



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

## SUBMITTAL TRANSMITTAL

August 29, 2011

WCM Submittal No: 03300-020

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: Weaver Construction Management

SUBJECT: Cast-in-Place Concrete Exterior Slabs on Grade, Air Entrained 4" Max Slump

SPEC SECTION: 03300 - Cast-In-Place Concrete

PREVIOUS SUBMISSION DATES: n/a

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: 8/29/11

Reviewed by: H.C. Myers

(X) Reviewed Without Comments

( ) Reviewed With Comments

ENGINEER'S  
COMMENTS:

# TRANSIT MIX CONCRETE CO.

**Colorado Springs**  
P.O. Box-1030, CO 80901  
(719) 475-0700 (Fax) 475-0226

**Pueblo**  
P.O. Box-857, CO 81002  
(719) 561-8350 (Fax) 566-0231

## CONCRETE MIX DESIGN

August 26, 2011

HDT RFP BP1 Equipment Maintenance Building  
Birdsall Road East of Old Pueblo Road  
Fountain, Colorado.

### "Structural Concrete for Exterior Slabs-On-Grade"

4500 PSI @ 28 Days • 15% Fly Ash • Air Entrained • 0.42 Maximum W/CM

#### WEAVER GENERAL CONSTRUCTION

3679 S Huron St. - Suite-404  
Englewood, Colorado 80110

		<u>ONE CUBIC YARD</u>
Cement	( Holcim Type I/II )	520 lbs
Fly Ash	( SRMG Class F )	91 lbs
AEA	( Master Builders AE-90 )	3.3 oz
WRA	( Master Builders 200N )	18.3 oz
HRWRA	(Master Builders Polyheed 1020)	22.9 oz
Sand	( Daniels Sand Co. )	1310 lbs
Rock	( Castle Concrete )	1700 lbs
Water		255 lbs

#### Transit Mix Concrete CO Identification Number: 34502110

#### Approximate Physical Properties:

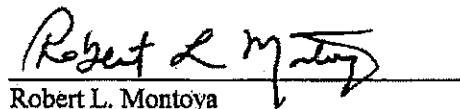
Unit Weight - pcf	± 142.1
Slump - Inches	4" Max
Air Content - %	6% ± 1%
Water / Cementitious Ratio	0.42

This mix is derived from the enclosed "Summary of Concrete Mix Data" series (Table No.107-36).

Compliance information on the various materials is also enclosed.

Production and delivery is in accordance with ASTM C 94 Standard Specification for Ready-Mixed Concrete. Compressive strength performance is conditional with strict adherence to the current ASTM Standards relating to concrete, and the latest revisions of ACI 301 and 318.

TRANSIT MIX CONCRETE CO.



Robert L. Montoya  
Technical Service Manager

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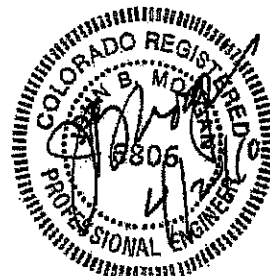
# J. B. Morgan, P. E., C.C.E.

CONSULTING STRUCTURAL ENGINEER

## Summary of Concrete Mix Data

Table NO. 107-36 (Air Entrained Normal Weight Concrete w/ Fly Ash @ 3-5' Slump)

Client: Transit Mix Concrete CO  
Project: Plant Mixes  
Aggregates: ASTM C 33 Coarse and Fine  
Cement: ASTM C-150 Type I-II  
Fly Ash: ASTM C 618 Class F  
Admixtures: ASTM C-494 (WRA) and ASTM C 260 (AEA)



