

BMP Testing for Erosion and Sediment Control

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FINAL REPORT

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REPORT OF BMP TESTING

for the

GEORGIA SOIL AND WATER CONSERVATION COMMISSION (GSWCC)

1. Overview of the Project

1.1 <u>Overview</u>

The testing program is intended to characterize full-scale, installed performance of commonly used best management practices (BMPs) for sediment control. The specific BMPs are commonly referred to as sediment retention devices, SRDs. The SRDs to be tested include what the GSWCC refers to as sediment barriers and check dams and are to be exposed to conditions relevant to typical installations. This testing will serve as a "baseline" for qualification of future SRDs. Additionally, the "index properties" of the tested materials will be verified and documented along with their associated performance properties. This will facilitate efforts to correlate performance to certain easily measured properties of the SRD components, as well as, to "bench-mark" the performance of a given product to specific index properties.

The testing protocols will, as much as possible, conform to existing or currently proposed ASTM <u>standardized</u> procedures so that future SRDs can be subjected to the same protocols and can easily and reliably be compared to the results of this program.

1.2 <u>Why ASTM Standard Test Procedures?</u>

There is relatively little performance data available for most SRDs and the limited data that is available has generally been developed using widely differing protocols. Thus, it is rarely possible to accurately compare SRD performance data developed on different SRDs at different testing organizations. The solution to this is to define common, or <u>standard</u>, protocols that can be used by all testing organizations.

Additionally, most SRDs are comprised of components that may be easily changed by the manufacturer without understanding the affect the change may have on product performance. At very least, the manufacturer must perform regular quality control (QC) tests on the components used in SRD manufacture, and these QC tests must be consistently run and reported. These QC test results are often used as the basis for QPL listing and must, therefore, be independently verifiable. Thus, it is important that a common, or <u>standard</u>, protocol be used by manufacturer and regulator alike.

1.3 <u>Objectives</u>

The project team will accomplish the following objectives:

- Document easily measureable (index/QC) properties of SRDs for "bench-marking", or relating, the performance results to the component materials used in the SRDs tested.
- Document the actual performance of SRDs under application-specific simulations to provide "baseline" information to compare to performance tests on future products.
- Use test experience and results to recommend preferred test protocols for both QC and performance testing of SRDs used in sediment barrier and check dam applications.
- Assess project results in light of GADOT and GSWCC goals when using these BMPs.



2. Overview of Standard Test Procedures for SRDs

2.1 Basic Index Tests for QC and "Bench-marking" of Tested Products

All product manufacturers must perform a few tests on a very frequent basis so that they can prove that they are keeping their manufacturing processes within preset limits and thereby producing a consistent product. In the manufacturing of SRDs and SRD components, a few basic mechanical properties are routinely measured in the manufacturer's own QC lab.

2.1.1 Basic Mechanical Index Properties

2.1.1.1 Mass per Unit Area – The mass per unit area, also known as the "weight" per square yard of a sample, is an important quality control property. The most commonly used test for SRD components is ASTM D 5261, "Standard Test Method for Measuring Mass per Unit Area of Geosynthetics."

2.1.1.2 Thickness – Thickness is another important quality control property. To this end, the following standardized test method for SRD components is available: ASTM D 5199, "Standard Test Method for Measuring Thickness of Geosynthetics."

2.1.1.3 Tensile Strength – Tensile strength is the other primary quality control property measured on most SRD components. Arguably, tensile strength may also be important if an SRD is subject to the weight of sediments or the pressures associated with impounding runoff. The following standardized test method is most commonly used: ASTM D 4632, "Standard Test Method for Grab Breaking Load and Elongation of Geosynthetics."

2.1.1.4 3-Dimensional Structures – Many SRDs are 3-dimensional products (i.e. wattles, bales, etc.), thus non-standard procedures are currently used to measure such things as density (or unit weight per length) and circumference.

2.1.2 Basic Hydraulic Index Properties

The most unique thing about SRD's is that, typically, for them to be very effective in retaining sediment they must also impound most of the runoff. Conversely, for them to freely pass runoff, they have to be allowed to pass a significant amount of sediment. Neither of these extremes is usually preferred, so the user has to determine the proper balance of retaining sediment while permitting seepage. Thus, a basic knowledge of the hydraulic properties that characterize the openings and flow capacity of the SRD components is essential to product selection and to manufacturing consistency.

2.1.2.1 Permittivity (a.k.a. Water Flow Rate) – Permittivity is a geotextile term that relates to the vertical water flow capacity of the material. It is often reported as gallons per minute per square foot of material and uses clear water. The standard test method is ASTM D 4491, "Standard Test Methods for Water Permeability of Geotextiles by Permittivity".

2.1.2.2 Apparent Opening Size (AOS) – The measure of the approximate largest (d85) size opening in the fabric is called apparent opening size (AOS). The standard test method is ASTM D 4751, "Standard Test Method for Measuring the Apparent Opening Size of Geosynthetics".



2.1.2.3 Percent Open Area (POA) – While the AOS is a good indicator of a geotextile's ability to retain sediments when the geotextile has lots of varying sized openings – such as with a nonwoven geotextile – a woven geotextile can have a few larger openings and a lot of very small ones making it prone to clogging even though the AOS test may indicate that it has relatively large openings. To make sure it has enough openings, the overall percent of open area can be determined using a light box. Though this test is not standardized by ASTM for geotextiles, there is a Corps of Engineers protocol that has been successfully used for decades.

2.1.3 *Basic Durability Index Property* – UV Resistance

Another unique thing about SRD's is that, typically, they are exposed to the degrading effects of sunlight for extended periods. The ultraviolet portion of sunlight degrades plastics. Thus, since SRDs frequently are composed of polymeric materials, their ability to resist degradation when exposed to ultraviolet light is commonly documented via lab testing. The most common standard accelerated lab test, ASTM D 4355, which uses a Xenon Arc light source, includes 500 hrs or more of continuous exposure. Unfortunately, because of the length of time and associated costs associated with this testing, it is not practical as either a QC test or a "bench-mark" test.

2.2 <u>Full-scale Performance Testing</u>

As noted earlier, the actual performance of many SRDs is system or installation dependent. Therefore a large-scale test that can incorporate full-scale "as installed" conditions is the ideal evaluation procedure. Recently these needs have been addressed with the issuance of two large-scale standard test methods: ASTM D 7351 and ASTM D 7208.

2.2.1 SRDs in Perimeter Control Applications

The most common SRDs, including silt fences and wattles, are used as so-called "perimeter devices" around relative small building sites to intercept modest sheet flows when no obvious low point or ponding capacity exists on-site. Characterization testing associated with this application is described in work item, WK11340, now making its way through the ASTM process. Testing is a derivation of ASTM D 6459, Large-scale Slope Erosion Testing, but permits a flatter slope and calls for a lighter rainfall.

2.2.2 *SRDs as Check Structures*

SRDs have been used to slow, or "check", concentrated flows to make them less erosive until the associated channel can vegetate sufficiently to resist flow erosion. Critical elements of this protection are the ability of the temporary check structure to: (a.) slow and/or pond runoff to encourage sedimentation, thereby reducing soil particle transport downstream, (b.) trap soil particles upstream of a structure, and (c.) decrease soil erosion. ASTM D 7208, "*Determination of Temporary Ditch Check Performance in Protecting Earthen Channels from Stormwater-Induced Erosion*" has been developed to simulate this condition. It uses full-scale channel flow (up to 3 cubic feet per second) in a trapezoidal channel with check structure(s) installed.

3. Products Tested and Associated Index Properties

3.1 Participating Companies and Products

Table 1 presents the products used in testing along with the company and contact. Companies and products were randomly chosen from approved product listings of the GADOT and GSWCC.



3.2 Index Testing Results

Table 2 presents a summary of index testing results for the products used in testing. Detailed test reports are included in Appendix A.

	all a (Babb				Company / Product Identification	SRD Type
SB	Silt Saver / BSRF	Silt Fence – GSWCC C Alt.		SB	GeoFabrics / GFG-B	Silt Fence – GADOT Type B
SB	Belton / Beltech 1935	Silt Fence – GADOT Type A		SB	Belton / Beltech 1935	Silt Fence – GADOT Type B
SB	Willacoochee / 1215 or 1216	Silt Fence – GADOT Type A		SB	Filtrexx Filter Soxx	Silt Fence – GSWCC Alt.
SB	Propex / Geotex 111F	Silt Fence – GADOT Type C		SB	Straw Bales	GSWCC
SB	ThraceLinq / GRF-400EO	Silt Fence – GADOT Type C	[CD	Filtrexx Filter Soxx	GSWCC Alt.
SB	Ten Cate / FW402	Silt Fence – GADOT Type C		CD	Straw Bales	GSWCC / GADOT
SB	Hanes / GASF-A	Silt Fence – GADOT Type A		CD	Stone Check Dam	GSWCC / GADOT
SB	DDDErosion / GA-CSA	Silt Fence – GADOT C-System		CD	Fabric on Posts	GADOT Type C
SB	ErosionTech / C-System	Silt Fence - GADOT C-System			Key: SB = sediment barrier test;	CD = check dam test

Table 1. Participating Companies and Products

Table 2. Specifications and Index Testing Results

	Type A	Silt Fence		Α	19	35	GAS	SF-A	12	15
Property	Units	Spec	Test	Spec	Published	Tested	Published	Tested	Published	Tested
Tensile	lb	min	D4632	120 x 100	140 x 130	175 x 157	124 x 124	167 x 127	175 x 130	173 x 119
Elong	%	max	D4632	40	20 x 14	31 x 20	15 x 15	25 x 22	8 x 8	26 x 23
AOS	mm	max size	D4751	0.6	0.85	0.539	0.6	0.579	0.6	0.607
Flow	gpm/ft ²	min	GDT 87	25	17.5	22.9	8	111	90	85
POA	%	-	-	-	-	3	-	16	-	8
	Type B S	Silt Fence		В	19	35	GFO	G-B]	
Property	Units	Spec	Test	Spec	Published	Tested	Published	Tested		
Tensile	lb	min	D4632	120 x 100	140 x 130	175 x 157	n/a	232 x 171		
Elong	%	max	D4632	40	20 x 14	31 x 20	n/a	21 x 16		
AOS	mm	max size	D4751	0.6	0.85	0.539	n/a	0.465		
Flow	gpm/ft ²	min	GDT 87	25	17.5	23	n/a	169		
POA	%	-	-	-	-	3	n/a	7		
	Type C	Silt Fence		С	FW	402	11	1F	400	EO
Property	Units	Spec	Test	Spec	Published	Tested	Published	Tested	Published	Tested
Tensile	lb	min	D4632	260 x 180	365 x 200	451 x 256	370 x 220	351 x 259	365 x 200	458 x 262
Elong	%	max	D4632	40	24 x 10	42 x 76	20 x 15	20 x 12	24 x 10	45 x 21
AOS	mm	max size	D4751	0.6	0.43	0.49	0.6	0.416	0.425	0.505
Flow	gpm/ft ²	min	GDT 87	70	145	394	115	131	145	585
POA	%	-	-	-	10	28	8	18	10	21
	C-System	Silt Fence		С	GA-	CSA	ET-C	GA-C]	
Property	Units	Spec	Test	Spec	Published	Tested	Published	Tested		
Tensile	lb	min	D4632	260 x 180	n/a	364 x 201	268 x 180	296 x 181		
Elong	%	max	D4632	40	n/a	21 x 15	40	19 x 14		
AOS	mm	max size	D4751	0.6	n/a	0.416	0.425	0.417		
Flow	gpm/ft ²	min	GDT 87	70	n/a	171	70	114		
POA	%	-	-	-	n/a	30	n/a	14		
	GSWCC A	lt Silt Fence		C-Alt	BS	RF				
Property	Units	Spec	Test	Spec	Prev. Test	Tested				
Tensile	lb	min	D4632	120 x 100	421 x 352	105 x 90				
Elong	%	max	D4632	40	97 x 100	96 x 117				
AOS	mm	max size	D4751	0.6	0.099	0.164				
	/c. ²	min	GDT 87	25	78	112	1			
Flow	gpm/ft ²	111111	00107	25	70	112				



4. Sediment Barrier Performance Testing in accordance with ASTM's WK 11340

4.1 <u>Testing Overview</u>

Sediment Barriers were tested in accordance with ASTM's WK11340 (as of Feb 2012) except the slope of the test plots was modified to be 3:1, had a 40 ft slope length, and index tests were run on each material. The rainfall sequence for sediment barriers was run according to ASTM D 6459 - 2 in/hr, 4 in/hr, and 6 in/hr each for 20 minutes. The rain water was tested for turbidity. The P-Factor was calculated and reported in accordance with ASTM WK 11340. The test soil was classified as a Sandy Clay as shown on the USDA soil triangle. Index tests were run as follows:

- Index tests on 2-dimensional (geotextile-type) products will include mass/area, thickness, tensile strength, permittivity (flow), Apparent Opening Size, and Percent Open Area (of woven geotextiles;)
- Index tests on 3-dimensional (wattle-type) products will include mass/volume, circumference/perimeter, and relevant component properties like netting tensile strength.

4.1.1 *Test Setup*

The large-scale sediment barrier testing reported herein was performed in accordance with WK11340 modified as necessary to accommodate the selected products, on 3:1 slopes using sandy clay test plots measuring 27 ft long x 8 ft wide. The simulated rainfall was produced by "rain trees" arranged around the perimeter of each test slope. Each rain tree has four sprinkler heads atop a 15 ft riser pipe. The rainfall system has been calibrated prior to testing to determine the number of sprinkler heads and associated pressure settings necessary to achieve target rainfall intensities and drop sizes. The target rainfall intensities are 2, 4, and 6 in/hr and are applied in sequence for 20 minutes each. Three replicate test slopes with the perimeter SB installed at the bottom were tested. The sediment retention provided by the product tested is obtained by comparing the protected slope results to control (bare soil) results. Tables and graphs of rainfall versus soil loss are generated from the accumulated data.



Figure 1. Test Slopes (Control Setup)

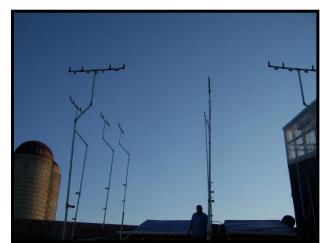


Figure 2. "Rain Trees" around Test Slopes

4.1.2 Test Soil

The test soil used in the test plots had the following characteristics.



Soil Characteristic	Test Method	Value
% Gravel		0
% Sand	ASTM D 422	49.2
% Silt	ASTM D 422	12.6
% Clay		38.2
Liquid Limit, %	ASTM D 4318	50
Plasticity Index, %	ASTM D 4518	26
Soil Classification	USDA	Sandy Clay
Soil Classification	USCS	Sandy Fat Clay
K-Factor	WK11340	0.03

Table 3. TRI Sandy-Clay Characteristics

4.1.3 Preparation of the Test Slopes

The initial slope soil veneer (12-inch thick minimum) is placed and compacted. Compaction is verified to be 90% (\pm 3%) of Proctor Standard density using ASTM D2937 (drive cylinder method). Subsequently, the test slopes undergo a "standard" preparation procedure prior to each slope test. First, any rills or depressions resulting from previous testing are filled in with test soil and subject to heavy compaction. The entire test plot is then tilled to a depth not less than four inches. The test slope is then raked to create a slope that is smooth both side-to-side and top-to-bottom. Finally, a steel drum roller is rolled down-and-up the slope 3 times proceeding from one side of the plot to the other. The submitted erosion control product is then installed using the technique acceptable to / recommended by the client. For this testing, TRI applied the product to the slopes.

4.1.4 Installation of Sediment Barrier at the End of the Test Slopes

Each sediment barrier was installed as directed by the client. For the tests reported herein, the sediment barrier installations were in accordance with the GSWCC's Manual for Erosion and Sediment Control in Georgia ("the Manual") or manufacturer's specifications. The products chosen for testing by the laboratory are listed in Table 1. The specific installations included:

- 1. Three Type A fabrics from GADOT QPL 36. (36-inch wide)
 - Install according to specifications in the Manual using wood posts
 - Wood posts shall be oak and 1.5" x 1.5" and 4ft in length.
- 2. Three Type C fabrics from GADOT QPL 36. (36-inch wide)
 - Install according to specifications in the Manual
- 3. Two C-Systems from GADOT QPL 36. (36-inch wide)
 - Install according to manufactures specifications
- 4. One Type C Silt Fence Alternative from the GSWCC Approved Products List.
 - Install according to manufactures specifications
- 5. Two Type B fabrics from GADOT QPL 36. (24-inch wide)
 - Install according to specifications in the Manual using wood posts
 - Wood posts shall be 2" x 2" soft wood or 1" x1" hardwood and 3ft in length.
- 6. One Type B Silt Fence Alternative from the GSWCC Approved Products List:
 - Compost Filter Sock install according to manufactures specifications (~12-inch diameter, 25 lbs/ft; approx. 9" high x 16" wide installed).
- 7. Straw bales installed per the Manual (42"L x 18"H x 14"W (a) $26.5 \text{ lbs} = 4.3 \text{ lbs/ft}^3$).



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4.1.5 Specific Test Procedure

Immediately prior to testing, rain gauges are placed at the quarter points (i.e. 10, 20, 30 ft) on the slope. The slope is then exposed to sequential 20-minute rainfalls having target intensities of 2, 4, and 6 inches per hour. All runoff is collected during the testing. Additionally, periodic sediment concentration grab samples are taken and runoff rate measurements are made. Between rainfall intensities, the rainfall is stopped and rainfall depth is read in the six rain gauges, valves are adjusted to facilitate the subsequent rainfall intensity, and empty collection vessels are positioned to collect subsequent runoff. After allowing for sediments to settle, water is decanted from the collected runoff. The remaining sediments are collected and dried to determine total soil loss. Pictures of prepared and end-of-test slopes are shown in Figures 3 through 8.



Figure 3. Typical Prepared Control Slope



Figure 5. Control End-of-Test



Figure 7. Type C End-of-Test



Figure 4 Typical Prepared Slope & Sediment Barrier Installation



Figure 6. Type A End-of-Test



Figure 8. C-System End-of-Test



4.2 <u>Test Results</u>

The Practice Management (P) Factor from the Revised Universal Soil Loss Equation (RUSLE) of the USDA-ARS Agricultural handbook 703 is the reported performance measure for slopes determined from this testing. The A-Factor, R-Factor, and P-Factor reported herein are related through RUSLE by the following relationship:

A = R x K x LS x C x P

where: A = the computed soil loss in tons per acre (measured/calculated from test);

- R = the rainfall erosion index (measured/calculated from test);
- K = the erodibility of the soil (calculated from control tests);
- LS = the topographic factor (2.02 for 8 x 27 ft slope);
- C = the cover factor = (1.0 for all test slopes); and
- P = the practice factor = ratio of protected slope sediment loss (via seepage through a sediment barrier) to control slope sediment loss (via runoff without sediment barrier). Note: P = 1.0 for the control slope.

Total sediment loss and the associated rainfall depth measured during the testing are the principle data used to determine the P-Factor. Based on the RUSLE, the following steps are followed to derive the P-Factor for the tested product:

1. Using the control test results, the K-Factor is derived by fitting a linear regression to the plot of cumulative "A" to cumulative "R" (see Figure 9). The slope of the regression line is used to calculate the "K", or characteristic erodibility, of the test soil. The regression equation is used to calculate the "A", or soil loss, at R = 231. This is the normalized cumulative R-Factor calculated for the target test events: 2 in/hr for 20 minutes + 4 in/hr for 20 minutes + 6 in/hr for 20 minutes based on the equation:

R-Factor = [total kinetic energy of the storm (E)] x [the max 30-minute Intensity (I)]

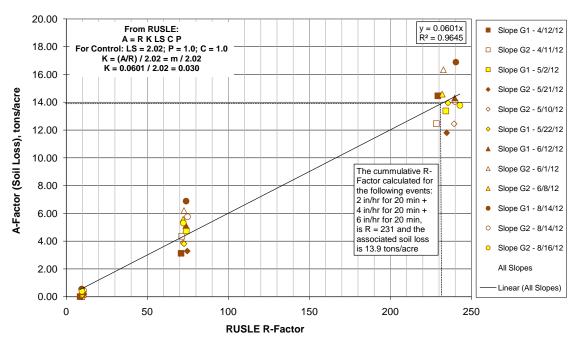
- 2. Using the protected test results, a "best fit" regression line is fitted to a plot of cumulative "A" and cumulative "R". The "A", or soil loss, is calculated for R = 231 using the best fit regression equation.
- 3. The P-Factor at R = 231 is then calculated for the protected condition using the following equation:

$$P$$
-Factor = ["A" protected at $R = 231$] / ["A" control at $R = 231$]

The P-Factor thus calculated is the reported performance value. This facilitates product-toproduct comparison of test results at a common point of the storm event. Additionally, using the regression equations for the protected and the control conditions, the users of the test report can evaluate performance at other points in the model storm by selecting the R factor (and the corresponding A-Factor) that may fit local conditions and calculating the ratio.

Table 4 summarizes the test data and associated P-Factor calculations for all the tests performed.





Soil Loss vs RUSLE R (Control Testing of TRI - Sandy Clay; 3:1 Slope)

Figure 9. Cumulative Plot of Control Tests

4.3 <u>Discussion</u>

When the data in Table 4 is presented graphically, as shown in Figures 13 through 16, some relationships between fabric index properties and installed system performance measurements are suggested. In general, lower system seepage rates correlate with lower system sediment loss rates. Related to this, lower fabric permittivity rates parallel lower system seepage rates and thus lower sediment loss, and higher fabric percent open area (for woven fabrics) correlates with maintaining higher system seepage rates along with associated higher sediment loss rates.

Following are the specific correlations between fabric properties and system performance:

- Fabric Percent Open Area vs. System Seepage: $R^2 = 0.79$
- Fabric Permittivity vs. System Seepage: $R^2 = 0.97$
- Fabric Permittivity vs. System Soil Loss: $R^2 = 0.94$
- Fabric Apparent Opening Size vs. System Soil Loss: $R^2 = 0.16$
- Fabric Percent Open Area vs. System Soil Loss: $R^2 = 0.92$

It is not possible to make similar comparisons for non-fabric systems, since there are no standardized index tests for these 3-dimensional (3-D) materials. Still, it would be likely that these 3-D systems have lower open area and size (i.e. straight-thru open spaces) but as high or higher flow (similar to permittivity). This suggests that 3-D structures may be able to provide superior balance of properties (greater filtration and greater flow) as long as there is no piping, undermining, or overtopping. Testing of the Type B (shorter) systems suggests that these systems are more susceptible to piping, undermining, and/or overtopping.



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Table 4. Summary Data Table – Protected Slopes

		1	1		Test Slope 1		mmary Da	Test Slope 2			Test Slope 3				Average All	Slones	
Product	Properties	Values	Rainfall	Sed. Conc.			Sed. Conc.			Sed. Conc.			Sed. Conc.	Sed. Loss,	Runoff,		
			Event	Losses	Sed. Loss	Runoff	Losses	Sed. Loss	Runoff	Losses	Sed. Loss	Runoff	Losses, lbs	lbs	gal	A-Factor	P-Factor
			2	0.2	0.1	5	0.0	0.0	1	1.8	2.2	7	· · · · · ·	1			
Control			4	46.5	45.8	110	62.1	64.0	110	67.3	67.5	114					
			6	168.4	166.6	223	120.3	119.0	207	129.2	126.8	211					
	TOTAL			215	213	338	182	183	318	198	197	332	199	197	329	13.880	1
	AOS, µm	164	2	0.08	0.025	7	0.2	0.043	7	0.01	0.044	4					
BSRF	Permittivity, gpm/ft ²	112	4	0.71	0.489	51	0.76	0.597	56	0.87	0.709	68					
	POA, %	n/a	6	1.4	1.185	102	1.16	1.194	115	1.74	1.379	126					
	TOTAL			2	2	160	2	2	178	3	2	198	2.3	1.9	179	0.126	0.009078
	AOS, µm	416	2	0.13	0.13	4	0.21	0.21	9	0.26	0.26	5					
GA-CSA	Permittivity, gpm/ft2	171	4	2.31	2.38	79	2.44	2.48	74	3.01	2.89	78					
	POA, %	22.8	6	4.74	4.53	140	4.71	4.89	146	4.7	4.63	145					
· · ·	TOTAL			7	7	223	7	8	229	8	8	228	7.5	7.5	227	0.501	0.036095
ſ	AOS, µm	416	2	0.2	0.1	7	0	0.02	6	0.07	0.07	5					
111F	Permittivity, gpm/ft ²	131	4	2.49	2.18	72	2.15	2	67	1.8	2.05	71					
	POA, %	18.2	6	5.26	4.97	133	4.44	4.38	128	5.21	5.4	133					
· · ·	TOTAL			8	7	212	7	6	201	7	8	209	7.2	7.1	207	0.478	0.034438
			2	2.94	2.6	15	3.83	3.1	22	2	2	23					
Control			4	46.31	45.6	101	54.16	53.9	96	54.98	54	115					
1 7			6	121.87	125.1	213	130.14	125.9	226	149.01	148.9	207					
	TOTAL		•	171	173	329	188	183	344	206	205	345	188	187	339	13.880	1
	AOS, µm	539	2	0.27	0.09	4	0	0.01	2	0.14	0.25	7					
1935	Permittivity, gpm/ft ²	22.9	4	0.76	1	57	1.17	0.96	60	1.68	1.48	63					
	POA, %	3.29	6	1.88	1.5	97	2.51	2.5	94	2.05	1.88	98					
	TOTAL	•	•	3	3	158	4	3	156	4	4	168	3.5	3.2	161	0.215	0.01549
	AOS, µm	490	2	0.47	0.3	8	0.43	0.6	14	0.45	0.41	12					
FW402	Permittivity, gpm/ft ²	394	4	2.88	2.7	76	3.74	3.8	83	2.92	2.7	76					
	POA, %	27.6	6	5.04	4.8	150	5.36	5.2	155	5.41	5.2	157					
· · ·	TOTAL			8	8	234	10	10	252	9	8	245	8.9	8.6	244	0.569	0.040994
	AOS, µm	579	2	0.36	0.4	15	0.33	0.4	11	0.44	0.4	10					
GASF-A	Permittivity, gpm/ft ²	111	4	2.29	2.2	66	2.49	2.3	67	2.34	2.1	66					
	POA, %	16.1	6	4.2	4.1	126	4.21	4.05	125	4.16	4.25	128					
	TOTAL			7	7	207	7	7	203	7	7	204	6.9	6.7	205	0.443	0.031916
			2	4.88	5.04	21	6.15	6.3	19	5.38	5.5	25					
Control			4	61.1	70.4	140	81.28	84.8	150	74.14	76.4	131					
1			6	134.2	134.8	213	146.29	149	218	130.23	132.4	209					
	TOTAL			200	210	374	234	240	387	210	214	365	215	222	375	13.880	1
	AOS, µm	607	2	0.13	0.11	6	0.3	0.15	7	0.25	0.21	8					
1215	Permittivity, gpm/ft ²	85	4	1.22	1.45	65	1.76	1.75	70	2.39	2.1	72					
I T	POA, %	8	6	3.55	3.75	120	4.07	3.85	120	4.41	4.3	125					
	TOTAL			5	5	191	6	6	197	7	7	205	6.0	5.9	198	0.393	0.028314
	AOS, µm	417	2	0.14	0.04	9	0.19	0.03	11	0.29	0.05	8					
ET-GA-C	Permittivity, gpm/ft2	114	4	2.75	1.9	70	1.79	1.95	71	2.12	2.2	69					
	POA, %	14	6	4.31	4.76	135	5.08	4.96	138	4.59	4.2	130					
	TOTAL			7	7	214	7	7	220	7	6	207	7.1	6.7	214	0.441	0.031772
	AOS, µm	505	2	0.12	0.02	7	0.23	0.18	11	0.24	0.27	9					
400-EO	Permittivity, gpm/ft ²	260	4	2.47	2.44	80	3.01	2.9	75	3.05	2.84	82					
	POA, %	21	6	5.42	5.2	151	5.76	5.4	148	5.93	5.81	152					
	TOTAL			8	8	238	9	8	234	9	9	243	8.7	8.4	238	0.565	0.040706



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					I able	4 (cont [*] a). Summar	y Data Ta	Die – Pro	otected Slop	pes						
			Rainfall	1	Fest Slope 1		Т	'est Slope 2		Т	Test Slope 3			A	Average All	Slopes	
Product	Properties	Values	Event	Sed. Conc. Losses	Sed. Loss	Runoff	Sed. Conc. Losses	Sed. Loss	Runoff	Sed. Conc. Losses	Sed. Loss	Runoff	Sed. Conc. Losses, lbs	Sed. Loss, lbs	Runoff, gal	A-Factor	P-Factor
			2	8.74	8.12	28	7.18	6.6	23	5.56	5.8	20					
Control			4	96.95	93	123	78.77	78	119	74.56	72.2	129					
			6	148.12	147	217	124.54	122	188	127.54	124.4	224					
	TOTAL			254	248	368	210	207	330	208	202	373	224	219	357	13.880	1
GFG-B	AOS, μm	465	2	0.18	0.2	6	0.11	0.11	5	0.12	0.1	6					
(24-inch)	Permittivity, gpm/ft ²	169	4	2.55	5.52	55	1.23	1.21	61	1.85	1.8	62					
(24-men)	POA, %	7	6	3.66	3.7	153	2.97	2.98	149	2.8	2.5	144					
	TOTAL			6	9	214	4	4	215	5	4	212	5.2	6.0	214	0.372	0.026801
1935	AOS, µm	539	2	0.15	0.18	6	0.27	0.2	6	0.12	0.14	4					
(24-inch)	Permittivity, gpm/ft ²	23	4	1.11	0.99	60	0.7	0.8	62	0.89	1.1	57					
(24-men)	POA, %	3	6	1.92	1.6	178	2.64	1.9	187	3.95	2.35	172					
	TOTAL		-	3	3	244	4	3	255	5	4	233	3.9	3.1	244	0.207	0.014914
Straw	AOS, µm	n/a	2	0.07	0.06	5	0.03	0.04	4	0.09	0.08	9					
Bales	Permittivity, gpm/ft ²	n/a	4	2.15	1.8	80	2.69	2.7	81	2.67	2.42	87					
(18-inch)	POA, %	n/a	6	6.97	6.9	173	7.37	8.3	166	5.99	6.23	173					
	TOTAL			9	9	258	10	11	251	9	9	269	9.3	9.5	259	0.721	0.051945
Compost	AOS, µm	n/a	2	0.07	0.03	6	0.17	0.1	10	0.2	0.26	14					
Sock	Permittivity, gpm/ft ²	n/a	4	1.21	0.76	74	1.12	0.83	76	1.99	1.65	110					
(12-inch)	POA, %	n/a	6	4.18	3.6	176	4.58	4.3	164	7.21	5.72	176					
	TOTAL			5	4	256	6	5	250	9	8	300	6.9	5.8	269	0.375	0.027017

Table 4 (cont'd). Summary Data Table – Protected Slopes



Figure 10. Type B Silt Fence End-of-Test

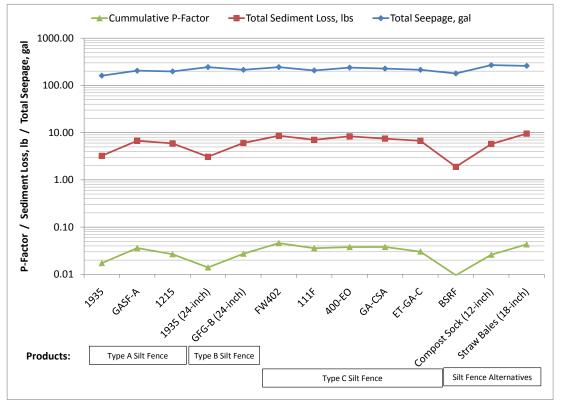


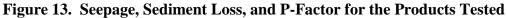
Figure 11. Type B Compost Sock End-of-Test



Figure 12. Type B Straw Bales End-of-Test







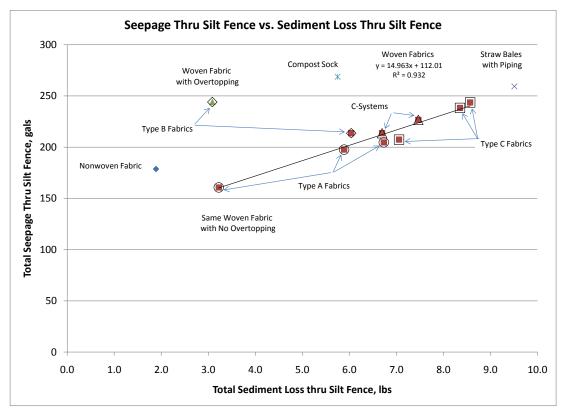


Figure 14. Seepage vs. Sediment Loss for All Tested Products



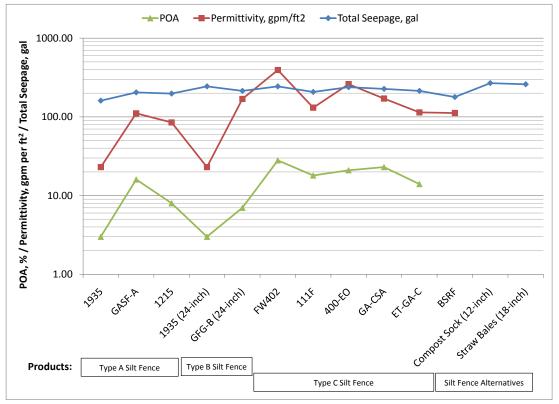


Figure 15. Seepage and Related Index Properties for the Tested Products

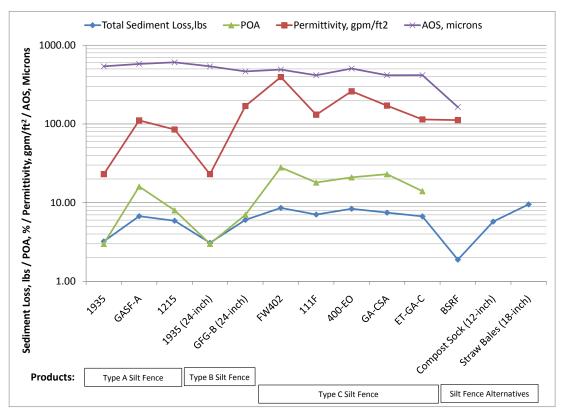


Figure 16. Sediment Loss and Related Index Properties for the Tested Products



5. Check Dam Testing in accordance with ASTM D7208

5.1 <u>Testing Overview</u>

Check Dams were tested in accordance with ASTM D 7208-06, except the test was run with one replicate each at 0.5, 1.0, and 2.0 cfs instead of 3 replicates at 3 cfs. In addition to testing compost socks, straw bales, and 2"-10" rock checks, a Type C silt fence check was tested. It was installed in a special configuration to control energy dissipation per the GaDOT detail Cd-F specifications. The test soil was classified as a Sandy Clay as shown on the USDA soil triangle. Index tests were run as follows:

- Index tests on 2-dimensional (geotextile-type) products will include mass/area, thickness, tensile strength, permittivity (flow), Apparent Opening Size, and Percent Open Area (of woven geotextiles;)
- Index tests on 3-dimensional (wattle-type) products will include mass/volume, circumference/perimeter, and relevant component properties like netting tensile strength.

5.1.1 Test Setup

The large-scale check dam testing reported herein was performed in accordance with ASTM D7208 modified as described above. The testing is performed in a trapezoidal shaped flume with a 2 ft wide bottom and 2:1 side slopes and a 5% bed slope. The concentrated flow is produced by opening a valve to allow gravity flow from an adjacent pond. Each test is run at a single predetermined flow rate for 30 minutes. The test channel is 60 ft long and includes a 40 ft test section along with a 10ft upstream and a 10 ft downstream transition section. Flow is metered into the channel via a calibrated sharp-crested weir. Nine (9) evenly spaced cross-sections are delineated within the test section and nine (9) evenly spaced measurement points are located at each cross-section. These measurement points enable before and after measurements of the soil surface. Tables and graphs of cross-sectional soil loss are generated from the accumulated data.



Figure 17. Flume Setup (typical control)



Figure 18. Flow into Channel at Weir

5.1.2 Test Soil

The test soil used was the same as used in the sediment barrier tests. See section 4.1.2.



5.1.3 *Preparation of the Test Channels*

The initial channel soil veneer (12-inch thick minimum) is placed and compacted. Compaction is verified to be 90% (\pm 3%) of Proctor Standard density using ASTM D2937 (drive cylinder method). The test channels undergo a "standard" preparation procedure prior to each test. First, any rills or depressions resulting from previous testing are filled in with test soil. The soil surface is replaced to a depth of 1 inch and groomed to create a channel bottom that is level side-to-side with smooth, compacted 2:1 side slopes and at a smooth 5% bed slope. Finally, a trapezoidal form with a vibrating plate compactor is run over the renewed channel surface. The submitted check dam system is then installed as directed by the client.

5.1.4 Installation of Check Dams in the Test Channels

As noted, each check dam was installed as directed by the client. For the tests reported herein, the check dam installations were in accordance with the GSWCC's Manual for Erosion and Sediment Control in Georgia ("the Manual"), except that the silt fence was installed in accordance with GADOT detail Cd-F. The specific installations included:

- 1. Stone check dams using graded size 2-10 inch stone per the Manual (1.4 tons/yd^3) ;
- 2. Straw bales installed per the Manual (42"L x 18"H x 14"W @ $26.5 \text{ lbs} = 4.3 \text{ lbs/ft}^3$);
- 3. Compost Filter Socks installed per manufacturer's requirements (~12-inch diameter, 25 lbs/ft; approx. 9" high x 16" wide installed);
- 4. Fabric from the Georgia Department of Transportation's (GA DOT) Qualified Product List 36. Installed per the GA DOT specifications for the check dam composed of synthetic fiber fabric with reinforced wire post and bracing placed in ditches in a special configuration which controls energy dissipation. GA DOT detail Cd-F

5.1.5 Specific Test Procedure

Immediately prior to testing, the initial soil surface elevation readings are made at predetermined cross-sections. The channel is then exposed to the predetermined flow rate for 30 minutes. During the testing, flow depth and corresponding flow velocity measurements are taken at the predetermined cross-section locations. At the end of 30 minutes, the flow is stopped and soil surface elevation measurements are made to facilitate calculation of soil loss. Pictures of channel preparation are shown in Figures 19 and 20. Pictures of typical channel flows are shown in Figures 21 thru 24.



Figure 19. Compaction of Veneer



Figure 20. Channel Forming (typical)



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5.2 <u>Test Results</u>

Soil loss and the associated flow depth and velocity measurements made during the testing are the principle data used to determine the performance of the product tested. This data is entered into a spreadsheet that transforms the soil gain/loss measurements into related soil accretion and loss volumes using cut/fill calculations based on the Simpson Rule. From this data a Soil Accretion Index (SAI) and a Clopper Soil Loss Index (CSLI) are determined. Data and calculations are summarized for each test in Table 5.



Figure 21. Compost Sock Check Structure



Figure 23. Straw Bale (NRCS) Check Structure



Figure 22. Rock Check Structure



Figure 24. Silt Fence Check Structure

5.3 Discussion

When the data in Table 5 is presented graphically, as shown in Figures 25 and 26, some relationships between check dam types and installed system performance measurements are suggested. In general, as a check dam gets taller it may be able to increasingly reduce channel soil loss by creating greater ponding and, thus, greater slowing of water. Yet, in the process, the check dam must provide greater structural integrity and adjacent scour resistance. The original straw bale system and the silt fence system both offered taller damming, but even at the lowest flow level they provide insufficient structure integrity and scour resistance to function effectively. Conversely, the compost sock, rock check, and the enhanced (NRCS) straw bale systems provided the necessary balance between damming and scour resistance to perform effectively under all flow levels.



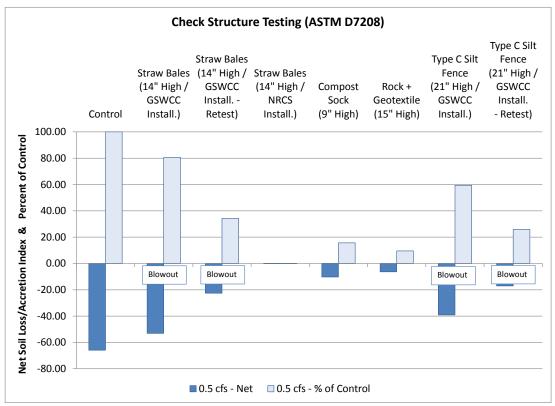
Tested System (0.5 cfs)	Total Soil Gain, ft ³	Total Soil Loss, ft ³	Total Wetted Area, ft ²	SAI	CSLI	Net	Net % of Unchecked	Obser- vations	Approx. Installation Time, min.
Control (Unchecked Channel)	0.00	-2.53	3.84	0.000	-65.86	-65.86	100		0
Straw Bales (14" High / GSWCC Install.)	2.99	-9.68	12.60	23.726	-76.83	-53.10	81	Blowout	30
Straw Bales (14" High / GSWCC Install Retest)	3.74	-6.24	11.07	33.802	-56.40	-22.59	34	Blowout	30
Straw Bales (14" High / NRCS Install.)	2.33	-2.34	16.62	14.034	-14.10	-0.07	0		60
Compost Sock (9" High)	0.28	-1.21	9.01	3.083	-13.39	-10.31	16		10
Rock + Geotextile (15" High)	0.97	-1.55	9.24	10.509	-16.81	-6.31	10		60
Type C Silt Fence (21" High / GSWCC Install.)	0.77	-4.14	8.60	9.001	-48.14	-39.14	59	Blowout	240
Type C Silt Fence (21" High / Retest)	2.90	-4.78	11.02	26.35	-43.40	-17.05	26	Blowout	240

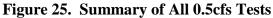
Table 5. Summary Data Table – ASTM D7208 Channel Tests

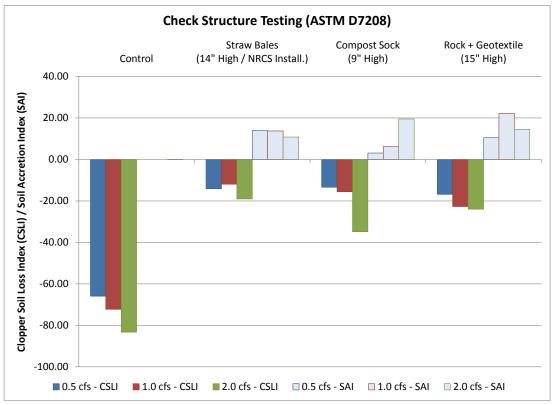
Tested System (1.0 cfs)	Total Soil Gain, ft ³	Total Soil Loss, ft ³	Total Wetted Area, ft ²	SAI	CSLI	Net	Net % of Unchecked	Obser- vations	Approx. Installation Time, min.
Control	0.00	-4.07	5.63	0.000	-72.27	-72.27	100		0
Straw Bales (14" High / NRCS Install.)	2.93	-2.54	21.33	13.718	-11.92	1.79	-2		60
Compost Sock (9" High)	0.62	-1.55	10.01	6.230	-15.52	-9.29	13		10
Rock + Geotextile (15" High)	2.87	-2.94	12.94	22.180	-22.70	-0.52	1		60

Tested System (2.0 cfs)	Total Soil Gain, ft ³	Total Soil Loss, ft ³	Total Wetted Area, ft ²	SAI	CSLI	Net	Net % of Unchecked	Obser- vations	Approx. Installation Time, min.
Control	0.00	-6.79	8.15	0.045	-83.26	-83.21	100		0
Straw Bales (14" High / NRCS Install.)	2.91	-5.13	26.92	10.827	-19.04	-8.22	10		60
Compost Sock (9" High)	2.19	-3.90	11.20	19.535	-34.85	-15.32	18		10
Rock + Geotextile (15" High)	2.22	-3.66	15.27	14.518	-23.97	-9.45	11		60













6. Conclusions and Recommendations

6.1 Sediment Barrier Performance Testing in accordance with ASTM's WK 11340

Figure 27 summarizes the results of all sediment barrier testing. The figure is similar to Figure 14, but instead of plotting system seepage vs. sediment loss, it relates seepage to P-Factor which is the sediment loss for the protected condition divided by the sediment loss from the control condition. This is the reported performance value. Figure 27 also shows suggested performance envelopes for "High Retention" and "High Flow" systems, respectively. Clearly, a lower P-Factor is generally associated with the High Retention systems, while High Flow systems typically have higher seepage rates. Table 6 shows how these performance limits could be incorporated into the existing GADOT specifications for silt fence fabrics. Straw bales are not recommended as sediment barriers for slopes greater than or equal to 3:1. Generally, the test results agree with the GADOT and GSWCC goals of specifying high retention systems for applications that can accommodate the associated ponding and high flow systems where ponding would create a hazard or exceed the available area.

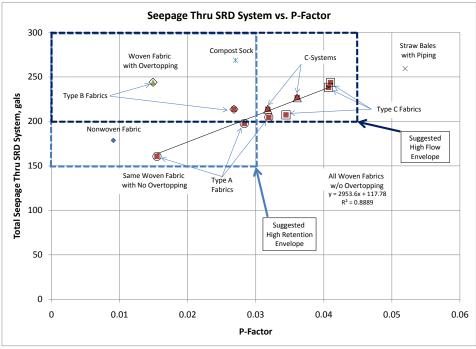


Figure 27. Seepage vs. P-Factor for All Tested Products

	14010 0		maca nevibea	nucerial Sp	connections	
Property	Units	Spec	Test	Type A & B	Type C	Alt. Systems
Tensile	lb	min	D4632	120 x 100	260 x 180	Properties and
Elong	%	max	D4632	40	40	Installation
AOS	mm	max size	D4751	0.6	0.6	Guidelines To
Flow	gpm/ft ²	min	D4491	25	70	Be Provided By
POA	%	min	Light Projection	-	10	Manufacturer
Large-scale	P-Factor	max	WK11340	0.03	0.045	TBD
Performance	gals	min	WK11340	150	200	TBD

Table 6. Recommended Revised Material Specifications



6.2 Check Dam Testing in accordance with ASTM D7208 (modified)

Figure 28 summarizes the results of check dam testing associated with systems that did not experience some type of failure during testing. Both the single-row straw bale and "zig-zag" silt fence installations experienced significant undermining under the lowest flow events, and thus are considered undesirable alternatives. Figure 28 presents the "net" of soil accretion and soil loss in the test section and the percent of the control soil loss that this represents. Superimposed on Figure 28 is the suggested performance level (20% of control) for acceptable check dam systems. Table 7 shows how this performance limit could be incorporated into the existing GADOT specifications for check dams. Generally, the test results agree with the GADOT and GSWCC goals of specifying check structure systems that provide the structural capacity to resist concentrated flows, ease of installation, and resistance to downstream scour.

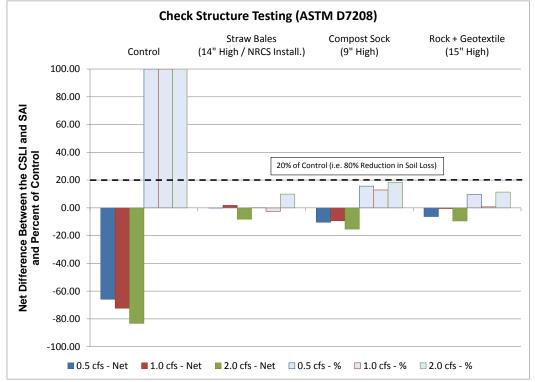


Figure 28. Net Soil Loss/Accretion & Percent of Control

Property	Units	Spec	ASTM Test	Straw Bales (NRCS 2-row Installation)	Compost Socks	Rock over Geotextile
Material	-	-	-	Straw	Compost	2 – 10 inch
Density	pcf	min	-	4.3 lb/ft ³	25 lb/ft	1.4 tons/yd^3
Installed Height	in	max	-	14	9	15
Staking / Underlayment	-	min	-	2"x2" wood at 12" c-c	2"x2" wood at 12" c-c	8 oz/sy nonwoven geotextile
Large-scale Performance	%	max	D7208	20	20	20

Table 7. Recommended Revised Specification



GSWCC - BMP Testing October 27, 2012 Appendix

APPENDIX A –SEDIMENT BARRIER TEST REPORTS



ASTM Proposed - WK11340 STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 27-Jul-12 31-Jul-12 31-Jul-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: 1935-B

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.09	6.09	10.09	0.180	0.012	0.02022
Slope 1	3.98	60.17	72.51	0.992	0.080	0.01830
	6.00	178.23	232.44	1.600	0.189	0.01351
			10.09		0.606	
Bare Soil Controls			72.51		4.358	
			232.44		13.970	

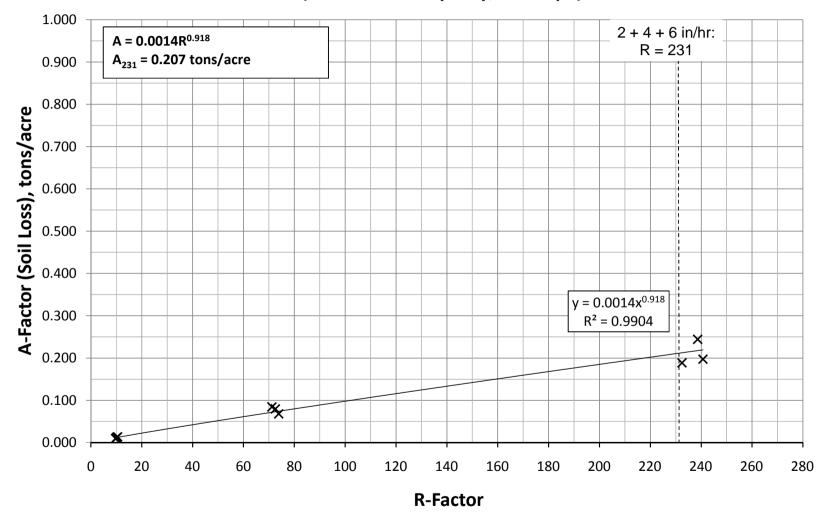
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.13	6.23	10.50	0.200	0.014	0.02159
Slope 2	4.00	61.99	73.86	0.800	0.068	0.01533
	6.14	186.62	240.69	1.900	0.197	0.01365
			10.50		0.631	
Bare Soil Controls			73.86		4.439	
			240.69		14.466	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.05	3.57	9.68	0.140	0.010	0.01640
Slope 3	3.96	57.05	71.18	1.100	0.084	0.01973
	6.16	172.18	238.58	2.350	0.244	0.01704
			9.68		0.582	
Bare Soil Controls			71.18		4.278	
			238.58		14.339	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 7/31/12 Quality Review / Date A Texas Research International Company

A-Factor vs. R-Factor (1935-B on Sandy-Clay; 3:1 Slope)



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TYPICAL TESTING PICTURES



Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340 STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 30-May-12 24-May-12 30-May-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: 1215

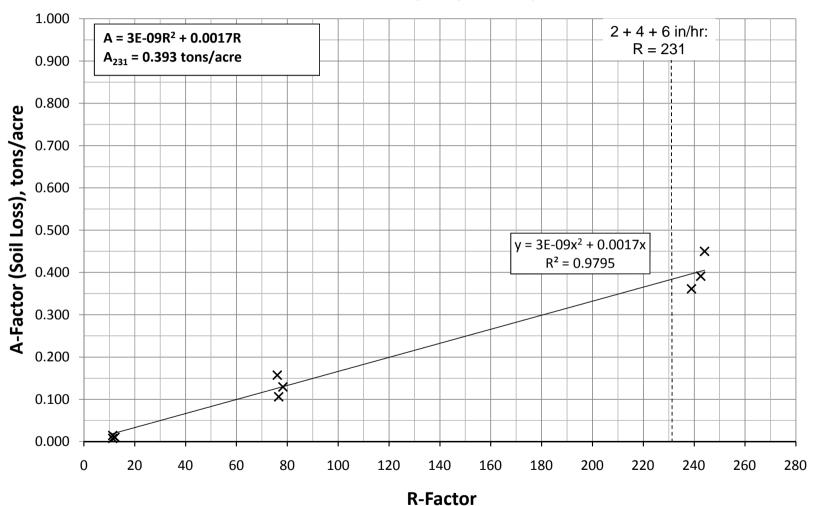
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.20	6.32	11.35	0.110	0.007	0.01098
Slope 1	4.04	64.83	76.58	1.450	0.106	0.02307
	6.04	119.60	238.92	3.750	0.361	0.02517
			11.35		0.682	
Bare Soil Controls			76.58		4.603	
			238.92		14.359	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.28	6.55	12.23	0.150	0.010	0.01391
Slope 2	4.04	69.55	78.25	1.750	0.129	0.02750
	6.08	119.60	242.53	3.850	0.391	0.02685
			12.23		0.735	
Bare Soil Controls			78.25		4.703	
			242.53		14.576	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.20	7.57	11.35	0.210	0.014	0.02097
Slope 3	4.02	71.98	76.04	2.100	0.157	0.03440
	6.16	124.91	244.06	4.300	0.450	0.03067
			11.35		0.682	
Bare Soil Controls			76.04		4.570	
			244.06		14.668	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 6/30/12 Quality Review / Date A Texas Research International Company



A-Factor vs. R-Factor (1215 on Sandy-Clay; 3:1 Slope)

9063 Bee Austin, Texas 78733 / ph: 512 263 2101 / fax: 512 263 2558 / www.GeosyntheticTesting.com



TYPICAL TESTING PICTURES



Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340 STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 6-Jun-12 7-Jun-12 1-Jun-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: ET-GA-CSystem

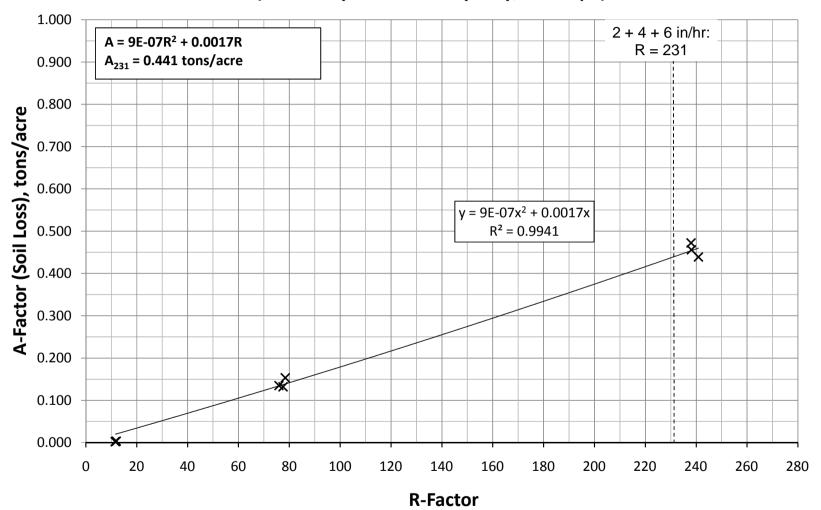
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.22	8.57	11.56	0.040	0.003	0.00393
Slope 1	4.06	70.29	77.54	1.900	0.132	0.02833
	6.00	134.53	238.10	4.760	0.456	0.03187
			11.56		0.695	
Bare Soil Controls			77.54		4.660	
			238.10		14.310	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.22	10.79	11.56	0.030	0.002	0.00294
Slope 2	4.00	70.96	75.92	1.950	0.135	0.02954
	6.04	137.59	237.96	4.960	0.472	0.03303
			11.56		0.695	
Bare Soil Controls			75.92		4.563	
			237.96		14.301	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.26	7.98	12.00	0.050	0.003	0.00472
Slope 3	4.06	68.67	78.38	2.200	0.153	0.03251
	6.04	130.16	240.87	4.200	0.439	0.03033
			12.00		0.721	
Bare Soil Controls			78.38		4.711	
			240.87		14.476	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 6/30/12 Quality Review / Date A Texas Research International Company



A-Factor vs. R-Factor (ET-GA-CSystem on Sandy-Clay; 3:1 Slope)

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TYPICAL TESTING PICTURES



Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340

STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 18-Jun-12 18-Jun-12 20-Jun-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: GTF 400EO

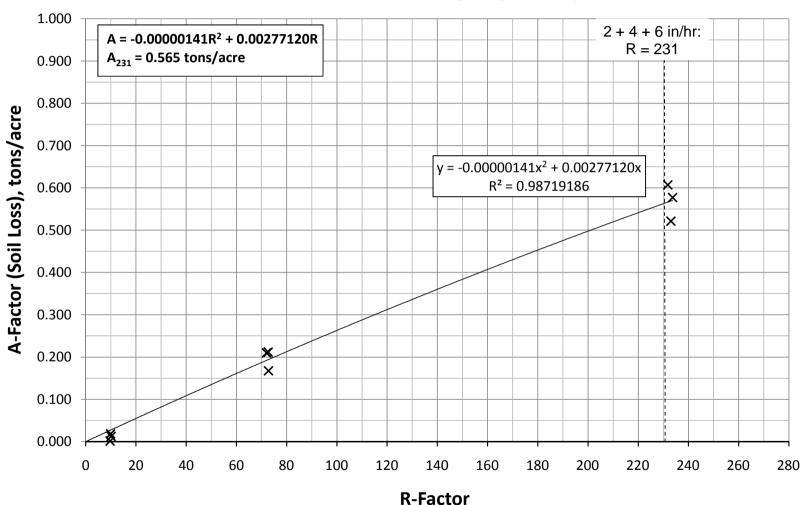
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
Flot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.05	7.38	9.68	0.020	0.001	0.00235
Slope 1	4.02	79.98	72.76	2.440	0.167	0.03829
	6.00	151.06	232.98	5.200	0.521	0.03724
			9.68		0.582	
Bare Soil Controls			72.76		4.373	
			232.98		14.002	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
Pill	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.09	10.67	10.09	0.180	0.012	0.02022
Slope 2	3.96	75.15	71.99	2.900	0.210	0.04845
	6.04	147.57	233.67	5.400	0.577	0.04110
			10.09		0.606	
Bare Soil Controls			71.99		4.326	
			233.67		14.043	

Dist	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.07	9.27	9.89	0.270	0.018	0.03096
Slope 3	4.00	81.69	72.63	2.840	0.212	0.04849
	5.98	152.01	231.76	5.810	0.607	0.04359
			9.89		0.594	
Bare Soil Controls			72.63		4.365	
			231.76		13.929	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose.

CJS 6/30/12 Quality Review / Date A Texas Research International Company



A-Factor vs. R-Factor (GTF 400EO on Sandy-Clay; 3:1 Slope)



TYPICAL TESTING PICTURES



Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



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ASTM Proposed - WK11340

STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 16-May-12 18-May-12 9-May-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: FW402

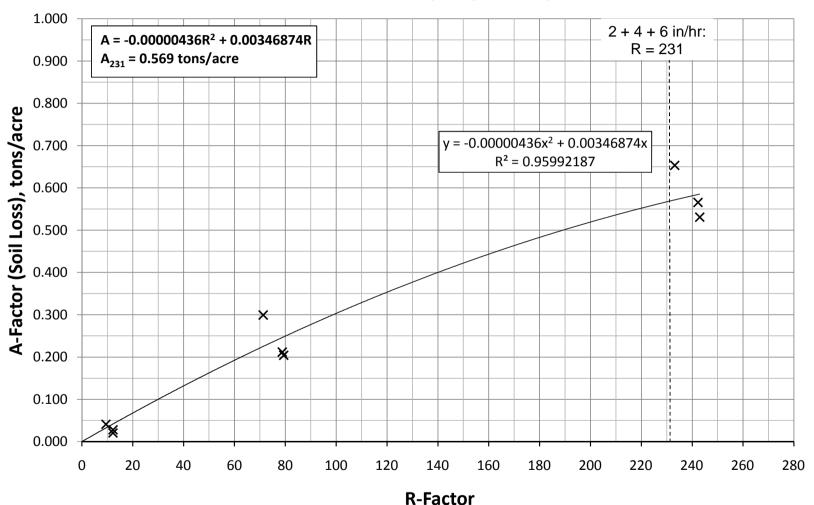
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
Slope 1	2.28	7.59	12.23	0.300	0.020	0.02781
	4.07	75.97	79.35	2.700	0.204	0.04282
	6.06	149.89	242.95	4.800	0.531	0.03636
Bare Soil Controls			12.23		0.735	
			79.35		4.769	
			242.95		14.601	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
Slope 2	2.03	14.21	9.49	0.600	0.041	0.07170
	3.98	83.32	71.30	3.800	0.299	0.06989
	6.04	155.29	233.10	5.200	0.653	0.04664
Bare Soil Controls			9.49		0.570	
			71.30		4.285	
			233.10		14.009	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
Slope 3	2.28	12.22	12.23	0.410	0.028	0.03801
	4.06	75.89	78.80	2.700	0.212	0.04470
	6.06	156.79	242.26	5.200	0.566	0.03885
Bare Soil Controls			12.23		0.735	
			78.80		4.736	
			242.26		14.560	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 5/31/12 Quality Review / Date



A-Factor vs. R-Factor (FW402 on Sandy-Clay; 3:1 Slope)





Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340

STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 13-Apr-12 17-Apr-12 20-Apr-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: GA-CSA

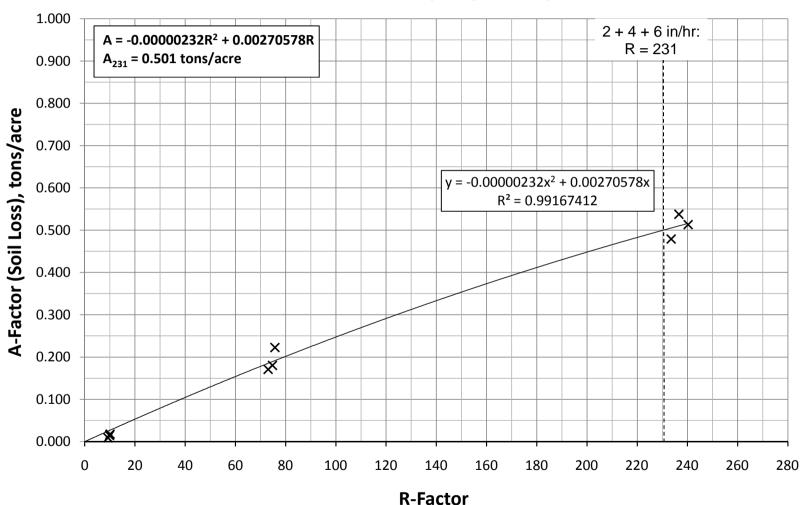
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.01	4.26	9.29	0.130	0.009	0.01586
Slope 1	4.06	78.96	73.00	2.380	0.171	0.03894
	6.00	139.78	233.51	4.530	0.479	0.03414
			9.29		0.558	
Bare Soil Controls			73.00		4.387	
			233.51		14.034	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.07	9.28	9.89	0.210	0.014	0.02407
Slope 2	4.07	73.64	74.76	2.440	0.180	0.04014
	6.10	146.29	240.27	4.890	0.513	0.03554
			9.89		0.594	
Bare Soil Controls			74.76		4.493	
			240.27		14.440	

Dist	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.09	4.50	10.09	0.260	0.018	0.02920
Slope 3	4.09	77.94	75.71	3.010	0.223	0.04891
	6.00	145.25	236.56	4.630	0.538	0.03782
			10.09		0.606	
Bare Soil Controls			75.71		4.550	
			236.56		14.217	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose.

