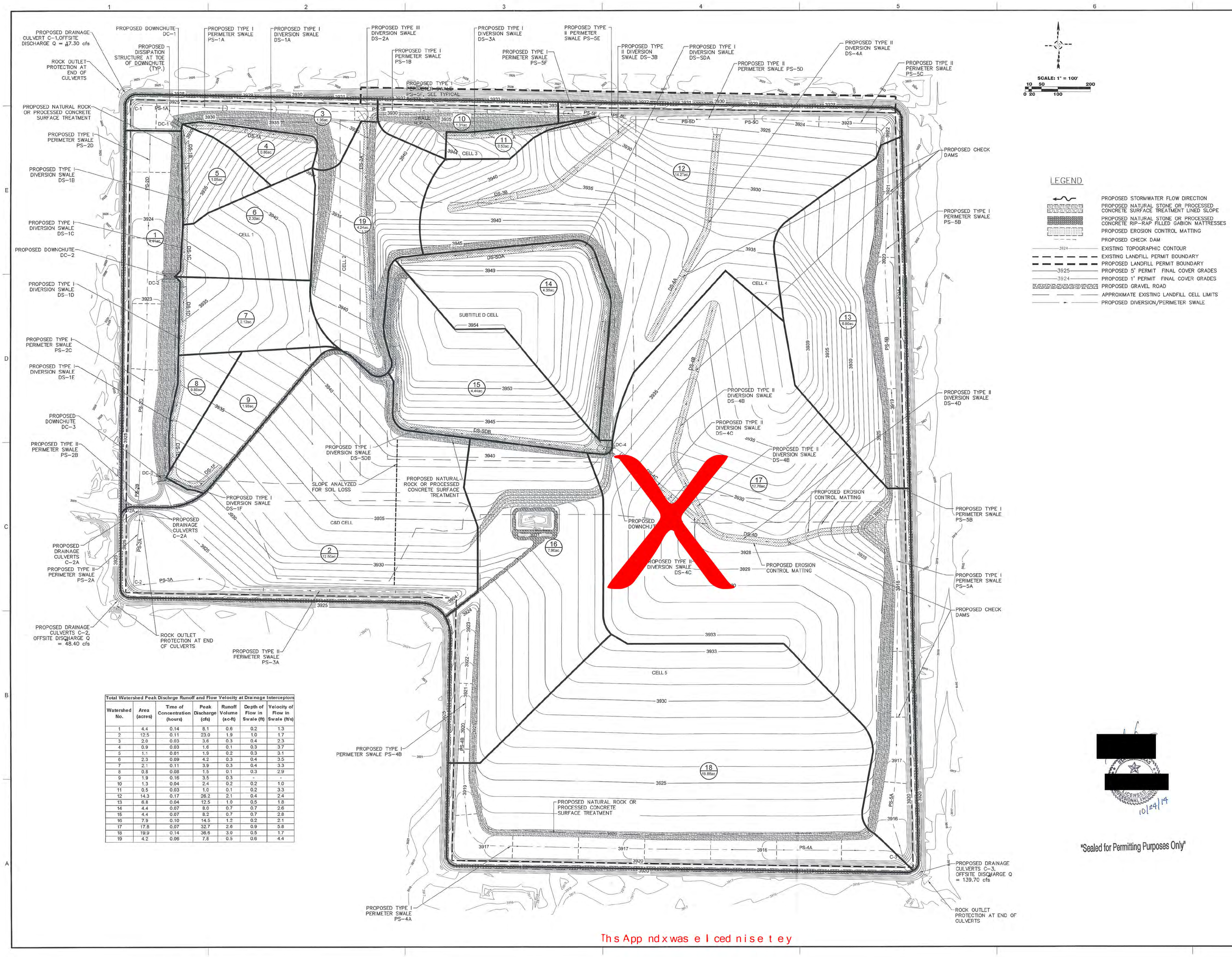

Total Watershed Peak Dischrge Runoff and Flow Velocity at Drainage Interceptors

Watershed No.	Area (acres)	Time of Concentration (hours)	Peak Discharge (cfs)	Runoff Volume (ac-ft)	Depth of Flow in Swale (ft)	Velocity of Flow in Swale (ft/s)
1	4.4	0.14	8.1	0.6	0.2	1.3
2	12.5	0.11	23.0	1.9	1.0	1.7
3	2.0	0.03	3.6	0.3	0.4	2.3
4	0.9	0.03	1.6	0.1	0.3	3.7
5	1.1	0.01	1.9	0.2	0.3	3.1
6	2.3	0.09	4.2	0.3	0.4	3.5
7	2.1	0.11	3.9	0.3	0.4	3.3
8	0.8	0.08	1.5	0.1	0.3	2.9
9	1.9	0.16	3.5	0.3	-	-
10	1.3	0.04	2.4	0.2	0.2	1.0
11	0.5	0.03	1.0	0.1	0.2	3.3
12	14.3	0.17	26.2	2.1	0.4	2.4
13	6.8	0.04	12.5	1.0	0.5	1.8
14	4.4	0.07	8.0	0.7	0.7	2.6
15	4.4	0.07	8.2	0.7	0.7	2.8
16	7.9	0.10	14.5	1.2	0.2	2.1
17	17.8	0.07	32.7	2.6	0.9	5.8
18	19.9	0.14	36.6	3.0	0.5	1.7
19	4.2	0.06	7.8	0.5	0.6	4.4

[redacted]
10/24/14
"Sealed for Permitting Purposes Only"

Ths App ndx was e l ced n se t ey

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY: | DATE: JAN 2014 | SOLICITATION NO.
DWN BY: | CHD BY: | CONTRACT NO.
SUBMITTED BY: | PLOT SCALE: 1:100 | PLOT DATE: 10/24/14 | FILE NUMBER:
SIZE: | FILE NAME: 0467260DS.DWG

U.S. ARMY CORPS OF ENGINEERS
FORT WORTH DISTRICT
FORT WORTH, TEXAS
[redacted]

FORT BLISS MUNICIPAL SOLID WASTE LANDFILL
PERMIT MODIFICATION FOR CLOSURE
OPTIMIZED EVAPO-TRANSPIRATION (ET)
ALTERNATIVE COVER SYSTEM

DRAINAGE AREAS

SHEET IDENTIFICATION
D-1
SHEET 1 OF 1

Attachment 2

Intermediate Erosion and Soil Control Design Calculations *(Peak Runoff Velocity, Swale Design, and Soil Loss)*

Temporary Soil Berm Hydraulic Analysis
25-Year Storm

