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Skagit County Auditor  
3/29/2018 Page

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

for:

*Nicholas Court Apartments*

Located at:

*665 Cook Road*

Prepared for:

***Rubicon Development LLC***

Prepared by:

*Sound Development Group, LLC*

*Grantor – Rubicon Development LLC  
133 State Street #34  
Sedro-Woolley, WA 98284*

*Grantee – Sedro-Woolley Public  
Parcel Number – P76912  
Sec/Twp/Rng - Section 23, Township 35 North, Range 4 East*

**STORMWATER SYSTEM MAINTENANCE PLAN  
FOR  
Nicholas Court Apartments**

The stormwater drainage system designed and constructed for the Nicholas Court Development, is located within the roadway/parking corridor, as well as south of Building 7.

Maintenance of the drainage system is of primary importance in order to ensure that the infiltration trenches function as originally designed. It is the sole responsibility of the property owner to maintain and repair the systems, as required.

The system shall be maintained in conformity with applicable sections of the Stormwater Management Manual for Western Washington (excerpts attached), and the requirements of the City of Sedro-Woolley. See attached checklists for requirements.

The Owner shall:

1. Keep and maintain a copy of the drainage plan drawings and of the Maintenance Plan, and use them for reference and guidance in fulfilling all maintenance obligations.
2. Inspect and clean, as required, the stormwater facilities. One inspection shall occur during the month of September and the other during the month of April – the beginning and end of the rainy season.
3. After each major storm event, the owner or owner's representative, shall inspect the stormwater facilities. Corrective action shall be promptly taken as dictated by the circumstances.
4. Use the attached checklist (or similar document) to record inspections. This written log is to be kept of operation, inspection, and repair as well as any chemical applications, including the action taken (inspection, repair, application, etc.), date performed and by whom.
5. Ensure Lawns and landscaping around the homes is maintained by mowing and removing the clippings. Lawn clippings and yard waste shall not be disposed of on site.

**Maintenance Responsibilities and Reporting**

All on-site permanent stormwater facilities (catch basins, pipes and bioretention cells) shall be maintained in perpetuity in a manner that allows them to function as originally designed. The owner of the property or it's 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 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 January 31<sup>st</sup> 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 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.

Maintenance of Bioretention Cells

Date Inspected: \_\_\_\_\_

Frequency	Maintenance Component	Defect	Condition When Maintenance is needed	Results Expected When Maintenance is Performed
M	General	Trash and Debris (Includes Sediment)	Any trash and debris which exceed 5 cubic feet per 1000 square feet (approximately 1 std size garbage can) shall be removed. Trash not meeting this volume should be removed monthly.	Trash and debris cleared from pond.
		Poisonous/Noxious Vegetation	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public.	No danger of poisonous vegetation where maintenance personnel or the public might normally be.
		Contaminants and Pollution	Any evidence of noxious weeds as defined by the State of Washington or Whatcom County.	Complete eradication of noxious weeds may not be possible, compliance with State and Whatcom County eradication policies required.
		Rodent Holes	Any evidence of oil, gasoline, contaminants or other pollutants.	No Contaminants or Pollutants present.
		Insects	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through rodent holes.	Rodents destroyed and berm repaired.
		Tree Growth and Hazard trees	When insects such as wasps and hornets interfere with maintenance activities.	Insects destroyed or removed from site. Apply insecticides in compliance with State and Whatcom County policies.
		Erosion	Tree growth that does not allow maintenance access or interferes with maintenance activity.	Trees do not hinder maintenance activities. Harvested trees should be recycled into mulch or other beneficial uses. Remove hazard trees.
		Sediment	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted berm embankment.	Slopes should be stabilized using appropriate
		Emergency Overflow	Accumulated sediment that exceeds 10% of the designed pond depth unless otherwise specified or affects inletting or outletting condition of the facility. Emergency overflow / Spillway is the catch basin within each cell. CB beehive inlet shall be clear of trash, and blockages.	Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion. Overflow CB's are 100% clear of blockages, silt and trash.

