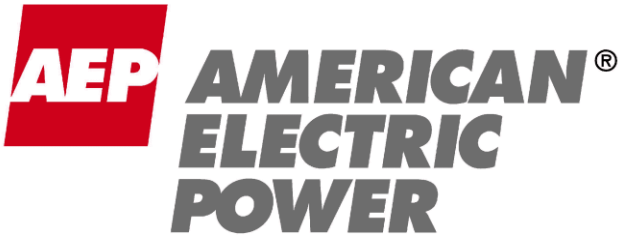
ATTACHMENT 41
Construction Quality Control (CQC) Plan
Special Waste Landfill Permit
Big Sandy Plant – Ash Pond Closure
Lawrence County, Kentucky

A Construction Quality Assurance/Quality Control Plan has been developed for the proposed closure activities for the existing ash pond closure. The plan includes the requirements for materials and their evaluation, to include example construction documentation forms used for the project.

AEP BIG SANDY POWER PLANT – LAWRENCE COUNTY, KENTUCKY

CONSTRUCTION QUALITY ASSURANCE PLAN

Prepared for



American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43215

May, 2013

Prepared by

URS

URS Corporation
1375 Euclid Avenue, Suite 600
Cleveland, OH 44115

URS Project No. 13815151

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Appendices

1.0 INTRODUCTION

This Construction Quality Assurance/Quality Control Plan (CQA Plan) has been developed in support of the permit application for closure of the ash pond disposal facility located at American Electric Power's (AEP's) Big Sandy Power Plant in Lawrence County, Kentucky.

PURPOSE

The purpose of this Construction Quality Assurance (CQA) Plan is to outline the observation and testing requirements needed to document and verify the following:

- How each new "as built" solid waste disposal facility unit(s) cover system(s) will be inspected and/or tested by a QA Engineer during construction or installation for uniformity, damage, and imperfections;
- How each constructed section of the final cover system will be certified by a registered engineer; and
- The engineered components meet the lines and grades shown in the construction drawings and conform to the specifications in the Contract documents.

REFERENCES TO STANDARDS

The CQA Plan includes references to test procedures of ASTM International and the Geosynthetics Research Institute (GRI).

QA/QC PROGRAM

Although they are related, there is a significant difference between Quality Assurance and Quality Control. These elements are often confused and interchanged because they are interdependent. Quality Assurance (QA) relies on the Quality Control (QC) feedback and both work to deliver good quality products and services. Although this plan is focused on construction quality assurance, it necessarily also contains items associated with quality control. Refer to the project specifications for more information about the QA/QC Program.

2.0 PREQUALIFICATION TESTING

The following section discusses the specific QA/QC requirements for prequalification conformance testing of the engineered components for the pond closure facility.

PREQUALIFICATION CONFORMANCE TESTING

Prequalification testing is necessary to establish that the materials used for the engineered components conform to the minimum specifications contained in this document. Some prequalification testing is generally necessary for any engineered component comprised in

whole or in part of aggregate, compacted clay, or geosynthetics. Conformance testing is performed on representative materials obtained from the location of origin and results submitted prior to arrival on site unless otherwise directed by the Resident Engineer.

Material characteristics testing are contained in Tables 1 through 5 as applicable for each engineered component. Minimum testing requirements and frequencies for soils and aggregates are located in Table 1. Tables 2 through 5 contain testing requirements for geosynthetic related elements.

SUBMITTALS

Submit the results of all required prequalification testing to the QA Engineer for review and verification that the reported test results meet with project specifications at least 14 days prior to use of the material at the job site unless otherwise directed by the QA Engineer.

3.0 STRUCTURAL FILL

The following section discusses the specific QA/QC requirements for the testing and construction of this material.

MATERIALS

Obtain soil or other acceptable material for construction of the structural fill from on-site and/or off-site borrow sources as contained in the construction plans and/or as directed by the Resident Engineer and Construction Manager. Remove excess or unsatisfactory material to designated on-site stockpiles as directed by the Resident Engineer or QA Engineer. Soil material removed from excavations may be reused as fill provided it meets the prequalification requirements listed herein.