CJS 5/31/12 Quality Review / Date



A-Factor vs. R-Factor (GA-CSA on Sandy-Clay; 3:1 Slope)





Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340 STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 7-May-12 4-May-12 9-May-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: Beltech 1935

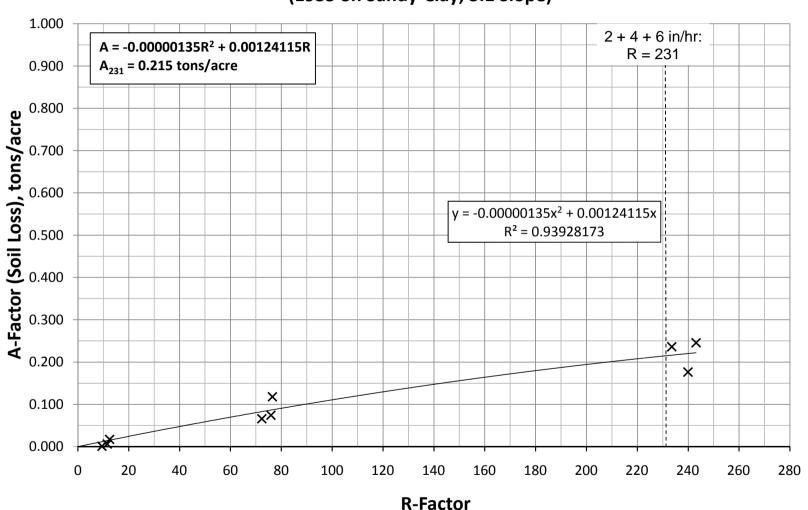
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.22	4.01	11.56	0.090	0.006	0.00883
Slope 1	4.00	56.91	75.92	1.000	0.074	0.01626
	6.08	96.81	239.89	1.500	0.176	0.01223
			11.56		0.695	
Bare Soil Controls			75.92		4.563	
			239.89		14.417	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.03	1.70	9.49	0.010	0.001	0.00118
Slope 2	4.02	60.46	72.35	0.960	0.066	0.01518
	6.02	93.76	233.51	2.500	0.236	0.01683
			9.49		0.570	
Bare Soil Controls			72.35		4.348	
			233.51		14.034	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
1 101	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.30	7.29	12.45	0.250	0.017	0.02276
Slope 3	3.96	62.76	76.49	1.480	0.118	0.02561
	6.14	98.05	243.09	1.880	0.246	0.01682
			12.45		0.748	
Bare Soil Controls			76.49		4.597	
			243.09		14.609	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 5/31/12 Quality Review / Date



A-Factor vs. R-Factor (1935 on Sandy-Clay; 3:1 Slope)





Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340 STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 18-Apr-12 12-Apr-12 20-Apr-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: BSRF

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.15	7.34	10.71	0.025	0.002	0.00261
Slope 1	4.00	50.93	74.27	0.489	0.035	0.00783
	6.00	102.15	234.37	1.185	0.116	0.00821
			10.71		0.644	
Bare Soil Controls			74.27		4.464	
			234.37		14.086	

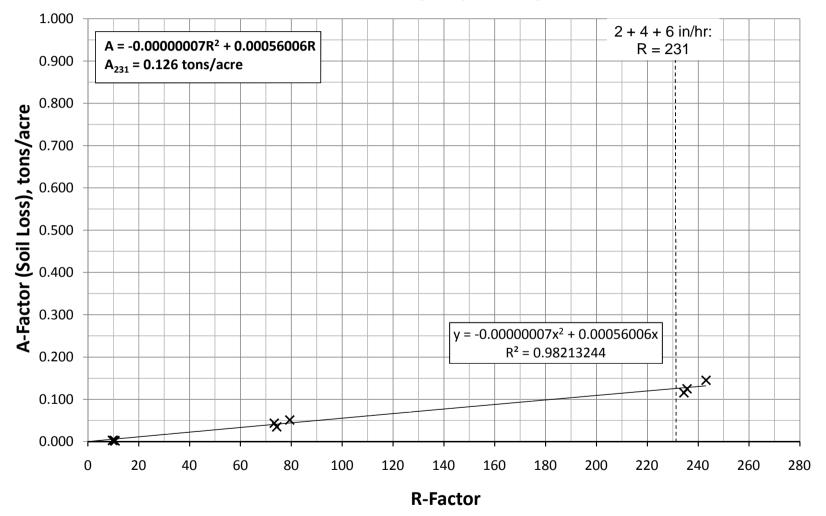
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.05	6.51	9.68	0.043	0.003	0.00503
Slope 2	4.04	55.61	73.28	0.597	0.044	0.00989
	6.04	114.99	235.58	1.194	0.125	0.00882
			9.68		0.582	
Bare Soil Controls			73.28		4.404	
			235.58		14.158	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
1100	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.11	3.69	10.29	0.044	0.003	0.00483
Slope 3	4.21	67.86	79.40	0.709	0.051	0.01074
	6.04	125.84	243.07	1.379	0.145	0.00993
			10.29		0.619	
Bare Soil Controls			79.40		4.772	
			243.07		14.609	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 5/31/12 Quality Review / Date

A-Factor vs. R-Factor (BSRF on Sandy-Clay; 3:1 Slope)







Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340 STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 15-May-12 23-May-12 24-May-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: GASF-A

DI .	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event		Factor
	2.11	15.38	10.29	0.390	0.027	0.04291
Slope 1	4.00	66.05	73.45	2.191	0.176	0.03979
	6.04	125.59	235.46	4.103	0.455	0.03215
			10.29		0.619	
Bare Soil Controls			73.45		4.414	
			235.46		14.151	

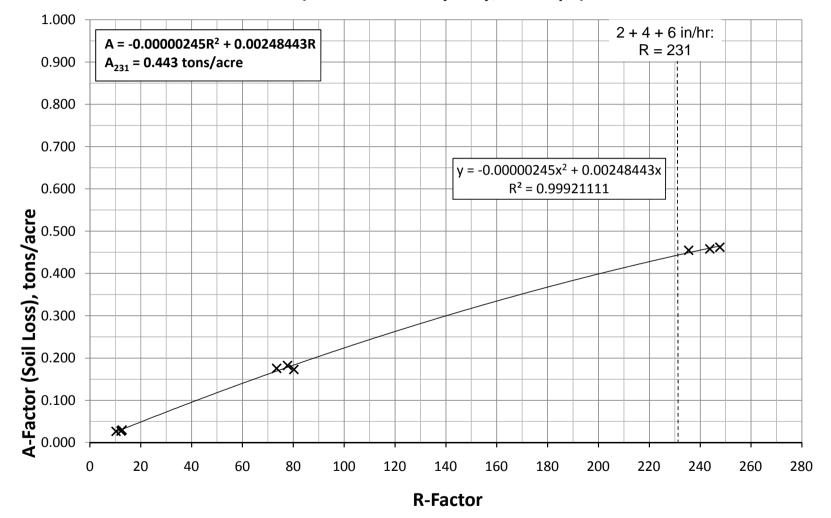
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.28	11.40	12.23	0.400	0.027	0.03709
Slope 2	4.02	66.91	77.71	2.280	0.182	0.03906
	6.12	124.80	243.79	4.050	0.458	0.03126
			12.23		0.735	
Bare Soil Controls			77.71		4.670	
			243.79		14.652	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
Flot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.32	10.15	12.68	0.440	0.030	0.03935
Slope 3	4.07	66.41	80.20	2.100	0.173	0.03587
	6.14	127.66	247.71	4.250	0.462	0.03104
			12.68		0.762	
Bare Soil Controls			80.20		4.820	
			247.71		14.887	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 5/31/12 Quality Review / Date

A-Factor vs. R-Factor (GASF-A on Sandy-Clay; 3:1 Slope)







Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Note: The testi

Typical Control Run - Before and After



ASTM Proposed - WK11340 STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 25-Jul-12 24-Jul-12 27-Jul-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: GFG-B

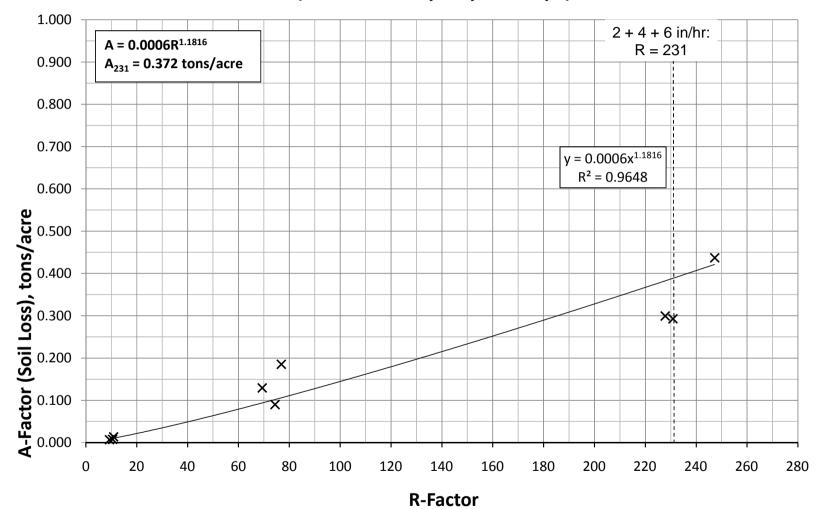
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.17	5.88	10.92	0.200	0.014	0.02076
Slope 1	4.07	54.72	76.84	2.521	0.185	0.04011
	6.20	152.88	247.27	3.700	0.437	0.02941
			10.92		0.656	
Bare Soil Controls			76.84		4.618	
			247.27		14.861	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.13	4.57	10.50	0.113	0.008	0.01220
Slope 2	4.02	60.55	74.39	1.210	0.090	0.02014
	5.93	148.72	230.83	2.980	0.293	0.02111
			10.50		0.631	
Bare Soil Controls			74.39		4.471	
			230.83		13.873	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.01	5.67	9.29	0.100	0.007	0.01220
Slope 3	3.92	61.95	69.34	1.800	0.129	0.03103
	5.98	143.61	227.80	2.500	0.299	0.02188
			9.29		0.558	
Bare Soil Controls			69.34		4.167	
			227.80		13.691	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 8/23/12 Quality Review / Date



A-Factor vs. R-Factor (GFG-B on Sandy-Clay; 3:1 Slope)







Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340

STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 25-Apr-12 25-Apr-12 1-May-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: 111F

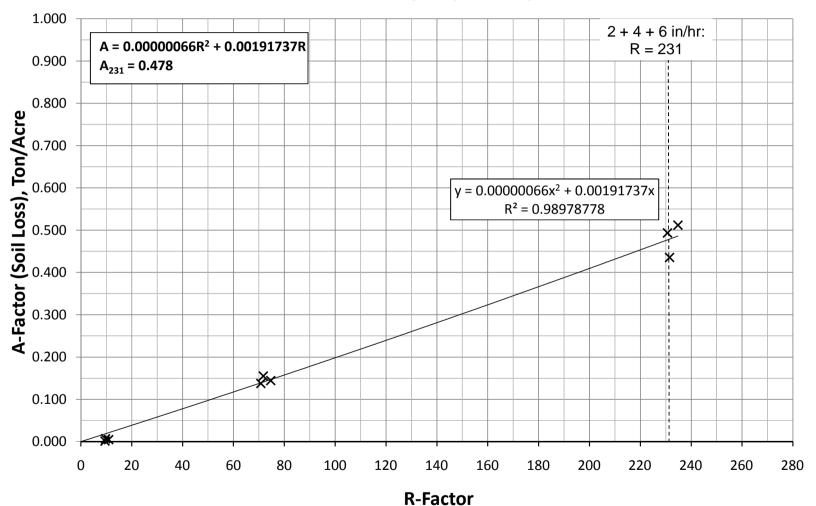
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
Flot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.05	6.71	9.68	0.100	0.007	0.01165
Slope 1	3.98	72.07	71.70	2.180	0.155	0.03600
	5.98	132.77	230.66	4.970	0.493	0.03559
			9.68		0.582	
Bare Soil Controls			71.70		4.309	
			230.66		13.863	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.03	6.35	9.49	0.020	0.001	0.00240
Slope 2	3.96	67.19	70.78	2.000	0.137	0.03232
	6.02	128.21	231.46	4.380	0.436	0.03131
			9.49		0.570	
Bare Soil Controls			70.78		4.254	
			231.46		13.911	

Dist	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average C
Plot	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.17	4.52	10.92	0.070	0.005	0.00727
Slope 3	4.00	71.39	74.68	2.050	0.144	0.03215
	6.00	132.84	234.79	5.400	0.512	0.03627
			10.92		0.656	
Bare Soil Controls			74.68		4.488	
			234.79		14.111	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 5/31/12 Quality Review / Date



A-Factor vs. R-Factor (111F on Sandy-Clay; 3:1 Slope)





Test Slope Prepared and Fence Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



ASTM Proposed - WK11340 STANDARD TEST METHOD FOR DETERMINATION OF SEDIMENT RETENTION DEVICES (SRDs) PERFORMANCE IN REDUCING SOIL LOSS FROM RAINFALL-INDUCED EROSION DURING PERIMETER CONTROL APPLICATIONS

Client: GSWCC Test Dates: 8-Aug-12 10-Aug-12 16-Aug-12 Rainfall Rates: 2,4,6 in/hr (target) Bed Slope: 3 to 1 Event: 20 minutes at each intensity (60 min. total) Product: Compost Sock

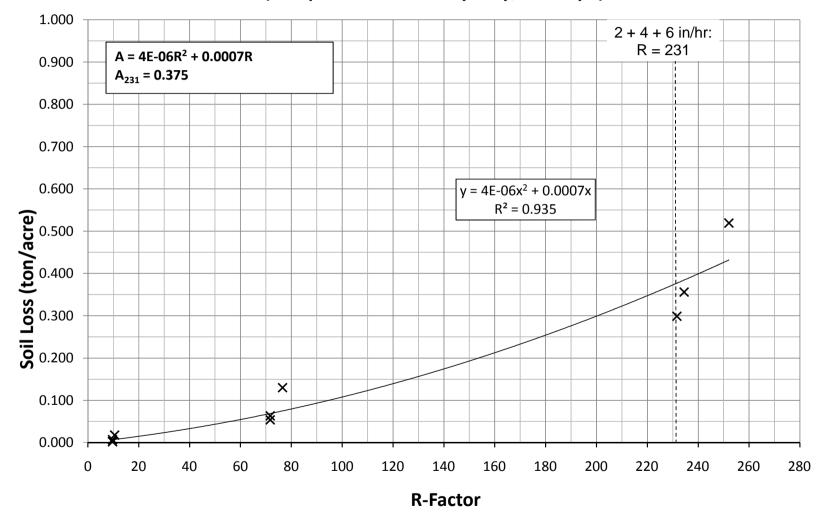
Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.05	5.51	9.68	0.030	0.002	0.00351
Slope 1	3.98	74.37	71.70	0.760	0.054	0.01248
	6.00	176.40	231.61	3.600	0.299	0.02147
			9.68		0.582	
Bare Soil Controls			71.70		4.309	
			231.61		13.920	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
Pill	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.05	9.65	9.68	0.100	0.007	0.01170
Slope 2	3.98	75.80	71.70	0.830	0.063	0.01469
	6.06	164.47	234.47	4.300	0.356	0.02526
			9.68		0.582	
Bare Soil Controls			71.70		4.309	
			234.47		14.092	

Plot	Intensity	Runoff	Cumm. R	Soil Loss	Cumm. Soil	Average P
FIOL	(in/hr)	(gallons)	Factor	(lbs/plot/event	Loss (T/A)	Factor
	2.13	14.06	10.50	0.260	0.018	0.02808
Slope 3	4.09	110.35	76.54	1.650	0.130	0.02826
	6.30	176.44	252.05	5.720	0.519	0.03428
			10.50		0.631	
Bare Soil Controls			76.54		4.600	
			252.05		15.148	

Note: The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose

CJS 8/23/12 Quality Review / Date



A-Factor vs. R-Factor (Compost Sock on Sandy-Clay; 3:1 Slope)







Slope Prepared and Compost Sock Installed

After 2 in/hr Event



After 4 in/hr Event

After 6 in/hr Event



Typical Control Run - Before and After



GSWCC - BMP Testing October 27, 2012 Appendix

APPENDIX B -CHECK DAM TEST REPORTS



Project: ASTM D 7208: Standard Test Method for Determination of Temporary Ditch Check Performance in Protecting Earthen Channels from Stormwater-Induced Erosion.

Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

Client: GSWCC Product: Straw Bales with Wooden Stakes

	Flow:	0.5 cfs for 3	0 minutes		Test Date:	5/14/2012			_
		Soil Gain,	Soil Loss,	Soil Gain,	Soil Loss,				
	Station, ft	in	in.	ft ²	ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf	
	0	0.00	0.00	0.03	-0.115	1.00	2.96	0.26	
	5	0.00	0.00	0.00	-0.189	1.13	3.08	0.29	BLOWOUT UNDER
	10	0.00	0.00	0.02	-0.201	1.25	2.37	0.32	CHECK STRUCTURE
14" High	15	0.00	0.00	0.00	-0.127	4.00	0.23	1.04	&
GADOT	20	0.00	0.00	0.23	-0.201	7.25	0.10	1.88	ACCELERATED SCOUR
Check	25	0.00	0.00	0.52	-0.017	7.50	0.10	1.95	DOWNSTREAM OF
Location	30	0.00	0.00	0.09	-0.517	4.00	0.30	1.04	CHECK
	35	0.00	0.00	0.01	-0.403	2.75	2.65	0.71	
	40	0.07	-2.64	0.02	-0.981	1.37	3.07	0.36	
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper	
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index	
				2.99	-9.68	12.60	23.73	-76.83	

	Flow:	0.5 cfs for 3	0 minutes		Test Date:	6/7/2012			
		Soil Gain,	Soil Loss,	Soil Gain,	Soil Loss,				
	Station, ft	in	in.	ft ²	ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf	
	0	0.00	0.00	0.00	-0.115	0.94	2.98	0.25	
RETEST:	5	0.00	0.00	0.01	-0.079	3.15	2.43	0.82	DI OWOUT UNDED
14" High	10	0.00	0.00	0.23	-0.191	4.41	1.85	1.15	BLOWOUT UNDER CHECK STRUCTURE
GADOT	15	0.00	0.00	0.11	-0.150	6.81	1.80	1.77	&
Check	20	0.00	0.00	0.38	-0.014	6.34	0.41	1.65	ACCELERATED SCOUR
Location	25	0.00	0.00	0.01	-0.290	1.14	1.43	0.30	DOWNSTREAM OF
	30	0.00	0.00	0.02	-0.247	1.26	1.06	0.33	CHECK
	35	0.00	0.00	0.01	-0.348	1.77	1.81	0.46	
	40	0.01	-0.72	0.00	-0.280	0.75	2.71	0.19	
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper	
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index	
				3.74	-6.24	11.07	33.80	-56.40]

	Flow:	0.5 cfs for 3	0 minutes		Test Date:	7/3/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	0.00	0.00	-0.036	0.98	3.00	0.26
	5	0.00	0.00	0.00	-0.050	0.98	3.10	0.26
	10	0.00	0.00	0.03	-0.056	5.31	1.61	1.38
14" High	15	0.00	0.00	0.15	-0.147	6.38	0.78	1.66
NRCS	20	0.00	0.00	0.16	-0.007	10.16	0.16	2.64
Check	25	0.00	0.00	0.23	-0.009	11.46	0.00	2.98
Location	30	0.00	0.00	0.00	-0.098	1.85	2.40	0.48
	35	0.00	0.00	0.00	-0.095	1.57	2.90	0.41
	40	0.00	-0.23	0.00	-0.084	1.18	2.80	0.31
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				2.33	-2.34	16.62	14.03	-14.10

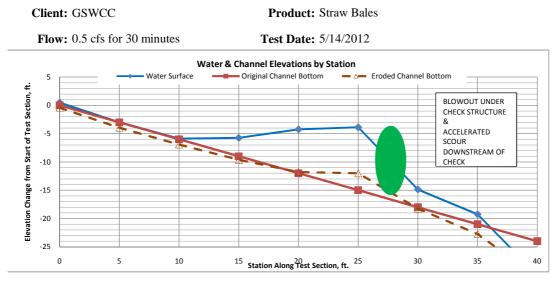
CJS 7/5/2012

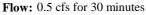
Quality Review / Date

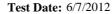


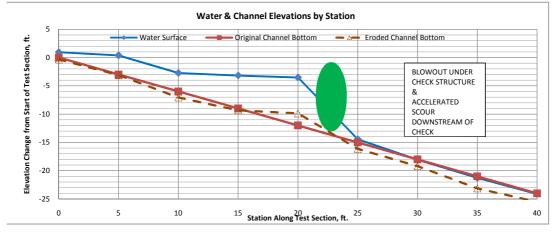
Project: ASTM D 7208: Standard Test Method for Determination of Temporary Ditch Check Performance in Protecting Earthen Channels from Stormwater-Induced Erosion.

Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;



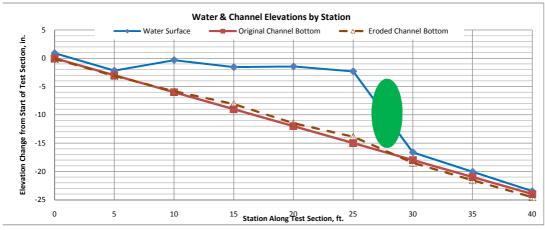








Test Date: 7/3/2012



1	ASTM D7208	Da	e: 5/14/12							S	tart Time:			3:58 PM	End Time:	4:28 PM	
60 ft long flume 40 ft test section 2 ft wide flume		S	il: Sandy C	lay						Target F	low (cfs):			0.50	Slope:	5%	
60 ft l	ong flume 40 ft f	test section SR	: Straw B	ales		Inst	allation:	Wooden	Stakes								
_	2 ft v	wide flume								1	TEST	DATA					
	1 2 3	Outlet Wei								Weir						Channel Targets	
	FLOW	Water Depth,								0.00						0.00	
	th (ft) = 2	Water Velocity, f								0.00						0.00	
υπ	CDEFGH	Flow Rate, of Cross-section		в	с	D	E	F	G	0.00 H	0.00	[ft ²]	[in]	V @ 0.2d	V @ 0.64	0.00 V @ 0.8d	To Water Surf, f
		To original Surface Elev		7.781	8.031	8.042	8.042	8.052	8.031	7.844	7.583	31.696		v @ 0.2u	2.96	V @ 0.80	8.0
	+	To eroded Surface Elev		7.729	8.073	8.063	8.083	8.094	8.063	7.896	7.583	31.776		Vavg (fps) =	2.96		
		Soil Gain	ft 0.000	0.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.104	navg =	0.021	Bed Max Shear Stress (psf)	Water Depth (ft
		Clopper Soil Loss	ft 0.000	0.000	-0.042	-0.021	-0.042	-0.042	-0.031	-0.052	0.000	-0.115	-0.344	Flow (cfs) =	0.50	0.26	0.08
5 ft			,	Avg Bottor	m Gain, ft	0.01	Avg C	lopper Sc	oil Loss, ft	-0.03							
		Cross-section	2 A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original Surface Elev		8.063	8.292	8.302	8.313	8.292	8.250	7.948	7.740	32.622 32.809			3.08		8.3
		To eroded Surface Elev		8.073	8.292	8.396	8.406	8.344	8.281	8.010	7.729	0.002	0.005	Vavg (fps) =	3.08	Bed Max Shear	
		Soil Gain		0.000	0.000	0.000	0.000	0.000	0.000	-0.062	0.010	-0.189	-0.568	navg = Flow (cfs) =	0.022	O.29	Water Depth (ft 0.09
10 ft		Clopper Soil Loss		Avg Bottor	•	0.00		lopper Sc		-0.04	0.000			110W (CIS) =	0.50	0.23	0.09
		Cross-section		В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original Surface Elev	ft 8.104	8.365	8.542	8.583	8.594	8.573	8.542	8.260	8.031	33.769			2.37		8.6
		To eroded Surface Elev	ft 8.083	8.344	8.594	8.667	8.688	8.625	8.563	8.344	8.021	33.951		Vavg (fps) =	2.37	Bed Max Shear	
		Soil Gain	ft 0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.019	0.057	navg =	0.031	Stress (psf)	Water Depth (ft
		Clopper Soil Loss		0.000	-0.052	-0.083	-0.094	-0.052	-0.021	-0.083	0.000	-0.201	-0.604	Flow (cfs) =	0.50	0.32	0.10
15 ft	<u> </u>	Cross-section		Avg Bottor B	m Gain, ft C	0.01 D	Avg C E	lopper Sc F	G G	-0.04 H		[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		To original Surface Elev		B.677	8.917	8.958	E 8.958	F 8.938	8.917	8.688	8.396	35.241	1	v @ 0.2d	0.23	V @ 0.8d	8.7
		To eroded Surface Elev		8.698	8.979	9.021	9.021	8.969	8.938	8.688	8.406	35.366		Vavg (fps) =	0.23		0.7
		Soil Gain		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.005	navg =	0.695	Bed Max Shear Stress (psf)	Water Depth (ft
		Clopper Soil Loss	ft 0.000	-0.021	-0.063	-0.063	-0.063	-0.031	-0.021	0.000	-0.010	-0.127	-0.380	Flow (cfs) =	0.50	1.04	0.33
20 ft			,	Avg Botto	m Gain, ft	0.00	Avg C	lopper Sc	il Loss, ft	-0.03							
		Cross-section	5 A	В	с	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		To original Surface Elev		9.010	9.240	9.271	9.313	9.281	9.260	9.083	9.802	36.792 36.760			0.1		8.7
		To eroded Surface Elev		9.229	9.271	9.302	9.271	9.240	9.146	9.115	8.885	0.233	0.698	Vavg (fps) =	0.10	Bed Max Shear	
		Soil Gain Clopper Soil Loss		0.000	0.000	0.000	0.042	0.042	0.115	0.000	0.917	-0.201	-0.604	navg = Flow (cfs) =	2.375 0.50	Stress (psf) 1.88	Water Depth (ft 0.60
25 ft		Ciopper Soir Eoss		Avg Bottor	•	0.12		lopper Sc		-0.04	0.000			110W (CIS) =	0.50	1.00	0.00
		Cross-section		в	С	D	E	F	G		1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
				Б						н							
		To original Surface Elev		9.188	9.469	9.500	9.510	9.500	9.490	H 9.323	9.031	37.491			0.1		8.6
		-	ft 8.938		9.469 9.438			9.500 9.344	9.490 9.271		9.031 9.094	36.984		Vavg (fps) =	0.1		8.6
		To original Surface Elev	ft 8.938 ft 8.979	9.188		9.500	9.510			9.323		36.984 0.524	1.573	navg =		Bed Max Shear Stress (psf)	
		To original Surface Elev To eroded Surface Elev	ft 8.938 ft 8.979 ft 0.000 ft -0.042	9.188 9.177 0.010 0.000	9.438 0.031 0.000	9.500 9.208 0.292 0.000	9.510 9.208 0.302 0.000	9.344 0.156 0.000	9.271 0.219 0.000	9.323 9.271 0.052 0.000	9.094	36.984	1.573 -0.052		0.10	Bed Max Shear	
30 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss	ft 8.938 ft 8.979 ft 0.000 ft -0.042	9.188 9.177 0.010 0.000 Avg Bottor	9.438 0.031 0.000 m Gain, ft	9.500 9.208 0.292 0.000 0.12	9.510 9.208 0.302 0.000 Avg C	9.344 0.156 0.000 lopper Sc	9.271 0.219 0.000 vil Loss, ft	9.323 9.271 0.052 0.000 -0.01	9.094 0.000	36.984 0.524 -0.017	-0.052	navg = Flow (cfs) =	0.10 2.429 0.13	Bed Max Shear Stress (psf) 1.95	Water Depth (ft 0.63
30 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-section	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A	9.188 9.177 0.010 0.000 Avg Bottor B	9.438 0.031 0.000 m Gain, ft C	9.500 9.208 0.292 0.000 0.12 D	9.510 9.208 0.302 0.000 Avg C E	9.344 0.156 0.000 lopper Sc	9.271 0.219 0.000 vil Loss, ft G	9.323 9.271 0.052 0.000 -0.01 H	9.094 0.000 -0.063 I	36.984 0.524		navg =	0.10 2.429 0.13 V @ 0.6d	Bed Max Shear Stress (psf)	Water Depth (ft 0.63 To Water Surf,
30 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A ft 9.125	9.188 9.177 0.010 0.000 Avg Bottor	9.438 0.031 0.000 m Gain, ft	9.500 9.208 0.292 0.000 0.12	9.510 9.208 0.302 0.000 Avg C	9.344 0.156 0.000 lopper Sc	9.271 0.219 0.000 vil Loss, ft	9.323 9.271 0.052 0.000 -0.01	9.094 0.000	36.984 0.524 -0.017 [ft ²]	-0.052	navg = Flow (cfs) = V @ 0.2d	0.10 2.429 0.13	Bed Max Shear Stress (psf) 1.95 V @ 0.8d	Water Depth (ft 0.63
30 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A ft 9.125 ft 9.188	9.188 9.177 0.010 0.000 Avg Bottor B 9.365	9.438 0.031 0.000 m Gain, ft C 9.573	9.500 9.208 0.292 0.000 0.12 D 9.646	9.510 9.208 0.302 0.000 Avg C E 9.677	9.344 0.156 0.000 lopper Sc F 9.823	9.271 0.219 0.000 vil Loss, ft G 9.646	9.323 9.271 0.052 0.000 -0.01 H 9.458	9.094 0.000 -0.063 I 9.198	36.984 0.524 -0.017 [ft ²] 38.214	-0.052	navg = Flow (cfs) =	0.10 2.429 0.13 V @ 0.6d 0.3	Bed Max Shear Stress (psf) 1.95	Water Depth (ft 0.63 To Water Surf, 9.4
30 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-section To original Surface Elev To eroded Surface Elev	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A ft 9.125 ft 9.188 ft 0.000	9.188 9.177 0.010 0.000 Avg Botton B 9.365 9.813 0.000	9.438 0.031 0.000 m Gain, ft C 9.573 9.771	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750	9.344 0.156 0.000 lopper Sc F 9.823 9.708	9.271 0.219 0.000 il Loss, ft G 9.646 9.604	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531	9.094 0.000 -0.063 I 9.198 9.198	36.984 0.524 -0.017 [ft ²] 38.214 38.641	-0.052 [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear	Water Depth (ft 0.63 To Water Surf, t 9.4
30 ft 35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-section To original Surface Elev To eroded Surface Elev Soil Gain	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A ft 9.125 ft 9.188 ft 0.000 ft -0.063	9.188 9.177 0.010 0.000 Avg Bottor B 9.365 9.813 0.000	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750 0.000 -0.073 Avg C	9.344 0.156 0.000 lopper Sc F 9.823 9.708 0.115 0.000 lopper Sc	9.271 0.219 0.000 iil Loss, ft <u>9.646</u> 9.604 0.042 0.000 iil Loss, ft	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11	9.094 0.000 -0.063 I 9.198 9.198 0.000	36.984 0.524 -0.017 [ft ²] 38.214 38.641 0.090 -0.517	-0.052 [in] 0.271 -1.552	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33
		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-section To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-section	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A ft 9.125 ft 9.188 ft 0.000 ft -0.063 8 A	9.188 9.177 0.010 0.000 B 9.365 9.813 0.000 -0.448 Avg Bottor B	9.438 0.031 0.000 m Gain, ft C 9.573 9.771 0.000 -0.198 m Gain, ft C	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750 0.000 -0.073 Avg C E	9.344 0.156 0.000 lopper Sc F 9.823 9.708 0.115 0.000 lopper Sc F	9.271 0.219 0.000 iil Loss, ft 9.646 9.604 0.042 0.000 iil Loss, ft G	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I	36.984 0.524 -0.017 [ft ²] 38.214 38.641 0.090 -0.517 [ft ²]	-0.052 [in] 0.271	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 1
		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Clopper Soil Loss Cross-sectior To original Surface Elev	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A ft 9.125 ft 9.188 ft 0.000 ft -0.063 8 A ft 9.302	9.188 9.177 0.010 0.000 Avg Botton B 9.365 9.813 0.000 -0.448 Avg Botton B 9.521	9.438 0.031 0.000 m Gain, ft C 9.573 9.771 0.000 -0.198 m Gain, ft C 9.792	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750 0.000 -0.073 Avg C E 9.854	9.344 0.156 0.000 kopper Sc 9.823 9.708 0.115 0.000 kopper Sc F 9.823	9.271 0.219 0.000 iil Loss, ft G 9.646 9.604 0.042 0.000 iil Loss, ft G 9.802	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I 9.375	36.984 0.524 -0.017 [ft ²] 38.214 38.641 0.090 -0.517 [ft ²] 38.797	-0.052 [in] 0.271 -1.552	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33
		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev To eroded Surface Elev	ft 8.938 ft 8.979 ft 0.000 ft 0.042 g g g A ft 9.125 ft 9.125 ft 9.188 ft 0.000 ft -0.063 g A ft 9.302 g.292 ft	9.188 9.177 0.010 0.000 Avg Botton 9.365 9.813 0.000 -0.448 Avg Botton B 9.521 9.531	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft C 9.792 10.104	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750 0.000 -0.073 Avg C E 9.854 9.938	9.344 0.156 0.000 lopper Sc F 9.823 9.708 0.115 0.000 lopper Sc F 9.823 9.823 9.917	9.271 0.219 0.000 iil Loss, ft G 9.604 0.042 0.000 iil Loss, ft G 9.802 9.802	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667	9.094 0.000 -0.063 1 9.198 9.198 0.000 0.000 0.000 1 9.3375 9.333	36.984 0.524 -0.017 [ft ²] 38.214 38.641 0.090 -0.517 [ft ²]	-0.052 [in] 0.271 -1.552	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear	Water Depth (ft 0.63 To Water Surf, 9.4 Water Depth (ft 0.33 To Water Surf, 9.7
		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev To eroded Surface Elev Soil Gain	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A ft 9.125 ft 9.125 ft 9.188 ft 0.000 ft 9.163 gt A gt 9.188 ft 9.063 gt A gt 9.302 gt 9.292 ft 0.010	9.188 9.177 0.010 0.000 Avg Botton B 9.365 9.813 0.000 -0.448 Avg Botton B 9.521 9.531 0.000	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft C 9.792 10.104 0.000	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750 0.000 -0.073 Avg C E 9.854 9.938 0.000	9.344 0.156 0.000 lopper Sc F 9.823 9.708 0.115 0.000 lopper Sc F 9.823 9.917 0.000	9.271 0.219 0.000 iil Loss, ft G 9.646 9.604 0.042 0.000 iil Loss, ft G 9.802 9.802 9.802 0.000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000	9.094 0.000 -0.063 1 9.198 9.198 0.000 0.000 1 9.375 9.333 0.042	36.984 0.524 -0.017 [ft ²] 38.214 38.641 0.090 -0.517 [ft ²] 38.797 39.191	-0.052 [in] 0.271 -1.552 [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d V @ 0.2d Vavg (fps) = navg =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 1 9.7 Water Depth (ft
		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev To eroded Surface Elev	ft 8.938 ft 8.979 ft 0.000 ft -0.042 7 A ft 9.125 ft 9.000 ft 9.001 ft 9.292 ft 0.010 ft 0.000	9.188 9.177 0.010 0.000 Avg Botton 9.365 9.813 0.000 -0.448 Avg Botton B 9.521 9.531	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft C 9.792 10.104 0.000 -0.313	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750 0.000 -0.073 Avg C E 9.854 9.938 0.000 -0.083	9.344 0.156 0.000 lopper Sc F 9.823 9.708 0.115 0.000 lopper Sc F 9.823 9.823 9.917	9.271 0.219 0.000 iil Loss, ft G 9.646 9.604 0.042 0.000 iil Loss, ft G 9.802 9.802 9.802 0.000 0.000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667	9.094 0.000 -0.063 1 9.198 9.198 0.000 0.000 0.000 1 9.3375 9.333	36.984 0.524 -0.017 [ft ²] 38.214 38.641 0.090 -0.517 [ft ²] 38.797 39.191 0.009	-0.052 [in] 0.271 -1.552 [in] 0.026	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear	Water Depth (ft 0.63 To Water Surf, 9.4 Water Depth (ft 0.33 To Water Surf, 9.7
35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev To eroded Surface Elev Soil Gain	tt 8.938 tt 8.979 tt 0.000 tt 0.042 7 A tt 9.125 tt 9.188 tt 0.000 tt -0.063 8 A ft 9.302 tt 9.292 ft 0.010 ft 0.000	9.188 9.177 0.010 0.000 Avg Botton B 9.365 9.813 0.000 -0.448 Avg Botton B 9.521 9.531 0.000 -0.010	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft C 9.792 10.104 0.000 -0.313	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750 0.000 -0.073 Avg C E 9.854 9.938 0.000 -0.083	9.344 0.156 0.000 lopper Sc F 9.823 9.708 0.115 0.000 lopper Sc F 9.823 9.917 0.000 -0.094	9.271 0.219 0.000 iil Loss, ft G 9.646 9.604 0.042 0.000 iil Loss, ft G 9.802 9.802 9.802 0.000 0.000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042	9.094 0.000 -0.063 1 9.198 9.198 0.000 0.000 1 9.375 9.333 0.042	36.984 0.524 -0.017 [ft ²] 38.214 38.641 0.090 -0.517 [ft ²] 38.797 39.191 0.009	-0.052 [in] 0.271 -1.552 [in] 0.026	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d V @ 0.2d Vavg (fps) = navg =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 9.7 Water Depth (ft 0.23
35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss	tt 8.938 tt 8.979 tt 0.000 tt 0.042 7 A tt 9.125 tt 9.188 tt 0.000 tt -0.063 8 A tt 9.302 tt 9.292 tt 0.010 tt 0.000 y A	9.188 9.177 0.010 0.000 B 9.365 9.813 0.000 -0.448 Avg Bottor B 9.521 9.531 0.000 -0.000 -0.010	9.438 0.001 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft C 9.792 10.104 0.000 -0.313 n Gain, ft	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260 0.01	9.510 9.208 0.302 0.000 Avg C E 9.677 9.750 0.000 -0.073 Avg C E 9.854 9.938 0.000 -0.083 Avg C	9.344 0.156 0.000 lopper Sc F 9.823 9.708 0.115 0.000 lopper Sc F 9.823 9.917 0.000 -0.094 lopper Sc	9.271 0.219 0.000 iil Loss, ft <u>9.646</u> 9.604 0.042 0.000 iil Loss, ft <u>9.802</u> 9.802 0.000 0.000 iil Loss, ft	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042 -0.09	9.094 0.000 -0.063 1 9.198 9.198 0.000 0.000 1 9.375 9.333 0.042 0.000	36.984 0.524 -0.017 [ft²] 38.214 38.641 0.090 -0.517 [ft²] 38.797 39.191 0.009 -0.403 [ft²] 40.049	-0.052 [in] 0.271 -1.552 [in] 0.026 -1.208	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.10 2.429 0.13 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.71	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 9.7 Water Depth (ft 0.23
35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Soil Gain Clopper Soil Loss	tt 8.938 tt 8.979 tt 0.000 tt 0.042 7 A tt 9.125 tt 9.188 tt 0.000 tt -0.063 8 A tt 9.302 tt 9.302 tt 9.292 tt 0.010 tt 0.000 9 A 19.604	9.188 9.177 0.010 9.000 9.365 9.813 0.000 -0.448 9.521	9.438 0.031 0.000 n Gain, ft 9.573 9.771 0.000 -0.198 n Gain, ft C 9.792 10.104 0.000 -0.313 n Gain, ft C	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260	9.510 9.208 0.302 0.000 Avg C 9.677 9.750 0.000 -0.073 Avg C 9.854 9.938 0.000 -0.083 Avg C 9.854	9.344 0.156 0.000 kopper Sc 9.823 9.708 0.115 0.000 kopper Sc F 9.823 9.917 0.000 -0.094 kopper Sc F	9.271 0.219 0.000 iii Loss, ft 9.646 9.604 0.042 0.000 iii Loss, ft 9.802 9.802 0.000 0.000 iii Loss, ft G	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.011 H 9.625 9.667 0.000 -0.042 0.042 H	9.094 0.000 -0.063 1 9.198 9.198 0.000 0.000 1 9.375 9.333 0.042 0.000 1	36.984 0.524 -0.017 1 38.214 38.641 0.090 -0.517 1 88.797 39.191 0.009 -0.403 1 9.0403 1 40.049 41.010	-0.052 [in] 0.271 -1.552 [in] 0.026 -1.208 [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21 V @ 0.6d	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.71	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 1 0.23 To Water Surf, 1
35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Original Surface Elev Soil Gain To original Surface Elev To eroded Surface Elev Soil Gain	ft 8.938 ft 8.979 ft 0.000 ft 0.002 gt 0.010 ft 9.125 ft 9.000 ft 9.000 ft 9.302 ft 9.292 ft 0.010 ft 9.604 ft 9.604 ft 9.615 ft 0.000	9.188 9.177 0.010 0.000 B 9.365 9.813 0.000 -0.448 9.521 9.531 0.000 B 9.521 9.531 0.000 B 9.833 9.823 0.010	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 m Gain, ft 0.000 -0.313 m Gain, ft C 10.094 10.198 0.000	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260 0.01 D 10.146 10.448 0.000	9.510 9.208 0.302 0.000 Avg C 9.677 9.750 0.000 -0.073 Avg C 9.854 9.938 0.000 -0.083 Avg C E 10.208 10.823 0.000	9.344 0.156 0.000 F 9.823 9.708 0.115 0.000 10000 -0.094 0.000 -0.094 10.167 10.833 0.000	9.271 0.219 0.000 iii Loss, ft 9.646 9.604 0.042 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042 -0.08 H 9.906 9.896 0.010	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I 9.375 9.333 0.042 0.000 I 9.667 9.635 0.031	36.984 0.524 -0.017 1 1 38.214 38.641 0.090 -0.517 1 38.797 39.191 0.009 -0.403 1 40.049 41.010 0.019	-0.052 [in] 0.271 0 -1.552 0 (in] 0.026 0 -1.208 [in] 0.057	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = flow (cfs) = V @ 0.2d V @ 0.2d	0.10 2.429 0.13 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21 V @ 0.6d 3.07 3.07 0.026	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.71	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.23 To Water Depth (ft 0.23 To Water Surf, 1 10.7 Water Depth (ft
35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Oil Gain Clopper Soil Loss To eroded Surface Elev To original Surface Elev To original Surface Elev	ft 8.938 ft 8.979 ft 0.000 ft 0.002 7 A ft 9.125 ft 9.000 ft 9.302 ft 9.302 ft 9.292 ft 0.010 ft 9.604 ft 9.604 ft 9.615 ft 0.000	9.188 9.177 0.010 0.000 B 9.365 9.813 0.000 -0.448 9.521 9.531 0.000 -0.010 B 9.333 9.823 0.010 0.000	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 m Gain, ft 0.000 -0.313 m Gain, ft C 10.094 10.198 0.000 -0.104	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260 0.01 D 10.146 10.448 0.000 -0.302	9.510 9.208 0.302 0.000 Avg C 9.677 9.750 0.000 -0.073 Avg C 9.854 9.938 0.000 -0.083 Avg C E 10.208 10.823 0.000 -0.615	9.344 0.156 0.000 F 9.823 9.708 0.115 0.000 10000 -0.004 -0.004 -0.004 F 10.167 10.833 0.000 -0.667	9.271 0.219 0.000 iii Loss, ft 9.646 9.604 0.042 0.0000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.000000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042 -0.09 H 9.906 9.896 0.010 0.000	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I 9.375 9.333 0.042 0.000 I 9.667 9.635	36.984 0.524 -0.017 1 38.214 38.641 0.090 -0.517 1 88.797 39.191 0.009 -0.403 1 9.0403 1 40.049 41.010	-0.052 [in] 0.271 -1.552 [in] 0.026 -1.208 [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21 V @ 0.6d 3.07 3.07	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 9.7 Water Depth (ft 0.23 To Water Surf, 1 10.7
35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss	ft 8.938 ft 8.979 ft 0.000 ft 0.002 gt 0.125 ft 9.125 ft 9.125 ft 9.125 ft 9.125 ft 9.126 ft 9.125 ft 9.000 ft 9.002 ft 9.302 ft 9.302 ft 9.604 ft 9.604 ft 9.615 ft 0.000	9.188 9.177 0.010 0.000 8 9.365 9.813 0.000 -0.448 9.521 9.531 0.000 -0.010 8 9.833 9.823 0.010 0.000	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft C 9.792 10.104 0.000 -0.313 n Gain, ft 10.094 10.198 0.000 -0.104 n Gain, ft	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260 0.01 D 10.146 10.448 0.000 -0.302 0.01	9.510 9.208 0.302 0.000 Avg C 9.677 9.750 0.000 -0.073 Avg C 9.854 9.938 0.000 -0.083 Avg C 10.208 10.823 0.000 -0.615 Avg C	9.344 0.156 0.000 PF 9.823 9.708 0.115 0.000 kopper Sc 9.823 9.917 0.000 -0.094 10.167 10.833 0.000 -0.667	9.271 0.219 0.000 iii Loss, ft 9.646 9.604 0.042 0.000 iii Loss, ft 9.802 9.802 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042 -0.09 H 9.906 9.836 0.010 0.000 0.010	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I 9.375 9.333 0.042 0.000 I 9.667 9.635 0.031 0.000	36.984 0.524 -0.017 [# ²] 38.214 38.641 0.090 -0.517 [# ²] 38.797 39.191 0.009 -0.403 [# ²] 40.049 41.010 0.019 -0.981	-0.052 [in] 0.271 -1.552 [in] 0.026 -1.208 [in] 0.057 -2.943	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vw @ 0.2d Vw @ 0.2d Flow (cfs) = Flow (cfs) =	0.10 2.429 0.13 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21 V @ 0.6d 3.07 3.07 0.026 0.70	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.36	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 1 9.7 Water Depth (ft 0.23 To Water Surf, 1 10.7 Water Depth (ft 0.11
35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss	tt 8.938 tt 8.979 tt 0.000 tt 0.042 7 A tf 9.125 tf 9.188 tf 0.000 tf 0.063 7 A tf 9.292 tf 0.010 tf 0.000 7 A tf 9.302 tf 9.292 tf 0.010 tf 0.000 ft 0.0000 ft 0.00000 ft 0.00000 ft 0.00000 ft 0.00000 ft 0.000000 ft 0.00000 ft 0.00000 ft 0.00000 ft 0.00000 ft 0.0000000 ft 0.00000 ft 0.0000000 ft 0.00000000000000	9.188 9.177 0.010 0.000 Wg Bottou 9.365 9.813 0.000 -0.448 9.521 9.531 0.000 -0.010 8 9.833 9.823 0.010 0.000 0.005	9.438 0.031 0.000 n Gain, ft 9.573 9.771 0.000 -0.198 n Gain, ft 0.000 -0.313 m Gain, ft 10.094 10.198 0.000 -0.104 n Gain, ft	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260 0.01 D 10.146 10.448 0.000 -0.302 0.01 0.000	9.510 9.208 0.302 0.000 Avg C 9.677 9.750 0.000 -0.073 Avg C 9.854 9.938 0.000 -0.083 Avg C E 10.208 10.823 0.000 -0.615 Avg C 0.002	9.344 0.156 0.000 PF 9.823 9.708 0.115 0.000 kopper Sc 9.823 9.917 0.000 -0.094 10.167 10.833 0.000 -0.667 0.002	9.271 0.219 0.000 ii Loss, ft 9.646 9.604 0.042 0.000 iii Loss, ft 9.802 9.802 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042 -0.09 H 9.906 9.896 0.010 0.0000 -0.22 0.001	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I 9.375 9.333 0.042 0.000 I 9.667 9.635 0.031 0.000 0.057	36.984 0.524 -0.017 1 38.214 38.641 0.090 -0.517 1 88.797 39.191 0.009 -0.403 1 40.049 41.010 0.019 -0.981	-0.052 [in] 0.271 -1.552 [in] 0.026 -1.208 [in] 0.057 -2.943 June	navg = Flow (cfs) = V @ 0.2d Vayg (fps) = navg = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Flow (cfs) = Navg = Flow (cfs) = Navg = Flow (cfs) = Navg = Flow (cfs) = Navg = Navg = Navg (fps) = Navg = Navg (fps) = Navg = Navg (fps) = Navg	0.10 2.429 0.13 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21 V @ 0.6d 3.07 3.07 0.026 0.70 Bottom Getting	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.36 ain per Xsection, ft =	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 1 9.7 Water Depth (ft 0.23 To Water Surf, 1 10.7 Water Depth (ft 0.11 0.006
35 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Soil Gain, Clopper Soil Loss	tt 8.938 tf 8.979 tf 0.000 tf 0.042 7 A tf 9.125 tf 9.188 tf 0.000 tf 0.063 7 8 A tf 9.302 tf 9.292 tf 0.010 tf 0.000 9 A tf 9.604 tf 9.615 tf 0.000 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9.188 9.177 0.010 0.000 Wg Botto 9.365 9.813 0.000 -0.448 9.521 9.531 0.000 -0.010 8 9.833 9.823 0.010 0.000 -0.015	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 m Gain, ft 0.000 -0.313 m Gain, ft 0.000 -0.313 m Gain, ft 0.000 -0.104 n Gain, ft 0.000	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260 0.01 D 10.146 10.448 0.000 -0.302 0.01 0.000 -0.048	9.510 9.208 0.302 9.000 Avg C 9.677 9.750 0.000 -0.073 Avg C 9.854 9.938 0.000 -0.083 Avg C 10.208 10.823 0.000 -0.615 Avg C 0.002 -0.056	9.344 0.156 0.000 PF 9.823 9.708 0.115 0.000 kopper Sc 9.823 9.917 0.000 -0.094 10.167 10.833 0.000 -0.667	9.271 0.219 0.000 ii Loss, ft 9.646 9.604 0.042 0.000 ii Loss, ft 9.802 9.802 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.00000 0.000000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042 -0.09 H 9.906 9.896 0.010 0.000 0.022 0.001 -0.22	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I 9.375 9.333 0.042 0.000 I 9.667 9.635 0.031 0.000 0.057 -0.001	36.984 0.524 -0.017 [ft ²] 38.214 38.641 0.090 -0.517 [ft ²] 38.797 39.191 0.009 -0.403 [ft ²] 40.049 41.010 0.019 -0.981 [ft ²] Volt [ft ²]	-0.052 [in] 0.271 -1.552 [in] 0.026 -1.208 [in] 0.057 -2.943	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Flow (cfs) = Flow (cfs) = Ravg = Flow (cfs) = Avg (for the set of the set o	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21 V @ 0.6d 3.07 3.07 0.026 0.70 Bottom Geoper Soil Loc	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.36 ain per Xsection, ft = ssper Xsection, ft =	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 1 9.7 Water Depth (ft 0.23 To Water Depth (ft 0.107 Water Depth (ft 0.11 0.006 -0.220
35 ft 40 ft		To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss	tt 8.938 tt 8.979 tt 0.000 tt 0.042 7 A tf 9.125 tf 9.188 tf 0.000 tf 0.063 7 A tf 9.292 tf 0.010 tf 0.000 7 A tf 9.302 tf 9.292 tf 0.010 tf 0.000 ft 0.0000 ft 0.00000 ft 0.00000 ft 0.00000 ft 0.00000 ft 0.000000 ft 0.00000 ft 0.00000 ft 0.00000 ft 0.00000 ft 0.0000000 ft 0.00000 ft 0.0000000 ft 0.00000000000000	9.188 9.177 0.010 0.000 Wg Botto 9.365 9.813 0.000 -0.448 9.521 9.531 0.000 -0.010 8 9.833 9.823 0.010 0.000 -0.015	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft 0.000 -0.313 m Gain, ft 0.000 -0.313 m Gain, ft 0.000 -0.104 n Gain, ft 0.000 -0.034 X-Se	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260 0.01 D 10.146 10.448 0.000 -0.302 0.01 0.000	9.510 9.208 0.302 9.000 Avg C 9.677 9.750 0.000 -0.073 Avg C 9.854 9.938 0.000 -0.083 Avg C E 10.208 10.823 0.000 -0.615 Avg C 0.002 -0.056	9.344 0.156 0.000 PF 9.823 9.708 0.115 0.000 kopper Sc 9.823 9.917 0.000 -0.094 10.167 10.833 0.000 -0.667 0.002	9.271 0.219 0.000 ii Loss, ft 9.646 9.604 0.042 0.000 iii Loss, ft 9.802 9.802 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.000000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042 -0.09 H 9.906 9.896 0.010 0.0000 -0.22 0.001	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I 9.375 9.333 0.042 0.000 I 9.667 9.635 0.031 0.000 0.057 -0.001 e Elev	36.984 0.524 -0.017 1 38.214 38.641 0.090 -0.517 1 88.797 39.191 0.009 -0.403 1 40.049 41.010 0.019 -0.981	-0.052 [in] 0.271 -1.552 [in] 0.026 -1.208 [in] 0.057 -2.943 June	navg = Flow (cfs) = V @ 0.2d Vayg (fps) = navg = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Flow (cfs) = Navg = Flow (cfs) = Navg = Flow (cfs) = Navg = Flow (cfs) = Navg = Navg = Navg (fps) = Navg = Navg (fps) = Navg = Navg (fps) = Navg	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21 V @ 0.6d 3.07 3.07 0.026 0.70 Bottom Ge pper Soil Lo	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.36 ain per Xsection, ft =	Water Depth (ft 0.63 To Water Surf, 1 9.4 Water Depth (ft 0.33 To Water Surf, 1 9.7 Water Depth (ft 0.23 To Water Depth (ft 0.107 Water Depth (ft 0.11 0.006 -0.220 5
35 ft 40 ft	apezoidal Analysis	To original Surface Elev To eroded Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Cross-sectior To original Surface Elev Soil Gain Clopper Soil Loss Soil Gain, Clopper Soil Loss Soil Gain, Clopper Soil Loss	ft 8.938 ft 8.979 ft 0.000 ft 0.002 7 A ft 9.125 ft 9.125 ft 9.125 ft 9.125 ft 9.125 ft 9.126 ft 9.125 ft 0.000 ft 9.002 ft 9.302 ft 9.302 ft 9.0010 ft 9.604 ft 9.604 ft 9.615 ft 0.000 in 0.002 in 0.002 in 0.002	9.188 9.177 0.010 0.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 0.000	9.438 0.031 0.000 n Gain, ft C 9.573 9.771 0.000 -0.198 n Gain, ft C 10.044 0.000 -0.313 m Gain, ft C 10.094 10.198 0.000 -0.104 N Gain, ft C 10.094 1.0198 0.000 -0.104 X.54 Test S	9.500 9.208 0.292 0.000 0.12 D 9.646 9.750 0.000 -0.104 0.02 D 9.833 10.094 0.000 -0.260 0.01 D 10.146 10.448 0.000 -0.302 0.01 0.000 -0.048	9.510 9.208 0.302 0.000 Avg C 9.677 9.750 0.000 -0.073 Avg C 9.854 9.938 0.000 -0.083 Avg C E 10.208 10.208 10.620 -0.615 Avg C 0.002 -0.056	9.344 0.156 0.000 ppper Sc 9.823 9.708 0.115 0.000 10000 -0.004 10.167 10.833 0.000 -0.0667 10.667 0.002 -0.053 5	9.271 0.219 0.000 ii Loss, ft 9.646 9.604 0.042 0.000 iii Loss, ft 9.802 9.802 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.000000	9.323 9.271 0.052 0.000 -0.01 H 9.458 9.531 0.000 -0.073 -0.11 H 9.625 9.667 0.000 -0.042 -0.09 H 9.906 9.896 0.010 0.000 0.022 0.001 -0.22	9.094 0.000 -0.063 I 9.198 9.198 0.000 0.000 I 9.375 9.333 0.042 0.000 I 9.667 9.635 0.031 0.000 0.057 -0.001 e Elev e Elev	36.984 0.524 -0.017 [# ²] 38.214 38.641 0.090 -0.517 [# ²] 38.797 39.191 0.009 -0.403 -0.403 -0.403 -0.403 -0.517 (# ²] -0.909 -0.403 -0.909 -0.909 -0.403 -0.909 -0.403 -0.909 -0.909 -0.403 -0.909 -	-0.052 [in] 0.271 -1.552 [in] 0.026 -1.208 [in] 0.057 -2.943 June	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Flow (cfs) = Flow (cfs) = Ravg = Flow (cfs) = Avg (for the set of the set o	0.10 2.429 0.13 V @ 0.6d 0.3 0.30 0.532 0.20 V @ 0.6d 2.65 2.65 0.047 1.21 V @ 0.6d 3.07 3.07 0.026 0.70 Bottom Ge pper Soil Lo	Bed Max Shear Stress (psf) 1.95 V @ 0.8d Bed Max Shear Stress (psf) 1.04 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.71 V @ 0.8d Bed Max Shear Stress (psf) 0.36 ain per Xsection, ft = ss per Xsection, ft = Section Spacing, ft =	Water Depth (ft) 0.63 To Water Surf, f 9.4 Water Depth (ft) 0.33 To Water Depth (ft) 0.23 To Water Depth (ft) 0.23 To Water Depth (ft) 0.11 0.006 -0.220 5 40



0.5 cfs Flow





Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding with Some Underflow



Increased Ponding, Start Overtopping, Increased Underflow



End-of-test and Post-test With Undermined Bale Removed

	40TM D7000		Date:	6/7/12							S	tart Time:			3:58 PM	End Time:	4:28 PM	
	ASTM D7208		Soil:	Sandy C	lay						Target F	Flow (cfs):			0.50	Slope:	5%	-
60 ft lo	ng flume 40 ft	test section	SRD:	Straw Ba	ales		Ins	tallation:	Wooden	Stakes								
	2 ft	wide flume										TEST	DATA					
	1 2 3		Outlet Weir								Weir						Channel Targets	
	FLOW		Water Depth, in								0.00						0.00	
eir width	(ft) = 2	Wa	ater Velocity, ft/s								0.00						0.00	
0 ft	CDEFGH		Flow Rate, cfs	0.00			_				0.00	0.00	2-				0.00	
			Cross-section 1	A	В	С	D	E	F	G	Н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
	Ļ	-	I Surface Elev, ft		2.077	2.333	2.356	2.362	2.339	2.283	2.047	1.808	8.819 8.931	ł		2.98		2.3
		To eroded	Surface Elev, ft	1.864	2.113	2.388	2.369	2.362	2.411	2.323	2.051	1.801	0.003	0.008	Vavg (fps) =	2.98	Bed Max Shear	
			Soil Gain, ft	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	-0.115	-0.344	navg =	0.020	Stress (psf)	Water Depth (f
5 ft		Clop	pper Soil Loss, ft	0.000	-0.036	-0.056	-0.013 0.00	0.000	-0.072 Clopper So	-0.039	-0.003	0.000	0.110	0.011	Flow (cfs) =	0.50	0.25	0.08
511			Cross-section 2	A	B	C C	0.00 D	E	F	G G	-0.02 H		[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		-	I Surface Elev, ft	1.969	2.185	2.454	2.503	2.552	2.451	2.421	2.149	1.942	9.320		V & 0.24	2.43	V & 0.04	2.3
		-	I Surface Elev, ft	1.978	2.211	2.470	2.513	2.533	2.487	2.408	2.145	1.939	9.388	t	Vavg (fps) =	2.43		2.0
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.020	0.000	0.013	0.000	0.003	0.011	0.034	navg =	0.056	Bed Max Shear Stress (psf)	Water Depth (f
		Clor	oper Soil Loss, ft		-0.026	-0.016	-0.010	0.000	-0.036	0.000	-0.036	0.000	-0.079	-0.238	Flow (cfs) =	0.50	0.82	0.26
10 ft					Avg Bottor		0.00		Clopper So	oil Loss, ft	-0.01							
Γ			Cross-section 3	A	в	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	l Surface Elev, ft	2.274	2.507	2.530	2.546	2.539	2.493	2.267	2.231	2.021	9.679			1.85		2.3
		To eroded	l Surface Elev, ft	1.991	2.247	2.516	2.618	2.635	2.589	2.411	2.231	2.014	9.645		Vavg (fps) =	1.85	Bed Max Shear	
			Soil Gain, ft	0.282	0.259	0.013	0.000	0.000	0.000	0.000	0.000	0.007	0.225	0.676	navg =	0.092	Stress (psf)	Water Depth (f
		Clop	pper Soil Loss, ft	0.000	0.000	0.000	-0.072	-0.095	-0.095	-0.144	0.000	0.000	-0.191	-0.574	Flow (cfs) =	1.36	1.15	0.37
15 ft					Avg Bottor		0.06		Clopper So		-0.05							
			Cross-section 4	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			I Surface Elev, ft		2.024	2.280	2.323	2.333	2.306	2.283	2.054	1.781	8.698 8.741	ł		1.8		1.8
		To eroded	Surface Elev, ft	1.765	2.087	2.316	2.421	2.415	2.205	2.182	2.051	1.801	0.107	0.322	Vavg (fps) =	1.80	Bed Max Shear	
		01-1	Soil Gain, ft	0.020	0.000	0.000	0.000	0.000	0.102	0.102	0.003	0.000	-0.150	-0.449	navg =	0.127	Stress (psf)	Water Depth (f
20 ft		Ciop	pper Soil Loss, ft		-0.062	-0.036	-0.098 0.03	-0.082	0.000	0.000	0.000	-0.020	0.100	0.110	Flow (cfs) =	2.04	1.77	0.57
20 11			Cross-section 5		B	C C	0.03 D	E	F	G G	-0.03 H		[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		-	I Surface Elev, ft		2.264	2.500	2.572	2.592	2.566	2.549	2.343	2.093	9.723		V @ 0.20	0.41	V @ 0.00	1.9
		-	I Surface Elev, ft	1.995	2.283	2.493	2.421	2.415	2.362	2.398	2.303	2.073	9.360	ł	Vavg (fps) =	0.41		1.0
			Soil Gain, ft	0.000	0.000	0.007	0.151	0.177	0.203	0.151	0.039	0.020	0.377	1.132	navg =	0.530	Bed Max Shear Stress (psf)	Water Depth (f
		Clop	oper Soil Loss, ft		-0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.014	-0.043	Flow (cfs) =	0.43	1.65	0.53
25 ft				A	Avg Bottor	n Gain, ft	0.08	Avg C	Clopper Sc	bil Loss, ft	0.00							
			Cross-section 6	А	в	с	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	l Surface Elev, ft	1.788	1.975	2.123	2.270	2.323	2.333	2.316	2.080	1.860	8.634	ļ		1.43		2.3
		To eroded	Surface Elev, ft	1.755	1.962	2.402	2.425	2.372	2.418	2.375	2.080	1.867	8.910		Vavg (fps) =	1.43	Bed Max Shear	
			Soil Gain, ft	0.033	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.043	navg =	0.048	Stress (psf)	Water Depth (fr
		Clop	pper Soil Loss, ft	0.000	0.000	-0.279	-0.154	-0.049	-0.085	-0.059	0.000	-0.007	-0.290	-0.869	Flow (cfs) =	0.27	0.30	0.10
30 ft						m Gain, ft	0.01		Clopper So				10.21	[:-1				
			Cross-section 7		В	С	D	E	F	G	н	1	[ft ²] 10.045	[in]	V @ 0.2d		V @ 0.8d	To Water Surf,
		ů	Surface Elev, ft		2.372	2.589	2.664	2.667	2.664	2.621	2.375	2.129	10.045			1.06		2.7
		I o eroded	Surface Elev, ft		2.365	2.776	2.789	2.779	2.726	2.690	2.356	2.123	0.019	0.057	Vavg (fps) =	1.06	Bed Max Shear	Watan D
		0	Soil Gain, ft oper Soil Loss, ft		0.007	0.000	0.000	0.000	0.000	0.000	0.020	0.007	-0.247	-0.741	navg = Flow (cfs) =	0.070	Stress (psf)	Water Depth (f
35 ft		Ciop	pper our Loss, ft		0.000		-0.125 0.00	-0.112 Avg C	-0.062 Clopper So	-0.069 oil Loss, ft	-0.06	0.000			Flow (cis) =	0.22	0.33	0.10
50 n		1 .	Cross-section 8		B	C	D.00	E	F	G	-0.00	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			I Surface Elev, ft		1.854	2.123	2.165	2.198	2.195	2.156	1.932	1.677	8.136			1.81		2.2
		ů	I Surface Elev, ft		1.844	2.136	2.408	2.369	2.313	2.290	1.932	1.686	8.477		Vavg (fps) =	1.81	D 111 - C	_
			Soil Gain, ft		0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.023	navg =	0.051	Bed Max Shear Stress (psf)	Water Depth (f
		Clop	pper Soil Loss, ft		0.000	-0.013	-0.243	-0.171	-0.118	-0.135	0.000	-0.010	-0.348	-1.045	Flow (cfs) =	0.53	0.46	0.15
40 ft				A	Avg Bottor	m Gain, ft	0.00	Avg C	lopper So	oil Loss, ft	-0.08							
			Cross-section 9	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	I Surface Elev, ft	1.916	2.165	2.418	2.454	2.477	2.464	2.461	2.215	1.965	9.297			2.71		2.5
		To eroded	Surface Elev, ft	1.919	2.169	2.408	2.592	2.549	2.628	2.612	2.215	1.975	9.574		Vavg (fps) =	2.71	Bed Max Shear	
		1	Soil Gain, ft	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.010	navg =	0.019	Stress (psf)	Water Depth (f
		Clop	pper Soil Loss, ft		-0.003	0.000	-0.138	-0.072	-0.164	-0.151	0.000	-0.010	-0.280	-0.840	Flow (cfs) =	0.34	0.19	0.06
					Avg Bottor		0.00		Clopper So		-0.06							
			Soil Gain, in		0.015	0.002	0.008	0.011	0.017	0.015	0.002	0.002		ume	1		ain per Xsection, ft =	
			oper Soil Loss, in		-0.008	-0.007	-0.032	-0.024	-0.027	-0.026	-0.002	-0.002	[ft ³]	[in]			ss per Xsection, ft =	
			Surface Elev	230.733	1 thru 6:			acing, ft =			nal Surfac		89.039		7 thru 9:		Section Spacing, ft =	
Trap	ezoidal Analysis		Surface Elev	230.270				ength, ft = acing, ft =		Erod	ed Surfac		92.004	0.007		Tes	t Section Length, ft = gauge spacing, ft =	
			oil Gain	3.649	0.274	hannel w			0.0		Soil Gair	1	0.094	0.007		channel	width measured, ft =	0.5
		L	CSLI	-3.185	-0.239				14	I	CSLI		-3.059	-0.229	l	Sharing		4



0.5 cfs Flow (Retest)





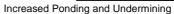
Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding







End-of-test and Post-test condition.

ļ	ASTM D7208		Date:	7/3/12								tart Time:			4:30 PM		5:00 PM	-
			Soil:	Sandy Cl	ау							low (cfs):			0.50	Slope:	5%	
60 ft long flu		test section	SRD:	Straw Ba	les		Inst	allation:	Wooden	Stakes /	NRCS Ins							
— .												TEST					o	
1	2 3 FLOW		Outlet Weir								Weir						Channel Targets	
eir width (ft) =		W	Water Depth, in ater Velocity, ft/s								1.50 0.00						0.00	
	- <u>-</u> DEFGH		Flow Rate, cfs	0.00							0.00	0.00					0.00	
			Cross-section 1	А	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	Surface Elev, ft	1.880	2.149	2.352	2.382	2.379	2.359	2.326	2.139	1.854	8.994		-	3		2.3
	•	To eroded	Surface Elev, ft	1.880	2.149	2.392	2.402	2.385	2.362	2.343	2.139	1.854	9.030		Vavg (fps) =	3.00	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Water Depth (ft
		Clop	oper Soil Loss, ft	0.000	0.000	-0.039	-0.020	-0.007	-0.003	-0.016	0.000	0.000	-0.036	-0.108	Flow (cfs) =	0.50	0.26	0.08
5 ft					vg Bottor		0.00		lopper So		-0.01		[ft ²]	[in]				
			Cross-section 2 Surface Elev, ft	A 2.123	B 2.343	C 2.595	D 2.612	E 2.631	F 2.618	G 2.608	H 2.359	2.149	9.944		V @ 0.2d	V @ 0.6d 3.1	V @ 0.8d	To Water Surf, 2.6
		-	Surface Elev, ft	2.123	2.345	2.602	2.621	2.644	2.625	2.615	2.382	2.149	9.995		Vavg (fps) =	3.10		2.0
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.020	Bed Max Shear Stress (psf)	Water Depth (ft
		Clo	oper Soil Loss, ft	0.000	-0.023	-0.007	-0.010	-0.013	-0.007	-0.007	-0.023	0.000	-0.050	-0.151	Flow (cfs) =	0.50	0.26	0.08
10 ft				A	vg Bottor	n Gain, ft	0.00	Avg C	lopper So	oil Loss, ft	-0.01							
			Cross-section 3	А	в	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	Surface Elev, ft	1.946	2.215	2.398	2.428	2.454	2.448	2.431	2.208	1.942	9.274			1.61		2.0
		To eroded	Surface Elev, ft	1.969	2.247	2.375	2.402	2.425	2.461	2.484	2.208	1.965	9.295	0.405	Vavg (fps) =	1.61	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.023	0.026	0.030	0.000	0.000	0.000	0.000	0.035	0.105	navg =	0.120	Stress (psf)	Water Depth (f
15 ft		Clop	oper Soil Loss, ft	-0.023	-0.033	0.000	0.000	0.000	-0.013 lopper So	-0.052	0.000	-0.023	0.000	0.107	Flow (cfs) =	0.50	1.38	0.44
15 11			Cross-section 4	A	B	n Gain, rt C	0.01 D	E AVG C	F	G G	-0.02 H		[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			Surface Elev, ft	1.988	2.238	2.454	2.500	2.520	2.513	2.497	2.270	2.037	9.508		. 00.20	0.78	0.00	1.9
		-	Surface Elev, ft	2.073	2.352	2.398	2.470	2.431	2.402	2.461	2.349	2.060	9.501		Vavg (fps) =	0.78		
			Soil Gain, ft	0.000	0.000	0.056	0.030	0.089	0.112	0.036	0.000	0.000	0.154	0.463	navg =	0.280	Bed Max Shear Stress (psf)	Water Depth (ft
		Clop	oper Soil Loss, ft	-0.085	-0.115	0.000	0.000	0.000	0.000	0.000	-0.079	-0.023	-0.147	-0.441	Flow (cfs) =	0.50	1.66	0.53
20 ft				A	vg Bottor	n Gain, ft	0.04	Avg C	lopper So	oil Loss, ft	-0.03		<u> </u>					
			Cross-section 5	А	В	С	D	E	F	G	н	I	[ft ²] 8.321	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		-	Surface Elev, ft	1.683	1.919	2.152	2.198	2.228	2.228	2.215	1.975	1.775	8.321			0.16		1.3
		To eroded	Surface Elev, ft	1.686	1.923	2.103	2.156	2.195	2.172	2.077	1.939	1.798	0.163	0.489	Vavg (fps) =	0.16	Bed Max Shear	Mater Darth (ft
		Clor	Soil Gain, ft oper Soil Loss, ft	0.000	0.000	0.049	0.043	0.033	0.056	0.138	0.036	0.000	-0.007	-0.020	navg = Flow (cfs) =	1.858 0.50	Stress (psf) 2.64	Water Depth (ft 0.85
25 ft		City	per 301 L035, 11		vg Bottor		0.000		lopper Sc	•	0.00	-0.023			110W (013) =	0.50	2.04	0.05
			Cross-section 6	A	в	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	Surface Elev, ft	1.785	2.054	2.306	2.336	2.369	2.339	2.280	2.093	1.844	8.805			0		1.3
		To eroded	Surface Elev, ft	1.834	2.047	2.241	2.254	2.267	2.241	2.215	2.054	1.847	8.585		Vavg (fps) =	0.00	Bed Max Shear	
			Soil Gain, ft	0.000	0.007	0.066	0.082	0.102	0.098	0.066	0.039	0.000	0.229	0.686	navg =	#DIV/0!	Stress (psf)	Water Depth (ft
		Clop	oper Soil Loss, ft	-0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.003	-0.009	-0.026	Flow (cfs) =	#DIV/0!	2.98	0.95
30 ft					vg Bottor		0.05		lopper Sc		-0.01		[f# ²]	[in]				
			Cross-section 7	A	B	C	D	E	F	G	H	1	[ft ²] 8.174	[in]	V @ 0.2d		V @ 0.8d	To Water Surf,
		-	Surface Elev, ft Surface Elev, ft	1.608	1.860 1.864	2.083	2.159	2.208	2.205 2.238	2.159 2.208	1.975 1.975	1.742	8.273		Vavg (fps) =	2.4		2.1
		10 210080	Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.040	Bed Max Shear Stress (psf)	Water Depth (ft
		Clor	oper Soil Loss, ft	0.000	-0.003	-0.043	-0.046	-0.039	-0.033	-0.049	0.000	0.000	-0.098	-0.295	Flow (cfs) =	0.74	0.48	0.15
35 ft					vg Bottor		0.00		lopper So		-0.02							
			Cross-section 8	А	в	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	Surface Elev, ft	1.939	2.215	2.408	2.467	2.487	2.470	2.421	2.159	1.932	9.291			2.9		2.4
		To eroded	Surface Elev, ft	1.939	2.215	2.464	2.530	2.539	2.497	2.421	2.159	1.932	9.386	0.000	Vavg (fps) =	2.90	Bed Max Shear	
		-	Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.030	Stress (psf)	Water Depth (ft
40.4		Clop	oper Soil Loss, ft	0.000	0.000	-0.056	-0.062	-0.052	-0.026	0.000	0.000	0.000	0.095	0.200	Flow (cfs) =	0.76	0.41	0.13
40 ft			Cross-section 9	A	Bottor	n Gain, ft C	0.00 D	Avg C	lopper So	G G	-0.02 H	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			Surface Elev, ft	1.854	2.087	2.316	2.346	2.339	2.316	2.270	2.018	1.775	8.758		. 00.20	2.8	0.00	2.3
		-	Surface Elev, ft	1.854	2.087	2.333	2.398	2.395	2.346	2.287	2.018	1.775	8.842		Vavg (fps) =	2.80	5.11.1	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.025	Bed Max Shear Stress (psf)	Water Depth (f
		Clop	oper Soil Loss, ft	0.000	0.000	-0.016	-0.052	-0.056	-0.030	-0.016	0.000	0.000	-0.084	-0.253	Flow (cfs) =	0.55	0.31	0.10
				A	vg Bottor	n Gain, ft	0.00	Avg C	lopper Sc	oil Loss, ft	-0.02							
			Soil Gain, in		0.000	0.007	0.006	0.008	0.009	0.010	0.002	0.000		ume			ain per Xsection, ft =	
			per Soil Loss, in	-0.006	-0.010	-0.007	-0.008	-0.007	-0.004	-0.005	-0.006	-0.004	[ft ³]	[in]			ss per Xsection, ft =	
			Surface Elev	229.738	1 thru 6:		ction Spa		5		nal Surfac		88.786		7 thru 9:		Section Spacing, ft =	
Trapezoid	idal Analysis		Surface Elev	228.817			ection Le gauge spa		40	Erode	ed Surfac		89.719			Tes	t Section Length, ft = gauge spacing, ft =	
		S	oil Gain	2.332	0.175				0.5		Soil Gain	1	0.000	0.000				0.0
			CSLI	-1.411	-0.106	hannel w	dth mean	ured ** -	4		CSLI		-0.932	-0.070		channel	width measured, ft =	4



0.5 cfs Flow (Enhanced NRCS Installation)



Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding Starting





Increased Ponding and Overtopping. No Apparent Underflow



End-of-test and Post-test With Upstream Sediment Deposition and Modest Downstream Scour



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Project: ASTM D 7208: Standard Test Method for Determination of Temporary Ditch Check Performance in Protecting Earthen Channels from Stormwater-Induced Erosion.

Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

	Client:	GSWCC			Product:	Straw Bales	Wooden Stakes / N	NRCS Install
	Flow:	0.5 cfs for 3	0 minutes		Test Date:	7/3/2012		
		Soil Gain,	Soil Loss,	Soil Gain,	Soil Loss,			
	Station, ft	in	in.	ft ²	ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	-0.11	0.00	-0.036	0.98	3.00	0.26
	5	0.00	0.00	0.00	-0.050	0.98	3.10	0.26
	10	0.00	0.00	0.03	-0.056	5.31	1.61	1.38
	15	0.00	0.00	0.15	-0.147	6.38	0.78	1.66
14" High	20	0.00	0.00	0.16	-0.007	10.16	0.16	2.64
Check	25	0.00	0.00	0.23	-0.009	11.46	0.00	2.98
Location	30	0.00	0.00	0.00	-0.098	1.85	2.40	0.48
	35	0.00	0.00	0.00	-0.095	1.57	2.90	0.41
	40	0.00	0.00	0.00	-0.084	1.18	2.80	0.31
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				2.33	-2.34	16.62	14.03	-14.10

	Flow:	1.0 cfs for 3	0 minutes		Test Date:	7/5/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	0.00	0.00	-0.102	1.73	3.83	0.45
	5	0.00	0.00	0.00	-0.072	2.52	3.14	0.65
	10	0.00	0.00	0.00	-0.090	6.46	2.04	1.68
	15	0.00	0.00	0.14	-0.133	8.27	1.81	2.15
14" High	20	0.00	0.00	0.24	-0.008	12.44	0.51	3.23
Check	25	0.00	0.00	0.40	-0.008	13.62	0.10	3.54
Location	30	0.00	0.00	0.00	-0.080	2.83	3.36	0.74
	35	0.00	0.00	0.00	-0.067	1.89	3.71	0.49
	40	0.00	-0.24	0.00	-0.087	1.42	4.04	0.37
				Total Soil Gain, ft ³	Total Soil Loss, ft ³	Total Wetted Area, ft ²	SAI - Soil Accretion Index	CSLI - Clopper Soil Loss Index
				2.93	-2.54	21.33	13.72	-11.92

	Flow:	2.0 cfs for 3	0 minutes		Test Date:	7/16/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	-0.39	0.00	-0.147	2.01	5.10	0.52
	5	0.00	0.00	0.00	-0.160	6.85	3.63	1.78
	10	0.00	0.00	0.01	-0.082	9.13	1.46	2.37
	15	0.00	0.00	0.09	-0.121	11.02	0.34	2.86
14" High	20	0.00	0.00	0.32	-0.188	12.13	0.33	3.15
Check	25	0.00	0.00	0.31	-0.062	14.49	0.25	3.77
Location	30	0.00	0.00	0.00	-0.163	4.72	3.66	1.23
	35	0.00	0.00	0.00	-0.197	2.05	4.54	0.53
	40	0.00	0.00	0.00	-0.183	2.20	6.26	0.57
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				2.91	-5.13	26.92	10.83	-19.04

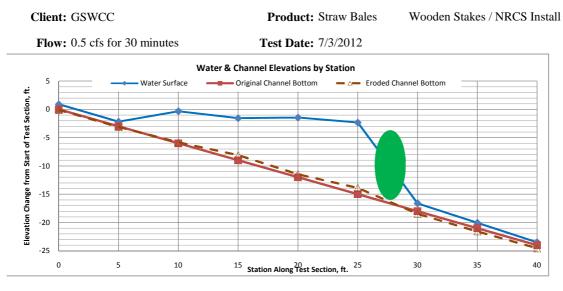
CJS 7/19/2012

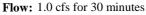
Quality Review / Date

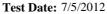


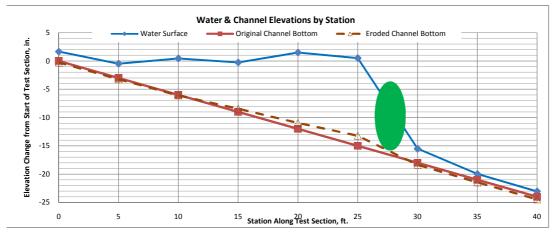
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Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;



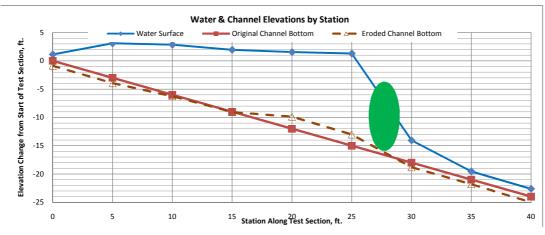






Flow: 2.0 cfs for 30 minutes

Test Date: 7/16/2012



	ACTA	1 07209		Date:	7/3/12							S	tart Time:			4:30 PM	End Time:	5:00 PM	
	ASTN	1 D7208		Soil:	Sandy C	lay						Target F	low (cfs):			0.50	Slope:	5%	-
60 ft lor	ng flume	40 ft te	est section	SRD:	Straw Ba	ales		Ins	tallation:	Wooden	Stakes / I	NRCS Ins	stall						
_		2 ft w	/ide flume										TEST	DATA					
_	1 2	3		Outlet Weir								Weir						Channel Targets	
	FLO	W		Water Depth, in								1.50						0.00	
eir width	(ft) = 2		Wa	ater Velocity, ft/s								0.00						0.00	
0 ft	CDE	FG H		Flow Rate, cfs	0.00							0.00	0.00					0.00	
Γ			с	cross-section 1	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, ft
		-	1	Surface Elev, ft	1.880	2.149	2.352	2.382	2.379	2.359	2.326	2.139	1.854	8.994			3		2.3
	+		To eroded	Surface Elev, ft	1.880	2.149	2.392	2.402	2.385	2.362	2.343	2.139	1.854	9.030		Vavg (fps) =	3.00	Bed Max Shear	Mater Death (4)
				Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Water Depth (ft)
			Clop	per Soil Loss, ft	0.000	0.000	-0.039	-0.020	-0.007	-0.003	-0.016	0.000	0.000	-0.036	-0.108	Flow (cfs) =	0.50	0.26	0.08
5 ft					A	vg Bottor	m Gain, ft	0.00	Avg C	lopper Sc	oil Loss, ft	-0.01							
			C	Cross-section 2	A	В	С	D	Е	F	G	н	Т	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, ft
			To original	Surface Elev, ft	2.123	2.343	2.595	2.612	2.631	2.618	2.608	2.359	2.149	9.944			3.1		2.6
			To eroded	Surface Elev, ft	2.123	2.365	2.602	2.621	2.644	2.625	2.615	2.382	2.149	9.995		Vavg (fps) =	3.10	Bed Max Shear	Water Depth (ft)
				Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.020	Stress (psf)	
			Clop	per Soil Loss, ft	0.000	-0.023	-0.007	-0.010	-0.013	-0.007	-0.007	-0.023	0.000	-0.050	-0.151	Flow (cfs) =	0.50	0.26	0.08
10 ft					A	vg Bottor	m Gain, ft	0.00	Avg C	lopper Sc	oil Loss, ft	-0.01							
				Cross-section 3		В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, ft
			0	Surface Elev, ft		2.215	2.398	2.428	2.454	2.448	2.431	2.208	1.942	9.274			1.61		2.0
			To eroded	Surface Elev, ft		2.247	2.375	2.402	2.425	2.461	2.484	2.208	1.965	9.295		Vavg (fps) =	1.61	Bed Max Shear Stress (psf)	Water Depth (ft)
				Soil Gain, ft		0.000	0.023	0.026	0.030	0.000	0.000	0.000	0.000	0.035	0.105	navg =	0.120	. ,	
			Clop	per Soil Loss, ft		-0.033	0.000	0.000	0.000	-0.013	-0.052	0.000	-0.023	-0.056	-0.167	Flow (cfs) =	0.50	1.38	0.44
15 ft						vg Bottor	1	0.01		lopper Sc		-0.02						Veasi	T 11/1 O 1/1
				Cross-section 4		B	C	D	E	F	G	H	0.007	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, ft
			-	Surface Elev, ft Surface Elev, ft		2.238	2.454 2.398	2.500 2.470	2.520 2.431	2.513 2.402	2.497 2.461	2.270 2.349	2.037	9.508 9.501		Vava (fps) -	0.78		1.9
			TO eloded	Soil Gain, ft		0.000	0.056	0.030	0.089	0.112	0.036	0.000	0.000	0.154	0.463	Vavg (fps) = navg =	0.280	Bed Max Shear Stress (psf)	Water Depth (ft)
			Clon	oper Soil Loss, ft		-0.115	0.000	0.000	0.000	0.000	0.000	-0.079	-0.023	-0.147	-0.441	Flow (cfs) =	0.200	1.66	0.53
20 ft			Ciop	per 00ii 2033, it		vg Bottor		0.000		lopper Sc		-0.03	0.020	0.147	0.441	110W (013) =	0.00	1.00	0.00
				cross-section 5		В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, ft
				Surface Elev, ft		1.919	2.152	2.198	2.228	2.228	2.215	1.975	1.775	8.321			0.16		1.3
			To eroded	Surface Elev, ft	1.686	1.923	2.103	2.156	2.195	2.172	2.077	1.939	1.798	8.165		Vavg (fps) =	0.16	Bed Max Shear	
				Soil Gain, ft	0.000	0.000	0.049	0.043	0.033	0.056	0.138	0.036	0.000	0.163	0.489	navg =	1.858	Stress (psf)	Water Depth (ft)
			Clop	per Soil Loss, ft	-0.003	-0.003	0.000	0.000	0.000	0.000	0.000	0.000	-0.023	-0.007	-0.020	Flow (cfs) =	0.50	2.64	0.85
25 ft					A	vg Bottor	m Gain, ft	0.04	Avg C	lopper Sc	oil Loss, ft	0.00							
			c	Cross-section 6	А	В	С	D	Е	F	G	Н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, ft
			To original	Surface Elev, ft	1.785	2.054	2.306	2.336	2.369	2.339	2.280	2.093	1.844	8.805			0.001		1.3
			To eroded	Surface Elev, ft	1.834	2.047	2.241	2.254	2.267	2.241	2.215	2.054	1.847	8.585		Vavg (fps) =	0.00	Bed Max Shear	Water Depth (ft)
				Soil Gain, ft		0.007	0.066	0.082	0.102	0.098	0.066	0.039	0.000	0.229	0.686	navg =	322.173	Stress (psf)	,
			Clop	per Soil Loss, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.003	-0.009	-0.026	Flow (cfs) =	0.00	2.98	0.95
30 ft					A	vg Bottor	m Gain, ft	0.05	Avg C	lopper Sc	oil Loss, ft	-0.01							
				Cross-section 7		В	С	D	E	+	G	н	1	[ft ²]	[in]	V @ 0.2d		V @ 0.8d	To Water Surf, ft
			-	Surface Elev, ft		1.860	2.083	2.159	2.208	2.205	2.159	1.975	1.742	8.174			2.4		2.1
			10 eroded	Surface Elev, ft		1.864	2.126	2.205	2.247	2.238	2.208	1.975	1.742	8.273	0.000	Vavg (fps) =	2.40	Bed Max Shear Stress (psf)	Water Depth (ft)
			Ole-	Soil Gain, ft oper Soil Loss, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg = Flow (cfs) =	0.040	0.48	0.15
35 ft			Ciup	.por ouii 2058, II		vg Bottor		0.046		lopper Sc		-0.02	0.000	0.030	0.280	1 IOW (CIS) =	5.74	0.40	0.13
33 11				Cross-section 8		B BOTTOR	n Gain, rt C	0.00 D	E AVG C	F	G G	-0.02 H	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, ft
				Surface Elev, ft		2.215	2.408	2.467	2.487	2.470	2.421	2.159	1.932	[π] 9.291	[]	• ⊜ 0.2u	2.9	. © 0.00	2.4
			-	Surface Elev, ft		2.215	2.464	2.530	2.539	2.497	2.421	2.159	1.932	9.386		Vavg (fps) =	2.90	Bed Max Shear	
				Soil Gain, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.030	Stress (psf)	Water Depth (ft)
			Clop	per Soil Loss, ft		0.000	-0.056	-0.062	-0.052	-0.026	0.000	0.000	0.000	-0.095	-0.285	Flow (cfs) =	0.76	0.41	0.13
40 ft						vg Bottor	1	0.00	Avg C	lopper Sc	oil Loss, ft	-0.02							
			C	Cross-section 9		В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, ft
			To original	Surface Elev, ft	1.854	2.087	2.316	2.346	2.339	2.316	2.270	2.018	1.775	8.758			2.8		2.3
			To eroded	Surface Elev, ft	1.854	2.087	2.333	2.398	2.395	2.346	2.287	2.018	1.775	8.842		Vavg (fps) =	2.80	Bed Max Shear	Water Derth (f)
				Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.025	Stress (psf)	Water Depth (ft)
			Clop	per Soil Loss, ft	0.000	0.000	-0.016	-0.052	-0.056	-0.030	-0.016	0.000	0.000	-0.084	-0.253	Flow (cfs) =	0.55	0.31	0.10
					A	vg Bottor	m Gain, ft	0.00	Avg C	lopper Sc	oil Loss, ft	-0.02							
			/	Avg Soil Gain, ft	0.000	0.000	0.018	0.014	0.022	0.024	0.025	0.005	0.000	Volu	ume	Avg	Bottom Ga	ain per Xsection, ft =	0.000
				per Soil Loss, ft	1	-0.025	-0.017	-0.021	-0.018	-0.011	-0.013	-0.015	-0.010	[ft ³]	[in]			ss per Xsection, ft =	
			-	Surface Elev	229.738	1 thru		ection Spa		5	-	al Surfac		88.786		7 thru 9:		Section Spacing, ft =	
			Eroded	Surface Elev	228.817	6:	Test S	Section Le	ength, ft =	40	Erode	d Surfac	e Elev	89.719		1	Tes	t Section Length, ft =	40
Trap	oezoidal Ar	nalysis		10.								0 1 0 1							
Trap	oezoidal Ar	nalysis	Sc	oil Gain CSLI	2.332	0.175			acing, ft = sured, ft =			Soil Gair CSLI	1	0.000	0.000			gauge spacing, ft = width measured, ft =	



0.5 cfs Flow (Enhanced Installation)



Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding Starting





Increased Ponding and Overtopping. No Apparent Underflow



End-of-test and Post-test With Upstream Sediment Deposition and Modest Downstream Scour

101		Date:	7/5/12							.51	art Time:			2:07 PM	End Time:	2:37 PM	
ASI	TM D7208		Sandy Cl	ay						Target F				0.50	Slope:	5%	-
60 ft long flume	e 40 ft test section		Straw Ba	-		Ins	tallation:	Wooden	Stakes /								
	2 ft wide flume										TEST D	DATA					
1	2 3	Outlet Weir								Weir						Channel Targets	
F	LOW	Water Depth, in								2.25						1.50	
/eir width (ft) = 2	Wa	ater Velocity, ft/s								0.00						4.00	
0 ft C D E	E F G H	Flow Rate, cfs	0.00							0.00	0.00					0.00	
		Cross-section 1	Α	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
	1 1	Surface Elev, ft	1.864	2.093	2.346	2.392	2.418	2.379	2.352	2.152	1.883	9.007			3.83		2.3
	 To eroded 	Surface Elev, ft	1.864	2.106	2.395	2.428	2.425	2.405	2.372	2.188	1.896	9.109		Vavg (fps) =	3.83	Bed Max Shear Stress (psf)	Water Depth (ft
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.024	. , ,	
F 4	Clop	oper Soil Loss, ft	0.000	-0.013	-0.049	-0.036	-0.007	-0.026	-0.020	-0.036	-0.013	-0.102	-0.305	Flow (cfs) =	0.50	0.45	0.14
5 ft		Cross-section 2	A	Avg Bottor B	C C	0.00 D	E	lopper Sc	G G	-0.02 H	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		I Surface Elev, ft	2.110	2.372	2.579	2.605	2.621	2.605	2.598	2.313	2.080	9.894	[]	V & 0.20	3.14	V & 0.00	2.4
	-	Surface Elev, ft	2.192	2.379	2.598	2.644	2.621	2.621	2.615	2.320	2.083	9.967		Vavg (fps) =	3.14	Bed Max Shear	
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.037	Stress (psf)	Water Depth (ft
	Clop	oper Soil Loss, ft	-0.082	-0.007	-0.020	-0.039	0.000	-0.016	-0.016	-0.007	-0.003	-0.072	-0.217	Flow (cfs) =	0.50	0.65	0.21
10 ft			A	Avg Bottor	n Gain, ft	0.00	Avg C	lopper Sc	oil Loss, ft	-0.02							
		Cross-section 3	А	В	С	D	E	F	G	Н	Ι	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
	To original	I Surface Elev, ft	1.834	2.083	2.310	2.323	2.343	2.336	2.303	2.057	1.804	8.791			2.04		1.8
	To eroded	Surface Elev, ft	1.867	2.106	2.320	2.329	2.343	2.349	2.352	2.106	1.827	8.881		Vavg (fps) =	2.04	Bed Max Shear	Water Depth (ft
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.108	Stress (psf)	
	Clop	oper Soil Loss, ft	-0.033	-0.023	-0.010	-0.007	0.000	-0.013	-0.049	-0.049	-0.023	-0.090	-0.271	Flow (cfs) =	0.50	1.68	0.54
15 ft				Avg Bottor B	n Gain, ft C	0.00 D	Avg C E	lopper So	oil Loss, ft G	-0.02 H		10.2	1 1-3	Vennet	V @ 0.6d	V @ 0.8d	To Water Ov (
		Cross-section 4	A 1.991	в 2.218	2.451	D 2.493	E 2.500	F 2.493	G 2.484	H 2.228	I 1.982	[ft ²] 9.429	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, 1
	-	l Surface Elev, ft	2.054	2.210	2.451	2.493	2.500	2.493	2.464	2.333	2.047	9.429		Vavg (fps) =	1.81	5 111 01	1.0
	10 010000	Soil Gain, ft	0.000	0.000	0.092	0.059	0.039	0.043	0.092	0.000	0.000	0.142	0.427	navg =	0.143	Bed Max Shear Stress (psf)	Water Depth (ft
	Clor	oper Soil Loss, ft	-0.062	-0.062	0.000	0.000	0.000	0.000	0.000	-0.105	-0.066	-0.133	-0.399	Flow (cfs) =	0.50	2.15	0.69
20 ft			A	Avg Bottor	n Gain, ft	0.04	Avg C	lopper Sc	il Loss, ft	-0.03				. ,			
		Cross-section 5	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
	To original	l Surface Elev, ft	1.844	1.991	2.208	2.238	2.274	2.257	2.241	2.011	1.772	8.508			0.51		1.1
	To eroded	Surface Elev, ft	1.844	1.962	2.156	2.165	2.185	2.156	2.159	1.962	1.821	8.274	•	Vavg (fps) =	0.51	Bed Max Shear	Water Depth (ft)
		Soil Gain, ft	0.000	0.030	0.052	0.072	0.089	0.102	0.082	0.049	0.000	0.243	0.728	navg =	0.667	Stress (psf)	Water Depth (ft)
	Clop	oper Soil Loss, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.049	-0.008	-0.025	Flow (cfs) =	0.50	3.23	1.04
25 ft				Avg Bottor		0.05		lopper Sc		-0.01							
		Cross-section 6	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, I
		Surface Elev, ft	1.831	2.070	2.297						1.877	8.882					1.1
			4 0 0 7			2.356	2.382	2.359	2.326	2.110		0.400		\/ (f==)	0.1		
	To eroded	Surface Elev, ft	1.837	2.080	2.192	2.208	2.224	2.218	2.169	2.008	1.877	8.490	1 201	Vavg (fps) =	0.10	Bed Max Shear Stress (psf)	
		l Surface Elev, ft Soil Gain, ft	0.000	2.080 0.000	2.192 0.105	2.208 0.148	2.224 0.157	2.218 0.141	2.169 0.157	2.008 0.102	1.877 0.000	0.400	1.201	navg =	0.10 3.616	Stress (psf)	Water Depth (ft
30 ft		Surface Elev, ft	0.000	2.080 0.000 -0.010	2.192 0.105 0.000	2.208 0.148 0.000	2.224 0.157 0.000	2.218 0.141 0.000	2.169 0.157 0.000	2.008	1.877		1.201		0.10		
30 ft	Clop	l Surface Elev, ft Soil Gain, ft	0.000	2.080 0.000	2.192 0.105 0.000	2.208 0.148 0.000	2.224 0.157 0.000	2.218 0.141	2.169 0.157 0.000	2.008 0.102 0.000	1.877 0.000	0.400		navg =	0.10 3.616	Stress (psf)	Water Depth (ft
30 ft		l Surface Elev, ft Soil Gain, ft oper Soil Loss, ft	0.000 -0.007	2.080 0.000 -0.010	2.192 0.105 0.000 n Gain, ft	2.208 0.148 0.000 0.09	2.224 0.157 0.000 Avg C	2.218 0.141 0.000	2.169 0.157 0.000 bil Loss, ft	2.008 0.102 0.000 0.00	1.877 0.000 0.000	0.400	-0.023	navg = Flow (cfs) =	0.10 3.616 0.23	Stress (psf) 3.54	Water Depth (ft
30 ft	Clop To original	l Surface Elev, ft Soil Gain, ft oper Soil Loss, ft Cross-section 7	0.000 -0.007 A	2.080 0.000 -0.010 Avg Bottor B	2.192 0.105 0.000 n Gain, ft C	2.208 0.148 0.000 0.09 D	2.224 0.157 0.000 Avg C E	2.218 0.141 0.000 lopper Sc	2.169 0.157 0.000 vil Loss, ft G	2.008 0.102 0.000 0.00 H	1.877 0.000 0.000 I	0.400 -0.008 [ft ²]	-0.023	navg = Flow (cfs) =	0.10 3.616 0.23 V @ 0.6d	Stress (psf) 3.54	Water Depth (ft 1.14 To Water Surf, 2.0
30 ft	Clop To original	I Surface Elev, ft Soil Gain, ft Oper Soil Loss, ft Cross-section 7 I Surface Elev, ft	0.000 -0.007 A 1.644	2.080 0.000 -0.010 Avg Bottor B 1.913	2.192 0.105 0.000 n Gain, ft C 2.142	2.208 0.148 0.000 0.09 D 2.195	2.224 0.157 0.000 Avg C E 2.208	2.218 0.141 0.000 lopper Sc F 2.195	2.169 0.157 0.000 oil Loss, ft G 2.172	2.008 0.102 0.000 0.00 H 1.975	1.877 0.000 0.000 I 1.739	0.400 -0.008 [ft ²] 8.256	-0.023	navg = Flow (cfs) = V @ 0.2d	0.10 3.616 0.23 V @ 0.6d 3.36	Stress (psf) 3.54 V @ 0.8d	Water Depth (ft 1.14 To Water Surf, t 2.0
30 ft	Clop To original To eroded	I Surface Elev, ft Soil Gain, ft oper Soil Loss, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft	0.000 -0.007 A 1.644 1.644	2.080 0.000 -0.010 Vg Bottor B 1.913 1.913	2.192 0.105 0.000 n Gain, ft C 2.142 2.165	2.208 0.148 0.000 0.09 D 2.195 2.221	2.224 0.157 0.000 Avg C E 2.208 2.238	2.218 0.141 0.000 lopper Sc F 2.195 2.231	2.169 0.157 0.000 iil Loss, ft G 2.172 2.234	2.008 0.102 0.000 0.00 H 1.975 1.975	1.877 0.000 0.000 I 1.739 1.739	0.400 -0.008 [ft ²] 8.256 8.336	-0.023 [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.10 3.616 0.23 V @ 0.6d 3.36 3.36	Stress (psf) 3.54 V @ 0.8d Bed Max Shear	Water Depth (ft 1.14 To Water Surf, t 2.0
30 ft	Clop To original To eroded	I Surface Elev, ft Soil Gain, ft Opper Soil Loss, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft	0.000 -0.007 A 1.644 1.644 0.000 0.000	2.080 0.000 -0.010 Wg Bottor B 1.913 1.913 0.000	2.192 0.105 0.000 n Gain, ft C 2.142 2.165 0.000 -0.023 n Gain, ft	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.00	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc	2.169 0.157 0.000 iil Loss, ft 2.172 2.234 0.000 -0.062 iil Loss, ft	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000	1.877 0.000 0.000 I 1.739 1.739 0.000	0.400 -0.008 [ft ²] 8.256 8.336 0.000	-0.023 [in] 0.000	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.10 3.616 0.23 V @ 0.6d 3.36 3.36 0.038 1.59	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74	Water Depth (ft 1.14 To Water Surf, 1 2.0 Water Depth (ft
	Clop To original To eroded Clop	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8	0.000 -0.007 A 1.644 1.644 0.000 0.000 A A	2.080 0.000 -0.010 Wg Bottor B 1.913 1.913 0.000 0.000 Wg Bottor B	2.192 0.105 0.000 n Gain, ft C 2.142 2.165 0.000 -0.023 n Gain, ft C	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.00 D	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030 Avg C E	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc F	2.169 0.157 0.000 iil Loss, ft G 2.172 2.234 0.000 -0.062 iil Loss, ft G	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000 -0.02 H	1.877 0.000 0.000 1 1.739 1.739 0.000 0.000 0.000	0.400 -0.008 [ft²] 8.256 8.336 0.000 -0.080 [ft²]	-0.023 [in] 0.000	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	0.10 3.616 0.23 V @ 0.6d 3.36 3.36 0.038 1.59 V @ 0.6d	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 1.14 To Water Surf, 2.0 Water Depth (ft 0.24 To Water Surf,
	Clop To original To eroded Clop To original	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Cross-section 8 Cross-section 8	0.000 -0.007 A 1.644 1.644 0.000 0.000 A 1.909	2.080 0.000 -0.010 Xvg Bottor B 1.913 1.913 0.000 0.000 Xvg Bottor B 2.201	2.192 0.105 0.000 n Gain, ft C 2.142 2.165 0.000 -0.023 n Gain, ft C 2.428	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.000 D 2.457	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030 Avg C E 2.464	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc F 2.448	2.169 0.157 0.000 iil Loss, ft G 2.172 2.234 0.000 -0.062 iil Loss, ft G 2.425	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000 -0.02 H 2.175	1.877 0.000 0.000 I 1.739 1.739 0.000 0.000 0.000 I 1.923	0.400 -0.008 (ft²) 8.256 8.336 0.000 -0.080 (ft²) 9.265	-0.023 [in] 0.000 -0.240	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74	Water Depth (ft 1.14 To Water Surf, 2.0 Water Depth (ft 0.24
	Clop To original To eroded Clop To original	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft I Surface Elev, ft	0.000 -0.007 A 1.644 1.644 0.000 0.000 A 1.909 1.909	2.080 0.000 -0.010 Avg Bottor B 1.913 1.913 0.000 0.000 Avg Bottor B 2.201 2.201	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft C 2.428 2.444	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.000 D 2.457 2.477	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc F 2.448 2.448 2.470	2.169 0.157 0.000 iil Loss, ft 2.172 2.234 0.000 -0.062 iil Loss, ft G 2.425 2.425 2.451	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000 -0.02 H 2.175 2.175	1.877 0.000 0.000 1 1.739 1.739 0.000 0.000 0.000 1 1.923 1.923	0.400 -0.008 [ft ²] 8.256 8.336 0.000 -0.080 -0.080 [ft ²] 9.265 9.332	-0.023 [in] 0.000 -0.240 [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear	Water Depth (ft 1.14 To Water Surf, 1 2.0 Water Depth (ft 0.24 To Water Surf, 1 2.4
	Clop To original To eroded Clop To original To eroded	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft Soil Gain, ft	0.000 -0.007 A 1.644 1.644 0.000 0.000 A 1.909 1.909 0.000	2.080 0.000 -0.010 Wg Bottor B 1.913 1.913 0.000 0.000 Wg Bottor B 2.201 2.201 0.000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft C 2.428 2.444 0.000	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.000 D 2.457 2.477 0.000	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc F 2.448 2.470 0.000	2.169 0.157 0.000 iil Loss, ft 2.172 2.234 0.000 -0.062 iil Loss, ft G 2.425 2.451 0.000	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000 -0.02 H 2.175 2.175 0.000	1.877 0.000 0.000 1 1.739 1.739 0.000 0.000 0.000 1 1.923 1.923 1.923 0.000	0.400 -0.008 [ft ²] 8.256 8.336 0.000 -0.080 [ft ²] 9.265 9.332 0.000	-0.023 [in] 0.000 -0.240 [in] [in] 0.000	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = rlow (cfs) = V @ 0.2d Vavg (fps) = navg =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71 0.026	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 1.14 To Water Surf, 2.0 Water Depth (ft 0.24 To Water Surf, 2.4 Water Depth (ft
35 ft	Clop To original To eroded Clop To original To eroded	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft I Surface Elev, ft	0.000 -0.007 A 1.644 1.644 0.000 0.000 A 1.909 1.909 0.000 0.000	2.080 0.000 -0.010 Wg Bottor B 1.913 1.913 0.000 0.000 Wg Bottor B 2.201 2.201 0.000 0.000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft C 2.428 2.444 0.000 -0.016	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.00 D 2.457 2.457 2.477 0.000 -0.020	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc F 2.448 2.470 0.000 -0.023	2.169 0.157 0.000 iil Loss, ft 2.172 2.234 0.000 -0.062 iil Loss, ft G 2.425 2.451 0.000 -0.026	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000 -0.02 H 2.175 2.175 2.175 0.000	1.877 0.000 0.000 1 1.739 1.739 0.000 0.000 0.000 1 1.923 1.923	0.400 -0.008 [ft ²] 8.256 8.336 0.000 -0.080 -0.080 [ft ²] 9.265 9.332	-0.023 [in] 0.000 -0.240 [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear	Water Depth (ft 1.14 To Water Surf, 2.0 Water Depth (ft 0.24 To Water Surf, 2.4
	Clop To original To eroded Clop To original To eroded Clop	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft Soil Gain, ft	0.000 -0.007 A 1.644 1.644 0.000 0.000 A 1.909 1.909 0.000 0.000	2.080 0.000 -0.010 Wg Bottor B 1.913 1.913 0.000 0.000 Wg Bottor B 2.201 2.201 0.000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft C 2.428 2.444 0.000 -0.016	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.000 D 2.457 2.477 0.000	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc F 2.448 2.470 0.000	2.169 0.157 0.000 iil Loss, ft 2.172 2.234 0.000 -0.062 iil Loss, ft 0.000 -0.026 iil Loss, ft	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000 -0.02 H 2.175 2.175 0.000	1.877 0.000 0.000 1 1.739 1.739 0.000 0.000 0.000 1 1.923 1.923 1.923 0.000	0.400 -0.008 [ft²] 8.256 8.336 0.000 -0.080 [ft²] 9.265 9.332 0.000 -0.067	-0.023 [in] 0.000 -0.240 [in] 0.000 -0.200	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71 0.026	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 1.14 To Water Surf, 2.0 Water Depth (ft 0.24 To Water Surf, 2.4 Water Depth (ft 0.16
35 ft	Clop To original To eroded Clop To original To eroded Clop	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft	0.000 -0.007 A 1.644 1.644 1.644 0.000 0.000 A 1.909 1.909 0.000 0.000 A A	2.080 0.000 -0.010 Wg Bottor B 1.913 1.913 0.000 0.000 Wg Bottor B 2.201 2.201 0.000 0.000 0.000 Wg Bottor	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft 2.428 2.444 0.000 -0.016 n Gain, ft	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.00 D 2.457 2.457 2.477 0.000 -0.020 0.00	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 Avg C	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc 2.448 2.470 0.000 -0.023 lopper Sc	2.169 0.157 0.000 iil Loss, ft 2.172 2.234 0.000 -0.062 iil Loss, ft G 2.425 2.451 0.000 -0.026	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000 -0.02 H 2.175 2.175 0.000 0.000 0.000	1.877 0.000 1 1 1.739 0.000 0.000 0.000 1 1.923 1.923 0.000 0.000	0.400 -0.008 [ft ²] 8.256 8.336 0.000 -0.080 [ft ²] 9.265 9.332 0.000	-0.023 [in] 0.000 -0.240 [in] [in] 0.000	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = rlow (cfs) = V @ 0.2d Vavg (fps) = navg =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71 0.026 1.17	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.74 0.74 0.74 0.74 0.74 0.74	Water Depth (ft 1.14 To Water Surf, 2.0 Water Depth (ft 0.24 To Water Surf, 2.4 Water Depth (ft 0.16
35 ft	Clop To original To eroded Clop To original To eroded Clop To eroded Clop To original	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Cross-section 9	0.000 -0.007 A 1.644 1.644 1.644 0.000 0.000 A 1.909 1.909 0.000 0.000 A A	2.080 0.000 -0.010 Wg Bottor B 1.913 1.913 0.000 0.000 Wg Bottor B 2.201 2.201 0.000 0.000 Wg Bottor B 2.201 2.201 0.000 0.000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft C 2.428 2.444 0.000 -0.016 n Gain, ft C	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.00 D 2.457 2.477 0.000 -0.020 0.00 D	2.224 0.157 0.000 Avg C E 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 Avg C E E	2.218 0.141 0.000 lopper Sc 2.195 2.231 0.000 -0.036 lopper Sc 7 2.448 2.470 0.000 -0.023 lopper Sc F	2.169 0.157 0.000 il Loss, ft 2.172 2.234 0.000 -0.062 il Loss, ft G 2.425 2.451 0.000 -0.026 il Loss, ft G	2.008 0.102 0.000 H 1.975 1.975 0.000 0.000 H 2.175 2.175 0.000 0.000 0.000 0.000 0.000 H H	1.877 0.000 1.000 1.739 1.739 0.000 0.000 1 1.923 1.923 0.000 0.000 0.000	0.400 -0.008 [ft²] 8.256 8.336 0.000 -0.080 [ft²] 9.265 9.332 0.000 -0.067 [ft²]	-0.023 [in] 0.000 -0.240 [in] 0.000 -0.200	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71 0.026 1.17 V @ 0.6d	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.49 V @ 0.8d	Water Depth (ft 1.14 To Water Surf, 2.0 Water Depth (ft 0.24 To Water Surf, 2.4 Water Depth (ft 0.16 To Water Surf, 2.3
35 ft	Clop To original To eroded Clop To original To eroded Clop To eroded Clop To original	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Soil Coss, ft Cross-section 9 I Surface Elev, ft	0.000 -0.007 A 1.644 1.644 0.000 0.000 A 1.909 1.909 0.000 0.000 A A 1.844	2.080 0.000 -0.010 Vg Bottor B 1.913 0.000 0.000 Vg Bottor B 2.201 2.201 0.000 0.000 Vg Bottor B 2.201 2.201 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.00000000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 0.000 -0.023 2.428 2.444 0.000 -0.016 n Gain, ft 0.000 -0.016 n Gain, ft 2.2428 2.444 0.000 -0.016 0.000 -0.016 0.000 -0.015 0.000 -0.023 0.0000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.023 0.000 -0.025 0.000 -0.025 0.000 -0.025 0.000 -0.025 0.000 -0.025 0.000 -0.025 0.025 0.000 -0.025 0.000 -0.025 0.000 -0.025 0.000 -0.025 0.000 -0.025 0.000 -0.025 0.000 -0.0000 -0.0000 -0.000 -0.000 -0.000 -0.000 -0.000000 -0.0000 -0.0000000 -0.0	2.208 0.148 0.000 D 2.195 2.221 0.000 -0.026 0.00 D 2.457 2.477 0.000 -0.020 0.00 0.00 0.00 0.00 0.00 0	2.224 0.157 0.000 E 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 2.464 2.536 0.000 -0.072 2.464 2.536 0.000 0.072 2.235	2.218 0.141 0.000 F 2.195 2.231 0.000 -0.036 F 2.448 2.470 0.000 -0.023 0.000 -0.023 F 2.365	2.169 0.157 0.000 iil Loss, ft 2.172 2.234 0.000 -0.062 2.425 2.451 0.000 -0.026 G -0.026 G 0.000 -0.026 G 2.329	2.008 0.102 0.000 H 1.975 0.000 0.000 4.02 2.175 0.000 0.000 0.000 4.02 4.02 4.02 4.02 4	1.877 0.000 1.000 1.739 0.000 0.000 1.923 0.000 0.000 0.000 1.923 0.000 1.923 1.923	0.400 -0.008 [ft ²] 8.256 8.336 0.000 -0.080 [ft ²] 9.265 9.332 0.000 -0.067 [ft ²] 8.867	-0.023 [in] 0.000 -0.240 [in] 0.000 -0.200	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = Navg = Flow (cfs) = Flow (cfs) = V @ 0.2d	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71 0.026 1.17 V @ 0.6d 4.04	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.74 0.74 0.74 0.74 0.74 0.74	Water Depth (ft 1.14 To Water Surf, 1 2.0 Water Depth (ft 0.24 To Water Surf, 1 2.4 Water Depth (ft 0.16 To Water Surf, 1 2.3
35 ft	Clop To original To eroded Clop To original To eroded Clop To original To eroded	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft Soil Cos, ft Soil	0.000 -0.007 A 1.644 1.644 0.000 0.000 A 1.909 0.000 0.000 A 1.909 0.000 0.000 A 1.844 1.844	2.080 0.000 -0.010 B 1.913 1.913 0.000 0.000 0.000 8 2.201 2.201 0.0000 0.00000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000	2.192 0.105 0.000 1 Gain, ft 2.142 2.165 0.000 -0.023 0.000 -0.023 2.428 2.444 0.000 -0.016 0.0016 0.0016 2.297 2.326	2.208 0.148 0.000 0.09 2.195 2.221 0.000 -0.026 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.000000	2.224 0.157 0.000 Avg C 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 Avg C E 2.375 2.415	2.218 0.141 0.000 F 2.195 2.231 0.000 -0.036 F 2.448 2.470 0.000 -0.023 content conten	2.169 0.157 0.000 III Loss, ft 2.234 0.000 -0.062 2.425 2.451 0.000 -0.026 2.425 0.000 -0.026 2.329 2.365	2.008 0.102 0.000 H 1.975 0.000 0.000 -0.02 H 2.175 0.000 0.000 0.000 H 2.075 2.175 0.0000 0.0000 0.000 0.0000 0.0000 0.0000 0.0000 0.000000	1.877 0.000 0.000 1 1.739 0.000 0.000 0.000 1.923 1.923 0.000 0.000 0.000 1.824 1.844 1.844	0.400 -0.008 [ft²] 8.256 8.336 0.000 -0.080 [ft²] 9.265 9.332 0.000 -0.067 [ft²] 8.867 8.955	-0.023 [in] 0.000 -0.240 [in] 0.000 -0.200 -0.200 [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Navg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 0.026 1.17 V @ 0.6d 4.04 4.04	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d V @ 0.8d Bed Max Shear V @ 0.8d V @ 0.8d	Water Depth (ft 1.14 To Water Surf, 1 2.0 Water Depth (ft 0.24 To Water Surf, 1 2.4 Water Depth (ft 0.16 To Water Surf, 1 2.3
35 ft	Clop To original To eroded Clop To original To eroded Clop To original To eroded	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft Cross-section 9 I Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft	0.000 -0.007 A A 1.644 1.644 0.000 0.000 A A 1.909 0.000 0.000 A A 1.844 1.844 0.000 0.000	2.080 0.000 -0.010 B 1.913 1.913 0.000 0.000 0.000 8 2.201 2.201 0.0000 0.00000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft 2.428 2.444 0.000 -0.016 n Gain, ft C 2.297 2.326 0.000 -0.030	2.208 0.148 0.000 0.09 2.195 2.221 0.000 -0.026 0.000 2.457 2.477 0.000 -0.020 0.000 0.000 0.000 2.382 2.421 0.000	2.224 0.157 0.000 Avg C 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 Avg C E 2.375 2.415 0.000 -0.039	2.218 0.141 0.000 Per Sc 2.231 0.000 -0.036 F 2.448 2.470 0.000 -0.023 Sc 5 2.405 0.000	2.169 0.157 0.000 III Loss, ft 2.234 0.000 -0.062 2.425 2.451 0.000 -0.026 2.425 2.451 0.000 -0.026 2.329 2.365 0.000 -0.036	2.008 0.102 0.000 H 1.975 0.000 0.000 -0.02 H 2.175 0.000 0.000 -0.02 H 2.073 0.000	1.877 0.000 0.000 1 1.739 0.000 0.000 0.000 1.923 0.000 0.000 0.000 1.824 1.844 1.844 1.844	0.400 -0.008 [ft²] 8.256 8.336 0.000 -0.080 [ft²] 9.265 9.332 0.000 -0.067 [ft²] 8.867 8.867 8.955 0.000	-0.023 (in) 0.000 0.000 (in) 0.000 0.000 1. 0.000 0.000 0.000 0.000	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = N @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 0.026 1.17 V @ 0.6d 4.04 4.04 0.020	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.49 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 1.14 To Water Surf, 2.0 Water Depth (ft 0.24 To Water Surf, 2.4 Water Depth (ft 0.16 To Water Surf, 2.3 Water Depth (ft
35 ft	Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop Clop	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft Cross-section 9 I Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft	0.000 -0.007 A A 1.644 1.644 0.000 0.000 A A 1.909 0.000 0.000 0.000 0.000 A A 1.844 1.844 0.000 0.000 A A	2.080 0.000 -0.010 B 1.913 1.913 0.0000 0.00000 0.0000 0.0000 0.0000 0.00000 0.000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft 2.428 2.444 0.000 -0.016 n Gain, ft C 2.297 2.326 0.000 -0.030	2.208 0.148 0.000 0.09 2.195 2.221 0.000 -0.026 0.000 2.457 0.000 -0.020 0.000 0.000 0.000 2.382 2.421 0.000 0.039	2.224 0.157 0.000 Avg C 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 Avg C E 2.375 2.415 0.000 -0.039	2.218 0.141 0.000 Per Sc 2.231 0.000 -0.036 F 2.448 2.470 0.000 -0.023 P F 2.365 2.405 0.000 -0.039	2.169 0.157 0.000 III Loss, ft 2.234 0.000 -0.062 2.425 2.451 0.000 -0.026 2.425 2.451 0.000 -0.026 2.329 2.365 0.000 -0.036	2.008 0.102 0.000 H 1.975 0.000 -0.02 H 2.175 0.000 0.000 -0.02 H 2.073 0.000 -0.02 H 2.073 0.000 0.000 0.000	1.877 0.000 0.000 1 1.739 0.000 0.000 0.000 1.923 0.000 0.000 0.000 1.824 1.844 1.844 1.844	0.400 -0.008 [ft²] 8.256 8.336 0.000 -0.080 [ft²] 9.265 9.332 0.000 -0.067 [ft²] 8.867 8.867 8.955 0.000	-0.023 (in) (0.000 -0.240 (in) 0.000 -0.240 (in) 0.000 0.020 0.000 0.020 0.000 0.0262 0.000	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flow (cfs) =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 0.026 1.17 V @ 0.6d 4.04 4.04 0.020 0.95	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.49 V @ 0.8d Bed Max Shear Stress (psf)	Water Depth (ft 1.14 To Water Surf, 1 2.0 Water Depth (ft 0.24 To Water Surf, 1 2.4 Water Depth (ft 0.16 To Water Surf, 1 2.3 Water Depth (ft 0.12
35 ft	Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Cross-section 8 I Surface Elev, ft Soil Gain, ft	0.000 -0.007 A A 1.644 1.644 0.000 0.000 A A 1.809 0.000 0.000 A A 1.844 1.844 1.844 0.000 0.000 A 0.000 A 0.000 A	2.080 0.000 -0.010 0.010 1.913 1.913 0.000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft 2.444 0.000 -0.016 n Gain, ft 2.297 2.326 0.000 -0.030 n Gain, ft	2.208 0.148 0.000 0.09 2.195 2.221 0.000 -0.026 0.000 2.457 0.000 -0.020 0.000 0.000 2.382 2.421 0.000 0.039 0.000	2.224 0.157 0.000 Avg C 2.208 2.238 0.000 -0.030 Avg C 2.464 2.536 0.000 -0.072 Avg C E 2.454 Avg C 0.000 -0.072 Avg C 0.000 Avg C 0.039 Avg C	2.218 0.141 0.000 Per Sc 2.231 0.000 -0.036 F 2.448 2.470 0.000 -0.023 F 2.365 2.405 0.000 -0.039	2.169 0.157 0.000 01 Loss, ft 2.234 0.000 -0.062 2.425 0.000 -0.026 2.425 2.451 0.000 -0.026 G 2.329 2.365 0.000 -0.036	2.008 0.102 0.000 H 1.975 0.000 -0.02 H 2.175 0.000 0.000 -0.02 H 2.073 0.000 0.000 0.000 0.000 0.000 0.000	1.877 0.000 0.000 1 1.739 0.000 0.000 0.000 1.923 0.000 0.000 1.844 1.844 1.844 0.000 0.000	0.400 -0.008 [ft²] 8.256 8.336 0.000 -0.080 [ft²] 9.265 9.332 0.000 -0.067 [ft²] 8.867 8.955 0.000 -0.087 [ft²]	-0.023 (in) (0.000 -0.240 (0.000 -0.240 (0.000 -0.200 (0.000 (0.000 -0.200 -0.200 (0.000 -0.200 -0.200 -0.200 (0.000 -0.2	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flow (cfs) = Flow (cfs) =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 0.026 1.17 V @ 0.6d 4.04 4.04 0.020 0.95 Bottom Ga	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.49 V @ 0.8d Bed Max Shear Stress (psf) 0.37	Water Depth (ft 1.14 To Water Surf, 1 2.0 Water Depth (ft 0.24 To Water Surf, 2.4 Water Depth (ft 0.16 To Water Surf, 2.3 Water Depth (ft 0.12 0.000
35 ft	Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop To original Clop To original	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Avg Soil Gain, ft Soper Soil Loss, ft	0.000 -0.007 A A 1.644 1.644 0.000 A A 1.909 0.000 0.000 A A 1.844 1.844 1.844 0.000 0.000 A 0.000 2.227.835	2.080 0.000 -0.010 Vy Bottor 1.913 1.913 0.0000 0.0000 0.0000 0.0000 0.0000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft 0.000 -0.016 n Gain, ft C 2.297 2.326 0.000 -0.030 n Gain, ft 0.021 -0.018 X-Sec	2.208 0.148 0.000 0.09 D 2.195 2.221 0.000 -0.026 0.00 D 2.457 2.477 0.000 -0.020 0.00 D 2.382 2.421 0.000 -0.039 0.00 0.019 -0.020	2.224 0.157 0.000 Avg C 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 Avg C E 2.375 2.415 0.000 -0.039 Avg C 0.018 -0.017 -0.017	2.218 0.141 0.000 0pper Sc 2.231 0.000 -0.036 F 2.448 2.470 0.000 -0.023 10pper Sc 2.405 0.000 -0.039 00pper Sc 0.021 -0.017 5	2.169 0.157 0.000 il Loss, ft 2.234 0.000 -0.062 2.425 2.451 0.000 -0.026 2.329 2.365 0.000 -0.036 0.035, ft 0.000 -0.036 0.025 0.021 Origin	2.008 0.102 0.000 H 1.975 0.000 -0.02 H 2.175 0.000 0.000 -0.02 H 2.073 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	1.877 0.000 0.000 1.739 0.000 0.000 0.000 1.923 0.000 0.000 0.000 1.844 1.844 1.844 0.000 0.000 0.000 0.000 0.002 8.Elev	0.400 -0.008 [ft ²] 8.256 8.336 0.000 -0.080 [ft ²] 9.265 9.332 0.000 -0.067 [ft ²] 8.867 8.955 0.000 -0.087 [ft ²] 8.955 0.000 -0.087 [ft ²] 8.9134	-0.023 (in) 0.000 -0.240 (in) 0.000 -0.200 (in) 0.000 0.000 0.020	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flow (cfs) = Flow (cfs) =	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71 0.026 1.17 V @ 0.6d 4.04 4.04 0.020 0.95 Bottom Ga pper Soil Loo	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.49 V @ 0.8d Bed Max Shear Stress (psf) 0.37 ain per Xsection, ft = Section Spacing, ft =	Water Depth (ft 1.14 To Water Surf, 1 2.0 Water Depth (ft 0.24 To Water Surf, 1 2.4 Water Depth (ft 0.16 To Water Surf, 1 2.3 Water Depth (ft 0.12 0.000 -0.020 5
35 ft	Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop To original Analysis	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Soper Soil Loss, ft Avg Soil Gain, ft Surface Elev Surface Elev Surface Elev	0.000 -0.007 A A 1.644 1.644 0.000 A A 1.909 0.000 0.000 A A 1.844 1.844 1.844 0.000 0.000 6.000 2.227.835 226.701	2.080 0.000 -0.010 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft C 2.428 2.444 0.000 -0.016 n Gain, ft C 2.297 2.326 0.000 -0.030 n Gain, ft 0.000 -0.030 n Gain, ft C 2.297 2.326 0.000 -0.030 n Gain, ft -0.030 N Gain, ft -0.031 N Gain, ft -0.031 -0.031 N Gain, ft -0.031 -	2.208 0.148 0.000 0.09 D 2.195 2.221 0.000 -0.026 0.00 D 2.457 2.477 0.000 -0.020 0.00 D 2.382 2.421 0.000 -0.039 0.00 0.019 -0.020 c.0019 -0.020 cetion Space	2.224 0.157 0.000 Avg C 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 Avg C E 2.375 2.415 0.000 -0.039 Avg C 0.039 Avg C 0.039 Avg C 0.030 0.030 -0.030 -0.072 -0.039 Avg C -0.039 Avg C -0.039 Avg C -0.039 -0.017 -	2.218 0.141 0.000 opper Sc 2.231 0.000 -0.036 Iopper Sc 0.000 -0.039 Iopper Sc 0.021 5 40	2.169 0.157 0.000 il Loss, ft 2.234 0.000 -0.062 2.425 2.451 0.000 -0.026 2.329 2.365 0.000 -0.036 0.035, ft 0.000 -0.036 0.025 0.021 Origin	2.008 0.102 0.000 H 1.975 1.975 0.000 -0.02 H 2.175 0.000 0.000 -0.02 H 2.073 0.000 0.000 -0.02 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	1.877 0.000 0.000 1.739 0.000 0.000 1.739 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.400 -0.008 [ft ²] 8.256 8.336 0.000 -0.080 [ft ²] 9.265 9.332 0.000 -0.067 [ft ²] 8.867 8.955 0.000 -0.087 [ft ²] 8.9134 89.885	-0.023 [in] 0.000 -0.240 -0.240 0.000 -0.240 0.000 -0.200 0.000 0.000 0.0262 June [in]	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flow (cfs) = Vavg (fps) = Avg Avg Cop	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71 0.026 1.17 V @ 0.6d 4.04 4.04 0.020 0.95 Bottom Ga pper Soil Loo	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.49 V @ 0.8d Bed Max Shear Stress (psf) 0.37 ain per Xsection, ft = Section Spacing, ft = Section Length, ft =	Water Depth (ft) 1.14 To Water Surf, f 2.0 Water Depth (ft) 0.24 To Water Depth (ft) 0.16 To Water Surf, f 2.3 Water Depth (ft) 0.12 0.000 -0.020 5 40
35 ft	Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop Avg Clop Avg Clop Avg Clop Aralysis	I Surface Elev, ft Soil Gain, ft Cross-section 7 I Surface Elev, ft I Surface Elev, ft Soil Gain, ft Avg Soil Gain, ft Soper Soil Loss, ft	0.000 -0.007 A A 1.644 1.644 0.000 A A 1.909 0.000 0.000 A A 1.844 1.844 1.844 0.000 0.000 A 0.000 2.227.835	2.080 0.000 -0.010 Vy Bottor 1.913 1.913 0.0000 0.0000 0.0000 0.0000 0.0000	2.192 0.105 0.000 n Gain, ft 2.142 2.165 0.000 -0.023 n Gain, ft C 2.428 2.444 0.000 -0.016 n Gain, ft C 2.297 2.326 0.000 -0.030 n Gain, ft C 2.297 2.326 0.000 -0.030 n Gain, ft Second C 2.297 2.326 0.000 -0.030 n Gain, ft Second C 2.297 2.326 0.000 -0.030 Second C 2.297 2.326 0.000 -0.030 Second C 2.297 2.326 0.000 -0.030 Second C 2.297 2.326 0.000 -0.030 Second C 2.297 2.326 0.000 -0.030 Second C 2.297 2.326 0.000 -0.030 Second C 2.297 2.326 0.000 -0.030 Second C 2.297 -0.030 Second C 2.297 -0.030 Second C 2.297 -0.030 Second C 2.297 -0.030 Second Seco	2.208 0.148 0.000 0.09 D 2.195 2.221 0.000 -0.026 0.00 D 2.457 2.477 0.000 -0.020 0.00 D 2.382 2.421 0.000 -0.039 0.00 0.019 -0.020 0.019 -0.020 Section Le sauge space	2.224 0.157 0.000 Avg C 2.208 2.238 0.000 -0.030 Avg C E 2.464 2.536 0.000 -0.072 Avg C E 2.375 2.415 0.000 -0.039 Avg C 0.018 -0.017 -0.017	2.218 0.141 0.000 opper Sc 2.231 0.000 -0.036 Iopper Sc 2.448 2.470 0.000 -0.023 Iopper Sc 0.000 -0.039 Iopper Sc 0.021 5 40 0.5	2.169 0.157 0.000 il Loss, ft 2.234 0.000 -0.062 2.425 2.451 0.000 -0.026 2.329 2.365 0.000 -0.036 0.035, ft 0.000 -0.036 0.025 0.021 Origin	2.008 0.102 0.000 H 1.975 0.000 -0.02 H 2.175 0.000 0.000 -0.02 H 2.073 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	1.877 0.000 0.000 1.739 0.000 0.000 1.739 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.400 -0.008 [ft ²] 8.256 8.336 0.000 -0.080 [ft ²] 9.265 9.332 0.000 -0.067 [ft ²] 8.867 8.955 0.000 -0.087 [ft ²] 8.955 0.000 -0.087 [ft ²] 8.9134	-0.023 (in) 0.000 -0.240 (in) 0.000 -0.200 (in) 0.000 0.000 0.020	navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d V @ 0.2d V @ 0.2d V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flow (cfs) = Vavg (fps) = Avg Avg Cop	0.10 3.616 0.23 V @ 0.6d 3.36 0.038 1.59 V @ 0.6d 3.71 3.71 0.026 1.17 V @ 0.6d 4.04 4.04 0.020 0.95 Bottom Ga per Soil Lo X.5	Stress (psf) 3.54 V @ 0.8d Bed Max Shear Stress (psf) 0.74 V @ 0.8d Bed Max Shear Stress (psf) 0.49 V @ 0.8d Bed Max Shear Stress (psf) 0.37 ain per Xsection, ft = Section Spacing, ft =	Water Depth (ft) 1.14 To Water Surf, f 2.0 Water Depth (ft) 0.24 To Water Surf, f 2.4 Water Depth (ft) 0.16 To Water Surf, f 2.3 Water Depth (ft) 0.12 0.000 -0.020 5 40 0.5





Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding





Increased Ponding & Overtopping



End-of-test and Post-test

1 1				Date:	7/16/12							SI	art Time:			4:49 PM	End Time:	5:19 PM	
1 2 3 0	AS	STM D7208		Soil:	Sandy C	lay						Target F	low (cfs):			2.00	Slope:	5%	=
1 2 3 Out Weight Signed Si	60 ft long flum	ie 40 ft t	est section	SRD:	Straw Ba	ales		Ins	tallation:	Wooden	Stakes /	NRCS Ins	tall						
1.000 1.000 <th< th=""><th></th><th>2 ft v</th><th>vide flume</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>TEST D</th><th>DATA</th><th></th><th></th><th></th><th></th><th></th></th<>		2 ft v	vide flume										TEST D	DATA					
Norm Norm <th< td=""><td>1</td><td>2 3</td><td></td><td>Outlet Weir</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Weir</td><td></td><td></td><td></td><td></td><td></td><td>Channel Targets</td><td></td></th<>	1	2 3		Outlet Weir								Weir						Channel Targets	
0 0	F	FLOW		Water Depth, in								1.50						0.00	
	eir width (ft) = 2	2	Wa	ater Velocity, ft/s								0.00						0.00	
	0 ft C D	EFGH		Flow Rate, cfs	0.00							0.00	0.00					0.00	
				Cross-section 1	А	В	С	D	Е	F	G	Н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		1	. ''	I Surface Elev, ft	1.037	1.460	1.932	2.379	2.405	2.343	1.873	1.375	0.889				5.1		2.3
A B A B A B A B A B A B A B A B A B A B		•	To eroded	I Surface Elev, ft	1.037	1.460	1.962	2.451	2.477	2.415	1.916	1.378	0.889	7.575		Vavg (fps) =	5.10		Water Depth (ft
Set Set <td></td> <td></td> <td></td> <td></td> <td>0.000</td> <td>navg =</td> <td>0.020</td> <td>Stress (psr)</td> <td></td>					0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.020	Stress (psr)	
			Clop	oper Soil Loss, ft				-0.072	-0.072	-0.072	-0.043	-0.003		-0.147	-0.440	Flow (cfs) =	2.00	0.52	0.17
10 100 </td <td>5 ft</td> <td></td> <td></td> <td></td> <td>A</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	5 ft				A	1					1	1							
															[in]	V @ 0.2d		V @ 0.8d	To Water Surf,
And in the set of th			-																2.1
Normal Normal<			I o eroded																Water Depth (ft
Image: state Image: state<			Class																0.57
Image: state Image: state<	40.4		Ciop	oper Soil Loss, ft					-0.062					-0.160	-0.479	FIOW (CTS) =	2.00	1.78	0.57
1 1 0	10 11			Cross contion 2		1			-		1	1		re. ² 1	[:=]	V@00d	VOOd	V@084	To Water Surf
Part of the ended Suria Ref in a set of the													-		[in]	v @ 0.2d		v @ 0.80	To Water Surf, 1
Bode Sold Sold <th< td=""><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>Vava (fps) -</td><td></td><td>5 111 5</td><td>1.0</td></th<>			-											-		Vava (fps) -		5 111 5	1.0
Process of the state			10 010000												0.020				Water Depth (ft
15 h N			Clor													-		u ,	0.76
Cross-section A B C D E F G H I IV IO V 0.20 V 0.00 V 0.20 V 0.00 V 0.00 V 0.00 0.00 0.00 <	15 ft		0.01	.poi 00ii 2000, Il					0.023					0.002	0.240	. 1011 (013) =	2.22	2.31	0.70
Image: state in the				Cross-section 4			1		F	-		1		[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
Part or ended Suriace Even, Sol Gam, 1 1000															1				1.6
Nome Nome <th< td=""><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Vavg (fps) =</td><td></td><td>Red May Cheer</td><td></td></th<>			-													Vavg (fps) =		Red May Cheer	
characterization characterization <thcharacterization< th=""> <thcharacterization< t<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0.279</td><td></td><td></td><td></td><td>Water Depth (ft</td></thcharacterization<></thcharacterization<>															0.279				Water Depth (ft
20 h 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 <td></td> <td></td> <td>Clor</td> <td></td> <td>-</td> <td></td> <td>2.86</td> <td>0.92</td>			Clor													-		2.86	0.92
Image: constraint or organis divince liev, no. A B C D E F G H I Image: constraint organis divince liev, no. Ossible	20 ft															. (,			
Image: state in the				Cross-section 5		1	1	D	Е		1	1	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, I
And and any integra Solution integra Solutin integra Solution integr			To original	I Surface Elev, ft	0.689	1.132	1.614	2.106	2.119	2.080	1.594	1.125	0.640				0.33		1.0
Set of the			To eroded	I Surface Elev, ft	0.689	1.194	1.585	1.896	2.001	1.880	1.732	1.276	0.640	6.159		Vavg (fps) =	0.33	Bed Max Shear	
25 h Image: mark Image: mark Image: mark Mode Mode <thm< td=""><td></td><td></td><td></td><td>Soil Gain, ft</td><td>0.000</td><td>0.000</td><td>0.030</td><td>0.210</td><td>0.118</td><td>0.200</td><td>0.000</td><td>0.000</td><td>0.000</td><td>0.323</td><td>0.968</td><td>navg =</td><td>1.014</td><td></td><td>Water Depth (ft</td></thm<>				Soil Gain, ft	0.000	0.000	0.030	0.210	0.118	0.200	0.000	0.000	0.000	0.323	0.968	navg =	1.014		Water Depth (ft
Image: constraint of the image: constraint of th			Clop	oper Soil Loss, ft	0.000	-0.062	0.000	0.000	0.000	0.000	-0.138	-0.151	0.000	-0.188	-0.564	Flow (cfs) =	0.67	3.15	1.01
Nominal surface line, inclusion of the integral surface line,	25 ft				A	vg Botto	m Gain, ft	0.06		Avg C	lopper Sc	oil Loss, ft	-0.04						
Image: bold state barbone barb			0	Cross-section 6	А	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, I
And integration Solidant, formation Conde <			To original	I Surface Elev, ft	0.965	1.378	1.962	2.385	2.438	2.352	1.906	1.450	0.988	7.471			0.25		1.1
Normal base Sector in transformed base Sol can, tr 0.000			To eroded	I Surface Elev, ft	0.981	1.414	1.877	2.093	2.287	2.300	1.995	1.457	0.994	7.224		Vavg (fps) =	0.25	Bed Max Shear	Water Depth (ft
$30 \ h$ 3				Soil Gain, ft	0.000	0.000	0.085	0.292	0.151	0.052	0.000	0.000	0.000	0.308	0.925	navg =	1.507	Stress (psf)	water Deptri (it
$ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$			Clop	oper Soil Loss, ft	-0.016	-0.036	0.000	0.000	0.000	0.000	-0.089	-0.007	-0.007	-0.062	-0.185	Flow (cfs) =	0.60	3.77	1.21
Image: state	30 ft				A	vg Botto	m Gain, ft	0.06		Avg C	lopper Sc	oil Loss, ft	-0.02						
No			0	Cross-section 7	А	В	С	D	Е	F	G	Н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
A Soil Gain, fill 0.000			To original	I Surface Elev, ft	1.755	2.008	2.152	2.224	2.254	2.228	2.175	1.929	1.654	8.355			3.66		1.9
35 ft Soli Gain, ft 0.000			To eroded													Vavg (fps) =			Water Depth (ft
$35 \text{ ft} = \frac{1}{35 \text{ ft}} + \frac{1}{35 \text{ ft}} $				Soil Gain, ft	0.000			0.000	0.000					0.000	0.000		0.049	Stress (psf)	
$ \begin{array}{ $			Clop	oper Soil Loss, ft					-0.066					-0.163	-0.490	Flow (cfs) =	2.88	1.23	0.39
$40 \text{ fr} = \frac{1}{10 \text{ original Surface Elev, fr}} = \frac{1}{10 \text{ sol}} + \frac{1}{10 \text{ sol}$	35 ft					1					1	1							
$40 \text{ fr} = \frac{1}{10 \text{ coded Surface Elev}, fr} = \frac{1}{10 \text{ coded Surface Elev}} = \frac{1}{10 $															[in]	V @ 0.2d		V @ 0.8d	To Water Surf, I
$40 \text{ ft} = \frac{1}{10000000000000000000000000000000000$			Ŭ																2.2
$ \begin{tabular}{ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$			To eroded																Water Depth (ft
$40 \text{ fr} = \frac{1}{10000000000000000000000000000000000$																			
Image: Construction of the image: Construction of th	40.4		Clop	oper Soil Loss, ft					-0.049					-0.197	-0.591	riow (cfs) =	1.55	0.53	0.17
$ \frac{1}{10000000000000000000000000000000000$	40 11			TOPP. CONT C			1		-			-		10.25	[:]	Vecor	Venn	Vend	To Water Durf
$ \begin{tabular}{ l l l l l l l l l l l l l l l l l l l$															[in]	v @ 0.2d		v @ U.80	To Water Surf,
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$			-													Vava (foc)			2.3
Avg Soil Gain, ft 0.000			10 010000												0.000				Water Depth (ft
Avg Bottom Gain, ft 0.00 Avg Clopper Soil Loss, ft -0.04 Volume Avg Bottom Gain per Xsection, ft = 0. Avg Clopper Soil Loss, ft 0.000 0.004 0.007 0.048 0.017 0.020 0.000 0.000 Volume Avg Bottom Gain per Xsection, ft = 0. Avg Clopper Soil Loss, ft 0.000 -0.019 -0.030 -0.040 -0.022 -0.023 0.000 ftr³ [fin] Avg Clopper Soil Loss per Xsection, ft = 0. Avg Clopper Soil Loss, ft 0.000 -0.019 -0.030 -0.040 -0.022 -0.023 0.000 [ft³] [fin] Avg Clopper Soil Loss per Xsection, ft = 0. Original Surface Elev 185.441 1 thru X-Section Spacing, ft = 5 Original Surface Elev 86.128 7 thru 9: X-Section Spacing, ft = 40 Trapezoidal Analysis 185.804 6: Test Section Length, ft = 40 Eroded Surface Elev 87.977 Iso Strain Surface Elev Test Section Length, ft = 40			Clor																0.18
Avg Soil Gain, ft 0.000 0.004 0.007 0.048 0.017 0.029 0.000 0.000 0.00me Avg BottomGain per Xsection, ft = 0. Avg Clopper Soil Loss, ft 0.000 -0.019 -0.036 -0.040 -0.082 -0.072 -0.023 0.000 [ft ³] [in] Avg Clopper Soil Loss per Xsection, ft = 0. Original Surface Elev 185.441 1 thru X-Section Spacing, ft = 5 Original Surface Elev 86.128 7 thru 9: X-Section Spacing, ft = 5 Trapezoidal Analysis Eroded Surface Elev 185.804 6: Test Section Length, ft = 40 Eroded Surface Elev 87.977 Test Section Length, ft = 40			Ciop	.poi 001 L055, II					0.009					0.105	0.040	. iow (cis) =	2.00	0.07	0.10
Avg Clopper Soil Loss, ft 0.000 -0.039 -0.036 -0.040 -0.082 -0.072 -0.023 0.000 [ft³] [in] Avg Clopper Soil Loss per Xsection, ft = -0 Original Surface Elev 185.441 1 thru X-Section Spacing, ft = 5 Original Surface Elev 86.128 7 thru 9: X-Section Spacing, ft = 40 Trapezoidal Analysis Eroded Surface Elev 185.804 6: Test Section Length, ft = 40 Eroded Surface Elev 87.977 Test Section Length, ft = 40			1	Avg Soil Gain. ft					0.017					Volu	ume	Av	g BottomGa	ain per Xsection. ft =	0.000
Original Surface Elev 185.441 1 thru X-Section Spacing, ft = 5 Original Surface Elev 86.128 7 thru 9: X-Section Spacing, ft = 5 Trapezoidal Analysis Eroded Surface Elev 185.804 6: Test Section Length, ft = 40 Eroded Surface Elev 87.977 Test Section Length, ft = 40				-															
Trapezoidal Analysis Trapezoidal Analysis Trapezoidal Analysis			1																1
Trapezoidal Analysis			-							-									
Soil Gain 2.914 0.219 gauge spacing, ft =[0.5 Soil Gain 0.000 0.000 gauge spacing, ft =[0.5	Trapezoidal	I Analysis				0.219			-						0.000				
CSLI -3.277 -0.246 hannel width measured, ft = 4 CSLI -1.850 -0.139 channel width measured, ft = 4									-	4							channel		



TYPICAL TEST PICTURES 2.0 cfs Flow



Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding





Increased Ponding and Overtopping



End-of-test and Post-test condition.



Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

Client: GSWCC Product: Filtrexx Compost Sock

	Flow:	0.5 cfs for 3	0 minutes		Test Date:	5/15/2012		
		Soil Gain,	Soil Loss,	Soil Gain,	Soil Loss,			
	Station, ft	in	in.	ft ²	ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	-0.08	0.00	-0.038	1.25	2.80	0.32
	5	0.00	0.00	0.00	-0.017	1.00	3.00	0.26
	10	0.00	0.00	0.00	-0.042	1.25	2.90	0.32
	15	0.00	0.00	0.00	-0.017	3.50	0.23	0.91
9" High	20	0.00	0.00	0.03	-0.010	4.88	0.19	1.27
Check	25	0.00	0.00	0.04	0.000	6.00	0.60	1.56
Location	30	0.00	0.00	0.00	-0.049	1.38	1.95	0.36
	35	0.00	0.00	0.00	-0.066	1.37	2.50	0.36
	40	0.00	0.00	0.00	-0.090	1.00	3.00	0.26
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				0.28	-1.21	9.01	3.08	-13.39

	Flow:	1.0 cfs for 3	0 minutes		Test Date:	6/13/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	-0.09	0.00	-0.038	1.50	3.20	0.39
	5	0.00	0.00	0.00	-0.039	1.50	3.40	0.39
	10	0.00	0.00	0.00	-0.057	1.54	3.00	0.40
	15	0.00	0.00	0.00	-0.004	3.66	0.30	0.95
9" High	20	0.00	0.00	0.06	-0.008	5.12	0.21	1.33
Check	25	0.00	0.00	0.13	-0.015	5.75	0.61	1.49
Location	30	0.00	0.00	0.00	-0.068	1.81	2.59	0.47
	35	0.00	0.00	0.00	-0.074	1.61	3.00	0.42
	40	0.00	0.00	0.00	-0.135	1.54	3.42	0.40
			•	Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				0.62	-1.55	10.01	6.23	-15.52

_	Flow:	2.0 cfs for 3	0 minutes		Test Date:	5/22/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	-0.14	0.00	-0.056	2.13	4.60	0.55
	5	0.00	0.00	0.00	-0.094	2.00	4.80	0.52
	10	0.00	0.00	0.00	-0.042	2.13	4.50	0.55
	15	0.00	0.00	0.00	-0.118	4.63	0.39	1.20
9" High	20	0.00	0.00	0.18	-0.200	5.25	0.23	1.36
Check	25	0.00	0.00	0.51	-0.217	3.25	0.65	0.84
Location	30	0.00	0.00	0.00	-0.106	3.12	3.30	0.81
	35	0.00	0.00	0.00	-0.069	2.25	4.40	0.58
	40	0.00	0.00	0.00	-0.138	2.13	4.70	0.55
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				2.19	-3.90	11.20	19.53	-34.85

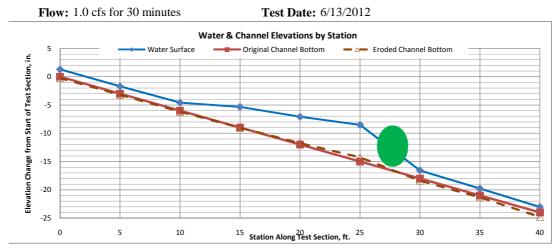
CJS 6/30/2012

Quality Review / Date



Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

Client: GSWCC Product: Filtrexx Compost Sock Flow: 0.5 cfs for 30 minutes Test Date: 5/15/2012 Water & Channel Elevations by Station 5 Original Channel Bottom Eroded Channel Bottom Water Surface Elevation Change from Start of Test Section, ft. 0 -5 -10 -15 -20 -25 5 10 0 30 35 40 ¹⁵ Station Along Test Section, ft. ²⁵



Flow: 2.0 cfs for 30 minutes Test Date: 5/22/2012 Water & Channel Elevations by Station Original Channel Bottom Eroded Channel Bottom 5 Elevation Change from Start of Test Section, ft. 0 -5 -10 -15 -20 -25 0 5 10 30 35 40 ¹⁵ Station Along Test Section, ft. ²⁵

	ASTM D7208	3	Date:	5/15/12							S	tart Time:	11:3	8 AM		End Time:	12:08 PM	_
	ASTM D/208	.	Soil:	Sandy C	lay				<u> </u>	<u> </u>	Target F	low (cfs):	0.50			Slope:	5%	-
60 ft long flu	lume 40	ft test section	SRD:	Filtrexx S	iock		Inst	tallation:	Wooden	Stakes								
	2	ft wide flume										TEST	ATA					
1		3	Outlet Weir								Weir						Channel Targets	
_	FLOW		Water Depth, in								0.00						0.00	
eir width (ft) =			ater Velocity, ft/s								0.00						0.00	
oft C D	DEFG		Flow Rate, cfs	0.00		0	D	-	-	0	0.00	0.00		F -1	Veod		0.00	To Water Out
			Cross-section 1	A 6.635	B 6.802	C 7.010	D 7.031	E 7.010	F 6.969	G 6.938	H 6.917	I 6.792	[ft ²] 27.703	[in]	V @ 0.2d	V @ 0.6d 2.8	V @ 0.8d	To Water Surf, 6.9
	ţ	-	d Surface Elev, ft	6.635	6.802	7.010	7.052	7.010	7.000	6.938	6.917	6.792	27.741		Vavg (fps) =	2.80	Ded May Obser	0.5
		10 010000	Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.026	Bed Max Shear Stress (psf)	Water Depth (f
		Clo	pper Soil Loss, ft	0.000	0.000	0.000	-0.021	-0.010	-0.031	0.000	0.000	0.000	-0.038	-0.115	Flow (cfs) =	0.50	0.32	0.10
5 ft					vg Bottor	l m Gain, ft	0.00	Avg C	lopper Sc	il Loss, ft	-0.01				. ,			
			Cross-section 2	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	I Surface Elev, ft	6.719	6.958	7.188	7.344	7.344	7.344	7.271	7.104	6.865	28.698			3		7.3
		To eroded	d Surface Elev, ft	6.719	6.958	7.188	7.354	7.354	7.354	7.271	7.104	6.865	28.715		Vavg (fps) =	3.00	Bed Max Shear	Water Depth (f
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Water Deptir (i
		Clop	pper Soil Loss, ft	0.000	0.000	0.000	-0.010	-0.010	-0.010	0.000	0.000	0.000	-0.017	-0.052	Flow (cfs) =	0.50	0.26	0.08
10 ft		╡ ──		A	vg Bottor		0.00		lopper Sc	1	0.00							
			Cross-section 3	A	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		Ů	I Surface Elev, ft	6.979	7.250	7.490	7.583	7.583	7.583	7.563	7.427	7.198	29.804			2.9		7.5
		I o erodeo	d Surface Elev, ft	6.979	7.250	7.490	7.615	7.604	7.604	7.563	7.427	7.198	29.845	0.000	Vavg (fps) =	2.90	Bed Max Shear Stress (psf)	Water Depth (f
		Class	Soil Gain, ft pper Soil Loss, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg = Flow (cfs) =	0.025	0.32	0.10
15 ft		CIQ	pper Juli LUSS, II		vg Bottor	!	0.00		lopper Sc		-0.01	0.000	-0.042	-0.125	1 IOW (CIS) =	0.50	0.52	0.10
			Cross-section 4	A	B	C C	0.00 D	E	F	G G	-0.01 H	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			I Surface Elev, ft	7.208	7.438	7.677	7.771	7.823	7.823	7.781	7.615	7.375	30.622			0.23		7.5
		-	d Surface Elev, ft	7.208	7.438	7.677	7.781	7.833	7.833	7.781	7.615	7.375	30.639		Vavg (fps) =	0.23	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.635	Stress (psf)	Water Depth (f
		Clop	pper Soil Loss, ft	0.000	0.000	0.000	-0.010	-0.010	-0.010	0.000	0.000	0.000	-0.017	-0.052	Flow (cfs) =	0.50	0.91	0.29
20 ft				A	vg Bottor	m Gain, ft	0.00	Avg C	lopper Sc	il Loss, ft	0.00							
			Cross-section 5	Α	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	I Surface Elev, ft	7.396	7.594	7.844	7.969	8.021	8.021	7.917	7.875	7.646	31.406			0.19		7.6
		To eroded	d Surface Elev, ft	7.396	7.594	7.854	7.979	8.000	8.010	7.885	7.865	7.646	31.385		Vavg (fps) =	0.19	Bed Max Shear Stress (psf)	Water Depth (f
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.021	0.010	0.031	0.010	0.000	0.031	0.094	navg =	0.959		
		Clo	pper Soil Loss, ft	0.000	0.000	-0.010	-0.010	0.000	0.000	0.000	0.000	0.000	-0.010	-0.031	Flow (cfs) =	0.50	1.27	0.41
25 ft			Cross-section 6	A	vg Bottor B	m Gain, ft C	0.01 D	Avg C E	lopper Sc F	G G	0.00 H	1	10.23	[:=]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			I Surface Elev, ft	7.594	7.844	8.104	8.219	8.250	8.219	8.198	8.010	7.771	[ft ²] 32.273	[in]	v @ 0.2u	0.6	v @ 0.00	7.7
		-	d Surface Elev, ft	7.594	7.844	8.094	8.198	8.229	8.198	8.188	8.010	7.771	32.231		Vavg (fps) =	0.60	Bed Max Shear	1.1
			Soil Gain, ft	0.000	0.000	0.010	0.021	0.021	0.021	0.010	0.000	0.000	0.042	0.125	navg =	0.349	Stress (psf)	Water Depth (f
		Clop	pper Soil Loss, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Flow (cfs) =	0.60	1.56	0.50
30 ft				A	vg Bottor	m Gain, ft	0.01	Avg C	lopper Sc	oil Loss, ft	0.00							
			Cross-section 7	А	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	I Surface Elev, ft	7.948	8.135	8.365	8.479	8.490	8.490	8.458	8.302	8.063	33.377			1.95		8.4
		To eroded	d Surface Elev, ft	7.948	8.135	8.365	8.510	8.521	8.510	8.469	8.302	8.063	33.425		Vavg (fps) =	1.95	Bed Max Shear	Water Depth (f
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.040	Stress (psf)	
		Clop	pper Soil Loss, ft	0.000	0.000	0.000	-0.031	-0.031	-0.021	-0.010	0.000	0.000	-0.049	-0.146	Flow (cfs) =	0.45	0.36	0.11
35 ft			Cross santian C		vg Bottor	1	0.00		lopper Sc	1	-0.01		11-25	(6-1	Venni	Venni	Vecol	To Water Or 1
			Cross-section 8		B 8.375	C 8.615	D 8.688	E 8.698	F 8.688	G 8.635	H 8.469	l 8.177	[ft ²] 34.184	[in]	V @ 0.2d	V @ 0.6d 2.5	V @ 0.8d	To Water Surf, 8.6
		-	d Surface Elev, ft	8.156	8.375	8.604	8.729	8.698	8.719	8.656	8.469	8.177	34.184		Vavg (fps) =	2.5	Red May Ohren	0.0
			Soil Gain, ft	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.010	navg =	0.031	Bed Max Shear Stress (psf)	Water Depth (f
		Clop	pper Soil Loss, ft		0.000	0.000	-0.042	-0.031	-0.031	-0.021	0.000	0.000	-0.066	-0.198	Flow (cfs) =	0.57	0.36	0.11
40 ft					vg Bottor	m Gain, ft	0.00	Avg C	lopper Sc	oil Loss, ft	-0.01							
			Cross-section 9	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To origina	I Surface Elev, ft	8.365	8.594	8.823	8.969	9.021	9.021	8.979	8.885	8.635	35.420			3		9.0
		To eroded	d Surface Elev, ft	8.365	8.594	8.823	9.000	9.083	9.083	9.000	8.885	8.635	35.510		Vavg (fps) =	3.00	Bed Max Shear	Water Depth (f
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Popul (I
		Clop	pper Soil Loss, ft		0.000	0.000	-0.031	-0.063	-0.063	-0.021	0.000	0.000	-0.090	-0.271	Flow (cfs) =	0.50	0.26	0.08
					vg Bottor		0.00	-	lopper Sc		-0.02							
			Soil Gain, in		0.000	0.001	0.000	0.001	0.001	0.002	0.001	0.000		ume			ain per Xsection, ft =	
		1	pper Soil Loss, in		0.000	-0.001	-0.009	-0.008	-0.009	-0.002	0.000	0.000	[ft ³]	[in]			oss per Xsection, ft =	1
			Surface Elev	752.587	1 thru 6:		ection Spa	-	5 40	-	nal Surfac		342.912		7 thru 9:		Section Spacing, ft =	
Trapezoio	idal Analysis		Surface Elev	752.856			Section Le			C100	ed Surfac Soil Gair		343.572	0.001		165	t Section Length, ft =	40
		3							4							chann-		4
		S	CSLI	0.260 -0.530	0.020 -0.040		gauge spa idth meas		0.5 4		CSLI	1	0.017 -0.677	0.001 -0.051		channel	gauge spacing, ft = width measured, ft =	0.5 4





Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding



Increased Ponding and Overtopping

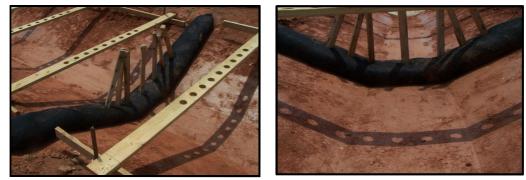


End-of-test and Post-test condition.

ASTN	D7208		6/13/12	-							tart Time:	-	PM	-	End Time:	4:28 PM	-
00 ft lana ft ima	40.444-4		: Sandy Cl	-		Incl	allation	Wooden	Stoken	Target F	low (cfs):	1.00			Slope:	5%	
60 ft long flume	40 ft test se 2 ft wide fl	L	: Filtrexx S	OCK		Inst	tallation:	wooden	Stakes		TEST						
1 2		Outlet Weir								Weir						Channel Targets	
FLC		Water Depth, i	n							2.13						0.00	
eir width (ft) = 2		Water Velocity, ft/								0.00						0.00	
Oft C D E	FG H	Flow Rate, cf								0.00	0.00					0.00	
		Cross-section	1 A	в	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
	To o	riginal Surface Elev, t	t 1.857	2.123	2.359	2.415	2.421	2.434	2.434	2.274	2.008	9.213			3.2		2.3
+	To e	roded Surface Elev,	t 1.857	2.123	2.359	2.428	2.438	2.470	2.434	2.274	2.008	9.251		Vavg (fps) =	3.20	Bed Max Shear	
		Soil Gain,	t 0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.026	Stress (psf)	Water Depth
		Clopper Soil Loss,	t 0.000	0.000	0.000	-0.013	-0.016	-0.036	0.000	0.000	0.000	-0.038	-0.115	Flow (cfs) =	1.00	0.39	0.12
5 ft	Straw Ba	les	1	Avg Bottor	n Gain, ft	0.00	Avg C	lopper So	oil Loss, ft	-0.01							
		Cross-section	2 A	В	С	D	Е	F	G	н	Ι	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
	To o	riginal Surface Elev,	t 2.087	2.313	2.582	2.638	2.651	2.657	2.641	2.477	2.224	10.067			3.4		2.5
	To e	roded Surface Elev,	t 2.087	2.313	2.595	2.648	2.667	2.684	2.657	2.477	2.224	10.106		Vavg (fps) =	3.40	Bed Max Shear	Water Depth
		Soil Gain,	t 0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.024	Stress (psf)	Water Deptit
		Clopper Soil Loss,	t 0.000	0.000	-0.013	-0.010	-0.016	-0.026	-0.016	0.000	0.000	-0.039	-0.118	Flow (cfs) =	1.00	0.39	0.12
10 ft			1	Avg Bottor	n Gain, ft	0.00	Avg C	lopper So	oil Loss, ft	-0.01							
	_	Cross-section		В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
1		riginal Surface Elev,		2.060	2.326	2.362	2.382	2.385	2.382	2.215	1.985	9.008			3		2.3
	To e	roded Surface Elev,		2.060	2.333	2.392	2.392	2.395	2.431	2.228	1.985	9.064		Vavg (fps) =	3.00	Bed Max Shear Stress (psf)	Water Depth
		Soil Gain, f		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.028		
15.0		Clopper Soil Loss,	t 0.000	0.000	-0.007	-0.030	-0.010	-0.010	-0.049	-0.013	0.000	-0.057	-0.171	Flow (cfs) =	1.00	0.40	0.13
15 ft		Croos		Avg Bottor	n Gain, ft C	0.00		lopper So	1	-0.01		10.25	(i -)	V @ 0.2d	V @ 0.6d	V@AAJ	To Water Surf
		Cross-section		B 2.215	2.444	D 2.493	E 2.503	F 2.493	G 2.497	H 2.323	I 2.139	[ft ²] 9.514	[in]	v @ 0.2d	0.3	V @ 0.8d	2.2
		riginal Surface Elev, t roded Surface Elev, t		2.215	2.444	2.493	2.503	2.493	2.497	2.323	2.139	9.514		Vavg (fps) =	0.30		2.2
	100	Soil Gain, 1		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.502	Bed Max Shear Stress (psf)	Water Depth
		Clopper Soil Loss,		0.000	-0.007	0.000	0.000	-0.003	0.000	0.000	0.000	-0.004	-0.013	Flow (cfs) =	1.00	0.95	0.31
20 ft		01000001 0001 2033,1		Avg Bottor		0.00		lopper So		0.00	0.000	0.004	0.010	1100 (013) =	1.00	0.30	0.01
		Cross-section		В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
	To o	riginal Surface Elev,		1.903	2.159	2.254	2.297	2.306	2.339	2.172	1.939	8.617			0.21		1.9
		roded Surface Elev,	-	1.906	2.142	2.185	2.313	2.293	2.339	2.172	1.939	8.565		Vavg (fps) =	0.21	Bed Max Shear	
		Soil Gain,	t 0.000	0.000	0.016	0.069	0.000	0.013	0.000	0.000	0.000	0.060	0.180	navg =	0.897	Stress (psf)	Water Depth (
		Clopper Soil Loss,	t 0.000	-0.003	0.000	0.000	-0.016	0.000	0.000	0.000	0.000	-0.008	-0.023	Flow (cfs) =	1.00	1.33	0.43
25 ft			,	Avg Bottor	n Gain, ft	0.01	Avg C	lopper So	bil Loss, ft	0.00							
		Cross-section	6 A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
	To o	riginal Surface Elev,	t 1.827	2.073	2.320	2.336	2.346	2.359	2.316	2.195	1.978	8.937			0.61		1.8
	To e	roded Surface Elev,	t 1.827	2.096	2.287	2.260	2.283	2.313	2.274	2.192	1.978	8.823		Vavg (fps) =	0.61	Bed Max Shear	Water Depth
		Soil Gain,	t 0.000	0.000	0.033	0.075	0.062	0.046	0.043	0.003	0.000	0.129	0.387	navg =	0.333	Stress (psf)	Water Depth (
		Clopper Soil Loss,	t 0.000	-0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.015	-0.046	Flow (cfs) =	0.58	1.49	0.48
30 ft			1	Avg Bottor	n Gain, ft	0.03	Avg C	lopper So	oil Loss, ft	0.00							
	_	Cross-section	7 A	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
		riginal Surface Elev,		1.886	2.126	2.169	2.169	2.169	2.103	2.067	1.824	8.237			2.59		2.1
	To e	roded Surface Elev, t		1.886	2.126	2.195	2.201	2.205	2.149	2.067	1.824	8.304		Vavg (fps) =	2.59	Bed Max Shear Stress (psf)	Water Depth
		Soil Gain, f		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.036		
25.4		Clopper Soil Loss,		0.000	0.000	-0.026	-0.033	-0.036	-0.046	0.000	0.000	-0.068	-0.203	Flow (cfs) =	0.78	0.47	0.15
35 ft		Cross-soatis-		Avg Bottor	n Gain, ft C	0.00 D		F	oil Loss, ft G	-0.02 н	I	14.23	[in]	V @ 0.2d	V @ 0.6d	V@004	To Water Surf
		Cross-section		B 2.116	2.329	D 2.372	E 2.382	F 2.385	G 2.375	H 2.175	1.936	[ft ²] 9.028	[in]	v @ 0.2d	V @ 0.6d	V @ 0.8d	2.3
		roded Surface Elev,		2.116	2.329	2.372	2.382	2.385	2.375	2.175	1.936	9.028		Vavg (fps) =	3.00	Ded Mar Of	2.3
	100	Soil Gain, 1		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.029	Bed Max Shear Stress (psf)	Water Depth
		Clopper Soil Loss, 1		0.000	-0.043	-0.030	-0.033	-0.020	-0.049	0.000	0.000	-0.074	-0.223	Flow (cfs) =	0.81	0.42	0.13
40 ft				Avg Bottor		0.00			oil Loss, ft	-0.02				. (,			
		Cross-section		В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
	To o	riginal Surface Elev,		1.978	2.195	2.306	2.346	2.326	2.283	2.096	1.854	8.679			3.42		2.3
		roded Surface Elev,		1.978	2.195	2.372	2.392	2.408	2.346	2.096	1.854	8.813		Vavg (fps) =	3.42	Bed Max Shear	
		Soil Gain,	t 0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.025	Stress (psf)	Water Depth
		Clopper Soil Loss,	t 0.000	0.000	0.000	-0.066	-0.046	-0.082	-0.062	0.000	0.000	-0.135	-0.404	Flow (cfs) =	0.88	0.40	0.13
				Avg Bottor	n Gain, ft	0.00	Avg C	lopper So	oil Loss, ft	-0.03							
	•	Soil Gain, i	n 0.000	0.000	0.001	0.004	0.000	0.001	0.000	0.000	0.000	Vol	ume	Avg	Bottom Ga	ain per Xsection, ft =	0.000
		Clopper Soil Loss, i	n 0.000	0.000	-0.004	-0.008	-0.008	-0.010	-0.010	-0.001	0.000	[ft ³]	[in]	Avg Clop	per Soil Lo	ss per Xsection, ft =	-0.007
	0	riginal Surface Elev	231.400	1 thru	X-Se	ection Spa	acing, ft =	5	Origin	nal Surfac	e Elev	87.430		7 thru 9:	Х-	Section Spacing, ft =	5
		1 10 (51	231.452	6:	Test S	Section Le	ength, ft =	40	Erod	ed Surfac	e Elev	88.308			Tes	t Section Length, ft =	40
Troponsidad		oded Surface Elev	201.402														
Trapezoidal Ar		Soil Gain	0.623	0.047	Ç	gauge spa	acing, ft =	0.5		Soil Gain	L	0.000	0.000			gauge spacing, ft =	0.5







Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding with Overtopping







End-of-test and Post-test With Upstream Sediment Deposition

·			Date:	5/22/12							s	tart Time:	3:21	AM		End Time:	3:51 PM	
AS	STM D7208		-	Sandy C	ay							Flow (cfs):				Slope:	5%	-
60 ft long flum	ne 40 ft te	est section	RECP:	Filtrexx S	lock		And	chorage:	Wooden	Stakes	-							
	2 ft v	vide flume										TEST	DATA					
1	2 3		Outlet Weir								Weir						Channel Targets	
F	FLOW		Water Depth, in								0.00						0.00	
eir width (ft) = 2	2	Wa	ter Velocity, ft/s								0.00						0.00	
0 ft C D	EFGH		Flow Rate, cfs	0.00							0.00	0.00					0.00	
		c	cross-section 1	А	В	С	D	Е	F	G	н	- I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		To original	Surface Elev, ft	4.906	5.198	5.344	5.417	5.458	5.417	5.354	5.208	5.063	21.207			4.6		5.3
	+	To eroded	Surface Elev, ft	4.906	5.198	5.344	5.458	5.500	5.438	5.354	5.208	5.063	21.262		Vavg (fps) =	4.60	Bed Max Shear	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.023	Stress (psf)	water Deptri (ri
		Clop	per Soil Loss, ft	0.000	0.000	0.000	-0.042	-0.042	-0.021	0.000	0.000	0.000	-0.056	-0.167	Flow (cfs) =	2.00	0.55	0.18
5 ft				A	vg Bottor	n Gain, ft	0.00	Avg C	lopper So	oil Loss, ft	-0.01							
		C	cross-section 2	А	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		To original	Surface Elev, ft	4.990	5.292	5.500	5.625	5.667	5.625	5.583	5.458	5.188	21.946			4.8		5.6
		To eroded	Surface Elev, ft	4.990	5.292	5.500	5.625	5.719	5.698	5.667	5.458	5.188	22.040		Vavg (fps) =	4.80	Bed Max Shear	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	
		Clop	per Soil Loss, ft	0.000	0.000	0.000	0.000	-0.052	-0.073	-0.083	0.000	0.000	-0.094	-0.281	Flow (cfs) =	2.00	0.52	0.17
10 ft				A	vg Bottor		0.00	Avg C	lopper So	oil Loss, ft	-0.02							
			cross-section 3	А	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, I
		J J J	Surface Elev, ft	5.302	5.573	5.813	5.917	5.938	5.938	5.896	5.740	5.500	23.127			4.5		5.8
		To eroded	Surface Elev, ft	5.302	5.573	5.833	5.917	5.969	5.958	5.927	5.740	5.500	23.168		Vavg (fps) =	4.50	Bed Max Shear	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.023	Stress (psf)	
		Clop	per Soil Loss, ft	0.000	0.000	-0.021	0.000	-0.031	-0.021	-0.031	0.000	0.000	-0.042	-0.125	Flow (cfs) =	1.59	0.55	0.18
15 ft					vg Bottor		0.00	-	lopper So	1	-0.01							T 111 (T 1
			Cross-section 4	A	B	C	D	E	F	G	H	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		-	Surface Elev, ft	5.458	5.708	5.990	6.063	6.104	6.125	6.083	5.906	5.688	23.785		\/(f==)	0.39		5.8
		To eroded	Surface Elev, ft	5.458	5.750	5.979 0.010	6.104 0.000	6.167 0.000	6.156 0.000	6.146 0.000	5.906 0.000	5.688 0.000	23.899	0.010	Vavg (fps) =	0.39	Bed Max Shear Stress (psf)	Water Depth (ft
		Close	Soil Gain, ft	0.000	0.000								0.003		navg =			0.20
20 ft		Ciop	per Soil Loss, ft	0.000	-0.042	0.000	-0.042	-0.063	-0.031 lopper So	-0.063	0.000	0.000	-0.118	-0.354	Flow (cfs) =	0.30	1.20	0.39
20 11			cross-section 5	A	B	C C	0.00 D	E	F	G G	-0.03 H	1	res ² 1	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
			Surface Elev, ft	5.615	5.896	6.146	6.281	6.313	6.323	6.323	6.229	6.010	[ft ²] 24.684	[111]	V @ 0.20	0.23	v @ 0.00	5.8
		-	Surface Elev, ft	5.708	6.125	6.177	6.115	6.219	6.292	6.313	6.208	6.135	24.703		Vavg (fps) =	0.23	5 11 0	0.0
		10 010000	Soil Gain, ft	0.000	0.000	0.000	0.167	0.094	0.031	0.010	0.021	0.000	0.181	0.542	navg =	0.833	Bed Max Shear Stress (psf)	Water Depth (ft)
		Cloc	per Soil Loss, ft	-0.094	-0.229	-0.031	0.000	0.000	0.000	0.000	0.000	-0.125	-0.200	-0.599	Flow (cfs) =	0.20	1.36	0.44
25 ft					vg Bottor	-	0.04		lopper Sc		-0.05				. (,			
		C	cross-section 6	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		To original	Surface Elev, ft	5.823	6.104	6.333	6.479	6.563	6.521	6.490	6.365	6.083	25.425			0.65		5.9
		To eroded	Surface Elev, ft	6.063	6.240	6.375	6.146	6.146	6.302	6.521	6.406	6.292	25.135		Vavg (fps) =	0.65	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.333	0.417	0.219	0.000	0.000	0.000	0.507	1.521	navg =	0.214	Stress (psf)	Water Depth (ft
		Clop	per Soil Loss, ft	-0.240	-0.135	-0.042	0.000	0.000	0.000	-0.031	-0.042	-0.208	-0.217	-0.651	Flow (cfs) =	0.35	0.84	0.27
30 ft				A	vg Bottor	n Gain, ft	0.11	Avg C	lopper Sc	oil Loss, ft	-0.08							
			cross-section 7	А	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, I
		To original	Surface Elev, ft	6.146	6.396	6.656	6.771	6.802	6.813	6.792	6.646	6.396	26.590			3.3		6.6
		To eroded	Surface Elev, ft	6.156	6.406	6.656	6.802	6.833	6.854	6.823	6.688	6.396	26.696		Vavg (fps) =	3.30	Bed Max Shear	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.041	Stress (psf)	copur (it
		Clop	per Soil Loss, ft	-0.010	-0.010	0.000	-0.031	-0.031	-0.042	-0.031	-0.042	0.000	-0.106	-0.318	Flow (cfs) =	1.72	0.81	0.26
35 ft				A	vg Bottor		0.00		lopper So	1	-0.02							
			cross-section 8	А	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
			Surface Elev, ft	6.438	6.698	6.948	7.021	7.021	7.010	6.958	6.771	6.427	27.453			4.4		6.9
		To eroded	Surface Elev, ft	6.438	6.698	6.958	7.042	7.063	7.063	6.969	6.771	6.427	27.523		Vavg (fps) =	4.40	Bed Max Shear	Water Depth (ft)
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.025	Stress (psf)	
		Clop	per Soil Loss, ft	0.000	0.000	-0.010	-0.021	-0.042	-0.052	-0.010	0.000	0.000	-0.069	-0.208	Flow (cfs) =	1.65	0.58	0.19
40 ft					vg Bottor		0.00		lopper So	r	-0.02				Veasi	Vecci	Venni	To Weter C. C.
			Surface Flow ft	A	B	C	D	E	F	G	H	 6 954	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, 1
			Surface Elev, ft	6.740	6.979	7.229	7.292	7.396	7.333	7.281	7.094	6.854	28.700		Vova (fra)	4.7		7.3
		ro eroded	Surface Elev, ft	6.740	6.979 0.000	7.235 0.000	7.365 0.000	7.458	7.417 0.000	7.313	7.094	6.854	28.837	0.000	Vavg (fps) =	4.70 0.022	Bed Max Shear Stress (psf)	Water Depth (ft
		04-	Soil Gain, ft	0.000	0.000	-0.000	-0.073	0.000	-0.083	0.000	0.000	0.000	0.000	-0.413	navg =		0.55	0.18
		Сюр	per Soil Loss, ft		0.000 vg Bottor		-0.073		-0.083 lopper Sc		-0.03	0.000	-0.138	-0.413	Flow (cfs) =	1.66	0.55	0.18
I		1	Soil Gain, in		0.000	0.001	0.009	0.005	0.002	0.001	0.001	0.000	Vol	ume	Δ	Bottom G	ain per Xsection, ft =	0.000
		Clon	per Soil Loss, in		-0.015	-0.004	-0.010	-0.016	-0.016	-0.012	0.001	-0.007	[ft ³]	in]			ain per Xsection, it =	
			Surface Elev	584.288			ection Spa		5		nal Surfac		275.490	Cull	7 thru 9:	1	Section Spacing, ft =	5
			Surface Elev	585.048	1 thru 6:			ngth, ft =	40		ed Surfac		276.446				t Section Length, ft =	40
Trapezoidal	I Analysis		oil Gain	2.188	0.164			acing, ft =			Soil Gair		0.000	0.000			gauge spacing, ft =	0.5
			CSLI	-2.947	-0.221	hannel wi			4		CSLI		-0.956	-0.072		channel	width measured, ft =	4
				2.077	0.221			2.00, it =	<u> </u>	<u> </u>			0.000	0.012		5		1.





Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding





Increased Ponding and Overtopping



End-of-test and Post-test condition.



Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

	Client:	GSWCC			Product:	Rock Check	over Geotextile	
	Flow:	0.5 cfs for 3	0 minutes		Test Date:	6/8/2012		
		Soil Gain,	Soil Loss,	Soil Gain,	Soil Loss,			
	Station, ft	in	in.	ft ²	ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	0.00	0.00	-0.034	1.46	2.80	0.38
	5	0.00	0.00	0.00	-0.044	1.06	3.00	0.28
	10	0.00	0.00	0.00	-0.035	1.50	2.69	0.39
	15	0.00	0.00	0.00	-0.042	3.19	1.72	0.83
15" High	20	0.00	0.00	0.00	-0.021	5.39	1.65	1.40
Check	25	0.00	0.00	0.39	-0.026	5.24	0.50	1.36
Location	30	0.00	0.00	0.00	-0.027	1.81	2.20	0.47
	35	0.00	-0.26	0.00	-0.086	1.42	2.68	0.37
	40	0.00	0.00	0.00	-0.079	1.10	3.10	0.29
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				0.97	-1.55	9.24	10.51	-16.81

	Flow:	1.0 cfs for 3	0 minutes		Test Date:	6/19/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	0.00	0.00	-0.087	1.97	3.71	0.51
	5	0.00	0.00	0.00	-0.108	1.57	3.98	0.41
	10	0.00	0.00	0.00	-0.106	1.73	3.87	0.45
	15	0.00	0.00	0.08	-0.078	5.75	2.35	1.49
15" High	20	0.00	0.00	0.32	-0.121	6.38	1.28	1.66
Check	25	0.00	0.00	0.35	-0.018	8.35	0.37	2.17
Location	30	0.00	0.00	0.00	-0.039	2.09	2.04	0.54
	35	0.00	-0.15	0.00	-0.043	1.69	3.10	0.44
	40	0.00	0.00	0.00	-0.118	1.54	3.43	0.40
				Total Soil Gain, ft ³	Total Soil Loss, ft ³	Total Wetted Area, ft ²	SAI - Soil Accretion Index	CSLI - Clopper Soil Loss Index
				2.87	-2.94	12.94	22.18	-22.70

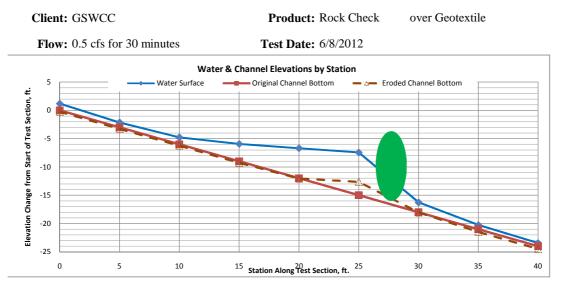
_	Flow:	2.0 cfs for 3	0 minutes		Test Date:	6/19/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	0.00	0.00	-0.102	3.03	4.37	0.79
	5	0.00	0.00	0.00	-0.094	1.97	5.05	0.51
	10	0.00	0.00	0.00	-0.094	2.17	4.95	0.56
	15	0.00	0.00	0.06	-0.068	5.47	3.84	1.42
15" High	20	0.00	0.00	0.18	-0.102	7.56	1.80	1.96
Check	25	0.00	0.00	0.42	-0.119	9.45	0.86	2.46
Location	30	0.00	0.00	0.00	-0.019	2.76	3.60	0.72
	35	0.00	-0.52	0.00	-0.167	2.17	4.42	0.56
	40	0.00	0.00	0.00	-0.175	2.09	4.80	0.54
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				2.22	-3.66	15.27	14.52	-23.97

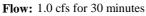
CJS 6/30/2012

Quality Review / Date

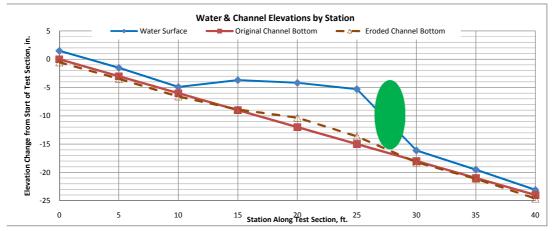


Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

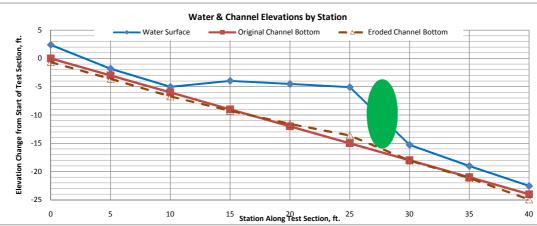




Test Date: 6/19/2012







	ASTM D7208		Date:	6/8/12							S	tart Time:	3:58	PM		End Time:	4:28 PM	
	ASTM D7208		Soil:	Sandy C	lay						Target F	low (cfs):	0.50			Slope:	5%	-
60 ft lo	ng flume 40 ft	test section	SRD:	Rock Ch	eck		Inst	allation:	over Geo	otextile								
	2 ft	wide flume										TEST D	DATA					
	1 2 3		Outlet Weir								Weir						Channel Targets	
	FLOW		Water Depth, in								2.25						1.00	
/eir width	(ft) = 2	Wa	ater Velocity, ft/s								0.00						3 - 4	
0 ft	CDEFGH	- -	Flow Rate, cfs	0.00				-		-	0.00	0.00					0.50	
			Cross-section 1	Α	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	Surface Elev, ft	1.873	2.139	2.349	2.431	2.444	2.461	2.438	2.260	2.021	9.254			2.8		2.3
	v	To eroded	Surface Elev, ft	1.873	2.139	2.352	2.451	2.467	2.477	2.441	2.260	2.021	9.288		Vavg (fps) =	2.80	Bed Max Shear	Water Depth (f
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.029	Stress (psf)	
		Clop	oper Soil Loss, ft	0.000	0.000	-0.003	-0.020	-0.023	-0.016	-0.003	0.000	0.000	-0.034	-0.102	Flow (cfs) =	0.50	0.38	0.12
5 ft				A	Avg Bottor	m Gain, ft	0.00	Avg C	lopper So	il Loss, ft	-0.01							
			Cross-section 2	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	Surface Elev, ft	2.073	2.326	2.579	2.677	2.684	2.677	2.671	2.474	2.241	10.133			3		2.6
		To eroded	Surface Elev, ft	2.073	2.326	2.579	2.687	2.700	2.717	2.687	2.474	2.241	10.177		Vavg (fps) =	3.00	Bed Max Shear	Water Depth (f
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.022	Stress (psf)	
		Clop	oper Soil Loss, ft	0.000	0.000	0.000	-0.010	-0.016	-0.039	-0.016	0.000	0.000	-0.044	-0.131	Flow (cfs) =	0.50	0.28	0.09
10 ft					Avg Bottor	1	0.00		lopper Sc	-	-0.01							
			Cross-section 3	A	В	С	D	E	F	G	Н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		-	Surface Elev, ft	1.824	2.087	2.349	2.444	2.461	2.470	2.457	2.277	2.044	9.253			2.69		2.4
		To eroded	Surface Elev, ft	1.824	2.087	2.356	2.461	2.484	2.490	2.461	2.277	2.044	9.288		Vavg (fps) =	2.69	Bed Max Shear Stress (psf)	Water Depth (f
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.031		
		Clop	oper Soil Loss, ft	0.000	0.000	-0.007	-0.016	-0.023	-0.020	-0.003	0.000	0.000	-0.035	-0.105	Flow (cfs) =	0.50	0.39	0.12
15 ft					Avg Bottor	r -	0.00		lopper Sc		-0.01							
			Cross-section 4	A	В	С	D	E	F	G	Н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		-	Surface Elev, ft	1.932	2.185	2.441	2.559	2.569	2.592	2.569	2.388	2.152	9.690			1.72		2.3
		I o eroded	Surface Elev, ft	1.932	2.185	2.441	2.572	2.579	2.635	2.572	2.388	2.152	9.732		Vavg (fps) =	1.72	Bed Max Shear Stress (psf)	Water Depth (f
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.080		
aa (i		Clop	oper Soil Loss, ft	0.000	0.000	0.000	-0.013	-0.010	-0.043	-0.003	0.000	0.000	-0.042	-0.125	Flow (cfs) =	0.50	0.83	0.27
20 ft					Avg Bottor	1	0.00		lopper Sc	-	-0.01		2					
			Cross-section 5	A	B	C	D	E	F	G	H	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		-	Surface Elev, ft	1.637	1.919	2.142	2.280	2.303	2.326	2.280	2.159	1.939	8.628			1.65		1.9
		To eroded	Surface Elev, ft	1.637	1.919 0.000	2.156 0.000	2.283	2.310 0.000	2.329	2.290 0.000	2.159 0.000	1.978 0.000	8.648	0.000	Vavg (fps) =	1.65	Bed Max Shear Stress (psf)	Water Depth (f
			Soil Gain, ft	0.000									0.000		navg =	0.118		0.45
05.4		Ciop	oper Soil Loss, ft	0.000	0.000	-0.013	-0.003	-0.007	-0.003	-0.010	0.000	-0.039	-0.021	-0.062	Flow (cfs) =	0.50	1.40	0.45
25 ft			Cross-section 6	A	Avg Bottor B	n Gain, rt C	0.00 D	Avg C E	lopper So F	G G	-0.01 H	1	10.21	(i.e.)	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			Surface Elev, ft	1.857	2.087	2.339	2.421	2.434	2.425	2.434	2.218	1.995	[ft ²] 9.145	[in]	v ⊛ 0.2u	0.5	V @ 0.00	1.8
		-	Surface Elev, ft	1.837	2.007	2.339	2.421	2.434	2.425	2.356	2.210	1.995	8.783		Vavg (fps) =	0.50		1.0
		10 0.0000	Soil Gain, ft	0.020	0.010	0.069	0.151	0.194	0.246	0.079	0.000	0.000	0.388	1.165	navg =	0.382	Bed Max Shear Stress (psf)	Water Depth (f
		Clor	oper Soil Loss, ft		0.000	0.000	0.000	0.000	0.000	0.000	-0.039	0.000	-0.026	-0.079	Flow (cfs) =	0.44	1.36	0.44
30 ft					Avg Bottor		0.09		lopper Sc		0.00				()			••••
			Cross-section 7	A	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			Surface Elev, ft	1.617	1.873	2.100	2.211	2.238	2.238	2.215	2.037	1.827	8.331	1	1 0 0.20	2.2		2.1
		Ŭ	Surface Elev, ft	1.617	1.873	2.110	2.215	2.244	2.241	2.234	2.054	1.827	8.358		Vavg (fps) =	2.20	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.043	Stress (psf)	Water Depth (f
		Clor	oper Soil Loss, ft		0.000	-0.010	-0.003	-0.007	-0.003	-0.020	-0.016	0.000	-0.027	-0.082	Flow (cfs) =	0.66	0.47	0.15
35 ft					Avg Bottor		0.00		lopper Sc		-0.01				() =			
ŀ			Cross-section 8	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			Surface Elev, ft	1.847	2.110	2.346	2.425	2.444	2.434	2.408	2.192	1.939	9.137			2.68		2.4
		Ŭ	Surface Elev, ft	1.847	2.110	2.379	2.470	2.500	2.454	2.448	2.192	1.939	9.224		Vavg (fps) =	2.68	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.030	Stress (psf)	Water Depth (f
		Clop	oper Soil Loss, ft		0.000	-0.033	-0.046	-0.056	-0.020	-0.039	0.000	0.000	-0.086	-0.259	Flow (cfs) =	0.63	0.37	0.12
40 ft					Avg Bottor	m Gain, ft	0.00	Avg C	lopper Sc	il Loss, ft	-0.02							
ŀ		0	Cross-section 9	A	В	С	D	E	F	G	н	Т	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	Surface Elev, ft	1.765	1.995	2.185	2.323	2.326	2.306	2.297	2.073	1.818	8.665			3.1		2.3
			Surface Elev, ft	1.765	1.995	2.208	2.362	2.372	2.343	2.313	2.073	1.818	8.743		Vavg (fps) =	3.10	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.022	Stress (psf)	Water Depth (f
		Clop	oper Soil Loss, ft	0.000	0.000	-0.023	-0.039	-0.046	-0.036	-0.016	0.000	0.000	-0.079	-0.236	Flow (cfs) =	0.57	0.29	0.09
					Avg Bottor	1	0.00		lopper Sc		-0.02							
		So	il Loss / Gain, in		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Volu	ume	Avg	Bottom Ga	ain per Xsection, ft =	0.000
		Clop	per Soil Loss, in	0.000	0.000	-0.004	-0.008	-0.010	-0.010	-0.005	0.000	-0.002	[ft ³]	[in]			ss per Xsection, ft =	
				004 540		X-Se	ection Spa	acing, ft =	5	Origin	nal Surfac	e Flev	88.175		7 thru 9:	X-	Section Spacing, ft =	5
		Original	Surface Elev	234.510	1 thru				-	÷	a ounao	0 2.01	00.110					
			Surface Elev Surface Elev	234.510	1 thru 6:		Section Le			-	ed Surfac		88.872			Tes	t Section Length, ft =	
Тгар	ezoidal Analysis	Eroded				Test S		ngth, ft =	40	-		e Elev		0.000		Tes		40





Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding





Increased Ponding and Seepage



End-of-test and Post-test condition.

			Date:	6/19/12							9	tart Time:	2:58	AM		End Time:	3:28 PM	
	ASTM D7208		-	Sandy Cl	av							low (cfs):		740		Slope:	5%	-
60 ft lo	ong flume 40 ft	test section		Rock Che	-		An	chorage:	over Geo			. (,						
	-	wide flume										TEST	DATA					
	1 2 3		Outlet Weir								Weir						Channel Targets	
	FLOW		Water Depth, in								2.25						1.50	
eir width	h (ft) = 2	Wa	ater Velocity, ft/s								0.00						4 - 5	
0 ft	C D E FG H		Flow Rate, cfs	0.00							0.00	0.00					1.00	
		0	Cross-section 1	А	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, I
		To original	Surface Elev, ft	1.752	1.972	2.211	2.323	2.333	2.326	2.320	2.175	1.939	8.767			3.71		2.2
	*	To eroded	Surface Elev, ft	1.752	1.972	2.221	2.369	2.372	2.375	2.343	2.175	1.939	8.854		Vavg (fps) =	3.71	Bed Max Shear	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.027	Stress (psf)	Trator Dopar (re
		Clop	oper Soil Loss, ft	0.000	0.000	-0.010	-0.046	-0.039	-0.049	-0.023	0.000	0.000	-0.087	-0.262	Flow (cfs) =	1.00	0.51	0.16
5 ft	St	raw Bales		A	Avg Bottor	n Gain, ft	0.00	Avg C	lopper So	il Loss, ft	-0.02							
			Cross-section 2	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		-	Surface Elev, ft	1.959	2.228	2.461	2.487	2.500	2.493	2.441	2.188	1.985	9.389			3.98		2.4
		To eroded	Surface Elev, ft	1.959	2.228	2.493	2.549	2.507	2.539	2.510	2.188	1.985	9.497		Vavg (fps) =	3.98	Bed Max Shear Stress (psf)	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.022		0.40
10.4		Ciop	oper Soil Loss, ft	0.000	0.000	-0.033	-0.062	-0.007	-0.046	-0.069	0.000	0.000	-0.108	-0.325	Flow (cfs) =	1.00	0.41	0.13
10 ft	-		Press section 2		Avg Bottor	-	0.00	-	lopper So		-0.02		10.21	[:=]	V@0.2d	V@064	V@09d	To Wotor Surf
			Cross-section 3	A 1.824	B 2.051	C 2.274	D 2.329	E 2.346	F 2.320	G 2.283	H 2.031	I 1.811	[ft ²] 8.727	[in]	V @ 0.2d	V @ 0.6d 3.87	V @ 0.8d	To Water Surf, 2.3
		-	Surface Elev, ft	1.824	2.051	2.274	2.329	2.340	2.320	2.283	2.031	1.811	8.833		Vavg (fps) =	3.87	Ded Mar Of	2.0
		10 0100000	Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.024	Bed Max Shear Stress (psf)	Water Depth (ff
		Clor	oper Soil Loss, ft	0.000	0.000	-0.036	-0.039	-0.052	-0.052	-0.046	0.000	0.000	-0.106	-0.318	Flow (cfs) =	1.00	0.45	0.14
15 ft		2.0			Avg Bottor		0.00		lopper So		-0.03				() =			
		0	Cross-section 4	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	Surface Elev, ft	2.067	2.320	2.510	2.549	2.566	2.552	2.484	2.247	2.014	9.646			2.35		2.1
		To eroded	Surface Elev, ft	2.067	2.362	2.595	2.562	2.602	2.474	2.408	2.244	2.008	9.642		Vavg (fps) =	2.35	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.079	0.075	0.003	0.007	0.081	0.243	navg =	0.087	Stress (psf)	Water Depth (fr
		Clop	oper Soil Loss, ft	0.000	-0.043	-0.085	-0.013	-0.036	0.000	0.000	0.000	0.000	-0.078	-0.233	Flow (cfs) =	1.00	1.49	0.48
20 ft			-	A	Avg Bottor	n Gain, ft	0.02	Avg C	lopper So	il Loss, ft	-0.02							
		0	Cross-section 5	А	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, I
		To original	Surface Elev, ft	1.883	2.136	2.270	2.287	2.326	2.297	2.254	2.060	1.808	8.752			1.28		1.7
		To eroded	Surface Elev, ft	1.916	2.297	2.274	2.162	2.205	2.126	2.041	2.047	1.854	8.556		Vavg (fps) =	1.28	Bed Max Shear	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.125	0.121	0.171	0.213	0.013	0.000	0.317	0.951	navg =	0.170	Stress (psf)	Water Depth (it
		Clop	oper Soil Loss, ft	-0.033	-0.161	-0.003	0.000	0.000	0.000	0.000	0.000	-0.046	-0.121	-0.364	Flow (cfs) =	1.00	1.66	0.53
25 ft		Clop	oper Soil Loss, ft		-0.161 Avg Bottor		0.000		0.000 lopper So		0.000	-0.046	-0.121	-0.364	Flow (cfs) =	1.00	1.66	0.53
25 ft			oper Soil Loss, ft Cross-section 6		!							-0.046 I	-0.121 [ft ²]	-0.364 [in]	Flow (cfs) =	1.00 V @ 0.6d	1.66 V @ 0.8d	
25 ft		C To original	Cross-section 6	A 1.978	Avg Bottor B 2.221	n Gain, ft C 2.451	0.07 D 2.474	Avg C E 2.497	lopper So F 2.490	il Loss, ft G 2.408	-0.03 H 2.211	I 1.995	[ft ²] 9.378			V @ 0.6d 0.37		
25 ft		C To original	Cross-section 6 Surface Elev, ft Surface Elev, ft	A 1.978 2.087	B 2.221 2.178	n Gain, ft C 2.451 2.405	0.07 D 2.474 2.372	Avg C E 2.497 2.382	F 2.490 2.362	il Loss, ft G 2.408 2.303	-0.03 H 2.211 2.093	I 1.995 1.975	[ft ²] 9.378 9.044	[in]	V @ 0.2d Vavg (fps) =	V @ 0.6d 0.37 0.37	V @ 0.8d Bed Max Shear	To Water Surf, 1.7
25 ft		To original To eroded	Cross-section 6 Surface Elev, ft Surface Elev, ft Soil Gain, ft	A 1.978 2.087 0.000	B 2.221 2.178 0.043	n Gain, ft C 2.451 2.405 0.046	0.07 D 2.474 2.372 0.102	Avg C E 2.497 2.382 0.115	lopper So F 2.490 2.362 0.128	il Loss, ft G 2.408 2.303 0.105	-0.03 H 2.211 2.093 0.118	I 1.995 1.975 0.020	[ft ²] 9.378 9.044 0.352	[in] 1.056	V @ 0.2d Vavg (fps) = navg =	V @ 0.6d 0.37 0.37 0.705	V @ 0.8d Bed Max Shear Stress (psf)	To Water Surf, 1.7 Water Depth (ft
-		To original To eroded	Cross-section 6 Surface Elev, ft Surface Elev, ft	A 1.978 2.087 0.000 -0.108	B 2.221 2.178 0.043 0.000	n Gain, ft C 2.451 2.405 0.046 0.000	0.07 D 2.474 2.372 0.102 0.000	Avg C E 2.497 2.382 0.115 0.000	lopper So F 2.490 2.362 0.128 0.000	iil Loss, ft G 2.408 2.303 0.105 0.000	-0.03 H 2.211 2.093 0.118 0.000	I 1.995 1.975	[ft ²] 9.378 9.044	[in]	V @ 0.2d Vavg (fps) =	V @ 0.6d 0.37 0.37	V @ 0.8d Bed Max Shear	To Water Surf, 1.7
25 ft 30 ft		To original To eroded Clop	Cross-section 6 Surface Elev, ft Surface Elev, ft Soil Gain, ft oper Soil Loss, ft	A 1.978 2.087 0.000 -0.108	B 2.221 2.178 0.043 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft	0.07 D 2.474 2.372 0.102 0.000 0.08	Avg C E 2.497 2.382 0.115 0.000 Avg C	lopper So F 2.490 2.362 0.128 0.000 lopper So	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft	-0.03 H 2.211 2.093 0.118 0.000 -0.01	I 1.995 1.975 0.020 0.000	[ft ²] 9.378 9.044 0.352 -0.018	[in] 1.056 -0.054	V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	V @ 0.6d 0.37 0.37 0.705 0.51	V @ 0.8d Bed Max Shear Stress (psf) 2.17	To Water Surf, 1.7 Water Depth (ft 0.70
-		To original To eroded Clop	Cross-section 6 Surface Elev, ft Surface Elev, ft Soil Gain, ft Soper Soil Loss, ft Cross-section 7	A 1.978 2.087 0.000 -0.108 A	Avg Bottor B 2.221 2.178 0.043 0.000 Avg Bottor B	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C	0.07 D 2.474 2.372 0.102 0.000 0.08 D	Avg C E 2.497 2.382 0.115 0.000 Avg C E	lopper Sc F 2.490 2.362 0.128 0.000 lopper Sc F	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft G	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H	I 1.995 1.975 0.020 0.000 I I	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²]	[in] 1.056	V @ 0.2d Vavg (fps) = navg =	V @ 0.6d 0.37 0.37 0.705 0.51 V @ 0.6d	V @ 0.8d Bed Max Shear Stress (psf)	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf,
-		To original To eroded Clop To original	Cross-section 6 I Surface Elev, ft Soil Gain, ft Soper Soil Loss, ft Cross-section 7 Surface Elev, ft	A 1.978 2.087 0.000 -0.108 A 1.601	Avg Bottor B 2.221 2.178 0.043 0.000 Avg Bottor B 1.886	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149	lopper So F 2.490 2.362 0.128 0.000 lopper So F 2.159	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft G 2.119	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873	I 1.995 1.975 0.020 0.000 I 1.627	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069	[in] 1.056 -0.054	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	V @ 0.6d 0.37 0.37 0.705 0.51 V @ 0.6d 2.04	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d	To Water Surf, 1.7 Water Depth (ft 0.70
-		To original To eroded Clop To original	Cross-section 6 I Surface Elev, ft Soil Gain, ft Soper Soil Loss, ft Cross-section 7 Surface Elev, ft Surface Elev, ft	A 1.978 2.087 0.000 -0.108 A 1.601 1.601	Avg Bottor B 2.221 2.178 0.043 0.000 Avg Bottor B 1.886 1.886	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142 2.162	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165	lopper So F 2.490 2.362 0.128 0.000 lopper So F 2.159 2.175	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft G 2.119 2.123	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 1.873	I 1.995 1.975 0.020 0.000 I 1.627 1.627	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108	[in] 1.056 -0.054 [in]	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04	V @ 0.8d Bed Max Shear Stress (psf) 2.17	To Water Surf, 1.7 Water Depth (ff 0.70 To Water Surf, 2.0
-		To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft Suiface Elev, ft Soil Gain, ft Soil Loss, ft Cross-section 7 Surface Elev, ft Suiface Elev, ft Suiface Elev, ft Suiface Elev, ft	A 1.978 2.087 0.000 -0.108 A A 1.601 1.601 0.000	Avg Bottor B 2.221 2.178 0.043 0.000 Avg Bottor B 1.886 1.886 0.000	n Gain, ft C 2.451 2.405 0.006 n Gain, ft C 2.142 2.162 0.000	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000	lopper So F 2.490 2.362 0.128 0.000 lopper So F 2.159 2.175 0.000	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft G 2.119 2.123 0.000	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 1.873 0.000	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000	[in] 1.056 -0.054 [in] 0.000	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf)	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft
-		To original To eroded Clop To original To eroded	Cross-section 6 I Surface Elev, ft Soil Gain, ft Soper Soil Loss, ft Cross-section 7 Surface Elev, ft Surface Elev, ft	A 1.978 2.087 0.000 -0.108 A 1.601 1.601 1.601 0.000 0.000	B 2.221 2.178 0.043 0.000 Wg Bottor B 1.886 0.000 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142 2.162 0.000 -0.020	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016	lopper Sc F 2.490 2.362 0.128 0.000 lopper Sc F 2.159 2.175 0.000 -0.016	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft G 2.119 2.123 0.000 -0.003	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 1.873	I 1.995 1.975 0.020 0.000 I 1.627 1.627	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108	[in] 1.056 -0.054 [in]	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0
30 ft		To original To eroded Clop To original To eroded Clop	Cross-section 6 Surface Elev, ft Suiface Elev, ft Soil Gain, ft Soil Coss, ft Cross-section 7 Surface Elev, ft Suiface Elev, ft Soil Gain, ft Soil Gain, ft	A 1.978 2.087 0.000 -0.108 A 1.601 1.601 0.000 0.000 0.000	B 2.221 2.178 0.043 0.000 Avg Bottor B 1.886 1.886 0.000 Avg Bottor	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142 2.162 0.000 -0.020 n Gain, ft	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.00	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 Avg C	lopper So F 2.490 2.362 0.128 0.000 lopper So F 2.159 2.175 0.000 -0.016 lopper So	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft G 2.119 2.123 0.000 -0.003 il Loss, ft	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 1.873 0.000 0.000 0.000 -0.01	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000 0.000	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000 -0.039	[in] 1.056 -0.054 [in] 0.000 -0.118	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	V @ 0.6d 0.37 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17
30 ft		To original To eroded Clop To original To eroded Clop	Cross-section 6 Surface Elev, ft Suiface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Gain, ft Sper Soil Loss, ft Cross-section 8	A 1.978 2.087 0.000 -0.108 A 1.601 1.601 1.601 0.000 0.000	B 2.221 2.178 0.043 0.000 Wg Bottor B 1.886 0.000 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142 2.162 0.000 -0.020	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016	lopper Sc F 2.490 2.362 0.128 0.000 lopper Sc F 2.159 2.175 0.000 -0.016	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft G 2.119 2.123 0.000 -0.003	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 1.873 0.000 0.000	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000	[in] 1.056 -0.054 [in] 0.000	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf)	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17
30 ft		To original To eroded Clop To original To eroded Clop To original	Cross-section 6 Surface Elev, ft Suiface Elev, ft Soil Gain, ft Soil Coss, ft Cross-section 7 Surface Elev, ft Suiface Elev, ft Soil Gain, ft Soil Gain, ft	A 1.978 2.087 0.000 -0.108 A 1.601 1.601 1.601 0.000 0.000 A A	Avg Bottor B 2.221 2.178 0.043 0.000 Avg Bottor B 1.886 0.000 0.000 0.000 B B	n Gain, ft C 2.451 2.405 0.006 n Gain, ft C 2.142 2.162 0.000 -0.020 n Gain, ft C	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.000 D	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 Avg C E	lopper So F 2.490 2.362 0.128 0.000 lopper So F 2.159 2.175 0.000 -0.016 lopper So F	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft G 2.119 2.123 0.000 -0.003 il Loss, ft G	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 1.873 0.000 0.000 -0.01 H	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000 0.000 I I I	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000 -0.039 [ft ²]	[in] 1.056 -0.054 [in] 0.000 -0.118	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71 V @ 0.6d	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17 To Water Surf, 2.3
30 ft		To original To eroded Clop To original To eroded Clop To original	Cross-section 6 Surface Elev, ft Suiface Elev, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Soper Soil Loss, ft Cross-section 8 Surface Elev, ft	A 1.978 2.087 0.000 -0.108 A 1.601 1.601 1.601 0.000 0.000 A 1.873	Avg Bottor B 2.221 2.178 0.043 0.000 Avg Bottor B 1.886 0.000 0.000 Avg Bottor B 2.123	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142 2.162 0.000 -0.020 n Gain, ft C 2.283	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.000 D 2.411	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 Avg C E 2.438	lopper So F 2.490 2.362 0.128 0.000 lopper So 2.175 2.175 0.000 -0.016 lopper So F 2.441	ii Loss, ft G 2.408 2.303 0.105 0.000 iil Loss, ft G 2.119 2.123 0.000 -0.003 iil Loss, ft G 2.411	-0.03 H 2.211 2.093 0.0118 0.000 -0.01 H 1.873 1.873 0.000 0.000 0.000 -0.01 H 2.182	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000 0.000 I I 1.972	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000 -0.039 [ft ²] 9.123	[in] 1.056 -0.054 [in] 0.000 -0.118	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 0.051 0.71 V @ 0.6d 3.1	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54	To Water Surf, 1.7 Water Depth (ff 0.70 To Water Surf, 2.0 Water Depth (ff 0.17 To Water Surf, 2.3
30 ft		To original To eroded Clop To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Cross-section 8 Surface Elev, ft Surface Elev, ft	A 1.978 2.087 0.000 -0.108 A 1.601 1.601 1.601 0.000 0.000 A A 1.873 1.873	B 2.221 2.178 0.043 0.000 B 1.886 1.886 1.886 0.000 0.000 0.000 B 2.123 2.123	n Gain, ft C 2.451 2.405 0.006 n Gain, ft C 2.142 2.162 0.000 -0.020 n Gain, ft C 2.283 2.359	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.000 D 2.411 2.418	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 Avg C E 2.438 2.454	lopper So F 2.490 2.362 0.128 0.000 lopper So F 2.159 2.175 0.000 -0.016 lopper So F 2.441 2.448	ii Loss, ft G 2.408 2.303 0.105 0.000 ii Loss, ft G 2.119 2.123 0.000 -0.003 ii Loss, ft G 2.411 2.421	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 1.873 0.000 0.000 -0.01 H 2.182 2.182	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000 0.000 I 1.972 1.972	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000 -0.039 [ft ²] 9.123 9.166	[in] 1.056 -0.054 [in] 0.000 -0.118 [in]	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Rlow (cfs) = V @ 0.2d Vavg (fps) =	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 0.051 0.71 V @ 0.6d 3.1 3.10	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17 To Water Surf, 2.3
30 ft		To original To eroded Clop To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8 Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft	A 1.978 2.087 0.000 -0.108 # A 1.601 1.601 0.000 0.000 A A 1.601 1.601 1.801 1.873 1.873 0.000 0.000	B 2.221 2.178 0.043 0.000 Wg Bottor B 1.886 1.886 0.000 Wg Bottor B 1.886 0.000 Wg Bottor B 2.123 2.123 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft 2.142 2.162 0.000 -0.020 0.000 r Gain, ft C 2.283 2.359 0.000 -0.075	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.00 D 2.411 2.418 0.000	Avg C E 2.497 2.382 0.115 0.000 Avg C 2.149 2.165 2.149 2.165 C 2.149 2.165 C 2.438 2.454 0.000 0.0016	lopper So F 2.490 2.362 0.128 0.000 lopper So F 2.175 0.000 -0.016 lopper So F 2.441 2.448 0.000	il Loss, ft G 2.408 0.105 0.000 ii Loss, ft 2.119 0.000 -0.003 G 2.411 ii Loss, ft 2.421 C 2.421 0.000 -0.000 -0.000	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 0.000 0.000 H H 2.182 2.182 2.182	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000 0.000 I 1.972 1.972 1.972 0.000	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000 -0.039 [ft ²] 9.123 9.166 0.000	[in] 1.056 -0.054 [in] 0.000 -0.118 [in] 0.000	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = navg =	 V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 0.051 0.71 V @ 0.6d 3.1 3.10 0.029 	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear Stress (psf)	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17 To Water Surf, 2.3 Water Depth (ft
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8 Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft	A 1.978 2.087 0.000 -0.108 # A 1.601 1.601 0.000 0.000 A A 1.601 1.601 1.801 1.873 1.873 0.000 0.000	Vg Bottor B 2.221 2.178 0.043 0.000 Vg Bottor B 1.886 1.886 0.000 0.000 Vg Bottor B 2.123 2.123 2.123 0.000 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft 2.142 2.162 0.000 -0.020 0.000 r Gain, ft C 2.283 2.359 0.000 -0.075	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.000 D 2.411 2.418 0.000 0.000 -0.007	Avg C E 2.497 2.382 0.115 0.000 Avg C 2.149 2.165 2.149 2.165 C 2.149 2.165 C 2.438 2.454 0.000 0.0016	Image: opper sector 2.490 2.362 0.128 0.000 F 2.159 2.175 0.000 -0.016 F 2.441 2.448 0.000 -0.007	il Loss, ft G 2.408 0.105 0.000 ii Loss, ft 2.119 0.000 -0.003 G 2.411 ii Loss, ft 2.421 C 2.421 0.000 -0.000 -0.000	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 -0.01 1.873 0.000 -0.01 H 2.182 2.182 0.000 0.000	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000 0.000 I 1.972 1.972 1.972 0.000	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000 -0.039 [ft ²] 9.123 9.166 0.000	[in] 1.056 -0.054 [in] 0.000 -0.118 [in] 0.000	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = navg =	 V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 0.051 0.71 V @ 0.6d 3.1 3.10 0.029 	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear Stress (psf)	To Water Surf, 1.7 Water Depth (ff 0.70 To Water Surf, 2.0 Water Depth (ff 0.17 To Water Surf, 2.3 Water Depth (ff 0.14
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 8 Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Soil Gain, ft Soil Gain, ft	A A 1.978 2.087 -0.108 A A 1.601 1.601 0.000 0.000 4 A A 1.873 1.873 1.873 1.873 0.000 0.000 4 A	B 2.221 2.778 0.043 0.000 B 1.886 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft 2.142 2.162 0.000 -0.020 n Gain, ft 2.283 2.359 0.000 -0.075 n Gain, ft	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.000 D 2.411 2.411 2.418 0.000 -0.007 0.00	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 E 2.438 2.454 0.000 -0.016 Avg C 0.0016 Avg C	Image: opper Science F 2.490 2.362 0.128 0.000 Image: opper Science 2.159 2.175 0.000 -0.016 Image: opper Science F 2.441 2.448 0.000 -0.007 olopper Science	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft 2.119 2.123 0.000 -0.003 il Loss, ft 2.411 2.421 0.000 -0.010 il Loss, ft	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 -0.01 H 2.182 2.182 0.000 0.000 0.000 0.000	I 1.995 1.975 0.020 0.000 I 1.627 0.000 0.000 0.000 I 1.972 1.972 0.000 0.000	[tt ²] 9.378 9.044 0.352 -0.018 8.069 8.108 0.000 -0.039 9.123 9.166 0.000 -0.043	(in) 1.056 -0.054 (in) 0.000 -0.118 (in) (in) 0.000 -0.128 -0.001	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71 V @ 0.6d 3.1 3.10 0.029 0.87	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear Stress (psf) 0.44	To Water Surf, 1.7 Water Depth (ff 0.70 To Water Surf, 2.0 Water Depth (ff 0.17 To Water Surf, 2.3 Water Depth (ff 0.14
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30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Oross-section 7 Surface Elev, ft Soil Gain, ft Soil Cost, ft Soil C	A A 1.978 2.087 0.000 -0.108 A 1.601 1.601 0.000 A A 1.873 1.873 0.000 0.000 A A 1.873 1.873 0.000 A 1.873 1.873 0.000 A 1.873 1.875 1.	B 2.221 2.778 0.043 0.000 B 1.886 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft 2.142 2.162 0.000 -0.020 n Gain, ft C 2.283 2.359 0.000 -0.075 n Gain, ft C 2.349	0.07 D 2.474 2.372 0.102 0.000 0.08 2.172 2.195 0.000 -0.023 0.000 D 2.411 2.411 2.418 0.000 -0.007 0.000 D 2.388	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 E 2.438 2.454 0.000 -0.016 Avg C E 2.438 2.454 0.000 -0.016 E 2.332	Image: Non-Section 2 Non-Section 2 0.128 0.000 0.001 100per Scd 7 2.159 0.000 2.175 0.000 0.0016 0.001 -0.016 F 2.141 2.441 2.441 0.400 -0.007 F 2.365 F 2.365 -0.007	I Loss, ft G 2.408 2.303 0.105 0.000 II Loss, ft 2.119 2.123 0.000 -0.003 II Loss, ft 2.411 2.421 0.000 -0.010 II Loss, ft G G 2.320	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 0.000 -0.01 K 2.182 0.000 0.000 0.000 H 0.000 0.001 H 2.060	I 1.995 1.975 0.020 0.000 1.1627 1.627 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	[ft ²] 9.378 9.044 0.352 -0.018 8.069 8.108 0.000 -0.039 [ft ²] 9.123 9.166 0.000 -0.043 [ft ²] 8.903	(in) 1.056 -0.054 (in) 0.000 -0.118 (in) (in) 0.000 -0.128 -0.001	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	 V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71 V @ 0.6d 3.1 3.10 0.029 0.87 V @ 0.6d 3.43 	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear Stress (psf) 0.44 V @ 0.8d	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17 To Water Surf, 2.3 Water Depth (ft 0.14 To Water Surf, 2.3
30 ft 35 ft		To original To eroded Clop To original To eroded Clop Clop Cor To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil G	A A 1.978 2.087 0.000 -0.108 A 1.601 1.601 0.000 A 1.873 1.873 0.000 0.000 A 1.873 1.873 1.873 1.873 0.000 A 1.860 1.860 1.860	B 2.221 2.778 0.043 0.000 B 1.886 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft 2.162 0.000 -0.020 n Gain, ft C 2.283 2.359 0.000 -0.075 n Gain, ft C 2.349 2.392	0.07 D 2.474 2.372 0.102 0.000 0.08 2.172 2.195 0.000 -0.023 0.000 0.000 2.411 2.411 0.0000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 E 2.438 2.454 0.000 -0.016 Avg C E 2.438 2.454 0.000 -0.016 E 2.392 2.444	Image: constraint of the system 2.490 2.362 0.128 0.000 Image: constraint of the system 2.175 2.175 2.175 0.000 -0.016 Image: constraint of the system 0.000 -0.016 F 2.441 2.448 0.000 -0.007 F 2.365 2.421	I Loss, ft G 2.408 2.303 0.105 0.000 II Loss, ft 2.123 0.000 -0.003 II Loss, ft 2.421 0.000 -0.010 II Loss, ft G G 2.320 2.375	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 0.000 -0.01 H 2.182 0.000 0.000 0.000 H 2.182 0.000 0.000 H 2.060 2.060	I 1.995 1.975 0.020 0.000 1.1627 1.627 0.000 0.000 1.1627 1.627 1.627 0.000 0.000 0.000 0.000 0.000 1.972 0.000 0.000 0.000 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.974 1.975	[ft ²] 9.778 9.044 0.352 -0.018 7 8.069 8.108 0.000 -0.039 [ft ²] 9.123 9.166 0.000 -0.043 [ft ²] 8.903 9.021	(in) 1.056 -0.054 (in) 0.000 -0.118 (in) 0.000 -0.128 (in) (in)	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = ravg = Flow (cfs) = V @ 0.2d Vavg (fps) =	V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71 V @ 0.6d 3.1 3.10 0.029 0.87 V @ 0.6d 3.43 3.43	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d V @ 0.8d U @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.44 V @ 0.8d	To Water Surf, 1.7 Water Depth (ff 0.70 To Water Surf, 2.0 Water Depth (ff 0.17 To Water Surf, 2.3 Water Depth (ff 0.14 To Water Surf, 2.3
30 ft 35 ft		To original To eroded Clop To original To eroded Clop Clop Cor To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Surface Elev, ft	A A 1.978 2.087 0.000 -0.108 A 1.601 0.000 0.000 A 1.873 0.000 0.000 A 1.873 0.000 0.000 A 1.860 1.860 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.	B 2.221 2.778 0.043 0.000 B 1.886 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft 2.142 2.162 0.000 -0.020 n Gain, ft C 2.283 2.359 0.000 -0.075 n Gain, ft C 2.349 2.392 0.000 -0.043	0.07 D 2.474 2.372 0.102 0.000 0.08 2.172 2.195 0.000 -0.023 0.000 0.000 2.411 2.411 0.0000 0.000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.000000	Avg C E 2.497 2.382 0.115 0.000 Avg C 2.149 2.165 0.000 -0.016 Avg C E 2.438 2.454 0.000 -0.016 Avg C E 2.392 2.444 0.000 -0.052	Image: constraint of the system	I loss, ft G 2.408 2.303 0.105 0.000 II loss, ft 2.123 0.000 -0.003 II loss, ft 2.421 0.000 -0.010 0.010 G 2.320 2.375 0.000 -0.056	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 0.000 -0.01 H 2.182 0.000 0.000 -0.01 H 2.060 2.060 0.000	I 1.995 1.975 0.020 0.000 1.627 1.627 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.972 0.000 0.000 0.000 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 1.972 0.000	[ft ²] 9.778 9.044 0.352 -0.018 7 8.069 8.108 0.000 -0.039 [ft ²] 9.166 0.000 -0.043 [ft ²] 8.803 9.021 0.000	(in) 1.056 -0.054 (in) 0.000 -0.118 0.000 -0.128 (in) (in) 0.000 0.0128	V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = navg =	 V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71 V @ 0.6d 3.10 0.029 0.87 V @ 0.6d 3.43 3.43 0.025 	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear Stress (psf) 0.44 V @ 0.8d	To Water Surf, 1.7 Water Depth (ff 0.70 To Water Surf, 2.0 Water Depth (ff 0.17 To Water Surf, 2.3 Water Depth (ff 0.14 To Water Surf, 2.3 Water Depth (ff
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30 ft 35 ft		To original To eroded Clop To original To eroded Clop Cor To original To eroded Clop To original To eroded Clop Cor So Clop	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Coss, ft Soil Loss, ft Soil Loss, ft Soil Loss, ft	A 1.978 2.087 0.000 -0.108 A 1.601 0.000 0.000 A 1.873 0.000 0.000 A 1.873 0.000 0.000 A 1.860 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.000	B 2.221 2.778 0.043 0.000 1.886 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft 2.142 2.162 0.000 -0.020 n Gain, ft C 2.283 0.000 -0.075 n Gain, ft C 2.349 2.392 0.000 -0.043 n Gain, ft	0.07 D 2.474 2.372 0.000 0.08 0.000 2.172 2.195 0.000 -0.023 0.000 0.000 2.411 0.0000 0.0000 0.0000 0.0000 0.000000	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 Avg C E 2.438 2.454 0.000 -0.016 E 2.392 2.444 0.000 -0.052 Avg Q	Image: constraint of the second sec	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft 2.123 0.000 -0.003 il Loss, ft 2.421 0.000 -0.010 il Loss, ft 0.000 -0.056 0.001 0.011	-0.03 H 2.211 2.03 0.118 0.000 -0.01 1.873 0.000 0.000 -0.01 H 2.182 0.000 0.000 -0.01 H 2.060 0.000 0.000 0.000 0.000 0.000	I 1.995 1.975 0.020 0.000 1.627 1.627 0.000 0.000 0.000 0.000 0.000 1.1627 0.000 0.000 1.972 0.000 0.000 1.808 1.808 0.000 0.000 0.000 0.000	[ft ²] 9.778 9.044 0.352 -0.018 7 8.069 8.108 0.000 -0.039 9.123 9.166 0.000 -0.043 9.166 0.000 -0.043 9.021 0.0000 -0.118 Volid [ft ³]	(in) 1.056 -0.054 -0.054 -0.054 -0.054 -0.118 -0.000 -0.128 -0.000 -0.128 -0.000 -0.354 -0.000	V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Rlow (cfs) = Flow (cfs) = Flow (cfs) =	 V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71 V @ 0.6d 3.10 0.029 0.87 V @ 0.6d 3.43 0.025 0.88 Bottom Gat 	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear Stress (psf) 0.44 V @ 0.8d	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17 To Water Surf, 2.3 Water Depth (ft 0.14 To Water Surf, 2.3 Water Depth (ft 0.13 0.000
30 ft 35 ft		To original To eroded Clop To original To eroded Clop Corg To original To eroded Clop To original To eroded Clop Corg To original	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Coss, ft Surface Elev	A 1.978 2.087 0.000 -0.108 A 1.601 0.000 0.000 A 1.873 0.000 0.000 A 1.873 0.000 0.000 A 1.860 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.000	B 2.221 2.178 0.043 0.000 B 1.886 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142 2.162 0.000 -0.020 n Gain, ft C 2.283 0.000 -0.075 n Gain, ft C 2.349 2.392 0.000 -0.043 n Gain, ft 0.000 -0.043	0.07 D 2.474 2.372 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.000 D 2.411 0.000 0.000 0.000 D 2.388 2.434 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0	Avg C E 2.497 2.382 0.115 0.000 Avg C E 2.149 2.165 0.000 -0.016 Avg C E 2.438 2.454 0.000 -0.016 Avg C E 2.392 2.444 0.000 -0.052 Avg C 0.007 -0.011 -0.011 -0.011 -0.011 -0.011 -0.011 -0.011 -0.011 -0.011 -0.011 -0.011 -0.011 -0.015 -0.011 -0.015 -0.01	Image: constraint of the system 2.490 2.362 0.128 0.000 constraint of the system 2.175 2.000 -0.016 r 2.441 2.441 2.444 0.000 -0.007 F 2.365 2.421 0.000 -0.056 lopper Sc 0.012 5	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft 2.123 0.000 -0.003 il Loss, ft 2.421 0.000 -0.010 il Loss, ft 0.000 -0.056 0.001 0.016 -0.011 Origin	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 0.000 -0.01 H 2.182 0.000 0.000 -0.01 H 2.060 0.000 0.000 0.000 0.000 0.000 0.000 0.000	 1.995 1.975 0.020 0.000 1.1627 1.627 0.000 0.000 1.1627 1.972 0.000 0.000 0.000 1.1808 1.808 0.000 0.	[ft ²] 9.778 9.044 0.352 -0.018 7 8.069 8.108 0.000 -0.039 9.123 9.166 0.000 -0.043 9.166 0.000 -0.043 9.021 0.0000 -0.118 Volid [ft ²] 88.044	(in) 1.056 -0.054 -0.054 -0.054 -0.054 -0.018 -0.118 -0.000 -0.128 -0.000 -0.128 -0.000 -0.354 -0.000 -0.354 -0.000	V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Rlow (cfs) = Flow (cfs) = Flow (cfs) =	 V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71 V @ 0.6d 3.1 3.10 0.029 0.87 V @ 0.6d 3.43 0.025 0.88 Bottom Gapper Soil Log X- 	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear Stress (psf) 0.44 V @ 0.8d Bed Max Shear Stress (psf) 0.44 Stress (psf) 0.40 Bed Max Shear Stress (psf	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17 To Water Surf, 2.3 Water Depth (ft 0.14 To Water Surf, 2.3 Water Depth (ft 0.13 0.000 -0.013 5
30 ft 35 ft 40 ft	pezoidal Analysis	To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop Clop Clop To original To eroded Clop	Cross-section 6 Surface Elev, ft Soil Gain, ft Soper Soil Loss, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Gain, ft Soper Soil Loss, ft Cross-section 8 Surface Elev, ft Soil Gain, ft Soil Coss, ft Surface Elev Surface Elev	A 1.978 2.087 0.000 -0.108 A 1.601 1.601 0.000 A 1.801 1.801 1.801 0.000 A 1.873 0.000 A 1.860 0.000 A 1.860 0.000 A 1.860 0.000 0.000 227928 22738	B 2.221 2.778 0.043 0.000 1.886 0.000	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142 2.162 0.000 -0.020 n Gain, ft C 2.283 2.359 0.000 -0.075 0.000 -0.075 0.000 -0.075 0.000 -0.075 0.000 -0.043 n Gain, ft St C 2.349 2.339 2.339 0.000 -0.045 0.000 -0.046 -0.046 -0.020 -0.046 -0.020 -	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.00 D 2.411 0.000 D 2.411 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 0.023 0.000 D 2.414 0.000 D 2.414 0.000 D 2.415 0.000 D 2.415 0.000 D 2.415 0.000 D 2.415 0.000 D 2.415 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.438 2.434 0.000 D 0.007 0.007 0.000 D 0.007 0.000 D 0.001 D 0.0	Avg C E 2.497 2.382 0.115 0.000 2.165 0.000 -0.016 Avg C E 2.438 2.454 0.000 E 2.438 2.454 0.000 E 2.438 2.454 0.000 E 2.438 2.454 0.000 E 2.392 2.444 0.000 -0.016 E 2.392 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.454 0.000 -0.052 2.454 0.000 -0.052 2.454 0.000 -0.052 2.454 0.000 -0.052 2.454 0.000 -0.052 2.454 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.000 -0.052 2.444 0.007 -0.052 2.444 0.007 -0.051 -0.052 -0.051 -0.052 -0.051 -0.051 -0.052 -0.052 -0.051 -0.052 -0.051 -0.052 -0.051 -0.052 -0.052 -0.051 -0.052 -0.	Image Image 00pper Sc 2 2,362 0.128 0,128 0.000 10pper Sc 0.000 -0.016 0 0,000 -0.016 0,000 -0.016 0,000 -0.007 2,441 0.000 -0.000 -0.0007 2,365 2,421 0,000 -0.056 10,000 -0.056 10,0012 5 40 -0.012	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft 2.123 0.000 -0.003 il Loss, ft 2.421 0.000 -0.010 il Loss, ft 0.000 -0.056 0.001 0.016 -0.011 Origin	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 0.000 -0.01 H 2.182 2.182 2.182 0.000 0.000 -0.01 H 2.060 0.000 0.001 H 2.060 0.000 0.001 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.000000	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000 0.000 1.1627 1.627 0.000 0.000 0.000 1.972 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	[ft ²] 9.378 9.044 0.352 -0.018 [ft ²] 8.069 8.108 0.000 -0.039 [ft ²] 9.166 0.000 -0.043 9.166 0.000 -0.043 9.021 0.000 -0.118 88.044 88.651	(in) 1.056 -0.054 (in) 0.000 -0.118 0.000 -0.128 (in) 0.000 -0.128 (in) 0.000 -0.354 (in) 0.000 0.0354 (in) 0.000 0.0354 (in) 0.000 0.0354 (in) 0.000 0.0354 (in) 0.000 0.0354 (in) 0.000 0.0354 (in) 0.000 0.0354 (in) 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.00	V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = Rlow (cfs) = V @ 0.2d Vavg (fps) = Rlow (cfs) = Flow (cfs) = Flow (cfs) = Flow (cfs) =	 V @ 0.6d 0.37 0.705 0.51 V @ 0.6d 2.04 2.04 0.051 0.71 V @ 0.6d 3.1 3.10 0.029 0.87 V @ 0.6d 3.43 0.025 0.88 Bottom Gapper Soil Log X- 	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.44 V @ 0.8d Bed Max Shear Stress (psf) 0.44 Stress (psf) 0.44 Extension of the stress (psf) 0.40 Bed Max Shear Stress (psf) 0.40 Bed Max Shear	To Water Surf, 1.7 Water Depth (ft 0.70 To Water Surf, 2.0 Water Depth (ft 0.17 To Water Surf, 2.3 Water Depth (ft 0.14 To Water Surf, 2.3 Water Depth (ft 0.13 0.000 -0.013 5 40
30 ft 35 ft 40 ft	pezoidal Analysis	To original To eroded Clop To original To eroded Clop To original To eroded Clop Clop Clop Clop Clop Clop Clop Clop	Cross-section 6 Surface Elev, ft Soil Gain, ft Soil Gain, ft Soil Gain, ft Cross-section 7 Surface Elev, ft Soil Gain, ft Soil Coss, ft Surface Elev	A A 1.978 2.087 0.000 -0.108 A 1.601 0.000 0.000 A 1.873 0.000 0.000 A 1.860 0.0000 0.0000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00	P B 2.221 2.178 0.043 0.000 Wg Bottor B 1.886 0.000 0.000 0.000 0.000 0.000 0.000 2.123 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 1 thru 6: 0.215	n Gain, ft C 2.451 2.405 0.046 0.000 n Gain, ft C 2.142 2.162 0.000 -0.020 n Gain, ft C 2.283 2.359 0.000 -0.075 0.000 -0.075 0.000 -0.075 0.000 -0.075 0.000 -0.043 n Gain, ft St C 2.349 2.339 2.339 0.000 -0.045 0.000 -0.046 -0.046 -0.020 -0.046 -0.020 -	0.07 D 2.474 2.372 0.102 0.000 0.08 D 2.172 2.195 0.000 -0.023 0.00 D 2.411 0.000 D 2.411 0.000 D 2.411 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.414 0.000 D 2.415 0.000 D 2.415 0.000 D 2.415 0.000 D 2.415 0.000 D 2.415 0.000 D 2.414 0.000 D 2.411 0.000 D 2.411 0.000 D 2.411 0.000 D 2.411 0.000 D 2.438 0.000 D 2.388 2.434 0.000 0.000 D 2.388 2.434 0.000 0.007 0.000 D 2.388 2.434 0.000 0.007 0.007 0.000 0.007 0.000 D 2.388 2.434 0.000 0.007 0.000 D 2.415 0.000 0.000 D 2.438 0.000 0.000 D 2.438 0.000 0.000 D 2.438 0.000 0.007 0.000 D 2.438 0.000 0.007 0.000 D 2.388 2.434 0.000 0.007 0.0	Avg C E 2.497 2.382 0.115 0.000 2.165 0.000 -0.016 Avg C E 2.438 2.454 0.000 E 2.438 2.454 0.000 E 2.438 C 2.438 0.000 E 2.438 C 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.438 0.000 E 2.392 2.444 0.000 0.055 E 2.444 0.000 0.055 E Avg C 0.007 0.055 E Avg C 0.007 0.005 E 2.444 0.000 0.005 E 2.444 0.000 0.005 E 2.444 0.000 0.005 E 2.444 0.000 0.005 E 2.444 0.000 0.005 E 2.444 0.000 0.005 E 2.444 0.000 0.005 E 2.444 0.000 0.055 E Avg C 0.007 0.055 E Avg C 0.007 0.055 E Avg C 0.007 0.055 E Avg C 0.007 0.005 E 0.007 0.007 0.005 E 0.007 0.007 0.055 E 0.007 0	Image Image 00pper Sc 2 2,490 2,362 0,128 0,000 10pper Sc 2 2,175 0,000 -0,016 0 10pper Sc 2 2,441 2,448 0,000 -0,007 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,000 -0,005 6 10,000 -0,012 5 40 0,5 -0,012	il Loss, ft G 2.408 2.303 0.105 0.000 il Loss, ft 2.123 0.000 -0.003 il Loss, ft 2.421 0.000 -0.010 il Loss, ft 0.000 -0.056 0.001 0.016 -0.011 Origin	-0.03 H 2.211 2.093 0.118 0.000 -0.01 H 1.873 0.000 0.000 -0.01 H 2.182 0.000 0.000 -0.01 H 2.060 0.000 0.000 0.000 0.000 0.000 0.000 0.000	I 1.995 1.975 0.020 0.000 I 1.627 1.627 0.000 0.000 1.1627 1.627 0.000 0.000 0.000 1.972 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	[ft ²] 9.778 9.044 0.352 -0.018 7 8.069 8.108 0.000 -0.039 9.123 9.166 0.000 -0.043 9.166 0.000 -0.043 9.021 0.0000 -0.118 Volid [ft ²] 88.044	(in) 1.056 -0.054 (in) 0.000 -0.118 (in) 0.000 -0.128 (in) 0.000 -0.128 0.000 -0.354 -0.000 -0.354	V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = Rlow (cfs) = V @ 0.2d Vavg (fps) = Rlow (cfs) = Flow (cfs) = Flow (cfs) = Flow (cfs) =	 V @ 0.6d 0.37 0.705 0.51 2.04 2.04 2.04 0.051 0.71 V @ 0.6d 3.1 3.10 0.029 0.87 V @ 0.6d 3.43 0.025 0.88 Bottom Gapper Soil Loo X- Tes 	V @ 0.8d Bed Max Shear Stress (psf) 2.17 V @ 0.8d Bed Max Shear Stress (psf) 0.54 V @ 0.8d Bed Max Shear Stress (psf) 0.44 V @ 0.8d Bed Max Shear Stress (psf) 0.44 Stress (psf) 0.40 Bed Max Shear Stress (psf	To Water Surf, 1 1.7 Water Depth (ft 0.70 To Water Surf, 1 2.0 Water Depth (ft 0.17 To Water Surf, 1 2.3 Water Depth (ft 0.14 To Water Surf, 1 2.3 Water Depth (ft 0.13 0.000 -0.013 5 40 0.5





Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding





Increased Pondin & Overtopping



End-of-test and Post-test

			Date:	6/19/12							S	tart Time:	4:44	AM		End Time:	5:14 PM	
	ASTM D7208		Soil:	Sandy C	lay						Target F	Flow (cfs):	2.00			Slope:	5%	-
60 ft k	ong flume 40 ft t	est section	RECP:	Rock Ch	eck		An	chorage:	over Geo	otextile								
	2 ft v	wide flume										TEST	DATA					
	1 2 3	0	Outlet Weir								Weir						Channel Targets	
	FLOW	Wat	ater Depth, in								2.75						1.50	
/eir width	h (ft) = 2	Water	Velocity, ft/s								0.00						5 - 6	
0 ft	CDEFGH	Flo	low Rate, cfs	0.00							0.00	0.00					2.00	
		Cros	ss-section 1	A	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original Sur	ł	1.837	2.054	2.320	2.385	2.388	2.379	2.444	2.274	1.939	9.074			4.37		2.2
	•	To eroded Sur		1.837	2.054	2.320	2.411	2.441	2.464	2.474	2.274	1.939	9.176		Vavg (fps) =	4.37	Bed Max Shear Stress (psf)	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.030		
		Clopper	r Soil Loss, ft	0.000	0.000	0.000	-0.026	-0.052	-0.085	-0.030	0.000	0.000	-0.102	-0.305	Flow (cfs) =	2.00	0.79	0.25
5 ft					Avg Bottor	1	0.00		lopper So	1	-0.02		16.23	P . 1			NOAN	
			ss-section 2	A	B	C 2.543	D	E	F	G	H 2.441	I 2.201	[ft ²] 9.926	[in]	V @ 0.2d	V @ 0.6d 5.05	V @ 0.8d	To Water Surf,
		To original Sur To eroded Sur	-	2.041 2.041	2.280 2.280	2.543	2.602 2.625	2.625 2.690	2.615 2.680	2.615 2.638	2.441	2.201	10.020		Vour (fpg)	5.05		2.5
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.002	Vavg (fps) = navg =	0.020	Bed Max Shear Stress (psf)	Water Depth (ft
			r Soil Loss, ft	0.000	0.000	-0.016	-0.023	-0.066	-0.066	-0.023	0.000	0.000	-0.094	-0.282	Flow (cfs) =	2.00	0.51	0.16
10 ft		Оюррсі	0011 2033, 11		Avg Bottor		0.020		lopper So	1	-0.02	0.000	0.004	0.202	11000 (013) =	2.00	0.01	0.10
		Cros	ss-section 3	A	B	C	D.00	E	F	G G	H	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original Sur		1.729	1.988	2.280	2.346	2.346	2.349	2.388	2.172	1.962	8.857	,		4.95		2.3
		To eroded Sur		1.729	1.988	2.287	2.408	2.444	2.369	2.402	2.172	1.962	8.951		Vavg (fps) =	4.95	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Water Depth (ff
			r Soil Loss, ft	0.000	0.000	-0.007	-0.062	-0.098	-0.020	-0.013	0.000	0.000	-0.094	-0.282	Flow (cfs) =	1.79	0.56	0.18
15 ft				F	Avg Bottor	m Gain, ft	0.00	Avg C	lopper So	oil Loss, ft	-0.02							
		Cros	ss-section 4	A	В	С	D	E	F	G	н	Т	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original Sur	rface Elev, ft	1.909	2.182	2.438	2.490	2.520	2.526	2.516	2.343	2.116	9.523			3.84		2.1
		To eroded Sur	rface Elev, ft	1.909	2.182	2.444	2.559	2.556	2.484	2.431	2.343	2.162	9.534		Vavg (fps) =	3.84	Bed Max Shear	Water Depth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.043	0.085	0.000	0.000	0.057	0.171	navg =	0.051	Stress (psf)	water Deptri (ii
		Clopper	r Soil Loss, ft	0.000	0.000	-0.007	-0.069	-0.036	0.000	0.000	0.000	-0.046	-0.068	-0.203	Flow (cfs) =	3.50	1.42	0.46
20 ft				A	Avg Bottor	m Gain, ft	0.01	Avg C	lopper So	oil Loss, ft	-0.02							
		Cros	ss-section 5	А	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original Sur	rface Elev, ft	1.578	1.854	2.103	2.201	2.224	2.254	2.234	2.123	1.886	8.386			1.8		1.6
		To eroded Sur	rface Elev, ft	1.578	1.877	2.188	2.264	2.231	2.080	2.051	2.133	1.932	8.310		Vavg (fps) =	1.80	Bed Max Shear	Mater Death (6
																		vvater Debth (ft
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.174	0.184	0.000	0.000	0.177	0.531	navg =	0.136	Stress (psf)	water Depth (It
			Soil Gain, ft r Soil Loss, ft	0.000	0.000 -0.023	0.000	0.000	0.000	0.174	0.184 0.000			0.177	0.531 -0.305	navg = Flow (cfs) =	0.136 2.27	Stress (psf)	Water Depth (ft) 0.63
25 ft		Clopper	r Soil Loss, ft	0.000 A	-0.023 Avg Bottor	-0.085 m Gain, ft	-0.062 0.04	-0.007 Avg C	0.000 Clopper Sc	0.000 oil Loss, ft	0.000 -0.010 -0.03	0.000	-0.102	-0.305	Flow (cfs) =	2.27	1.96	0.63
25 ft		Clopper Cros	r Soil Loss, ft ss-section 6	0.000 A A	-0.023 Avg Bottor B	-0.085 m Gain, ft C	-0.062 0.04 D	-0.007 Avg C E	0.000 Clopper So	0.000 bil Loss, ft G	0.000 -0.010 -0.03 H	0.000 -0.046 I	-0.102 [ft ²]			2.27 V @ 0.6d		0.63 To Water Surf,
25 ft		Clopper Cros	r Soil Loss, ft ss-section 6 rface Elev, ft	0.000 A 1.736	-0.023 Avg Bottor B 1.975	-0.085 n Gain, ft C 2.224	-0.062 0.04 D 2.343	-0.007 Avg C E 2.352	0.000 Clopper So F 2.349	0.000 pil Loss, ft G 2.303	0.000 -0.010 -0.03 H 2.172	0.000 -0.046 I 1.962	-0.102 [ft ²] 8.802	-0.305	Flow (cfs) =	2.27 V @ 0.6d 0.86	1.96	
25 ft		Clopper Cros To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft	0.000 A 1.736 1.818	-0.023 Avg Bottor B 1.975 2.070	-0.085 n Gain, ft C 2.224 2.287	-0.062 0.04 D 2.343 2.339	-0.007 Avg C E 2.352 2.313	0.000 Copper So F 2.349 2.047	0.000 bil Loss, ft G 2.303 1.883	0.000 -0.010 -0.03 H 2.172 2.080	0.000 -0.046 I 1.962 2.090	-0.102 [ft ²] 8.802 8.503	-0.305 [in]	Flow (cfs) = V @ 0.2d Vavg (fps) =	2.27 V @ 0.6d 0.86 0.86	1.96 V @ 0.8d Bed Max Shear	0.63 To Water Surf, 1
25 ft		Clopper Cros To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft	0.000 A 1.736 1.818 0.000	-0.023 Avg Bottor B 1.975 2.070 0.000	-0.085 n Gain, ft C 2.224 2.287 0.000	-0.062 0.04 D 2.343 2.339 0.003	-0.007 Avg C E 2.352 2.313 0.039	0.000 F 2.349 2.047 0.302	0.000 bil Loss, ft G 2.303 1.883 0.420	0.000 -0.010 -0.03 H 2.172 2.080 0.092	0.000 -0.046 I 1.962 2.090 0.000	-0.102 [ft ²] 8.802 8.503 0.418	-0.305 [in] 1.253	Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	2.27 V @ 0.6d 0.86 0.329	1.96 V @ 0.8d Bed Max Shear Stress (psf)	0.63 To Water Surf, 1 1.5 Water Depth (ft
		Clopper Cros To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft	0.000 A 1.736 1.818 0.000 -0.082	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095	-0.085 m Gain, ft C 2.224 2.287 0.000 -0.062	-0.062 0.04 D 2.343 2.339 0.003 0.000	-0.007 Avg C E 2.352 2.313 0.039 0.000	0.000 F 2.349 2.047 0.302 0.000	0.000 bil Loss, ft 2.303 1.883 0.420 0.000	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000	0.000 -0.046 I 1.962 2.090	-0.102 [ft ²] 8.802 8.503	-0.305 [in]	Flow (cfs) = V @ 0.2d Vavg (fps) =	2.27 V @ 0.6d 0.86 0.86	1.96 V @ 0.8d Bed Max Shear	0.63 To Water Surf, 1
25 ft 30 ft		Clopper Cros To original Sur To eroded Sur Clopper	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft	0.000 A 1.736 1.818 0.000 -0.082	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095 Avg Bottor	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C	0.000 F 2.349 2.047 0.302 0.000	0.000 bil Loss, ft 2.303 1.883 0.420 0.000 bil Loss, ft	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04	0.000 -0.046 I 1.962 2.090 0.000 -0.128	-0.102 [ft ²] 8.802 8.503 0.418 -0.119	-0.305 [in] 1.253 -0.358	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	2.27 V @ 0.6d 0.86 0.329 1.35	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46	0.63 To Water Surf, 1 1.5 Water Depth (ft 0.79
		Clopper Cros To original Sur To eroded Sur Clopper	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7	0.000 A 1.736 1.818 0.000 -0.082 A	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095 Avg Bottor B	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D	-0.007 Avg C 2.352 2.313 0.039 0.000 Avg C E	0.000 F 2.349 2.047 0.302 0.000 Copper Sc F	0.000 bil Loss, ft 2.303 1.883 0.420 0.000 bil Loss, ft G	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²]	-0.305 [in] 1.253	Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d	1.96 V @ 0.8d Bed Max Shear Stress (psf)	0.63 To Water Surf, 1.5 Water Depth (ft 0.79 To Water Surf,
		Clopper To original Sur To eroded Sur Clopper Cros To original Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft	0.000 A 1.736 1.818 0.000 -0.082 A 1.608	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095 Avg Bottor B 1.886	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205	0.000 Copper Sc 2.349 2.047 0.302 0.000 Copper Sc F 2.208	0.000 0.000 0il Loss, ft G 2.303 1.883 0.420 0.000 0.000 0.000 0.000 0.000 0.2244	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051	0.000 -0.046 1 1.962 2.090 0.000 -0.128 1 1.831	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²] 8.329	-0.305 [in] 1.253 -0.358	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d	0.63 To Water Surf, 1 1.5 Water Depth (ft 0.79
		Clopper To original Sur To eroded Sur Clopper Cros To original Sur To eroded Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft	0.000 A 1.736 1.818 0.000 -0.082 A 1.608 1.614	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095 Avg Bottor B 1.886 1.886	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087 2.106	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221 2.221	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208	0.000 Copper Sc 2.349 2.047 0.302 0.000 Copper Sc F 2.208 2.221	0.000 0.000 G 2.303 1.883 0.420 0.000 0.000 0.000 0.000 0.000 0.2.244 2.244	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051 2.051	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²] 8.329 8.348	-0.305 [in] 1.253 -0.358 [in]	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 3.60	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0
		Clopper To original Sur To eroded Sur Clopper Cros To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft rface Elev, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft Soil Gain, ft	0.000 A 1.736 1.818 0.000 -0.082 A 1.608 1.614 0.000	-0.023 Vg Bottor B 1.975 2.070 0.000 -0.095 Vg Bottor B 1.886 1.886 0.000	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000	0.000 Copper Sc 2.349 2.047 0.302 0.000 Copper Sc F 2.208 2.221 0.000	0.000 0.000 G 2.303 1.883 0.420 0.000 bil Loss, ft G 2.244 2.247 0.000	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051 2.051 0.000	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 0.000	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²] 8.329 8.348 0.000	-0.305 [in] 1.253 -0.358 [in] 0.000	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 3.60 0.035	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d Bed Max Shear Stress (psf)	0.63 To Water Surf, 1 1.5 Water Depth (ft 0.79 To Water Surf, 1 2.0 Water Depth (ft
		Clopper To original Sur To eroded Sur Clopper Cros To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft	0.000 A 1.736 1.818 0.000 -0.082 A 1.608 1.614 0.000 -0.007	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095 Avg Bottor B 1.886 1.886	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087 2.106 0.000 -0.020	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221 2.221 2.221 0.000	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003	0.000 Copper Sc 2.349 2.047 0.302 0.000 Copper Sc F 2.208 2.221	0.000 0.000 0.000 0.2.303 1.883 0.420 0.000 0.000 0.000 0.2.244 2.247 0.000 -0.003	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051 2.051	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²] 8.329 8.348	-0.305 [in] 1.253 -0.358 [in]	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 3.60	1.96 V @ 0.8d Bed Max Shear Stress (psl) 2.46 V @ 0.8d Bed Max Shear	0.63 To Water Surf, 1.5 Water Depth (ft 0.79 To Water Surf, 2.0
30 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft rface Elev, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft Soil Gain, ft	0.000 A 1.736 1.818 0.000 -0.082 A 1.608 1.614 0.000 -0.007	-0.023 Wg Bottor B 1.975 2.070 0.000 -0.095 Wg Bottor B 1.886 1.886 0.000 0.000	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087 2.106 0.000 -0.020	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221 2.221 2.221 0.000 0.000	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003	0.000 0.000 0.00per Sc 2.349 2.047 0.302 0.000 0.000 0.000 2.221 0.000 -0.013	0.000 0.000 0.000 0.2.303 1.883 0.420 0.000 0.000 0.000 0.2.244 2.247 0.000 -0.003	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051 2.051 0.000 0.000	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 0.000	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²] 8.329 8.348 0.000 -0.019	-0.305 [in] 1.253 -0.358 [in] 0.000 -0.056	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 3.60 0.035	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d Bed Max Shear Stress (psf)	0.63 To Water Surf, 1 1.5 Water Depth (ft 0.79 To Water Surf, 1 2.0 Water Depth (ft 0.23
30 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur To eroded Sur Clopper	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 8	0.000 A 1.736 1.818 0.000 -0.082 A 1.608 1.614 0.000 -0.007 A	-0.023 Vg Bottor B 1.975 2.070 0.000 -0.095 Vg Bottor B 1.886 1.886 0.000 0.000 Vg Bottor	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087 2.106 0.000 -0.020 n Gain, ft	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221 2.221 0.000 0.000 0.000	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg C	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.013 0.000 0.013 0.000	0.000 0.000 0.000 0.303 0.420 0.000 0.000 0.000 0.2244 2.247 0.000 -0.003 0.000 -0.003	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051 2.051 0.000 0.000 -0.01	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 1.831 0.000 0.000	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²] 8.329 8.348 0.000	-0.305 [in] 1.253 -0.358 [in] 0.000	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d Bed Max Shear Stress (psf) 0.72	0.63 To Water Surf, 1 1.5 Water Depth (ft 0.79 To Water Surf, 1 2.0 Water Depth (ft 0.23
30 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft soil Gain, ft r Soil Loss, ft ss-section 8 rface Elev, ft	0.000 A 1.736 1.818 0.000 -0.082 A 1.608 1.614 0.000 -0.007 A A	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095 Avg Bottor B 1.886 0.000 0.000 Avg Bottor B B	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087 2.106 0.000 -0.020 n Gain, ft C	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221 2.221 2.221 0.000 0.000 0.000 0.000 0.000	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg C E	0.000 Copper Sc F 2.349 2.047 0.302 0.000 Copper Sc F 2.208 2.221 0.000 -0.013 Copper Sc F	0.000 0.000 001 Loss, ftt G 2.303 1.883 0.420 0.000 0.000 01 Loss, ftt G 2.244 2.247 0.000 -0.003 001 Loss, ftt G	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051 2.051 2.051 0.000 0.000 -0.01 H	0.000 -0.046 1 1.962 2.090 0.000 -0.128 1 1.831 1.831 0.000 0.000 1	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²] 8.329 8.348 0.000 -0.019 [ft ²]	-0.305 [in] 1.253 -0.358 [in] 0.000 -0.056	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d Bed Max Shear Stress (psf) 0.72 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ft 0.79 To Water Surf, 2.0 Water Depth (ft 0.23 To Water Surf, 2.2
30 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur To eroded Sur Clopper To eroded Sur To original Sur To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft soil Gain, ft r Soil Loss, ft ss-section 8 rface Elev, ft	0.000 A 1.736 1.818 0.000 -0.082 A 1.608 1.614 0.000 -0.007 A 1.811	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095 Avg Bottor B 1.886 1.886 0.000 0.000 0.000 Avg Bottor B 2.057	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087 2.106 0.000 -0.020 n Gain, ft C 2.251	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221 2.221 2.221 0.000 0.000 0.000 0.000 0.000 D 2.382	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg C E 2.388	0.000 Copper Sc F 2.349 2.047 0.302 0.000 Copper Sc F 2.208 2.221 0.000 -0.013 Copper Sc F 2.379	0.000 0.000 001 Loss, ftt G 2.303 1.883 0.420 0.000 0.000 0.000 0.2244 2.247 0.000 -0.003 001 Loss, ftt G 2.195	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051 2.051 0.000 0.000 -0.01 H 2.073	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 0.000 0.000 I I 1.867	-0.102 [ft ²] 8.503 0.418 -0.119 [ft ²] 8.329 8.348 0.000 -0.019 [ft ²] 8.818	-0.305 [in] 1.253 -0.358 [in] 0.000 -0.056	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d 4.42	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d Bed Max Shear Stress (psf) 0.72	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0 Water Depth (ff 0.23 To Water Surf, 2.2
30 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper To eroded Sur Clopper To original Sur To original Sur To original Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft	0.000 A 1.736 1.818 0.000 0.082 A 1.608 1.614 1.614 0.000 A A 1.614 1.811 1.811 0.000	-0.023 Avg Bottor B 1.975 2.070 0.000 -0.095 Avg Bottor B 1.886 1.886 0.000 0.000 Avg Bottor B 2.057 2.057	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 n Gain, ft C 2.087 2.106 0.000 -0.020 n Gain, ft C 2.251 2.320	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.10 D 2.221 2.221 0.000 0.000 0.000 D 2.382 2.382 2.382	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg C E 2.388 2.388 2.405	0.000 F 2.349 2.047 0.302 0.000 Copper Sc F 2.208 2.221 0.000 -0.013 Copper Sc F 2.379 2.398	0.000 iii Loss, ft 2.303 1.883 0.420 0.000 iii Loss, ft G 2.244 2.247 0.000 -0.003 iii Loss, ft G 2.195 2.388	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 H 2.051 2.051 0.000 0.000 0.000 1.000 H 2.073 2.165	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 1.831 0.000 0.000 0.000 I 1.867 1.867	-0.102 [ft ²] 8.503 0.418 -0.119 [ft ²] 8.329 8.348 0.000 -0.019 [ft ²] 8.818 8.818 8.986	-0.305 [in] 1.253 -0.358 [in] 0.000 -0.056 [in]	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = V @ 0.2d V @ 0.2d	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d 4.42 4.42	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d V @ 0.8d Bed Max Shear V @ 0.8d U @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0 Water Depth (ff 0.23 To Water Surf, 2.2
30 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper To eroded Sur Clopper To original Sur To original Sur To original Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft r Soil Gain, ft rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft soil Gain, ft	0.000 A 1.736 1.818 0.000 0.002 A 1.608 1.614 1.614 0.000 A A 1.611 1.811 1.811 0.000 0.000	0.023 B 1.975 2.070 0.000 -0.095 B 1.886 0.0000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft C 2.251 2.320 0.000 -0.069	-0.062 0.04 D 2.343 2.339 0.003 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 00	-0.007 Avg Q E 2.352 2.313 0.039 0.000 Avg Q E 2.205 2.208 0.000 -0.003 Avg Q E 2.388 2.405 0.000 0-0.016	0.000 Compersisting 0.000 Compension 0.000 0.000 Compension 0.000 Compension 0.000 0.000 0.000 0.000 Compension 0.0000 Compension 0.000 Compension 0.0000 Compension 0.0000 Compension 0.0000 Compension 0.0000 Compension 0.0000 Compension 0.0000 Compen	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 -0.010 -0.03 H 2.172 2.080 0.092 0.000 -0.04 H 2.051 0.000 0.000 0.000 -0.01 H 2.073 2.165 0.000	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 0.000 0.000 I 1.867 1.867 0.000	-0.102 (ft ²) 8.802 8.503 0.418 -0.119 (ft ²) 8.329 8.348 0.000 -0.019 (ft ²) 8.818 8.886 0.000	-0.305 (in) 1.253 1.253 -0.358 (in) 0.000 (in) (in) 0.000 0.000	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Varg (fps) = N @ 0.2d N @ 0.	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d 4.42 4.42 0.024	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.72 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ft 0.79 To Water Surf, 2.0 Water Depth (ft 0.23 To Water Surf, 2.2 Water Depth (ft
30 ft 35 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper To original Sur To original Sur To original Sur To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft r Soil Gain, ft rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft soil Gain, ft	0.000 A 1.736 1.818 0.000 0.002 A 1.608 1.614 1.614 0.000 A A 1.611 1.811 1.811 0.000 0.000	0.023 USE Constraints Output O	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft C 2.251 2.320 0.000 -0.069	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	-0.007 Avg Q E 2.352 2.313 0.039 0.000 Avg Q E 2.205 2.208 0.000 -0.003 Avg Q E 2.388 2.405 0.000 0-0.016	0.000 0.000 F 2.349 2.047 0.302 0.000 0.000 Coper St 2.228 0.000 -0.013 Stopper St 2.379 2.398 0.000 -0.020	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 2.051 0.000 -0.04 H 2.051 0.000 -0.01 H 2.073 2.165 0.000 -0.092	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 0.000 0.000 I 1.867 1.867 0.000	-0.102 (ft ²) 8.802 8.503 0.418 -0.119 (ft ²) 8.329 8.348 0.000 -0.019 (ft ²) 8.818 8.886 0.000	-0.305 (in) 1.253 1.253 -0.358 (in) 0.000 (in) (in) 0.000 0.000	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Varg (fps) = N @ 0.2d N @ 0.	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d 4.42 4.42 0.024	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.72 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0 Water Depth (ff 0.23 To Water Surf, 2.2 Water Depth (ff 0.18
30 ft 35 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper To original Sur To original Sur To original Sur To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft soil Gain, ft r Soil Gain, ft r Soil Gain, ft r Soil Loss, ft	0.000 / / / / / / / / / / / / / / / / /	0.023 0.023 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-0.085 n Gain, ft C 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft 2.320 0.000 -0.069 n Gain, ft	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	-0.007 Avg Q E 2.352 2.313 0.039 0.000 Avg Q E 2.205 2.208 0.000 -0.003 Avg Q E 2.388 2.405 0.000 -0.016 Avg Q	0.000 looper Sta 2.349 2.047 0.302 0.000 looper Sta 2.221 0.000 -0.013 looper Sta 2.379 2.398 0.000 -0.020 looper Sta	0.000 iii Loss, ft G 2.303 1.883 0.420 0.000 iii Loss, ft 2.244 0.000 -0.003 iii Loss, ft G 2.195 2.388 0.000 -0.194 iii Loss, ft	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.01 H 2.073 2.165 0.000 -0.022 -0.04	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 0.000 0.000 I 1.867 1.867 0.000 0.000	-0.102 [t ²] 8.802 8.503 0.418 -0.119 [t ²] 8.329 8.348 0.000 -0.019 [t ²] 8.818 8.8986 0.000 -0.167	-0.305 (in) 1.253 -0.358 (in) (in) 0.000 -0.056 (in) 0.000 -0.502 -0.502	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flow (cf	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d 4.42 4.42 0.024 1.60	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.72 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0 Water Depth (ff 0.23 To Water Surf, 2.2 Water Depth (ff 0.18
30 ft 35 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper To original Sur To original Sur To eroded Sur Clopper To eroded Sur Clopper	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft rface Elev, ft soil Gain, ft r Soil Loss, ft soil Gain, ft r Soil Loss, ft soil Gain, ft r Soil Loss, ft ss-section 9 rface Elev, ft	0.000 / ///////////////////////////////	0.023 0.023 8 1.975 2.070 0.000 -0.095 1.886 0.000 0.000 0.000 8 2.057 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft 2.320 0.000 -0.069 n Gain, ft C	-0.062 0.04 D 2.343 2.339 0.003 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	-0.007 Avg Q E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg Q E 2.388 2.405 0.000 -0.016 Avg Q E	0.000 looper Sid 2.349 2.047 0.302 0.000 Voper Sid 2.221 0.000 -0.013 Voper Sid 2.379 2.398 0.000 -0.020 Voper Sid F	0.000 iii Loss, ft, G 2.303 1.883 0.420 0.000 iii Loss, ft 2.244 2.247 0.000 -0.003 iii Loss, ft G 2.195 2.388 0.000 -0.194 G 4.205 1.55	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.01 H 2.073 2.165 0.000 -0.092 -0.04 H	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 0.000 0.000 I 1.867 1.867 0.000 0.000 0.000 I 1.87	-0.102 (ft ²) 8.802 8.503 0.418 -0.119 (ft ²) 8.329 8.348 8.348 0.000 -0.019 (ft ²) 8.818 8.898 0.000 -0.167 (ft ²) (ft ²)	-0.305 (in) 1.253 -0.358 (in) (in) 0.000 -0.056 (in) 0.000 -0.502 -0.502	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flow (cf	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d 4.42 4.42 0.024 1.60 V @ 0.6d	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d Bed Max Shear Stress (psf) 0.72 V @ 0.8d Stress (psf) 0.56 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0 Water Depth (ff 0.23 To Water Surf, 2.2 Water Depth (ff 0.18 To Water Surf, 2.2
30 ft 35 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper To original Sur To eroded Sur Clopper To eroded Sur Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft rface Elev, ft soil Gain, ft r Soil Loss, ft soil Gain, ft r Soil Loss, ft soil Gain, ft r Soil Loss, ft ss-section 9 rface Elev, ft	0.000 / ///////////////////////////////	0.023 0.023 8 1.975 2.070 0.000 -0.095 1.886 0.000 0.000 0.000 8 2.057 0.000 0.000 0.000 0.000 8 1.946	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.069 n Gain, ft C 2.251 2.320 0.000 -0.069 n Gain, ft C 2.254 2.320 0.000 -0.062 2.254 2.320 0.000 -0.062 2.254 2.320 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 2.264 0.000 -0.062 0.000 -0.062 0.000 -0.062 0.000 -0.062 0.000 -0.062 0.000 -0.062 0.000 -0.062 0.000 -0.062 0.000 -0.062 0.000 -0.062 0.000 0.000 0.000 -0.062 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.000 0.000 0.000 0.0000 0.000 0.0000 0.000 0.0000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.0000 0.000 0.000000	-0.062 0.04 D 2.343 2.339 0.003 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0	-0.007 Avg Q E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg Q E 2.388 2.405 0.000 -0.016 Avg Q E 2.338	0.000 lopper Siz 2.349 2.047 0.302 0.000 lopper Siz 2.221 0.000 -0.013 lopper Siz 2.379 2.398 0.000 -0.020 lopper Siz F 2.290	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.01 H 2.073 2.165 0.000 -0.092 -0.04 H 2.033	0.000 -0.046 I 1.962 2.090 0.000 -0.128 I 1.831 1.831 0.000 0.000 I 1.867 0.000 0.000 0.000 I 1.867 I 1.867 I 1.850	-0.102 (ft ²) 8.802 8.503 0.418 -0.119 (ft ²) 8.329 8.348 0.000 -0.019 (ft ²) 8.818 8.898 0.000 -0.167 (ft ²) 8.568	-0.305 (in) 1.253 -0.358 (in) (in) 0.000 -0.056 (in) 0.000 -0.502 -0.502	Flow (cfs) = V @ 0.2d Vag (fps) = ravg = Flow (cfs) = V @ 0.2d Vag (fps) = ravg = Flow (cfs) = V @ 0.2d Vavg (fps) = Ravg = Flow (cfs) = Ravg = Flow (cfs) = Ravg = Flow (cfs) = Ravg = Flow (cfs) = Flow (cfs	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.60 0.035 1.65 V @ 0.6d 4.42 4.42 0.024 1.60 V @ 0.6d 4.8	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.72 V @ 0.8d Bed Max Shear Stress (psf) 0.56 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0 Water Depth (ff 0.23 To Water Surf, 2.2 Water Depth (ff 0.18 To Water Surf, 2.2
30 ft 35 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft rface Elev, ft r Soil Gain, ft r Soil Coss, ft ss-section 9 rface Elev, ft rface Elev, ft r	0.000 / ///////////////////////////////	0.023 0.023 B 1.975 2.070 0.000 -0.095 B 1.886 0.000 0.000 0.000 0.000 B 2.057 0.000 0.000 0.000 B 1.946 1.946	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft 2.320 0.000 -0.069 n Gain, ft C 2.216 2.218	-0.062 0.04 D 2.343 2.339 0.003 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0	-0.007 Avg Q E 2.352 2.313 0.039 0.000 Avg Q 2.205 2.208 0.000 -0.003 Avg Q E 2.388 2.405 0.000 -0.016 Avg Q E 2.303 2.356	0.000 looper Sid 2.349 2.047 0.302 0.000 looper Sid 2.221 0.000 -0.013 looper Sid 2.379 2.398 0.000 -0.020 looper Sid 2.290 2.402 2	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.01 H 2.073 2.165 0.000 -0.092 -0.04 H 2.033 2.083	0.000 -0.046 I I 1.962 2.090 0.000 -0.128 I I 1.831 1.831 0.000 0.000 I I 1.867 0.000 0.000 I I 1.867 I 1.850	-0.102 [ft ²] 8.802 8.503 0.418 -0.119 [ft ²] 8.329 8.348 0.000 -0.019 [ft ²] 8.818 8.898 0.000 -0.167 [ft ²] 8.668 8.743	-0.305 (in) 1.253 -0.358 -0.358 (in) 0.000 -0.056 (in) 0.000 -0.502 (in) (in) -0.502 -0.	Flow (cfs) = V @ 0.2d Varg (fps) = ravg = Flow (cfs) = V @ 0.2d Varg (fps) = ravg = Flow (cfs) = V @ 0.2d Varg (fps) = ravg = Flow (cfs) = V @ 0.2d Varg (fps) = Flow (cfs) = V @ 0.2d Varg (fps) = Flow (cfs) =	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.60 0.035 1.65 V @ 0.6d 4.42 4.42 0.024 1.60 V @ 0.6d 4.8 4.80	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d Bed Max Shear Stress (psf) 0.72 V @ 0.8d Stress (psf) 0.56 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0 Water Depth (ff 0.23 To Water Surf, 2.2 Water Depth (ff 0.18 To Water Surf, 2.2
30 ft 35 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft rface Elev, ft soil Gain, ft r Soil Loss, ft ss-section 9 rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft Soil Gain, ft Soil Gain, ft	0.000 / ///////////////////////////////	0.023 B B 1.975 2.070 0.000 -0.095 F 1.886 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.000000	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft C 2.251 2.320 0.000 -0.069 n Gain, ft C 2.165 2.218 0.000 -0.052	-0.062 0.04 0.04 2.343 2.339 0.003 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.00000 0.000000	-0.007 Avg Q E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg C E 2.388 2.405 0.000 -0.016 Avg O E 2.333 2.356 0.000 -0.052	0.000 looper Sid 2.349 2.047 0.302 0.000 looper Sid 2.221 0.000 -0.013 looper Sid 2.379 2.398 0.000 -0.020 looper Sid 2.290 2.390 2.398 0.000 -0.020 looper Sid 2.290 2.390 0.0000 0.00000 0.0000 0.0000 0.0000 0.00000 0.000	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.01 H 2.073 2.165 0.000 -0.092 -0.04 H 2.033 2.083 0.000	0.000 -0.046 I I 1.962 2.090 0.000 -0.128 I 1.831 1.831 1.831 0.000 0.000 I I.867 1.867 0.000 0.000 I I.850 1.850 0.000	-0.102 (ft ²) 8.802 8.503 0.418 -0.119 (ft ²) 8.329 8.348 0.000 -0.019 (ft ²) 8.818 8.898 0.000 -0.167 (ft ²) 8.568 8.743 0.000	-0.305 (in) 1.253 -0.358 -0.358 -0.358 -0.358 -0.050 -0.050 -0.502 -	Flow (cfs) = V @ 0.2d Vag (fps) = ravg = Flow (cfs) = V @ 0.2d Vag (fps) = ravg = Flow (cfs) = V @ 0.2d Vavg (fps) = ravg = Flow (cfs) = V @ 0.2d Vavg (fps) = ravg = Flow (cfs) = Flo	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.60 0.035 1.65 V @ 0.6d 4.42 4.42 0.024 1.60 V @ 0.6d 4.8 4.80 0.022	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d V @ 0.8d 0.72 V @ 0.8d V @ 0.8d Stress (psf) 0.56 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ff 0.79 To Water Surf, 2.0 Water Depth (ff 0.23 To Water Surf, 2.2 Water Depth (ff 0.18 To Water Surf, 2.2 Water Depth (ff
30 ft 35 ft		Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur Clopper Cros To original Sur To eroded Sur Clopper To original Sur To eroded Sur Clopper	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 7 rface Elev, ft rface Elev, ft rface Elev, ft soil Gain, ft r Soil Loss, ft ss-section 9 rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft Soil Gain, ft Soil Gain, ft	0.000 / / / / / / / / / / / / / / / / /	0.023 0.023 B 1.975 2.070 0.000 0.000 1.886 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.00000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft C 2.251 2.320 0.000 -0.069 n Gain, ft C 2.165 2.218 0.000 -0.052	-0.062 0.04 0.04 2.343 2.339 0.003 0.000 2.221 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000	-0.007 Avg Q E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg C E 2.388 2.405 0.000 -0.016 Avg O E 2.333 2.356 0.000 -0.052	0.000 looper Sid 2.349 2.047 0.302 0.000 looper Sid 2.221 0.000 -0.013 looper Sid 0.000 -0.020 looper Sid 2.398 0.000 -0.020 looper Sid 2.290 2.398 0.000 -0.020 looper Sid 2.290 2.398 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.020 0.000 -0.020	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.01 H 2.073 2.165 0.000 -0.092 -0.04 H 2.033 2.083 0.000 0.000 0.000	0.000 -0.046 I I 1.962 2.090 0.000 -0.128 I 1.831 1.831 1.831 0.000 0.000 I I.867 1.867 0.000 0.000 I I.850 1.850 0.000	-0.102 (ft ²) 8.802 8.503 0.418 -0.119 7 8.329 8.348 0.000 -0.019 7 8.818 8.986 0.000 -0.167 8.858 8.743 0.000 -0.175 -0.175	-0.305 (in) 1.253 -0.358 -0.358 -0.358 -0.050 -0.050 -0.502 -	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flow (cf	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.60 0.035 1.65 V @ 0.6d 4.42 4.42 0.024 1.60 V @ 0.6d 4.8 4.80 0.022 1.67	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d V @ 0.8d 0.72 V @ 0.8d V @ 0.8d Stress (psf) 0.56 V @ 0.8d	0.63 To Water Surf, 1.5 Water Depth (ft 0.79 To Water Surf, 2.0 Water Depth (ft 0.23 To Water Surf, 2.2 Water Depth (ft 0.18 To Water Surf, 2.2 Water Depth (ft 0.17
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30 ft 35 ft 40 ft	pezoidal Analysis	Clopper To original Sur To eroded Sur To original Sur To eroded Sur Clopper Soil Lo Clopper	r Soil Loss, ft ss-section 6 frace Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft Soil Gain, ft r Soil Loss, ft Soil Gain, ft r Soil Loss, ft ss-section 8 rface Elev, ft Soil Gain, ft r Soil Loss, ft ss-section 9 rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft Soil Gain, ft r Soil Loss, ft Soil Loss, ft Soil Loss, ft rface Elev rface Elev rface Elev	0.000 / // // // // // // // // // // // // // //	0.023 0.023 0 0.00	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft 2.320 0.000 -0.069 n Gain, ft 2.218 0.000 -0.052 2.218 0.000 -0.052 n Gain, ft 0.000 -0.052 n Gain, ft 0.000 -0.052	-0.062 0.04 0.04 2.343 2.339 0.003 0.000 0.10 2.221 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg C E 2.388 2.405 0.000 -0.016 E 2.388 2.405 0.000 -0.016 E 2.335 0.000 -0.016 E 2.335 0.000 -0.052 Avg C 0.000 0.0052 Avg C 0.000 0.0052 Avg C 0.000 0.0052 Avg C 0.000 0.0052 Avg C 0.000 0.0052 Avg C 0.000 0.0052 Avg C 0.000 0.0052 Avg C 0.0000 0.000 0.00000 0.0000 0.0000 0.0000 0.0000 0.000000	0.000 lopper Sic F 2.349 2.047 0.302 0.000 lopper Sic 2.221 0.000 -0.013 lopper Sic 2.379 2.398 0.000 -0.020 F 2.379 2.398 0.000 -0.020 IOPPER Sic 0.000 -0.112 IOPPER Sic 0.012 -0.017	0.000 iii Loss, ft G 2.303 1.883 0.420 0.000 iii Loss, ft 2.244 2.247 0.000 -0.003 iii Loss, ft G 2.195 2.388 0.000 -0.194 G 2.267 2.326 0.000 -0.059 iii Loss, ft 0.015 -0.018 0.015	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 2.051 0.000 -0.04 H 2.051 2.051 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 -0.04 H 2.051 0.000 0.000 -0.04 H 2.051 0.000 0.000 -0.04 H 2.051 2.155 0.000 0.000 -0.04 H 2.051 2.155 0.000 0.000 -0.04 H 2.053 0.000 0.000 -0.04 H 2.053 0.000 0.000 0.000 -0.04 H 2.053 0.0000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0	0.000 -0.046 - 1 - 1.962 2.090 0.000 -0.128 - 1 1.831 1.831 0.000 0.000 - 0.000 1 1.867 1.867 0.0000 0.000000	-0.102 [#²] 8.802 8.503 0.418 -0.119 8.329 8.348 0.000 -0.019 [#²] 8.818 8.986 0.000 -0.167 [#²] 8.568 8.743 0.000 -0.175 Voll [#²] 8.534 8.745	-0.305 (in) 1.253 -0.358 -0.358 -0.358 -0.000 -0.056 -0.056 -0.050 -0.050 -0.502 -0.000 -0.502 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.558 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.558 -0.000 -0.000 -0.558 -0.000 -0.558 -0.000 -0.000 -0.000 -0.558 -0.000 -	Flow (cfs) = V @ 0.2d Vag ((ps) = navg = Flow (cfs) = V @ 0.2d V	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d 4.42 4.42 0.024 1.60 V @ 0.6d 4.8 4.80 0.022 1.67 Soltom Ga oper Soil Lo X-	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d V @ 0.8d 0.72 V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d Stress (psf) 0.56 V @ 0.8d Note: 100 million (psi) 0.56 V @ 0.8d Note: 100 million (psi) 0.56 Note: 100 million (psi) 0.54 Note: 100 million (psi) 0.54	0.63 To Water Surf, 1.5 Water Depth (ft 0.79 To Water Surf, 1 2.0 Water Depth (ft 0.23 To Water Surf, 1 2.2 Water Depth (ft 0.18 To Water Surf, 1 2.2 Water Depth (ft 0.17 0.000 -0.043 5
30 ft 35 ft 40 ft	pezoidal Analysis	Clopper To original Sur To eroded Sur Clopper To original Sur To original Sur To eroded Sur Clopper To original Sur To eroded Sur Clopper To original Sur To eroded Sur Clopper Soil Lo Clopper	r Soil Loss, ft ss-section 6 rface Elev, ft rface Elev, ft Soil Gain, ft r Soil Loss, ft Soil Gain, ft r Soil Loss, ft Soil Gain, ft r Soil Loss, ft ss-section 8 rface Elev, ft rface Elev, ft soil Gain, ft r Soil Loss, ft soil Gain, ft r Soil Loss, ft soil Loss, ft rface Elev ftace Elev ftace Elev ftace Elev ftace Elev ftace Elev	0.000 / // // // // // // // // // // // // // //	-0.023 -0.023 -0.025 -0.000 -0.095 -0.095 -0.000 -0.095 -0.000 -0	-0.085 n Gain, ft 2.224 2.287 0.000 -0.062 2.087 2.106 0.000 -0.020 n Gain, ft 2.320 0.000 -0.069 n Gain, ft 2.218 0.000 -0.052 2.218 0.000 -0.052 n Gain, ft 0.000 -0.052 x-165 2.218 0.000 -0.052 x-165 0.0000 -0.052 x-165 0.000 -0.052 x-165 0.055 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-0.062 0.04 0.04 2.343 2.339 0.003 0.000 0.10 2.221 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00	-0.007 Avg C E 2.352 2.313 0.039 0.000 Avg C E 2.205 2.208 0.000 -0.003 Avg C E 2.388 2.405 0.000 -0.016 E 2.388 2.405 0.000 -0.016 E 2.335 0.000 -0.016 E 2.335 0.000 -0.016 E 2.335 0.000 -0.016 E 2.335 0.000 -0.016 E 2.335 0.000 -0.016 E 2.335 0.000 -0.016 E 2.335 0.000 -0.016 E 2.335 0.000 -0.016 E 2.355 0.000 -0.052 E 2.355 0.000 -0.052 E 2.355 0.000 -0.052 E 2.355 0.000 -0.052 E 2.355 0.000 -0.016 E 2.355 0.000 -0.052 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.0000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.016 E 2.355 0.000 -0.005 E 2.355 0.000 -0.005 E 2.355 0.000 -0.005 E 2.355 0.000 -0.005 E 2.355 0.000 -0.005 E 2.355 0.000 -0.005 E 2.355 0.000 -0.000 -0.005 E 2.355 0.000 -0.0000 -0.000000 -0.0000 -0.00000 -0.00000 -0.0000 -0.000000	0.000 lopper Sic F 2.349 2.047 0.302 0.000 lopper Sic 2.221 0.000 -0.013 lopper Sic 2.379 2.398 0.000 -0.020 IO 2.398 0.000 -0.020 IO 2.398 0.000 -0.020 IO 2.398 0.000 -0.020 IO 2.398 0.000 -0.020 IO 2.398 0.000 -0.020 IO 2.398 0.000 -0.020 IO 2.398 0.000 IO 2.398 0.000 IO 2.398 0.000 IO 2.398 0.000 IO 2.398 0.000 IO 2.398 IO 2.398 IO 2.398 IO 2.398 IO 2.399 IO 2.398 IO 2.399 IO 2.399 IO 2.399 IO 2.399 IO 2.399 IO 2.399 IO 2.399 IO 2.399 IO 2.399 IO 2.399 IO 2.390 IO 2.390 IO 2.399 IO 2.399 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.390 IO 2.402 IO IO IO IO IO IO IO IO IO IO	0.000 iii Loss, ft G 2.303 1.883 0.420 0.000 iii Loss, ft 2.244 2.247 0.000 -0.003 iii Loss, ft G 2.195 2.388 0.000 -0.194 G 2.267 2.326 0.000 -0.059 iii Loss, ft 0.015 -0.018 0.015	0.000 -0.010 -0.03 H 2.172 2.080 0.092 -0.04 H 2.051 2.051 0.000 -0.04 H 2.053 2.051 0.000 -0.04 H 2.053 2.053 0.000 -0.04 H 2.053 2.053 0.000 -0.04 H 2.053 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.051 2.051 0.000 -0.04 H 2.051 2.051 0.000 -0.04 H 2.051 2.051 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.053 0.000 -0.04 H 2.055 0.000 -0.04 H 2.055 0.000 -0.04 H 2.055 0.000 -0.04 H 2.055 0.000 -0.04 H 2.053 0.000 -0.04 H 2.063 0.000 -0.04 H 2.063 0.000 -0.04 H 2.063 0.000 -0.04 H 2.063 0.000 -0.04 H 2.063 0.000 -0.04 H 2.063 0.000 -0.04 H 2.063 0.000 -0.04 -	0.000 -0.046 - 1 - 1.962 2.090 0.000 -0.128 - 1 1.831 1.831 0.000 0.000 - 0.000 1 1.867 1.867 0.0000 0.000000	-0.102 [#²] 8.802 8.503 0.418 -0.119 8.329 8.348 0.000 -0.019 [#²] 8.818 8.986 0.000 -0.167 [#²] 8.668 8.743 0.000 -0.175 Voll [#²] 8.634	-0.305 (in) 1.253 -0.358 -0.358 -0.358 -0.000 -0.056 -0.050 -0.050 -0.502 -0.000 -0.502 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.525 -0.000 -0.558 -0.000 -0.000 -0.000 -0.558 -0.000 -	Flow (cfs) = V @ 0.2d Vag ((ps) = navg = Flow (cfs) = V @ 0.2d V	2.27 V @ 0.6d 0.86 0.329 1.35 V @ 0.6d 3.6 0.035 1.65 V @ 0.6d 4.42 4.42 0.024 1.60 V @ 0.6d 4.8 4.80 0.022 1.67 Soltom Ga oper Soil Lo X-	1.96 V @ 0.8d Bed Max Shear Stress (psf) 2.46 V @ 0.8d U @ 0.8d 0.72 V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d U @ 0.8d Ded Max Shear Stress (psf) 0.56 V @ 0.8d Ded Max Shear Stress (psf) 0.54 Ded Max Shear Stress (psf) Ded Max Shear Ded Max Shear Stress (psf) Ded Max Shear Stress (psf) Ded Max Shear Ded Max She	0.63 To Water Surf, 1 1.5 Water Depth (ft 0.79 To Water Surf, 1 2.0 Water Depth (ft 0.23 To Water Surf, 1 2.2 Water Depth (ft 0.18 To Water Surf, 1 2.2 Water Depth (ft 0.17 0.000 -0.043 5 40





Check Structure Installation over Bare Soil





Initial Flow & Upstream Ponding





Increased Ponding and Overtopping



End-of-test and Post-test condition.



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Project: ASTM D 7208: Standard Test Method for Determination of Temporary Ditch Check Performance in Protecting Earthen Channels from Stormwater-Induced Erosion.

Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

	Client:	GSWCC			Product:	Silt Fence +	Steel Posts & Wire	e Fence
	Flow:	0.5 cfs for 3	0 minutes		Test Date:	7/18/2012		
		Soil Gain,	Soil Loss,	Soil Gain,	Soil Loss,			
	Station, ft	in	in.	ft ²	ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	0.00	0.00	-0.078	0.91	3.03	0.24
	5	0.00	0.00	0.01	-0.037	1.54	2.13	0.40
	10	0.00	0.00	0.00	-0.161	1.77	1.82	0.46
	15	0.00	0.00	0.00	-0.105	1.57	1.63	0.41
21" High	20	0.00	0.00	0.01	-0.087	3.07	1.87	0.80
Check	25	0.00	0.00	0.03	-0.035	4.88	0.39	1.27
Location	30	0.00	0.00	0.13	-0.207	1.93	2.75	0.50
	35	0.00	0.00	0.06	-0.181	3.27	2.86	0.85
	40	0.01	-0.44	0.00	-0.193	1.69	2.98	0.44
			•	Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				0.77	-4.14	8.60	9.00	-48.14

	Flow:	0.5 cfs for 3	0 minutes		Test Date:	7/20/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	0.00	0.00	-0.163	1.18	2.96	0.31
	5	0.00	0.00	0.00	-0.177	1.89	2.91	0.49
	10	0.00	0.00	0.00	-0.173	1.77	2.81	0.46
	15	0.00	0.00	0.09	-0.086	4.06	2.99	1.05
21" High	20	0.00	0.00	0.15	-0.068	5.04	0.78	1.31
Check	25	0.00	0.00	0.18	-0.031	6.69	0.72	1.74
Location	30	0.00	0.00	0.01	-0.432	3.98	2.75	1.03
	35	0.00	0.00	0.13	-0.119	1.93	3.07	0.50
	40	0.58	-0.08	0.22	-0.042	-0.08	3.06	-0.02
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³ 2.90	Loss, ft ³ -4.78	Area, ft ² 11.02	Accretion Index 26.35	Soil Loss Index -43.40

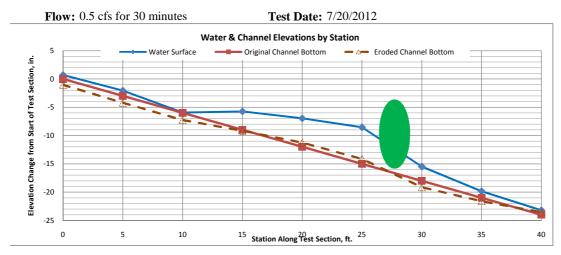
CJS 7/23/2012

Quality Review / Date



Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

Client: GSWCC Product: Silt Fence + Steel Posts & Wire Fence Flow: 0.5 cfs for 30 minutes Test Date: 7/18/2012 Water & Channel Elevations by Station Original Channel Bottom 5 Water Surface Eroded Channel Bottom Elevation Change from Start of Test Section, ft. 0 -5 -10 -15 -20 -25 0 5 10 30 35 40 ¹⁵ Station Along Test Section, ft. ²⁵



1			Date:	7/18/12							9	tart Time:			5:00 PM	End Time:	5:30 PM	
i	ASTM D7208			Sandy C	lay							Flow (cfs):			0.50	Slope:	5:30 PM	
60 ft long	g flume 40 ft t	est section		Silt Fenc	-		Ins	tallation:	Steel Po:			, <u>-</u> /·						
		L wide flume					ļ					TEST D	ATA					
1	1 2 3		Outlet Weir								Weir						Channel Targets	
	FLOW		Water Depth, in								1.50						1.00	
eir width (f	(ft) = 2	Wa	ater Velocity, ft/s								0.00						0.00	
0 ft C	DEFGH		Flow Rate, cfs	0.00							0.00	0.00					0.00	
			Cross-section 1	Α	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		To original	Surface Elev, ft	1.010	1.506	2.034	2.457	2.493	2.457	1.978	1.467	0.991	7.760			3.03		2.4
	*	To eroded	Surface Elev, ft	1.010	1.506	2.034	2.520	2.516	2.500	1.978	1.467	0.991	7.838		Vavg (fps) =	3.03	Bed Max Shear	Water Depth (ft)
			SoilGain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.020	Stress (psf)	
		Clop	oper Soil Loss, ft	0.000	0.000	0.000	-0.062	-0.023	-0.043	0.000	0.000	0.000	-0.078	-0.233	Flow (cfs) =	0.50	0.24	0.08
5 ft				A	vg Bottor		0.00		Avg C	lopper Sc	il Loss, ft	-0.01						
			Cross-section 2	A	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		-	Surface Elev, ft	0.968	1.509	2.005	2.467	2.510	2.421	1.991	1.555	1.119	7.818			2.13		2.4
		To eroded	Surface Elev, ft	0.968	1.509	2.005	2.516	2.523	2.408	1.991	1.555	1.119	7.847		Vavg (fps) =	2.13	Bed Max Shear Stress (psf)	Water Depth (ft)
			SoilGain, ft	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0.000	0.009	0.026	navg =	0.040		
40.4		Clop	oper Soil Loss, ft	0.000	0.000	0.000	-0.049	-0.013	0.000	0.000	0.000	0.000	-0.037	-0.112	Flow (cfs) =	0.50	0.40	0.13
10 ft					vg Bottor	n Gain, rt C	0.00 D	-	Avg C	lopper Sc		-0.01	re 21	P. 1	Venni	V @ 0.04	Vend	To Webs Out 4
			Surface Elev, ft	A 0.892	B 1.348	1.834	2.290	E 2.336	F 2.329	G 1.804	H 1.316	0.794	[ft ²] 7.128	[in]	V @ 0.2d	V @ 0.6d 1.82	V @ 0.8d	To Water Surf, f 2.3
		-	Surface Elev, ft	0.892	1.348	1.834	2.290	2.336	2.329	1.804	1.316	0.794	7.128		Vavg (fps) =	1.82	Dedde Ci	2.0
		10 cioueu	SoilGain, ft	0.092	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.794	0.000	0.000	navg (ips) =	0.051	Bed Max Shear Stress (psf)	Water Depth (ft
		Clor	oper Soil Loss, ft	0.000	0.000	0.000	-0.154	-0.128	-0.023	0.000	0.000	0.000	-0.161	-0.482	Flow (cfs) =	0.051	0.46	0.15
15 ft		CiOL	.poi 00ii 2033, Il		Vg Bottor		0.00	0.120		lopper Sc		-0.03	0.101	0.402	. iow (crs) =	0.00	0.40	0.15
			Cross-section 4	A	B	C C	0.00 D	E	F	G G	H LUSS, IL	-0.03	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
			Surface Elev, ft	1.129	1.617	2.090	2.556	2.612	2.539	2.047	1.591	1.112	8.159	1		1.63		2.6
		-	Surface Elev, ft	1.129	1.617	2.096	2.644	2.697	2.556	2.060	1.591	1.112	8.264		Vavg (fps) =	1.63	Red May Sheer	
			SoilGain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.053	Bed Max Shear Stress (psf)	Water Depth (ft)
		Cloc	oper Soil Loss, ft	0.000	0.000	-0.007	-0.089	-0.085	-0.016	-0.013	0.000	0.000	-0.105	-0.315	Flow (cfs) =	0.50	0.41	0.13
20 ft					vg Bottor		0.00			lopper So		-0.02			. (,			
			Cross-section 5	A	в	С	D	Е	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		To original	Surface Elev, ft	0.797	1.237	1.752	2.208	2.297	2.244	1.781	1.302	0.830	6.876			1.87		2.1
		To eroded	Surface Elev, ft	0.797	1.237	1.837	2.270	2.316	2.260	1.755	1.302	0.830	6.954		Vavg (fps) =	1.87	Bed Max Shear	
1																		
1			SoilGain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.000	0.009	0.026	navg =	0.072	Stress (psf)	water Depth (It)
		Clop	SoilGain, ft oper Soil Loss, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.000	0.009	0.026	navg = Flow (cfs) =	0.072	Stress (psf) 0.80	0.26
25 ft		Clop		0.000		-0.085			-0.016		0.000				-			
25 ft		. <u> </u>		0.000	0.000	-0.085	-0.062		-0.016	0.000	0.000	0.000			-			0.26
25 ft			oper Soil Loss, ft	0.000 A	0.000	-0.085 n Gain, ft	-0.062 0.00	-0.020	-0.016 Avg C	0.000 lopper Sc	0.000 il Loss, ft	0.000	-0.087	-0.262	Flow (cfs) =	0.50	0.80	0.26
25 ft		C To original	oper Soil Loss, ft Cross-section 6	0.000 A A	0.000 Vg Bottor B	-0.085 n Gain, ft C	-0.062 0.00 D	-0.020 E	-0.016 Avg C F	0.000 Clopper Sc	0.000 il Loss, ft H	0.000 -0.02 I	-0.087 [ft ²]	-0.262	Flow (cfs) =	0.50 V @ 0.6d	0.80 V @ 0.8d Bed Max Shear	0.26 To Water Surf, f 2.1
25 ft		C To original	oper Soil Loss, ft Cross-section 6 Surface Elev, ft	0.000 A 1.017	0.000 Nyg Bottor B 1.460	-0.085 m Gain, ft C 1.923	-0.062 0.00 D 2.392	-0.020 E 2.520	-0.016 Avg C F 2.490	0.000 Copper Sc G 2.047	0.000 il Loss, ft H 1.588	0.000 -0.02 I 1.109	-0.087 [ft ²] 7.804	-0.262	Flow (cfs) =	0.50 V @ 0.6d 0.39	0.80 V @ 0.8d	0.26 To Water Surf, f 2.1
25 ft		To original To eroded	Cross-section 6 Surface Elev, ft Surface Elev, ft	0.000 A 1.017 1.017	0.000 Nyg Bottor B 1.460 1.460	-0.085 n Gain, ft C 1.923 1.903	-0.062 0.00 D 2.392 2.434	-0.020 E 2.520 2.539	-0.016 Avg C F 2.490 2.490	0.000 lopper Sc G 2.047 1.998	0.000 il Loss, ft H 1.588 1.581	0.000 -0.02 I 1.109 1.109	-0.087 [ft ²] 7.804 7.812	-0.262 [in]	Flow (cfs) =	0.50 V @ 0.6d 0.39 0.39	0.80 V @ 0.8d Bed Max Shear	0.26 To Water Surf, f 2.1
25 ft		To original To eroded	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft	0.000 A 1.017 1.017 0.000 0.000	0.000 B 1.460 1.460 0.000 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020	-0.062 0.00 D 2.392 2.434 0.000 -0.043	-0.020 E 2.520 2.539 0.000	-0.016 Avg C F 2.490 2.490 0.000	0.000 G 2.047 1.998 0.049	0.000 il Loss, ft H 1.588 1.581 0.007 0.000	0.000 -0.02 I 1.109 1.109 0.000	-0.087 [ft ²] 7.804 7.812 0.027	-0.262 [in] 0.082	Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	0.50 V @ 0.6d 0.39 0.39 0.468	0.80 V @ 0.8d Bed Max Shear Stress (psf)	0.26 To Water Surf, f 2.1 Water Depth (ft)
		To original To eroded Clop	pper Soil Loss, ft Cross-section 6 Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7	0.000 A 1.017 1.017 0.000 0.000 A A	0.000 B 1.460 1.460 0.000 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D	-0.020 E 2.520 2.539 0.000 -0.020 E	-0.016 Avg C F 2.490 2.490 0.000 0.000 Avg C F	0.000 lopper Sc 2.047 1.998 0.049 0.000 clopper Sc G	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H	0.000 -0.02 I 1.109 0.000 0.000 -0.01 I	-0.087 [ft²] 7.804 7.812 0.027 -0.035 [ft²]	-0.262 [in] 0.082	Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	0.50 V @ 0.6d 0.39 0.39 0.468 0.32 V @ 0.6d	0.80 V @ 0.8d Bed Max Shear Stress (psf)	0.26 To Water Surf, 1 2.1 Water Depth (ft 0.41 To Water Surf, 1
		To original To eroded Clop To original	cross-section 7 Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft	0.000 A 1.017 1.017 0.000 0.000 A A 2.569	0.000 Wg Bottor B 1.460 0.000 0.000 Wg Bottor B 2.897	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878	-0.016 Avg C F 2.490 0.000 0.000 Avg C F 3.868	0.000 lopper Sc 2.047 1.998 0.049 0.000 lopper Sc G 3.455	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927	0.000 -0.02 I 1.109 0.000 0.000 -0.01 I 2.457	-0.087 [ft²] 7.804 7.812 0.027 -0.035 [ft²] 13.439	-0.262 [in] 0.082 -0.105	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41
		To original To eroded Clop To original	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft Surface Elev, ft Surface Elev, ft	0.000 A A 1.017 1.017 0.000 0.000 A A 2.569 2.569	0.000 Wy Bottor B 1.460 1.460 0.000 0.000 Wy Bottor B 2.897 2.877	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 3.389	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901	-0.016 Avg C F 2.490 0.000 0.000 Avg C F 3.868 4.121	0.000 G 2.047 1.998 0.049 0.000 Ropper Sc G 3.455 3.360	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 2.972	0.000 -0.02 I 1.109 0.000 0.000 -0.01 I 2.457 2.457	-0.087 [ff ²] 7.804 7.812 0.027 -0.035 [ff ²] 13.439 13.515	-0.262 [in] 0.082 -0.105 [in]	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 - 2.75	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7
		To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft Cross-section 7 Surface Elev, ft Surface Elev, ft SoilGain, ft	0.000 A A 1.017 0.000 0.000 A A 2.569 2.569 0.000	0.000 Wy Bottor B 1.460 0.000 0.000 0.000 Wy Bottor B 2.897 2.877 0.020	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 3.389 0.030	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720 0.115	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000	-0.016 Avg C F 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000	0.000 lopper Sc 2.047 1.998 0.049 0.000 lopper Sc G 3.455 3.360 0.095	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 2.972 0.000	0.000 -0.02 I 1.109 0.000 0.000 -0.01 I 2.457 2.457 0.000	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131	-0.262 [in] 0.082 -0.105 [in] 0.394	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 2.75 0.036	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf)	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft)
30 ft		To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft Surface Elev, ft Surface Elev, ft	0.000 A 1.017 1.017 0.000 0.000 A 2.569 2.569 0.000 0.000	0.000 Wg Bottor B 1.460 0.000 0.000 Wg Bottor B 2.897 2.877 0.020 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 3.389 0.030 0.000	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720 0.115 0.000	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901	-0.016 Avg C F 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253	0.000 lopper Sc 2.047 1.998 0.049 0.000 lopper Sc G 3.455 3.360 0.095 0.000	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 2.972 0.000 -0.046	0.000 -0.02 I 1.109 0.000 -0.01 I 2.457 2.457 0.000 0.000	-0.087 [ff ²] 7.804 7.812 0.027 -0.035 [ff ²] 13.439 13.515	-0.262 [in] 0.082 -0.105 [in]	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 - 2.75	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7
		To original To eroded Clop To original To eroded Clop	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft	0.000 A A 1.017 1.017 0.000 0.000 A A 2.569 2.569 0.000 0.000 A	0.000 Wg Bottor B 1.460 1.460 0.000 0.000 Wg Bottor 2.897 2.877 0.020 0.000 Wg Bottor	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 3.389 0.030 0.000 n Gain, ft	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720 0.115 0.000 0.03	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023	-0.016 Avg C F 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C	0.000 Ropper Sc 2.047 1.998 0.049 0.000 Ropper Sc 3.455 3.360 0.095 0.000 Ropper Sc	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 2.972 0.000 -0.046 il Loss, ft	0.000 -0.02 I 1.109 0.000 0.000 -0.01 I 2.457 2.457 0.000 0.000 -0.04	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 	-0.262 [in] 0.082 -0.105 [in] 0.394 -0.620	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = N @ 0.2d V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.50 ∨ @ 0.6d 0.39 0.468 0.32 ∨ @ 0.6d 2.75 2.75 0.036 0.88	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16
30 ft		To original To eroded Clop To original To eroded Clop	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 2.569 0.000 0.000 0.000 A A	0.000 Wg Bottor B 1.460 0.000 0.000 Wg Bottor B 2.897 2.877 0.020 0.000 Wg Bottor B	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 3.389 0.030 0.000 n Gain, ft C	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720 0.115 0.000 0.03 D	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 C	-0.016 Avg C F 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F	0.000 G 2.047 1.998 0.049 0.000 G 0.000 3.455 3.360 0.095 0.000 C 0 C	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 2.972 0.000 -0.046 il Loss, ft H	0.000 -0.02 I 1.109 0.000 0.000 -0.01 I 2.457 2.457 0.000 0.000 -0.04 I	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²]	-0.262 [in] 0.082 -0.105 [in] 0.394	Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 0.036 0.88 V @ 0.6d	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf)	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f
30 ft		To original To eroded Clop To original To eroded Clop Clop To original	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft Surface Elev, ft	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 2.569 0.000 0.000 A A 2.654	0.000 Wg Bottor B 1.460 0.000 0.000 0.000 Wg Bottor B 2.897 0.020 0.000 Wg Bottor B 2.956	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 3.389 0.030 0.000 n Gain, ft C 3.494	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720 0.115 0.000 0.033 D 3.835	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 E E 4.016	-0.016 Avg C F 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029	0.000 G G 2.047 1.998 0.049 0.000 G G 3.455 3.360 0.095 0.000 G 0.000 G G 3.655	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 2.972 0.000 -0.046 il Loss, ft H 3.268	0.000 -0.02 1 1.109 0.000 0.000 -0.01 1 2.457 2.457 0.000 0.000 -0.04 1 2.799	-0.087 [ft²] 7.804 7.812 0.027 -0.035 [ft²] 13.439 13.515 0.131 -0.207 [ft²] 14.022	-0.262 [in] 0.082 -0.105 [in] 0.394 -0.620	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 2.75 0.036 0.88 V @ 0.6d 2.86	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16
30 ft		To original To eroded Clop To original To eroded Clop Clop To original	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft Surface Elev, ft Surface Elev, ft	0.000 A 1.017 1.017 0.000 0.000 A A 2.569 0.000 0.000 A A 2.654 2.654	0.000 Wg Bottor B 1.460 1.460 0.000 0.000 Wg Bottor B 2.897 2.877 0.020 0.000 Wg Bottor B 2.956 2.976	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 3.389 0.030 0.000 n Gain, ft C 3.494 3.537	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720 0.115 0.000 0.03 D 3.835 3.835 3.911	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 E E 4.016 4.137	-0.016 Avg C F 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101	0.000 dopper Sc G 2.047 1.998 0.049 0.000 dopper Sc G 3.455 3.360 0.095 0.000 dopper Sc G 3.655 3.694	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 2.972 0.000 -0.046 il Loss, ft H 3.268 3.182	0.000 -0.02 I 1.109 1.109 0.000 0.000 -0.01 I 2.457 2.457 0.000 0.000 -0.04 I 2.799 2.808	-0.087 [ff ²] 7.804 7.812 0.027 -0.035 [ff ²] 13.439 13.515 0.131 -0.207 [ff ²] 14.022 14.146	-0.262 [in] 0.082 -0.105 [in] 0.394 -0.620 [in]	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 2.75 0.036 0.88 V @ 0.6d 2.86 - 2.86	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9
30 ft		To original To eroded Clop To original To eroded Clop Clop To original To eroded	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft SoilGain, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft	0.000 A A 1.017 1.017 0.000 0.000 0.000 A A 2.569 0.000 A A 2.569 0.000 A A 2.569 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.	0.000 B 1.460 1.460 0.000 0.000 B 2.897 2.877 0.020 0.000 B 2.937 0.020 0.000 B 2.956 6 2.956 0.000	-0.085 n Gain, ft 1.923 1.903 0.020 0.000 n Gain, ft C C 3.419 0.030 0.000 n Gain, ft 3.389 0.030 0.000 n Gain, ft 3.389 0.030 0.0000 0.000 0.000 0.000 0.0000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.000000	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720 0.015 0.000 0.03 D 3.835 3.911 0.000	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 0.000 E 4.016 4.137 0.000	-0.016 Avg C F 2.490 0.000 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000	0.000 lopper Sco 2.047 1.998 0.049 0.000 0.000 0.095 0.000 0.095 0.000 0.005 0.000 0.000 0.005 0.000 0.005 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000	0.000 ii Loss, ft H 1.588 1.581 0.007 0.000 0.000 0.000 0.046 H 2.927 0.000 -0.046 H 3.268 3.182 0.085	0.000 -0.02 I 1.109 0.000 0.000 0.000 1 2.457 0.000 0.000 0.000 1 2.457 0.000 0.000 1 2.808 0.000	-0.087 [ft²] 7.804 7.812 0.027 -0.035 [ft²] 13.439 13.515 0.131 -0.207 [ft²] 14.022 14.146 0.057	-0.262 (in) (in) 0.082 (in) (in) 0.394 (in) (in) (in) 0.394 (in) 0.171	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = navg =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 2.75 0.036 0.88 V @ 0.6d 2.86 2.86 0.049	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 3.9 Water Depth (ft)
30 ft 35 ft		To original To eroded Clop To original To eroded Clop Clop To original To eroded	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft Surface Elev, ft Surface Elev, ft	0.000 A A 1.017 1.017 0.000 0.000 A A 2.569 0.000 0.000 A A 2.654 2.654 0.000 0.000 0.000	0.000 B 1.460 0.000 0.000 0.000 B 2.897 0.020 0.000 8 8 2.956 2.976 0.000 0.000 0.000 0.000 0.000 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 0.030 0.000 n Gain, ft C 3.439 0.030 0.000 n Gain, ft C 3.439 0.030 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000	-0.062 0.00 2.392 2.434 0.000 -0.043 0.01 0.01 0.03 0.0115 0.000 0.03 0.03 0.03 0.03 0.03 0.03 0.	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 E E 4.016 4.137	-0.016 Avg C F 2.490 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 0.000 0.007	0.000 lopper Sco 2.047 1.998 0.049 0.000 lopper Sco 3.360 0.095 0.000 iopper Sco G 3.655 3.694 0.000 0.039	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 2.972 0.000 -0.046 il Loss, ft H 3.268 3.182 0.085 0.000	0.000 0.02 1 1.109 0.000 0.000 0.000 1 2.457 0.000 0.000 0.000 1 2.457 0.000 0.000 1 2.457 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0	-0.087 [ff ²] 7.804 7.812 0.027 -0.035 [ff ²] 13.439 13.515 0.131 -0.207 [ff ²] 14.022 14.146	-0.262 [in] 0.082 -0.105 [in] 0.394 -0.620 [in]	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 2.75 0.036 0.88 V @ 0.6d 2.86 - 2.86	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9
30 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop	Cross-section 6 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft Surface Elev, ft SoilGain, ft Surface Elev, ft SoilGain, ft	0.000 A A 1.017 1.017 0.000 0.000 A A 2.569 0.000 0.000 A A 2.654 0.000 0.000 A A 2.554 0.000 0.000 A A 2.554 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0	0.000 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 0.030 0.000 n Gain, ft 3.389 0.030 0.000 n Gain, ft 0.000 0.000 n Gain, ft 0.030 0.000 n Gain, ft 0.0300 0.0300 0.0300 0.0300 0.0300000000	-0.062 0.00 2.392 2.434 0.000 -0.043 0.01 3.835 3.720 0.115 0.000 0.03 3.835 3.391 0.000 0.03 3.911 0.000 0.0075 0.01	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 E 4.016 4.137 0.000 -0.121	-0.016 Avg C F 2.490 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 0.072 Avg C	0.000 lopper Sco 2.047 1.998 0.049 0.000 lopper Sco 3.360 0.095 0.000 0.095 3.655 3.694 0.000 0.039	0.000 il Loss, ft 1.588 1.581 0.007 0.000 il Loss, ft H 2.927 0.000 -0.046 il Loss, ft H 3.268 3.162 0.008 0.000 il Loss, ft	0.000 -0.02 I 1.109 0.000 -0.01 2.457 0.000 0.000 0.000 1. 2.457 0.000 0.000 1. 2.457 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.000	-0.087 [ft²] 7.804 7.812 0.027 -0.035 [ft²] 13.439 13.515 0.131 -0.207 [ft²] 14.022 14.146 0.057 -0.181]	-0.262 (in) (0.082 -0.105 (in) (in) -0.620 (in) (in) (0.171 -0.543	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 0.036 0.88 V @ 0.6d 2.86 0.88 V @ 0.6d 2.86 0.049 1.56	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 0.27
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop	Cross-section 8 Surface Elev, ft Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 0.000 0.000 A A 2.654 0.000 0.000 A A 2.654 0.000 A A 2.554 0.000 A A A 2.555 0.000 A A A A A A A A A A A A A	0.000 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 0.030 0.000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.0000 0.000000	-0.062 0.00 2.392 2.434 0.000 -0.043 0.01 3.835 3.720 0.115 0.000 0.03 3.835 3.911 0.000 -0.075 0.01 D	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 E 4.016 4.137 0.000 -0.121 E	-0.016 Avg C F 2.490 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F	0.000 lopper Sco 2.047 1.998 0.049 0.000 lopper Sco 3.360 0.095 0.000 0.095 3.655 3.694 0.000 0.039 0.000 0.039	0.000 il Loss, ft H 1.588 1.581 0.007 0.000 il Loss, ft H 3.268 3.182 0.005 0.000 il Loss, ft H	0.000 0.02 1 1.109 0.000 0.000 0.000 1 2.457 0.000 0.000 0.000 1 2.457 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.	-0.087 [ft²] 7.804 7.812 0.027 -0.035 (ft²] 13.439 13.515 0.131 -0.207 (ft²] 14.022 14.146 0.057 -0.181 -0.181 -0.057 -0.181 -0.181 -0.057 -0.181 -0.181 -0.057 -0.181	-0.262 (in) (in) 0.082 (in) (in) 0.394 (in) (in) (in) 0.394 (in) 0.171	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = navg =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 2.75 0.036 0.88 V @ 0.6d 2.86 0.049 1.56 V @ 0.6d	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 0.27 To Water Surf, f
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded	Cross-section 6 Surface Elev, ft SollGain, ft SollGain, ft SollGain, ft Cross-section 7 Surface Elev, ft SollGain, ft SollGain, ft SollGain, ft Surface Elev, ft Surface Elev, ft SollGain, ft SollGain	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 0.000 0.000 A A 2.554 0.000 0.000 A A 2.554 0.000 A A 2.554 0.000 A A 2.554 0.000 A A 2.555 0.000 A A 2.555 0.000 A A 2.555 0.000 A A 2.555 0.000 A A A 2.555 0.000 A A A 2.555 0.000 A A A 2.555 0.000 A A A A A A A A A A A A A	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 0.030 0.000 0.030 0.000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.000000	-0.062 0.00 2.392 2.434 0.000 -0.043 0.01 3.835 3.720 0.115 0.000 0.03 3.835 3.911 0.000 0.03 3.835 0.000 0.001 0.001 0.01 0.01 0.01 0.01	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 E 4.016 4.137 0.000 -0.121 E 4.022	-0.016 Avg C F 2.490 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F F 4.029 4.101 0.000 -0.072 -0.016 -0.017 -0.016 -0	0.000 lopper Sco 2.047 1.998 0.049 0.000 lopper Sco 3.360 0.095 3.655 3.694 0.000 -0.039 lopper Sco G 3.655 3.694 0.000	0.000 il Loss, ft 1.588 1.581 0.007 0.000 il Loss, ft 1.2927 0.000 -0.046 il Loss, ft 1.208 0.005 0.000 il Loss, ft H 3.182 0.005 0.000	0.000 0.02 1 1.109 0.000 0.000 0.000 1 2.457 0.000 0.000 0.000 0.000 1 2.799 2.808 0.000 0.000 0.000 1 2.457 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.146 0.057 -0.181 [ft ²] 13.752	-0.262 (in) 0.082 -0.105 (in) 0.394 -0.620 0.394 (in) 0.171 -0.543 -0.543	Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Varg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 0.036 0.88 V @ 0.6d 2.86 0.049 1.56 V @ 0.6d 2.98	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d Bed Max Shear Stress (psf) 0.85 V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 0.27
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded	Pross-section 6 Surface Elev, ft SoilGain, f	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 0.000 0.000 A 2.554 0.000 0.000 A A 2.554 0.000 0.000 A A 2.554 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 A A 2.5554 0.000 A A 2.5554 0.000 A A 2.5554 0.000 A A 2.5554 0.000 A A 2.5554 0.000 A A 2.5554 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.0000 0.00000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000000	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.389 0.030 0.000 n Gain, ft C 3.494 3.537 0.000 -0.043 n Gain, ft C 3.353 3.360	-0.062 0.00 2.392 2.434 0.000 -0.043 0.011 3.835 3.720 0.115 0.000 0.03 0.03 0.03 0.03 0.03 0.00 0.03 0.01 0.000 0.03 0.01 0.000 0.03 0.01 0.000 0.03 0.01 0.000 0.03 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.00000 0.0000 0.0000 0.00	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 E 4.016 4.137 0.000 -0.121 E 4.022 4.035	-0.016 Avg C F 2.490 2.490 0.000 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F F 4.029 4.101 0.000 -0.072 Avg C 4.029 -0.254 -0.2	0.000 lopper Sco G 2.047 1.998 0.049 0.000 lopper Sco G 3.360 0.095 0.000 0.095 3.655 3.694 0.000 0.039 0.000 0.039 0.000 0.039 0.000 0.039 0.000 0.039 0.000 0.039 0.000 0.039 0.000 0.039 0.000 0.039 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000	0.000 il Loss, ft 1.588 1.581 0.007 0.000 il Loss, ft 1.2927 0.000 -0.046 il Loss, ft H 3.268 0.005 0.000 il Loss, ft H 3.3182 0.005 0.000 il Loss, ft H 3.325	0.000 0.02 1 1.109 0.000 0.000 0.000 1 2.457 0.000 0.000 0.000 0.000 0.000 1 2.799 2.808 0.000 0.000 1 2.259 1 2.259 0.0000 0.0000 0.0000 0.000 0.000 0.0000 0.0000 0.000 0.000 0.0000 0.0000 0.0000 0	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.146 0.057 -0.181 [ft ²] 13.752 13.943	-0.262 (in) (0.082 -0.105 (in) (in) -0.620 (in) (in) -0.543 (in) (in)	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 0.036 0.88 V @ 0.6d 2.86 0.049 1.56 V @ 0.6d 2.98 2.98	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 0.27 To Water Surf, f 3.9
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded	proper Soil Loss, ft Cross-section 6 Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft SoilGain, ft SoilGain,	0.000 A A 1.017 1.017 0.000 A 2.569 0.000 0.000 A A 2.554 0.000 0.000 A A 2.554 0.000 0.000 A A 2.554 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.5554 0.000 0.000 A A 2.5554 0.0000 A A 2.5554 0.0000 0.000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5554 0.0000 0.0000 A A 2.5539 0.0000 0.0000 A A 2.5539 0.0000 0.0000 A A 2.5539 0.0000 0.0000 0.5539 0.0000 0.0000 0.5539 0.00000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.00000000	0.000 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.389 0.030 0.000 n Gain, ft C 3.494 3.537 0.000 -0.043 n Gain, ft C 3.353 3.360 0.000	-0.062 0.00 2.392 2.434 0.000 -0.043 0.011 3.835 3.720 0.115 0.000 0.03 3.835 3.911 0.000 -0.075 0.011 D 3.835 3.355 3.658 0.000	-0.020 -0.020 2.539 0.000 -0.020 -0.020 -0.020 -0.023 -0.023 -0.023 -0.023 -0.023 -0.023 -0.024 -0.020 -0.024 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020	-0.016 Avg C F 2.490 2.490 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F F 4.029 4.101 0.0000 0.000000	0.000 lopper Scc G 2.047 1.998 0.049 0.000 lopper Sc 3.360 0.095 3.360 0.095 3.655 3.694 0.000 -0.039 lopper Sc G 3.655 3.652 3.652 3.645 0.007	0.000 0.000 1 Loss, ft 1.588 1.581 0.007 0.000 1 Loss, ft 1 Loss, ft 1 J. 0.000 -0.046 3.182 0.005 0.000 1 Loss, ft H 3.268 0.000 0.005 0.000 1 Loss, ft H 3.268 0.000 0.005 0.000 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.000 0.000 0.005 0.000 0.000 0.000 0.000 0.005 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 0.02 1 1.109 0.000 0.000 0.000 1 2.457 0.000 0.000 0.000 0.000 1 2.457 0.000 0.000 0.000 0.000 1 2.457 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.146 0.057 -0.181 [ft ²] 13.752 13.943 0.002	-0.262 (in) (in) (0.082 -0.105 (in) (in) (in) (in) (in) (in) (in) (in)	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = V @ 0.2d	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 0.036 0.88 V @ 0.6d 2.86 0.049 1.56 V @ 0.6d 2.98 0.030	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d V @ 0.8d U Bed Max Shear Stress (psf) 0.50 V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 0.27 To Water Surf, f 3.9 Water Depth (ft)
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded	Pross-section 6 Surface Elev, ft SoilGain, f	0.000 A A 1.017 1.017 0.000 A 2.569 0.000 0.000 A A 2.554 0.000 0.000 A A 2.554 0.000 A A 2.554 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 A A 2.555 0.000 A A 2.555 0.000 A A 2.555 0.000 A A 2.555 0.000 A A 2.555 0.000 A A 2.555 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 A A 2.555 0.000 0.000 0.000 A A 2.555 0.000 0.000 0.000 0.000 A A 2.555 0.0000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.00000 0.0000 0.0000 0.00000 0	0.000 0.000	-0.085 -0.085 -0.085 -0.000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.001 -0.000 -0.000 -0.000 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.007 -0.007 -0.005 -0.005 -0.007 -0.005	-0.062 0.00 2.392 2.434 0.000 -0.043 0.011 3.835 3.720 0.115 0.000 0.03 0.03 0.03 0.03 0.03 0.000 0.03 0.000 0.03 0.000 0.03 0.000 0.03 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0	-0.020 E 2.520 2.539 0.000 -0.020 E 3.878 3.901 0.000 -0.023 E 4.016 4.137 0.000 -0.121 E 4.022 4.035	-0.016 Avg C F 2.490 2.490 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F F 4.029 4.101 0.000 -0.072 Avg C 0.000 -0.072 -0.	0.000 lopper Sco 2.047 1.998 0.049 0.000 lopper Sco 3.360 0.095 3.360 0.095 3.655 3.694 0.000 -0.039 lopper Sco G 3.655 3.652 3.665	0.000 0.007 0.007 0.007 0.000 0.007 0.000 0.007 0.000 0.000 0.004 0.000 0.004 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 0.02 1 1.109 0.000 0.000 0.000 1 2.457 0.000 0.000 0.000 0.000 0.000 1 2.799 2.808 0.000 0.000 1 2.259 1 2.259 0.0000 0.0000 0.0000 0.000 0.000 0.0000 0.0000 0.000 0.000 0.0000 0.0000 0.0000 0	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.146 0.057 -0.181 [ft ²] 13.752 13.943	-0.262 (in) (0.082 -0.105 (in) (in) -0.620 (in) (in) -0.543 (in) (in)	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) =	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 0.036 0.88 V @ 0.6d 2.86 0.049 1.56 V @ 0.6d 2.98 2.98	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.85 V @ 0.8d Bed Max Shear Stress (psf) 0.85	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 0.27 To Water Surf, f 3.9
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded	proper Soil Loss, ft Cross-section 6 Surface Elev, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft SoilGain, ft SoilGain,	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 0.000 0.000 A 2.554 0.000 0.000 A A 2.554 0.000 0.000 A A 2.553 0.000 0.000 A A 2.559 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.0000	-0.085 -0.085 -0.085 -0.000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.001 -0.000 -0.000 -0.000 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.000 -0.007 -0.007 -0.007 -0.005 -0.005 -0.007 -0.005	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.011 3.835 3.720 0.115 0.000 0.03 0.03 0.03 3.835 3.911 0.000 0.03 3.835 3.911 0.000 0.03 3.835 3.911 0.000 0.03 3.835 3.911 0.000 0.03 3.835 0.000 0.03 3.835 0.000 0.03 0.011 0.000 0.03 0.011 0.000 0.03 0.011 0.000 0.03 0.011 0.000 0.03 0.011 0.000 0.03 0.011 0.000 0.03 0.011 0.000 0.03 0.000 0.03 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	-0.020 -0.020 2.539 0.000 -0.020 -0.020 -0.020 -0.023 -0.023 -0.023 -0.023 -0.023 -0.023 -0.024 -0.020 -0.024 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020 -0.021 -0.020	-0.016 Avg C F 2.490 2.490 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F F 4.029 4.101 0.000 -0.072 Avg C 0.000 -0.072 -0.	0.000 lopper Scc G 2.047 1.998 0.049 0.000 lopper Sc 3.360 0.095 3.360 0.095 3.655 3.694 0.000 -0.039 lopper Sc G 3.655 3.652 3.652 3.645 0.007	0.000 0.007 0.007 0.007 0.000 0.007 0.000 0.007 0.000 0.000 0.004 0.000 0.004 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 0.02 1.109 0.000 0.000 0.000 1.109 0.000 1.109 2.457 0.000 0.000 0.000 0.000 1.1 2.457 0.000 0.000 0.000 1.1 2.457 0.000 0.000 0.000 0.000 1.1 2.457 0.0000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.146 0.057 -0.181 [ft ²] 13.752 13.943 0.002	-0.262 (in) (in) (0.082 -0.105 (in) (in) (in) (in) (in) (in) (in) (in)	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = navg = Flow (cfs) = Flo	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 0.036 0.88 V @ 0.6d 2.86 0.049 1.56 V @ 0.6d 2.98 0.030 0.84	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d V @ 0.8d V @ 0.8d Stress (psf) 0.85 V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 3.9 Water Depth (ft) 0.27
30 ft 35 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop Coriginal To eroded	pper Soil Loss, ft Cross-section 6 Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft Cross-section 7 Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft Surface Elev, ft SoilGain, ft Surface Elev, ft SoilGain, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft Surface Elev, ft SoilGain,	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 0.000 0.000 A 2.554 0.000 0.000 A A 2.554 0.000 0.000 A A 2.553 0.000 0.000 A A 2.559 0.000 0.000 A A 2.559 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000000	0.000 0.000	0.085 0.085 0.020 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.01 3.835 3.720 0.115 0.000 0.03 0.01 0.03 3.835 3.911 0.000 0.03 3.835 3.911 0.000 0.03 3.835 3.911 0.000 0.03 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.015 3.835 3.911 0.000 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.001 0.000 0.000 0.000 0.001 0.0000 0.000 0.000 0.000 0.000 0.00000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000000 0.00000 0.00000 0.000000	-0.020 -0.020 2.539 0.000 -0.020 -0.020 -0.020 -0.023 -0.023 -0.023 -0.023 -0.024 -0.024 -0.024 -0.024 -0.024 -0.025 -0.000 -0.020	-0.016 Avg C F 2.490 2.490 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F 4.009 4.029 0.000 0.000 0.020 0.000 0.020 0.020 0.020	0.000 lopper Sco 2.047 1.998 0.049 0.000 lopper Sco 3.360 0.095 3.360 0.095 3.655 3.694 0.000 -0.039 lopper Sco 3.655 3.655 3.654 0.000 -0.039 1.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.00000 0.0000	0.000 0.007 0.007 0.007 0.000 0.007 0.000 0.007 0.000 0.004 0.000 0.046 0.000 0.046 0.000 0.046 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.000 0.005 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 0.02 1.109 0.000 0.000 0.000 1.109 2.457 0.000 0.000 0.000 0.000 1.1 2.457 0.000 0.000 0.000 1.1 2.457 0.000 0.000 1.1 2.457 0.000 0.000 1.1 2.457 0.000 0.000 1.1 2.457 0.0000 0.000	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.146 0.057 -0.181 [ft ²] 13.752 13.943 0.002 -0.193 [ft ²]	-0.262 (in) (in) (0.082 -0.105 (in) (in) (in) (in) (in) (in) (in) (in)	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = Navg = Flow (cfs) = Navg = Flow (cfs) = Flow	0.50 V @ 0.6d 0.39 0.468 0.32 V @ 0.6d 2.75 0.036 0.88 V @ 0.6d 2.86 0.049 1.56 V @ 0.6d 2.98 0.049 0.049 1.56	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d V @ 0.8d U Bed Max Shear Stress (psf) 0.50 V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.27 To Water Surf, f 3.9 Water Depth (ft) 0.27 To Water Depth (ft) 0.27 O Water Depth (ft) 0.14 0.01
30 ft 35 ft		To original To eroded Clop To original To eroded Clop Clop To original To eroded Clop Clop Clop	pper Soil Loss, ft Cross-section 6 Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft Surface Elev, ft SoilGain, ft Surface Elev, ft SoilGain, ft Surface Elev, ft SoilGain, ft Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, in	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 0.000 0.000 A 2.554 0.000 0.000 A A 2.554 0.000 0.000 A A 2.553 0.000 0.000 A A 2.559 0.000 0.000 A A 2.559 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000000	0.000 0.000 1.460 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.389 0.030 0.000 n Gain, ft C 3.353 3.360 0.000 -0.043 n Gain, ft 0.000 -0.007 n Gain, ft 0.000 -0.008	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.011 3.835 3.720 0.115 0.000 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.000 -0.075 0.011 D 3.835 0.000 0.001 0.002 0.001 0.002 0.002 0.0000 0.002 0.0000 0.002 0.002 0.0000 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.0021 0.002	-0.020 -0.020 2.539 0.000 -0.020 -0.020 -0.020 -0.023 -0.023 -0.023 -0.023 -0.024 -0.024 -0.024 -0.024 -0.024 -0.020 -0.025 -0.000 -0.020	-0.016 Avg C F 2.490 2.490 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F 4.009 4.029 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F C C C C C C C C C C C C C C C C C	0.000 lopper Sco G 2.047 1.998 0.049 0.000 lopper Sco G 3.455 3.360 0.095 0.000 0.095 3.655 3.694 0.000 -0.039 lopper Sco 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.000 0.007 0.000 0.007 0.000 0.000 0.007 0.0000 0.000 0.000 0.0000 0.0000 0.000 0.000 0.0000 0.0000 0.0	0.000 0.007 0.007 0.007 0.000 0.007 0.000 0.007 0.000 0.046 0.000 0.046 0.005 0.000 0.046 0.005 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.000 0.025 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.000 0.02 1.109 0.000 0.000 0.000 1.109 0.000 1.109 2.457 0.000 0.000 0.000 1.10 2.457 0.000 0.000 1.10 2.457 0.000 0.000 1.10 0.000 0.000 1.109 0.0000 0.000	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.146 0.057 -0.181 [ft ²] 13.752 13.943 0.002 -0.193 [ft ²]	-0.262 (in) (in) (0.082 -0.105 (in) (in) (in) (in) (in) (in) (in) (in)	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = Navg = Flow (cfs) = Navg = Flow (cfs) = Flow	0.50 ∨ @ 0.6d 0.39 0.468 0.32 ∨ @ 0.6d 2.75 0.036 0.88 ∨ @ 0.6d 2.86 0.049 1.56 ∨ @ 0.6d 2.98 0.049 0.54 0.030 0.84 •	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d Stress (psf) 0.85 V @ 0.8d	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 0.27 To Water Surf, f 3.9 Water Depth (ft) 0.27 To Water Depth (ft) 0.27
30 ft 35 ft 40 ft		To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop	pper Soil Loss, ft Cross-section 6 Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft Surface Elev, ft SoilGain, ft Surface Elev, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, ft SoilGain, in per Soil Loss, ft	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 0.000 0.000 A 2.569 0.000 0.000 A 2.554 0.000 0.000 A 2.553 0.000 0.000 A 0.000 0.000 A 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000000	0.000 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.389 0.030 0.000 n Gain, ft C 3.353 3.360 0.000 -0.007 n Gain, ft 0.000 -0.008 X-Sec	-0.062 0.00 D 2.392 2.434 0.000 -0.043 0.011 3.835 3.720 0.115 0.000 0.03 0.03 0.03 0.03 0.03 3.835 3.911 0.000 -0.075 0.01 D 3.835 3.911 0.000 0.001 0.03 3.835 0.000 0.001 0.015 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	-0.020 -0.020 2.539 0.000 -0.020 -0.020 -0.020 -0.023 -0.023 -0.020 -0.023 -0.020 -0.021 -0.020 -0.023 -0.000 -0.023 -0.000 -0.023 -0.000 -0.023 -0.000 -0.023 -0.000 -0.023 -0.000	-0.016 Avg C F 2.490 2.490 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F 4.009 4.029 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.072 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F 0.000 -0.075 Avg C C F C C C C C C C C C C C C C C C C C	0.000 lopper Sco G 2.047 1.998 0.049 0.000 lopper Sco 3.360 0.095 0.000 0.095 3.360 0.095 0.000 0.095 3.655 3.694 0.000 -0.039 lopper Sco 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.000 0.007 0.0000 0.0	0.000 0.000 1 Loss, ft 1.588 1.581 0.007 0.000 1 Loss, ft 2.927 0.000 -0.046 0.000 -0.046 3.268 3.182 0.005 0.000 -0.128 0.000 -0.128 0.005 -0.007	0.000 0.02 1.109 0.000 0.000 0.000 1.109 0.000 0.000 1.10 2.457 0.000 0.000 0.000 1.10 2.457 0.000 0.000 1.10 0.000 0.000 1.10 0.000 0.000 1.10 0.0000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.022 14.146 0.057 -0.181 [ft ²] 13.752 13.943 0.002 -0.193 [ft ²]	-0.262 (in) (in) (0.082 -0.105 (in) (in) (in) (in) (in) (in) (in) (in)	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = Flow	0.50 ∨ @ 0.6d 0.39 0.468 0.32 ∨ @ 0.6d 2.75 0.036 0.88 ∨ @ 0.6d 2.86 0.88 ∨ @ 0.6d 2.86 0.049 1.56 ∨ @ 0.6d 2.98 0.030 0.84 ↓ 0.030 0.84	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d Stress (psf) 0.85	0.26 To Water Surf, f 2.1 Water Depth (ft) 0.41 To Water Surf, f 3.7 Water Depth (ft) 0.16 To Water Surf, f 3.9 Water Depth (ft) 0.27 To Water Surf, f 3.9 Water Depth (ft) 0.14 0.01 0.001 -0.037 5
30 ft 35 ft 40 ft	ezoidal Analysis	To original To eroded Clop To original To eroded Clop To original To eroded Clop To original To eroded Clop Clop	Cross-section 6 Surface Elev, ft SoilGain, ft Surface Elev, ft SoilGain, ft SoilGa	0.000 A A 1.017 1.017 0.000 0.000 A 2.569 0.000 0.000 A 2.569 0.000 0.000 A 2.5654 0.000 0.000 A 2.554 0.000 0.000 0.000 A 2.559 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0	0.000 0.000 1.460 0.000	-0.085 n Gain, ft C 1.923 1.903 0.020 0.000 n Gain, ft C 3.419 3.389 0.030 0.000 n Gain, ft C 3.494 3.537 0.000 n Gain, ft C 3.494 3.537 0.004 3.533 3.360 0.000 -0.043 3.3360 0.000 -0.043 3.3360 0.000 -0.044 3.333 0.000 -0.044 3.333 0.000 -0.044 3.3360 -0.044 3.3360 -0.044 3.3360 -0.044 3.3360 -0.044 3.3360 -0.044 -0.044 3.357 -0.044 -0.044 -0.044 -0.045 -0.044 -0.045 -0	-0.062 0.00 2.392 2.434 0.000 -0.043 0.01 D 3.835 3.720 0.115 0.000 0.03 D 3.835 3.911 0.000 -0.075 3.835 3.858 0.001 D 3.835 3.858 0.001 0.01 D 3.835 3.858 0.001 0.015 D 3.835 3.858 0.001 0.015 0.015 0.017 0.000 0.017 0.000 0.017 0.000 0.017 0.000 0.017 0.000 0.017 0.000 0.017 0.000 0.017 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000	-0.020 -0.020 2.539 0.000 -0.020 -0.020 -0.023 -0.023 -0.023 -0.024	-0.016 Avg C 2.490 2.490 0.000 Avg C F 3.868 4.121 0.000 -0.253 Avg C F 4.029 4.101 0.000 -0.072 Avg C F 4.009 4.029 0.000 -0.020 Avg C 0.001 -0.011 5	0.000 lopper Sc 2.047 1.998 0.049 0.000 lopper Sc 0.005 0.009 0.009 0.009 0.009 0.009 0.000 0.009 0.000 0.009 0.000 0.009 0.000 0.009 0.000 0.009 0.000 0.009 0.000 0.000 0.009 0.0000 0.000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.000 0.000	0.000 ii Loss, ft ii Loss, ft 1.588 1.581 0.007 0.000 ii Loss, ft 2.927 0.000 -0.046 ii Loss, ft 3.268 0.000 ii Loss, ft H 3.268 0.000 ii Loss, ft H 3.007 3.225 0.000 -0.128 ii Loss, ft 0.005 -0.07	0.000 0.02 1 1.109 1.109 0.000 0.000 1.001 1 2.457 0.000 0.000 0.000 1 2.799 2.808 0.000 1 2.799 2.808 0.000 1 1 2.680 0.000 1 2.680 0.000 0.011 2.680 0.000 0.011 2.680 0.000 0.001 0.04 1 2.680 0.000 0.001 0.04 0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002	-0.087 [ft ²] 7.804 7.812 0.027 -0.035 [ft ²] 13.439 13.515 0.131 -0.207 [ft ²] 14.022 14.022 14.146 0.057 -0.181 [ft ²] 13.752 13.943 0.002 -0.193 [ft ²] 13.8.091	-0.262 (in) (in) (0.082 -0.105 (in) (in) (in) (in) (in) (in) (in) (in)	Flow (cfs) = V @ 0.2d Vag (fps) = navg = Flow (cfs) = V @ 0.2d Vag (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = V @ 0.2d Vavg (fps) = Navg = Flow (cfs) = Flow	0.50 ∨ @ 0.6d 0.39 0.468 0.32 ∨ @ 0.6d 2.75 0.036 0.88 ∨ @ 0.6d 2.86 0.88 ∨ @ 0.6d 2.86 0.049 1.56 ∨ @ 0.6d 2.98 0.030 0.84 ↓ 0.030 0.84	0.80 V @ 0.8d Bed Max Shear Stress (psf) 1.27 V @ 0.8d Bed Max Shear Stress (psf) 0.50 V @ 0.8d V @ 0.8d V @ 0.8d V @ 0.8d Stress (psf) 0.85 V @ 0.8d Automation of the stress (psf) 0.44 Stress (psf) 0.44 Stress (psf) 0.44 Stress (psf) 0.44	To Water Surf, ft 2.1 Water Depth (ft) 0.41 To Water Surf, ft 3.7 Water Depth (ft) 0.16 To Water Surf, ft 3.9 Water Depth (ft) 0.27 To Water Surf, ft 3.9 Water Depth (ft) 0.14 0.01 -0.037 5 40



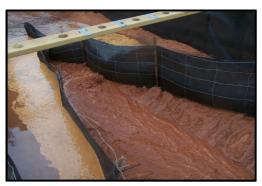


Check Structure Installation over Bare Soil



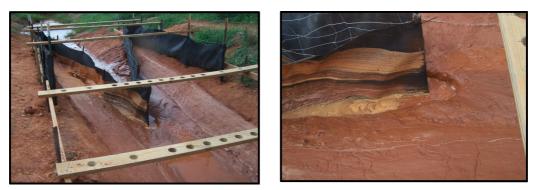


Initial Flow & Upstream Ponding Starting





Increased Ponding Reaches Maximum and then Blows Out Under Fence



Post-test With Upstream Scour Hole

			Date:	7/20/12							S	tart Time:			5:00 PM	End Time:	5:30 PM	
	ASTM D7208			Sandy Cl	ay						Target F	low (cfs):			0.50	Slope:	5%	-
60 ft lo	ng flume 40 ft t	est section	SRD:	Silt Fence	e +		Ins	tallation:	Steel Po	sts & Wire	e Fence							
	2 ft v	wide flume					-				1	TEST D	DATA					
_	1 2 3		Outlet Weir								Weir						Channel Targets	
	FLOW		Water Depth, in								1.50						1.00	
eir width	(ft) = 2 C D E F G H	Wa	ater Velocity, ft/s	0.00							0.00	0.00					0.00	
0 11	CDEFG H	1	Flow Rate, cfs	0.00 A	в	С	D	E	F	G	0.00 H	0.00	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	0.00 V @ 0.8d	To Water Surf,
			Surface Elev, ft	0.928	1.371	1.864	2.303	2.392	2.369	1.880	1.411	0.981	7.333	[m]	v @ 0.2u	2.96	V @ 0.00	2.3
	ŧ	-	Surface Elev, ft	0.928	1.371	1.864	2.467	2.431	2.425	1.890	1.411	0.981	7.496		Vavg (fps) =	2.96	Bed Max Shear	2.0
			SoilGain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.024	Stress (psf)	Water Depth (fl
		Clop	per Soil Loss, ft	0.000	0.000	0.000	-0.164	-0.039	-0.056	-0.010	0.000	0.000	-0.163	-0.489	Flow (cfs) =	0.50	0.31	0.10
5 ft				A	Avg Bottor	m Gain, ft	0.00		Avg C	lopper Sc	oil Loss, ft	-0.03						
		c	Cross-section 2	А	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	Surface Elev, ft	0.965	1.470	1.975	2.431	2.520	2.484	2.011	1.555	1.102	7.806			2.91		2.4
		To eroded	Surface Elev, ft	0.965	1.470	1.975	2.628	2.598	2.513	2.011	1.555	1.102	7.983		Vavg (fps) =	2.91	Bed Max Shear	Water Depth (ft
			SoilGain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.033	Stress (psf)	
		Clop	oper Soil Loss, ft	0.000	0.000	0.000	-0.197	-0.079	-0.030	0.000	0.000	0.000	-0.177	-0.531	Flow (cfs) =	0.50	0.49	0.16
10 ft		—			Avg Bottor		0.00			lopper Sc	1	-0.03						
			Surface Elev, ft	A 0.925	B 1.401	C 1.870	D 2.402	E 2.405	F 2.303	G 1.818	H 1.375	I 0.915	[ft ²] 7.324	[in]	V @ 0.2d	V @ 0.6d 2.81	V @ 0.8d	To Water Surf, 1 2.4
		-	Surface Elev, ft	0.925	1.401	1.870	2.402	2.405	2.303	1.818	1.375	0.915	7.324		Vavg (fps) =	2.81	Ded Mar Of	2.4
			SoilGain, ft	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.002	0.007	navg (ips) =	0.033	Bed Max Shear Stress (psf)	Water Depth (ff
		Clop	oper Soil Loss, ft	0.000	0.000	-0.023	-0.177	-0.141	0.000	0.000	0.000	0.000	-0.173	-0.518	Flow (cfs) =	0.50	0.46	0.15
15 ft		'			Avg Bottor		0.00			lopper Sc		-0.04						
		c	Cross-section 4	Α	В	С	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	Surface Elev, ft	1.106	1.581	2.110	2.582	2.651	2.562	2.083	1.627	1.171	8.229			2.99		2.4
		To eroded	Surface Elev, ft	1.106	1.581	2.090	2.677	2.717	2.441	2.087	1.627	1.171	8.228		Vavg (fps) =	2.99	Bed Max Shear	Water Depth (ft
			SoilGain, ft	0.000	0.000	0.020	0.000	0.000	0.121	0.000	0.000	0.000	0.087	0.262	navg =	0.054	Stress (psf)	
		Clop	oper Soil Loss, ft	0.000	0.000	0.000	-0.095	-0.066	0.000	-0.003	0.000	0.000	-0.086	-0.259	Flow (cfs) =	0.50	1.05	0.34
20 ft					Avg Bottor	1	0.02			lopper Sc	1	-0.02						
			Cross-section 5	A	B	C	D	E	F	G	H	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
		-	Surface Elev, ft Surface Elev, ft	0.830	1.293 1.293	1.818 1.883	2.297 2.336	2.365 2.365	2.300 2.073	1.798 1.857	1.322	1.194 1.194	7.139 7.055		Vour (foo)	0.78		1.9
		To eroded	SoilGain, ft	0.830	0.000	0.000	0.000	0.000	0.226	0.000	0.000	0.000	0.151	0.453	Vavg (fps) = navg =	0.78	Bed Max Shear Stress (psf)	Water Depth (ft
		Clor	oper Soil Loss, ft	0.000	0.000	-0.066	-0.039	0.000	0.000	-0.059	0.000	0.000	-0.068	-0.203	Flow (cfs) =	0.50	1.31	0.42
25 ft					Avg Bottor		0.03			lopper Sc		-0.02						
		C	Cross-section 6	A	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	Surface Elev, ft	1.047	1.506	1.972	2.451	2.503	2.425	1.959	1.526	1.109	7.775			0.72		2.0
		To eroded	Surface Elev, ft	1.047	1.506	1.959	2.385	2.523	2.257	2.031	1.493	1.109	7.624		Vavg (fps) =	0.72	Bed Max Shear	Water Depth (ft
			SoilGain, ft	0.000	0.000	0.013	0.066	0.000	0.167	0.000	0.033	0.000	0.182	0.545	navg =	0.313	Stress (psf)	Water Deptil (It
		Clop	oper Soil Loss, ft	0.000	0.000	0.000	0.000	-0.020	0.000	-0.072	0.000	0.000	-0.031	-0.092	Flow (cfs) =	0.80	1.74	0.56
30 ft					Avg Bottor	-	0.03		-	lopper Sc	-	-0.01						
			Cross-section 7	A	В	С	D	E	F	G	Н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf, f
			Surface Elev, ft	2.661	2.838	3.310	3.907	3.927	3.944	3.494	2.966	2.631	13.562		Vouc (fra)	2.75	_	3.7
		10 eroded	Surface Elev, ft SoilGain, ft	2.605 0.056	2.927 0.000	3.337 0.000	3.917 0.000	4.049 0.000	4.098 0.000	3.642 0.000	3.123 0.000	2.992 0.000	13.985 0.009	0.028	Vavg (fps) = navg =	2.75 0.058	Bed Max Shear Stress (psf)	Water Depth (ff
		Clor	oper Soil Loss, ft	0.000	-0.089	-0.026	-0.010	-0.121	-0.154	-0.148	-0.157	-0.361	-0.432	-1.296	Flow (cfs) =	1.82	1.03	0.33
35 ft			,		Avg Bottor		0.01	521		lopper Sc		-0.12	552					0.00
ŀ			Cross-section 8	A	В	С	D	E	F	G	н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
			Surface Elev, ft	2.730	3.045	3.576	4.006	4.147	4.127	3.773	3.255	2.858	14.385			3.07		4.1
		To eroded	Surface Elev, ft	2.700	2.940	3.704	4.055	4.213	4.160	3.753	3.228	2.648	14.370		Vavg (fps) =	3.07	Bed Max Shear	Water Depth //
			SoilGain, ft	0.030	0.105	0.000	0.000	0.000	0.000	0.020	0.026	0.210	0.134	0.402	navg =	0.032	Stress (psf)	Water Depth (ft
		Clop	oper Soil Loss, ft	0.000	0.000	-0.128	-0.049	-0.066	-0.033	0.000	0.000	0.000	-0.119	-0.358	Flow (cfs) =	0.99	0.50	0.16
40 ft					Avg Bottor		0.04			lopper Sc		-0.03						
			Cross-section 9	A	В	С	D	E	F	G	Н	1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		-	Surface Elev, ft	2.618	2.913	3.330	3.822	4.003	3.999	3.632	3.107	2.644	13.760		Vour (f.)	3.06		3.9
		10 eroded	Surface Elev, ft SoilGain, ft	2.618	2.874 0.039	3.327 0.003	3.724 0.098	3.930 0.072	4.062 0.000	3.501 0.131	3.015 0.092	2.644 0.000	13.579 0.222	0.666	Vavg (fps) =	3.06 #NUM!	Bed Max Shear Stress (psf)	Water Depth (ff
		CUS MMA	oper Soil Loss, ft	0.000	0.039	0.003	0.098	0.072	-0.062	0.131	0.092	0.000	-0.042	-0.125	navg = Flow (cfs) =	#NUM!	-0.02	-0.01
		500 Gildh	-por 00n 2000, II		Avg Bottor		0.000	0.000		lopper Sc		-0.01	0.042	0.123	. 1017 (013) =	#HOW:	0.02	0.01
		I	Soil Gain, in		0.008	0.001	0.006	0.004	0.020	0.008	0.007	0.012	Vol	ume	Avo	Bottom Ga	ain per Xsection, ft =	0.048
		Clop	per Soil Loss, in		0.000	-0.012	-0.041	-0.022	-0.010	-0.004	0.000	0.000	[ft ³]	[in]	1		oss per Xsection, ft =	
						X O			-							1		
		Original	Surface Elev	190.263	1 thru	7-26	ection Spa	acing, ft =	5	Origir	nal Surfac	e Elev	140.230		7 thru 9:	^-	Section Spacing, ft =	5
Tre	ezoidal Analysia		Surface Elev Surface Elev	190.263 191.611	1 thru 6:			ength, ft =			nal Surfac		140.230 140.762		7 thru 9:		Section Spacing, ft = t Section Length, ft =	
Тгар	pezoidal Analysis	Eroded				Test S	Section Le		40			e Elev		0.094	7 thru 9:			40



TYPICAL TEST PICTURES 0.5 cfs Flow (RETEST)



Check Structure Installation over Bare Soil



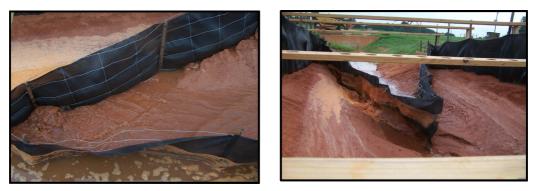


Initial Flow & Upstream Ponding





Increased Ponding & Very Near Overtopping



Close-up of Blowout and End-of-test Upstream Scour Hole



Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;

	Flow:	0.5 cfs for 3	0 minutes		Test Date:	6/21/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	-0.07	0.00	-0.022	1.14	2.31	0.30
	5	0.00	0.00	0.00	-0.040	0.98	2.61	0.26
	10	0.00	0.00	0.00	-0.034	1.06	2.81	0.28
	15	0.00	0.00	0.00	-0.065	0.91	3.03	0.24
	20	0.00	0.00	0.00	-0.070	1.14	2.96	0.30
No Check	25	0.00	0.00	0.00	-0.059	0.98	3.10	0.26
Structure	30	0.00	0.00	0.00	-0.068	0.98	3.15	0.26
	35	0.00	0.00	0.00	-0.103	1.06	3.18	0.28
	40	0.00	0.00	0.00	-0.084	0.94	3.20	0.25
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				0.00	-2.53	3.84	0.00	-65.86

	Flow:	1.0 cfs for 3	0 minutes		Test Date:	6/21/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	-0.28	0.00	-0.110	1.61	3.78	0.42
	5	0.00	0.00	0.00	-0.075	1.54	3.94	0.40
	10	0.00	0.00	0.00	-0.121	1.50	4.03	0.39
	15	0.00	0.00	0.00	-0.085	1.38	3.99	0.36
	20	0.00	0.00	0.00	-0.105	1.54	3.94	0.40
No Check	25	0.00	0.00	0.00	-0.139	1.54	3.94	0.40
Structure	30	0.00	0.00	0.00	-0.097	1.34	4.08	0.35
	35	0.00	0.00	0.00	-0.094	1.57	4.05	0.41
	40	0.00	0.00	0.00	-0.107	1.50	4.10	0.39
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				0.00	-4.07	5.63	0.00	-72.27

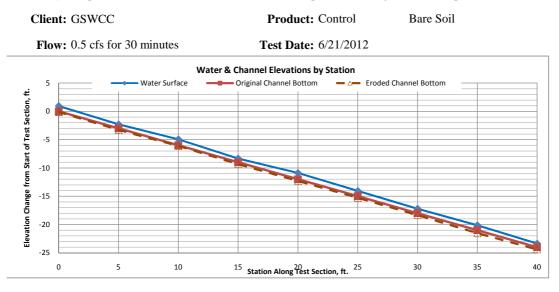
_	Flow:	2.0 cfs for 3	0 minutes		Test Date:	6/27/2012		
	Station, ft	Soil Gain, in	Soil Loss, in.	Soil Gain, ft ²	Soil Loss, ft ²	Flow Depth, in	Flow Velocity, ft/s	Shear, psf
	0	0.00	-0.27	0.00	-0.100	2.20	4.84	0.57
	5	0.00	0.00	0.00	-0.171	2.28	4.80	0.59
	10	0.00	0.00	0.00	-0.186	2.13	4.90	0.55
	15	0.00	0.00	0.00	-0.170	2.13	5.10	0.55
	20	0.00	0.00	0.00	-0.145	2.48	5.05	0.64
No Check	25	0.00	0.00	0.00	-0.161	2.05	5.15	0.53
Structure	30	0.00	0.00	0.00	-0.164	2.20	5.10	0.57
	35	0.00	0.00	0.00	-0.194	1.97	5.10	0.51
	40	0.00	0.00	0.00	-0.203	2.13	5.17	0.55
				Total Soil	Total Soil	Total Wetted	SAI - Soil	CSLI - Clopper
				Gain, ft ³	Loss, ft ³	Area, ft ²	Accretion Index	Soil Loss Index
				0.00	-6.79	8.15	0.04	-83.26

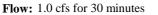
CJS 6/30/2012

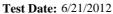
Quality Review / Date

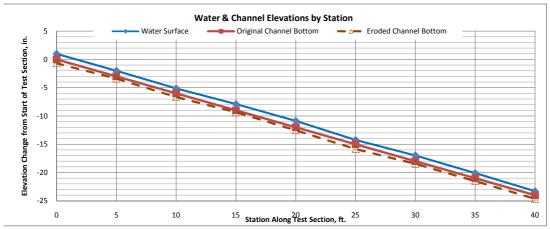


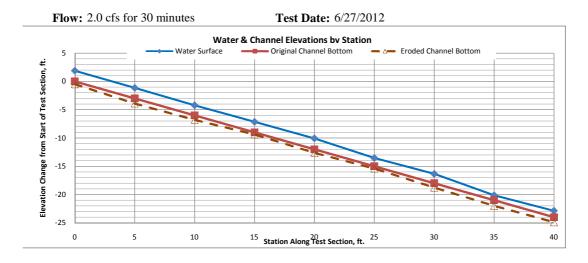
Test Setup: Trapezoid with 2-ft wide bottom and 2:1 side slopes x 40-ft long; 5% Bed Slope;











ASTM D7208				-											End Time: Slope:	4:28 PM 5%	-	
lume 40 ft f	test section			lay		Ins	tallation:	Bare Soi	1	Target I	1011 (013).	0.00			olope.	576		
	wide flume	SKD.	Control			115	tanation.	Dale Su			TEST	DATA						
		Outlet Weir								Weir						Channel Targets		
FLOW										1.50								
= 2										0.00						3 - 4		
DEFGH		Flow Rate, cfs	0.00							0.00	0.00					0.50		
	с	ross-section 1	А	в	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf	
	To original	Surface Elev, ft	1.808	2.041	2.293	2.310	2.320	2.306	2.306	2.067	1.821	8.727			2.31		2.2	
*	To eroded	Surface Elev, ft	1.808	2.041	2.313	2.310	2.336	2.320	2.310	2.067	1.821	8.749		Vavg (fps) =	2.31	Dad May Chase		
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.030	Stress (psf)	Water Depth (
	Clop	per Soil Loss, ft	0.000	0.000	-0.020	0.000	-0.016	-0.013	-0.003	0.000	0.000	-0.022	-0.066	Flow (cfs) =	0.00	0.30	0.10	
			A	Avg Bottor	m Gain, ft	0.00		Avg C	lopper So	oil Loss, ft	-0.01							
	C	ross-section 2	A	В	С	D	Е	F	G	н	Т	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf	
	To original	Surface Elev, ft	1.913	2.175	2.405	2.454	2.493	2.474	2.431	2.208	1.982		-		2.61		2.4	
	To eroded	Surface Elev, ft	1.913	2.175	2.405	2.484	2.516	2.493	2.431	2.208	1.982	9.340		Vavg (fps) =	2.61	Bed Max Shear		
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			navg =	0.024	Stress (psf)	Water Depth (
	Clop	per Soil Loss, ft	0.000	0.000	0.000	-0.030	-0.023	-0.020	0.000	0.000	0.000	-0.040	-0.121	Flow (cfs) =	0.00	0.26	0.08	
						0.00			lopper So	oil Loss, ft	-0.01							
	-		A	В	С	D	E	F	G	н	I		[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf	
	•		1.831	2.080	2.290	2.316	2.336	2.310	2.287	2.001	1.768				2.81		2.2	
	To eroded		1.831	2.080	2.323	2.343	2.336	2.310	2.303	2.001	1.768		0.000	Vavg (fps) =	2.81	Bed Max Shear		
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			navg =	0.023	Stress (psf)	Water Depth	
	Clop	per Soil Loss, ft	0.000	0.000	-0.033	-0.026	0.000	0.000	-0.016	0.000	0.000	-0.034	-0.102	Flow (cfs) =	0.00	0.28	0.09	
	-			Ŭ			-					[f+ ²]	[in]					
													[111]	V @ 0.2d		V @ 0.8d	To Water Sur	
	-																2.5	
	I o eroded												0.000			Bed Max Shear		
	0																Water Depth	
	Ciopi	per Soil Loss, ft					-0.020					0.000	0.101	Flow (cfs) =	0.00	0.24	0.08	
		race costion F					-				-0.01	[ft ²]	[in]	V @ 0.24	VOOR	V @ 0.84	To Water Surf	
											1 700			v @ 0.2u		v @ 0.80	To Water Surf 2.2	
	-											8.848		Vova (foc) -			2.2	
	TO eloded											0.000	0.000			Bed Max Shear Stress (psf)	Water Depth (
	Clop											-0.070	-0.210				0.10	
	Ciop	per 30ii 2033, it					-0.003							110W (013) =	0.00	0.30	0.10	
	6	ross-section 6					F	F			1	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf	
	-							2.513			2.073	9.483					2.4	
	•		1.949	2.188	2.467	2.536	2.526	2.530	2.539	2.287	2.073	9.542		Vavg (fps) =				
		Soil Gain, ft										0.000	0.000				Water Depth (
	Clop	per Soil Loss, ft		0.000	-0.030	-0.046	-0.003	-0.016	-0.020	0.000	0.000	-0.059	-0.177	Flow (cfs) =	0.51	0.26	0.08	
			A	Avg Bottor	m Gain, ft	0.00		Avg C	lopper So	oil Loss, ft	-0.01							
	с	ross-section 7	A	в	С	D	Е	F	G	н	Т	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf	
			1.706	2.005	2.198	2.218	2.208	2.205	2.152	1.893	1.647	8.292			3.15		2.1	
	-		1.706	2.005	2.224	2.260	2.224	2.231	2.175	1.893	1.647	8.360		Vavg (fps) =	3.15	Ded Mar Of		
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.020	Bed Max Shear Stress (psf)	Water Depth (
	Clop	per Soil Loss, ft	0.000	0.000	-0.026	-0.043	-0.016	-0.026	-0.023	0.000	0.000	-0.068	-0.203	Flow (cfs) =	0.52	0.26	0.08	
			A	Avg Bottor	m Gain, ft	0.00		Avg C	lopper So	oil Loss, ft	-0.01							
	C	ross-section 8	A	В	с	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur	
	To original	Surface Elev, ft	1.896	2.156	2.408	2.454	2.484	2.500	2.438	2.231	1.995	9.319			3.18		2.4	
	To eroded	Surface Elev, ft	1.896	2.156	2.434	2.516	2.500	2.552	2.474	2.231	1.995	9.421		Vavg (fps) =	3.18	Bed Max Shear		
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Water Depth	
	Clop	per Soil Loss, ft	0.000	0.000	-0.026	-0.062	-0.016	-0.052	-0.036	0.000	0.000	-0.103	-0.308	Flow (cfs) =	0.56	0.28	0.09	
			A	vg Botto	m Gain, ft	0.00		Avg C	lopper So	oil Loss, ft	-0.02							
	C	ross-section 9	A	В	с	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur	
	To original	Surface Elev, ft	1.870	2.119	2.365	2.425	2.408	2.402	2.333	2.106	1.837	9.021			3.2		2.4	
	To eroded	Surface Elev, ft	1.870	2.119	2.425	2.464	2.434	2.434	2.356	2.106	1.837	9.105		Vavg (fps) =	3.20	Bed Max Shear		
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.019	Stress (psf)	Water Depth	
	Clop	per Soil Loss, ft	0.000	0.000	-0.059	-0.039	-0.026	-0.033	-0.023	0.000	0.000	-0.084	-0.253	Flow (cfs) =	0.50	0.25	0.08	
				Avg Bottor	m Gain, ft	0.00			lopper So		-0.02							
				-						0.000	0.000	Volu	ıme	A				
		Avg Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000				-	AVg	g Bottom Ga	ain per Xsection, ft =	0.000	
		Avg Soil Gain, ft per Soil Loss, ft	0.000	-	0.000 -0.027	0.000	-0.015	-0.030	-0.020	0.000	0.000	[ft³]	[in]	-	oper Soil Lo	ss per Xsection, ft =	-0.006	
			0.000	0.000					-0.020		0.000			-	oper Soil Lo		-0.006	
			0.000	0.000					-0.020 Origir	0.000	0.000 e Elev	[ft³]		-	oper Soil Lo X∹	ss per Xsection, ft =	-0.006 = 5 = 40	
	lume 40 ft 2 ft FLOW =	Iume 40 ft test section 2 ft wide flume FLOW = 2 Wa D E F G H To original To eroded Clop Clop Com To original To eroded Clop Com To original To eroded Clop Com Com Com Com Com Com Com Com	ASTM D7208 Soit: Iume 40 ft test section 2 ft wide flume FLOW Vater Depth, in 2 ft wide flume FLOW Vater Depth, in 2 To original Surface Elev, ft To eroded Surface Elev, ft Soil Gain, ft Clopper Soil Loss, ft Clopper S	Soit: Sandy C Iume 40 ft test section SRD: Control 2 ft wide flume Outlet Weir Image: Control FLOW Water Depth, in Image: Control Amage: Control 2 To wide flume Outlet Weir Image: Control Amage: Control 2 Image: Control Amage: Control Amage: Control Amage: Control 2 Image: Control Amage: Control Amage: Control Amage: Control 1 Control Control Amage: Control Amage: Control 1 Control Control Amage: Control Amage: Control 1 Control Control Amage: Control Amage: Control Amage: Control 1 Control Control Control Amage: Control Amage: Control 1 Control Control Control Amage: Control Amage: Control 1 Control Control Control Amage: Control Amage: Control Amage: Control Amage: Control Amage: Control	ASTM D7208	ASTM D7208 Soil: Sandy Clay ume 40 ft test section SRD: Control 2 ft wide flume Image: Control Coulted Weir Image: Control Image: Control = 2 Water Velocity, ft/s Image: Control = 2 Water Velocity, ft/s Image: Control D E F G H Flow Rate, cfs 0.00 Image: Control To original Surface Elev, ft 1.808 2.041 2.313 Soil Gain, ft 0.000 0.000 0.000 0.000 Cross-section 2 A B C To original Surface Elev, ft 1.913 2.175 2.405 To original Surface Elev, ft 1.913 2.175 2.405 Soil Gain, ft 0.000 0.	ASTM D7208 Soil: Sandy Clay 1ume 40 ft test section SRD: Control Image: SRD: Contro Imag	ASTM D7208 Soit: Sandy Clay ume 40 It test section SRD: Control Installation: 2 twide flume Cutlet Weir Image: Control Image: Control Image: Control FLOW Water Depth, ints Image: Control Image: Control Image: Control Image: Control Image: Control P FLOW Water Depth, ints Image: Control Image: Control	ASTM D7208 Soit Sandy Cay ume 40 ft test section SRD: Cortrol Installation: Bare Soit PL Untel Weir Installation: Bare Soit Installation: Bare Soit PL FLOW Water Velocity, fts Installation: Bare Soit D E F G H Flow Rate, cfs 0.00 Installation: Bare Soit To original Surface Elev, ft 1808 2.041 2.313 2.336 2.320 Soit Gan, ft 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Copper Soit Loss, ft 0.000	ASTM 0208 Sol: Sandy Cly 40 ft test section SRD: Control Installation: Bare Soll FLOW Water Depth, in Color Soli Soli <td>ASTM 2028 Boti Sandy Clay Turne Mestallation: Bare Sol 0 ft test section 0<td>ASTM 0208 Soft Sundy Clay Unitation: Earc Suitation: Earc Suitatio: Earc Suitation: Earc Suitation: Earc Suitation: E</td><td>ASTM 07208 Sub: Sundy Cluy Target Plaw (rd) Got 2 Note Network SRD: Cortor Note Network Note Network C Value Value Network Note Network Note Network Note Network C Value Value Network Note Network Note Network Note Network D E F 0 Note Network Note Network D E F 0 Note Network Note Network To original Sufface Elev, N 1.880 2.041 2.310 2.320 2.300 0.300 0.000</td><td>ASTM 07200 Sol: Sandy Clay Turget F.D.W (1) 0.00 10 St0: Corror Intellistical St0: Corror Intellistical St0: Sandy Clay St0: Sandy Sandy</td><td>ASTM 07201 Target Prov (nb) <th colsp<="" td=""><td>Alth Dist <thdis< th=""> Dist Dist D</thdis<></td><td>ASTN 0739 Dot <thdot< th=""> Dot <thdot< th=""> <thdot<< td=""></thdot<<></thdot<></thdot<></td></th></td></td>	ASTM 2028 Boti Sandy Clay Turne Mestallation: Bare Sol 0 ft test section 0 <td>ASTM 0208 Soft Sundy Clay Unitation: Earc Suitation: Earc Suitatio: Earc Suitation: Earc Suitation: Earc Suitation: E</td> <td>ASTM 07208 Sub: Sundy Cluy Target Plaw (rd) Got 2 Note Network SRD: Cortor Note Network Note Network C Value Value Network Note Network Note Network Note Network C Value Value Network Note Network Note Network Note Network D E F 0 Note Network Note Network D E F 0 Note Network Note Network To original Sufface Elev, N 1.880 2.041 2.310 2.320 2.300 0.300 0.000</td> <td>ASTM 07200 Sol: Sandy Clay Turget F.D.W (1) 0.00 10 St0: Corror Intellistical St0: Corror Intellistical St0: Sandy Clay St0: Sandy Sandy</td> <td>ASTM 07201 Target Prov (nb) <th colsp<="" td=""><td>Alth Dist <thdis< th=""> Dist Dist D</thdis<></td><td>ASTN 0739 Dot <thdot< th=""> Dot <thdot< th=""> <thdot<< td=""></thdot<<></thdot<></thdot<></td></th></td>	ASTM 0208 Soft Sundy Clay Unitation: Earc Suitation: Earc Suitatio: Earc Suitation: Earc Suitation: Earc Suitation: E	ASTM 07208 Sub: Sundy Cluy Target Plaw (rd) Got 2 Note Network SRD: Cortor Note Network Note Network C Value Value Network Note Network Note Network Note Network C Value Value Network Note Network Note Network Note Network D E F 0 Note Network Note Network D E F 0 Note Network Note Network To original Sufface Elev, N 1.880 2.041 2.310 2.320 2.300 0.300 0.000	ASTM 07200 Sol: Sandy Clay Turget F.D.W (1) 0.00 10 St0: Corror Intellistical St0: Corror Intellistical St0: Sandy Clay St0: Sandy	ASTM 07201 Target Prov (nb) Target Prov (nb) <th colsp<="" td=""><td>Alth Dist <thdis< th=""> Dist Dist D</thdis<></td><td>ASTN 0739 Dot <thdot< th=""> Dot <thdot< th=""> <thdot<< td=""></thdot<<></thdot<></thdot<></td></th>	<td>Alth Dist <thdis< th=""> Dist Dist D</thdis<></td> <td>ASTN 0739 Dot <thdot< th=""> Dot <thdot< th=""> <thdot<< td=""></thdot<<></thdot<></thdot<></td>	Alth Dist Dist <thdis< th=""> Dist Dist D</thdis<>	ASTN 0739 Dot Dot <thdot< th=""> Dot <thdot< th=""> <thdot<< td=""></thdot<<></thdot<></thdot<>



0.5 cfs Flow







Control Channel Prepared

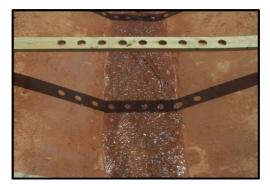


10



20





Initial Flow



30

35

40



On-going Flow . . . And Erosion



End-of-test Eroded Condition.

