

High Point Community

Natural Drainage and Landscape Maintenance Guidelines For Right-of-way and Open Space



High Point Community Landscape Maintenance Guidelines



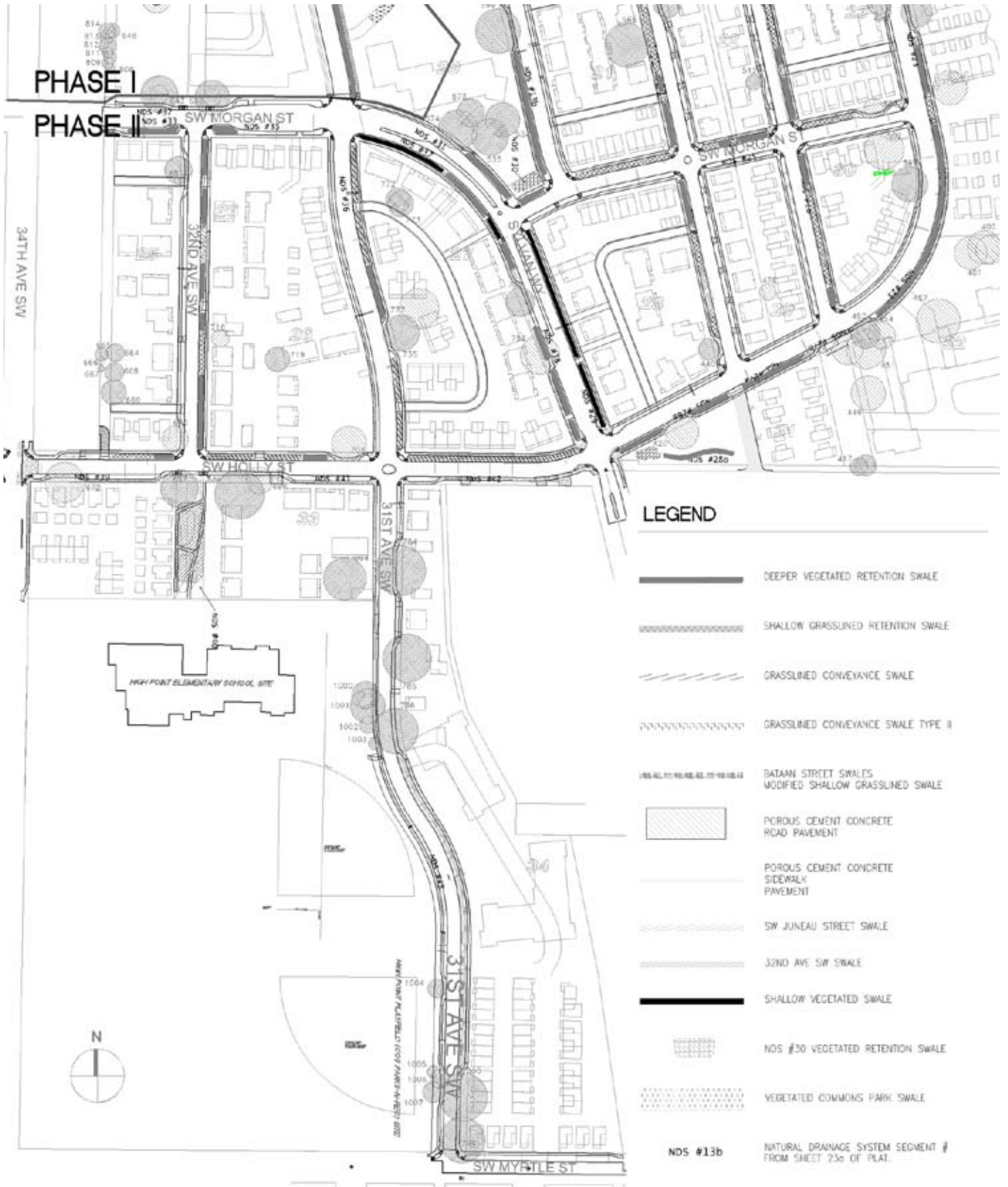
High Point Community Maintenance Responsibilities Plan



High Point Community NDS Swales Plan



High Point Community Landscape Maintenance Guidelines



High Point Community Landscape Maintenance Guidelines





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High Point Community Landscape Maintenance Guidelines



1 INTRODUCTION

Natural Drainage Infrastructure

The *Right-of-way (ROW)* and *open space* landscape at High Point Community consists of parks, tree-lined streets, grass planting strips, and pockets of shrub and ground cover plantings. These elements not only serve to enhance and unify the neighborhood, they also provide a natural drainage function. This natural drainage approach to *stormwater* management utilizes conveyance and treatment structures that mimic the functions of natural systems such as streams and wetlands, through the use of soil, grading, and vegetation.

The High Point Community is located within a sub-basin of the Longfellow Creek *Watershed*. Because stormwater drainage from the High Point Community is a significant contributor to the Longfellow Creek system, the natural systems drainage approach was incorporated into the *infrastructure* of the new community to enhance *water quality* and reduce peak flows draining to the creek. High Point Community's drainage goals, defined in the Drainage Covenant and the Plat of High Point Community, are achieved through a combination of public stormwater control systems and private drainage facilities. The Natural Drainage System (NDS) is a combination of grass-lined and vegetated *swales* located in the ROW that receive street and residential stormwater runoff. This system allows stormwater to infiltrate into the soil then conveys excess stormwater through the swales to a pond that serves this drainage basin.

Natural Landscape Approach

Long-term maintenance of the High Point Community landscape will utilize a natural approach, conforming to the most current *integrated pest management (IPM)* techniques in use by the City of Seattle and King County. Using a natural landscape approach supports long-term NDS functions, reduces maintenance efforts, minimizes negative impacts on the Longfellow Creek watershed, improves the longevity and health of plantings, and enhances the quality of the environment for people who reside in the neighborhood.

High Point Community's natural landscape approach for the ROW and open spaces includes the following objectives:

- Protect the aesthetic and functional values of the Natural Drainage System.
- Use ecological methods to maintain the landscaping.
- Maintain to support an attractive, safe and user-friendly landscape.
- Protect and enhance the natural character of plantings.
- Minimize water and material waste.

Maintenance Guidelines

This manual provides the Maintenance Association with a guide to maintain the landscape and soils within the ROW and open space areas. It is a working and living document and is not intended to be an exhaustive or stand alone maintenance resource. In addition to following standard horticultural and best management practices, High Point Community maintenance should be adaptive, adjusting in response to what is learned on-site and current industry best practices.

A glossary of terms (shown in *italics*) is located in Section 9. For additional information on maintenance techniques, materials, tree preservation guidelines, plant selection and other related topics see:

- **Section 10 - Recommended Publications**
- **Section 11 - Additional Resources**
- **Section 12 - Current Tree Survey & Preservation Code**
- **Section 13 - Maps**
- **Section 14 - Included Documents**

⇒ *This icon indicates resources for further information on a particular topic. Print outs are located in Included Documents, Section 13. Related websites are listed in the Resources section.*

High Point Community Landscape Maintenance Guidelines

Maintenance Schedule At-A-Glance

Applies to All Landscaped Areas (Non-NDS and NDS)

	Remove Trash	Remove Leaf and Branch Debris	Mow Lawn	Redefine Lawn Edge	Trim Lawn	Weed Lawn Areas Including Swales	Aerate, Overseed and Topdress Lawn	Trim Planted Areas Along Paved Edges	Weed Planted Areas	Groom Perennials and Grasses	Prune Trees and Shrubs	Irrigation System
January	1 time/ week	1 time/ month								See grooming schedule, Section 2.4d		
February	1 time/ week	1 time/ month	1 time					swales 1 time			Late dormant season	
March	1 time/ week	1 time/ month	2 times	1 time	1 time	1 time		beds 1 time pond 1 time			Late dormant season	
April	1 time/ week	1 time/ month	3 times		2 times	1 time	1/3 spring and/or fall				Post bloom season	
May	1 time/ week	1 time/ month	3 times	1 time	2 times	1 time		1 time			Post bloom season	System Start Up
June	1 time/ week	1 time/ month	weekly		3 times	1 time		beds, swales and pond 1 time				Manual Walk-thru.
July	1 time/ week	1 time/ month	weekly	1 time	3 times	1 time					Prune suckers in summer	Manual Walk-thru.
August	1 time/ week	1 time/ month	weekly		3 times	1 time		beds 1 time				Manual Walk-thru.
September	1 time/ week	1 time/ week	weekly	1 time late Sept. OR...	3 times	1 time		1 time	swales 1 time pond 1 time			Manual Walk-thru.
October	1 time/ week	1 time/ week	3 times	... early Oct.	2 times	1 time	1/3 spring and/or fall				Bleeding sap pruning season	
November	1 time/ week	1 time/ week	2 times		1 time							
December	1 time/ week	1 time/ month										

Maintenance Schedule At-A-Glance

	NDS Areas*							Non-NDS Areas ONLY		Pond	
	Apply Compost Mulch & Compost Tea	Sweep Porous & Regular Concrete Walks	Vacuum and/or Pressure Wash Porous Concrete Walks	Sweep Gravel Back into Gravel Pave Areas	Vacuum Sediment From Gravel Pave, Refill Gravel	Sediment Removal at Lowest Curb Cuts	Sediment Removal at All Curb Cuts	Sediment Removal at Low Points in Swales	Add Medium Bark Mulch	Fertilize	Pond Maintenance
January		1 time		1 time			1 time (plus as needed)				See Pond Operations and Maintenance Manual in Pond section of binder
February		1 time		1 time			1 time (plus as needed)				
March	Tea- 1 time March thru...	1 time		1 time			1 time (plus as needed)	After 1st weeding	Mixed plantings 1 time early spring		
April	...	1 time	1 time (as needed)	1 time			1 time (plus as needed)		lawn - 1 time late spring		
May	...June	1 time		1 time			1 time (plus as needed)	1 time / 3 yrs			
June	Mulch-1 time	1 time		1 time							
July		1 time		1 time	1 time / 3 yrs				Mixed plantings 1 time mid grow. season.		
August		1 time		1 time							
September		2-3 times	1 time (as needed)	1 time		every Friday (plus as needed)	1 time (plus as needed)	After last weeding	lawn - 1 time early fall		
October		2-3 times		1 time		every Friday (plus as needed)	1 time (plus as needed)				
November		2-3 times		1 time		every Friday (plus as needed)	1 time (plus as needed)				
December		1 time		1 time			1 time (plus as needed)				

* See Section 3.1a for guideline on Protecting Swales During Maintenance

High Point Community Landscape Maintenance Guidelines

2 LANDSCAPE MAINTENANCE

Regular maintenance of the High Point Community landscape enhances the appearance, safety and drainage functions of the right-of-way and open spaces.

- Carry out regular maintenance of landscaped areas in accordance with the information contained below and the Schedule At-A-Glance.
 - Regular maintenance includes using the High Point ROW and Open Space Maintenance Checklist.
 - Submit all completed checklists to the Maintenance Association Site Manager.
- ⇒ *High Point ROW Swale Section(s) (Section 14.3)*
- ⇒ *High Point ROW and Open Space Maintenance Checklists (Section 14.3)*

2.1 Natural Landscape Approach

In keeping with High Point Community’s natural landscape approach, all planted and lawn areas are to be cared for using integrated pest management (IPM) techniques. Physical and mechanical means should be the method of first resort for control of weeds, unwanted insects, and other pests. If chemical means become necessary, the most environmentally-benign products should be selected; all use of chemical products should follow the City of Seattle’s current pesticide Tier Tables and the City and/or King County’s most recent IPM guidelines. This commitment will protect the NDS, the Longfellow Creek watershed, High Point’s residents and wildlife. Specific alternatives to chemical landscape maintenance products are covered in the Weed Control, Pest Control, Fertilization and Materials sections of this document.

- ⇒ *Tri-County Integrated Pest and Vegetation Management Guidelines (Section 14.9)*
- ⇒ *City of Seattle Pesticide Tier Tables (Section 14.9)*

2.2 Debris and Trash Removal

Leaves, branches and trash can prevent water and light from getting to lawn and other landscaped areas. Excessive leaf litter around plantings can provide cover for pests and allow mildew growth. Removal of this debris enhances the appearance and success of planted areas.

- Clear leaves, branches and other organic matter from the following areas:
 - Planting beds
 - Gutters and depressions
 - Curb cuts



leaf litter around plantings and on lawn area

- Culverts
- Trench grates
- Drainage swales
- Walks
- Lawn areas
- **Collection frequency should be 1 time/month normally, but at least 1 time/week during fall leaf drop (mid-September to mid-November or longer if needed). See Fall Maintenance, Section 2.6.**
- **Collect and properly dispose of trash/litter (1 time/week) from the following areas:**
 - Culverts
 - Trench grates
 - Catch basin grates
 - Inlet grates
 - “Beehive” grates (raised grates in swales)
 - Drainage swales
 - Gutters and depressions
 - Curb cuts
 - Walks
 - Lawn areas
 - Planting beds

2.2a Blowing

- **When using leaf blowers to move and collect organic debris, DO NOT blow any material over or across porous pavements. Material should be blown off of and away from porous paving.**

2.2b Debris and Trash Disposal

- **Biodegradable landscape debris should be collected for on-site composting, green waste pick up or off site disposal to a recycling facility.**
 - Dispose of NO biodegradable materials on the surface of the *hillside greenbelt*, or at landfill sites.
 - If future compost bins are located in hillside greenbelt by agreement with owner, refer to City of Seattle (COS) for slope and use requirements.
 - Do not compost any potentially diseased plant material on-site.



multi-bin on-site compost system

- If space is available, establish small (under 3 cubic yard) on-site composting area(s) for biodegradable landscape debris (clippings, thatch, leaves, branches, annuals, dead plant materials, etc.); use the composted material to mulch the vegetated swales.
 - Construct a simple three-bin turning system
 - Dispose of trash through COS approved waste collection.
 - If debris is recyclable, such as bottles and cans, recycle through COS approved recycle collection.
- ⇒ *Plans for a 3-bin composting system (Section 14.1)*
- ⇒ *SPU Yard Waste Composting website (Section 14.1)*

2.3 Lawn Areas

Proper care of lawn areas will ensure an attractive appearance year-round, reduced maintenance costs and improved function of the NDS. There are two types of lawn areas in the High Point Community ROW:

- The “traditional” grassy planting strips along the sidewalks within the ROW.
 - The grass swales in the natural drainage system (NDS).
- ⇒ *The Natural Lawn & Garden - Choosing the Right Plants for a Beautiful, Trouble-Free Garden article (Section 14.7)*
- ⇒ *Ecologically Sound Lawn Care for the Pacific NW (Section 14.7)*

2.3a Mowing Tasks

- Mow with a mulching mower.
 - Mow per At-A-Glance schedule.
 - Maintain uniform grass height (2 to 2.5 inches)
 - Note: the grass swales in Phase One construction include a layer of sand; however, the grass swales in Phase Two construction do not and if grass in Phase Two swales is cut short small rocks will be encountered.
 - Do not scalp
 - Large areas - alternate mowing directions each mowing cycle.
 - Small strips - alternate mowing directions one time per month.
- ⇒ *SPU Mulching Lawn Mower information (Section 14.2)*

2.3b Edging



tree planter may be enlarged to facilitate trimming and edging of lawn

Edging of lawn areas reduces migration of lawn onto walkways and into planted areas. Areas to be edged include lawn perimeters, tree zones and other areas where the spread of lawn is not desired.

