



Review Status: NO EXCEPTIONS TAKEN

for MDOT by AECOM Great Lakes, Inc.
AECOM | 3950 Sparks Dr. SE | Grand Rapids, MI 49546

Reviewer: DPC

Date: 06/24/2021

Review is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the contract documents nor departure therefrom. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of assembly and construction, and for performing the work in a safe manner. Markings or comments do not authorize work resulting in contract cost revisions unless stated in separate letter or work order from the Engineer.



6/23/2021

Century Cement Company
12600 Sibley Road
Riverview, MI 48193

ATTN: AJ Pighin

Project: PW 7023 Conner Ave from Mack Ave to Jefferson

We submit the following mixes for the project listed above.

MIX ID	Description
P1-DETM-1	CITY OF DETROIT 3500 PSI AE W/MR – 6" MAX
P1-DETM-2	CITY OF DETROIT 3500 PSI AE W/MR – 6" MAX
P-NCOM-1	MDOT P-NC 3500 PSI AE W/MR W/O NCA – 6" MAX
P-NCOM-2	MDOT P-NC 3500 PSI AE W/MR W/O NCA – 6" MAX

The mix designs listed above have been designed in accordance with MDOT 2012 Standard Specifications for Construction and the project specifications also in reference to ACI 318-08, chapter 5 (Quality Concrete), and ACI standard deviation / over design requirements. Please forward any and all concrete tests for record keeping purposes to gcbreakdata@herculesconcrete.com

Please do not hesitate to reach out to your salesman or any Hercules staff for further assistance should you need anything further.

Respectfully submitted,

Giuseppe Palumbo
Sales Manager
Hercules Concrete LLC.

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	JOB NUMBER	PROJECT LOCATION PW-7023 Conner Ave from Mack Ave to Jefferson	PROJECT ENGINEER City of Detroit
CONCRETE SUPPLIER Hercules Concrete	PLANT LOCATION 6497 East 10 Mile Road, Centerline		PLANT NUMBER HER-02-CEN
GRADE OF CONCRETE P1	PSI REQUIREMENT 3500	MIX DESIGN NUMBER P1-DETM-1	INTENDED USE (S) Pavement
		CONTRACTOR QC PLAN SUBMITTED? (MDOT use only)	Y ☐ N ☐
PRIME / SUBCONTRACTOR(S) Century Cement Company / All Sub Contractors			
STANDARD SPEC DATE 01/01/12	QC/QA SPECIAL PROVISION DATE 06/14/19	JMF EFFECTIVE DATE 06/23/21	AGG. CORRECTION 0.2

MATERIAL DESIGN SOURCES AND PROPERTIES

COARSE AGGREGATE		INTERMEDIATE AGGREGATE		FINE AGGREGATE	
Aggregate Type	Limestone	Aggregate Type		Source Name	Springmill Reclamati
Source Name	Calcite	Source Name		MDOT Source No.	47-003
MDOT Source No.	71-3	MDOT Source No.		MDOT Series Class	2NS
MDOT Series Class	6AA	MDOT Series Class		Specific Gravity (Bulk Dry)*	2.61
Specific Gravity (Bulk Dry)*	2.53	Specific Gravity (Bulk Dry)*		Specific Gravity (Bulk SSD) optional	
Specific Gravity (Bulk SSD) optional		Specific Gravity (Bulk SSD) optional		Absorption	1.1
Absorption	1.5	Absorption		Fineness Modulus (FM)	2.75
Unit Weight (Dry Rodded) DR or	94.2	Unit Weight (Dry Rodded) DR or			
Unit Weight (Dry Loose) DL	83.9	Unit Weight (Dry Loose) DL			
Percent Crushed	100%	Percent Crushed			
MDOT Freeze-Thaw (F-T) Dilation	0.028	MDOT Freeze-Thaw (F-T) Dilation			
Specific Gravity (Bulk Dry) of F-T	2.54	Specific Gravity (Bulk Dry) of F-T			
Sample*		Sample*			
Date of MDOT Freeze-Thaw Report	08/22/18	Date of MDOT Freeze-Thaw Report			

* If the bulk dry 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 the use on Department projects.

CEMENTITIOUS		ADMIXTURES	
Cement Source / Plant	Ash Grove (Mississauga)	Air Entrainment	GRT, Polychem SA 50
Cement Type	Type1	Water Reducer	GRT, KB 1200
Cement Specific Gravity	3.15	Water Reducer	
Fly Ash Source (distributer & plant)		Water Reducer	
Fly Ash Class		Accelerator	
Fly Ash Specific Gravity		Other	
Slag Cement Source		(Indicate Source & Product name with ticket code)	
Slag Cement Grade			
Slag Cement Specific Gravity		TYPE OF MIX WINTER/SUMMER	Winter & Summer
Other			

MIX PROPORTIONS

Volume of Coarse Aggregate (DR)	70%	Design Slump	5"
Coarse Aggregate Weight (Dry)	1698 (1720 SSD)	Specified Slump	4-6"
Intermediate Aggregate Weight (Dry)		Design Air %	6.5%
Fine Aggregate Weight (Dry)	1268 (1282 SSD)	Specified Air %	5.5-8.0%
Portland Cement Weight	564	PSI minimum required	3500
Fly Ash Weight		Total Cementitious	564
Fly Ash Percent of Cementitious		Yield cu/ft	27
Slag Cement Weight			
Slag Cement Percent of Cementitious		I certify that all applicable standard test methods have been followed verifying the mix design and JMF:	
Total Water Weight	285	Signature	Brad Yuill
Net Water Weight	250		Digitally signed by Brad Yuill Date: 2021.03.22 11:54:20 -04'00'
WC (as designed)	.44	MCA Level II Expiration Date:	04/15/22
Air Entrainment (dosage)	1 oz/cwt	Date:	06/23/21
Water Reducer (dosage)	5-7 oz/cwt		
Other (dosage)			

