

Practice: 642 - Water Well

Scenario: #1 - Large Diameter Drilled Well

Scenario Description: Typical construction is for the drilling of a well using a bucket well drill rig. These wells are large diameter drilled wells. The purpose of the practice is to provide water for livestock. An average well depth is less than 100 foot at 36" diameter. These wells are typically implemented in glacial till areas where the ground water resource has slow recharge rate, and the large diameter of the well allows for storage of water to meet the demand.

Before Situation: Livestock have insufficient water or are fenced from their water source.

After Situation: A 48 ft, 36" diameter well is installed using a bucket drill rig. The large diameter of the well allows for storage of water in glacial till areas where the groundwater recharge rate is less than demand. The well is dug and then cased with concrete. Perforated concrete casing is used as a screen around the bottom of the well. Approximately 6" of gravel is placed around the screen. Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 48

Total Scenario Cost: \$9,154.96

Scenario Cost/Unit: \$190.73

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$25.57	4	\$102.28
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.74	5	\$13.69
Well Casing, Concrete	2173	Concrete tile 3' diameter x 8' long. Materials only.	Foot	\$61.96	40	\$2,478.20
Well Casing, Concrete, perforated	2174	Perforated concrete tile 3' diameter x 8' long. Materials only.	Foot	\$68.15	8	\$545.20

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	\$21.71	8	\$173.67
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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	\$251.62	1	\$251.62
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Equipment Installation

Bucket Drill Rig with operator	2183	Bucket drill rig including equipment and power unit costs and labor.	Hour	\$559.03	10	\$5,590.28
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Practice: 642 - Water Well

Scenario: #2 - Shallow Drilled Well, <= 100 feet, <= 6in Diam

Scenario Description: Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface, and the flow is such that a smaller diameter well is sufficient. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock.

Before Situation: Livestock have insufficient water or are fenced from their water source.

After Situation: An average well depth is 100 feet. Well casings are 6" in diameter. Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 100

Total Scenario Cost: \$5,253.33

Scenario Cost/Unit: \$52.53

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$251.62	1	\$251.62
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Materials

Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.74	1	\$2.74
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$687.39	1	\$687.39
Well Cap, 6"	1786	Well cap, 6". Materials only.	Each	\$33.60	1	\$33.60
Well Casing, Plastic, 6"	1804	PVC or ABS non-threaded well casing, 6". Materials only.	Foot	\$6.52	70	\$456.48
Well Screen, plastic, 6"	1999	6" PVC well screen. Materials only.	Foot	\$16.09	30	\$482.73

Equipment Installation

Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	\$333.88	10	\$3,338.76
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Practice: 642 - Water Well

Scenario: #3 - Shallow Drilled Well, <= 100 feet, > 6in Diam

Scenario Description: Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface, and the flow is such that a larger diameter well is needed. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock.

Before Situation: Livestock have insufficient water or are fenced from their water source.

After Situation: An average well depth is 100 feet. Well casings are 12" in diameter. Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 100

Total Scenario Cost: \$6,325.08

Scenario Cost/Unit: \$63.25

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$251.62	1	\$251.62
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Materials

Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.74	1	\$2.74
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$687.39	1	\$687.39
Well Cap, 12"	1789	Well cap, 12". Materials only.	Each	\$113.30	1	\$113.30
Well Casing, Plastic, 12"	1807	PVC or ABS non-threaded well casing, 12". Materials only.	Foot	\$16.88	70	\$1,181.52
Well Screen, plastic, 8"	2000	8" PVC well screen. Materials only.	Foot	\$24.99	30	\$749.75

Equipment Installation

Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	\$333.88	10	\$3,338.76
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Practice: 642 - Water Well

Scenario: #4 - Deep Drilled Well, > 100 Feet

Scenario Description: Typical construction is for the installation of a well, in areas where sufficient water is known to occur >100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock.

Before Situation: Livestock have insufficient water or are fenced from their water source.

After Situation: An average well depth is 300 feet. Well casings are 4-6" in diameter. Well is dug into consolidated (bedrock or firm material) where casing and lining is installed to a depth of 240 feet. The remaining depth does not need lining or screening due to the "open hole" construction and nature of wells in this substrate. Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 300

Total Scenario Cost: \$12,382.66

Scenario Cost/Unit: \$41.28

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$251.62	1	\$251.62
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Materials

Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.74	1	\$2.74
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$687.39	1	\$687.39
Well Cap, 6"	1786	Well cap, 6". Materials only.	Each	\$33.60	1	\$33.60
Well Casing, Metal, 6"	1810	Steel well casing, 6". Materials only.	Foot	\$14.14	240	\$3,394.29

Equipment Installation

Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	\$333.88	24	\$8,013.02
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