

## Benchmark Report

**Project Name:** Grassed Waterway Example,  
 GWW\_Example

**Project Description:** Project Example

**Designed by:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Practice:** \_\_\_\_\_

**Checked by:** \_\_\_\_\_

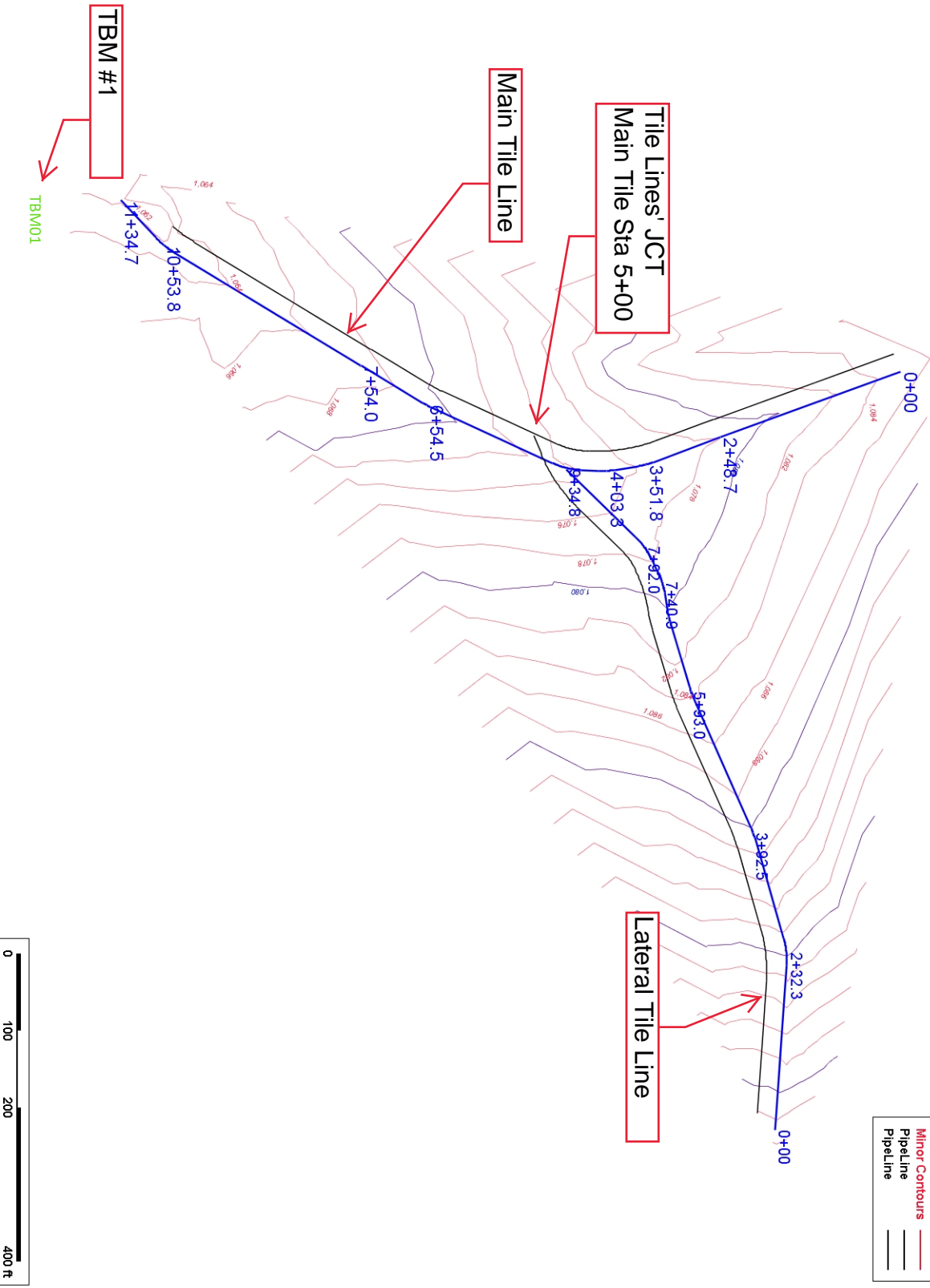
**Date:** \_\_\_\_\_

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**Surveyed by** \_\_\_\_\_ **Date** \_\_\_\_\_ **Checked by** \_\_\_\_\_ **Date** \_\_\_\_\_

Bench Mark Table	
Bench Mark Description	Elevation
Top 1x2 hub, 100' south of outlet culvert.	1063.70

Field Survey Notes									
Desc.	B.S.	H.I.	F.S.	Elev.	Desc.	B.S.	H.I.	F.S.	Elev.



LEGEND	
CenterLine	GRD
Stations	GRD
CenterLine	GRD
Stations	123
Contour Labels	
Major Contours	
Minor Contours	
Pipeline	
PipeLine	

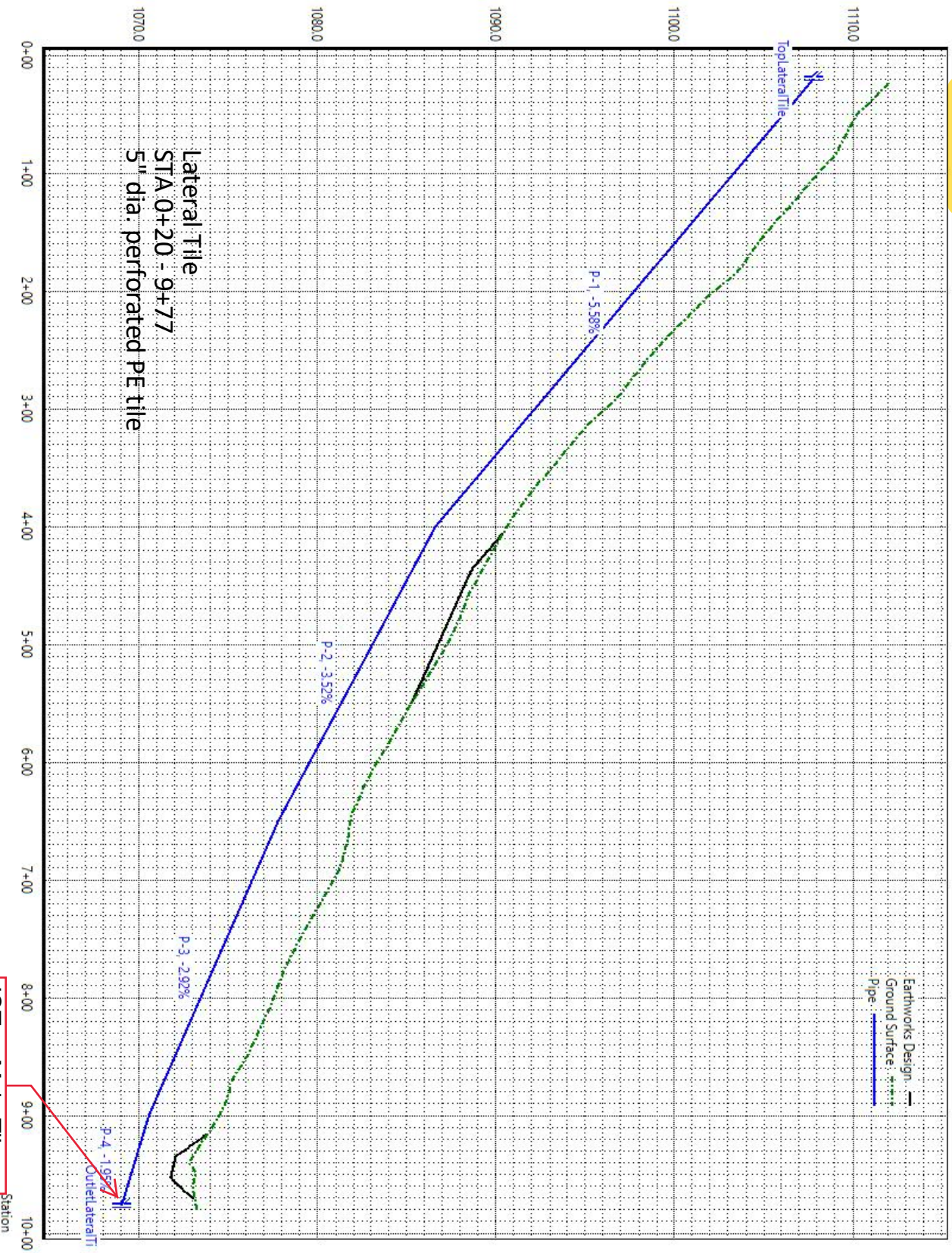


Your Logo Here

Cover Page  
 Grassed Waterway Example,  
 GWW\_Example

Designed \_\_\_\_\_  
 Drawn \_\_\_\_\_  
 Checked \_\_\_\_\_  
 Approved \_\_\_\_\_  
 EFT Version 4.0.6.1r1