- **Redefine lawn edges with mechanical blade-type edger 3X/ year.**
 - First: Early to mid-March
 - Second: Late July
 - Third: Late September to mid October
- **Tree plantings in lawn areas should be rectangular in shape, not circular.** See Landscaping Trouble-shooting, Section 5.1f, Tree Plantings in Lawn, for recommended modifications.
- **If plants overhang lawn at lawn/planting area edge, making it difficult to trim the grass, it is acceptable to increase the planting area slightly by creating a new edge and removing excess grass.**
 - See Landscaping Trouble-shooting, Section 5.1f, Tree Plantings in Lawn, for recommended tree planter dimensions.
- **Remove clippings and debris.**
- **Do not use edger within 2 feet of trees to avoid accidental trunk damage.**

2.3c Trimming

Trimming of lawn areas improves their appearance.

- **Regularly trim lawn at edges using a power (or hand trimmer where needed) per At-A-Glance schedule.**
 - Lawn perimeters
 - Tree zones
 - Other areas inaccessible by mower (adjacent to poles, vaults, signs, walls, above-grade structures, and other obstacles).
- **Trim to same height as mowing.**
- **Remove clippings and debris.**
- **Do not use trimmer within 2 feet of tree trunks to avoid scarring.**

2.3d Weed Control

Weeds negatively impact the health of lawn areas by competing for sunlight, water and nutrients and should be kept under control.

- Regularly weed all lawn areas, including drainage swales, per the At-A-Glance schedule.
- Remove weeds manually using pincer-type weeding tools, flame weeders, or hot water weeders (see Equipment, Section 8 for information).
- Repair, reseed and mulch bare spots resulting from weeding in lawn areas.
- Pay special attention to nuisance and invasive vegetation before it establishes a foothold.
 - Particular threats to wet areas in swales are reed canary grass and Japanese knot weed.
 - Others threats include clover, horsetail, morning glory, alder seedlings and, of course, blackberry.
 - Watch for any signs of these plants and remove them completely!
- When regular maintenance cannot control lawn weeds, including clover, see Weed Control, Section 5.1c in Landscape Troubleshooting.

⇒ [King County Noxious Weed Control brochures \(Section 14.9\)](#)



lawn overwhelmed by clover

2.3e Aeration, Overseeding and Top Dressing

Lawn aeration improves root growth and water penetration into the root zone during storm events and irrigation. Reseeding with a top dressing will help to maintain dense and healthy lawn areas. Begin lawn aeration Spring 2007. In the NDS areas topdressing is compost only, with a sand/compost mix used in the non-NDS areas.

- Aerate one-third of the total lawn areas one time per year in the spring and/or fall.
- Rotate applications to achieve 100% lawn area coverage every 3 years minimum.
 - Adjust aeration schedule based on need (some areas one time per year and others only as required to meet the 3 year minimum rotation).
 - More frequent aeration is recommended where clover is an issue.
- Complete a double aeration pass for greater impact, especially where soil condition or lawn coverage is poor.

- **Vacuum plugs after aeration, before topdressing.**
 - Dispose of plugs in accordance with COS requirements.
- **Overseed following aeration, when conditions are good for germination and growth.**
 - Typically between March 15 to April 15 in the spring, or September 15 to October 15 in the fall.
- **Apply seed mix at a rate of approximately 7 pounds/1000 sf.**
 - Adding a mycorrhizal inoculant to the seed mix will give an extra boost, especially in problem areas. See Materials and Products, Section 7.1d.
- **Apply topdressing at a rate of approximately 1.5 cy/1000 sf.**
 - NDS areas: Use specified compost topdressing
 - Non-NDS areas: Use specified compost/sand mix, 70/30, topdressing.
- **Rake or drag topdressing to:**
 - Fill plug holes. This is critical for NDS function.
 - Provide ¼ to ½ inch topdressing depth.
- **To prevent accumulation of surface organics, check a soil core prior to repeated applications to see that previous applications have been mixed into the upper soil.**
- **Note: If drainage systems are clogged by sand used in non-NDS topdressing mix, discontinue use of sand in those areas.**
- **Note: Timing of compost application should be after aeration/overseeding/topdressing. See Section 2.3g.**

2.3f Fertilization

Fertilizer is used to replenish nutrients within the soil, which enhances the appearance of lawn areas.

- **Do not apply fertilizer to NDS lawn areas.**
- **Fertilize non-NDS lawn areas 2 times per year (late spring and fall). See the At-A-Glance schedule for timing.**
 - Note: Natural fertilizers must be applied before October 15th.
 - Note: Apply fertilizer after aeration/reseeding/topdressing.

- Use only approved natural, non-chemical fertilizers. See Materials, Section 7.
- Consider using corn gluten to naturally “weed and feed” lawn areas. See Materials and Products, Section 7.4a.
- Follow product guidelines for application schedule and rates.

2.3g Compost and Compost Tea

A compost topdressing or application of compost tea introduces nutrients and beneficial microorganisms to the soil, resulting in improved growing conditions. Compost and compost tea is approved for application to the NDS lawn areas.

- Apply 1 inch layer of specified compost mulch to **NDS** lawn areas 1 time per year (spring or fall, opposite of aeration/topdressing schedule).
- Apply compost tea 1 time per year (between March and June).
 - Outdoor temperature should be above 40 degrees and below 90 degrees.
 - Avoid applying in bright sunlight, which can kill the beneficial organisms in compost tea.
 - Compost tea must be used within 24 hours of tea production to ensure product quality.
 - Order special “brews” for different uses, plant types and/or soil conditions.
- If excess buildup results from compost applications, replace compost mulch application with a compost tea application.
- If nutrient deficiencies exist, apply additional compost tea applications.
- See Materials, Section 7.4 for specified compost and approved compost teas.

2.3h Lime Application

Acidic conditions may allow moss to establish in lawn areas. Lime can be used periodically to correct soil conditions by raising the pH. This adjustment improves the ability of lawn areas to take in nutrients. See the Moss section under Landscape Trouble-shooting, Section 5.1e for more information.

2.3i Pest Control

The best way to prevent pests is by following a regular maintenance schedule for a natural healthy lawn. If pest populations become too large, however, they can negatively impact lawn health and appearance. Under these conditions, pest control may be needed.

- **Monitor lawn for signs of pests, such as wilting grass, bare areas, spotting or other indicators.**
 - **Control lawn pest insects by applying beneficial nematodes to the soil. See Materials, Section 7.2 and follow manufacturer instructions.**
 - **Remove pests using IPM-approved natural pesticides. See Materials, Section 7.2. Reapply, if necessary.**
- ⇒ *WSU Extension - Gardening Fact Sheets (Section 14.9)*
- ⇒ *Journal of Pesticide Reform - Managing Crane Flies in Lawns article (Section 14.9)*

2.4 Planted Areas - Tree, Shrub and Ground Cover Care

The following information is a guideline for the long-term maintenance of planted areas in the ROW, pond and the NDS swales at the High Point Community. For further information on plant care and pruning techniques see the resources in the Included Documents and Recommended Publications sections.

2.4a Staking and Guying

Stakes and guys are used to support trees during establishment.

- **Repair tree stakes and guys as needed.**
- **Remove tree stakes as soon as they are no longer needed for tree stabilization.**
 - Minimum of one year and a maximum of two years after installation.
- **Inspect and adjust stakes and connections to provide support, to prevent girdling of trunks or branches, and to prevent rubbing that causes bark wounds.**

⇒ *High Point Tree Staking Detail (Section 14.3)*

2.4b Edging and Trimming Planted Areas

Edging and trimming of planted areas to control ground covers and shrubs from overreaching the sidewalks, paths and street edge improves appearance and reduces clogging of porous pavements by leaf litter, mulch and soil.

- **Redefine edges with mechanical blade-type edger 2X/ year.**
 - First: early to mid-May
 - Second: early to mid-September
- **Remove clippings and debris.**
- **Do not use edger or trimmer within 2 feet of tree trunks.**
- **Where plant migration onto porous pavement is an issue, see Drainage Facilities Modification, Section 6.2b Porous Pavement and Ground Cover Migration.**

2.4c Weed Control

Weeds compromise plant health by competing for water, nutrients and sunlight. Weeds can be controlled through hand-removal, flame or hot water weeders, mulching and the use of herbicides approved through the IPM process.

- **Weed all planted areas, including the vegetated swales and the pond hillsides, per the following schedule:**

Month	Weeding Schedule by Landscaped Area Type		
	Planted beds	Vegetated swales	Pond area
February		X	
March	X		X
June	X	X	X
August	X		
September		X	X
October	X		

- **Remove weeds with their roots manually with pincer-type weeding tools, flame weeders, or hot water weeders as appropriate.**
- **Spot treat stubborn weed infestations with an IPM-approved fatty-acid (soap) based non-selective herbicide. Reapply, if necessary.**
- **Remove weeds with their roots.**
- **Watch for and respond to new occurrences of especially aggressive weeds such as Himalayan blackberry, Japanese knotweed, morning glory, English ivy, reed canary grass and horsetail to avoid invasions.**
- **When installed plants appear overly aggressive, see Section 5.2e When a Landscape Plant Becomes a Weed**



strawberry ground cover encroaching on porous walk



weeds establishing in ground cover plantings

- **Monitor and maintain records of weeds as time allows:**
 - Establish tolerance thresholds within a maintenance program.
 - Evaluate and record effectiveness.
 - Modify maintenance plan to promote plant recovery and prevent weed recurrence.
- ⇒ *Tri-County Integrated Pest and Vegetation Management Guidelines (Section 14.9)*
- ⇒ *City of Seattle Pesticide Tier Tables (Section 14.9)*
- ⇒ *Sample Maintenance Log forms (Section 14.7)*
- ⇒ *King County Noxious Weed Control brochures (Section 14.9)*
- ⇒ *WSU Extension - Gardening Fact Sheets (Section 14.9)*
- ⇒ *TNC Weed Management - Documents for Reed Canary Grass, English Ivy and Himalayan Blackberry (Section 14.9)*
- ⇒ *Journal of Pesticide Reform - Nonchemical Methods for Removing Unwanted Blackberry Plants (Section 14.9)*

2.4d Pest Control

Pests can compromise the health of plants by increasing their vulnerability to disease and should be kept under control. The best way to control pests is to prevent them in the first place. When needed, however, pests can be controlled through the use of pesticides that are approved through the IPM process.

- **Reduce hiding places for pests by removing diseased and dead plants.**
- **Look for signs of pests, such as wilting leaves, chewed leaves spotting or other indicators.**
- **For infestations, apply an IPM-approved, soap-based or other pesticide. See Materials, Section 7.2 for approved products.**
- **Monitor and maintain records of pest infestations with every site visit:**
 - Establish tolerance thresholds within a maintenance program.
 - Evaluate and record effectiveness.
 - Modify maintenance plan to promote plant recovery and prevent pest recurrence.
- ⇒ *Tri-County Integrated Pest and Vegetation Management Guidelines (Section 14.9)*
- ⇒ *City of Seattle Pesticide Tier Tables (Section 14.9)*

- ⇒ [Sample Maintenance Log forms \(Section 14.7\)](#)
- ⇒ [WSU Extension - Gardening Fact Sheets \(Section 14.9\)](#)
- ⇒ [WSU Extension - Insecticidal Soaps Info Sheet \(Section 14.9\)](#)

2.4e Grooming Perennials and Ornamental Grasses

Grooming maintains a tidy appearance and encourages next year's growth and flowering. Grooming includes cutting off spent blooms and leaves, deadheading during the bloom period and hand-raking or cutting back grasses.

- **Flowering plants** - remove spent flowers (deadhead) by cutting just above the nearest branch or bud.
- **Perennials** - cut back dying or dead and fallen foliage and stems.
- **Perennial grasses** - leave dry foliage for winter interest. Cut it back to within several inches from the soil before new growth emerges or earlier if the foliage collapses.
- **Evergreen grasses** - Hand-rake with a small rake or fingers to remove dead growth. Cut when grasses become too tall.
- See resource section for additional information on plant specific grooming methods and timing. See the table below for a general plant grooming schedule.
- High Point plant-specific grooming techniques should be reviewed with the Association Manager.



perennial grasses provide winter interest



perennial grasses cut back in late winter



new growth emerges from trimmed grasses

Season	Grooming Perennials and Ornamental Grasses			
	Flowering plants	Perennials	Ornamental grasses (perennial)	Ornamental grasses (evergreen)
Fall		cut back spent plants	leave foliage for winter interest	cut back to ground or thin every 2-3 years as needed
Winter			cut back if foliage collapses	
Spring	deadhead 1 time/ month during bloom period		cut back before new growth emerges	hand-rake before new growth emerges
Summer	deadhead 1 time/ month during bloom period			

2.4f Pruning

Pruning is performed to promote plant health, enhance the natural character of trees and shrubs, meet clearances for vehicular and pedestrian traffic and for visual safety. Improper or excessive pruning can increase vulnerability to pests and disease and result in unnatural, oddly shaped plants.

Reasons for Pruning

- Enhance the natural growth and shape of the plant.
- Maintain proper sight lines for vehicular and pedestrian safety.
 - Provide a minimum height clearance at roadways and walkways for vehicular and pedestrian traffic.
 - Remove visual obstructions of street signs, traffic signals and streetlights to provide clear visibility, especially at intersections.
- Maintain appropriate access for pedestrian and vehicular use and facilities.
 - Keep ADA ramps in intersections clear by pruning shrubs and ground covers to prevent them from overflowing onto the ramps.
- Prevent some evergreen grasses (rushes) from becoming too tall. These grasses can be cut back or thinned if over-crowding occurs.
- **Note:** Maintenance of the cherry trees located on SW Sylvan Street along the cemetery property shall be performed by the Maintenance Association.



low growing branches over walkway



cut back aggressive fragaria if needed so that slower growing plants may establish

When to Prune

The best time to prune most shrubs and trees is during the dormant season. Late winter pruning leaves wounds exposed for a shorter time before spring growth can heal them. It is also easier to see and make proper cuts without leaves obscuring the branches.

- There are exceptions to dormant season pruning - always check pruning resources for each plant species before cutting.
- Annually assess for pruning needs by plant type.
 - Late winter for dormant season plant group
 - Spring following bloom for some early blooming trees and shrubs
 - Fall for sap bleeder plant group
 - Summer for removing suckers from trees

- See the At-A-Glance schedule for an overview of pruning timing.
- Inspect trees for limb damage following large storm events with high winds, freezing conditions and/or snow accumulation.
- Where shrubs and ground covers are planted around street trees, prune 3 years after they are installed and again every 1 to 2 years or as needed.
 - This pruning is intended to maintain a maximum height of 36 inches for sight clearance.
- When continued, regular pruning (more than one time/ growing season) is required to maintain visual sight lines for safety or clearance along a walk or drive, consider relocating the plant to a more appropriate location. See Trouble-shooting, Section 5.2c Relocating Plants.



bad pruning with cut made at the wrong angle and torn bark

How to Prune

Proper cutting technique is a critical step in avoiding disease. It also lends to a more natural and attractive appearance.

