



WEAVER GENERAL CONSTRUCTION COMPANY
 3679 S. Huron St., Suite 404
 Englewood, CO 80110
 Phone: (303) 789-4111 FAX: (303) 789-4310

SUBMITTAL TRANSMITTAL

April 20, 2011

WGC Submittal No: 03300-009.E

PROJECT: **Harold Thompson Regional WRF**
 Birdsell Rd.
 Fountain, CO 80817
 Job No. 2908

ENGINEER: **GMS, Inc.**
 611 No. Weber St., #300
 Colorado Springs, CO 80903
 719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan
 Sewage Disposal District**
 901 S. Santa Fe Ave.
 Fountain, CO 80817
 719-382-5303 James Heckman

CONTRACTOR: **Baker Concrete Construction**
 1904 Jasper Street
 Aurora, CO 80011
 937-536-9000 Nick Dewald

SUBJECT: Response to questions addressed in 03300-009.D on Polyheed 1720 admixture.

SPEC SECTION: 03300 - Cast-In-Place Concrete

PREVIOUS SUBMISSION DATES: 2/28/11

DEVIATIONS FROM SPEC: ___ YES X NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver General Construction and approved with respect to the means, methods, techniques, & safety precautions & programs incidental thereto. Weaver General Construction also warrants that this submittal complies with contracted documents and comprises on deviations thereto:

Contractor's Stamp:

Engineer's Stamp:

Date: 4/20/11
 Reviewed by: H.C. Myers
 (X) Reviewed Without Comments
 () Reviewed With Comments

**ENGINEER'S
 COMMENTS:** _____



Letter of Transmittal/Submittal

FROM: **Baker Concrete Construction**
 1904 Jasper Street
 Aurora, CO 80011
 303.367.8111
 Nick Dewald 937.536.9000

DATE	04/19/11	JOB NUMBER	9921
ATTENTION	John Jacob/Leslie Brown		
RE:	Harold Thompson Regional WRF		
TR#	03300-018	SM#	03300-009E

TO: **John Jacob/Leslie Brown**
 Weaver General Construction Co.
 3679 South Huron St., Suite 404
 Englewood, CO 80110
 john@weavergc.com / leslie@weavergc.com

We are sending you: via the following:

COPIES	DATE	PAGES	Description
1	4/19/2011	22	Response to 03300-009D Questions

THESE ARE TRANSMITTED as noted below:

FOR APPROVAL	

REMARKS Attached is BCCI's response to the engineer's questions in 03300-009D concerning Polyheed 1720.

COPY TO File SIGNED: Nick Dewald
 Baker Concrete Construction, Inc.

If enclosures are not as noted, kindly notify us at once

We trust this meets your current needs regarding the Polyheed 1720 product. If there are any questions or if we can be of further service regarding this concrete mixture, please do not hesitate to contact us.

Respectfully,

A handwritten signature in black ink, appearing to read 'Zachariah J. Ballard', with a long horizontal line extending to the right.

Zachariah J. Ballard, EI
Quality Control Manager

ZJB/zjb

Attachments: BASF letter RE: Polyheed 1720, dated April 12, 2011.



The Chemical Company

April 12, 2011

Mr. Zachariah Ballard
Rocky Mountain Premix, Inc.
Colorado Springs, CO

RE: PolyHeed 1720

Dear Mr. Ballard:

Per request of Bill Deal, our local area BASF Sales Specialist, I would like to confirm that PolyHeed 1720 will provide the same good concrete performance characteristics as PolyHeed 1020. PolyHeed 1720 is part of the next generation polycarboxylate admixtures which have been specifically designed to provide the same water reduction, better slump retention, better setting characteristics, more consistent air contents and higher early age strengths than the earlier polycarboxylate based Mid-Range Water Reducing Admixtures such as PolyHeed 1020. From a producer standpoint, usage and handling of PolyHeed 1720 will be very similar to that of PolyHeed 1020. Contractors will see the benefits of the longer slump retention and more consistent air content.

PolyHeed 1720 was introduced in 2007. It has been approved by 13 State DOT's and has been tested by AASHTO NTPEP. It conforms to ASTM C494 Type A, Water-Reducing and Type F, High-Range Water-Reducing Admixture specifications. The ASTM C494 Test Reports are available for review upon request.

The purpose of Water-Reducing admixtures such as PolyHeed 1720 and PolyHeed 1020 is to provide concrete workability while reducing water content, thus increasing concrete strength and durability properties. They are not generally designed to specifically provide protection against hydrogen sulfide attack in sewage treatment applications. However, by reducing the water/cement ratio of the concrete, the density of the concrete structure is increased and the permeability is decreased, which provides a more durable concrete which resists the ingress of corrosive chemicals.

Please feel free to give me a call with any questions you may have concerning BASF admixtures.

A handwritten signature in black ink that reads "Mark E. Piechuta".