Date \_\_\_\_\_  
 File Name GWW\_Example.xt  
 Drawing Name Cover Page  
 04/14/2021  
 Sheet \_\_\_\_ of \_\_\_\_



JCT to Main Tile,  
Sta 5+00

Your Logo  
Here



Underground Outlet Profile Report  
Grassed Waterway Example, GWW\_Exam

Designed \_\_\_\_\_ Date \_\_\_\_\_  
 Drawn \_\_\_\_\_  
 Checked \_\_\_\_\_  
 Approved \_\_\_\_\_  
 EFT Version 4.0.6.1r1

File Name: GWW\_Example.xml  
 Drawing Name: Pipeline Profile  
 Date: 04/14/2021  
 Sheet \_\_\_\_\_ of \_\_\_\_\_



## Underground Outlet Documentation

**Project Name:** Grassed Waterway Example, GWW\_Example

**Location:** \_\_\_\_\_

**Project Description:** \_\_\_\_\_

**Practice:** \_\_\_\_\_

**Designed by:** \_\_\_\_\_

**Checked by:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Date:** \_\_\_\_\_

<b>Underground Outlet</b>	LateralUGO
<b>Alignment</b>	TileLateral
<b>Design Status</b>	A stand-alone junction is not allowed (LateralUGO:TopLateralTile) Untested

### Fixtures

<b>Name</b>	TopLateralTile	<b>Description</b>	TopLateralTile, Junction of 5" CORRUG_PE_PERF
<b>Name</b>	GB203940083	<b>Description</b>	(grade break)
<b>Name</b>	GB771408703	<b>Description</b>	(grade break)
<b>Name</b>	GB332434389	<b>Description</b>	(grade break)
<b>Name</b>	OutletLateralTi	<b>Description</b>	OutletLateralTi, Junction of 8" CORRUG_PE_PERF

**Pipe P-1**

<b>Water source</b>	Junction: TopLateralTile	<b>Diameter (in)</b>	5.0
<b>Start station</b>	0+20.0	<b>Pipe slope (%)</b>	5.58
<b>Start elevation</b>	1107.80	<b>Flow type</b>	Non-Pressure
<b>End Station</b>	4+00	<b>Required capacity (cfs)</b>	0.00
<b>End Elevation</b>	1086.60	<b>Design Capacity (cfs)</b>	0.71
<b>Material</b>	CORRUG PE PERF	<b>Design flow of pipe (cfs)</b>	0.07
<b>Manning's N</b>	0.015	<b>Velocity (fps)</b>	3.32

**Pipe P-2**

<b>Water source</b>	Junction: TopLateralTile	<b>Diameter (in)</b>	5.0
<b>Start station</b>	4+00	<b>Pipe slope (%)</b>	3.52
<b>Start elevation</b>	1086.60	<b>Flow type</b>	Non-Pressure
<b>End Station</b>	6+50.0	<b>Required capacity (cfs)</b>	0.00
<b>End Elevation</b>	1077.80	<b>Design Capacity (cfs)</b>	0.56
<b>Material</b>	CORRUG PE PERF	<b>Design flow of pipe (cfs)</b>	0.07
<b>Manning's N</b>	0.015	<b>Velocity (fps)</b>	2.82

**Pipe P-3**

<b>Water source</b>	Junction: TopLateralTile	<b>Diameter (in)</b>	5.0
<b>Start station</b>	6+50.0	<b>Pipe slope (%)</b>	2.92
<b>Start elevation</b>	1077.80	<b>Flow type</b>	Non-Pressure
<b>End Station</b>	9+00	<b>Required capacity (cfs)</b>	0.00
<b>End Elevation</b>	1070.50	<b>Design Capacity (cfs)</b>	0.51
<b>Material</b>	CORRUG PE PERF	<b>Design flow of pipe (cfs)</b>	0.07
<b>Manning's N</b>	0.015	<b>Velocity (fps)</b>	2.63

**Pipe P-4**

<b>Water source</b>	Junction: TopLateralTile	<b>Diameter (in)</b>	5.0
<b>Start station</b>	9+00	<b>Pipe slope (%)</b>	1.95
<b>Start elevation</b>	1070.50	<b>Flow type</b>	Non-Pressure
<b>End Station</b>	9+77.0	<b>Required capacity (cfs)</b>	0.00
<b>End Elevation</b>	1069.00	<b>Design Capacity (cfs)</b>	0.42
<b>Material</b>	CORRUG PE PERF	<b>Design flow of pipe (cfs)</b>	0.07
<b>Manning's N</b>	0.015	<b>Velocity (fps)</b>	2.28

**Grade Breaks**

<b>Name</b>	GB203940083	<b>Station</b>	4+00	<b>Elevation</b>	1086.60
<b>Name</b>	GB203940083	<b>Station</b>	6+50.0	<b>Elevation</b>	1077.80
<b>Name</b>	GB203940083	<b>Station</b>	9+00	<b>Elevation</b>	1070.50

Junction TopLateralTile					
Added flow (cfs)	0.07	Station	0+20.0	Elevation	1107.80
Water source of added Q	support				

Junction OutletLateralTi					
Added flow (cfs)	0.00	Station	9+77.0	Elevation	1069.00
Water source of added Q					

# UGO Construction Checkout Sheet

**Project Name:** Grassed Waterway Example, GWW\_Example

**Location:** \_\_\_\_\_

**Project Description:** \_\_\_\_\_

**Practice:** \_\_\_\_\_

**Designed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Checked by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Surveyed by**

**Date**

**Checked by**

**Date**

I certify the information recorded on this sheet is a true representation of the actual practice installation and the practice as installed does ( ) or does not ( ) meet NRCS plans and specifications.

**Certified by**

**Date**

**NRCS Rep.**

**Date**

(ground) <b>LateralUGO Profile</b>							
Station	Fixture ID	Ref. Elev. (ft)	Plan Flowlin Elev. (ft)	Plan Cut (ft)	Plan Pipe Grade (%)	Actual Pipe Grade (%)	
0+20.0	TopLate	N/A	1107.8	NaN	BM _____ BS _____		
Pipe	80 ft of 5.0 in diam. CORRUG_PE_PERF				5.58		Len. = _____ (ft) Dia. = _____ (in) Material = _____
1+00	-	1108.1	1103.3	4.7	BM _____ BS _____		
Pipe	100 ft of 5.0 in diam. CORRUG_PE_PERF				5.58		Len. = _____ (ft) Dia. = _____ (in) Material = _____
2+00	-	1102.2	1097.8	4.5	BM _____ BS _____		
Pipe	100 ft of 5.0 in diam. CORRUG_PE_PERF				5.58		Len. = _____ (ft) Dia. = _____ (in) Material = _____
3+00	-	1096.1	1092.2	3.9	BM _____ BS _____		
Pipe	100 ft of 5.0 in diam. CORRUG_PE_PERF				5.58		Len. = _____ (ft) Dia. = _____ (in) Material = _____
4+00	GB2035	1090.6	1086.6	4.0	BM _____ BS _____		

## LateralUGO Profile

Station	Fixture ID	Ref. Elev. (ft)	Plan Flowlin Elev. (ft)	Plan Cut (ft)	Plan Pipe Grade (%)	Actual Pipe Grade (%)	
Pipe	100 ft of 5.0 in diam. CORRUG_PE_PERF				3.52		Len. = _____(ft) Dia. = _____(in) Material = _____
5+00	-	1087.2	1083.1	4.1	BM _____ BS _____		
Pipe	100 ft of 5.0 in diam. CORRUG_PE_PERF				3.52		Len. = _____(ft) Dia. = _____(in) Material = _____
6+00	-	1083.3	1079.6	3.8	BM _____ BS _____		
Pipe	50 ft of 5.0 in diam. CORRUG_PE_PERF				3.52		Len. = _____(ft) Dia. = _____(in) Material = _____
6+50.0	GB7714	1081.8	1077.8	4.0	BM _____ BS _____		
Pipe	50 ft of 5.0 in diam. CORRUG_PE_PERF				2.92		Len. = _____(ft) Dia. = _____(in) Material = _____
7+00	-	1080.9	1076.3	4.5	BM _____ BS _____		
Pipe	100 ft of 5.0 in diam. CORRUG_PE_PERF				2.92		Len. = _____(ft) Dia. = _____(in) Material = _____
8+00	-	1077.5	1073.4	4.1	BM _____ BS _____		
Pipe	100 ft of 5.0 in diam. CORRUG_PE_PERF				2.92		Len. = _____(ft) Dia. = _____(in) Material = _____
9+00	GB3324	1074.4	1070.5	3.9	BM _____ BS _____		
Pipe	77 ft of 5.0 in diam. CORRUG_PE_PERF				1.95		Len. = _____(ft) Dia. = _____(in) Material = _____
9+77.0	OutletL	1073.1	1069.0	4.1	BM _____ BS _____		
Pipe					N/A		Len. = _____(ft) Dia. = _____(in) Material = _____

