



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

SUBMITTAL TRANSMITTAL

October 22, 2010

WGC Submittal No: 03300-009

PROJECT: **Harold Thompson Regional WRF**
 Birdsall 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: Concrete Mix Designs

SPEC SECTION: 03300 - Cast-In-Place Concrete

PREVIOUS SUBMISSION DATES: None

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: 10/22/10
 Reviewed by: H.C. Myers
 (X) Reviewed Without Comments
 () Reviewed With Comments

**ENGINEER'S
 COMMENTS:** _____



Rocky Mountain Premix, Inc.
2895 Capital Drive
Colorado Springs, CO 80915
Office: (719) 591-8080
Fax: (719) 550-8000
Dispatch: (719) 638-8000

October 10, 2010

Mr. Dan Eynon
Baker Concrete Construction, Inc.
1904 Jasper Street
Aurora, CO 80011

Subject: Concrete Mixture Proportions for Harold D. Thompson Water Treatment Plant
Lower Fountain Metropolitan Sewage Disposal District
Mixture A – N65FBZ05: Drilled Caissons; 3750 psi
Mixture B – A70F: Walls, Footings, and General Use; 4500 psi

Mr. Eynon:

This letter presents the results of concrete mixture designs for the above mentioned project. The concrete mixture design and proportions were developed and tested in general accordance with applicable ACI, ASTM, AASHTO, and CDOT procedures. Concrete mixture verification testing was performed on October 11, 2010, at the Rocky Mountain Premix Quality Control Laboratory. Concrete mixtures incorporate Clevenger Pit coarse and fine aggregates, GCC Low Alkali Type I/II cement, Boral Denver Class F fly ash, and BASF admixtures.

Mixture proportions as designed and tested will meet applicable project specifications and criteria as delivered. This assumes proper handling and placement by the contractor and testing at the standard of care for the industry.

Admixture dosages and batch water may be adjusted based on aggregate conditions, varying environmental and jobsite conditions.

We trust this meets your current needs. 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 blue ink, appearing to read "Zachariah J. Ballard", with a long horizontal flourish extending to the right.

Zachariah J. Ballard, EI
Quality Control Manager

ZJB/zjb

Attachments: Concrete mixture submittals and supporting documentation



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

Mixture Design Submittal

Date: 10/11/2010
Project: Harold D. Thompson Regional Water Reclamation Facility
Contractor: Baker Concrete Construction, Inc.
Location: Lower Fountain Metropolitan Sewage Disposal District
Design PSI: 3750
Mix Design ID: N65FBZ05
Plant: Plant 1 & 2
Use: Drilled Caissons

W/cm ratio: 0.38
Sand / Total Agg: 0.45
Design Unit Weight: 148.9
Design Slump Range: 5 - 7"
Design Air % Range: 1 - 3%
Placement Method: Chute

	(%)	Wt. Lb	Sp.Gr.	Ft ³	Source	Spec.
Cementitious: Cement Type I II	85%	519	3.15	2.64	GCC / Pueblo	ASTM C 150
Fly Ash Class F	15%	92	2.36	0.62	Boral Denver	ASTM C 618
	(%)	Wt. Lb		Ft ³	Source	Spec.
Aggregates: ASTM # 57/67	55%	1770	2.64	10.74	Clevenger	ASTM C 33
ASTM Sand (WCS)	45%	1452	2.60	8.95	Clevenger	ASTM C 33
Air: (%) Design Air	1.5%			0.41		
Water (Gal - lbs - Vol)	30.9	257		4.11		
Fiber / Color						
Totals		4090		27.47		
	Oz/cwt	Oz/yd ³			Source	Spec.
Admixtures: POLYHEED 1020	7.00	42.8			BASF	ASTM C 494

We guarantee that the strengths produced by this concrete mix design will meet the acceptance criteria of ACI 318, "Building Code Requirements for Reinforced Concrete" and ACI 301, "Specification for Structural Concrete Buildings" when sampling and specimen preparation are performed by personnel certified as technicians by ACI in full accord with applicable ASTM standards. ASTM C94 requires that the ready-mix producer be given copies of test reports in a timely manner or on request.