Mark E. Piechuta
Sr. Technical Marketing Specialist
BASF Corporation
(216) 839-7072

cc: Bill Deal- BASF Corporation



Rocky Mountain Premix, Inc.
 2895 Capital Drive
 Colorado Springs, Colorado 80935
 Office: (719) 591-8080
 Fax: (719) 550-8000
 Dispatch: (719) 638-8000

CONCRETE MIXTURE DESIGN REPORT

RMPM Mixture ID#: A65FDP
 Date Mix Reported : 4/12/2011
 Class / Use: Drilled Piers, 3750 psi

Material	Amount / Cubic Yard	Source / Type	ASTM Std.
Cement	489 lbs	GCC, Pueblo Plant, Type I-II LA	C 150
Fly Ash	122 lbs	Boral, FACT Craig, Class F	C 618
Coarse Aggregate*	1690 lbs	RMMA, Clevenger Pit, #57/67	C 33
Fine Aggregate*	1340 lbs	RMMA, Clevenger Pit, WCS	C 33
Water (25.9 gal.)	216 lbs	Municipal	C 94
Air Entraining Agent (1.05 oz./cwt)**	6.4 oz	BASF, MB AE 90	C 260
Water Reducer (1.47 oz./cwt)**	9.0 oz	BASF, Pozzolith 200 N	C 494
Water Reducer (3.99 oz./cwt)**	24.4 oz	BASF, Polyheed 1720	C 494

*Aggregate masses determined in SSD condition.

**Admixture dosages may be adjusted based on varying environmental and/or jobsite conditions.

Design Physical Properties

Unit Weight: 141.5 pcf
 Air Content: 6.6 %
 Slump: 5.25 in.
 (w/cm) Ratio: 0.35
 Relative Yield: 1.01 cy
 Percent Fly Ash: 20 %
 Cementitious Content: 611 lbs.
 Percent Coarse Aggregate: 56 %

Prepared by Rocky Mountain Premix, Inc.

Zachariah J. Ballard, EI
 Quality Control Manager

A65F20 Compressive Strength History			
Cast Date	7 Day Break Results	Cast Date	28 day Break Results
2/12/2011	3820	2/12/2011	5120
	4180		5260
1/21/2011	3240	1/21/2011	4020
	3290		4240
1/19/2011	3270	1/19/2011	4650
	3290		4520
1/17/2011	3800	1/17/2011	4650
	3840		4410
1/14/2010	3360	1/14/2010	4040
	3050		4180
1/8/2011	3790	1/8/2011	4200
	3980		4650
	3900		4820
1/5/2011	4070	1/5/2011	5010
	3900		4940
12/23/2010	3420	12/23/2010	4700
			4810

28 day Avg Strength: 4601 psi
 Standard Deviation: 376 psi
 k-factor(K): 1.16
 f'_c: 4000 psi
 f'_c required: f'_c+1.34ks
 f'_c required: 4584 psi



The Chemical Company

April 12, 2011

Project: Various
Project location: Various

Certificate of Conformance
MB-AE™ 90
BASF Construction Chemicals, LLC* Air-Entraining Admixture for Concrete

*(successor in interest to BASF Construction Chemicals, LLC, which is successor by merger to BASF Admixtures, Inc., formerly known as Degussa Admixtures, Inc., formerly known as Master Builders, Inc.)

I, Richard Hubbard, Sr. Technical Marketing Specialist for BASF Corporation, Cleveland, Ohio, certify:

That MB-AE 90 is a BASF Corporation Air-Entraining Admixture for concrete; and

That no calcium chloride or chloride based ingredient is used in the manufacture of MB-AE 90; and

That MB-AE 90, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.000068 percent (0.68 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and

That MB-AE 90 meets the requirements of ASTM C 260, Corps of Engineers' CRD-C 13 and AASHTO M154, the Standard Specifications for Air-Entraining Admixtures for Concrete.

A handwritten signature in cursive script that reads "Richard Hubbard III".

Richard Hubbard
Sr. Technical Marketing Specialist, BASF Corporation



The Chemical Company

April 12, 2011

Project: Various
Project location: Various

Certificate of Conformance
Polyheed® 1720
BASF Corporation* Admixture for Concrete

*(successor in interest to BASF Construction Chemicals, LLC, which is successor by merger to BASF Admixtures, Inc., formerly known as Degussa Admixtures, Inc., formerly known as Master Builders, Inc.)

I, Richard Hubbard, Sr. Technical Marketing Specialist for BASF Corporation, Cleveland, Ohio, certify:

That PolyHeed 1720 is a BASF Corporation Mid-Range Water-Reducing Admixture for concrete; and

That no calcium chloride or chloride based ingredient is used in the manufacture of PolyHeed 1720; and

That PolyHeed 1720, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00014 percent (1.4 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and

That, depending on the dosage used, PolyHeed 1720 meets the requirements for a Type A, Water-Reducing, and Type F, Water-Reducing High Range Admixture specified in ASTM C 494, Corps of Engineers' CRD-C 87 and AASHTO M194, the Standard Specifications for Chemical Admixtures for Concrete.

A handwritten signature in cursive script that reads "Richard Hubbard III".

