

STORMWATER FACILITIES O&M COST ESTIMATE

Instructions

In accordance with Section 3.8.4 of Volume I of the Thurston County Drainage Design and Erosion Control Manual (2009) an estimate of the average annual cost of maintenance shall be included in the Maintenance Plan for projects meeting specific thresholds for compliance with Minimum Requirement #10, *Operation and Maintenance*. The annual cost shall include the annualized cost of major items such as sediment removal from ponds, etc.

A complete cost estimate for O&M shall include the following:

1. **Cost of Construction**: Provide an estimate of the cost of construction of the stormwater system for the project. This may have been completed as part of the project permitting to obtain a maintenance bond, if so, this may be indicated and the construction estimate attached.
2. **Facilities Inventory**: List all stormwater facilities associated with the project including data necessary to estimate costs such as pond bottom area and lineal feet of swale.
3. **Assumptions**: State overall assumptions. Include in this section what the assumed labor rate is, inflation rate, interest rate, cost of sediment disposal, whether inspections/minor maintenance will be volunteer labor or contracted, whether a maintenance/landscape contract is to be used, how frequently CB's are to be vactored, streets swept, wet pond and detention pond sediment removed, etc.
4. **Non-Contracted Routine Inspections & Maintenance**: Identify and estimate the cost and time associated with inspections and maintenance which will be performed by the Property Owners Association (or property owner for commercial projects) and administration.
 - a. List estimated annual hours for inspections and administration
 - b. Cost of complying with reporting requirements
 - c. Apply appropriate labor rate to estimate.
 - d. Equipment or supplies purchased to support routine maintenance.
5. **Contracted Routine Maintenance**: Identify and estimate the cost of routine maintenance items that will likely be performed by an outside contractor such as a landscape company, sewer maintenance service, or other contracted entity. Note: Routine maintenance is maintenance that is anticipated to be performed annually, or more frequently.
 - a. Landscape contractor – mowing, trimming, pruning, etc.
 - b. Street sweeping (especially for porous pavements).
 - c. Catch Basin pumping
 - d. Fence maintenance and repair.
 - e. Inlet/outlet protection refurbishment (riprap installation, fix erosion problems)

- f. Swale/ditch maintenance (seeding, sodding, fix erosion problems)
 - g. Removal of trash and debris – include cost of disposal
 - h. Removal of invasive plants (e.g. scotch broom, alder, cattails).
 - i. Proprietary device maintenance contract costs.
1. **Non-Routine Maintenance**: Identify major maintenance items that will be performed infrequently (i.e. greater than annually) and provide an estimate of cost and estimated frequency of occurrence. Convert to an annual amount by dividing cost by frequency. Cost of infrequent maintenance such as pond sediment removal; fence repair, replacement and painting; pipe replacements; catch basin and control structure replacement; infiltration pond and bioretention facility refurbishment, etc.
 - a. Indicate anticipated frequency of activity.
 - b. Provide a breakdown of cost of the infrequent activity
 - i. Mobilization cost
 - ii. Cost of sediment excavation and disposal
 - iii. Cost of replanting or restoration
 - iv. Assume a sediment depth and actually calculated estimated sediment volume for removal/disposal.
 - c. Divide the estimated cost by the estimated frequency to annualize the cost.

 6. **Facility Replacement Fund**: Establish a replacement fund to allow for future major restoration or replacement of stormwater facilities. A target for the replacement fund is to have 20% of the cost of construction available after 20 years. This amount should be set aside to provide for unexpected costs and major repair/replacement of facilities.

The attached Annual Maintenance Estimate is provided as an example to be used in preparing the average annual cost of maintenance.

