

**Practice: 378 - Pond**

**Scenario: #1 - Excavated Pond**

**Scenario Description:**

A low-hazard water impoundment structure on agricultural lands to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems and other related uses. Pond is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

**Before Situation:**

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

**After Situation:**

The typical pond is constructed by excavating 3000 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

**Scenario Feature Measure:** Excavated Volume

**Scenario Unit:** Cubic Yard

**Scenario Typical Size:** 3,000

**Scenario Cost:** \$7,823.62

**Scenario Cost/Unit:** \$2.61

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$129.42	6	\$776.52
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	\$2.12	3000	\$6,360.00
<b>Labor</b>						
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	\$25.79	6	\$154.74
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36

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**Scenario: #2 - Excavated Pond with Embankment**

**Scenario Description:**

A low-hazard water impoundment structure on agricultural lands to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems, and other related uses. Pond is created by excavation and impounds more than 3 feet against the embankment or spoil. Excavated material is placed in a designed embankment. Earthen spillway is constructed as needed, a trickle tube (pipe) is installed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

**Before Situation:**

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

**After Situation:**

The typical pond is constructed by excavating 3000 cubic yards and utilizing 1000 cy of excavated material to construct a compacted embankment which is approximately 800 CY. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

**Scenario Feature Measure:** Excavated Volume

**Scenario Unit:** Cubic Yard

**Scenario Typical Size:** 3,000

**Scenario Cost:** \$9,620.04

**Scenario Cost/Unit:** \$3.21

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$2.12	2000	\$4,240.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.17	34	\$175.78
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	\$3.23	800	\$2,584.00
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$129.42	10	\$1,294.20
<b>Labor</b>						
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	\$25.79	10	\$257.90
<b>Materials</b>						
Pipe, PVC, 8", SDR 26	991	Materials: - 8" - PVC - SDR 26 160 psi - ASTM D2241	Foot	\$8.93	60	\$535.80
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36

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**Scenario: #3 - Embankment Pond, no principal spillway**

**Scenario Description:**

An earthen embankment dam without a principal spillway pipe. A low flow tube of 6 inches or less to reduce saturation of the auxiliary spillway is installed, anti-seep collars or sand diaphragms are not required. A low-hazard water impoundment structure on agricultural land to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Cost estimate is based upon a typical amount of earthfill of 2,000 cubic yards, and 80 feet of pipe 6" PVC pipe. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the embankment will not result in loss of life or damages of any kind.

**After Situation:**

The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and creating an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed. No principle spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

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

**Scenario Unit:** Cubic Yard

**Scenario Typical Size:** 2,000

**Scenario Cost:** \$9,887.22

**Scenario Cost/Unit:** \$4.94

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$2.12	100	\$212.00
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	\$118.74	5	\$593.70
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.93	2000	\$7,860.00
<b>Labor</b>						
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	\$18.71	1	\$18.71
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	\$29.26	5	\$146.30
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	\$25.79	5	\$128.95
<b>Materials</b>						
Pipe, PVC, 6", SDR 26	990	Materials: - 6" - PVC - SDR 26 160 psi - ASTM D2241	Foot	\$4.94	80	\$395.20
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36

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**Scenario: #4 - Embankment Pond, pipe < 24 inches**

**Scenario Description:**

An earthen embankment dam with a principle spillway pipe less than 24 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. A low-hazard water impoundment structure on agricultural land to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Cost estimate is based upon a typical amount of earthfill of 4000 cubic yards, 90 feet of 18" PVC, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the embankment will not result in loss of life or damages of any kind.

**After Situation:**

The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and creating an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed, and a principle spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

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

**Scenario Unit: Cubic Yard**

**Scenario Typical Size: 4,000**

**Scenario Cost: \$22,953.49**

**Scenario Cost/Unit: \$5.74**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$118.74	10	\$1,187.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.17	29	\$149.93
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.93	4000	\$15,720.00
<b>Labor</b>						
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	\$18.71	9	\$168.39
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	\$29.26	18	\$526.68
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	\$25.79	10	\$257.90
<b>Materials</b>						
Pipe, PVC, 18", SCH 40	1373	Materials: - 18" - PVC - SCH 40 - ASTM D1785	Foot	\$31.65	90	\$2,848.50
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$59.69	22	\$1,313.18
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$22.65	11	\$249.15
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36

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**Scenario: #5 - Embankment Pond, pipe >= 24 inches**

**Scenario Description:**

An earthen embankment dam with a principle spillway pipe greater than or equal to 24 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. A low-hazard water impoundment structure on agricultural land to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Cost estimate is based upon a typical amount of earthfill of 10,000 cubic yards, corrugated metal drop inlet principle spillway with a 11 ft riser and 100 ft barrel, and 82 Square feet of anti-seep collars. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the embankment will not result in loss of life or damages of any kind.

**After Situation:**

The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and creating an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed, and a principle spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

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

**Scenario Unit: Cubic Yard**

**Scenario Typical Size: 10,000**

**Scenario Cost: \$50,501.73**

**Scenario Cost/Unit: \$5.05**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$119.70	1	\$119.70
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	\$118.74	13	\$1,543.62
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.17	129	\$666.93
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	\$378.21	2	\$756.42
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.93	10000	\$39,300.00
<b>Labor</b>						
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	\$29.26	36	\$1,053.36
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	\$18.71	18	\$336.78
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	\$25.79	13	\$335.27

**Materials**

**Materials**

Pipe, CMP, 30", 12 Gauge	1824	30" Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only.	Foot	\$30.95	12	\$371.40
Pipe, CMP, 24", 12 Gauge	1417	24" Corrugated Metal Pipe, Galvanized, Uncoated, 12 gage. Material cost only.	Foot	\$24.91	100	\$2,491.00
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$22.65	11	\$249.15
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$59.69	46	\$2,745.74

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36
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