Richard Hubbard
Sr. Technical Marketing Specialist, BASF Corporation



The Chemical Company

April 12, 2011

Project: Various
Project location: Various

Certificate of Conformance
Pozzolith® 200 N
BASF Corporation* Admixture for Concrete

*(successor in interest to BASF Construction Chemicals, LLC, which is successor by merger to BASF Admixtures, Inc., formerly known as Degussa Admixtures, Inc., formerly known as Master Builders, Inc.)

I, Richard Hubbard, Sr. Technical Marketing Specialist for BASF Corporation, Cleveland, Ohio, certify:

That Pozzolith 200 N is a BASF Corporation Water-Reducing Admixture for concrete; and

That no calcium chloride or chloride based ingredient is used in the manufacture of Pozzolith 200 N; and

That Pozzolith 200 N, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00013 percent (1.3 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and

That, depending on the dosage used, Pozzolith 200 N meets the requirements for a Type A, Water-Reducing, Type B, Retarding, and Type D, Water Reducing and Retarding Admixture as specified in ASTM C 494, Corps of Engineers' CRD-C 87 and AASHTO M194, the Standard Specifications for Chemical Admixtures for Concrete.

Richard Hubbard
Sr. Technical Marketing Specialist, BASF Corporation

June 14, 2010

Rocky Mountain Premix Inc.
2895 Capital Drive
Colorado Springs, Colorado 80939

Attention: Mr. Randy Morris

Subject: Physical Properties Testing
No. 57/67, Clevenger Pit
Project No. CT15042.000-400

Dear Mr. Morris:

This report presents results of physical properties testing performed on material delivered to our laboratory in May, 2010. Representative samples delivered were identified as No. 57/67 rock from the Clevenger Pit. Testing was performed to determine the materials compliance with Colorado Department of Transportation (CDOT) specifications. The following testing was performed in general conformance with the applicable standards.

- 1) Sieve Analysis (Gradation)
- 2) Material Finer Than No. 200 Sieve by Washing
- 3) Specific Gravity & Absorption
- 4) Clay Lumps & Friable Particles
- 5) Lightweight Particles 2.0 & 2.4
- 6) Sodium Sulfate Soundness
- 7) Rodded Unit Weight & Voids
- 8) Los Angeles Abrasion

A summary of the aggregate test results is attached, followed by the complete test results. Based on the test results, the material tested meets the CDOT specifications for coarse aggregate. If you have any questions regarding this report, please call.

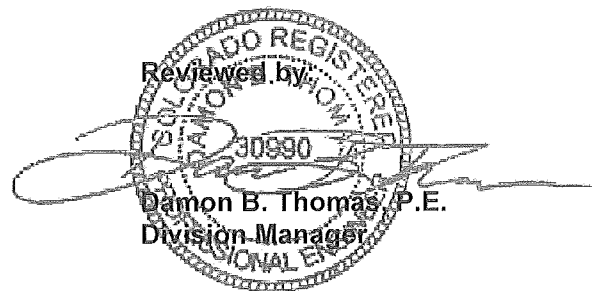
Respectfully submitted,

CTL | THOMPSON MATERIALS ENGINEERS, INC.


Daniel L. Barrett
Materials Lab Manager

DLB:DBT/dlb
Enclosures

1 copy emailed: lab@rockymountainpremix.com



Aggregate Qualification Summary - CDOT Specifications (AASHTO M 80)

Rocky Mountain Premix - Clevenger Pit, No. 57/67



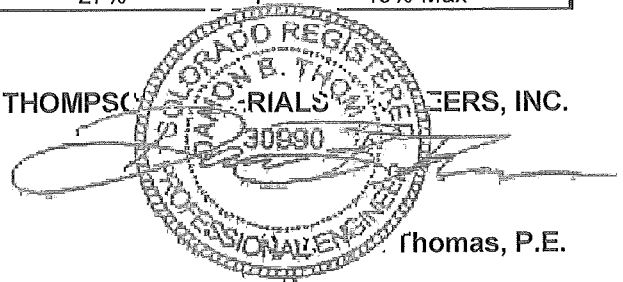
Project No. CT15042-400

Report Date: June 14, 2010

Sieve Analysis (AASHTO T 27 & T 11)		
Sieve Size	Passing (%)	Specification (%)
1-1/2 inch (37.5 mm)	100	100
1 inch (25 mm)	100	100
3/4 inch (19 mm)	90	90-100
1/2 inch (12.5 mm)	47	25-60
3/8 inch (9.5 mm)	24	20-55
No. 4 (4.75 mm)	5	0-10
No. 8 (2.36 mm)	3	0-5
No. 200 (75 µm)	0.7	1.0 Max
Fineness Modulus	-	-

