SEATTLEU

SEATTLE UNIVERSITY

GROUNDS

SUSTAINABLE ATHLETIC FIELDS MANAGEMENT

OPERATIONS & MAINTENANCE MANUAL

Championship Field

Seattle University Park

Logan Field

JULY 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
Athletic Fields Operations Manual – DRAFT 7/24/2020

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CHAF

SUPK

LOGN

stma CERTIFIED FACILITY Environmentally Responsible Management

2017-2020
Seattle University – Championship Field
Natural Grass Athletic Field
Awarded by
The Sports Turf Managers Association

Section 1 – Championship Field, CHAF, Maintenance - Sand Based Sport Turf Maintenance

A. Introduction: Description, Responsibilities, Field Maintenance

Description

Championship field venue includes university tennis courts that are open to the public, grandstands with a press box for home games and seating up to 1,000 spectators. The field house building accommodates grounds storage for tools and equipment, team rooms, concessions and restrooms and soccer field. Adjacent to the field house are outdoor utility storage space. Fields staff perform litter pick up, sweeping and safety walks weekly noting any landscape maintenance needs and reporting damage needing repairs.

Championship field is an award winning collegiate soccer field. The field is 86,000 s.f. sand based natural turf that is cared for to the highest standards of excellence and sustainability.
The soccer field is specialized sand based natural sport turf supported by underground drainage and irrigation. Field staff perform regular sport turf maintenance supporting training and competitive game use for university men and women varsity soccer, soccer camps and occasional special sport event use.

Responsibilities

Championship field maintenance program is comprehensive and addresses routine maintenance. Grounds Athletic Fields Specialist Lead is responsible for performing and leading staff in accomplishing a broad scope of natural sport turf maintenance including; mow, fertilize, solid tine and hollow core aeration, game day mowing and field painting for games and training and maintaining frequent and effective communication with athletic staff and coaches regarding field condition and coordinating scheduling of field use. Renovation maintenance within the turf profile occurs monthly and includes core and solid tine aeration, seeding, fertilizing, topdressing with USGS fairway sand. Recycle dressing is scheduled quarterly and fraze mowing scheduled every 2-3 years.

Coordinate routinely with Irrigation Specialist regarding a broad scope of controller based irrigation system watering cycles operated digitally and manually, repair and replace in ground systems, coordinate watering schedules with Fields Lead.

Field Maintenance

Turf health and vigor are supported by an intricate program of mowing, fertility, aeration, de-thatching, seeding and irrigation that includes organic granular and liquid fertilizer products. A digitally controlled irrigation system insures consistent moisture when and where needed. Underground drainage helps maintain balanced moisture throughout the turf profile and prevents saturation and puddling.

Field preparedness and playability is determined by the Athletic Fields Specialist Lead for Grounds. Decisions are based on conditions related to wear from use and weather impacts. On rare occasions playability can be impacted by overuse and unforeseen damages.

B. Maintenance and Schedule: mowing, mow height, schedule, function of mow patterns, weeds and invasive grasses, irrigation, aeration, top dress, seed
(See Section 1.H. for Equipment)

Mowing

The optimal mow height for collegiate soccer in the Seattle Capitol Hill area is 1”-1 1/8” facilitates a healthy grass stand with the physical dynamics of varsity soccer training and competitive play. The seasonal schedule for mowing includes 3-5 times per week during the growing season and 1-2 times per week during the off season. See **Table 1** for an overall schedule of maintenance and equipment used. A mow pattern reflecting a checker board or grid pattern is followed for most mechanical maintenance processes that require riding equipment or pulled implements such as the mower, aerator, sweeper, top dresser and de-thatcher. This pattern facilitates a vertical grass stand versus one that can lay horizontal over time from following the same direction each time when performing mechanical processes. See **Figure 1** for an example of a grid pattern mowed onto CHAF.

Figure 1. Checker board or grid pattern on CHAF

Invasive weeds and grasses

Invasive weeds and grasses (poa annua) are often annual plants and weaken the wear tolerances of the field of play. Their removal is important to the overall health, vigor and tolerance for wear of sport turf. Integrated pest management, IPM, and organic methods used on CHAF include removal of weeds and invasive grasses in sport turf by hand or circle cutter, irrigation shovel or weeding knife followed by heavy seeding with perennial rye to outcompete and shade out weeds and mostly invasive grasses. A larger mechanical process for removing invasive grasses and weeds include fraze mowing every 2-3 years as a method for renewal by removing the top layer of turf followed by heavy seed, fertilizer and top dress sand.