AST	M D7208	Date:	6/21/12	-							tart Time:				End Time:	4:37 PM	-
			Sandy Cl	ay						Target F	low (cfs):			1.00	Slope:	5%	
60 ft long flume	40 ft test section		Control			An	chorage:	Bare So	il								
	2 ft wide flum	e									TEST	DATA					
		Outlet Weir								Weir						Channel Targets	
FL	WC	Water Depth, in								2.25						1.50	
r width (ft) = 2		Water Velocity, ft/s								0.00						4 - 5	
Oft CDE	FG H	Flow Rate, cfs	0.00							0.00	0.00					1.00	
		Cross-section 1	A	В	С	D	E	F	G	Н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
	To origi	nal Surface Elev, ft	1.873	2.093	2.310	2.333	2.346	2.352	2.339	2.119	1.880	8.889	-		3.78		2.3
	To eroo	led Surface Elev, ft	1.873	2.093	2.310	2.388	2.398	2.415	2.382	2.119	1.880	8.999		Vavg (fps) =	3.78	Bed Max Shear	
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.023	Stress (psf)	Water Depth
	C	lopper Soil Loss, ft	0.000	0.000	0.000	-0.056	-0.052	-0.062	-0.043	0.000	0.000	-0.110	-0.331	Flow (cfs) =	1.00	0.42	0.13
5 ft	Straw Bales		F	Avg Botto	m Gain, ft	0.00	-	Avg C	Clopper Sc	il Loss, ft	-0.02	2					
		Cross-section 2	A	В	С	D	E	F	G	Н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
	To origi	nal Surface Elev, ft	2.244	2.474	2.651	2.680	2.661	2.654	2.549	2.320	2.073	10.092			3.94		2.6
	To eroo	led Surface Elev, ft	2.244	2.474	2.684	2.707	2.707	2.684	2.585	2.320	2.073	10.167	0.000	Vavg (fps) =	3.94	Bed Max Shear	
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Water Depth
	C	lopper Soil Loss, ft		0.000	-0.033	-0.026	-0.046	-0.030	-0.036	0.000	0.000	-0.075	-0.226	Flow (cfs) =	1.00	0.40	0.13
0 ft				Avg Bottor		0.00			Clopper Sc		-0.02	re-25	(°.1				
	—	Cross-section 3		В	С	D	E	F	G	н	1	[ft ²] 8.937	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Su
	-	nal Surface Elev, ft		2.133	2.303	2.339	2.362	2.359	2.362	2.133	1.867		-		4.03		2.3
	To eroo	led Surface Elev, ft		2.133	2.326	2.408	2.415	2.405	2.421	2.133	1.867	9.058	0.000	Vavg (fps) =	4.03	Bed Max Shear	
		Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Water Depth
	C	lopper Soil Loss, ft		0.000	-0.023	-0.069	-0.052	-0.046	-0.059	0.000	0.000	-0.121	-0.304	Flow (cfs) =	1.00	0.39	0.12
5 ft				Avg Bottor		0.00			Clopper Sc		-0.03	rr,21	[:=]				
		Cross-section 4	A	В	С	D	E	F	G	н	I	[ft ²] 9.546	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
	-	nal Surface Elev, ft		2.303	2.480	2.516	2.520	2.516	2.477	2.238	1.988	9.631	-		3.99		2.4
	To eroo	led Surface Elev, ft		2.303	2.552	2.556	2.543	2.543	2.507	2.238	1.988	0.000	0.000	Vavg (fps) =	3.99	Bed Max Shear	
		Soil Gain, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			navg =	0.020	Stress (psf)	Water Depth
	C	lopper Soil Loss, ft		0.000	-0.072	-0.039	-0.023	-0.026	-0.030	0.000	0.000	-0.085	-0.256	Flow (cfs) =	1.00	0.36	0.11
20 ft				Avg Bottor		0.00			Clopper Sc		-0.02	10.21	[in]				
		Cross-section 5		В	С	D	E	F	G	Н	I	[ft ²] 8.367	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
	-	nal Surface Elev, ft		1.880	2.139	2.208	2.238	2.228	2.221	2.064	1.867	8.472	-		3.94		2.1
	To eroo	led Surface Elev, ft	1.621	1.880	2.201	2.267	2.270	2.270	2.238	2.064	1.867	0.000	0.000	Vavg (fps) =	3.94	Bed Max Shear	
		Soil Gain, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.105	-0.315	navg =	0.021	Stress (psf)	Water Depth
	C	lopper Soil Loss, ft		0.000	-0.062	-0.059	-0.033	-0.043	-0.016	0.000	0.000	-0.105	-0.313	Flow (cfs) =	1.00	0.40	0.13
25 ft				Avg Bottor		0.00	_		Clopper Sc		-0.02	[ft ²]	[in]				
		Cross-section 6		В	С	D	E	F	G	н	I	8.741	[111]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
	-	nal Surface Elev, ft		1.949	2.182	2.306	2.326	2.336	2.333	2.188	1.949	8.880	-		3.94		2.3
	lo eroc	led Surface Elev, ft	1.696	1.949	2.218	2.405	2.392	2.382	2.359	2.188	1.949	0.000	0.000	Vavg (fps) =	3.94	Bed Max Shear	
		Soil Gain, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.139	-0.417	navg =	0.021	Stress (psf)	Water Depth
	, c	lopper Soil Loss, ft		0.000	-0.036	-0.098	-0.066	-0.046	-0.026	0.000	0.000	0.100	0.117	Flow (cfs) =	1.01	0.40	0.13
30 ft		· · ·	F	Avg Botto	m Gain, ft	0.00	-	Avg C	Clopper Sc	ul Loss, ft	-0.03	[ft ²]	[in]			Veas	T 111 () 0
		Cross-section 7	A	В	C	U	E	F	G	н	1	8.695	[m]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
		nal Surface Elev, ft		1.995	2.251	2.290	2.310	2.293	2.303	2.126	1.873	8.792	-		4.08		2.2
	To eroo	led Surface Elev, ft		1.995	2.283	2.336	2.336	2.333	2.365	2.126	1.873	0.000	0.000	Vavg (fps) =	4.08	Bed Max Shear	
		Soil Gain, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.097	-0.292	navg =	0.019	Stress (psf)	Water Depth
	C	lopper Soil Loss, ft		0.000	-0.033	-0.046	-0.026	-0.039			0.000	5.051	5.2.52	Flow (cfs) =	0.91	0.35	0.11
35 ft		0		Avg Botto		0.00	-		Clopper Sc		-0.02	[ft ²]	[in]	Nessi		N.@	T- W(-) - C
		Cross-section 8		B	C	D	E	F	G	H	4 05 -	9.018	[]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
	-	nal Surface Elev, ft		2.060	2.323	2.385	2.411	2.405	2.375	2.188	1.926	9.112		V/01/5 /6	4.05		2.3
	To eroo	led Surface Elev, ft		2.060	2.375	2.405	2.467	2.454	2.411	2.188	1.926	0.000	0.000	Vavg (fps) =	4.05	Bed Max Shear	Water
		Soil Gain, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.094	-0.282	navg =	0.021	Stress (psf)	Water Depth
		lopper Soil Loss, ft		0.000	-0.052	-0.020	-0.056	-0.049	-0.036	0.000	0.000			Flow (cfs) =	1.06	0.41	0.13
	CJ <u>S</u>	30/2012 Cross-section 9		Avg Bottor B	n Gain, ft C	0.00 D	Е	Avg C	G G	H H	-0.02	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Su
0 ft												8.564		v 🙂 U.2d		v 🙂 0.80	
ю п	-	nal Surface Elev, ft		1.903	2.142	2.274	2.290	2.290	2.313	2.123	1.844	8.671		Vour (fra)	4.1		2.2
i0 ft		led Surface Elev, ft		1.903	2.175	2.336	2.356	2.326	2.339	2.123	1.844	0.000	0.000	Vavg (fps) =	4.10	Bed Max Shear	Water Deat
io ft	To eroo	Soil Gain, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.107	-0.322	navg =	0.020	Stress (psf)	Water Depth
40 ft				0.000	-0.033	-0.062	-0.066	-0.036	-0.026	0.000	0.000	507	JIGEL	Flow (cfs) =	1.02	0.39	0.12
		lopper Soil Loss, ft			m C-1			Avg C	Clopper Sc	ni LOSS, ft	-0.02						
		lopper Soil Loss, ft	A	Avg Botto 0.000		0.00	0.000	0.000	0.000	0.000	0.000	Volu	ume	-	D-// -		0.000
0 ft	c	Clopper Soil Loss, ft Avg Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Volu		-		ain per Xsection, ft =	
0 ft	c	lopper Soil Loss, ft	0.000	-			0.000 -0.047	0.000	-0.035	0.000	0.000	[ft³]	ime [in]	-	oper Soil Lo	ss per Xsection, ft =	-0.024
	c	Clopper Soil Loss, ft Avg Soil Gain, ft	0.000	0.000	0.000	0.000			-0.035 Origir	0.000 nal Surfac	0.000 e Elev	[ft ³] 365.061		-	oper Soil Lo X-	ss per Xsection, ft = Section Spacing, ft =	-0.024 : 5
	c	Clopper Soil Loss, ft Avg Soil Gain, ft	0.000	0.000	0.000	0.000			-0.035 Origir Erode	0.000	0.000 e Elev e Elev	[ft³]		-	oper Soil Lo X-	ss per Xsection, ft =	-0.024 5 40







Control Channel Prepared





Initial Flow & Inlet Weir





On-going Flow . . . And Erosion



End-of-test Eroded Condition.

ASTM D7208		6/27/12						Start Time:				2:29 PM End Time: 2:59 PM 2.00 Slope: 5%						
60 ft long flume 40 ft test section RECP:		Sandy Clay Control Anchorage: Bare Soil						Target Flow (cfs):				2.00 Slope: 5%						
<u> </u>		ide flume	REGF.	Control			All	chorage.	Dale SU			TEST	ΠΑΤΑ					
			Outlet Weir								Weir						Channel Targets	
FL	.OW		Water Depth, in								2.50						1.75	
eir width (ft) = 2		Wa	ater Velocity, ft/s								0.00						5.5 - 6	
Oft C D E	FG H		Flow Rate, cfs	0.00							0.00	0.00					2.00	
		C	Cross-section 1	А	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf,
		To original	Surface Elev, ft	1.814	2.047	2.303	2.329	2.339	2.346	2.320	2.116	1.870	8.827			4.84		2.2
	*	To eroded	Surface Elev, ft	1.814	2.047	2.343	2.382	2.365	2.392	2.356	2.116	1.870	8.927		Vavg (fps) =	4.84	Ded May Obser	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.022	Bed Max Shear Stress (psf)	Water Depth (
		Clop	per Soil Loss, ft	0.000	0.000	-0.039	-0.052	-0.026	-0.046	-0.036	0.000	0.000	-0.100	-0.299	Flow (cfs) =	2.00	0.57	0.18
5 ft				A	vg Bottor	n Gain, ft	0.00		Avg C	lopper Sc	oil Loss, ft	-0.02						
		C	cross-section 2	А	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
		To original	Surface Elev, ft	1.923	2.126	2.402	2.441	2.461	2.441	2.411	2.188	1.972	9.204			4.8		2.3
		To eroded	Surface Elev, ft	1.923	2.126	2.418	2.539	2.497	2.533	2.490	2.188	1.972	9.375		Vavg (fps) =	4.80	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.023	Stress (psf)	Water Depth (
		Clop	oper Soil Loss, ft	0.000	0.000	-0.016	-0.098	-0.036	-0.092	-0.079	0.000	0.000	-0.171	-0.512	Flow (cfs) =	2.00	0.59	0.19
10 ft					vg Bottor		0.00			lopper Sc	il Loss, ft	-0.04						
			Cross-section 3	А	В	С	D	E	F	G	Н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
		To original	Surface Elev, ft	1.745	1.972	2.211	2.270	2.306	2.267	2.238	2.008	1.814	8.523			4.9		2.2
		To eroded	Surface Elev, ft	1.749	1.972	2.283	2.395	2.336	2.310	2.359	2.008	1.814	8.710	0.000	Vavg (fps) =	4.90	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Stress (psf)	Water Depth
		Clop	per Soil Loss, ft	-0.003	0.000	-0.072	-0.125	-0.030	-0.043	-0.121	0.000	0.000	-0.186	-0.559	Flow (cfs) =	1.74	0.55	0.18
15 ft					vg Bottor		0.00			lopper Sc		-0.04	16.21	[in]				
			cross-section 4	A	В	С	D	E	F	G	Н	1	[ft ²] 9.635	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
		Ū.	Surface Elev, ft	2.018	2.274	2.493	2.549	2.572	2.536	2.520	2.287	2.037	9.804			5.1		2.4
		To eroded	Surface Elev, ft	2.018	2.274	2.713	2.579	2.595	2.575	2.648	2.287	2.037	0.000	0.000	Vavg (fps) =	5.10	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.170	-0.509	navg =	0.021	Stress (psf)	Water Depth
		Clop	oper Soil Loss, ft	0.000	0.000	-0.220	-0.030	-0.023	-0.039	-0.128	0.000	0.000	-0.170	-0.303	Flow (cfs) =	1.81	0.55	0.18
20 ft					vg Bottor		0.00	-		lopper Sc		-0.05	[ft ²]	[in]			Veas	-
			Cross-section 5	A	B	C	D	E	F	G	Н	1 700	8.575	[11]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
		-	Surface Elev, ft	1.781	2.051	2.228	2.254	2.277	2.274	2.238	2.021	1.788	8.720) (5.05		2.1
		I o eroded	Surface Elev, ft	1.788	2.051	2.320	2.316	2.323	2.323	2.310	2.021	1.788	0.000	0.000	Vavg (fps) =	5.05	Bed Max Shear	Water Death (
		Clor	Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.145	-0.436	navg =	0.023	Stress (psf)	Water Depth (
25 ft		Ciop	per Soil Loss, ft	-0.007	0.000	-0.092	-0.062	-0.046	-0.049	-0.072	0.000	0.000			Flow (cfs) =	2.09	0.64	0.21
25 11			Cross-section 6	A	B	C	0.00 D	Е	F	G	Н	-0.04	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
			Surface Elev, ft	1.909	2.169	2.421	2.487	2.510	2.513	2.474	2.290	2.057	9.435		V & 0.20	5.15	V & 0.00	2.4
		-	Surface Elev, ft	1.909	2.169	2.536	2.523	2.559	2.530	2.687	2.290	2.057	9.596	ł	Vavg (fps) =	5.15		
		10 0.0000	Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.020	Bed Max Shear Stress (psf)	Water Depth (
		Clop	oper Soil Loss, ft	0.000	0.000	-0.115	-0.036	-0.049	-0.016	-0.213	0.000	0.000	-0.161	-0.482	Flow (cfs) =	1.76	0.53	0.17
30 ft					vg Bottor		0.00			lopper Sc		-0.05						
			Cross-section 7	А	В	С	D	Е	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Surf
			Surface Elev, ft		1.896	2.126	2.175	2.195	2.192	2.149	1.959	1.690	8.189			5.1		2.1
			Surface Elev, ft	1.624	1.896	2.195	2.264	2.241	2.247	2.234	1.959	1.690	8.353		Vavg (fps) =	5.10	D 1/1 ()	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.021	Bed Max Shear Stress (psf)	Water Depth (
		Clop	oper Soil Loss, ft	-0.007	0.000	-0.069	-0.089	-0.046	-0.056	-0.085	0.000	0.000	-0.164	-0.492	Flow (cfs) =	1.87	0.57	0.18
35 ft					vg Bottor		0.00		Avg C	lopper Sc		-0.04						
			Cross-section 8	А	В	с	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
		To original	Surface Elev, ft	1.795	2.031	2.303	2.359	2.402	2.415	2.392	2.234	2.011	9.026			5.1		2.3
		To eroded	Surface Elev, ft	1.791	2.031	2.402	2.451	2.493	2.480	2.467	2.234	2.011	9.219		Vavg (fps) =	5.10	Bed Max Shear	
			Soil Gain, ft	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	navg =	0.020	Stress (psf)	Water Depth
		Clop	oper Soil Loss, ft	0.000	0.000	-0.098	-0.092	-0.092	-0.066	-0.075	0.000	0.000	-0.194	-0.581	Flow (cfs) =	1.67	0.51	0.16
40 ft		CJ <u>S 6/30</u>	0/2012	A	vg Bottor	n Gain, ft	0.00		Avg C	lopper Sc	il Loss, ft	-0.05						
			Cross-section 9	А	В	с	D	E	F	G	н	I	[ft ²]	[in]	V @ 0.2d	V @ 0.6d	V @ 0.8d	To Water Sur
		To original	Surface Elev, ft	1.827	2.080	2.310	2.359	2.385	2.352	2.320	2.083	1.824	8.863			5.17		2.3
		To eroded	Surface Elev, ft	1.827	2.080	2.457	2.474	2.467	2.375	2.425	2.083	1.824	9.067		Vavg (fps) =	5.17	Bed Max Shear	
			Soil Gain, ft	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	navg =	0.020	Stress (psf)	Water Depth
		Clop	oper Soil Loss, ft	0.000	0.000	-0.148	-0.115	-0.082	-0.023	-0.105	0.000	0.000	-0.203	-0.610	Flow (cfs) =	1.83	0.55	0.18
					vg Bottor		0.00			lopper Sc		-0.05						
			Avg Soil Gain, ft		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Volu	ıme	Avg	g Bottom Ga	ain per Xsection, ft =	0.000
		Avg Clop	oper Soil Loss, ft	-0.001	0.000	-0.098	-0.082	-0.048	-0.051	-0.088	0.000	0.000	[ft ³]	[in]	Avg Clop	oper Soil La	ss per Xsection, ft =	-0.022
										Origir	nal Surfac	e Elev	362.440			X-	Section Spacing, ft =	5
										Erode	ed Surfac	e Elev	369.224			Tes	t Section Length, ft =	
										So	oil Loss/ G	ain	0.004	0.000			gauge spacing, ft =	
											CSLI		-6.788	-0.509		channel	width measured, ft =	4







Control Channel Prepared





Initial Flow & Closeup





On-going Flow . . . And Erosion



End-of-test Eroded Condition.



GSWCC - BMP Testing October 27, 2012 Appendix

APPENDIX C – SEDIMENT BARRIER TEST PROCEDURE

	Page 1 of 7	Document Number: 30SOP-GSWCC-SB, Rev 0			
TRI/ENVIRONMENTAL		Effective Date: Sept 1, 2012			

Date:

Approved:_____ Sam R. Allen, Vice President

Standard Test Method for Determination of Sediment Retention Devices (SRDs) Performance in Reducing Sediment Loss from Rainfall-Induced Erosion during Perimeter Control Applications

DDRF Division

Title	Large-scale Slope Sediment Retention
Test Method Reference	GSWCC-SB / WK11340
Test Category	Hydraulic Performance
Material Applicability	Sediment Retention Devices (a.k.a. SRDs)
Target Property	Soil Loss / Seepage
Units of Test Result	Practice Factor (as used in the Universal Soil Loss Equation)
Test Specimen Configuration	8 feet wide
Number of Replicate Specimens	Three (one each on three different slopes)
Equipment Required	Rainfall simulators, water source, runoff and sediment collection system, other miscellaneous equipment including: rain gauges, sieve set (standard US sieves), drying cans, a drying oven or microwave oven, balances, meteorological equipment (wind speed, temperature, precipitation), sample bottles, and camera and video recorder.

1.0 PURPOSE

1.1 This test method covers the determination of a practice factor (a.k.a. "P-Factor") for a sediment retention device.

2.0 SCOPE

- 2.1 This test method is a performance test, but can be used for quality assurance to determine product conformance to project specifications. Caution is advised since information regarding laboratory specific precision is incomplete. For project specific conformance, unique project-specific conditions may be taken into consideration.
- 2.2 This test method covers the guidelines, requirements and procedures for evaluating the ability of Sediment Retention Devices (SRDs) to retain sediments resulting from rainfall-induced erosion.
- 2.3 This test method utilizes full-scale testing procedures, and is patterned after conditions typically found on construction sites prior to revegetation work. Further, procedures for evaluation of baseline conditions are provided. Thus, test preparation, test execution, data collection, data analysis and reporting procedures herein are intended to be suitable for testing of bare soil and SRDs.
- 2.4 One control plot (bare soil) shall be tested either before or after the product testing. All testing shall follow identical procedures. The control plot results are combined with previous control runs to characterize control plot performance and to obtain an associated "K-Factor" for use in P-Factor computations.

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3.0 **RESPONSIBILITIES**

- 3.1 The Corporate Quality Officer in conjunction with the laboratory director is responsible for the implementation and maintenance of the standard operating procedure.
- 3.2 The Laboratory Director/Assistant Laboratory Director is responsible for informing the technicians of the maintenance and operation requirements for specific equipment and provides training to technicians.
- 3.3 The Technicians are responsible for performing apparatus/facility setup, conducting the test, performing the required equipment preventive maintenance and documenting the results.

4.0 SAFETY

4.1 Take care when performing preparation and testing operations on the slope.

5.0 APPARATUS / FACILITY

- 5.1 Testing is performed on three earthen embankment test plots having a surface slope of 3H:1V and a slope length of 40 ft, though the actual exposed surface upstream of the SRD is 27 ft. The test plot width is 8 ft.
- 5.2 The test plot shall be constructed with a minimum 12-inch thick veneer of compacted soil of the type requested for testing. The default soil type is sandy clay as defined by the USDA soil triangle. Representative samples of the test soil shall be sent to a geotechnical laboratory at least once per year, or whenever the stockpile is changed, for determination of grain size distribution, Atterberg limits, organic matter content, standard Proctor density, and optimum moisture content.
- 5.3 The test plot soil is compacted to create a geotechnically (structurally) stable subgrade. Place soil in a minimum of two lifts and compact to 90 ± 3 % of standard Proctor density in accordance with Test Method D 698. In-situ density shall be verified via any generally accepted method, such as ASTM D 2937 (drive cylinder method).
- 5.4 Test plots are separated sufficiently to prevent work activities and overspray from one plot from impacting adjacent plots. The top and side edges of each plot are constructed with edging sufficient to prevent run-on of water from outside the plot.
- 5.5 The test plots are encircled by sprinkler risers around the perimeter of the test plot to provide uniform distribution of the rainfall intensities to be used in testing. The sprinkler risers and locations shall be established based on the calibration procedures set forth in Section 7.0. The sprinkler risers are supplied and connected by a piping system capable of providing consistent water supply to maintain the calibrated performance.

6.0 PROCEDURE

- 6.1 Test Plot Preparation:
 - 6.1.1 Repair depressions, voids, soft, or uncompacted areas.
 - 6.1.2 Also, free the plot from obstructions or protrusions, such as roots, large stones, or other foreign material.

- 6.1.3 If the plots have been used for previous test series, discard the soil carried off the plot and obliterate any rills and gullies. Spread new soil of the same type across the plot and blend (rake or till) into the surface.
- 6.1.4 Loosen the soil veneer to a depth of approximately 10 cm (4 in.) using a tiller or other appropriate tool.
- 6.1.5 Determine the moisture content of the soil on each test plot.
- 6.1.6 Wet or dry each plot until the soil reaches the optimum moisture content $\pm 4\%$.
- 6.1.7 Rake the tilled plot smooth with a steel hand rake.
- 6.1.8 Lightly compact the soil surface using a turf roller.
- 6.2 Test Set-Up
 - 6.2.1 Control (Bare Soil) Testing Proceed to 6.2.4
 - 6.2.2 Product Testing
 - 6.2.2.1 Install the SRD at the base of the plot as directed by the client after the test plot has been prepared.
 - 6.2.2.2 Permit no foot traffic on the plot, once the SRD has been installed.
 - 6.2.2.3 Document the installation methodology for the SRD.
 - 6.2.2.4 Install the SRD so that no runoff is allowed to run around the ends of the SRD.
 - 6.2.3 Take soil samples from each test plot to determine the pretest soil moisture content within 1 hour prior to the test. Generally, 3 samples are taken from each test plot at the horizontal quarter points.
 - 6.2.4 Place rain gauges on each test plot to document actual rainfall amount. Generally, 6 gauges are used on each test plot and positioned in pairs, each 2 ft from the plot edge, at the horizontal quarter points.
 - 6.2.5 Take photographs of the plot prior to testing.
- 6.3 Pre-Test Documentation:
 - 6.3.1 Maintain a digital test folder for each test, including the following information:
 - 6.3.1.1 Calibrated rainfall properties.
 - 6.3.1.2 Calibrated test soil properties, including soil classification; standard proctor moisture-density relationship; "K" factor; gradation (including hydrometer test for the P200 fraction); and Atterberg limits.
 - 6.3.1.3 Data from the on-site weather station at the time of the test, including ambient air temperature, wind speed, and precipitation.
 - 6.3.1.4 Product manufacturer; product name; description; specifications; size; and a picture of the material, if practical.
 - 6.3.1.5 Test data, including soil moisture condition, all measurements made during testing, and pictures and videos of the test.

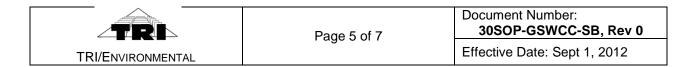


6.3.2 When product testing, obtain a sufficient size sample of the product to be tested and submit the sample for the index tests shown in the following table:

SRD – Silt Fence	SRD – RECP	SRD - Wattle
Mass/Area	Mass/Area	Mass/Volume
Thickness	Thickness	Circumference / Perimeter
Tensile Strength	Ground Cover	
Permittivity	Tensile Strength	
Apparent Opening Size	Absorption (temporary)	
Percent Open Area	Specific Gravity (permanent)	

6.4 **Test Operation and Data Collection:**

- 6.4.1 Include the following test data:
 - 6.4.1.1 operator identification;
 - 6.4.1.2 operating pressure;
 - 6.4.1.3 sprinkler heads activated;
 - 6.4.1.4 time rainfall began;
 - 6.4.1.5 time stopped;
 - 6.4.1.6 time runoff stopped, and;
 - 6.4.1.7 volume (timed) readings taken at 1 minute intervals;
 - 6.4.1.8 sediment concentrations taken at 3 minute intervals.
- 6.4.2 Perform testing at sequential target intensities of 5.1, 10.2, 15.2 cm/hr (2, 4, 6 in/hr) for 20 min.
- 6.4.3 During each target intensity, collect all runoff. Take timed volume samples at 1 minute intervals and grab samples at 3 minute intervals to determine runoff rate and sediment concentration, respectively. Commence sampling when runoff starts and continue until runoff stops (or becomes minimal). Take timed volume samples from the plot apron in appropriately sized containers. Take grab samples from the plot apron in 250 mL laboratory sample bottles and analyze for suspended sediment.
- 6.4.4 When the test is stopped at the end of each intensity (20 minutes of catastrophic failure) measure and record the depth of rainfall collected in each rain gauge.
- 6.4.5 Determine total sediment from the plot tested by allowing settlement to occur in the runoff collection tanks. Allow a minimum of 12 hours for settlement or use a flocculating agent. Decant and discard excess water, making sure that the sediment in the bottom of the tank is not disturbed. Collect the entire amount of the settled sediment.
- 6.4.6 Repeat 6.4.1 thru 6.4.5 for two additional slopes when testing a product.
- 6.4.7 Dry, weigh, and record the dry sediment weight.
- 6.4.8 Record general observations regarding the condition of the tested SRD at the conclusion of the data collection. Take photographs of the test plot after testing has been completed.
- 6.4.9 Carefully remove the SRD from the plot with as little disturbance of the soil as possible. Note general observations regarding the condition and erosion patterns (rills, etc.). Take photographs to record the condition of the soil.



6.5 Test Data:

- 6.5.1 Tabulate runoff data showing discharge as a function of time.
- 6.5.2 Tabulate sediment concentration as a function of time.
- 6.5.3 From the total sediment yield and available control data, compute the cummulative practice factor (P-Factor), comparing soil loss from the protected condition to that of the bare soil condition.

6.6 Report

Report at a minimum the following information:

- 6.6.1 General information, including test facility location, date, time and operator(s),
- 6.6.2 Test plot preparation,
- 6.6.3 Calibration data and analysis,
- 6.6.4 Materials documentation including SRD material and installation description,
- 6.6.5 Test operation, data collected, and data analysis.
- 6.6.6 Cumulative results of associated control (bare soil) testing.

7.0 Calibration and Associated Calculations

- 7.1 Simulated Rainfall Calibration
 - 7.1.1 Calibration of the rainfall simulation equipment includes establishing: Rainfall intensity; Uniformity of rainfall application across the plot; Drop size distribution for each intensity, and; Rainfall drop height.
 - 7.1.2 To ensure uniform distribution, do not conduct calibration and testing when the wind velocity is greater than 8 km/h (3 mph).
 - 7.1.3 Conduct calibration annually or following equipment maintenance work. Conduct one intensity/uniformity check every 90 days, or after no more than four test series, whichever comes first.
 - 7.1.4 Place sprinkler risers around the perimeter of the test plot to provide uniform distribution. The precise location of the risers to provide uniform rainfall distribution will be determined by the calibration process and the nuances of any given simulator system.
 - 7.1.5 To measure rainfall intensity and uniformity, calibration tests shall be fun for 15 minutes, recorded to the nearest second. The data shall be used to calculate the rainfall intensity uniformity using the Christiansen uniformity coefficient. Uniformity calibration shall be based on 14 rain gauges positioned equi-distant from each other across and down the slope. Thus, they are located 2 ft from the closest edge and 4 ft from each other. Perform calibrations at uniform pressure for each intensity. Adjust valve and pressure settings until an acceptably uniform rainfall distribution pattern is achieved.

- 7.1.6 To measure drop size distribution, completely fill three labeled pie pans with sifted flour, struck off with a ruler to produce a smooth, uncompacted surface.
 - 7.1.6.1 Identify three locations along the vertical centerline of the test plot, and at the horizontal quarter points.
 - 7.1.6.2 Extend the covered, filled pie pans out into the rainfall at the identified locations.
 - 7.1.6.3 At the desired test intensity, remove the cover briefly so that drops impinge on the flour to form pellets.
 - 7.1.6.4 Re-cover the pans after only a few seconds and before the drops start to touch each other, and remove the pans from the rainfall.
 - 7.1.6.5 Repeat this procedure at each desired intensity.
 - 7.1.6.6 Air-dry the flour pellets for a minimum of 12 h. Screen each sample of these semi-dry pellets by emptying the entire contents of the pan onto a 70 mesh sieve to carefully remove as much loose flour as possible. Then transfer the remaining pellets to evaporating dishes and heat in an oven at approximately 43°C (110°F) for 2 h.
 - 7.1.6.7 Record the total weight of the hard flour pellets.
 - 7.1.6.8 Sieve the pellets through standard soil sieves by shaking for 2 min.
 - 7.1.6.9 Cull foreign matter and any double pellets from each sieve and record the total weight and pellet count for each size.
 - 7.1.6.10 Raindrop sizes shall be shown to include no more than 10% greater than 6mm (0.24 in) and no more than 10% less than 1mm (0.04 in).
 - 7.1.6.11 Repeat the raindrop size calibration procedure three times for each desired intensity.
- 7.1.7 Determine raindrop fall height by measuring the average height of the raindrop trajectory using a surveyor's rod. Hold the rod vertically in the spray of a single riser and measure the wetted height. Repeat the height measurement for each desired intensity.

7.2 Calibration Data:

- 7.2.1 Calculate the Christiansen uniformity coefficient (Cu) using the network of rain gauges described in 7.1.5, each of which represents an equal area of the test plot. Calculate the Cu as follows:
 - 7.2.1.1 where:Cu = Christiansen uniformity coefficient,

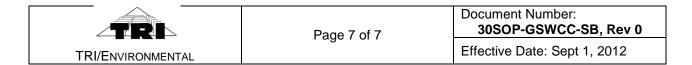
 $C_u = 100 [1.00 - \sum |d| \div n \bar{X}]$

where:

 C_{μ} = Christiansen uniformity coefficient,

 $d = X_i - \bar{X},$

- n = number of observations (20 in this case),
- X = average depth caught, and
- X_i = depth caught in each rain gauge, *i*.



7.2.2 The average rainfall intensity over the entire test plot is the average depth of rainfall collected in the rain gauges divided by the elapsed time of the test. The formula to calculate intensity (in centimeters per hour) is:

$$i = 60\left[\sum_{j=1}^{J} P_j \div Jt\right]$$

- i = rainfall intensity (cm / h),
- P_j = depth of rainfall (cm),
- J' = number of rain gauges (20 in this case), and
- t = time of test (minutes).
- 7.2.3 Plot the raindrop size distribution for each rainfall intensity. The plot should relate the percent of total volume to drop diameter.

8.0 TRAINING

8.1 The Laboratory Director and Assistant Laboratory Director in conjunction with Division Management are responsible for providing initial and ongoing training. This SOP and all associated SOPs are included in the department training program of all department new hires that perform any part of this SOP's activities and as continued training for existing personnel.

9.0 REFERENCES

- 9.1 ISO 9001, Quality Management System Requirements
- 9.2 ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories
- 9.3 01CQSP, Corporate Quality System Plan
- 9.4 ASTM WK11340 (February 2012)
- 9.5 ASTM D 698
- 9.6 ASTM D 2937

10.0 CHANGES TO PROCEDURE

Each change shall be documented.

Changes	Date	Revision Level		
New	9/01/12	0		



GSWCC - BMP Testing October 27, 2012 Appendix

APPENDIX D – CHECK DAM TEST PROCEDURE

	Page 1 of 6	Document Number: 30SOP-GSWCC_CD, Rev 0
TRI/ENVIRONMENTAL		Effective Date: Sept.1, 2012

	Data	A	Data
Approved:	_ Date:	Approved:	Date:
Sam R. Allen, Vice President		Alfred J. Ransom, C	Corporate Quality Officer

Standard Test Method for Determination of Temporary Ditch Check Performance in Protecting Earthen Channels from Stormwater-Induced Erosion

DDRF Division

Title	Large-scale Channel Erosion			
Test Method Reference	GSWCC-CD / ASTM D 7208-06			
Test Category	Hydraulic Performance			
Material Applicability	Sediment Retention Devices (a.k.a. SRDs)			
Target Property	Soil Loss			
Units of Test Result	Soil Loss			
Test Specimen Configuration	Minimum 12 ft long to fit across trapezoidal channel having			
	0.61 m (2 ft) bottom width and 2:1 side slopes.			
Number of Replicate Specimens	Three (one each in three different flumes)			
Equipment Required	Water delivery system, water source, survey apparatus,			
	velocity probe, earthwork equipment, photographic			
	equipment: camera and video recorder.			

1.0 PURPOSE

1.1 This test method covers the determination of a check structure performance via its ability to slow runoff, trap sediments, and decrease erosion.

2.0 SCOPE

- 2.1 This test method is a performance test, but can be used for quality assurance to determine product conformance to project specifications. Caution is advised since information regarding laboratory specific precision is incomplete. For project specific conformance, unique project-specific conditions may be taken into consideration.
- 2.2 This test method covers the guidelines, requirements, and procedures for evaluating the ability of temporary ditch checks to protect earthen channels from stormwater-induced erosion. Critical elements of this protection are the ability of the temporary ditch check to:
 - 2.2.1 Slow and/or pond runoff to encourage sedimentation, thereby reducing soil particle transport downstream;
 - 2.2.2 Trap soil particles upstream of the check structure; and
 - 2.2.3 Decrease soil erosion.
- 2.3 This test method utilizes full-scale testing procedures, and is patterned after conditions typically found on construction sites at the conclusion of earthwork operations, but prior to the start of revegetation work. Therefore this test method considers only unvegetated conditions. This test method provides a comparative evaluation of a temporary ditch check to baseline bare soil conditions under controlled and documented conditions.

3.0 **RESPONSIBILITIES**

- 3.1 The Corporate Quality Officer in conjunction with the laboratory director is responsible for the implementation and maintenance of the standard operating procedure.
- 3.2 The Laboratory Director/Assistant Laboratory Director is responsible for informing the technicians of the maintenance and operation requirements for specific equipment and provides training to technicians.
- 3.3 The Technicians are responsible for performing apparatus/facility setup, conducting the test, performing the required apparatus preventive maintenance and documenting the results.

4.0 SAFETY

4.1 Take care when performing preparation and testing operations in the channels.

5.0 APPARATUS / FACILITY

- 5.1 Testing is performed in trapezoidal cross section channels. Test channels have an approximate bed slope of 5% and a test channel length of 60 ft. The trapezoidal channel has a 2 ft bottom width and 2:1 side slopes.
- 5.2 The test channel shall be constructed with a minimum 12-inch thick veneer of compacted soil of the type requested for testing. The default soil type is sandy clay as defined by the USDA soil triangle. Representative samples of the test soil shall be sent to a geotechnical laboratory at least once per year, or whenever the stockpile is changed, for determination of grain size distribution, Atterberg limits, organic matter content, standard Proctor density, and optimum moisture content.
- 5.3 The channel bed soil is compacted to create a geotechnically (structurally) stable subgrade. Place soil in a minimum of two lifts and compact to 90 ± 3 % of standard Proctor density in accordance with Test Method D 698. In-situ density shall be verified via any generally accepted method, such as ASTM D2937 (drive cylinder method).

6.0 PROCEDURE

- 6.1 Test Channel Preparation:
 - 6.1.1 Soil preparation methods for bare soil (control) testing should be identical to soil preparation methods for the protected scenario.
 - 6.1.1.1 In the case previous testing was completed in the channel, obliterate any rills and gullies and spread new soil of the same type across the plot and blend (rake or till) into the surface.
 - 6.1.1.2 Determine the moisture content of the soil on each test plot.
 - 6.1.1.3 Wet or dry each plot until the soil reaches the optimum moisture content $\pm 4\%$.
 - 6.1.1.4 Rake the plot smooth with a steel hand rake.
 - 6.1.1.5 Compact the soil surface using a trapezoid form "drag" and/or hand compaction.
 - 6.1.2 Locate a 40 ft test reach sufficiently downstream of the channel inlet structure or transitions of flow to ensure straight and parallel stream lines. Flow should enter test reach as uniform flow, or as close to uniform flow as possible.

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- 6.1.3 Check Dam Installation Install the check dam in accordance with the client's directions. Locate the check structure (and associated scour apron, if required) at a point in the test reach that will allow any upstream ponding to be contained in the test reach. (Data acquisition cross-sections should be 2.5 ft upstream and downstream of the center of the check dam.)
 - 6.1.3.1 Record all pertinent information.
 - 6.1.3.2 Extend the check dam ends up the channel side slopes to prohibit flow from circumventing the check dam.
- 6.2 Pre-Test Documentation:
 - 6.2.1 Maintain a digital test folder for each test, including the following information:
 - 6.2.1.1 Calibrated flow properties.
 - 6.2.1.2 Calibrated test soil properties, including soil classification; standard proctor moisture-density relationship; "K" factor; gradation (including hydrometer test for the P200 fraction); and Atterberg limits.
 - 6.2.1.3 Product manufacturer; product name; description; specifications; size; and a picture of the material, if practical.
 - 6.2.1.4 Test data, including all measurements made during testing and pictures and videos of the test.
 - 6.2.2 When product testing, obtain a sufficient size sample of the product to be tested and submit the sample for the index tests shown in the following table:

SRD – Silt Fence	SRD - Wattle	SRD - Other
Mass/Area	Mass/Volume	TBD
Thickness	Circumference / Perimeter	TBD
Tensile Strength		
Permittivity		
Apparent Opening Size		
Percent Open Area		

- 6.3 Test Section Preparation:
 - 6.3.1 Test Section Immediately prior to testing, delineate cross sections for data acquisition. At a minimum, nine cross sections should be included through the test reach, with a maximum spacing between sections of 5 ft in the direction of flow. The test section shall be a minimum of 40 ft long.
 - 6.3.2 Establish a sufficient number of uniformly spaced data acquisition locations within each cross section to record water surface elevation and bed elevation both below and above the maximum water level. At a minimum, three data acquisition locations along the bed of the channel and up each side slope must be identified and monitored at each cross section. Record the elevation of each data acquisition location by survey apparatus or point gauge assembly. If using a point gauge assembly in a relative frame of reference, determine the longitudinal slope of the installation by survey apparatus. Elevation readings can be sensitive to the diameter of the probe (rod or point gauge assembly) in contact with the ground surface. Thus, the point gauge assembly or survey rod should include an extension

rod between 6.4 mm (0.25 in.) and 9.5 mm (0.375 in.) in diameter to make contact with the ground surface.

- 6.3.3 Use an upstream hydraulic control structure with a calibrated weir to introduce volumetric flows to the channel. Three increasing flows one per channel will be used in the testing. The test flow rates shall be 0.5, 1.0, and 2.0 cfs.
- 6.4 Prepare facility for testing.
 - 6.4.1 Provide access to each data acquisition cross section to permit measurement of bed and water surface elevations by means of survey apparatus or point gauge assembly without walking on channel surface. Record elevation of each data acquisition location to establish the baseline elevations.
- 6.5 Test Operation and Data Collection:
 - 6.5.1 Record the following information and test data:
 - 6.5.1.1 operator identification;
 - 6.5.1.2 baseline channel elevations;
 - 6.5.1.3 actual discharge recorded during testing, time flow began;
 - 6.5.1.4 time flow stopped;
 - 6.5.1.5 flow depths; and measured velocities;
 - 6.5.1.6 final channel elevations.
 - 6.5.2 Slowly increase flow to initial target discharge.
 - 6.5.3 Allow flow to increase over approximately ten minutes to minimize shock to the system.
 - 6.5.4 Once the flow has been increased to the target discharge, allow the flow to reach equilibrium.
 - 6.5.5 Record water surface elevation measurements at each data acquisition location at each cross section using the point gauge assembly or survey apparatus used to record bed elevations.
 - 6.5.6 Record velocity measurements at the centerline point of each test cross section using the velocity probe.
 - 6.5.7 Velocity measurements at approximately the mid-point of depth.
 - 6.5.8 Record photographs and video footage of the testing. Convey flow for thirty minutes at the target discharge or until the check dam becomes dislodged, whichever is shorter.
 - 6.5.9 At the conclusion of the initial target discharge, inspect the test channel noting any changes in SRD or bed soil condition. Record photographs and video footage of the installation. Record elevation of each data acquisition location at the same locations as recorded during initial data collection.
 - 6.5.10 Carefully remove the SRD from the channel, with as little disturbance of the soil as possible. Note general observations regarding the condition and scour patterns. Take photographs to record the condition of the test channel. Markers may be used to identify any scour patterns for the pictorial documentation. Photographs should show the final condition of the test plot with and without the SRD in place.
 - 6.5.11 Setup and run identical channels for each of the higher flows.

6.5.12 A total of three tests (1 each at 0.5, 1.0, and 2.0 cfs) should be performed on each check dam system to obtain a range of performance measurements. Each test should follow identical procedures as noted above.

6.6 Test Data:

- 6.6.1 Tabulate before and after elevations and flow (velocity/depth), as well as flow at weir measurements.
- 6.6.2 From the available data, compute soil loss and associated flow (shear/velocity) characteristics and channel properties as discussed in 7.0.

7.0 Data Analysis

- 7.1 The objective of the analysis of test data is to determine the relationship between volumetric flow (including velocity) and soil loss and to determine the hydraulic conditions created by check dams.
- 7.2 Determine total discharge from weir, inline flow meter, or alternative procedure.
- 7.3 Develop profile plot for each test to include bed surface, water surface and energy grade line.
- 7.4 Bed elevation prior to testing should be plotted in conjunction with the water surface elevation measured during testing.
- 7.5 Flow depth is computed as the vertical difference between water surface and bed surface elevation measurements.
- 7.7 Calculate the Clopper Soil Loss Index (CSLI) from the topographic data gathered before and after test flows. Use the change in channel topography to define the performance of the SRD. Quantify areas of degradation (soil loss) as "cut" and quantify areas of aggradation (sediment deposition) as "fill." Compute CSLI as follows:

$$\begin{split} & \text{CSLI} = (\text{C}_{\text{T}}/\text{A}_{\text{T}}) \text{ x 100} \\ & \underline{\text{Where}}\text{:} \\ & \text{SAI} = \text{Soil Aggradation Index} \\ & \text{C}_{\text{T}} = \text{total cut, m}^3\text{, and} \\ & \text{A}_{\text{T}} = \text{wetted channel area, m}^2 \end{split}$$

7.9 Calculate the Soil Aggradation Index (SAI) from the topographic data gathered before and after test flows. Use the change in channel topography to define the performance of the SRD. Quantify areas of degradation (soil loss) as "cut" and quantify areas of aggradation (sediment deposition) as "fill." Compute SAI as follows:

$$\begin{split} SAI &= (F_T/A_T) \ x \ 100 \\ \underline{Where}: \\ SAI &= Soil \ Aggradation \ Index \\ F_T &= total \ aggradation, \ m^3, \ and \\ A_T &= wetted \ channel \ area, \ m^2 \end{split}$$

- 8.0 **Report** An engineering report documenting the test facility, test preparation, test execution, collected data, data analysis and results must be generated to include:
 - 8.1 General information, including test facility location, date, and time,



- 8.2 Test channel preparation including geotechnical properties of test soil,
- 8.3 In-situ compaction validation,
- 8.4 Weir calibration data and analysis, if used,
- 8.5 Materials documentation including check dam material and installation details,
- 8.6 Test operation and data collected, and
- 8.7 Data analysis,
- 8.8 Table and/or plot of flow depth, flow velocity, and soil loss.

9.0 TRAINING

9.1 The Laboratory Director and Assistant Laboratory Director in conjunction with Division Management are responsible for providing initial and ongoing training. This SOP and all associated SOPs are included in the department training program of all department new hires that perform any part of this SOP's activities and as continued training for existing personnel.

10.0 REFERENCES

- 10.1 ISO 9001, Quality Management System Requirements
- 10.2 ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories
- 10.3 01CQSP, Corporate Quality System Plan
- 10.4 ASTM D 7208
- 10.5 ASTM D 698
- 10.6 ASTM D 2937

11.0 CHANGES TO PROCEDURE

Each change shall be documented.

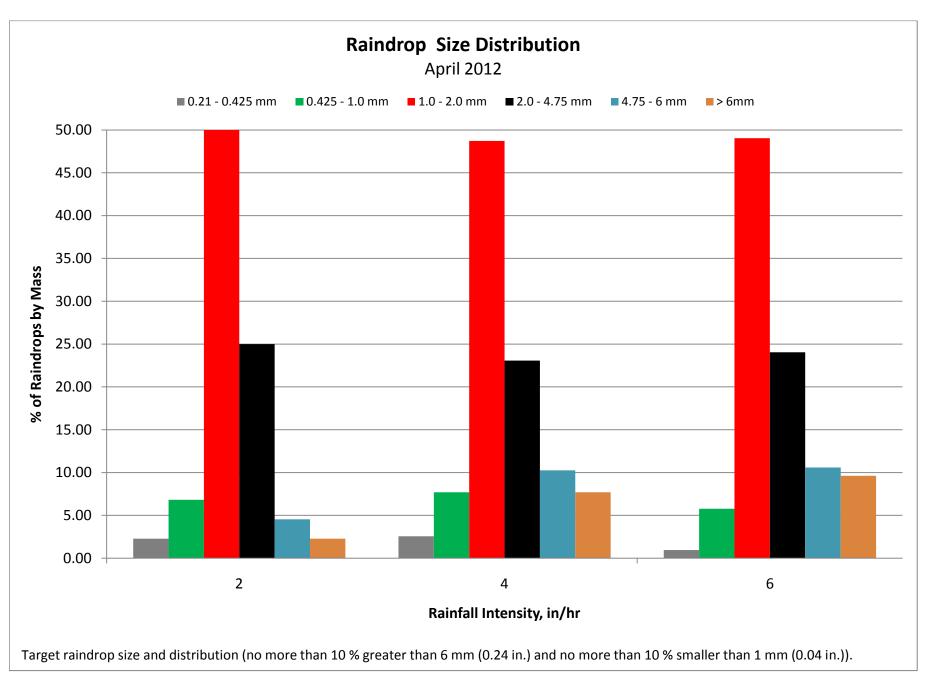
Changes	Date	Revision Level		
New	9/1/12	0		



GSWCC - BMP Testing October 27, 2012 Appendix

APPENDIX E – RAINFALL CALIBRATION DATA







DDRF Rainfall Calibration

Slope 2 - Target 6 in/hr

Date: <u>13-Apr-12</u>

Start Time: 12:30 PM

End Time: 12:45 PM

Test Time: <u>15</u> min.

(circle "x" for open valves)

TOP OF SLOPE

				P =		psi							
					Α	_							
	d =	mm		1	2		d =	mm					Х
	i =	0.00 in/hr		•	2	в	i =	0.00 in/hr	P) = <u> </u>		psi	Х
x	d =	mm		3	4		d =	mm					Х
X P =psi	i =	0.00 in/hr	С	3	-		i =	0.00 in/hr					х
X	d =	mm		5	6		d =	mm					Х
x	i =	0.00 in/hr		5	U	D	i =	0.00 in/hr	P) =	9	psi	Х
x	d =	35 mm		7	8		d =	35 mm					Х
X P = <u>9</u> psi	i =	5.51 in/hr	Е	7	U		i =	5.51 in/hr					х
X	d =	39 mm		9	10		d =	37 mm					х
x	i =	6.14 in/hr		5	10	F	i =	5.83 in/hr	P) =	9	psi	Х
x	d =	<u>40</u> mm		11	12		d =	<u>39</u> mm					Х
X P = <u>9</u> psi	i =	6.30 in/hr	G		12		i =	6.14 in/hr					Х
X	d =	<u>41</u> mm		13	14		d =	<u>41</u> mm					х
X	i =	6.46 in/hr		15	14	н	i =	6.46 in/hr	P) =	9	psi	Х
x	d =	<u>41</u> mm		15	16		d =	<u>39</u> mm					Х
X P = <u>9</u> psi	i =	6.46 in/hr	I	15	10		i =	6.14 in/hr					Х
X	d =	<u>38</u> mm		17	18		d =	<u>36</u> mm					Х
X	i =	5.98 in/hr			10	J	i =	5.67 in/hr	F) = <u> </u>	9	psi	X
	d =	<u>36</u> mm		19	20		d =	<u>34</u> mm					Х
	i =	5.67 in/hr		13	20		i =	5.35 in/hr					Χ

175	gal
16	_psi
0	mph
37.93	_mm
5.97	in/hr
95	
	16 0 37.93 5.97



DDRF

Rainfall Calibration

Slope 2 - Target 4 in/hr

Date: 13-Apr-12

Start Time: 1:30 PM

End Time: 1:45 PM

Test Time: <u>15</u> min.

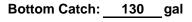
(circle "x" for open valves)

TOP OF SLOPE

x x **X X**

P = ___psi A

			A		
	d =mm	1	2	d = mm	X
	i = 0.00 in/hr			B i = 0.00 in/hr	P = psi X
X	d =mm	3	4	d =mm	x
X P =psi	i = 0.00 in/hr	c	-	i = 0.00 in/hr	x
х	d =mm	5	6	d =mm	X
х	i = 0.00 in/hr	Ŭ	Ŭ	D i = 0.00 in/hr	P = 9 psi X
x	d = <u>25</u> mm	7	8	d = <u>23</u> mm	x
X P = <u>9</u> psi	i = 3.94 in/hr	E	0	i = 3.62 in/hr	x
х	d = <u>25</u> mm	9	10	d = <u>24</u> mm	x
х	i = 3.94 in/hr	Ũ	10	F i = 3.78 in/hr	P= <u>9</u> psi x
х	d = <u>26</u> mm	11	12	d = <u>27</u> mm	X
x P = <u>9</u> psi	i = 4.09 in/hr	G		i = 4.25 in/hr	X
x	d = <u>28</u> mm	13	14	d = <u>28</u> mm	x
X	i = 4.41 in/hr		14	H i = 4.41 in/hr	P = <u>9</u> psi x
х	d = <u>26</u> mm	15	16	d = <u>27</u> mm	X
X P = <u>9</u> psi	i = 4.09 in/hr	I		i = 4.25 in/hr	X
X	d = <u>24</u> mm	17	18	d = <u>25</u> mm	x
X	i = 3.78 in/hr	.,		J i = 3.94 in/hr	P = <u>9</u> psi X
	d = <u>23</u> mm	19	20	d = <u>24</u> mm	x
	i = 3.62 in/hr	13	20	i = 3.78 in/hr	X



Inlet Pressure: 16 psi

Average Wind: 0 mph

Average Depth: 25.3571 mm

Average Rainfall Intensity: <u>3.99</u> in/hr



DDRF **Rainfall Calibration** Slope 2 - Target 2 in/hr

Date: <u>13-Apr-12</u>

Start Time: 2:00 PM

End Time: 2:15 PM

Test Time: ____15 ___min. (circle "x" for open valves)

TOP OF SLOPE

x x **X** x

P = ___psi

		_		A			
d =	mm		1	2	d =mm		х
i =	0.00 in/hr				B i = 0.00 in/hr	P =	psi X
d =	mm		3	4	d =mm		х
i =	0.00 in/hr	С	•	-	i = 0.00 in/hr		x
d =	mm		5	6	d =mm		х
i =	0.00 in/hr		3	0	D i = 0.00 in/hr	P = 9	psi X
d =	<u>13</u> mm		7	8	d = <u>13</u> mm		х
i =	2.05 in/hr	Е		0	i = 2.05 in/hr		х
d =	<u>13</u> mm		9	10	d = <u>14</u> mm		х
i =	2.05 in/hr		•		F i = 2.20 in/hr	P = 9	psi x
d =	<u>14</u> mm		11	12	d = <u>14</u> mm		Х
i =	2.20 in/hr	G			i = 2.20 in/hr		Х
d =	<u>13</u> mm		13	14	d = <u>15</u> mm		х
i =	2.05 in/hr		10	14	H i = 2.36 in/hr	P = 9	psi x
d =	<u>13</u> mm		15	16	d = <u>13</u> mm		Х
i =	2.05 in/hr	I	15	10	i = 2.05 in/hr		x
d =	<u>14</u> mm		17	18	d = <u>13</u> mm		х
i =	2.20 in/hr		17	10	J i = 2.05 in/hr	P = 9	psi x
d =	<u>12</u> mm		10	20	d = <u>12</u> mm		Х
i =	1.89 in/hr		19	20	i = 1.89 in/hr		X
	i = d = i =	i = 0.00 in/hr d = mm i = 0.00 in/hr d = mm i = 0.00 in/hr d = 13 mm i = 2.05 in/hr d = 13 mm i = 2.05 in/hr d = 14 mm i = 2.05 in/hr d = 13 mm i = 2.05 in/hr d = 14 mm i = 2.20 in/hr d = 12 mm	i = 0.00 in/hr d = mm i = 0.00 in/hr C d = mm i = 0.00 in/hr C d = mm i i = 0.00 in/hr C d = 13 mm i i = 2.05 in/hr E d = 13 mm i i = 2.05 in/hr G d = 14 mm G d = 13 mm i i = 2.05 in/hr G d = 13 mm i i = 2.05 in/hr I d = 13 mm i i = 2.05 in/hr I d = 14 mm i i = 2.20 in/hr I d = 14 mm i i = 2.20 in/hr I d = 12 mm i	d = mm 1 $i =$ 0.00 in/hr 3 $d =$ mm 3 $i =$ 0.00 in/hr C $d =$ mm 5 $i =$ 0.00 in/hr C $d =$ mm 5 $i =$ 0.00 in/hr C $d =$ mm 7 $i =$ 0.00 in/hr C $d =$ 13 mm 7 $i =$ 2.05 in/hr E $d =$ 13 mm 9 $i =$ 2.05 in/hr G $d =$ 13 mm 13 $i =$ 2.05 in/hr I $d =$ 13 mm 15 $i =$ 2.05 in/hr I $d =$ 14 mm 15 $i =$ 2.05 in/hr I $d =$ 14 mm 17 $i =$ 2.20 in/hr I $d =$ 12 mm 19	i = 0.00 in/hr 1 2 d = mm 3 4 i = 0.00 in/hr C 3 4 d = mm 5 6 6 i = 0.00 in/hr C 5 6 d = 13 mm 7 8 6 d = 13 mm 7 8 6 d = 13 mm 9 10 10 i = 2.05 in/hr F 9 10 d = 14 mm 11 12 12 d = 13 mm 13 14 14 i = 2.05 in/hr G 13 14 i = 2.05 in/hr 13 14 14 i = 2.05 in/hr 15 16 16 d = 14 mm 17 18 16 16 d = 12 mm 19 20 20	$d = _$ mm 1 2 $d = _$ mm B $a = _$ mm B $a = _$ _mm B $a = _$ _mm B $a = _$ _mm <td< th=""><th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th></td<>	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

Bottom Catch: 60 gal

Inlet Pressure: 16 psi

Average Wind: 0 mph

Average Depth: 13.28571 mm

Average Rainfall Intensity: in/hr 2.09



DDRF

Rainfall Calibration

Slope 1 - Target 6 in/hr

Date: <u>13-Apr-12</u>

Start Time: 9:10 AM E

End Time: 9:25 AM

Test Time: <u>15</u> min.

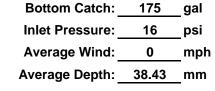
(circle "x" for open valves)

TOP OF SLOPE

x X X X	
----------------	--

Ρ	=	9	
		•	

				Α	_	_		
x	d =	mm	1	2	d =mm			
X P = <u>9</u> psi	i = 0.00) in/hr B			i = 0.00 in/hr			
x	d =	mm	3	4	d =mm			X
x	i = 0.00) in/hr			C i = 0.00 in/hr	P = 9	psi	Х
x	d =	mm	5	6	d =mm			х
X P =9 psi	i = 0.00) in/hr D	Ū	•	i = 0.00 in/hr			х
x	d =39	mm	7	8	d = <u>37</u> mm			X
x	i = 6.14	in/hr	-		E i = 5.83 in/hr	P = 9	psi	Χ
x	d =40	mm	9	10	d = <u>39</u> mm			X
X P = <u>9</u> psi	i = 6.30) in/hr F	•		i = 6.14 in/hr			Х
x	d =41	mm	11	12	d = <u>40</u> mm			x
x	i = 6.46	6 in/hr			G i = 6.30 in/hr	P = 9	psi	Х
x	d =40	mm	13	14	d = <u>40</u> mm			X
X P =9 psi	i = 6.30	in/hr H			i = 6.30 in/hr			Χ
x	d =38	mm	15	16	d = <u>38</u> mm			X
Х	i = 5.98	3 in/hr			l i = 5.98 in/hr	P = 9	psi	Χ
x	d =37	mm	17	18	d = <u>39</u> mm			х
X P =9 psi	i = 5.83	in/hr J	••		i = 6.14 in/hr			Χ
x	d =34	mm	19	20	d = <u>36</u> mm			
X	i = 5.35	in/hr		20	i = 5.67 in/hr	_		



Average Rainfall Intensity: 6.05 in/hr



DDRF Rainfall Calibration Slope 1 - Target 4 in/hr

Date: <u>13-Apr-12</u>

Start Time: 8:30 AM

End Time: 8:45 AM

Test Time: <u>15</u> min.

