

Tuesday, November 26, 2019

Merlo Const. Co. Inc.
4964 Technical Dr.
Milford, Mi. 48381



Administrative Office
30701 West 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

RE: Concrete submittal for mix addition for MDOT 82000-205935 Various Locations in Detroit.

**** Correction on the PSI****

Superior Materials, LLC submits the following concrete mixture(s) and documents for review.

Immediately below is a summary of this submittal.

SUPERIOR MATERIALS WARRANTS CONCRETE PLASTIC MEASURES WHEN TESTED AT THE DELIVERY UNIT DISCHARGE CHUTE UPON ARRIVAL ON SITE. WE WILL NOT BE RESPONSIBLE FOR PWL OR NON-PWL NEGATIVE ADJUSTMENTS AFTER OTHER TRANSPORT AND CONSOLIDATION METHODS ARE UTILIZED SUCH AS PUMPING, PAVING EQUIPMENT, VIBRATION, CONVEYORS, DROPPING, ... ETC., AS THESE HANDLING PROCEDURES ARE KNOWN TO ALTER PLASTIC MEASURES. IF A PLASTIC MEASURE(S), WHEN TESTED AT THE DELIVERY UNIT, IS FOUND TO BE OUTSIDE OF SPECIFICATION LIMITS (INCLUDING TOTAL AIR CONTENT BELOW 5.5% OR HIGHER THAN 8.5%), THE CONCRETE MUST EITHER BE REJECTED OR BROUGHT INTO SPECIFICATION LIMITS BEFORE PLACEMENT. ALL PLASTIC MEASURES RESULTS FOUND OUTSIDE OF QC PLAN ACTION LIMITS MUST BE CALLED INTO SUPERIOR MATERIALS QC DEPARTMENT AT ANY ONE OF THE NUMBERS: 810-240-9286 / 248-361-0958 / 248-875-3640 / 586-531-0004.

- 1.) Mix ID # S1H5ERCQA032-Grade S1 Concrete, 5 inch slump.
 - a. JMF and Verification Forms.
- 2.) Stockpile Management SOP
- 3.) Certifications
 - a. NRMCA certification
 - b. Scale Calibration Certification
 - c. Admix Certification Letter
 - d. Admix Calibration Certification
- 4.) ASR documentation
 - a. ASTM C-1293
- 5.) Materials:
 - a. Cement Mill Report
 - b. Slag Mill Report
 - c. Aggregates
 - d. Admixtures

Please provide approval status when available.

Sincerely,

Nancy Donahue
Technical Service
Superior Materials, LLC
(248) 640-2380 Cell
nxdonahue@superiormaterials.net

Serving All of Southeastern Michigan

Toll Free Order desk: (888) 988-4400 * Office: (248) 788-8000 * Fax: (248) 592-9074

JOB MIX FORMULA (JMF)

CONCRETE FIELD COMMUNICATION

File 206

This form applies only to the project listed below and is not transferable to other projects
DISTRIBUTION: ORIGINAL - Project Engineer COPIES - Contractor, Lansing CFS, Region, Inspector

CONTROL SECTION 82000	JOB NUMBER 205935	PROJECT LOCATION VARIOUS LOCATIONS	PROJECT ENGINEER JOHN J QUALEY III
CONCRETE SUPPLIER Superior Materials		PLANT LOCATION 8911 W. Jefferson, Detroit, MI 48209	PLANT NUMBER Plant 32 (M-02)
GRADE OF CONCRETE S1	PSI REQUIREMENT 4000	MIX DESIGN NUMBER S1H5ERCQA032	INTENDED USE (S) FOUNDATIONS
PRIME / SUBCONTRACTOR (S) MERLO CONSTRUCTION CO. INC.		CONTRACTOR QC PLAN SUBMITTED? (MDOT use only) Y ☐ N ☐	
STANDARD SPEC DATE 2012	QC/QA SPECIAL PROVISION 12SP-604A-09	DATE 6/11/2018	JMF EFFECTIVE DATE 11/25/2019
		AGG. CORRECTION 0.2	

MATERIALS DESIGN SOURCES AND PROPERTIES					
COARSE AGGREGATE		INTERMEDIATE AGGREGATE		FINE AGGREGATE	
Aggregate Type	limestone	Aggregate Type	NA	Source Name	Smelter Bay - Maple Ridge
Source Name	Presque Isle	Source Name	NA	MDOT Source Number	95-013
MDOT Source Number	71-47	MDOT Source Number	NA	MDOT Series Class	2NS
MDOT Series Class	6AA	MDOT Series Class	NA	Specific Gravity (Bulk Dry)*	2.62
Specific Gravity (Bulk Dry)*	2.56	Specific Gravity (Bulk Dry)*	NA	Specific Gravity (Bulk SSD) optional	
Specific Gravity (Bulk SSD) optional		Specific Gravity (Bulk SSD) optional		Absorption	0.68
Absorption	1.3	Absorption	0	Fineness Modulus (FM)	2.72
Unit Weight (Dry Rodded) DR or	98	Unit Weight (Dry Rodded) DR or	0		
Unit Weight (Dry Loose) DL		Unit Weight (Dry Loose) DL			
Percent Crushed	100	Percent Crushed	100		
MDOT Freeze-Thaw (F-T) Dilation	0.016	MDOT Freeze-Thaw (F-T) Dilation	NA		
Specific Gravity (Bulk Dry) of F-T Sample	2.56	Specific Gravity (Bulk Dry) of F-T Sample *	NA		
Date of MDOT Freeze-Thaw Report	5/8/2014	Date of MDOT Freeze-Thaw Report	NA		

* If the bulk specific gravity is more than 0.04 less than the bulk dry specific gravity of the most recently tested freeze-thaw sample, the aggregate will be considered to have changed characteristics and be required to have a new freeze-thaw test conducted prior to use on Department projects.

CEMENTITIOUS		ADMIXTURES		Manufacturer/Product Name	Type	Supplier Code
Cement Source / Plant	St. Marys Detroit	Air Entrainment* (Source/Prod/Type) w/ticket code		BASF MasterAir AE 200	AE	XUE12
Cement Type	I	WR** (Source/Prod/Type) w/ticket code		BASF MasterPozzolith 200	D	XUN12
Cement Specific Gravity	3.15	MR*** (Source/Prod/Type) w/ticket code		BASF MasterPolyheed 997	MR	XUM11
Fly Ash Source (distributor & plant)	NA	HR**** (Source/Prod/Type) w/ticket code		NA	NA	NA
Fly Ash Class	NA	Accelerator (Source/Prod/Type) w/ticket code		NA	NA	NA
Fly Ash Specific Gravity	NA	Other (Source/Prod/Type) w/ ticket code		NA	NA	NA
Slag Cement Source	St. Marys					
Slag Cement Grade	100					
Slag Cement Specific Gravity	2.9					
Other	NA					

TYPE OF MIX WINTER / SUMMER

* If AE dosage is less than 1.0 oz/cwt DO NOT REJECT refer to notes at end of QPL Admix Listings.