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CONTROL SECTION	JOB NUMBER	PROJECT LOCATION PW-7023 Conner Ave from Mack Ave to Jefferson	PROJECT ENGINEER City of Detroit
CONCRETE SUPPLIER Hercules Concrete	PLANT LOCATION 2791 West Jefferson Street, Detroit MI		PLANT NUMBER HER-01-DET
GRADE OF CONCRETE P1	PSI REQUIREMENT 3500	MIX DESIGN NUMBER P1-DETM-2	INTENDED USE (S) Pavement
		CONTRACTOR QC PLAN SUBMITTED? (MDOT use only)	Y ☐ N ☐
PRIME / SUBCONTRACTOR(S) Century Cement Company / All Sub Contractors			
STANDARD SPEC DATE 01/01/12	QC/QA SPECIAL PROVISION DATE 06/14/19	JMF EFFECTIVE DATE 06/23/21	AGG. CORRECTION 0.2

MATERIAL DESIGN SOURCES AND PROPERTIES

COARSE AGGREGATE		INTERMEDIATE AGGREGATE		FINE AGGREGATE	
Aggregate Type	Limestone	Aggregate Type		Source Name	Springmill Reclamati
Source Name	Ottawa Lake	Source Name		MDOT Source No.	47-003
MDOT Source No.	58-003	MDOT Source No.		MDOT Series Class	2NS
MDOT Series Class	6AA	MDOT Series Class		Specific Gravity (Bulk Dry)*	2.61
Specific Gravity (Bulk Dry)*	2.65	Specific Gravity (Bulk Dry)*		Specific Gravity (Bulk SSD) optional	
Specific Gravity (Bulk SSD) optional		Specific Gravity (Bulk SSD) optional		Absorption	1.1
Absorption	1.97	Absorption		Fineness Modulus (FM)	2.75
Unit Weight (Dry Rodded) DR or	98.7	Unit Weight (Dry Rodded) DR or			
Unit Weight (Dry Loose) DL	88	Unit Weight (Dry Loose) DL			
Percent Crushed	100%	Percent Crushed			
MDOT Freeze-Thaw (F-T) Dilation	.010	MDOT Freeze-Thaw (F-T) Dilation			
Specific Gravity (Bulk Dry) of F-T	2.65	Specific Gravity (Bulk Dry) of F-T			
Sample*		Sample*			
Date of MDOT Freeze-Thaw Report	12/09/20	Date of MDOT Freeze-Thaw Report			

* If the bulk dry 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 the use on Department projects.

CEMENTITIOUS		ADMIXTURES	
Cement Source / Plant	Ash Grove (Mississauga)	Air Entrainment	GRT, Polychem SA 14
Cement Type	Type1	Water Reducer	GRT, KB 1200
Cement Specific Gravity	3.15	Water Reducer	
Fly Ash Source (distributer & plant)		Water Reducer	
Fly Ash Class		Accelerator	
Fly Ash Specific Gravity		Other	
Slag Cement Source		(Indicate Source & Product name with ticket code)	
Slag Cement Grade			
Slag Cement Specific Gravity		TYPE OF MIX WINTER/SUMMER	Winter & Summer
Other			

MIX PROPORTIONS

Volume of Coarse Aggregate (DR)	70%	Design Slump	5"
Coarse Aggregate Weight (Dry)	1731 (1765 SSD)	Specified Slump	4-6"
Intermediate Aggregate Weight (Dry)		Design Air %	6.5%
Fine Aggregate Weight (Dry)	1308 (1322 SSD)	Specified Air %	5.5-8.0%
Portland Cement Weight	564	PSI minimum required	3500
Fly Ash Weight		Total Cementitious	564
Fly Ash Percent of Cementitious		Yield cu/ft	27
Slag Cement Weight			
Slag Cement Percent of Cementitious		I certify that all applicable standard test methods have been followed verifying the mix design and JMF:	
Total Water Weight	285	Signature Brad Yuill Digitally signed by Brad Yuill	
Net Water Weight	250	Date: 2021.03.22 11:54:20 -04'00'	
WC (as designed)	.44	MCA Level II Expiration Date: 04/15/22	
Air Entrainment (dosage)	1 oz/cwt	Date: 06/23/21	
Water Reducer (dosage)	5-7 oz/cwt		
Other (dosage)			



Concrete Mix Evaluation Report

ACI 318 Required Average Strength

Mix ID P1-DETM
Mix Name Detroit P1 6 SACK 3500 PSI W/MR
Design Strength (f'c) 3500 psi @ 28 Days
Required Strength (f'cr) 4700 psi @ 28 Days

Number Of Tests 11
Average Strength 5425 psi
St Dev 604 psi
St Dev (Modified) 528 psi

Test Date	Mix	Lab	Slump (in)	Air Content (%)	Comp Strength (7-Day) (psi)	Acceptance Strength (28-Day) (psi)	Moving Average (psi)
04/23/2020			5.25	6.3		6070	
04/24/2020			5.25	6.3		5960	
05/11/2020			5	6		4750	5593
12/07/2020			5	6.9	4640	5900	5537
02/26/2021			5.5	6.8		4670	5107
02/26/2021			4.5	6.3		5180	5250
02/26/2021			4	6.9		5270	5040
02/27/2021			5	6.1		6440	5630
02/27/2021			5.5	7		5270	5660
02/27/2021			6	8		5480	5730
03/02/2021			5.5	6.8		4680	5143

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CONCRETE SUPPLIER Hercules Concrete		PLANT LOCATION 6497 East 10 Mile Road, Centerline	PLANT NUMBER HER-02-CEN	
GRADE OF CONCRETE PNC	PSI REQUIREMENT 3500	MIX DESIGN NUMBER P-NC0M-1	INTENDED USE (S) Pavement	CONTRACTOR QC PLAN Y ☐ SUBMITTED? (MDOT use only) N ☐
PRIME / SUBCONTRACTOR(S) Century Cement Company / All Sub Contractors				
STANDARD SPEC DATE 01/01/12		QC/QA SPECIAL PROVISION DATE 06/14/19	JMF EFFECTIVE DATE 06/23/21	AGG. CORRECTION 0.2

