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Skagit County Auditor

**Permanent Stormwater Control Facilities
Operation and Maintenance (O&M) Manual**

for:

Baker Estates Short Plat

Located at:

***528 F & S Grade Road,
Sedro-Woolley, WA 98284***

Prepared for:

***Monte Petersen
525 F & S Grade Road,
Sedro-Woolley, WA 98284
PH: 360-661-5649***

Prepared by:

***Davido Consulting Group, Inc
2210 Riverside Drive, Suite #110
Mount Vernon, WA 98273
PH: 360.899.110***

***Grantor – Monte Petersen
Grantee – Sedro-Woolley Public
Parcel Number – P135580
Assessor Number –
Sec/Twp/Rng – NW ¼ of Section 23, T35N, R04E, Skagit County, WA***

Baker Estates Short Plat
Stormwater Operation and Maintenance Manual

Organization Responsible for Maintenance of the On-Site Storm System:

Monte Petersen (*their successors, or assigns)
525 F & S Grade Road, Sedro-Woolley, WA 98284
PH: 360-661-5649

The Location Where the Operation and Maintenance Manual is to be Kept:

A copy of the final, approved O&M Manual shall be kept on site (528 F & S Grade Road, Sedro Woolley, WA 98284) and at Monte Petersen's address, their successors or assigns.

The final, approved O&M Manual will be recorded in Skagit County at:

1800 Continental Place
Mount Vernon WA 98273
PH: 360-416-1800

*Inspection and maintenance requirements may change in the future, and this manual does not exempt this facility from any future changes in inspection and maintenance requirements.

Maintenance Responsibilities and Reporting:

All on-site permanent stormwater facilities (*infiltration trenches, yard basins*) shall be maintained in perpetuity in a manner that allows them to function as originally designed. The owner of the property, association, or its designated representative is solely responsible for the inspection, maintenance, repair, and replacement of all permanent stormwater facilities located on site and any and all costs associated therewith. The City of Sedro-Woolley is under no obligation to maintain or repair permanent stormwater facilities located on this site.

The owner, association or its designated representative shall submit an annual operation and maintenance report for the permanent stormwater facilities to the City of Sedro-Woolley Public Works Department on or before March 31st of each year for the previous year's inspection and maintenance activities. The report shall include any remedial actions taken, how the actions were completed, who performed them, any problems encountered, and any required follow-up actions such as maintenance, repair, or replacement. Annual report and other maintenance records shall be maintained on-site and available to the City upon request.

The City shall have the right to enter onto the property for inspection and compliance purposes. Should inspection reports (either by the property owner, association or by the City) indicate the permanent stormwater facilities are not being properly maintained or show signs of failure and the property owner has not remedied any maintenance standards exceedances, the City of Sedro-Woolley reserves the right but not the obligation to perform work that is necessary to maintain the permanent stormwater facilities that has not been performed by the property owner, and recover any and all costs so incurred by the City from the property owner. Failure to

Baker Estates Short Plat
Stormwater Operation and Maintenance Manual

properly maintain the permanent stormwater facilities may also result in City levied fines in accordance with Sedro-Woolley Municipal Code Title 13, Chapter 13.40.

Description of the On-Site Storm System:

The on-site storm system for the Baker Estates Short Plat site consists of stormwater Best Management Practices (BMPs) including yard basins and BMP T7.20: Infiltration trenches. Stormwater runoff from the proposed shared driveway and parking area shall sheet flow into the proposed infiltration trenches for full infiltration. Stormwater runoff from roofs shall be tightlined via downspouts to yard basins and then conveyed into the infiltration trenches for storage and full infiltration. All onsite stormwater facilities are privately owned and therefore privately maintained.

Record drawings should be consulted during maintenance, inspection, and repair activities. Record drawings shall be kept at the City of Sedro-Woolley offices.

Description of On-Site BMP Facilities:

Yard Basin:

Yard basins are designed to service roof downspouts' stormwater. They also allow small debris, soil, garbage, etc. to collect in the basin and be manually removed during maintenance.

Yard basins will be used to service stormwater runoff from roofs before being conveyed into infiltration trenches. The yard basin can be found on Details Sheet C11 in the Civil Plan Set. See **Figure 1** below for this detail.