34502110

<u>Mix Proportions</u>	<u>4.00</u>	<u>4.50</u>	<u>5.00</u>	<u>5.50</u>	<u>6.00</u>	<u>6.50</u>	<u>7.00</u>	<u>7.50</u>
Cement (Type I-II), lbs.	320	360	400	440	480	520	560	600
Fly Ash (Class F), lbs.	56	63	70	77	84	91	98	105
Air Entrainer, oz.	2.5	2.6	2.7	2.9	3.1	3.3	3.6	3.9
Water Reducer, oz.	11.3	12.7	14.1	15.5	16.9	18.3	19.7	21.2
High Range Water Reducer, oz.	0	0	0	19.4	21.1	22.9	24.7	26.4
ASTM C 33 Fine Aggregate, lbs.	1550	1500	1460	1390	1350	1310	1270	1230
No. 57/67 Coarse Aggregate, lbs.	1700	1700	1700	1700	1700	1700	1700	1700
Water, gallons	29.0	29.5	30.0	30.2	30.4	30.6	31.0	31.5
Water, lbs.	241.6	245.7	249.9	251.6	253.2	254.9	258.2	262.4

### Physical Properties

Wet Unit WT. (PCF)	140.5	140.7	141.0	141.2	141.7	142.1	142.4	142.4
Slump (Inches)	4.00	4.50	4.25	4.00	4.00	3.75	4.25	4.00
Air Content, %	5.2	5.5	5.8	6.0	5.8	6.0	6.0	6.2
Water Cement Ratio	0.642	0.581	0.532	0.487	0.449	0.417	0.392	0.372
Temperature, (°F)	72	73	75	76	77	77	78	78

<u>Compressive Strength, psi</u>	<u>2000</u>	<u>2500</u>	<u>3000</u>	<u>3500</u>	<u>4000</u>	<u>4500</u>	<u>5000</u>	<u>5500</u>
3 Day Average	1850	2310	2780	3250	3720	4240	4380	4570
7 Day Average	2400	2860	3150	3640	4180	4620	5010	5220
28 Day Average	3020	3650	4440	5180	5790	6220	6740	7040

Date : Monday, February 08, 2010

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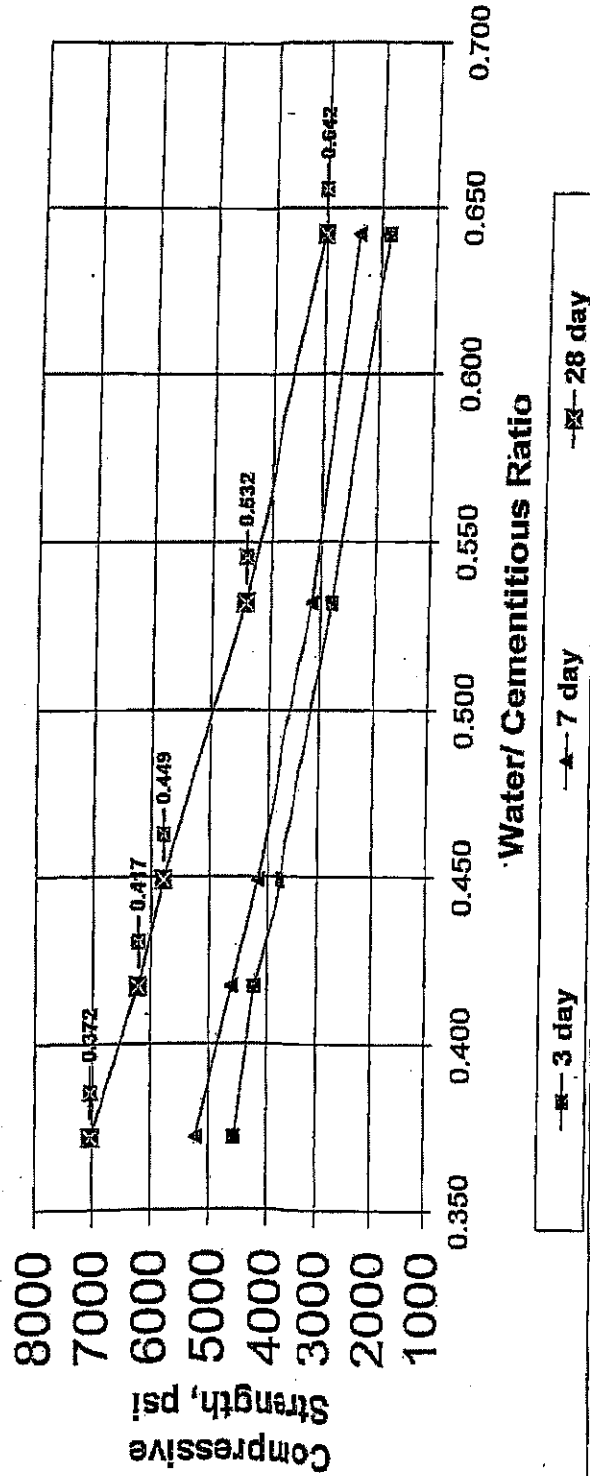
400 South 7<sup>th</sup> Street, Raton, New Mexico 87

