SEATTLEU

SEATTLE UNIVERSITY GROUNDS

SUSTAINABLE LANDSCAPE MANAGEMENT

OPERATIONS & MAINTENANCE MANUAL

JUNE 2020

FACILITIES SERVICES / GROUNDS DEPARTMENT

901 12th Avenue, P.O. Box 222000, Seattle, WA 98122 (206) 296-6440 seattleu.edu

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Facilities Grounds
Sustainable Landscape Management Operations Manual – DRAFT 6/7/2021

Section 1 – Foundations in sustainable and organic practices

A. Introduction: The legacy of Sustainable Landscape Management, IPM, Biodiversity, Pesticide Free, Water Conservation

The legacy of sustainable landscape management at SU includes foundational principles of biodiversity and sustainability in the environment. Integrated Pest Management, pesticide free practices and biodiversity began on campus 1986 with Cisco Morris who 'wanted to garden in a more environmentally friendly manner'. (Cisco Morris IPM History, IPM at Seattle University, date unknown)

Philosophy and Practices (website)

B. Acknowledgements

C. Mission and Vision

Mission
To maintain the most environmentally conscious, attractive, and safe campus in the Pacific Northwest; to continue to be the leader in developing sustainable grounds maintenance practices; to create a unique landscape that identifies Seattle University as a progressive, inviting, well-cared-for campus, and supports the University's learning environment.

Vision
To create the premier campus grounds in the Northwest by providing state of the art sustainable landscape maintenance and landscape development. To continue to promote, document and share our successes with our peers, agencies, customers, neighbors, staff, faculty and students. Guide the campus grounds evolution and development in a manner that has the lowest environmental impact, maximum environmental benefit and maximum educational benefit.

Goals
To achieve our vision of being the most environmentally conscious campus
To achieve our goal of being the most attractive campus in the Northwest
To achieve our goal of maintaining a safe campus

D. Future planning – student involvement – education outreach – next generations

Section 2 – Campus Lawn Care
Campus lawn care shall reflect neatly mown and trimmed lawns on a regular schedule throughout the year. Edges between lawns and hard surfaces shall receive a hard edge at least once a year in the spring and maintained with a line trimmer weekly. Edges between lawns and

landscape beds shall be established and straightened annually and as need with a stick edger or walk behind edger and kept weeded throughout the year.

A. Maintenance and schedule

Grounds and Landscaping staff shall follow lawn care practices established in *Ecologically Sound Lawn Care for the Pacific Northwest*, David K. McDonald, 1999, Seattle Public Utilities.

Grounds Gardeners carry out best practices in campus lawn maintenance:

- Assess equipment for safety, function and sharpness
- Assess campus turf grass for managing plant health and applying sustainable IPM practices
- Using mulching mowers, allow clippings to recycle nutrients into the lawn and eliminate labor and waste costs of collection
- Maintain mowing height of 2.5" during the growing season
- Mow weekly throughout the growing season, APR-OCT and other months as needed
- Line trim lawn edges and around fixtures every other week and as needed
- Carry out mechanical aeration, fertilizing and seeding in the Spring and Fall

	Turf	**Equipment**	**Conservation**	**Pest and Disease**
Mowing	Mow height 2.5"-3" - weekly MAR - OCT Manage for plant health Apply organic IPM strategies	Gas powered and battery powered Routine maintenance for optimal function	Mulch mowing, leave clippings in lawn to recycle nutrients, reduce labor and waste	Keep blades sharpened and equipment in good working order prevents tearing leaving more open tissue inviting into the plant pest and disease
Edging	Next to hard surfaces 1-2x/yr Next to landscape beds weekly and as needed	Gas powered walk behind and gas powered hand held or 'stick' edger Line trimmer		Same as above
Feeding Seeding	Organic fertilizers 1-2x/year	Walk behind spreaders	Organic fertilizers reduced carbon footprint	Assists turf growth in out competing pest and disease
Watering	Schedules per local transpiration rates and 5-10%	Campus irrigation infrastructure	Reduced watering times	Less moisture can benefit resistance

	further reductions			
Aeration	Spring and Fall	Ryan walk behind, up to 5" cores	Opens up root zone to oxygen, water and nutrients, reduces compaction,	Aerification prevents anaerobic environment assists in

B. Lawn Care Nutrients and IPM

Trained Grounds staff carry out recommendations of best practices for IPM in a sustainable and organically maintained landscape and are established in the SU Guidelines for Sustainable Landscape Management (2009).

