

## Appendix F

## Guidance on Preparation of Construction and Maintenance Costs

## Northwest Area (NWA) Inver Grove Heights Stormwater Manual

# Guidance on Preparation of Construction and Maintenance Costs

Appendix F

**Key Topics:** cost estimates for select BMPs

#### **Contents**

I.	Bioretention Cost Estimate	3
II.	Infiltration Basin Cost Estimate	4
III.	Stormwater Pond Cost Estimate	5
IV.	Stormwater Wetland Cost Estimate	6
	Surface Sand Filter Cost Estimate	

#### BIORETENTION DEVICE COST ESTIMATE WORKSHEET 2005 Prices

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 - salvage	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		\$6.50	\$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
outer suddiare	cuon		Ψ2,000.00	ψο.σσ
Site Restoration				00.00
Filter strip	square yard			\$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
		Apply	Subtotal MN Location Factor	\$0.00
			STRUCTION COST	\$0.00
		TOTAL CON	3110011011 0001	Ψ0.00
Annual Operation and Maintenance				
Debris removal	per visit		\$50.00	\$0.00
Weed control	per visit		\$50.00	\$0.00
Sediment removal	per year		\$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
			MN Location Factor	
		IOTAL AN	NUAL O&M COST	\$0.00
Minnesota Location Factors				
Bemidji	0.963			
Brainerd	1.003			
Detroit Lakes	0.962			
Duluth	0.991			
Mankato Minneapolis	0.990 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 RSMeans prices for Spring, 2005, then factored into an area basis based on typical design features for Bioretention BMPs. To be used for preliminary cost estimation.



#### INFILTRATION BASIN COST ESTIMATE WORKSHEET 2005 Prices

Project Title	
Owner	
Location	
Project Number	
Date	

Description	Units	Quantity	Unit Cost	Total Estimated Price
Site Preparation				
Free removal - up to 12" diameter	each		\$350.00	\$0.00
Clear and grub brush	square yard		\$1.50	\$0.00
ree protection - temp. fence	lineal foot		\$3.00	\$0.00
nfiltration area protection - silt fence	lineal foot		\$2.00	\$0.00
opsoil - 6" depth, salvage on site	square yard		\$4.50	\$0.00
Site Formation				
Excavation - 6' depth	square yard		\$8.00	\$0.00
Grading	square yard		\$1.50	\$0.00
Hauling off-site - 6' depth	square yard		\$10.00	\$0.00
Structural Components				
nlet structure	each		\$1,500.00	\$0.00
Multi-stage outlet structure	each		\$2,500.00	\$0.00
Site Restoration				
Sod filter strip	lineal foot		\$1.50	\$0.00
Soil preparation	square yard		\$5.00	\$0.00
Seeding	square yard		\$0.50	\$0.00
Planting - below outlet elevation	square yard		\$30.00	\$0.00
Mulch	square yard		\$2.00	\$0.00
			Subtotal	\$0.00
			10% Contingencies	\$0.00
			Subtotal	\$0.00
		Apply	MN Location Factor	
		TOTAL CON	STRUCTION COST	\$0.00
Annual Operation and Maintenance	aguara vard		\$12.00	\$0.00
Replace planting media Debris removal	square yard		\$12.00 \$50.00	\$0.00
Mow filter strips	per visit per visit		\$50.00 \$50.00	\$0.00
Sediment removal	•		\$500.00	\$0.00
	per year			\$0.00
Replace plants	per plant		\$5.00	
Erosion repair	square yard		\$75.00 \$125.00	\$0.00 \$0.00
Gate / valve operation	per visit			\$0.00
nspection	per visit		\$125.00	φυ.υυ
		Apply	Subtotal MN Location Factor	\$0.00
			NNUAL O&M COST	\$0.00
		TOTALAI	NIVOAL ORIVI COST	φυ.υυ
Minnesota Location Factors				
Bemidji	0.963			
Brainerd	1.003			
Detroit Lakes Duluth	0.962			
Juluth Mankato	0.991 0.990			
Minneapolis	1.035			
Rochester	0.983			
St. Paul	1.000			
St. Cloud	1.002			
Thief River Falls	1.042			
Villmar	0.961			
Windom	0.935			

