


# Procurement Specification Cover Sheet

1. Title F Tank Farm, Tank 18F and Tank 19F, Furnishing and Delivery of Tank Closure Mixes (U)			
			ENGINEERING DOC. CONTROL - SRS  00706138
2. Specification No. C-SPP-F-00047	3. Revision 2	4. <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Engineered	5. Page 1 of 55
6. Functional Classification GS	7. Requester Department DESIGN EXECUTION	8. Requester Division PE&CD SFSD	
9. Cognizant Technical Function			
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Department HLW			



**TABLE OF CONTENTS**

<b>SECTION NUMBER</b>	<b>TITLE</b>	<b>REVISION NUMBER</b>	<b>DATE</b>
<b>DIVISION 1 - GENERAL REQUIREMENTS</b>			
01100	Summary of Work	2	
01300	Administrative Requirements	2	
01323	Schedules	2	
01330	Submittal Procedures	2	
01410	Independent Inspection/Testing Laboratory Services	2	
<b>DIVISION 3 - CONCRETE</b>			
03311	Tank Closure Mixes	2	

## SUMMARY OF WORK

### PART 1 GENERAL

#### 1.1 WORK DESCRIPTION

- A. This work includes furnishing and delivering various tank closure mixes for filling and closing Tank 18 and Tank 19 in the F Area Tank Farm at the Savannah River Site, Aiken, South Carolina.

#### 1.2 RELATED SECTIONS

- A. Section 01300 Administrative Requirements
- B. Section 01323 Schedules
- C. Section 01330 Submittal Procedures
- D. Section 01410 Independent Inspection/Testing Laboratory Services
- E. Section 03311 Tank Closure Mixes

#### 1.3 WORK BY SUBCONTRACTOR

- A. Subcontractor shall provide and install a qualified portable centralized batching facility and stationary mixer unit(s). The portable centralized batching facility and stationary mixer unit(s) shall be installed in an area outside of the F Area Tank Farm at the Savannah River Site. The area outside the F Area Tank Farm shall also be used as the staging area, stockpiling area, and storage area for the products used to generate the various tank closure mixes for the Tank 18 and Tank 19 filling and closing.
- B. The portable centralized batching facility and stationary mixer unit(s) shall be capable of generating 75 cubic yards per hour of the various tank closure mixes. The total quantity of tank closure mixes to be generated over the scheduled time frame by the portable centralized batching facility and stationary mixer unit(s) is approximately 17,264 cubic yards.
- C. Subcontractor shall provide a conveying system for delivery of the dry tank closure mixes. The conveying system shall be capable of transporting the dry tank closure mixes from the portable centralized batching facility and stationary mixer unit(s) to areas near Tank 18 and Tank 19 inside the F Area Tank Farm at the Savannah River Site.
- D. Subcontractor shall provide a conveying system for delivery of the last 50 cubic yards of the wet tank closure mix for the thirteenth lift. The conveying system shall be capable of transporting the wet closure mix from the portable centralized

batching facility and stationary mixer unit(s) to areas near Tank 18 and Tank 19 inside the F Area Tank Farm at the Savannah River Site.

- E. Subcontractor shall provide a conveying system for delivery of the wet closure mix for the fifteenth lift. The conveying system shall be capable of transporting the wet closure mix from the portable centralized batching facility and stationary mixer unit(s) or the locally approved Site Supplier to areas near Tank 18 and Tank 19 inside the F Area Tank Farm at the Savannah River Site.
- F. Subcontractor shall control the quality of products and services to meet the requirements of this specification, applicable codes and standards, and other Subcontractor documents.
- G. Subcontractor shall obtain, stage, stockpile, and store all of the products used to generate the various tank closure mixes.
- H. Subcontractor shall generate the various quantities of the tank closure mixes for the Tank 18 and Tank 19 filling and closing as scheduled.
- I. Subcontractor shall engage an Independent Inspection/Testing Laboratory to perform inspections and testing of the equipment and material used to generate the various tank closure mixes.
- J. Subcontractor shall submit the appropriate documentation in accordance with this specification and Subcontractor documents.

#### 1.4 WORK BY BSRI

- A. BSRI shall provide independent testing services for the various tank closure mixes at the point of discharge from the portable centralized batching facility and stationary mixer unit(s) and the point of discharge inside of the F Area Tank Farm for the wet closure mixes as required.
- B. BSRI shall provide and operate the pumping equipment for transport of the various wet tank closure mixes from the point of discharge at the portable centralized batching facility and stationary mixer unit(s) to Tank 18 and Tank 19.
- C. BSRI shall provide the hose connection to the discharge connection of the conveying system for delivery of the dry tank closure mixes, the hose, and the hose connection to Tank 18 and Tank 19 for transport of the dry closure mixes from areas near Tank 18 and Tank 19 inside the F Area Tank Farm at the Savannah River Site to Tank 18 and Tank 19.
- D. BSRI shall provide and operate the pumping equipment for transport of the last 50 cubic yards of the wet tank closure mix for the thirteenth lift from areas near Tank 18 and Tank 19 inside the F Area Tank Farm at the Savannah River Site to Tank 18 and Tank 19.

- E. BSRI shall provide and operate the pumping equipment for transport of the wet tank closure mix for the fifteenth lift from areas near Tank 18 and Tank 19 inside the F Area Tank Farm at the Savannah River Site to Tank 18 and Tank 19.
- F. BSRI shall monitor the placement of the tank closure mixes internally at Tank 18 and Tank 19 to ensure the various tank closure mixes are flowing properly and self-leveling properly.
- G. BSRI shall monitor the placement of the tank closure mixes internally at Tank 18 and Tank 19 for the production of bleed water.
- H. BSRI shall advise the Subcontractor, through the Subcontractor Technical Representative, on the amount of water to be provided in the various tank closure mixes based upon flow properties, self-leveling properties, and the production of bleed water.
- I. BSRI shall provide a wash area in order to washout Subcontractor operated equipment for the conveying systems used to deliver wet tank closure mixes to areas near Tank 18 and Tank 19 inside the F Area Tank Farm at the Savannah River Site.
- J. BSRI shall provide radio communications between Tank 18 and Tank 19 inside the F Area Tank Farm at the Savannah River Site to the portable centralized batching facility and stationary mixer unit(s).

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

**END OF SECTION**

## ADMINISTRATIVE REQUIREMENTS

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Subcontractor shall attend all identified meetings and provide coordination activities.

#### 1.2 RELATED SECTIONS

- A. Section 01323 Schedules
- B. Section 01330 Submittal Procedures

#### 1.3 WORK INCLUDED

- A. Subcontractor shall attend a pre-mobilization meeting at the Savannah River Site scheduled and held by BSRI.
- B. Subcontractor shall attend BSRI coordination meetings scheduled and held before each lift, if required, to ensure all organizations understand the lift activities required and ensure each organization can perform the required lift activities.
- C. Subcontractor shall coordinate with BSRI during each lift to ensure production rates, tank closure mix flow performance, and water addition or reduction in the tank closure mix.

### PART 2 PRODUCTS

NOT USED

### PART 3 EXECUTION

NOT USED

END OF SECTION

## SCHEDULES

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Subcontractor shall submit a schedule(s) based upon the information provided in this section.

#### 1.2 RELATED SECTIONS

- A. Section 01300 Administrative Requirements
- B. Section 01330 Submittal Procedures
- C. Section 03311 Tank Closure Mixes

#### 1.3 SUBCONTRACTOR SUBMITTALS

- A. Subcontractor shall submit a preliminary schedule with the proposal. The preliminary schedule shall be based upon the Subcontract Field Conditions provided. The preliminary schedule shall include the furnishing and delivery schedule conditions. The preliminary schedule shall be based upon a weekly timeline and shall not be based upon actual dates. The preliminary schedule shall begin with award as the start date.
- B. Subcontractor shall submit a final schedule subsequent to award that includes the furnishing and delivery schedule used and delivery schedule conditions. The final schedule shall be based upon the Subcontractor Field Conditions. The final schedule shall be submitted within two (2) weeks after award. The final schedule shall be based upon actual dates. The final schedule shall begin with mobilization as the start date.

#### 1.4 FURNISHING AND DELIVERY SCHEDULE CONDITIONS

- A. The schedule shall incorporate mobilization time.
- B. The schedule shall incorporate demobilization time.
- C. The schedule shall incorporate the portable centralized batching facility and stationary mixer unit(s) calibration and inspection time.
- D. The schedule shall incorporate time required for submittals.
- E. Tank closure mix quantities provided vary based upon conditions in the waste tanks and quantities associated with the dry tank closure mixes used.



- F. The riser grout to be supplied for the fifteenth lift for each waste tank may be obtained locally from an approved Site Supplier (LaFarge) in lieu of producing the riser grout using the portable centralized batching facility and stationary mixer unit(s).

## 1.5 FURNISHING AND DELIVERY SCHEDULE

### TANK 19

- A. First lift using reducing grout (OPDEXE-X-P-0-BS)
  - 1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing grout shall be discharged in a wet form into a pump provided and operated by BSRI.
  - 2. Total quantity of reducing grout is approximately 632 cubic yards.
- B. Second lift using dry reducing grout mixture (4TK-X-S)
  - 1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing grout mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing grout mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing grout mixture into the waste tank.
  - 2. Total quantity of dry reducing grout mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
- C. Third lift using reducing grout (OPDEXE-X-P-0-BS)
  - 1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing grout shall be discharged in a wet form into a pump provided and operated by BSRI.
  - 2. Total quantity of reducing grout is approximately 260 cubic yards.
- D. Fourth lift using dry reducing grout mixture (4TK-X-S)
  - 1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing grout mixture shall be discharged in a dry form into a conveying system provided and operated

by the Subcontractor. The dry reducing grout mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing grout mixture into the waste tank.

2. Total quantity of dry reducing grout mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
- E. Fifth lift using reducing grout (OPDEXE-X-P-0-BS)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing grout shall be discharged in a wet form into a pump provided and operated by BSRI.
  2. Total quantity of reducing grout is approximately 2,100 cubic yards.
- F. Sixth lift using dry reducing grout mixture (4TK-X-S)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing grout mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing grout mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing grout mixture into the waste tank.
  2. Total quantity of dry reducing grout mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
- G. Seventh lift using reducing CLSM (OPCEXE-X-P-0-BS)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing CLSM shall be discharged in a wet form into a pump provided and operated by BSRI.
  2. Total quantity of reducing CLSM is approximately 2,100 cubic yards.
- H. Eighth lift using dry reducing CLSM mixture (3TK-X-S)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing CLSM mixture shall be

discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing CLSM mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing CLSM mixture into the waste tank.