MATERIAL DESIGN SOURCES AND PROPERTIES

COARSE AGGREGATE		INTERMEDIATE AGGREGATE		FINE AGGREGATE	
Aggregate Type	Limestone	Aggregate Type		Source Name	Springmill Reclamati
Source Name	Calcite	Source Name		MDOT Source No.	47-003
MDOT Source No.	71-3	MDOT Source No.		MDOT Series Class	2NS
MDOT Series Class	6AA	MDOT Series Class		Specific Gravity (Bulk Dry)*	2.61
Specific Gravity (Bulk Dry)*	2.53	Specific Gravity (Bulk Dry)*		Specific Gravity (Bulk SSD) optional	2.64
Specific Gravity (Bulk SSD) optional	2.57	Specific Gravity (Bulk SSD) optional		Absorption	1.1
Absorption	1.5	Absorption		Fineness Modulus (FM)	2.75
Unit Weight (Dry Rodded) DR or	94.2	Unit Weight (Dry Rodded) DR or			
Unit Weight (Dry Loose) DL	83.9	Unit Weight (Dry Loose) DL			
Percent Crushed	100%	Percent Crushed			
MDOT Freeze-Thaw (F-T) Dilation	0.028	MDOT Freeze-Thaw (F-T) Dilation			
Specific Gravity (Bulk Dry) of F-T	2.54	Specific Gravity (Bulk Dry) of F-T			
Sample*		Sample*			
Date of MDOT Freeze-Thaw Report	08/22/18	Date of MDOT Freeze-Thaw Report			

* If the bulk dry 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 the use on Department projects.

CEMENTITIOUS		ADMIXTURES	
Cement Source / Plant	Ash Grove (Mississauga)	Air Entrainment	GRT, Polychem SA 50
Cement Type	Type1	Water Reducer	GRT, KB 1200
Cement Specific Gravity	3.15	Water Reducer	
Fly Ash Source (distributer & plant)		Water Reducer	
Fly Ash Class		Accelerator	
Fly Ash Specific Gravity		Other	
Slag Cement Source		(Indicate Source & Product name with ticket code)	
Slag Cement Grade			
Slag Cement Specific Gravity		TYPE OF MIX WINTER/SUMMER	Winter & Summer
Other			

MIX PROPORTIONS

Volume of Coarse Aggregate (DR)	70%	Design Slump	5"
Coarse Aggregate Weight (Dry)	1725 (1750 SSD)	Specified Slump	4-6"
Intermediate Aggregate Weight (Dry)		Design Air %	6.5%
Fine Aggregate Weight (Dry)	1100 (1112 SSD)	Specified Air %	5.5-8.5%
Portland Cement Weight	658	PSI minimum required	3500
Fly Ash Weight		Total Cementitious	658
Fly Ash Percent of Cementitious		Yield cu/ft	27
Slag Cement Weight			
Slag Cement Percent of Cementitious		I certify that all applicable standard test methods have been followed verifying the mix design and JMF:	
Total Water Weight	300	Signature Brad Yuill Digitally signed by Brad Yuill Date: 2021.03.22 11:54:20 -04'00'	
Net Water Weight	263	MCA Level II Expiration Date: 04/15/22	
WC (as designed)	.40	Date: 06/23/21	
Air Entrainment (dosage)	1 oz/cwt		
Water Reducer (dosage)	5 oz/cwt 5-7		
Other (dosage)			

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CONCRETE SUPPLIER Hercules Concrete	PLANT LOCATION 2791 West Jefferson Street, Detroit MI		PLANT NUMBER HER-01-DET
GRADE OF CONCRETE PNC	PSI REQUIREMENT 3500	MIX DESIGN NUMBER P-NC0M-2	INTENDED USE (S) Pavement
		CONTRACTOR QC PLAN SUBMITTED? (MDOT use only)	Y ☐ N ☐
PRIME / SUBCONTRACTOR(S) Century Cement Company / All Sub Contractors			
STANDARD SPEC DATE 01/01/12	QC/QA SPECIAL PROVISION DATE 06/14/19	JMF EFFECTIVE DATE 06/23/21	AGG. CORRECTION 0.2

MATERIAL DESIGN SOURCES AND PROPERTIES

COARSE AGGREGATE		INTERMEDIATE AGGREGATE		FINE AGGREGATE	
Aggregate Type	Limestone	Aggregate Type		Source Name	Springmill Reclamati
Source Name	Ottawa Lake	Source Name		MDOT Source No.	47-003
MDOT Source No.	58-003	MDOT Source No.		MDOT Series Class	2NS
MDOT Series Class	6AA	MDOT Series Class		Specific Gravity (Bulk Dry)*	2.61
Specific Gravity (Bulk Dry)*	2.65	Specific Gravity (Bulk Dry)*		Specific Gravity (Bulk SSD) optional	
Specific Gravity (Bulk SSD) optional		Specific Gravity (Bulk SSD) optional		Absorption	1.1
Absorption	1.97	Absorption		Fineness Modulus (FM)	2.75
Unit Weight (Dry Rodded) DR or	98.7	Unit Weight (Dry Rodded) DR or			
Unit Weight (Dry Loose) DL	88	Unit Weight (Dry Loose) DL			
Percent Crushed	100%	Percent Crushed			
MDOT Freeze-Thaw (F-T) Dilation	0.010	MDOT Freeze-Thaw (F-T) Dilation			
Specific Gravity (Bulk Dry) of F-T	2.65	Specific Gravity (Bulk Dry) of F-T			
Sample*		Sample*			
Date of MDOT Freeze-Thaw Report	12/09/20	Date of MDOT Freeze-Thaw Report			

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CEMENTITIOUS		ADMIXTURES	
Cement Source / Plant	Ash Grove (Mississauga)	Air Entrainment	GRT, Polychem SA 14
Cement Type	Type1	Water Reducer	GRT, KB 1200
Cement Specific Gravity	3.15	Water Reducer	
Fly Ash Source (distributer & plant)		Water Reducer	
Fly Ash Class		Accelerator	
Fly Ash Specific Gravity		Other	
Slag Cement Source		(Indicate Source & Product name with ticket code)	
Slag Cement Grade			
Slag Cement Specific Gravity		TYPE OF MIX WINTER/SUMMER	Winter & Summer
Other			