SOURCE QUALITY CONTROL

Utilize material for structural fill with the following minimum characteristics:

- Consists of well-graded natural earth material that is not excessively dry or saturated
- Free of organic materials, debris, waste, frozen materials, vegetation, roots, and any other deleterious materials and any materials that could damage or puncture overlying materials
- Conforms with project specifications

Additional requirements are contained in **Table 1**.

CONSTRUCTION AND INSTALLATION

Place structural fill to the lines and grades shown on the construction drawings.

Prepare the final surface to be relatively smooth such that the surface is suitable for the overlying engineered component(s).

FIELD QUALITY ASSURANCE

Quality assurance of the placement of structural fill will be by proofroll in accordance with **Table 1** and be performed by the QA Engineer. Lift thickness and source verification will be visually observed and confirmed by the QA Engineer.

4.0 RECOMPACTED SOIL BARRIER

The following section discusses the specific QA/QC requirements for the testing and construction of this material. Recompacted Soil Barrier (RSB) is a compacted clay material placed as a low permeability barrier layer in parts of the cap cover system where geomembrane will not be placed.

MATERIALS

Obtain clay soil for construction of the RSB from the on-site borrow area as shown in the construction plans and/or as directed by the Resident Engineer and Construction Manager. Remove excess or unsatisfactory material to designated on-site stockpiles as directed by the Resident Engineer or QA Engineer. Soil material removed from excavations may be reused as structural fill provided it meets the prequalification requirements listed herein.

SOURCE QUALITY CONTROL

Utilize material for RSB with the following minimum characteristics:

- Consists of natural earth material that is not excessively dry or saturated
- Free of organic materials, debris, waste, frozen materials, vegetation, roots, and any other deleterious materials and any materials that could damage or puncture overlying materials
- Conforms with project specifications

Additional requirements are contained in **Table 1**.

CONSTRUCTION AND INSTALLATION

Place RSB to the lines and grades shown on the construction drawings.

Prepare and process the material as necessary to achieve the required minimum compaction requirements as determined by ASTM D698 and/or ASTM D1557 in accordance with the requirements contained in **Table 1**.

FIELD QUALITY ASSURANCE

Quality assurance of the placement of RSB will be by in-place density testing in accordance with **Table 1** and be performed by the QA Engineer. The locations of the individual tests must be adequately spaced to represent the constructed area. Any penetrations will be repaired using bentonite. Lift thickness and source verification will be visually observed and confirmed by the QA Engineer.

The QA Engineer will maintain a log of in-place moisture/density tests and will indicate the remediation measures undertaken to correct deficient work. Construction quality test reports will identify the subsequent retest number after remediation. The retest report will also indicate the test number for the previous failed report. Retests will be performed at the same location as the failed test.

5.0 Protective Cover Soil and Vegetation

The following section discusses the specific QA/QC requirements for the testing and construction of this material.

PROTECTIVE COVER SOIL

Obtain soil for placement of the protective cover soil from on-site and/or off-site borrow sources as shown in the construction plans and/or as directed by the Project Engineer and Construction Manager. Remove excess or unsatisfactory material to designated on-site stockpiles as directed by the Resident Engineer or QA Engineer.

SOURCE QUALITY CONTROL

Utilize material for the protective cover soil with the following characteristics:

- Consists of well-graded natural earth materials that are not excessively dry or saturated unless otherwise specified by the construction specifications
- Has sufficient fertility or can be amended to support vegetation in the top 6-inches of material

Material used for the protective cover layer must be compatible with the geocomposite drainage layer (as appropriate).

Additional requirements are contained in **Table 1**.

QUALITY ASSURANCE

Protective cover soil lift thickness and source verification will be visually observed and confirmed by the QA Engineer.

The QA Engineer will monitor material placement over the geosynthetics to assess the potential for damage to the underlying engineered components.

6.0 GEOMEMBRANE

The following section discusses the specific QA/QC requirements for the testing and installation of this material. Geomembrane must be placed on a stable subgrade and may be used in conjunction with other geosynthetics to act as a composite liner or barrier system. Geomembrane typically has extensive QA/QC requirements for the manufacturer, installer, and the QA Engineer.