Maintenance of Bioretention Cells

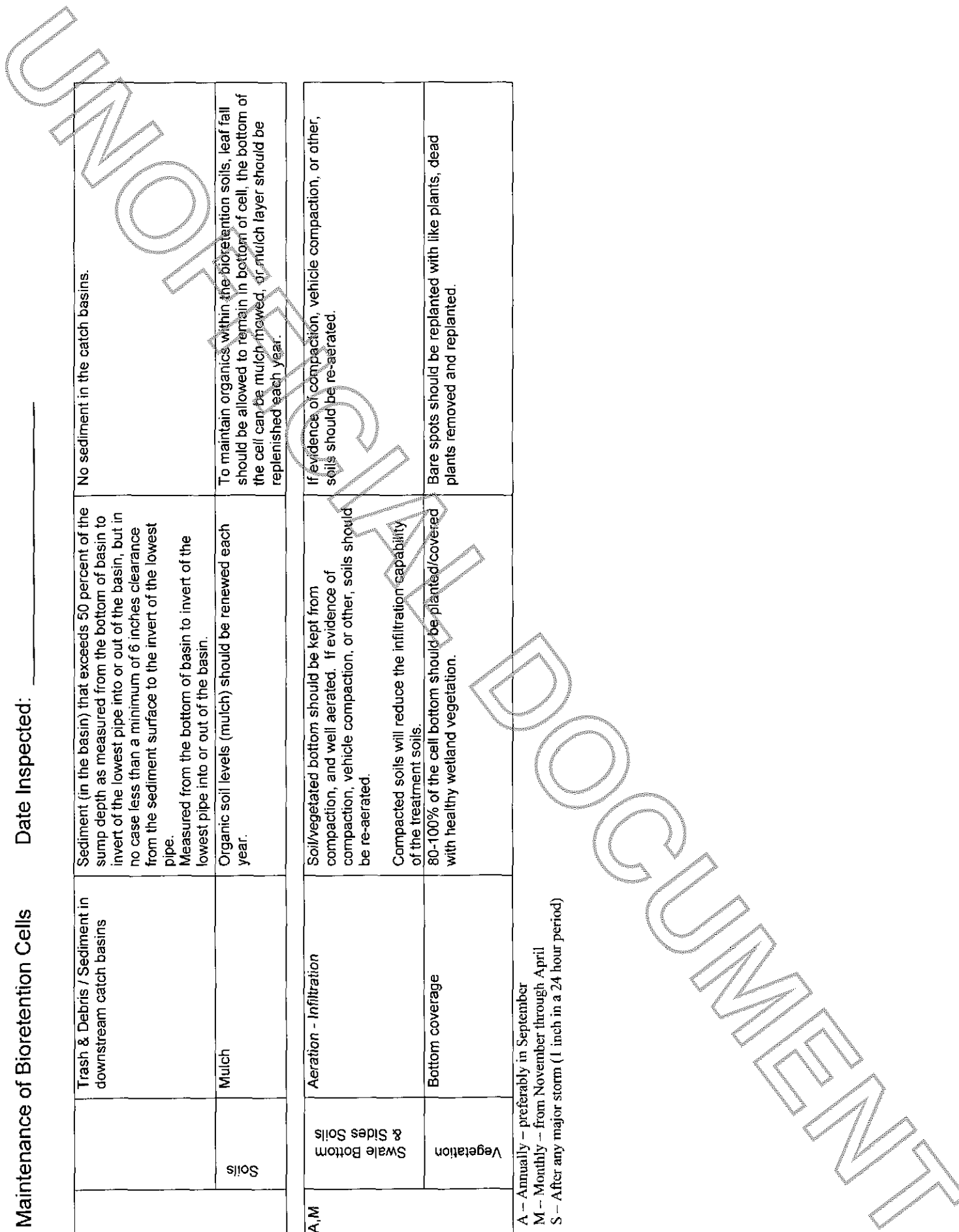
Date Inspected: \_\_\_\_\_

	Trash & Debris / Sediment in downstream catch basins	Sediment (in the basin) that exceeds 50 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. Measured from the bottom of basin to invert of the lowest pipe into or out of the basin.	No sediment in the catch basins.
	Soils Mulch	Organic soil levels (mulch) should be renewed each year.	To maintain organics within the bioretention soils, leaf fall should be allowed to remain in bottom of cell, the bottom of the cell can be mulch mowed, or mulch layer should be replenished each year.
A, M	Aeration - Infiltration Swale Bottom & Sides Soils	Soil/vegetated bottom should be kept from compaction, and well aerated. If evidence of compaction, vehicle compaction, or other, soils should be re-aerated.  Compacted soils will reduce the infiltration capability of the treatment soils.	If evidence of compaction, vehicle compaction, or other, soils should be re-aerated.
	Vegetation Bottom coverage	80-100% of the cell bottom should be planted/covered with healthy wetland vegetation.	Bare spots should be replanted with like plants, dead plants removed and replanted.