MIX PROPORTIONS

Volume of Coarse Aggregate (DR)	70%	Design Slump	5"
Coarse Aggregate Weight (Dry)	1765 (1800 SSD)	Specified Slump	0-6"
Intermediate Aggregate Weight (Dry)		Design Air %	6.5%
Fine Aggregate Weight (Dry)	1137 (1150 SSD)	Specified Air %	5.5-8.5%
Portland Cement Weight	658	PSI minimum required	3500
Fly Ash Weight		Total Cementitious	658
Fly Ash Percent of Cementitious		Yield cu/ft	27
Slag Cement Weight			
Slag Cement Percent of Cementitious		I certify that all applicable standard test methods have been followed verifying the mix design and JMF:	
Total Water Weight	310	Signature	Brad Yuill
Net Water Weight	264		Digitally signed by Brad Yuill Date: 2021.03.22 11:54:20 -04'00'
WC (as designed)	0.40		
Air Entrainment (dosage)	1 oz/cwt	MCA Level II Expiration Date:	04/15/22
Water Reducer (dosage)	5 oz/cwt 5-7		
Other (dosage)		Date:	06/23/21



Concrete Mix Evaluation Report

ACI 318 Required Average Strength

Mix ID P-NC0M
 Mix Name P-NC 3500 PSI AE W/MR
 W/O NCA
 Design Strength (f'c) 3500 psi @ 28 Days
 Required Strength (f'cr) 4700 psi @ 28 Days

Number Of Tests 10
 Average Strength 5847 psi
 St Dev 931 psi
 St Dev (Modified) 938 psi

Test Date	Mix	Temp (Concrete) (°F)	Slump (in)	Air Content (%)	Acceptance Strength (28-Day) (psi)	Moving Average (psi)
03/19/2021			5.5	6.4	5490	
03/19/2021		56	5	5.5	7390	
02/26/2021			4	8	4090	5657
02/26/2021			4.5	5.5	5980	5820
02/26/2021			6	6	5360	5143
02/27/2021			5.75	5.5	6800	6047
02/27/2021			5	5.9	5430	5863
02/27/2021			5.5	5.8	5440	5890
03/25/2021			5	5.8	5810	5560
03/26/2021			6	7.9	6680	5977



Re: All MDOT Projects

Admixture General Certification

<u>Spec.# and Material Name</u>	<u>Manufacturer</u>	<u>Product Name</u>	<u>Hercules Item #</u>
903.01 – Air Entraining Admix	MAPEI/GRT	SA-14	AE
903.01 - Air Entraining Admix	MAPEI/GRT	SA-50	AE
903.02 – Water Reducing Admix	MAPEI/GRT	KB-1200	MR
903.04 – Concrete Accelerators	MAPEI/GRT	SUPER SET PLUS	NCA
903.02 – Water reducing Retarders	MAPEI/GRT	POLY R	RET

We certify the above referenced materials are provided into the referenced project.

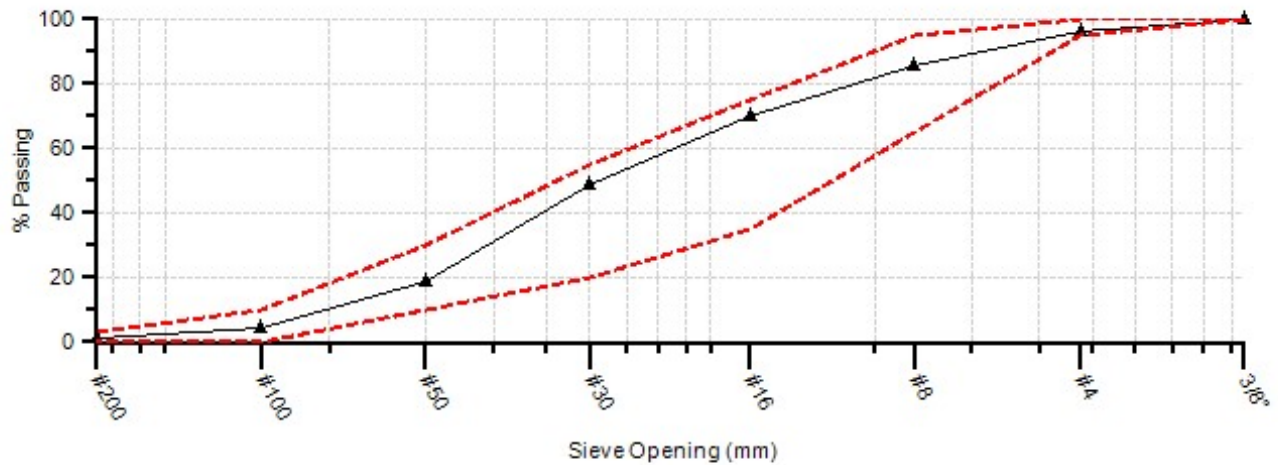
Respectfully Submitted,

Jim Plohg II
Senior Director
Hercules Concrete LLC.

Detail Gradation Statistical Summary Report

Plant 01-Spring Mill Reclamation LLC
Product 2NS-SMR-MDOT 2NS SPRING MILL MDOT# 47-003
Specification MIDOT 2NS
Period 11/10/2020 - 03/04/2021

Sieve/Test	Tests	Average	Min	Max	Range	St Dev	Target	Specification	PWS
3/8" (9.5mm)	3	100.0	100.0	100.0	0.0	0.00		100-100	100.0
#4 (4.75mm)	3	96.2	95.8	97.0	1.2	0.67		95-100	96.3
#8 (2.36mm)	3	85.5	84.4	86.8	2.4	1.22		65-95	100.0
#16 (1.18mm)	3	70.3	69.2	71.5	2.3	1.15		35-75	100.0
#30 (.6mm)	3	49.0	48.2	50.2	2.0	1.04		20-55	100.0
#50 (.3mm)	3	18.7	17.3	21.1	3.8	2.09		10-30	100.0
#100 (.15mm)	3	4.1	3.5	4.8	1.3	0.67		0-10	100.0
#200 (75µm)	3	1.5	1.3	1.7	0.4	0.21		0-3	100.0
Pan	3	0.0	0.0	0.0	0.0	0.00			
FM	3	2.76	2.73	2.81	0.08	0.042	2.8	2.6-3	100.0
Wash Loss (#200/75um)	3	1.3	1.3	1.3	0.0	0.00			
Total Moisture	3	4.87	4.14	5.42	1.28	0.659			





