LETTER OF TRANSMITTAL

PIPELINE CONTRACTORS
8600 Verbena St.
Commerce City, CO 80022
Office 303-289-4355
Fax 303-289-4353

ISSUED TO:

Owner ATTN: Owner Representative

DATE: 8/28/19

TRANSMITTAL NO.: A-012

REGARDING:

Project JBS Job No 0210

We are issuing you under separate cover the following (via): Email

- [ ] Blue Prints
- [X] Submittals
- [ ] Change Order
- [ ] Request for Information
- [ ] Copy of a letter
- [ ] Shop Drawings

#	Copies	Item Dated	Item #	Description
	1-Electronic		A-012	Concrete for Manholes and Thrust Blocks
				Supplier 2

- [ ] For your bid
- [ ] Returned for Correction
- [X] For Approval
- [ ] For Review and Comment
- [ ] As Requested
- [ ] For Pricing
- [ ] Prints are loaned to you and are to be returned to us by: Date:
- [ ] Bids are due on or before: Date:

COMMENTS

JBS will try to have multiple suppliers in order to allow for availibility when we need it.

CC:

Amie Parent

Amie Parent
JBS Pipeline Contractors

BURNCO Colorado, LLC
301 Centennial Drive
Milliken, CO 80543

19--0004971
8/27/2019

JBS PIPELINE CONTRACTORS

Attention: Amie Parent

RE: #210-004 DR HORTON F2 AND F3

BURNCO Colorado is pleased to attach our concrete mixes for the above project. Please reference the mix code when ordering concrete. Please contact **Dispatch at 303-637-0900** to place your order. It is the responsibility of the contractor to order additives required in concrete i.e. fiber, color, accelerator, etc.

This submission contains the following mix designs:

Mix Code	Description/Usage
45VM21C4C	**Douglas County Class D Handwork**
45VM21B2C	**Douglas County Class D Low Slump**
45VN21C4C	**Douglas County Class P Handwork**
45VN21B2C	**Douglas County Class P Low Slump**

BURNCO Colorado Company will deliver concrete as to the specifications ordered. The physical properties of the concrete are measured at the point of discharge from our mixer truck unless otherwise agreed to by all parties prior to delivery. If the concrete is pumped, placed in a bucket or other device or otherwise manipulated prior to placement the quality will become the responsibility of the contractor or subcontractor responsible for the placement.

BURNCO Colorado produces in accordance to ACI and ASTM standards. We strive to provide our customers with quality products and service. We look forward to working with you on this project. If you have any questions please give us a call.

Sincerely yours,

Stacy Ehrlick

Stacy Ehrlick
Sales Associate
720.215.9590
Stacy.Ehrlick@burnco.com

BURNCO Colorado, LLC
301 Centennial Drive
Milliken, CO 80543

JBS PIPELINE CONTRACTORS
#210-004 DR HORTON F2 AND F3
N CROWFOOT BALLEY RD & RICHALAWN PRKWY
PARKER

Project #: 1001618-13443

Mixture Usage	Mix Code	Special Attribute	PSI	@__d	Max WC	Slump	Tolerance	Air (%)	Tolerance	Approved Y/N
Douglas County Class D Handwork	45VM21C4C		4500	@28D	0.45	4	+/- 1.00"	6.50	+/- 1.5 %	
Douglas County Class D Low Slump	45VM21B2C		4500	@28D	0.45	2	+/- 1.00"	6.50	+/- 1.5 %	
Douglas County Class P Handwork	45VN21C4C		4500	@28D	0.45	4	+/- 1.00"	6.50	+/- 1.5 %	
Douglas County Class P Low Slump	45VN21B2C		4500	@28D	0.45	2	+/- 1.00"	6.50	+/- 1.5 %	

CRMCA Concrete Quality Pre-Construction Checklist

www.crmca.org

Project Information

Project Name: _____ **Location:** _____

Project Representatives:

Owner: _____ Architect: _____

Structural Engineer: _____ Construction Manager: _____

General Contractor: _____ Concrete Supplier: Bestway Concrete

Testing Agency: _____ Other: _____

Concrete Mixture Design Submittals

Mixture Usage	Mixture Code	Special Attributes	Mixture Design Specifications				Approved Y/N
			Strength @ __ d	Max. w/cm	Slump (in.)	Air (%)	
SEE MATRIX ABOVE	SEE MATRIX ABOVE	SEE MATRIX ABOVE					

Special Attribute Codes:

AE	Air Entrained	CLR	Color Addition	NCA	Non-Chloride Acceleration
NAE	Non-Air Entrained	CI	Corrosion Inhibiting	SF	Silica Fume
LTWT	Lightweight Agg.	SRA	Shrinkage Reduction	UFFA	Ultra Fine Fly Ash
SCC	Self-Consolidating	FP	Fiber Product	HVWT	Heavy Weight Aggregate
HRWR	High Range WRA	HE	High Early Strength	RET	Retardation/ Hyd. Stabilization
Other					

Concrete Quality Control/ Assurance

(Circle Yes or No)

Does Owner's testing/laboratory meet ASTM C1077 as required by ACI 301/318? yes no*

***CCRL Lab Listing** **(Click on link to see listing of laboratories inspected by CCRL)**

Note 1: Section 26.12.1.1(b) of Building Code Requirements for Structural Concrete (ACI 318-14) and section 1.6.1.1 of Specifications for Structural Concrete (ACI 301-10) require that the agency performing acceptance testing comply with ASTM C1077 Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.

If no, explain remedies _____

Does the technician(s) performing concrete and aggregate testing on this project posses current technician certification in accordance with ASTM C1077? (Circle Yes or No)

Concrete Field Testing Technician Section 6.1.6 yes no

Concrete Laboratory Testing Technician Section 6.1.5 yes no

Concrete Aggregate Testing Technician Section 6.1.4 yes no

CRMCA Concrete Quality Pre-Construction Checklist

Contractor's Responsibilities in accordance with ACI 301-10 Section 1.6.2

- Allow access to the project site or to the source of materials and assist Owner's testing agency in obtaining and handling samples at the project site or at the source of materials.
- Advise Owner's testing agency at least 24 hours in advance of operations to allow for scheduling of quality assurance tests, review of project requirements, and for the assignment of personnel.
- Provide space and source of electrical power on the project site for facilities to be used for initial curing of concrete test specimens as required by ASTM C31 for the sole use of Owner's quality assurance testing agency.

Concrete Sampling and Testing Requirements

Sampling Frequency: _____

Sampling Location: (Circle Yes or No)

Pt. of truck discharge (in accordance with ASTM C94)	yes	no
Pt. of placement (must be specified and comply with OSHA regulations)	yes	no

Note 2: The concrete supplier will be responsible for compliance when samples are obtained at truck discharge after 10% or before 90% of the batch has been discharged and tests are conducted in accordance with applicable ASTM standards.

Tests to be performed on each sample: (Circle Yes or No)

Slump:	yes	no	Compressive Strength:	yes	no
Air Content:	yes	no	# cylinders per test	_____	
Density (unit wt.):	yes	no	Flexural Strength:	yes	no
Temperature:	yes	no	Other: _____	yes	no

Note 3: ASTM C172, section 4.1.1 states, "Transport the individual samples to the place where fresh concrete tests are to be performed or where test specimens are to be molded." Section 4.1.2 states, " Start tests for slump, temperature and air content within 5 min. after obtaining the final portion of the composite sample."

Acceptance/Rejection of Fresh Concrete:

Who has the authority to accept or reject a concrete delivery? _____

What criteria will be used to accept or reject a concrete delivery? (Circle Yes or No)

Slump:	yes	no	Temperature:	yes	no
Air Content:	yes	no	Density (unit wt.)	yes	no
W/CM Ratio:	yes	no	Time Limit:	yes	no

Note 4: ASTM C94, section 7.2 states, "the producer shall not be responsible for the limitation of minimum slump or slump flow after 30 min. have elapsed starting either on arrival of the vehicle at the prescribed destination or at the requested delivery time, whichever is later."

Who's responsible for adding water and/or air entrainment at the project site? _____

Note 5: ASTM C94 section 12.7, allows a 'one-time' water addition as long as the maximum water content for the batch as established by the mixture design proportions has not been exceeded. A 'one-time' water addition may be several distinct additions provided no concrete has been discharged except for slump or slump flow testing. When air content is below the specified level, Section 8.3 allows the concrete supplier to adjust the level with additional air-entraining admixture.

Test Specimen Storage and Transportation

Standard Curing Method: (Concrete Acceptance) (Circle Yes or No)

Immersed in water-controlled temperature environment (Preferred)	yes	no
Storage box-controlled temperature environment	yes	no
Exposed to the environment	yes	no

Who's responsible for providing specimen storage water tank or box? _____

Who's responsible for maintaining the temperature of the storage environment? _____

Note 6: ASTM C31 states, "Immediately after molding and finishing, the specimens shall be stored for a period up to 48h in a temperature range from 60 and 80 F and in an environment preventing moisture loss from the specimens. For concrete mixtures with a specified strength of 6000 psi or greater, the initial curing temperature shall be between 68 and 78 F." ASTM C31 also states, "The storage temperature shall be controlled by use of heating and cooling devices, as necessary. Record the temperature using a maximum-minimum thermometer."

Note 7: ASTM C31 states, "Upon completion of initial curing and within 30 min after removing the molds, cure specimens with free water maintained on their surfaces at all times at a temperature of 73.5 +/- 3.5 F. …"

Transportation of Specimens to the Laboratory

ASTM C31, Section 11.1 states, " Specimens shall not be transported until at least 8 h after final set. During transporting, protect the specimens with suitable cushioning material to prevent damage from jarring. During cold weather, protect the specimens from freezing with suitable insulation material. Prevent moisture loss during transportation by wrapping the specimens in plastic, wet burlap, by surrounding them with wet sand, or tight fitting plastic caps on plastic molds. Transportation time shall not exceed 4 h."

When will specimens, cast on days preceding non-work days, be transported to the laboratory?

Please explain: _____

Field Curing Method: (Form or Shoring Removal but not Acceptance) (Circle Yes or No)

Storage under conditions consistent with concrete in the structure	yes	no
Maturity	yes	no

Acceptance Criteria for Hardened Concrete (ACI 301/318)

In accordance with ACI 318-14, Section 26.12.1.1 (e) and ACI 301 Section 1.6.3.1 (a-c) the Owner's testing agency shall report results to the Architect/Engineer, Contract, Concrete Supplier, and if requested, the Owner. ACI 301 also requires that the testing agency issue a report immediately, to these parties when it appears that furnished material is not in compliance with the specifications. Test results from standard molded and cured strength specimens will be evaluated separately for each concrete mixture. Evaluation is valid only if tests have been conducted in accordance with specified procedures. Each Validation of tests not conducted in accordance with specified procedures will be the responsibility of the Owner's testing agency.

Contact Information for Test Results to be sent to (via email, fax, mail) to

Owner:		Architect:	
Structural Engineer:		Concrete Supplier:	
General Contractor:		Other:	

Acceptance of Concrete Strength in accordance with ACI 301-10

The strength of standard molded and cured strength specimens is satisfactory if the following criteria are met:

1.6.6.1 a Every average of three consecutive strength tests equals or exceeds the specified compressive strength f'c.

1.6.6.1 b No strength test result falls below f'c by more than 500 psi when f'c is 5000 psi or less, or by more than 0.10 f'c when f'c is more than 5000 psi.

Coring

Section 1.6.6.2- The strength of concrete in the area represented by cores, tested in accordance with ASTM C42, is considered adequate when the average compressive strength of the cores is at least 85% of f'c and if no single core is less than 75% of f'c.

Statement of Acknowledgement

The American Concrete Institute (ACI) and the ASTM International have established many standards and practices related to the performance and safety of concrete construction. The quality of concrete construction is heavily dependent upon the commitment of the project team to the standard practices associated with the production, delivery, placement, and testing of ready mixed concrete. We believe the information in this document accurately reflects the discussion(s) between all attendees.

	(Circle Yes or No)			(Circle Yes or No)	
Owner:	Yes	No	Architect:	Yes	No
Structural Engineer:	Yes	No	Construction Manager:	Yes	No
General Contractor:	Yes	No	Concrete Supplier:	Yes	No
Owners Testing Agency:	Yes	No	Testing Agency:	Yes	No

Additional Items for Possible Discussion include: Subgrade prep, Scheduling, Delivery, Washout Location, Jointing, Curing (evaporation control, moisture protection, hot/cold weather)

BURNCO Colorado, LLC
301 Centennial Drive
Milliken, CO 80543

Concrete Mix Submittal

Mix Code: 45VM21C4C **Submittal:** 19--000497 **Version:** 1 **Date:** 8/27/2019

Description: Douglas County Class D Handwork

Customer: JBS PIPELINE CONTRACTORS

Project Name: #210-004 DR Horton F2 & F3

Class / Use:

Bestway Concrete Company will deliver concrete as to the specifications ordered. The physical properties of the concrete are to be measured at the point of discharge from our mixer truck unless otherwise agreed to by all parties prior to delivery. If the concrete is pumped, placed in a bucket or other device or otherwise manipulated prior to placement, the quality will become the responsibility of the contractor responsible for the placement.