A - Annually - preferably in September

M - Monthly - from November through April

S - After any major storm (1 inch in a 24 hour period)



Maintenance of Catch Basins and Control Structure

Date Inspected: \_\_\_\_\_

Frequency	Maintenance Component	Defect	Condition When Maintenance is needed	Results Expected When Maintenance is Performed
M S	General	Trash and Debris (includes Sediment)	Material exceeds 25% of sump depth or 1 foot below orifice plate.	Control structure orifice is not blocked. All trash and debris removed.
		Structural Damage	Structure is not securely attached to manhole wall. Structure is not in upright position (allow up to 10% from plumb) Connections to outlet pipe are not watertight and show signs of rust. Any holes—other than designed holes—in the structure Clean out gate is not watertight or is missing. Gate cannot be moved up and down by one maintenance person. Chain/rod leading to gate is missing or damaged. Gate is rusted over 50% of its surface area. Control device is not working properly due to missing out of place, or bent orifice plate Any trash, debris, sediment, or vegetation blocking the plate.	Structure securely attached to walk and outlet pipe. Structure in correct position Connections to outlet pipe are water tight; structure repaired or replaced and works as designed. Structure has no holes other than designed holes. Gate is watertight and works as designed. Gate moves up and down easily and is watertight Chain is in place and works as designed Gate is repaired or replaced to meet design standards. Plate is in place and works as designed.
	Clean out Gate	Damaged or missing		
	Orifice Plate	Damaged or missing		
	Overflow pipe	Obstructions		
	General	Obstruction Trash & Debris	Any trash or debris blocking (or having the potential of blocking) the overflow pipe 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).	Pipe is free of all obstruction and works as designed. 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.

Maintenance of Catch Basins and Control Structure

Date Inspected: \_\_\_\_\_

Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of the 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.  Measured from the bottom of basin to invert of the lowest pipe into or out of the basin. Top slab has holes larger than 2 square inches or cracks wider than ¼ inch	No sediment in the catch basin.  Top slab is free of holes and cracks.
Structure Damage to Frame and/or Top Slab	(Intent is to make sure no material is running into basin). Frame not sitting flush on top slab, i.e., separation of more than ¾ 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.  Grout fillet has separated or cracked wider than ½ 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 regouted and secure at basin wall.
Settlement/ Misalignment Vegetation	If failure of basin has created a safety, function, or design problem. 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.	Basin replaced or repaired to design standards.  No vegetation blocking opening to basin.  No vegetation or root growth present.
Contamination and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.	No pollution present.
Cover not in place.	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed.
Locking Mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. bolts into frame have less than ½ 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.

A  
Catch Basin Cover

# Maintenance of Catch Basins and Control Structure

Date Inspected: \_\_\_\_\_

A	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.
M	Outlet Pipe	Trash, Debris, Beaver dam	Trash, debris or any signs of beaver dam activity shall be removed upon inspection.	Outlet is free of trash, debris, or beaver dam blockage.
A	Metal Grates (if Applicable)	Grate Opening unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
M		Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
A		Damaged or Missing	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