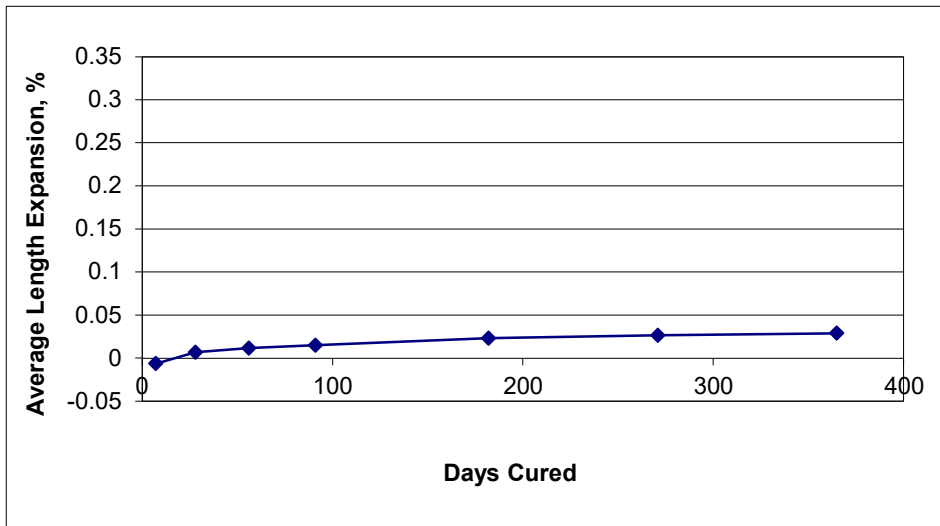
Potential Alkali Reactivity of Aggregates ASTM C 1293

Project: 2020 Spring Mill Lab Testing
Project No.: 83665
Client: Spring Mill LLC

Date: 2/17/2021
Prepared By: Ryan Wilk

Date Molded: 02/18/20
Portland Cement: CRH Type I

Fine Aggregate: Spring Mill South
Coarse Aggregate: MDOT Pit #58-011



Date	Days Cured	Specimen			Average Expansion, %
		1	2	3	
02/25/20	7	-0.010	-0.003	-0.006	-0.0064
03/17/20	28	0.004	0.010	0.007	0.0069
04/14/20	56	0.008	0.012	0.014	0.0115
05/19/20	91	0.014	0.014	0.017	0.0149
08/18/20	182	0.024	0.022	0.023	0.0229
11/15/20	271	0.027	0.025	0.027	0.0264
02/17/21	365	0.030	0.027	0.030	0.0289

Notes: Aggregates that exceed 0.04% expansion at one year using this test criteria could be considered potentially reactive.

Remarks: Aggregates were tested in accordance to ASTM C1293.

Tested by: Ryan Wilk

Reviewed by: Nick Atkins



Project No.:	079365.00
Report No.:	MAT:18-15616-S1-1

CC:

This report represents conditions at specific locations, therefore, conditions might vary away from those locations. No one except our client may rely on our findings/opinions, or reproduce this report. SME is not responsible for site safety on this project.

Nick Atkins

Contractor: McCoig Materials

Reviewed By: Nicholas E. Atkins

Other Test Results

Description	Method	Result	Limits
Lightweight particles (%)	ASTM C 123	0.4	
Test sample mass (g)		212	
Nominal Maximum Size (in)		#4	
Type of heavy liquid		Zinc Chloride	
Heavy liquid specific gravity		2.0	
Specific Gravity (OD)	ASTM C 128	2.61	
Specific Gravity (SSD)		2.64	
Apparent Specific Gravity		2.69	
Absorption (%)		1.1	
Additional Notes			

Particle Size Distribution

N/A

National Ready Mixed Concrete Association



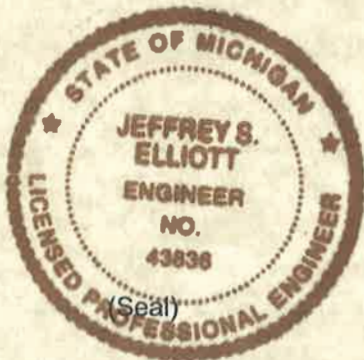
Certificate of Conformance For Concrete Production Facilities

THIS IS TO CERTIFY THAT

Detroit Plant 1, Detroit, MI
Hercules Concrete, 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

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





Signature of Licensed Professional Engineer

June 03, 2020

Inspection Date

June 03, 2022

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

Senior Director

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.

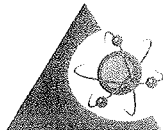
This certificate is issued by the National Ready Mixed Concrete Association on verification that the production facility conforms to the requirements of the NRMCA Certification of Ready Mixed Concrete Production Facilities, QC3. Unauthorized reproduction or misuse of this certificate may result in legal action.

Plant ID #: 854246

Certification ID #: 26172

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

National Ready Mixed Concrete Association 66 Canal Center Plaza, Suite 250 • Alexandria • Virginia 22314



PJLA
Calibration
Accreditation # 59303

METRO SCALE COMPANY, INC.
17670 ALLEN ROAD, MELVINDALE, MI 48122
PHONE: (313) 382-6190 FAX: (313) 382-6194

76551

SCALE CALIBRATION REPORT

TECHNICIAN: <i>Alvin L. L. / Mike L. L.</i>	DATE: <i>3-10-21</i>	Next Due: <i>9-10-21</i>
SCALE MFG: Cardinal	CUSTOMER: HERCULES CONCRETE INC(DETROIT)	
MODEL NO: 201	ADDRESS: 2791 W. JEFFERSON	
SERIAL NO: E36419-0104		
LOCATION: Agg Scale	DETROIT, MI 48216	

CAPACITY/RESOLUTION: 45,000 X 10 LB

CONDITION PRIOR TO CALIBRATION: ☒ ACCEPTABLE ☐ NEEDS REPAIR - UNABLE TO CAL.