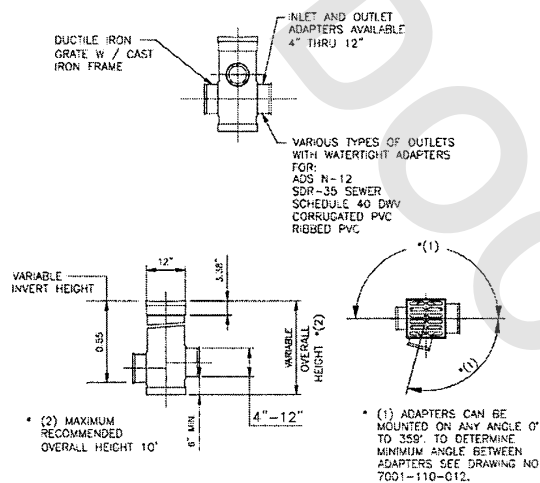


Figure 1 Yard Basin

Baker Estates Short Plat
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BMP T7.20: Infiltration Trench:

Infiltration trenches are trenches constructed to be at least 24 inches wide and filled with coarse aggregate to allow for stormwater storage and infiltration into the surrounding soils.

Six infiltration trenches shall be placed on site. 1 infiltration each, is proposed for the roof runoff from Lots 1, 2, and 4. These infiltration trenches will include a cleanout on one end with a yard drain on the other end creating a connection point for roof runoff. Runoff from the driveway and parking area shall sheet flow into three infiltration trenches along the driveway's western edge. The infiltration trench detail can be found on Details Sheet C09 in the Civil Plan Set. See Figure 2 below for this detail.

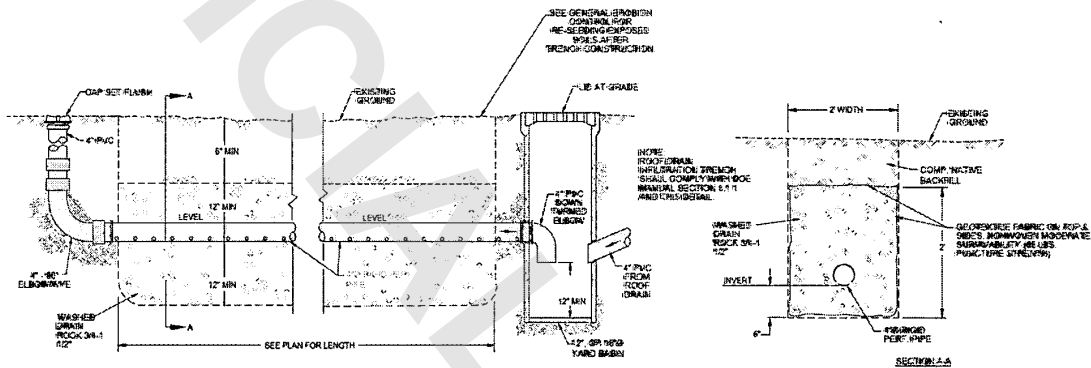


Figure 2 Infiltration Trench

Maintenance Procedures:

Yard Basins:

All yard basins on site connected to infiltration trenches shall follow maintenance standards listed in Table V-A.5 of the Stormwater Management Manual for Western Washington attached to this report. Following these procedures shall be important to ensure stormwater runoff can discharge through the perforated pipes in the aggregate storage layer connected to the yard basins.

BMP T7.20: Infiltration Trench:

Infiltration trenches servicing roof runoff shall be serviceable via a 4" cleanout. Maintenance shall be performed on the perforated transfer pipe via the 4" cleanout when the infiltration trench is not fully infiltrating runoff.

Additional maintenance procedures attached:

Volume V-A: BMP Maintenance Tables of the 2019 Stormwater Management Manual for Western Washington

Table VA.5: Maintenance Standards - Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Trash & Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%. Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe. Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height. Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No Trash or debris located immediately in front of catch basin or on grate opening. No trash or debris in the catch basin. Inlet and outlet pipes free of trash or debris. No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin
Catch Basin Cover	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (Intent is to make sure no material is running into basin). Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Top slab is free of holes and cracks. Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound. Groat filler has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Basin replaced or repaired to design standards. Pipe is regrouted and secure at basin wall.
	Settlement/ Mis-alignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening. Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation blocking opening to basin. No vegetation or root growth present.
	Contamination and Pollution	See <u>Table V-A.1: Maintenance Standards - Detention Ponds</u>	No pollution present.
	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Cover/grate is in place, meets design standards, and is secured
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
	Metal Grates (If Applicable)	Grate opening Unsafe Trash and Debris Damaged or Missing.	Grate free of trash and debris. Grate opening meets design standards. Grate is in place, meets the design standards, and is installed and aligned with the flow path.