Test	Results	Specification
Specific Gravity (AASHTO T 85)	2.64	-
Absorption (AASHTO T 85)	1.2%	-
Clay Lumps and Friable Particles (AASHTO T 112)	0.7% Weighted Particles	2.0% Max
Lightweight Particles, 2.0 sp.g. (AASHTO T 113)	< 0.1%	0.5% Max
Lightweight Particles, 2.4 sp.g. (AASHTO T 113)	2.1%	3.0% Max
Sodium Sulfate Soundness (AASHTO T 104)	0% Weighted Loss	12% Max
Magnesium Sulfate Soundness (AASHTO T 104)	-	18% Max
Rodded Unit	Unit Weight	104 pcf
Weight & Voids (AASHTO T 19)	Percent Voids	36%
	Tons per cubic yard	1.4 tons/cu. yd.
Loose Unit	Unit Weight	-
Weight & Voids (AASHTO T 19)	Percent Voids	-
	Tons per cubic yard	-
Los Angeles Abrasion (AASHTO T 96)	27%	45% Max

CTL | THOMPSON REGISTERED MATERIALS ENGINEERS, INC.



Damon B. Thomas, P.E.



ATTACHMENT A
LABORATORY TEST RESULTS

PHYSICAL PROPERTIES OF AGGREGATES



Company Name: Rocky Mountain Premix
 Material Source: Clevenger Pit
 Material Type: No. 57/67

Project No. CT15042-400
 Report Date: June 14, 2010

Sieve Analysis of Coarse Aggregate
 (AASHTO T 27)

Sieve Size	Percent Passing No. 57/67	Percent Passing (AASHTO M 80)
1-1/2 inch (37.5 mm)	100	100
1 inch (25 mm)	100	100
3/4 inch (19 mm)	90	90-100
1/2 inch (12.5 mm)	47	25-60
3/8 inch (9.5 mm)	24	20-55
No. 4 (4.75 mm)	5	0-10
No. 8 (2.36 mm)	3	0-5
No. 200 (75 µm)	0.7	1.0 Max

Material Finer Than No. 200 Sieve by Washing
 (AASHTO T 11)

Initial Dry Weight (g)	Final Dry Weight (g)	Material Finer Than No. 200 Sieve (%)
5340.3	5300.3	0.7

Specific Gravity and Absorption of Coarse Aggregate
 (AASHTO T 85)

Oven Dry Weight (g)	SSD in Air Weight (g)	Submerged Weight (g)	Bulk Volume	Bulk (SSD) Specific Gravity	Absorption (%)
6765.8	6845.8	4254.0	2591.8	2.64	1.2

Clay Lumps and Friable Particles in Aggregate
 (AASHTO T 112)

Sieve Size		Percent Grading of Sample	Weight Before (g)	Weight After (g)	Percent Loss	Weighted Percent Loss
Passing	Retained					
	1-1/2 inch	0				
1-1/2 inch	3/4 inch	10	3002.5	2991.1	0.4	0.0
3/4 inch	3/8 inch	66	2001.8	1988.3	0.7	0.5
3/8 inch	No. 4	19	1000	992.4	0.8	0.2
Less Than No. 4		5	-	-	-	-
Total Percent Grading		100	Total Weighted Loss		0.7%	

Fig. A-1

PHYSICAL PROPERTIES OF AGGREGATES



Company Name: Rocky Mountain Premix
 Material Source: Clevenger Pit
 Material Type: No. 57/67

Project No. CT15042-400
 Report Date: June 14, 2010

Lightweight Particles in Aggregate

(AASHTO T 113)

Sample Weight (g)	Specific Gravity of Liquid	Percentage by Mass of Lightweight Particles
8156.4	2.0	< 0.1
8156.4	2.4	2.1

Soundness of Coarse Aggregates by Use of Sodium Sulfate

(AASHTO T 104)

Sieve Size		Percent Grading of Sample	Weight Before (g)	Weight After (g)	Percent Loss	Weighted % Loss
Passing	Retained					
1-1/2 inch	1 inch	0				
1 inch	3/4 inch	10	670.4	670.1	0.0	0.0
3/4 inch	1/2 inch	43	1000.0	999.6	0.0	0.0
1/2 inch	3/8 inch	23	330.1	329.3	0.2	0.1
3/8 inch	No. 4	19	300.0	298.8	0.4	0.1
Less Than No. 4		5	-	-	-	-

Total Percent Grading: 100

Total Weighted Loss: 0

Bulk Density (Unit Weight) and Voids in Aggregates (Rodded Method)

(AASHTO T 19)

Sample Weight (lbs)	Bucket Volume (ft ³)	Unit Weight (pcf)
34.70	0.333	104.2
34.36	0.333	103.2
34.46	0.333	103.5

Average Unit Weight: 104 pcf

Bulk Specific Gravity (OD) = 2.61

Voids in Aggregate Compacted by Rodding = 36%

Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

(AASHTO T 96)

Grading	Initial Weight	Final Weight	Percent Loss
B	5000	3638.9	27.2

June 14, 2010

Rocky Mountain Premix Inc.
2895 Capital Drive
Colorado Springs, Colorado 80939

Attention: Mr. Randy Morris

Subject: Physical Properties Testing
Sand, Clevenger Pit
Project No. CT15042.000-400

Dear Mr. Morris:

This report presents results of physical properties testing performed on material delivered to our laboratory in May, 2010. Representative samples delivered were identified as Sand from the Clevenger Pit. Testing was performed to determine the materials compliance with Colorado Department of Transportation (CDOT) specifications. The following testing was performed in general conformance with the applicable standards.