2. Total quantity of dry reducing CLSM mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
- I. Ninth lift using reducing CLSM (OPCEXE-X-P-0-BS)
    1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing CLSM shall be discharged in a wet form into a pump provided and operated by BSRI.
    2. Total quantity of reducing CLSM is approximately 2,100 cubic yards.
  - J. Tenth lift using dry reducing CLSM mixture (3TK-X-S)
    1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing CLSM mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing CLSM mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing CLSM mixture into the waste tank.
    2. Total quantity of dry reducing CLSM mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
  - K. Eleventh lift using strong grout (B2000-X-0-0-BS)
    1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the strong grout shall be discharged in a wet form into a pump provided and operated by BSRI.
    2. Total quantity of strong grout is approximately 700 cubic yards.
  - L. Twelfth lift using dry reducing CLSM mixture (3TK-X-S)
    1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to

support the lift. For this lift, the dry reducing CLSM mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing CLSM mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing CLSM mixture into the waste tank.

2. Total quantity of dry reducing CLSM mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.

M. Thirteenth lift using strong grout (B2000-X-0-0-BS)

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the first 400 cubic yards of the strong grout shall be discharged in a wet form into a pump provided and operated by BSRI.
2. For this lift, the last 50 cubic yards of the strong grout shall be discharged in a wet form into a conveying system provided and operated by the Subcontractor. The strong grout shall be delivered into the F Area Tank Farm where it shall be discharged in a wet form into a pump provided and operated by BSRI.
3. Total quantity of strong grout is approximately 450 cubic yards.

N. Fourteenth lift using dry reducing CLSM mixture (3TK-X-S)

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing CLSM mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing CLSM mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing CLSM mixture into the waste tank.
2. Total quantity of dry reducing CLSM mixture is approximately 10 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.

O. Fifteenth lift using riser grout (D5000-X-0-0-A)

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the riser grout shall be discharged in a wet

form into a conveying system provided and operated by the Subcontractor. The riser grout shall be delivered into the F Area Tank Farm where it shall be discharged in a wet form into a pump provided and operated by BSRI.

2. Total quantity of riser grout is approximately 100 cubic yards.

#### TANK 18

##### P. First lift using reducing grout (OPDEXE-X-P-0-BS)

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing grout shall be discharged in a wet form into a pump provided and operated by BSRI.
2. Total quantity of reducing grout is approximately 632 cubic yards.

##### Q. Second lift using dry reducing grout mixture (4TK-X-S)

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing grout mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing grout mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing grout mixture into the waste tank.
2. Total quantity of dry reducing grout mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.

##### R. Third lift using reducing grout (OPDEXE-X-P-0-BS)

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing grout shall be discharged in a wet form into a pump provided and operated by BSRI.
2. Total quantity of reducing grout is approximately 260 cubic yards.

##### S. Fourth lift using dry reducing grout mixture (4TK-X-S)

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing grout mixture shall be discharged in a dry form into a conveying system provided and operated

by the Subcontractor. The dry reducing grout mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing grout mixture into the waste tank.

2. Total quantity of dry reducing grout mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
- T. Fifth lift using reducing grout (OPDEXE-X-P-0-BS)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing grout shall be discharged in a wet form into a pump provided and operated by BSRI.
  2. Total quantity of reducing grout is approximately 2,100 cubic yards.
- U. Sixth lift using dry reducing grout mixture (4TK-X-S)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing grout mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing grout mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing grout mixture into the waste tank.
  2. Total quantity of dry reducing grout mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
- V. Seventh lift using reducing CLSM (OPCEXE-X-P-0-BS)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing CLSM shall be discharged in a wet form into a pump provided and operated by BSRI.
  2. Total quantity of reducing CLSM is approximately 2,100 cubic yards.
- W. Eighth lift using dry reducing CLSM mixture (3TK-X-S)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing CLSM mixture shall be

discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing CLSM mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing CLSM mixture into the waste tank.

2. Total quantity of dry reducing CLSM mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
- X. Ninth lift using reducing CLSM (OPCEXE-X-P-0-BS)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the reducing CLSM shall be discharged in a wet form into a pump provided and operated by BSRI.
  2. Total quantity of reducing CLSM is approximately 2,100 cubic yards.
- Y. Tenth lift using dry reducing CLSM mixture (3TK-X-S)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing CLSM mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing CLSM mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing CLSM mixture into the waste tank.
  2. Total quantity of dry reducing CLSM mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.
- Z. Eleventh lift using strong grout (B2000-X-0-0-BS)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the strong grout shall be discharged in a wet form into a pump provided and operated by BSRI.
  2. Total quantity of strong grout is approximately 700 cubic yards.
- AA. Twelfth lift using dry reducing CLSM mixture (3TK-X-S)
1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to

support the lift. For this lift, the dry reducing CLSM mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing CLSM mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing CLSM mixture into the waste tank.

2. Total quantity of dry reducing CLSM mixture is approximately 30 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.

**BB. Thirteenth lift using strong grout (B2000-X-0-0-BS)**

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the first 400 cubic yards of the strong grout shall be discharged in a wet form into a pump provided and operated by BSRI.
2. For this lift, the last 50 cubic yards of the strong grout shall be discharged in a wet form into a conveying system provided and operated by the Subcontractor. The strong grout shall be delivered into the F Area Tank Farm where it shall be discharged in a wet form into a pump provided and operated by BSRI.
3. Total quantity of strong grout is approximately 450 cubic yards.

**CC. Fourteenth lift using dry reducing CLSM mixture (3TK-X-S)**

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the dry reducing CLSM mixture shall be discharged in a dry form into a conveying system provided and operated by the Subcontractor. The dry reducing CLSM mixture shall be delivered into the F Area Tank Farm where BSRI personnel will connect to the conveying system and make the appropriate connections at the waste tank. BSRI will dictate the flow rate of the dry reducing CLSM mixture into the waste tank.
2. Total quantity of dry reducing CLSM mixture is approximately 10 cubic yards. This quantity will vary based upon the amount of free liquid in the waste tank.

**DD. Fifteenth lift using riser grout (D5000-X-0-0-A)**

1. Subcontractor shall provide personnel coverage for operation of the portable centralized batching facility and stationary mixer unit(s) to support the lift. For this lift, the riser grout shall be discharged in a wet



form into a conveying system provided and operated by the Subcontractor. The riser grout shall be delivered into the F Area Tank Farm where it shall be discharged in a wet form into a pump provided and operated by BSRI.

2. Total quantity of riser grout is approximately 100 cubic yards.

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

**END OF SECTION**

## SUBMITTAL PROCEDURES

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Subcontractor shall submit all documentation in accordance with the submittal process identified in this section.

#### 1.2 SUBMITTAL PROCESS

##### A. Submittal Process

1. Subcontractor shall submit all submittals as specified in individual sections of this specification and identified on the Engineering Document Requirements (EDR) Form and the Quality Verification Document Requirements (QVDR) Form. The Engineering Document Requirements Form and Instructions are provided in Attachment 01330.1 and the Quality Verification Document Requirements Form and Instructions are provided in Attachment 01330.2.
2. Subcontractor shall submit all submittals as legible and reproducible copies.
3. Subcontractor shall not use recycled paper for submittals.
4. Subcontractor shall transmit all submittals with a transmittal letter to:  
  
Document Control Center (730-B)  
Westinghouse Savannah River Company  
Savannah River Site  
Aiken, SC 29808
5. Subcontractor shall transmit one (1) copy of the transmittal letter only to:  
  
Attn: Buyer (to be named later), 730-4B  
Westinghouse Savannah River Company  
Savannah River Site  
Aiken, SC 29808
6. Subcontractor shall provide the following information on all submittals, transmittal letters, and correspondence:  
  
Subcontract Technical Representative  
Name (assigned by BSRI at a later date)  
Building (assigned by BSRI at a later date)  
Bechtel Savannah River, Incorporated

Savannah River Site  
P.O. Box 616  
Aiken, SC 29808

**B. Review and Status**

1. Submittals transmitted after award will be reviewed, processed, and returned to the Subcontractor with a status using the Supplier Document Status Form. The Supplier Document Status Form and Instructions are provided in Attachment 01330.4.
2. Subcontractor shall allow 30 days from the date submittals are received for review and processing.
3. Subcontractor shall incorporate required changes and resubmit revised submittals for review within 15 calendar days. Subcontractor shall indicate revisions to resubmitted submittals and the previous assigned submittal control number.
4. Subcontractor shall resubmit revised submittals that previously received a Status 1.

**C. Subcontractor Record Documents**

1. Subcontractor shall maintain a log of submittal revisions, dates, and current status.

**1.3 SUPPLIER DEVIATION DISPOSITION REQUEST**

- A. Subcontractor shall prepare a Supplier Deviation Disposition Request (SDDR) for any proposed changes to this specification after contract award. Supplier Deviation Disposition Request and Instructions are provided in Attachment 01330.3.
- B. Subcontractor shall not implement a Supplier Deviation Disposition Request until the Supplier Deviation Disposition Request has been accepted.
- C. Subcontractor shall provide the following information for each exception or nonconforming item:
  1. Applicable document and revision number
  2. Criteria affecting the proposed change by section number and subsection
  3. Summary of the reasons for the exception or nonconforming item
  4. Proposal for resolution including justification
  5. Cost and schedule impacts

- D. Subcontractor shall transmit two (2) copies of the Supplier Deviation Disposition Request to Document Control.

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

ATTACHMENT 01330.1

ENGINEERING DOCUMENT REQUIREMENTS

1. Document Category Number	2. Specification Paragraph Reference	3. Document Description	4. Permission to Proceed Required		5. Submittal Schedule	6. Quantity Required		7. Kind of Copies	8. Remarks
			Yes	No		Init.	Final		
11.0	03311, 1.6A	NRMCA QC3 Certification or Alternate Documentation with Equivalence to NRMCA QC3 Certification	X		After Installation of Batch Plant	2	1	Repro	
11.0	03311, 1.6B	ASTM C685/C685M Calibration and Efficiency Testing	X		After Installation of Batch Plant	2	1	Repro	
11.0	03311, 1.6C	Inspection Report for the Conveying System for the Required Dry tank Closure Mixes	X		Prior to use	2	1	Repro	
11.0	03311, 1.6D	Inspection Report for the Conveying System for the Required Wet Tank Closure Mixes	X		Prior to Use	2	1	Repro	
28.0	01410, 1.5A	Independent Inspection/Testing Laboratory Information		X	With Proposal	2	1	Repro	
28.0	01410, 1.5B	Independent Inspection/Testing Laboratory Inspection Information	X		2 weeks after Award	2	1	Repro	
28.0	01410, 1.5C	Independent Inspection/Testing Laboratory Accreditation Documentation	X		2 weeks after Award	2	1	Repro	
6.0	01410, 1.5E	Independent Inspection/Testing Laboratory Quality Assurance Program	X		2 weeks after Award	2	1	Repro	
5.0	01323, 1.3A	Preliminary Schedule		X	With Proposal	2	1	Repro	
5.0	01323, 1.3B	Final Schedule	X		2 Weeks after Award	2	1	Repro	

**ATTACHMENT 01330.1**

**Engineering Document Requirements Form Instructions**

Purpose: The Engineering Document Requirements (EDR) form is prepared by the originator, establishes a basis of actions required of a Supplier and provides the schedule for the submittal of engineering documents by the Supplier.

