixtures as long as they are added separately to the concrete mix. In general, it is recommended that Darex II AEA be added to the concrete mix near the beginning of the batch sequence for optimum performance, preferably by "dribbling" on the sand. Different sequencing may be used if local testing shows better performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations. Darex II AEA should not be added directly to heated water.

Pretesting of the concrete mix should be performed before use, as conditions and materials change in order to assure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. Please consult your GCP Applied Technologies representative for guidance.

Packaging & Handling

Darex II AEA is available in bulk, delivered by metered tank trucks, totes and drums.

Darex II AEA will freeze at about 30 °F (-1 °C), but its air-entraining properties are completely restored by thawing and thorough mechanical agitation.

Dispensing Equipment

A complete line of accurate dispensing equipment is available. These dispensers can be located to discharge into the water line, the mixer, or on the sand.

Specifications

Concrete shall be air entrained concrete, containing 4% to 8% entrained air. The air contents in the concrete shall be determined by the pressure method (ASTM Designation C231), gravimetric method (ASTM Designation C138) or volumetric method (ASTM Designation C173). The air-entraining admixture shall be Darex II AEA as manufactured by GCP Applied Technologies, or equal. The air-entraining admixture shall be added at the concrete mixer or batching plant at approximately ½ to 5 fl oz/100 lbs (30 to 320 mL/100 kg) of cement, or in such quantities as to give the specified air contents.

gcpat.com | North America Customer Service: 1-877-4AD-MIX1 (1-877-423-6491)

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

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GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

GCP0083

AIR-3-1216



gcp applied technologies



GCP Inc.
2325 Lakeview Pkwy
Suite 450
Alpharetta, GA 30009

SCC Customer Service:
1-877- 423-6491

gcpat.com

Tim Kopec
Carolina Sunrock LLC
200 Horizon Dr. Ste 100
Raleigh, North Carolina 27617
Project Name: General Production

January 03, 2024

This is to certify that **ZYLA® 640**, a **Water Reducer**, as manufactured and supplied by GCP Applied Technologies Inc., is formulated to comply with the Specifications for Chemical Admixtures for Concrete, ASTM: **C494, Type A, D**, AASHTO: **M194, Type A, D**.

ZYLA® 640 does not contain calcium chloride or chloride containing compounds as a functional ingredient. Chloride ions may be present in trace amounts contributed from the process water used in manufacturing.

Yours sincerely

A handwritten signature in black ink, appearing to read "Robert J. Hoopes", written in a cursive style.

Robert J. Hoopes

Product Development Engineer

GCP Applied Technologies

ZYLA[®] 640

Water-reducing admixture

ASTM C494 Type A and D

Product Description

ZYLA[®] 640 water-reducing admixture is a proprietary formulation incorporating polycarboxylate and highly purified specialty organic chemicals. ZYLA 640 promotes more complete hydration of Portland cement and has minimal effect on concrete air entrainment.

The ZYLA product line of water reducers is specially formulated to have a synergistic effect with polycarboxylate-based mid-range and high-range water reducers that improve flat-work finishability. This product contains no intentionally added chloride and as such is essentially chloride free. It is manufactured under rigid controls that provide uniform, predictable performance. ZYLA 640 is supplied as a light brown, low viscosity liquid, and is ready-to-use as received. ZYLA 640 is supplied as a light brown, low viscosity liquid, and is ready-to-use as received. One gallon weighs approximately 9.1 lbs (1.1 kg/L).

Uses

ZYLA 640 is used to produce concrete mixes with lower water content (typically 3% to 10% reduction), greater plasticity and higher compressive strengths. ZYLA 640 is suitable for normal weight and light weight concrete in ready-mix, precast and prestressed applications.

Finishability

The unique chemistry of ZYLA 640 positively impacts the finishability of concrete by providing a creamier and more homogenous texture, with more uniform and increased bleed rate relative to

traditional lignin-based water reducers, although less than ZYLA 610. The influence of ZYLA 640 on the finishability of lean mixes has been particularly noticeable. Floating and troweling, by machine or hand, imparts a smooth, close tolerance surface.

