

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	1
Scenario Name	4" CPT only

Scenario Description	Install 75 feet of 4" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated 52" deep and 24" wide by hydraulic track excavator. Costs include 4" CPT or PVC pipe, trench excavation, pipe bedding, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with roof runoff practices.
Before Practice Situation	Roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	"Clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342) and Roof Runoff Structure (558).

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	75

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$191.71	\$2.56
Equipment/Installation	\$135.24	\$1.80
Labor	\$51.42	\$0.69
Mobilization	\$274.33	\$3.66
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$652.70	\$8.70

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1270	Pipe, HDPE, 4", PCPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	\$0.48	55	\$26.40	to convey water. Solid CPT not available so using PCPT	
Materials	989	Pipe, PVC, 4", SDR 26	Materials: - 4" - PVC - SDR 26 160 psi - ASTM D2241	Foot	\$2.10	20	\$42.00	stronger pipe at outlet	
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	0.25	\$16.47	Necessary to provide stable outlet	
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$26.71	4	\$106.84	required to bed CPT pipe	2"wx0.7'dx75'/27 =4 cy

Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	20	\$40.20	Manual compaction of trench backfill above pipe	2'wx3.6'dx75'/27= 20 cy
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	44	\$95.04	Trench excavated and backfilled by excavator	4.3'dx 2'wx75'/27 = 24 CY of excavation and 20 cy of backfill
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	2	\$51.42	to check grades, lay pipe, hand compact next to pipe	estimated for 75 LF
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		

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	2
Scenario Name	UO<=6" w CB

Scenario Description	Install 150 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated 52" deep and 24" wide by hydraulic track excavator. Costs include 6" SDR-35 pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways, roof runoff structures, or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), Roof Runoff Structure (558), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,126.69	\$7.51
Equipment/Installation	\$236.27	\$1.58
Labor	\$134.78	\$0.90
Mobilization	\$274.33	\$1.83
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,772.07	\$11.81

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1257	Catch Basin, concrete, 2'x2'x6'	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Cubic Yard	\$531.32	1	\$531.32	Necessary to collect stormwater	1 Each
Materials	993	Pipe, PVC, 6", SDR 35	Materials: - 6" - PVC - SDR 35 - ASTM D3034	Foot	\$3.53	150	\$529.50	Pipe necessary to convey stormwater	only 150' in NE
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	1	\$65.87	Necessary to provide stable outlet	1 CY
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.34	16	\$85.44	Manual compaction around and 1' over pipe	(2'x1.5'x150)/27=16 CY
Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	33	\$66.33	Manual compaction earth around CB and to backfill trench	(2'wx3'dx150!)/27= 33 cy

Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.69	50	\$84.50	Trench excavated by excavator	4.5'x3'x150'/27 = 50 CY
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	2	\$83.36	Foreman or Supervisor	
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	2	\$51.42	to check grades, lay pipe, hand compact next to pipe	estimated for 75 LF
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	Mobilize one excavator	

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	3
Scenario Name	UO<=6" w Riser

Scenario Description	Install 150 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54" deep and 24" wide by excavator. Costs include 6" HDPE corrugated single wall plastic tubing, 8" Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$774.52	\$5.16
Equipment/Installation	\$225.10	\$1.50
Labor	\$134.78	\$0.90
Mobilization	\$274.33	\$1.83
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,408.73	\$9.39

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1242	Pipe, HDPE, 6", CPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only.	Foot	\$1.12	150	\$168.00	Pipe necessary to convey stormwater	150'
Materials	1262	Inlet, riser, 8"	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8" diameter. Materials only.	Foot	\$123.42	2	\$246.84	Necessary to collect stormwater	2 Each
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$26.71	11	\$293.81	sand or other bedding req'd to bed CPT	(2'wx1'dx150L)/27=11 cy
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	1	\$65.87	Necessary to provide stable outlet	1 CY

Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	38	\$76.38	Manual compaction of backfill above pipe bedding	(2'wx3.5'dx150'l)/27
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.69	88	\$148.72	excavation and backfill by excavator	2'wx4.5'dx150'l/27=50 cy excav and 38 cy backfill
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	2	\$51.42	to check grades, lay pipe, hand compact next to pipe	estimated
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	2	\$83.36	Foreman or Supervisor	
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	Mobilize one trencher	

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	4
Scenario Name	6" CPT only

Scenario Description	Install 150 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54" deep and 24" wide by excavator. Costs include 6" HDPE corrugated single wall plastic tubing, trench excavation, trench backfill and compaction, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$575.88	\$3.84
Equipment/Installation	\$228.80	\$1.53
Labor	\$134.78	\$0.90
Mobilization	\$274.33	\$1.83
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,213.79	\$8.09