Watershed Swale	Slope (ft/ft)	Manning Roughness, n	Side Slope 1 (z_1:1)	Side Slope 1 (z_1:1)	Depth (ft)	Area (ft2)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Average Velocity (ft/s)	Flow (cfs)
Temp. Soil Berm - Top Dome	0.020	0.026	50.0	2.0	0.37	3.46	19.07	0.18	2.60	9.0

Manning's n-Values

Previous Top

Description	Manning's "n"
Pipes	
Reinforced concrete	0.013
Vitrified clay pipe	0.013
Smooth welded pipe	0.011
Corrugated metal pipe	0.023
Polyvinyl chloride (PVC)	0.010
Natural Channels	
Gravel beds, Straight	0.025
Gravel beds, large boulders	0.040
Earth, straight, some grass	0.026
Earth, winding, no vegetation	0.030
Earth, winding	0.050
Miscellaneous	
Smooth surfaces (concrete, asphalt, bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils	0.06-0.17
Short grass	0.15
Dense grass	0.24
Bermuda grass	0.41
Light underbrush woods	0.40
Dense underbrush woods	0.80

Source: Soil Conservation Service TR-55

USDA NRCS Natural Resources Conservation Service

RUSLE2 Expanded Profile Erosion Calculation Record

Info:

File: profiles\Fort Bliss Final

Inputs:
Location: Texas\El Paso County
Soil: HW HUECO-WINK ASSOCIATION, HUMMOCKY\WINK fine sandy loam 35%
Slope length (horiz): 140 ft
Avg. slope steepness: 5.0 %

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial

Outputs:
T value: 3.0 t/ac/yr
Soil loss erod. portion: 1.2 t/ac/yr
Detachment on slope: 1.2 t/ac/yr
Soil loss for cons. plan: 1.2 t/ac/yr
Sediment delivery: 1.2 t/ac/yr

Crit. slope length: -- ft
Surf. cover after planting: -- %

Soil conditioning index (SCI): 0.11
Avg. annual slope STIR: 0
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	No operation		0