MATERIAL REQUIREMENTS

FML Barrier Liner for the Final Cover: Utilize 30-mil PVC geomembrane for the final cover system containing no fillers or extenders. The minimum acceptable physical, mechanical, and hydraulic properties of the PVC-manufactured sheet are outlined in ASTM D 7176.

INTERFACE SHEAR REQUIREMENTS

If the geomembrane cap system is to be used for slopes equal to or greater than 4H:1V with a slope length of greater than 30 feet (approx. 7 feet in height), then the geomembrane cap system shall meet the interface shear requirements shown in Table 2.

SOURCE QUALITY CONTROL

Quality Control testing for the geomembrane will be performed by the manufacturer on the representative samples of the proposed material to demonstrate and verify the materials meet minimum requirements outlined in ASTM D 7176. Results should be submitted to the QA Engineer for review.

CONSTRUCTION AND INSTALLATION

Install the geomembrane above a stable subgrade. Installer shall approve the subgrade surface prior to installing the geomembrane. A daily Prepared Subgrade Acceptance form is to be signed and submitted by the Installer to the Resident Engineer.

Complete all geosynthetics field installation in accordance with the manufacturer's recommended installation procedures, the construction specifications, and to the lines and grades shown on the construction drawings.

Record all construction details for all deployed geomembrane on individual forms acceptable to the Resident Engineer. This includes at a minimum:

- Panel placement logs
- Panel seaming logs
- Repair logs
- Non-destructive test result logs

Prepare panel layout drawings (field sketches) of the deployed and tested geomembrane for review by the QA Engineer.

Complete the installation such that the geomembrane is relatively smooth, without significant wrinkles, without tears or holes, and covers the total surface of the area on which it is to be installed per the construction drawings. Do not leave tools, debris, or surplus materials on the surface.

TRIAL WELDS

Verify seaming conditions and techniques are adequate by performing daily trial welds on representative pieces of geomembrane in accordance with the following procedures for all combinations of seamer and seaming equipment:

- Perform trial welds once in the morning and once in the afternoon, when operator/machine combinations change, and when an apparatus is turned off and restarted
- Perform additional trial welds when the FML temperature changes by 45°F or more since the previous trial weld was performed

All trial weld seams must meet or exceed the requirements of ASTM D7408. A passing trial seam must be made at the frequency noted above for each seaming device and technician prior to performing production seaming. The QA Engineer will periodically observe trial welding and will review trial welding logs.

FIELD QUALITY CONTROL

During deployment and seaming of the geomembrane, perform the following quality control tests and record the results for review and concurrence by the Resident Engineer:

- Trial welds
- Non-destructive test results
- Repair logs

Perform non-destructive testing on 100 percent of field seams over their full length using an air pressure test, air lance test, or other acceptable method in accordance with industry accepted standards, manufacturer's recommendations, and the project specifications.

Complete non-destructive testing of the seams as the seaming work progresses and any required repairs in accordance with industry standards and in accordance with manufacturer's recommendations.

Ensure all field testing equipment is calibrated in accordance with **Table 5**.

AIR PRESSURE TESTING

The initial pressure will be set appropriately as indicated in ASTM D7177, and the test will last for 5 minutes after reading the initial test pressure. If pressure loss exceeds the allowable specification in the ASTM D7177 or if the pressure does not stabilize, locate the faulty area and repair as needed. Flap welding is not an acceptable repair for a failing air channel test. For passing tests, at the end of the 5-minute period, cut the far end of the seam and note the resultant pressure drop. The QA Engineer shall observe air pressure testing and review non-destructive test logs.

AIR LANCE TESTING

Unless otherwise specified, air lance testing will be required on all chemical fusion welded seams. The QA Engineer shall witness the testing, and the seam shall be clearly visible to the QA Engineer and Installer during the test. Unbonded areas or defects shall be marked by the QA Engineer for repair by the Installer. Any voids in the seam will be marked, repaired, and re-tested with the air lance. The testing technician and the inspector will mark each seam or repair with an indelible marker as accepted immediately after completion of final air lance testing. The QA Engineer shall observe air lance testing and review air lance testing logs.

