

Practice: 561 - Heavy Use Area Protection

Scenario: #1 - Reinforced Concrete with sand or gravel foundation

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of approximately 10 cubic yards of welded wire mesh reinforced concrete with 12 cubic yards of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of Concrete

Scenario Unit: Square Foot

Scenario Typical Size: 630

Scenario Cost: \$2,708.82

Scenario Cost/Unit: \$4.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
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	\$1.91	22	\$42.02
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$173.54	10	\$1,735.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	12	\$469.08
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard-Mile	\$0.34	600	\$204.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #2 - Rock/Gravel on Geotextile with site prep

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with rock and or gravel on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns of soil erosion and water quality degradation. Typical situation is in pasture setting where small herds (< 30 head) need small winter feeding area away from surface water bodies. This pad is usually shared by 2 or more rotated pastures and has good grass or other filter area between it and water conveyance.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation:

Scenario is based on a 28 ft x 58 ft x 8 in thickness of rock/gravel. The stabilized area is surfaced with approximately 1624 square feet of compacted rock and or gravel on approximately 203 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). 560-Access Road, 382-Fencing, 587-Structure for Water Control, 575-Animal Trails & Walkways, 516-Pipeline

Scenario Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Foot

Scenario Typical Size: 1,624

Scenario Cost: \$4,059.52

Scenario Cost/Unit: \$2.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$37.24	1	\$37.24
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$67.34	10	\$673.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	10	\$234.70
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	\$19.09	20	\$381.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	40.2	\$1,571.42
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.08	203	\$219.24
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard-Mile	\$0.34	2010	\$683.40
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #3 - HUA Livestock Watering Ramp, Streams

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with rock and or gravel on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns of soil erosion and water quality degradation. Typical scenario will provide a stable livestock access to surface water with a 5:1 slope or flatter gravel/geo access ramp. Side slopes into watering area are protected from high flows or livestock access by riprap (D50=8") on 2:1 side slope. Used in conjunction with exclusion fence. Floating fence or gates are sometimes utilized at the end of the ramp to control livestock. Also, exclusion fence is used to control livestock access at the top of bank and in adjacent areas. Gravel Access Ramp (paid by width of ramp times length of ramp, i.e., 12' wide by 48' equals 576 sf) This scenario is for ramps into streams.

Before Situation:

Cattle have unlimited access to the stream and are cause water quality degradation with animal waste and also by breaking down the streambank in numerous locations and causing erosion and sedimentation.

After Situation:

The 12' x 48' stabilized area is surfaced with approximately 576 square feet of rock and or gravel 8 inches thick on approximately 64 square yards of geotextile fabric foundation material. for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). other associated practices: The filter strip shall be established and maintained in permanent vegetation in accordance with Filter Strip (Code 393) or Riparian Forest Buffer (Code 391); rThe fence shall be installed in accordance with Fence (Code 382).

Scenario Feature Measure: Area of Ramp

Scenario Unit: Square Foot

Scenario Typical Size: 576

Scenario Cost: \$3,512.95

Scenario Cost/Unit: \$6.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$124.56	8	\$996.48
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.11	4	\$224.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$37.24	1	\$37.24
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	\$19.09	3	\$57.27
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	\$25.37	12	\$304.44
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	14	\$547.26
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.08	64	\$69.12
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$87.01	6	\$522.06
Mobilization						

Mobilization

Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard-Mile	\$0.34	700	\$238.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	2	\$516.64

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Scenario: #4 - Concrete Slab with curb (reinforced)

Scenario Description:

This scenario addresses stabilizing areas intensively used by larger herds (> 50 head) of livestock typically concentrated year round where manure and wasted feed are collected/transferred very frequently (daily to every other day) to storage facility. The concrete HUA is designed to support heavy equipment loads for manure management. It provides a permanent area of steel reinforced 5" thick concrete (typically #4 or #5 rebar on 12" centers). A 12 inch tall by 8 inch wide reinforced concrete curb is included around the perimeter of the slab to contain scraped waste materials for transport to storage facility. This practice is typically associated with confined animal feeding operation where temporary storage is needed so that nutrients can be applied at maximum crop utilization periods, but can be considered for larger herds (>50 head) on a multi- pasture grazing system where animals are managed in controlled central area for winter feeding and lounging. A Comprehensive Nutrient Management Plan (CNMP) would usually address use of this scenario on a confined animal feeding operation.