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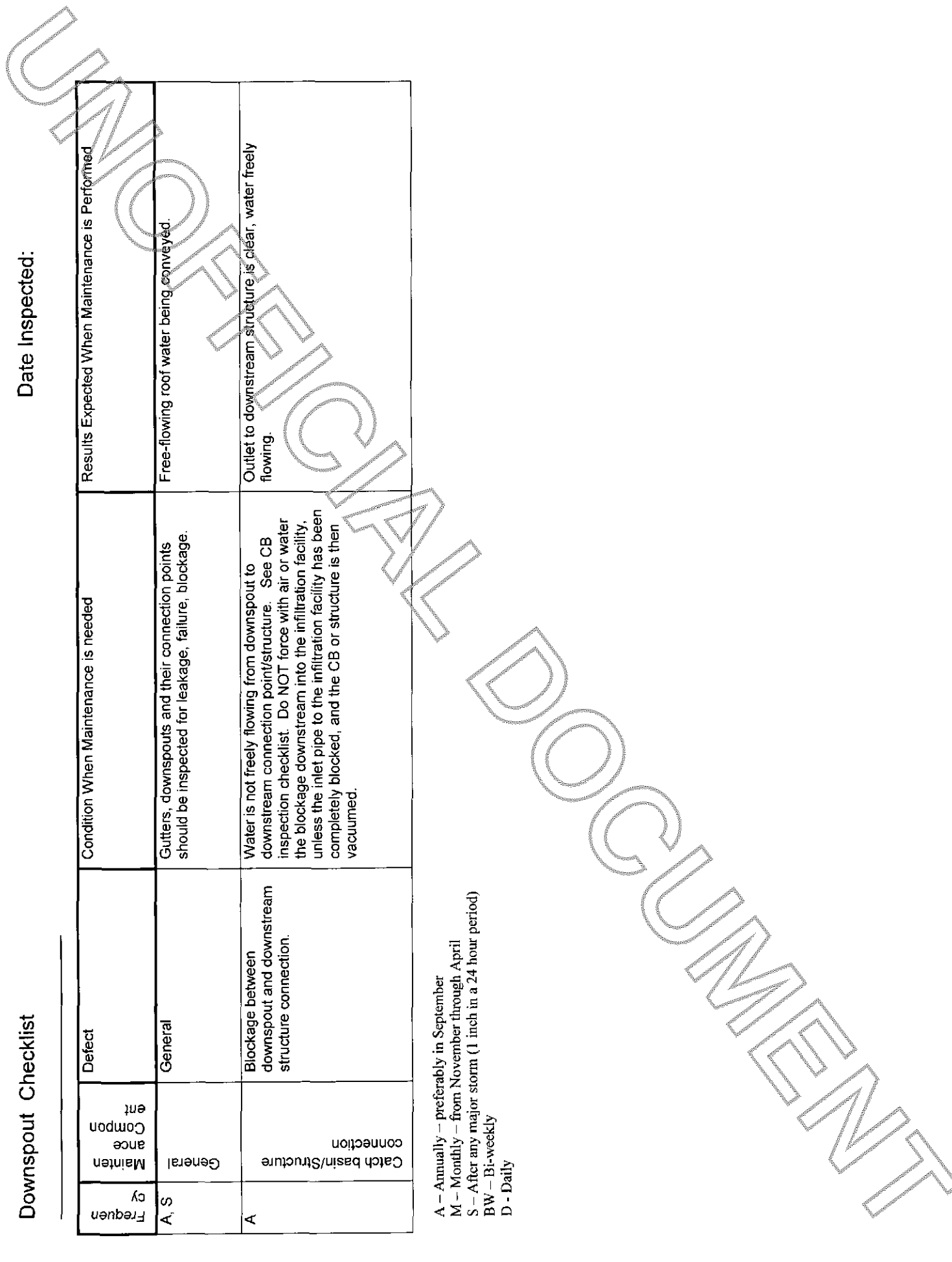


# Downspout Checklist

Date Inspected: \_\_\_\_\_

Frequency	Maintenance Component	Defect	Condition When Maintenance is needed	Results Expected When Maintenance is Performed
A, S	General	General	Gutters, downspouts and their connection points should be inspected for leakage, failure, blockage.	Free-flowing roof water being conveyed.
A	Catch basin/Structure connection	Blockage between downspout and downstream structure connection.	Water is not freely flowing from downspout to downstream connection point/structure. See CB inspection checklist. Do NOT force with air or water the blockage downstream into the infiltration facility, unless the inlet pipe to the infiltration facility has been completely blocked, and the CB or structure is then vacuumed.	Outlet to downstream structure is clear, water freely flowing.

- A - Annually - preferably in September
- M - Monthly - from November through April
- S - After any major storm (1 inch in a 24 hour period)
- BW - Bi-weekly
- D - Daily