Phone: (575) 445-8738 Mobile: (719) 332-4557 Fax: (575) 445-7055

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**Transit Mix Concrete Company  
Table No. 107-36**

**Compressive Strength  
VS.  
Water Cementitious Ratio**



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# Material Certification Report

Material: Portland Cement  
Type: I-II(MH) (ASTM C 150)

Test Period: 01-Jun-2011  
To: 30-Jun-2011

## Certification

Holcim cement meets the specifications of ASTM C 150 for Type I-II(MH) cement.

## General Information

Supplier: Holcim (US) Inc.  
Address: 3500 State Highway 120  
Florence, Co. 81226  
Telephone: 719-784-1307  
Date Issued: 11-Jul-2011

Source Location: Portland Plant  
3500 State Highway 120  
Florence, Co. 81226  
Contact: Dick Roush

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

## Tests Data on ASTM Standard Requirements

Chemical			Physical		
Item	Limit <sup>A</sup>	Result	Item	Limit <sup>A</sup>	Result
SiO <sub>2</sub> (%)	-	19.6	Air Content (%)	12 max	7
Al <sub>2</sub> O <sub>3</sub> (%)	6.0 max	4.7	Blaine Fineness (m <sup>2</sup> /kg)	260 min 430 max	397
Fe <sub>2</sub> O <sub>3</sub> (%)	6.0 max	3.4			
CaO (%)	-	63.2			
MgO (%)	6.0 max	1.4	Autoclave Expansion (%) (C 151)	0.80 max	0.00
SO <sub>3</sub> (%) <sup>C</sup>	3.0 max	3.4	Compressive Strength MPa (psi):		
Loss on Ignition (%)	3.0 max	2.4			
Insoluble Residue (%)	0.75 max	0.48	3 days	10.0 (1450) min	30.4 (4410)
CO <sub>2</sub> (%)	-	1.2	7 days	17.0 (2470) min	36.8 (5330)
Limestone (%)	5.0 max	3.2			
CaCO <sub>3</sub> in Limestone (%)	70 min	84	Initial Vicat (minutes)	45-375	127
Inorganic Processing Addition	5.0 max	0.0			
Potential Phase Compositions <sup>D</sup> :			Mortar Bar Expansion (%) (C 1038)		-0.016
C <sub>3</sub> S (%)	-	59			
C <sub>2</sub> S (%)	-	11			
C <sub>3</sub> A (%)	8 max	7			
C <sub>4</sub> AF (%)	-	10			
C <sub>3</sub> S + 4.75C <sub>3</sub> A (%)	100 max	82			

## Tests Data on ASTM Optional Requirements

Chemical			Physical		
Item	Limit <sup>A</sup>	Result	Item	Limit <sup>A</sup>	Result
Equivalent Alkalies (%)		0.72	Heat of Hydration: 7 days, kJ/kg (cal/g) <sup>B</sup>		354 (85)

## Notes

<sup>A</sup> Dashes in the limit / result columns mean Not Applicable.

<sup>B</sup> Test result represents most recent value and is provided for information only. Analysis of Heat of Hydration has been carried out by CTLGroup, Skokie, IL.

<sup>C</sup> It is permissible to exceed the specification limit provided ASTM C 1038 Mortar Bar Expansion does not exceed 0.020 %.

<sup>D</sup> Adjusted per Annex A1.6 of ASTM C150 and AASHTO M85.

This data may have been reported on previous mill certificates. It is typical of the cement being currently shipped.

