

Technical Memorandum #3



700 Washington Street
Suite 401
Vancouver, WA 98660
Phone (360) 737-9613
Fax (360) 737-9651

To: Clark County
From: Deanna Hutchinson / Tim Kraft
Copies:
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Subject: Stormwater Facility Maintenance Manual
Comparison
Project No.: 14505

To facilitate the update of the 2000 Clark County (CC) *Stormwater Facility Maintenance Manual* to meet the new NPDES permit, we compared the manual with Volume V, Section 4.6 (Maintenance Standards for Drainage Facilities) of the 2005 Department of Ecology (DOE) *Stormwater Management Manual for Western Washington* and identified all differences. Several patterns emerged during analysis:

- The CC Manual, but not the DOE Manual, includes OSHA safety standards for facilities that include confined spaces.
- The CC Manual tends to specify required inspection intervals, while the DOE Manual says “the inspection and maintenance schedules shall be adjusted to minimize the length of time that a facility is in a condition that requires a maintenance action (Vol. V p.4-30).”
- For all but one of the CC facilities, only a partial or simplified list of DOE repairs is provided. However, many of the CC facilities reference the CC Inspection Sheets, which we have evaluated separately to ensure they reflect DOE requirements.
- The CC Manual tends to require some form of inspection and removal of pollutant sources, while this is not addressed in the DOE Manual.
- Material handling was addressed in the CC Manual, but not in the DOE Manual.
- The remaining discrepancies vary between the DOE Manual or the CC Manual being more explicit. The majority of these differences occur under vegetation management and cleaning.

Tables of the differences between the CC Manual and the DOE Manual (for all the CC Manual facilities that have corresponding sections in the DOE Manual) are found below. Differences that may be considered significant have been highlighted in yellow. Most of the highlighted differences refer to DOE repair items that were omitted from the CC Manual if the CC Manual also did not refer to the activity sheets.

The CC Manual included all of the facilities in the DOE Manual. However, fourteen of the CC facilities are not listed in the DOE manual. These include:

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- Fences, Gates, and Water Quality Signs (p. 12)
- Access Roads and Easements (p. 13)
- Manholes (p. 14)
- Drywells (p. 34)
- Drainage Trenches (p. 36)
- Storm Pipe (p. 44)
- Dry Drainage Ditches (p. 46)
- Water-Bearing (base flow) Drainage Ditches (p. 48)
- Installation, Repair and Replacement of Enclosed Drainage Systems (p. 49)
- Minor Culvert Repair (Not in a Stream) (p. 51)
- Major Culvert Repair (at a Stream Crossing) (p. 52)
- Pavement Sweeping (p. 53)
- Vegetation and Pest Management in Stormwater Control Facilities (p. 55)
- Vegetation and Pest Management in Stormwater Facility Wetland Areas (p. 57)

Facility: Catch Basins and Inlets				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-36	8	Inspection	1	CC calls for inspections at least once a year. DOE gives no return interval.
			2	CC calls for periodic inspection of pollutant sources. Not discussed in DOE.
		Cleaning	1	CC more restrictive than DOE about allowable sediment depth.
			N/A	DOE lists additional cleaning requirements not found in CC such as catch basin opening and inlet and outlet pipes. Note: these appear in activity sheets (evaluated separately) along with sediment depth requirements.
		Safety	1	CC mentions special OSHA-required confined space equipment and procedures. Not discussed in DOE.
		Material Handling	1	CC requires disposal in accordance with federal, state, and local regulations. Not discussed in DOE.
			2	CC discusses how types of materials may be disposed of. Not discussed in DOE.
		Repairs	1 to 2	CC partially lists the DOE repairs and refers to activity sheets (evaluated separately).
Facility: Debris Barriers/Trash Racks				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-37	10	Inspection	1	CC calls for inspections at least once a year. DOE gives no return interval.
		Cleaning	1	CC requires Washington Department of Fish and Wildlife to be consulted if obstructions to fish passage are created. Not discussed in DOE.
		Repairs	1 to 4	CC partially lists the DOE repairs and refers to activity sheets (evaluated separately).

