

CHAPTER 9

OPERATION AND MAINTENANCE

Contents

9.0	INTRODUCTION	9-1
9-1	OPERATION AND MAINTENANCE MANUAL	9-1
9-2	OPERATION AND MAINTENANCE REQUIREMENTS	9-3
	9.2.1 Responsibility for Maintenance	9-3
	9.2.2 Maintenance Frequency	9-3
	9.2.3 Disposal of Waste from Maintenance Activities	9-3
9.3	MAINTENANCE OF PLAT FACILITIES DURING HOME BUILDING	9-3
 APPENDIX 9A STORMWATER FACILITY MAINTENANCE SCHEDULES		 9A-1
	Checklist for Detention Ponds	9A-2
	Checklist for Infiltration Facilities	9A-5
	Checklist for Closed Detention Systems (Tanks/Vaults)	9A-9
	Checklist for Control Structure/Flow Resistor	9A-12
	Checklist for Catch Basins	9A-15
	Checklist for Debris Barriers (Trash Racks)	9A-19
	Checklist for Energy Dissipaters	9A-20
	Checklist for Typical Biofiltration Swale	9A-23
	Checklist for Filter Strips	9A-27
	Checklist for Wet Ponds	9A-28
	Checklist for Treatment Wetlands	9A-30
	Checklist for Wet Vaults	9A-34
	Checklist for Sand Filters (aboveground/open)	9A-37
	Checklist for Sand Filters (below ground/enclosed)	9A-39
	Checklist for Stormfilter™	9A-41
	Checklist for Baffle Oil/Water Separators	9A-44
	Checklist for Coalescing Plate Oil/Water Separators	9A-46
	Checklist for Fencing/Shrubbery Screen/Other Landscaping	
	9A48	
	Checklist for Gates	9A-49
	Checklist for Grounds (Landscaping)	9A-50
	Checklist for Media Filter Drain	9A-51
	Checklist for Vortechs Stormwater Treatment System by Contech	
	Stormwater Solutions	9A-54
	Checklist for Stormceptor System	9A-55
	Checklist for Filterra	9A-57

Checklist for CDS Media Filtration System (MFS) ® by Contech Solutions	9A-58
Checklist for Aqua Shield Aqua-Swirl	9A-60
Checklist for Bioretention (Swales and Planters)	9A-61
Checklist for Cisterns	9A-66
Checklist for Compost Amended Soil	9A-68
Checklist for Vegetated Roof	9A-70
Checklist for Pervious Pavement	9A-73

CHAPTER 9

OPERATION AND MAINTENANCE

9.0 INTRODUCTION

For stormwater quantity and quality control facilities to achieve their intended results, proper operation and timely maintenance are essential.

For most developments other than single-family residential, the permanent responsibility for operation and maintenance of stormwater facilities rests with the property owner. In addition, for single-family developments, the property owner/developer must temporarily bear this responsibility for a period of time following the completion of construction.

9.1 OPERATION AND MAINTENANCE MANUAL

Upon completion of construction, and when "as-built" construction plans are submitted to the County, an Operation and Maintenance (O & M) Manual shall be submitted to the County for all proposed stormwater quantity and quality control facilities that are to be privately maintained or that have special non-standard features. The O & M Manual shall be prepared by a civil engineer. This manual should be brief and simply written so it can be effectively followed by those persons who will be responsible for operating and maintaining the facilities.

The following basic outline should be followed in the preparation of the Operation and Maintenance Manual:

- A. General Information:
 - 1. Purpose of O & M Manual (briefly provide an introduction to the O & M Manual and a general statement on the overall purpose of operation and maintenance of the facility).
 - 2. Location and Access to Facility (name of stream/tributary/lake, etc., that facility discharges to, nearest cross streets; traveling directions to facility, including location of maintenance access roads). Include a vicinity map.
 - 3. Purpose of Facility (e.g. peak rate runoff control, water quality, etc.).
 - 4. General Description of Facility (e.g. detention pond, biofiltration swale, etc.).
 - 5. Ownership (name, address, and telephone number of owner of facility).
 - 6. Project History (development for which facility was constructed, date of construction, original project engineer and contractor, any significant modifications that have taken place during the life of the facility).
 - 7. Project Data Sheet (lists all major features of the facility in an easy-to-follow tabular format, including catchment area, impervious area, off-site

contribution of runoff, storage volume, orifice sizes, and designed release rates).