**Legend:**

Entry No.	Information Required
1	Document category number - see below
2	Applicable specification number and appropriate paragraph
3	Description corresponding to document category number.
4	Permission to proceed with fabrication or other specific processes is marked yes, if required.
5	List a milestone after award i.e., prior to fabrication, prior to test, prior to shipment, or with shipment that the listed document is to be submitted by the Supplier.
6	Number of copies required for the submittal.
7	Reproducible, Mylar, Vellum, etc.
8	Enter remarks when appropriate.

**Document Category Number and Descriptions**

1.0	<b>Drawings</b>
1.1	Outline Dimensions, Services, Foundations, and Mounting Details - Drawings providing external envelope, including lugs, centerline(s), location and size for electrical cable, conduit, fluid, and other service connections, isometrics and details related to foundations and mountings.
1.2	Assembly Drawings - Detailed drawings indicating sufficient information to facilitate assembly of the component parts of an equipment item.
1.3	Shop Detail Drawings - Drawings which provide sufficient detail to facilitate fabrication, manufacture, or installation. This includes pipe spool drawings, internal piping and wiring details, cross-section details and structural and architectural details.
1.4	Wiring Diagrams - Drawings which show schematic diagram equipment, internal wiring diagrams, and interconnection wiring diagram for electrical items.
1.5	Control Logic Diagrams - Drawings which show paths which input signals must follow to accomplish the required responses.
1.6	Piping and Instrumentation Diagrams - Drawings which show piping system scheme and control elements.
2.0	Parts Lists and Costs - Sectional view with identified parts and recommended spare parts for one year's operation and specified with unit cost.
3.0	Complete SRS Data Sheets - Information provided by Supplier on data sheets furnished by WSRC.
4.0	<b>Instructions</b>
4.1	Erection/Installation - Detailed written procedures, instructions, and drawings required to erect or install material or equipment.
4.2	Operations - Detailed written instructions describing how an item or system should be operated.
4.3	Maintenance - Detailed written instructions required to disassemble, reassemble and maintain items or systems in an operating condition.
4.4	Site Storage and Handling - Detailed written instructions, requirements, and time period for lubrication, rotation, heating, lifting or other handling requirements to prevent damage or deterioration during storage and handling at jobsite. This includes shipping instructions for return.
5.0	<b>Schedules: Engineering and Fabrication/Erection</b> - Bar charts or critical path method diagram which detail the chronological sequence of activities, i.e., Engineering submittals, fabrication and shipment.
6.0	<b>Quality Assurance Manual/Procedures</b> - The document(s) which describe the planned and systematic measures that are used to assure that structures, systems, and components will meet the requirements of the procurement documents.
7.0	<b>Seismic Data Reports</b> - The analytical or test report which provides information and demonstrates suitability of material, component, or system in relation to the conditions imposed by the stated seismic criteria.
8.0	<b>Analysis and Design Reports</b> - The analytical data (stress, electrical loading, fluid dynamics, design verification reports, etc.) which demonstrate that an item satisfies specified requirements.
9.0	<b>Acoustic Data Reports</b> - The noise, sound, and other acoustic vibration data required by the procurement documents.
10.0	<b>Samples</b>
10.1	Typical Quality Verification Documents - A representative data package which will be submitted for the items furnished as required by the procurement documents.
10.2	Typical Material Used - A representative sample of the material to be used.
11.0	<b>Material Descriptions</b> - The technical data describing a material which a Supplier proposes to use. This usually applies to architectural items: metal siding, decking, doors, paints, coatings.
12.0	<b>Welding Procedures and Qualifications</b> - The welding procedure, specification, and supporting qualification record required for welding, hard facing, overlaying, brazing, and soldering.
13.0	<b>Material Control Procedures</b> - The procedures for controlling issuance, handling, storage and traceability of materials such as weld rod.
14.0	<b>Repair Procedures</b> - The procedures for controlling material removal and replacement by welding, brazing, etc., subsequent thermal treatments, and final acceptance inspection.
15.0	<b>Cleaning and Coating Procedures</b> - The procedures for removal of dirt, grease, or other surface contamination and preparation and application of protective coatings.
16.0	<b>Heat Treatment Procedures</b> - The procedures for controlling temperature and time at temperature as a function of thickness, furnace atmosphere, cooling rate and methods, etc.
19.0	<b>UT - Ultrasonic Examination Procedures</b> - Procedures for detecting discontinuities and inclusions in materials by the use of high frequency acoustic energy.

**ATTACHMENT 01330.1**

**Engineering Document Requirements Form Instructions Continued**

- 20.0 RT - Radiographic Examination Procedures - Procedures for detecting discontinuities and inclusions in materials by x-ray or gamma ray exposure of photographic film.
- 21.0 MT - Magnetic Particle Examination Procedures - Procedures for detecting discontinuities and inclusions in magnetic materials by the distortion of an applied magnetic field.
- 22.0 PT - Liquid Penetrant Examination Procedures - Procedures for detecting discontinuities and inclusions in materials by the application of a penetrating liquid in conjunction with suitable developing materials.
- 23.0 Eddy Current Examination Procedures - Procedures for detecting discontinuities in materials by distortion of an applied electromagnetic field.
- 24.0 Pressure Test - Hydro, Air, Leak, Bubble or Vacuum Test Procedures - Procedures for performing hydrostatic or pneumatic structural integrity and leakage tests.
- 25.0 Inspection Procedures - Organized process followed for the purpose of determining that specified requirements (dimensions, properties, performance results, etc.) are met.
- 26.0 Performance Test Procedures - Test performed to demonstrate that functional design and operational parameters are met.
  - 26.1 Mechanical Tests - Example: pump performance, data, valve stroking, load, temperature rise, calibration, environmental, etc.
  - 26.2 Electrical Tests - Example: impulse, overload, continuity, voltage, temperature rise, calibration, saturation, loss, etc.
- 27.0 Prototype Test Reports - Reports of a test which is performed on a standard or typical examination of equipment or item, and which is not required for each item produced in order to substantiate the acceptability of equal items. This may include tests which result in damage to the item(s) tested.
- 28.0 Personnel Qualification Procedures - Procedures for qualifying welders, inspectors, and other special process personnel.
- 29.0 Supplier Shipping Preparation Procedures - Procedures used by a Supplier to prepare finish materials or equipment for shipment from its facility to the jobsite.





ATTACHMENT 01330.2

QUALITY VERIFICATION DOCUMENT REQUIREMENTS

1. Document Category Number	2. Specification Paragraph Reference	3. Document Description	4. SSR Release	5. WSRC Receipt Inspection Check-In	6. Remarks	7. DOC Supplier Page Count
13.0	03311, 1.6S	Batch Ticket(s)			Subcontractor to submit at work completion	
13.0	03311, 1.6K	Analysis Results for the Aggregate Moisture Content in accordance with ASTM C566			Subcontractor to submit at work completion	
13.0	03311, 1.6L	Analysis Results for the Fine Aggregate Gradation in accordance with ASTM C136			Subcontractor to submit at work completion	
13.0	03311, 1.6M	Analysis Results for the Material Finer than No. 200 Sieve for Aggregate in accordance with ASTM C117			Subcontractor to submit at work completion	
13.0	03311, 1.6N	Analysis results for the Organic Impurities Test for Aggregate in accordance with ASTM C40			Subcontractor to submit at work completion	
13.0	03311, 1.6O	Analysis results for the Friable Particle Test for Aggregate in accordance with ASTM C142			Subcontractor to submit at work completion	
8. Supplier's Order No.		9. Supplier's Part		10. Supplier's Part Name		11. Quantity
12. PO No.		13. WSRC Line/Equip Tag or Code No.		14. WSRC Part Name		
15. Supplier's Conformance Statement We certify that the work and required documents meet the requirements of the procuring documents.  _____ Authorized Supplier Signature Title Date						
16. Source Surveillance Representative at Suppliers Facility Work was released based on satisfactory completion of quality surveillance and review of documentation.  ___ With Authorized Deviations Noted in Column 6 ___ No Deviations  _____ Signature of SSR Date						
17. Receiving Inspection at SRS  This form and the quality verification documents referenced hereon have been received and their relationship to the hardware items verified.  _____ Signature of WSRC Inspector Date						

**ATTACHMENT 01330.2**

**Quality Verification Document Requirements Form Instructions**

**Purpose:** The Quality Verification Document Requirements (QVDR) is initiated by SRS and completed by the Supplier when providing quality verification documents. The QVDR is a multipurpose form to:

- Transmit quality verification documents from the Supplier,
- Provide evidence of SSR release of documentation and/or work, and
- Provide evidence of an SRS inspection check of documentation received at SRS.

**WSRC Entries**

Entry No.	Information Required
1	Enter Document Category Number – see below.
2	Enter Specification Number and Paragraph Reference.
3	Enter Description corresponding to the Document Category Number.
4	SSR to initial upon item release.
6	Enter "Remarks": as appropriate.
16	SSR and dates release.

**Field Entries**

Entry No.	Information Required
5	SRS inspector at the jobsite to complete check-in.
17	The SRS Inspector will review the quality verification documentation package. If found satisfactory, he signs and dates the check-in statement.

**Supplier Entries**

Entry No.	Information Required
7	Enter number of pages of quality verification document being submitted.
8	Enter information required.
9	Enter information required.
10	Enter information required.
11	Enter the quantity of units covered by the documents submitted. For each item on Entry No. 12 being released, provide a separate copy of this completed form and the supporting quality verification documents.
12	Enter information required.
13	Enter information required.
14	Enter information required.
15	Supplier - Signature of an employee authorized to sign such documents.