Concrete Properties:

Slump: 4 +/- 1.00" Strength Class: 4500 psi Maximum W/C Ratio: 0.45

Air Content: 6.5 +/- 1.5 % Sand / Aggregate Ratio: 40.1 %

Unit Weight: 140.6 lb/ft3

Material Type	Description	Source Supplier	ASTM	Design Quantity	Specific Gravity	Volume (ft3)
Cement	CEM1	Mountain Cement-Laramie	C150	540 lb	3.15	2.75
Fly Ash	FLY ASH	Boral Materials-Prairie State	C618	95 lb	2.46	0.62
Coarse Aggregate	CRUSHED #57-67	Aggregate Industries-Morrison Pit	C33	1769 lb	2.68	10.59
Fine Aggregate	CONCRETE SAND	BURNCO Aggregates-Lupton Meadows Pit	C33 Fine	1162 lb	2.63	7.08
Admixture	Air Entrainment	Chryso Admixtures-Air260	C260	2 lq oz	-	-
Admixture	MIDRANGE WRA	Chryso Admixtures-EnviroMix300	C494	5.0 dose	-	-
Water	WATER1	Water-Potable	C1602	286 lb	1.00	4.58
			Air Content	6.50 %	--	1.78
			Yield	3852 lb	--	27.40

Prepared By :

Stacy Ehrlick

Stacy Ehrlick Sales Associate

BURNCO

Cover Letter

Classification:

Mix Design # : **45VM21C4C**
CDOT Concrete Class: Douglas County Class D Handwork
Slump (+/- 1 in.): **4.00**
Air (+/- 1.5%): **6.5%**

Mix Design Properties:

Date of Trial: **1/15/2019**

Cement:	ASTM C-150	Mountain Cement, Laramie Plant , Type V, LA
Fly Ash:	ASTM C-618	Boral, Prarie State, Class F
Supplementary CM:	ASTM C-1240	-
***Coarse Aggregate:**	ASTM C-33	# 57/67 (3/4"), Aggregate Industries Morrison Pit
***Coarse Aggregate:**	ASTM C-33	# 89 (3/8"), BURNCO Lupton Meadows Pit
***Fine Aggregate:**	ASTM C-33	Concrete Sand, BURNCO Firestone Pit
AEA:	ASTM C-260	GCP, Daravair 1000
Low-Range Water Reducer:	ASTM C-494	Type A, GCP Zyla 630
Mid-Range Water Reducer:	ASTM C-494	Type A/F, GCP Daracem 55
High-Range Water Reducer:	ASTM C-494	Type A/F, GCP Adva 198
Water:	Potable Water	

NOTE: Accelerators and/or retarders can be added at purchaser's discretion following manufacturer's recommended dosage rates
*All aggregate proportions are based upon SSD Conditions and may be adjusted to account for yield

Administrative Information:

Concrete Supplier: BURNCO Colorado
301 Centennial Drive, Milliken, CO 80543

Laboratory: BURNCO Colorado, Technical Services Laboratory
455 W. 155th Ave, Unit 1, Northglenn, CO 80234

BURNCO

Lab Trial Results

Classification:

Mix Design # : **45VM21C4C**
CDOT Concrete Class: Douglas County Class D Handwork
Slump (+/- 1 in.): **4.00**
Air (+/- 1.5%): **6.5%**

Lab Trial Physical Properties:

Date of Trial: **1/15/2019**

Slump *(ASTM C143)* **:**	**4.50 in.**	**Air Content** *(ASTM C231)* **:**	**6.7%**
Design Density (ASTM C138):	**141.7 lb/ft^3**	**Temperature** *(ASTM C1064)* **:**	**66 °F**
Batch Density (ASTM C138):	**141.4 lb/ft^4**		
Design Yield:	**27.00 ft^3**	**W/C Ratio:**	**0.45**
Batch Yield:	**27.24 ft^3**		

Proportions:

Material:	Source / Name:		Quantity / yd^3	
Cement:	ASTM C-150	Mountain Cement, Laramie Plant , Type V, LA	540	lbs.
Fly Ash:	ASTM C-618	Boral, Prarie State, Class F	95	lbs.
Supplementary CM:	ASTM C-1240	-	0	lbs.
***Coarse Aggregate:**	ASTM C-33	# 57/67 (3/4"), Aggregate Industries Morrison Pit	1769	lbs.
***Coarse Aggregate:**	ASTM C-33	# 89 (3/8"), BURNCO Lupton Meadows Pit	0	lbs.
***Fine Aggregate:**	ASTM C-33	Concrete Sand, BURNCO Firestone Pit	1162	lbs.
AEA:	ASTM C-260	GCP, Daravair 1000	6.4	oz/yd^3
Low-Range Water Reducer:	ASTM C-494	Type A, GCP Zyla 630	0.0	oz/yd^3
Mid-Range Water Reducer:	ASTM C-494	Type A/F, GCP Daracem 55	31.8	oz/yd^3
High-Range Water Reducer:	ASTM C-494	Type A/F, GCP Adva 198	0.0	oz/yd^3
Water:	Potable Water		286	lbs.

NOTE: Accelerators and/or retarders can be added at purchaser's discretion following manufacturer's recommended dosage rates
*All aggregate proportions are based upon SSD Conditions and may be adjusted to account for yield

Compressive Strength (ASTM C39):

Date:	Age (Days):	PSI	Mpa
1/18/2019	3	2970	20.5
1/18/2019	3	2950	20.3
1/22/2019	7	4810	33.2
1/22/2019	7	4760	32.8
2/12/2019	28	6050	41.7
2/12/2019	28	6080	41.9
2/12/2019	28	6010	41.4
2/12/2019	**28 Day Avg:**	**6047**	**41.7**

Modulus of Rupture (ASTM C78):

Date:	Age (Days):	PSI	Mpa
1/22/2019	7	690	4.8
1/22/2019	7	680	4.7
2/12/2019	28	750	5.2
2/12/2019	28	760	5.2
2/12/2019	28	755	5.2
2/12/2019	**28 Day Avg:**	**755**	**5.2**

Concrete Supplier: BURNCO Colorado
301 Centennial Drive, Milliken, CO 80543

Laboratory: BURNCO Colorado, Technical Services Laboratory
455 W. 155th Ave, Unit 1, Northglenn, CO 80234

BURNCO Colorado, LLC
301 Centennial Drive
Milliken, CO 80543

Concrete Mix Submittal

Mix Code: 45VM21B2C **Submittal:** 19--000497 **Version:** 1 **Date:** 8/27/2019

Description: Douglas County Class D Low Slump

Customer: JBS PIPELINE CONTRACTORS

Project Name: #210-004 DR Horton F2 & F3

Class / Use:

Bestway Concrete Company will deliver concrete as to the specifications ordered. The physical properties of the concrete are to be measured at the point of discharge from our mixer truck unless otherwise agreed to by all parties prior to delivery. If the concrete is pumped, placed in a bucket or other device or otherwise manipulated prior to placement, the quality will become the responsibility of the contractor responsible for the placement.

Concrete Properties:

Slump:	2	+/- 1.00"	Strength Class: 4500 psi	Maximum W/C Ratio: 0.45	
Air Content:	6.5	+/- 1.5 %	Sand / Aggregate Ratio: 40.1	%	
Unit Weight:	140.6	lb/ft3			

Material Type	Description	Source Supplier	ASTM	Design Quantity	Specific Gravity	Volume (ft3)
Cement	CEM1	Mountain Cement-Laramie	C150	540 lb	3.15	2.75
Fly Ash	FLY ASH	Boral Materials-Prairie State	C618	95 lb	2.46	0.62
Coarse Aggregate	CRUSHED #57-67	Aggregate Industries-Morrison Pit	C33	1769 lb	2.68	10.59
Fine Aggregate	CONCRETE SAND	BURNCO Aggregates-Lupton Meadows Pit	C33 Fine	1162 lb	2.63	7.08
Admixture	Air Entrainment	Chryso Admixtures-Air260	C260	2 lq oz	-	-
Admixture	MIDRANGE WRA	Chryso Admixtures-EnviroMix300	C494	3.0 dose	-	-
Water	WATER1	Water-Potable	C1602	286 lb	1.00	4.58
			Air Content	6.50 %	--	1.78
			Yield	3852 lb	--	27.40

Prepared By :

Stacy Ehrlick

Stacy Ehrlick Sales Associate

BURNCO

Cover Letter

Classification:

Mix Design # : **45VM21B2C**
CDOT Concrete Class: Douglas County Class D Low Slump
Slump (+/- 1 in.): **2.00**
Air (+/- 1.5%): **6.5%**

Mix Design Properties:

Date of Trial: **1/15/2019**

Cement:	ASTM C-150	Mountain Cement, Laramie Plant , Type V, LA
Fly Ash:	ASTM C-618	Boral, Prarie State, Class F
Supplementary CM:	ASTM C-1240	-
***Coarse Aggregate:**	ASTM C-33	# 57/67 (3/4"), Aggregate Industries Morrison Pit
***Coarse Aggregate:**	ASTM C-33	# 89 (3/8"), BURNCO Lupton Meadows Pit
***Fine Aggregate:**	ASTM C-33	Concrete Sand, BURNCO Firestone Pit
AEA:	ASTM C-260	GCP, Daravair 1000
Low-Range Water Reducer:	ASTM C-494	Type A, GCP Zyla 630
Mid-Range Water Reducer:	ASTM C-494	Type A/F, GCP Daracem 55
High-Range Water Reducer:	ASTM C-494	Type A/F, GCP Adva 198
Water:	Potable Water	

NOTE: Accelerators and/or retarders can be added at purchaser's discretion following manufacturer's recommended dosage rates
*All aggregate proportions are based upon SSD Conditions and may be adjusted to account for yield

Administrative Information:

Concrete Supplier: BURNCO Colorado
301 Centennial Drive, Milliken, CO 80543

Laboratory: BURNCO Colorado, Technical Services Laboratory
455 W. 155th Ave, Unit 1, Northglenn, CO 80234

BURNCO

Lab Trial Results

Classification:

Mix Design # : **45VM21B2C**
CDOT Concrete Class: Douglas County Class D Low Slump
Slump (+/- 1 in.): **2.00**
Air (+/- 1.5%): **6.5%**

Lab Trial Physical Properties:

Date of Trial: **1/15/2019**

Slump *(ASTM C143)* **:**	**2.00 in.**	**Air Content** *(ASTM C231)* **:**	**6.3%**
Design Density (ASTM C138):	**141.7 lb/ft^3**	**Temperature** *(ASTM C1064)* **:**	**66 °F**
Batch Density (ASTM C138):	**142.1 lb/ft^4**		
Design Yield:	**27.00 ft^3**	**W/C Ratio:**	**0.45**
Batch Yield:	**27.11 ft^3**		

Proportions:

Material:	Source / Name:		Quantity / yd^3	
Cement:	ASTM C-150	Mountain Cement, Laramie Plant , Type V, LA	540	lbs.
Fly Ash:	ASTM C-618	Boral, Prarie State, Class F	95	lbs.
Supplementary CM:	ASTM C-1240	-	0	lbs.
***Coarse Aggregate:**	ASTM C-33	# 57/67 (3/4"), Aggregate Industries Morrison Pit	1769	lbs.
***Coarse Aggregate:**	ASTM C-33	# 89 (3/8"), BURNCO Lupton Meadows Pit	0	lbs.
***Fine Aggregate:**	ASTM C-33	Concrete Sand, BURNCO Firestone Pit	1162	lbs.
AEA:	ASTM C-260	GCP, Daravair 1000	6.4	oz/yd^3
Low-Range Water Reducer:	ASTM C-494	Type A, GCP Zyla 630	0.0	oz/yd^3
Mid-Range Water Reducer:	ASTM C-494	Type A/F, GCP Daracem 55	19.1	oz/yd^3
High-Range Water Reducer:	ASTM C-494	Type A/F, GCP Adva 198	0.0	oz/yd^3
Water:	Potable Water		286	lbs.

NOTE: Accelerators and/or retarders can be added at purchaser's discretion following manufacturer's recommended dosage rates
*All aggregate proportions are based upon SSD Conditions and may be adjusted to account for yield

Compressive Strength (ASTM C39):

Date:	Age (Days):	PSI	Mpa
1/18/2019	3	3060	21.1
1/18/2019	3	3000	20.7
1/22/2019	7	5040	34.8
1/22/2019	7	5060	34.9
2/12/2019	28	6310	43.5
2/12/2019	28	6350	43.8
2/12/2019	28	6320	43.6
2/12/2019	**28 Day Avg:**	**6327**	**43.6**

Modulus of Rupture (ASTM C78):

Date:	Age (Days):	PSI	Mpa
1/22/2019	7	740	5.1
1/22/2019	7	730	5.0
2/12/2019	28	790	5.4
2/12/2019	28	780	5.4
2/12/2019	28	770	5.3
2/12/2019	**28 Day Avg:**	**780**	**5.4**

Concrete Supplier: BURNCO Colorado
301 Centennial Drive, Milliken, CO 80543

Laboratory: BURNCO Colorado, Technical Services Laboratory
455 W. 155th Ave, Unit 1, Northglenn, CO 80234

BURNCO Colorado, LLC
301 Centennial Drive
Milliken, CO 80543

Concrete Mix Submittal

Mix Code: 45VN21C4C **Submittal:** 19--000497 **Version:** 1 **Date:** 8/27/2019

Description: Douglas County Class P Handwork

Customer: JBS PIPELINE CONTRACTORS

Project Name: #210-004 DR Horton F2 & F3

Class / Use:

Bestway Concrete Company will deliver concrete as to the specifications ordered. The physical properties of the concrete are to be measured at the point of discharge from our mixer truck unless otherwise agreed to by all parties prior to delivery. If the concrete is pumped, placed in a bucket or other device or otherwise manipulated prior to placement, the quality will become the responsibility of the contractor responsible for the placement.

Concrete Properties:

Slump: 4 +/- 1.00" Strength Class: 4500 psi Maximum W/C Ratio: 0.45

Air Content: 6.5 +/- 1.5 % Sand / Aggregate Ratio: 38.1 %

Unit Weight: 139.7 lb/ft3

Material Type	Description	Source Supplier	ASTM	Design Quantity	Specific Gravity	Volume (ft3)
Cement	CEM1	Mountain Cement-Laramie	C150	576 lb	3.15	2.93
Fly Ash	FLY ASH	Boral Materials-Prairie State	C618	102 lb	2.46	0.66
Coarse Aggregate	CRUSHED #57-67	Aggregate Industries-Morrison Pit	C33	1776 lb	2.68	10.63
Fine Aggregate	CONCRETE SAND	BURNCO Aggregates-Firestone Pit	C33 Fine	1072 lb	2.63	6.53
Admixture	Air Entrainment	Chryso Admixtures-Air260	C260	2 lq oz	-	-
Admixture	MIDRA NGE WRA	Chryso Admixtures-EnviroMix300	C494	5.0 dose	-	-
Water	WATER1	Water-Potable	C1602	305 lb	1.00	4.89
			Air Content	6.50 %	--	1.78
			Yield	3831 lb	--	27.43

Prepared By :

Stacy Ehrlick

Stacy Ehrlick Sales Associate

BURNCO

Cover Letter

Classification:

Mix Design # : **45VN21C4C**
CDOT Concrete Class: Douglas County P
Slump (+/- 1 in.): **4.00**
Air (+/- 1.5%): **6.5%**

Mix Design Properties:

Date of Trial: **1/15/2019**

Cement:	ASTM C-150	Mountain Cement, Laramie Plant , Type V, LA
Fly Ash:	ASTM C-618	Boral, Prarie State, Class F
Supplementary CM:	ASTM C-1240	-
***Coarse Aggregate:**	ASTM C-33	# 57/67 (3/4"), Aggregate Industries Morrison Pit
***Coarse Aggregate:**	ASTM C-33	# 89 (3/8"), BURNCO Lupton Meadows Pit
***Fine Aggregate:**	ASTM C-33	Concrete Sand, BURNCO Firestone Pit
AEA:	ASTM C-260	GCP, Daravair 1000
Low-Range Water Reducer:	ASTM C-494	Type A, GCP Zyla 630
Mid-Range Water Reducer:	ASTM C-494	Type A/F, GCP Daracem 55
High-Range Water Reducer:	ASTM C-494	Type A/F, GCP Adva 198
Water:	Potable Water	

NOTE: Accelerators and/or retarders can be added at purchaser's discretion following manufacturer's recommended dosage rates
*All aggregate proportions are based upon SSD Conditions and may be adjusted to account for yield