Addition Rates

The addition rate range of 3 to 5 fl oz/100 lbs (195 to 325 mL/100 kg) of cement or cementitious is typical for most applications. However, addition rates of 2 to 7 fl oz/100 lbs (130 to 455 mL/100 kg) of cement or cementitious may be used if local testing shows acceptable performance. Pretesting is required to determine the appropriate addition rate for desired performance. The optimum addition rate depends on the other concrete mixture components, job conditions, and desired performance characteristics.

Compatibility with Other Admixtures and Batch Sequencing

ZYLA 640 is compatible with most GCP admixtures as long as they are added separately to the concrete mix, usually through the water holding tank discharge line. However, ZYLA 640 is not recommended for use in concrete containing naphthalene-based admixtures including Daracem 19 and Daracem 100, and melamine-based admixtures including Daracem 65. In general, it is recommended that ZYLA 640 be added to the concrete mix near the end of the batch sequence for optimum performance. Different sequencing may be used if local testing shows better performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations.

Product Advantages

- No impact on concrete air content
- Better control of water reduction and setting times as compared to traditional lignin-based water reducers
- Synergistic performance of polycarboxylate-based mid-range and high-range water reducers, which includes water reduction and concrete strength and air control
- In the hardened state, improves the compressive and flexural strengths at all ages of concrete versus traditional lignin-based water reducers

Pretesting of the concrete mix should be performed before use, as conditions and materials change in order to assure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. For concrete that requires air entrainment, the use of an ASTM C260 air-entraining agent (such as Daravair or Darex product lines) is recommended to provide suitable air void parameters for freeze-thaw resistance. Please consult your GCP Applied Technologies representative for guidance.

Packaging & Handling

ZYLA 640 is available in bulk, delivered by metered tank trucks, in totes, and in drums.

ZYLA 640 will freeze at about 28°F (-2°C), but will be completely uniform after thawing and thorough agitation.

Dispensing Equipment

A complete line of accurate, automatic dispensing equipment is available. ZYLA 640 may be introduced to the mix through the water holding tank discharge line. The ZYLA product line is formulated to be free of sediment.

Specifications

Concrete shall be designed in accordance with *Standard Recommended Practice for Selecting Proportions for Concrete*, ACI 211.

The water-reducing admixture shall be ZYLA 640, as manufactured by GCP Applied Technologies, or equal. The admixture shall not contain calcium chloride as a functional ingredient. ZYLA 640 will not promote corrosion of reinforcing steel embedded in concrete. It shall be used in strict accordance with the manufacturers' recommendations. The admixture shall comply with ASTM Designation C494, Type A and D water-reducing admixtures. Certification of compliance shall be made available on request.

The admixture shall be delivered as a ready-to-use liquid product and shall require no mixing at the batching plant or job site.

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ZYLA-640-1016



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Tim Kopec
Carolina Sunrock LLC
200 Horizon Dr. Ste 100
Raleigh, North Carolina 27617
Project Name: General Production

January 03, 2024

This is to certify that **ADVA® 140(M)**, a **High Range Water Reducer**, as manufactured and supplied by GCP Applied Technologies Inc., is formulated to comply with the Specifications for Chemical Admixtures for Concrete, ASTM: **C494 Type A, F and ASTM C1017**, AASHTO: **M194, Type A, F**.

ADVA® 140(M) does not contain calcium chloride or chloride containing compounds as a functional ingredient. Chloride ions may be present in trace amounts contributed from the process water used in manufacturing.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Robert J. Hoopes', written in a cursive style.

Robert J. Hoopes

Product Development Engineer

GCP Applied Technologies

ADVA® 140M

High-range water-reducing admixture
ASTM C494 Type A and F and ASTM C1017 Type I

Product Description

ADVA® 140M is a high-range water-reducing admixture based on polycarboxylate technology specifically formulated to meet the needs of the concrete industry. ADVA 140M meets the requirements of ASTM C494 as a Type A and F, and ASTM C1017 Type I. One gallon weighs approximately 8.8 lbs (1.1 kg/L) and does not contain intentionally added chloride. It is a low viscosity liquid that has been formulated by the manufacturer for use as received.

