

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	2
Scenario Name	Bioengineered
Scenario Description	<p>Protection of streambanks consisting of a bioengineered technique comprised of non-structural measures such as earth revetments and benches with vegetative measures to stabilize and protect the streambank against scour and erosion. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brushmattresses, live stakes, joint plantings, vegetated geogrids, branchpacking, and live fascines.</p> <p>The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, livestake, rootwads and revetments: a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes.</p> <p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has moderately degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
Before Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
After Practice Situation	
Scenario Feature Measure	Linear Feet of Streambank/Shoreline Protected
Scenario Unit	Linear Feet
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$39,319.12	\$39.32
Equipment/Installation	\$28,100.72	\$28.10
Labor	\$16,815.40	\$16.82
Mobilization	\$2,681.30	\$2.68
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$86,916.54	\$86.92

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	176	Ryegrass, Annual (Lolium multiflorum)	Annual Grasses, Cover Crops and shipping.	Pound	\$1.25	100	\$125.00
Materials	1426	Tree, willow	Willow tree for planting, 18" to 36" seedling. Materials only.	Each	\$0.72	1000	\$720.00
Materials	1213	Erosion Control Blanket, biodegradable	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials only.	Square Yard	\$1.46	2222	\$3,244.12
Materials	1905	Wattles or facines, 9 to 12 inch diameter	Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 9"- 12" diameter. Materials only.	Foot	\$10.95	3000	\$32,850.00
Materials	2045	Root Wad	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	\$22.00	100	\$2,200.00
Materials	87	Fescue, Tall (Festuca arundinacea)	Introduced Perennial Grasses and shipping.	Pound	\$1.80	100	\$180.00
Equipment/Installation	959	Seeding Operation, Broadcast, Ground	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	\$20.52	0.46	\$9.44
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	2500	\$5,400.00
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.58	16	\$889.28
Equipment/Installation	932	Hydraulic Excavator, 2 CY	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$157.36	75	\$11,802.00

Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.00	2500	\$10,000.00
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	80	\$3,334.40
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$34.10	75	\$2,557.50
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.90	16	\$382.40
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	410	\$10,541.10
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$41.30	10	\$413.00
Mobilization	1138	Mobilization, small equipment	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$187.23	1	\$187.23
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	3	\$822.99
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$26.21	48	\$1,258.08

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	3
Scenario Name	Structural
Scenario Description	<p>Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated.</p> <p>Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.</p> <p>Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream</p>
Before Practice Situation	<p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Linear Feet of Streambank/Shoreline Protected
Scenario Unit	Linear Feet
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$110,774.55	\$110.77
Equipment/Installation	\$21,091.74	\$21.09
Labor	\$11,944.00	\$11.94
Mobilization	\$2,436.06	\$2.44
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$146,246.35	\$146.25

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	176	Ryegrass, Annual (Lolium multiflorum)	Annual Grasses, Cover Crops and shipping.	Pound	\$1.25	90	\$112.50
Materials	1213	Erosion Control Blanket, biodegradable	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials only.	Square Yard	\$1.46	556	\$811.76
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	1667	\$109,805.29
Materials	87	Fescue, Tall (Festuca arundinacea)	Introduced Perennial Grasses and shipping.	Pound	\$1.80	25	\$45.00
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.00	2500	\$10,000.00
Equipment/Installation	1228	Excavation, common earth, wet, side cast, large equipment	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$4.08	2500	\$10,200.00
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.58	16	\$889.28
Equipment/Installation	959	Seeding Operation, Broadcast, Ground	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	\$20.52	0.12	\$2.46
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	80	\$3,334.40

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	320	\$8,227.20
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.90	16	\$382.40
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$41.30	10	\$413.00
Mobilization	1138	Mobilization, small equipment	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$187.23	1	\$187.23
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
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$513.10	1	\$513.10
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$26.21	40	\$1,048.40

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	4
Scenario Name	Structural and Bio Mix
Scenario Description	<p>Protection of streambanks using a mix of structural and bioengineering measures such as riprap, concrete block, gabions, wattles, facines, root wads, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions.</p> <p>The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated.</p> <p>Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for</p>
Before Practice Situation	<p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Linear Feet of Streambank/Shoreline Protected
Scenario Unit	Linear Feet
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$108,085.06	\$108.09
Equipment/Installation	\$21,091.74	\$21.09
Labor	\$14,000.80	\$14.00
Mobilization	\$2,436.06	\$2.44
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$145,613.66	\$145.61

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	176	Ryegrass, Annual (Lolium multiflorum)	Annual Grasses, Cover Crops and shipping.	Pound	\$1.25	90	\$112.50
Materials	1213	Erosion Control Blanket, biodegradable	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials only.	Square Yard	\$1.46	556	\$811.76
Materials	1761	Boulder	Rock boulders. Includes materials and local delivery (less than 50 miles) only.	Ton	\$29.07	500	\$14,535.00
Materials	1905	Wattles or facines, 9 to 12 inch diameter	Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 9"- 12" diameter. Materials only.	Foot	\$10.95	3000	\$32,850.00
Materials	2045	Root Wad	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	\$22.00	200	\$4,400.00
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	840	\$55,330.80
Materials	87	Fescue, Tall (Festuca arundinacea)	Introduced Perennial Grasses and shipping.	Pound	\$1.80	25	\$45.00
Equipment/Installation	959	Seeding Operation, Broadcast, Ground	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	\$20.52	0.12	\$2.46
Equipment/Installation	1228	Excavation, common earth, wet, side cast, large equipment	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$4.08	2500	\$10,200.00
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.58	16	\$889.28
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.00	2500	\$10,000.00

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	80	\$3,334.40
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.90	16	\$382.40
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	400	\$10,284.00
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$41.30	10	\$413.00
Mobilization	1138	Mobilization, small equipment	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$187.23	1	\$187.23
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
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$26.21	40	\$1,048.40
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$513.10	1	\$513.10

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	1
Scenario Name	Vegetative
Scenario Description	<p>Protection of streambanks consisting of conventional plantings of vegetation to stabilize and protect against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation and erosion control fabric; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes.</p> <p>Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.</p> <p>Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility</p>
Before Practice Situation	<p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has marginally degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Linear Feet of Streambank/Shoreline Protected
Scenario Unit	Linear Feet
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,549.12	\$3.55
Equipment/Installation	\$6,298.72	\$6.30
Labor	\$8,475.52	\$8.48
Mobilization	\$1,758.87	\$1.76
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$20,082.23	\$20.08

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	176	Ryegrass, Annual (Lolium multiflorum)	Annual Grasses, Cover Crops and shipping.	Pound	\$1.25	100	\$125.00
Materials	1213	Erosion Control Blanket, biodegradable	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials only.	Square Yard	\$1.46	2222	\$3,244.12
Materials	87	Fescue, Tall (Festuca arundinacea)	Introduced Perennial Grasses and shipping.	Pound	\$1.80	100	\$180.00
Equipment/Installation	959	Seeding Operation, Broadcast, Ground	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	\$20.52	0.46	\$9.44
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	2500	\$5,400.00
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.58	16	\$889.28
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	56	\$2,334.08
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.90	16	\$382.40
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	224	\$5,759.04

Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$41.30	7	\$289.10
Mobilization	1138	Mobilization, small equipment	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$187.23	1	\$187.23
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	2	\$548.66
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$26.21	28	\$733.88