USDA NRCS Natural Resources Conservation Service

RUSLE2 Expanded Profile Erosion Calculation Record

Info:

File: profiles\Fort Bliss Final

Inputs:
Location: Texas\El Paso County
Soil: HW HUECO-WINK ASSOCIATION, HUMMOCKY\WINK fine sandy loam 35%
Slope length (horiz): 350 ft
Avg. slope steepness: 2.5 %

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial

Outputs:
T value: 3.0 t/ac/yr
Soil loss erod. portion: 0.69 t/ac/yr
Detachment on slope: 0.69 t/ac/yr
Soil loss for cons. plan: 0.69 t/ac/yr
Sediment delivery: 0.69 t/ac/yr

Crit. slope length: -- ft
Surf. cover after planting: -- %

Soil conditioning index (SCI): 0.15
Avg. annual slope STIR: 0
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	No operation		0

Period Start Date	*Operation*	*PLU*	*Avg. surf. cover, %*	*Avg. SC subfactor*	*Avg. CC subfactor*	*Avg. roughness, in.*	*Avg. SR subfactor*	*Avg. C factor*	*EI, %*
4/15/0	No operation	0.45	0	1.0	1.0	0.24	1.00	0.45	0.034
4/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.61
5/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.89
5/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	1.4
6/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	3.8
6/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	6.4
7/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	13
7/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	15
8/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	14
8/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	15
9/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	10
9/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	7.3
10/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	3.7
10/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	2.6
11/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	1.1
11/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.97
12/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.91
12/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.81
1/1/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.13
1/16/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.19
2/1/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.26
2/15/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.30
3/1/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.35
3/16/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.43
4/1/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.45

Period Start Date, m/d/y	*Operation Name*	*Man soil loss rate, t/ac/yr*	*Man sed del. rate*	*EI, %*
4/15/0	No operation	0.069	0.069	0.034
4/16/0		0.081	0.081	0.61
5/1/0		0.12	0.12	0.89
5/16/0		0.18	0.18	1.4
6/1/0		0.52	0.52	3.8
6/16/0		0.87	0.87	6.4
7/1/0		2.0	2.0	13
7/16/0		2.3	2.3	15
8/1/0		2.7	2.7	14
8/16/0		2.7	2.7	15
9/1/0		1.9	1.9	10
9/16/0		1.3	1.3	7.3
10/1/0		0.56	0.56	3.7
10/16/0		0.34	0.34	2.6
11/1/0		0.15	0.15	1.1
11/16/0		0.14	0.14	0.97
12/1/0		0.15	0.15	0.91
12/16/0		0.12	0.12	0.81
1/1/1		0.020	0.020	0.13
1/16/1		0.026	0.026	0.19
2/1/1		0.041	0.041	0.26
2/15/1		0.046	0.046	0.30
3/1/1		0.047	0.047	0.35
3/16/1		0.053	0.053	0.43
4/1/1		0.065	0.065	0.45

Period Start Date	*Operation*	*PLU*	*Avg. surf. cover, %*	*Avg. SC subfactor*	*Avg. CC subfactor*	*Avg. roughness, in.*	*Avg. SR subfactor*	*Avg. C factor*	*EI, %*
4/15/0	No operation	0.45	0	1.0	1.0	0.24	1.00	0.45	0.034
4/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.61
5/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.89
5/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	1.4
6/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	3.8
6/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	6.4
7/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	13
7/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	15
8/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	14
8/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	15
9/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	10
9/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	7.3
10/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	3.7
10/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	2.6
11/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	1.1
11/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.97
12/1/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.91
12/16/0		0.45	0	1.0	1.0	0.24	1.00	0.45	0.81
1/1/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.13
1/16/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.19
2/1/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.26
2/15/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.30
3/1/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.35
3/16/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.43
4/1/1		0.45	0	1.0	1.0	0.24	1.00	0.45	0.45