- Never leave a stub!
- Remove any dead, diseased or damaged growth.
- Remove severely crossing tree branches and branches that grow in toward the tree trunk.
- Do not shear, top, heavily prune or hedge plantings. Always cut just above future growth (a bud or stem).
- Plantings (shrubs & ground covers) in and adjacent to intersections should be pruned to a 3 foot maximum height.
- Trees branches should be pruned to allow 8 feet clearance over sidewalks and 14 feet over roadway travel lanes.
 - See Conifer Pruning, Section 2.4h, for guidelines on pruning young conifers
- Use the right tool for the job.
- Cut at the correct angle.
- Look under Recommended Publications, Section 11 for further resources on pruning.

⇒ [Plant Amnesty Pruning Guide \(Section 14.4\)](#)



good pruning with branch collar left intact

2.4g Mature Tree Care

- The mature trees at High Point have different needs. Contact an ISA certified arborist for tree by tree maintenance recommendations.
- All pruning of mature trees should be performed by or under the direct guidance of an ISA certified arborist.
- When working around and below mature trees take care to minimize any damage to tree roots and avoid compaction of soil.
- Planting of small shrubs or groundcovers beneath mature trees may be desirable in some cases; such plantings should use mainly plants that come as bulbs, bare root or in 4-inch (4") pots; plants should be in no larger than 1 gallon containers.
- If planting below mature trees, select species that tolerate some shade, are not overly aggressive or invasive, and are suitable for the conditions. Potentially suitable plants include *Epimedium* species, mondo grass, ferns, kinnikinnick, and various bulbs.
- See Open Space Association requirements for specific conditions that may be required for access to mature trees. Some locations may require a temporary street use permit for access and pruning work.
- See Current Tree Survey & Preservation Code, Section 12, for further information on current mature tree conditions and regulations affecting their care.

2.4h Conifer Pruning

Conifers along the right-of-way shall be pruned (limbed up) as growth allows.

- Maintain 3 foot clearance from grade for the first three years after planting.
- Limb up as growth allows to eventually achieve 6 to 7-foot clearance.
- Thin internal branches as appropriate for species.
- No topping of conifers.
- Pay particular attention to cypress or cedar trees that may be diseased, and take precautions to avoid spread of disease on site. Do not chip or compost trimmings on site. See Diseases, Section 5.2b.

2.4i Non-NDS Areas - Bark Mulch Replacement

Bark mulch reduces the ability of weeds to establish and keeps soil moist longer. Bark mulch is not used in the NDS planted areas. Composted mulch may, however, be used in non-NDS areas (see section 2.4h) given maintenance staff accepts that additional weeding may be required.

- Use a medium-grade Douglas fir bark mulch, not shredded or chips.
- Apply 1 to 2 inches of mulch 2 times/year.
 - First following first weeding of growing season
 - Second following fall weeding (September or October)
- See Materials, Section 7.3 for approved mulch products.



medium bark mulch around trees and shrubs in non-NDS areas

2.4j NDS Areas - Composted Mulch Replacement

Composted mulch reduces the ability of weeds to establish, keeps soil moist longer and replenishes nutrients in the soil. Compost is used in place of bark mulch for all NDS planted areas.

- Apply 1 to 2 inches of composted mulch 1 time/year.
 - Following the June weeding
- Use only specified composted mulch. See Materials, Section 7.3 for approved composted mulch products.



composted mulch on swale sideslope planting

2.4k Fertilization (Non-NDS Only) and Compost Tea

Fertilizer and compost tea are used to replenish soil nutrients, enhancing the appearance of planted areas. For the health and maintenance of the High Point landscapes and to reflect the goals of High Point Community, fertilizers must be made of non-chemical ingredients and are only applied to the non-NDS areas.

- Apply NO fertilizers in the NDS or Pond areas without prior approval by the Maintenance Association Site Manager.
- Apply compost tea to NDS planted areas 1 time per year (between March and June).
- Additional applications of compost tea may be made in the NDS and non-NDS areas as needed.
 - See Compost and Compost Tea, Section 2.3g, for guidelines on the application of compost tea

- Fertilize non-NDS planted areas per the following guidelines:



plant mortality

Non-NDS Planted Area Fertilizer Guidelines	
Deciduous trees	Use deep root injection system. Fertilizer, application and timing as approved by an ISA certified arborist.
Conifers	Apply only as needed.
Mixed planting areas	Once early spring (Feb. - Mar.). Second time (mid growing season) where nutrient deficient.
Gaultheria shallon (salal)	Typically does not benefit from fertilizing.
Ornamental grasses	Typically do not benefit from fertilizing.

- See Materials, Section 7.4, for approved fertilizers and compost tea.

2.5 Plant Replacement and Installation

Plants may die due to unsuitable conditions or microclimates, disease, pests or other unforeseen issues. These plants must be removed/ replaced to avoid the spread of disease, establishment of weeds in bare areas and reduction of NDS functionality. Proper and careful installation of plant material will increase establishment rates and reduce maintenance requirements. Unless otherwise noted, the information in this section can be applied to B & B, bare-root and container plants.



dead tree requiring replacement

- Report dead and dying plants immediately to Maintenance Association Site Manager to obtain direction regarding their replacement.
- Coordinate removal and replacement of dead and dying plants within 30 days of notification by the Maintenance Association Site Manager.
- Replacement vegetation shall be of equal size, conditions, and variety (when appropriate) to original plantings.
- For replacement guidelines, see Landscape Troubleshooting, Section 5.2d Plant Species Replacement.
- Confirm that as-built conditions are appropriate for species planted there. When conditions are not working for the original plantings, see Landscape Troubleshooting - Plant Species Replacement, Section 5.2d.

⇒ [WSU Community Horticulture - Planting Landscape Plants Fact Sheet \(Section 14.4\)](#)

2.5a Planting Pit Preparation

- Excavate circular plant pits and scarify vertical sides
 - Use care when planting near existing plants.
- Provide planting pits at least twice the diameter of the root system or container and deep enough to accommodate the entire root ball.
- For trees, scarify the bottom and sides of the pit to a depth of approximately 4 inches into adjacent soil.

2.5b Tree and Shrub Placement

Proper placement of plants improves a plant's ability to establish and its long-term growth.

- Container plants - carefully remove plants from containers.
- If plant is rootbound or roots are growing in a circle, loosen them.
- Set crown of plant material at the finish grade. Avoid filling soil around trunks or stems or above grafts on grafted trees.
- Backfill planting pit with native soil that is not frozen or muddy. For areas needing NDS soil replacement less than 2 cu. ft., use NDS minor soil replacement mix. See Section 7.5d.
- Trees and B & B plants - form a raised ring of soil around the edge of the planting pit to retain water. Provide water bags to allow for establishment watering.
- B & B plants - cut away and remove all burlap or plastic wrapping materials, twine, wires, and wire baskets from root balls. Avoid damage to the rootball, particularly cracking, which can lead to dessication.
- Following planting, broadcast approved natural fertilizer (non-NDS areas only) at rate recommended by supplier, but not to exceed one-half pound (1/2#) of nitrogen per 1,000 square feet.

2.5c Ground Cover Placement

Ground covers are used to enhance the character of planted areas, reduce the ability of weeds to establish and reduce erosion. Proper spacing ensures full coverage of an area once plants are established.

- Follow plant placement guidelines in the previous section.



fern planted with crown too high above finish grade



ground cover spacing
"on-center"

- Space ground cover plants using on-center (O.C.) triangular spacing following the Ground Cover Spacing Chart located in Section 13, Included Documents.
- Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants and to avoid damaging roots of adjacent plants.
- Plant to within eighteen inches (18") of tree trunks and shrubs and to within twelve inches (12") of the planting bed edge.

⇒ [Ground Cover Spacing Chart \(Section 14.4\)](#)

2.5d Mulching Replacement Plantings

Mulch all replacement plantings to reduce weed establishment and keep the soil moist for longer periods.

- Apply the appropriate mulch type for the area:
 - Composted mulch for NDS planted areas
 - Medium bark mulch for non-NDS areas
- Mulch to a depth of two inches (2") immediately after planting.
- Thoroughly water mulched areas.
- After watering, rake mulch to provide a uniform finished surface.

2.5e Staking Replacement Plantings

Stake newly planted replacement trees to stabilize and prevent leaning during establishment.

- Stake all deciduous and coniferous trees immediately after planting.
- See Included Documents, Section 10 for approved staking detail.
- Follow Section 2.4a for staking and guying maintenance.

⇒ [High Point Tree Staking Detail \(Section 14.3\)](#)



stakes and guys on a newly
planted tree

2.6 Fall Maintenance

This section on fall maintenance has been included to address issues that are pertinent at all times of the year, but need particular attention during the fall. This is due to the large volume of leaves and plant material dropped by trees and other plants during the fall. Stormwater from the typical wet fall weather patterns will tend to collect and concentrate the plant material in low areas during that time of year, potentially leading to blocked elements in the NDS and erosion, washouts, excessive ponding, or flooding.

See map of Low Points in NDS System, Section 13.1, for sketch of low points in the streets for priority checking in the fall.

2.6a Leaf Blowing

Leaf blowing and collection should be done regularly, to prevent excessive transport and buildup of leaves in the natural drainage system features and along curb gutters.

- **When using leaf blowers to move and collect organic debris, DO NOT blow any material over or across porous pavements. Material should be blown off of and away from porous paving.**
- **Biodegradable landscape debris such as fallen leaves should be collected for on-site composting, green waste pick up or off site disposal to a recycling facility.**
 - Dispose of NO biodegradable materials on the surface of the *hillside greenbelt*, or at landfill sites.
 - If future compost bins are located in hillside greenbelt by agreement with owner, refer to COS for slope and use requirements.
 - Do not compost any potentially diseased plant material on-site.

2.6b Clearing Curb Cuts and Drain Inlets

Curb cuts and drain inlets are particularly susceptible to clogging in the fall during the leaf drop period. These areas should be cleared regularly during the fall; see the Maintenance Schedule At-A-Glance.

- **Clear the lowest curb cuts and drain inlets at regular intervals, and first during and after any storm events.**
- **Clear leaves, debris, and sediment from all curb cuts, culverts, and drain inlets at least once a month; see Schedule At-A-Glance.**
- **Check for any signs of erosion within the NDS, and if found follow the maintenance and repair guidelines found in Erosion, Section 3.1c.**

3 DRAINAGE FACILITIES MAINTENANCE

Regular maintenance of the natural drainage systems enhances their appearance and long-term function. Features associated with the NDS, such as drain curb cuts, inlets, culverts, pedestrian berms and porous cement concrete walks, driveways and streets require their own scheduled upkeep.

- Carry out regular maintenance of all drainage facilities in accordance with the following guidelines.
 - Regular maintenance includes monitoring of drainage facilities using the Maintenance Checklist.
 - Submit all completed checklists to the Maintenance Association Site Manager.
- ⇒ *High Point ROW Swale Section(s) (Section 14.3)*
- ⇒ *High Point ROW and Open Space Maintenance Checklists (Section 14.3)*

3.1 Drainage Swales

3.1a Protecting Swales During Maintenance

Soils in natural drainage areas have been carefully engineered and installed to allow specific stormwater infiltration rates and capacities, while providing appropriate conditions for plant growth. Care must be taken when working in swales to avoid soil compaction, which would alter their stormwater function. This includes swales planted with shrubs and ground covers, as well as the grass-lined swales.

- When performing extensive maintenance in swales (such as major plant changes, tree removal, utility or irrigation work) place 2- to 4-foot long x 6- to 8-inch wide board(s) for walking and standing on in swales, to distribute weight and avoid soil compaction.
 - Stay on board during construction/repairs to reduce compaction.
 - Lay board flat on bottom of swale taking care not to damage plants.

3.1b Debris

- Clean out trash
 - One time per week
 - If rain is forecasted, verify all culverts, openings for drainage structures and grates are clear of debris and monitor during storm event.



debris in swale

- Within 1 to 2 days after all major storm events (1 inch or more rainfall in 24 hours).
- **Remove organic debris (leaves, twigs and plant material)**
 - One time per month normally, but 1 time/week during fall leaf drop (mid September to mid November or longer if needed)
 - Within 1 to 4 days after rainfall to prevent debris blockage.
- **When working in swales, protect from compaction following guidelines in Section 3.1a.**
- **Deposit trash and other debris in proper waste facilities.**
 - All biodegradable debris (leaves, branches and dead plant material) to on-site composting, green waste pick up or off site yard recycling facility.
 - Dispose of NO biodegradable materials in the hillside greenbelt, in regular waste bins, or at landfill sites.
 - Dispose of trash through COS approved waste collection.
 - If debris is recyclable such as bottles and cans, dispose of through COS approved recycle collection.
- **Immediately report any contaminants found in swales (paint, oil, gas, antifreeze, or other spilled/dumped pollutants) to the Maintenance Association Site Manager.**
 - If a vehicle is associated with the spill, record and report the license number.
 - Maintenance Associate Site Manager is responsible for reporting spills to SPU's Surface Water hotline at 206/684-7587 and SPU's Maintenance Division at 206/386-1800.
- **Once reported, follow applicable safety standards to remove substance from swale.**



channeling and erosion in grass swale

3.1c Erosion

Soil erosion (such as channels, cuts and soil migration) can be caused by improper stabilization through plantings, grading issues and point discharge. Eroded areas can clog the NDS and reduce its ability to function as a drainage system. The following steps are required to minimize erosion impacts:

- **Inspect for channels or cuts over 2 inches wide throughout the swale.**
 - One time per month.

- Within 1 to 4 days after all major storm events (1 inch or more rainfall in 24 hours).
- **Report erosion on Maintenance Checklist sheet and submit to Maintenance Association Site Manager.**
 - Note channel or cut location on map provided with checklist.
 - Clearly describe location.
 - Note if channel or cut is recurring.
- **Note: A supply of specified NDS Soil Mix #1 shall be kept in maintenance vehicle during all routine maintenance activities and at least one cubic yard shall be kept on-site at all times.**
- **When working in swales, protect from compaction following guidelines in Section 3.1a.**
- **Shallow channels (under 3 inches in ponding depth) shall be graded out and remulched.**
- **For deep channels or cuts (over 3 inches in ponding depth), temporary erosion control measures should be put in place until permanent repairs can be made.**
 - Install coir logs or compost berms across the path of erosion, as a temporary measure during seasons or weather when seeding or plants will not have time to establish and hold soil in place
 - When weather permits, eroding areas shall be filled with NDS Soil Mix #1 and compacted lightly with hand tamper.
 - See Materials, Section 7.5 for approved NDS Soil Mix #1.
- **Install plants or sod, or reseed area.**
 - Replace vegetation with in-kind material.
 - See Plant Replacement & Installation, Section 2.5.
- **Mulch newly planted vegetation.**
 - See Mulching, Section 2.5d and Materials, Section 7.3
- **Check area within 6 weeks to see all exposed soils within the facility are covered by erosion control material (seed, vegetation, sod, or the like).**
- **If repeated erosion occurs, see Excessive and Repeated Erosion, Section 6.1A.**



*erosion and sediment build-up
in swale*

3.1d Sediment Accumulation

Sediment can accumulate in the bottom of drainage swales due to erosion or silty runoff. Sediment may also accumulate at curb cut openings or other low points where water slows down or backs up. This sediment can infiltrate into open spaces of the NDS soil and clog it, reducing its function.