**Document Category Numbers and Descriptions:**

- 12.0 Welding Verification Reports - Reports of welding performed to include weld identification, and certification that qualified welding procedures and welders were used.
- 13.0 Material Verification Reports - Reports relative to material which confirm, substantiate or assure that an activity or condition has been implemented in conformance with code and material specifications imposed by the procurement documents.
- 14.0 Major Repair Verification Reports - Reports may include weld repair locations (maps), material test reports for filter metal, pre- and post-weld heat treatment records, NDE records, etc. The resolution of whether a repair is major or not is an SRS responsibility.
- 15.0 Cleaning and Coating Verification Reports - Reports include a certification of visual examination for surface preparation, surface profile, materials, etc.; and also humidity data, temperature data and coating thickness data as required by the procurement documents.
- 16.0 Heat Treat Reports - Reports normally include furnace charts and similar records which identify and certify the item(s) treated, the procedure used, furnace atmosphere, time at temperature, cooling rate, etc.
- 17.0 Material Property Reports
- 17.1 MTR (Material Test Reports) - These reports include all chemical, physical, mechanical, and electrical property test data required by the material specification and applicable codes. These are applicable to cement, concrete, metals, cable jacket materials, rebar, rebar splices, etc.
- 17.2 Impact Test Data - Reports of Charpy or drop weight tests including specimen configuration, test temperature and fracture data.
- 17.3 Ferrite Data - Reports of the ferrite percentage for stainless steel materials used, including castings and welding filler metals as deposited.
- 17.4 Material Certificate of Compliance - Documents which certify conformance to the requirements of the applicable material specification.
- 17.5 Electrical Property Reports - Reports of electrical characteristics, e.g., dielectric, impedance, resistance, flame tests, corona, etc.
- 18. Code Compliance - Verifying documents (such as data Forms U-1, M-2, State, etc.), which are prepared by the manufacturer or installer and certified by the Authorized Code Inspector.
- 19.0 UT - Ultrasonic Examination and Verification Reports - Examination results of certain characteristics of discontinuities and inclusions in material by the use of high frequency acoustic energy.
- 20.0 RT - Radiographic Examination and Verification Reports - Examination results of certain characteristics of discontinuities and inclusions in materials by x-ray or gamma-ray exposure of photographic film, including film itself.
- 21.0 MT - Magnetic Particle Examination and Verification Reports - Examination results of surface (or near surface) discontinuities in magnetic materials by distortion of an applied magnetic field.
- 22.0 PT - Liquid Penetrant Examination and Verification Reports - Examination results of surface discontinuities in materials by application of a penetrating liquid in conjunction with suitable developing techniques.
- 23.0 Eddy Current Examination and Verification Reports - Examination results of discontinuities in material by distortion of an applied electromagnetic field.

**ATTACHMENT 01330.2**

**Quality Verification Document Requirements Form Instructions Continued**

- 24.0 Pressure Test - Hydro, Air, Leak, Bubble or Vacuum Test and Verification Reports - Results of hydrostatic or pneumatic structural integrity and leakage tests.
- 25.0 Inspection and Verification Reports - Documented findings resulting from an inspection.
- 26.0 Performance Test and Verification Reports - Reports of Test Results.
- 26.1 Mechanical Test, e.g., pump, performance data, valve stroking, load, temperature rise, calibration, environment, etc.
- 26.2 Electrical Tests, e.g., load, impulse, overload, continuity, voltage, temperature rise, calibration, saturation, loss, etc.
- 27.0 Prototype Test Report - Report of the test which is performed on a standard or typical example of equipment, material or item, and which is not required for each item produced in order to substantiate the acceptability of equal items. This normally includes tests which may, or could be expected to, result in damage to the item(s) tested.

ATTACHMENT 01330.3

Supplier Deviation Disposition Request

CSR 45-48 (Rev 4-23-2002)  
 Scores: 26-19104.00  
 Page 1 of 2

Supplier Deviation  
 Disposition Request

Attachment No. \_\_\_\_\_  
 Spec \_\_\_\_\_  
 Revision No. \_\_\_\_\_  
 Page \_\_\_\_\_ of \_\_\_\_\_

Note

1. Completion instructions attached.
2. Items 1-19 below to be completed by Supplier.
3. \*Items WSRC entries only.
4. Attach additional information whenever necessary.
5. WSRC 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.

For Supplier Use		For WSRC Use			
Supplier SDDR No.		Date Submitted	WSRC SDDR No.	Project No.	Date Received
1. Supplier Name	Address	City/State	Zip	2. Supplier's Order No.	
2.1 WSRC Document	3. Supplier's Part No.	4. Suppliers Part Name		5. Deviation Detected (Date)	Method
6. All Previous SDDRS (No./Date)		7. WSRC PO No./Change Notice No.		8. WSRC Buyer	9. WSRC Part No.
10. WSRC Part Name	11. WSRC SSR Notified (Date)		Method	12. WSRC Eng Notified (Date)	Method
13. Deviation Description (Attach extra sheets, photographs, sketches, etc., as necessary, and identify quantity and serial No.'s, as applicable.)					
14. Suppliers Proposed Disposition <input type="checkbox"/> Use-As-Is <input type="checkbox"/> Repair <input type="checkbox"/> Modify WSRC Requirement					
15. Cost Impact			16. Schedule Impact		
17. Proposed Disposition and Technical (plus cost/schedule if applicable) Justification (Attach extra sheets, sketches, etc., as necessary.)					
18. Associated Supplier Document Change(s)					
19. Suppliers Authorized Representative (Name)					Date
Signature			Title		
*20. SRS Eng Action					
<input type="checkbox"/> Accepted		<input type="checkbox"/> Drawing Change ( <input type="checkbox"/> WSRC <input type="checkbox"/> Supplier)		Item Description _____	
<input type="checkbox"/> Rejected		<input type="checkbox"/> Specification/Requisition Change		End Use _____	
		<input type="checkbox"/> Other Suppliers Affected <input type="checkbox"/> Follow-Up		Responsible Division _____	
		<input type="checkbox"/> Baseline Change <input type="checkbox"/> Other _____		Functional Class _____	
*21. USQ Document No.					
*22. WSRC Disposition Statement including Justification (Attach extra sheets, sketches, etc., as necessary)					
Incorporation Required <input type="checkbox"/> Yes <input type="checkbox"/> No		Document No.(s)		WSRC Action Required <input type="checkbox"/> Yes <input type="checkbox"/> No	
*23. WSRC Acceptance/Printed Name/Signature					
CTF/Disposition Originator		Date	CQF		Date
VER/CHK		Date	P&MMO		Date
MGR		Date	Other		Date

ATTACHMENT 01330.3

Supplier Deviation Disposition Request Instructions

INSTRUCTIONS

(USE BLACK INK OR TYPEWRITER)

This form is to be used after Purchase Order Award by a supplier or subtier supplier to

- a) Notify WSRC when manufactured product or service does not meet established contract requirements and to document the supplier's proposed disposition, with their technical proposed disposition, with their technical (and where appropriate, Cost/ Schedule) justification.
- b) Notify WSRC when the supplier wants to propose changes to the contract documents unanticipated at time of award.
- c) Record WSRC disposition of the SDDR.

A deviation is any departure from the requirements of the procuring documents, which the supplier has incorporated or proposes to incorporate in the completed item or service provided. Deviation disposition can be classified as Use-As-Is or Repair.

Repair is defined as the process of restoring a nonconforming characteristic to a condition such that the capability of an item to function reliably and safety is unimpaired, even though that item still may not conform to the original requirement. Repair includes alternations to the properties to the material through heat-treating, welding, metal deposition, chemical processing, etc. The SDDR form is not required for cases where WSRC has previously provided authorization to proceed, using an accepted repair method for a specific type of repair. Records must be maintained for each specific repair.

An WSRC Engineering action and disposition statement does not relieve the supplier from responsibility for the accuracy, adequacy, or suitability of the item or service being provided as defined in the procurement documents, nor does it constitute waiver of the right to renegotiate the terms of the procurement documents.

**Block No.**                      **Entry Information**

1. Supplier's name and address - city, state, and zip code. List same information for subtier suppliers if applicable.
2. Supplier's order number if one has been assigned.
3. Supplier's Part Number as applicable from the drawings, catalog, internal specification, etc.
4. Supplier's Part Name.
5. Date deviation detected and method used to detect deviation (NDE, dimensional, check, visual, etc.)
6. List all previous SDDRs and their dates that have been submitted for similar deviations requested on this purchase order.
7. WSRC Purchase Order Number and Revision Number.
8. WSRC Purchase Requisition (item, part, tag or code) Number(s).
9. WSRC Part Name, if one has been assigned.
10. Date and method (Fax, letter, etc.) used to notify the WSRC Supplier Surveillance Representative (SSR) whenever WSRC Quality Surveillance is applicable. If the Purchase Requisition identified no requirements for Supplier Surveillance, enter "Not Required."
11. Date and method (Fax, letter, etc.) used to notify WSRC Engineering.
12. Describe the deviating characteristics and define the extent of the out-of specification condition for each identified piece affected. Identify the location of the deviation characteristic by print coordinates or specific location, as applicable. Attach reproducible quality extra sheets, sketches, photographs, etc., as necessary. When proposing a change in either supplier or WSRC documents; describe the change; identify the documents completely including title or subject, date and revision; and where appropriate, attach a copy of areas in question.
13. State proposed disposition.
14. Enter cost impact that would result from proposed changes and which will be reflected in appropriate Procurement documents.
15. Enter delivery schedule impact that would result from proposed changes.
16. Describe the proposed disposition and provide technical (and where appropriate cost/schedule) justification for WSRC evaluation. Attach reproducible quality copies whenever required. If the deviation is correctable by repair, submit a detailed repair procedure or reference the procedure previously submitted and approved by WSRC for use in similar situations. Provide supplier control number and procedure title. For documents, provide suggested corrective wording, procedures, documents, etc. Provide a copy of each SDDR attachment to the WSRC SSR at the supplier's location.
17. Identify the nature of changes that may be needed on associated supplier documents (drawings, specifications, procedures, installation instructions, etc.).
18. Enter the name (typed or printed) and title of the supplier's representative authorizing the disposition request and have appropriate signature and date signed.
19. Check all applicable boxes to define the action required by WSRC Engineering. Refer to baseline change procedures for baseline changes.
20. Provide appropriate justification for the WSRC action(s) indicated in Block 19. When changes to drawings, specifications, requisitions, or other WSRC documents are involved, each document should be identified and the associated change briefly described. If other suppliers are affected, indicate who they are and the documents that initiated resolution of that involvement. "Other" follow-up action (e.g., the need for additional WSRC calculations, additional drawings or sketches, inspection by WSRC Engineering representative, etc.) should also be identified here. If WSRC action is required, so indicate.
21. Originator - Signature of Responsible Engineer. Verifier/Checker - Signature of the Verifier/Checker Reviewing the Engineering action and the date signed. MGR - Signature of the WSRC Department Manager and the date signed. COF - Signature of the Cognizant Quality Function Representative and the date signed. P&MMD - Signature of the WSRC Procurement and Materials Management Department representative acknowledging the SDDR and the date signed.
22. Signature of the supplier's inspector or other representative authorized to verify that the accepted disposition was correctly accomplished and the date signed. Not required for "use-as-is" disposition.