Period Start Date, m/d/y	*Operation Name*	*Man soil loss rate, t/ac/yr*	*Man sed del. rate*	*EI, %*
4/15/0	No operation	0.12	0.12	0.034
4/16/0		0.14	0.14	0.61
5/1/0		0.21	0.21	0.89
5/16/0		0.31	0.31	1.4
6/1/0		0.89	0.89	3.8
6/16/0		1.5	1.5	6.4
7/1/0		3.5	3.5	13
7/16/0		3.9	3.9	15
8/1/0		4.6	4.6	14
8/16/0		4.6	4.6	15
9/1/0		3.2	3.2	10
9/16/0		2.3	2.3	7.3
10/1/0		0.96	0.96	3.7
10/16/0		0.59	0.59	2.6
11/1/0		0.26	0.26	1.1
11/16/0		0.24	0.24	0.97
12/1/0		0.25	0.25	0.91
12/16/0		0.21	0.21	0.81
1/1/1		0.035	0.035	0.13
1/16/1		0.046	0.046	0.19
2/1/1		0.071	0.071	0.26
2/15/1		0.078	0.078	0.30
3/1/1		0.081	0.081	0.35
3/16/1		0.092	0.092	0.43
4/1/1		0.11	0.11	0.45

Attachment 3

Final Erosion and Soil Control Design Calculations (Soil Loss)

USDA NRCS

RUSLE2 Expanded Profile Erosion Calculation Record

Info: Ft. Bliss Permit Modification 2014
Final Conditions
1st Segment of 1,500' Soil Loss Estimation Slope

File: profiles\Ft Bliss MSWLF Final Cover

Inputs:
Location: Texas\El Paso County
Soil: loamy sand
Slope length (horiz): 1000 ft
Avg. slope steepness: 2.6 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 23\d.Construction Site Templates\Construction site	Grama, yr 1	lbs	300
Strip/Barrier Managements\Straw bale barrier	Permanent cover not harvested\straw bale barrier	pounds	50.0

Contouring: a. rows up-and-down hill
Strips/barriers: 1 Straw bale barrier at end of slope
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial

Outputs:
T value: 3.0 t/ac/yr
Soil loss erod. portion: 2.1 t/ac/yr
Detachment on slope: 2.1 t/ac/yr
Soil loss for cons. plan: 2.1 t/ac/yr
Sediment delivery: 0.061 t/ac/yr

Crit. slope length: -- ft
Surf. cover after planting: 0 %

Soil conditioning index (SCI): -0.013
Avg. annual slope STIR: 29
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
2/15/0	Bulldozer, clearing/cutting		0
3/15/0	Bulldozer, filling/leveling		0
8/15/0	Disk, tandem light finishing		0
9/1/0	default		0
9/2/0	Add mulch		69
9/3/0	Mulch crimper		68
1/1/1	Begin growth	Permanent cover not harvested\straw bale barrier	0

Period Start Date	Operation	PLU	Avg. surf. cover, %	Avg. SC subfactor	Avg. CC subfactor	Avg. roughness, in.	Avg. SR subfactor	Avg. C factor	EI, %
2/15/0	Bulldozer, clearing/cutting	0.45	0	1.0	1.0	0.32	0.95	0.43	0.30
3/1/0		0.45	0	1.0	1.0	0.31	0.95	0.43	0.33
3/15/0	Bulldozer, filling/leveling	1.0	0	1.0	1.0	0.24	1.00	1.00	0.024
3/16/0		1.00	0	1.0	1.0	0.24	1.00	1.00	0.43
4/1/0		1.00	0	1.0	1.0	0.24	1.00	1.00	0.49
4/16/0		1.00	0	1.0	1.0	0.24	1.00	0.99	0.61
5/1/0		0.99	0	1.0	1.0	0.24	1.00	0.99	0.89
5/16/0		0.99	0	1.0	1.0	0.24	1.00	0.99	1.4
6/1/0		0.99	0	1.0	1.0	0.24	1.00	0.98	3.8
6/16/0		0.98	0	1.0	1.0	0.24	1.00	0.98	6.4
7/1/0		0.98	0	1.0	1.0	0.24	1.00	0.98	13
7/16/0		0.98	0	1.0	1.0	0.24	1.00	0.97	15
8/1/0		0.97	0	1.0	1.0	0.24	1.00	0.97	13
8/15/0	Disk, tandem light finishing	1.0	0	1.0	1.0	0.29	0.97	0.97	0.97
8/16/0		1.00	0	1.0	1.0	0.28	0.97	0.97	15
9/1/0	default	1.00	0	1.0	1.0	0.28	0.97	0.97	0.76
9/2/0	Add mulch	1.00	69	0.16	1.0	0.28	0.97	0.16	0.74
9/3/0	Mulch crimper	0.99	67	0.17	1.0	0.28	0.97	0.16	8.6
9/16/0		0.99	66	0.17	1.0	0.28	0.97	0.17	7.3
10/1/0		0.99	65	0.18	1.0	0.27	0.98	0.17	3.7
10/16/0		0.99	64	0.18	1.0	0.27	0.98	0.17	2.6
11/1/0		0.98	64	0.18	1.0	0.27	0.98	0.18	1.1
11/16/0		0.98	63	0.19	1.0	0.27	0.98	0.18	0.97
12/1/0		0.98	63	0.19	1.0	0.27	0.98	0.18	0.91
12/16/0		0.97	62	0.19	1.0	0.27	0.98	0.18	0.81
1/1/1	straw bale barrier	0.97	62	0.19	1.0	0.27	0.98	0.18	0.13
1/16/1		0.96	62	0.19	1.0	0.27	0.98	0.18	0.19
2/1/1		0.96	61	0.20	1.0	0.27	0.98	0.18	0.26