Administrative Information:

Concrete Supplier: BURNCO Colorado
301 Centennial Drive, Milliken, CO 80543

Laboratory: BURNCO Colorado, Technical Services Laboratory
455 W. 155th Ave, Unit 1, Northglenn, CO 80234

BURNCO

Lab Trial Results

Classification:

Mix Design # : **45VN21C4C**
CDOT Concrete Class: Douglas County P
Slump (+/- 1 in.): **4.00**
Air (+/- 1.5%): **6.5%**

Lab Trial Physical Properties:

Date of Trial: **1/15/2019**

Slump *(ASTM C143)* **:**	**2.50 in.**	**Air Content** *(ASTM C231)* **:**	**6.8%**
Design Density (ASTM C138):	**140.9 lb/ft^3**	**Temperature** *(ASTM C1064)* **:**	**68 °F**
Batch Density (ASTM C138):	**140.1 lb/ft^4**		
Design Yield:	**27.00 ft^3**	**W/C Ratio:**	**0.45**
Batch Yield:	**27.34 ft^3**		

Proportions:

Material:	Source / Name:		Quantity / yd^3	
Cement:	ASTM C-150	Mountain Cement, Laramie Plant , Type V, LA	576	lbs.
Fly Ash:	ASTM C-618	Boral, Prarie State, Class F	102	lbs.
Supplementary CM:	ASTM C-1240	-	0	lbs.
***Coarse Aggregate:**	ASTM C-33	# 57/67 (3/4"), Aggregate Industries Morrison Pit	1776	lbs.
***Coarse Aggregate:**	ASTM C-33	# 89 (3/8"), BURNCO Lupton Meadows Pit	0	lbs.
***Fine Aggregate:**	ASTM C-33	Concrete Sand, BURNCO Firestone Pit	1072	lbs.
AEA:	ASTM C-260	GCP, Daravair 1000	5.4	oz/yd^3
Low-Range Water Reducer:	ASTM C-494	Type A, GCP Zyla 630	0.0	oz/yd^3
Mid-Range Water Reducer:	ASTM C-494	Type A/F, GCP Daracem 55	33.9	oz/yd^3
High-Range Water Reducer:	ASTM C-494	Type A/F, GCP Adva 198	0.0	oz/yd^3
Water:	Potable Water		305	lbs.

NOTE: Accelerators and/or retarders can be added at purchaser's discretion following manufacturer's recommended dosage rates
*All aggregate proportions are based upon SSD Conditions and may be adjusted to account for yield

Compressive Strength (ASTM C39):

Date:	Age (Days):	PSI	Mpa
1/18/2019	3	3030	20.9
1/18/2019	3	3090	21.3
1/22/2019	7	4710	32.5
1/22/2019	7	4640	32.0
2/12/2019	28	6170	42.5
2/12/2019	28	6040	41.6
2/12/2019	28	6050	41.7
2/12/2019	**28 Day Avg:**	**6087**	**42.0**

Modulus of Rupture (ASTM C78):

Date:	Age (Days):	PSI	Mpa
1/22/2019	7	670	4.6
1/22/2019	7	680	4.7
2/12/2019	28	760	5.2
2/12/2019	28	750	5.2
2/12/2019	28	750	5.2
2/12/2019	**28 Day Avg:**	**753**	**5.2**

Concrete Supplier: BURNCO Colorado
301 Centennial Drive, Milliken, CO 80543

Laboratory: BURNCO Colorado, Technical Services Laboratory
455 W. 155th Ave, Unit 1, Northglenn, CO 80234

BURNCO Colorado, LLC
301 Centennial Drive
Milliken, CO 80543

Concrete Mix Submittal

Mix Code: 45VN21B2C **Submittal:** 19--000497 **Version:** 1 **Date:** 8/27/2019

Description: Douglas County Class P Low Slump

Customer: JBS PIPELINE CONTRACTORS

Project Name: #210-004 DR Horton F2 & F3

Class / Use:

Bestway Concrete Company will deliver concrete as to the specifications ordered. The physical properties of the concrete are to be measured at the point of discharge from our mixer truck unless otherwise agreed to by all parties prior to delivery. If the concrete is pumped, placed in a bucket or other device or otherwise manipulated prior to placement, the quality will become the responsibility of the contractor responsible for the placement.

Concrete Properties:

Slump: 2 +/- 1.00" Strength Class: 4500 psi Maximum W/C Ratio: 0.45

Air Content: 6.5 +/- 1.5 % Sand / Aggregate Ratio: 38.1 %

Unit Weight: 139.7 lb/ft3

Material Type	Description	Source Supplier	ASTM	Design Quantity	Specific Gravity	Volume (ft3)
Cement	CEM1	Mountain Cement-Laramie	C150	576 lb	3.15	2.93
Fly Ash	FLY ASH	Boral Materials-Prairie State	C618	102 lb	2.46	0.66
Coarse Aggregate	CRUSHED #57-67	Aggregate Industries-Morrison Pit	C33	1776 lb	2.68	10.63
Fine Aggregate	CONCRETE SAND	BURNCO Aggregates-Firestone Pit	C33 Fine	1072 lb	2.63	6.53
Admixture	Air Entrainment	Chryso Admixtures-Air260	C260	2 lq oz	-	-
Admixture	MIDRA NGE WRA	Chryso Admixtures-EnviroMix300	C494	3.0 dose	-	-
Water	WATER1	Water-Potable	C1602	305 lb	1.00	4.89
			Air Content	6.50 %	--	1.78
			Yield	3831 lb	--	27.43

Prepared By :

Stacy Ehrlick

Stacy Ehrlick Sales Associate

BURNCO

Cover Letter

Classification:

Mix Design # : **45VN21B2C**
CDOT Concrete Class: Douglas County P
Slump (+/- 1 in.): **2.00**
Air (+/- 1.5%): **6.5%**

Mix Design Properties:

Date of Trial: **1/15/2019**

Cement:	ASTM C-150	Mountain Cement, Laramie Plant , Type V, LA
Fly Ash:	ASTM C-618	Boral, Prarie State, Class F
Supplementary CM:	ASTM C-1240	-
***Coarse Aggregate:**	ASTM C-33	# 57/67 (3/4"), Aggregate Industries Morrison Pit
***Coarse Aggregate:**	ASTM C-33	# 89 (3/8"), BURNCO Lupton Meadows Pit
***Fine Aggregate:**	ASTM C-33	Concrete Sand, BURNCO Firestone Pit
AEA:	ASTM C-260	GCP, Daravair 1000
Low-Range Water Reducer:	ASTM C-494	Type A, GCP Zyla 630
Mid-Range Water Reducer:	ASTM C-494	Type A/F, GCP Daracem 55
High-Range Water Reducer:	ASTM C-494	Type A/F, GCP Adva 198
Water:	Potable Water	

NOTE: Accelerators and/or retarders can be added at purchaser's discretion following manufacturer's recommended dosage rates
*All aggregate proportions are based upon SSD Conditions and may be adjusted to account for yield

Administrative Information:

Concrete Supplier: BURNCO Colorado
301 Centennial Drive, Milliken, CO 80543

Laboratory: BURNCO Colorado, Technical Services Laboratory
455 W. 155th Ave, Unit 1, Northglenn, CO 80234

BURNCO

Lab Trial Results

Classification:

Mix Design # : **45VN21B2C**
CDOT Concrete Class: Douglas County P
Slump (+/- 1 in.): **2.00**
Air (+/- 1.5%): **6.5%**

Lab Trial Physical Properties:

Date of Trial: **1/15/2019**

Slump *(ASTM C143)* **:**	**2.50 in.**	**Air Content** *(ASTM C231)* **:**	**6.3%**
Design Density (ASTM C138):	**140.9 lb/ft^3**	**Temperature** *(ASTM C1064)* **:**	**68 °F**
Batch Density (ASTM C138):	**140.5 lb/ft^4**		
Design Yield:	**27.00 ft^3**	**W/C Ratio:**	**0.45**
Batch Yield:	**27.27 ft^3**		

Proportions:

Material:	Source / Name:		Quantity / yd^3	
Cement:	ASTM C-150	Mountain Cement, Laramie Plant , Type V, LA	576	lbs.
Fly Ash:	ASTM C-618	Boral, Prarie State, Class F	102	lbs.
Supplementary CM:	ASTM C-1240	-	0	lbs.
***Coarse Aggregate:**	ASTM C-33	# 57/67 (3/4"), Aggregate Industries Morrison Pit	1776	lbs.
***Coarse Aggregate:**	ASTM C-33	# 89 (3/8"), BURNCO Lupton Meadows Pit	0	lbs.
***Fine Aggregate:**	ASTM C-33	Concrete Sand, BURNCO Firestone Pit	1072	lbs.
AEA:	ASTM C-260	GCP, Daravair 1000	5.4	oz/yd^3
Low-Range Water Reducer:	ASTM C-494	Type A, GCP Zyla 630	0.0	oz/yd^3
Mid-Range Water Reducer:	ASTM C-494	Type A/F, GCP Daracem 55	20.3	oz/yd^3
High-Range Water Reducer:	ASTM C-494	Type A/F, GCP Adva 198	0.0	oz/yd^3
Water:	Potable Water		305	lbs.

NOTE: Accelerators and/or retarders can be added at purchaser's discretion following manufacturer's recommended dosage rates
*All aggregate proportions are based upon SSD Conditions and may be adjusted to account for yield

Compressive Strength (ASTM C39):

Date:	Age (Days):	PSI	Mpa
1/18/2019	3	3250	22.4
1/18/2019	3	3260	22.5
1/22/2019	7	4970	34.3
1/22/2019	7	4930	34.0
2/12/2019	28	6230	43.0
2/12/2019	28	6180	42.6
2/12/2019	28	6210	42.8
2/12/2019	**28 Day Avg:**	**6207**	**42.8**

Modulus of Rupture (ASTM C78):

Date:	Age (Days):	PSI	Mpa
1/22/2019	7	720	5.0
1/22/2019	7	710	4.9
2/12/2019	28	770	5.3
2/12/2019	28	770	5.3
2/12/2019	28	780	5.4
2/12/2019	**28 Day Avg:**	**773**	**5.3**

Concrete Supplier: BURNCO Colorado
301 Centennial Drive, Milliken, CO 80543

Laboratory: BURNCO Colorado, Technical Services Laboratory
455 W. 155th Ave, Unit 1, Northglenn, CO 80234

WesTest

627 Sheridan Boulevard • Lakewood, CO 80214
P: 303.975.9959 • F: 303.975.9969
office@westest.net • www.westest.net

November 12, 2018

BURNCO Colorado
455 W. 115th Avenue Unit 1
Northglenn, CO 80234

Attention: Mr. Daniel B. Bentz, P.E.

Subject: Laboratory Test Results
ASTM C 1260
Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM & AASHTO Fine Aggregate
ASTM & AASHTO Size No. 57/67 Coarse Aggregate
Firestone Pit
WesTest Project No. 623118

Gentlemen:

Included as Figures 1 and 2 are the results of potential alkali reactivity testing (mortar bar method), performed on aggregate sampled from the above-referenced source on October 8, 2018. The aggregate was prepared and tested in general accordance with ASTM Procedures. ASTM C 1260 defines the potential of an aggregate for deleterious expansion as follows:

Test Expansion	Classification	Potential for Deleterious ASR
< 0.10%	Innocuous	Low
0.10% to 0.20%	Inconclusive	Not Predictable
> 0.20%	Deleterious	High

Based on the test results of 0.04% and 0.06% expansion at 14 days in solution, 16 days after casting, the potential for deleterious alkali-silica behavior of this aggregate in concrete is considered Low.

If you have any questions on the data presented, please contact us at your convenience.

Sincerely,
WesTest

Quyen T. Liu, EIT

COLORADO LICENSED DYLAN A. HULLINGER 49996 11/12/18 PROFESSIONAL ENGINEER

Reviewed by:

Dylan A. Hullinger, P.E.

CC: Shawn Simmerman and Steve Heinrich

AASHTO ACCREDITED

WesTest
627 Sheridan Boulevard • Lakewood, CO 80214
303.975.9959 • office@westest.net

LABORATORY TEST REPORT

POTENTIAL ALKALI REACTIVITY OF AGGREGATES
(MORTAR-BAR METHOD)
ASTM C 1260

REPORT DATE: November 12, 2018

CLIENT: BURNCO Colorado
PROJECT NO.: 623118

SAMPLE DATE: October 8, 2018
SAMPLE ID: 6231D

AGGREGATE:
SOURCE: Firestone Pit
SIZE: ASTM & AASHTO Fine Aggregate
COMMENTS: Aggregate graded as per Section 8.2, Table 1

CEMENT:
SOURCE: Holcim
TYPE: I/II
AUTOCLAVE EXPANSION: 0.00%
ALKALIS CONTENT: 0.56%
COMMENTS: Cement data provided by Holcim

MIX WATER:
W/C RATIO: 0.47

EFFECTIVE GAUGE LENGTH = 250 mm

	10/25/18	10/26/18	10/30/18		11/2/18		11/6/18		11/9/18	
	Initial	Zero	4 Days		7 Days		11 Days		14 Days	
Specimen	Comparator Reading	Comparator Reading	Comparator Reading	Length Change	Comparator Reading	Length Change	Comparator Reading	Length Change	Comparator Reading	Length Change
A	2.070	2.216	2.224	0.00%	2.272	0.02%	2.272	0.02%	2.320	0.04%
B	1.998	2.148	2.150	0.00%	2.204	0.02%	2.204	0.02%	2.246	0.04%
C	-1.046	-0.900	-0.894	0.00%	-0.844	0.02%	-0.838	0.02%	-0.800	0.04%
AVERAGE		1.155	1.160	0.00%	1.211	0.02%	1.213	0.02%	1.255	0.04%