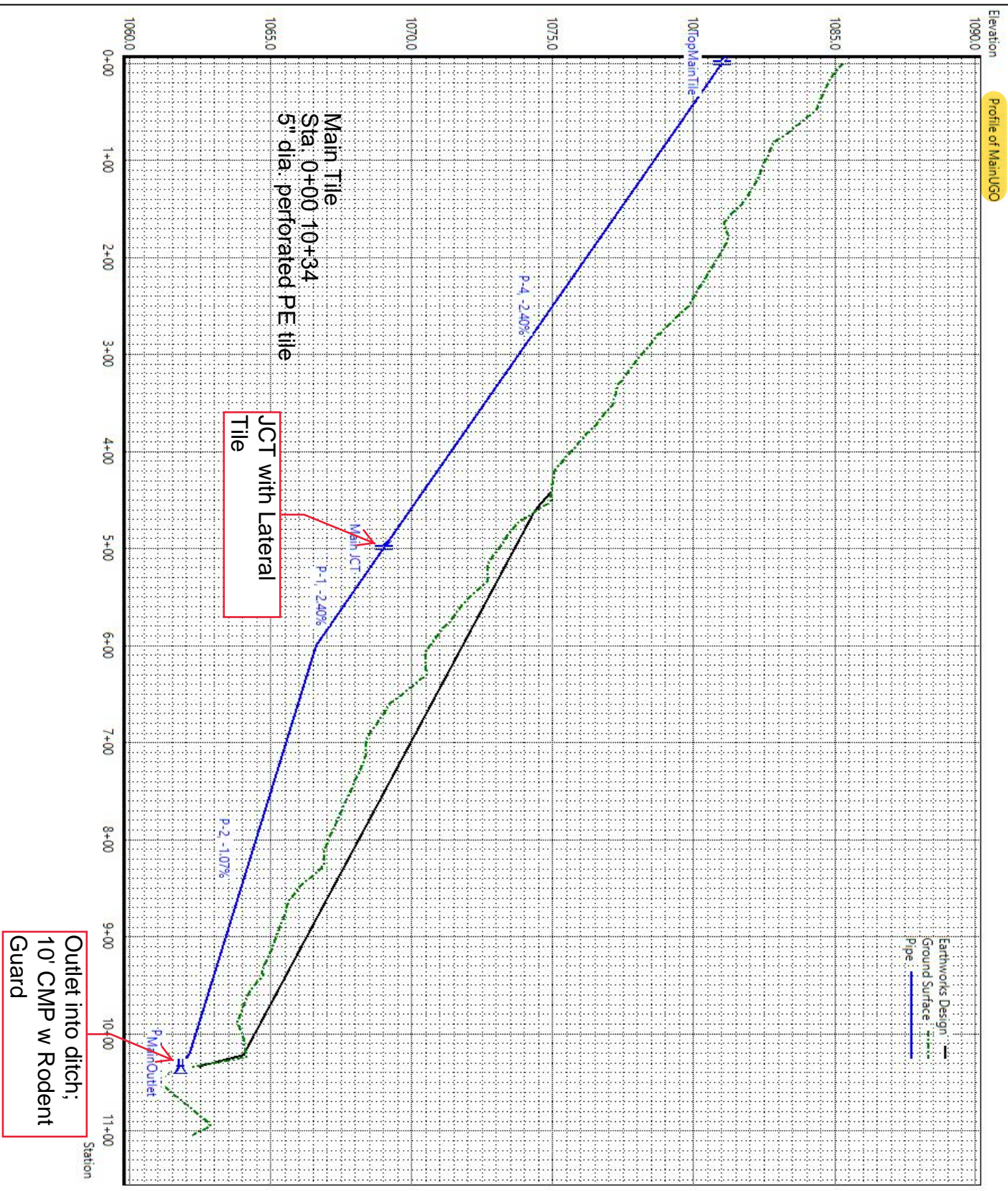


### LateralUGO Inlet(s)

Inlet ID	Channel Bottom Elev.	Channel Cut	Inlet Diam. (in)	Perf Size (in)	Holes / Foot	Perf. Length (ft)	Guard	Orifice Elev.	Orifice Diam. (in)	Base / Elbow Elev.	Offset Pipe Diam. (in)	Offset Pipe Length (ft)
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### LateralUGO Outlet

Outlet ID	Outlet Type	Outlet Diam. (in)	Length or Height (ft)	Holes / Foot	Perf Size (in)	Guard	Outlet Elev.	Material
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Underground Outlet Profile Report  
**Grassed Waterway Example, GWW\_Exam**

\_\_\_\_\_

\_\_\_\_\_

Designed \_\_\_\_\_ Date \_\_\_\_\_  
 Drawn \_\_\_\_\_  
 Checked \_\_\_\_\_  
 Approved \_\_\_\_\_  
 EFT Version 4.0.6.1r1

File Name: GWW\_Example.xml  
 Drawing Name: Pipeline Profile  
 Date: 04/14/2021  
 Sheet \_\_\_\_\_ of \_\_\_\_\_

## Underground Outlet Documentation

**Project Name:** Grassed Waterway Example, GWW\_Example  
**Project Description:** \_\_\_\_\_  
**Designed by:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Location:** \_\_\_\_\_  
**Practice:** \_\_\_\_\_  
**Checked by:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

<b>Underground Outlet</b>	MainUGO
<b>Alignment</b>	TileMainCh
<b>Design Status</b>	WARNING: Using user-added Flow Q thru junction MainUGO:TopMainTile (0.070)

### Fixtures

Name	TopMainTile	Description	TopMainTile, Junction of 8" CORRUG_PE_PERF
Name	Main JCT	Description	Main JCT, Junction of 8" CORRUG_PE_PERF
Name	GB776016319	Description	(grade break)
Name	GB1275594050	Description	(grade break)
Name	MainOutlet	Description	MainOutlet, free outlet, 8" CORRUG_METAL_ANNULAR, w/ animal guard

**Pipe P-4**

<b>Water source</b>	Junction: TopMainTile	<b>Diameter (in)</b>	8.0
<b>Start station</b>	0+00	<b>Pipe slope (%)</b>	2.40
<b>Start elevation</b>	1081.00	<b>Flow type</b>	Non-Pressure
<b>End Station</b>	5+00	<b>Required capacity (cfs)</b>	0.00
<b>End Elevation</b>	1069.00	<b>Design Capacity (cfs)</b>	1.52
<b>Material</b>	CORRUG PE PERF	<b>Design flow of pipe (cfs)</b>	0.07
<b>Manning's N</b>	0.016	<b>Velocity (fps)</b>	2.22

**Pipe P-1**

<b>Water source</b>	Junction: Main JCT	<b>Diameter (in)</b>	8.0
<b>Start station</b>	5+00	<b>Pipe slope (%)</b>	2.40
<b>Start elevation</b>	1069.00	<b>Flow type</b>	Non-Pressure
<b>End Station</b>	6+00	<b>Required capacity (cfs)</b>	0.00
<b>End Elevation</b>	1066.60	<b>Design Capacity (cfs)</b>	1.52
<b>Material</b>	CORRUG PE PERF	<b>Design flow of pipe (cfs)</b>	0.07
<b>Manning's N</b>	0.016	<b>Velocity (fps)</b>	2.22

**Pipe P-2**

<b>Water source</b>	Junction: Main JCT	<b>Diameter (in)</b>	10.0
<b>Start station</b>	6+00	<b>Pipe slope (%)</b>	1.07
<b>Start elevation</b>	1066.60	<b>Flow type</b>	Non-Pressure
<b>End Station</b>	10+20.0	<b>Required capacity (cfs)</b>	0.00
<b>End Elevation</b>	1062.10	<b>Design Capacity (cfs)</b>	1.73
<b>Material</b>	CORRUG PE PERF	<b>Design flow of pipe (cfs)</b>	0.07
<b>Manning's N</b>	0.017	<b>Velocity (fps)</b>	1.56

**Pipe P-3**

<b>Water source</b>	Junction: Main JCT	<b>Diameter (in)</b>	8.0
<b>Start station</b>	10+20.0	<b>Pipe slope (%)</b>	2.14
<b>Start elevation</b>	1062.10	<b>Flow type</b>	Non-Pressure
<b>End Station</b>	10+34.0	<b>Required capacity (cfs)</b>	0.00
<b>End Elevation</b>	1061.80	<b>Design Capacity (cfs)</b>	1.44
<b>Material</b>	CORRUG PE PERF	<b>Design flow of pipe (cfs)</b>	0.07
<b>Manning's N</b>	0.016	<b>Velocity (fps)</b>	2.14