Period Start Date, m/d/y	*Operation Name*	*Man soil loss rate, t/ac/yr*	*Man sed del. rate*	*EI, %*
2/15/0	Bulldozer, clearing/cutting	0.064	0.064	0.30
3/1/0		0.065	0.065	0.33
3/15/0	Bulldozer, filling/leveling	0.23	0.23	0.024
3/16/0		0.25	0.25	0.43
4/1/0		0.30	0.30	0.49
4/16/0		0.37	0.37	0.61
5/1/0		0.54	0.54	0.89
5/16/0		0.80	0.80	1.4
6/1/0		2.3	2.3	3.8
6/16/0		3.7	3.7	6.4
7/1/0		8.3	8.3	13
7/16/0		9.1	9.1	15
8/1/0		10	10	13
8/15/0	Disk, tandem light finishing	11	11	0.97
8/16/0		10	10	15
9/1/0	default	8.2	8.2	0.76
9/2/0	Add mulch	0.86	0.86	0.74
9/3/0	Mulch crimper	0.80	0.80	8.6
9/16/0		0.60	0.60	7.3
10/1/0		0.26	0.26	3.7
10/16/0		0.16	0.16	2.6
11/1/0		0.070	0.070	1.1
11/16/0		0.067	0.067	0.97
12/1/0		0.071	0.071	0.91
12/16/0		0.060	0.060	0.81
1/1/1	straw bale barrier	0.0098	0.0098	0.13
1/16/1		0.013	0.013	0.19
2/1/1		0.020	0.020	0.26

USDA NRCS

RUSLE2 Expanded Profile Erosion Calculation Record

Info: Ft. Bliss Permit Modification 2014
Final Conditions
2nd Segment of 1,500' Soil Loss Estimation Slope

File: profiles\Ft Bliss MSWLF Final Cover

Inputs:
Location: Texas\El Paso County
Soil: loamy sand
Slope length (horiz): 500 ft
Avg. slope steepness: 1.8 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 23\d.Construction Site Templates\Construction site	Grama, yr 1	lbs	300
Strip/Barrier Managements\Straw bale barrier	Permanent cover not harvested\straw bale barrier	pounds	50.0

Contouring: a. rows up-and-down hill
Strips/barriers: 1 Straw bale barrier at end of slope
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial

Outputs:
T value: 3.0 t/ac/yr
Soil loss erod. portion: 1.0 t/ac/yr
Detachment on slope: 1.00 t/ac/yr
Soil loss for cons. plan: 1.00 t/ac/yr
Sediment delivery: 0.020 t/ac/yr

Crit. slope length: -- ft
Surf. cover after planting: 0 %

Soil conditioning index (SCI): 0.071
Avg. annual slope STIR: 29
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
2/15/0	Bulldozer, clearing/cutting		0
3/15/0	Bulldozer, filling/leveling		0
8/15/0	Disk, tandem light finishing		0
9/1/0	default		0
9/2/0	Add mulch		69
9/3/0	Mulch crimper		68
1/1/1	Begin growth	Permanent cover not harvested\straw bale barrier	0