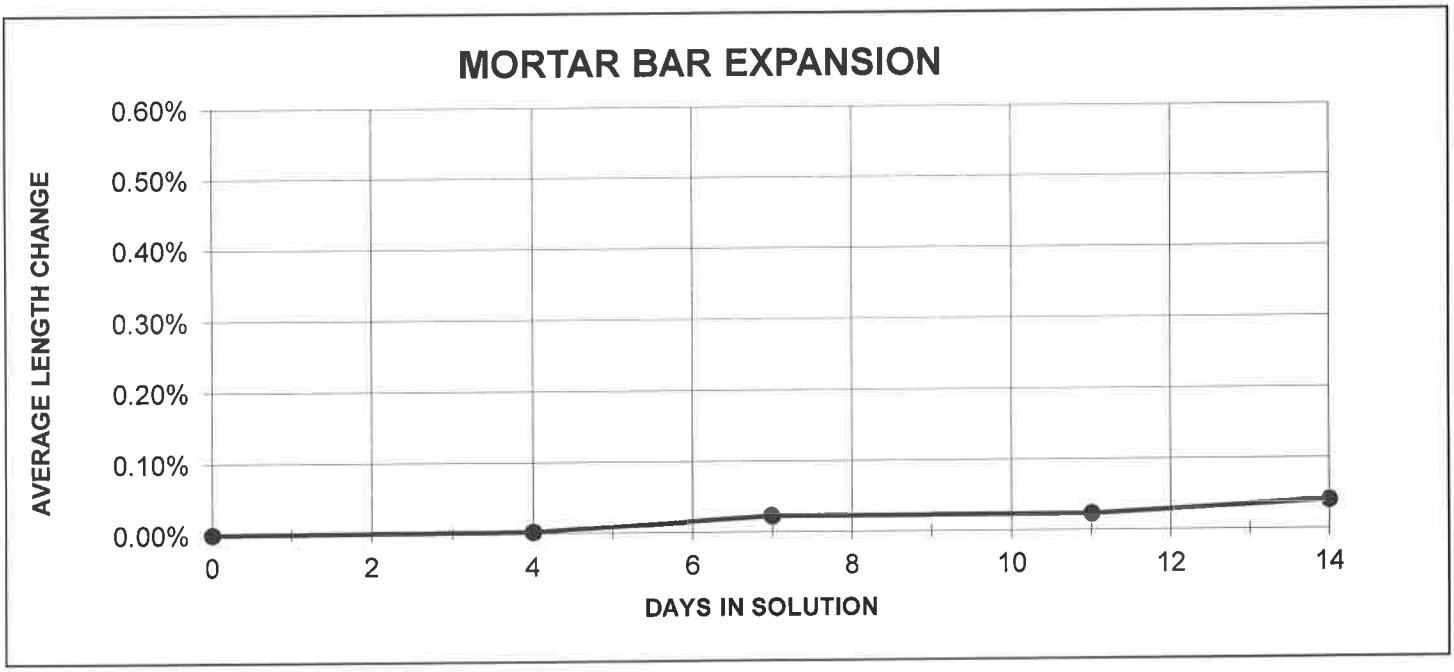

FIGURE 1

WesTest

627 Sheridan Boulevard • Lakewood, CO 80214
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office@westest.net • www.westest.net

Revised: July 11, 2019
November 7, 2018

BURNCO Colorado
455 W. 115th Avenue Unit 1
Northglenn, CO 80234

Attention: Mr. Daniel B. Bentz, P.E.

Subject: Laboratory Test Results
ASTM C1260
Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM & AASHTO Fine Aggregate
ASTM & AASHTO Size No. 57/67 Coarse Aggregate
ASTM & AASHTO Size No. 8 Coarse Aggregate
ASTM & AASHTO Size No. 89 Coarse Aggregate
Lupton Meadows Pit
WesTest Project No. 623318

Gentlemen:

Included as Figures 1 and 2 are the results of potential alkali reactivity testing (mortar bar method), performed on aggregate sampled from the above-referenced source on October 8, 2018. The aggregate was prepared and tested in general accordance with ASTM Procedures. ASTM C 1260 defines the potential of an aggregate for deleterious expansion as follows:

Test Expansion	Classification	Potential for Deleterious ASR
< 0.10%	Innocuous	Low
0.10% to 0.20%	Inconclusive	Not Predictable
> 0.20%	Deleterious	High

Based on the test results of 0.05% and 0.06% expansion at 14 days in solution, 16 days after casting, the potential for deleterious alkali-silica behavior of this aggregate in concrete is considered Low.

If you have any questions on the data presented, please contact us at your convenience.

Sincerely,
WesTest

COLORADO LICENSED DYLAN A. HULLINGER 49996 7/11/19 PROFESSIONAL ENGINEER

Dylan A. Hullinger, P.E.

CC: Shawn Simmerman and Steve Heinrich

AASHTO ACCREDITED

WesTest
627 Sheridan Boulevard • Lakewood, CO 80214
303.975.9959 • office@westest.net

LABORATORY TEST REPORT

POTENTIAL ALKALI REACTIVITY OF AGGREGATES
(MORTAR-BAR METHOD)
ASTM C 1260

CLIENT: BURNCO Colorado
PROJECT NO.: 623318

REPORT DATE: November 7, 2018
REVISED REPORT DATE: July 11, 2019
SAMPLE DATE: October 8, 2018
SAMPLE ID: 6233CC

AGGREGATE:
SOURCE: Lupton Meadows Pit
SIZE: ASTM & AASHTO Fine Aggregate
COMMENTS: Aggregate graded as per Section 8.2, Table 1

CEMENT:
SOURCE: Holcim
TYPE: I/II
AUTOCLAVE EXPANSION: 0.00%
ALKALIS CONTENT: 0.56%
COMMENTS: Cement data provided by Holcim

MIX WATER:
W/C RATIO: 0.47

EFFECTIVE GAUGE LENGTH = 250 mm

	10/17/18	10/18/18	10/22/18		10/25/18		10/29/18		11/1/18	
	Initial	Zero	4 Days		7 Days		11 Days		14 Days	
Specimen	Comparator Reading	Comparator Reading	Comparator Reading	Length Change	Comparator Reading	Length Change	Comparator Reading	Length Change	Comparator Reading	Length Change
A	-1.136	-0.982	-0.962	0.01%	-0.932	0.02%	-0.896	0.03%	-0.858	0.05%
B	-1.142	-0.988	-0.970	0.01%	-0.938	0.02%	-0.900	0.04%	-0.858	0.05%
C	-0.104	0.052	0.072	0.01%	0.106	0.02%	0.146	0.04%	0.190	0.06%
AVERAGE		-0.639	-0.620	0.01%	-0.588	0.02%	-0.550	0.04%	-0.509	0.05%

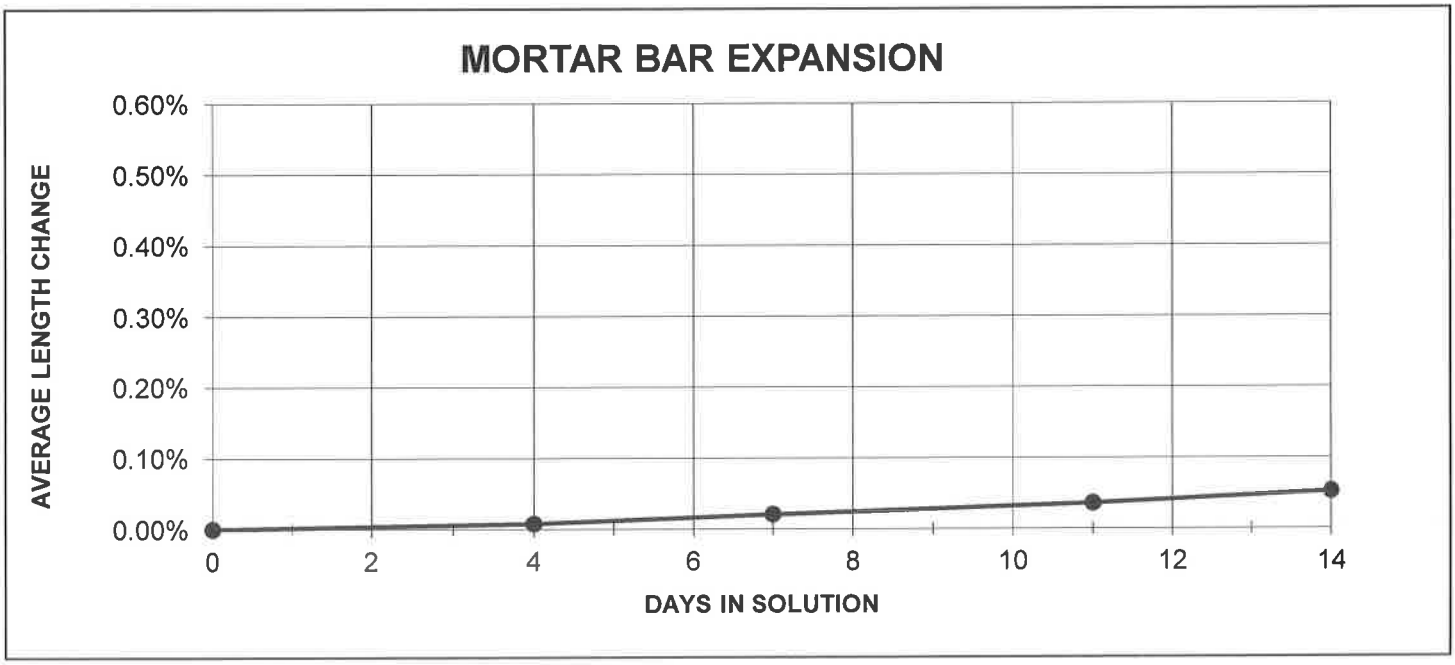

FIGURE 1

WesTest
1998 - 2018 CELEBRATING 20 YEARS

627 Sheridan Boulevard • Lakewood, CO 80214
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office@westest.net • www.westest.net

November 28, 2018

BURNCO Colorado
455 W. 115th Avenue, Unit 1
Northglenn, CO 80234

Attention: Mr. Daniel B. Bentz, P.E.

Subject: Laboratory Test Results
Firestone Pit Aggregate Tests
ASTM & AASHTO Fine Aggregate
ASTM & AASHTO Size No. 57/67 Coarse Aggregate
WesTest Project No. 623118

Gentlemen:

Enclosed on Tables 1 and 2 are the results of aggregate physical property and quality tests, done in general accordance with ASTM and AASHTO criteria, on concrete aggregate sampled from the above-referenced source on October 8, 2018.

The test results indicate the material meets ASTM C33, *Standard Specification for Concrete Aggregates*, AASHTO M 6, *Standard Specification for Fine Aggregate for Hydraulic Cement Concrete,* AASHTO M 80, *Standard Specification for Coarse Aggregate for Hydraulic Cement Concrete* and Colorado Department of Transportation requirements for the properties tested.

If you have any questions on the data presented, please contact us at your convenience.

Sincerely,
WesTest

Quyen T. Liu, EIT

COLORADO LICENSED DYLAN A HULLINGER 49996 11/28/18 PROFESSIONAL ENGINEER

Reviewed by:

Dylan A. Hullinger, P.E.

CC: Shawn Simmerman and Steve Heinrich

AASHTO ACCREDITED

LABORATORY TEST REPORT

WesTest 1998 - 2018 CELEBRATING 20 YEARS
627 Sheridan Boulevard • Lakewood, CO 80214
303.975.9959 • office@westest.net

CLIENT: BURNCO Colorado
SOURCE: Firestone Pit
SAMPLED BY: Client
PROJECT: Firestone Pit Aggregate Testing

WesTest PROJECT NO.: 623118
REPORT DATE: November 28, 2018

MATERIAL DESCRIPTION	ASTM & AASHTO Fine Aggregate
DATE SAMPLED	October 8, 2018
SAMPLE LOCATION	Stockpile

Aggregate Physical Property and Quality Tests (ASTM C33 & AASHTO M 6 Specifications)

ASTM C117 & C136, AASHTO T 11 & T 27

SIEVE SIZE	% Passing	ASTM C33 Spec.	AASHTO M 6 Spec.
1"			
3/4"			
1/2"			
3/8"	100	100	100
# 4	100	95 - 100	95 - 100
# 8	91	80 - 100	80 - 100
# 16	61	50 - 85	50 - 85
# 30	33	25 - 60	25 - 60
# 50	14	5 - 30	10 - 30
# 100	4	0 - 10	2 - 10
# 200	1.0	0 - 3.0	0 - 2.0
Fineness Modulus	2.98	2.3 - 3.1	2.3 - 3.1

ASTM C128, AASHTO T 84,
Bulk Specific Gravity = 2.61, Bulk Specific Gravity (SSD) = 2.63, Apparent Specific Gravity = 2.68, Absorption = 1.0%

ASTM D2419, AASHTO T 176,
Sand Equivalent Value = 94
Specification: 80 Min. (CDOT)

ASTM C142, AASHTO T 112,
Clay Lumps & Friable Particles
FINE AGG. = 0.1%, Specification: 3.0% Max.

ASTM C123, AASHTO T 113,
Lightweight Particles in Aggregate

SAMPLE WT. (g)	LIQUID TYPE / SPECIFIC GRAVITY	LIGHTWEIGHT PARTICLES	SPEC.
373.1	$ZnCl_2$/2.0	0.0%	0.25% Max.
373.1	$ZnBr_2$/2.4	0.0%	3.0% Max.

ASTM C88, AASHTO T 104, Sodium Sulfate Soundness, 5 Cycles

SIEVE SIZE	GRADING OF ORIGINAL SAMPLE	WEIGHT BEFORE TEST, g	PERCENT PASSING AFTER TEST	WEIGHTED PERCENT LOSS
Minus #100	4			
# 50 to # 100	10			
# 30 to # 50	19	100.0	0.6	0.1
# 16 to # 30	28	100.0	1.2	0.3
# 8 to # 16	30	100.0	4.1	1.2
# 4 to # 8	9	100.0	8.5	0.8
3/8" to # 4	0			
TOTAL	100	FINE AGG. TOTAL 100%		2
SPECIFICATION:				10 Max.

ASTM C40, AASHTO T 21, Organic Impurities:
Less than Organic Plate No. 1
Specification: Organic Plate No. 3 or Less

COMMENTS:

TABLE 1

WesTest
1998 - 2018 CELEBRATING 20 YEARS

627 Sheridan Boulevard • Lakewood, CO 80214
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office@westest.net • www.westest.net

November 30, 2018

BURNCO Colorado
455 W. 115th Avenue, Unit 1
Northglenn, CO 80234

Attention: Mr. Daniel B. Bentz, P.E.

Subject: Laboratory Test Results
Lupton Meadows Pit Aggregate Tests
ASTM & AASHTO Fine Aggregate
ASTM & AASHTO Size No. 89 Coarse Aggregate
ASTM & AASHTO Size No. 8 Coarse Aggregate
ASTM & AASHTO Size No. 57/67 Coarse Aggregate
WesTest Project No. 623318

Gentlemen:

Enclosed on Tables 1 through 4 are the results of aggregate physical property and quality tests, done in general accordance with ASTM and AASHTO criteria, on concrete aggregate sampled from the above-referenced source on October 8, 2018.

The test results indicate the material meets ASTM C33, *Standard Specification for Concrete Aggregates*, AASHTO M 6, *Standard Specification for Fine Aggregate for Hydraulic Cement Concrete,* AASHTO M 80, *Standard Specification for Coarse Aggregate for Hydraulic Cement Concrete* and Colorado Department of Transportation requirements for the properties tested.

If you have any questions on the data presented, please contact us at your convenience.

Sincerely,
WesTest

Quyen T. Liu, EIT

Reviewed by:

COLORADO LICENSED DYLAN A. HULLINGER 49996 11/30/18 PROFESSIONAL ENGINEER

Dylan A. Hullinger, P.E.