- B. Facility Operation (this section provides detailed procedures for normal "day-to-day" operation as well as emergency situations).
1. Operating Instructions for Normal Operation.
 2. Emergency Action Plan (special operating procedures to be followed during emergency conditions resulting from extreme weather conditions or from structural failure of the facility). 24-hour emergency contact telephone numbers must be included.
 3. Facility Maintenance (detailed information and instructions on performing periodic maintenance of the facility).
 4. Regularly Scheduled Maintenance (maintenance tasks performed on a regularly scheduled basis).
 5. Monitored Maintenance (involves periodic surveillance of facility and making repairs and modification as needed).
 6. Maintenance Plan (instructions for performing periodic maintenance should be given in detail, so that new personnel can understand the tasks and experienced personnel can verify that the work has been performed properly. All regularly scheduled and monitored maintenance should be identified and listed in a maintenance plan section of the O & M Manual).
 7. Unscheduled Maintenance (despite having a proper maintenance program, unexpected deficiencies can occur at any time, prompting the need for repairs and maintenance, e.g. repairing and reseeding eroded areas on embankments. Although unscheduled maintenance cannot be planned for in a maintenance plan, an owner should anticipate the need for repair or rehabilitation of unexpected deficiencies. To this end, a section should be provided in the maintenance plan that gives instructions for dealing with unscheduled maintenance).
- C. Facility Inspection (this section specifies required frequency intervals for inspections and includes an inspection checklist and an inspection report form).
1. Routine Inspections (a brief, visual inspection of the major features of the facility, performed on a frequent, informal basis, e.g. weekly, monthly).
 2. Periodic Inspection (a periodic inspection is a more detailed inspection, during which all features and equipment at the facility are evaluated at regularly scheduled intervals.). A checklist should be provided to ensure that all critical features are examined.
 3. Inspection Report Form (a simple form, to be completed by the persons performing the periodic inspection, reporting the date of inspection, person performing inspection, findings, inspection checklist).

9.2 OPERATION AND MAINTENANCE REQUIREMENTS

The following minimum requirements for operation and maintenance of stormwater facilities shall be incorporated into the Operation and Maintenance Manual.

9.2.1 Responsibility for Maintenance

Property owners are responsible for the maintenance, operation, or repair of stormwater drainage systems and BMPs. Property owners shall maintain, operate, and repair these facilities in compliance with the requirements of Kitsap County Code Title 12 and with the requirements of this Manual.

9.2.2 Maintenance Frequency

Stormwater facilities shall be inspected and maintained routinely and cleared of debris, sediment, and vegetation when the functioning and/or design capacity of the facility is affected. Where lack of maintenance is causing or contributing to a water quality problem, immediate action shall be taken to correct the problem. All inspections shall adhere to the schedules published in Appendix 9 A.

9.2.3 Disposal of Waste from Maintenance Activities

Disposal of waste from stormwater maintenance activities shall be conducted in accordance with Kitsap County Board of Health Ordinance 2004-2, Solid Waste Regulations that adopts the Solid Waste Handling Standards in Chapter 173-350 WAC and where appropriate, the Dangerous Waste Regulations, Chapter 173-303 WAC.

9.3 MAINTENANCE OF PLAT FACILITIES DURING HOME BUILDING

The responsibility for maintenance of a residential plat rests with the entity that bonded the plat for maintenance in accordance with KCC 12.12.060. This party shall be responsible for maintaining the stormwater management facilities required by the manual. Kitsap County shall inspect these facilities at least once every 6 months during home construction to ensure maintenance is conducted during the 2-year bonding period.