

Practice: 367 - Roofs and Covers

Scenario: #1 - Fabric Roof with Timber Foundation

Scenario Description: 104' x 42' hoop structure (4368 SF) with fabric cover with steel trusses and supporting foundation. Steel trusses are supported in 10"x10" PT Timber Posts embedded in the ground 6' and extending 8' above the ground. Posts are placed on 18" footings and are encased in concrete. Associated practices include Heavy Use Area Protection (561), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable where the exclusion of precipitation from an animal waste storage, composting facilities, heavy use area (barnyard or feedlot) or other appropriate application will improve an existing or planned system. Excess precipitation can cause manure laden runoff and impact surface and ground water resources.

After Situation: Hoop structure with fabric cover with steel trusses and supporting timber foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 104'x42' or 4,368 square feet. Roof or cover is typically installed over an approved barnyard or feedlot or other practices an approved component of a CNMP. The system is designed to exclude precipitation and allow proper management of animal wastes (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 4368

Total Scenario Cost: \$54,482.71

Scenario Cost/Unit: \$12.47

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

Equipment Installation

Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hour	\$355.08	10	\$3,550.85
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	\$511.29	18	\$9,203.22
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$5.90	20	\$118.01
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	\$113.50	20	\$2,269.98

Labor

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	\$36.00	20	\$719.96
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	\$26.15	60	\$1,569.12
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	\$43.61	20	\$872.24

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$487.39	1	\$487.39
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	2	\$510.55
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$70.49	2	\$140.98

Materials

Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	\$1.67	3267	\$5,455.52
Roof, Hoop Truss Arch Structure, 30-60' wide	1668	Hoop Truss Arch Structure with fabric cover - 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Foot	\$6.77	4368	\$29,584.90

Practice: 367 - Roofs and Covers

Scenario: #2 - Fabric Roof with Concrete Foundation

Scenario Description: 104' x 42' hoop structure (4368 SF) with fabric cover with steel trusses and supporting concrete foundation. Concrete foundation is required due to shallow bedrock conditions and lack of proper embedment depth for timber posts. Steel truss is attached directly to top of concrete wall. Associated practices include Heavy Use Area Protection (561), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable where the exclusion of precipitation from an animal waste storage, composting facilities, heavy use area (barnyard or feedlot) or other appropriate application will improve an existing or planned system. Excess precipitation can cause manure laden runoff and impact surface and ground water resources.

After Situation: Hoop structure with fabric cover with steel trusses and supporting timber/concrete foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 104'x42' or 4,368 square feet. Roof or cover is typically installed over an approved barnyard or feedlot or other practice as an approved component of a CNMP. The system is designed to exclude precipitation and allow proper management of animal wastes (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 4368

Total Scenario Cost: \$68,662.45

Scenario Cost/Unit: \$15.72

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

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	\$511.29	65	\$33,233.85
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$5.90	162	\$955.89
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	\$113.50	20	\$2,269.98

Labor

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	\$36.00	20	\$719.96
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	\$43.61	20	\$872.24

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	2	\$510.55
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	3	\$515.08

Materials

Roof, Hoop Truss Arch Structure, 30-60' wide	1668	Hoop Truss Arch Structure with fabric cover - 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Foot	\$6.77	4368	\$29,584.90
--	------	---	-------------	--------	------	-------------

Practice: 367 - Roofs and Covers

Scenario: #3 - Fabric Roof with No Foundation

Scenario Description: 104' x 42' hoop structure (4368 SF) with fabric cover with steel trusses. Roof is designed to be mounted directly on top of another practice, such as a WSF, which has been properly designed to support the roof. Steel trusses typically mounted on top of a concrete wall which has been properly design to support this additional load. Associated practices include Heavy Use Area Protection (561), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable where the exclusion of precipitation from an animal waste storage, composting facilities, heavy use area (barnyard or feedlot) or other appropriate application will improve an existing or planned system. Excess precipitation can cause manure laden runoff and impact surface and ground water resources.