- 1) Sieve Analysis (Gradation)
- 2) Material Finer Than No. 200 Sieve by Washing
- 3) Specific Gravity & Absorption
- 4) Clay Lumps & Friable Particles
- 5) Lightweight Particles 2.0
- 6) Sodium Sulfate Soundness
- 7) Rodded Unit Weight & Voids
- 8) Sand Equivalency
- 9) Organic Impurities

A summary of the aggregate test results is attached, followed by the complete test results. Based on the test results, the material tested meets the CDOT specifications for fine aggregate. If you have any questions regarding this report, please call.

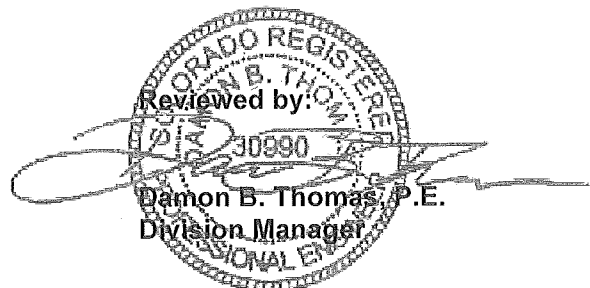
Respectfully submitted,

CTL | THOMPSON MATERIALS ENGINEERS, INC.

Daniel L. Barrett
Daniel L. Barrett
Materials Lab Manager

DLB:DBT/dlb
Enclosures

1 copy emailed: lab@rockymountainpremix.com



Aggregate Qualification Summary - CDOT Specifications (AASHTO M 6)

Rocky Mountain Premix - Clevenger Pit, Sand



Project No. CT15042-400

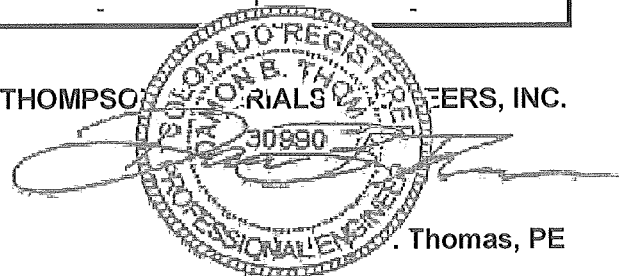
Report Date: June 08, 2010

Sieve Analysis (AASHTO T 27 & T 11)		
Sieve Size	Passing (%)	Specification (%)
2 inch (50 mm)	100	-
1-1/2 inch (37.5 mm)	100	-
1 inch (25 mm)	100	-
3/4 inch (19 mm)	100	-
1/2 inch (12.5 mm)	100	-
3/8 inch (9.5 mm)	100	100
No. 4 (4.75 mm)	97	95-100
No. 8 (2.36 mm)	80	80-100
No. 16 (1.18 mm)	62	50-85
No. 30 (600 µm)	43	25-60
No. 50 (300 µm)	18	10-30
No. 100 (150 µm)	5	2-10
No. 200 (75 µm)	1.7	3.0 Max
Fineness Modulus	2.95	2.50 - 3.50

Test	Results	Specification	
Specific Gravity (AASHTO T 84)	2.60	-	
Absorption (AASHTO T 84)	1.1%	-	
Clay Lumps and Friable Particles (AASHTO T 112)	2.4% Weighted Particles	3.0% Max	
Lightweight Particles, 2.0 sp.g. (AASHTO T 113)	0.1%	0.5% Max	
Lightweight Particles, 2.4 sp.g. (AASHTO T 113)	-	3.0% Max	
Sodium Sulfate Soundness (AASHTO T 104)	1% Weighted Loss	10% Max	
Magnesium Sulfate Soundness (AASHTO T 104)	-	15% Max	
Rodded Unit	Unit Weight	111 pcf	-
Weight & Voids (AASHTO T 19)	Percent Voids	31%	-
	Tons per cubic yard	1.5 tons/cu. yd.	-
Loose Unit	Unit Weight	-	-
Weight & Voids (AASHTO T 19)	Percent Voids	-	-
	Tons per cubic yard	-	-
Los Angeles Abrasion (AASHTO T 96)	-	-	
Percentage of Fractured Particles (ASTM D 5821)	-	-	
Sand Equivalency (AASHTO T 176)	88 (Average)	80 Minimum	
Sum of Deleterious Materials	-	-	
Organic Impurities (AASHTO T 21)	Plate 1	< Plate 3	

Potential Alkali Reactivity (ASTM C 1260 & CP-L 4201)			
Days in Soak	Average Expansion (%)	Classification	Potential for Deleterious ASR
-	-	-	-

CTL | THOMPSON ENGINEERING & CONSTRUCTION SERVICES, INC.