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1242	Pipe, HDPE, 6", CPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only.	Foot	\$1.12	130	\$145.60	Pipe necessary to convey stormwater	130'
Materials	993	Pipe, PVC, 6", SDR 35	Materials: - 6" - PVC - SDR 35 - ASTM D3034	Foot	\$3.53	20	\$70.60	Protected outlet section	20' end section
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$26.71	11	\$293.81	sand or other bedding req'd to bed CPT	(2'wx1'dx150L)/27=11 cy
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	1	\$65.87	Necessary to provide stable outlet	1 CY

Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	39	\$78.39	Manual compaction of backfill above pipe bedding	(2'wx3.5'dx150'l)/27=39
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.69	89	\$150.41	excavation and backfill by excavator	2'wx4.5'dx150'l/27=50 cy excav and 39 cy backfill
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	2	\$51.42	to check grades, lay pipe, hand compact next to pipe	estimated for 75 LF
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	2	\$83.36	Foreman or Supervisor	
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	Mobilize one trencher	

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	5
Scenario Name	8" CPT only

Scenario Description	Install 150 feet of 8" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54" deep and 24" wide by excavator. Costs include 8" HDPE corrugated single wall plastic tubing, trench excavation, trench backfill and compaction, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$917.14	\$6.11
Equipment/Installation	\$206.60	\$1.38
Labor	\$186.20	\$1.24
Mobilization	\$274.33	\$1.83
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,584.27	\$10.56

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	994	Pipe, PVC, 8", SDR 35	Materials: - 8" - PVC - SDR 35 - ASTM D3034	Foot	\$6.34	20	\$126.80		
Materials	1272	Pipe, HDPE, 8", PCPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8" diameter - ASTM F667. Material cost only.	Foot	\$2.08	130	\$270.40		
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$26.71	17	\$454.07	sand or other bedding req'd to bed CPT	(2'wx1.5dx150L)/27=17 cy
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	1	\$65.87	Necessary to provide stable outlet	1 CY

Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	33	\$66.33	Manual compaction of backfill above pipe bedding	(2'wx3'dx150'l)/27=33
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.69	83	\$140.27	excavation and backfill by excavator	2'wx4.5'dx150'l/27=50 cy excav and 33 cy backfill
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	to check grades, lay pipe, hand compact next to pipe	estimated
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	2	\$83.36	Foreman or Supervisor	
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	Mobilize one trencher	

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	6
Scenario Name	10" HDPE only

Scenario Description	Install 150 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,472.49	\$9.82
Equipment/Installation	\$224.76	\$1.50
Labor	\$186.20	\$1.24
Mobilization	\$274.33	\$1.83
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,157.78	\$14.39

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1243	Pipe, HDPE, CPT, Double Wall, Soil Tight, 10"	Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only.	Foot	\$5.46	150	\$819.00	Pipe necessary to convey stormwater	150'L
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$26.71	22	\$587.62	Required to bed CPT pipe	2'wx2'dx150'l/27=22
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	1	\$65.87	Necessary to provide stable outlet	1 CY
Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	28	\$56.28	Manual compact trench backfill above pipe bedding	2'wx2.5'dx150'l/27=28cy

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	78	\$168.48	Trench excavated and backfilled by excavator	2'wx4.5'dx150'l/27 = 50 CY excavated and 28 cy backfilled
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	to check grades, lay pipe, hand compact next to pipe	estimated
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	2	\$83.36	Foreman or Supervisor	
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	Mobilize one trencher	

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	7
Scenario Name	6" <UO<=12"

Scenario Description	Install 150 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,003.81	\$13.36
Equipment/Installation	\$224.76	\$1.50
Labor	\$186.20	\$1.24
Mobilization	\$274.33	\$1.83
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,689.10	\$17.93

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1243	Pipe, HDPE, CPT, Double Wall, Soil Tight, 10"	Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only.	Foot	\$5.46	150	\$819.00	Pipe necessary to convey stormwater	150
Materials	1257	Catch Basin, concrete, 2'x2'x6'	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Cubic Yard	\$531.32	1	\$531.32	Necessary to collect stormwater	1 Each
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$26.71	22	\$587.62	Required to bed CPT pipe	2'wx2'dx150'l/27=22
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	1	\$65.87	Necessary to provide stable outlet	1 CY

Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	28	\$56.28	Manual compact earth around CB and to backfill trench	2'wx2.5'dx150'/27=28cy
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	78	\$168.48	excavation and backfill by excavator	2'wx4.5'dx150'/27=50 cy excav and 28 cy backfill
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	to check grades, lay pipe, hand compact next to pipe	estimated
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	2	\$83.36	Foreman or Supervisor	
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	Mobilize one excavator	