Facility: Energy Dissipaters				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-38	11	Inspection	1	CC calls for inspections at least once a year. DOE gives no return interval.
		Cleaning	N/A	DOE lists additional cleaning requirements not found in CC such as pipe perforations, catch basin opening, and inlet and outlet pipes. Note: these appear in activity sheets (evaluated separately).
		Repairs	1	CC partially lists the DOE repairs and refers to activity sheets (evaluated separately).
Facility: Oil/Water Separators and Buried Wetvaults				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-43, 4-48, 4-49	16	Inspection	1	CC calls for periodically checking stormwater flow out of the facility. This is listed in DOE for the oil/water separators (4-48 and 4-49) but not the wetvault (4-43).
			2	CC calls for annual inspection. DOE gives not return interval.
			3	CC calls for periodic inspection of pollutant sources. Not discussed in DOE.
			4	CC calls for water levels to be inspected after an extended dry period to check for leakage.
		Cleaning	2	CC calls for removing oil when it reaches 1" thickness. This is listed in DOE for the oil/water separators (4-48 and 4-49) but not the wetvault (4-43).
			3	CC more restrictive than DOE about allowable sediment depth for wetvault (4-43).
			N/A	DOE lists additional cleaning requirements not found in CC such as vault, pipe, and inlets/outlets. Note: these appear in activity sheets (evaluated separately) along with cleaning requirements listed above.
		Safety	1	CC mentions special OSHA-required confined space equipment and procedures. Not discussed in DOE.
		Material Handling	1 to 3	Entire subheading section listed in CC is not found in DOE.
		Repairs	1	CC more restrictive: CC requires repair of 1/4" cracks, DOE requires repair of 1/2" cracks.
			2 to 3	CC partially lists the DOE repairs and refers to activity sheets (evaluated separately).

Facility: StormFilter™ (Leaf Compost Filter)				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-47	18	Inspection	1	CC calls for StormFilter inspections every 6 months. DOE gives no return interval.
			2	CC calls for annual inspections of permanent structures. DOE gives no return interval.
			3	CC calls for periodic inspection of pollutant sources. Not discussed in DOE.
		Cleaning	1 to 3	CC lists the first 3 of the 4 DOE cleaning items (vault, settling chambers, filter media, and drain pipes and clean-outs).
		Safety	1	CC mentions special OSHA-required confined space equipment and procedures. Not discussed in DOE.
		Material Handling	1 to 3	Entire subheading section listed in CC is not found in DOE.
		Repairs	1 to 4	CC partially lists the DOE repairs and refers to activity sheets (evaluated separately).
Facility: Catch Basin Inserts				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-50	20	Inspection	1	CC discusses inspection intervals during wet and dry seasons. Not discussed in DOE.
			2	CC requires inspection after every major storm if trapping construction sediment. Not discussed in DOE.
			3	CC calls for periodic inspection and removal of pollutant sources. Not discussed in DOE.
		Cleaning	1	CC offers general cleaning instructions not included in DOE.
			4	CC calls for cleaning or replacement when sediment clogs the filter. DOE calls for maintenance when a sediment cap forms over the media.
		Material Handling	1 to 3	Entire subheading section listed in CC is not found in DOE.
		Repairs	N/A	CC does not list water saturated or oil saturated maintenance conditions that are listed in DOE. CC does not refer to the activity sheets.