B. Thomas, PE



ATTACHMENT A
LABORATORY TEST RESULTS

PHYSICAL PROPERTIES OF AGGREGATES



Company Name: Rocky Mountain Premix
Material Source: Clevenger Pit
Material Type: Sand

Project No. CT15042-400
Report Date: June 8, 2010

Sieve Analysis of Fine Aggregate
(AASHTO T 27)

Sieve Size	Percent Passing Sand	Percent Passing (AASHTO M 6)
3/8 inch (9.5 mm)	100	100
No. 4 (4.75 mm)	97	95-100
No. 8 (2.36 mm)	80	80-100
No. 16 (1.18 mm)	62	50-85
No. 30 (600 µm)	43	25-60
No. 50 (300 µm)	18	10-30
No. 100 (150 µm)	5	2-10
No. 200 (75 µm)	1.7	3.0 Max

Material Finer Than No. 200 Sieve by Washing
(AASHTO T 11)

Initial Dry Weight (g)	Final Dry Weight (g)	Material Finer Than No. 200 Sieve (%)
757.7	744.6	1.7

Specific Gravity and Absorption of Fine Aggregate
(AASHTO T 84)

Pycnometer Weight With Water (g)	SSD In Air Weight (g)	Pycnometer Weight With Sample (g)	Bulk Volume	Oven Dry Weight (g)	Bulk (SSD) Specific Gravity	Absorption (%)
672.3	500.0	980.3	192.0	494.6	2.60	1.1

Clay Lumps and Friable Particles in Aggregate
(AASHTO T 112)

Sieve Size		Weight Before (g)	Weight After (g)	Percent Particles
Passing	Retained			
No. 4	No. 16	25.2	24.6	2.4

Lightweight Particles in Aggregate
(AASHTO T 113)

Sample Weight (g)	Specific Gravity of Liquid	Percentage by Mass of Lightweight Particles
2297.6	2.0	0.1
	2.4	

PHYSICAL PROPERTIES OF AGGREGATES



Company Name: Rocky Mountain Premix
 Material Source: Clevenger Pit
 Material Type: Sand

Project No. CT15042-400
 Report Date: June 8, 2010

Soundness of Fine Aggregates by Use of Sodium Sulfate
 (AASHTO T 104)

Sieve Size		Percent Grading of Sample	Weight Before(g)	Weight After (g)	Percent Loss	Weighted % Loss
Passing	Retained					
3/8"	No. 4	3	-	-	0.6	0.0
No. 4	No. 8	17	100.0	99.4	0.6	0.1
No. 8	No. 16	18	100.0	99.3	0.7	0.1
No. 16	No. 30	19	100.0	99.0	1.0	0.2
No. 30	No. 50	25	100.0	98.6	1.4	0.4
Less than No. 50		18	-	-	-	-

Total Percent Grading: 100

Total Weighted Loss: 1

Bulk Density (Unit Weight) and Voids in Aggregates (Rodded Method)
 (AASHTO T 19)

Sample Weight (lbs)	Bucket Volume (ft ³)	Unit Weight (pcf)
10.88	0.0985	110.5
10.90	0.0985	110.7
10.94	0.0985	111.1

Average Unit Weight: 111 pcf

Bulk Specific Gravity (OD) = 2.58

Voids in Aggregate Compacted by Rodding = 31%

Sand Equivalent Value of Soils and Fine Aggregate
 (AASHTO T 176)

Tube Number	Clay Reading	Sand Reading	Sand Equivalent
No. 1	4.3	3.8	88
No. 2	4.2	3.7	88
No. 3	4.2	3.7	88

Average Sand Equivalency: 88

Organic Impurities in Fine Aggregate
 (AASHTO T 21)

Organic Plate Number
Plate Number 1



ASTM C 618 TEST REPORT

Sample Number: S-101210012
Sample Date: November 2010

Report Date: 1/28/2011
Sample Source: Denver
Tested By: jx

TESTS	RESULTS	ASTM C 618 CLASS F/C	AASHTO M 295 CLASS F/C
CHEMICAL TESTS			
Silicon Dioxide (SiO ₂), %	54.82		
Aluminum Oxide (Al ₂ O ₃), %	23.70		
Iron Oxide (Fe ₂ O ₃), %	5.30		
Sum of SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , %	83.82	70.0/50.0 min.	70.0/50.0 min.
Calcium Oxide (CaO), %	8.57		
Magnesium Oxide (MgO), %	2.31		
Sulfur Trioxide (SO ₃), %	0.45	5.0 max.	5.0 max.
Sodium Oxide (Na ₂ O), %	0.37		
Potassium (K ₂ O), %	1.21		
Total Alkalies (as Na ₂ O), %	1.17		
Available Alkalies (as Na ₂ O), %	0.59		
PHYSICAL TESTS			
Moisture Content, %	0.04	3.0 max.	3.0 max.
Loss on Ignition, %	0.59	6.0 max.	5.0 max.
Amount Retained on No. 325 Sieve, %	18.31	34 max.	34 max.
Specific Gravity	2.34		
Autoclave Soundness, %	0.03	0.8 max.	0.8 max.
SAI, with Portland Cement at 7 Days, % of Control	77.7	75 min.*	75 min.*
SAI, with Portland Cement at 28 Days, % of Control	92.4	75 min.*	75 min.*
Water Required, % of Control	95.9	105 max.	105 max.
Loose, Dry Bulk Density, lb/cu. ft.	71.90		

Meets ASTM C 618 and AASTO M 295, FDOT Section 929, TxDOT DMS 4610, SCDHPT and MDOT specifications for Class F Fly Ash

* Meeting the 7 day or 28 day Strength Activity Index will indicate specification compliance.