**Grade Breaks**

<b>Name</b>	GB203940083	<b>Station</b>	6+00	<b>Elevation</b>	1066.60
<b>Name</b>	GB203940083	<b>Station</b>	10+20.0	<b>Elevation</b>	1062.10

Outlet MainOutlet			
<b>Station</b>	10+34.0	<b>Length (ft)</b>	10.00
<b>FL Elevation</b>	1061.80	<b>Rim Elevation</b>	N/A
<b>Diameter (in)</b>	8.0	<b>Flow Velocity (ft/sec)</b>	N/A
<b>Material</b>	CORRUG METAL ANNULAR	<b>Drain Pipe</b>	N/A
<b>Guard</b>	Animal Guard	<b>Rock Fill (T)</b>	N/A
<b>Conditions</b>	Free, tailwater 1061.80 ft		

Junction TopMainTile			
<b>Added flow (cfs)</b>	0.07	<b>Station</b>	0+00
<b>Elevation</b>	1081.00		
<b>Water source of added Q</b>	support		

Junction Main JCT			
<b>Added flow (cfs)</b>	0.00	<b>Station</b>	5+00
<b>Elevation</b>	1069.00		
<b>Water source of added Q</b>			

# UGO Construction Checkout Sheet

**Project Name:** Grassed Waterway Example, GWW\_Example

**Location:** \_\_\_\_\_

**Project Description:** \_\_\_\_\_

**Practice:** \_\_\_\_\_

**Designed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Checked by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Surveyed by**

**Date**

**Checked by**

**Date**

*I certify the information recorded on this sheet is a true representation of the actual practice installation and the practice as installed does ( ) or does not ( ) meet NRCS plans and specifications.*

**Certified by**

**Date**

**NRCS Rep.**

**Date**

MainUGO Profile							
Station	Fixture ID	Ref. Elev. (ft)	Plan Flowlin Elev. (ft)	Plan Cut (ft)	Plan Pipe Grade (%)	Actual Pipe Grade (%)	
0+00	TopMai	1085.3	1081.0	4.3	BM _____ BS _____		
Pipe	100 ft of 8.0 in diam. CORRUG_PE_PERF				2.40		Len. = _____ (ft) Dia. = _____ (in) Material = _____
1+00	-	1082.5	1078.6	3.9	BM _____ BS _____		
Pipe	100 ft of 8.0 in diam. CORRUG_PE_PERF				2.40		Len. = _____ (ft) Dia. = _____ (in) Material = _____
2+00	-	1080.8	1076.2	4.6	BM _____ BS _____		
Pipe	100 ft of 8.0 in diam. CORRUG_PE_PERF				2.40		Len. = _____ (ft) Dia. = _____ (in) Material = _____
3+00	-	1078.2	1073.8	4.4	BM _____ BS _____		
Pipe	100 ft of 8.0 in diam. CORRUG_PE_PERF				2.40		Len. = _____ (ft) Dia. = _____ (in) Material = _____
4+00	-	1075.6	1071.4	4.2	BM _____ BS _____		

## MainUGO Profile

Station	Fixture ID	Ref. Elev. (ft)	Plan Flowlin Elev. (ft)	Plan Cut (ft)	Plan Pipe Grade (%)	Actual Pipe Grade (%)	
Pipe	100 ft of 8.0 in diam. CORRUG_PE_PERF				2.40		Len. = _____(ft) Dia. = _____(in) Material = _____
5+00	Main JCT	1073.1	1069.0	4.1	BM _____ BS _____		
Pipe	100 ft of 8.0 in diam. CORRUG_PE_PERF				2.40		Len. = _____(ft) Dia. = _____(in) Material = _____
6+00	GB776C	1070.6	1066.6	4.0	BM _____ BS _____		
Pipe	100 ft of 10.0 in diam. CORRUG_PE_PERF				1.07		Len. = _____(ft) Dia. = _____(in) Material = _____
7+00	-	1068.3	1065.5	2.8	BM _____ BS _____		
Pipe	100 ft of 10.0 in diam. CORRUG_PE_PERF				1.07		Len. = _____(ft) Dia. = _____(in) Material = _____
8+00	-	1067.0	1064.5	2.6	BM _____ BS _____		
Pipe	100 ft of 10.0 in diam. CORRUG_PE_PERF				1.07		Len. = _____(ft) Dia. = _____(in) Material = _____
9+00	-	1065.2	1063.4	1.8	BM _____ BS _____		
Pipe	100 ft of 10.0 in diam. CORRUG_PE_PERF				1.07		Len. = _____(ft) Dia. = _____(in) Material = _____
10+00	-	1063.9	1062.3	1.6	BM _____ BS _____		
Pipe	20 ft of 10.0 in diam. CORRUG_PE_PERF				1.07		Len. = _____(ft) Dia. = _____(in) Material = _____
10+20.0	GB1275	1064.1	1062.1	2.0	BM _____ BS _____		
Pipe	14 ft of 8.0 in diam. CORRUG_PE_PERF				2.14		Len. = _____(ft) Dia. = _____(in) Material = _____
10+34.0	Outlet MainOu	1062.2	1061.8	0.4	BM _____ BS _____		
Pipe					N/A		Len. = _____(ft) Dia. = _____(in) Material = _____

### MainUGO Inlet(s)

Inlet ID	Channel Bottom Elev.	Channel Cut	Inlet Diam. (in)	Perf Size (in)	Holes / Foot	Perf. Length (ft)	Guard	Orifice Elev.	Orifice Diam. (in)	Base / Elbow Elev.	Offset Pipe Diam. (in)	Offset Pipe Length (ft)

### MainUGO Outlet

Outlet ID	Outlet Type	Outlet Diam. (in)	Length or Height (ft)	Holes / Foot	Perf Size (in)	Guard	Outlet Elev.	Material
MainOutl	Standard	8.00	10.0	-	-	YES	1061.80	CORRUG_METAL_ANNULAR
As-Built								



Waterway **LateralWW**

Waterway Type: TRAPEZOIDAL

Name:

Flag Line: Center:

or Offset  
Distance (ft):

Waterway Cut Sheet

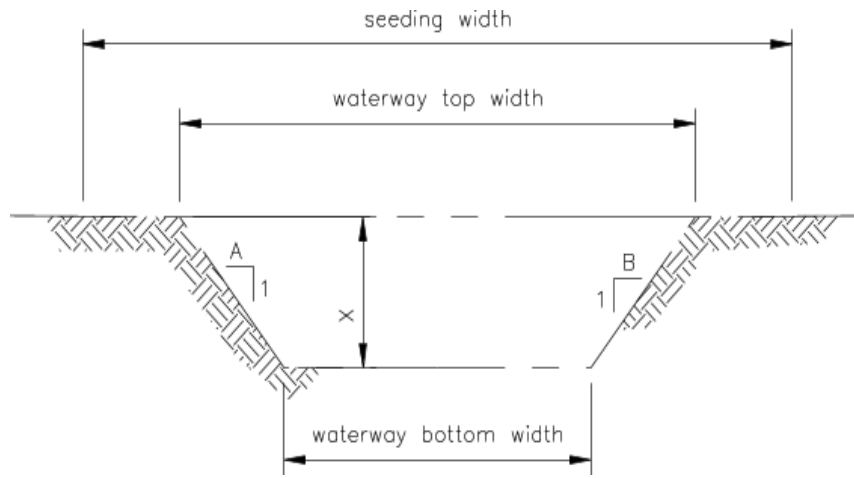
Benchmark 0.00

Elev:

Benchmark Description  
and Location:

Side Slope **8.00**  
(A):

Side Slope **8.00**  
(B):



### DESIGN

Station (ft)	Design Bottom Elevation (ft)	Centerline Existing Elevation (ft)	Centerline Cut + or Fill - (ft)	Grade	Design Depth X (ft)	Design Bottom Width (ft)	Design Top Width (ft)	Seeding Width (ft)
0.0	1111.70	1112.91	1.21	5.67%	0.53	12.00	20.41	100.4
100.0	1106.03	1107.63	1.60	5.67%	0.53	12.00	20.41	100.4
200.0	1100.37	1101.99	1.62	5.67%	0.53	12.00	20.41	100.4
300.0	1094.70	1095.63	0.93	5.67%	0.53	12.00	20.41	100.4
400.0	1089.03	1089.99	0.96	5.67%	0.53	12.00	20.41	100.4
450.0	1086.20	1087.89	1.69	2.97%	0.53	12.00	20.41	100.4
500.0	1084.72	1086.63	1.91	2.97%	0.55	12.00	20.72	100.7
600.0	1081.75	1082.97	1.22	2.97%	0.58	12.00	21.33	101.3
700.0	1078.78	1080.20	1.41	2.97%	0.62	12.00	21.94	101.9
750.0	1077.30	1078.69	1.39	2.93%	0.64	12.00	22.25	102.2
800.0	1075.83	1077.05	1.21	2.93%	0.64	12.00	22.26	102.3
900.0	1072.90	1074.26	1.36	0.79%	0.64	12.00	22.29	102.3
933.1	1072.64	1073.67	1.03		0.96	12.00	27.38	107.4

