

**Scenario Worksheet**

**Practice and Scenario Description:**

<b>Information Type</b>	<b>Data</b>
Region	Appalachian
State	North Carolina
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	2
Scenario Name	Rock/Gravel on Geotextile
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. Scenario is based on a 28 ft x 58 ft x 8 in thickness of compacted gravel/crusher run underlain by geotextile 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 Practice 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 Practice Situation	The stabilized area is surfaced with approximately 1624 square feet of rock and or gravel on approximately 193 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	1624

**Cost Summary:**

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,321.31	\$0.81
Equipment/Installation	\$577.91	\$0.36
Labor	\$569.60	\$0.35
Mobilization	\$229.73	\$0.14
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
<b>Total</b>	<b>\$2,698.55</b>	<b>\$1.66</b>

**Cost Details:**

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1209	Geotextile, non-woven, light weight	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials only.	Square Yard	\$1.87	193	\$360.91
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$24.01	40	\$960.40
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.16	10	\$551.60
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$26.31	1	\$26.31
Labor	231	General Labor	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	\$18.67	20	\$373.40
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$19.62	10	\$196.20
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$18.55	2	\$37.10
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$19.43	1	\$19.43
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$173.20	1	\$173.20

**Scenario Worksheet**

**Practice and Scenario Description:**

Information Type	Data
Region	Appalachian
State	North Carolina
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	4
Scenario Name	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 waste 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. The typical slab dimensions used for this scenario are 40 ft x 100 ft x 5 in thick reinforced concrete with 3 inch thick compacted gravel base (#57 stone) underneath. 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 Practice 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 Practice Situation	The stabilized area is surfaced with approximately 4000 square feet of welded wire reinforced concrete pavement on 37 cubic yards of 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	4000

**Cost Summary:**

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$888.37	\$0.22
Equipment/Installation	\$27,598.20	\$6.90
Labor	\$3,697.68	\$0.92
Mobilization	\$619.02	\$0.15
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$32,803.27	\$8.20

**Cost Details:**

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$24.01	37	\$888.37
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	\$329.10	70	\$23,037.00
Equipment/Installation	933	Skidsteer, 80 HP	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$35.06	24	\$841.44
Equipment/Installation	928	Dozer, 200 HP	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$154.99	24	\$3,719.76
Labor	231	General Labor	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	\$18.67	96	\$1,792.32
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$35.43	24	\$850.32
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$21.98	48	\$1,055.04
Mobilization	1144	Mobilization, Heavy Equipment Operator	Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$21.77	6	\$130.62
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$173.20	1	\$173.20

Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$92.60	1	\$92.60
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$18.55	12	\$222.60

**Scenario Worksheet**

**Practice and Scenario Description:**

Information Type	Data
Region	Appalachian
State	North Carolina
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	6
Scenario Name	Concrete Slab (non-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 non-reinforced 4 inch thick concrete slab for the purpose of feeding hay and/or other designated heavy use. The typical slab dimensions used for this scenario are 24 ft x 24 ft x 4 in thick, non-reinforced 4,000 psi concrete (fiber or welded wire fabric included) with 3 inch thick compacted gravel base (#57 stone) underneath. 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 Practice 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). It addresses protection of the soil water resources by installation of a non-reinforced 4 inch thick concrete slab for the purpose of feeding hay and/or other designated heavy use. The typical slab dimensions used for this scenario are 24 ft x 24 ft x 4 in thick, non-reinforced 4,000 psi concrete (fiber or welded wire fabric included) with 3 inch thick compacted gravel base (#57 stone) underneath. 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.
After Practice Situation	The 576 square foot stabilized area is surfaced with approximately 7 cubic yards of nonreinforced concrete on 6 cubic yards of 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

**Cost Summary:**

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$144.06	\$0.25
Equipment/Installation	\$1,289.73	\$2.24
Labor	\$0.00	\$0.00
Mobilization	\$101.88	\$0.18
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,535.67	\$2.67

**Cost Details:**

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$24.01	6	\$144.06
Equipment/Installation	1225	Concrete, CIP, Slab on Grade, non reinforced	Non 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	\$183.27	7	\$1,282.89
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$1.71	4	\$6.84
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$92.60	1	\$92.60
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$18.55	0.5	\$9.28