Water Reducer / *Mid-Range Water Reducer / ****High-Range Water Reducer

MIX PROPORTIONS					
Bulk Volume of Coarse Aggregate (DR)	0.65	Design Slump* (in)	5.0	Slump Range	(3.5-6)
Coarse Aggregate Weight (Dry)	1708	Specified Slump (in)	0 - 6		
Intermediate Aggregate Weight (Dry)	0	Design Air %	6.5%		
Fine Aggregate Weight (Dry)	1220	Specified Air %	5.5% - 8.5%		
Portland Cement Weight	458	PSI minimum required	3500		
Fly Ash Weight	0				
Fly Ash Percent of Cementitious	0	Total Cementitious	611		
Slag Cement Weight	153				
Slag Cement Percent of Cementitious	25	Yield cu/ft	27		
Total Water Weight	296				
Net Water Weight	265				
W/C (as designed)	0.43				
Air Entrainment* (dosage)	1.0 oz/cwt	HR (dosage)	NA	NA	
WR (dosage)	4.0 oz/cwt	Accelerator (dosage)	NA	NA	
MR (dosage)	8.0 oz/cwt	Other (dosage)	NA	NA	

I certify that all applicable standard test methods have been followed verifying the mix design and JMF:

Signature NXDonahue Digitally signed by NXDonahue
Date: 2019.11.26 11:06:27 -05'00'

MCA Level II Expiration Date: 4/15/2021

Date: 11/25/2019

Remarks:

Portland Cement Concrete (PCC) Mixture Design Verification:For PCC Grade: S1**Mix Verification:** For Mix Number: S1H5ERCQA032**Mix Verification Method:** 2Mix Verification tests conducted by: Superior Materials, LLC LaboratoryProject Number: 82000 Address: 10147 Grand RiverJob Number: 205935 City / State / Zip Brighton, MI 48116Telephone: 248-788-8000**Verification Mix Proportions***

Workability Factor, b/bo	0.65	
b/bo, Based on Unit Weight (DL) or (DR)	DR	
Coarse Aggregate Weight (Dry)	1708	
Intermediate Aggregate Weight (Dry)	0	
Fine Aggregate Weight (Dry)	1220	
Portland Cement Weight	458	
Fly Ash Weight	0	
Fly Ash Percent of Cementitious	0	
GGBFS Weight	153	
GGBFS Percent of Cementitious	25	
Total Water Weight	296	
Net Water Weight	265	
W/C (as designed)	0.43	
Air Entrainment (dosage)	1.0	oz/cwt
Water Reducer (dosage)	4.0	oz/cwt
Mid Range Water Reducer (dosage)	8.0	oz/cwt
High Range Water Reducer (dosage)	NA	NA
Accelerator (dosage)	NA	NA
Other (dosage)	NA	NA

*Refer to accompanying JMF Form for specifics on materials used in concrete mix design.

Verification Mix Properties

Batch			
	1	2	3
Date of Batch	8/22/2018	9/6/2018	6/8/2019
Air Content	7.6	8	7
Slump	5.25	5.75	5.5
Temperature	79	82	75
Density (pcf)	140.5	140.1	141
Strength at	Days Old		
Cylinder 1			
Cylinder 2			
Average			
Strength at	7 Days Old		
Cylinder 1	4860	4060	3550
Cylinder 2			
Average	4860	4060	3550
Strength at	28 Days Old		
Cylinder 1	6000	5270	5290
Cylinder 2	5910	5490	5020
Average	5955	5380	5155

Statement of Verification

All applicable ACI and ASTM methods have been followed in verifying this mix design.

Signed: NANCY DONAHUEDate: 11/25/19Title: Technical Service / MCA-ACI Level II Certified Technician

SOP Ops82
Effective Date 1-5-03

SUPERIOR MATERIALS, INC STANDARD OPERATING PROCEDURE

FUNCTION	OPERATIONS	TOPIC	AGGREGATE STOCK PILE MANAGEMENT & USE
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OBJECTIVE (S): Standardized procedure for aggregates inventory and use during concrete production.

RESPONSIBILITY: Plant operators, yardmen, area managers.

(1) STATEMENT OF POLICY

- a. Proper aggregate inventory/use procedures are mandatory to eliminate material cross contamination and segregation issues as well as inventory balancing/control.
- b. The required procedures apply for all concrete production facilities – including both wet and dry batched plants, and the block plant.

(2) REQUIRED PROCEDURES

- a. Before any aggregate(s) are received in the yards:
 - Appropriately sized storage bins (as determined by the applicable area manager) must be constructed.
 - i. The area selected must be pitched to prevent rain-water or rain-bird collection/ponding.
 - ii. The area selected must be not impede gravel train or front loader traffic.
 1. Do not allow mixer traffic and aggregate traffic to cross.
 - iii. Use interlocking concrete blocks erected to an elevation of 8'.
 1. The block storage bin must have three sides and an open face.
 - iv. Label each yard storage bin with lettering at least 12" in height. Use the following designations for labeling:

1. 6AA, 6A, 2NS, 467, 29A, 26A, HAYDITE C, HAYDITE B, 17A, PEASTONE, 31A, 6AASLAG

- b. When receiving raw materials into the yard:
 - All delivery tickets must be signed by the plant operator, before dumping.
 - The plant operator will retain a copy of the delivery.
 - The plant operator will maintain inventory in Oracle PPM and the Spectrum/Eagle batch computer.
 - The plant operator will inter-office mail these tickets to Farmington Hills office at the end of each day.
- c. Maintaining aggregate stock piles:
 - The yardman will keep the stock pile levels so that the do not extend beyond, or outside of the concrete block yard storage bins.
 - For aggregate sizes of 1.5" or larger, the stone must be remixed with the loader during stock pile maintenance.
 - The yardman will operate the rain-birds (aggregate stock pile water sprinklers) from 5/1 to 9/1.
- d. Using aggregates:
 - When loading the plant(s) with aggregates from stockpiles, work across the entire face of the stock pile to prevent segregation.
 - To prevent segregation, keep the plant aggregate bins full at all times.

(3) RESPONSIBILITIES

- a. Plant operators and area managers are responsible for training of gravel train drivers and yardmen on procedure execution.
- b. Plant operators and yardmen are responsible for procedure execution.

Approved By: _____

Date: _____

National Ready Mixed Concrete Association



Certificate of Conformance For Concrete Production Facilities

THIS IS TO CERTIFY THAT

Jefferson Avenue Plant 32, Detroit, MI

Superior Materials, LLC

has been inspected by the undersigned licensed professional engineer for conformance with the requirements of the *Check List for Ready Mixed Concrete Production Facilities*. As of the inspection date, the facilities met the requirements for production by

*Truck Mixing with Automatic Batching and Recordings of
Cementitious Materials, Aggregate, Water, and Chemical Admixtures*



Signature of Licensed Professional Engineer

January 18, 2018

Inspection Date

January 28, 2020

Certification Expiration Date

This company will maintain these facilities in compliance with the *Check List* requirements and will correct promptly any deficiencies which develop.

Signature of Company Official

Title of Company Official

NOTICE: The Check List indicates only that plant facilities are satisfactory for the production of concrete when properly operated. Conformance of the concrete itself with specification requirements must be verified by usual inspection methods in accordance with sales agreements.

This certificate is issued by the National Ready Mixed Concrete Association on verification that the production facility conforms to the requirements of the NRMCA Certification of Ready Mixed Concrete Production Facilities, QCS. Unauthorized reproduction or misuse of this certificate may result in legal action.

Plant ID #: 800340

Certification ID #: 22464

© 1965, 1992, 2001, 2002, 2006, 2007, 2012

National Ready Mixed Concrete Association 900 Spring Street • Silver Spring • Maryland 20910



WORK ORDER

Great Lakes Scale

35380 UNION LAKE RD
HARRISON TOWNSHIP, MI 48045
Phone: (586)776-0517
Fax: (586)776-3169
Fed Tax ID: 38-3206225

Work Order# 0027354-1**Request Date** 11/1/2019 2:08:00 PM**Schedule Date** 11/4/2019 9:00:00 AM**Bill To** SUP0896

SUP0896
SUPERIOR MATERIALS HOLDINGS LLC
PO BOX 2900
FARMINGTON HILLS, MI, 48336
(248) 788-8000

Ship To SUP1173

SUP1173
SUPERIOR MATERIALS S2
8911 WEST JEFFERSON
DETROIT, MI,
(248) 788-8000

Customer P.O**Requester** DAN THOMAS**Phone** (248) 788-8048**Email** delthomas@superformaterials.net**CONTRACT TYPE:** No Contract**DESCRIPTION:****TASK DESCRIPTION****SERVICE TYPE:** CAL**Service Date** 11/4/2019

SCALE CHECK WAYNE COUNTY 9 AM

2 hours minimum portal to portal

WORK PERFORMED

CALL COMPLETE

CALIBRATIONS COMPLETE. Test scales with county inspector. Couldn't start right away due to customer loading trucks. Then Hilo ran out of gas. Floors had to clean to move weights around. Agg was bad. Maint helped clean floor for agg. Setup on cement scale to check scale and belt guard was in way to drop chains. Customer told us to move to water so they could remove guard. Moved all equipment to water. Customer loaded trucks between scale checks. Had to wait to remove and install equipment. Cement was heavy customer recalibrated scale.