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Concrete Mixture Design # N65FBZ05 (Drilled Caissons)

MIX DESIGN MATERIALS

Material	Amount / Cubic Yard		Specific Gravity
Sand	1410	lbs.	2.64
Aggregate Size 57/67	1720	lbs.	2.66
Cement (Type I/II)	519	lbs.	3.15
Fly Ash (Class F)	92	lbs.	2.34
Water	257	lbs. (27.9 gal.)	1.00
POLYHEED 1020 (water reducer)	42.8	oz. (7.00 oz./cwt)	1.10

DESIGN PHYSICAL PROPERTIES (As Tested)

Unit Weight	148.1	lbs./cu. Ft.
W/(C+P) Ratio	0.42	
Air Content	2.0	%
Slump	3	in.
Percent Fly Ash	15	%
Cementitious Content	611	lbs.
Percent Coarse Agg.	55	%
Yield	1.00	cy

SPECIFIED PHYSICAL PROPERTIES

Compressive Strength F'c	3750	psi (Min)
W/(C+P) Ratio	0.45	(Max.)
Air Content	N/A	%
Slump	1-4	in. (Range)
Percent Fly Ash (Class F)	15-20	% Range
Cementitious Content	610	lb/cy (Min.)
Percent Coarse Agg.	N/A	%
Yield	0.99-1.02	cy (Range)

The above weights are based upon aggregates in a saturated surface dry condition. Batch plant corrections must be made for moisture in aggregates.

COMPRESSIVE STRENGTH RESULTS (From Laboratory Trial)

Cylinder Break Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	Average Strength (psi)
1-Day	2300	2060								2180
7-Day			4310	4240						4280
28-Day										
56-Day										

MATERIAL SUPPLIERS AND SOURCES

Material	Company	Source
Fine Aggregate	RMMA	Clevenger Pit
Coarse Aggregate	RMMA	Clevenger Pit
Cement (Type I/II)	GCC	Pueblo
Fly Ash (Class F)	Boral	Denver
Mid Range Water Reducer	BASF	POLYHEED 1020



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Mixture Design Submittal

Date: 10/11/2010
Project: Harold D. Thompson Regional Water Reclamation Facility
Contractor: Baker Concrete Construction, Inc.
Location: Lower Fountain Metropolitan Sewage Disposal District
Design PSI: 4500
Mix Design ID: A70F
Plant: Plant 1 & 2
Use: Walls, Footings, and General Use

W/cm ratio: 0.40
Sand / Total Agg: 0.45
Design Unit Weight: 141.1
Design Slump Range: 5 - 8"
Design Air % Range: 5 - 7%
Placement Method: Chute

	(%)	Wt. Lb	Sp.Gr.	Ft ³	Source	Spec.
Cementitious: Cement Type I II	85%	559	3.15	2.84	GCC / Pueblo	ASTM C 150
Fly Ash Class F	15%	99	2.36	0.67	Boral Denver	ASTM C 618
	(%)	Wt. Lb		Ft ³	Source	Spec.
Aggregates: ASTM # 57/67	55%	1590	2.64	9.65	Clevenger	ASTM C 33
ASTM Sand (WCS)	45%	1300	2.60	8.01	Clevenger	ASTM C 33
Air: (%) Design Air	6.0%			1.62		
Water (Gal - lbs - Vol)	31.6	263		4.21		
Fiber / Color						
Totals		3811		27.00		
	Oz/cwt	Oz/yd ³			Source	Spec.
Admixtures: POLYHEED 997	6.84	45.0			BASF	ASTM C 494
MB AE 90	1.22	8.0			BASF	ASTM C 260

We guarantee that the strengths produced by this concrete mix design will meet the acceptance criteria of ACI 318, "Building Code Requirements for Reinforced Concrete" and ACI 301, "Specification for Structural Concrete Buildings" when sampling and specimen preparation are performed by personnel certified as technicians by ACI in full accord with applicable ASTM standards. ASTM C94 requires that the ready-mix producer be given copies of test reports in a timely manner or on request.