Facility: Stormwater Biofiltration Swales				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-39	22	Inspection	1	CC calls for frequent visual inspections. DOE gives no return interval.
			2	CC calls for identification and removal of pollutant sources. Not discussed in DOE.
		Cleaning	2	CC more detailed than DOE regarding allowable amount of debris.
		Veg. Management	1	CC states preferred grass height of 6" (not found in DOE). CC Minimum height 4" (DOE minimum height is 3"). CC requires a minimum of 4 cuttings per year (not discussed in DOE).
			2	CC more specific about how and where to remove grass clippings than DOE.
			3	DOE more detailed than CC about when to reestablish vegetation.
			4	CC lists using cover BMPs (hydroseeding or mulches) on bare soils. Not discussed in DOE.
			5	CC discusses tree and shrubbery removal due to facility function or maintenance discussion. DOE only discusses tree or shrub trimming for facility function (remove excessive shading).
			6	CC prevents pesticide and fertilizer use. Not discussed in DOE.
		Repairs	1	CC discusses correcting the underlying problem for flooding or erosion before repairing the symptom. Not discussed in DOE.
			2 to 3	CC lists only some of the repair activities in DOE. CC does not refer to the activity sheets.

Facility: Wet Biofiltration Swales and Treatment Wetlands				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-40	24	Inspection	1	CC calls for frequent visual inspections. DOE gives no return interval.
			2	CC calls for identification and removal of pollutant sources. Not discussed in DOE.
		Cleaning	2	DOE more detailed than CC regarding litter and trash removal.
		Veg. Management	2	CC discusses drainage problems. Not discussed in DOE.
			3	CC discusses preserving and reestablishing vegetation outside of the treatment area and using cover BMPs. Not discussed in DOE.
			4	CC discusses tree and shrubbery removal due to facility function or maintenance discussion. Not discussed in DOE.
			5	CC prevents pesticide and fertilizer use. Not discussed in DOE.
		Repairs	1	CC discusses correcting the underlying problem for flooding or erosion before repairing the symptom. Not discussed in DOE.
			2	DOE more detailed than CC about preventing the swale from drying out during the wet season.
			N/A	CC does not discuss erosion/scouring issues present in DOE.
			3	CC calls for signage maintenance. Not discussed in DOE.

Facility: Filter Strips

DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-41	26	Inspection	1	CC calls for frequent visual inspections. DOE gives no return interval.
			2	CC calls for identification and removal of pollutant sources. Not discussed in DOE.
		Cleaning	2	CC specifically calls for hand removing sediment using a rake and shovel. Method not discussed in DOE.
		Veg. Management	1	CC states preferred grass height of 6" (not found in DOE). CC Minimum height 4" (DOE minimum height is 3"). CC requires a minimum of 4 cuttings per year (not discussed in DOE).
			2	CC calls for grass clippings to be removed. Not discussed in DOE.
			3	CC calls for preserving and reestablishing vegetation. Not discussed in DOE.
			4	CC calls for cover BMPs to be used on bare soils. Not discussed in DOE.
			5	CC prevents pesticide and fertilizer use. Not discussed in DOE.
		Repairs	1	CC discusses correcting the underlying problem before repairing the symptom. Not discussed in DOE.
			3	DOE more detailed than CC about erosion/scouring and the required repairs.

Facility: Sand Filters				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-44, 4-45	28	Inspection	1 to 3	Everything listed under inspection in CC not found in DOE.
		Cleaning	3	CC more restrictive: CC requires sediment removal from pre-settling chambers at 6" depth. DOE at sediment zone plus 6" depth.
		Veg. Management	1 to 3	Everything listed under vegetation management in CC not found in DOE.
		Safety	1	CC mentions special OSHA-required confined space equipment and procedures. Not discussed in DOE.
		Material Handling	1 to 2	Everything listed under materials handling in CC not found in DOE.
		Repairs	1	CC discusses correcting the underlying problem before repairing the symptom. Not discussed in DOE.
			5	CC lists sand filter erosion and repair. Not discussed in DOE.
			6	DOE more detailed than CC about damaged pipes.
			7	CC more restrictive than DOE about cracks. CC requires repair of 1/4" cracks. DOE requires repair of 1/2" cracks.
			8	DOE lists several repairs not listed in CC: short circuiting, erosion/damage to slopes, rock pad, and ventilation. CC refers to activity sheets (evaluated separately).