TECHNICIAN(S)

JOE BELARZ, RAY MCCREARY

EQUIPMENT SERVICED	ASSET/UNIT #	SERIAL #	MODEL	LOCATION
10,000 x 5 lb	662821 CEMENT	662821 CEMENT	ALUKON SCALE/INDICATOR / COMMAND	
6000 x 1	662821 WATER	662821 WATER	ALUKON SCALE/INDICATOR / COMMAND	
40,000 x 20 lb	662821 AGG A	662821 AGG A	ALUKON SCALE/INDICATOR / COMMAND	AGG A

PARTS LIST

Customer Signature

Name:

GREAT LAKES SCALE COMPANY
35380 UNION LAKE RD.
HARRISON TOWNSHIP, MI 48045
Phone: (586) 776-0517

Certificate of Calibration

Customer: SUPERIOR MATERIALS 32
SUP1173 8911 WEST JEFFERSON

Certificate ID: 60201 CEMENT191104121113

Test Date: 11/04/2019

DETROIT, MI

I&O Number: MS-FM-CEN-001

(*) Make: ALKON Model : COMMAND SN#: 62821 CEMENT Capacity: 10000 lb Graduation: 5 lb

CALIBRATION DATE	DUE DATE	TEST INTERVAL	SCALE ID	SCALE CLASS
11/04/2019	05/05/2020	Semi-Annually	52821 CEMENT	III
SCALE LOCATION		EQUIPMENT CONDITIONS		
		Working Clean		
SELECT NUMBER OF PM DAYS:	CAPACITY	10000 UOM	lb	INCREMENT
				5

AS FOUND TEST USING TEST WEIGHTS

Weight Applied			Reading			Error			Weight Applied			Reading			Error		
0	lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb
2000	lb	2005	lb	5	lb	6000	lb	6000	lb	0	lb	6000	lb	6000	lb	0	lb
4000	lb	4010	lb	10	lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb
6000	lb	6015	lb	15	lb	1000	lb	1000	lb	0	lb	1000	lb	1000	lb	0	lb
	lb		lb		lb	2000	lb	2000	lb	0	lb	2000	lb	2000	lb	0	lb
	lb		lb		lb	3000	lb	3000	lb	0	lb	3000	lb	3000	lb	0	lb
	lb		lb		lb	4000	lb	4000	lb	0	lb	4000	lb	4000	lb	0	lb
	lb		lb		lb	5000	lb	5000	lb	0	lb	5000	lb	5000	lb	0	lb
	lb		lb		lb	6000	lb	6000	lb	0	lb	6000	lb	6000	lb	0	lb
	lb		lb		lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb

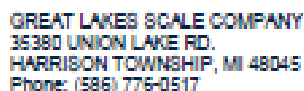
AS LEFT TEST USING TEST WEIGHTS

Weight Applied			Reading			Error			Weight Applied			Reading			Error		
0	lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb
2000	lb	2005	lb	5	lb	6000	lb	6000	lb	0	lb	6000	lb	6000	lb	0	lb
4000	lb	4010	lb	10	lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb
6000	lb	6015	lb	15	lb	1000	lb	1000	lb	0	lb	1000	lb	1000	lb	0	lb
	lb		lb		lb	2000	lb	2000	lb	0	lb	2000	lb	2000	lb	0	lb
	lb		lb		lb	3000	lb	3000	lb	0	lb	3000	lb	3000	lb	0	lb
	lb		lb		lb	4000	lb	4000	lb	0	lb	4000	lb	4000	lb	0	lb
	lb		lb		lb	5000	lb	5000	lb	0	lb	5000	lb	5000	lb	0	lb
	lb		lb		lb	6000	lb	6000	lb	0	lb	6000	lb	6000	lb	0	lb
	lb		lb		lb	0	lb	0	lb	0	lb	0	lb	0	lb	0	lb

AS LEFT BUILD TEST

[illegible]

OVERALL TEST RESULTS PASS



Customer: SUPERIOR MATERIALS 32
SUP1173 8911 WEST JEFFERSON

Certificate ID: 000021 WALTER H H 04/10/2008

Test Date: 11/04/2019

DETROIT, MI

ISO Number: 185-FW-CEN-071

(*Make: ALKON Model : COMMAND S/N#: 662821 WATER Capacity: 6000 lb Graduation: 1 lb

AS FOUND TEST USING TEST WEIGHTS

Weight Applied			Reading			Error			Weight Applied			Reading			Error		
0	lb	0	lb	0	lb	0	lb	0	0	lb	0	lb	0	lb	0	lb	
6000	lb	6000	lb	0	lb	1000	lb	1000	lb	0	lb						
0	lb	0	lb	0	lb	2000	lb	2000	lb	0	lb						
	lb		lb		lb	3000	lb	3000	lb	0	lb						
	lb		lb		lb	4000	lb	4000	lb	0	lb						
	lb		lb		lb	5000	lb	5000	lb	0	lb						
	lb		lb		lb	6000	lb	6000	lb	0	lb						
	lb		lb		lb		lb		lb		lb						
	lb		lb		lb		lb		lb		lb						
	lb		lb		lb		lb		lb		lb						

[illegible]

OVERALL TEST RESULTS: N/A



GREAT LAKES SCALE COMPANY
36380 UNION LAKE RD.
HARRISON TOWNSHIP, MI 48045
Phone: (586) 776-0517

Certificate of Calibration

Customer: SUPERIOR MATERIALS 32
SUP1173 8911 WEST JEFFERSON

Certificate ID: 003021 AGG A101104120003

Test Date: 11/04/2019

DETROIT, MI

ISO Number: MS-FM-CEM-001

(*) Make: ALKON Model: COMMAND S/N: 662821 AGG A Capacity: 40000 LB Graduation: 20 LB

CALIBRATION DATE	DUE DATE	TEST INTERVAL	SCALE ID	SCALE CLASS
11/04/2019	05/05/2020	Semi-Annually	662821 AGG A	III L
SCALE LOCATION		EQUIPMENT CONDITIONS		
AGG A		Working	Clean	
SELECT NUMBER OF PM DAYS:		CAPACITY	40000 UOM LB	INCREMENT 20

AS FOUND TEST USING TEST WEIGHTS

AS LEFT TEST USING TEST WEIGHTS

Weight Applied	Reading	Error	Weight Applied	Reading	Error
0	LB 0	LB 0		LB	LB
6000	LB 6000	LB 0		LB	LB
0	LB 0	LB 0		LB	LB
1000	LB 1000	LB 0		LB	LB
2000	LB 2000	LB 0		LB	LB
3000	LB 3000	LB 0		LB	LB
4000	LB 4000	LB 0		LB	LB
5000	LB 5000	LB 0		LB	LB
6000	LB 6000	LB 0		LB	LB
0	LB 0	LB 0		LB	LB

AS LEFT BUILD TEST

Test Weight Applied	Material Weight Applied	Reading	Error
2000	LB 6000	LB 8000	LB 0
4000	LB 6000	LB 10000	LB 0
6000	LB 6000	LB 12000	LB 0
2000	LB 12000	LB 14000	LB 0
4000	LB 12000	LB 16000	LB 0
6000	LB 12000	LB 18000	LB 0
2000	LB 18000	LB 20000	LB 0
4000	LB 18000	LB 22000	LB 0
6000	LB 18000	LB 24000	LB 0
2000	LB 24000	LB 26000	LB 0
4000	LB 24000	LB 28000	LB 0
6000	LB 24000	LB 30000	LB 0
2000	LB 30000	LB 32000	LB 0
4000	LB 30000	LB 34000	LB 0
6000	LB 30000	LB 36000	LB 0
	LB 36000	LB 38000	LB 0
	LB	LB	LB
	LB	LB	LB
	LB	LB	LB
	LB	LB	LB