Approved By:

Diana Benfield
QC Specialist

Approved By:

Brian Shaw
Materials Testing Manager



Potential Alkali Reactivity (Mortar Bar Method) ASTM C 1567
 (250 mm Mold)
 Modified for Proportioning of Aggregates & Blends of Cementitious Materials

Project No.: 11.013.B, Rocky Mountain Premix, Inc. Technician: raz
 Project Name: General Lab Testing Date: 23-Mar-11
 Lab ID Number: 115031 Reviewer: WSC
 Type & Source of Aggregate (1): Clevenger Pit # 57/ # 67 (55%)
 Type & Source of Aggregate (2): Clevenger Washed Concrete Sand (45%)
 Type & Source of Cement: GCC LA Type I/II (80%)
 Type & Source of Fly Ash: Boral Fact Craig Class F (20%)

Grading: Retaining Sieve	WCS Mass, g @ (45%)	Rock Mass, g @ (55%)
#8	44.5	54.5
#16	111.4	136.1
#30	111.4	136.1
#50	111.4	136.1
#100	66.8	81.7
45.0%	445.5	544.5
Total	990.0	

Cement Mass, g (80%)	Fly Ash Mass, g (20%)
352.0	88.0
Mass of Cement, g:	440.0
Mass of Water, g:	206.8
W/C Ratio:	0.47

Comparator Readings

	(24 hrs) Initial		(48 hrs) Zero	
Date:	3/24/2011	A: 0.594	3/25/2011	A: 0.772
	Readings:	B: -0.342	Readings:	B: -0.162
		C: -0.214		C: -0.038

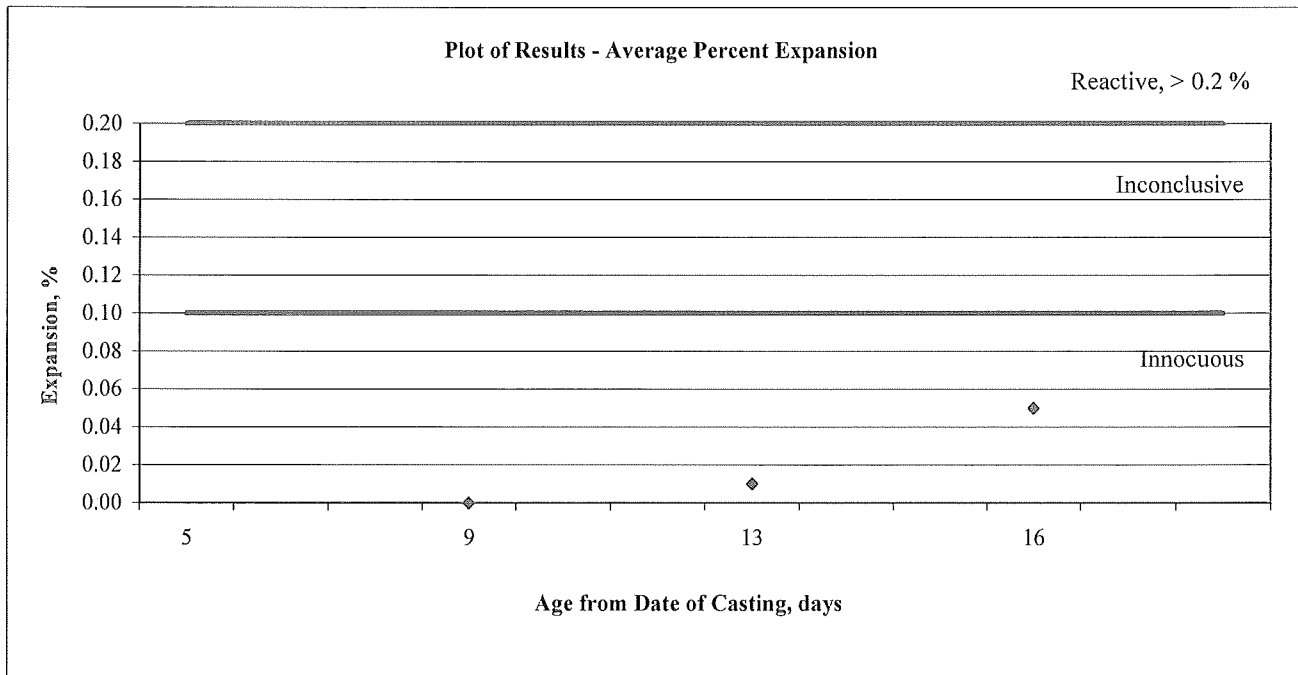
Date	Age, days	Reading, mm	Difference	% Change	Average % Expansion
3/28/2011	5	A	0.740	-0.032	-0.013
		B	-0.186	-0.024	-0.010
		C	-0.068	-0.030	-0.012
4/1/2011	9	A	0.768	-0.004	-0.002
		B	-0.164	-0.002	-0.001
		C	-0.050	-0.012	-0.005
4/5/2011	13	A	0.795	0.023	0.009
		B	-0.142	0.020	0.008
		C	-0.026	0.012	0.005
4/8/2011	16	A	0.900	0.128	0.051
		B	-0.023	0.139	0.056
		C	0.080	0.118	0.047

