OSR 45-4 (Rev 4-15-2008)

Attachment No. N/A
Spec C-SPP-F-00055
Revision No. 4
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Supplier Deviation Disposition Request

NOTE
1. Completion instructions attached.
2. Items 1-19 below to be completed by Supplier.
3. *Items SRS entries only.
4. Attach additional information whenever necessary.
5. SRS must be notified within 5 days after detection of deviation.
6. A copy of the completed SDDR form shall be included by the Supplier in the Quality Verification Data Package for each item to which this SDDR applies.

Supplier Completed

For Supplier Use		For SRS Use		
Supplier SDDR No. TC-15-001	Date Submitted 3-30-15	SRS SDDR No. 13182	Project No. N/A	Date Received 6/5/15

1. Supplier Name	Address	City/State/Zip	2. Supplier's Order No.
Argos Ready Mix LLC	205 Laney Walker Blvd. Ext.	Augusta, GA 30901	SRRA0C4184

2.1 SRS Document	3. Supplier's Part No.	4. Supplier's Part Name	5. Deviation Detected (Date)	Method
C-SPP-F-00055	Slag Cement	Slag Cement	3-04-15	Phone

6. All Previous SDDRS (No./Date)	7. SRS PO No./Change Notice No.	8. SRS Buyer	9. SRS Part No.
None	SRRA0C4184	Abbey Evans	N/A

10. SRS Part Name	11. SRS SSR Notified (Date)	Method	12. SRS Eng Notified (Date)	Method
Slag Cement	03-04-15	Phone	3-09-15	Phone

13. Deviation Description (attach extra sheets, photographs, sketches, etc., as necessary and identify quantity and Serial Nos. as applicable).
Section 3.2.3.3 states the slag cement must meet ASTM C989, Grade 100. This slag is no longer available in the Southeast, USA.

14. Supplier's Proposed Disposition ○ Use As-Is ○ Repair ☑ Modify SRS Requirement

15. Cost Impact	16. Schedule Impact
TBD	TBD

17. Proposed Disposition and Technical (plus cost/schedule if applicable) Justification (attach extra sheets, sketches, etc., as necessary).
Change specification to allow for the use of ASTM 989, Grade 120 slag from Lehigh or other source ~~from~~ available in the SE, USA. Test Reports attached.

18. Associated Supplier Document Change(s) Attached Last 12 months ASTM C989 Test Reports

19. Supplier's Authorized Representative (Print Name/Signature)	Title	Date
Carl Darlak Carl Darlak	QA Manager	3-30-15

SRS

*20. SRS Eng Action
☒ Accepted * ☐ Rejected
* Per Block 22
☐ Drawing Change: ☐ SRS ☐ Supplier
☒ Specification/Requisition Change
☐ Other Suppliers Affected
☐ Baseline Change
☐ Follow-up
☐ Other

Item Description Slag Cement
End Use SRR/Construction
Responsible Division SRR/DS
Functional Class GS

*21. USQ/TSQ Document No.	For Prior Use USQ Application (Print Name/Signature) CTF1:	CTF2:
USQ-HTF-2015-00300	N/A	N/A

*22. SRS Disposition Statement Including Justification (attach extra sheets, sketches, etc., as necessary).
See pages 15-16 for Engineering disposition, including the grout mix requalification requirements for the acceptance of the proposed slag cement material, in Block 17 of this SDDR.

Incorporation Required	Document No.(s)	SRS Action Required
☒ Yes ○ No	C-SPP-F-00055, Rev.4	☒ Yes ○ No

*23. SRS Acceptance/Printed Name/Signature

Amit Ganguly / A Ganguly (CTF/Disposition Originator)	6/15/15 (Date)	Bruce Dragon / (CQF)	8/31/15 (Date)
Carlos Chiappetto / Carlos C Chiappetto (VER/CHK)	8-27-15 (Date)	Marcus Deason / M K Deason (PMMD)	9/14/15 (Date)
Max Howard / E. Howard (MGR)	9-14-15 (Date)	R. Voeltzel (Other) DESIGN AUTHORITY CIVIL/STRUCTURAL ENGINEERING	9/3/15 (Date)

Material Certification Report

Hanson

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989

DATE: 01-Apr-2014

General Information

Supplier:	Hanson Slag Cement DBA Civil and Marine, Inc	Source Location:	Hanson Slag Cement
Address	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
Telephone	(321) 302-2254	Contact:	Dennis Thompson (321) 302-2254

The following information is based on average test data. The data is typical of GGBFS shipped by Hanson Slag Cement; individual shipments may vary