**ATTACHMENT 01330.3**

**Supplier Deviation Disposition Request Instructions Continued**

23. Signature of the WSRC SSR (when an SSR is assigned to the order) and date. This signature indicates that the accepted disposition was correctly implemented and verified (on a random sample basis if the SDDR applies to several parts). Not required for "use-as-is" disposition.

**ATTACHMENT 01330.4**

**Supplier Document Status Instructions and Form**

**Supplier Document Status Instructions**

**Purpose**

The supplier Document Status is completed by the Reviewer to document the review of Supplier Documents and to provide a status on actions to be taken by the supplier.

**Entries**

- A) The Reviewer/Cognizant Technical Function indicates the document category as noted in block 1 of the EDR form.
- B) Upon completion of the review(s), the Reviewer/Cognizant Technical Function shall check off a Status 1 through 5 as appropriate, sign, date, and forward the Supplier Document Status Form to PMMD for further processing.

**Status 1**

The document required no changes or additions. Matters remaining to be resolved by the supplier will not require document changes and can be handled by correspondence.

**Status 2**

The document is either not suitable for retention or requires certain non-technical changes (inclusion of equipment or tag numbers, addition of shipping notes, etc.) to qualify as a final document.

**Status 3**

Deviations have been noted, some aspects of the subject matter are incomplete, or other minor technical changes are required to make the item suitable.

**Status 4**

Information delineated on the document is not to be used by the supplier because it:

- a) is of a design that is technically unusable without significant changes,
- b) does not meet design requirements (for example, orientation of equipment, nozzles, conduit connections), or
- c) does not conform to the procurement requirements.

**Status 5**

Information delineated on the document need not be reviewed prior to its use by the supplier. This Status is given to those documents for which "permission to Proceed" is not required provided the documents are suitable for retention.

**ATTACHMENT 01330.4**

**Supplier Document Status Instructions and Form Continued**

<b>Westinghouse Savannah River Company</b>	
Supplier Document Status	
1.	Work may proceed.
2.	Submit Final Document work may proceed.
3.	Revise and Resubmit, Work may proceed subject to resolution of comments.
4.	Revise and Resubmit. Work may not proceed.
5.	Permission to proceed is not required.
<p>Permission to proceed does not constitute acceptance or approval of design details, calculations, test methods, analysis or materials developed or selected by the supplier, and does not relieve supplier from full compliance with contractual obligations or release of any "holds" place on the contract.</p>	
Document Category	Date
Reviewer	

**END OF SECTION**



## INDEPENDENT INSPECTION/TESTING LABORATORY SERVICES

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Subcontractor shall engage the services of an independent inspection/testing laboratory to perform the specified inspection/testing of the portable centralized batching facility and stationary mixer unit(s) in order to meet the NRMCA QC3 Checklist or in order to meet alternate documentation with equivalence to the NRMCA Checklist.
- B. Subcontractor shall engage the services of an independent inspection/testing laboratory to perform the specified inspection/testing of the products used in the generation of the six (6) tank closure mixes.
- C. Subcontractor shall engage the services of an independent inspection/testing laboratory to perform the specified inspection/testing of the conveying system for delivery of the required dry tank closure mixes and the specified inspection/testing of the conveying system for the delivery of the required wet tank closure mixes.

#### 1.2 RELATED SECTIONS

- A. Section 01330            Submittal Procedures
- B. Section 03311           Tank Closure Mixes

#### 1.3 REFERENCED CODES AND STANDARDS

- A. Later dates of codes and standards may not be used without prior BSRI approval.
  - 1. American Society for Testing and Materials (ASTM)
    - E329-00b            Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
  - 2. National Ready-Mixed Concrete Association (NRMCA)
    - QC3                    Section 3 of QC Manual, "Plant Certification Checklist", Seventh Revision, April 1999

#### 1.4 QUALITY REQUIREMENTS

- A. Inspection/Testing

1. Independent Inspection/Testing Laboratory shall be authorized to operate in the State of South Carolina and conform to the requirements of ASTM E329.
2. Independent Inspection/Testing Laboratory shall maintain on staff a full time engineer registered as a Professional Engineer in the State of South Carolina to review services.
3. Inspect Independent Inspection/Testing Laboratory procedures and equipment at intervals of not more than three (3) years by a qualified national authority as defined in ASTM E329.
4. Independent Inspection/Testing Laboratory shall calibrate annually under normal use or semi-annually under heavy or dynamic use. Independent Inspection/Testing Laboratory shall recalibrate or replace equipment in which the standard operating range has been exceeded, damaging physical or electrical conditions have occurred, or otherwise exposed to abnormal operating conditions.
5. Independent Inspection/Testing Laboratory shall keep a current list of testing equipment and calibration documents for the two (2) most recent calibrations for each unit and associated components.
6. Independent Inspection/Testing Laboratory shall apply a calibration sticker or certificate to all laboratory and field equipment.
7. Independent Inspection/Testing Laboratory shall use testing equipment calibrated at intervals with devices of an accuracy traceable to either the National Institute of Standards and Technology (NIST) or accepted values of natural physical constants.

**B. Quality Assurance Program**

1. Independent Inspection/Testing Laboratory shall provide a Quality Assurance Program in accordance with ASTM E329.

**1.5 SUBCONTRACTOR SUBMITTALS**

- A. Subcontractor shall submit the Independent Inspection/Testing Laboratory name, address, telephone number, and names of laboratory technicians and engineers assigned to the Project and the responsible officer. Submittal shall include all resumes, personnel qualifications, and certifications.
- B. Subcontractor shall submit a report of Independent Inspection/Testing Laboratory inspection made by a qualified national authority during the most recent tour of inspection with memorandums of deficiencies reported during the inspection tour and the corrective actions taken to resolve the deficiencies.

- C. Subcontractor shall submit the current Independent Inspection/Testing Laboratory accreditation document(s) received from the nationally recognized accreditation organization(s).
- D. Subcontractor shall submit Independent Inspection/Testing Laboratory reports of required testing and inspections specified within the individual sections and indicate the conformance or nonconformance of the test results and/or inspections with the appropriate identified requirements.
- E. Subcontractor shall submit the Independent Inspection/Testing Laboratory Quality Assurance program details.
- F. Subcontractor shall submit a Supplier Deviation Disposition Request immediately upon notification by the Independent Inspection/Testing Laboratory of out of calibration equipment used to perform inspections and testing of the equipment and material used to generate the various tank closure mixes.

#### 1.6 INDEPENDENT INSPECTION/TESTING LABORATORY RESPONSIBILITIES

- A. Independent Inspection/Testing Laboratory shall perform calibrations of equipment as required by the manufacturer's instructions and the specific testing procedures/standards being used.
- B. Independent Inspection/Testing Laboratory shall document all out of calibration equipment and notify the Subcontractor immediately of all out of calibration equipment.
- C. Independent Inspection/Testing Laboratory shall perform inspection and testing as specified in the individual specification sections in accordance with specified standards.

#### 1.7 INDEPENDENT INSPECTION/TESTING LABORATORY REPORTS

- A. Independent Inspection/Testing Laboratory Reports shall include the following information on each report as a minimum.
  - 1. Date issued
  - 2. Project title and description
  - 3. Name of inspector or laboratory technician
  - 4. Date and time of inspection or testing
  - 5. Identification of product and applicable specification section
  - 6. Inspection location in the Project
  - 7. Type of inspection or test

8. Serial number or distinct identification number of instrument used
9. Results of inspection or test and description of observed irregularities
10. Specified criteria/limits evaluated against

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

**END OF SECTION**

## TANK CLOSURE MIXES

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Subcontractor shall furnish and deliver the six (6) tank closure mixes identified in this section to fill and close waste tanks located in the F Area Tank Farm at the Savannah River Site, Aiken, South Carolina.
- B. Subcontractor shall provide a portable centralized batching facility and stationary mixer unit(s) to furnish and deliver the required six (6) tank closure mixes identified in this section. The six (6) tank closure mixes are identified as riser grout, strong grout, dry reducing CLSM mixture, reducing CLSM, dry reducing grout mixture, and reducing grout. Two (2) of the tank closure mixes shall be furnished and delivered dry and ready to be blown into the waste tanks. Four (4) of the tank closure mixes shall be furnished and delivered wet and ready to be pumped into the waste tanks.
- C. Subcontractor shall provide a conveying system for delivery of the two (2) dry tank closure mixes from the portable centralized batching facility and stationary mixer unit(s) to areas near the waste tanks located in the F Area Tank Farm at the Savannah River Site. The two (2) dry tank closure mixes are identified as dry reducing CLSM mixture and dry reducing grout mixture.
- D. Subcontractor shall provide a conveying system for delivery of two (2) wet tank closure mixes from the portable centralized batching facility and stationary mixer unit(s) to areas near the waste tanks located in the F Area Tank Farm at the Savannah River Site. The two (2) wet tank closure mixes are identified as riser grout and strong grout.

#### 1.2 RELATED SECTIONS

- A. Section 01330 Submittal Procedures
- B. Section 01410 Independent Inspection/Testing Laboratory Services

#### 1.3 REFERENCED CODES AND STANDARDS

- A. Later dates of codes and standards may not be used without prior BSRI approval.
  - 1. American Society for Testing and Materials (ASTM)
    - C31/C31M-00 Standard Practice for Making and Curing Concrete Test Specimens in the Field
    - C33-02 Standard Specification for Concrete Aggregates

C39/C39M-01	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
C40-99	Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
C94/C94M-00	Standard Specification for Ready-Mixed Concrete
C109/C109M-02	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50-mm Cube Specimens)
C117-95	Standard Test Method for Materials Finer than 75- $\mu$ m (No. 200) Sieve in Mineral Aggregates by Washing
C136-01	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
C138/C138M-01a	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
C142-97	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
C150-02a	Standard Specification for Portland Cement
C260-01	Standard Specification for Air-Entraining Admixtures for Concrete
C494/C494M-99a	Standard Specification for Chemical Admixtures for Concrete
C566-97	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
C618-03	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
C685/C685M-01	Standard Specification for Concrete made by Volumetric Batching and Continuous Mixing
C989-99	Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars

- |          |   |
|----------|---|
| D4832-02 | Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders                            |
| D5971-01 | Standard Practice for Sampling Freshly Mixed Controlled Low-Strength Material   |
| D6023-02 | Standard Test Method for Unit Weight, Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low Strength Material (CLSM) |
| D6103-97 | Standard Test Method for Flow Consistency of Controlled Low Strength Material (CLSM)  |
2. National Ready-Mixed Concrete Association (NRMCA)
- |     |   |
|-----|---|
| QC3 | Section 3 of QC Manual, "Plant Certification Checklist", Seventh Revision, April 1999 |
|-----|---|
3. American Concrete Institute
- |                              |                         |
|------------------------------|-------------------------|
| 305R-99                      | Hot Weather Concreting  |
| 306R-88<br>(Reapproved 1997) | Cold Weather Concreting |

#### 1.4 WORK INCLUDED

- A. Subcontractor shall provide, qualify, operate, and maintain the necessary plant facilities and equipment for batching, mixing, and delivering the six (6) tank closure mixes identified in this section.
- B. Subcontractor shall store and protect the products used to produce the six (6) tank closure mixes identified in this section in accordance with the manufacturer's requirements.
- C. Subcontractor shall provide the six (6) tank closure mixes identified in this section ready-mixed in dry form or wet form ready to be blown or pumped.
- D. Subcontractor shall provide products that conform to the requirements of this specification that are required for the six (6) tank closure mixes identified in this section.
- E. Subcontractor shall engage the services of a qualified independent inspection/testing laboratory to perform initial and periodic testing and inspections of the products used in the production of the six (6) tank closure mixes identified in this section.

