

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #1 - Check Dams

**Scenario Description:** Typical setting is on a 40-acre pasture/hayland field having a slope of 5 to 10 percent where ephemeral gullies have formed. Typical installation consists of stabilizing/regrading the gully and installing six check dams with a top width of 3', average height of 2.5', 19' length, and 2:1 side slopes, ; containing an average of 21 tons of rock for a total of 126 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

**Before Situation:** The operator presently has erosion gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed vegetation of disturbed areas use Critical Area Planting (342).

**Scenario Feature Measure:** Tons of rock installed

**Scenario Unit:** Ton

**Scenario Typical Size:** 126

**Total Scenario Cost:** \$8,753.04

**Scenario Cost/Unit:** \$69.47

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Materials**

Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	\$93.23	84	\$7,831.55
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**Labor**

General Labor	231	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	\$20.07	8	\$160.56
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**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	2	\$507.76
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**Equipment Installation**

Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$1.58	160	\$253.18
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**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #2 - Embankment, Pipe <= 6"

**Scenario Description:** An earthen embankment dam with a principal spillway pipe of 6 inches or less. Assessment shows anti-seep collars or sand diaphragms are not required. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,000 cubic yards, and 80 feet of pipe 6" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yard

**Scenario Typical Size:** 2000

**Total Scenario Cost:** \$9,668.48

**Scenario Cost/Unit:** \$4.83

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$4.71	20	\$94.30
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$3.57	2000	\$7,147.14
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$112.88	5	\$564.40

**Labor**

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.21	5	\$121.05
General Labor	231	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	\$20.07	10	\$200.70
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$25.14	20	\$502.76

**Materials**

Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.63	80	\$530.37
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**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	2	\$507.76
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**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #3 - Embankment, Pipe 8"-12"

**Scenario Description:** An earthen embankment dam with a principle spillway pipe between 8 and 12 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yard

**Scenario Typical Size:** 2500

**Total Scenario Cost:** \$14,537.81

**Scenario Cost/Unit:** \$5.82

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Materials**

Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$39.89	3	\$119.67
Pipe, PVC, 10", SCH 80	1351	Materials: - 10" - PVC - SCH 80 - ASTM D1785	Foot	\$21.77	90	\$1,959.43
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	\$1.38	60	\$83.06

**Equipment Installation**

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$4.71	29	\$136.73
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$3.57	2500	\$8,933.93
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$112.88	10	\$1,128.79

**Labor**

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.21	10	\$242.11
General Labor	231	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	\$20.07	30	\$602.09
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$25.14	30	\$754.15

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	2	\$507.76
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$70.11	1	\$70.11

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #4 - Embankment, Pipe >12"

**Scenario Description:** An earthen embankment dam with a principle spillway pipe greater than 12 inches. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, smooth steel drop inlet principle spillway with a 7 ft riser and 90 ft barrel, and 82 Square feet of anti-seep collars. A rock lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yard

**Scenario Typical Size:** 2500

**Total Scenario Cost:** \$18,224.49

**Scenario Cost/Unit:** \$7.29

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$352.59	2	\$705.18
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$111.73	1	\$111.73
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$4.71	129	\$608.21
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$3.57	2500	\$8,933.93
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$112.88	13	\$1,467.43

**Materials**

Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.89	30	\$26.82
Pipe, Steel, 12", Std Wt, USED	1356	Materials: - USED - 12" - Steel Std Wt	Foot	\$20.78	90	\$1,870.13
Pipe, Steel, 16", Std Wt, USED	1357	Materials: - USED - 16" - Steel Std Wt	Foot	\$27.40	7	\$191.80
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	\$93.23	14	\$1,305.26
Steel, Plate, 1/8"	1047	Flat Steel Plate, 1/8" thick, materials only.	Square Foot	\$3.82	82	\$313.24

**Labor**

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.21	13	\$314.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and	Hour	\$20.07	42	\$842.92

		other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.				
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$25.14	38	\$955.25

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	2	\$507.76
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$70.11	1	\$70.11

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #6 - Pipe Drop, Plastic

**Scenario Description:** A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed using plastic pipe without anti-seep collars. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon 6 ft high 18" (1.5') PVC riser with a 40 ft long barrel (1.5' x 3.14 x 40' = 188 SF). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Riser Weir Length x Barrel Length

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 188

**Total Scenario Cost:** \$4,867.24

**Scenario Cost/Unit:** \$25.89

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$352.59	1	\$352.59
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$4.71	20	\$94.30
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$3.57	100	\$357.36
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$112.88	2	\$225.76

**Labor**

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.21	2	\$48.42
General Labor	231	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	\$20.07	8	\$160.56

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	1	\$253.88
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$70.11	1	\$70.11

**Materials**

Coupling, PVC, Tee, 24x18, SCH 40	1374	Materials: - Tee, 24"x18" - PVC - SCH 40 - ASTM D1785	Each	\$1,642.11	1	\$1,642.11
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Pipe, PVC, 18", SCH 40	1373	Materials: - 18" - PVC - SCH 40 - ASTM D1785	Foot	\$36.47	40	\$1,458.72
Pipe, PVC, 24", ASTM-2241, SDR 26	1945	Materials: -24" -PVC - ASTM 2241, SDR 26	Foot	\$33.91	6	\$203.44

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #7 - Pipe Drop, Steel

**Scenario Description:** A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed with a metal anti-seep collar. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel pipe drop structure with a 36", 12' tall riser and a 100' long 30" barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 30ft = 940). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Riser Weir Length x Barrel Length