WORK ORDER

Great Lakes Scale

35380 UNION LAKE RD
HARRISON TOWNSHIP, MI 48045
Phone: (586)776-0517
Fax: (586)776-3169
Fed Tax ID: 38-506225

Bill To SUP0896

SUP0896
SUPERIOR MATERIALS HOLDINGS LLC
PO BOX 2900
FARMINGTON HILLS, MI, 48336
(248) 788-8000

Ship To SUP1173

SUP1173
SUPERIOR MATERIALS 32
8911 WEST JEFFERSON
DETROIT, MI,
(248) 788-8000

Customer P.O

Requester DAN THOMAS
Phone (248) 788-8048
Email dehthomas@superiormaterials.net

CONTRACT TYPE: No Contract

DESCRIPTION:
TASK DESCRIPTION
SERVICE TYPE: CAL

SCALE CHECK WAYNE COUNTY 9 AM

Service Date 11/4/2019

2 hours minimum portal to portal

WORK PERFORMED

CALL COMPLETE

CALIBRATIONS COMPLETE. Test scales with county inspector. Couldn't start right away due to customer loading trucks. Then Hilo ran out of gas. Floors had to clean to move weights around. Agg was bad. Maint helped clean floor for agg. Setup on cement scale to check scale and belt guard was in way to drop chains. Customer told us to move to water so they could remove guard. Moved all equipment to water. Customer loaded trucks between scale checks. Had to wait to remove and install equipment. Cement was heavy customer recalibrated scale.

TECHNICIAN(S)

JOE BIELASZ, RAY MCCREARY

EQUIPMENT SERVICED	ASSET/UNIT #	SERIAL #	MODEL	LOCATION
10,000 x 5 lb	662821 CEMENT	662821 CEMENT	ALCON SCALE/INDICATOR / COMMAND	
6000 x 1	662821 WATER	662821 WATER	ALCON SCALE/INDICATOR / COMMAND	
40,000 x 20 lb	662821 AGG A	662821 AGG A	ALCON SCALE/INDICATOR / COMMAND	AGG A

PARTS LIST
Customer Signature



GREAT LAKES SCALE COMPANY
 35380 UNION LAKE RD.
 HARRISON TOWNSHIP, MI 48045
 Phone: (586) 776-0517

Customer: SUPERIOR MATERIALS 32
 SUP1173 8911 WEST JEFFERSON

DETROIT, MI

Certificate ID: 002021 AGG A191104130003

Test Date: 11/04/2019

ISO Number: MS-FM-CEM-001

TEST INFORMATION

TEST WEIGHT CLASSIFICATION	EXPANDED UNCERTAINTY
F	15
ENVIRONMENTAL CONDITIONS	TEMPERATURE
Acceptable	55
WAS THE SCALE WITHIN CUSTOMERS REQUIRED ACCURACY?	
Yes	
TEST LOCATION	OVERALL RESULT
Onsite	Pass w/o adjustment

Comments:

TRACEABILITY CERTIFICATE NUMBERS:

Kit	NIST	Date	Date Due
Description			
GL0801	MI-08-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0802	MI-08-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0803	MI-08-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0804	MI-08-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0805	MI-08-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0806	MI-08-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			

Technician(s): RAY MCCREARY; Joe Bielarz

Signature:

A handwritten signature in red ink, appearing to be "JTB", is written over the signature line.

Devices were calibrated with the certified test weights. Adjustments made to restore and/or maintain the accuracy of the device conform to the tolerances established by NIST or Manufacturers Specifications. Best measurement of uncertainty calculated using a coverage factor of K=2. This provides confidence level of 95%.

Page 2 of 2



GREAT LAKES SCALE COMPANY
35380 UNION LAKE RD.
HARRISON TOWNSHIP, MI 48045
Phone: (586) 776-0517

Customer: SUPERIOR MATERIALS 32
SUP1173 8911 WEST JEFFERSON

DETROIT, MI

Certificate ID: 060321 WATER191104120029

Test Date: 11/04/2019

I&O Number: MS-FM-CEM-001

TEST INFORMATION

TEST WEIGHT CLASSIFICATION	EXPANDED UNCERTAINTY
F	1.28
ENVIRONMENTAL CONDITIONS	TEMPERATURE
Acceptable	55
WAS THE SCALE WITHIN CUSTOMERS REQUIRED ACCURACY?	
Yes	
TEST LOCATION	OVERALL RESULT
Onsite	Pass w/o adjustment

Comments:

TRACEABILITY CERTIFICATE NUMBERS:

Kit	NIST	Date	Date Due
Description			
GL0601	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0602	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0603	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0604	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0605	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0606	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			

Technician(s): RAY MCCREARY; Joe B.

Signature:

A handwritten signature in black ink, appearing to read 'Ray M', is written over the signature line.

Devices were calibrated with the certified test weights. Adjustments made to restore and/or maintain the accuracy of the device conform to the tolerances established by NIST or Manufacturers Specifications. Best measurement of uncertainty calculated using a coverage factor of K=2. This provides confidence level of 95%.

Page 2 of 2



GREAT LAKES SCALE COMPANY
35380 UNION LAKE RD.
HARRISON TOWNSHIP, MI 48045
Phone: (586) 776-0517

Customer: SUPERIOR MATERIALS 32
SUP1173 8911 WEST JEFFERSON

DETROIT, MI

Certificate ID: 02021 CEMENT19H104121113

Test Date: 11/04/2019

I&O Number: MS-FM-CEM-001

TEST INFORMATION

TEST WEIGHT CLASSIFICATION	EXPANDED UNCERTAINTY
F	3.50
ENVIRONMENTAL CONDITIONS	TEMPERATURE
Acceptable	55
WAS THE SCALE WITHIN CUSTOMERS REQUIRED ACCURACY?	
Yes	
TEST LOCATION	OVERALL RESULT
Onsite	Pass adjustment needed

Comments:
Test and cal scale with county inspector

TRACEABILITY CERTIFICATE NUMBERS:

Kit	NIST	Date	Date Due
Description			
GL0601	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0602	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0603	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0604	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0605	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			
GL0606	MI-06-19-14292	6/13/2019	6/13/2021
TRUCK 6 - 1000 LB			

Technician(s): RAY MCCREARY; Joe B

Signature:

Ray M

Devices were calibrated with the certified test weights. Adjustments made to restore and/or maintain the accuracy of the device conform to the tolerances established by NIST or Manufacturers Specifications. Best measurement of uncertainty calculated using a coverage factor of $K=2$. This provides confidence level of 95%.

CUSTOMER LOCATION

Superior Jefferson Plant

ADMIXTURE	REQUIRED	MEASURED	OVER/UNDER
Masterair AE200	32oz	32oz	0
MasterPozzolith 200	42oz	42oz	0
MasterPolyheed 997	50oz	50oz	0
MasterPolyheed 100	50oz	50oz	0
MasterRheobuild1000	60oz	60oz	0
Masterset AC 534	60oz	60oz	0
Masterglenium 7925	40oz	40oz	0
Masterset Delvo	-----	-----	-----
MasterLife CI30	3 Gal	3 Gal	0
Water	150gal	150gal	0

To Whom It May Concern:

This letter is to certify that Admixture dispensing equipment was tested to meet the requirements for measuring material according to ASTM C-94 the standard specifications for Ready Mixed Concrete.

TESTED AND APPROVED BY: *Jacob Honey*

DATE: 10/11/19



30701 West 10 Mile Rd.
Suite 500
Farmington Hills, Mi. 48336

ADMIXTURE GENERAL CERTIFICATION

Date: Monday, November 25, 2019

Contractor: MERLO CONSTRUCTION CO. INC.