Aerate, De-thatch, Sweep, Seed, Top Dress

Reverse direction of travel each application to avoid wear patterns in turf. For example when seeding, top dress, aerate, sweep, spring tine de-thatching rotate directions, N, S, E, W, each application and when top dressing or operating the spray rig rotate N, S directions each application.

Aeration is the process of creating holes in the turf profile for de-compaction and allowing air, water and nutrients downward access into the root zone where nutrient exchange with the root hairs and tissue take place driving upward growth, health and vigor for the grass stand.
The process is both mechanical and hand operated equipment distributing openings or holes through the turf thatch and crown layer and applying a seed and sand to facilitate new growth and rejuvenation. See **Table 1** for equipment used in each process mentioned.

De-thatching is performed with a spring tine attachment to the pro-gator and towed across the turf. The spring tines perform a combing action that digs into the top 1/4" to 1/2" of root crown and lifts the buildup of decomposing grass blades and root crown material that can block air, sunlight, moisture and nutrients from penetrating to the root zone.

Sweeping is performed after each aeration and dethatching to pick up and remove grass debris from the field. Sweeping is often performed before and after games to clean the field.

Seeding sport turf frequently, helps increase density, reduce bare spots and improve stability for play. The type of seed currently used is a blend of perennial rye, PR and Kentucky bluegrass, KBG. PR is a bunching grass that germinates in 7-10 days and KBG germinates in roughly 30 days and spreads through runners, is a tighter stitch, longer wear and exhibits different disease resistance than PR. See section H for sport turf seed vendors the Fields team currently uses.

Spreading seed is accomplished by walk behind broadcast spreader and/or the speed seeder attachment to the pro gator. The speed seeder reinforces better germination by causing a dimple into the ground followed by brush action that sweeps the seed into the dimple and a rolling action that presses the seed into the dimple. Broadcasting seed throws seed out that then floats on the surface of the turf. Watering helps the seed sink down to contact the growing surface. Scheduling extra watering at the irrigation controller helps keep seed moist for germination.

Top Dressing descript type of material, process frequency and rate, equip, model, vendor,

Turf viruses that have been present on CHAF in the past: Red thread is a nutrient deficiency, mostly in PR and has required extra fertilizer as treatment. Fairy ring has been treated in the past with a wetting agent. Snow mold and leaf spot have been treated preventatively by changing the environment with an application of phosphyte and allowed to dry between watering cycles.
Network with vendors, local universities and labs for studied material and assistance in diagnosing turf diseases and determining recommended course of action.

Red Thread – Laetisaria fuciformis forms as an intertwined mass of hyphae, threads, and infects grass blades through natural openings and mower cuts. Treatment includes increasing nutrients through fertilizer.
http://psuturf.com/2013/06/red-thread-and-pink-patch-making-annual-appearance-in-pa-lawns/
Fairy Ring – Armillaria sp. Disrupts the environment below the surface. Type 1 fariy ring turf stand loss is due to reduction in plant available water. Treatment includes applying surfactants and increasing higher than usual volumes of water.
https://www.gcsaa.org/uploadedfiles/Course/Pests-and-Diseases/Diseases/Fairy-Ring/Fairy-ring-101.pdf
Snow mold – Typhula blight can occur beneath snow cover shows up as light yellow to gray circular areas
Leaf Spot – Septoria a fungal disease on the leaves of grass showing up as spots near tips that fade to yellow. Black to brown spots appear in the dead leaf areas. Affected areas of lawn appear scorched. Disease development is favored by cool wet weather, unmowed turf and poor nutrition. It is spread by splashing water and mowing equipment. Can also be carried on seed. Vigorous healthy grass is more resistant. Good cultural practices for fertility, mowing and irrigation.
WSU Extension, Hortsense fact sheets, Lawn and Turf, Typhula Blight (gray snow mold) and Leaf Spot. Also at; T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\3_FIELDS\Athletic Fields Operations Manual\WSU Ext Lawn and Turf.