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Concrete Mixture Design # A70F (Walls, Footings, and General Use)

MIX DESIGN MATERIALS

Material	Amount / Cubic Yard		Specific Gravity
Sand	1320	lbs.	2.64
Aggregate Size 57/67	1610	lbs.	2.66
Cement (Type I/II)	559	lbs.	3.15
Fly Ash (Class F)	99	lbs.	2.34
Water	243	lbs. (29.2 gal.)	1.00
POLYHEED 997 (water reducer)	45.0	oz. (6.84 oz./cwt)	1.10

DESIGN PHYSICAL PROPERTIES (As Tested)

Unit Weight	141.1	lbs./cu. Ft.
W/(C+P) Ratio	0.36	
Air Content	5.6	%
Slump	5	in.
Percent Fly Ash	15	%
Cementitious Content	658	lbs.
Percent Coarse Agg.	55	%
Yield	1.00	cy

SPECIFIED PHYSICAL PROPERTIES

Compressive Strength F'c	4500	psi (Min)
W/(C+P) Ratio	0.45	(Max.)
Air Content	5-7	%
Slump	1-3	in. (Range)
Percent Fly Ash (Class F)	15-20	% Range
Cementitious Content	N/A	lb/cy (Min.)
Percent Coarse Agg.	N/A	%
Yield	0.99-1.02	cy (Range)

The above weights are based upon aggregates in a saturated surface dry condition. Batch plant corrections must be made for moisture in aggregates.

COMPRESSIVE STRENGTH RESULTS (From Laboratory Trial)

Cylinder Break Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	Average Strength (psi)
1-Day	1990	2090								2040
7-Day			3790	3780						3790
28-Day										
56-Day										

MATERIAL SUPPLIERS AND SOURCES

Material	Company	Source
Fine Aggregate	RMMA	Clevenger Pit
Coarse Aggregate	RMMA	Clevenger Pit
Cement (Type I/II)	GCC	Pueblo
Fly Ash (Class F)	Boral	Denver
Mid Range Water Reducer	BASF	POZZOLITH 997

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,

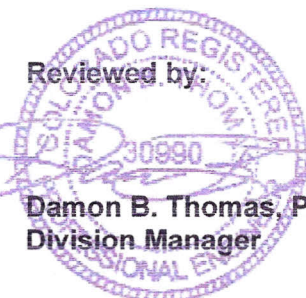
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Daniel L. Barrett
Materials Lab Manager

DLB:DBT/dlb
Enclosures

1 copy emailed: lab@rockymountainpremix.com

Reviewed by:

Damon B. Thomas, P.E.
Division Manager



Aggregate Qualification Summary - CDOT Specifications (AASHTO M 80)

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

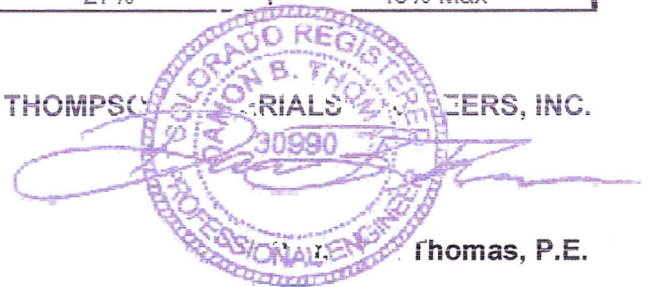
Project No. CT15042-400

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

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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%