- F. Subcontractor shall engage the services of a qualified independent inspection/testing laboratory to perform initial and periodic inspections and testing of the portable centralized batching facility equipment and stationary mixer unit(s) as required in this section.
- G. Subcontractor shall engage the services of a qualified independent inspection/testing laboratory to perform initial and periodic inspections of the conveying system for delivery of the required dry tank closure mixes as required in this section.
- H. Subcontractor shall engage the services of a qualified independent inspection/testing laboratory to perform initial and periodic inspections of the conveying system for delivery of the required wet tank closure mixes as required in this section.

#### 1.5 QUALITY REQUIREMENTS

- A. Control the quality of products and services to meet the requirements of this specification and applicable codes and standards.

#### 1.6 SUBCONTRACTOR SUBMITTALS

- A. Subcontractor shall submit NRMCA QC3 checklist or alternate documentation with equivalence to the NRMCA QC3 checklist for the portable centralized batching facility equipment and stationary mixer unit(s) as appropriate.
- B. Subcontractor shall submit inspection and testing report(s) in accordance with ASTM C685 for the portable centralized batching facility equipment and stationary mixer unit(s) for volumetric batching and continuous mixing (auger mixer) as appropriate.
- C. Subcontractor shall submit inspection report(s) in accordance with Section 2.2C for the conveying system for delivery of the required dry tank closure mixes.
- D. Subcontractor shall submit inspection report(s) in accordance with Section 2.3G for the conveying system for delivery of the required wet tank closure mixes.
- E. Subcontractor shall submit Certified Material Test Report(s) confirming compliance with ASTM C150 for the Portland cement.
- F. Subcontractor shall submit documentation, such as laboratory test results, showing conformance to the chemical and physical requirements of ASTM C260 for the air-entraining admixture. Documentation shall also show that the air-entraining admixture does not contain chlorides except those that may be contained in the water used in the manufacture of the air-entraining admixture.
- G. Subcontractor shall submit Certified Material Test Report(s) confirming compliance with ASTM C618 for the fly ash.



- H. Subcontractor shall submit Certified Material Test Report(s) confirming compliance with ASTM C989 for the slag.
- I. Subcontractor shall submit Certified Material Test Report(s) for the sodium thiosulfate.
- J. Subcontractor shall submit documentation, such as laboratory test results, showing conformance to the physical and chemical requirements of ASTM C33 for the fine aggregates for the six (6) tank closure mixes identified in this section.
- K. Subcontractor shall submit analysis results for the aggregate moisture content in accordance with ASTM C566.
- L. Subcontractor shall submit analysis results for the fine aggregate gradation in accordance with ASTM C136.
- M. Subcontractor shall submit analysis results for the material finer than No. 200 sieve for aggregate in accordance with ASTM C117.
- N. Subcontractor shall submit analysis results for the organic impurities test for aggregate in accordance with ASTM C40.
- O. Subcontractor shall submit analysis results for the friable particle test for aggregate in accordance with ASTM C142.
- P. Subcontractor shall submit documentation, such as laboratory test results, showing conformance to ASTM C494/C494M for the water reducing admixture. Documentation shall also show that the water reducing admixture does not contain chlorides except those contained in the water used in the manufacture of the water reducing admixture.
- Q. Subcontractor shall submit documentation, such as laboratory test results, showing conformance to ASTM C494/C494M for the high range water reducing admixture. Documentation shall also show that the high range water reducing admixture does not contain chlorides except those contained in the water used in the manufacture of the high range water reducing admixture.
- R. Subcontractor shall submit documentation, such as purchase order information, showing conformance to the requirements of this specification for the special viscosifying admixture.
- S. Subcontractor shall submit the batch ticket(s).

## **PART 2 PRODUCTS**

### **2.1 PORTABLE CENTRALIZED BATCHING FACILITY AND STATIONARY MIXER UNIT(S)**

- A. Provide a portable centralized batching facility and stationary mixer unit(s) for production of the six (6) tank closure mixes identified in this section or an

equivalent system that maintains mix homogeneity as approved by BSRI that conforms to the testing requirements in this specification.

- B. The portable centralized batching facility and stationary mixer unit(s) shall meet the NRMCA QC3 checklist certification requirements for batching, mixing, and transporting facilities and equipment. Certification shall be maintained through completion of the contract.
- C. IF NRMCA QC3 checklist certification for the portable centralized batching facility and stationary mixer unit(s) is unavailable, Subcontractor shall submit alternate documentation with equivalence to the NRMCA QC3 checklist certification requirements that demonstrates that the portable centralized batching facility and stationary mixer unit(s) have received and passed a recent independent inspection. If the available certifications and inspections do not demonstrate current equivalences with the NRMCA QC3 checklist certification requirements, an independent inspection/testing laboratory shall perform additional inspections and testing as directed. Correct any deficiencies identified prior to production of the six (6) tank closure mixes identified in this section.
- D. For volumetric batching and continuous mixing (auger mixer), the portable centralized batching facility and stationary mixer unit(s) shall have current calibration and efficiency test as required by ASTM C685/C685M.
- E. Truck mixer unit(s) shall not be substituted for stationary mixer unit(s).
- F. The term, "batching and mixing facility", is substituted for the remainder of this section to cover all of the types of portable centralized batching facility and stationary mixer unit(s) mentioned.

## 2.2 CONVEYING SYSTEM FOR DELIVERY OF THE REQUIRED DRY TANK CLOSURE MIXES

- A. The conveying system for delivery of the dry reducing CLSM mixture and dry reducing grout mixture shall have a discharge pressure at the discharge connection not exceeding 25 psig, a variable flow rate between 200 scfm and 400 scfm at the discharge connection, a discharge connection with a maximum size of 4" nominal, and the capability to deliver the dry reducing CLSM mixture and dry reducing grout mixture a maximum of 150 feet from the discharge connection with a positive elevation change of 20 feet.
- B. Facility specific training may be required for entry into the F Area Tank Farm and is identified in the Subcontract Field Conditions if required.
- C. The conveying system for delivery of the dry reducing CLSM mixture and dry reducing grout mixture shall be inspected to ensure the discharge pressure and discharge flow rate requirements of Section 2.2A are met. Inspection requirements can be met by inspection of the manufacturer's specification plate on the conveying system for delivery of the required dry tank closure mixes.

**2.3 CONVEYING SYSTEM FOR DELIVERY OF THE REQUIRED WET TANK CLOSURE MIXES**

- A. The conveying system for delivery of the strong grout shall meet the requirements of Section 10.0 of ASTM C94/94M for agitators and Section 11.0 of ASTM C94/94M for central-mixed concrete.
- B. The conveying system for delivery of the riser grout shall meet the requirements of Section 10.0 of ASTM C94/94M for agitators and Section 11.0 of ASTM C94/94M for central-mixed concrete if the riser grout is produced by the batching and mixing facility.
- C. The conveying system for delivery of the riser grout shall meet the requirements of Section 10.0 of ASTM C94/94M for truck mixers and Section 11.0 of ASTM C94/94M for truck-mixed concrete if the riser grout is obtained locally from an approved Site Supplier.
- D. Mixer performance testing and mixer uniformity testing as required by Section 11.0 of ASTM C94/94M is not required for the conveying system for the delivery of the strong grout and riser grout.
- E. At the discretion of BSRI, required strong grout and riser grout that exceed ninety (90) minutes or three hundred (300) revolutions may still be used provided the strong grout and riser grout can be placed and consolidated properly without the addition of water to the batch.
- F. Facility specific training may be required for entry into the F Area Tank Farm and is identified in the Subcontract Field Conditions if required.
- G. The conveying system for delivery of the strong grout and riser grout shall be inspected to ensure the specified requirements of Section 10.0 and Section 11.0 of ASTM C94/94M are met.

**2.4 TANK CLOSURE MIX DESIGNS**

The historical strength of the tank closure mixes has been proven by testing and modification of the tank closure mixes shall be performed in accordance with Section 2.6.

A. Riser grout, Mix No. D5000-X-0-0-A	
Portland Cement	885 lbs/cyd
Water (Maximum)	66 gals/cyd
Sand	2038 lbs/cyd
WRA	36 fl oz/cyd
AEA	7 fl oz/cyd

Notes: The riser grout has a 28 day compressive strength of 5,000 psi. This information is provided for reference only.

Water shall be adjusted on the basis of the moisture content of the sand.

B. Strong grout, Mix No. B2000-X-0-0-BS

Portland Cement	550 lbs/cyd
Water	65 gals/cyd
Sand	2285 lbs/cyd
Special Viscosifying Admixture (Kelco-Crete®)	275 gms/cyd
HRWR (Advaflow)	90 fl oz/cyd
Flow Consistency	11 in (Minimum)
	12 in (Standard)
	14 in (Recommended Maximum)

Notes: The strong grout has a 28 day compressive strength of 2,000 psi. This information is provided for reference only.

The water content of strong grout, as placed, shall be adjusted in order to maintain the specified minimum flow consistency as measured using ASTM D6103. If the strong grout is not flowing properly during placement, the water content of the strong grout shall be increased to increase the flow consistency. The recommended maximum flow consistency of the strong grout, as measured using ASTM D6103, is not the maximum flow consistency. The maximum flow consistency of the strong grout is the point where the water content has been increased such that bleed water appears at the point of placement. The recommended maximum flow consistency is the point where, during testing, that the strong grout usually produced bleed water. Extreme care should be used during the increase of water content of the strong grout since the point at which bleed water appears at the point of placement is based upon numerous variables. Any amount of bleed water at the point of placement must be minimized. Additional flow consistency testing using ASTM D6103 should be used to aid in the identification of bleed water for the strong grout. Additional flow consistency testing shall be performed at the point of discharge from the batching and mixing facility.