Red Thread


Fairy Ring


Snow Mold


Leaf Spot

Table 1. Maintenance Schedule and Equipment

	Equipment	JAN-FEB-MAR	APR-MAY-JUN	JUL-AUG-SEP	OCT-NOV-DEC
Mow/sweep	TORO REELMASTER 5010-H				
Fertility	Professional walk behind 100 lb hopper	foliar 1x/3-4 weeks, apply when not windy or rainy	granular – for spring soccer season lasts 6-8 weeks	organic granular slow release No July fertility	Foliar DEC– soil sample, no fertility
Aerate/sweep	Weidemann Terra spike GX18				
De-thatch/sweep	Woodbay FDS 9200	Weekly			

	Turf Dethatcher				
Seed	Speed seeder, walk behind spreader	JAN – JUN Weekly to build up seed bank for grow in during times of rest	JUL – AUG Once a month Support seed bank when Growth has slowed during the hot months	SEP – OCT Weekly to build up seed bank for grow in during times of rest	NOV One more seed supporting the seed bank going into winter – will be available when warmer temps return No seed DEC
Sweep	Smithco Sweep Star V62 and John Deer TC125				
Top dress	Turfco Widespin 1550				

Sport Turf Irrigation: Fields Lead and Irrigation specialist communicate daily during the growing season and coordinate the schedule based on conditions for weather, maintenance and schedules for training and game day operations. Equipment includes, booster pump & motor, controller, irrigation spray heads; rain bucket & ET gauge on the score board, rain switch on the SW corner of the field house turns off the system in rain.

Equipment specific for sand based sport turf maintenance and frequency of replacement. The booster pump, located in the field house provides added pressure to carry specified gallons of water needed for operating the turf spray heads and reaching head to head coverage. Pump and motor maintenance are provided by SU Facilities Mechanical shop and local pump maintenance and replacement contractors. Calsense controller provides digital operation and field reporting on water consumption. Spray heads are stainless steel body to prevent wear due to sand based field profile. Table 3 below provides a quick look at CHAF irrigation equipment.

Table 2. Sport Turf Irrigation Equipment specific to CHAF.
T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\irrigation standards specifications

Equipment	General Specs	Vendor
Berkeley Centrifugal Booster Pump and Motor	115 gal/min 65-70 psi at the distal head (furthest away)	
Calsense ET2000e Controller	Ethernet connection	Calsense
Weathermatic Valves	8200CR Series Bronze Bullet	HD Fowler
Rainbird Turf Spray Heads	Rainbird 8005 Rotors #18 dark blue nozzle	HD Fowler
Lasco Unitized or Rainbird TSJ Series	Swing joints	HD Fowler

Routine irrigation practices and operations for a typical growing season include monitoring daily moisture by evaporative transpiration, collecting ET gauge data at the controller and performing moisture probes 3 times each week to 4" depth on the field near the end of the day. Watering cycles are adjusted daily and determined by weather, dry periods, schedules for maintenance, team training and games.

Optimal turf moisture is accomplished by allowing the field to dry out 50% of maximum allowable depletion (MAD) of available water that is 100% available to the turf, encourages root growth downward strengthening turf stability and depends on season and weather cycles.

Syringe watering mid-summer in short frequent irrigation cycles set at the controller, keeps seed wet and cools multiple hot spots.

Hot spots mid-summer on noticeable hot-hot days 85-95 degrees or more are cooled by providing hand held hose end spray just enough to cool the grass blade. Field staff are not trying to water deeply to the roots. This would soften the field surface which is undesirable for play.

Games some watering before only on coach request, moisture on the field makes grass blade slick enough to facilitate ball roll, treat hot spots as needed and time allows,

Hot weather moisture practices include watering heavy 2 days before a game to fill the turf profile and grass blade with moisture. After that water needs are based on evapo-transpiration, ET measurement data provided at the controller.

Reference documents T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\irrigation standards specifications

C. Fertility

Granular applications methods include using seasonal combination of synthetic and organic fertilizer. Preparing to apply granular fertilizer establish a starting point and ending point. Identify start point on the field and end point is a preset marker on the horizon to aim and walk toward. Distance between markers should include desired feet of overlap of broadcasting product. Granular spreader equipment includes 100 lb professional walk behind spreader.