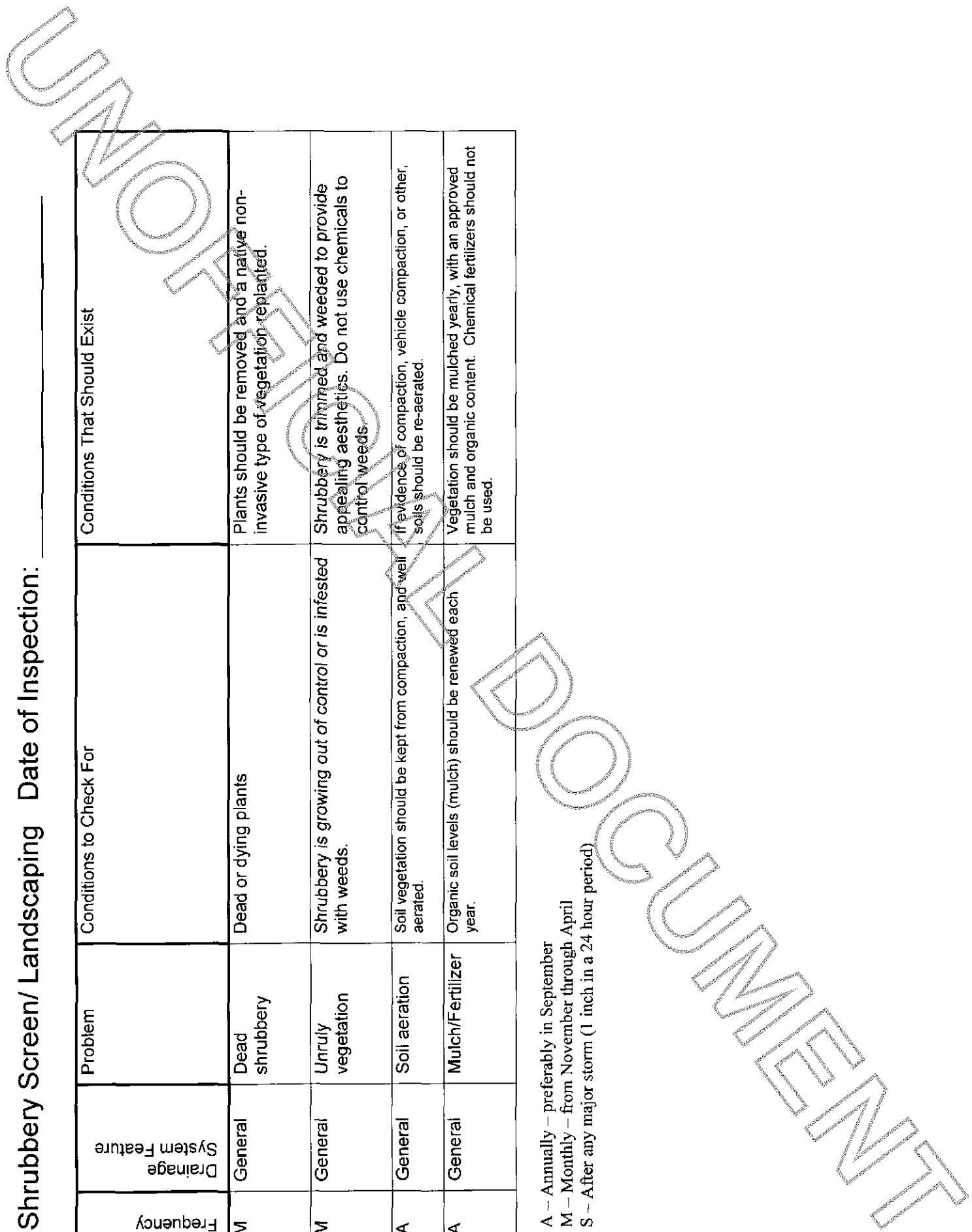
Shrubbery Screen/ Landscaping Date of Inspection: \_\_\_\_\_

Frequency	Drainage System Feature	Problem	Conditions to Check For	Conditions That Should Exist
M	General	Dead shrubbery	Dead or dying plants	Plants should be removed and a native non-invasive type of vegetation replanted.
M	General	Unruly vegetation	Shrubbery is growing out of control or is infested with weeds.	Shrubbery is trimmed and weeded to provide appealing aesthetics. Do not use chemicals to control weeds.
A	General	Soil aeration	Soil vegetation should be kept from compaction, and well aerated.	If evidence of compaction, vehicle compaction, or other, soils should be re-aerated.
A	General	Mulch/Fertilizer	Organic soil levels (mulch) should be renewed each year.	Vegetation should be mulched yearly, with an approved mulch and organic content. Chemical fertilizers should not be used.

A – Annually – preferably in September

M – Monthly – from November through April

S – After any major storm (1 inch in a 24 hour period)



# Structure Checklist

Inspection Date: \_\_\_\_\_

Catch Basin / Structure / Item	Inspector's Initials	Inspection notes and actions taken
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