(circle "x" for open valves)

TOP OF SLOPE

x x **X X**

P = <u>9</u> psi

			A		_
X	d = mm	1	2	d =mm	
X P = <u>9</u> psi	i = 0.00 in/hr	В		i = 0.00 in/hr	
х	d =mm	3	4	d =mm	X
х	i = 0.00 in/hr			C i = 0.00 in/hr	P = <u>9</u> psi X
x	d =mm	5	6	d =mm	x
X P = 9 psi	i = 0.00 in/hr	D		i = 0.00 in/hr	х
x	d = <u>23</u> mm	7	8	d = <u>24</u> mm	x
х	i = 3.62 in/hr		Ŭ	E i = 3.78 in/hr	P= 9 psi X
x	d = <u>26 </u> mm	9	10	d = <u>26</u> mm	x
xP= 9 psi	i = 4.09 in/hr	F	10	i = 4.09 in/hr	х
x	d = <u>26</u> mm	11	12	d = <u>27</u> mm	x
Х	i = 4.09 in/hr			G i = 4.25 in/hr	P = 9 psi x
x	d = <u>25</u> mm	13	14	d = <u>28</u> mm	x
xP=psi	i = 3.94 in/hr	н		i = 4.41 in/hr	X
x	d = <u>24</u> mm	15	16	d = <u>27</u> mm	x
Х	i = 3.78 in/hr		10	I i = 4.25 in/hr	P = 9 psi X
x	d = <u>24</u> mm	17	18	d = <u>25</u> mm	x
X P =9 psi	i = 3.78 in/hr	J		i = 3.94 in/hr	X
x	d = <u>23</u> mm	19	20	d = <u>24</u> mm	
X	i = 3.62 in/hr	13	20	i = 3.78 in/hr	_

Bottom Catch: 125 gal

Inlet Pressure: <u>16</u>psi

Average Wind: 0 mph

Average Depth: 25.14 mm

Average Rainfall Intensity: 3.96 in/hr



DDRF

Rainfall Calibration

Slope 1 - Target 2 in/hr

Date: 13-Apr-12

Start Time: 8:10 AM

End Time: 8:25 AM

Test Time: <u>15</u> min.

(circle "x" for open valves)

TOP OF SLOPE

				X x			
P =psi A							
x X P = psi	d =mm i =0.00 in/hr	В	1	2	d = mm i =0.00 in/hr		
x _x	d =mm i =0.00 in/hr		3	4	d =mm C i =0.00 in/hr	P = psi X	
x X P = 9 psi	d =mm i =0.00 in/hr	D	5	6	$d = \underline{\qquad} mm$ $i = 0.00 in/hr$	x x	
x x	d = <u>12</u> mm i = 1.89 in/hr		7	8	d = <u>12</u> mm E i = 1.89 in/hr	x P= 9 psi x	
x X P = 9 psi	d = <u>14</u> mm i = 2.20 in/hr	F	9	10	d = 14 mm i = 2.20 in/hr	x x	
x x	d = <u>14</u> mm i = 2.20 in/hr		11	12	d = <u>15</u> mm G i = 2.36 in/hr	x P= 9 psi x	
x x P = 9 psi	d = <u>13</u> mm i = 2.05 in/hr	Н	13	14	d = <u>15</u> mm i = 2.36 in/hr	x x	
x	d = <u>12</u> mm i = 1.89 in/hr		15	16	d = <u>13</u> mm I i = 2.05 in/hr	x P = 9 psi X	
x X P = 9 psi	d = <u>12</u> mm i = 1.89 in/hr	J	17	18	d = 13 mm i = 2.05 in/hr	x x	
X X	d = 11 mm i = 1.73 in/hr		19	20	d = 11 mm i = 1.73 in/hr	- <u> ^</u>	

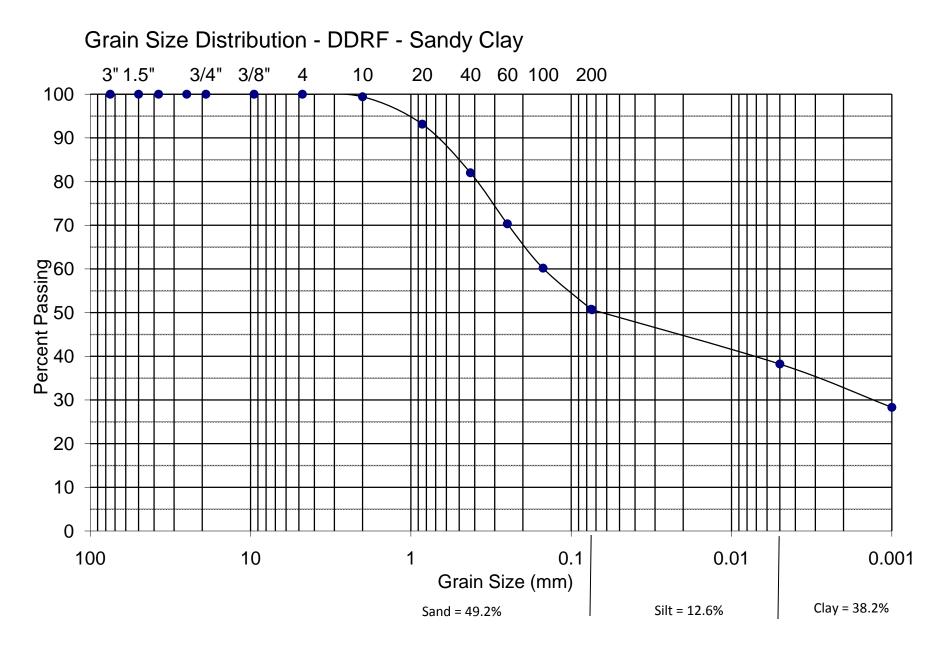
Bottom Catch: 60	gal
Inlet Pressure: 16	psi
Average Wind: 0	mph
Average Depth: 12.9	0 <u>3</u> mm
Average Rainfall Intensity: 2.0	4_in/hr
Christiansen Uniformity Coefficient: 92	

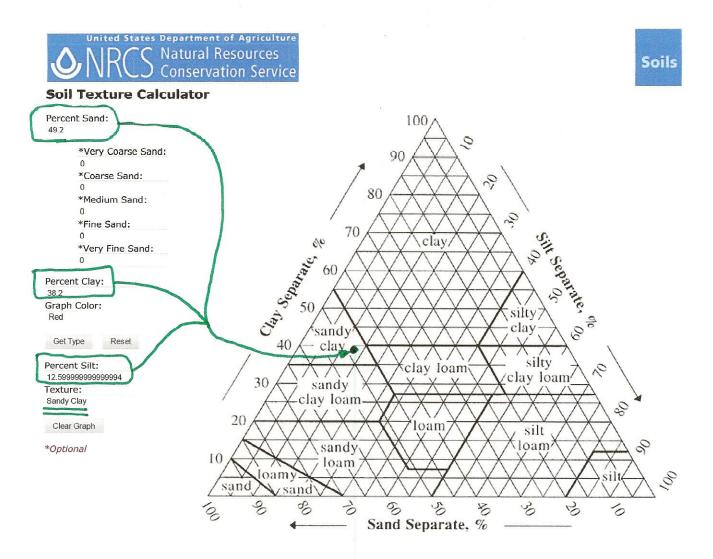


GSWCC - BMP Testing October 27, 2012 Appendix

APPENDIX F – TEST SOIL CHARACTERIZATION

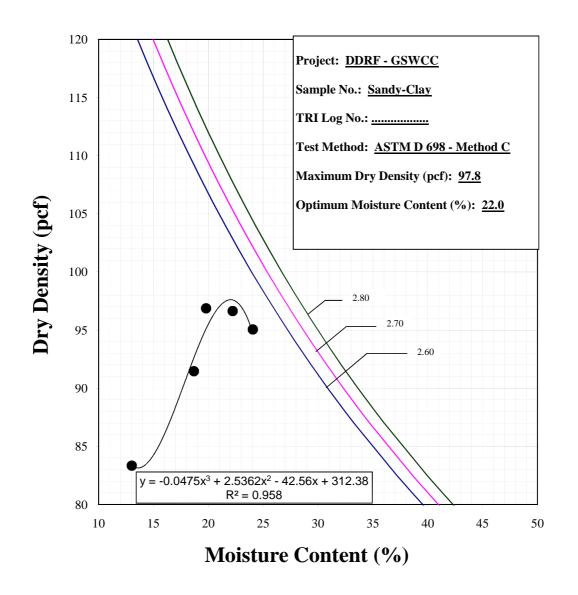






TRI/ENVIRONMENTAL, INC.

A Texas Research International Company



Proctor Compaction Test

ASTM D 4718, Oversize Particle Correction				
Corrected Maximum Dry Density (pcf):	97.8			
Corrected Optimum Moisture Content (%):	22.0			

C. Joel Sprague, 8/19/12

Quality Review/Date

Tested by: J. Sprague

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

9063 Bee Caves Road 🗆 Austin, TX 78733-6201 🗆 (512) 263-2101 🗆 (512) 263-2558 🗆 1-800-880-TEST



Compaction Worksheet ASTM D 2937

Location: GSWCC Slopes				Date: 8/19/2012		
Drive Cylinder:	Dia., mm =	98	Length, mm =	127	Volume, ft ³ =	0.034
Г			Comp	action		
Tube #	1	2	3	4	5	6
Wt. of Wet Soil + Mold (g)	2266.0	2311.0	2311.0	2339.0	2323.0	2325.0
Wt. of Mold (g)	613.0	612.0	613.0	615.0	615.0	615.0
Wt. of Wet Soil (g)	1653.0	1699.0	1698.0	1724.0	1708.0	1710.0
Γ	Moisture Content					
Tare Number	D-13	D-17	D-15	D-4	D-3	D-9
Wt. of Tare (g)	236.0	232.0	231.0	234.0	232.0	231.0
Wt. of Wet Soil + Tare (g)	1889.0	1931.0	1929.0	1958.0	1940.0	1941.0
Wt. of Dry Soil + Tare (g)	1507.0	1530.0	1544.0	1577.0	1546.0	1558.0
Water Content, w (%)	30.055	30.894	29.322	28.369	29.985	28.862
_						
Wet density, $\gamma_{wet} = W' / V_h (lb/ft^3) =$	107.63	110.62	110.56	112.25	111.21	111.34
Dry density, $\gamma_{dry} = \gamma_{wet} / [1 + w] (lb/ft^3) =$	82.75	84.51	85.49	87.44	85.55	86.40
Max Std. Proctor Dry density $(lb/ft^3) =$	97.80	97.80	97.80	97.80	97.80	97.80
Opt. Moisture (%) =	22.00	22.00	22.00	22.00	22.00	22.00
_						
Compaction as % of Std. Proctor =	84.6%	86.4%	87.4%	89.4%	87.5%	88.3%
Avg Compaction as % of Std. Proctor =			87.	3%		
-						

C. Joel Sprague, 8/19/12

Quality Review/Date

Tested by: J. Sprague

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reported of this report, except in full, without prior approval of TRI.

9063 Bee Caves Road 🗆 Austin, TX 78733-6201 🗆 (512) 263-2101 🗆 (512) 263-2558 🗆 1-800-880-TEST



Compaction Worksheet ASTM D 2937

Location: GSWCC Channels				Date: 8/19/2012		
Drive Cylinder:	Dia., mm =	98	Length, mm =	127	Volume, ft ³ =	0.034
Г			Comp	action		
Tube #	1	2	3	4	5	6
Wt. of Wet Soil + Mold (g)	2357.0	2333.0	2358.0			
Wt. of Mold (g)	613.0	612.0	613.0			
Wt. of Wet Soil (g)	1744.0	1721.0	1745.0	0.0	0.0	0.0
Г	Moisture Content					
Tare Number	В	Т	Μ			
Wt. of Tare (g)	217.0	217.1	216.8			
Wt. of Wet Soil + Tare (g)	334.4	341.1	357.4			
Wt. of Dry Soil + Tare (g)	309.1	314.6	326.8			
Water Content, w (%)	27.482	27.218	27.802	#DIV/0!	#DIV/0!	#DIV/0!
Wet density, $\gamma_{wet} = W' / V_h (lb/ft^3) =$	113.55	112.05	113.62	0.00	0.00	0.00
Dry density, $\gamma_{dry} = \gamma_{wet} / [1 + w] (lb/ft^3) =$	89.07	88.08	88.90	#DIV/0!	#DIV/0!	#DIV/0!
_						
Max Std. Proctor Dry density $(lb/ft^3) =$	97.80	97.80	97.80			
Opt. Moisture (%) =	22.00	22.00	22.00			
_						
Compaction as % of Std. Proctor =	91.1%	90.1%	90.9%	#DIV/0!	#DIV/0!	#DIV/0!
Avg Compaction as % of Std. Proctor =			90	.7%		
Avg compaction as $\%$ of Std. Plottof =			90.	. / 70		

C. Joel Sprague, 8/19/12

Quality Review/Date

Tested by: J. Sprague

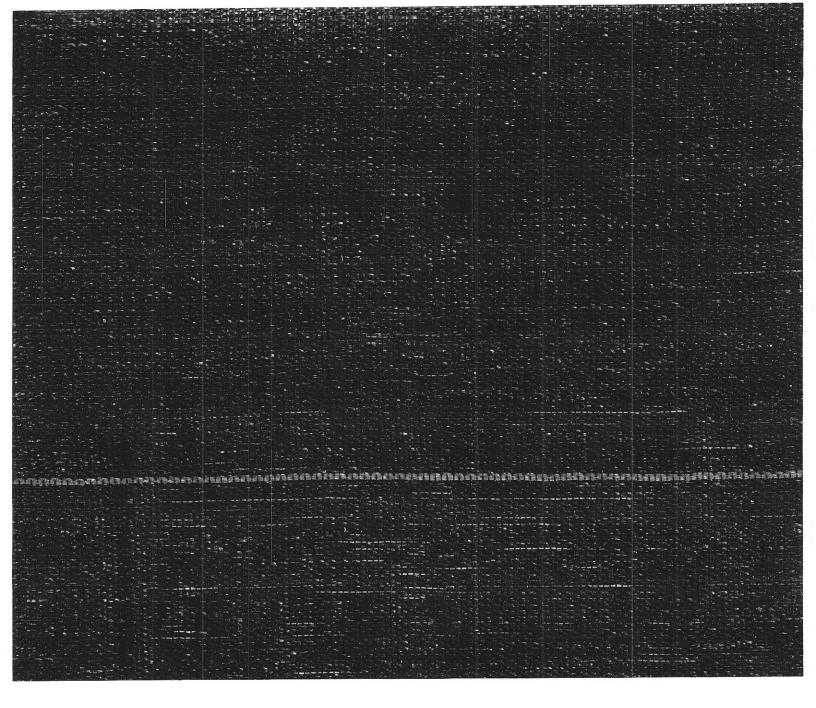
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9063 Bee Caves Road 🗆 Austin, TX 78733-6201 🗆 (512) 263-2101 🗆 (512) 263-2558 🗆 1-800-880-TEST



GSWCC - BMP Testing October 27, 2012 Appendix

APPENDIX G – TESTED PRODUCTS



GEOFABRICS GFG-B Type B



TRI / Environmental, Inc. A Texas Research International Company

August 14, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF , TRI / Environmental P.O. Box 9192 Greenville, SC 29604

email: jspraue@tri-env.com email: jespraue@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2368-68-04
Material(s) Tested:	1, GeoFabrics GFG-B Woven Geotextile
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Percent Open Area (COE Method) Falling Head Permittivity (ASTM D 4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager



LABORATORY TEST RESULTS

TRI Client: DDRF , TRI / Environmental

Material: GeoFabrics GFG-B Woven Geotextile Sample Identification: GFG-B-1 TRI Log #: E2368-68-04

PARAMETER	TEST R	EPLICA		IBER							MEAN	STD. DEV.
Thickness (ASTM D 5199)	1	2	3	4	5	6	7	8	9	10		
Thickness (mils)	27	26	27	27	27	27	27	27	29	27	27 26	1 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams) Mass/Unit Area (oz/sq.yd)	1.98 4.61	1.98 4.61	2.02 4.70	2.01 4.68	1.96 4.56	1.96 4.56	1.98 4.61	1.97 4.58	1.98 4.61	1.97 4.58	1.98 4.61	0.02 0.05
Grab Tensile Properties (ASTM D	4632)											
MD - Tensile Strength (lbs) TD - Tensile Strength (lbs)	240 168	241 161	229 156	224 175	235 175	218 171	259 181	200 162	247 181	224 179	232 171	17 9
MD - Elong. @ Max. Load (%) TD - Elong. @ Max. Load (%)	21 14	21 15	23 15	19 17	21 16	20 15	23 19	17 15	21 17	19 16	21 16	2 1
Apparent Opening Size (ASTM D	4751)											
Opening Size Diameter (mm) Sieve No.	0.558 30	0.420 40	0.419 40	0.443 35	0.487 35						0.465 35	0.058

MD Machine Direction TD Transverse Direction

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



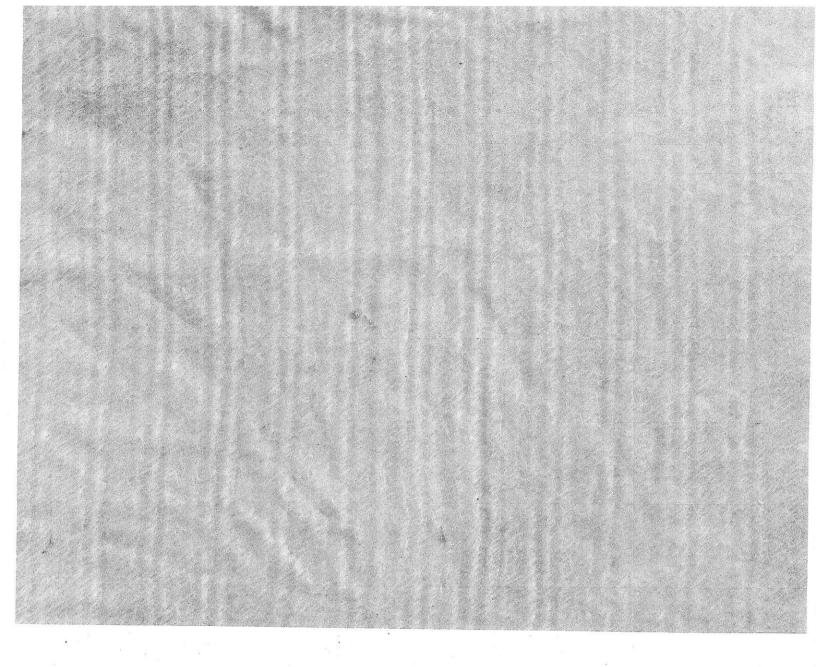
LABORATORY TEST RESULTS

TRI Client: DDRF , TRI / Environmental

Material: GeoFabrics GFG-B Woven Geotextile Sample Identification: GFG-B-1 TRI Log #: E2368-68-04

												STD.
PARAMETER	TEST R	-	-				_			- 10	MEAN	DEV.
Percent Open Area (COE Method)	1	2	3	4	5	6	7	8	9	10		
Open Area (%)	14.2	5.2	2.4								7.3	
Falling Head Permittivity (ASTM D 4	1 491, 9-ir	2 Upper	3 Standn	4 ipe: 2.0	5 in oper	6 hing)	7	8	9	10		
	40 I, 0 II	-	otanap	.po, <u>_</u> .o	in oper							
Water Temp. (C):	20.7											
Correction Factor:	0.99	J										
Test Speciemn No. >:			1					2				
Thickness (mils)	27.4	27.4	27.4	27.4	27.4	27.6	27.6	27.6	27.6	27.6		
Time (s)	12.7	12.7	12.6	12.2	12.7	13.2	13.2	13.2	13.1	13.2		
Specimen Permittivity (s-1)	2.23	2.23	2.25	2.33	2.23	2.15	2.15	2.15	2.17	2.15		
Specimen Permittivity @20°C (sec-1)	2.21	2.21	2.22	2.30	2.21	2.12	2.12	2.12	2.14	2.12		
Specimen Flow rate (GPM/ft2)	165	165	166	172	165	159	159	159	160	159		
Specimen Permeability (cm/s)	0.15	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.15	0.15		
Test Speciemn No. >:			3					4				
Thickness (mils)	27.9	27.9	27.9	27.9	27.9	27.3	27.3	27.3	27.3	27.3		
Time (s)	11.6	11.6	12.1	12.0	11.6	12.2	12.1	12.1	12.2	12.2		
Permittivity (s-1)	2.45	2.45	2.34	2.36	2.45	2.33	2.34	2.34	2.33	2.33		
Specimen Permittivity @20°C (sec-1)	2.42	2.42	2.32	2.34	2.42	2.30	2.32	2.31	2.30	2.30		
Specimen Flow rate (GPM/ft2)	181	181	173	175	181	172	173	173	172	172		
Specimen Permeability (cm/s)	0.17	0.17	0.16	0.17	0.17	0.16	0.16	0.16	0.16	0.16		
						-						
			TEMPERATURE			Permittivity (s-1)					2.26	
				RRECT					rate (GF		169	
				VALUES	5			Perme	eability	(cm/s)	0.16	

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



SILT SAVER BSRF C-AH pu GSWCC



May 7, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF, TRI/Environmental P.O. Box 9192 Greenville, SC 29604

email: jsprague@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2366-60-08
Material(s) Tested:	1, Siltsaver - BSRF Nonwoven Geotextile
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Constant Head Permittivity (4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager



GEOTEXTILE TEST RESULTS

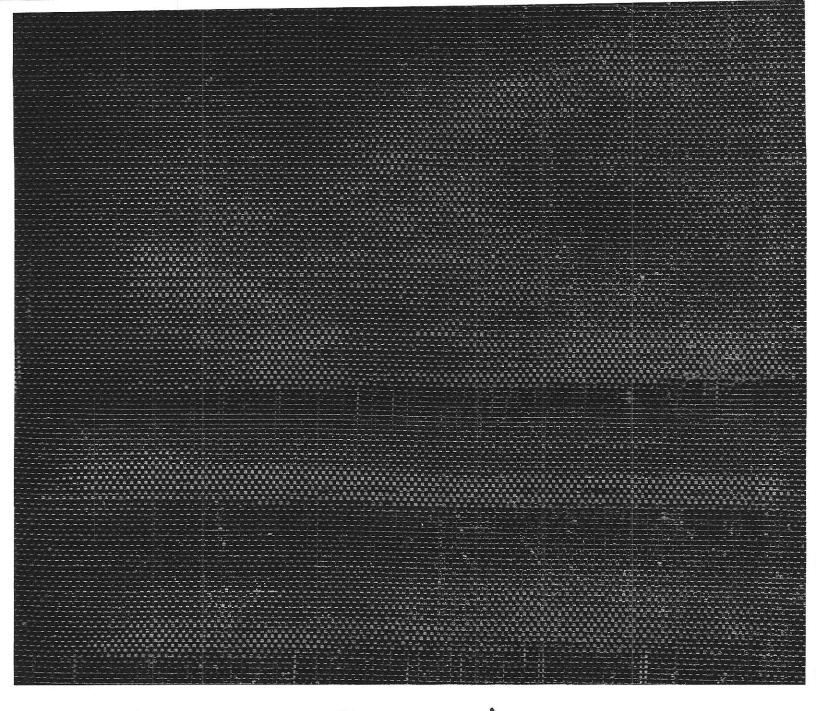
TRI Client: DDRF, TRI/Environmental

Material: SiltSaver BSRF Nonwoven Geotextile Sample Identification: GSWCC - BSRF TRI Log #: E2366-60-08

PARAMETER	TEST R	EPLICA	TE NUM	BER							MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Thickness (ASTM D 5199)												
Thickness (mils)	48	46	37	46	44	37	49	35	50	37	43	6
											35	<< min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams)	2.01	1.93	2.07	2.19	1.79	1.84	2.20	1.90	2.03	1.83	1.98	0.15
Mass/Unit Area (oz/sq.yd)	4.68	4.49	4.81	5.09	4.16	4.28	5.12	4.42	4.72	4.26	4.60	0.34
Grab Tensile Properties (ASTM D 4	632)											
MD - Tensile Strength (lbs)	102	115	106	108	86	102	114	114	101	106	105	9
TD - Tensile Strength (lbs)	68	100	73	82	107	92	100	79	122	77	90	17
MD - Elong. @ Max. Load (%)	95	111	94	102	83	99	105	98	81	94	96	9
TD - Elong. @ Max. Load (%)	132	117	120	123	113	104	122	118	109	115	117	8
Apparent Opening Size (ASTM D 47	E4)										8	
	-											
Opening Size Diameter (mm) Sieve No.	0.200 70	0.156 80	0.209 70	0.148 100	0.105 140						0.164 80	0.042
	-										80	
Constant Head Permittivity (ASTM I	D 4491, 5	51-mm C _	onstant	Head;	2 in ope	ning)						
Water Temp. (C):	20											
Correction Factor:	1.000											
Test Speciemn No. >:			1					2				
Thickness (mils)	40.75	40.75	40.75	40.75	40.75	39.35	39.35	39.35	39.35	39.35		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	17.1	17.1	17.4	17.6	17.6	11.1	11.2	11.2	11.2	11.1		
Specimen Permittivity @20°C (sec-1)	1.15	1.15	1.13	1.12	1.12	1.77	1.76	1.76	1.76	1.77		
Specimen Flow rate (GPM/ft2)	86	86	85	84	84	133	131	131	131	133		
Specimen Permeability (cm/s)	0.12	0.12	0.12	0.12	0.12	0.18	0.18	0.18	0.18	0.18		
Test Speciemn No. >:			3					4				
Thickness (mils)	47	47	47	47	47	38.4	38.4	38.4	38.4	38.4		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	13.8	13.8	13.8	13.8	13.8	11.7	11.7	11.7	11.7	11.7		
Specimen Permittivity @20°C (sec-1)	1.43	1.43	1.43	1.43	1.43	1.68	1.68	1.68	1.68	1.68		
Specimen Flow rate (GPM/ft2)	107	107	107	107	107	126	126	126	126	126		
Specimen Permeability (cm/s)	0.17	0.17	0.17	0.17	0.17	0.20	0.20	0.16	0.16	0.16		
										· (a 4)	4.50	
				IPERAT					rmittivit		1.50	
				VALUE					rate (GF eability		112 0.16	

MD Machine Direction TD Transverse Direction

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



THRACE LINQ

GRF - 400 EO Type C



June 28, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF , TRI / Environmental P.O. Box 9192 Greenville, SC 29604

email: jsprague@tri-env.com email: jesprague@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2368-16-09
Material(s) Tested:	1, Thrace Linq GTF-400EO Woven Geotextile
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Percent Open Area (COE Method) Falling Head Permittivity (ASTM D 4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com



LABORATORY TEST RESULTS TRI Client: DDRF , TRI / Environmental

Material: Thrace Ling GTF-400EO Woven Geotextile Sample Identification: Thrace Linq 400EO TRI Log #: E2368-16-09

PARAMETER	TEST R	EPLICA	FE NUM	BER							MEAN	STD. DEV.
Thickness (ASTM D 5199)	1	2	3	4	5	6	7	8	9	10		
Thickness (mils)	30	28	29	30	29	29	29	28	29	29	29 28	1 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams)	2.85	2.82	2.81	2.76	2.77	2.74	2.85	2.83	2.83	2.77	2.80	0.04
Mass/Unit Area (oz/sq.yd)	6.63	6.56	6.54	6.42	6.44	6.37	6.63	6.58	6.58	6.44	6.52	0.09
Grab Tensile Properties (ASTM D	4632)											
MD - Tensile Strength (lbs)	339	326	336	326	346	375	340	312	346	377	342	21
TD - Tensile Strength (lbs)	186	187	182	178	198	184	193	180	180	171	184	8
MD - Elong. @ Max. Load (%)	24	24	26	23	24	27	25	23	23	27	25	2
TD - Elong. @ Max. Load (%)	11	11	13	13	11	11	12	12	13	12	12	1
Apparent Opening Size (ASTM D	4751)											
Opening Size Diameter (mm)	0.418	0.589	0.677	0.423	0.418						0.505	0.121
Sieve No.	40	30	25	40	40						30	

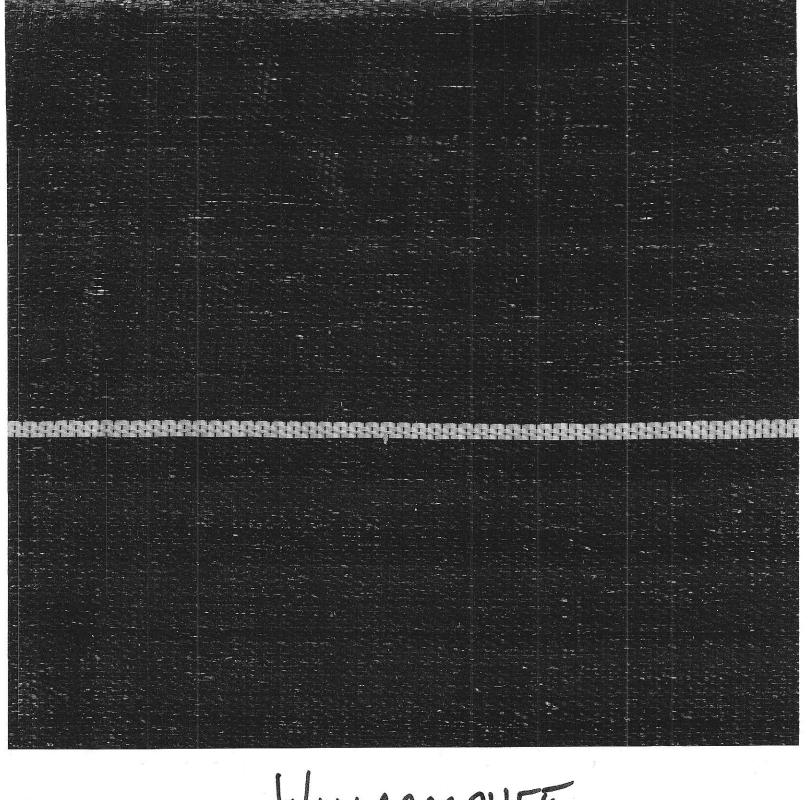
MD Machine Direction **TD** Transverse Direction

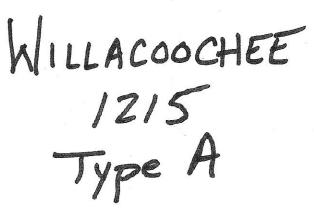


TRI Client: DDRF , TRI / Environmental

Material: Thrace Linq GTF 400EO Woven Geotextile Sample Identification: Thrace Linq 400EO TRI Log #: E2368-16-09

												STD.
PARAMETER	TEST R				_				-		MEAN	DEV.
Percent Open Area (COE Method)	1	2	3	4	5	6	7	8	9	10		
Open Area (%)	24.4	18.4	21.1								21.3	
	1	2	3	4	5	6	7	8	9	10		
Falling Head Permittivity (ASTM D 4	491, 9-ir	Upper	Standpi	pe; 1.5	in open	ing)						
Water Temp. (C):	19.5	1										
Correction Factor:	1.02]										
Test Speciemn No. >:			1					2				
Thickness (mils)	29.1	29.1	29.1	29.1	29.1	28.5	28.5	28.5	28.5	28.5		
Time (s)	15.5	15.4	15.4	14.9	15.4	14.3	14.3	14.3	14.3	14.3		
Specimen Permittivity (s-1)	3.25	3.28	3.28	3.39	3.28	3.53	3.53	3.53	3.53	3.53		
Specimen Permittivity @20°C (sec-1)	3.30	3.32	3.32	3.44	3.32	3.58	3.58	3.58	3.58	3.58		
Specimen Flow rate (GPM/ft2)	247	249	249	257	249	268	268	268	268	268		
Specimen Permeability (cm/s)	0.24	0.25	0.25	0.25	0.25	0.26	0.26	0.26	0.26	0.26		
Test Speciemn No. >:			3					4				
Thickness (mils)	28.5	28.5	28.5	28.5	28.5	29.1	29.1	29.1	29.1	29.1		
Time (s)	14.8	14.3	14.9	14.3	14.9	14.8	14.8	14.8	14.3	14.8		
Permittivity (s-1)	3.41	3.53	3.39	3.53	3.39	3.41	3.41	3.41	3.53	3.41		
Specimen Permittivity @20°C (sec-1)	3.46	3.58	3.44	3.58	3.44	3.46	3.46	3.46	3.58	3.46		
Specimen Flow rate (GPM/ft2)	259	268	257	268	257	259	259	259	268	259		
Specimen Permeability (cm/s)	0.25	0.26	0.25	0.26	0.25	0.26	0.26	0.26	0.26	0.26		
			TEN	IPERAT	URE			Pe	mittivit	y (s-1)	3.48	
			CC	DRRECT	ED			Flow	rate (GP	M/ft2)	260	
			,	VALUES	6			Perme	eability	(cm/s)	0.25	







May 16, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF , TRI / Environmental P.O. Box 9192 Greenville, SC 29604

email: jsprague@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2366-72-03
Material(s) Tested:	1 Willacooche 1215 Woven Geotextile
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Percent Open Area (COE Method) Constant Head Permittivity (ASTM D 4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com



TRI Client: DDRF , TRI / Environmental

Material: Willacoochee 1215 Woven Geotextile Sample Identification: Willacoochee 1215 TRI Log #: E2366-72-03

PARAMETER	TEST R	EPLICA	TE NUM	IBER							MEAN	STD. DEV.
Thickness (ASTM D 5199)	1	2	3	4	5	6	7	8	9	10		
Thickness (mils)	25	25	28	27	26	24	25	25	22	23	25 22	2 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams) Mass/Unit Area (oz/sq.yd)	1.43 3.33	1.44 3.35	1.44 3.35	1.43 3.33	1.42 3.30	1.44 3.35	1.45 3.37	1.45 3.37	1.44 3.35	1.44 3.35	1.44 3.34	0.01 0.02
Grab Tensile Properties (ASTM D	9 4632)											
MD - Tensile Strength (lbs) TD - Tensile Strength (lbs) MD - Elong. @ Max. Load (%)	191 114 29	191 127 27	180 117 28	171 120 25	172 135 25	169 124 26	159 118 25	169 118 27	159 101 23	166 119 25	173 119 26	11 9 2
TD - Elong. @ Max. Load (%)	24	24	23	23	25	26	22	24	23	23	23	1
Apparent Opening Size (ASTM D	4751)											
Opening Size Diameter (mm) Sieve No.	0.514 30	0.532 30	0.830 20	0.592 30	0.568 30						0.607 25	0.128

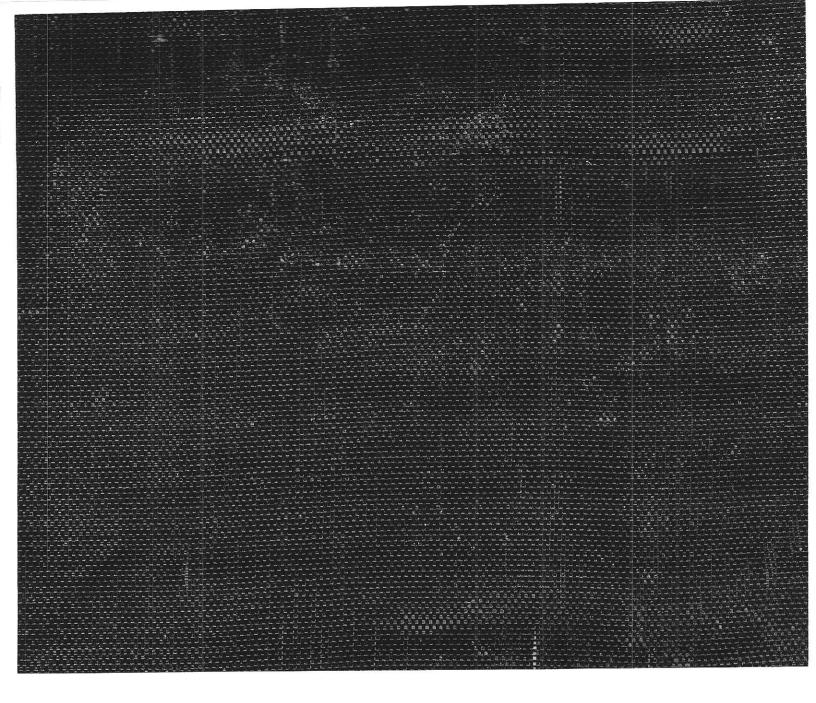
MD Machine Direction TD Transverse Direction



TRI Client: DDRF , TRI / Environmental

Material: Willacoochee 1215 Woven Geotextile Sample Identification: Willacoochee 1215 TRI Log #: E2366-72-03

PARAMETER	TEST R	EPLICA	TE NUM	BER							MEAN	STD. DEV.
Percent Open Area (COE Method)	1	2	3	4	5	6	7	8	9	10		
Percent Open Area (COE Method)												
Open Area (%)	8.1										8.1	#DIV/0!
Constant Head Permittivity (ASTM	D 4491, 5	1-mm C	onstant	Head; 2	2 in ope	ning)						
Water Temp. (C):	22											
Correction Factor:	0.953]										
Test Speciemn No. >:			1					2				
Thickness (mils)	21	21	21	21	21	24	24	24	24	24		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	16.3	17.4	16.9	17.4	17.4	17.4	17.4	17.4	18.5	18.4		
Specimen Permittivity @20°C (sec-1)	1.15	1.08	1.11	1.08	1.08	1.08	1.08	1.08	1.01	1.02		
Specimen Flow rate (GPM/ft2)	86.1	80.6	83.0	80.6	80.6	80.6	80.6	80.6	75.8	76.3		
Specimen Permeability (cm/s)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06		
Test Speciemn No. >:			3					4				
Thickness (mils)	24	24	24	24	24	23	23	23	23	23		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	15.8	15.8	15.8	15.8	16.4	14.8	14.8	15.3	16.7	15.9		
Specimen Permittivity @20°C (sec-1)	1.19	1.19	1.19	1.19	1.14	1.27	1.27	1.23	1.12	1.18		
Specimen Flow rate (GPM/ft2)	88.8	88.8	88.8	88.8	85.6	94.8	94.8	91.7	84.0	88.2		
Specimen Permeability (cm/s)	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.07		
				IPERAT					mittivit		1.14	
				RRECT					rate (GF		85.0	
				VALUES	>			Perme	eability	(cm/s)	0.07	



TEN CATE FW402 Type C



May 25, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF , TRI / Environmental P.O. Box 9192 Greenville, SC 29604

email: jsprague@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2366-71-10
Material(s) Tested:	1, Ten Cate FW402 Woven Geotextile
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Percent Open Area (COE Method) Constant Head Permittivity (ASTM D 4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com



LABORATORY TEST RESULTS TRI Client: DDRF, TRI / Environmental

Material: Ten Cate FW 402 Woven Geotextile Sample Identification: Ten Cate FAS 402-125-30 TRI Log #: E2366-71-10

	TEAT D											STD.
PARAMETER	TEST R	-	-								MEAN	DEV.
Thickness (ASTM D 5199)	1	2	3	4	5	6	7	8	9	10		
Thickness (mils)	29	28	27	31	28	27	27	28	34	29	29 27	2 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams)	2.58	2.55	2.58	2.55	2.53	2.67	2.62	2.62	2.67	2.60	2.60	0.05
Mass/Unit Area (oz/sq.yd)	6.00	5.93	6.00	5.93	5.88	6.21	6.09	6.09	6.21	6.05	6.04	0.11
Grab Tensile Properties (ASTM D	4632)											
MD - Tensile Strength (lbs)	474	477	421	387	446	418	413	490	491	494	451	39
TD - Tensile Strength (lbs)	322	276	285	256	257	234	213	264	233	220	256	33
MD - Elong. @ Max. Load (%)	44	45	40	39	43	40	39	45	43	45	42	2
TD - Elong. @ Max. Load (%)	95	77	82	80	84	64	63	73	69	71	76	10
Apparent Opening Size (ASTM D	4751)											
Opening Size Diameter (mm) Sieve No.	0.415 40	0.415 40	0.416 40	0.417 40	0.786 20						0.490 35	0.166

MD Machine Direction TD Transverse Direction

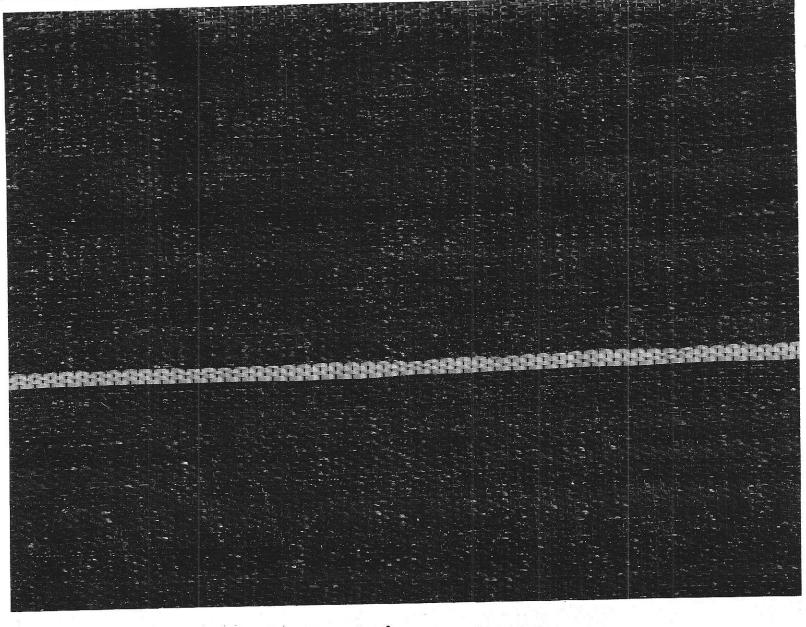


LABORATORY TEST RESULTS TRI Client: DDRF, TRI / Environmental

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Material: Ten Cate FW 402 Woven Geotextile Sample Identification: Ten Cate FAS 402-125-30 TRI Log #: E2366-71-10

PARAMETER	TEST R	EPLICA	LE NOW	BER							MEAN	STD. DEV.
Percent Open Area (COE Method)	1	2	3	4	5	6	7	8	9	10		
Open Area (%)	28.0	27.2									27.6	
Constant Head Permittivity (ASTM I	D 4491, 5	1-mm C	onstant	Head;	1 in ope	ning)						
Water Temp. (C):	20.7											
Correction Factor:	0.99											
Test Speciemn No. >:			1					2				
Opening Diameter, cm Contant Head, cm	2.54 5.08											
Thickness (mils)	5.08 27.5	5.08 27.5	5.06 27.5	5.06 27.5	5.06 27.5	5.08 28.5	28.5	5.08 28.5	5.08 28.5	5.08 28.5		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	13.3	13.3	13.4	12.8	13.2	14.3	13.8	14.3	13.7	14.8		
Specimen Permittivity @20°C (sec-1)	5.77	5.77	5.73	6.00	5.81	5.37	5.56	5.37	5.60	5.19		
Specimen Flow rate (GPM/ft2)	432	432	428	449	435	401	416	401	419	388		
Specimen Permeability (cm/s)	0.40	0.40	0.40	0.42	0.41	0.37	0.39	0.39	0.41	0.38		
Test Speciemn No. >:			3*					4			1	
Opening Diameter, cm	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54		
Contant Head, cm	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08		
Thickness (mils) Volume Collected (liters)	27.6 2.0	27.6 2.0	27.6 2.0	27.6 2.0	27.6 2.0	26.7 2.0	26.7 2.0	26.7 2.0	26.7 2.0	26.7 2.0		
Time (s)	2.0 14.8	2.0 14.7	2.0 14.8	2.0 15.3	2.0 15.3	2.0 16.4	2.0 16.4	2.0 15.9	2.0 16.4	2.0 16.4		
Specimen Permittivity @20°C (sec-1)	5.19	5.22	5.19	5.02	5.02	4.68	4.68	4.83	4.68	4.68		
Specimen Flow rate (GPM/ft2)	388	391	388	375	375	350	350	361	350	350		
Specimen Permeability (cm/s)	0.36	0.37	0.36	0.35	0.35	0.33	0.33	0.33	0.32	0.32		
			TEN	IPERAT	URE			Pe	rmittivit	y (s-1)	5.27	
			CC	ORRECT	ED			Flow	rate (GF	PM/ft2)	394	
				VALUE	S			Perme	eability	(cm/s)	0.37	



HANES GASF-A Type A



May 17, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF , TRI / Environmental P.O. Box 9192 Greenville, SC 29604

email: jsprague@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

)

TRI Job Reference Number:	E2366-72-04
Material(s) Tested:	1, Terratex GASF-A Woven Geotextile
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Percent Open Area (COE Method) Constant Head Permittivity (ASTM D 4491

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com



TRI Client: DDRF , TRI / Environmental

Material: Hanes Terratex GASF-A Woven Geotextile Sample Identification: Terratex GASF , 402/125/30 TRI Log #: E2366-72-04

PARAMETER	TEST R	EPLICA ⁻	TE NUM	BER							MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Thickness (ASTM D 5199)												
Thickness (mils)	25.7	24.1	25.6	24.6	24.5	25.0	23.5	23.0	23.2	24.8	24.4 23.0	0.9 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams)	1.58	0.56	1.55	1.57	1.58	1.52	1.54	1.50	1.50	1.57	1.45	0.31
Mass/Unit Area (oz/sq.yd)	3.68	1.30	3.61	3.65	3.68	3.54	3.58	3.49	3.49	3.65	3.37	0.73
Grab Tensile Properties (ASTM D	4632)											
MD - Tensile Strength (lbs)	173	172	164	153	171	165	165	166	172	174	167	6
TD - Tensile Strength (lbs)	127	119	134	140	111	132	114	127	130	135	127	10
MD - Elong. @ Max. Load (%)	23	27	26	21	23	25	23	27	25	27	25	2
TD - Elong. @ Max. Load (%)	23	21	25	25	19	23	19	19	25	25	22	3
Apparent Opening Size (ASTM D 4	1751)											
Opening Size Diameter (mm) Sieve No.	0.586 30	0.599 30	0.589 30	0.524 30	0.597 30						0.579 30	0.031

MD Machine Direction TD Transverse Direction

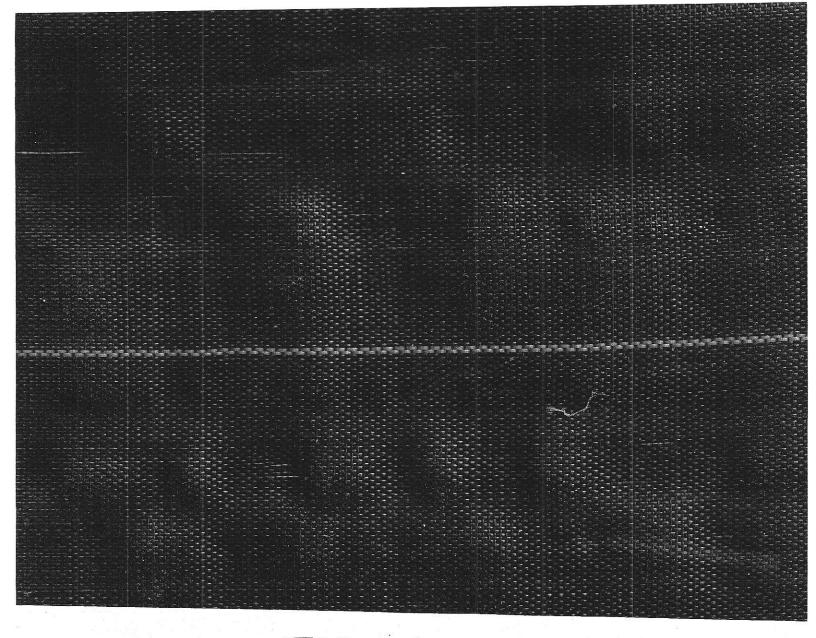


TRI Client: DDRF , TRI / Environmental

Material: Belton 1935 Woven Geotextile Sample Identification: Belton 1935 TRI Log #: E2366-72-04

PARAMETER	TEST R	EPLICA	TE NUM	BER							MEAN	ST DI
	1	2	3	4	5	6	7	8	9	10		
Percent Open Area (COE Method)												
Open Area (%)	9.05	13.3	26.0								16.1	
Constant Head Permittivity (ASTM	D 4491, 5	1-mm C	onstant	Head; 2	2 in ope	ning)						
Vater Temp. (C):	22	1										
Correction Factor:	0.958											
est Speciemn No. >:			1					2				
hickness (mils)	25.7	25.7	25.7	25.7	25.7	24.3	24.3	24.3	24.3	24.3		
olume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	11.0	11.1	10.6	11.1	10.5	11.6	12.6	12.6	13.2	13.2		
Specimen Permittivity @20°C (sec-1)	1.71	1.70	1.78	1.70	1.80	1.63	1.50	1.50	1.43	1.43		
Specimen Flow rate (GPM/ft2)	128	127	133	127	134	122	112	112	107	107		
pecimen Permeability (cm/s)	0.11	0.11	0.12	0.11	0.12	0.11	0.10	0.09	0.09	0.09		
est Speciemn No. >:			3					4				
hickness (mils)	23.9	23.9	23.9	23.9	23.9	24.9	24.9	24.9	24.9	24.9		
olume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
ïme (s)	13.7	13.7	14.2	13.8	14.3	13.7	13.8	13.7	13.7	13.7		
pecimen Permittivity @20°C (sec-1)	1.38	1.38	1.33	1.37	1.32	1.38	1.37	1.38	1.38	1.38		
Specimen Flow rate (GPM/ft2)	103	103	99	102	99	103	102	103	103	103		
Specimen Permeability (cm/s)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09		
				IPERAT	-				rmittivit rate (GF		1.49 111	
	CORRECTED VALUES							(cm/s)	0.09			

MD Machine Direction TD Transverse Direction



DDD GA-CSA C-System

May 7, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF , TRI / Environmental P.O. Box 9192 Greenville, SC 29604

email: jspraue@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2366-60-09
Material(s) Tested:	1 GA-CSA Woven Geotextile -Netting Composite Material
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Percent Open Area (COE Method) Constant Head Permittivity (CGSB 148,1 Method 4-94;)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com

TRI Client: DDRF , TRI / Environmental

Material: Woven Geotextile - Netting Composite Material Sample Identification: GSWCC - DDD GA-CSA TRI Log #: E2366-60-09

PARAMETER	TEST R	EPLICA	TE NUM	BER							MEAN	STD. DEV.
Thickness (ASTM D 5199)	1	2	3	4	5	6	7	8	9	10		
Thickness (mils)	83	88	87	84	84	88	84	82	89	87	86 82	2 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams)	3.26	3.26	3.23	3.27	3.22	3.30	3.26	3.27	3.23	3.29	3.26	0.03
Mass/Unit Area (oz/sq.yd)	7.58	7.58	7.51	7.61	7.49	7.68	7.58	7.61	7.51	7.65	7.58	0.06
Grab Tensile Properties (ASTM I	D 4632)											
MD - Tensile Strength (lbs)	330	353	344	358	370	404	361	326	374	418	364	29
TD - Tensile Strength (lbs)	222	200	208	193	164	197	180	211	214	223	201	19
MD - Elong. @ Max. Load (%)	20	21	21	19	21	22	22	19	21	23	21	1
TD - Elong. @ Max. Load (%)	15	13	13	13	14	16	13	17	17	17	15	2
Apparent Opening Size (ASTM D	4751)											
Opening Size Diameter (mm)	0.419	0.416	0.417	0.417	0.409						0.416	0.004
Sieve No.	40	40	40	40	40						40	

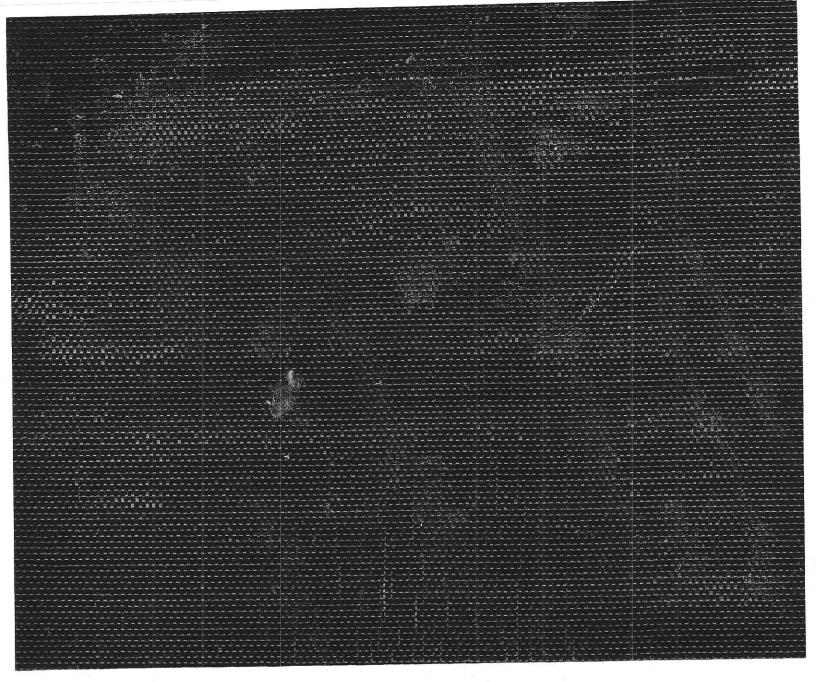
MD Machine Direction TD Transverse Direction

TRI Client: DDRF , TRI / Environmental

Material: Woven Geotextile - Netting Composite Material Sample Identification: GSWCC - DDD GA-CSA TRI Log #: E2366-60-09

PARAMETER	TEST R	EPLICA	ГЕ NUM	BER							MEAN	STE DE\
Percent Open Area (COE Method)	1	2	3	4	5	6	7	8	9	10		
Open Area (%)	20.9	24.8									22.9	
Constant Head Permittivity (ASTM I	D 4491, 5	1-mm C	onstant	Head; 2	2 in ope	ning)						
Vater Temp. (C):	20]										
Correction Factor:	1.000]										
est Speciemn No. >:			1					2				
Thickness (mils)	88.55	88.55	88.55	88.55	88.55	90.45	90.45	90.45	90.45	90.45		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Гime (s)	9.5	10.0	9.5	10.0	10.1	8.6	8.9	8.6	8.5	9.0		
Specimen Permittivity @20°C (sec-1)	2.07	1.97	2.07	1.97	1.95	2.29	2.21	2.29	2.32	2.19		
Specimen Flow rate (GPM/ft2)	155	147	155	147	146	171	165	171	173	164		
Specimen Permeability (cm/s)	0.47	0.44	0.47	0.44	0.44	0.51	0.50	0.53	0.53	0.50		
Fest Speciemn No. >:			3					4				
Thickness (mils)	89.7	89.7	89.7	89.7	89.7	91.1	91.1	91.1	91.1	91.1		
/olume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Гіme (s)	7.5	7.4	8.0	7.5	8.0	8.5	8.4	8.5	8.5	8.5		
Specimen Permittivity @20°C (sec-1)	2.62	2.66	2.46	2.62	2.46	2.32	2.34	2.32	2.32	2.32		
Specimen Flow rate (GPM/ft2)	196	199	184	196	184	173	175	173	173	173		
Specimen Permeability (cm/s)	0.60	0.61	0.56	0.60	0.56	0.53	0.53	0.54	0.54	0.54		
			-			-						
				IPERAT	-				mittivit		2.29 171	
				VALUES							0.52	

MD Machine Direction TD Transverse Direction



PROPEX Geotex 111F Type C



May 7, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF - TRI/Environmental, Inc. P.O. Box 9192 Greenville, SC 29604

email: jspraue@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2366-60-10
Material(s) Tested:	1 ,Propex 111F Black Woven Geotextile
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Constant Head Permittivity (ASTM D 4491) Percent Open Area (COE Method)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com



GEOTEXTILE TEST RESULTS

TRI Client: DDRF - TRI/Environmental, Inc.

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Material: Propex 111F Black Woven Geotextile Sample Identification: GSWCC - Propex - 111F TRI Log #: E2366-60-10

PARAMETER	TEST R	EPLICA		BER							MEAN	STD. DEV.
Thickness (ASTM D 5199)	1	2	3	4	5	6	7	8	9	10		
Thickness (mils)	34	34	33	35	34	35	35	34	32	34	34 32	1 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams)	3.13	3.09	3.10	3.14	3.11	3.12	3.10	3.08	3.11	3.13	3.11	0.02
Mass/Unit Area (oz/sq.yd)	7.28	7.19	7.21	7.30	7.23	7.26	7.21	7.16	7.23	7.28	7.24	0.04
Grab Tensile Properties (ASTM I	D 4632)											
MD - Tensile Strength (lbs)	359	349	343	360	355	362	352	321	348	358	351	12
TD - Tensile Strength (lbs)	231	2665	237	234	254	281	265	290	280	259	259	22
MD - Elong. @ Max. Load (%)	21	20	19	20	21	20	20	20	19	21	20	1
TD - Elong. @ Max. Load (%)	11	13	11	9	13	12	13	13	13	13	12	1
Apparent Opening Size (ASTM D	4751)											
Opening Size Diameter (mm)	0.414	0.414	0.416	0.417	0.417						0.416	0.001
Sieve No.	40	40	40	40	40						40	

MD Machine Direction TD Transverse Direction



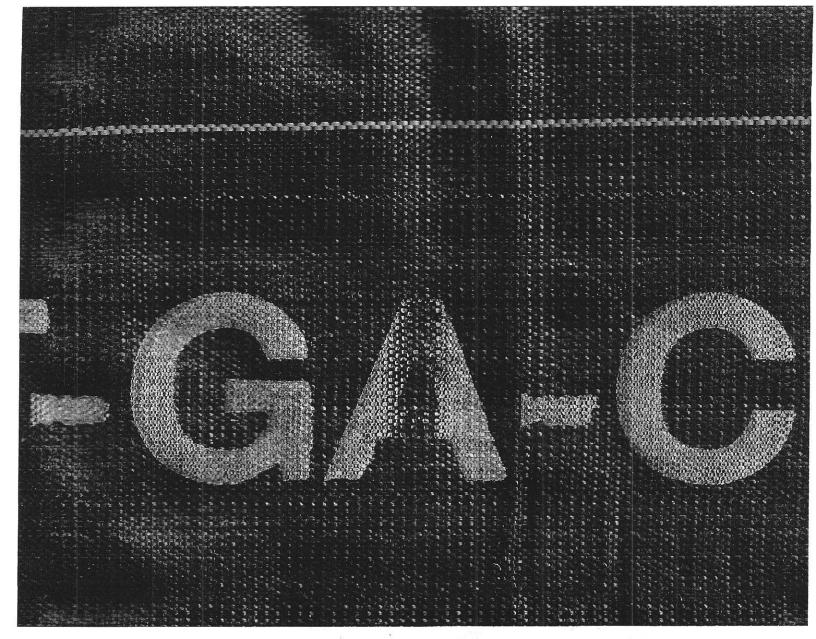
GEOTEXTILE TEST RESULTS

TRI Client: DDRF - TRI/Environmental, Inc.

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Material: Propex 111F Black Woven Geotextile Sample Identification: GSWCC - Propex - 111F TRI Log #: E2366-60-10

PARAMETER	TEST R	EPLICA		BER							MEAN	STD DEV
Percent Open Area (COE Method)	1	2	3	4	5	6	7	8	9	10		
Open Area (%)	22.2	21.1	11.1								18.2	
Constant Head Permittivity (ASTM	D 4491, 5	1-mm C	onstant	Head;	2 in ope	ning)						
Vater Temp. (C):	20.5]										
Correction Factor:	0.988	J										
est Speciemn No. >:			1					2				
hickness (mils)	33	33	33	33	33	33	33	33	33	33		
/olume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	10.6	10.5	10.5	11.1	10.6	10.5	10.6	10.6	10.6	10.6		
Specimen Permittivity @20°C (sec-1)	1.83	1.85	1.85	1.75	1.83	1.85	1.83	1.83	1.83	1.83		
Specimen Flow rate (GPM/ft2)	137	139	139	131	137	139	137	137	137	137		
Specimen Permeability (cm/s)	0.15	0.16	0.16	0.15	0.15	0.16	0.15	0.15	0.15	0.15		
est Speciemn No. >:			3					4				
Thickness (mils)	33	33	33	33	33	32	32	32	32	32		
/olume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	10.6	10.6	10.5	10.6	10.5	12.7	13.2	13.2	13.7	13.2		
Specimen Permittivity @20°C (sec-1)	1.83	1.83	1.85	1.83	1.85	1.53	1.47	1.47	1.42	1.47		
Specimen Flow rate (GPM/ft2)	137	137	139	137	139	115	110	110	106	110		
Specimen Permeability (cm/s)	0.15	0.15	0.16	0.15	0.16	0.13	0.12	0.12	0.12	0.12		
			ТЕМ					De	rmittivit	v (o 1)	1.74	
			TEMPERATURE CORRECTED						rate (GF	• • •	1.74	
				VALUES				(cm/s)	0.15			



Erosion Tech ET-GA-C C-System



June 11, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF , TRI / Environmental P.O. Box 9192 Greenville, SC 29604

email: jsprague@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2366-93-07
Material(s) Tested:	1, Erosion Tech ET-GA-C Woven Geotextile -Geo Grid Composite
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Percent Open Area (COE Method) Constant Head Permittivity (ASTM D 4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com



LABORATORY TEST RESULTS TRI Client: DDRF, TRI / Environmental

Material: Erosion Tech ET-GA-C System Woven Geotextile - Geo Grid Composite Material Sample Identification: ET-GA-C TRI Log #: E2366-93-07

PARAMETER	TEST R	EPLICA [.]	TE NUM	BER							MEAN	STD. DEV.
Thickness (ASTM D 5199)	1	2	3	4	5	6	7	8	9	10		
Thickness (mils)	91	81	84	87	84	94	83	94	82	87	87 81	5 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams) Mass/Unit Area (oz/sq.yd)	3.31 7.70	3.28 7.63	3.32 7.72	3.31 7.70	3.20 7.44	3.37 7.84	3.28 7.63	3.37 7.84	3.27 7.61	3.35 7.79	3.31 7.69	0.05 0.12
Grab Tensile Properties (ASTM D	9 4632)											
MD - Tensile Strength (lbs) TD - Tensile Strength (lbs)	302 173	278 169	303 201	302 185	306 203	313 192	267 179	295 164	274 169	321 171	296 181	18 14
MD - Elong. @ Max. Load (%) TD - Elong. @ Max. Load (%)	17 11	19 9	20 17	19 12	19 17	20 19	19 13	19 15	16 13	18 14	19 14	1 3
Apparent Opening Size (ASTM D	4751)											
Opening Size Diameter (mm) Sieve No.	0.418 40	0.415 40	0.418 40	0.415 40	0.417 40						0.417 40	0.001

MD Machine Direction TD Transverse Direction

White Spray paint marks area where posts were attached to fabric had been avoided for index testing



LABORATORY TEST RESULTS TRI Client: DDRF, TRI / Environmental

Material: Erosion Tech ET-GA-C Woven Geotextile - Geo Grid Composite Material Sample Identification: ET-GA-C TRI Log #: E2366-93-07

PARAMETER	TEST R			DED							MEAN	STD. DEV.
PARAMETER	1	2	1 E NUM 3	BER 4	5	6	7	8	9	10	MEAN	DEV.
Percent Open Area (COE Method)	•	2	3	4	3	U	'	0	3	10		
Open Area (%)	13.50										13.50	
Constant Head Permittivity (ASTM I	0 4491, 5	1-mm C	onstant	Head;	2 in ope	ning)						
Water Temp. (C):	20.2	1										
Correction Factor:	1.00]										
Test Speciemn No. >:			1					2				
Thickness (mils)	80.7	80.7	80.7	80.7	80.7	85.9	85.9	85.9	85.9	85.9		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	12.8	12.8	12.8	12.8	12.8	13.4	13.3	13.4	13.3	13.4		
Specimen Permittivity @20°C (sec-1)	1.54	1.54	1.54	1.54	1.54	1.47	1.48	1.47	1.48	1.47		
Specimen Flow rate (GPM/ft2)	115	115	115	115	115	110	111	110	111	110		
Specimen Permeability (cm/s)	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.32	0.32	0.32		
Test Speciemn No. >:			3					4				
Thickness (mils)	81.8	81.8	81.8	81.8	81.8	80.7	80.7	80.7	80.7	80.7		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	13.3	13.3	13.4	13.3	13.0	12.3	12.3	12.3	12.2	12.3		
Specimen Permittivity @20°C (sec-1)	1.48	1.48	1.47	1.48	1.51	1.60	1.60	1.60	1.61	1.60		
Specimen Flow rate (GPM/ft2)	111	111	110	111	113	120	120	120	121	120		
Specimen Permeability (cm/s)	0.31	0.31	0.30	0.31	0.31	0.33	0.33	0.33	0.33	0.33		
				IPERAT	-				mittivit	• • •	1.52	
						Flow rate (GPM/ft2) Permeability (cm/s)					114	
			L	VALUES	>			Perme	eability	(cm/s)	0.32	

White Spray paint marks area where posts were attached to fabric had been avoided for index testing

BELTON BELTECH 935 Type A. Type B



May 17, 2012

Mail To:

Bill To:

<= Same

Mr. C. Joel Sprague DDRF , TRI / Environmental P.O. Box 9192 Greenville, SC 29604

email: jsprague@tri-env.com

Dear Mr. Sprague:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

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TRI Job Reference Number:	E2366-72-02
Material(s) Tested:	1, Beltech 1935 Woven Geotextile
Test(s) Requested:	Thickness (ASTM D 5199) Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Apparent Opening Size (ASTM D 4751) Percent Open Area (COE Method) Constant Head Permittivity (ASTM D 4491

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mansukh Patel Sr. Laboratory Coordinator Geosynthetic Services Division www.GeosyntheticTesting.com



TRI Client: DDRF , TRI / Environmental

Material: Beltech 1935 Woven Geotextile Sample Identification: Beltech 1935 TRI Log #: E2366-72-02

PARAMETER	TEST R	EPLICA ⁻	TE NUM	IBER							MEAN	STD. DEV.
Thickness (ASTM D 5199)	1	2	3	4	5	6	7	8	9	10		
Thickness (mils)	15	19	16	19	17	15	16	17	16	19	17 15	2 << min
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams) Mass/Unit Area (oz/sq.yd)	1.51 3.51	1.53 3.56	1.52 3.54	1.48 3.44	1.49 3.47	1.47 3.42	1.49 3.47	1.47 3.42	1.42 3.30	1.41 3.28	1.48 3.44	0.04 0.09
Grab Tensile Properties (ASTM D	4632)											
MD - Tensile Strength (lbs) TD - Tensile Strength (lbs)	177 150	182 166	184 157	189 155	175 161	168 167	160 165	176 150	164 149	172 147	175 157	9 8
MD - Elong. @ Max. Load (%) TD - Elong. @ Max. Load (%)	33 21	35 21	33 21	34 20	33 21	28 21	29 21	29 21	27 19	28 19	31 20	3 1
Apparent Opening Size (ASTM D	4751)											
Opening Size Diameter (mm) Sieve No.	0.501 30	0.388 40	0.537 30	0.564 30	0.707 25						0.539 30	0.115

MD Machine Direction TD Transverse Direction



TRI Client: DDRF , TRI / Environmental

Material: Beltech 1935 Woven Geotextile Sample Identification: Beltech 1935 TRI Log #: E2366-72-02

PARAMETER	TEST R	EPLICA	TE NUM	BER							MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Percent Open Area (COE Method)												
Open Area (%)	3.83	1.21	4.83								3.29	
Constant Head Permittivity (ASTM	D 4491, 5	1-mm C	onstant	Head; 2	2 in ope	ning)						
Water Temp. (C):	20											
Correction Factor:	1.000]										
Test Speciemn No. >:			1					2				
Thickness (mils)	16.4	16.4	16.4	16.4	16.4	16.5	16.5	16.5	16.5	16.5		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	53.2	53.8	53.8	54.3	54.3	68.6	69.1	69.1	69.7	70.2		
Specimen Permittivity @20°C (sec-1)	0.37	0.37	0.37	0.36	0.36	0.29	0.28	0.28	0.28	0.28		
Specimen Flow rate (GPM/ft2)	27.7	27.4	27.4	27.1	27.1	21.5	21.3	21.3	21.1	21.0		
Specimen Permeability (cm/s)	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01		
Test Speciemn No. >:			3					4				
Thickness (mils)	17.9	17.9	17.9	17.9	17.9	17.5	17.5	17.5	17.5	17.5		
Volume Collected (liters)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Time (s)	56.9	57.5	57.0	57.5	57.5	85.5	85.1	85.5	86.0	85.4		
Specimen Permittivity @20°C (sec-1)	0.35	0.34	0.35	0.34	0.34	0.23	0.23	0.23	0.23	0.23		
Specimen Flow rate (GPM/ft2)	25.9	25.6	25.8	25.6	25.6	17.2	17.3	17.2	17.1	17.2		
Specimen Permeability (cm/s)	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01		
			-									
				IPERAT		, , , , , , , , , , , , , , , , , , ,					0.31	
			CORRECTED Flow rate (GPM/ft2) VALUES Permeability (cm/s)						22.9			
				VALUES	5			Perme	eability	(cm/s)	0.01	
									,	. /		-