Before Situation:

Cattle are fed in a concentrated area. Animal waste is causing a resource concern as it is not being captured and properly utilized.

After Situation:

The stabilized area is 40' x 100'x 5 in thick, surfaced with approximately 4000 square feet of welded wire reinforced concrete pavement on 74 cubic yards of compacted, graded aggregate gravel material. For surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of concrete

Scenario Unit: Square Foot

Scenario Typical Size: 4,000

Scenario Cost: \$25,693.03

Scenario Cost/Unit: \$6.42

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$173.54	63	\$10,933.02
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	\$373.29	7	\$2,613.03
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$186.80	16	\$2,988.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.24	16	\$691.84
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	\$19.09	96	\$1,832.64
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	\$38.32	24	\$919.68
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	\$25.37	32	\$811.84

Materials

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	74	\$2,892.66
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Mobilization

Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard-Mile	\$0.34	3700	\$1,258.00
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$493.20	1	\$493.20
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #5 - Concrete(reinforced) Curb on existing slab

Scenario Description:

This practice is typically associated with confined animal feeding operation where temporary storage is needed so that nutrients can be applied at maximum crop utilization periods, but can be considered for larger herds (> 50 head) on multiple pasture-based grazing systems where animals are managed in controlled central area for winter feeding and lounging. A Comprehensive Nutrient Management Plan (CNMP) would usually address use of this scenario on a confined animal feeding operation.

Before Situation:

Before the practice is installed cattle waste accumulates on the slab but can run off the edges of the slab since there are no curbs to contain it.

After Situation:

A 12" tall by 8" wide reinforced concrete curb is installed on an existing slab. The curb is typically reinforced with #4 or #5 steel bars. The curbs will aid in manure management and reduce water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Length of concrete curb in Ln Ft

Scenario Unit: Linear Foot

Scenario Typical Size: 280

Scenario Cost: \$4,981.67

Scenario Cost/Unit: \$17.79

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
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	\$373.29	7	\$2,613.03
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$37.24	2	\$74.48
Labor						
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	\$38.32	24	\$919.68
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	\$19.09	72	\$1,374.48

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Scenario: #6 - Concrete Slab, not rebar reinforced

Scenario Description:

This scenario addresses stabilizing soil areas where livestock are fed, typically during winter months. Typical herd size is small to medium (~30 to 50 head). It addresses protection of the soil water resources by installation of a not rebar reinforced 5 inch thick concrete slab for the purpose of feeding hay and/or other designated heavy use. Waste materials are removed periodically from the pad with small front end loader tractor and land applied at appropriate times. This practice is typically associated with pasture grazing operations and would be located to serve 2 or more pastures.

Before Situation:

This scenario addresses stabilizing soil areas where livestock are fed, typically during winter months. Typical herd size is small to medium (~30 to 50 head). Currently the cattle are winter fed on the ground and they disturb the soil, degrading soil quality. Animal waste is also able to run off the site, causing potential degradation to water quality.

After Situation:

The 24' by 24' x 5 in thick (576 square foot) stabilized area is surfaced with approximately 9 cubic yards of concrete with welded wire or fiber on 11 cubic yards of graded aggregate gravel material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). other associated practices: 560-Access Road, 382-Fencing, 587-Structure for Water Control, 575-Animal Trails & Walkways, 516-Pipeline

Scenario Feature Measure: Area of concrete

Scenario Unit: Square Foot

Scenario Typical Size: 576

Scenario Cost: \$2,563.03

Scenario Cost/Unit: \$4.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, Slab on Grade, fiber reinforced	2001	Fiber reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$183.28	9	\$1,649.52
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	\$1.91	20	\$38.20
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	11	\$429.99
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard-Mile	\$0.34	550	\$187.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32