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0 51
			Blaine Fineness (m2/kg)	-	534
Sulfide S (%)	2.5 max	1 1	Air Content (%)	12 max	4.0
Sulfate Ion - SO_3 (%)	NA	3 2	Slag Activity Index (SAI %)		
			Average of Last 5 Samples:		
			Avg 7 Day Index	75 min	95
			Avg 28 Day Index	95 min	121
			Current Samples		
			7 Day Index	70 min	97
			28 Day Index	90 min	125

Test Data on Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0 60 - 0 90	0 64	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi):		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.38	Specific Gravity	-	2 89
%Cl (Chloride)	-	0 01	1 Day Accelerated (C-1073) psi	-	2267

Certification Statement

Hanson Slag Cement meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989

DATE: 01-May-2014

General Information

Supplier:	Lehigh Cement Company	Source Location:	Lehigh Cement Company
Address	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
		Contact:	Dennis Thompson (321) 302-2254

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant; individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0.41
			Blaine Fineness (m2/kg)	-	532
Sulfide S (%)	2.5 max	1.1	Air Content (%)	12 max	4.0
Sulfate Ion - SO_3 (%)	NA	3.4	Slag Activity Index (SAI %)		
			Average of Last 5 Samples		
			Avg 7 Day Index	75 min	98
			Avg 28 Day Index	95 min	127
			Current Samples		
			7 Day Index	70 min	99
			28 Day Index	90 min	131

Test Data on CCRL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0.60 - 0.90	0.64	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi)		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.40	Specific Gravity	-	2.89
%Cl (Chloride)	-	0.01	1 Day Accelerated (C-1073) psi	-	2300

Certification Statement

Lehigh Cement Co. CAMCEM meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989

DATE: 01-Jun-2014

General Information

Supplier:	Lehigh Cement Company	Source Location:	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
		Contact:	Dennis Thompson (321) 302-2254

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0.94
			Blaine Fineness (m2/kg)	-	528
Sulfide S (%)	2.5 max	1.1	Air Content (%)	12 max	4.1
Sulfate Ion - SO_3 (%)	NA	3.4	Slag Activity Index (SAI %)		
			Average of Last 5 Samples:		
			Avg 7 Day Index	75 min	102
			Avg 28 Day Index	95 min	122
			Current Samples		
			7 Day Index	70 min	100
			28 Day Index	90 min	121

Test Data on CCRL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0.60 - 0.90	0.64	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi):		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.40	Specific Gravity	-	2.89
%Cl (Chloride)	-	0.01	1 Day Accelerated (C-1073) psi	-	2227

Certification Statement

Lehigh Cement Co. CAMCEM meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™ HEIDELBERGCEMENT Group

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989

DATE: 01-Jul-2014

General Information

Supplier:	Lehigh Cement Company	Source Location	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
		Contact:	Dennis Thompson (321) 302-2254

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0.98
			Blaine Fineness (m2/kg)	-	527
Sulfide S (%)	2.5 max	1.1	Air Content (%)	12 max	4.0
Sulfate Ion - SO_3 (%)	NA	3.4	Slag Activity Index (SAI %)		
			Average of Last 5 Samples		
			Avg 7 Day Index	75 min	100
			Avg 28 Day Index	95 min	124
			Current Samples		
			7 Day Index	70 min	103
			28 Day Index	90 min	122

Test Data on CORL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0.60 - 0.90	0.64	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi):		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.40	Specific Gravity	-	2.89
%Cl (Chloride)	-	0.01	1 Day Accelerated (C-1073) psi	-	2201

Certification Statement

Lehigh Cement Co. CAMCEM meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

SDDR #13162,
PAGE 6 of 16

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989

DATE: 01-Aug-2014

General Information

Supplier:	Lehigh Cement Company	Source Location	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
		Contact:	Dennis Thompson (321) 302-2254

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	1.13
			Blaine Fineness (m2/kg)	-	529
Sulfide S (%)	2.5 max	0.9	Air Content (%)	12 max	4.0
Sulfate Ion - SO_3 (%)	NA	3.2	Slag Activity Index (SAI %)		
			Average of Last 5 Samples:		
			Avg 7 Day Index	75 min	100
			Avg 28 Day Index	95 min	125
			Current Samples:		
			7 Day Index	70 min	99
			28 Day Index	90 min	124

Test Data on CCRL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0.60 - 0.90	0.64	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi)		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.40	Specific Gravity	-	2.89
%Cl (Chloride)	-	0.01	1 Day Accelerated (C-1073) psi	-	2330

Certification Statement

Lehigh Cement Co. CAMCEM meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989

