



Cost-benefit considerations for bioretention

General cost estimation methods can be used by site planners to compare the relative construction and maintenance costs for structural BMPs. However, it is recommended that construction and maintenance budgets should be based on site specific information. Once the construction plans are created, designers could use the table below and the cost estimation worksheet. The table below lists the site components that are specific to bioretention practices. Not included in this table are those cost items that are common to all construction projects, such as mobilization, traffic control, erosion and sediment control, permitting, etc.

This table shows cost Components for Bioretention Practices

(Link to this table)

Implementation Stage	Primary Cost Components	Basic Cost Estimate	Other Considerations
Site Preparation	Tree & plant protection	Protection Cost (\$/area) x Affected Area	Removal of existing structures, topsoil removal and stockpiling
	Clearing & grubbing	Clearing Cost (\$/area) x Affected Area	Removal of existing structures, topsoil removal and stockpiling
	Topsoil salvage	Clearing Cost (\$/area) x Affected Area	Removal of existing structures, topsoil removal and stockpiling
Site Formation	Excavation / grading	4-ft Depth Excavation Cost (\$/acre) x Area (acre)	Soil & rock fill material, tunneling
	Hauling material offsite	Excavation Cost x (% of Material to be hauled away)	Soil & rock fill material, tunneling
Structural Components	Under-drains	Under-drain cost (\$/lineal foot) x length of device	Pipes, catch-basins, manholes, valves
	Inlet structure	(\$/structure) or (\$/curb cut)	Pipes, catch-basins, manholes, valves
	Outlet structure	(\$/structure)	Pipes, catch-basins, manholes, valves
	Liner	Liner cost (\$/square yard) x area of device)	Pipes, catch-basins, manholes, valves
Site Restoration	Filter strip	Sod cost (\$/square foot) x filter strip area	Tree protection, soil amendments, seed bed preparation, trails
	Soil preparation	Topsoil or amendment cost (\$/acre) x Area (acre)	Tree protection, soil amendments, seed bed preparation, trails

Implementation Stage	Primary Cost Components	Basic Cost Estimate	Other Considerations
	Seeding	Seeding Cost (\$/acre) x Seeded Area (acre)	Tree protection, soil amendments, seed bed preparation, trails
	Planting / transplanting	Planting Cost (\$/acre) x Planted Area (acre)	Tree protection, soil amendments, seed bed preparation, trails
Annual Operation, Maintenance, and Inspection	Debris removal	Removal Cost (\$/acre) x Area (acre) x Frequency	Vegetation maintenance, cleaning of structures
	Sediment removal	Removal Cost (\$/acre) x Area (acre) x Frequency	Vegetation maintenance, cleaning of structures
	Weed control	Labor cost (\$/hour) x Hours per visit x Frequency	Vegetation maintenance, cleaning of structures
	Inspection	Inspection Cost (\$) x Inspection Frequency	Vegetation maintenance, cleaning of structures
	Mowing	Mowing Cost (\$) x Mowing Frequency	Vegetation maintenance, cleaning of structures

Bioretention device cost estimate worksheet.

Link to this table

Project Title

Owner

Location

Project Number

Date

Description	Units	Quantity	Unit Cost	Total Estimated Price
Site Preparation				
Tree removal - up to 12" diameter	each		\$350.00	\$0.00
Clear and grub brush	square yard		\$1.50	\$0.00
Tree protection - temp. fence	lineal foot		\$3.00	\$0.00
Topsoil - 6" depth, salvage on site	square yard		\$4.50	\$0.00
Site Formation				
Excavation - 4' average depth	square yard		\$10.00	\$0.00
Grading	square yard		\$1.50	\$0.00
Hauling off-site	square yard		\$5.50	\$0.00
Structural Components				
Underdrain - with pea gravel and geotextile	lineal foot		\$30.00	\$0.00
Inlet structure	each		\$1,500.00	\$0.00
Outlet structure	each		\$2,500.00	\$0.00
Site Restoration				
Filter strip	square yard		\$0.00	\$0.00
Soil preparation	square yard		\$30.00	\$0.00
Seeding - above outlet elevation	square yard		\$0.50	\$0.00
Planting - below outlet elevation	square yard		\$30.00	\$0.00

Mulch	square yard	\$5.00	\$0.00
Subtotal			\$0.00
10% Contingencies			\$0.00
Subtotal			\$0.00
Apply MN Location Factor			\$0.00
TAL CONSTRUCTION COST			\$0.00

Annual Operation and Maintenance

Debris removal	per visit	\$50.00	\$0.00
Weed control	per visit	\$50.00	\$0.00
Sediment removal	per yeart	\$500.00	\$0.00
Replace planting media	square yard	\$12.00	\$0.00
Replace plants	per plant	\$5.00	\$0.00
Mow filter strips	per visit	\$50.00	\$0.00
Erosion repair	square yard	\$75.00	\$0.00
Inspection	per visit	\$125.00	\$0.00
Subtotal			\$0.00
Apply MN Location Factor			\$0.00
TOTAL ANNUAL O&M COST			\$0.00

Minnesota Location Factors

Bemidji	0.963
Brainerd	1.003
Detroit Lakes	0.962
Duluth	0.991
Mankato	0.990
Bemidji	0.963
Minneapolis	1.035
Rochester	0.983
St. Paul	1.000
St. Cloud	1.002
Thief River Falls	1.042
Willmar	0.961
Windom	0.935

Note: Suggested unit costs are based on RS Means prices for Spring, 2005, then factored into an area basis based on typical design features for Constructed Wetlands BMPs. To be used for preliminary cost estimation

Related pages

- Bioretention terminology (including types of bioretention)
- Overview for bioretention
- Design criteria for bioretention
- Construction specifications for bioretention

- Operation and maintenance of bioretention
- Assessing the performance of bioretention
- Cost-benefit considerations for bioretention
- Calculating credits for bioretention
- Soil amendments to enhance phosphorus sorption
- Summary of permit requirements for bioretention
- Supporting material for bioretention
- External resources for bioretention
- References for bioretention
- Requirements, recommendations and information for using bioretention with no underdrain BMPs in the MIDS calculator
- Requirements, recommendations and information for using bioretention with an underdrain BMPs in the MIDS calculator

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This page was last edited on 24 February 2016, at 20:00.

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