Period Start Date	*Operation*	*PLU*	*Avg. surf. cover, %*	*Avg. SC subfactor*	*Avg. CC subfactor*	*Avg. roughness, in.*	*Avg. SR subfactor*	*Avg. C factor*	*EI, %*
2/15/0	Bulldozer, clearing/cutting	0.45	0	1.0	1.0	0.32	0.95	0.43	0.30
3/1/0		0.45	0	1.0	1.0	0.31	0.95	0.43	0.33
3/15/0	Bulldozer, filling/leveling	1.0	0	1.0	1.0	0.24	1.00	1.00	0.024
3/16/0		1.00	0	1.0	1.0	0.24	1.00	1.00	0.43
4/1/0		1.00	0	1.0	1.0	0.24	1.00	1.00	0.49
4/16/0		1.00	0	1.0	1.0	0.24	1.00	0.99	0.61
5/1/0		0.99	0	1.0	1.0	0.24	1.00	0.99	0.89
5/16/0		0.99	0	1.0	1.0	0.24	1.00	0.99	1.4
6/1/0		0.99	0	1.0	1.0	0.24	1.00	0.98	3.8
6/16/0		0.98	0	1.0	1.0	0.24	1.00	0.98	6.4
7/1/0		0.98	0	1.0	1.0	0.24	1.00	0.98	13
7/16/0		0.98	0	1.0	1.0	0.24	1.00	0.97	15
8/1/0		0.97	0	1.0	1.0	0.24	1.00	0.97	13
8/15/0	Disk, tandem light finishing	1.0	0	1.0	1.0	0.29	0.97	0.97	0.97
8/16/0		1.00	0	1.0	1.0	0.28	0.97	0.97	15
9/1/0	default	1.00	0	1.0	1.0	0.28	0.97	0.97	0.76
9/2/0	Add mulch	1.00	69	0.16	1.0	0.28	0.97	0.15	0.74
9/3/0	Mulch crimper	0.99	67	0.17	1.0	0.28	0.97	0.16	8.6
9/16/0		0.99	66	0.17	1.0	0.28	0.97	0.17	7.3
10/1/0		0.99	65	0.18	1.0	0.27	0.98	0.17	3.7
10/16/0		0.99	64	0.18	1.0	0.27	0.98	0.17	2.6
11/1/0		0.98	64	0.18	1.0	0.27	0.98	0.18	1.1
11/16/0		0.98	63	0.19	1.0	0.27	0.98	0.18	0.97
12/1/0		0.98	63	0.19	1.0	0.27	0.98	0.18	0.91
12/16/0		0.97	62	0.19	1.0	0.27	0.98	0.18	0.81
1/1/1	straw bale barrier	0.97	62	0.19	1.0	0.27	0.98	0.18	0.13
1/16/1		0.96	62	0.19	1.0	0.27	0.98	0.18	0.19
2/1/1		0.96	61	0.20	1.0	0.27	0.98	0.18	0.26

Period Start Date, m/d/y	*Operation Name*	*Man soil loss rate, t/ac/yr*	*Man sed del. rate*	*EI, %*
2/15/0	Bulldozer, clearing/cutting	0.037	0.037	0.30
3/1/0		0.038	0.038	0.33
3/15/0	Bulldozer, filling/leveling	0.11	0.11	0.024
3/16/0		0.12	0.12	0.43
4/1/0		0.14	0.14	0.49
4/16/0		0.18	0.18	0.61
5/1/0		0.26	0.26	0.89
5/16/0		0.38	0.38	1.4
6/1/0		1.1	1.1	3.8
6/16/0		1.8	1.8	6.4
7/1/0		4.0	4.0	13
7/16/0		4.4	4.4	15
8/1/0		4.9	4.9	13
8/15/0	Disk, tandem light finishing	5.2	5.2	0.97
8/16/0		5.0	5.0	15
9/1/0	default	3.9	3.9	0.76
9/2/0	Add mulch	0.47	0.47	0.74
9/3/0	Mulch crimper	0.44	0.44	8.6
9/16/0		0.32	0.32	7.3
10/1/0		0.14	0.14	3.7
10/16/0		0.088	0.088	2.6
11/1/0		0.038	0.038	1.1
11/16/0		0.037	0.037	0.97
12/1/0		0.038	0.038	0.91
12/16/0		0.032	0.032	0.81
1/1/1	straw bale barrier	0.0053	0.0053	0.13
1/16/1		0.0070	0.0070	0.19
2/1/1		0.011	0.011	0.26

Attachment 4

Erosion and Soil Control Measures Specifications Information

[redacted]

Installation Guide for Rolled Erosion Control Products (RECPs) Including Mulch Control Nettings (MCNs), Open Weave Textiles (OWTs), Erosion Control Blankets (ECBs), and Turf Reinforcement Mats (TRMs)

This document is intended to provide general guidelines for the installation of RECPs and does not supersede manufacture's guidelines. The following sections summarize the general, accepted procedures for installation of RECPs and provide basic guidance for slope and channel installations. Detailed design/installation information should be obtained from the manufacturer.