- **Where sediment accumulation is visible remove it.**
- **Only remove sediment when the facility is dry.**
- **When working in swales, protect from compaction following guidelines in Section 3.1a.**
- **Remove manually, using shovels.**
- **Dispose of sediment in accordance with COS requirements.**
- **Replace any vegetation damaged or destroyed by sediment accumulation and removal.**
 - Replace vegetation with in-kind material.
 - See Plant Replacement & Installation, Section 2.5.
- **Mulch newly planted vegetation.**
 - See Mulching, Section 2.5d and Materials, Section 7.3
- **Report areas of heavy or frequent sediment buildup on Maintenance Checklist Sheet and submit to Maintenance Association Site Manager.**
- **Monitor sediment accumulation to identify problem areas, as time allows.**
- **For problem areas, see Sediment Buildup, Section 6.1b.**

3.1e Ponding and Mosquito Control

Areas of shallow ponding for longer than 72 hours may become breeding areas for virus carrying insects such as mosquitoes. Proper monitoring of swales and other low points beginning in early spring and continuing through the fall, until cold weather ends mosquito activity, can reduce these risks.

- **Do not use pesticides or *Bacillus thuringiensis israelensis* (Bti). They are not permitted.**
- **Remove cattails from stormwater pond.**
- **See High Point's Stormwater Pond Maintenance Manual for additional recommendations regarding mosquito control for the pond.**
- **Monitor infiltration rates of water in grass-lined and vegetated swales.**



ponding at swale bottom

- If water does not infiltrate within 24 hours, contact Maintenance Association Site Manager.
 - Where excessive sediment causes ponding, see Ponding, Section 6.1c for corrective actions.
 - If ponding lasts up to 72 hours alert the Maintenance Association Site Manager to contact SPU Maintenance Division at 206/386-1800.
- ⇒ SPU - “About West Nile Virus” (Section 14.8)
- ⇒ City of Seattle, West Nile Virus Response Plan (Section 14.8)

3.1f Drain Curb Cut Openings

Street runoff is directed to the drainage swales through cuts in the curbs. These cuts must be unobstructed to allow water to flow from the street to the NDS.

- Remove accumulated sediment within the drain curb cut opening when accumulation exceeds 1/2 inch and/or when water is blocked from draining into the swale.
 - Follow removal guidelines in Sediment Accumulation, Section 3.1d.
- Remove any accumulated debris within the drain curb cut opening. Dispose of debris properly.
- Manually remove any weeds that establish in pavement cracks at drain curb cut.
- In grass swales, maintain grass low and trimmed at drain curb cut opening to facilitate water flow in to swale.
- Monitor during rain event to ensure proper functioning.
- In planted swales where vegetation blocks flow from entering, adjust location of plants located within 1 foot (1') of curb cut opening.
- Report any damage to the drain curb cut opening such as chipped concrete or cracking.
- Report any damaged or missing bronze art element curb cut markers to the Maintenance Association Site Manager.
- Coordinate with Maintenance Association Site Manager on repair and/or replacement.
- Report sediment accumulation at drain curb cut openings on Maintenance Checklist Sheet and submit to Maintenance Association Site Manager.
- Monitor sediment accumulation to identify problem areas.



examples of sediment build-up in drain curb cut openings



curb cut inlet art requires sediment removal



overflow channel and pedestrian berm

- If repeated erosion occurs at a drain curb cut opening, see Drainage Facilities Modifications, Section 6.1.

3.1g Overflow Channels and Pedestrian Berms

Overflow channels and pedestrian berms are raised areas between individual drainage swale cells. These areas are intended to direct stormwater and provide crossings for pedestrians. They must be kept clear of sediment, debris and other obstructions at all times to facilitate movement of stormwater.

- **Remove any sediment within the overflow channel when accumulation exceeds depth of 1 inch.**
 - Follow removal guidelines in Sediment Accumulation, Section 3.1d.
- **When working in swales, protect from compaction following guidelines in Section 3.1a.**
- **Remove any accumulated debris.**
 - Dispose of debris in accordance with COS requirements.
- **Maintain grass and/or vegetation within the overflow channel.**
 - Replace any damaged or dead vegetation and reseed bare lawn areas.
 - Replace with in-kind plant material.
 - For more information see Plant Replacement & Installation, Section 2.5.
- **If vegetation across a pedestrian berm is excessively worn, see Drainage Facilities Modifications, Section 6.1h.**

3.1h Culverts (Outlets)

Culverts, also called outlets, direct stormwater via storm pipes under driveways or pedestrian pathways from one drainage swale cell to the next and from the site to the Community Pond.

- **When working in swales, protect from compaction following guidelines in Section 3.1a.**
- **Remove any accumulated sediment within the culvert or path to culvert.**
 - Follow removal guidelines in Sediment Accumulation, Section 3.1d.
- **Maintain grass and/or vegetation within the route of travel to the culvert.**



outlet

- **Maintain grass low and trimmed along the path to the culvert.**
- **Remove debris and obstructions within the path to the culvert.**
- **In planted swales where vegetation blocks flow from reaching a culvert or outlet, the location of vegetation planted within two feet (2') of an outlet may be adjusted slightly to allow for improved flow to the culvert/outlet.**
- **During rain events, monitor culverts to ensure pipes are clear for conveying stormwater.**

3.1i Catch Basins and Inlets

Catch basins and inlets are structures that collect stormwater and direct it to the community pond via a storm pipe. Maintenance of the interior of the structures themselves is the responsibility of Seattle Public Utilities (SPU). However, keeping the nearby gutters and catch basin grates clear will reduce maintenance and benefit the NDS.

- **Remove debris and obstructions from catch basin and inlet grates within the public right-of-way.**
- **During rain events, monitor grates at catch basins and inlets in order to ensure structures are clear and able to collect stormwater.**
- **Manually remove and properly dispose of sediment and weeds that establish in pavement cracks adjacent to catch basins.**



inlet grate

3.2 Hardscape and Other Features

There are various types of porous pavements constructed at High Point. Porous cement concrete pavement is cement concrete pavement without the sand in the mix which allows water to filter through the pavement section into the underlying gravel subbase layer below the pavement section. Porous gravel pave pavement is a grid cell system filled with gravel and placed over a gravel subbase layer below the grid cells.

Porous cement concrete walks, gravel pave parking stalls and porous cement concrete streets serve to reduce stormwater runoff by capturing rainwater in voids of the pavement's gravel subbase and allowing it to infiltrate. Keeping the porous pavement surfaces clean and free of plants decreases sediment clogging and lengthens their functional life.

Note: Maintenance of the porous street on 32nd Ave SW is the responsibility of the City; however routine maintenance of the porous sidewalks in the right-of-way is the responsibility of the Association. If

major clogging occurs that results in extensive ponding, then notify SPU for maintenance.

3.2a Porous Cement Concrete Walks



soil and mulch deposited on a porous cement concrete walk

- **Manually sweep walks to maintain appearance per Right-of-way Maintenance Schedule At-A-Glance.**
- **Vacuum and/or pressure wash walks per Right-of-way Maintenance Schedule At-A-Glance.**
- **Watch for washouts from planted areas where soil, mulch or sediment is deposited on walks.**
 - Clear immediately and vacuum or sweep area.
 - Report washouts on Maintenance Checklist Sheet and submit to Maintenance Association Site Manager.
 - Monitor washout occurrences to identify problem areas.
 - For problem areas, follow guidelines in Section 6.2a, Washout, for corrective actions.
- **Moss growth has been a particular issue for porous pavements in the Pacific Northwest. Moss begins to fill in the open pores in the concrete aggregate and can reduce or block stormwater infiltration.**
 - The extent of moss growth should be controlled through regular cleaning and maintenance. See Right-of-way Maintenance Schedule At-A-Glance.
 - Pressure washing, vacuum sweeping, or some combination of the two have been found to be effective for cleaning moss from porous concrete.
 - Both the City of Seattle (SPU) and the City of Olympia have tested various cleaning techniques for porous cement concrete sidewalks.
 - Local cleaning and restoration consultants may also have experience cleaning porous pavements. Local companies include ServiceMaster and the Belarde Company.
- **If adjacent ground covers spread to porous pavement, see Section 6.2b, Porous Pavement and Ground Cover Migration, for corrective actions.**
- **Immediately report any spills (paint, oil, gas, antifreeze, or other spilled/dumped pollutants) or other damage to the porous cement concrete, to the Maintenance Association Site Manager.**
 - If a vehicle is associated with the spill, record and report the license number.

- The Maintenance Associate Site Manager is responsible for reporting spills to SPU’s Surface Water hotline at 206/684-7587 and SPU’s Maintenance Division at 206/386-1800.
- ⇒ *City of Olympia (porous pavement maintenance research) (Section 11)*
- ⇒ *The American Concrete Institute (Section 11)*
- ⇒ *National Ready Mixed Concrete Association (Section 11)*

3.2b Porous Gravel Pavement Pathways

Note: It is possible that areas other than pathways have used gravel pave for surfacing. If that is the case then the Maintenance Association should review approach for the specific application.

- **If porous system has been clogged by debris, when dry, vacuum up gravel from pavement section and properly dispose of waste material. Replace and fill cells with clean crushed gravel and bring back up to grade.**
 - **If gravel has worn away exposing grid cells of gravel pave, refill cells with approved gravel to top of geogrid surface.**
 - See Materials and Products, Section 7.6 for approved gravel.
 - **Watch for washouts from planted areas where soil, mulch or sediment is deposited on driveways or streets.**
 - Clear immediately and sweep area.
 - Report washouts on Maintenance Checklist Sheet and submit to Maintenance Association Site Manager.
 - Monitor washout occurrences to identify problem areas.
 - For problem areas, follow guidelines in Section 6.2a, Washout, for corrective actions.
 - **Weeds or moss may become an issue in porous gravel pave areas. Weeds can reduce the stormwater function of the porous gravel pave materials and should be removed.**
 - Weeds should be hand removed regularly through routine maintenance.
 - For persistent weed problems, refer to weed control products listed in Materials and Products, Section 7.
- ⇒ *Grass Pave and Gravel Pave, reinforced lawn and paving geogrid - Manufacturer information for maintenance and installation (Section 14.5)*



gravel pave

4 IRRIGATION

The irrigation system installed at the High Point Community is a hybrid type allowing for fully automatic or manual operation. It includes a Rainbird field satellite controller and Maxicom central control setup. This system has significant capability in terms of programming, responsiveness to weather conditions and remote operation (monitoring, programming and troubleshooting). Because the system's capabilities are extensive and the options for how they are used vary greatly, only general irrigation guidelines are included in this manual. For a current status of how the system is being used, contact the Maintenance Association Site Manager. For technical guidance on the system, refer to the appropriate product manuals.

4.1 Irrigation Schedule

Following initial landscape installation at the High Point Community, the irrigation schedule should be programmed to promote strong establishment of lawn and planted areas. To encourage the development of healthy plants with vigorous root systems, both drought AND over-watering should be avoided.

Establishment of landscaped areas throughout the High Point Community will require regular irrigation during the growing season. As the landscape becomes established irrigation may be decreased so that watering matches the maturity of plantings. A general guideline is that once plantings are established and stable (2-3 years), the irrigation schedule may be cut back to one or two deep waterings per week with additional watering during periods of high temperatures (above 80 degrees). Ongoing monitoring of plant and root system health should inform the irrigation schedule.

4.1a Lawn Irrigation

- Irrigate to achieve approximately 1 inch of water per week.
- Adjust controller in accordance with manufacturer's recommendations for this amount.
- Do not irrigate during times of heavy rainfall.
- Set irrigation system timers to run during off hours (at night/very early morning) to reduce irrigation conflicts with users and resulting damage to sprinklers/pop up heads.
- Monitor lawn areas for dry patches, saturated areas or other inconsistent water conditions.
- Contact a professional irrigation specialist to correct problem conditions.

4.1b Tree, Shrub and Ground Cover Irrigation

- Irrigate to achieve approximately 1 inch of water per week.
- Adjust controller in accordance with manufacturer's recommendations for this amount.
- Avoid irrigation during times of heavy rainfall.
- Monitor bed areas for dry patches, over-saturated areas or other inconsistent water conditions.
- Contact a professional irrigation specialist to correct problem conditions.

4.1c Extreme Drought Conditions

In the event of extreme drought conditions resulting in mandated city-wide irrigation reductions, the NDS areas at High Point are the highest priority for receiving irrigation. Cut back irrigation in the following order:

- **First:** cut back water to level lawn areas (not swales/ NDS areas).
- **Second:** cut back water to trees and other level planted areas (not swales/ NDS areas).
- Continue limited irrigation to maintain health and function of all swale/ NDS areas.

4.1d Irrigation System Maintenance

- Refer to owner's manual for proper irrigation system maintenance.
- Monitor irrigation heads, controllers, automatic control valves and quick coupler valves for damage or improper function.
- Carry out the following visual walk through tests of irrigation system:
 - First: beginning of growing season, spring irrigation start up (May)
 - Ongoing: one time per month during the growing season (June - September).
 - Utilize system's hand held remote to facilitate walk through testing.
- Note broken sprinkler and pop up head locations on Maintenance Checklist.

- **Maintain a record of locations to identify problem areas associated with vandalism or vehicular conflicts.**
 - See Irrigation Trouble-Shooting below.
 - **Contact a professional irrigation specialist to correct problem conditions.**
 - **Irrigation audit by outside certified auditor recommended at least every 3 years.**
- ⇒ *Irrigation system manuals (Section 14.2)*

4.2 Irrigation Trouble-Shooting

Irrigation maintenance records may identify areas where conflicts occur between the installed system and use of certain areas. The primary issues will likely be related to accidental damage by users, vandalism and vehicular impacts.

4.2a User Damage

- **Check irrigation timing and adjust schedule to avoid user conflicts.**
- **If continued damage or vandalism occurs, consider changing sprinkler or pop up head type.**

4.2b Vehicular Damage

In the case of vehicular damage, assess adjacent vehicular travel to identify the best possible intervention.

- **Above ground damage to system:**
 - Where appropriate, install a half buried one-man boulder to protect sprinkler head from vehicles.
 - Where vehicles will continue to impact system, modify system layout.
 - Relocate sprinkler heads further away from pavement.
- **Below ground impacts to system caused by vehicular loads:**
 - Install a reinforcing geogrid material for added protection.
 - Replace swing joints with flex poly pipe.



irrigation overspray and day time watering necessitate irrigation adjustments.



dead lawn area points to a need for irrigation adjustment.

5 LANDSCAPE TROUBLE-SHOOTING

5.1 Lawns

A healthy lawn is light green in color. It may contain small amounts of weeds and some bare patches. If a lawn area begins to look unhealthy, such as a yellow appearance, brown patches, many weeds, ponding or excess thatch, steps may be taken to return it to a healthy condition. Many of the following recommendations are taken from [Ecologically Sound Lawn Care for the Pacific Northwest](#).

- **More questions? Call the Natural Lawn and Garden Hotline 206.633.0224 and talk to an expert!**
- ⇒ *Ecologically Sound Lawn Care for the Pacific NW (Section 14.7)*
- ⇒ *Green Meridian, Total Lawn Health Care article (Section 14.7)*

5.1a Poor Color

For lawns that are yellow or brown, the optimal time for repairs is in spring or fall.