# Waterway Design Documentation

**Project Name:** Grassed Waterway Example, GWW\_Example

**Location:** \_\_\_\_\_

**Project Description:** \_\_\_\_\_

**Practice:** \_\_\_\_\_

**Designed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Checked by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Waterway Name** LateralWW

**Alignme** LateralWW  
0+00 to 9+34.8

**Design Status**

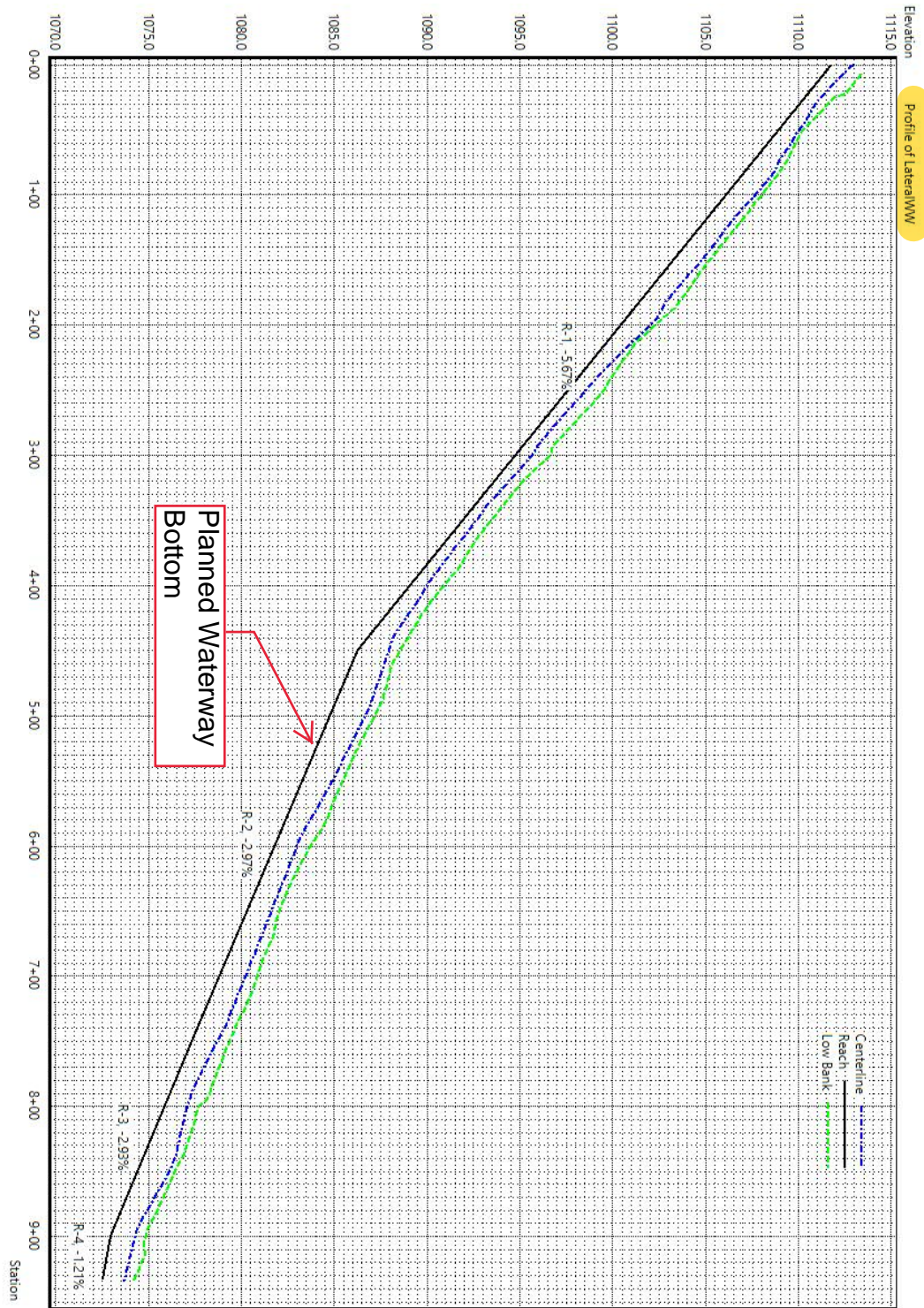
WARNING WARNING: Earthwork extends beyond surveyed ground, calculated volumes are incomplete

Storm Runoff Inputs		Storm Runoff Outputs		Channel Parameters		Design Statistics	
Drained Area (ac)	0.0	Total Runoff (ac-in)	0.00	Channel Shape	TRAPEZOIDAL	Length (ft)	933.10
Runoff Model	EFH2 Hydrology	Runoff Q (in)	0.00	Min Bed Width (ft)	12.00	Total Cut (cu yd)	1442.98
Precipitation (in)	1.00	Qu (cfs/ac-in)	0.21	Offsets 1, 2, 3 (%)	N/A	Total Fill (cu yd)	0.01
Storm Type	II	Peak Discharge (cfs)	<del>0.00</del>	Left Slope (ft/ft)	8.00	Total Area (sq ft)	41398.20
Curve Number	40.00			Right Slope (ft/ft/)	8.00	Cut/Fill Balance (cu yd)	1442.97
Watershed Length	200.00			Bottom Dip	NO_DIP	Cut/Fill Ratio	251472.14
Watershed Slope (%)	0.10			Dip Depth (ft)	N/A		
				Freeboard (ft)	0.00		

Soil/Veg									Capacity	
Start Station	End Station	Allowable Stress	Soil Grain Roughness	Vegetal Cover Factor	Vegetal Cover Type	Stability Retardance	Capacity Retardance			
0+00	9+33.1	0.050	0.0156	0.87	Kentucky Bluegrass (0.87)	4.44	5.60			

Vertices	Station	Channel Elev. (ft)	Design Width (ft)	Design Depth (ft)	Bed Slope	Bottom Width (ft)	Ap	Runoff Q (cfs)	Added Q (cfs)	Total Q (cfs)	Sim Width (ft)	Sim Depth (ft)	Vel. (fps)	Mannin; n	Tractive Stress (psi)	X-Sect. Area (sq ft)	Hydr. Radius (ft)	Sim. Messages
Capacity Stability	0+00	1111.70	20.41	0.53	5.67%	12.00	N/A	24.00	0.00	24.00	20.41 19.00	0.53 0.44	2.82 3.54	0.070 0.050	0.019	8.52 6.78	0.42 0.36	No Problem
Capacity Stability	4+50.0	1086.20	20.41	0.53	5.67%	12.00	N/A	24.00	0.00	24.00	20.41 19.00	0.53 0.44	2.82 3.54	0.070 0.050	0.019	8.52 6.78	0.42 0.36	No Problem
Capacity Stability	7+50.0	1077.30	22.25	0.64	2.97%	12.00	N/A	24.00	0.00	24.00	22.25 20.49	0.64 0.53	2.19 2.78	0.073 0.052	0.012	10.97 8.62	0.49 0.42	No Problem
Capacity Stability	9+00	1072.90	22.29	0.64	2.93%	12.00	N/A	24.00	0.00	24.00	22.29 20.52	0.64 0.53	2.18 2.77	0.073 0.052	0.012	11.02 8.66	0.49 0.42	No Problem

Vertices	Station	Channel Elev. (ft)	Design Width (ft)	Design Depth (Ft)	Bed Slope	Bottom Width (ft)	Ap	Runoff Q (cfs)	Added Q (cfs)	Total Q (cfs)	Sim Width (ft)	Sim Depth (ft)	Vel. (fps)	Mannin; n	Tractive Stress (psi)	X-Sect. Area (sq ft)	Hydr. Radius (ft)	Sim. Messages
Capacity Stability	9+33.1	1072.50	27.38	0.96	0.79%	12.00	N/A	24.00	0.00	24.00	27.38 24.62	0.96 0.79	1.27 1.66	0.081 0.056	0.004	18.93 14.44	0.69 0.58	Warning: Average Capacity velocity is < 1.5 ft/sec Design channel is 27.4 ft wide x 0.96 ft deep



United States  
Department of  
Agriculture

Natural Resources  
Conservation Service

**LateralWW Profile Report**  
Grassed Waterway Example, GWW\_Examp

\_\_\_\_\_  
\_\_\_\_\_

Designed	_____	Date	_____
Drawn	_____		
Checked	_____		
Approved	_____		

EFT Version 4.0.6.1r1

File Name	GWW_Example.xml
Drawing Name	Waterway Profile
	04/14/2021
Sheet	___ of ___

# Waterway Construction Checkout Sheet

**Project Name:** Grassed Waterway Example, GWW\_Example

**Location:** \_\_\_\_\_

**Project Description:** \_\_\_\_\_

**Practice:** \_\_\_\_\_

**Designed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Checked by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Surveyed by**

**Date**

**Checked by**

**Date**

I certify the information recorded on this sheet is a true representation of the actual practice installation and the practice as installed ( ) or does not ( ) meet NRCS plans and specifications.