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Transit Mix Concrete  
 Attn: Robert Montoya  
 444 E. Costilla St.  
 Colorado Springs, CO 80903-3761

**PHOENIX CEMENT**

Product: AASHTO M 295 Class F Fly Ash, Cholla  
 ASTM C 618

**Corporate Headquarters**  
 8800 E Chaparral Rd, Ste 155  
 Scottsdale, AZ 85250  
 Phone: 480-850-5757  
 Fax: 480-850-5758

**Cement Manufacturing**  
 601 N Cement Plant Rd  
 Clarkdale, AZ 86324  
 Phone: 928-634-2261  
 Fax: 928-634-3543

**19th Avenue Facility**  
 1802 W Lower Buckeye Rd  
 Phoenix, AZ 85007  
 Phone: 602-253-9149  
 Fax: 602-253-9160

**Lower Buckeye Facility**  
 1941 W Lower Buckeye Rd  
 Phoenix, AZ 85009  
 Phone: 602-258-7798  
 Fax: 602-252-3362

**21st Avenue Facility**  
 1325 N 21st Avenue  
 Phoenix, AZ 85009  
 Phone: 602-254-3824  
 Fax: 602-254-3825

**Mesa Community Storage**  
 Dobson & McKellips  
 Mesa, AZ 85211  
 Phone: 480-990-7847

**Cholla Fly Ash Facility**  
 P O Box 380  
 Joseph City, AZ 86032  
 Phone: 928-288-1661  
 Fax: 928-288-1663

**Four Corners Fly Ash Facility**  
 P O Box 1007  
 Fruitland, NM 87416  
 Phone: 505-598-8657  
 Fax: 505-598-8633

**San Juan Fly Ash Facility**  
 San Juan Generating Station  
 Waterflow, NM 87421  
 Phone: 505-598-7546  
 Fax: 505-598-7547

**Escalante Fly Ash Facility**  
 CR19 / P O Box 620  
 Prewitt, NM 87405  
 Phone: 505-285-4590  
 Fax: 505-285-4667

**Gallup Fly Ash Facility**  
 9001/4 N 9th St  
 Gallup, NM 87305

**5-11-11 POZZOLAN TEST REPORT** Clt#: 52543

Lot: 2093	Results	Specifications
<b>Chemical Analysis</b> (C311 / C114 / D4326)		
Silicon Dioxide, SiO <sub>2</sub>	60.07 %	---
Aluminum Oxide, Al <sub>2</sub> O <sub>3</sub>	25.68 %	---
Ferric Oxide, Fe <sub>2</sub> O <sub>3</sub>	6.55 %	---
SiO <sub>2</sub> + Al <sub>2</sub> O <sub>3</sub> + Fe <sub>2</sub> O <sub>3</sub>	92.30 %	70.00 Min
Calcium Oxide, CaO	5.31 %	---
Magnesium Oxide, MgO	1.56 %	---
Sulfur Trioxide, SO <sub>3</sub>	0.29 %	5.00 Max
Moisture Content	0.09 %	3.00 Max
Loss on Ignition	0.15 %	6.00 Max
Available Alkalis as Na <sub>2</sub> O	0.24 %	---
Alkalis (%Na <sub>2</sub> O + 0.658% K <sub>2</sub> O)	1.30 %	---
R Factor (%CaO -5) / (%FeO)	0.05 %	---

<b>Physical Analysis</b>		
Fineness, amount retained on #325 sieve, % (C430)	18.40	34.00 Max
variation, points from average	0.06	5.00 Max
Density, g/cm <sup>3</sup> (C180)	2.18	---
Variation from average, %	0.01	5.00 Max
<b>Strength Activity Index with Portland Cement</b> (C311 / C109)		
at 7 days, % of cement control	82.46	---
at 28 days, % of cement control	88.32	75.00 Min
<b>Water Requirement</b> (C311)		
% of cement control	96.69	105.00 Max
Soundness, autoclave expansion or contraction, % (C311 / C151)	-0.04	0.80 Max

All tests have been made in strict accordance with the current standards of the American Society for Testing and Materials covering the type of material specified.