UNITS OF MEASURE: ☒ POUNDS ☐ KG ☐ GRAMS ☐ OTHER:

CALIBRATED TO HANDBOOK 44 TOLERANCE: ☐ YES ☐ NO ☐ LEGAL FOR TRADE

APPLIED WEIGHT	TEST READING		SERIAL NUMBERS OF WEIGHTS USED:			
	BEFORE	AFTER				
0 LB	0 LB	0 LB	0N76, 0N77, 22222 @ 1000 LB			
2000LB	2000LB	2000LB				
4000LB						
6000LB	7120 LB	7120 LB	Shift Test: Before <u>L/C Cable/Indicator</u> After Position 1: <i>NA</i> Position 2: Position 3: Position 4: 1 2 3 4			
12000LB	14,340 LB	14,340 LB				
24000LB	28,650 LB	28,650 LB				
36000LB	33,550 LB	33,550 LB				

COMMENTS:

SCALE OK FOR USE ☒ YES ☐ NO

NOTES:

- SCALE TOLERANCE AS APPLIED TO NIST HANDBOOK 44 REQUIREMENTS.
- DEVICES LISTED ON THIS SHEET WERE CHECKED AND CALIBRATED WITH WEIGHTS TRACEABLE TO SI THROUGH N.I.S.T. CERTIFICATIONS FOR TEST WEIGHTS ARE AVAILABLE UPON REQUEST.
- CALIBRATION COMPLIES WITH MSC INSTRUCTION QW 4.11.02, ISO IEC 17025:2017 AND WITH REFERENCE TO NIST HANDBOOK 44 WHERE APPLICABLE.
- RESULTS OF THIS CALIBRATION RELATE ONLY TO THE ITEMS SPECIFIED ABOVE.
- THIS REPORT IS NOT TO BE REPRODUCED EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION OF MSC.
- ALL CALIBRATIONS PERFORMED UNDER NORMAL WORKING ENVIRONMENTAL CONDITIONS UNLESS NOTED UNDER COMMENTS.
- THE UNCERTAINTY CALCULATIONS ARE AVAILABLE UPON WRITTEN REQUEST FROM THE CUSTOMER.
- END OF REPORT.



PJLA
Calibration
Accreditation # 59303

METRO SCALE COMPANY, INC.
17670 ALLEN ROAD, MELVINDALE, MI 48122
PHONE: (313) 382-6190 FAX: (313) 382-6194

76550

SCALE CALIBRATION REPORT

TECHNICIAN: <i>Alex Lulko / Mike Lulko</i>	DATE: <i>3-10-21</i> Next Due:
SCALE MFG: Cardinal	CUSTOMER: HERCULES CONCRETE INC(DETROIT)
MODEL NO: 201	ADDRESS: 2791 W. JEFFERSON
SERIAL NO: E36119-0156	
LOCATION: Cement Scale	DETROIT, MI 48216

CAPACITY/RESOLUTION: 10,000 X 2 LB

CONDITION PRIOR TO CALIBRATION: ☒ ACCEPTABLE ☐ NEEDS REPAIR – UNABLE TO CAL.

UNITS OF MEASURE: ☒ POUNDS ☐ KG ☐ GRAMS ☐ OTHER:

CALIBRATED TO HANDBOOK 44 TOLERANCE: ☐ YES ☐ NO ☐ LEGAL FOR TRADE

APPLIED WEIGHT	TEST READING		SERIAL NUMBERS OF WEIGHTS USED:				
	BEFORE	AFTER					
0 LB	0Lb	0Lb	ON 11 @ 1000 Lb				
1000LB	1004 Lb	1000 Lb					
2000LB		2072 Lb	Shift Test: Before		L/C Cable/Indicator		After
3000LB		3072 Lb	Position 1:		1	2	
4000LB		4232 Lb	Position 2:				
5000LB		5090 Lb	Position 3:		3	4	
			Position 4:				

COMMENTS:

SCALE OK FOR USE ☒ YES ☐ NO

NOTES:

- SCALE TOLERANCE AS APPLIED TO NIST HANDBOOK 44 REQUIREMENTS.
- DEVICES LISTED ON THIS SHEET WERE CHECKED AND CALIBRATED WITH WEIGHTS TRACEABLE TO SI THROUGH N.I.S.T. CERTIFICATIONS FOR TEST WEIGHTS ARE AVAILABLE UPON REQUEST.
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- THE UNCERTAINTY CALCULATIONS ARE AVAILABLE UPON WRITTEN REQUEST FROM THE CUSTOMER.
- END OF REPORT.

Metro

Scale

Company Inc.

A Michigan Corporation

17670 Allen Road Melvindale, MI 48122

Sales • Service • Calibrations • ISO/IEC 17025: 2005

PH: 313-382-6190 Fax: 313-382-6194

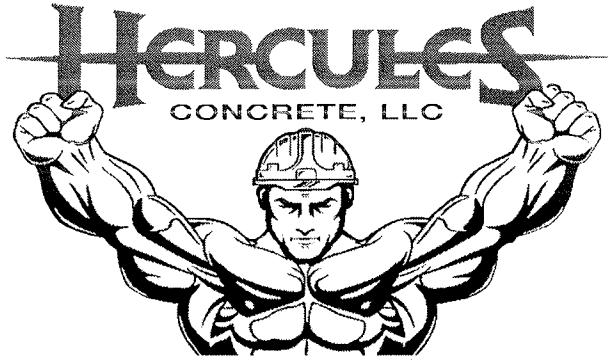
Industrial Weighing Equipment

www.metroscaleco.com

Work Order No. 14225

DATE: 3-10-21

P.O. #		TECH <i>Alex Lukko / Mike Lukko</i>	
CUSTOMER <i>Hercules Concrete Inc.</i>			
ADDRESS <i>2791 W. Jefferson</i>			
CITY <i>Detroit</i>	STATE <i>MI</i>	ZIP <i>48216</i>	PHONE
EQUIPMENT		SERIAL NUMBER	
REMOVED FOR REPAIR ☐		RETURNED FROM REPAIR ☐	
WORK PERFORMED <i>Scale Inspection. Checked The Batch Plant Scales For Proper Operation And Calibration. Made Adjustments When Needed.</i>			
<i>The Scales Are OK For Use.</i>			
PARTS		COST	
		PRICE BREAKDOWN	COST
		PARTS TOTAL	
		SHOP LABOR	
		LABOR:	
		HR. REG. @ \$	
		LABOR:	
		HR. O/T @ \$	
		ISO 17025 DOC.	
CUSTOMER SIGNATURE: <i>David Pembae</i>		TRUCK EXP.	
		TOTAL	