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,

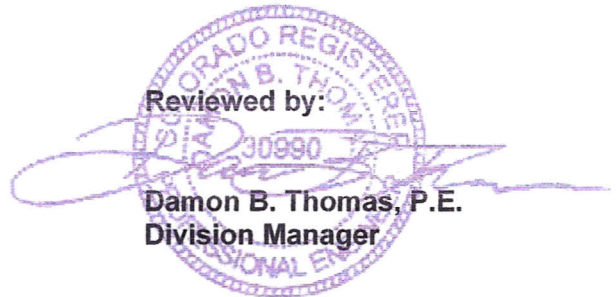
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Daniel L. Barrett
Materials Lab Manager

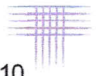
DLB:DBT/dlb
Enclosures

1 copy emailed: lab@rockymountainpremix.com



Aggregate Qualification Summary - CDOT Specifications (AASHTO M 6)

Rocky Mountain Premix - Clevenger Pit, Sand



Project No. CT15042-400

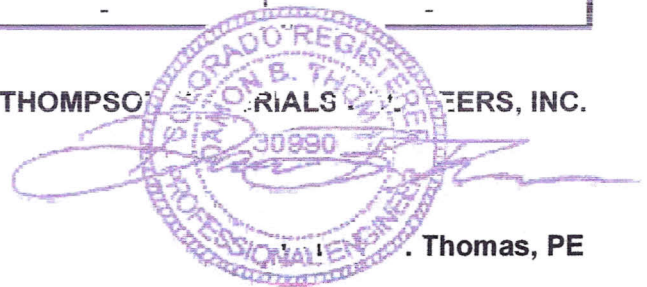
Report Date: June 08, 2010

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
-	-	-	-

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. 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

GCC of America

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

Plant: Pueblo	Cement Type: I/II, I/II(MH), Low Alkali
3600 Lime Road	Date: 9/30/2010
Pueblo, CO 81004	Production Period: September
Contact: David Eckhardt	Silo: 1, 2 & 4
Phone: (719) 647-6800	

STANDARD REQUIREMENTS ASTM C 150 -09/AASHTO M 85

CHEMICAL		
Item	Spec. Limit	Test Result
SiO ₂ (%)	A	20.54
Al ₂ O ₃ (%)	6.0 max	4.50
Fe ₂ O ₃ (%)	6.0 max	3.32
CaO (%)	A	
MgO (%)	6.0 max.	1.11
SO ₃ (%)	3.0 max.	2.96
Ignition Loss (%)	3.0 max.	2.60
Na ₂ O (%)	A	
K ₂ O (%)	A	
Equivalent Alkalies	B	0.55
Insoluble Residue	0.75 max	0.75
CO ₂ (%)	A	
Limestone (%)	5.0 max.	3.35
CaCO ₃ in Limestone	70 min	87
C ₂ S	A	
C ₃ A	8 max.	6.32
C ₄ AF	A	10.08
C ₃ S + 4.75 C ₃ A	100 max.	83.3

PHYSICAL					
Item	Spec. Limit	Test Result			
Air content of mortar	12 max.	7.9			
Blaine fineness (m ² /kg)	260 min.	392			
	430 max.				
Autoclave expansion (%)	0.80 max	-0.02			
False set (%)	50 min.	63			
Compressive strength (MPa)	psi				
		1 day, Minimum	A	15	2560
		3 day, Minimum	12 (1740)	25	4300
		7 day, Minimum	19 (2760)	25	5170
		28 day, Minimum	A	0	0
Time of setting, Vicat (min)					
Initial	45	110			
Initial	375				
PROCESS ADDITION (If Applicable)					
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 the use of its cements in any application other than that intended by the manufacturer.