CC: Shawn Simmerman and Steve Heinrich

AASHTO ACCREDITED

LABORATORY TEST REPORT

WesTest 1998 - 2018 CELEBRATING 20 YEARS
627 Sheridan Boulevard • Lakewood, CO 80214
303.975.9959 • office@westest.net

CLIENT: BURNCO Colorado
SOURCE: Lupton Meadows Pit
SAMPLED BY: Client
PROJECT: Lupton Meadows Pit Aggregate Testing

WesTest PROJECT NO.: 623318
REPORT DATE: November 30, 2018

MATERIAL DESCRIPTION	ASTM & AASHTO Fine Aggregate
DATE SAMPLED	October 8, 2018
SAMPLE LOCATION	Stockpile

Aggregate Physical Property and Quality Tests (ASTM C33 & AASHTO M 6 Specifications)

ASTM C117 & C136, AASHTO T 11 & T 27

SIEVE SIZE	% Passing	ASTM C33 Spec.	AASHTO M 6 Spec.
1"			
3/4"			
1/2"			
3/8"	100	100	100
# 4	100	95 - 100	95 - 100
# 8	93	80 - 100	80 - 100
# 16	62	50 - 85	50 - 85
# 30	30	25 - 60	25 - 60
# 50	10	5 - 30	10 - 30
# 100	3	0 - 10	2 - 10
# 200	0.5	0 - 3.0	0 - 2.0
Fineness Modulus	3.02	2.3 - 3.1	2.3 - 3.1

ASTM C128, AASHTO T 84,
Bulk Specific Gravity = 2.62, Bulk Specific Gravity (SSD) = 2.63, Apparent Specific Gravity = 2.66, Absorption = 0.7%

ASTM D2419, AASHTO T 176,
Sand Equivalent Value = 97
Specification: 80 Min. (CDOT)

ASTM C142, AASHTO T 112,
Clay Lumps & Friable Particles
FINE AGG. = 0.0%, Specification: 3.0% Max.

ASTM C123, AASHTO T 113,
Lightweight Particles in Aggregate

SAMPLE WT. (g)	LIQUID TYPE / SPECIFIC GRAVITY	LIGHTWEIGHT PARTICLES	SPEC.
231.3	$ZnCl_2$/2.0	0.0%	0.25% Max.
231.3	$ZnBr_2$/2.4	0.0%	3.0% Max.

ASTM C88, AASHTO T 104, Sodium Sulfate Soundness, 5 Cycles

SIEVE SIZE	GRADING OF ORIGINAL SAMPLE	WEIGHT BEFORE TEST, g	PERCENT PASSING AFTER TEST	WEIGHTED PERCENT LOSS
Minus #100	3			
# 50 to # 100	7			
# 30 to # 50	20	100.0	0.4	0.1
# 16 to # 30	32	100.0	0.5	0.2
# 8 to # 16	31	100.0	0.5	0.2
# 4 to # 8	7	100.0	2.4	0.2
3/8" to # 4	0			
TOTAL	100	FINE AGG. TOTAL 100%		1
SPECIFICATION:				10 Max.

ASTM C40, AASHTO T 21, Organic Impurities:
Less than Organic Plate No. 1
Specification: Organic Plate No. 3 or Less

COMMENTS:

TABLE 1

LABORATORY TEST REPORT

WesTest
627 Sheridan Boulevard • Lakewood, CO 80214
303.978.9959 • office@westest.net

CLIENT: Aggregate Industries
SOURCE: Morrison Quarry
SAMPLED BY: Client
PROJECT: Morrison Quarry Aggregate Testing

WesTest PROJECT NO.: 633219
REPORT DATE: January 31, 2019
REVISED REPORT DATE: March 21, 2019

MATERIAL DESCRIPTION	ASTM & AASHTO Size No. 57/67 Coarse Aggregate
DATE SAMPLED	January 14, 2019
SAMPLE LOCATION	Stockpile

Aggregate Physical Property and Quality Tests (ASTM C33 & AASHTO M 80 Specifications)

ASTM C117 & C136, AASHTO T 11 & T 27

SIEVE SIZE	% Passing	Size No. 57 Specification	Size No. 67 Specification
1-1/2"	100	100	
1"	100	95 - 100	100
3/4"	91		90 - 100
1/2"	43	25 - 60	
3/8"	28		20 - 55
# 4	6	0 - 10	0 - 10
# 8	3	0 - 5	0 - 5
# 16	2		
# 30	2		
# 50	2		
# 100	2		
# 200	1.4	0 - 1.5	0 - 1.5

ASTM C127, AASHTO T 85,
Bulk Specific Gravity = 2.647, Bulk Specific Gravity (SSD) = 2.662, Apparent Specific Gravity = 2.688, Absorption = 0.6%

ASTM C131, AASHTO T 96, L.A. Abrasion
Grading B, Loss = 24%
Specification: 45% Max.

ASTM C142, AASHTO T 112,
Clay Lumps & Friable Particles
COARSE AGG. = 0.0%, Specification: 2.0% Max.

ASTM C123, AASHTO T 113,
Lightweight Particles in Aggregate

SAMPLE WT (g)	LIQUID TYPE / SPECIFIC GRAVITY	LIGHTWEIGHT PARTICLES	SPEC
3057.4	$ZnCl_2$/2.0	0.0%	0.5% Max.
3057.4	$ZnBr_2$/2.4	0.0%	3.0% Max.

ASTM C88, AASHTO T 104, Magnesium/Sodium Sulfate Soundness, 5 Cycles

SIEVE SIZE	GRADING OF ORIGINAL SAMPLE	WEIGHT BEFORE TEST, g		PERCENT PASSING AFTER TEST		WEIGHTED PERCENT LOSS	
		Mag.	Sod.	Mag.	Sod.	Mag.	Sod.
1-1/2" to 1"	10			0.9	1.4	0.1	0.1
1" to 3/4"		512.2	506.5				
3/4" to 1/2"	67	672.5	669.8	2.6	1.8	1.7	1.2
1/2" to 3/8"		328.4	329.6				
3/8" to No.4	23	301.6	301.9	4.3	1.4	1.0	0.3
TOTAL	100	COARSE AGG. TOTAL 94%				3	2
SPECIFICATION:						18 Max.	12 Max.

ASTM C29, AASHTO T 19,
Bulk Density and Voids in Aggregate
Rodding Method; Bulk Density = 99 pcf
Voids in Aggregate = 40%

ASTM D4791, Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate, Ratio 5:1

SAMPLE WT (g)	FLAT (%)	ELONGATED (%)	FLAT AND ELONGATED (%)	TOTAL (%)
5391.6	0	0	1	1

Sum of Clay Lumps, Friable Particles, Chert = 0.0%
Specification: 3.0% Max.

TABLE 1

WesTest

627 Sheridan Boulevard • Lakewood, CO 80214
P: 303.975.9959 • F: 303.975.9969
office@westest.net • www.westest.net

January 31, 2019

Aggregate Industries
1705 S. Acoma Street
Denver, CO 80223

Attention: Mr. John Cheever

Subject: Laboratory Test Results
ASTM C1260
Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM & AASHTO Size No. 57/67 Coarse Aggregate
ASTM & AASHTO Size No. 4 Coarse Aggregate
Morrison Quarry
WesTest Project No. 633219

Gentlemen:

Included as Figure 1 is the result of potential alkali reactivity testing (mortar-bar method), performed on aggregate sampled from the above-referenced source on January 14, 2019. The aggregate was prepared and tested in general accordance with ASTM Procedures. ASTM C1260 defines the potential of an aggregate for deleterious expansion as follows:

Test Expansion	Classification	Potential for Deleterious ASR
< 0.10%	Innocuous	Low
0.10% to 0.20%	Inconclusive	Not Predictable
> 0.20%	Deleterious	High

Based on the test result of 0.05% expansion at 14 days in solution, 16 days after casting, the potential for deleterious alkali-silica behavior of this aggregate in concrete is considered Low.

If you have any questions on the data presented, please contact us at your convenience.

Sincerely,
WesTest

Quyen T. Liu, EIT

Reviewed by:

Dylan A. Hullinger, P.E.

AASHTO ACCREDITED

WesTest
627 Sheridan Boulevard • Lakewood, CO 80214
303.975.9959 • office@westest.net

LABORATORY TEST REPORT

POTENTIAL ALKALI REACTIVITY OF AGGREGATES
(MORTAR-BAR METHOD)
ASTM C1260

REPORT DATE: January 31, 2019

CLIENT: Aggregate Industries
PROJECT NO.: 633219

SAMPLE DATE: January 14, 2019
SAMPLE ID: 6332630

AGGREGATE:
SOURCE: Morrison Quarry
SIZE: ASTM & AASHTO Size No. 57/67 Coarse Aggregate
SIZE: ASTM & AASHTO Size No. 4 Coarse Aggregate
COMMENTS: Aggregate graded as per Section 8.2, Table 1

CEMENT:
SOURCE: Holcim
TYPE: I/II
AUTOCLAVE EXPANSION: -0.02%
ALKALIS CONTENT: 0.78% (as Na equivalent)
COMMENTS: Cement data provided by Holcim

MIX WATER:
W/C RATIO: 0.47

EFFECTIVE GAUGE LENGTH = 250 mm

	1/16/19	1/17/19	1/21/19		1/24/19		1/28/19		1/31/19	
	Initial	Zero	4 Days		7 Days		11 Days		14 Days	
Specimen	Comparator Reading	Comparator Reading	Comparator Reading	Length Change	Comparator Reading	Length Change	Comparator Reading	Length Change	Comparator Reading	Length Change
A	-0.700	-0.548	-0.532	0.01%	-0.490	0.02%	-0.444	0.04%	-0.426	0.05%
B	-1.464	-1.314	-1.300	0.01%	-1.256	0.02%	-1.214	0.04%	-1.192	0.05%
C	-0.030	0.124	0.138	0.01%	0.184	0.02%	0.232	0.04%	0.250	0.05%
AVERAGE		-0.579	-0.565	0.01%	-0.521	0.02%	-0.475	0.04%	-0.456	0.05%

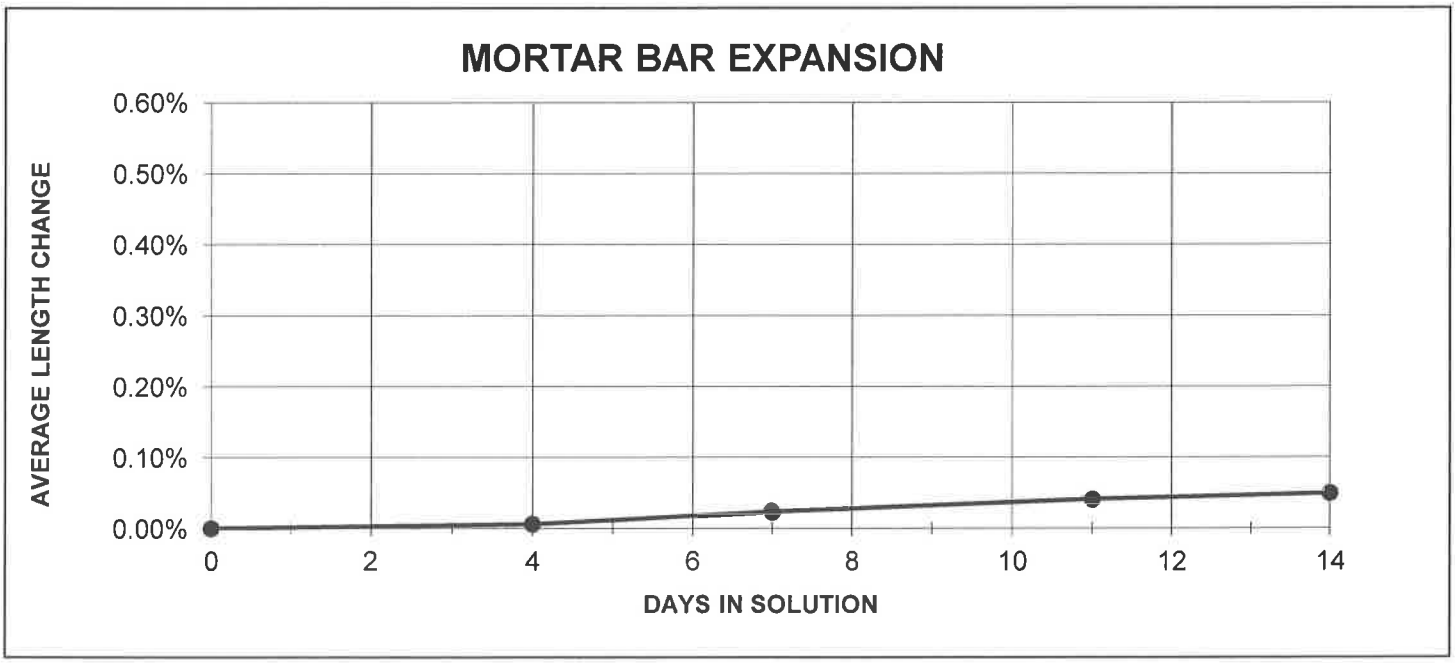


FIGURE 1

MOUNTAIN CEMENT COMPANY

Certificate of Test

ASTM C150 Type V Low-Alkali **September 14, 2018**
AASHTO M85 Type V Low-Alkali **Lot 213-243**

C150 Chemical Requirements – Table 1

Item	Spec Limit	Result
Al_2O_3	N/A	3.8
Fe_2O_3	N/A	3.4
MgO	6.0 Max	1.0
SO_3	2.3*	3.5
L.O.I.	3.5 Max	2.4
Insoluble Residue	1.5 Max	0.7

*Does not apply. In compliance with Footnote D, Table 1, ASTM Standard Specification C150 and AASHTO Standard Specification M85.

Compound Composition

Item	Spec Limit	Result
C_3A, %	5 Max**	4
Equivalent Alkalies, %	0.60 Max	0.58
$C_4AF + 2*C_3A$	25 Max**	19
Inorganic Processing Addt's, %	5.0 Max	0
$CaCO_3$ in Limestone, %	70 Min	87.8
Limestone Additions	5.0 Max	3.8
C1038 Mortar Bar Expansion, %	0.020% Max	0.008

**Does not apply when C452 sulfate resistance limit in Table 4 is used, see below

C150 Physical Requirements – Table 3

Item	Spec Limit	Result
Blaine Specific Surface, m^2/kg	260 Min	393
Air Content of Mortar, Vol %	12 Max	7.7
Autoclave Expansion, %	0.80 Max	-0.01
Vicat Initial Time of Set, minutes	45 Min	104
Vicat Final Time of Set, minutes	375 Max	185
Compressive Strength, psi:		
3 Days	1740 Min	3590
7 Days	2760 Min	4500
Lot 182-212 28 Days	3050 Min	5820

ASTM C150 Optional Requirements – Table 4

Item	Spec Limit	Result
C452 Sulfate Resistance, 14 Days, max, % expansion	0.040 max	0.021

This cement has been sampled and tested in accordance with ASTM standard methods and procedures. Cement analysis are reported as oxides, in accordance with ASTM Test Method C114. This cement is manufactured at our Laramie, Wyoming facility. All test results are certified to comply with the type and specification designated. We are not responsible for improper use or workmanship.