Allowed products, if required for pest control, shall be taken from the most current edition of the Organic Materials Review (OMRI) List (www.omri.org/complete_company.pdf).

A copy of the product label and Material Safety Data Sheet shall be kept in the Integrated Pest Management (IPM) Coordinator's office and available upon request. Only licensed applicators shall apply allowed products.

C. Irrigation and Water Conservation

SECTION 3 - Organic Landscape Maintenance

A. Maintenance and Schedule

	Mechanical	**Biological/Mulching**	**Planting**	**Pest and Disease**
Weed suppression	Hand removal using a weeding fork, pitch fork or shovel to loosen	Compost mulch/tree chip mulch provides weed suppression and moisture retention during drought	Tree, shrub and groundcover canopy shade out weeds, holds in moisture	Compost Tea

Biological	Inputs applied could include compost, mulch, beneficial insects	Enhances ecological function for beneficial organisms, supporting predator and prey	Creates biodiversity supporting wide array of ecological functions	Supports balance of diverse populations, avoids single organism unchecked devastation
Pruning *	Follow pruning practice standards administered by Grounds department according to ANSI A300 Part 1 Pruning	Thinning and reshaping supports circulation, enhances appearance	Shade for weed suppression, increase large shrub and tree canopy, improve ecological functions	Supports removal of pest and disease Supports safe, healthy structure and best fit in the institutional landscape
Nursery Storage	weeding	mulching	Watering	
Planting and Design	See Sunset Western Garden Book	Design for biodiversity in plant contributions to ecological functions	Design for tree and shrub canopy improves ecological functions and supports climate control	Design for biodiversity support balanced ecological functions and quality in water, air, soil, climate, habitat, vegetation

B. Nutrients, IPM, Compost Tea, Invasive Weed Management, Pruning, Wasp and Yellowjacket Control

IPM

Compost Tea making safety and procedures follow the *Aerated Compost Tea: Field Guide to Production Methods, Formulas and Application Protocols*, produced by, USDA/Western Sustainable Agriculture Research and Education.

Compost tea treatments uses on campus include disease suppression, support for seasonal plant stress and construction impacts on root systems. Treatments are used for trees, shrubs, turf, soil conditioning and compost making.
Compost tea brewing equipment, products and operations are performed and stored in the CHAF house.

Sources: USDA, Soil Food Web,

Compost Tea
Compost tea is a watery extract of compost that is "cold" brewed. The organisms are extracted from the compost, ie, the bacteria, fungi, protozoa and nematodes are given foods which result in an increased number and activity of the beneficial species generating an enormous diversity of beneficial bacteria. Applying compost tea returns to the soil the biology that should be present to grow desired plants. Adjusting soil biology and chemistry helps match the needs of the plant.

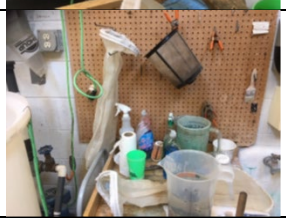
Compost tea can be applied as a foliar spray or as a soil drench. Applications and timing are dependent on the plant, the soil and the season.
Dr. Elaine R. Ingham, The Compost Tea Brewing Manual, Fourth Edition, 2003, Soil Food Web Incorporated.

Compost tea treatments and uses on campus include disease suppression, support for seasonal plant stress and construction impacts on root systems. Treatments are used for trees, shrubs, turf, soil conditioning and compost making.
Compost tea brewing equipment, products and operations are performed and stored in the CHAF house.

Operations and safety follow the *Compost Tea Brewing Manual 2003* and the *Western Sustainable Agriculture Research Education – Aerated Compost Tea Field Guide 2017.* Located in the Reference Documents section in this document.