*Lee Gorby*  
 Lee Gorby, Quality Assurance Manager  
 28 JUN 2011





The Chemical Company

July 20, 2011

Transit Mix Concrete CO  
444 East Costilla  
Colorado Springs, Colorado 80903

**Attention:** Robert Montoya  
**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.

Richard Hubbard  
Sr. Technical Marketing Specialist, BASF Corporation

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

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Builders  
Admixture Solutions  
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The Chemical Company

May 12, 2011

Transit Mix Concrete CO  
444 East Costilla  
Colorado Springs, Colorado 80903

**Attention:** Robert Montoya  
**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

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

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The Chemical Company

July 1, 2011

Transit Mix Concrete CO  
444 East Costilla  
Colorado Springs, Colorado 80903

**Attention:** Robert Montoya  
**Project:** Various  
**Project location:** Various

Certificate of Conformance  
PolyHeed® 1020  
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 1020 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 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 Corporation

BASF Corporation  
23700 Chagrin Boulevard  
Cleveland, OH 44122  
216 839-7500 ph  
[www.masterbuilders.com](http://www.masterbuilders.com)

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# Transit Mix Concrete Co. Materials Laboratory

444 East Costilla Avenue  
 Colorado Springs, Colorado 80903  
 Ph. (719) 475-0700 Fax (719) 475-0226

2596 Hwy 96 East  
 Pueblo, Colorado 81002  
 Ph. (719) 543-7898 Fax (719) 583-0345

July 8, 2010

RE: No. 57/67 Coarse Concrete Aggregate  
 Castle Concrete  
 7250 Allegheny Drive  
 Colorado Springs, CO 80919

Gentlemen:

This letter presents the results of physical properties and deleterious substances tests performed on a coarse aggregate that was sampled on June 7, 2010 at Black Canyon Quarry. The results are as follows:

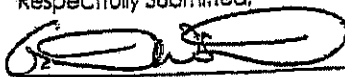
Sieve Size	Percent Passing	Specifications	
		No. 57	No. 67
37.5 mm, 1 1/2"	100	100	----
25.0 mm, 1"	100	95-100	100
19.0 mm, 3/4"	95	----	90-100
12.5 mm, 1/2"	54	25-60	----
9.5 mm, 3/8"	29	----	20-55
4.75 mm, No. 4	5.2	0-10	0-10
2.36 mm, No. 8	3.7	0-5	0-5
75 um, No. 200	0.9	0-1.5	0-1.5
Los Angeles Abrasion (Grading B): 28.0% Loss		AASHTO	T-96
Bulk Specific Gravity (SSD): 2.63 Absorption: 1.4%		AASHTO	T-85
Magnesium Sulfate Soundness (Five Cycles): 6.7% Loss		AASHTO	T-104
Sodium Sulfate Soundness (Five Cycles): 4.8% Loss		AASHTO	T-104
Clay Lumps and Friable Particles: 0		AASHTO	T-112
Fractured Particles (2 Fractured Faces): 100%			
Organic Impurities: Clear		AASHTO	T-21
Bulk Density, by Rodding: 98 lb/ft <sup>3</sup> Voids: 40%		AASHTO	T-19
Mortar Bar Expansion (ASR) - Sodium Hydroxide:		0.03%	ASTM C 1260

The above sample was tested according to American Society for Testing and Materials (ASTM) procedures D-75, D-5821, C-702, C-117, C-136, C-33, C-40, C-142, C-88, C-127, C-131, C-29 and C-1567.

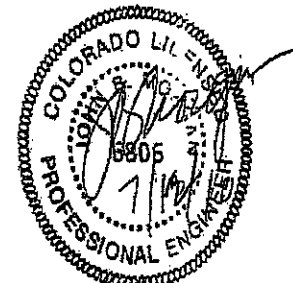
The above sample conforms to the requirements of ASTM C 33, TABLE 1, Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete, (1S, 2S, 3S, 4S, 5S, 1M, 2M, 3M, 4M, 5M, 1N and 2N).

If you have any questions feel free to contact me at your earliest convenience.