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	8
Scenario Name	6" <UO<=12" w Riser

Scenario Description	Install 150 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, 12" Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,813.61	\$12.09
Equipment/Installation	\$224.76	\$1.50
Labor	\$186.20	\$1.24
Mobilization	\$274.33	\$1.83
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,498.90	\$16.66

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1263	Inlet, riser, 10"	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 10" diameter. Materials only.	Foot	\$170.56	2	\$341.12	Necessary to collect stormwater	2 Each
Materials	1243	Pipe, HDPE, CPT, Double Wall, Soil Tight, 10"	Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only.	Foot	\$5.46	150	\$819.00	Pipe necessary to convey stormwater	150'L
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$26.71	22	\$587.62	Required to bed CPT pipe	2'wx2'dx150'l/27=22
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	1	\$65.87	Necessary to provide stable outlet	1 CY

Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	28	\$56.28	Manual compact trench backfill above pipe bedding	2'wx2.5'dx150'/27= 28cy
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	78	\$168.48	Trench excavated and backfilled by excavator	2'wx4.5'dx150'/27 = 50 CY excavated and 28 cy backfilled
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	to check grades, lay pipe, hand compact next to pipe	estimated
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	2	\$83.36	Foreman or Supervisor	
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	Mobilize one excavator	

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	9
Scenario Name	12" $UO \le 18''$

Scenario Description	Install 150 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 66" deep x 39" wide. Costs include 18" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,610.37	\$17.40
Equipment/Installation	\$1,208.34	\$8.06
Labor	\$186.20	\$1.24
Mobilization	\$513.10	\$3.42
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$4,518.01	\$30.12

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1418	Headwall, stone or concrete bag	Laid up stone or concrete bag headwall for a pipe inlet. Square Foot unit is a vertical area measurement of the headwall cross-section. Includes materials, equipment and labor.	Square Foot	\$23.36	9	\$210.24	required to support outlet	1.5' ea side and 1' above pipe
Materials	1245	Pipe, HDPE, CPT, Double Wall, Soil Tight, 18"	Pipe, Corrugated HDPE Double Wall, 18" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	\$10.75	150	\$1,612.50	Pipe necessary to convey stormwater	150'
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$27.76	26	\$721.76	Necessary to bed around pipe	(3.25'wx 2')- (PI*(0.75') ² x 150'/27 = 26 CY
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	1	\$65.87	Necessary to provide stable outlet	1 CY

Equipment/Installation	1258	Catch Basin, concrete, 3'x3'x6'	Catch Basin, Precast Concrete, 3' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	\$774.63	1	\$774.63	To collect runoff, and trap sediments	
Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	72	\$144.72	Manual compaction of trench backfill above pipe	3.25'wx4'dx150'/27=72 cy
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.69	171	\$288.99	Trench excavated and backfilled by excavator	5.5'x3.25'x150'/27 = 99 CY of excan and 72 cy of backfill
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	to check grades, lay pipe, hand compact next to pipe	estimated
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	2	\$83.36	Foreman or Supervisor	
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	
Practice Code/Name	620 - Underground Outlet
Scenario ID	10
Scenario Name	18"<UO<=24"

Scenario Description	Install 150 feet of 24" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 72" x 48" wide. Costs include 24" HDPE pipe, Precast concrete drop inlet with steel grate, 24" HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$4,218.29	\$28.12
Equipment/Installation	\$1,384.68	\$9.23
Labor	\$207.04	\$1.38
Mobilization	\$787.43	\$5.25
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$6,597.44	\$43.98

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1418	Headwall, stone or concrete bag	Laid up stone or concrete bag headwall for a pipe inlet. Square Foot unit is a vertical area measurement of the headwall cross-section. Includes materials, equipment and labor.	Square Foot	\$23.36	14	\$327.04	to support/protect pipe outlet	2' ea. Side and 1' above pipe
Materials	1246	Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	\$18.47	150	\$2,770.50	Pipe necessary to convey stormwater	150
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$27.76	38	\$1,054.88	Necessary to backfill around pipe	$(4.0' \times 2.5') - (\pi \times (1.0')^2 \times 150' / 27 = 38 \text{ CY})$
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	1	\$65.87	Necessary to provide stable outlet	1 CY

Equipment/Installation	1258	Catch Basin, concrete, 3'x3'x6'	Catch Basin, Precast Concrete, 3' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	\$774.63	1	\$774.63	To collect runoff, and trap sediments	
Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	89	\$178.89	Manual compaction of trench backfill above pipe	4' wx4'dx150'l/27=89 cy
Equipment/Installation	1220	Excavation, common earth, small equipment, 50 ft	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.30	89	\$204.70	backfill put into trench by dozer	"= amount to be compacted"
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.69	134	\$226.46	Trench excavated by excavator	6.0'x4.0'x150'/27 = 134 CY
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	to check grades, lay pipe, hand compact next to pipe	estimated
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	2.5	\$104.20	Foreman or Supervisor	
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	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		