Control Section: 82000 **Job No.:** 205935

QC/QA Spec. Prov.: 12SP-604A-09 **Date Effective:** 6/11/2018

Project/Location: VARIOUS LOCATIONS

We certify that the following described QPL materials have been tested and meets the specification requirements of the MICHIGAN DEPARTMENT OF TRANSPORTATION and ASTM, or MDOT Specs, and were provided and incorporated into the identified project.

The following admixtures are listed on the MDOT QUALIFIED PRODUCTS LIST (QPL) and may be used in the above listed project.

Table 903-1 (from 2012 Standard Specifications for Construction, Sec 903) ASTM C 494 Terms for Chemical Admixtures		
Type	Term	Manufacturer: BASF Construction Chemical Co.
A	Water-reducing admixtures	MasterPozzolith 200
C	Accelerating admixtures	MasterSet AC 534
D	Water-reducing and retarding admixtures	MasterPozzolith 200
E	Water-reducing and accelerating admixtures	NA
F	Water-reducing, high range admixtures	MasterRheobuild 1000
G	Water-reducing, high range, and retarding admixtures	NA

903.01 - Master Air AE 200

The Department refers to water-reducing, mid range admixtures, not included in ASTM C 494, as MR. Admixtures from BASF that fall under this "Type" are as follows:

MasterPolyheed 997

MasterPolyheed 100

All admixtures as used, meet the minimum dosage rates as set forth in MDOT's QPL.

Nancy Donahue
Technical Service
Superior Materials, LLC
(248) 640-2380 Cell

nxdonahue@superiormaterials.net

Serving All of Southeastern Michigan

Toll Free Order desk: (888) 988-4400 * Office: (248) 788-8000 * Fax: (248) 592-9074

BOWSER-MORNER, INC.

Delivery Address: 4518 Taylorsville Rd • Dayton, Ohio 45424 Mailing Address: P.O. Box 51 • Dayton, Ohio 45401

AASHTO/ISO 17025 Accredited • USACE Validated



LABORATORY REPORT

Report To: E. C. Levy Co.
Attn.: John Perry
8800 Dix Ave.
Detroit, MI 48209

Report Date: 01/16/18
Job No.: 177392
Report No.: 018676B
No. of Pages: 3

Report On: Laboratory Determination of Alkali-Silica Reactivity (ASR)

Procedure: Length Change of Concrete Due to Alkali-Silica Reaction (ASTM C 1293)

Material and Source Information

Sample Identification: MDOT 2NS
Fine Aggregate Source: Smelter Bay; Maple Ridge (95-13)
Coarse Aggregate Source: MMA - Phillipsburg, OH
Cement Source: Cemex - Fairborn, OH
Date Received: 11/09/16
Date Cast: 01/16/17

Results are summarized below and detailed on the attached data sheets.

	Average Length Change, %	ASTM C 1293 Specification, %
56 Days:	0.010	---
90 Days:	0.017	---
180 Days:	0.019	---
270 Days:	0.025	---
365 Days:	0.027	0.040 Max.

Should you have any questions, or if we may be of further service, please contact me at (937) 238-8805, ext. 329.

Respectfully submitted,

BOWSER-MORNER, INC.

Scott D. Ruhkamp, Supervisor
Special Projects Section
Construction Materials Laboratory

SDR/sdr
018676B
1-File
1-kschroeden@edwcevy.net
1-jperry@edwcevy.net

All Reports Remain The Confidential Property Of BOWSER-MORNER And No Publication Or Distribution Of Reports May Be Made Without Our Express Written Consent, Except As Authorized By Contract. Results Contained In This Report Are Reflective Only Of The Items Calibrated Or Tested. Unless Otherwise Agreed, Samples or Specimens Will Be Returned Or Retained At Bowser-Morner's Discretion. AASHTO/ISO 17025 Accreditation applies only to the parameters included in BOWSER-MORNER'S current scope of accreditation. Go to www.bowser-morner.com/accreditation for review.

Report To: E. C. Levy Co.
Sample ID: MDOT 2NS
Source: Smelter Bay; Maple Ridge (95-13)

Job No.: 177392
Report No.: 018676B
Date Received: 11/09/16

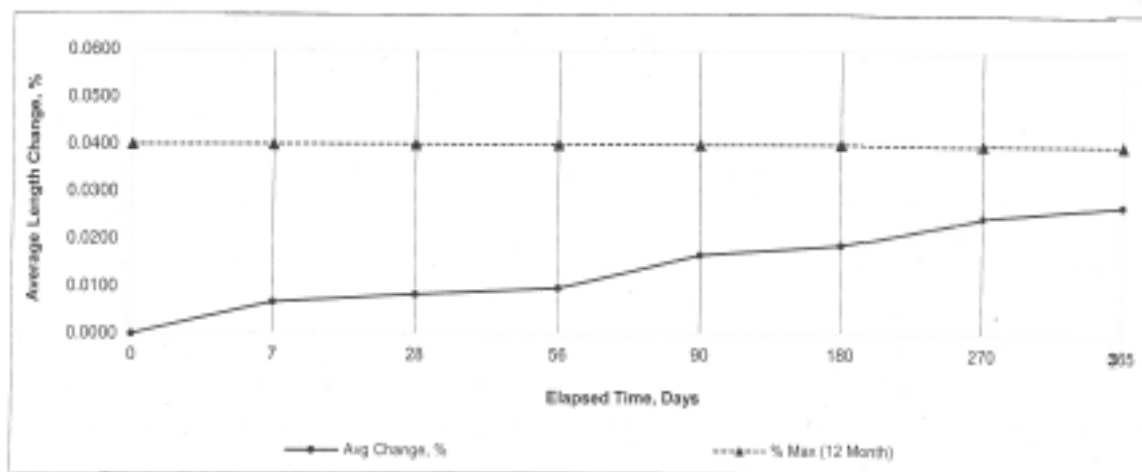
Concrete Mixture Summary				
Aggregates Used	Type	Source	Grading	
Coarse (Lab Standard)	#57 crLS	MMA-Phillipsburg, OH	Table 1, coarse	
Fine (Subject)	MDOT 2NS	Smelter Bay; Maple Ridge (95-13)	Table 1, fine	
Cement Used	Source	Type	Na ₂ O Equiv., %	
Cemex	Fairborn, OH	Portland Type I	0.8	
Pozzolan Used	Source	Type	Na ₂ O Equiv., %	
n/a	n/a	n/a	n/a	
Admixtures Used	Source	Type	Dosage Rate	
n/a	n/a	n/a	n/a	
Concrete Proportions, SSD, lbs/cubic yard				
Component	Source	Specific Gravity	Mass, lbs	Volume, cubic yard
Portland Cement	Cemex Fairborn*	3.15	708	3.60195
Water	BMI Standard	1.00	308	4.93590
#57 crLS	MMA-Phillipsburg, OH	2.664	1824	10.97251
MDOT 2NS	Smelter Bay (95-13)	2.700	1262	7.49050
Entrained Air, %:	n/a	n/a	2.7	0.72900
Total	n/a	n/a	4102	27.7
*The cement and coarse aggregate used in this test are BMI's laboratory standards and meet sections 7.1 and 7.2				
Sodium Hydroxide Added, %	W/Cm	Slump, inches	Air, %	
0.4	0.435	3 1/4	2.7	
Fresh Unit Weight, cubic yard	Mass Yield, %			
150.4	101.0			
Storage Containers				
6-gallon (23-liter) plastic pail with gamma seal lid conforming to ASTM C1293, sections 5.2.1 and 5.3.1				

Report To: E. C. Levy Co.
Sample ID: MDOT 2NS
Source: Smelter Bay, Maple Ridge (95-13)
Date Cast: 01/16/17

Job No.: 177392
Report No.: 018676B
Date Received: 11/09/16
Ref. Rod Length: 11.622118

Procedure: Length Change of Concrete Due to Alkali-Silica Reaction (ASTM C 1293)