- **Aerate, overseed and topdress unhealthy areas.**
 - See Landscape Maintenance, Section 2.3e
- **Dethatch (see below) unhealthy areas with more than 1 inch of thatch.**
- **For areas impacted by significant pet urine, water regularly.**

5.1b Excess Thatch

The tough layer of roots and stems that accumulates on top of the soil is thatch. This layer can be beneficial; however, if it is more than 1 inch thick, it can inhibit root development and water infiltration. Excess thatch can be prevented by avoiding over watering and over-fertilizing. The following may improve excess thatch conditions.

- **Use a power thatcher to remove excess build up from dense areas**
 - Make several passes with the power thatcher.
- **Aerate, overseed and topdress areas following thatch removal.**
 - See Landscape Maintenance, Section 2.3e
- **Check irrigation schedule and set for less frequent and deeper watering.**
- **Avoid overfertilizing.**



bare patches in lawn areas



yellow, poorly establishing lawn

5.1c Weed Problem Areas

Where lawn areas are comprised of large patches of weeds or particularly aggressive weeds are establishing and standard maintenance can not keep up, additional maintenance steps are needed.

Annual weeds: Examples include crabgrass, dandelions, redroot pigweed, purslane, lambsquarters, foxtail, and barnyard grass. A corn gluten regimen can be beneficial. Corn gluten is approved for use in NDS areas.

- **Hand-remove weeds in problem area.**
- **Apply corn gluten using a spreader.**
 - For best results time application with weed germination.
 - Follow manufacturer’s guidelines for application schedule and rates.
 - Repeat applications are necessary.
 - Note: results are not immediate. Benefits are cumulative and will be achieved if product is used for several years.
- **Repair, reseed and mulch bare spots resulting from weed removal.**
 - ⇒ *Journal of Pesticide Reform - Corn Gluten Meal (Section 14.9)*
 - ⇒ *Iowa State - How to Use Corn Gluten Meal (Section 14.9)*
 - ⇒ *Eartheasy Corn Gluten article (Section 14.9)*



clover comprises much of lawn area

Clover: Where large patches of clover out-compete turf grasses, it is likely that soils are nitrogen deficient. A specialized approach to amending these soils should be carried out, and differs for the NDS and non-NDS lawns.

- **Hand-remove weed patches, including roots.**
 - Where appropriate, consider using flame weeders on patches.
 - Aerate, reseed and topdress any bare patches, see Section 2.3e.
- **Test soil to identify nitrogen or other deficiency.**
- **NDS areas:**
 - Apply custom compost tea brews based on soil testing results and supplier recommendations.
 - If deficiency continues, apply compost tea with natural nutrient additives or an approved natural fertilizer.

- + Application (including formulation) must be pre-approved by Maintenance Association Site Manager.
- + Seek input from SPU contact to provide best timing from a watershed perspective.
- See Materials and Products, Section 7.4 on Fertilizers and Amendments.
- **Non-NDS areas:**
 - Apply natural fertilizer based on soil testing results.
 - If continued efforts do not control clover, consult with a professional knowledgeable in the area of natural amendments.
 - See Materials and Products, Section 7.4 on Fertilizers and Amendments.

Last Resort: Where manual removal and addressing soil deficiencies does not control weed infestations, chemical weed removal products approved through the IPM process may be applied.

- **Obtain approval from Maintenance Association Site Manager.**
- **Spot treat weeds with IPM-approved natural herbicides. See Materials and Products, Section 7.2a.**
- **Apply according to manufacturer's directions.**
- **Reapply, if necessary.**
- ⇒ *Tri-County Integrated Pest and Vegetation Management Guidelines (Section 14.9)*
- ⇒ *City of Seattle Pesticide Tier Tables (Section 14.9)*

5.1d Compacted Soils

Signs of compacted soils in lawn areas include poor drainage, shallow root development (less than four inches into soil), worn patches and hard surface. The following may improve compacted soil conditions.

- **Aerate, overseed and topdress (see Landscape Maintenance, Section 2.3e)**
- **Monitor irrigation to avoid overwatering.**

In extreme cases, renovating the problem lawn may be the best option. If so, be sure to identify and correct or adjust conditions contributing to original compaction, such as poor grading, foot traffic, excessive irrigation and nutrient deficiencies.

- **Remove existing grass turf.**



soils compacted from construction activity

- Test the soil to learn what corrections may be needed.
- Apply organic natural amendments (lime or in non-NDS areas specialized natural fertilizers) as recommended by test results.
- Spread 2 inches of approved compost material and till it to a depth of 6-8 inches.
- Rake to level the soil, roll with a landscape roller, water to settle for a day, and rake again.
- Apply approved High Point lawn seed mix and water as recommended by seed supplier.

5.1e Moss

Moss can accumulate in shady areas, acidic, compacted or infertile soils or in areas that are saturated or poorly draining. The following actions can reduce moss growth.

- Take core samples in affected lawn area and test the soil pH. Apply agricultural grade pellet form of lime to attain a pH between 5.5 and 7.5. Apply lime at a rate based on samples and not to exceed 40 pounds per 1,000 square feet.
- If area is saturated or poorly draining, use measures described in this section, under Compacted Soils, 5.1d.
- Stop watering the area or let it dry completely between waterings.
- Remove moss with a dethatching tool and overseed area with a shade-tolerant local lawn mix.
- If moss returns, apply iron treatments annually to burn moss in the summer (treatments will not harm lawn).
 - Avoid iron treatment contact with concrete as it may stain.
- If these measures do not alleviate the problem, obtain Maintenance Association Site Manager's permission to plant the area with shade-tolerant shrubs and/or ground covers.

⇒ *Journal of Pesticide Reform - Moss in Lawn Areas (Section 14.9)*

5.1f Tree Plantings in Lawn

For ease of long-term maintenance, the lawn edge around all trees located in lawn areas should be rectangular or rectangular with rounded corners and of sufficient dimensions. In some cases, these areas were incorrectly installed as round planters, which should be corrected. Use the following tree planting area guidelines:



tree planting area round and too small - square and enlarge

- Where planter is round, replace with rectangular edge.
 - Maximum dimension of planter should be six by seven feet (6' x 7').
- Where too small, enlarge to six by five feet (6' x 5').

5.1g Reinforced Grass Edges

Reinforced grass edges (a geogrid system planted with grass) are installed along alleys where vehicular impact is anticipated. These areas should be monitored for excessive wear and retrofitted if needed. If after a period of one year, grass appears excessively worn (many or large bald patches) replace grass with gravel or ground covers.

- Manually remove all remaining grass, all roots and soil from geogrid.
 - Prepare geogrid for pocket planting with fast-growing, tough, evergreen ground cover.
 - Backfill some cells with a planting soil mix
 - Select planting cells based on desired ground cover spacing
 - Locate planting cells away from paved edge to decrease vehicular impacts.
 - Plant soil filled cells with ground cover plugs.
 - Utilize the High Point Community plant lists to select ground cover.
 - Backfill remaining geogrid cells with approved gravel to top of geogrid surface.
 - See Materials and Products, Section 7.6 for approved gravel.
- ⇒ *Grass Pave and Gravel Pave, reinforced lawn and paving geogrid - Manufacturer information for maintenance and installation (Section 14.5)*
- ⇒ *High Point Community ROW Plant Lists for Phases 1 and 2 (Section 14.3)*



worn reinforced grass edge

5.1h Ponding in Lawn Areas

Ponding should not be occurring in non-NDS lawn areas. Instances of ponding in these areas should be investigated and addressed. Possible reasons for ponding in these areas include:

- Overly compacted soils or subgrade
- High groundwater in the area
- Broken or leaking irrigation lines or heads



as-built conditions resulted in bare areas needing plant material

- Improper grading leading to a closed depression
- Possible solutions to such issues include: small adjustments to finished grade; removal of sod and re-preparation (tilling, amendment) of soils; or installation of French drains or other minor conveyance facilities. Any changes should be approved by the Maintenance Association Site Manager, and any necessary permitting agencies.
- Any work around the Pond should avoid disturbance of the sub-surface pond liner or any element integral to the Pond facility.

5.2 Trees, Shrubs and Ground Covers

Healthy trees, shrubs and ground covers show growth, habit and flowering according to their species. Signs of ill-health can include poor growth, dying branches, yellowing or spotted leaves, few or excessive buds on flowering plants and much more. The following are general problems associated with unhealthy plants. For more information on plant types or species, refer to Section 11, Recommended Publications.

5.2a Nutrient Deficiencies

Look for plants to have a color, growth habit and character typical of their species. Yellowing, poor growth, weak flowering, spotting or weakness may be a sign of nutrient deficiencies. Some typical symptoms and their deficiencies are:

- **Yellowing: Nitrogen (N) deficiency.**
- **Poor growth: Phosphorous (P) deficiency.**
- **Poor flowering, spotting or curled leaves, or weak roots or stems: Potassium (K) deficiency.**
- **If needed, test soil to identify specific nutrient deficiencies.**
- **Consult with a professional knowledgeable in the area of natural amendments.**
 - See Materials and Products, Section 7.4.
- **NDS areas:**
 - Apply custom compost tea brews based on soil testing results and recommendations.
 - If deficiency continues apply compost tea with natural nutrient additives or an approved natural fertilizer.
 - + Must be pre-approved by Maintenance Association Site Manager.
 - + Seek input from SPU contact to provide best timing from a watershed perspective.

- **Non-NDS areas:**
 - Apply natural fertilizer based on soil testing results and recommendations.

5.2b Diseases

Look for plants to have a color, growth habit and character typical of their species. Spotting, rust, blackened leaves and other irregularities can be signs of disease. In all cases, disinfect gardening tools after pruning or treating a diseased plant to reduce spreading. For more information on plant types or species, refer to Section 11 Recommended Publications.

Diseased plant material disposal: Any whole diseased plants, and all plant material removed from plants that appear to be diseased should be removed from site and disposed of in commercial compost or landfill, to avoid risk of spreading the disease to other plants. Pay particular attention to potentially diseased coniferous trees, especially cypress and cedar.

- **Dark gray to tan sunken spots on leaves: May be caused by anthracnose.**
 - Avoid overhead watering
 - Add mulch to root zone
 - Increase air circulation around plant
 - Remove and destroy infected portions of plant
- **Blackened portions of plant: May be caused by fireblight.**
 - Remove and destroy infected portions of plant, pruning 6 inches minimum from diseased area.
- **Dull, yellow leaves, sparse, wilting, whitish fungal tissue below on roots below soil line: May be caused by oak root fungus.**
 - Remove tree and all roots larger than ½ inch in diameter.
- **White to gray circular patches, poor growth and fruiting: May be caused by powdery mildew.**
 - Spray infected areas with water early in the day to wash spores from plants.
 - Spray with IPM-approved natural treatment, such as Neem oil, vegetable oil or a 10:1 mix of water and milk.
- **Wilting, leaves with poor color and premature drop: May be caused by root rots or water molds.**



diseased dwarf red-twig dogwood

- Check irrigation to eliminate overwatering.
- Check for and remedy poor drainage.
- **Yellow to purple-brown powdery bumps on leaf underside or yellow spots: May be caused by rust.**
 - Remove infected leaves.
 - Remove fallen leaves or branches.
 - Increase air circulation around plants.
- **Wilting or failing on one side of plant, yellowing leaves: May be caused by verticillium wilt. It can take more than one season to kill a larger plant.**
 - Irrigate deeply and infrequently.
 - Fertilize if plant shows poor growth.
 - Remove dead branches.
- **Coniferous trees, particularly cedar and cypress species, exhibiting yellowing, wilting, or browning through all or most of crown: May be caused by *Phytophthora* spp., a fungus which attacks the roots.**
 - Consult immediately with a certified arborist
 - Test root material and/or adjacent soil for presence of the fungus
 - If disease is strongly suspected or confirmed, remove tree and surrounding soil from site.
 - Use extreme care not to spread or track any soil or plant material from site of diseased tree to other areas of site.
- **Clean and disinfect any equipment used to remove, handle, or transport any diseased plant material or soil.**
 - ⇒ *Tri-County Integrated Pest and Vegetation Management Guidelines (Section 14.9)*
 - ⇒ *City of Seattle Pesticide Tier Tables (Section 14.9)*



rosemary planted too close to sidewalk requires excessive trimming

5.2c Relocating Plants

Relocating plants is labor intensive and can be hard on the plant. There are times, however, when this is the best course of action. The most common reasons for relocating plants are when shrubs grow too large for their location and when as-built conditions do not match plant requirements. The following are guidelines for electing to relocate a plant:

- **A shrub requires frequent, extensive pruning or shearing to maintain visual sight lines for safety or clearances along a walk or roadway.**

- Understory plants overtaken by adjacent shrubs are shaded out and will die if not moved.
- A conifer has been placed in a spot that impairs necessary sight lines or is too close to curb/roadway or sidewalk.
- Initial understory plantings are too dense.
 - Consider moving to underplanted or otherwise bare areas of landscape.
- A plant is suffering due to as-built conditions that will not change.
 - Wet-loving in dry location
 - Dry-loving in wet location
 - Sun-loving in full shade
 - Shade-loving in full sun



plants may be thinned by relocating to other areas where vegetation is sparse

When relocation is the best option, follow these guidelines to lessen the impact on plants:

- **Move plants when conditions are best.**
 - During cool weather
 - When plants are dormant or semi-dormant
- **Replant the same day.**
- **Prepare the new location first to shorten transition time.**
- **Presoak the plant several days before moving to ease digging and hold the root ball together.**
- **Trench around the plant outside of the drip line.**
 - For larger shrubs consider a partial root prune at least three months ahead of time.
 - Trench should be as deep as root ball width.
- **It may be necessary to hold together the root ball of larger plants with burlap or chicken wire during transfer.**
- **Transplanting trees will require special care.**
 - For trees under 4-inch (4") diameter, follow standard transplanting practices.
 - For trees over 4-inch (4") diameter, consult with a tree specialist with experience moving larger trees.
- **Refer to planting guidelines in Plant Replacement and Installation, Section 2.5.**

5.2d Plant Species Replacement

The plant species in the High Point Community ROW were carefully selected for their locations. However, as-built conditions can differ from plans resulting in poor performance, mortality and the need for replacement plants with different requirements (see the previous section, Relocating Plants). Use the following guidelines when a different plant species must be selected:



tree planter with large gaps

- **Select plants from the attached High Point Community ROW Plant List.**
- **Identify basic desired characteristics of replacement plant.**
 - Type (shrub, perennial, ground cover)
 - Size and form
 - Function (flowering, water quality, weed suppression)
- **Narrow down choices matching plant requirements to as-built conditions.**
 - Sun
 - Shade
 - Wet
 - Dry
 - Soil type
 - Foot traffic
- **Submit proposed replacement plants to Maintenance Association Site Manager for review/approval.**
 - Provide notes outlining replacement on a Maintenance Checklist Sheet noting location on map (included with checklist).
- **Refer to planting guidelines in Plant Replacement and Installation, Section 2.5.**
 - ⇒ *High Point Community ROW Plant Lists for Phases 1 and 2 (Section 14.3)*
 - ⇒ *King County, Going Native brochure (Section 14.7)*

5.2e When a Landscape Plant Becomes a Weed

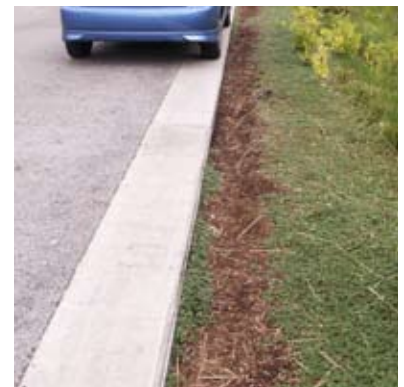
Occasionally, plants intended for use in the landscape begin to exhibit invasive characteristics and may be reclassified as a weed. This is especially common when plants are new to the region and have a limited horticultural track record. Invasive plants will exhibit weedy characteristics that may be used to identify them as problem plants needing extra maintenance or requiring removal.