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



#### STORMWATER POND COST ESTIMATE WORKSHEET 2005 Prices

Project Title	
Owner	
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 - 8' depth	square yard		\$10.00	\$0.00
Grading	square yard		\$1.50	\$0.00
Hauling off-site - 8' depth	square yard		\$10.00	\$0.00
Structural Components				
Inlet structure	each		\$2,000.00	\$0.00
Overflow structure	each		\$3,500.00	\$0.00
Site Restoration				
Sod - above vegetative bench	square yard		\$4.50	\$0.00
Soil preparation	square yard		\$5.00	\$0.00
Seeding - vegetative bench	square yard		\$0.50	\$0.00
Mulch	square yard		\$1.00	\$0.00
			Subtotal	\$0.00
			10% Contingencies	\$0.00
			Subtotal	\$0.00
		Apply	MN Location Factor	
		TOTAL CONS	STRUCTION COST	\$0.00
Annual Operation and Maintenance Debris removal	per visit		\$100.00	\$0.00
	•			\$0.00
Remove invasive plants	per visit		\$500.00	
Replant wetland vegetation	per plant		\$10.00	\$0.00
Repair erosion	square yard		\$75.00	\$0.0
Sediment removal and disposal	cubic yard		\$10.00	\$0.00
Mow	per visit		\$150.00	\$0.0
Gate / valve operation	per visit		\$125.00	\$0.0
Inspection	per visit		\$125.00	\$0.00
			Subtotal	\$0.0
		Apply MN Location Factor TOTAL ANNUAL O&M COST		\$0.0
		TOTAL AI	NNUAL O&W COST	\$0.00
Minnesota Location Factors				
Bemidji	0.963			
Brainerd	1.003			
Detroit Lakes	0.962			
Duluth	0.991			
Mankato	0.990			
Minneapolis	1.035			
Rochester	0.983			
St. Paul St. Cloud	1.000			
St. Cloud Thief River Falls	1.002			
Thief River Falls Willmar	1.042 0.961			