Table V-A.1: Maintenance Standards - Detention Ponds (continued)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
	Liner (if Applicable)	Liner is visible and has more than three 1/4-inch holes in it.	Liner repaired or replaced. Liner is fully covered.
	Settlements	Any part of berm which has settled 4 inches lower than the design elevation. If settlement is apparent, measure berm to determine amount of settlement. Settling can be an indication of more severe problems with the berm or outlet works. A licensed engineer in the state of Washington should be consulted to determine the source of the settlement.	Dike is built back to the design elevation.
	Pond Berms (Dikes)	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.)	Piping eliminated. Erosion potential resolved.
	Emergency Overflow/Spillway and Berms over 4 feet in height	Tree growth on emergency spillways creates blockage problems and may cause failure of the berm due to uncontrolled overtopping. Tree growth on berms over 4 feet in height may lead to piping through the berm which could lead to failure of the berm. Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.)	Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. A licensed engineer in the state of Washington should be consulted for proper berm/spillway restoration. Piping eliminated. Erosion potential resolved.
	Emergency Overflow/Spillway	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of our flow path of spillway. (Rip-rap on inside slopes need not be replaced.)	Rocks and pad depth are restored to design standards.
	Erosion	See "Side Slopes of Pond"	

Table V-A.2: Maintenance Standards - Infiltration

Conditions When Maintenance is Needed

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash & Debris	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
	Poisonous/Noxious Vegetation	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
	Contaminants and Pollution	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
	Rodent Holes	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
Storage Area	Sediment	Water ponding in infiltration pond after rainfall ceases and appropriate time allowed for infiltration. Treatment basins should infiltrate Water Quality Design Storm Volume within 48 hours, and empty within 24 hours after cessation of most rain events.	Sediment is removed and/or facility is cleaned so that infiltration system works according to design.

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
		(A percolation test pit or test of facility indicates facility is only working at 90% of its designed capabilities. Test every 2 to 5 years. If two inches or more sediment is present, remove).	
Filter Bags (if applicable)	Filled with Sediment and Debris	Sediment and debris fill bag more than 1/2 full.	Filter bag is replaced or system is redesigned.
Rock Filters	Sediment and Debris	By visual inspection, little or no water flows through filter during heavy rain storms.	Gravel in rock filter is replaced.
Slide Slopes of Pond	Erosion	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
Emergency Overflow Spillway and Berms over 4 feet in height.	Tee Growth	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
	Piping	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
Emergency Overflow Spillway	Rock Missing	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
	Erosion	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
Pre-settling Ponds and Vaults	Facility or sump filled with Sediment and/or debris	6" or designed sediment trap depth of sediment.	Sediment is removed.

Table V-A.2: Maintenance Standards - Infiltration (Continued)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Storage Area	Plugged Air Vents	One-half of the cross section of a vent is blocked at any point or the vent is damaged.	Vents open and functioning.
	Debris and Sediment	Accumulated sediment depth exceeds 10% of the diameter of the storage area for 1/2 length of storage vault or any point depth exceeds 15% of diameter. (Example: 72-inch storage tank would require clearing when sediment reaches depth of 7 inches for more than 1/2 length of tank.)	All sediment and debris removed from storage area.
	Joints Between Tank/Pipe Section	Any openings or voids allowing material to be transported into facility. (Will require engineering analysis to determine structural stability).	All joint between tank/pipe sections are sealed.
Storage Area	Tank/Pipe Bent Out of Shape	Any part of tank/pipe is bent out of shape more than 10% of its design shape. (Review required by engineer to determine structural stability).	Tank/pipe repaired or replaced to design.
	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch and any evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determines that the vault is not structurally sound. Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or any evidence of soil particles entering the vault through the walls.	Vault repaired or replaced to design specifications and is structurally sound. No cracks more than 1/4-inch wide at the joint of the inlet/outlet pipe.

Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)



PERMANENT STORMWATER FACILITY PERMIT ANNUAL REPORTING FORM

City of Sedro-Woolley
Public Works Department
RE: Permanent Stormwater Facilities Permit – Annual Reporting
325 Metcalf Street, Sedro-Woolley, WA 98284
Phone: 360-855-0771

This form must be completed and the certification signed by the Owner, its administrator, executor, successor, heir or assign. One signed copy of the completed Annual Report, including attachments, shall be submitted to the Public Works Department by March 31st for the year prior.

GENERAL INFORMATION	
Owner Name (<input type="checkbox"/> check if new):	Reporting Period:
Facility Address:	Jan. 1 st to Dec 31 st _____
Contact Person (<input type="checkbox"/> check if new) Name: Phone Number (<input type="checkbox"/> check if new): Mailing Address (<input type="checkbox"/> check if new):	* Reports for each year are due to the City by Mar. 31 st of the following year.
Have there been any major changes to or maintenance on the BMPs?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Does the BMP have any major deficiencies?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Do you have an updated Inspection and Maintenance Plan?	<input type="checkbox"/> YES <input type="checkbox"/> NO

"I certify that to the best of my knowledge and belief the maintenance and inspection of the permanent BMPs is being implemented in accordance to the Stormwater Facility Operation and Maintenance Plan for this property or that a notice of any deficiencies has been provided."

Signature

Date

ATTACHMENTS:

Inspection Log/Certification

[Attach additional information as needed. Remedial actions taken, how they were completed, and who performed them. Deficiencies to the BMPs, or problems encountered.]