FIELD QUALITY ASSURANCE

The QA Engineer and Resident Engineer will confirm the panel identification corresponds to quality control certificates issued by the manufacturer.

The QA Engineer will document observations during installation including damage, seaming logs, repair logs, test results, and conformance to specifications. Other items that will be noted include:

- The method and equipment used to deploy the panels does not cause scratches or crimps in the geomembrane and does not damage the supporting soil
- The method used to place the panels for minimization of wrinkles and temporary loading utilized to prevent wind damage

7.0 GEOCOMPOSITE

The following section discusses the specific QA/QC requirements for the testing and installation of this material. Geocomposite will serve as a collection and transport layer of infiltrating storm water in the final cover system where geomembrane is installed.

MATERIAL REQUIREMENTS

Utilize a geocomposite for the final cover system that meets the minimum transmissivity requirements contained in **Table 3** and has the following properties:

- Has a minimum thickness of 250 mils or as required to meet the required minimum transmissivity
- Consists of a geonet with geotextile layers factory heat-bonded to both sides

Additional minimum acceptable physical, mechanical, and hydraulic properties for the geocomposite-manufactured sheet are contained in **Table 3**.

SOURCE QUALITY CONTROL

Quality Control testing for the geocomposite will be performed by the manufacturer on the representative samples of the proposed material to demonstrate and verify the materials meet minimum requirements outlined in **Table 3**. Results should be submitted to the QA Engineer for review.

CONSTRUCTION AND INSTALLATION

Install the geocomposite above geomembrane after receipt of approval from the QA Engineer confirming the geomembrane repair documentation is complete.

Complete all geosynthetics field installation in accordance with the manufacturer's recommended installation procedures, the project specifications, and to the lines and grades shown on the construction drawings.

FIELD QUALITY ASSURANCE

Seams for the geocomposite will be 100% visually inspected, including inspection of the geonet seams, inspection of the lower geotextile overlaps, and inspection of the upper geotextile sewing or heat seaming.

8.0 GEOTEXTILE

The following section discusses the specific QA/QC requirements for the testing and installation of this material. Geotextile will serve as a permeable, separative, and protective fabric layer between soil, aggregate, geosynthetic, and waste materials.

SOURCE QUALITY CONTROL

Quality Control testing for the geotextile will be performed by the manufacturer on the representative samples of the proposed material to demonstrate and verify the materials meet

minimum requirements outlined in **Table 4**. Results should be submitted to the QA Engineer for review.

CONSTRUCTION AND INSTALLATION

Complete all geosynthetics field installation in accordance with the manufacturer's recommended installation procedures, the project specifications, and to the lines and grades shown on the construction drawings.

FIELD QUALITY ASSURANCE

In addition to reviews of QC documentation, the Resident Engineer or QA Engineer will visually inspect installed geotextile for damage and conformance with the Specifications.

The QA Engineer and Resident Engineer will confirm the roll identification corresponds to quality control certificates issued by the manufacturer.

The QA Engineer will document observations during installation including damage, seaming logs, repair logs, test results, and conformance to specifications.

