

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	6
Scenario Name	Concrete Block
Scenario Description	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
Scenario Unit	Square Feet
Scenario Typical Size	540

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,280.16	\$2.37
Equipment/Installation	\$227.72	\$0.42
Labor	\$783.76	\$1.45
Mobilization	\$274.33	\$0.51
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$9.62	\$0.02
Total	\$2,575.59	\$4.77

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$27.76	6	\$166.56
Materials	253	Block, concrete	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	\$1.74	640	\$1,113.60
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.44	65	\$158.60
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.16	32	\$69.12
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$41.68	4	\$166.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$25.71	24	\$617.04
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
Foregone Income	2033	Fl, Vegetables	Vegetables is Primary Crop	Acre	\$961.50	0.01	\$9.62

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Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	4
Scenario Name	Concrete
Scenario Description	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
Scenario Unit	Square Feet
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,053.60	\$0.68
Equipment/Installation	\$25,941.60	\$5.76
Labor	\$269.56	\$0.06
Mobilization	\$274.33	\$0.06
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$96.15	\$0.02
Total	\$29,635.24	\$6.59

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$27.76	110	\$3,053.60
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	Steel reinforced concrete formed and cast-in-place as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$316.71	80	\$25,336.80
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.16	280	\$604.80
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$41.68	4	\$166.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$25.71	4	\$102.84
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
Foregone Income	2033	Fl, Vegetables	Vegetables is Primary Crop	Acre	\$961.50	0.1	\$96.15

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Information Type	Data
Region	New England
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Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	7
Scenario Name	Geocell
Scenario Description	Install 300' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with gravel and geocell. 1/2 the channel is excavated, before excavation for geocell and subgrade material. Excess excavation is spoiled in the immediate area. Geocell is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile, 6" of clean sand or gravel subgrade, gravel to fill geocells, and 4" geocell. 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	Geocell with gravel lined waterway is 300' long by 15' wide by 1.5' deep. Waterway is excavated using a hydraulic excavator. Geocell is placed on 6" of clean sand or #57 stone and geotextile and gravel is placed within the geocell. Geocell is placed and graded 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
Scenario Unit	Square Foot
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$4,259.30	\$0.95
Equipment/Installation	\$7,236.00	\$1.61
Labor	\$950.48	\$0.21
Mobilization	\$274.33	\$0.06
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$96.15	\$0.02
Total	\$12,816.26	\$2.85

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1210	Geotextile, non-woven, heavy weight	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials only.	Square Yard	\$4.04	535	\$2,161.40
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	\$19.98	105	\$2,097.90
Equipment/Installation	1054	GeoCell, 4"	Polymer 3-D cellular grid 4" deep that is filled with stone or earth. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	\$12.96	535	\$6,933.60
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.16	140	\$302.40
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$41.68	8	\$333.44
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$25.71	24	\$617.04
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
Foregone Income	2033	Fl, Vegetables	Vegetables is Primary Crop	Acre	\$961.50	0.1	\$96.15

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Practice and Scenario Description:

Information Type	Data
Region	New England
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Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	5
Scenario Name	Membrane
Scenario Description	Install 300' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with a synthetic membrane. 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. Membrane is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, and furnishing and installing synthetic membrane and geotextile underlayment. 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	Membrane lined waterway is 300' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. Membrane liner and 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
Scenario Unit	Square Feet
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$1,499.80	\$0.33
Labor	\$475.24	\$0.11
Mobilization	\$274.33	\$0.06
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$96.15	\$0.02
Total	\$2,345.52	\$0.52

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.44	535	\$1,305.40
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.16	90	\$194.40
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$41.68	4	\$166.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$25.71	12	\$308.52
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
Foregone Income	2033	FJ, Vegetables	Vegetables is Primary Crop	Acre	\$961.50	0.1	\$96.15

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Practice and Scenario Description:

Information Type	Data
Region	New England
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Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	2
Scenario Name	Rock Lined - 12"
Scenario Description	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
Scenario Unit	Square Feet
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$13,503.35	\$3.00
Equipment/Installation	\$637.20	\$0.14
Labor	\$269.56	\$0.06
Mobilization	\$274.33	\$0.06
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$96.15	\$0.02
Total	\$14,780.59	\$3.28

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	44	Rock Riprap, Placed with geotextile	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$65.87	205	\$13,503.35
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.16	295	\$637.20
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$41.68	4	\$166.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$25.71	4	\$102.84
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
Foregone Income	2033	Fl, Vegetables	Vegetables is Primary Crop	Acre	\$961.50	0.1	\$96.15

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Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	3
Scenario Name	Rock Lined - 24"
Scenario Description	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
Scenario Unit	Square Feet
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$30,629.55	\$6.81
Equipment/Installation	\$1,198.80	\$0.27
Labor	\$269.56	\$0.06
Mobilization	\$274.33	\$0.06
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$96.15	\$0.02
Total	\$32,468.39	\$7.22

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	44	Rock Riprap, Placed with geotextile	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$65.87	465	\$30,629.55
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.16	555	\$1,198.80
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$41.68	4	\$166.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$25.71	4	\$102.84
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
Foregone Income	2033	Fl, Vegetables	Vegetables is Primary Crop	Acre	\$961.50	0.1	\$96.15

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Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	1
Scenario Name	Turf Reinforced Matting
Scenario Description	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
Scenario Unit	Square Feet
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$5,799.40	\$1.29
Equipment/Installation	\$194.40	\$0.04
Labor	\$166.72	\$0.04
Mobilization	\$274.33	\$0.06
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$96.15	\$0.02
Total	\$6,531.00	\$1.45

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1212	Turf reinforcement mat	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	\$10.84	535	\$5,799.40
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.16	90	\$194.40
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$41.68	4	\$166.72
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
Foregone Income	2033	FJ, Vegetables	Vegetables is Primary Crop	Acre	\$961.50	0.1	\$96.15