EXAMPLE
Average Annual Cost of Maintenance
Example Acres – Subdivision

Cost of Construction

Cost of Construction = \$80,000 (from maintenance bond estimate, see attached)

Facility Inventory

1. Biofiltration swales – 1800 lineal feet
2. Infiltration pond – 5,000 square foot bottom area
 - a. Pond information sign
 - b. Fencing – 300 lineal feet chain link, 1 gate
 - c. Overflow spillway
 - d. Inlet Pipe with trash rack – 12-inch
 - e. Access Road – 200 lineal feet
3. Catch Basin Storm Filters – two - 2 cartridge units
4. Bioretention Facility – 1500 square feet
5. Catch Basins – 4 Type 1
6. Driveway Culverts – eight 12” culverts
7. Pond Fencing – 300 lineal feet chain link, 1 gate
8. Road Crossing Culverts – two 12” culverts
9. Outfalls – two 12-inch outfall pipes with riprap outlet protection

Assumptions

- Contract Labor Cost: \$25/hour
- Volunteer Labor (HOA) for routine inspections and routine maintenance
- Pump out catch basins once every two years.
- Replace storm filter cartridges once every two years (Contract).
- Refurbish infiltration pond bottom once every 10 years
 - Assume 2” sediment removal = 31 cubic yards
 - Sediment disposal off site - \$20 per cubic yard
 - Excavator – 8 hours at \$150/hour
 - Dump Truck – 8 hours at \$100/hour
- Mulch Rain Garden annually – 2 inches x 1500 sf = 9.25 cubic yards
- Refurbish bioretention facility every 10 years
 - Excavate bioretention soil mix – 18”x1500sf = 83 cubic yards
 - Replace bioretention soil mix – 83 cubic yards
- Landscape Maintenance Contract - \$200/month (April – September)
 - Mow pond and swale areas
 - Edging, trimming and pruning
 - Remove trash and debris and dispose
 - Minor replanting and reseeding.

EXAMPLE ACRES SUBDIVISION – STORMWATER FACILITIES
AVERAGE ANNUAL COST OF MAINTENANCE

FACILITY	ACTIVITY	Frequency	Units	Quantity	Unit Price*	Cost	Cost per Year
All	Annual & Routine Inspections by HOA	3x per year	HRS	4	\$0	\$0	\$0
All	Annual Report	Annual	HRS	4	\$0	\$0	\$0
All	Landscape Maintenance Contract	Annual	LS	1	\$1200	\$1200	\$1200
All	Insurance, Supplies, Misc.	Annual	LS	1	\$250	\$250	\$250
Bioretention Facility	Annual Mulching – Mulch	Annual	CY	10	\$20	\$200	\$200
Bioretention Facility	Annual Mulching – Labor	Annual	HRS	4	\$25	\$100	\$100
Bioretention Facility	Refurbish Soils - Soil	1x 10 yrs	CY	83	\$30	\$2490	\$249
Bioretention Facility	Refurbish Soils – Removal/Disposal	1x 10 yrs	CY	83	\$20	\$1660	\$160
Bioretention Facility	Refurbish Soils - Labor	1x 10 yrs	HRS	20	\$25	\$500	\$50
Bioretention Facility	Refurbish Soils – Replanting	1x 10 yrs	SF	1500	\$2	\$3000	\$300
Catch Basins	Catch Basin Cleaning	1x 2 yrs	EA	4	\$50	\$200	\$100
StormFilters	Replace Cartridges	1x 2 yrs	EA	4	\$200	\$800	\$400
StormFilters	Remove Sediment	1x 2 yrs	EA	2	\$100	\$200	\$100
Infiltration Pond	Sediment Removal – Excavation	1x 5 yrs	HRS	8	\$150	\$1200	\$240
Infiltration Pond	Sediment Removal – Disposal	1x 5 yrs	CY	31	\$20	\$620	\$124
Infiltration Pond	Refurbishment – Till & Seed	1x 5yrs	SF	5000	\$0.25	\$1250	\$250
Culverts	Debris Removal	Annual	EA	10	\$20	\$200	\$200
Bioswales	Debris Removal/Seeding	Annual	LF	1800	\$0.10	\$180	\$180
Outfalls	Remove weeds/Replace Rip Rap	1x 5 yrs	Each	3	\$200	\$600	\$120
	SUBTOTAL:						\$4,223
All	Replacement Fund**	1x 20 yrs	LS	n/a	\$16,000	\$16,000	\$800
	TOTAL						\$5,023

*Unit prices for information purposes – project engineer shall verify unit prices for materials and labor.

**Alternatively, sinking fund could be based on estimated inflation rate and rate of return using PV/FV methods.