TABLES

Table 1. Minimum Requirements and Test Frequencies for Soil Materials

Component	Required Test	Minimum Frequency	Sample Size[(1)]	Acceptance Criteria
Structural Fill Prequalification Conformance Testing [(2)]	Visual Observation	As required	N/A	Substantially free of debris, large rocks, plant materials, or other deleterious material.
Structural Fill Performance Testing [(3)]	Visual Observation	As required	N/A	Final surface: firm, smooth, and uniform
	Lift Depth Check	As required	N/A	12 in. loose lift (exception: lifts for bridging layer)
	Proofroll	1 test per lift of fill area and at the discretion of the QA Engineer	N/A	No excessive pumping or rutting of subgrade
Recompacted Soil Barrier Prequalification Conformance Testing [(2)]	Visual Observation	As required	N/A	Substantially free of debris, large rocks, plant materials or other deleterious material. Must not pump or rut excessively
	Natural (as-received) Moisture Content (ASTM D2216)	2 per source & 1 per 5,000 yd^3	5-10 lb.	
	Sieve Analysis (ASTM D422)	2 per source & 1 per 5,000 yd^3	5-10 lb.	100% $\leq$ 2-in.sieve , 90% $\leq$ 0.75-in. sieve, 50% $\leq$ #200 sieve and max clod size of 3 in.
	Atterberg Limits (ASTM D4318)	2 per source & 1 per 5,000 yd^3	5-10 lb.	Plasticity index: 10 or more
	Standard Proctor (ASTM D698)	2 per source & 1 per 5,000 yd^3	50-100 lb.	Determination of window of acceptable moisture content given required dry density. Maximum dry unit weight greater than 90 lb./ft3
	Permeability (ASTM D5084)	2 per source & 1 per 10,000 yd^3	5-10 lb.	RSB must be less than $1x10^{-5}$ cm/s when compacted to 95% Standard Proctor maximum dry density and a moisture content of 0% to +4% of optimum.
Recompacted Soil Barrier Performance Testing [(3)]	Visual Observation	As required	N/A	Final surface: firm, smooth, and uniform
	Lift Depth Check	As required	N/A	Max 8 in. loose lift
	Nuclear Densiometer In-Place Density and Moisture Content (ASTM D6938)	4 tests per acre per lift of fill area	N/A	> 95% Standard Proctor maximum dry density. Moisture content 0 to +4% of optimum, or as required to achieve $1x10^{-5}$ cm/s
Protective cover soil Prequalification Conformance Testing [(2)]	Visual Observation	As required	N/A	Substantially free of debris, large rocks, plant materials, or other deleterious material. Must not pump or rut excessively.
	Topsoil Analysis			Top 6-inch layer - pH between 6.0 and 7.5 and organic content between 1.5 and 10% by weight
Protective cover soil Performance Testing [(3)]	Visual Observation	As required	N/A	Final surface: firm, smooth, and uniform
	Lift Depth Check	As required	N/A	12 or 18 in. uncompacted lift (exception: topsoil layer shall be placed in a single 6-inch lift)

(1) In general, where the symbol "N/A" (not applicable) is used, the test is performed on in-place materials.
(2) Conformance testing is performed on borrow sources and placed material to ensure the minimum required values are met and the material remains consistent.
(3) Performance testing is performed on materials after placement is complete to ensure that the lift or layer meets design requirements.

Table 2. Minimum Requirements and Test Frequencies for Shear Strength Prequalification

Item/Interface Description	Material Preparation	Required Tests	Material Selection	Frequency	Specification[(1),]			Basis For Test	Certification
Final Cover System									
					Peak Secant Angle (degrees)	Critical Normal Stress (psf)	Min. Peak Shear Stress (psf)		
Protective Cover Soil/ Geocomposite Drainage Geocomposite Drainage/ Geomembrane Liner Geomembrane Liner/ Contouring Fill	Soil is to be compacted to highest moisture and lowest density expected during construction. All geosynthetics interfaces to be oriented same side to same side as in the in the field.	Interface Shear Strength ASTM D5321 at normal force of 125 psf, 250 psf, and 375 psf.	Representative samples of geosynthetics and specific soils/aggregates to be used in construction	One test per interface for initial construction. An additional test will be required for any significant material change (soil or geosynthetic).	17.8	250	80	Shallow translational failure analysis of final cover slopes	Results evaluated and approved as having met applicable specifications established by the slope stability analysis
					Residual Secant Angle (degrees)	Critical Normal Stress (psf)	Min. Residual Shear Stress (psf)		
Protective Cover Soil/ Geocomposite Drainage Geocomposite Drainage/ Geomembrane Liner Geomembrane Liner/ Contouring Fill	Soil is to be compacted to highest moisture and lowest density expected during construction. All geosynthetics interfaces to be oriented same side to same side as in the in the field.	Interface Shear Strength ASTM D5321 at normal force of 125 psf, 250 psf, and 375 psf.	Representative samples of geosynthetics and specific soils/aggregates to be used in construction	One test per interface for initial construction. An additional test will be required for any significant material change (soil or geosynthetic).	12.4	250	55	Shallow translational failure analysis of final cover slopes	Results evaluated and approved as having met applicable specifications established by the slope stability analysis

