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Return to: Birdsvie Estates, LLC
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COVER SHEET
OPERATION AND MAINTENANCE MANUAL
STORMWATER COLLECTION SYSTEM AND INFILTRATION SYSTEM

GRANTOR: Birdsvie Estates LLC

GRANTEE: Skagit County

LEGAL DESCRIPTION

Portion of the Northeast $\frac{1}{4}$ of the Northwest $\frac{1}{4}$ of Section 17, Township 35 North, Range 7 East, W.M.

ASSESSOR'S PROPERTY TAX PARCEL NUMBER P42915 & P42916

BIRDSVIEW ESTATES

OPERATION AND MAINTENANCE MANUAL

FOR THE STORMWATER COLLECTION SYSTEM AND INFILTRATION SYSTEM

AUGUST 19, 2009



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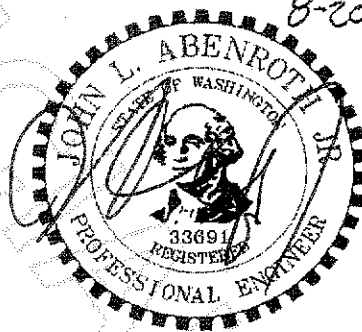
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OPERATION AND MAINTENANCE MANUAL

For

BIRDSVIEW ESTATES

Prepared by:



for

STORMWATER COLLECTION AND INFILTRATION SYSTEM

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EXHIBITS:

MAINTENANCE LOG
CONSTRUCTION PLAN SHEET



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A. PURPOSE OF MANUAL

The purpose of this manual is to outline the procedures for the proper operation and maintenance of the stormwater facilities for BIRSDVIEW ESTATES as required to be maintained by the BIRSDVIEW ESTATES lot owners.

Lot owners in BIRSDVIEW ESTATES have the responsibility for maintenance and repairs of the infiltration stormwater facilities within the plat of BIRSDVIEW ESTATES. The Skagit County Public Works Department will maintain the roads, culverts, and ditches including the side slopes.

This manual is the mechanism for the maintenance of the stormwater infiltration facilities.

II. PURPOSE OF FACILITY

In the development of the residential lots for BIRSDVIEW ESTATES, the natural drainage of the area was changed by the construction of the roads and houses. Instead of rain falling on trees and grass and percolating into the soil, some of the rain will fall on roads and roofs and quickly run off to the infiltration facility. The infiltration of the stormwater mitigates for this increase.

III. LAYOUT OF FACILITY

The stormwater system for BIRSDVIEW ESTATES basically is comprised of two parts, the collection system and the infiltration system.

The Exhibit "A" is a copy of sheet 2 of the construction drawings for the plat of BIRSDVIEW ESTATES. This shows the drainage easements within which the lot owners have legal right of access for maintenance purposes. The infiltration facilities are located within these easements across the front of lots 15, 16, 17, 18, 23, and 24.

IV. FUNCTION OF FACILITIES

A. ROAD DITCHES

The roadside ditches culvert crossings, and catch basins within the Right-of-Way are to be maintained by Skagit County Public Works. These should be kept vegetated and free of erosion or silt as they convey stormwater runoff to the infiltration facility. Poor maintenance of these could result in additional silt and sediment entering the infiltration facility resulting in failure of the system.



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B. CATCH BASINS

Prior to flowing into the infiltration system, the stormwater flows through a final privately maintained catch basin. This provides for a collection point for the sedimentation the stormwater. This control is provided by slowing down the velocity of the water in a pool inside the catchbasin. Catch basins should be maintained as described later in this manual.

C. INFILTRATION

The infiltration system is designed and sized to store and infiltrate stormwater runoff from the plat. The attached construction drawing shows the layout of the system. Maintenance requirements are listed later in this manual.

V. NORMAL OPERATING PROCEDURES

The stormwater collection and infiltration system is designed to function such that when a rainstorm comes, the water is collected and flows through the ditches and culverts to the infiltration system. The main operating procedure is to periodically inspect and verify that nothing has plugged the culverts or inlet grates. It is important that this and all other operating procedures be recorded.

The infiltration system should be inspected to verify that stormwater is receding after large storm. By looking down the inside of the adjacent catchbasin the water level can be monitored.

The County may wish to see a record of operating and maintenance procedures actually performed. A copy of a master form for keeping this log is attached.

An additional inspection should be performed after a very heavy rain. This way you will make sure everything worked properly and the system is ready for the next rainstorm. Be sure to log all of your inspection items on the attached log form.



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VI. MAINTENANCE OF FACILITY

Routine maintenance is an important part of any stormwater system. The following tables are copied from the 2005 DOE Manual. The major facilities listed below should be inspected and maintained as described. All other drainage features should also be regularly inspected (every 6 months or more frequently) and maintained as needed to maintain the effectiveness of the drainage system as a whole.

Project: BIRDSVIEW ESTATES

No. 2 – Infiltration

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Storage Area	Sediment	Water ponding in infiltration pond after rainfall ceases and appropriate time allowed for infiltration. (A percolation test pit or test of facility indicates facility is only working at 90% of its designed capabilities. If two inches or more sediment is present, remove).	Sediment is removed and/or facility is cleaned so that infiltration system works according to design.
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.
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.
General	Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size garbage can). In general, there should be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.	Trash and debris cleared from site.



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No. 5 – 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%.	No Trash or debris located immediately in front of catch basin or on grate opening.
		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.	No trash or debris in the catch basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	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
	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).	Top slab is free of holes and cracks.
		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	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.	Basin replaced or repaired to design standards.
		Grout fillet 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.	Pipe is regouted and secure at basin wall.
	Settlement/ Misalignment	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.	No vegetation blocking opening to basin.
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.



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No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
	Contamination and Pollution	See "Detention Ponds" (No. 1).	No pollution present.
Catch Basin Cover	Cover Not In Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed
	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	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	Grate, with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

VII. RECORD KEEPING

As explained in the previous sections, it is important to keep a log of all inspections and maintenance performed. This log is to be available for inspection by the Skagit County Public Works Department. This log should be kept up to date and in a binder, ready for any unexpected inspection.

IX. EMERGENCIES

If there is a situation, such as a major oil spill into your collection system, or if there is any other type of major damage to the stormwater collection or infiltration system, contact Skagit County Public Works Department at 360-336-9400 and report it to them. Inform the County what happened and what will be done to remedy it.

If any major repairs are necessary make sure they are done consistent with the initial construction plans.



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Maintenance Log

Blank lined paper with a large diagonal watermark reading "DRAFT" and "Copyright © 2014".



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OPERATION AND MAINTENANCE MANUAL
STORMWATER COLLECTION SYSTEM AND INFILTRATION SYSTEM

Grantor covenants that they own the property legally described herein and has lawful right to set in place this Operation and Maintenance Manual for the Birdsvie Estates Plat.

Owner:


Birdsvie Estates, LLC

State of Washington
County of Skagit

I certify that I know or have satisfactory evidence that Daniel R. Madlung is the person who signed this instrument, and said person acknowledged that he signed instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the Managing Member of Birdsvie Estates, LLC to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.



Dated 6-9-2010


Signature

Notary Kimberly Ann Kane

Title Notary

My appointment expires 7-19-2011



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