Water shall be adjusted on the basis of the moisture content of the sand.

Kelco-Crete® shall be premixed with the Advaflow by slowly introducing it into the Advaflow while using a power operated paddle/shear mixer and

mixing it for at least 20 minutes to ensure no lumps or settlement of solids occur. The pre-mixed solution shall be added to the strong grout per the standard sequence of mixing procedure.

C. Dry reducing CLSM mixture, Mix No. 3TK-X-S

Portland Cement	1353 lbs/cyd
Sand (Maximum Moisture Content – 3%)	1625 lbs/cyd
Slag	209 lbs/cyd

D. Reducing CLSM, Mix No. OPCEXE-X-P-0-BS

Portland Cement	75 lbs/cyd
Water	60 gals/cyd
Sand	2300 lbs/cyd
Slag	210 lbs/cyd
Fly Ash	375 lbs/cyd
Special Viscosifying Admixture (Kelco-Crete®)	275 gms/cyd
HRWR (Advaflow)	90 fl oz/cyd
Flow Consistency	11 in (Minimum)
	12 in (Standard)
	14 in (Recommended Maximum)

Notes: Batching tolerances of reducing CLSM ingredients shall be per ASTM C94/C94M except cement shall be  $\pm 1\%$  or  $\pm 10$  lbs, whichever is greater. The order of weighing cement before pozzolan may be reversed.

The reducing CLSM has a 28 day compressive strength of 900 psi to 1100 psi. The reducing CLSM has a 90 day compressive strength of 1800 psi to 2100 psi. This information is provided for reference only.

The water content of reducing CLSM, as placed, shall be adjusted in order to maintain the specified minimum flow consistency as measured using ASTM D6103. If the reducing CLSM is not flowing properly during placement, the water content of the reducing CLSM shall be increased to increase the flow consistency. The recommended maximum flow consistency of the reducing CLSM, as measured using ASTM D6103, is not the maximum flow consistency. The maximum flow consistency of

the reducing CLSM is the point where the water content has been increased such that bleed water appears at the point of placement. The recommended maximum flow consistency is the point where, during testing, that the reducing CLSM usually produced bleed water. Extreme care should be used during the increase of water content of the reducing CLSM since the point at which bleed water appears at the point of placement is based upon numerous variables. Any amount of bleed water at the point of placement must be minimized. Additional flow consistency testing using ASTM D6103 should be used to aid in the identification of bleed water for the reducing CLSM. Additional flow consistency testing shall be performed at the point of discharge from the batching and mixing facility.

Water shall be adjusted on the basis of the moisture content of the sand.

Kelco-Crete® shall be premixed with the Advaflow by slowly introducing it into the Advaflow while using a power operated paddle/shear mixer and mixing it for at least 20 minutes to ensure no lumps or settlement of solids occur. The pre-mixed solution shall be added to the reducing CLSM per the standard sequence of mixing procedure.

E. Dry reducing grout mixture, Mix No. 4TK-X-S

Portland Cement	1353 lbs/cyd
Sand (Maximum Moisture Content – 3%)	1625 lbs/cyd
Slag	209 lbs/cyd
Sodium Thiosulfate	2.1 lbs/cyd

F. Reducing grout, Mix No. OPDEXE-X-P-0-BS

Portland Cement	75 lbs/cyd
Water	60 gals/cyd
Sand	2300 lbs/cyd
Slag	210 lbs/cyd
Fly Ash	375 lbs/cyd
Sodium Thiosulfate	2.1 lbs/cyd
Special Viscosifying Admixture (Kelco-Crete®)	275 gms/cyd
HRWR (Advaflow)	90 fl oz/cyd
Flow Consistency	11 in (Minimum)

12 in (Standard)

14 in (Recommended  
Maximum)

Notes: Batching tolerances of reducing grout ingredients shall be per ASTM C94/C94M except cement shall be  $\pm 1\%$  or  $\pm 10$  lbs, whichever is greater. The order of weighing cement before pozzolan may be reversed.

The reducing grout has a 28 day compressive strength of 900 psi to 1100 psi. The reducing grout has a 90 day compressive strength of 1800 psi to 2100 psi. This information is provided for reference only.

The water content of reducing grout, as placed, shall be adjusted in order to maintain the specified minimum flow consistency as measured using ASTM D6103. If the reducing grout is not flowing properly during placement, the water content of the reducing grout shall be increased to increase the flow consistency. The recommended maximum flow consistency of the reducing grout, as measured using ASTM D6103, is not the maximum flow consistency. The maximum flow consistency of the reducing grout is the point where the water content has been increased such that bleed water appears at the point of placement. The recommended maximum flow consistency is the point where, during testing, that the reducing grout usually produced bleed water. Extreme care should be used during the increase of water content of the reducing grout since the point at which bleed water appears at the point of placement is based upon numerous variables. Any amount of bleed water at the point of placement must be minimized. Additional flow consistency testing using ASTM D6103 should be used to aid in the identification of bleed water for the reducing grout. Additional flow consistency testing shall be performed at the point of discharge from the batching and mixing facility.

Water shall be adjusted on the basis of the moisture content of the sand.

Kelco-Crete<sup>®</sup> shall be premixed with the Advaflow by slowly introducing it into the Advaflow while using a power operated paddle/shear mixer and mixing it for at least 20 minutes to ensure no lumps or settlement of solids occur. The pre-mixed solution shall be added to the reducing grout per the standard sequence of mixing procedure.

## 2.5 TANK CLOSURE MIX DESIGN IDENTIFIER

- A. An example of the tank closure mix design identifier is provided in Attachment 03311.1.

## 2.6 TANK CLOSURE MIX DESIGN MODIFICATION

- A. The Subcontractor shall redesign the tank closure mix design(s) identified if the products to be used in the tank closure mix design(s) change or the quantities of the products used for the tank closure mix designs are outside the requirements of this specification.
- B. Subcontractor shall include, as part of the redesigned tank closure mix design, a copy of the certified material test reports, documentation certifying conformance to this specification, or laboratory evaluation for each of the proposed products used in the trial batches. Refer to Sections 2.7 through 2.16 of this specification for a description of the specific data required.
- C. Subcontractor shall include, as part of the redesigned tank closure mix design, the dry weights of cement, saturated dry surface weights of fine aggregates, quantity of admixtures, and water per cubic yard.
- D. After contract award, all modifications made to the tank closure mix designs of this specification will be administratively controlled by a Supplier Deviation Disposition Request (SDDR). Tank closure mix design shall be revised and resubmitted by the Subcontractor with each change. The unique tank closure mix identification number assigned to each tank closure mix design shall be used on all documentation when orders are made from the batching and mixing facility.
- E. Strength is the required 28 day or 90 day compressive strength determined in accordance with ASTM C39/C39M or ASTM C109/C109M, as appropriate. Subcontractor shall include, as part of the redesigned tank closure mix design, the redesigned tank closure mix design strength information. The strength information is required for historical purposes.
- F. Flow consistency for the strong grout, the reducing CLSM, and the reducing grout shall be tested in accordance with ASTM D6103.
- G. After BSRI approval of the tank closure mix design is obtained, do not change the products used without prior BSRI approval. If any modification to the products of the tank closure mix design is made, requalification of the tank closure mix design is required in accordance with Paragraph 2.6D unless otherwise approved by BSRI.

## 2.7 PORTLAND CEMENT

- A. Subcontractor shall provide Portland Cement that meets the requirements of ASTM C150, Type I or Type II and contains no more than 0.60 percent, by weight, of alkalis calculated as:  $\text{Na}_2\text{O} + 0.685\text{K}_2\text{O}$ .
- B. For each shipment of Portland Cement used, Subcontractor shall obtain and retain a Certified Material Test Report on chemical and physical properties that confirms compliance with ASTM C150.



**2.8 AIR-ENTRAINING ADMIXTURE (AEA)**

- A. Subcontractor shall provide air-entraining admixture conforming to the requirements of ASTM C260.
- B. For each shipment of air-entraining admixture used, Subcontractor shall obtain and retain documentation, such as laboratory test results, showing conformance to the chemical and physical requirements of ASTM C260. Documentation shall also show that the air-entraining admixture does not contain chlorides except those that may be contained in the water used in the manufacture of the air-entraining admixture.

**2.9 FLY ASH**

- A. Subcontractor shall provide fly ash that meets ASTM C618, Class F except that the loss on ignition shall not exceed 6 percent.
- B. For each shipment of fly ash used, Subcontractor shall obtain and retain a Certified Material Test Report on chemical and physical properties that confirms compliance with ASTM C618.

**2.10 SLAG**

- A. Subcontractor shall provide slag that meets ASTM C989, Grade 100 for ground granulated blast furnace slag.
- B. For each shipment of slag used, Subcontractor shall obtain and retain a Certified Material Test Report on chemical and physical properties that confirms compliance with ASTM C989.

**2.11 SODIUM THIOSULFATE**

- A. Subcontractor shall provide sodium thiosulfate ( $\text{Na}_2\text{S}_2\text{O}_3$ ) Grade: Technical.
- B. For each shipment of sodium thiosulfate used, Subcontractor shall obtain and retain a Certified Material Test Report on chemical and physical properties.

**2.12 AGGREGATES**

- A. Subcontractor shall obtain aggregates for the mixes that conform to the chemical, physical, and gradation requirements of ASTM C33 for fine aggregates.
- B. For each source of fine aggregate used, Subcontractor shall obtain and retain documentation, such as laboratory test results, showing conformance to the chemical and physical requirements of ASTM C33 from the quarry or supplier used for the work.

### 2.13 WATER AND ICE

- A. Subcontractor shall obtain water and ice that conforms to ASTM C94/C94M or ASTM C685/C685M requirements for water and ice quality. Do not use wash water for batching specified products.

### 2.14 WATER REDUCING ADMIXTURE (WRA)

- A. Subcontractor shall obtain water reducing admixture(s) that conform to ASTM C494/C494M, Type A or D for riser grout.
- B. For each shipment of water reducing admixture used, Subcontractor shall obtain and retain documentation, such as laboratory test results, showing conformance to the chemical and physical requirements of ASTM C494/C494M. Documentation shall also show that the water reducing admixture does not contain chlorides except those that may be contained in the water used in the manufacture of the water reducing admixture.

### 2.15 HIGH RANGE WATER REDUCING ADMIXTURE (HRWR)

- A. Subcontractor shall obtain high range water reducing admixture(s) that conform to ASTM C494/C494M, Type F or G.
- B. For the strong grout (B2000-X-0-0-BS), the reducing CLSM (OPCEXE-X-P-0-BS) and the reducing grout (OPDEXE-X-P-0-BS), Subcontractor shall provide high range water reducing admixture "Advaflow" from W.R. Grace or BSRI approved equal.
- C. For each shipment of high range water reducing admixture used, Subcontractor shall obtain and retain documentation, such as laboratory test results, showing conformance to the requirements of ASTM C494/C494M. Documentation shall also show that the high range water reducing admixture does not contain chlorides except those that may be contained in the water used in the manufacture of the high range water reducing admixture.