Water Meter Accuracy Verification
55 Gallon Drum Calibration Sheet

90 day requirement for volumetric water batching devices per MDOT

Date of Calibration 2/2/2021

Next Calibration Date 5/2/2021

Plant Information

Plant Name	Hercules Concrete
Plant Number	1
Water Temp	62
Ambient Temp	76
Meter Type	Flow
Meter Brand	BMH
Pulse Count	1.0 gal
Source	City of Detroit Water

TEST # 1

Metered Quantity	<u>50</u>	Meter Setting	0.0385
Measured Quantity	<u>50</u>	Adjusted Setting	NA

Test # 2

Metered Quantity	<u>50</u>	Meter Setting	0.0385
Measured Quantity	<u>50</u>	Adjusted Setting	NA

Test # 3

Metered Quantity	<u>50</u>	Meter Setting	0.0385
Measured Quantity	<u>50</u>	Adjusted Setting	NA

I certify that the above information and test results are true and accurate.

Jim Plohg II

2/2/2021

Dan Bedford

2/2/2021



Calibration of Liquid Admixture Report

						Date	6/10/21
Customer Name:		Hercules Concrete					
Location:		Detroit					
State: MI		Yard/Plant ID:		DOT#			
Product Name	Pulse Rate oz	Control Panel Reading oz.		Calibrated Container Reading oz		Variance (+/-)%	Pass/Fail
SA-50	1	100		100		0.0%	Pass
KB 1200	5	150		150		0.0%	Pass
DYNAMON SX	2	100		100		0.0%	Pass
POLY R	1	100		100		0.0%	Pass
PC-383	2	150		150		0.0%	Pass
SUPER SET	4	200		200		0.0%	Pass
SUPER SET PLUS	4	200		200		0.0%	Pass
CaCl	16	320		320		0.0%	Pass
H2O	128	50 Gal.		50 Gal.		0.0%	Pass
All Calibrated container readings are accurate to within 1% of the total amount required.							
GRT Representative Signature: Chris Carnacchi							
DOT or Company Representative Signature:							



44265 Plymouth Oaks Blvd.
Plymouth, MI 48170
T 734-455-8600
F 734-455-8608
www.ttlassoc.com

June 11, 2021

TTL Project No. 1971101

Mr. James Plough
Hercules Concrete, LLC.
12225 Stephens Road
Warren, Michigan 48089

RE: Concrete Plant Inspection for Hercules' Titan Plant, Centerline, MI

Dear Mr. Plough:

TTL Associates, Inc. (TTL) on behalf of Hercules Concrete, LLC (Hercules) performed a concrete plant inspection of the Titan Concrete Plant located at 6497 East 10 Mile Road in Centerline, Michigan on June 2, 2021.

This inspection was performed by Mr. Jeffrey Elliott, PE who is a National Ready Mixed Concrete Association (NRMCA) Inspecting Engineer along with the NRMCA's Plant Certification Checklist, Revision 12. A copy of the completed checklist is attached to this letter. Based on this inspection, it has been determined that Hercules' Titan Plant is in conformance with the applicable NRMCA requirements.

If you have any questions or require further information, please feel free to contact us.

Respectfully submitted,

TTL Associates, Inc.

Jeffrey S. Elliott, P.E.
Vice President
(NRMCA Inspecting Engineer #803871)

Attachment



PJLA
Calibration
Accreditation # 59303

METRO SCALE COMPANY, INC.
17670 ALLEN ROAD, MELVINDALE, MI 48122
PHONE: (313) 382-6190 FAX: (313) 382-6194

No. 8915

SCALE CALIBRATION REPORT

TECHNICIAN: ALEX LULKO / MIKE LULKO		DATE: 5-20-21	
SCALE MFG: CARDINAL		CUSTOMER: HERCULES CONCRETE INC.	
MODEL NO: 205		ADDRESS: 6115 EAST 10 MILE RD.	
SERIAL NO: E33720-0013			
LOCATION: CEMENT #1		WARREN, MI. 48091	
CAPACITY/RESOLUTION: 10,000 x 5 LB			
CONDITION PRIOR TO CALIBRATION: ☒ ACCEPTABLE ☐ NEEDS REPAIR - UNABLE TO CAL.			
UNITS OF MEASURE: ☒ POUNDS ☐ KG ☐ GRAMS ☐ OTHER:			
CALIBRATED TO HANDBOOK 44 TOLERANCE: ☐ YES ☐ NO ☐ LEGAL FOR TRADE			
APPLIED WEIGHT	TEST READING		SERIAL NUMBERS OF WEIGHTS USED:
	BEFORE	AFTER	
0 LB		0 LB	110, 115, 22229, ON7A, ON76, ON77 @ 1000 LB.
2000 LB		2000 LB	
4000 LB		4000 LB	
6000 LB		6000 LB	
			Shift Test:
			Before
			L/C Cable/Indicator
			After
			Position 1:
			Position 2:
			Position 3:
			Position 4:
			1
			2
			3
			4

COMMENTS: NEW SCALE/PLANT, NO BEFORE READINGS.

SCALE OK FOR USE ☒ YES ☐ NO

NOTES:

1. SCALE TOLERANCE AS APPLIED TO NIST HANDBOOK 44 REQUIREMENTS.
2. DEVICES LISTED ON THIS SHEET WERE CHECKED AND CALIBRATED WITH WEIGHTS TRACEABLE TO SI THROUGH N.I.S.T. CERTIFICATIONS FOR TEST WEIGHTS ARE AVAILABLE UPON REQUEST.
3. CALIBRATION COMPLIES WITH MSC INSTRUCTION QW 4.11.02, ISO IEC 17025:2005 AND WITH REFERENCE TO NIST HANDBOOK 44 WHERE APPLICABLE.
4. RESULTS OF THIS CALIBRATION RELATE ONLY TO THE ITEMS SPECIFIED ABOVE.
5. THIS REPORT IS NOT TO BE REPRODUCED EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION OF MSC.
6. ALL CALIBRATIONS PERFORMED UNDER NORMAL WORKING ENVIRONMENTAL CONDITIONS UNLESS NOTED UNDER COMMENTS.
7. THE UNCERTAINTY CALCULATIONS ARE AVAILABLE UPON WRITTEN REQUEST FROM THE CUSTOMER.
8. END OF REPORT.