Respectfully Submitted,



Grant W. Smith  
 Quality Control Manager



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# Transit Mix Concrete Co. Materials Laboratory

444 East Castilla Avenue  
 Colorado Springs, Colorado 80903  
 Ph. (719) 475-0700 Fax (719) 475-0226

2396 Hwy 96 East  
 Pueblo, Colorado 81002  
 Ph. (719) 543-7898 Fax (719) 583-0345

## Modified ASTM C 1260 / C 1567 Tests

No. 004806BC

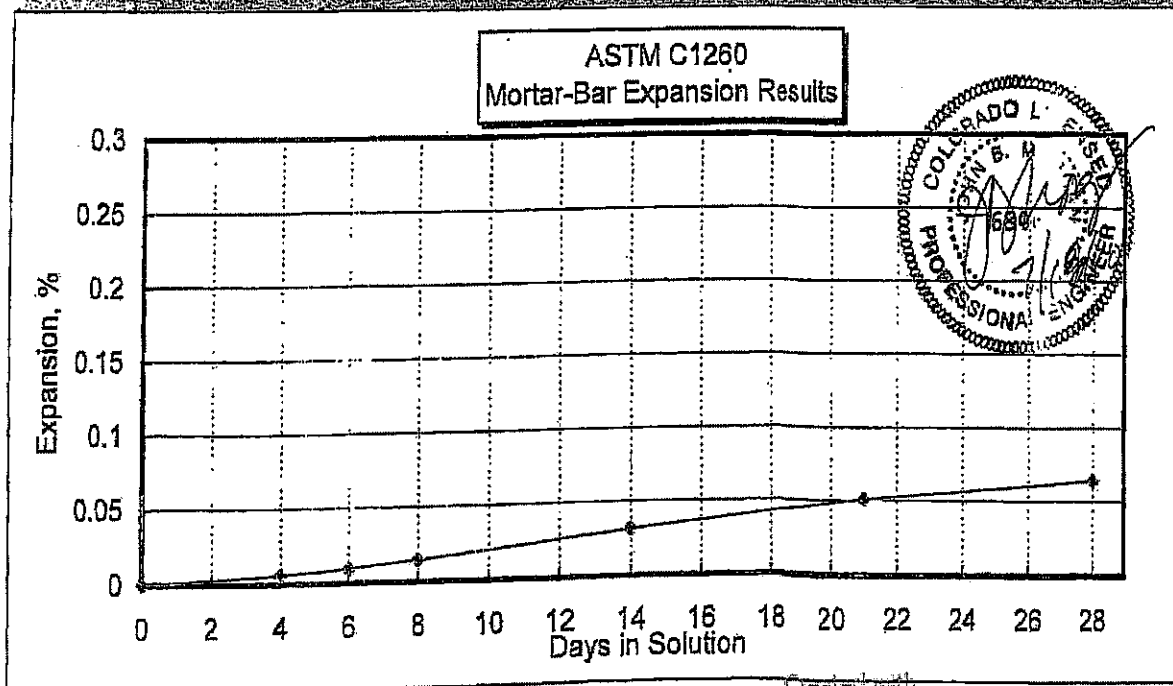
Standard Test Method for Accelerated Detection of Potentially Deleterious Expansion of Mortar Bars Due to Alkali-Silica Reaction

Materials	Source	Type	Qty.	Batch Weights, g	Notes
Cement	Holcim Florence, CO	I/II	100%	440	Batched: 6/8/2010
Flyash			0%	0	
Coarse Sand	Black Canyon Colo Spgs, CO	57/67		990	
Water				206.8	
W/C Ratio				0.47	Completed: 7/8/2010

Specimen ID:		BC -1, BC -2, BC -3			Mortar Bar Expansion, %			Average
Days	Date	Comparator Readings			1	2	3	
		1	2	3	1	2	3	
0	6/10/2010	0.1680	0.1708	0.1622				0.1600
4	6/14/2010	0.1685	0.1714	0.1629	0.0050	0.0060	0.0070	0.0060
6	6/16/2010	0.1675	0.1723	0.1641	-0.0050	0.0150	0.0190	0.0097
8	6/18/2010	0.1681	0.1729	0.1644	0.0010	0.0210	0.0220	0.0147
14	6/24/2010	0.1698	0.1738	0.1669	0.0180	0.0300	0.0270	0.0317
21	7/1/2010	0.1718	0.1748	0.1697	0.0380	0.0400	0.0750	0.0510
28	7/8/2010	0.1733	0.1759	0.1711	0.0530	0.0510	0.0890	0.0643