### 2.16 SPECIAL VISCOSIFYING ADMIXTURE

- A. Subcontractor shall provide special viscosifying admixture(s) to reduce bleed water and shrinkage for the strong grout (B2000-X-0-0-BS), the reducing CLSM (OPCEXE-X-P-0-BS), and the reducing grout (OPDEXE-X-P-0-BS). Special viscosifying admixture shall be Kelco-Crete<sup>®</sup> as manufactured by Kelco/Monsanto or an equivalent special admixture as approved by BSRI.
- B. For each shipment of special viscosifying admixture used, Subcontractor shall obtain and retain documentation, such as laboratory test results, that the special viscosifying admixture conforms to the requirements of this specification. Documentation shall also show that special viscosifying admixture does not contain chlorides except those that may be contained in the water used in the manufacture of the special viscosifying admixture.

### PART 3 EXECUTION

#### 3.1 MANUFACTURE

- A. The Subcontractor shall furnish batch ticket(s) with each delivery per Section 13 of ASTM C94/C94M or per Section 15 of ASTM C685/C85M. If the batching and mixing facility does not use volumetric batching and continuous mixing (auger mixing), the batch ticket(s) shall be provided for each batch. If the batching and mixing facility uses volumetric batching and continuous mixing (auger mixer), the Subcontractor shall furnish batch ticket(s) according to the frequency indicated below.

Riser grout	Every 25 cubic yards
Strong grout	Every 20 cubic yards
Reducing CLSM	Every 50 cubic yards
Reducing grout	Every 50 cubic yards

- B. Subcontractor shall monitor and record the moisture content of fine aggregates. Subcontractor shall adjust the quantity of tank closure mix water based on the aggregate moistures so that the total quantity of water in the batch does not exceed the quantity specified in the approved tank closure mix design. A moisture test shall be performed at the beginning of each batching day, twice daily as a minimum, and more frequently if the moisture condition changes during the day.
- C. Conform to ASTM C94/C94M for a batching and mixing facility or ASTM C685/C685M for a batching and mixing facility using volumetric batching and continuous mixing (auger mixer).
- D. Measuring materials and batching of products shall be in accordance with ASTM C94/C94M except as specified in 2.4D and 2.4F for a batching and mixing facility. For a batching and mixing facility using volumetric batching and continuous mixing (auger mixer), measuring materials and batching of products shall be in accordance with ASTM C685/C685M except as specified in 2.4D and 2.4F.
- E. Subcontractor shall provide the riser grout with a temperature range between 50°F and 90°F as measured at the discharge of the batching and mixing facility or at the discharge of the conveying system for delivery of the required wet tank closure mixes as appropriate. Riser grout that exceeds 90°F may still be used provided that the riser grout is sufficiently flowable to facilitate placement without the addition of water to the batch. Riser grout shall not be used if the temperature exceeds 100°F. The temperature of the riser grout shall be controlled in accordance with ACI 305R for hot weather concreting and ACI 306R for cold weather concreting.

- F. Subcontractor shall provide the strong grout, the reducing CLSM, and the reducing grout with a temperature range between 50°F and 90°F as measured at the discharge of the batching and mixing facility or at the discharge of the conveying system for delivery of the required wet tank closure mixes as appropriate. Strong grout, reducing CLSM, and reducing grout that exceeds 90°F may still be used provided the flow consistency requirements are met. Strong grout, reducing CLSM, and reducing grout shall not be used if the temperature exceeds 100°F. The temperature of the strong grout, reducing CLSM, and reducing grout shall be controlled in accordance with ACI 305R for hot weather concreting and ACI 306R for cold weather concreting.
- G. To maintain flowability, water may be added to the supplied riser grout, with the approval of BSRI, provided it does not exceed the maximum water quantity specified in the approved tank closure mix design. Record on the batch ticket(s) any water added to the batching and mixing facility tank closure mix.
- H. To maintain flow consistency, water may be added to the supplied strong grout, reducing CLSM, and reducing grout, with the approval of BSRI, provided it does not bleed water and meets the requirements of the strong grout mix design, reducing CLSM mix design, and reducing grout mix design. Record on the batch ticket(s) any water added to the batching and mixing facility tank closure mix.

### 3.2 SUBCONTRACTOR INSPECTION AND TESTING

- A. All products and batching and mixing facilities are subject to inspection by BSRI.
- B. Subcontractor shall perform aggregate testing during production for the six (6) tank closure mixes in accordance with the frequencies defined below to confirm compliance with ASTM C33. Subcontractor shall retain analysis results. If the source of the aggregate changes, the Subcontractor shall perform additional initial testing prior to production and subsequent testing in accordance with the frequencies defined below.

Aggregate Moisture Content (ASTM C566)

Beginning of each batching day, twice a day minimum, and upon moisture change during the day

Fine Aggregate Gradation (ASTM C136)

Initial and weekly or each lot, whichever is more frequent

Material Finer than No. 200 Sieve for Aggregate (ASTM C117)	Initial and monthly
Organic Impurities Test for Aggregate (ASTM C40)	Initial and monthly
Friable Particle Test for Aggregate (ASTM C142)	Initial and monthly

### 3.3 BSRI INSPECTION AND TESTING

- A. BSRI shall sample and test the riser grout, the strong grout, the reducing CLSM, and the reducing grout and test them for conformance to the requirements of temperature, compressive strength, and flow consistency as described in this section. Minimum frequency of testing will be as specified in Attachment 03311.2. BSRI may increase or decrease sampling and testing frequency at its discretion.
- B. Riser grout, strong grout, reducing CLSM, and reducing grout which, when tested, falls outside of the specified limits for temperature shall be retested immediately on another sample of the same load. If the retest falls outside of the specified limits for temperature, the riser grout, strong grout, reducing CLSM or reducing grout shall be subject to rejection.
- C. Four (4) compressive strength cylinders, 6 inches in diameter x 12 inches long, shall be cast from every 150 cubic yards, or fraction thereof, of each reducing CLSM mix or reducing grout mix delivered in any 24 hour period to BSRI. Two cylinders will be tested at 28 days, and two cylinders shall be tested at 90 days.
- D. Nine (9) compressive strength cubes (2 inch) shall be cast for every 150 cubic yards, or fraction thereof, of each riser grout mix or strong grout mix delivered in any 24 hour period to BSRI. Three (3) cubes will be tested at 7 days, three (3) cubes at 14 days, and three (3) cubes at 28 days.
- E. Compressive strength testing which falls on a weekend or a holiday may be adjusted as contained below.

7 or 14 day tests may be performed within -1 or +2 days of the corresponding test dates.

28 day test may be performed within -1 or +1 day of the corresponding test dates.

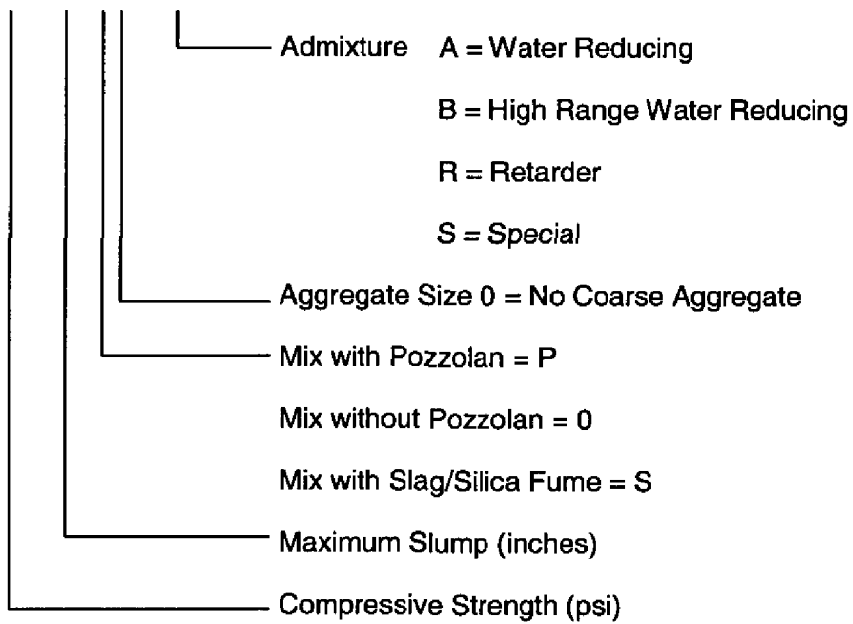
90 day test may be performed within -1 or +1 day of the corresponding test dates.

**ATTACHMENT 03311.1**

**TANK CLOSURE MIX DESIGN IDENTIFIER**

The following is an example of the tank closure mix design identifier.

A2000-X-0-0-ABRS



Compressive strengths ( $f'_c$ ) at 28 days

**ATTACHMENT 03311.2**

**INSPECTION AND TESTING OF RISER GROUT, STRONG GROUT, REDUCING CLSM, AND REDUCING GROUT TANK CLOSURE MIXES, AND BATCH PLANT- AUGER MIXER BY BSRI**

<b>INSPECTION AND TESTING OF RISER GROUT, STRONG GROUT, REDUCING CLSM, AND REDUCING GROUT TANK CLOSURE MIXES, AND BATCH PLANT-AUGER MIXER BY BSRI</b>		
<b>Material and Requirement</b>	<b>Test Method</b>	<b>Test Frequency</b>
<b>Riser grout</b>		
Sampling, Compressive Strength, and Yield test	ASTM C31/C31M with ASTM C109/C109M  ASTM C685/C685M with ASTM C138/C138M	Test first 3 cubic yards of each mix delivered/discharged each day and 1 test for every 150 cubic yards thereafter.
<b>Strong grout, Reducing CLSM, and Reducing grout</b>		
Sampling, Compressive Strength, flow consistency, and Yield Test	ASTM D4832, ASTM D5971, ASTM D6103, ASTM C685/C685M with ASTM D6023	Test first 3 cubic yards of each mix delivered/discharged each day and 1 test for every 150 cubic yards thereafter.
<b>Batch Plant-Auger Mixer</b>		
Batch Plant Calibration Check	ASTM C685/C685M	Verify calibration check for all recording devices in the accuracy of proportioning and production rate prior to batch of each type of mix each day and thereafter every 2 hours of operation for riser grout, strong grout, reducing CLSM, and reducing grout. The data shall be recorded on an appropriate log sheet.

**END OF SECTION**

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