After Situation: Hoop structure with fabric cover with steel trusses and supporting timber/concrete foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 104'x42' or 4,368 square feet. Roof or cover is typically installed over an approved barnyard or feedlot or other practice as an approved component of a CNMP. The system is designed to exclude precipitation and allow proper management of animal wastes (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 4368

Total Scenario Cost: \$32,092.73

Scenario Cost/Unit: \$7.35

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

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	\$26.15	40	\$1,046.08
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	\$43.61	10	\$436.12

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	2	\$510.55
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	3	\$515.08

Materials

Roof, Hoop Truss Arch Structure, 30-60' wide	1668	Hoop Truss Arch Structure with fabric cover - 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Foot	\$6.77	4368	\$29,584.90
--	------	---	-------------	--------	------	-------------

Practice: 367 - Roofs and Covers

Scenario: #4 - Timber Framed Roof with Timber Foundation

Scenario Description: 40' x 64' timber framed building (2560 SF) with timber trusses. 8" x 10" posts are embedded 6' in ground with concrete footing/collar. Bottom chord of truss is 12' off the ground. Scenario is based upon Vermont NRCS Drawing VT124060B-C. Snow Load = 60 pdf and Wind Load = 90 mph. Associated practices include Heavy Use Area Protection (561), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable where the exclusion of precipitation from an animal waste storage, composting facilities, heavy use area (barnyard or feedlot) or other appropriate application will improve an existing or planned system and is the least cost alternative. Excess precipitation can cause manure laden runoff and impact surface and ground water resources.

After Situation: The system is designed to exclude precipitation and allow proper management of animal wastes (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 2560

Total Scenario Cost: \$40,855.57

Scenario Cost/Unit: \$15.96

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

Equipment Installation

Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hour	\$355.08	10	\$3,550.85
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	\$511.29	12	\$6,135.48
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$44.50	10	\$445.04

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$36.06	10	\$360.62
Roof, Post Frame Building, 30' to 60' Wide, Hazardous Conditions	2512	Post Frame Building, no sides, - between 30' and 60' width. Hazardous building sites with snow loads exceeding 30 lbs per square foot and extreme wind exposure in areas of open terrain (flat open areas, grassland, shoreline, etc.). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Foot	\$11.00	2560	\$28,147.20

Labor

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	\$36.00	10	\$359.98
----------------------------	-----	---	------	---------	----	----------

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$487.39	1	\$487.39
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	2	\$510.55
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	5	\$858.47

Practice: 367 - Roofs and Covers

Scenario: #5 - Timber Framed Roof with Concrete Foundation

Scenario Description: 40' x 80' timber framed building (3,200 SF) with timber trusses and supporting concrete foundation. Concrete foundation is required due shallow bedrock conditions and lack of embedment depth for timber post. 6" x 8" PT posts are mounted on top of 4' concrete knee wall. Knee wall foundation is pinned into bedrock. Bottom chord of truss is 14' off the ground. Scenario is based upon Vermont NRCS Drawing VT084060B-CW. Snow Load = 60 pdf and Wind Load = 90 mph. Associated practices include Heavy Use Area Protection (561), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable where the exclusion of precipitation from an animal waste storage, composting facilities, heavy use area (barnyard or feedlot) or other appropriate application will improve an existing or planned system and is the least cost alternative. Excess precipitation can cause manure laden runoff and impact surface and ground water resources.