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	11
Scenario Name	24"<UO<=30"

Scenario Description	Install 200 feet of 30" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 78" deep x 56" wide. Costs include 30" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$9,627.26	\$48.14
Equipment/Installation	\$907.76	\$4.54
Labor	\$253.59	\$1.27
Mobilization	\$787.43	\$3.94
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$11,576.04	\$57.88

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1053	Manhole, 4' x 4'	Precast Manhole with base and top delivered. 4' diameter x 4' depth.	Each	\$1,755.33	1	\$1,755.33	To collect runoff, and trap sediments	one needed
Materials	1418	Headwall, stone or concrete bag	Laid up stone or concrete bag headwall for a pipe inlet. Square Foot unit is a vertical area measurement of the headwall cross-section. Includes materials, equipment and labor.	Square Foot	\$23.36	27.5	\$642.40	to support outlet end of pipe	2.5' ea side and above pipe
Materials	1247	Pipe, HDPE, CPT, Double Wall, Soil Tight, 30"	Pipe, Corrugated HDPE Double Wall, 30" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	\$25.86	200	\$5,172.00	Pipe necessary to convey stormwater	200'
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$27.76	67	\$1,859.92	Necessary to backfill around pipe	$(4.67 \times 3') - (P1 \times (1.25') \times 2 \times 200') / 27 = 67 \text{ CY}$

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	3	\$197.61	Necessary to provide stable outlet	Est. apron size to be: 1' dx6'wx12'!/27=2.7 cy, say 3
Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	122	\$245.22	Manual compaction of trench backfill above pipe	4.7'wx3.5'dx200'!/27=122 cy
Equipment/Installation	1220	Excavation, common earth, small equipment, 50 ft	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.30	122	\$280.60	backfill put into trench by dozer	"= amount to be compacted"
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.69	226	\$381.94	Trench excavated by excavator	6.5'x4.67'x200'!/27 = 226 CY
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	5	\$128.55	to check grades, lay pipe, hand compact next to pipe	estimated
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	3	\$125.04	Foreman or Supervisor	
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	Mobilize one excavator	
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	Mobilize one small dozer.	

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	
Practice Code/Name	620 - Underground Outlet
Scenario ID	12
Scenario Name	UO>30"

Scenario Description	Install 200 feet of 36" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 84" deep x 64" wide. Costs include 36" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)
Scenario Feature Measure	Length of Conduit
Scenario Unit	Foot
Scenario Typical Size	200

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$13,070.49	\$65.35
Equipment/Installation	\$1,141.42	\$5.71
Labor	\$295.27	\$1.48
Mobilization	\$787.43	\$3.94
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$15,294.61	\$76.47

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1053	Manhole, 4' x 4'	Precast Manhole with base and top delivered. 4' diameter x 4' depth.	Each	\$1,755.33	1	\$1,755.33	To collect runoff, and trap sediments	one needed
Materials	1418	Headwall, stone or concrete bag	Laid up stone or concrete bag headwall for a pipe inlet. Square Foot unit is a vertical area measurement of the headwall cross-section. Includes materials, equipment and labor.	Square Foot	\$23.36	28	\$654.08	to support end of pipe	2.5' ea side and above pipe
Materials	1248	Pipe, HDPE, CPT, Double Wall, Soil Tight, 36"	Pipe, Corrugated HDPE Double Wall, 36" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	\$33.25	200	\$6,650.00	Pipe necessary to convey stormwater	200'
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$27.76	135	\$3,747.60	Necessary to backfill pipe below haunches	$(5.33 \times 2.0') - (P1 \times (1.5')^2) \times 200' / 27 = 135 \text{ CY}$

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	4	\$263.48	Necessary to provide stable outlet	Est. apron size to be: 1' dx7'wx15'!/27=3.9 cy, say 4
Equipment/Installation	1260	Compaction, earthfill, vibratory plate	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	\$2.01	157	\$315.57	Manual compaction of trench backfill above pipe	5.3'wx4'dx200'!/27=157 cy
Equipment/Installation	1220	Excavation, common earth, small equipment, 50 ft	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.30	157	\$361.10	Trench backfilled by dozer	"= amount to be compacted"
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.69	275	\$464.75	Trench excavated by excavator	7.0'x5.33'x200'!/27 = 275 CY
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	5	\$128.55	to check grades, lay pipe, hand compact next to pipe	estimated
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	Foreman or Supervisor	
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	Mobilize one excavator	
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		