Liquid applications methods include using a range of products that support grass blade uptake of nutrients throughout the year. Especially during the cool season when granular fertilizers that are temperature dependent have minimal effect and liquids can extend the effectiveness of granular fertilizers between applications.

Liquid fertilizer products are applied through spray equipment specified for sport turf. Early morning hours when cooler and less breezy are best for scheduling spray application. Dry calm conditions allow the spray to coat and adhere to the grass blade and are optimal for timing of plant uptake. Fertilizer products and schedule of application is in Table 3. CHAF Seasonal Fertility.

Fields spray equipment includes the 150 gallon
~~200 gallon SelectSpray Sprayer, JOHN DEERE HD200 SelectSpray~~ (for ProGators 2020A, 2020 and 2030A, 2030) **UPDATE**

Table 3. CHAF Seasonal Fertility. Water in same day. Foliar applications early morning. Spray is dry prior to use.

Schedule	Foliar + Rate + Freq	Gran + Rate + Freq	NOTES
JAN – FEB	w/phosphites 1x/3-4 weeks		Apply when not windy
MAR – APR	1x/week	Synthetic .5-.75 lb N/ 1x/6 weeks	
MAY – JUN	1x/week	Organic .5-.75 lb N/	Foliar after renovation JUN Send in soil sample to Wilbur Ellis for pH, phosphorous,

			calcium, sulphur, magnesium, analysis
JUL			Camps usually prevent fertilization
AUG	1x/week	Organic .5-.75 lb N/	
SEP – OCT	1x/week	Organic .5 lb N/	
OCT - NOV	Foliar 1x/week	.75-1. lbs N/	
DEC			Send in soil sample to Wilbur Ellis for pH, phosphorous, calcium, sulphur, magnesium, analysis

Carbon footprint: Fields lead coordinates with CEJS Sustainability Coordinator to report fertility program volumes and frequencies relevant to carbon footprint.

Maintenance solid tine aeration and sweep: method, equipment, schedule,
Solid tine preceded by top dress, seed (applications can depend on time and weather constraints) Late winter and early spring best time of year for top dressing and seed
Methods: solid tine

- Solid tine punches hole 8-9" in depth, benefit is no clean up, helps with drainage and quick air circulation, does not remove thatch, play may occur immediately after,
    - Scheduling; weekly
    - Solid tinning preceded by top dress and seed

Sweeping: after play, after de-thatching, after core aerating

- Smithco grass clippings and de-thatching
- TC125 cores

Equipment: set up and process

Set up includes connecting to the JD4520 PTO and 3 point hitch

- Link to the ops manual for hook up safety and operations

Installing tines

- use manual socket wrenches, no impact wrenches that will strip threads

Equipment: set up and process - cont'd

- after a few aeration passes, check tightness of tines
- run tractor at 1.7 mph or gear A3 or slower
- RPMs at 2000 to operate the drive shaft for the aerator

- straight lines no turns, lift the aerator before making a turn
- start with aerator on the ground, not up in the air
- back roller needs to be up for core aeration, refer to ops manu
- frequently check level on top of the aerator according to ops manu
- refer to the operators manual for ground speed, RPMs, tine depth, heave angle, grease points

Field process: run north to south or east to west, do not run diagonal to preserve irrigation heads

Routes; Clean up routes,

Diagram here of starting and stopping positions on the field, options to change starting locations benefits

De-thatch and sweep:

- Methods, equipment, schedule

Methods: the Woodbay de-thatcher stands up the grass blade, minimal mess, evens out the field, quick ground speed, smooths divots, benefits are improved air flow, removes thatch which is dead grass material, breaks up cores, plan on seeding afterward followed by top dress conditions and schedule permitting

Equipment: Woodbay FDS 9200 Turf De-thatcher pull behind, lift before making a turn and back up to starting point,

Schedule: growing season, perform on dry days, after heavy use where loose grass material has been pushed down below the canopy,

Heavy use: camps, 2-a-day and 3-a-day trainings, double header and triple header games

Requires 4-5 hours to perform tinning and sweeping

D. Line Painting: training, games, special events; equipment, methods, frequency,

Line painting:

- Fields lead and assistants perform seasonal line painting that includes training and game day.
- Equipment includes gas powered line painting machine and white paint.
- NCAA rules are followed for painting on field dimensions and markings for collegiate soccer.