After Situation: The system is designed to exclude precipitation and allow proper management of animal wastes (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 3200

Total Scenario Cost: \$65,502.80

Scenario Cost/Unit: \$20.47

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

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	\$511.29	50	\$25,564.50
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	\$113.50	16	\$1,815.98
Jack Hammer	2190	60-90 pound jack hammer (electric, pneumatic, or hydraulic). Equipment only.	Hour	\$2.12	16	\$33.97

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$36.06	15	\$540.93
Roof, Post Frame Building, 30' to 60' Wide, Hazardous Conditions	2512	Post Frame Building, no sides, - between 30' and 60' width. Hazardous building sites with snow loads exceeding 30 lbs per square foot and extreme wind exposure in areas of open terrain (flat open areas, grassland, shoreline, etc.). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Foot	\$11.00	3200	\$35,184.00

Labor

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	\$36.00	16	\$575.97
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	\$26.15	16	\$418.43

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	2	\$510.55
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	5	\$858.47

Practice: 367 - Roofs and Covers

Scenario: #6 - Timber Framed Roof with No Foundation

Scenario Description: 40' x 80' timber framed building with timber trusses. Roof is designed to be mounted on top of another practice, such as a WSF, which as been designed to support the roof. 6" x 8" PT posts are typically mounted on top of a concrete wall which has been properly design to support this additional load. Bottom chord of truss is 14' off the ground. Scenario is based upon Vermont NRCS Drawing VT084060B-CW. Snow Load = 60 pdf and Wind Load = 90 mph. Associated practices include Heavy Use Area Protection (561), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable where the exclusion of precipitation from an animal waste storage, composting facilities, heavy use area (barnyard or feedlot) or other appropriate application will improve an existing or planned system and is the least cost alternative. Excess precipitation can cause manure laden runoff and impact surface and ground water resources.

After Situation: The system is designed to exclude precipitation and allow proper management of animal wastes (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 3200

Total Scenario Cost: \$39,542.96

Scenario Cost/Unit: \$12.36

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

Labor

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	\$36.00	20	\$719.96
----------------------------	-----	---	------	---------	----	----------

Equipment Installation

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	\$113.50	20	\$2,269.98
---------------------------	-----	--	------	----------	----	------------

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	2	\$510.55
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	5	\$858.47

Materials

Roof, Post Frame Building, 30' to 60' Wide, Hazardous Conditions	2512	Post Frame Building, no sides, - between 30' and 60' width. Hazardous building sites with snow loads exceeding 30 lbs per square foot and extreme wind exposure in areas of open terrain (flat open areas, grassland, shoreline, etc.). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Foot	\$11.00	3200	\$35,184.00
--	------	---	-------------	---------	------	-------------

Practice: 367 - Roofs and Covers

Scenario: #7 - Small Timber Framed Roof with No Foundation < 1000 SF

Scenario Description: Scenario is intended for small timber monoslope roofs which are typically less than 1000 SF in size. Typical size is 26' x 9' (overhang not included) timber framed building with rafters and no sides. Roof is designed to be mounted on top of another practice, such as a compost bin, SPCC facility, etc. which has been designed to support the roof. 6" x 8" PT posts are typically mounted on top of a concrete wall which has been properly design to support this additional load. Roof is typically 8' to 10' off the ground. Scenario is based upon Massachusetts Compost Bin Detail. Snow Load = 60 pdf and Wind Load = 90 mph. Associated practices include Heavy Use Area Protection (561), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable where the exclusion of precipitation from an animal waste storage, composting facilities, heavy use area (barnyard or feedlot) or other appropriate application will improve an existing or planned system and is the least cost alternative. Excess precipitation can cause runoff laden with manure or hydrocarbons to adversely impact surface and ground water resources.

After Situation: The system is designed to exclude precipitation and allow proper management of animal wastes (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 234

Total Scenario Cost: \$3,926.05

Scenario Cost/Unit: \$16.78

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

Materials

Corrugated Steel, 22 gauge	224	Corrugated or ribbed, galvanized, 22 gauge, includes fasteners, materials only.	Square Foot	\$2.35	356	\$836.97
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.93	716	\$664.81
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	\$1.67	224	\$374.05

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	\$26.15	30	\$784.56
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	\$42.19	30	\$1,265.65