Age, Days	ID	Reference Rod, inch	Specimen Readings, inch	Expansion, inch	Length Change, %	Avg. %
Initial 01/17/17	A	0.0000	0.0014	11.6235	n/a	0.0000
	B	0.0000	0.0035	11.6258	n/a	
	C	0.0000	0.0057	11.6278	n/a	
7 01/24/17	A	0.0000	0.0020	11.6241	0.0060	0.0067
	B	0.0000	0.0042	11.6263	0.0070	
	C	0.0000	0.0064	11.6285	0.0070	
28 02/14/17	A	0.0000	0.0022	11.6243	0.0080	0.0083
	B	0.0000	0.0044	11.6265	0.0090	
	C	0.0000	0.0065	11.6286	0.0080	
56 03/14/17	A	0.0000	0.0024	11.6245	0.0100	0.0097
	B	0.0000	0.0045	11.6266	0.0100	
	C	0.0000	0.0066	11.6287	0.0090	
90 04/18/17	A	0.0000	0.0029	11.6250	0.0150	0.0167
	B	0.0000	0.0053	11.6274	0.0180	
	C	0.0000	0.0074	11.6295	0.0170	
180 07/18/17	A	0.0000	0.0030	11.6251	0.0160	0.0187
	B	0.0000	0.0055	11.6276	0.0200	
	C	0.0000	0.0077	11.6298	0.0200	
270 10/17/17	A	0.0000	0.0037	11.6258	0.0230	0.0247
	B	0.0000	0.0064	11.6285	0.0290	
	C	0.0000	0.0079	11.6300	0.0220	
365 01/16/18	A	0.0000	0.0039	11.6260	0.0250	0.0273
	B	0.0000	0.0067	11.6288	0.0320	
	C	0.0000	0.0082	11.6303	0.0250	



Portland Cement Type I/II

Production Period: 9/01/2019 to 9/30/2019

STANDARD REQUIREMENTS

Chemical Data			Physical Data		
Item	Spec. Limit	Results	Item	Spec. Limit	Results
SiO ₂ (%)		19.0	Air Content of mortar (volume %)	12.0 max	8
Al ₂ O ₃ (%)	6.0 max	4.9	Blaine fineness (m ² /kg)	260.0 min	402
Fe ₂ O ₃ (%)		3.11	Autoclave expansion (%)	0.8 max	0.07
CaO (%)		61.8			
MgO (%)	6.0 max	2.6	Compressive strength (MPa/psi):		
SO ₃ (%)*	3.0 max	3.74	1 day		17.5 [2534]
Loss of ignition (%)	3.5 max	2.4	3 days	12.0[1740] min	27.6 [4001]
Na ₂ O (%)		0.25	7 days	19.0[2760] min	31.6 [4585]
K ₂ O (%)		1.11	28 days (previous month)	28.0[4060] min	39.4 [5720]
Insoluble residue (%)	1.5 max	0.27	Time of setting (minutes)		
CO ₂ (%)		1.5	(Vicat) Initial	45 - 375	93
Limestone (%)	5.0 max	3.5	(Vicat) Final		198
CaCO ₃ in limestone (%)	70.0 min	97.0			
Inorganic process addition(%)	5.0 max	0.0	Mortar Bar Expansion (ASTM C1038) (%)*	0.02 max	0.008
Potential phase composition			Base Cement Phase Composition		
C ₃ S (%)		59	C ₃ S (%)		59
C ₂ S (%)		10	C ₂ S (%)		10
C ₃ A (%)	8 max	8	C ₃ A (%)		8
C ₄ AF (%)		10	C ₄ AF (%)		10

OPTIONAL REQUIREMENTS

Item	Spec. Limit	Results	Item	Spec. Limit	Results
Equiv. Alkalies	A	0.97	False Set (%)	50 min	
			Retained 325 (%)		4.94

Additional Data

Type	Limestone	Inorganic Processing Addition
Amount	3.5	0.0
SiO ₂ (%)	2.1	
Al ₂ O ₃ (%)	0.6	
Fe ₂ O ₃ (%)	0.2	
CaO (%)	49.2	
SO ₃ (%)	0.4	

This cement meets ASTM C150, A3000 compendium, A3003, A3004, A3005 and CSA A3001 for Type I and Type II Portland Cement

*It is permissible to exceed the max value for SO₃ content, provided it is demonstrated by C1038 that the cement will not develop expansion exceeding 0.02% in 14 Days

A Test result provided for information only.

October 30, 2019

St. Marys Cement

Detroit Plant

9333 Dearborn Avenue

Detroit, MI 48209

Tel: (313) 842-4600 - Fax: (313) 849-4512

Linda Harris

Linda M. Harris
Quality Control Manager

Slag Cement Grade 100 - Cemplus

Production Period: 9/01/2019 to 9/30/2019

STANDARD REQUIREMENTS - SLAG

Chemical Data			Physical Data		
Item	Spec. Limit	Results	Item	Spec. Limit	Results
Sulfide Sulfur (S) (%)	2.5 max	1.0	Air Content of mortar (volume %)	12 max	5
Sulfate Sulfur (as SO ₃) (%)		2.4	Blaine fineness (m ² /kg)	260 min	543
Added Sulfate Sulfur (as SO ₃) (%)			Retained 325 (%)		3.05
Inorganic process addition (%)	5.0 max		Compressive strength (MPa/psi):		
			7 days		24.4 [3544]
			28 days (<i>previous month</i>)		41.2 [5980]
			Slag Activity Index (%) (SAI)		
			7 Day		80.0
			28 Day	95 min	108.7

STANDARD REQUIREMENTS - REFERENCE CEMENT

Chemical Data			Physical Data		
Item	Spec. Limit	Results	Item	Spec. Limit	Results
Equiv. Alkalies	A	0.78	Blaine fineness (m ² /kg)	260 min	390
Potential phase composition			Compressive strength (MPa/psi):		
C ₃ S (%)		58	7 days		30.5 [4429]
C ₂ S (%)		15	28 days		37.9 [5500]
C ₃ A (%)		8			
C ₄ AF (%)		8			

ADDITIONAL DATA

Item		Item	Results
Type	Inorganic Processing Addition	Specific Gravity (g/cm ³)	2.91
Amount	0.0	Autoclave expansion (%)	0.06
SiO ₂ (%)			
Al ₂ O ₃ (%)			
Fe ₂ O ₃ (%)			
CaO (%)			
SO ₃ (%)			

This cement meets ASTM C989 and AASHTO M302 Specifications for Grade 100 Slag Cement and CSA A3001 for Type S Slag Cement

A Test result provided for information only.

October 30, 2019
St. Marys Cement
Detroit Plant
9333 Dearborn Avenue
Detroit, MI 48209
Tel: (313) 842-4600 - Fax: (313) 849-4512

Linda Harris

Linda M. Harris
Quality Control Manager

Edw. C. Levy Co.

JMT
8911 W. Jefferson
Detroit, 48209
(313) 429-2429

Plant 958-JMT			
Product	1022-2NS GR - Smelter Bay	Name/Title	Casey Smith / QC Manager
Period:	06/14/2019 - 06/21/2019	Report Date	06/21/2019

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.2	%	95-100
	#8 (2.36mm)	86.0	%	65-95
	#16 (1.18mm)	69.2	%	35-75
	#30 (0.6mm)	46.2	%	20-55
	#50 (0.3mm)	17.6	%	10-30
	#100 (0.15mm)	3.0	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.80		2.6-3
	Wash Loss (#200/75µm)	0.8	%	0-3
	Total Moisture	4.2	%	



SOLUTIONS FOR
YOUR ENVIRONMENT™

8800 Dix Ave., Detroit, MI 48209

Weekly Product Conformance Report

For Week of October 14 2019 to October 19 2019

Product: 6AA Limestone
Source: Lafarge North America, Presque Isle Quarry
Location: SCA, Detroit Dock
State Pit Number: 71-47

U.S. Sieve	1 1/2"	1"	3/4"	1/2"	3/8"	#4	LBW
Metric Sieve	37.5mm	25.0mm	19.0mm	12.5mm	9.5mm	4.75mm	
MDOT Specification	100	95-100	-	30-60	-	0-8	0-2.0
Percent Passing							
2018 Shipping Average	100	100	86	46	23	3	1.2
September 2019 Average	100	97	74	39	23	5	1.4
Week of 10/14/2019	100	97	74	32	18	5	1.4