DATE: 01-Sep-2014

General Information

Supplier:	Lehigh Cement Company	Source Location:	Lehigh Cement Company
Address	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
		Contact:	Dennis Thompson (321) 302-2254

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	1 07
			Blaine Fineness (m2/kg)	-	526
Sulfide S (%)	2 5 max	0 9	Air Content (%)	12 max	4 4
Sulfate Ion - SO_3 (%)	NA	3 2	Slag Activity Index (SAI %)		
			Average of Last 5 Samples		
			Avg 7 Day Index	75 min	98
			Avg 28 Day Index	95 min	122
			Current Samples		
			7 Day Index	70 min	99
			28 Day Index	90 min	121

Test Data on CCRL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0 60 - 0 90	0 64	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi)		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0 40	Specific Gravity	-	2 89
%Cl (Chloride)	-	0 01	1 Day Accelerated (C-1073) psi	-	2300

Certification Statement

Lehigh Cement Co. CAMCEM meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

SDDR #13182,
PAGE 8 of 16

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989 Grade 120

DATE: 01-Oct-2014

General Information

Supplier:	Lehigh Cement Company	Source Location:	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
		Contact:	Dennis Thompson (321) 302-2254

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No 325) Sieve (%)	20 max	0.67
			Blaine Fineness (m2/kg)	-	522
Sulfide S (%)	2.5 max	0.5	Air Content (%)	12 max	4.4
Sulfate Ion - SO_3 (%)	NA	3.4	Slag Activity Index (SAI %)		
			Average of Last 5 Samples:		
			Avg 7 Day Index	75 min	100
			Avg 28 Day Index	95 min	122
			Current Samples:		
			7 Day Index	70 min	99
			28 Day Index	90 min	119

Test Data on CCRL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0.60 - 0.90	0.64	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi):		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.40	Specific Gravity	-	2.89
%Cl (Chloride)	-	0.01	1 Day Accelerated (C-1073) psi	-	2424

Certification Statement

Lehigh Cement Co. CAMCEM meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989 Grade 120

DATE: 01-Nov-2014

General Information

Supplier:	Lehigh Cement Company	Source Location	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
		Contact:	Dennis Thompson (321) 302-2254

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0 51
			Blaine Fineness (m2/kg)	-	527
Sulfide S (%)	2 5 max	0 8	Air Content (%)	12 max	4.4
Sulfate Ion - SO_3 (%)	NA	3.4	Slag Activity Index (SAI %)		
			Average of Last 5 Samples.		
			Avg 7 Day Index	75 min	101
			Avg 28 Day Index	95 min	124
			Current Samples:		
			7 Day Index	70 min	102
			28 Day Index	90 min	125

Test Data on CORL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0 60 - 0.90	0.64	Blaine Fineness (m2/kg)	-	383
C_3S	-	65	Compressive Strength MPa (psi)		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38 2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.40	Specific Gravity	-	2 89
%Cl (Chloride)	-	0 01	1 Day Accelerated (C-1073) psi	-	2418

Certification Statement

Lehigh Cement Co. CAMCEM meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™
HEIDELBERGCEMENTGroup

Brand Name: CAMCEM™
Material: Slag Cement
Type: ASTM C989 Grade 120

DATE: 01-Dec-2014

General Information

Supplier:	Lehigh Cement Company	Source Location:	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920
		Contact:	Dennis Thompson (321) 302-2254

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0 60
			Blaine Fineness (m2/kg)	-	528
Sulfide S (%)	2.5 max	0 8	Air Content (%)	12 max	4 2
Sulfate Ion - SO_3 (%)	NA	3 4	Slag Activity Index (SAI %)		
			Average of Last 5 Samples:		
			Avg 7 Day Index	75 min	101
			Avg 28 Day Index	95 min	123
			Current Samples		
			7 Day Index	70 min	100
			28 Day Index	90 min	125

Test Data on CORL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0 60 - 0 90	0 64	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi):		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0 40	Specific Gravity	-	2 89
%Cl (Chloride)	-	0 01	1 Day Accelerated (C-1073) psi	-	2313

Certification Statement

Lehigh Cement Co. CAMCEM meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: Lehigh Slag Cement
Material: Slag Cement
Type: ASTM C989 Grade 120

DATE: 01-Jan-2015

General Information

Supplier:	Lehigh Cement Company	Manuf. Location:	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0 50
			Blaine Fineness (m2/kg)	-	535
Sulfide S (%)	2 5 max	0 8	Air Content (%)	12 max	4 3
Sulfate Ion - SO_3 (%)	NA	3 4	Slag Activity Index (SAI %)		
			Average of Last 5 Samples:		
			Avg 7 Day Index	95 min	102
			Avg 28 Day Index	115 min	124
			Current Samples:		
			7 Day Index	90 min	102
			28 Day Index	110 min	126