Facility: Detention Ponds				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-30	31	Inspection	1	CC calls for identification and reporting of pollutant sources. Not discussed in DOE.
		Cleaning	2 to 3	All but the first CC sentence not discussed in DOE.
		Material Handling	1	CC discussion of waste disposal not discussed in DOE.
		Veg. Management	1 to 5	These CC vegetation management items not discussed in DOE.
			7	CC does not discuss DOE requirements if a dead, diseased, or dying tree is identified.
			N/A	DOE lists what to do regarding poisonous vegetation and noxious weeds. Not discussed in CC.
		Repairs	1	CC discussion on bare areas not discussed in DOE.
			2	CC level spreader repair not discussed in DOE.
			3	CC requires checking with WA Dept. of Fish and Wildlife prior to removing a game animal of far-bearer such as a muskrat, beaver, or nutria. Not discussed in DOE.
			N/A	DOE discusses beaver dams, insects, side slope erosion, and piping not found in CC. CC does not refer to the activity sheets.

Facility: Infiltration Basins/Ponds				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-33, 4-42	38	Inspection	1	CC calls for an inspection once a year after a rainstorm to check drainage and annually for all features. DOE gives no return interval.
			2	CC discusses observation point checks if retention capacity is reduced. Not discussed in DOE.
			3	CC calls for identification and removal of pollutant sources. Not discussed in DOE.
		Cleaning	2	CC more restrictive about sediment removal than DOE.
			3	CC discusses sediment trap or wetponds not discussed in DOE.
		Material Handling	1	CC discussion of waste disposal not discussed in DOE.
		Veg. Management	1 to 4	These CC vegetation management items not discussed in DOE.
			5 to 6	CC discussion of trees found in DOE infiltration (4-33) but not DOE wetponds (4-42)
			N/A	DOE lists what to do regarding poisonous vegetation and noxious weeds. Not discussed in CC.
		Repairs	1	CC discusses overflow during design infiltration storms. Not discussed in DOE.
			2	CC discusses bare areas DOE discusses in wetponds (4-42) but not infiltration (4-33).
			3	CC discusses rodent holes discussed by DOE in infiltration (4-33) but not wetponds (4-42)
			N/A	DOE discusses filter bags, rock filters, pond side slopes, erosion, water level, and dikes/berms not found in CC. CC does not refer to the activity sheets.

Facility: Closed Detention Systems in Tanks or Vaults				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-34	40	Inspection	1	CC calls for annual inspection of features under Cleaning and Repairs. DOE gives no return interval.
			2	CC calls for identification and removal of pollutant sources. Not discussed in DOE.
		Cleaning	3	Disagreement: CC requires sediment removal if it is 10% depth of rectangular vault of 10% the diameter of a round tank or pipe. DOE requires sediment removal if it is 10% of the diameter of the storage area for 1/2 the length of the storage vault or exceeds 15% of the diameter at any point.
			N/A	CC does not list cleaning associated with catch basins. DOE does.
		Safety	1	CC mentions special OSHA-required confined space equipment and procedures. Not discussed in DOE.
		Material Handling	1 to 2	CC discussion of waste disposal not discussed in DOE.
		Repairs	1 to 5	CC contains no details on the repairs of manholes, ladders, and catch basins (discussed in DOE), but refers to activity sheets (evaluated separately).
Facility: Flow Control Structures/Flow Restrictors				
DOE Vol V Page	CC Page	CC Practices Subheading	CC Paragraph	Difference
4-35	42	Inspection	1	CC calls for annual inspection of features under Cleaning and Repairs or when facility experiences problems such as improper drainage. DOE gives no return interval.
		Safety	1	CC mentions special OSHA-required confined space equipment and procedures. Not discussed in DOE.
		Material Handling	1	CC discussion of waste disposal not discussed in DOE.
		Repairs	1	CC discussion about outlet orifices that are enlarged, bypassed, or damaged differs from DOE.
			3	CC discussion of vertical status of structure not addressed in DOE.
			5	CC cleanout discussion is much less detailed than DOE.
			7	CC prevents modification of outflow controls. Not discussed in DOE.
			8	CC does not discuss manhole or catch basin repair, but refers to activity sheets.