- Observe all safety practices when operating tea making equipment and spray application equipment.
- Follow all manufacturer recommended safe operations specifications.
- Follow all required safety standards established by equipment manufacturer and OSHA when operating the compost tea sprayer.
- Educate and train grounds staff to assist with tea making and spraying operation and to observe all safety practices.
- Scheduling tea making and application during the growing season.
- Perform maintenance to tea making and spraying equipment.
- Maintain records of all spray application.
- A licensed pesticide applicator should be on campus and made aware of the spray schedule.

Equipment includes, Keep It Simple, KIS, Compost Tea Brewing 50 gallon tub and all pipe, fittings, air pump and filter. Other accessories include sock style mesh strainers for compost and other micro-organisms for making compost tea.

KIS 50 gallon compost tea brewing tub		
Dayton 4TY53 Above ground Pool Pump / Aerifying pump		
PVC pipe and fittings		
Mesh strainers for compost		

Seasonal Compost Tea Applications*

	Spring Mar-Apr-May-Jun	**Summer Jul-Aug-Sep**	**Fall Oct-Nov**
Insect	X	X	
Disease	X	X	X
Plant Health	X	X	X

*Compost Tea Spray Records;
T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\COMPOST TEA\Tea Spray records

Compost Making Operations

Facilities Recycle and Waste shop is primarily responsible for compost making on campus. Grounds staff backfill and assist with compost making operations following all established procedures located at:
T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\COMPOST\procedures and log

Operational Procedures for SU Compost Facility (updated 8/1/2018)

PPE: Wearing gloves, eye and ear protection is required for ALL compost facility operations. Wearing a dust mask is recommended for dry weather.
HOURS: ALL work at the compost facility must be performed between 8am and 4:30pm, Mon-Sat. and not during holidays.

Steps for mixing a batch of compost: Mixing a new batch is recommended 3 times a week (Mon-Wed-Fri) every week in order to avoid the build-up of excess foodwaste. Working in teams of 2-3 are encouraged.

1) Open composting barn door
2) Take temperature reading of active compost pile and remove temperature probe and metal stairs from compost barn. Place in out-of-the-way area.
3) Close blower valve to bay you are working in to prevent debris from being sucked into the system.
4) Turn mixer on.
5) Make sure outlet of mixer is closed.
6) Fill Bobcat bucket with feedstocks with a 2:1 'brown:green' ratio, or about 1 'heaping' bucket of woodchips to every 3 red bins of food waste.
7) Dump all feedstocks into mixer.
8) Rinse foodwaste bins into Bobcat bucket. Spray foodwaste bins with SimpleGreen solution and rinse into floor drain.
9) Move Bobcat bucket under mixer outlet.
10) Move wheeled stairs to mixer and add water to mix until it reaches about a 50% moisture content (the mix will be 'glistening'). Materials may need to be manually cleared from the grate covering the mixer with a shovel. Use caution when clearing the grate!
11) Mix thoroughly and fill Bobcat bucket while mixer is running. Use shovels to spread compost mixture out into bucket.
12) Close mixer outlet and dump full Bobcat bucket into active compost pile.
13) Return Bobcat to position with bucket under mixer outlet.
14) Repeat steps 9 - 11 until mixer is empty.
15) Repeat steps 5-12 until all food waste is incorporated into active compost pile.
16) On your last batch, rinse inside of mixer into Bobcat bucket until the mixer is clean.
17) Close mixer outlet.
18) Turn mixer off.
19) Dump final mixture in composting bay on top of existing pile.
20) Incorporate new mix into front of existing pile.
21) Coat active compost pile with a 6" layer of finished compost (as available). Optional on weekdays, recommended for every Friday.
22) Replace temperature probe into center of active pile and move metal stairs into composting barn for safe storage.
23) Close composting barn door.
24) Open blower valve to bay.
25) Check that blower and sump pump are in good working order (and that the breaker is not tripped) and that the electrical box is set to “auto.”