General Procedure. Prepare a stable and firm soil surface free of rocks and other obstructions. Apply soil amendments as necessary to prepare seedbed. Place fertilizer, water, and seed in accordance with manufacturer, local/state regulations, or engineer/specifiers requirements. Typically, RECPs are unrolled parallel to the primary direction of flow. Ensure the product maintains intimate contact with the soil surface over the entirety of the installation. Do not stretch or allow material to bridge over surface inconsistencies. Staple/stake RECPs to soil such that each staple/stake is flush with underlying soil. Install anchor trenches, seams and terminal ends as specified.

Install RECPs after application of seed, fertilizer, mulches (if necessary) and other necessary soil amendments, unless soil in-filling of the TRM is required. For TRMs if soil in-filling, install TRM, apply seed, and other soil amendments lightly brush or rake 0.3 to 0.7 in. (8 to 18 mm) of topsoil into TRM matrix to fill the product thickness. If in-filling with a hydraulically-applied matrix or medium is required; install TRM, then install hydraulically-applied matrix or medium at the manufacturer's suggested application rate.

Apply MCNs (Materials Type 1.A., 2.A., 3.A.) immediately after dry mulch application.

Anchor Trenches, Seams and Terminal Ends

(A) Upslope Anchor – utilize one of the methods detailed below for initial anchoring of RECPs

(1) Staples. Install the RECPs 3 ft. (900 mm) beyond the shoulder of the slope onto flat final grade. Secure roll end with a single row of stakes/staples on 1 ft. (300-mm) centers.

(2) Anchor trench. Excavate a 6 in. by 6 in. (150 mm by 150 mm) anchor trench. Extend the upslope terminal end of the RECPs 3 ft. (900 mm) past the anchor trench. Use stakes or staples to fasten the product into the bottom of the anchor trench on 1 ft. (300 mm) centers. Backfill the trench and compact the soil into the anchor trench. Apply seed and any necessary soil amendments to the compacted soil and cover with remaining 1 ft. (300 mm) terminal end of the RECPs. Fold product over compacted soil in anchor trench to overlap downslope material. Secure terminal end of RECPs with a single row of stakes or staples on 1 ft. (300 mm) centers.

(3) Staple check. Construct a stake/staple check slot along the top edge of the RECPs by installing two rows of staggered stakes/staples 4 in. (100 mm) apart on 4 in. (100 mm) centers.

(4) Single net product anchor trench. Excavate a 6 in. by 6 in. (150 mm by 150 mm) anchor trench. Position roll such that the leading end of the roll is downslope and upside down. Apply seed and necessary soil amendments. Extend product 1 ft. downslope of anchor trench and place material in anchor trench (upside down). Secure terminal end and material in anchor trench with staples at 1 ft. intervals. Fill anchor trench with soil and compact. Apply seed and necessary soil amendments to fill placed in anchor trench. Move remaining roll over and downslope of anchor trench and proceed unrolling RECP downslope (since roll was initially reversed, folding material over anchor trench will result in the net side up, and rolling correctly downslope over the anchor trench).

(B) Seams – utilize one of the methods detailed below for seaming of RECPs

(1) Adjacent seams. Overlap edges of adjacent RECPs by 2 to 4 in. (50 to 100 mm) or by abutting products as defined by manufacturer. Use a sufficient number of stakes or staples to prevent seam or abutted rolls from separating.

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(2) Consecutive rolls. Shingle and overlap consecutive rolls 2 to 6 in. (50 to 150 mm) in the direction of flow. Secure staples through seam at 1 ft. (300 mm) intervals.

(3) Check seam. Construct a stake/staple check seam along the top edge of RECPs for slope application and at specified intervals in a channel by installing two staggered rows of stakes/staples 4 in. (100 mm) apart on 4 in. (100 mm) centers.

(4) Slope interruption check slot. Excavate a trench measuring 6 in. wide by 6 in. deep (150 x 150 mm). Secure product to the bottom of the trench. Fold product over upslope material and fill and compact the trench on the downslope side of check slot and seed fill. Continue rolling material downslope over trench.