Bob Kersey, Chief Chemist

AASHTO Accredited Since 1996

Materials Testing & Research Facility
2650 Old State Hwy 113
Taylorsville, GA 30178
770-684-0102

ASTM C618 / AASHTO M295 Testing of Prairie State Fly Ash

Sample Date: 8/23 - 8/29/18 **Report Date:** 10/4/2018

Sample Type: composite **MTRF ID:** 2181PS

Sample ID:

Chemical Analysis	Results		ASTM Limit Class F/C	AASHTO Limit Class F/C
Silicon Dioxide (SiO2)	55.47	%		
Aluminum Oxide (Al2O3)	18.54	%		
Iron Oxide (Fe2O3)	10.66	%		
Sum (SiO2+Al2O3+Fe2O3)	84.67	%	70.0/50.0 min	70.0/50.0 min
Sulfur Trioxide (SO3)	1.49	%	5.0 max	5.0 max
Calcium Oxide (CaO)	6.44	%		
Magnesium Oxide (MgO)	1.46	%		
Sodium Oxide (Na2O)	1.19	%		
Potassium Oxide (K2O)	2.64	%		
Sodium Oxide Equivalent (Na2O+0.658K2O)	2.93	%		
Moisture	0.03	%	3.0 max	3.0 max
Loss on Ignition	0.73	%	6.0 max	5.0 max
Physical Analysis				
Fineness, % retained on 45-µm sieve	22.43	%	34 max	34 max
Fineness Uniformity	3.52	%	±5 max	±5 max
Strength Activity Index - 7 or 28 day requirement				
7 day, % of control	90	%	75 min	75 min
28 day, % of control	92	%	75 min	75 min
Water Requirement, % control	96	%	105 max	105 max
Autoclave Soundness	0.01	%	0.8 max	0.8 max
Density	2.33			
Density Uniformity	1.18	%	±5 max	±5 max

Boral Resources certifies that pursuant to current ASTM C618 protocol for testing, the test data listed herein was generated by applicable ASTM methods and meets the requirements of ASTM C618.

Doug Rhodes, CET
Facility Manager

AASHTO ACCREDITED

Concrete admixture

CHRYSO® Air 260

New generation air entrainer

■ Features

CHRYSO® Air 260 is an aqueous solution specially formulated for use as an air entraining admixture for concrete It's proprietary formulation introduces millions of uniformly sized and spaced air voids throughout the concrete mixture. Concrete containing this type of uniformly distributed air voids has been proven far more resistant to freezing and thawing than plain concrete.

CHRYSO® Air 260 improves concrete's rheology, finishability and resistance to freeze-thaw and surface deterioration caused by deicing chemicals.

CHRYSO® Air 260 is manufactured under rigid quality control measures to provide uniform, reliable results.

■ Benefits

- Improves concrete quality by decreasing water-cement ratio for a given degree of workability
- Increases concrete durability through reducing sensitivity to freeze-thaw & surface deterioration caused by deicing salts
- Improves the plasticity and workability of concrete
- Reduces concrete permeability
- Reduces segregation
- Improves surface paste qualities for superior and smoother finish
- Improves pumpability of concrete
- Enhance the resistance of concrete to segregation and reduces honeycombing
- Limits bleeding

■ Areas of Application

CHRYSO® Air 260 is recommended for all concrete mixes where improved resistance to freeze-thaw, superior workability, improved pumpability and enhanced finish characteristics are desirable.

CHRYSO® Air 260 is especially beneficial when concrete is to be exposed to freezing and thawing conditions.

CHRYSO

www.chryso.com

Concrete admixture

Technical Data Sheet

CHRYSO® Air 260

■ Description:

Characteristics:

Physical state: liquid
Color: amber to brown shade
Density: 1.01± 0.020 g/cc
pH: 12± 1.0
Cl^- ion content: Nil

CHRYSO® Air 260 does not contain any purposely added calcium chloride or other chloride based components. It will not promote or contribute to corrosion of reinforcing steel in concrete.

Packaging:

– 55 gallon (210 L) drums
– 264 gallon (1000 L) totes
– bulk deliveries

Standard specifications:

Conforms to ASTM C 260
AASHTO M 154
CRD C 13

■ Directions for use:

Dosage

There is no standard dosage rate for **CHRYSO® Air 260**

CHRYSO® Air 260 is typically used at a dosage rate of 0.2 to 3 fluid ounces per 100 pounds (13 to 196 ml per 100 kg) of cement.

Because local job conditions vary, please contact your local Chryso sales representative for further assistance if using outside recommended dosage ranges.

Compatibility

CHRYSO® Air 260 is compatible with all types of Portland cement, class C and F fly ash, slag, microsilica, calcium chloride, fibers and other approved **CHRYSO** admixtures.

CHRYSO® Air 260 can be used in all white, colored, and architectural concrete. For best results, each admixture must be dispensed separately into the concrete mix.

Precaution:

CHRYSO® Air 260 may freeze at temperatures below 35° F (2°C). Although freezing does not harm **CHRYSO® Air 260**, precautions should be taken to protect it from freezing. If **CHRYSO® Air 260** should happen to freeze, thaw and reconstitute with mechanical agitation.

Do Not Use Pressurized Air For Agitation.

Shelf life: 9 months.

■ Safety:

CHRYSO® Air 260 is an alkaline solution and therefore can cause moderate to severe irritation. Please refer to the material safety data sheet for additional information.

About CHRYSO:

CHRYSO is a subsidiary of the multi-billion dollar specialty construction chemicals Group, Materis.
Worldwide leader for Concrete and Cement additives, **CHRYSO** has been servicing the construction Industry for over half a century with outstanding innovation and service.
As a result, **CHRYSO**'s name and products have been associated with the most prestigious and demanding construction projects worldwide.
Respectful of the environment, **CHRYSO** continually develops and produces innovative and effective solutions for the cement and concrete industries.

CHRYSO Inc. Tel: (800) 557-4220 | Fax: (812) 256-4235
CHRYSO Eastern Division: P.O. Box 129 | Charlestown, IN | 47111-0459
CHRYSO Western Division: P.O. Box 190 | Rockwall, TX | 75087

CHRYSO

www.chryso.com

Concrete admixture

CHRYSO® EnviroMix® 300

Multi range water reducer - Enhanced finish

Features

CHRYSO®EnviroMix®300 is a multi-component water-reducing chemical admixture, which is carefully formulated to enhance the quality and performance characteristics of plastic and hardened concrete. Its unique chemistry results in more complete and efficient hydration of the cementitious materials in the concrete matrix, providing more psi per pound of cementitious materials, improved early and ultimate strength as well as improved concrete durability.

Powerful finishing aids in **CHRYSO®EnviroMix®300** provide enhanced rheology and improved paste qualities for superior concrete finishability, reducing labor costs and providing a superior finished concrete appearance.

CHRYSO®EnviroMix®300 is manufactured under rigid quality control measures to provide uniform, reliable results.

Benefits

- Allows better utilization of mixes incorporating high volumes of possolans such as fly ash
- Improves concrete quality by reducing the water-cement ratio for a given degree of workability
- Increases early and ultimate compressive and flexural strengths
  Provides superior finishability
- Improves surface quality and Reduces cracking potential
- Improves workability and ease of placement and consolidation
- Improves pumpability of concrete
- Provides uniform, normal-setting characteristics

Areas of Application

CHRYSO®EnviroMix®300 is recommended for all concrete mixes where significant water reduction, improved cementitious material performance (more psi/lb), normal to accelerated set times and enhanced finishing characteristics are desirable.

CHRYSO®EnviroMix®300 is especially effective in improving compressive strengths at all ages while enhancing finish and workability.

CHRYSO

www.chryso.com

Concrete admixture

Technical Data Sheet

CHRYSO® EnviroMix® 300

■ Description:

Characteristics:

Physical state: liquid
Color: brown
Density: 1.18 ± 0.020 g/cc
pH: 7.5 ± 2.0
Cl^- ion content: Nil

CHRYSO®EnviroMix®300 does not contain any purposely added calcium chloride or other chloride based components. It will not promote or contribute to corrosion of reinforcing steel in concrete.

Packaging:

– 55 gallon (210 L) drums
– 264 gallon (1000 L) totes
– bulk deliveries

Standard specifications:

CHRYSO®EnviroMix®300 meets the requirements of ASTM C494, Types A & F for a high range water reducing admixture.

■ Directions for use:

Dosage

CHRYSO®EnviroMix®300 is recommended for use at a dosage rate of 3 to 14 fluid ounces per 100 pounds (195 to 910 ml per 100 kg) of cement.

Because local job conditions vary, please contact your local Chryso sales representative for further assistance if using outside recommended dosage ranges.

Compatibility

CHRYSO®EnviroMix®300 is compatible with all types of Portland cement, class C and F fly ash, slag, microsilica, calcium chloride, fibers and approved air entraining admixtures.

CHRYSO®EnviroMix®300 can be used in all white, colored, and architectural concrete. For best results, each admixture must be dispensed separately into the concrete mix.

Precaution:

CHRYSO®EnviroMix®300 may freeze at temperatures below 35°F (2° C). Although freezing does not harm **CHRYSO® EnviroMix®300**, precautions should be taken to protect it from freezing.

If **CHRYSO®EnviroMix®300** should happen to freeze, thaw and reconstitute with mechanical agitation.

Do Not Use Pressurized Air For Agitation.

Shelf life: 12 months.

■ Safety:

CHRYSO®EnviroMix®300 is not considered dangerous to handle. Please refer to the material safety data sheet for additional information.

About CHRYSO:

CHRYSO is a subsidiary of the multi-billion dollar specialty construction chemicals Group, Materis.
Worldwide leader for Concrete and Cement additives, **CHRYSO** has been servicing the construction Industry for over half a century with outstanding innovation and service.
As a result, **CHRYSO**'s name and products have been associated with the most prestigious and demanding construction projects worldwide.
Respectful of the environment, **CHRYSO** continually develops and produces innovative and effective solutions for the cement and concrete industries.

CHRYSO Inc. Tel: (800) 557-4220 | Fax: (812) 256-4235
CHRYSO Eastern Division: P.O. Box 129 | Charlestown, IN | 47111-0459
CHRYSO Western Division: P.O. Box 190 | Rockwall, TX | 75087

CHRYSO

www.chryso.com

Concrete admixture

CHRYSO® NutralSet® TC

Hydration stabilizer

■ Features

CHRYSO®NutralSet®TC is a ready-to-use liquid solution manufactured to control the hydration process in Portland cement concrete and concrete wash water.

CHRYSO®NutralSet®TC coats the hydrating cement particles in the concrete and wash water, resulting in the suspension of the hydration chemical reaction.

CHRYSO®NutralSet®TC is manufactured under rigid quality control measures to provide uniform reliable results.

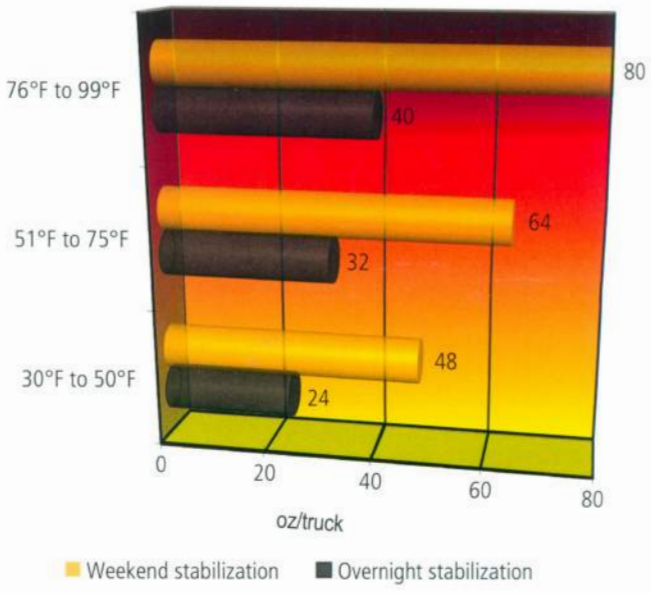
■ Benefits

- Improves ultimate compressive strength performance over conventional concrete
- Controls concrete temperature rise during times of elevated ambient temperatures and long transit times
- Little effect on initial slump when used in conjunction with a water reducer allowing the producer to extend the hydration control with little impact on initial slump
- Reduces disposal costs associated with returned concrete
- Allows reuse of concrete wash water overnight or over a weekend in many situations
- Reduces concrete was water disposal
- Reduces amount of concrete wash water needed and truck mixer washout
- Reduces expensive disposal costs associated with concrete wash water

■ Areas of Application

CHRYSO®NutralSet®TC is recommended for all concrete mixes where lower hydration temperature, increased ultimate strengths or retarded setting time characteristics are recommended.

Ambient temperature vs. typical dosage rate in oz / truck for treatment of concrete wash water



CHRYSO

www.chrysoinc.com

Concrete admixture

Technical Data Sheet

CHRYSO® NutralSet® TC

■ Description:

Characteristics:

- Physical state: liquid
- Color: Blue
- Density: 1.13 ± 0.02g/cc
- pH: 4.0 ± 2.0
- Cl^- ion content Nil
- Na^2O equiv.:<1.0%

CHRYSO®NutralSet®TC does not contain any purposely added calcium chloride or other chloride based components.

Packaging:

- 55 gallon (210 L) drums
- 264 gallon (1000 L) totes
- bulk deliveries

Standard Specifications:

Conforms to ASTM C 494 Type B
AASHTO M 194 Type B
CRD C 87 Type B

■ Directions for use:

Dosage:

There is no standard dosage rate for **CHRYSO®NutralSet®TC** as it will depend on ambient temperature, desired stabilization period or concrete mix design.

For treatment of concrete wash water **CHRYSO® NutralSet®TC** is typically used at a dosage rate of 24 to 80 fluid ounces (710 to 2366 ml) per truck.

For concrete setting time retardation **CHRYSO®NutralSet®TC** is typically used at a dosage rate of 1 to 12 fluid ounces per 100 lbs. (65 to 783 ml per 100kg) of Portland cement.

Because local job conditions vary, please contact your local **CHRYSO®** sales representative for recommended dosages when using **CHRYSO®NutralSet®TC** to stabilize returned concrete or to retard concrete.

Compatibility:

CHRYSO®NutralSet®TC is compatible with all types of Portland cement, class C and F fly ash, slag, microsilica, calcium chloride, fibers and approved air entraining admixtures.