Record-Keeping: To be done when you return to the office after mixing every new batch:

1) Open annual Compost Data Spreadsheet: T:\Finance_and_Business_Affairs\Facilities_Services\FacilOps_Recycling and Waste Reduction\Compost\Compost Data
2) Note starting temperature of active pile and gallons of each feedstock used (estimate).
3) Add any additional observations (i.e. pest sightings, odors, necessary repairs, etc.).

Compost Pile Measurements (reference your compost operator training materials)
1) Temperature
2) Oxygen

Pruning

Grounds staff shall maintain campus landscapes, trees, shrubs and other understory plantings through pruning, shearing to insure health and vigor of campus landscapes. Gardeners shall follow pruning practice standards administered by Grounds department according to ANSI A300 Part 1 Pruning

- Assessing equipment for safety, function and sharpness
- Assessing tree or woody shrub for managing plant health through pruning best practices
- Followed ANSI A300 Part 1 Pruning
- ANSI A300 Part 1 Pruning; *An Illustrated Guide to Pruning,* Third Edition, Edward Gilman

Wasp and Yellowjacket Control
Campus safety is grounds number one consideration when determining how to manage or treat a wasp nest in the landscape. When a wasp nest is discovered away from walkways and buildings grounds will put a caution sign and leave the nest in place for the benefits wasps provide in the environment. Such as eating other insects and helping reduce numbers of mosquitoes, spiders, ants and others.
When a wasp nest is discovered too close to a walkway or building entrance grounds will treat it with soap spray or a combination of dawn dish soap and peppermint spray*. Once the nest has been sprayed grounds staff will remove it and retreat as necessary for any returning wasps.

*T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\IPM\WASPS\ecosmart-wasp-hornet-label

Safety procedures and equipment includes;

- Signs and caution tape to cordon off the area
- Staff wear protective bee suit provided by grounds
- Refillable fire extinguisher that is pressurized with air and holds soap spray solution
- Pruning, digging tools for nest removal

Nest removal assistance cane be initiated by calling, Dan the Bee Man **(206) 289-0392**
dan@danthebeeman.com https://www.danthebeeman.com/
Reach him by email, include a brief description of the activity or nest including location, size, and color of wasp/bee.

Invasive Weed Management

The density of weeds and other invasive plants often require medium to heavy mulching to reduce. Mulching is the preferred method of weed suppression.

Mulching can include any or all of the following; removing existing weeds, apply layers of cardboard or other paper material to surface, apply 4”-6” mulch over area. Cardboard works best in areas of dense invasive vegetation.

Grounds receives tree chips from area arborists for use as mulch and making compost. The tree chips are located at 14th and Jefferson in the SE corner of parking lot 7.

Grounds resources for mulching include back hoe, dump truck and other street legal vehicles, wheel barrows, grain scoops, shovels, pitch forks, rakes, brooms, blowers.

ONLY trained operators may use the backhoe and dump truck and should always have another grounds staff as a spotter for safety.

Notify Public Safety in advance if there is a need to block off parking spots for dump truck access. DPS contact 206-296-5990.

All Grounds staff are responsible for team communication when scheduling the use of shared resources, vehicles and equipment. Grounds Landscapes Lead and Athletic Fields Lead coordinate and support scheduling.

	Material	Equipment	Communication
Mulch	Tree chips Compost Mulch	Back Hoe, Bobcat, *ONLY trained operators*	Call local arborists when running low, free dumping
Vehicles	Street cones, safety vests	Dump truck, *ONLY trained operators*¸ other street legal vehicles	Leads coordinate use of back hoe, dump truck,
Tools		Scoop, pitch fork, rake, broom, blower	
Scheduling		Grounds Leads coordinate with the team	Grounds leads/manager notify public safety if need to block off parking temporarily

Communicate and Implement

- Grounds Leads and staff are made aware of the upcoming project
- Use of shared equipment and labor is scheduled on Grounds office whiteboard as needed

Maintenance

- Update Grounds Leads of mulching project status
- Update Grounds Leads and staff of return of shared equipment to available for use

Review

C. Water Conservation

SECTION 4 - Trees

SECTION 5 – Significant Gardens

A. Introduction

B. Significant Gardens: Designed to honor a legacy, culture or art, or illustrate a theme, ecology, conservation or function