- Fields staff may be asked to paint the WAC logo, colored lines or alternate dimensions for special events.

E. Restorative Maintenance: aeration, tinning, recycle dressing, fraze mowing,

- Core punches a hole roughly 5-6”” deep and removes a core, holes stay open longer, benefits remove thatch, opens channel for drainage and air circulation, clean up with a mechanical sweeper is required, benefit is realized through repeated core aerations throughout the year, ideal number of core aerations annually could be 4-6 times during the off season for soccer
    - Day and a half to clean up sweep using the John Deere TC125 sweeper
    - 2-3 more days for recovery before play can resume
    - Scheduling every other month

F. Game Preparation: turf repairs for divots and goal wear, mow, mow pattern, paint, list of service:

- Turf Repairs
- Mowing and mow patterns
- Line painting

- List of services
  The list of services below are performed starting 2-3 days before day of game depending on weather. Day of game may include mowing and sweeping to groom the field if there was play the previous afternoon/evening.

	Task	**Staff Hours**	**Materials**	**Qty**
**	Mow Checkerboard 1 direction 2 directions option, add 1 hour	2		
	Sweep	1.5		
*	Field repair/ sweeping	2		
	String and paint	3	Paint	2.5 gal
	Sideline covers on/off	4		
	Blowing, litter p/u	1		

TL Hours		**12**		

*only if there are other activities on the field before the game
**Checker board 1 direction / 2 directions

G. Equipment and maintenance: mower, aerator, top dresser, de-thatcher, recycle dresser,

H. Vendors, Contacts and Manufacturers: equipment, products,

Vendor	**Contact**	**Product**	**Manufacturer**	
Wilbur Ellis		Granular fertilizer Fairway Supreme Perennial Rye		
Floratine		Liquid fertilizer		
Empire				
Ewing		Walk behind spreader, Eagle Kentucky Bluegrass		
Walrath		USGA Fairway sand		
Pacific Golf and Turf		John Deere, Woodbay	John Deere Pro Gator	

Truf Star/Western Equipment		Toro,		
Weidennmenn		Aerator		
GreensGroomer		SUPK field grooming		
Calsense		Controller		
	SU Mechanical Shop Irrigation Specialist	CHAF house irrigation pump & motor		

Reference Materials:

Source	**Location**	
SU Grounds Athletic Fields Operations Manual	T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\3_FIELDS\Athletic Fields Operations Manual	
Equipment Operators Manuals		
PENN State Sport Turf Maintenance UCONN Sport Turf Maintenance	T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\3_FIELDS\AthleticFields\CHAF\PennState_turfMgmt	
GreenSpec Recommended Spreader Settings	T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\3_FIELDS\AthleticFields\CHAF\Spreader settings	
Sport Turf Managers Association and PNWSTMA	https://www.stma.org/institute/	
American Society for Testing Materials; athletic fields;	https://www.astm.org/	
Irrigation Auditors Association		
Seattle Mariners		
Seattle Seahawks		

Section 2 – Seattle University Park - Synthetic Sport Turf Maintenance

A. Introduction: description, responsibilities, field maintenance, communications

Description
Synthetic turf condition and preservation program: Athletic Fields Lead and assistant perform regular grooming and sweeping of the synthetic turf to condition the turf blades, redistribute infill and remove debris from the field. Grooming is performed once a month or more as needed due to impacts from use or weather. Grooming equipment includes 'Litter Kat', brushes and tines for sweeping, removing debris and de-compaction. Work is performed during dry conditions. Fields staff report wear and damage and schedule repairs under warranty with Shaw Sport Turf. Groom, remove debris from turf field, infield dirt build up at turf edge, inspect turf for damage or other repairs.

Responsibilities
Synthetic Turf conditioning and preservation program:

- Groom/sweep, equipment, frequency, methods, schedules,
- UREC in season, off season,
- adjust infill, report damage to turf, schedule repairs,

Carbon footprint program: coordinated with CEJS Sustainability Coordinator; field inputs where applicable volumes and frequencies;

Field Maintenance

B. Grooming and Infill: picking up debris, replacing and leveling infill,

<u>Grooming</u>

Grounds staff monitor the field surface for wear and tear and scheduling maintenance. Fields staff report wear and damage and schedule repairs under warranty with Shaw Sport Turf. Grooming activities are schedule for dry weather facilitating most efficient and successful outcome. Brushing, tinning, sweeping and picking up debris facilitates synthetic turf blades standing up, redistributes and levels the infill and removes loose turf fibers and other litter from the field.

is performed once a month or more as needed due to impacts from use or weather. Grooming equipment includes 'Litter Kat', brushes and tines for sweeping, removing debris and de-compaction.