CHRYSO®NutralSet®TC can be used in all white, colored, and architectural concrete. For best results, each admixture must be dispensed separetly into the concrete mix.

Precaution:

CHRYSO®NutralSet®TC may freeze at temperatures below 35°F (2°C). Although freezing will does not harm **CHRYSO® NutralSet®TC**, precautions should be taken to protect it from freezing. If **CHRYSO®NutralSet®TC** should happen to freeze, thaw and reconstitute with mechanical agitation.

■ Safety:

CHRYSO®NutralSet®TC is not considered dangerous to handle. Please refer to the material safety data sheet for additional information.

About CHRYSO:

CHRYSO is a subsidiary of the multi-billion dollar specialty construction chemicals Group, Materis.
Worldwide leader for Concrete and Cement additives, **CHRYSO** has been servicing the construction Industry for over half a century with outstanding innovation and service.
As a result, **CHRYSO**'s name and products have been associated with the most prestigious and demanding construction projects worldwide.
Respectful of the environment, **CHRYSO** continually develops and produces innovative and effective solutions for the cement and concrete industries.

CHRYSO Inc. Tel: 800-936-7553 - 972-772-6010

Southern Division:	P.O. Box 190	Rockwall, TX	75087
Midwest Division:	P.O. Box 129	Charlestown, IN	47111
Western Division:	5090 Nome St	Denver, CO	80239
Eastern Division:	200 C Leonard Rd	Lexington, NC	27295

CHRYSO

www.chrysoinc.com

Concrete admixture

CHRYSO® TurboCast® NCT

Non-chloride accelerator

Features

CHRYSO® TurboCast® NCT is a ready to use aqueous solution of non-chloride accelerators which provides the benefits of accelerated set and enhanced early strength.

CHRYSO® TurboCast® NCT allows for cold weather concreting and/or early finishing.

CHRYSO® TurboCast® NCT can be used in combination with other CHRYSO admixtures. See you local sales representatives for further information on multi admixtures mix designs.

CHRYSO® TurboCast® NCT is manufactured under rigid quality control measures to provide uniform, reliable results.

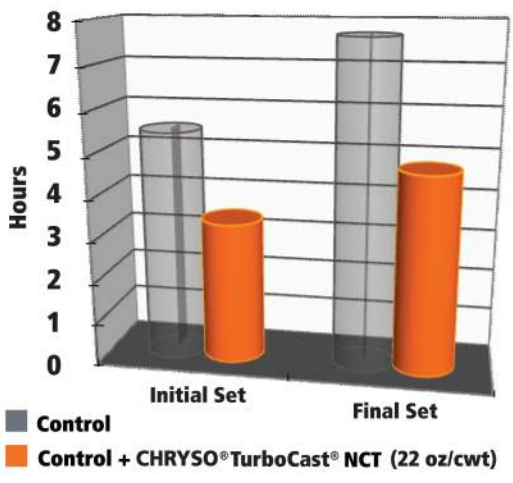
Benefits

- Accelerates set time and allows for early finish
- Increases early compressive and flexural strengths without detriment to ultimate strengths
- Allows for reduction of curing time and early stripping of concrete
- Reduces curing costs

Areas of Application

CHRYSO® TurboCast® NCT is recommended for all concrete mixes where accelerated set times, reduced curing costs and high early strengths characteristics are desirable.

CHRYSO® TurboCast® NCT is especially adapted for any Ready Mix concrete application requiring accelerated set time without detriment to ultimate strengths.



CHRYSO

www.chryso.com

Concrete admixture

Technical Data Sheet

CHRYSO® TurboCast® NCT

■ Description:

Characteristics:

CHRYSO®TurboCast® NCT is a chemically stable liquid and weighs approx. 11.5 lb./gal.

CHRYSO®TurboCast® NCT does not contain any purposely added calcium chloride or other chloride based components. It will not promote or contribute to corrosion of reinforcing steel in concrete.

Packaging:

– 55 gallon (210 L) drums
– 264 gallon (1000 L) totes
– bulk deliveries

Standard specifications:

Conforms to ASTM C 494 Type C
AASHTO M 194 Type C
CRD C 87 Type C

■ Directions for use:

Dosage

CHRYSO®TurboCast® NCT is recommended for use at a dosage rate of 8 to 90 fluid ounces per 100 pounds (520 to 5850 ml per 100 kg) of cement.

Dosage rates of **CHRYSO®TurboCast® NCT** are dependent upon desired concrete performance characteristics and variables including cement quantity and chemistry, concrete temperature and curing conditions.

Because local job conditions vary, please contact your local Chryso sales representative for further assistance if using outside recommended dosage ranges.

Compatibility

CHRYSO®TurboCast® NCT is compatible with all types of Portland cement, class C and F fly ash, slag, microsilica, calcium chloride, fibers and approved air entraining admixtures.

CHRYSO®TurboCast® NCT can be used in all white, colored, and architectural concrete. For best results, each admixture must be dispensed separately into the concrete mix.

Precaution:

CHRYSO®TurboCast® NCT may freeze at temperatures below 5°F (-15° C). Although freezing does not harm **CHRYSO® TurboCast® NCT**, precautions should be taken to protect it from freezing.

If **CHRYSO®TurboCast® NCT** should happen to freeze, thaw and reconstitute with mechanical agitation.

Do Not Use Pressurized Air For Agitation.

Shelf life: 12 months.

■ Safety:

CHRYSO®TurboCast® NCT is not considered dangerous to handle. Please refer to the material safety data sheet for additional information.

About CHRYSO:

CHRYSO is a subsidiary of the multi-billion dollar specialty construction chemicals Group, Materis.
Worldwide leader for Concrete and Cement additives, **CHRYSO** has been servicing the construction Industry for over half a century with outstanding innovation and service.
As a result, **CHRYSO**'s name and products have been associated with the most prestigious and demanding construction projects worldwide.
Respectful of the environment, **CHRYSO** continually develops and produces innovative and effective solutions for the cement and concrete industries.

CHRYSO Inc. Tel: (800) 557-4220 | Fax: (812) 256-4235
CHRYSO Eastern Division: P.O. Box 129 | Charlestown, IN | 47111-0459
CHRYSO Western Division: P.O. Box 190 | Rockwall, TX | 75087

CHRYSO

www.chryso.com

FORTA® CONCRETE FIBER
STRONGER LASTING™

SUPER-NET® FACT DATA

MICRO SYNTHETIC

Description

FORTA® SUPER-NET® is an easy to finish, color-blended micro synthetic fiber, made of 100% virgin homopolymer polypropylene in a collated fibrillated form. This heavy-duty fiber offers SUPER-NETWORKING power, long-term durability, and temperature/shrinkage control by incorporating a fibrillated pattern and long length option. SUPER-NET is non-corrosive, non-magnetic, and 100% acid and alkali proof.

Reinforcement Objective

To inhibit plastic and settlement shrinkage cracking prior to the initial set, and to reduce hardened concrete shrinkage cracking, improve impact strength, and enhance concrete toughness and durability as an alternate temperature/shrinkage reinforcement.

Physical Properties

Specific Gravity	0.91
Tensile Strength	83-96 ksi (570-660 MPa)
Length	1.5 in (38 mm), 0.75 in (19 mm)
Melting Point	319°F (160°C)
Material	Virgin Homopolymer Polypropylene
Form	Fibrillated
Color	Gray
Acid / Alkali Resistance	Excellent
Absorption	Nil

Compliance & Certification

- ASTM C1116 / C1116M-10a, Standard Specification for Fiber-Reinforced Concrete, "Type III Synthetic Fiber-Reinforced Concrete"
- ASTM D7508 / D7508M-10(2015), Standard Specification for Polyolefin Chopped Strands for Use in Concrete
- Certified UL / ULC: CBXQ.R18552
- DUNS: 094214129
- CAGE Code: 0AFN8
- NAICS: 325220

Applications

SUPER-NET is used in quality concrete applications such as slabs-on-ground, overlays/toppings, curbs, sloped paving, roads/highways, driveways, sidewalks, shotcrete, tilt-up panels, architectural/colored concrete, precast, mortar, grout, water tanks, and sewage treatment facilities – anywhere that peak fiber performance is desired and where the objective is to control temperature/shrinkage cracking while improving basic durability properties. Requires no mix design or placement changes!

Performance Benefits

- Enhance durability
- Reduce plastic and hardened concrete shrinkage
- Reduce settlement cracking
- Provide nominal impact strength
- Increase post-cracking residual strength
- Increase concrete toughness
- Provide 3-dimensional reinforcement against micro-cracking

Recommended Dosage

This product is typically used at a minimum dosage rate of 1.5 lb/cu yd (0.9 kg/cu m) of concrete. Contact FORTA Corporation for design assistance and dosage recommendations for alternate dosage rates used in specialty applications.

FORTA CONCRETE FIBER | 100 Forta Drive, Grove City, PA 16127 | 800-245-0306 | forta-ferro.com |

FORTA® CONCRETE FIBER
STRONGER LASTING™

SUPER-NET® FACT DATA

Packaging

	Domestic	International
Bags	1.5 lb	0.9 kg
Cartons	20 bags	20 bags
Pallets	16 cartons/320 bags	12 cartons/240 bags

Recommendations

Addition: SUPER-NET is packaged in mixer-ready bags that can be added directly into the concrete mixing system. The fiber should be added during or after batching of the other ingredients – never as the first mix ingredient.

Mixing: When possible, add fibers to a rotating drum. Once all fibers have been added to the batch, mix four to five minutes at standard mixing speed. Road-revolution speed should not be counted as part of the required fiber mixing time.

Slump: Fibers may reduce the visual slump measured by the slump-cone test, but has a lesser effect on flow-ability and workability. To regain any loss of workability or slump, the use of appropriate admixtures is recommended – avoid the addition of water.

Additional Information

Additional information such as the Safety Data Sheet, Certifications, videos and other literature can be found on the forta-ferro.com website. The website also features Project Profiles that show the many applications and benefits of SUPER-NET first-hand.

Warranty

FORTA® products are warranted to be free of defects in material and meet all quality control standards set by the manufacturer. FORTA Corporation specifically disclaims all other warranties, express or implied. The exclusive remedy for defective product shall be to replace the product or refund the purchase price. No agent or employee of this company is authorized to vary the terms of this warranty notice. FORTA Corporation has no control over the design, production, placement, or testing of the concrete products in which FORTA® products are incorporated, and therefore FORTA Corporation disclaims liability for the end product.

FORTA reserves the right to change the features and specifications of its products without prior notice.

SUPER-NET® can be purchased from FORTA Corporation or an authorized FORTA® products distributor, dealer or representative.

U.S. Patent Nos. 6,753,081 and 7,168,232. Additional patents pending.

MADE IN U. S. A.

FD.1.02.07.18

Ready Mix Concrete

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015).

Revision Date: 04/13/2017 Date of Issue: 02/26/2016 Supersedes Date: 02/01/2007 Version: 2.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: Ready Mix Concrete

1.2. Intended Use of the Product

Ready Mix Concrete is used in the construction of various structures and objects.

1.3. Name, Address, and Telephone of the Responsible Party

Company

BURNCO Rock Products Ltd.
Box 1480, Station T
CALGARY, ALBERTA, CANADA T2H 2P9
403-255-2600
www.burnco.com

1.4. Emergency Telephone Number

Emergency Number : 403-255-2600 BURNCO

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

GHS-US/CA Classification

HHNOC 1

Skin Corr. 1C	H314
Eye Dam. 1	H318
Skin Sens. 1	H317

Full text of hazard classes and H-statements : see section 16

2.2. Label Elements

GHS-US/CA Labeling

Hazard Pictograms (GHS-US/CA) :

GHS05 GHS07

Signal Word (GHS-US/CA) : Danger

Hazard Statements (GHS-US/CA) : H314 - Causes severe skin burns and eye damage.
H317 - May cause an allergic skin reaction.
H318 - Causes serious eye damage.
Causes severe damage to the respiratory tract.

Precautionary Statements (GHS-US/CA) : P260 - Do not breathe dust, mist, spray.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P280 - Wear protective gloves, protective clothing, and eye protection.
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 - Immediately call a POISON CENTER or doctor.
P321 - Specific treatment (see section 4 on this SDS).
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.

P362+P364 - Take off contaminated clothing and wash it before reuse.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

2.3. Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Wet cement on unprotected skin, whether direct or through saturated clothing, can cause severe, third degree caustic burns.

2.4. Unknown Acute Toxicity (GHS-US/CA)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Product Identifier	% *	GHS Ingredient Classification
Quartz**	(CAS-No.) 14808-60-7	0.1 - 100	Carc. 1A, H350 STOT SE 3, H335 STOT RE 1, H372
Gravel	(CAS-No.) Not applicable	45	Not classified
Natural Sand	(CAS-No.) Not applicable	34	Not classified
Cement, portland, chemicals	(CAS-No.) 65997-15-1	13	HHNOC 1 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 STOT SE 3, H335
Water	(CAS-No.) 7732-18-5	6	Not classified
Ashes, residues	(CAS-No.) 68131-74-8	2	Eye Irrit. 2B, H320

Full text of H-phrases: see section 16

*Percentages are listed in weight by weight percentage (w/w%) for liquid and solid ingredients. Gas ingredients are listed in volume by volume percentage (v/v%).

**Finely divided Quartz dust has caused cancer and lung disease in workers that inhale it over an extended period of time. Quartz dust is not respirable while this product is in liquid form, thus the hazards usually associated with Quartz dust are not applicable to this product.

SECTION 4: FIRST AID MEASURES

4.1. Description of First-aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

Skin Contact: Remove contaminated clothing. Immediately flush skin with plenty of water for at least 60 minutes. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for at least 60 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Causes severe skin burns and eye damage. Causes serious eye damage. Skin sensitization.

Inhalation: Causes severe damage to the respiratory tract.

Skin Contact: Corrosive. Causes burns. Redness, pain, swelling, itching, burning, dryness, and dermatitis. May cause an allergic skin reaction. When this product is wet it is corrosive.

Eye Contact: Causes serious eye damage. Redness, pain, swelling, itching, burning, tearing, and blurred vision. Causes permanent damage to the cornea, iris, or conjunctiva.

Ingestion: May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic Symptoms: If dust is generated, repeated exposure through inhalation may cause cancer or lung disease. Pre-existing lung diseases such as emphysema or asthma may be aggravated by exposure to dusts. Pulmonary function may be reduced by inhalation of respirable crystalline silica. Also lung scarring produced by such inhalation may lead to a progressive massive fibrosis of the lung which may aggravate other pulmonary conditions and diseases and which increases susceptibility to pulmonary tuberculosis. Progressive massive fibrosis may be accompanied by right heart enlargement, heart failure, and pulmonary failure. Smoking aggravates the effects of exposure. Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. Silicosis increases the risk of tuberculosis. Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Water spray, dry chemical, foam, carbon dioxide.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable.

Explosion Hazard: Product is not explosive.