**Certified by**

**Date**

**NRCS Rep.**

**Date**

**Benchmark Desc:**

**BS** \_\_\_\_\_ **HI** \_\_\_\_\_ **FS** \_\_\_\_\_

**BM Elev: 0.00**

**BS** \_\_\_\_\_ **HI** \_\_\_\_\_ **FS** \_\_\_\_\_

**Elev:** \_\_\_\_\_

**Earthwork:**

**Total Fill (cy): 0.0**

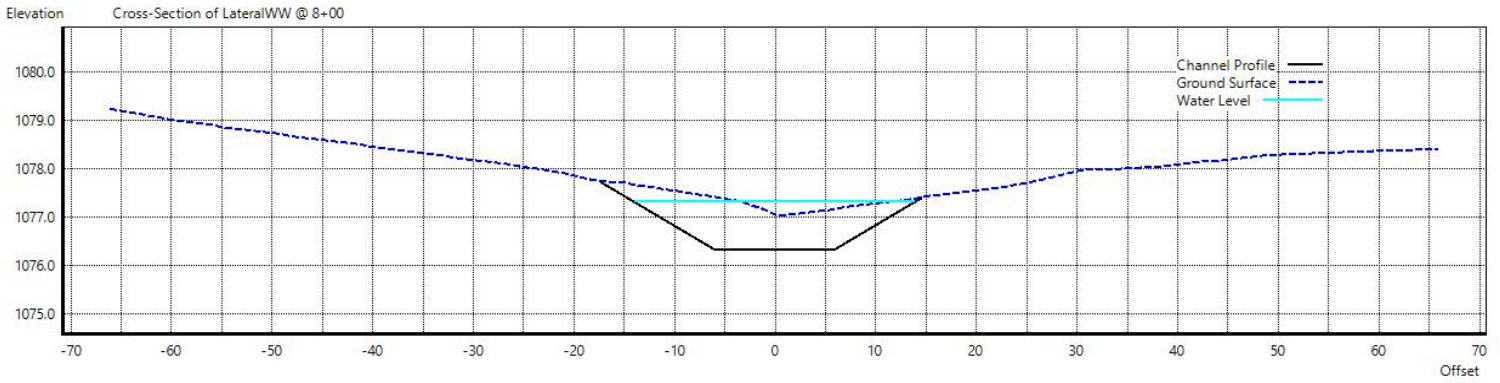
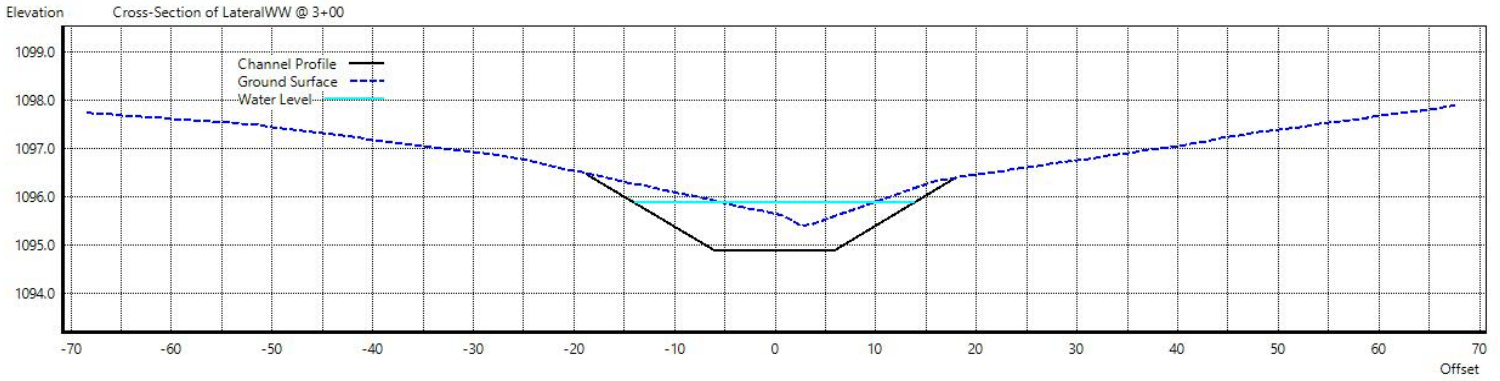
**Total Cut (cy): 1443.0**

**Total Length (ft): 933.1**

**Seeding Area (ac): 2.66**

## LateralWW Profile

Station	Cut/Fill @ CL	Bed Width	CL Design Elev	Design Top Width	Right Slope Ratio	Left Slope Ratio	Design Depth	% Grade
0+00	-1.21	12.0	1111.70	20.4	8.00	8.00	0.5	5.67
1+00	-1.60	12.0	1106.03	20.4	8.00	8.00	0.5	5.67
2+00	-1.62	12.0	1100.37	20.4	8.00	8.00	0.5	5.67
3+00	-0.93	12.0	1094.70	20.4	8.00	8.00	0.5	5.67
4+00	-0.96	12.0	1089.03	20.4	8.00	8.00	0.5	5.67
4+50.0	-1.69	12.0	1086.20	20.4	8.00	8.00	0.5	2.97
5+00	-1.91	12.0	1084.72	20.7	8.00	8.00	0.5	2.97
6+00	-1.22	12.0	1081.75	21.3	8.00	8.00	0.6	2.97
7+00	-1.41	12.0	1078.78	21.9	8.00	8.00	0.6	2.97
7+50.0	-1.39	12.0	1077.30	22.2	8.00	8.00	0.6	2.93
8+00	-1.21	12.0	1075.83	22.3	8.00	8.00	0.6	2.93
9+00	-1.36	12.0	1072.90	22.3	8.00	8.00	0.6	1.21
9+33.1	-1.03	12.0	1072.64	27.4	8.00	8.00	1.0	1.21



**USDA** United States  
Department of  
Agriculture  
Natural Resources  
Conservation Service

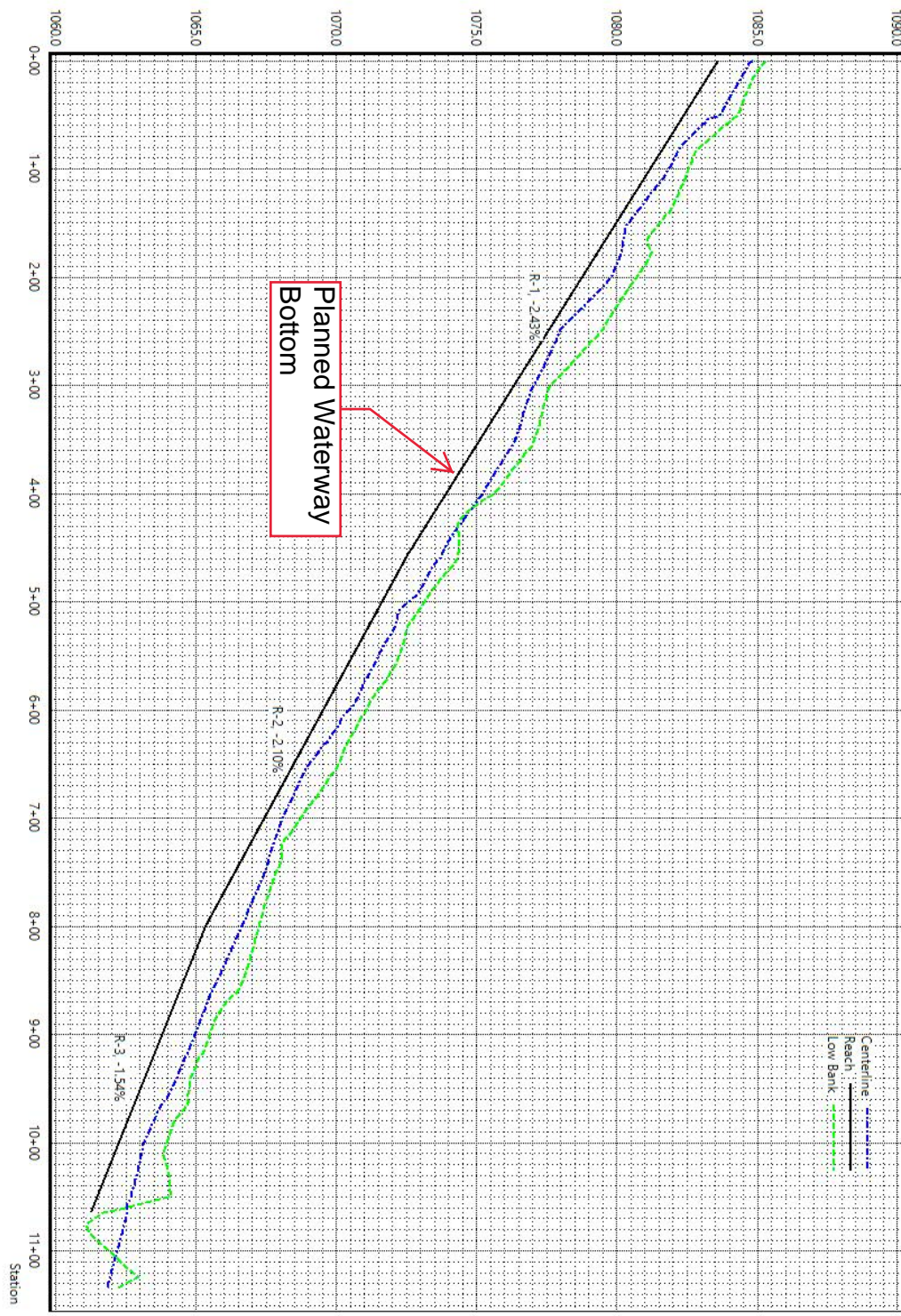
**LateralWW Design Cross Section**  
**Grassed Waterway Example, GWW\_Example**