Average Physical Property Data

MTM 110, Soft Particles (2017) - 0.0% (Specification 2.0% maximum) - Lafarge Data
MTM 110, Clay-Ironstone Particles (2017) - 0.0% (Specification 1.0% maximum) - Lafarge Data
MTM 110, Chert Particles (2017) - 0.0% - Lafarge Data
MTM 110, Sum of Soft Particles and Chert (2017) - 0.0% (Specification 4.0% maximum) - Lafarge Data
MTM 115, Freeze-Thaw Dilation - 0.016% (Tested 2014) - MDOT
ASTM C 29, Loose Unit Weight (2018 Average) - 89 lb/ft³
ASTM C 29, Rodded Unit Weight (2018 Average) - 96 lb/ft³
ASTM C 127, Bulk Specific Gravity Dry (2018) - 2.56
ASTM C 127, Bulk Specific Gravity SSD (2018) - 2.59
ASTM C 127, Absorption (2018) - 1.5%
ASTM C 142, Clay Lumps and Friable Particles in Aggregate - 0.2%
ASTM C 131, Abrasion and Impact in the Los Angeles Machine - 33%
ASTM C 88, Soundness of Aggregate by Use of Sodium Sulfate - 3% loss - Lafarge Data
ASTM C 123, Light Weight Particles (Chert [Less Than 2.40 sp gr SSD]) in Aggregate - 0.0% - TTL
ASTM C 123, Light Weight Particles (Coal and Ugnite) in Aggregate - 0.0% - TTL



The Chemical Company

3

03 30 00	Cast-in-Place Concrete
03 40 00	Precast Concrete
03 70 00	Mass Concrete

MasterAir® AE 200

Air-Entraining Admixture

Formerly Micro Air*

Description

MasterAir AE 200 air-entraining admixture provides concrete with extra protection by creating air bubbles that are ultrastable, small and closely spaced – a characteristic especially useful in the types of concrete known for their difficulty to entrain and maintain the air content desired.

Even when used at a lower dosage than standard air-entraining admixtures, MasterAir AE 200 admixture meets the requirements of ASTM C 260, AASHTO M 154, and CRD-C 13.

Applications

Recommended for use in:

- Concrete exposed to cyclic freezing and thawing
- Production of high-quality normal or lightweight concrete (heavyweight concrete normally does not contain entrained air)

Features

- Ready-to-use in the proper concentration for rapid, accurate dispensing
- Greatly improved stability of air-entrainment
- Ultra stable air bubbles

Benefits

- Increased resistance to damage from cyclic freezing and thawing
- Increased resistance to scaling from deicing salts
- Improved plasticity and workability
- Improved air-void system in hardened concrete
- Improved ability to entrain and retain air in low-slump concrete, concrete containing high-carbon content fly ash, concrete using large amounts of fine materials, concrete using high-alkali cements, high-temperature concrete, and concrete with extended mixing times
- Reduced permeability – increased watertightness
- Reduced segregation and bleeding

Performance Characteristics

Concrete durability research has established that the best protection for concrete from the adverse effects of freezing and thawing cycles and deicing salts results from: proper air content in the hardened concrete, a suitable air-void system in terms of bubble size and spacing and adequate concrete strength, assuming the use of sound aggregates and proper mixing, transporting, placing, consolidation, finishing and curing techniques. MasterAir AE 200 admixture can be used to obtain adequate freezing and thawing durability in a properly proportioned concrete mixture, if standard industry practices are followed.

MASTER®
»BUILDERS
SOLUTIONS

Air Content Determination: The total air content of normal weight concrete should be measured in strict accordance with ASTM C 231, "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method" or ASTM C 173/C 173M, "Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method."

The air content of lightweight concrete should only be determined using the Volumetric Method. The air content should be verified by calculating the gravimetric air content in accordance with ASTM C 138/C 138M, "Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete." If the total air content, as measured by the Pressure Method or Volumetric Method and as verified by the Gravimetric Method, deviates by more than 1.5%, the cause should be determined and corrected through equipment calibration or by whatever process is deemed necessary.

Guidelines for Use

Dosage: There is no standard dosage for MasterAir AE 200 admixture. The exact quantity of air-entraining admixture needed for a given air content of concrete varies because of differences in concrete making materials and ambient conditions. Typical factors that might influence the amount of air entrained include: temperature, cementitious materials, sand gradation, sand-aggregate ratio, mixture proportions, slump, means of conveying and placement, consolidation and finishing technique.

The amount of MasterAir AE 200 admixture used will depend upon the amount of entrained air required under actual job conditions. In a trial mixture, use 0.125 to 1.5 fl oz/cwt (8-98 mL/100 kg) of cement. In mixtures containing water-reducing or set-control admixtures, the amount of MasterAir AE 200 admixture needed is somewhat less than the amount required in plain concrete. Due to possible changes in the factors that can affect the dosage of MasterAir AE 200 admixture, frequent air content checks should be made during the course of the work. Adjustments to the dosage should be based on the amount of entrained air required in the mixture at the point of placement. If an unusually high or low dosage of MasterAir AE 200 admixture is required to obtain the desired air content, consult your Local sales representative. In such cases, it may be necessary to determine that, in addition to a proper air content in the fresh concrete, a suitable air-void system is achieved in the hardened concrete.

Dispensing and Mixing: Add MasterAir AE 200 admixture to the concrete mixture using a dispenser designed for air-entraining admixtures; or add manually using a suitable measuring device that ensures accuracy within plus or minus 3% of the required amount. For optimum, consistent performance, the air-entraining admixture should be dispensed on damp, fine aggregate or with the initial batch water. If the concrete mixture contains lightweight aggregate, field evaluations should be conducted to determine the best method to dispense the air-entraining admixture.

Precaution

In a 2005 publication from the Portland Cement Association (PCA R&D Serial No. 2789), it was reported that problematic air-void clustering that can potentially lead to above normal decreases in strength was found to coincide with late additions of water to air-entrained concretes. Late additions of water include the conventional practice of holding back water during batching for addition at the jobsite. Therefore, caution should be exercised with delayed additions to air-entrained concrete. Furthermore, an air content check should be performed after post-batching addition of any other materials to an air-entrained concrete mixture.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterAir AE 200 admixture will neither initiate nor promote corrosion of reinforcing and prestressing steel embedded in concrete, or of galvanized steel floor and roof systems. No calcium chloride or other chloride-based ingredients are used in the manufacture of this admixture.

Compatibility: MasterAir AE 200 admixture may be used in combination with any BASF admixture, unless stated otherwise on the data sheet for the other product. When used in conjunction with other admixtures, each admixture must be dispensed separately into the mixture.

Storage and Handling

Storage Temperature: MasterAir AE 200 admixture should be stored and dispensed at 35 °F (2 °C) or higher. Although freezing does not harm this product, precautions should be taken to protect it from freezing. If it freezes, thaw and reconstitute by mild mechanical agitation. Do not use pressurized air for agitation.

Shelf Life: MasterAir AE 200 admixture has a minimum shelf life of 18 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your Local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterAir AE 200 admixture has been exceeded.

Safety: MasterAir AE 200 admixture is a caustic solution. Chemical goggles and gloves are recommended when transferring or handling this material. (See SDS and/or product label for complete information.)

Packaging

MasterAir AE 200 admixture is supplied in 55 gal (208 L) drums, 275 gal (1040 L) totes and by bulk delivery.

Related Documents

Safety Data Sheets: MasterAir AE 200 admixture

Additional Information

For suggested specification information or for additional product data on MasterAir AE 200 admixture, contact your local sales representative.

The Admixture Systems business of BASF's Construction Chemicals division is the leading provider of solutions that improve placement, pumping, finishing, appearance and performance characteristics of specialty concrete used in the ready-mixed, precast, manufactured concrete products, underground construction and paving markets. For over 100 years we have offered reliable products and innovative technologies, and through the Master Builders Solutions brand, we are connected globally with experts from many fields to provide sustainable solutions for the construction industry.