- **Watch for plants exhibiting the following invasive characteristics:**
 - Highly self-sowing - many seeds
 - Broad germination - high germination and success rate
 - Early maturing - can germinate and reproduce within same season
 - Quick colonizing
 - Outcompete other plants
 - Difficult to remove seedlings or spreading growth
- **Plants in the High Point landscape with potential invasive character should be monitored:**
 - *Stipa tenuissima* (*Nassella tenuissima*) commonly known as Mexican feather grass is a species of possible concern. It self-sows broadly, reproduces quickly and is known to invade rangelands in other regions. Watch this plant.
 - *Fragaria chiloensis*, or beach strawberry. A creeping, low groundcover that may spread too aggressively, potentially spilling out of planting beds into sidewalks, roadway, lawn, or other plantings.
 - Report potential invasive landscape plants to the Maintenance Association Site Manager on a Maintenance Checklist, noting its location on the included map.
- **See Relocating Plants (Section 5.2c), Plant Species Replacement (Section 5.2d), and/or Excessive Vegetation (Section 6.1d) for guidelines on plant removal and replacement, should that become necessary.**

5.2f Vehicle/Landscape Edge Conflicts

Over time areas of vehicular conflict may become apparent. Some examples are where vehicles cross into landscaped areas at alley or driveway entrances and where car parking occurs along curbsless road edges. These areas should be monitored for excessive wear and retrofitted or protected as appropriate.

- **Where edge plantings are impacted at drive and alley entrances:**
 - If after a period of one year, plants do not establish (compacted soil little or no plant cover) replace with gravel.



vehicle damage to landscape edge

- Excavate soil in problem area to a **width of no more than 12 inches (12")** and a **depth of 6 inches (6")**.
- Backfill area with 1 inch (1") drain rock to a depth that is level with the adjacent paved surface.
- **Where vehicle parking overextends onto natural drainage systems, potentially impacting swale function:**
 - Consult with Maintenance Association Site Manager to obtain technical guidance in troubleshooting this conflict.
 - Possible retrofitting includes adding protective barriers.
 - Excessive compacting of swale soils may require excavation and replanting.
 - Where conflicts are not easily removed, it may be necessary to replace plantings with cobbles or other free-draining material.
- **Another retrofit option where vehicle/landscape edge conflicts occur is to add a structural (drivable) planting grid system, such as Ecogrid™ or Grasspave2™, and fill void spaces with appropriate replacement plantings.**

6 DRAINAGE FACILITIES MODIFICATIONS

There may be problem areas within the ROW drainage facilities that require special ongoing maintenance and may warrant field modifications. Drainage facility problem areas can result from grading issues, improper material use, plant growth and establishment, intensive rain events or user impacts. Obtain approval from the Maintenance Association Site Manager before making modifications.

6.1 Drainage Swales

6.1a Excessive and Repeated Erosion

- When working in swales, protect from compaction following guidelines in Section 3.1a.
- Install cobbles at top of erosion channel.
- Cobble area should be 3 times the width of the erosion channel and at least 12 inches minimum length
- See Materials and Products, Section 7.6 for approved cobble type.
- Avoid using river rock, gravel or rip rap.



cobbles placed in erosion-prone area near outlet pipe

6.1b Repeated Sediment Buildup

Where monitoring has identified problem areas for sediment build-up (see Sediment Accumulation, Section 3.1d) cobbles may be added to reduce erosion.

- Identify upstream source.
- Install cobbles at source.
 - See Section 6.1a above for guidelines on installing cobbles.
- When sediment issues require additional expertise and support, the Maintenance Association Site Manager should contact SPU Maintenance Division at 206/386-1800.

6.1c Ponding

If water is ponding for more than 24 hrs following a rain event, notify Maintenance Association Site Manager then take the following steps:

- When working in swales, protect from compaction following guidelines in Section 3.1a.
- Determine if sediment is built up within the top 2-3 inches of soil in cell.



grading adjustments are needed where extended ponding occurs

- If so, remove sediment and replace with mulch.
- See Sediment Accumulation, Section 3.1d
- See NDS Areas - Composted Mulch Replacement, Section 2.4j.
- **Fill any unintentional depressions with NDS Soil Mix #1 and grade to smooth.**
- **Smooth soil to direct water to the designated drainage point.**
- **Remove soil to a depth of 2 inches more than the accumulated sediment and replace with NDS Soil Mix #1.**
- **If extended ponding is recurring or lasts up to 72 hours alert the Maintenance Association Site Manager to contact SPU Maintenance Division at 206/386-1800.**

6.1d Excessive Vegetation

In general, strong plant establishment is a positive sign; however, dense plantings in a drainage swale may cause stormwater to back up and may inhibit stormwater flow beyond typical ponding. This condition will require assessment and corrective actions.

In addition to potential interference with stormwater flows, excessive vegetation may become a nuisance or hazard for pedestrian and vehicular circulation and safety. Overly aggressive or abundant vegetation can block sight lines and begin to encroach on sidewalk and roadway spaces.

- **Determine that pruning or other routine maintenance are not adequate or feasible to maintain proper plant density and aesthetics in an efficient manner.**
- **Determine if planting type should be replaced to avoid ongoing maintenance issues.**
 - An aggressive grower under perfect growing conditions should be transplanted to a location where it will not impact flow.
- **Look for areas that were planted too densely.**
 - A moderate grower planted too densely should be thinned by transplanting some individuals to make space for future growth while allowing for adequate flow-through.
- **When working in swales, protect from compaction following guidelines in Section 3.1a.**
- **Use the following general guidelines for modifications to areas with excessive vegetation:**

- Remove plants that are weak, broken or not true to form.
- Thin grass clumps at regular intervals at a ratio of 1:6.
- Thin grass or plants so as not to leave visual holes or bare soil areas.
- Smooth bare soil areas.
- **Corrections should not noticeably alter the character of the planting layout.**
- **During transplanting and replacement, follow the planting guidelines in Plant Replacement and Installation, Section 2.5.**

6.1e Change from Lawn to Planting

There may be requests to replace lawn with plantings. This may be done in areas where grades make it difficult to obtain an even mowing height or in areas that are too shady or moist for dense lawn growth.

- **Replace with plants using the nearest vegetated cell as a guide for plant species.**
 - See High Point ROW planting details and plant lists for reference.
- **Replacement plants should be installed following the planting guidelines in Plant Replacement and Installation, Section 2.5.**

6.1f Drain Curb Cut Channelization

Continued erosion and channelization in the swale at the drain curb cut may suggest the need for energy dissipation. A small amount of cobbles can be added to reduce erosion at these points.

- **Place cobbles in swale where flow from drain curb cut enters.**
 - Added cobbles shall not reduce or block in any way stormwater flow into the swale.
- **See Materials and Products, Section 7.6 for approved cobble type.**

6.1g Drain Curb Cut Ponding or Blockage from Excess Turf or Plantings

Where continued gutter line ponding or blockage occurs at curb cut opening due to built-up grass turf, improper soil elevation and/or plant material build up, removal of lawn/plant material and lowering of grade may be required.

- **Where excess turf exists:**
 - Remove grass.
 - Excavate a portion of soil.
 - Replace with new sod set slightly lower to allow proper inflow.
- **Where plantings cause similar backups at drain curb cut openings:**
 - Remove or thin out plantings.
 - Lower grade if needed.
 - Smooth soil.
 - Replace plants with smaller shrubs, ground cover or grasses.
 - See Plant Replacement and Selection, Section 2.5.
 - Replace mulch. See Mulching, Section 2.5d.

6.1h Pedestrian Berm

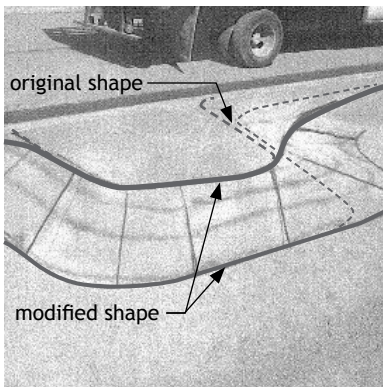
Vegetation within a pedestrian berm may become excessively worn from pedestrian use. The following modifications may remedy the issue.

- **If original ground cover type is too fragile for this application, replace with more durable species from High Point ROW Plant List.**
- **Add stepping stones at logical crossing points.**

6.1i Grading Modifications around Trees in Drainage Swales

Grading adjustments around trees planted in drainage swales may be made for easier mowing and a more natural appearance.

- **Follow general regrading and vegetation replacement techniques to those listed in Section 6.1g.**
- **Avoid grading changes within the critical root zone.**
- **Avoid impacting tree roots.**
- **Avoid grading changes that block the drain curb cuts.**
- **Replace any damaged plants or lawn with in-kind material.**
 - See Plant Replacement and Selection, Section 2.5.
 - Replace mulch. See Mulching, Section 2.5d.



modify for gradual grading at tree berms

6.1j Grading Modifications to Grass Berms in Swales

The berms in grass lined swales are intended to allow ponding in storm events. Although the berms may have a square shape, it is acceptable to make adjustments resulting in a rounded shape. However care should be taken during mowing and other maintenance activities to preserve the berms, which are integral to the proper function of the engineered stormwater system design.

- Top dress lawn with a thick layer (2 to 3 inches) of composted mulch, rounding out square edges.
- Grass will slowly grow up through the mulch, extending the mound in these areas.
- Apply seed mix to avoid the establishment of weeds.
- Once lawn has established on compost layer, additional applications may be made until a rounded form is achieved.
- If scalping is an issue when mowing, alternative maintenance equipment, such as a hand-held trimmer, should be used on berms.

6.2 Other Drainage Related Issues

6.2a Washout

A washout occurs when stormwater flows out of planted areas or swales and deposits soil, mulch or sediment on paving or elsewhere. This is of particular concern when material is deposited onto porous walks, drives or streets, which are intended to allow stormwater to infiltrate. Identify what is causing the stormwater to flow outside of the planted area and take steps to remedy the problem.

- Clean deposited soil or other materials from porous pavement or other adjacent surfacing. See *Hardscape and Other Features, Section 3.2a*.
- Is the surface elevation too high at edge of planted area? If so:
 - Protect porous pavement by covering with plastic and secure covering in place prior to start of regrading.
 - Remove lawn or plants at edge of planted area.
 - Remove soil so it slopes away from washout.
 - Replace removed plants with in-kind material. See *Plant Replacement and Installation, Section 2.5*.
 - Replace mulch. See *Mulching, Section 2.5d*.



washout from planting area onto street

- **Does grading of swale channel need adjustment?**
 - Protect porous pavement by covering with plastic and secure covering in place prior to start of regrading.
 - Remove plant material where work is to be done.
 - Grade at bottom and edges to match High Point ROW Swale Section.
 - Add NDS soil mix #1 and if necessary replace plants with in-kind material.
 - See Plant Replacement and Installation, Section 2.5.
 - Replace mulch. See Mulching, Section 2.5d.
- **Are there blockages (plant material, mulch build-up) in the channel redirecting water?**
 - Protect porous pavement by covering with plastic and secure covering in place prior to start of regrading.
 - Remove plant material causing blockage.
 - Remove mulch.
 - Replace plants at proper grade and provide appropriate spacing.
 - Use original plants or replace with in-kind material.
 - See Plant Replacement and Installation, Section 2.5.
 - Replace mulch. See Mulching, Section 2.5d.

⇒ *High Point ROW Swale Section(s) (Section 14.3)*

6.2b Porous Pavement and Ground Cover Migration

Where *Fragaria* species (strawberry) or other fast-spreading ground covers are planted adjacent to porous pavement, the ground cover may spread too aggressively and root in the pavement. This migration is of particular concern with porous paving, as the ground cover will establish, collect sediment and reduce the pavement's function. Ground cover plantings must be kept from establishing on porous pavement.

- **Regularly trim ground covers along porous pavement edge.**
 - Time trimming as needed to keep plants from rooting in adjacent porous pavement.
- **Vacuum porous pavement if sediment has collected.**
- **Note areas where ground cover is removed on High Point Maintenance Checklist map and submit to Maintenance Association Site Manager.**

For problem areas where removal cannot keep up, obtain Maintenance Association Site Manager approval to retrofit planting as follows:

- **Remove all *Fragaria* (or other invasive ground cover) from the swale on the porous pavement side (from the bottom up to the porous pavement edge).**
 - Remove all *Fragaria* plant material, including all roots.
 - Replace with a ground cover appropriate for the location.
 - See Plant Replacement and Installation, Section 2.5.
 - Be sure to use “steppable” plants for high traffic pedestrian berms.
 - Select plants from the High Point Community Plant Lists.

6.2c Moss and Weed Growth in Porous Pavement

In addition to the potential for colonizing by aggressive groundcovers, porous pavements can also become host substrate to moss and other invasive weeds. Such plant growth will eventually clog the porous pavement, and possibly damage it structurally. Thus, moss and other plants should be removed regularly through appropriate maintenance techniques.

- **See Drainage Facilities Maintenance - Hardscape and Other Features, Section 3.2, for guidance on removing weeds from and maintaining porous pavement.**
- ⇒ *City of Olympia (porous pavement maintenance research) (Section 11)*

7 MATERIALS AND PRODUCTS

The following materials and products are approved for use. Any substitutions must meet material or product requirements and be approved by the Maintenance Association Site Manager. Any additional materials or products not covered in this section must also be approved for use by the Maintenance Association Site Manager.

7.1 Plant Material

7.1a Plant Selection

Plant materials at High Point Community have been carefully selected to suit the varied conditions within the ROW. To ensure successful establishment and function of vegetation, select plants suited to the locations' microclimates.

Select plants based on these guidelines:

- Typical of their species or variety
- Healthy with vigorous growth
- Fully developed form with dense branching
- Vigorous, fibrous root systems

Select plants that are free from the following:

- Voids and open spaces in branching
- Broken branches, flush cuts or stubs
- Circling roots within container
- Disfiguring knots
- Sunscald injuries
- Abrasions of the bark
- Weeds
- Plant diseases
- Insect eggs
- Evidence of borers and other forms of infestation
- Other defects

7.1b Balled and Burlapped (B&B) and Bare-Root Plants

Trees and shrubs are often sold balled and burlapped (B & B) or bare-root. In addition to the general plant selection guidelines above, there are special characteristics to look for in B & B and bareroot plants.

Select B & B plants with the following characteristics:

- Firm ball of soil.
- Diameter and depth to encompass a root system of sufficient size to support the plant given its species and size.
- Balls that are not cracked or mushroomed.
- Free from pruning wounds that are more than one inch in diameter and do not show vigorous callusing.
- Firmly wrapped with burlap or similar landscape material and bound carefully with twine, cord or wire mesh.