\_\_\_\_\_  
\_\_\_\_\_

	Date
Designed	_____
Drawn	_____
Checked	_____
Approved	_____

EFT Version 4.0.6.1r1

File Name	GWW_Example.xml
Drawing Name	LateralWW
	04/15/2021
Sheet	___ of ___



**MainWW Profile Report**  
Grassed Waterway Example, GWW\_Examp

\_\_\_\_\_  
\_\_\_\_\_

Designed	_____	Date	_____
Drawn	_____		
Checked	_____		
Approved	_____		
EFT Version 4.0.6.1r1			

File Name	GWW_Example.xml
Drawing Name	Waterway Profile
	04/14/2021
Sheet	___ of ___

Waterway **MainWW**

Waterway Type: TRAPEZOIDAL

Name:

Flag Line: Center:

or Offset  
Distance (ft):

Waterway Cut Sheet

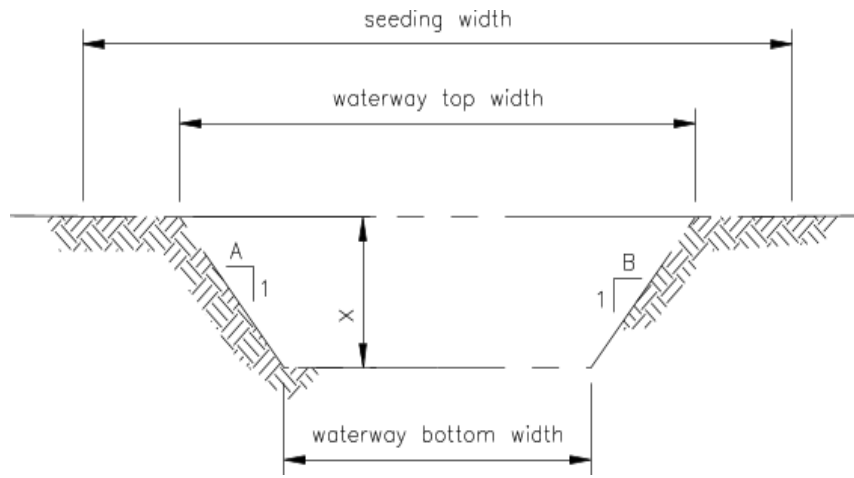
Benchmark 0.00

Elev:

Benchmark Description  
and Location:

Side Slope **8.00**  
(A):

Side Slope **8.00**  
(B):



### DESIGN

Station (ft)	Design Bottom Elevation (ft)	Centerline Existing Elevation (ft)	Centerline Cut + or Fill - (ft)	Grade	Design Depth X (ft)	Design Bottom Width (ft)	Design Top Width (ft)	Seeding Width (ft)
50.0	1082.40	1083.65	1.25	2.43%	0.89	12.00	26.22	106.2
100.0	1081.18	1081.82	0.63	2.43%	0.89	12.00	26.22	106.2
200.0	1078.75	1079.75	1.00	2.43%	0.89	12.00	26.22	106.2
300.0	1076.32	1077.04	0.72	2.43%	0.89	12.00	26.22	106.2
400.0	1073.89	1075.19	1.30	2.43%	0.89	12.00	26.22	106.2
457.0	1072.50	1073.75	1.25	2.10%	0.89	12.00	26.22	106.2
500.0	1071.60	1072.57	0.98	2.10%	0.89	12.00	26.30	106.3
600.0	1069.50	1070.43	0.93	2.10%	0.91	12.00	26.49	106.5
700.0	1067.40	1068.06	0.66	2.10%	0.92	12.00	26.67	106.7
800.0	1065.30	1066.60	1.30	1.54%	0.93	12.00	26.86	106.9
900.0	1063.76	1064.93	1.17	1.54%	0.96	12.00	27.40	107.4
1000.0	1062.23	1063.11	0.88	1.54%	1.00	12.00	27.94	107.9
1065.0	1061.23	1062.50	1.27		1.02	12.00	28.29	108.3



# Waterway Design Documentation

**Project Name:** Grassed Waterway Example, GWW\_Example

**Location:** \_\_\_\_\_

**Project Description:** \_\_\_\_\_

**Practice:** \_\_\_\_\_

**Designed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Checked by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Waterway Name** MainWW

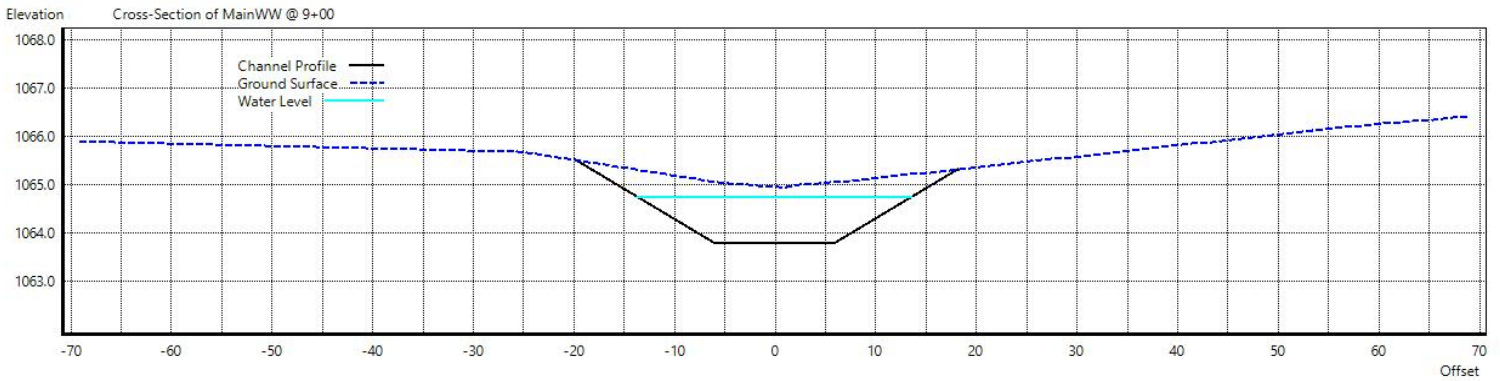
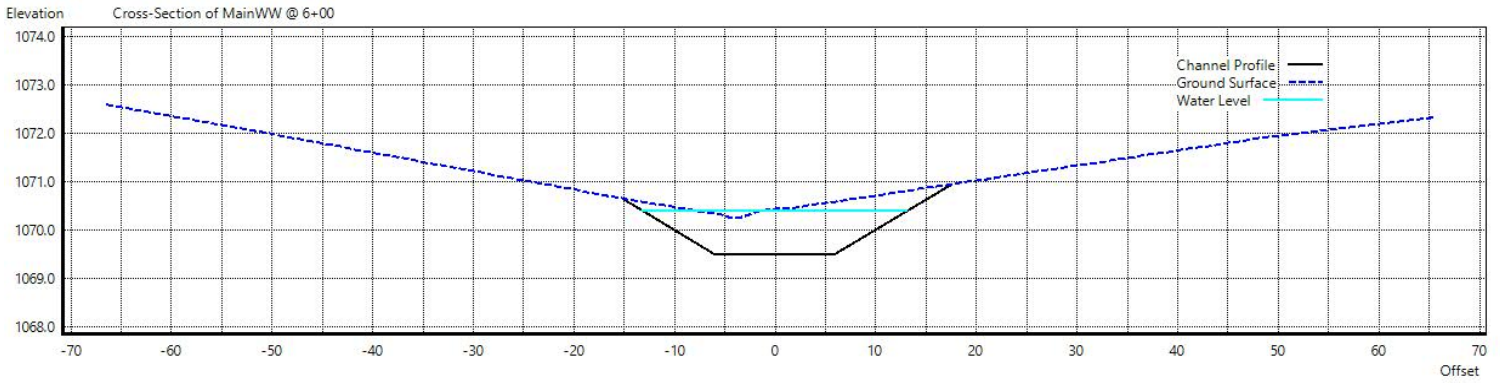
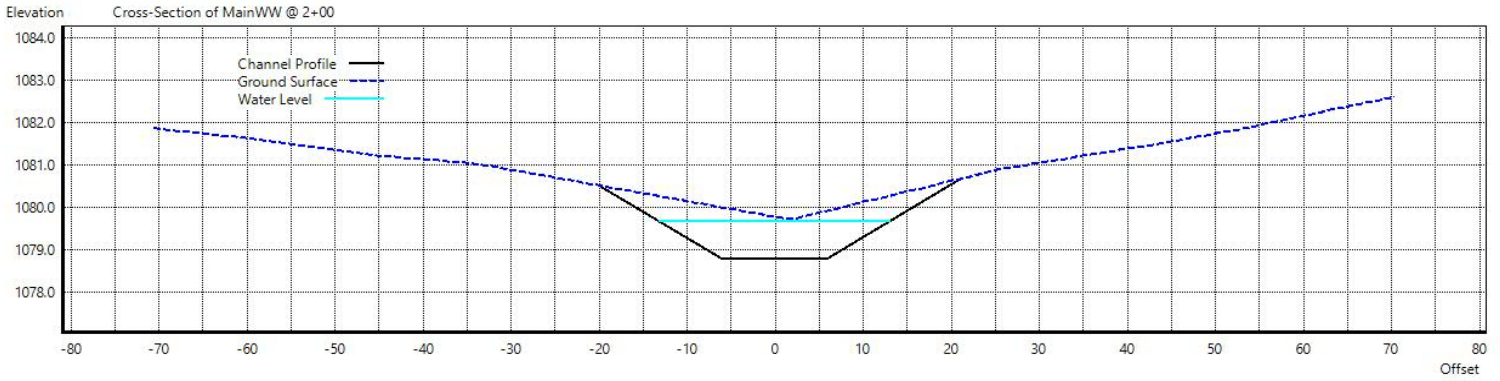
**Alignme** MainWW  
0+00 to 11+34.7