Limited Warranty Notice

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* Micro Air became MasterAir AE 200 under the Master Builders Solutions brand, effective January 1, 2014.

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BASF Corporation
Admixture Systems
www.master-builders-solutions.basf.us

United States
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5544
Tel: 800 629-9990 ■ Fax: 216 830-8821

Canada
1900 Clark Boulevard
Brampton, Ontario L6T 4M7
Tel: 800 387-5862 ■ Fax: 905 792-0651



MasterPozzolith® 200

Water-Reducing Admixture

Formerly Pozzolith 200 N *

Description

MasterPozzolith 200 ready-to-use, liquid admixture is used for making more uniform and predictable quality concrete. It meets ASTM C 494/C 494M requirements for Type A, water-reducing, Type B, retarding, and Type D, water-reducing and retarding, admixtures.

Applications

Recommended for use in:

- Prestressed concrete
- Precast concrete
- Reinforced concrete
- Shotcrete
- Lightweight concrete
- Pumped concrete
- 4x4™ Concrete
- Pervious concrete
- Self-consolidating concrete (SCC)

Features

- Reduced water content required for a given workability
- Controlled setting characteristics – normal or retarded

Benefits

- Improved workability
- Reduced segregation
- Improved finishing characteristics for flatwork and cast surfaces
- Increased compressive and flexural strengths

Guidelines for Use

Dosage: MasterPozzolith 200 admixture is recommended for use at a dosage of 3-4 fl oz/cwt (195-260 mL/100 kg) of cementitious materials for Type A applications and up to 6 fl oz/cwt (390 mL/100 kg) for Type B and D requirements. Because of variations in job conditions and concrete materials, dosages other than the recommended amounts may be required. In such cases, contact your local sales representative.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterPozzolith 200 admixture will neither initiate nor promote corrosion of reinforcing steel in concrete. This admixture does not contain intentionally-added calcium chloride or other chloride-based ingredients.

Compatibility: MasterPozzolith 200 admixture may be used in combination with any BASF admixtures. When used in conjunction with other admixtures, each admixture must be dispensed separately into the mixture.

Storage and Handling

Storage Temperature: MasterPozzolith 200 admixture should be stored above freezing temperatures. If MasterPozzolith 200 admixture freezes, thaw at 35 °F (2 °C) or above and completely reconstitute by mild mechanical agitation. **Do not use pressurized air for agitation.**

Shelf Life: MasterPozzolith 200 admixture has a minimum shelf life of 18 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterPozzolith 200 admixture has been exceeded.

Packaging

MasterPozzolith 200 admixture is supplied in 55 gal (208 L) drums, 275 gal (1040 L) totes and by bulk delivery.

Related Documents

Safety Data Sheets: MasterPozzolith 200 admixture

Additional Information

For additional information on MasterPozzolith 200 admixture or its use in developing a concrete mixture with special performance characteristics, contact your local sales representative.

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* Pozzolith 200 N became MasterPozzolith 200 under the Master Builders Solutions brand, effective January 1, 2014.

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BASF Corporation
Admixture Systems
www.master-builders-solutions.basf.us

United States
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5544
Tel: 800 829-0900 ■ Fax: 216 839-8821

Canada
1800 Clark Boulevard
Brampton, Ontario L8T 4M7
Tel: 800 387-5862 ■ Fax: 905 792-0851



MasterPolyheed® 997

Mid-Range Water-Reducing Admixture

Formerly PolyHeed 997*

Description

MasterPolyheed 997 admixture is a patented multi-component, mid-range water-reducing admixture. MasterPolyheed 997 admixture meets ASTM C 494/C 494M requirements for Type A, water-reducing, and Type F, high-range water-reducing, admixtures.

Applications

Recommended for use in:

- All concrete applications where superior workability, pumpability and finishability qualities are desired, in particular, flatwork, pumped concrete and pervious concrete
- Concrete containing manufactured sand and harsh concrete mixtures

Features

- True mid-range water reduction (5-15%) and excellent performance across a wide slump range, especially the difficult slump range of 5-8 in. (125-200 mm)
- Superior workability, pumpability and finishability qualities even in concrete mixtures containing low amounts of cementitious materials
- Superior finishing characteristics for residential/commercial flatwork and formed surfaces

Benefits

- Significantly reduced placement and finishing time resulting in lower in-place concrete costs
- Higher strength at all ages
- Enhanced concrete durability
- Increased service life of concrete structures

Performance Characteristics

Mixture Data: 500 lb/ycd³ (295 kg/m³) of Type I cement; slump 6-7 in. (150-180 mm); 5-6% air; concrete temperature 70 °F (21 °C); ambient temperature, 70 °F (21 °C).

Setting Time Performance¹

Mixture	Initial Set (h:min)	Difference (h:min)
Reference	6:01	—
MasterPolyheed 997 admixture @		
5 fl oz/cwt (325 mL/100 kg)	6:22	+0:21
10 fl oz/cwt (650 mL/100 kg)	6:57	+0:56
15 fl oz/cwt (980 mL/100 kg)	7:31	+1:30

Compressive Strength, psi (MPa)

Mixture	7-Day	28-Day
Plain	2360 (16.3)	3320 (22.9)
MasterPolyheed 997 admixture @		
5 fl oz/cwt (325 mL/100 kg)	3060 (21.1)	3930 (27.1)
10 fl oz/cwt (650 mL/100 kg)	3740 (25.8)	4610 (31.8)
15 fl oz/cwt (980 mL/100 kg)	4620 (31.9)	5460 (37.7)

¹Note: The data shown are based on controlled laboratory tests. Reasonable variations from the results shown here may be experienced as a result of differences in concrete making materials and jobsite conditions.

Guidelines for Use

Dosage: MasterPolyheed 997 admixture has a recommended dosage range of 3-15 fl oz /cwt (195-980 mL/100 kg) of cementitious material for most concrete mixes.

As the dosage of MasterPolyheed 997 admixture increases to 15 fl oz/cwt (980 mL/100 kg) of cementitious materials, normal concrete setting characteristics are maintained and early and ultimate compressive strengths increase.

BASF does not recommend the use of dosages outside the recommended range without trial testing. Consult your local sales representative for assistance in determining the dosage for optimum performance.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterPolyheed 997 admixture will neither initiate nor promote corrosion of reinforcing or prestressing steel embedded in concrete, or of galvanized steel floor and roof systems. MasterPolyheed 997 admixture does not contain intentionally added calcium chloride or other chloride-based ingredients.

Compatibility: MasterPolyheed 997 admixture may be used in combination with any BASF admixtures. When used in conjunction with other admixtures, each admixture must be dispensed separately into the concrete mixture.

Storage and Handling

Storage Temperature: If MasterPolyheed 997 admixture freezes, thaw at 35 °F (2 °C) or above and completely reconstitute by mild mechanical agitation. **Do not use pressurized air for agitation.**

Shelf Life: MasterPolyheed 997 admixture has a minimum shelf life of 18 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterPolyheed 997 admixture has been exceeded.

Packaging

MasterPolyheed 997 admixture is supplied in 55 gal (208 L) drums, 275 gal (1040 L) totes and by bulk delivery.

Related Documents

Safety Data Sheets: MasterPolyheed 997 admixture

Additional Information

For additional information on MasterPolyheed 997 admixture or its use in developing concrete mixtures with special performance characteristics, contact your local sales representative.

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* Polyheed 997 became MasterPolyheed 997 under the Master Builders Solutions brand, effective January 1, 2014.

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BASF Corporation
Admixture Systems
www.master-builders-solutions.basf.us

United States
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5544
Tel: 800 628-0900 ■ Fax: 216 830-6621

Canada
1900 Clark Boulevard
Brampton, Ontario L8T 4M7
Tel: 905 387-5982 ■ Fax: 905 792-0651