Test Data on CCRL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0 60 - 0 90	0.64	Blaine Fineness (m2/kg)	-	383
C_3S	-	65	Compressive Strength MPa (psi):		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0 40	Specific Gravity	-	2.89
%Cl (Chloride)	-	0.01	1 Day Accelerated (C-1073) psi	-	2433

Certification Statement

Lehigh Slag Cement meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: Lehigh Slag Cement
Material: GGBFS
Type: ASTM C989 Grade 120

DATE: 01-Feb-2015

General Information

Supplier:	Lehigh Cement Company	Manuf. Location:	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0.49
			Blaine Fineness (m2/kg)	-	534
Sulfide S (%)	2.5 max	0.9	Air Content (%)	12 max	5.0
Sulfate Ion - SO_3 (%)	NA	3.4	Slag Activity Index (SAI %)		
			Average of Last 5 Samples:		
			Avg 7 Day Index	95 min	99
			Avg 28 Day Index	115 min	121
			Current Samples		
			7 Day Index	90 min	101
			28 Day Index	110 min	121

Test Data on CCRL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0.60 - 0.90	0.64	Blaine Fineness (m2/kg)	-	383
C_3S	-	65	Compressive Strength MPa (psi):		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.40	Specific Gravity	-	2.89
%Cl (Chloride)	-	0.01	1 Day Accelerated (C-1073) psi	-	2312

Certification Statement

Lehigh Slag Cement meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

Material Certification Report

LEHIGH™
HEIDELBERGCEMENT Group

Brand Name: Lehigh Slag Cement
Material: GGBFS
Type: ASTM C989 Grade 120

DATE: 01-Mar-2015

General Information

Supplier:	Lehigh Cement Company	Manuf. Location:	Lehigh Cement Company
Address:	575 Cargo Road		575 Cargo Road
	Cape Canaveral, Florida 32920		Cape Canaveral, Florida 32920

The following information is based on monthly average test data. The data is typical of GGBFS shipped by Lehigh Cement Company, Cape Canaveral, FL Plant. Individual shipments may vary.

Test Data on ASTM "Standard" Requirements

Chemical (C989, Table 2)			Physical (C989, Table1)		
Item	Limit	Result	Item	Limit	Result
			+45 µm (No. 325) Sieve (%)	20 max	0.79
			Blaine Fineness (m2/kg)	-	538
Sulfide S (%)	2.5 max	0.9	Air Content (%)	12 max	4.7
Sulfate Ion - SO_3 (%)	NA	3.3	Slag Activity Index (SAI %)		
			Average of Last 5 Samples:		
			Avg 7 Day Index	95 min	98
			Avg 28 Day Index	115 min	121
			Current Samples:		
			7 Day Index	90 min	99
			28 Day Index	110 min	122

Test Data on CCRL Reference Cement

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
Total Alkalies as Na_2O (%)	0.80 - 0.90	0.84	Blaine Fineness (m2/kg)	-	363
C_3S	-	65	Compressive Strength MPa (psi):		
C_2S	-	8	7 Day	-	4358
C_3A	-	7	28 Day	35 (5000) min	38.2 (5450)
C_4AF	-	8			

Optional Test Data

Chemical			Physical		
Item	Limit	Result	Item	Limit	Result
% Total Alkalies	-	0.40	Specific Gravity	-	2.89
%Cl (Chloride)	-	0.01	1 Day Accelerated (C-1073) psi	-	2341

Certification Statement

Lehigh Slag Cement meets Section 929-1 and 929-5 of FDOT Specifications

Dennis S. Thompson (Laboratory Manager)

SDDR #13182,
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AECOM

Savannah River Site

4/30/2015

Tank Closure Mix Design
Specification C-SPP-F-00055 Rev. 4

Admixtures used for mix design:
Type I/II Cement = 6.94 lbs.
Type 100 Slag = 11.67 lbs.
Flyash = 20.17
Recover = as required / added 0.7 oz.
HRWR = allowed 2.22 oz. / only used 1.11 oz.
EXE 958 = 11.11 grams = allowed 2.3 oz. / only used 1.15 oz.
Water = 22.44 lbs.
Sand 99.44 lbs. absorption factor = 0.6%
#8 Stone 44.44 lbs. absorption factor = 0.36%

FOR INFORMATION ONL

Results Using Type 100 Slag (4/30/15):
Flow = 27/28 Avg. = 27.5"
Unit Wt. = 133.6
Air Content = 1.1%
Concrete Temp. 68°
Ambient 61°
Five (5) Compressive Strength Cyl, Cast at 10:00am (All 5 cyl. will be broken at 28)
Two (2) 6 x 12 in. cylinders was cast for Heat of Hydration
One (1) 6 x 12 in. cylinders was cast for Bleed Water

28 day avg. Ps. 2180
2140
2100
2140 psi.