Select bare-root plants with the following characteristics:

- Firm and moist roots.
- Note: Only accept delivery and bare-root material from October 15th to March 15th.

7.1c Container Plants

Trees are sometimes sold in containers. Shrubs, perennials and grasses are usually sold in containers. In addition to the general plant selection guidelines above, select container plants with the following characteristics:

- Sufficiently developed root system that holds soil together.
- Free of root-bound conditions (roots that encircle pot perimeter, grow out of container drainage holes or protrude above soil level).
- Free of weeds.
- Moist, not dried out soil.

7.1d Lawn Seed Mix

Use the same fine lawn seed mix applied in the initial construction or if not available, a similar mix approved by the Maintenance Association Site Manager. Mixing seeds with a mycorrhizal inoculant at application will give them additional support taking root.

- **High Point Fine Lawn Seed Mix following:**

	Proportions by Weight	Percent Purity	Percent Germination
Three-Way Rye	66%	98	90
Creeping Red Fescue	17%	98	90
Chewings Fescue	17%	98	90

- **Mycorrhizal inoculants:**

- Hendrikus Organics, Endo & Ecto Mycorrhizal
- Plant Health Care, Mycor™ Turf Saver™
- See Section 7.4 for contact information.

7.2 Pest, Weed and Disease Control Products

If products are to be used for pest, weed or disease control they must meet the following requirements.

It is recommended that a community notice about any pest, weed, or disease control products be posted on site at the time of application. Such notice should include any manufacturer- or industry-recommended times that the public should avoid use of the affected areas (e.g. playing, pet walking, etc.).

7.2a Weed Control

Weed control should first be by manual methods and soil amendment. For problem areas or when threatening invasions appear, manual removal may be supplemented with IPM-approved natural “weed and feed” corn gluten products or approved natural herbicides. Some accepted products include:

- **Corn gluten, a natural “weed and feed” product.**
 - See Section 7.4a below for use guidelines and products.
- **Approved vinegar-based products such as Burn-out (some such products are listed in Tier 1 of the pesticide tables due to the danger to handlers from corrosiveness of industrial-strength acetic acid).**
- **Approved non-selective fatty acid soap-based herbicides such as Safer brand Fast Acting Weed and Grass Killer.**

7.2b Pest and Disease Control

Prevention is the best approach to pest control, however, if pest populations begin to impact landscape health and appearance controls may be needed. All products used should be approved through the IPM process and pesticide Tier Tables. Following are a

number of products which are considered generally acceptable for use.

The following biological controls are approved:

- **Beneficial nematodes**
 - Available from numerous on-line suppliers.
 - Select nematode species based upon target pest.

The following natural/organic pesticides are approved:

- **Safer brand Insect Killing Soap II (OMRI Listed)**
- **Safer brand Bug Patrol (OMRI Listed) (test for colorfastness before use on evergreens)**
- **Neem oil**
 - For aphids, cutworms, leaf-miners, whitefly and mites.

The following natural products are approved to control mildew:

- **Neem oil**
- **Vegetable oil**
- **A 10:1 mix of water and milk**
- **See Supplier Websites, Section 11.**
 - ⇒ *Tri-County Integrated Pest and Vegetation Management Guidelines (Section 14.9)*
 - ⇒ *City of Seattle Pesticide Tier Tables (Section 14.9)*

7.3 Mulch

Mulch type differs depending on the application. Compost mulch is used for topdressing in planted NDS areas and on lawns. Medium bark mulch is used as a topdressing for non-NDS planted areas.

7.3a Compost Mulch

Compost mulch shall meet the following guidelines:

- **Made up of composted yard debris or organic waste material consisting of 100% recycled content with the following characteristics:**
 - Screened to 7/17 inch
 - Ph from 5.5 to 7.5
 - Maximum electrical conductivity of 3.0 ohms/cm
 - Maximum carbon to nitrogen ratio of 40:1
 - Certified by the Reduce Pathogens (PFRP) guideline for hot composting as established by the US EPA

- Fully composted, mature and stable
- **Accepted products include:**
 - Cedar Grove Compost
 - Whitney Farms Planting Compost
 - Any other compost mulch source must meet all of the above guidelines and be approved by the Maintenance Association Site Manager.

7.3b Medium Bark Mulch

Medium bark mulch shall meet the following guidelines:

- **Contains only medium ground Douglas fir bark.**
- **Shall not contain other plant materials, weed seeds, or substances injurious to plant growth.**
- **Accepted products include:**
 - Whitney Farms Bark Mulch
 - Any medium bark mulch source that meets all the above guidelines and is approved by the Maintenance Association Site Manager.

7.4 Fertilizers and Amendments

Approved natural fertilizers are for use in non-NDS lawn and planted areas only. Any application of fertilizer to NDS areas must be pre-approved by the Maintenance Association Site Manager with guidance from SPU contact. Because they are repeated within the subsections, a list of suppliers' contact information is provided at the end of this section.

It is recommended that a community notice about any fertilizer or amendment products be posted on site at the time of application. Such notice should include any manufacturer- or industry-recommended times that the public should avoid use of the affected areas (e.g. playing, pet walking, etc.).

7.4a Lawn Areas

A full range of natural lawn fertilizers are available on the market. Products used shall meet the following guidelines:

- **Contains all natural ingredients.**
- **Contains no petrochemical or synthetic ingredients.**
- **Approved products include:**
 - Hendrikus Organics, Seasons 8-2-4
 - Nature Safe, High Potassium 7-1-14

- Plant Health Care, Healthy Turf™ 8-1-9
- Many specialized natural fertilizer blends are available depending upon the conditions.
- Approved fertilizers shall be applied at the rate recommended by the supplier, but shall not exceed 1 pound of nitrogen per 1,000 square feet.

Corn gluten is a naturally occurring substance which has been found to provide similar benefits as “weed and feed” products. It simultaneously adds nitrogen while suppressing weed seed germination. Corn gluten may be applied to NDS areas.

- Corn gluten products may be obtained locally from:
 - Walt’s Organics

7.4b Trees

Tree fertilizers shall meet the following guidelines:

- Contains all natural ingredients.
- Use a deep root pressurized injection system.
- Fertilizer product to be approved by an ISA certified arborist.
- Approved products may include:
 - Plant Health Care, MycorTree Injectable
 - Plant Health Care (PHC) for Trees (select specific blend based on tree health, soil testing and location)

7.4c Mixed Planted Areas

In mixed planted areas (shrubs, perennials, ground covers and ornamental grasses) use multi-purpose fertilizers.

- Approved products include:
 - Hendrikus Organics, Complete 6-4-4
 - Nature Safe, Landscape Fertilizer 8-5-5
 - Walt’s Rainy Pacific NW Blend 7-4-9
- Corn gluten may also be applied to mixed planted areas to add nitrogen and suppress weed seed germination (see Section 7.4a above).

Approved Fertilizer and Amendment Suppliers/Consultants:

Local

- Hendrikus Organics (Natural plant care products and consulting)

Contact: Jules Durant or Tina Peterson
PO Box 1289
14461 Tiger Mtn Road SE
Issaquah, WA 98027
425/392-9977 (phone) 425/392-4335 (fax)
www.hendrikusorganics.com/

- Walt's Organics
1528 Leary Way (in Ballard)
Seattle, WA 98107
206/783-6685 (phone) 206/297.9093 (fax)

National

- Nature Safe
800/252-4727
www.naturesafe.com
- Plant Health Care
800/421.9051
www.planthealthcare.com
- Also see Included Documents Section 10 for supplier brochures.

7.4d Compost Tea

Compost tea may be used in all landscape areas of High Point, NDS and non-NDS. Compost tea contains aerobic organisms, and should be used within 24 hours of production. Tea brews can be special ordered to best meet needs of application.

- **Local suppliers include:**
 - Hendrikus Organics (provides application services in addition to tea)
(see preceding supplier list)
 - Bob's Brewers (compost tea brewing and application equipment)
9616 Fauntleroy Way SW
Seattle, WA 98136
206/937-2901 (phone)
<http://www.net-time.com/bobsbrew/index.html>
bob@bobsbrewers.com
- Compost tea should be tested and verified to be free of human pathogens (e.g. *E. coli*, *Salmonella* spp., etc.)
- Consider displaying public informational/educational signage about compost tea during applications

7.4e Lime

Lime is to be used as needed in lawn areas.

- Lime - agricultural grade pellet form

7.5 Sand and Soil Mixes

7.5a Fill sand

Fill sand is mixed with compost (60/40, compost/sand mix) to fill aeration holes and provide topdressing following aeration and overseeding of non-NDS lawn areas only.

- **The Fill Sand Mix shall meet the following requirements:**

<u>Size Sieve</u>	<u>Percent Passing</u>
No. 10	100%
No. 20	85-100
No. 60	40-60
No. 100	30-50
0.02 mm	10-15
0.002 mm	0-10

7.5b Gravelly Sand

Gravelly sand is mixed with compost to achieve the approved NDS #1 soil mix.

- **The Gravelly Sand Mix shall meet the following requirements:**

<u>Size Sieve</u>	<u>Percent Passing</u>
2-inch	100
¾-inch	70-100
¼-inch	50-80
No. 40	15-40
No. 200	0-3

7.5c NDS Soil Mix #1

The NDS Soil Mix #1 is a combination of gravelly sand mixed with compost (approximately 35/65, compost/sand mix).

- **The NDS Soil Mix #1 shall contain the following:**
 - Organic compost at 30 to 35 percent by volume
 - Remaining volume gravelly sand
- **Mix to provide an organic soil mix with the following properties:**
 - Organic content between 4 and 8 percent by dry weight per ASTM D 2974.
 - Minimum hydraulic conductivity rate of 4 inches per hour per ASTM Designation D 2434 when compacted to 80 percent of maximum dry density per ASTM Designation D 1557.

- **Mix each NDS Soil Mix uniformly to a homogeneous consistency.**
- **Do not mix in the rain or wet conditions.**

7.5d NDS Minor Soil Replacement Mix

For areas smaller than 2 cubic feet, the following mix of materials that are available at a local hardware store can be used.

- **Mix well the following quantities of material.**
 - 1 bag of pea gravel (1/2 cubic foot)
 - 1 bag of play sand (1/2 cubic foot)
 - 1 bag of Cedar Grove compost (1 cubic foot)
- **Commercial rain garden soil mix may also be used.**

7.6 Rock, Cobbles, Drain Rock and Gravel

7.6a Cobbles for Drainage Facilities

Cobbles are installed at top of erosion areas to dissipate energy of flows.

- **Cobbles shall meet the following requirements:**
 - 4-inch (4”) min to 10-inch (10”) max in dimension
 - Well-graded, washed cobblestone rock
 - Rough rounded is ok; angular rip-rap is not acceptable

7.6b Drain Rock for Landscaped Edges

Drain rock may be added in high vehicle conflict areas where plants will not establish.

- **Drain Rock shall meet the following requirements:**
 - 1 (1”) to 2-inch (2”) in diameter
 - Washed
 - Not river rock

7.6c Drain rock or gravel for Gravel Pave Geogrid Cells

Used to replace grass where it will not establish in reinforced grass areas.

- **Drain rock shall meet the following requirements:**
 - $\frac{3}{4}$ (3/4”) to $\frac{1}{2}$ -inch (1/2”) washed gravel
 - With less than 3% passing the U.S. No. 200 sieve
 - Not river rock

8 EQUIPMENT

The following equipment is recommended for use (purchase or rental) by maintenance personnel to ensure efficient and proper maintenance of the ROW landscape.

8.1 Power Equipment

Truck

Riding Mulching Mower - to be used for lawn areas where feasible.

Walk-behind Power Mulching Mower - to be used for lawn areas where a riding mower is not practical or accessible (small areas, steeper slopes).

Power Trimmer - to be used for cutting grass where a mower cannot reach.

Power Edger - for redefining lawn edge along walks, driveways and planted areas.

Power Core Aerator - to be used for aeration of lawn areas.

Power Lawn Vacuum - for vacuuming up aeration plugs in lawn areas. It may be possible to locate a multi-purpose vacuum for both hard surface and lawn applications.

Power Overseeder - for applying lawn seed following aeration.

Power Thatcher - for thatch removal of lawn areas.

Chipper - For breaking down woody material to be composted on-site or hauled away as green waste.

Golf Cart - for moving crews and equipment between areas.

Pressure Washer - for cleaning porous pavement and other paving or hardscapes.

Vacuum Sweeper - for vacuuming debris and sediment from porous paving areas. Vacuum sweepers can be very costly. Equipment can be rented or the tasks contracted to an outside maintenance provider.

8.2 Manual Equipment

Blade Sharpeners

Bypass Pruner - for shrub and perennial pruning and deadheading. Look for $\frac{3}{4}$ ($\frac{3}{4}$ "") to 1-inch (1") curved blades.

Cultivator/fork - for turning material at on-site compost facility.

Gloves - leather and cloth.

Hand Tamper - for compacting NDS soils in drainage swales.

Long-reach Pruners - for areas not easily accessible. Choose pruners with a 4 (4') to 5-foot (5') long handle and cut and hold feature.

Loppers - for pruning shrubs and smaller tree branches. Look for 24 (24") to 36-inch (36") handles and 2-inch (2") curved blades.

Manual Edger - for redefining lawn edge where power edger is not possible.

Manual Seed Broadcaster - for applying lawn seed following aeration, in place of power overseeder.

Pincer-type Weeders - long-handled weeder for pulling weeds with their roots.

Pruner Grease or Lubricant

Push Broom

Rakes - metal construction, seeding rakes and lawn rakes, including narrow width for raking in planted areas.

Shovels - flat, spade, transplanting spade. Various widths and lengths.

T-handle Soil Core Sampler or Soil Augur - for collecting samples in lawn areas for monitoring soil texture, color, compaction and running pH tests.

Tree Pruner - for trimming branches. Choose pruners with a 10 (10') to 14-foot (14') long handle.

Wheelbarrow - for transporting soil, mulch, plants and other landscape materials as needed.

8.3 Other Equipment/ Specialty Items

Flame Weeders - a set of propane flames that are used to burn weeds. They are best used over paved or larger weedy areas and are not appropriate for planted areas where they can potentially cause damage to plants. Small, single-flame weeders may be appropriate for use in lawn and planted areas.

Hot water weeders - for hand weeding of lawn and bed areas.

Small on-site composting bins - these are bins similar to those used at local P-patches. They are larger than residential bins, but small enough that they do not require large yard spaces, anything more than manual turning or regulation.

- ⇒ *Plans for a 3-bin composting system (Section 14.1) -or- call the Natural Lawn and Garden Hotline (206) 633-0224*
- ⇒ *Flame, radiant (infrared) and hot water weeders (Section 14.2)*

9 GLOSSARY

Biodegradable Material

An organic substance, such as plant matter, that can be broken down through decomposition, such as *composting*.

Composting

The controlled decomposition of organic matter achieved by creating the optimal environment (mix of carbon, nitrogen, oxygen and water) for composting organisms.

Hillside Greenbelt (also Greenbelt)

The open space area to the east of High Point Drive.

Infrastructure

A set of interconnected structural elements that provide the framework to support a developed area. Most typically this refers to roads, power, sewer and water supply.

Integrated Pest Management (IPM)

Note that 'pest' here includes insects, weeds, plant pathogens, etc.