Uses

ADVA® 140M has been used successfully in a wide variety of concrete applications for high-slump, low water-to-cementitious ratio concrete requiring a high-range water reducer to flatwork in residential applications requiring a mid-range water reducer. ADVA 140M produces concrete with excellent workability characteristics for high slump and moderate slump concrete.

ADVA 140M is ideal for use in any concrete where it is desired to keep the water/cementitious ratio to a minimum and still achieve the high strength and degree of workability necessary to provide easy placement and consolidation. ADVA 140M will also fluidize concrete making it ideal for tremie concreting or other applications where high slumps are desired.

Addition Rates

Addition rates of ADVA 140M can vary with type of materials and application. The addition rate can range between 2 oz/cwt and 20 oz/cwt (130 mL/100 kg and 1300 mL/100 kg) of cement.

Typical addition rates are:

- High-range water reducer—9 to 16 oz/cwt (590 to 1040 mL/100 kg)
- Mid-range water reducer—5 to 9 oz/cwt (325 to 590 mL/100 kg)

Optimal addition rates will depend on other concrete mixture components, job conditions, and desired performance characteristics. At a given water/cementitious ratio, the slump required for placement can be controlled by varying the addition rate. Should job site conditions require using more than recommended addition rates, please consult your GCP Applied Technologies representative.

Product Advantages

- Can be used as a high-range water reducer as well as a mid-range water reducer providing production flexibility
- Consistent air entrainment
- Consistent performance across cement chemistries
- Provides a superior combination of long slump life with near neutral set time
- Concrete finishes easily without stickiness, tearing or spotty set characteristics



Compatibility with Other Admixtures and Batch Sequencing

ADVA 140M is compatible with most GCP admixtures as long as they are added separately to the concrete mix. However, ADVA products are not recommended for use in concrete containing naphthalene-based admixtures including Daracem® 19 and Daracem 100, and melamine-based admixtures including Daracem 65. In general, it is recommended that ADVA 140M be added to the concrete mix near the end of the batch sequence for optimum performance. Different sequencing may be used if local testing shows better performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations.

Pretesting of the concrete mix should be performed before use and as conditions and materials change in order to assure compatibility with other admixtures, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. For concrete that requires air entrainment, the use of an ASTM C260 air-entraining agent (such as Daravair® or Darex® product lines) is recommended to provide suitable air void parameters for freeze-thaw resistance. Please consult your GCP Applied Technologies representative for guidance.

Packaging & Handling

ADVA 140M is available in bulk, delivered by metered tank trucks, totes and drums. It will begin to freeze at approximately 32°F (0°C), but will return to full strength after thawing and thorough agitation.

In storage, and for proper dispensing, ADVA 140M should not experience prolonged exposure below 32°F (0°C) nor above 132°F (55°C).

Dispensing Equipment

A complete line of accurate, automatic dispensing equipment is available.

ADVA 140M ASTM C494 Type F High-Range Water Reducer Test Data				
	U.S. Units		Metric	
	Control	ADVA 140M	Control	ADVA 140M
Cement (pcy) (kg/m ³)	517	517	307	307
Coarse aggregate (pcy) (kg/m ³)	1944	1944	1153	1153
Fine aggregate (pcy) (kg/m ³)	1144	1214	679	720
Water (pcy) (kg/m ³)	235	201	139	119
w/cm	0.455	0.389	0.455	0.389
Slump (inches) (mm)	3.75	3.75	95	95
Plastic air (%)	5.5	5.5	5.5	5.5
Compressive strength				
1 day (psi) (MPa)	1860	2750	12.8	19.0
7 day (psi) (MPa)	4520	5850	31.2	40.3
28 day (psi) (MPa)	5440	6640	37.5	45.8
Initial set time (hr:min)	4:02	4:18	4:02	4:18
Length change 28 day (%)	-0.031	-0.024	-0.031	-0.024
Freeze-thaw resistance (RDME %)	92	96	92	96a

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