Potential Alkali Reactivity (Mortar Bar Method) ASTM C 1567

(250 mm Mold)

Modified for Proportioning of Aggregates & Blends of Cementitious Materials

Project No.:	<u>11.013.B, Rocky Mountain Premix, Inc.</u>	Technician:	<u>raz</u>
Project Name:	<u>General Lab Testing</u>	Date:	<u>23-Mar-11</u>
Lab ID Number:	<u>115031</u>	Reviewer:	<u>WSC</u>
Type & Source of Aggregate (1):	<u>Clevenger Pit # 57/ # 67 (55%)</u>		
Type & Source of Aggregate (2):	<u>Clevenger Washed Concrete Sand (45%)</u>		
Type & Source of Cement:	<u>GCC LA Type I/II (80%)</u>		
Type & Source of Fly Ash:	<u>Boral Fact Craig Class F (20%)</u>		



GCC of America
 130 Rampart Way, Ste. 205 Denver, CO 80230
 Sales (303) 739-5900 Customer Service (800) CALL GCC



Plant: Pueblo
 3600 Lime Road
 Pueblo, CO 81004
 Contact: Bob Venable
 Phone: (719) 647-6800

Cement Type: I/II,III(MH), Low Alkali
 Date: 15-Feb-11
 Production Period: Jan-11
 Silo: 1, 2, 4

STANDARD REQUIREMENTS ASTM C 150 -09/AASHTO M 85

CHEMICAL		
Item	Spec. Limit	Test Result
SiO ₂ (%)	A	20.7
Al ₂ O ₃ (%)	6.0 max	4.5
Fe ₂ O ₃ (%)	6.0 max	3.3
CaO (%)	A	63.9
MgO (%)	6.0 max.	1.0
SO ₃ (%)	3.0 max.	2.9
Ignition Loss (%)	3.0 max.	2.4
Na ₂ O (%)	A	0.15
K ₂ O (%)	A	0.57
Equivalent Alkalies (%)	B	0.53
Insoluble Residue (%)	0.75 max.	0.41
CO ₂ (%)	A	1.27
Limestone (%)	5.0 max.	3.3
CaCO ₃ in Limestone (%)	70 min	87
Potential Compounds (%)		
C ₃ S	A	54
C ₂ S	A	19
C ₃ A	8 max	6
C ₄ AF	A	10
C ₃ S + 4.75 C ₃ A	100 max	84

PHYSICAL			
Item	Spec. Limit	Test Result	
Air content of mortar (volume %)	12 max	7	
Blaine fineness (m ² /kg)	260 min.	400	
	430 max.		
C-1038	0.02 max.	0.01	
Autoclave expansion (%)	0.80 max.	0.01	
False set (%)	50 min.	68	
Compressive strength (MPa)		MPa	psl
1 day, Minimum MPa (psi)	A	20	2860
3 day, Minimum MPa (psi)	12 (1740)	32	4660
7 day, Minimum MPa (psi)	19 (2760)	38	5470
28 day, Minimum MPa (psi)	A	In Progress	
Time of setting, Vicat (minutes)			
Initial Not less than	45	113	
Initial Not more than	375		
ADDITIONAL (if Applicable)			
Pozzolan Type:	N/A	Potential Compounds (%)	
SiO ₂ (%)	N/A	C ₃ S	N/A
Al ₂ O ₃ (%)	N/A	C ₂ S	N/A
Fe ₂ O ₃ (%)	N/A	C ₃ A	N/A
CaO (%)	N/A	C ₄ AF	N/A
SO ₃ (%)	N/A		

A Not applicable
 B Limit not specified by purchaser. Test result for information only.

GCC of America Portland Cement is warranted to conform at the time of shipment with ASTM C-150/AASHTO 85. No other warranty is made or implied. Having no control over the use of its cements, GCC of America does not guarantee finished work. GCC is not responsible for any additives not stated in the Certificate of Compliance. GCC of America certifies that the data described above under "Process Addition" represents the materials in the cement manufactured during the production period indicated.

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of ASTM C 150-09 and AASHTO M 85-09.

Signature: _____ Title: _____ Plant Manager