PJLA
Calibration
Accreditation # 59303

METRO SCALE COMPANY, INC.
17670 ALLEN ROAD, MELVINDALE, MI 48122
PHONE: (313) 382-6190 FAX: (313) 382-6194

No. 8916

SCALE CALIBRATION REPORT

TECHNICIAN: ALEX WLKO / MIKE WLKO		DATE: 5-20-21	
SCALE MFG: CARDINAL		CUSTOMER: HERCULES CONCRETE INC.	
MODEL NO: 205		ADDRESS: 6115 EAST 10 MILE RD.	
SERIAL NO: E33720-0006			
LOCATION: CEMENT #2		WARREN, MI. 48091	
CAPACITY/RESOLUTION: 10,000 x 5LB			
CONDITION PRIOR TO CALIBRATION: ☒ ACCEPTABLE ☐ NEEDS REPAIR - UNABLE TO CAL.			
UNITS OF MEASURE: ☒ POUNDS ☐ KG ☐ GRAMS ☐ OTHER:			
CALIBRATED TO HANDBOOK 44 TOLERANCE: ☐ YES ☐ NO ☐ LEGAL FOR TRADE			
APPLIED WEIGHT	TEST READING		SERIAL NUMBERS OF WEIGHTS USED:
	BEFORE	AFTER	
0 LB		0 LB	110, 115, 22229, ON7A, ON76, ON77 @ 1000 LB.
2000 LB		2000 LB	
4000 LB		4000 LB	
6000 LB		6000 LB	
			Shift Test:
			Before
			L/C Cable/Indicator
			After
			Position 1:
			Position 2:
			Position 3:
			Position 4:
			1
			2
			3
			4

COMMENTS: NEW SCALE/PLANT, NO BEFORE READINGS.

SCALE OK FOR USE ☒ YES ☐ NO

NOTES:

- SCALE TOLERANCE AS APPLIED TO NIST HANDBOOK 44 REQUIREMENTS.
- DEVICES LISTED ON THIS SHEET WERE CHECKED AND CALIBRATED WITH WEIGHTS TRACEABLE TO SI THROUGH N.I.S.T. CERTIFICATIONS FOR TEST WEIGHTS ARE AVAILABLE UPON REQUEST.
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- END OF REPORT.



METRO SCALE COMPANY, INC.
 17670 ALLEN ROAD, MELVINDALE, MI 48122
 PHONE: (313) 382-6190 FAX: (313) 382-6194

No. 8914

SCALE CALIBRATION REPORT

TECHNICIAN: ALEX LVLKO / MIKE LVLKO		DATE: 5-20-21	
SCALE MFG: CARDINAL		CUSTOMER: HERCULES CONCRETE INC.	
MODEL NO: 205		ADDRESS: 6115 EAST 10 MILE RD.	
SERIAL NO: E33720-0009			
LOCATION: AGGREGATE		WARREN, MI. 48091	
CAPACITY/RESOLUTION: 50,000 x 20 LB			
CONDITION PRIOR TO CALIBRATION: ☒ ACCEPTABLE ☐ NEEDS REPAIR - UNABLE TO CAL.			
UNITS OF MEASURE: ☒ POUNDS ☐ KG ☐ GRAMS ☐ OTHER:			
CALIBRATED TO HANDBOOK 44 TOLERANCE: ☐ YES ☐ NO ☐ LEGAL FOR TRADE			
APPLIED WEIGHT	TEST READING		SERIAL NUMBERS OF WEIGHTS USED:
	BEFORE	AFTER	
0 LB	/	0 LB	110, 115, 22229, ON7A, ON76, ON77 @ 1000 LB.
2000 LB		2000 LB	
4000 LB		4000 LB	
6000 LB		6000 LB	
12000 LB		12000 LB	
18000 LB		18000 LB	
24000 LB		24000 LB	
30000 LB		30000 LB	
36000 LB		36000 LB	

Shift Test:	Before	L/C Cable/Indicator		After
Position 1:	/	1	2	/
Position 2:				
Position 3:				
Position 4:		3	4	

COMMENTS: NEW SCALE / PLANT, NO BEFORE READINGS.

SCALE OK FOR USE ☒ YES ☐ NO

NOTES:

- SCALE TOLERANCE AS APPLIED TO NIST HANDBOOK 44 REQUIREMENTS.
- DEVICES LISTED ON THIS SHEET WERE CHECKED AND CALIBRATED WITH WEIGHTS TRACEABLE TO SI THROUGH N.I.S.T. CERTIFICATIONS FOR TEST WEIGHTS ARE AVAILABLE UPON REQUEST.
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- END OF REPORT.



Calibration of Liquid Admixture Report

						Date	6/11/21
Customer Name:		Titan Concrete					
Location:		Centerline					
State: MI		Yard/Plant ID:		DOT#			
Product Name	Pulse Rate oz	Control Panel Reading oz.		Calibrated Container Reading oz	Variance (+/-)%	Pass/Fail	
SA-14	1	100		100	0.0%	Pass	
POLY R	2	100		100	0.0%	Pass	
KB 1200	2	150		150	0.0%	Pass	
Dynamon SX	2	100		100	0.0%	Pass	
SUPER SET PLUS	4	200		200	0.0%	Pass	
CaCl	16	320		320	0.0%	Pass	
H2O	128	50 Gal.		50 Gal.	0.0%	Pass	
All Calibrated container readings are accurate to within 1% of the total amount required.							
GRT Representative Signature: <u>Chris Carnacchi</u>							
DOT or Company Representative Signature: _____							