Average Percent Expansion at 14 days in solution (15 days of age) 0.03

28 Day expansion results are for informational purposes only



Revised: 11/9/2009

# Transit Mix Concrete Co. Materials Laboratory

444 East Castilla Avenue  
Colorado Springs, Colorado 80903  
Ph. (719) 475-0700 Fax: (719) 475-0226

2596 Hwy 96 East  
Pueblo, Colorado 81002  
Ph. (719) 543-7898 Fax: (719) 583-0345

October 18, 2010

Daniels Sand Company  
3710 Bradley Road  
Colorado Springs, Colorado 80916

RE: Fine Concrete Aggregate

Gentlemen:

This letter presents the results of physical properties and deleterious substances tests performed on a Fine Concrete Aggregate that was sampled on September 9, 2010 at Daniels Sand Pit. The results are as follows:

Sieve Size	Percent Passing	Specifications
		ASTM C 33 Fine Concrete Agg.
9.5 mm, 3/8"	100	100
4.75 mm, No. 4	100	95 - 100
2.36 mm, No. 8	88	80 - 100
1.18 mm, No. 16	62	50 - 85
600 um, No. 30	40	25 - 60
300 um, No. 50	21	10 - 30
150 um, No. 100	7.0	0 - 10
75 um, No. 200	0.8	0 - 3
Fineness Modulus: 2.80		AASHTO T-37
Bulk Specific Gravity (SSD): 2.59	Absorption: 1.1%	AASHTO T-85
Magnesium Sulfate Soundness (Five Cycles): 2.0% Loss		AASHTO T-104
Sodium Sulfate Soundness (Five Cycles): 1.0% Loss		AASHTO T-104
Clay Lumps and Friable Particles: 0		AASHTO T-112
Average Sand Equivalent: 88		AASHTO T-176
Organic Impurities: Clear		AASHTO T-21
Mortar Bar Expansion (ASR) - Sodium Hydroxide: 0.04%		AASHTO T-303

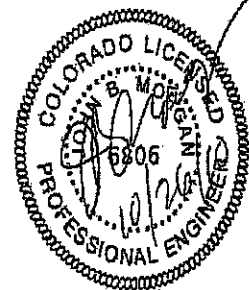
The above sample was tested according to American Society for Testing and Materials (ASTM) procedures D-75, D-2419, C-702, C-117, C-136, C-33, C-40, C-142, C-88, C-128 and C-1260.

If you have any questions feel free to contact me at your earliest convenience.

Respectfully Submitted,



Grant W. Smith  
Quality Control Manager



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## Modified ASTM C 1260 / C 1567 Tests

No. 0237D-9-14

Standard Test Method for Accelerated Detection of Potentially Deleterious Expansion of Mortar Bars Due to Alkali-Silica Reaction

Materials	Source		Batch Weights, g	Notes
Cement	Holcim Florence, CO	100%	440	Batched: 9/16/2010
Flyash		0%	0	
Coarse Sand	Daniels Colo Spgs, CO	No. 8	990	
Water			206.8	
W/C Ratio			0.47	Completed: 10/16/2010

Specimen ID: D No. 8 1, 2, 3

Days	Date	Comparator Readings			Mortar Bar Expansion, %			Average
		1	2	3	1	2	3	
0	9/18/2010	0.1601	0.1699	0.1710				0.0000
4	9/22/2010	0.1615	0.1718	0.1720	0.0140	0.0190	0.0100	0.0143
7	9/25/2010	0.1624	0.1732	0.1722	0.0230	0.0330	0.0120	0.0227
9	9/27/2010	0.1635	0.1726	0.1740	0.0340	0.0270	0.0300	0.0303
14	10/2/2010	0.1648	0.1737	0.1752	0.0470	0.0380	0.0420	0.0423
20	10/8/2010				-1.6010	-1.6990	-1.7100	
28	10/16/2010							

Average Percent Expansion at 14 days in solution (16 days of age)

0.04

28 Day expansion results for informational purposes only