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 940

**Total Scenario Cost:** \$12,917.94

**Scenario Cost/Unit:** \$13.74

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$4.71	100	\$471.48
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$3.57	600	\$2,144.14
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$112.88	4	\$451.52

**Labor**

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.21	4	\$96.84
General Labor	231	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	\$20.07	10	\$200.70
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$25.14	11	\$276.52

**Materials**

Pipe, Steel, 30", Std Wt, USED	1361	Materials: - USED - 30" - Steel Std Wt	Foot	\$73.61	100	\$7,360.70
Pipe, Steel, 36", Std Wt, USED	1362	Materials: - USED - 36" - Steel Std Wt	Foot	\$93.98	12	\$1,127.76
Steel, Plate, 1/8"	1047	Flat Steel Plate, 1/8" thick, materials only.	Square Foot	\$3.82	30	\$114.60
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	\$10.65	9	\$95.82

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	2	\$507.76
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Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$70.11	1	\$70.11
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**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #8 - Weir Drop Structures

**Scenario Description:** A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft (90 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Feet of Weir length times Drop Height

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 90

**Total Scenario Cost:** \$7,693.50

**Scenario Cost/Unit:** \$85.48

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$352.59	9	\$3,173.31
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$3.57	75	\$268.02
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.89	40	\$75.64
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.19	9	\$19.75
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$112.88	5	\$564.40

**Materials**

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$40.43	3	\$121.30
Corrugated Steel, 12 Gauge, galvanized	1376	Corrugated Steel, 12 gauge, 3" by 1" corrugations, galvanized, meets ASTM A 929. Materials only.	Square Foot	\$7.32	212	\$1,552.23
Pipe, CMP, 12", 14 Gauge	1377	12" - Corrugated Steel Pipe. Galvanized, uncoated. 14 Gauge. Materials only.	Foot	\$9.96	2	\$19.91
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$37.88	11	\$416.66

**Labor**

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.21	5	\$121.05
General Labor	231	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	\$20.07	30	\$602.09

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$25.14	10	\$251.38
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**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	2	\$507.76
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**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #9 - Rock Drop Structures

**Scenario Description:** A Straight Drop structure constructed of rock riprap held in place by galvanized wire, such as, gabion baskets, fence panels, or "sausage" baskets. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a gabion wall structure with a drop of 3ft and weir length of 8ft (24 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Feet of Weir length times Drop Height

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 24

**Total Scenario Cost:** \$3,192.57

**Scenario Cost/Unit:** \$133.02

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$3.57	40	\$142.94
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.89	7	\$13.24
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.19	23	\$50.47
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$112.88	5	\$564.40
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hour	\$106.27	3	\$318.80

**Labor**

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.21	5	\$121.05
General Labor	231	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	\$20.07	10	\$200.70
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$39.78	10	\$397.83

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	2	\$507.76
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**Materials**

Gabion basket or mat	1378	Gabion baskets or mats installed and filled on grade, includes	Cubic Yard	\$125.05	7	\$875.38
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		materials, transport, equipment, and labor, does not include geotextile fabric.				
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**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #12 - Chute Structure

**Scenario Description:** A chute structure consisting of rock riprap, pavers, concrete or any other durable material used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a 10' wide chute that has 2:1 side slopes and is 1' deep and consists of rock that is 20" thick, stone that is 6" thick, and geotextile. The chute drops 6' vertical on a 2:1 slope with a 3' flat inlet and a 6' flat outlet, therefore, the typical surface area of the project is 14.4' x 22' or 323 SqFt. The unit of payment measurement is defined as the Tons of Rock Riprap used to build the rock structure, including the chute, side slopes, entrance and exit sections. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Ton of Riprap

**Scenario Unit:** Ton

**Scenario Typical Size:** 33

**Total Scenario Cost:** \$1,926.47

**Scenario Cost/Unit:** \$58.38

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$4.71	10	\$47.15
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.89	10	\$18.91
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$112.88	2	\$225.76

**Labor**

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.21	2	\$48.42
General Labor	231	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	\$20.07	2	\$40.14

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$253.88	1	\$253.88
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**Materials**

Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.17	36	\$42.23
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$37.88	33	\$1,249.98

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #13 - Pipe Inlet

**Scenario Description:** A pipe inlet installed consisting of plastic or CMP that does not require any additional appurtenances such as headwalls or risers. The pipe inlet may be of any size, typically 12" and less than 18" and may require a face plate, which is included as a part of the structure. Payment rate is based on the length of the pipe in feet. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in swales that outlet into field borders or filter strips. Cost estimate is based upon 30 foot long, 12" PVC pipe with a faceplate. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:** The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:** Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

**Scenario Feature Measure:** Length of Pipe

**Scenario Unit:** Foot

**Scenario Typical Size:** 30

**Total Scenario Cost:** \$1,314.70

**Scenario Cost/Unit:** \$43.82

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Materials**

Pipe, PVC, 12", SDR 35	1252	Pipe, PVC, SDR 35, 12" Diameter - ASTM D3034. Material cost only.	Foot	\$17.83	30	\$534.96
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	\$93.23	5	\$466.16
Steel, Plate, 3/16"	1048	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	\$5.73	1	\$5.73

**Equipment Installation**

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$4.71	5	\$23.57
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.11	30	\$33.24

**Labor**

General Labor	231	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	\$20.07	4	\$80.28
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**Mobilization**

Mobilization, small equipment	1138	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	\$170.76	1	\$170.76
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