(1) Minimum peak shear strengths are provided in both friction angle and shear stress at specified critical normal load. Shear stress (τ) is calculated using the equation $\tau = c + \sigma\tan\phi$ where c = cohesion or adhesion and σ = normal force. Exceeding either the required friction angle with cohesion/adhesion = 0 or the minimum shear stress at the critical normal load is acceptable.

(2) The strength of these materials has been conservatively assumed in the slope stability analysis. These materials should be tested once prior to initial construction to verify the minimum assumed strength parameters are exceeded. Subsequent construction projects should have a geotechnical engineer verify the material characteristics are similar to those tested and verified as passing results. If different materials or a different borrow source are utilized, additional testing should be considered.

(3) Interface shear testing only required if 4H:1V slopes longer than 30 feet in slope length are utilized.

(4) Appropriate strain rates to be set by the QA Engineer.

Table 3. Required Geocomposite Properties – Manufacturing Quality Control

Material Property	Value	Units	Test Method	Manufacturer's Frequency
Geonet Component[(2)]:				
Thickness (min.)	250	mil	ASTM D 5199	per manufacturer
Specific Gravity (min. avg.)	0.94	g/cm^3	ASTM D 792 or ASTM D 1505	per manufacturer
Carbon Black Content	2-3	percent	ASTM D1603	per manufacturer
Tensile Strength, MD (Machine Direction)	45	lb./in.	ASTM D 5035	per manufacturer
Geotextile Component:				
Polymer Composition (min.)	95	% polypropylene or polyester by weight		per manufacturer
Mass per Unit Area (min.)	8	$oz./yd^2$	ASTM D 5261	per manufacturer
Apparent Opening Size	70 (or finer)	sieve size	ASTM D 4751	per manufacturer
Ultraviolet Resistance (min. avg.)	70	percent	ASTM D 4355 (after 500 hours)	per manufacturer
Geocomposite:				
Transmissivity [(1)] (min.)	$6.2x10^{-4}$	m^2/sec	ASTM D 4716	per manufacturer
Peel Strength (min.)	1	lb./in	GR1 GC-7	per manufacturer

[(1)] Transmissivity measured using water at 20°C with a gradient of 0.25 (or greater) and normal stress of up to 1,000 psf using plates for 100 hours or as required to achieve a steady state.

Table 4. Required Properties For Nonwoven Geotextiles – Manufacturing Quality Control

Material Property	Value[(1)]	Units	Test Method	Manufacturer's Frequency
10 oz./sy Nonwoven Geotextile				
Mass/Area (min. avg.)	10	oz./sy	ASTM D 5261	per manufacturer
Permittivity	0.8	sec^{-1}	ASTM D 4491	per manufacturer
Puncture Resistance	120	lb.	ASTM D 4833	per manufacturer
Apparent Opening Size	100	U.S. Sieve	ASTM D 4751	per manufacturer
8 oz./sy Nonwoven Geotextile				
Mass/Area (min. avg.)	8	oz./sy	ASTM D 5261	per manufacturer
Permittivity	1.0	sec^{-1}	ASTM D 4491	per manufacturer
Puncture Resistance	80	lb.	ASTM D 4833	per manufacturer
Apparent Opening Size	80	U.S. Sieve	ASTM D 4751	per manufacturer
6 oz./sy Nonwoven Geotextile				
Mass/Area (min. avg.)	6	oz./sy	ASTM D 5261	per manufacturer
Permittivity	1.0	sec^{-1}	ASTM D 4491	per manufacturer
Puncture Resistance	60	lb.	ASTM D 4833	per manufacturer
Apparent Opening Size	70	U.S. Sieve	ASTM D 4751	per manufacturer

Notes:

