

**Practice: 468 - Lined Waterway or Outlet**

**Scenario # 1 Turf Reinforced Matting**

**Scenario Description:**

**Louisiana**

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. TRM is installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, and furnishing and installing TRM. Lined waterway width is measured from top of bank to top of bank.

**Before Practice Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

**After Practice Situation:**

TRM lined waterway is 300 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. TRM is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Scenario Feature Measure:**

Square Foot of Waterway

<b>Scenario Typical Size:</b>	4500	Square Feet	Unit Cost	\$1.41
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Turf reinforcement mat	535	Square Yard	\$10.41	\$5,569.35
Equip./Install.	Excavation, Common Earth, side cast, small equipment	90	Cubic yard	\$1.80	\$162.00
Labor	Supervisor or Manager	2	Hour	\$36.21	\$72.42
Labor	General Labor	20	Hour	\$18.57	\$371.40
Mobilization	Mobilization, medium equipment	1	Each	\$133.51	\$133.51
Forgone Income	FI, Soybeans Irrigated	0.1	Acre	\$207.87	\$20.79
				<b>Total Cost:</b>	<b>\$6,329.47</b>

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**Scenario # 2 Rock Lined - 12"**

**Scenario Description:**

**Louisiana**

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 9", Velocity ~ 8 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 9" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

**Before Practice Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

**After Practice Situation:**

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Scenario Feature Measure:**

Square Foot of Waterway

<b>Scenario Typical Size:</b>	4500	Square Feet	Unit Cost	\$2.80
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Rock Riprap, Placed with geotextile	205	Cubic yard	\$57.49	\$11,785.45
Equip./Install.	Excavation, Common Earth, side cast, small equipment	295	Cubic yard	\$1.80	\$531.00
Labor	General Labor	2	Hour	\$18.57	\$37.14
Labor	Supervisor or Manager	2	Hour	\$36.21	\$72.42
Mobilization	Mobilization, medium equipment	1	Each	\$133.51	\$133.51
Forgone Income	FI, Soybeans Irrigated	0.1	Acre	\$207.87	\$20.79
				<b>Total Cost:</b>	<b>\$12,580.31</b>

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**Scenario # 3 Rock Lined - 24"**

**Scenario Description:**

**Louisiana**

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

**Before Practice Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

**After Practice Situation:**

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Scenario Feature Measure:**

Square Foot of Waterway

<b>Scenario Typical Size:</b>	4500	Square Feet	Unit Cost	\$6.22
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Rock Riprap, Placed with geotextile	465	Cubic yard	\$57.49	\$26,732.85
Equip./Install.	Excavation, Common Earth, side cast, small equipment	555	Cubic yard	\$1.80	\$999.00
Labor	Supervisor or Manager	2	Hour	\$36.21	\$72.42
Labor	General Labor	2	Hour	\$18.57	\$37.14
Mobilization	Mobilization, medium equipment	1	Each	\$133.51	\$133.51
Forgone Income	FI, Soybeans Irrigated	0.1	Acre	\$207.87	\$20.79
				<b>Total Cost:</b>	<b>\$27,995.71</b>

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**Scenario # 4 Concrete**

**Scenario Description:**

**Louisiana**

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with concrete. 1/2 the channel is excavated, before excavation for concrete and subgrade material. Excess excavation is spoiled in the immediate area. Concrete is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, 6" of clean sand or gravel subgrade, and 5" reinforced concrete slab. Lined waterway width is measured from top of bank to top of bank.

**Before Practice Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

**After Practice Situation:**

Concrete lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated using a hydraulic excavator. Concrete slab is placed on 6" of clean sand or #57 stone. Concrete is placed, graded and screeded by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Scenario Feature Measure:**

Square Foot of Waterway

<b>Scenario Typical Size:</b>	4500	Square Feet	Unit Cost	\$4.49
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Aggregate, Gravel, Graded	110	Cubic yard	\$24.23	\$2,665.30
Equip./Install.	Concrete, CIP, slab on grade, reinforced	80	Cubic yard	\$209.92	\$16,793.60
Equip./Install.	Excavation, Common Earth, side cast, small equipment	280	Cubic yard	\$1.80	\$504.00
Labor	Supervisor or Manager	2	Hour	\$36.21	\$72.42
Labor	General Labor	2	Hour	\$18.57	\$37.14
Mobilization	Mobilization, medium equipment	1	Each	\$133.51	\$133.51
Forgone Income	FI, Soybeans Irrigated	0.1	Acre	\$207.87	\$20.79
				<b>Total Cost:</b>	<b>\$20,226.76</b>

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**Scenario # 5 Concrete Block**

**Scenario Description:**

**Louisiana**

Install 36' long (including inlet and outlet aprons) by 15' wide by 1.5' deep trapezoidal shaped waterway or chute lined with concrete blocks. 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. 8"x8"x16" standard concrete blocks are installed over 100% of the width of the waterway/chute to prevent scour. Cost include excavation, spoiling of excess material, 3" stone subgrade, geotextile and furnishing and installing standard concrete blocks. Lined waterway width is measured from top of bank to top of bank.

**Before Practice Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

**After Practice Situation:**

Concrete block lined waterway or chute is 36 ' long by 15' wide by 1.5' deep. Chute is installed on a 3 to 1 slope. The practice is installed using a hydraulic excavator. Geotextile and concrete blocks are installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Scenario Feature Measure:**

Square Foot of Waterway

<b>Scenario Typical Size:</b>	540	Square Feet	Unit Cost	\$3.83
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Materials	Block, concrete	640	Each	\$1.68	\$1,075.20
Equip./Install.	Geotextile, woven	65	Square Yard	\$2.13	\$138.45
Materials	Aggregate, Gravel, Graded	6	Cubic yard	\$24.23	\$145.38
Equip./Install.	Excavation, Common Earth, side cast, small equipment	32	Cubic yard	\$1.80	\$57.60
Labor	Supervisor or Manager	2	Hour	\$36.21	\$72.42
Labor	General Labor	24	Hour	\$18.57	\$445.68
Mobilization	Mobilization, medium equipment	1	Each	\$133.51	\$133.51
Forgone Income	FI, Soybeans Irrigated	0.01	Acre	\$207.87	\$2.08
				<b>Total Cost:</b>	<b>\$2,070.32</b>