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

Signature: DAVID ECKHARDT

Title: Quality Control Manager



ASTM C 618 TEST REPORT

Sample Number: S-100511020
Sample Date: April 2010

Report Date: 6/17/2010
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), %	55.48		
Aluminum Oxide (Al ₂ O ₃), %	23.08		
Iron Oxide (Fe ₂ O ₃), %	5.71		
Sum of SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , %	84.27	70.0/50.0 min.	70.0/50.0 min.
Calcium Oxide (CaO), %	8.37		
Magnesium Oxide (MgO), %	2.02		
Sulfur Trioxide (SO ₃), %	0.36	5.0 max.	5.0 max.
Sodium Oxide (Na ₂ O), %	0.37		
Potassium (K ₂ O), %	1.22		
Total Alkalies (as Na ₂ O), %	1.17		
PHYSICAL TESTS			
Moisture Content, %	0.01	3.0 max.	3.0 max.
Loss on Ignition, %	0.74	6.0 max.	5.0 max.
Amount Retained on No. 325 Sieve, %	19.92	34 max.	34 max.
Specific Gravity	2.36		
Autoclave Soundness, %	-0.01	0.8 max.	0.8 max.
SAI, with Portland Cement at 7 Days, % of Control	79.9	75 min.*	75 min.*
SAI, with Portland Cement at 28 Days, % of Control	88.8	75 min.*	75 min.*
Water Required, % of Control	95.9	105 max.	105 max.
Loose, Dry Bulk Density, lb/cu. ft.	69.50		

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



The Chemical Company

October 19, 2010

Project: Various
Project location: Various

Certificate of Conformance
PolyHeed® 1020
BASF Construction Chemicals, LLC* Admixture for Concrete

(*Previously doing business as BASF Admixtures, Inc. and prior to that as Degussa Admixtures, Inc. and Master Builders, Inc.)

I, Richard Hubbard, Sr. Technical Marketing Specialist for BASF Construction Chemicals, LLC, Cleveland, Ohio, certify:

That PolyHeed 1020 is a BASF Construction Chemicals, LLC Mid-Range Water-Reducing Admixture for concrete; and

That no calcium chloride or chloride based ingredient is used in the manufacture of PolyHeed 1020; and

That PolyHeed 1020, 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 1020 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.

Richard Hubbard
Sr. Technical Marketing Specialist BASF Construction Chemicals, LLC

BASF Construction Chemicals, LLC
23700 Chagrin Boulevard
Cleveland, OH 44122
216 839-7500 ph
www.masterbuilders.com

**Master
Builders**
Admixture Solutions



The Chemical Company

October 19, 2010

Project: Various
Project location: Various

Certificate of Conformance
PolyHeed® 997
BASF Construction Chemicals, LLC* Admixture for Concrete

(*Previously doing business as BASF Admixtures, Inc. and prior to that as Degussa Admixtures, Inc. and Master Builders, Inc.)

I, Richard Hubbard, Sr. Technical Marketing Specialist for BASF Construction Chemicals, LLC, Cleveland, Ohio, certify:

That PolyHeed 997 is a BASF Construction Chemicals, LLC Mid-Range Water-Reducing Admixture for concrete; and

That no calcium chloride or chloride based ingredient is used in the manufacture of PolyHeed 997; and

That PolyHeed 997, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00012 percent (1.2 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 PolyHeed 997 meets the requirements for a Type A, Water-Reducing Admixture, 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.

Richard Hubbard
Sr. Technical Marketing Specialist BASF Construction Chemicals, LLC

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**Master
Builders**
Admixture Solutions



The Chemical Company

October 19, 2010

Project: Various
Project location: Various

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

(*Previously doing business as BASF Admixtures, Inc. and prior to that as Degussa Admixtures, Inc. and Master Builders, Inc.)

I, Richard Hubbard, Sr. Technical Marketing Specialist for BASF Construction Chemicals, LLC, Cleveland, Ohio, certify:

That MB-AE 90 is a BASF Construction Chemicals, LLC 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 blue ink that reads "Richard Hubbard III".

Richard Hubbard
Sr. Technical Marketing Specialist BASF Construction Chemicals, LLC

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