(1) Minimum average roll values

Table 5. CALIBRATION OF TESTING EQUIPMENT

Equipment	Required Test	Minimum Frequency	Acceptance Criteria
Nuclear Density Gauge	Radioactive Source Wipe Testing and Systems Electronics Check	Annually by Manufacturer or Specialty Testing firm qualified to inspect and calibrate nuclear source equipment	Certificate of Calibration and Safety by Testing Firm
Tensiometer	Tensile strength calibration to standard	Prior to arrival to project site. Tensionmeter to be field verified at the discretion of the Engineer	+/- 3 psi
Air Pressure Gauges	Pressure in psi compared to standard	Prior to arrival to project site or documentation that the product is new	+/- 1 psi
Other	As Determined by the Engineer	As Recommended by the Manufacturer, or Required by State Auditor of Measurement Devices	As Guaranteed by the Manufacturer

APPENDIX A

Example Construction Documentation Forms

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FIELD COMPACTION TESTING

Project: _____ Report No.: _____

_____ Date: _____

URS Personnel: _____

Project No. _____

Client: _____

Field Test Equipment: Troxler : _____

Standard Counts: Moisture _____ Density _____

Lift Thickness, in.: __" loose

Laboratory Reference Compaction: ___ pcf @ ___%

Placement Area: _____

TEST DATA

Lift Test No.	Location	Lift No.	Percent Water Content	In Place Dry Density/ PCF	Percent Compaction	Pass/ Fail	Type of Material	Comments
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

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Daily Log

Report No. 1

Project:
Contractor:
Owner:
URS Job No.

Date	**Cal. Day** 1
Day:	
AM Temp. & Weather	**PM Temp. & Weather**

Contractor	Work Force	Equipment

Item	Description	Quantity	Location

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FIRM:

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Non Destructive Testing Log

Project: _____ **Product:** _____
Contractor: _____ _____
Owner: _____ _____
URS Job No. _____ _____

Date	Seam Segment	Tester Initials	Pressure PSI Start	Pressure PSI End	Test Time Start	Test Time End	Pass Fail	V-Box Pass	Comments

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Panel Placement

Project: ____________________ **Product:** ____________________
Contractor: ____________________ ____________________
Owner: ____________________ ____________________
URS Job No. ____________________ ____________________

Date	Panel Number	Roll Number	Panel Length	Panel Width	Square Footage	Comments
					0.0	
					0.0	
					0.0	
					0.0	
					0.0	
					0.0	
					0.0	
					0.0	
					0.0	
					0.0	
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					0.0	
					0.0	
					0.0	
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Panel Seaming Form

Project: ______________________ **Product:** ______________________

Contractor: ______________________ ______________________

Owner: ______________________ ______________________

URS Job No. ______________________ ______________________

Date	Seam Number	Time	Seamer Initials	Machine Number	Seam Length (ft)	Comments

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REPAIR LOG

Project: _____ **Product:** _____

Contractor: _____ _____

Owner: _____ _____

URS Job No. _____ _____

Repair Number	Repair Date	Time of Repair	Location of Repair	Size of Repair	Repair Tech	Machine Number	V-Box Test	COMMENTS
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
13								
14								
23								
24								
25								
26								
27								
28								
29								
30								

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Trial Weld Log

Project: ____________________ **Product:** ______________________________
Contractor: ____________________ ______________________________
Owner: ____________________ ______________________________
URS Job No. ____________________ ______________________________

Date	Time	Mach. Number	Seamer Initials	Fusion Welder		Test Mode	Test Results in LBS/IN					Pass Fail
				Wedge Temp	Speed Ft/Min		Sample Number					
							1	2	3	4	5	
						PEEL						
						SHEAR						
						PEEL						
						SHEAR						
						PEEL						
						SHEAR						
						PEEL						
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						SHEAR						
						PEEL						
						SHEAR						

Date	Time	Mach. Number	Seamer Initials	Extrusion Welder		Test Mode	Test Results in LBS/IN					Pass Fail
				Barrel Temp	Preheat Setting		Sample Number					
							1	2	3	4	5	
						PEEL						
						SHEAR						
						PEEL						
						SHEAR						
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						PEEL						
						SHEAR						

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