Garden	Description	Honors/Illustrates
Kubota Legacy Gardens	CAMP Tea Garden HUNT Japanese American Remembrance Garden SENG (NEWB) Kubota north courtyard PIGT NE corner ADMN NW corner XAVR courtyard 10th and Columbia 4 corners BELL/12th and Cherry	Kubota Family Culture, Legacy, Theme
Taqwsheblu Vi Hilbert Ethnobotanical Garden	Garden biomes reflect geographical regions of the Duwamish, Lummi, and the native plants they used in cooking, shelter, apparel	Culture, Legacy, Theme Lushootseed Elder Vi Hilbert's legacy and connection with preserving language of the Lushootseed on plant tags in the garden,
LOYA' Cisco Morris' Biodiversity Garden	Diversity of plants, water feature, supporting ecological functions, habitat for pollinators,	Ecology, Legacy, Culture

LOYA Labyrinth	Blue stone traditional labyrinth, contemplative space	Culture, Spiritual
FINR Shakespeare Garden	Living tribute to plants in Shakespeare's plays	Culture, Theme, historical,
1103 Lee Miley Rain Garden	First rain garden on campus, captures and retains rainwater	Sustainability, Conservation, Function, safety, historical,
LEML Rain Garden	Captures and retains stormwater runoff	Sustainability, conservation,
BANN Green Roof	First and only green roof of its kind,	
Edible Gardens: CHDN and Broadway	Campus community pea patch and outdoor classroom	Preserving space, outdoor urban agriculture classroom,
Union Green NW corner Wildlife Garden		Preserving Backyard Wildlife Sanctuary
STIG Chapel 'Thinking Green'	Lawn, Katsuras	Jesuit, contemplative space
PIGT El Salvador Jesuit Martyrs memorial Garden (Lower mall entry)		Memorial, Legacy
1313 Columbia Orchard	Campus community and neighborhood food for all	Honoring 2010 year of Urban Agriculture, outdoor classroom

References;
Kubota Gardens and on SU Campus: https://www.seattleu.edu/grounds/campus-trees/more-information-on-su-trees/

Significant Gardens on SU Campus: https://www.seattleu.edu/grounds/campus-gardens/

C. Rain Gardens: Engineered Storm Water Retention: On site storm water bio filtration, semi-native landscape supports habitat and ecosystem services

Garden	Description	Illustrates
1103 Lee Miley Rain Garden	Below the surface storm water retention, bio-retentive soil supports landscape, urban wildlife habitat, shade, eco-system services	Water retention, flood prevention nearby building basement
LEML Rain Garden	Above surface ponds and below surface overflow vaults,	Achieved LEED rating

FITN Rain Garden	Below surface in vaults capturing, retaining building stormwater runoff	Achieved LEED rating
ADAL Rain Garden and Cistern	Storm water catchment and retention in cistern supplements irrigation, achieved LEED rating	Achieved LEED rating
Union Green Wildlife Garden	Surface pond surrounded by moisture tolerant vegetation creating wildlife habitat and peaceful garden, Catches surface water runoff and storm drain overflow from upper mall	Ecology and conservation On site storm water bio filtration and retention, landscape supports habitat and ecosystem services

D. Ponds

Ponds, CAMP, LOYA, ARRP;

Ponds that grounds cares for include the Campion Tea Garden Pond, the Loyola Courtyard and Labyrinth Pond and the Arrupe House Courtyard Pond.

- Pics of each –

Pond cleaning activities are scheduled mostly during late spring, summer and early fall. Cleaning includes vacuuming to remove algae buildup and adding organic water cleaning product to maintain balanced pond water quality and aquatic environment for Tea Garden landscape aesthetics, fish and other urban wildlife.
Equipment and products are purchased from The Pond Guy, online.

	MONTHLY APR thru SEP		
	CAMP	LOYA	ARRP
Pond Vac	X	X	X
DefensePAC	X	X	X

Pond equipment and products are currently purchased from The Pond Guy, TPG. Products include TPG DefensePAC Pond Maintenance.
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