(C) Terminal Ends – utilize one of the methods detailed below for all terminal ends of RECPs

(1) Staples. Install the RECPs 3 ft. (900 mm) beyond the end of the channel and secure end with a single row of stakes/staples on 1 ft. (300-mm) centers. Stakes/staples for securing RECPS to the soil are typically 6 in. (150 mm) long.

(2) Anchor trench. Excavate a 6 in. by 6 in. (150 mm by 150 mm) anchor trench. Extend the terminal end of the RECPs 3 ft. (900 mm) past the anchor trench. Use stakes or staples to fasten the product into the bottom of the anchor trench on 1 ft. (300 mm) centers. Backfill the trench and compact the soil into the anchor trench. Apply seed and any necessary soil amendments to the compacted soil and cover with remaining 1 ft. (300 mm) terminal end of the RECPs. Secure terminal end of RECPs with a single row of stakes or staples on 1 ft. (300 mm) centers.

(3) Check slot. Construct a stake/staple check slot along the terminal end of the RECPs by installing two rows of staggered stakes/staples 4 in. (100 mm) apart on 4 in. (100 mm) centers.

Slope Installations. At the top of slope, anchor the RECPs according to one of the method detailed in Section (A) above. Securely fasten all RECPs to the soil by installing stakes/staples at a minimum rate of 1.3/yd^2 (1.5/m^2) within the body of the blanket. For the most effective RECP installation use stake/staple patterns and densities as recommended by the manufacturer. For adjacent and consecutive rolls of RECPs follow seaming instructions detailed in Section (B) above. The terminal end of the RECPs installation must be anchored using one of the methods detailed in Section (C) above.

Channel Installations. Construct an anchor trench at the beginning of the channel across its entire width according to Section (A) (2) above. Follow the manufacturer's installation guidelines in constructing additional anchor trenches or stake/staple check slots at intervals along the channel reach and at the terminal end of the channel, according to paragraph (A) above respectively. Unroll RECPs down the center of the channel in the primary water flow direction. Securely fasten all RECPs to the soil by installing stakes/staples at a minimum rate of 1.7/yd^2 (1.5/m^2). Significantly higher anchor rates and longer stakes/staples may be necessary in sandy, loose, or wet soils and in severe applications. For adjacent and consecutive rolls of RECPs follow seaming instructions detailed in Section (B) above. All terminal ends of the RECPs must be anchored using one of the methods detailed in Section (C) above.

With any RECP installation, ensure sufficient staples to resist uplift from hydraulics, wind, mowers, and foot traffic. For the most effective installation of RECPs, the ECTC recommends using stake/staple patterns and densities as recommended by the manufacturer.

Repair any damaged areas immediately by restoring soil to finished grade, re-applying soil amendments and seed, and replacing the RECPs.

Shoreline Installations. When required, lower the waterline as necessary and construct an anchor trench at the top of slope as described in Section (A) (2). Unroll the product down the slope and follow the manufacturer's installation guidelines in constructing additional anchor trenches or stake/staple check slots at intervals along the shoreline. Construct an anchor trench just below the mean water line at the terminal end of the shoreline, according to paragraph (C) (2) above. Securely fasten all RECPs along the shoreline to the soil by installing

[redacted]

stakes/staples at a minimum rate of 1.7/yd^2 (1.5/m^2) through the body of the rolled erosion control product. Significantly higher anchor rates and longer stakes/staples may be necessary in sandy, loose, or wet soils, below the waterline and in severe applications. For adjacent and consecutive rolls of RECPs follow seaming instructions detailed in Section (B) above.

[redacted]

This Appendix was replaced in its entirety.

Attachment 5

~~2005~~ 2021 Stormwater Pollution Prevention Plan

(For Reference Only~~.~~ - Prepared by Directorate of Public Works Environmental Division Stormwater Compliance~~U.S. Army Center for Health Promotion and Preventive Medicine.~~)

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Storm Water Pollution Prevention Plan - 2005

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[redacted]. Army Center for H[redacted]romotion and [redacted]reventive Medicine

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Distribution limited to U.S. Government agencies only; protection of privileged information evaluating another command, November 2005. Requests for this document must be referred to. [redacted] and Ft. Bliss, ATTN: [redacted]