Results Using Type 120 Slag (4/30/15):
Flow = 28.5/28.5 Avg. = 28.5"
Unit Wt. = 133.8
Air Content = 1.0%
Concrete Temp. 66°
Ambient 64°
Five (5) Compressive Strength Cyl, Cast at 11:00am (All 5 cyl. will be broken at 28)
Two (2) 6 x 12 in. cylinders was cast for Heat of Hydration
One (1) 6 x 12 in. cylinders was cast for Bleed Water

28 day avg. Ps. 2200
2140
2210
2180 psi

BLOCK 22 – (Continued from Page 1)

References: 1) SRR Tank Closure Grout Specification # C-SPP-F-00055, Revision 4, "Furnishing and Delivery of Tank Closure Grout".

2) 28-day Compressive Strength Test results from AECOM, SRS Concrete Laboratory, dated 4/30/2015, (Page 14 of this SDDR).

3) Slag Cement Material Certification reports per Block 17 (pages 2-13) of this SDDR.

4) SRR IOM # SRR-CWDA-2015-00057, Revision 0, dated May 12, 2015, "Evaluation of the Use of Grade 120 Slag Cement in Tank Closure Grout versus Performance Assessment Assumptions".

5) SRR Report # VSL-15R3740-1, Revision 0, Final Report, "Investigation of Alternate Ground Granulated Blast Furnace Slag for the Saltstone Facility", by Vitreous State Laboratory, The Catholic University of America, Washington, DC 20064, dated July 24, 2015.

SRR DISPOSITION: Modify SRS Requirements

Considering material unavailability, SRR agrees to allow the use of slag cement which complies with ASTM C 989 Grade 100 or Grade 120 per the specification change proposed by the grout supplier in Block 17 of this SDDR, subject to the conditions stated below:

a) The grout supplier shall meet all other requirements in the specification (Ref.1), including the grout mix requalification tests required in Sections 1.1.2.5, 3.2.1.2.B, and 3.4.4.2.
b) Verification of compliance of the requalification test results with the specification requirements shall be completed by the grout supplier prior to using the proposed material in the grout mix.

Technical Justification:

- The material certification reports (Ref.3), the 28-day compressive strength test report (Ref.2) and the SRR IOM (Ref.4) showed that the Slag Cement Grade 120 met the ASTM C989 physical and chemical properties.
- Conclusion in page 5 of the SRR IOM (Ref.4), states "Use of the Grade 120 Slag Cement during H-Tank Farm waste tank closure is consistent with the inputs and assumptions contained within the HTF PA, and could be carried out in compliance with the HTF

Performance Objectives detailed within the PA, assuming other grout performance and testing requirements are met".

- An investigation of alternate ground granulated blast furnace slag (GGBFS) (Ref.5), utilized as a component in saltstone, tank closure grout, and the SDU concrete at SRS, was performed. Investigation included testing on the present Holcim GGBFS slag and four potential alternative GGBFS materials.

  The report (Ref.5, page 17) recommended that – "...Lehigh Grade 120 GGBFS appears to be a reasonable replacement for the current Holcim Grade 100 GGBFS and is the recommended selection based on the results from the present work. Lafarge Grade 120 GGBFS is the second best choice amongst the materials tested and is recommended as a back-up option...".

  The report (Ref.5, page 4) also stated that substituting Grade 100 slag with the higher Grade 120 slag will result in higher compressive strength, because of the smaller particle size and enhanced reactivity of the higher grade slag.

Based on above rationale and data, ASTM C989, Grade 120 may be used as an optional Slag Cement material.

DESCRIPTION OF SPECIFICATION CHANGES:

a) REPLACE "Grade 100" with "Grade 100 or Grade 120", at the end of the Sections 3.2.3.3.A, 3.2.3.3.B and 3.2.3.3.C (page 10) of the referenced specification.
b) ADD the following sentence at the end of the Section 3.2.3.3.A:
"The recommended material sources for the Grade 120 Slag Cement shall be Lehigh Grade 120 (preferred) or the Lafarge Grade 120 (optional)."
c) REPLACE SLAG CEMENT MATERIAL GRADE "100" by "100/120" in the Cementitious Material column, on page 1 of the Attachment 5.5 of the referenced specification.