Practice: 367 - Roofs and Covers

Scenario: #8 - Steel Frame and Cover with Concrete Foundation

Scenario Description: A steel framed building with steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Heavy Use Area Protection (561), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation: A steel framed building with steel "sheet" roof and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 104'x42' or 4,368 square feet and is over an approved barnyard or feedlot as a component of a CNMP. The system is designed to exclude precipitation and allow proper management of animal wastes (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 4368

Total Scenario Cost: \$85,538.34

Scenario Cost/Unit: \$19.58

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

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	\$511.29	65	\$33,233.85
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	\$113.50	20	\$2,269.98

Labor

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	\$36.00	20	\$719.96
----------------------------	-----	---	------	---------	----	----------

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	2	\$510.55
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$70.49	2	\$140.98

Materials

Roof, Steel Frame Monoslope Building, 30' to 60' wide	1681	Steel Frame Monoslope Building, 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Foot	\$11.14	4368	\$48,663.01
---	------	---	-------------	---------	------	-------------

Practice: 367 - Roofs and Covers

Scenario: #9 - Permeable Composite or Inorganic Cover

Scenario Description: Permeable organic or inorganic cover applied to the liquid surface of a waste storage or treatment facility. Permeable organic or inorganic cover to reduce radiation and wind velocity over the surface of a manure storage to reduce transmission of odors and act as a medium for growth of microorganisms that utilize carbon, nitrogen, and sulfur to decompose odorous compounds. Associated practices include Waste Storage Facility (313).

Before Situation: Applicable where the bio-treatment of emissions from an existing or planned waste storage or treatment facility will improve air quality.

After Situation: Permeable composite or inorganic cover applied to the liquid surface of a waste storage or treatment facility.

Scenario Feature Measure: Storage Surface Area at Normal Full Level

Scenario Unit: Square Foot

Scenario Typical Size: 10000

Total Scenario Cost: \$77,935.80

Scenario Cost/Unit: \$7.79

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$171.69	2	\$343.39
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$70.49	2	\$140.98

Materials

Composite Cover, floating cover, > 5,000 square feet	1860	Composite material that is used to cover open storages with an area greater than 5,000 sf. Example, Hexa-Cover. Materials only.	Square Foot	\$7.75	10000	\$77,451.43
--	------	---	-------------	--------	-------	-------------

Practice: 367 - Roofs and Covers

Scenario: #10 - Pump Building with No Foudation upto 300 SF

Scenario Description: 12' x 18' insulated timber framed pump or hopper building (216 SF). Building is designed to be constructed over a manure pump or a gravity manure hopper to protect practice from freezing and rain. Building is generally constructed with 2" x 6" studded walls with 2" x 8" roof rafters. Building is typically covered with 1/2" plywood sheeting. Roof is finished with asphalt shingles. Building ususally includes a door, window and small exhaust fan. Building is constructed on an existing concrete structure which was installed under Pumping Plant (533) or Waste Transfer (634). Associated practices include Pumping Plant (533), Waste Transfer (634), Heavy Use Area Protection (561), Waste Storage Facility (313), Roof Runoff Structure (558), and other practices requiring a roof.

Before Situation: Applicable in cold/humid climates where elements could damage or hinder performance of a pumping plant or waste transfer system. Consequences can be pollution of ground and surface water resources and improper collection of nutrient resources which will not be properly field applied in accordance to an approved CNMP.

After Situation: The system is designed to protect a pumping plant or waste transfer system from rain and cold weather and allow proper management of animal wastes, thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 216

Total Scenario Cost: \$2,713.81

Scenario Cost/Unit: \$12.56

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
----------------	----	-------------	------	------	-----	-------

Materials

Insulation, Fiberglass or cellulose, R-15	1196	Fiberglass or cellulose insulation R-15, includes materials, equipment and labor to install.	Square Foot	\$0.88	816	\$715.27
Post Frame Building, enclosed 4 sides	1046	Enclosed post frame building, four walls. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, and labor only.	Square Foot	\$9.25	216	\$1,998.54