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



### STORMWATER WETLAND COST ESTIMATE WORKSHEET 2005 Prices

Project Title	
Owner	
Location	
Project Number	
Date	

Site Preparation   Tree removal - up to 12" diameter   each   \$350.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Step	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Steep	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Tree protection - temp. fence   lineal foot   \$3.00   Topsoil - 6" depth, salvage on site   square yard   \$4.50    Site Formation   Excavation - deepwater zone - 4" average depth   square yard   \$5.00   Excavation - marsh zone - 1" average depth   square yard   \$1.00   Grading   square yard   \$1.50   Hauling off-site - 5" depth   square yard   \$5.00    Structural Components   structure   each   \$2,000.00   Dutlet structure   each   \$3,500.00    Site Restoration   Soil preparation   square yard   \$4.50   Soil preparation   square yard   \$25.00   Seeding - vegetative bench   square yard   \$0.50   Planting   square yard   \$30.00    Subtotal   10% Contingencies   Subtotal   Apply MIN Location Factor   TOTAL CONSTRUCTION COST    Annual Operation and Maintenance   Debris removal   per visit   \$100.00   Remove invasive plants   per visit   \$500.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Site Formation   Site Formation   Security   Standard	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Structural Components	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Structural Components	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Structural Components   Structural Components	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Structural Components   Structural Components	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Structural Components   Structure   each   \$2,000.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
Structural Components	\$0.00 \$0.00 \$0.00 \$0.00
Subtotal	\$0.00 \$0.00 \$0.00 \$0.00
Dutlet structure each \$3,500.00  Site Restoration  Sod - above vegetative bench square yard \$4.50 Soil preparation square yard \$25.00 Seeding - vegetative bench square yard \$0.50 Planting square yard \$30.00  Subtotal 10% Contingencies Subtotal Apply MN Location Factor TOTAL CONSTRUCTION COST  Annual Operation and Maintenance Debris removal per visit \$100.00 Remove invasive plants per visit \$500.00	\$0.00 \$0.00 \$0.00 \$0.00
Site Restoration Sod - above vegetative bench square yard \$4.50 Soil preparation square yard \$25.00 Seeding - vegetative bench square yard \$0.50 Planting square yard \$30.00  Subtotal 10% Contingencies Subtotal Apply MN Location Factor TOTAL CONSTRUCTION COST  Annual Operation and Maintenance Debris removal per visit \$100.00 Remove invasive plants per visit \$500.00	\$0.00 \$0.00 \$0.00
Sod - above vegetative bench   square yard   \$4.50	\$0.00 \$0.00 \$0.00
Soil preparation   Square yard   \$25.00	\$0.00 \$0.00 \$0.00
Soil preparation   Square yard   \$25.00	\$0.00 \$0.00
Seeding - vegetative bench square yard squ	\$0.00
Planting square yard \$30.00  Subtotal 10% Contingencies Subtotal Apply MN Location Factor TOTAL CONSTRUCTION COST  Annual Operation and Maintenance Debris removal per visit \$100.00 Remove invasive plants per visit \$500.00	\$0.00
Annual Operation and Maintenance Debris removal per visit \$100.00 Remove invasive plants per visit \$500.00	\$0.00
Annual Operation and Maintenance Debris removal per visit \$100.00 Remove invasive plants per visit \$500.00	50 0
Annual Operation and Maintenance Debris removal per visit \$100.00 Remove invasive plants per visit \$500.00	
Apply MN Location Factor  TOTAL CONSTRUCTION COST   Annual Operation and Maintenance  Debris removal per visit \$100.00  Remove invasive plants per visit \$500.00	\$0.00
Annual Operation and Maintenance Debris removal per visit \$100.00 Remove invasive plants per visit \$500.00	\$0.00
Annual Operation and Maintenance  Debris removal per visit \$100.00  Remove invasive plants per visit \$500.00	\$0.0
Debris removal         per visit         \$100.00           Remove invasive plants         per visit         \$500.00	Ψ0.01
Debris removal         per visit         \$100.00           Remove invasive plants         per visit         \$500.00	
Remove invasive plants per visit \$500.00	60.0
	\$0.0
	\$0.00
Replant wetland vegetation per plant \$10.00	\$0.00
Repair erosion square yard \$75.00	\$0.00
Sediment removal and disposal cubic yard \$10.00	\$0.0
Mow per visit \$150.00	\$0.00
Gate / valve operation per visit \$125.00	\$0.00
nspection per visit \$125.00	\$0.00
Subtotal	\$0.0
Apply MN Location Factor	
TOTAL ANNUAL O&M COST	\$0.0
Minnesota Location Factors Bemidji 0.963	
Brainerd 1.003	
Detroit Lakes 0.962	
Duluth 0.991	
Mankato 0.990 Minneapolis 1.035	
/inneapolis         1.035           Rochester         0.983	
St. Paul 1.000	
8t. Paul 1,000 St. Cloud 1,002 Thief River Falls 1,042	
St. Paul 1.000 St. Cloud 1.002	

Note: Suggested unit costs are based on RSMeans 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.



#### SURFACE SAND FILTER COST ESTIMATE WORKSHEET 2005 Prices

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 - 6' depth	square yard		\$8.00	\$0.00
Grading	square yard		\$1.50	\$0.00
Hauling off-site - 6' depth	square yard		\$10.00	\$0.00
Structural Components				
Underdrain - with pea gravel and geotextile	square yard		\$400.00	\$0.00
Inlet structure	each		\$1,500.00	\$0.00
Sand filter media - 18" depth	square yard		\$15.00	\$0.00
Outlet structure	each		\$3,000.00	\$0.00
Site Restoration				
Sod filter strip	lineal foot		\$1.50	\$0.00
Soil preparation	square yard		\$5.00	\$0.00
Seeding	square yard		\$0.50	\$0.00
			Subtotal	\$0.00
			10% Contingencies	\$0.00
			Subtotal	\$0.00
			MN Location Factor	
		TOTAL CONS	STRUCTION COST	\$0.00
Annual Operation and Maintenance				
Debris removal	per visit		\$50.00	\$0.00
Mowing	per visit		\$150.00	\$0.00
•	•			
Sediment removal	per year		\$500.00	\$0.00 \$0.00
Gate / valve operation	per visiit		\$125.00	
Erosion repair	square yard		\$75.00	\$0.00
Inspection	per visit		\$125.00	\$0.00
		Amalus	Subtotal	\$0.00
			MN Location Factor	\$0.00
		TOTAL AN	INUAL O&M COST	\$0.00
Minnesota Location Factors				
Bemidji	0.963			
Brainerd	1.003			
Detroit Lakes	0.962			
Duluth	0.991			
Mankato	0.990			
Minneapolis	1.035			
Rochester	0.983			
St. Paul	1.000			
St. Cloud	1.002			
Thief River Falls	1.042			
Willmar Windom	0.961 0.935			

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