(From 17.15.010 RCW, via Tri-County IP&VM Model Policy, 1999) A coordinated decision making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency programmatic pest management objectives. The elements of integrated pest management include:

- a) Preventing pest problems;
- b) Monitoring for the presence of pests and pest damage;
- c) Establishing the density of the pest population, that may be set at zero, that can be tolerated or correlated with a damage level sufficient to warrant treatment of the problem based on health, public safety, economic, or aesthetic thresholds;
- d) Treating pest problems to reduce populations below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical, and chemical control methods and that must consider human health, ecological impact, feasibility, and cost effectiveness; and
- e) Evaluating the effects and efficacy of pest treatments.

Market Garden

A separate organization located within the High Point Community. The Market Garden itself is located at the SE corner of SW Juneau Street and 32nd Ave SW.

Natural Drainage System

A drainage system that uses a combination of grass-lined and vegetated swales, pervious/porous paving, downspout disconnects, rainwater gardens, tree preservation and bioretention to manage stormwater runoff. Emphasis is on decentralizing stormwater collection and dispersal to many areas to maximize infiltration of water back into the soil.

Open Space

Areas, typically with few or only small buildings, that are intended for outdoor enjoyment and use by all.

Porous or Pervious Pavement

Pavement that allows water to filter through the pavement section via voids in the paving material. There are various types of porous pavements constructed at High Point. Special cleaning measures are required depending upon the porous pavement type.

Porous cement concrete pavement

Cement concrete pavement without the fines/sand in the mix which allows water to filter through the concrete section into the underlying gravel subbase layer below the pavement section.

Porous gravel pave pavement

A grid cell system filled with gravel and placed over a gravel subbase layer below the grid cells.

Right-of-way (ROW)

Land that is public and is owned by the City of Seattle and under the control of the Seattle Department of Transportation. The right-of-way typically includes sidewalks, landscaped area, the street and underground utilities.

Stormwater

The rainfall runoff from rooftops, streets, parking lots and other impervious surfaces that flows to waterways.

Swale

An open and gently sloping vegetated channel designed for treating and conveying stormwater runoff.

Water Quality

The chemical and physical characterization of water. The primary bases of which, are parameters relating to potability, safety of human contact and health of ecosystems.

Watershed

An area of land, defined by topography, upon which water drains into a specified body of water.

10 RECOMMENDED PUBLICATIONS

The following publications can be used as references on maintenance practices, plant materials and selection, weed and pest control, water conservation and other topics.

General Gardening

How to Get Your Lawn off Grass: A North American Guide to Turning Off the Water Tap and Going Native by Carole Rubin, 2002

Sunset Western Garden Book, 2001 Edition by Kathleen Norris Brenzel, 2001

Plant Selection & Identification

A Field Guide to the Common Wetland Plants of Western Washington & Northwestern Oregon by Sarah S. Cooke, 1997

Plants Of The Pacific Northwest Coast: Washington, Oregon, British Columbia & Alaska by Pojar and MacKinnon, 2004

Right Plant, Right Place by Nicola Ferguson, 1984

Plant Maintenance

Cass Turnbull's Guide to Pruning: What, When, Where, and How to Prune for a More Beautiful Garden by Cass Turnbull, 2004

Pruning Made Easy : A gardener's visual guide to when and how to prune everything, from flowers to trees by Lewis Hill, 1998

Pruning and Training: A fully illustrated plant-by-plant manual by Christopher Brickell and David Joyce, 1996

The Compost Tea Brewing Manual by Dr. Elaine Ingham, 2005 (5th ed.)

Disease & Pest Control

American Horticultural Society Pests and Diseases: The Complete Guide to Preventing, Identifying and Treating Plant Problems by Pippa Greenwood and Andrew Halstead, 2000

The Organic Gardener's Handbook of Natural Insect and Disease Control: A Complete Problem-Solving Guide to Keeping Your Garden and Yard Healthy Without Chemicals by Barbara W. Ellis, 1992

Paving

Porous Pavements by Bruce K. Ferguson, Taylor and Francis Group, 2005.

522 Guideline for Pervious Pavement by American Concrete Institute (ACI)

NRMCA publication #2 PPCRT Pervious Concrete Contractor Certification

Pervious Concrete Pavements by Paul Tennis, Michael Leming and David Akers, 2004

11 ADDITIONAL RESOURCES

The following resources can be used to gather further information on maintenance practices, plant materials and selection, weed and pest control, water conservation and other topics.

American Concrete Institute

Publication 522R-06 on Pervious Concrete May 2006
<http://www.aci-int.org/PUBS/newpubs/522.htm>

City of Olympia

Resources on maintenance and cleaning of porous pavements, including equipment comparisons and costs.
<http://www.olympiawa.gov/en/city-utilities/storm-and-surface-water/science-and-innovations/science-and-innovations-porous-pavement.aspx>

International Society of Arboriculture's Pacific Northwest Chapter

An organization providing information on tree protection and pruning techniques.
<http://www.pnwisa.org/tree-care.html>

King County Department of Natural Resources

This agency provides information on a variety of natural lawn and garden care topics. Detailed information on pest and weed-identification and control are available. <http://dnr.metrokc.gov/topics/yard-and-garden/>

WSU King County Extension

An organization that provides year-round advice on landscape issues, such as pests, diseases and plant selection. They are available weekdays by phone at 206/296-3440 and at various locations throughout the city, including West Seattle's Farmers Market.
<http://king.wsu.edu/Gardening/>

National Ready Mixed Concrete Association

Pervious Concrete Publications
www.nrmca.org

Seattle Tilth

A local organization that provides information on organic gardening with a focus on urban agriculture. Their website provides links to information on organic gardening, soils, plant selection and many other topics. Their Maritime Northwest Garden Guide may be purchased from their website.
<http://www.seattletilth.org/>

Seattle Public Utilities

This agency provides information on natural systems drainage, lawn care, plant selections, water use and other topics.
<http://www.seattle.gov/util/services/>

West Nile virus

http://www.seattle.gov/util/Services/Drainage_&_Sewer/Keep_Water_Safe_&_Clean/About_West_Nile_Virus/index.asp

Washington Department of Ecology

<http://www.ecy.wa.gov/pubs/0310023.pdf>

Supplier Websites

- **Bob's Brewers - compost tea brewing and application equipment**
<http://www.net-time.com/bobsbrew/index.html>
- **Earth Fortification (EarthFort) - soil, compost, and compost tea information and supplies**
<http://www.earthfort.com/>
- **Eartheasy Corn Gluten Meal**
www.eartheasy.com/article_corn_gluten.htm
- **Hendrikus Organics - natural plant care products and consulting**
www.hendrikusorganics.com/fertilizerblends.htm
- **Nature Safe - natural fertilizers and amendments**
www.naturesafe.com/content/products/organic.html
- **Plant Health Care - natural fertilizers and amendments**
<http://www.planthealthcare.com/Home>
- **Soil Foodweb's Oregon Lab - compost testing and information**
<http://oregonfoodweb.com/>
- **Walt's Organics - organic garden products & services**
www.waltsorganic.com

12 CURRENT TREE SURVEY & PRESERVATION CODE

This section is intended to contain a copy of the most recent tree survey for the High Point community. The survey can be used as a reference to check on the most recent professional opinion on the size and health of the trees in the community.

Users should also print and insert a copy of the most current City of Seattle tree preservation guidelines. Comparing the most recent survey with the current preservation guidelines can assist maintenance staff in determining which trees are currently listed as "exceptional," etc (which may be due to growth since previous surveys), and thus fall under specific preservation guidelines.

13 MAPS

This section includes the following maps:

13.1 Fall Maintenance/Storm Event Priority Clearing Guide

This map will assist with fall maintenance tasks relating to clearing low points and drain inlets of debris.

13.2 Quick Couple Locations

This map will help locate quick coupler locations when water sources are needed for watering, pressure washing, or other tasks.

13.3 High Point Community Phase I Irrigation Zoning Map

Shows irrigation zones and controller locations for Phase I.

13.4 High Point Community Phase II Irrigation Zoning Map

Shows irrigation zones and controller locations for Phase II.

14 INCLUDED DOCUMENTS

Index of Included Documents by Subject Area

14.1 Composting

- ⇒ *SPU Yard Waste Composting website* (http://www.seattle.gov/util/Services/Yard/Composting/SPU01_001996.asp)
- ⇒ *Plans for a 3-bin composting system* (<http://www.seattletilth.org/resources/compost>); (<http://www.rdn.bc.ca/cms/wpattachments/wpID1725atID2373.pdf>)

14.2 Equipment

- ⇒ *Irrigation system manuals* (located in Association Office).
- ⇒ *SPU Mulching Lawn Mower information* (http://www.seattle.gov/util/Services/Yard/Natural_Lawn_&_Garden_Care/Natural_Lawn_Care/MULCHINGL_200311261655016.asp)
- ⇒ *JOURNAL OF PESTICIDE REFORM -Radiant Heat Weeders* (<http://www.pesticide.org/solutions/home-and-garden-toolbox/landscape-and-plant-solutions/radiantheatweeders.pdf/view>)
- ⇒ *Flame, radiant (infrared) and hot water weeders* (<http://www.rtol.net/jonathanmeyer/flameweeder/>); (<http://www.the-organic-gardener.com/flame-weeder.html>); (<http://www.invasive.org/gist/tools/hotsteam.html>)

14.3 High Point Documents, Details and Specifications

- ⇒ *High Point Community ROW Plant Lists for Phases 1 and 2*
- ⇒ *High Point ROW and Open Space Maintenance Checklists*
- ⇒ *High Point ROW Swale Section(s)*
- ⇒ *High Point Tree Staking Detail*

14.4 Landscape Horticultural Practices

- ⇒ *City of Seattle Landscape and Grounds Management Guidelines* (<http://seattle.gov/environment/documents/landscape.pdf>)
- ⇒ *Plant Amnesty Pruning Guide* (http://www.plantamnesty.org/pruning_guides/pg_northwest_pacific_maritime.htm)
- ⇒ *University of Minnesota Extension Article: Pruning Trees and Shrubs* (<http://www.extension.umn.edu/distribution/horticulture/DG0628.html>)
- ⇒ *Ground Cover Spacing Chart*
- ⇒ *WSU Community Horticulture - Planting Landscape Plants Fact Sheet* (<http://king.wsu.edu/gardening/gardenfacts.htm>)

14.5 Materials

- ⇒ *Grass Pave and Gravel Pave, reinforced lawn and paving geogrid - Manufacturer information for maintenance and installation* (<http://www.invisiblestructures.com/>); (<http://www.mutualmaterials.com/professional/products/hardscape-products/pavers-and-architectural-slabs/environmental/turfstone>)

14.6 Fertilizers

- ⇒ *Hendrikus Organics* (<http://www.hendrikusorganics.com/fertilizerblends.php>)
- ⇒ *Nature Safe* (<http://www.naturesafe.com/content/products/organic.html>)
- ⇒ *Plant Health Care* (<http://www.planthealthcare.com/HT/Soil>)
- ⇒ *Walt's Organics* (<http://www.waltsorganic.com/page4.html>)

14.7 Natural Landscape Maintenance

- ⇒ *Sample Maintenance Log forms*
- ⇒ *Ecologically Sound Lawn Care for the Pacific NW* (http://www.seattle.gov/util/stellent/groups/public/@spu/@csb/documents/webcontent/ecological_200312021255394.pdf)
- ⇒ *King County, Going Native brochure* (<http://your.kingcounty.gov/dnrp/library/2003/gonative.pdf>)
- ⇒ *Mulching Lawn Mower information* (see Equipment section)
- ⇒ *The Natural Lawn & Garden - Choosing the Right Plants for a Beautiful, Trouble-Free Garden article* (http://www.seattle.gov/util/stellent/groups/public/@spu/@csb/documents/webcontent/choosingt_200311261701525.pdf)
- ⇒ *SPU Reasons to Choose Natural Lawn article* (http://www.seattle.gov/util/Services/Yard/Natural_Lawn_&_Garden_Care/Natural_Lawn_Care/REASONSTO_200311261654543.asp)
- ⇒ *Natural Pest Control* (see Weeds and Pests section)

14.8 Stormwater Management/Natural Drainage Systems

- ⇒ *City of Seattle, West Nile Virus Response Plan* (http://www.seattle.gov/util/stellent/groups/public/@spu/@csb/documents/webcontent/spu01_002060.pdf)
- ⇒ *SPU - "About West Nile Virus"* (http://www.seattle.gov/util/Services/Drainage_&_Sewer/Keep_Water_Safe_&_Clean/About_West_Nile_Virus/GeneralInformation/SPU01_002198.asp)

14.9 Weeds and Pests

- ⇒ *Tri-County Integrated Pest and Vegetation Management Guidelines* (<http://www.lhwmp.org/home/ChemToxPesticides/documents/IPMTriCountyGuidelines.pdf>)
- ⇒ *City of Seattle Pesticide Tier Tables (Herbicides, Insecticides)* (<http://www.lhwmp.org/home/ChemToxPesticides/ipm-eval.aspx>)
- ⇒ *Eartheasy Corn Gluten article* (http://www.eartheasy.com/article_corn_gluten.htm)
- ⇒ *Walt's Organic Corn Gluten Weed Control website printout* (<http://www.waltsorganic.com/page6.html>)
- ⇒ *Iowa State - How to Use Corn Gluten Meal* (<http://www.hort.iastate.edu/gluten/pdf/how-to-use-corn-gluten-meal.pdf>)
- ⇒ *Journal of Pesticide Reform - Corn Gluten Meal* (<http://www.pesticide.org/solutions/home-and-garden-toolbox/landscape-and-plant-solutions/corn-gluten-meal>)
- ⇒ *Journal of Pesticide Reform - Moss in Lawn Areas* (<http://www.pesticide.org/solutions/home-and-garden-toolbox/weed-solutions/moss-in-lawns>)
- ⇒ *Journal of Pesticide Reform - Managing Crane Flies in Lawns* (<http://www.pesticide.org/solutions/home-and-garden-toolbox/pest-solutions/crane-flies>)
- ⇒ *Journal of Pesticide Reform - Nonchemical Methods for Removing Unwanted Blackberry Plants* (<http://www.pesticide.org/solutions/home-and-garden-toolbox/weed-solutions/blackberries>)
- ⇒ *King County Noxious Weed Control brochures* (<http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds/brochures-reports.aspx>)
- ⇒ *The Natural Lawn & Garden - Natural Pest, Weed & Disease Control* (http://www.seattle.gov/util/stellent/groups/public/@spu/@csb/documents/webcontent/naturalpe_200311261701589.pdf)
- ⇒ *TNC Weed Management - Documents for Reed Canary Grass, English Ivy and Himalayan Blackberry* (<http://www.invasive.org/gist/moredocs/phaaru01.pdf>); (<http://www.invasive.org/gist/moredocs/hedhel02.pdf>); (<http://www.invasive.org/gist/moredocs/rubarm01.pdf>)
- ⇒ *WSU Extension - Gardening Fact Sheets* (<http://king.wsu.edu/gardening/gardenfacts.htm>)
- ⇒ *WSU Extension - Insecticidal Soaps Info Sheet* (<http://spokane-county.wsu.edu/spokane/eastside/Fact%20Sheets/C183%20Insecticidal%20Soaps%2005.pdf>)