Practice: 642 - Water Well

Scenario: #1 - 4" cased

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. 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 or irrigation. An average well depth is 250 feet. Well casings are 4" in diameter. Steel casing is installed to a depth of 110 feet.

Before Situation: Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation: Install a 250' deep well with 110' of 4" casing. Casing grouted to seal out surface water. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Scenario Feature Measure: Total depth of well

Scenario Unit: Foot

Scenario Typical Size: 250

Total Scenario Cost: $6,116.07

Scenario Cost/Unit: $24.46

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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	$963.46	3	$2,890.39
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$42.13	1	$42.13
Well Cap, 4"	1785	Well cap, 4". Materials only.	Each	$25.67	1	$25.67
Well Casing, Metal, 4"	1809	Steel well casing, 4". Materials only.	Foot	$8.14	110	$895.71
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$252.13	1	$252.13
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$334.55	6	$2,007.29

Practice: 642 - Water Well

Scenario: #2 - 4" Limited Casing

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. 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 or irrigation. The area is known for swallow wells and minimal depth to bedrock. An average well depth is 150 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 30 feet.

Before Situation: Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation: Install a 150' deep well with 30' of 4" casing. Casing grouted to seal out surface water. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Scenario Feature Measure: Total depth of well

Scenario Unit: Foot

Scenario Typical Size: 150

Total Scenario Cost: $2,868.62

Scenario Cost/Unit: $19.12

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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	$963.46	1	$963.46
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$42.13	1	$42.13
Well Cap, 4"	1785	Well cap, 4". Materials only.	Each	$25.67	1	$25.67
Well Casing, Metal, 4"	1809	Steel well casing, 4". Materials only.	Foot	$8.14	30	$244.29
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$252.13	1	$252.13
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$334.55	4	$1,338.19

Practice: 642 - Water Well

Scenario: #3 - Typical Well, 6"

Scenario Description: Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 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 or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 150 feet.

Before Situation: Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation: Install a 400' deep well with 150' of 6" casing. Casing grouted to seal out surface water. Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Scenario Feature Measure: Total depth of well

Scenario Unit: Foot

Scenario Typical Size: 400

Total Scenario Cost: $10,006.89

Scenario Cost/Unit: $25.02

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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	$963.46	5	$4,817.32
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$42.13	1	$42.13
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	150	$2,121.43
Well Screen, stainless steel, 6"	1995	6" Stainless steel well screen. Materials only.	Foot	$61.15	1	$61.15
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$252.13	1	$252.13
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$334.55	8	$2,676.39

Practice: 642 - Water Well

Scenario: #4 - High Volume Typical Well, 8" or greater

Scenario Description: Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 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 or micro-irrigation.

Before Situation: There is insufficient water for use in irrigation.

After Situation: A well is drilled with 150' feet of 8" casing and a total depth of 500'. Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Scenario Feature Measure: Total depth of well

Scenario Unit: Foot

Scenario Typical Size: 500

Total Scenario Cost: $21,209.46

Scenario Cost/Unit: $42.42

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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	$963.46	7	$6,744.25
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$42.13	1	$42.13
Well Cap, 8"	1787	Well cap, 8". Materials only.	Each	$50.37	1	$50.37
Well Casing, Metal, 8"	1811	Steel well casing, 8". Materials only.	Foot	$22.75	150	$3,412.29
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$252.13	1	$252.13
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$334.55	32	$10,705.55

Practice: 642 - Water Well

Scenario: #60 - 4" well cased, PVC, Shallow

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. 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 or irrigation. An average well depth is 100 feet. Well casings are 4" in diameter. Well screening is 30' in length.

Before Situation: Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in irrigation.

After Situation: Install a 100' deep well with 70' of 4" PVC casing and 30' of screening. Casing grouted to seal out surface water to a depth of 30 feet. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Scenario Feature Measure: Total depth of well

Scenario Unit: Linear Foot

Scenario Typical Size: 100

Total Scenario Cost: $3,760.83

Scenario Cost/Unit: $37.61

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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	$963.46	0.3	$289.04
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$42.13	1	$42.13
Well Cap, 4"	1785	Well cap, 4". Materials only.	Each	$25.67	1	$25.67
Well Casing, Plastic, 4"	1803	PVC or ABS non-threaded well casing, 4". Materials only.	Foot	$3.64	70	$254.88
Well Screen, plastic, 4"	1998	4" PVC well screen. Materials only.	Foot	$7.26	30	$217.85
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$252.13	1	$252.13
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$334.55	8	$2,676.39

Practice: 642 - Water Well

Scenario: #61 - 10" well cased, PVC, Shallow well

Scenario Description: Typical construction is for the installation of a well, in areas where sufficient water is known to occur within100 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 or irrigation. Well is typically cased 70% of the depth and the remaining 30% is screened.

Before Situation: There is insufficient water for livestock or irrigation.

After Situation: A well is drilled with 70 feet of 10" casing and 30 feet of well screening for a total depth of 100'. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Scenario Feature Measure: Total depth of well

Scenario Unit: Linear Foot

Scenario Typical Size: 100

Total Scenario Cost: $8,786.44

Scenario Cost/Unit: $87.86

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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	$963.46	0.7	$674.42
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$42.13	1	$42.13
Well Cap, 10"	1788	Well cap, 10". Materials only.	Each	$65.65	1	$65.65
Well Casing, Plastic, 10"	1806	PVC or ABS non-threaded well casing, 10". Materials only.	Foot	$12.69	70	$888.48
Well Screen, plastic, 8"	2000	8" PVC well screen. Materials only.	Foot	$27.97	30	$839.01
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$252.13	1	$252.13
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$334.55	18	$6,021.87

Practice: 642 - Water Well

Scenario: #62 - 8" well cased, PVC, Shallow well

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. 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 or irrigation. An average well depth is 100 feet. Well casings are 8" in diameter. Well is typically cased 70% of the depth and the remaining 30% is screened.

Before Situation: Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in irrigation.

After Situation: Install a 100' deep well with 70' of 8" PVC and 30' of well screening. Casing grouted to seal out surface water. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Scenario Feature Measure: Total depth of well

Scenario Unit: Linear Foot

Scenario Typical Size: 100

Total Scenario Cost: $7,621.37

Scenario Cost/Unit: $76.21

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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	$963.46	0.5	$481.73
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$42.13	1	$42.13
Well Cap, 8"	1787	Well cap, 8". Materials only.	Each	$50.37	1	$50.37
Well Casing, Plastic, 8"	1805	PVC or ABS non-threaded well casing, 8". Materials only.	Foot	$8.58	70	$600.48
Well Screen, plastic, 8"	2000	8" PVC well screen. Materials only.	Foot	$27.97	30	$839.01
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$252.13	1	$252.13
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$334.55	16	$5,352.78