**Design Status** OK

Storm Runoff Inputs		Storm Runoff Outputs		Channel Parameters		Design Statistics	
Drained Area (ac)	0.0	Total Runoff (ac-in)	0.00	Channel Shape	TRAPEZOIDAL	Length (ft)	1015.00
Runoff Model	EFH2 Hydrology	Runoff Q (in)	0.00	Min Bed Width (ft)	12.00	Total Cut (cu yd)	1061.86
Precipitation (in)	1.00	Qu (cfs/ac-in)	0.21	Offsets 1, 2, 3 (%)	N/A	Total Fill (cu yd)	3.02
Storm Type	II	Peak Discharge (cfs)	<del>0.00</del>	Left Slope (ft/ft)	8.00	Total Area (sq ft)	39660.78
Curve Number	40.00			Right Slope (ft/ft/)	8.00	Cut/Fill Balance (cu yd)	1058.83
Watershed Length	200.00			Bottom Dip	NO_DIP	Cut/Fill Ratio	351.51
Watershed Slope (%)	0.10			Dip Depth (ft)	N/A		
				Freeboard (ft)	0.00		

Soil/Veg									Capacity
Start Station	End Station	Allowable Stress	Soil Grain Roughness	Vegetal Cover Factor	Vegetal Cover Type	Stability Retardance	Capacity Retardance		
0+50.0	10+65.0	0.050	0.0156	0.87	Kentucky Bluegrass (0.87)	4.44	5.60		

Vertices	Station	Channel Elev. (ft)	Design Width (ft)	Design Depth (ft)	Bed Slope	Bottom Width (ft)	Ap	Runoff Q (cfs)	Added Q (cfs)	Total Q (cfs)	Sim Width (ft)	Sim Depth (ft)	Vel. (fps)	Mannin; n	Tractive Stress (psi)	X-Sect. Area (sq ft)	Hydr. Radius (ft)	Sim. Messages
Capacity Stability	0+50.0	1082.40	26.22	0.89	2.43%	12.00	N/A	53.00	0.00	53.00	26.22 24.16	0.89 0.76	3.12 3.86	0.056 0.041	0.021	16.99 13.75	0.65 0.57	No Problem
Capacity Stability	4+57.0	1072.50	26.22	0.89	2.43%	12.00	N/A	53.00	0.00	53.00	26.22 24.16	0.89 0.76	3.12 3.86	0.056 0.041	0.021	16.99 13.75	0.65 0.57	No Problem
Capacity Stability	8+00	1065.30	26.86	0.93	2.10%	12.00	N/A	53.00	0.00	53.00	26.86 24.69	0.93 0.79	2.94 3.64	0.056 0.042	0.019	18.04 14.56	0.67 0.59	No Problem
Capacity Stability	10+65.0	1061.25	28.29	1.02	1.54%	12.00	N/A	53.00	0.00	53.00	28.29 25.89	1.02 0.87	2.58 3.22	0.058 0.042	0.015	20.51 16.45	0.72 0.63	No Problem



**USDA** United States Department of Agriculture  
**Natural Resources Conservation Service**

**MainWW Design Cross Section**  
**Grassed Waterway Example, GWW\_Example**

\_\_\_\_\_  
 \_\_\_\_\_

	Date
Designed _____	_____
Drawn _____	_____
Checked _____	_____
Approved _____	_____
<i>EFT Version 4.0.6.1r1</i>	

File Name	GWW_Example.xml
Drawing Name	MainWW
Date	04/15/2021
Sheet	____ of ____

# Waterway Construction Checkout Sheet

**Project Name:** Grassed Waterway Example, GWW\_Example

**Location:** \_\_\_\_\_

**Project Description:** \_\_\_\_\_

**Practice:** \_\_\_\_\_

**Designed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Checked by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Surveyed by**

**Date**

**Checked by**

**Date**

I certify the information recorded on this sheet is a true representation of the actual practice installation and the practice as installed ( ) or does not ( ) meet NRCS plans and specifications.

**Certified by**

**Date**

**NRCS Rep.**

**Date**

**Benchmark Desc:**

**BS** \_\_\_\_\_ **HI** \_\_\_\_\_ **FS** \_\_\_\_\_

**BM Elev:** 0.00

**BS** \_\_\_\_\_ **HI** \_\_\_\_\_ **FS** \_\_\_\_\_

**Elev:** \_\_\_\_\_

**Earthwork:**

**Total Fill (cy):** 3.0

**Total Cut (cy):** 1061.9

**Total Length (ft):** 1015.0

**Seeding Area (ac):** 2.77

## MainWW Profile

Station	Cut/Fill @ CL	Bed Width	CL Design Elev	Design Top Width	Right Slope Ratio	Left Slope Ratio	Design Depth	% Grade
0+50.0	-1.25	12.0	1082.40	26.2	8.00	8.00	0.9	2.43
1+00	-0.63	12.0	1081.18	26.2	8.00	8.00	0.9	2.43
2+00	-1.00	12.0	1078.75	26.2	8.00	8.00	0.9	2.43
3+00	-0.72	12.0	1076.32	26.2	8.00	8.00	0.9	2.43
4+00	-1.30	12.0	1073.89	26.2	8.00	8.00	0.9	2.43
4+57.0	-1.25	12.0	1072.50	26.2	8.00	8.00	0.9	2.10
5+00	-0.98	12.0	1071.60	26.3	8.00	8.00	0.9	2.10
6+00	-0.93	12.0	1069.50	26.5	8.00	8.00	0.9	2.10
7+00	-0.66	12.0	1067.40	26.7	8.00	8.00	0.9	2.10
8+00	-1.30	12.0	1065.30	26.9	8.00	8.00	0.9	1.54
9+00	-1.17	12.0	1063.76	27.4	8.00	8.00	1.0	1.54
10+00	-0.88	12.0	1062.23	27.9	8.00	8.00	1.0	1.54
10+65.0	-1.27	12.0	1061.23	28.3	8.00	8.00	1.0	1.54