Reactivity: Reacts slowly with water forming hydrated compounds, releasing heat and producing a strong alkaline solution until reaction is substantially complete. May react exothermically with water releasing heat. Adding an acid to a base or base to an acid may cause a violent reaction.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions, hazardous fumes will be present.

Firefighting Instructions: Do not allow run-off from fire fighting to enter drains or water sources. Do not breathe fumes or vapors from fire. Use water spray or fog for cooling exposed containers.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO_2). Silicon oxides.

Reference to Other Sections

Refer to Section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid breathing dust, mist, spray. Do not get in eyes, on skin, or on clothing.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protective equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area. Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

6.2. Environmental Precautions

Prevent entry to sewers and public waters.

6.3. Methods and Materials for Containment and Cleaning Up

For Containment: Place spilled material into a container. Avoid contact with skin. Wear appropriate protective equipment as described in Section 8. Scrape wet concrete and place in container. Allow material to dry or solidify before disposal. Do not wash concrete down sewage and drainage systems or into bodies of water (e.g. streams). Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. As an immediate precautionary measure, isolate spill or leak area in all directions.

Methods for Cleaning Up: Cautiously neutralize spilled liquid. Clean up spills immediately and dispose of waste safely. Avoid actions that cause dust to become airborne during clean-up such as dry sweeping or using compressed air. Use HEPA vacuum or thoroughly wet with water to clean-up dust. Use PPE described in Section 8. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

6.4. Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Wet cement is corrosive. Take appropriate precautions to prevent unnecessary contact. Cutting, crushing or grinding hardened cement, concrete or other crystalline silica-bearing materials will release respirable crystalline silica. Use all appropriate measures of dust control or suppression, and Personal Protective Equipment (PPE) described in Section 8 below. Do not handle until all safety precautions have been read and understood. May release corrosive vapors.

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Handle empty containers with care because they may still present a hazard. Do not get in eyes, on skin, or on clothing. Do not breathe dust, mist, and spray.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Keep container closed when not in use. Store in a dry, cool place. Store in original container or corrosive resistant and/or lined container.

Incompatible Materials: Wet cement is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

7.3. Specific End Use(s)

Ready Mix Concrete is used in the construction of various structures and objects.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Cement, portland, chemicals (65997-15-1)		
Mexico	OEL TWA (mg/m³)	10 mg/m³
Mexico	OEL STEL (mg/m³)	20 mg/m³
USA ACGIH	ACGIH TWA (mg/m³)	1 mg/m³ (particulate matter containing no asbestos and <1% crystalline silica, respirable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m³)	15 mg/m³ (total dust) 5 mg/m³ (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m³)	10 mg/m³ (total dust) 5 mg/m³ (respirable dust)
USA IDLH	US IDLH (mg/m³)	5000 mg/m³
Alberta	OEL TWA (mg/m³)	10 mg/m³
British Columbia	OEL TWA (mg/m³)	1 mg/m³ (particulate matter containing no Asbestos and <1% Crystalline silica-respirable particulate)
Manitoba	OEL TWA (mg/m³)	1 mg/m³ (particulate matter containing no Asbestos and <1% Crystalline silica-respirable particulate matter)
New Brunswick	OEL TWA (mg/m³)	10 mg/m³ (particulate matter containing no Asbestos and <1% Crystalline silica)
Newfoundland & Labrador	OEL TWA (mg/m³)	1 mg/m³ (particulate matter containing no Asbestos and <1% Crystalline silica-respirable particulate matter)
Nova Scotia	OEL TWA (mg/m³)	1 mg/m³ (particulate matter containing no Asbestos and <1%

		Crystalline silica-respirable particulate matter)
Nunavut	OEL STEL (mg/m³)	20 mg/m³
Nunavut	OEL TWA (mg/m³)	10 mg/m³
Northwest Territories	OEL STEL (mg/m³)	20 mg/m³
Northwest Territories	OEL TWA (mg/m³)	10 mg/m³
Ontario	OEL TWA (mg/m³)	1 mg/m³ (containing no Asbestos and <1% Crystalline silica-respirable)
Prince Edward Island	OEL TWA (mg/m³)	1 mg/m³ (particulate matter containing no Asbestos and <1% Crystalline silica-respirable particulate matter)
Québec	VEMP (mg/m³)	10 mg/m³ (containing no Asbestos and <1% Crystalline silica-total dust) 5 mg/m³ (containing no Asbestos and <1% Crystalline silica-respirable dust)
Saskatchewan	OEL STEL (mg/m³)	20 mg/m³
Saskatchewan	OEL TWA (mg/m³)	10 mg/m³
Yukon	OEL STEL (mg/m³)	20 mg/m³
Yukon	OEL TWA (mg/m³)	30 mppcf 10 mg/m³

Quartz (14808-60-7)		
Mexico	OEL TWA (mg/m³)	0.1 mg/m³ (respirable fraction)
USA ACGIH	ACGIH TWA (mg/m³)	0.025 mg/m³ (respirable particulate matter)
USA ACGIH	ACGIH chemical category	A2 - Suspected Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m³)	50 µg/m³
USA NIOSH	NIOSH REL (TWA) (mg/m³)	0.05 mg/m³ (respirable dust)
USA IDLH	US IDLH (mg/m³)	50 mg/m³ (respirable dust)
Alberta	OEL TWA (mg/m³)	0.025 mg/m³ (respirable particulate)
British Columbia	OEL TWA (mg/m³)	0.025 mg/m³ (respirable)
Manitoba	OEL TWA (mg/m³)	0.025 mg/m³ (respirable particulate matter)
New Brunswick	OEL TWA (mg/m³)	0.1 mg/m³ (respirable fraction)
Newfoundland & Labrador	OEL TWA (mg/m³)	0.025 mg/m³ (respirable particulate matter)
Nova Scotia	OEL TWA (mg/m³)	0.025 mg/m³ (respirable particulate matter)
Nunavut	OEL TWA (mg/m³)	0.05 mg/m³ (respirable fraction)
Northwest Territories	OEL TWA (mg/m³)	0.05 mg/m³ (respirable fraction)
Ontario	OEL TWA (mg/m³)	0.1 mg/m³ (designated substances regulation-respirable)
Prince Edward Island	OEL TWA (mg/m³)	0.025 mg/m³ (respirable particulate matter)
Québec	VEMP (mg/m³)	0.1 mg/m³ (respirable dust)
Saskatchewan	OEL TWA (mg/m³)	0.05 mg/m³ (respirable fraction)
Yukon	OEL TWA (mg/m³)	300 particle/mL

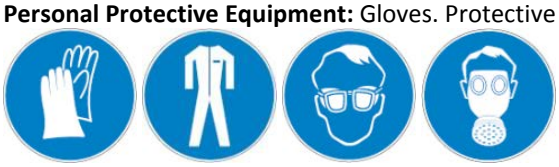
Particulates not otherwise classified (PNOC)		
USA ACGIH	ACGIH TWA (mg/m³)	3 mg/m^3 Respirable fraction 10 mg/m^3 Total Dust
USA OSHA	OSHA PEL (TWA) (mg/m³)	5 mg/m^3 Respirable fraction 15 mg/m^3 Total Dust
Alberta	OEL TWA (mg/m³)	10 mg/m³ (total) 3 mg/m³ (respirable)
British Columbia	OEL TWA (mg/m³)	10 mg/m³ (nuisance dust-total dust) 3 mg/m³ (nuisance dust-respirable fraction)
Manitoba	OEL TWA (mg/m³)	10 mg/m³ (inhalable particles, recommended) 3 mg/m³ (respirable particles, recommended)
New Brunswick	OEL TWA (mg/m³)	3 mg/m³ (particulate matter containing no Asbestos and <1% Crystalline silica, respirable fraction) 10 mg/m³ (particulate matter containing no Asbestos and <1% Crystalline silica, inhalable fraction)
Newfoundland & Labrador	OEL TWA (mg/m³)	10 mg/m³ (inhalable particles, recommended)

		3 mg/m³ (respirable particles, recommended)
Nova Scotia	OEL TWA (mg/m³)	10 mg/m³ (inhalable particles, recommended) 3 mg/m³ (respirable particles, recommended)
Nunavut	OEL STEL (mg/m³)	20 mg/m³ (insoluble or poorly soluble-inhalable fraction) 6 mg/m³ (insoluble or poorly soluble-respirable fraction)
Nunavut	OEL TWA (mg/m³)	10 mg/m³ (insoluble or poorly soluble-inhalable fraction) 3 mg/m³ (insoluble or poorly soluble-respirable fraction)
Northwest Territories	OEL STEL (mg/m³)	20 mg/m³ (insoluble or poorly soluble-inhalable fraction) 6 mg/m³ (insoluble or poorly soluble-respirable fraction)
Northwest Territories	OEL TWA (mg/m³)	10 mg/m³ (insoluble or poorly soluble-inhalable fraction) 3 mg/m³ (insoluble or poorly soluble-respirable fraction)
Ontario	OEL TWA (mg/m³)	10 mg/m³ (inhalable) 3 mg/m³ (respirable)
Prince Edward Island	OEL TWA (mg/m³)	10 mg/m³ (inhalable particles, recommended) 3 mg/m³ (respirable particles, recommended)
Québec	VEMP (mg/m³)	10 mg/m³ (including dust, inert or nuisance particulates-total dust)
Saskatchewan	OEL STEL (mg/m³)	20 mg/m³ (insoluble or poorly soluble-inhalable fraction) 6 mg/m³ (insoluble or poorly soluble-respirable fraction)
Saskatchewan	OEL TWA (mg/m³)	10 mg/m³ (insoluble or poorly soluble-inhalable fraction) 3 mg/m³ (insoluble or poorly soluble-respirable fraction)

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.



Materials for Protective Clothing: Chemically resistant materials and fabrics. Corrosion-proof clothing.

Hand Protection: Wear protective gloves.

Eye Protection: Chemical safety goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Grey
Odor	:	Not available
Odor Threshold	:	Not available
pH	:	12 - 13 in water
Evaporation Rate	:	Not available
Melting Point	:	Not available
Freezing Point	:	Not available
Boiling Point	:	Not available
Flash Point	:	Does not burn
Auto-ignition Temperature	:	Not available
Decomposition Temperature	:	Not available

Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	Not available
Upper Flammable Limit	:	Not available
Vapor Pressure	:	Not available
Relative Vapor Density at 20°C	:	Not available
Relative Density	:	Not available
Specific Gravity	:	Not available
Solubility	:	Not available
Partition Coefficient: N-Octanol/Water	:	Not available
Viscosity	:	Not available

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity: Reacts slowly with water forming hydrated compounds, releasing heat and producing a strong alkaline solution until reaction is substantially complete. May react exothermically with water releasing heat. Adding an acid to a base or base to an acid may cause a violent reaction.

10.2. Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

10.4. Conditions to Avoid: Direct sunlight, extremely high or low temperatures, and incompatible materials.

10.5. Incompatible Materials: Wet cement and cement clinker is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

10.6. Hazardous Decomposition Products: Thermal decomposition generates: Carbon oxides (CO, CO_2). Silicon oxides. Corrosive vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product

Acute Toxicity (Oral): Not classified

Acute Toxicity (Dermal): Not classified

Acute Toxicity (Inhalation): Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.

pH: 12 - 13 in water

Eye Damage/Irritation: Causes serious eye damage.

pH: 12 - 13 in water

Respiratory or Skin Sensitization: May cause an allergic skin reaction.

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified.

Specific Target Organ Toxicity (Repeated Exposure): Not classified.

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified.

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: May be corrosive to the respiratory tract.

Symptoms/Injuries After Skin Contact: Corrosive. Causes burns. Redness, pain, swelling, itching, burning, dryness, and dermatitis. May cause an allergic skin reaction. When this product is wet it is corrosive.

Symptoms/Injuries After Eye Contact: Causes serious eye damage. Redness, pain, swelling, itching, burning, tearing, and blurred vision. Causes permanent damage to the cornea, iris, or conjunctiva.

Symptoms/Injuries After Ingestion: May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic Symptoms: If dust is generated, repeated exposure through inhalation may cause cancer or lung disease. Pre-existing lung diseases such as emphysema or asthma may be aggravated by exposure to dusts. Pulmonary function may be reduced by inhalation of respirable crystalline silica. Also lung scarring produced by such inhalation may lead to a progressive massive fibrosis of the lung which may aggravate other pulmonary conditions and diseases and which increases susceptibility to pulmonary tuberculosis. Progressive massive fibrosis may be accompanied by right heart enlargement, heart failure, and pulmonary failure. Smoking

aggravates the effects of exposure. Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. Silicosis increases the risk of tuberculosis. Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Quartz (14808-60-7)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rat	> 5000 mg/kg

Ashes, residues (68131-74-8)	
LD50 Oral Rat	> 2000 mg/kg

Quartz (14808-60-7)	
IARC Group	1
National Toxicology Program (NTP) Status	Known Human Carcinogens.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Not classified.

12.2. Persistence and Degradability

Ready Mix Concrete	
Persistence and Degradability	Not established.

12.3. Bioaccumulative Potential

Ready Mix Concrete	
Bioaccumulative Potential	Not established.

12.4. Mobility in Soil

Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Additional Information: Container may remain hazardous when empty. Continue to observe all precautions.

Ecology - Waste Materials: Avoid release to the environment.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

14.1. In Accordance with DOT Not regulated for transport

14.2. In Accordance with IMDG Not regulated for transport

14.3. In Accordance with IATA Not regulated for transport

14.4. In Accordance with TDG Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Ready Mix Concrete	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Cement, portland, chemicals (65997-15-1)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Quartz (14808-60-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ashes, residues (68131-74-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Water (7732-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State Regulations

Cement, portland, chemicals (65997-15-1)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Quartz (14808-60-7)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

15.3. Canadian Regulations

Cement, portland, chemicals (65997-15-1)
Listed on the Canadian DSL (Domestic Substances List)

Quartz (14808-60-7)
Listed on the Canadian DSL (Domestic Substances List)

Ashes, residues (68131-74-8)
Listed on the Canadian DSL (Domestic Substances List)

Water (7732-18-5)
Listed on the Canadian DSL (Domestic Substances List)

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision : 04/13/2017

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Hazardous Products Regulations (HPR).

GHS Full Text Phrases:

Carc. 1A	Carcinogenicity Category 1A
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Eye Irrit. 2B	Serious eye damage/eye irritation Category 2B
HHNOC 1	Health hazard not otherwise classified, category 1
Skin Corr. 1C	Skin corrosion/irritation Category 1C
Skin Irrit. 2	Skin corrosion/irritation Category 2
Skin Sens. 1	Skin sensitization, Category 1
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H320	Causes eye irritation
H335	May cause respiratory irritation
H350	May cause cancer
H372	Causes damage to organs through prolonged or repeated exposure

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

NA GHS SDS 2015 (Can, US, Mex)