Groom, remove debris from turf field, infield dirt build up at turf edge, scrub paint lines, inspect turf for damage or other repairs. gMAX testing measures high impaction between athlete and the surface and is performed by Shaw Sport Turf 1x/2-3 years. SUPK has consistently tested below tolerances.

Replacing crumb rubber

Maintenance Schedule:
*closely follow operators' manual specifications for safe and efficient operation

	JAN-FEB-MAR	APR-MAY-JUN	JUL-AUG-SEPT	OCT-NOV-DEC
Litter Kat	1 time per month	2-3 times per month	2-3 times per month	1-2 times per month
Brushing				
Tinning		1 time per season	1 time per season	
Rec Sports line painting		1 time per season		1 time per season
Clean infield turf edge			1-2 times annually and as needed	
Scrubbing paint lines	ONLY as needed	ONLY as needed	ONLY as needed	ONLY as needed

Methods;
Brushing and combing; conditioning and making ready for play by making the surface even and de-compacting; picking up garbage and detatched fibers, smooths out the surface;
Distribution an Uneven surface casued by use, rain and weather , heavy use by sport teams, Rain and wind on the turf, puddling, water flows on slope toward the east, rivulets form and move the crumb rubber around,
Drag matt/friction matt for picking up debris (not loud clunky slow as litter kat) run in any direction,
Woodbay redistribute crumb rubber, loosens up debris
Brush for final touch of evening, aesthetics,
Litter Kat, currently out of service, may be changing to different equipment; must line up turns

Order of use – friction matt or litter kat then woodbay; then brush at the end for special events;
Matt and kat do same thing – kat has magnet bar, matt picks up more than the litter kat but still need the magnet bar
Litter kat out of service – talk with Josh
Need a magnet bar on one of the implements

Crumb rubber; added when cleaning turf/infield edges, removing dirt at the edge and replace rubber;

C. Line Painting: Softball and Recreational Sports
UREC orders paint, seasonal sport lines training and game day, equipment, methods, frequency, (see game day preparation procedure for more detail)

Notes with Ben
Paint lines 2x/yr – fall and spring both IM and Club, based on UREC direction
Marking, stringin, paitning should be cohesive process in one period of time/day for best results, straight lines, minimal mistakes, alignment of 90 degree at the corner for straight/flush connections, box and connecting corners,
Section 3

Find hash marks painted on the field for each respective sport, follow field diagram map
When no hash marks available make temp marks on the field with spray paint to outline the respective sport,
Follow diagrams for each sport as provided by EWING Sports Fields Publication
String the corresponding marks for the specific sport
String cleats plastic teeth inverted dig into the turf, loop string through hook, stretch tight between 2 points

Follow string with the paint sprayer and sprayer guide to paint the line, side lines and end lines paint to the outside of the string; inside lines paint on the inside of the string for goal box, penalty box and *semicircle, midfield circle,
*Follow Semi circle has marks of spray paint
Paint east west lines first or do north south lines first
Followed by detail markings, hash marking and goals,
Some hash marks difficulty – mens lacrosse field X mark in mid field, free handed the X 3’ in length; Ultimate Frisbee needs measured out and hash marked; womens lacrosse goal hash marks 2” shown on diagram but fields staff provided 4” for continuity with other lines being painted,
Paint from Eco-chemical Templine – called Fastbreak, – washes away over time, but not fully;, ToughTurf lasts longer, fades a little and Original somewhere in between for length of wear, SFTB foul lines use ToughTurf,

- paint is used as is – no dilution
- Graco paint machine; set height of spray nozzle for a 4” line, before starting perform test line on test turf, raise/lower to achieve 4” line to insure accurate height, implications for how far the paint will go,

Paint Colors; see table below
Paint machine cleaning, run warm water through multiple times, using sink water from RRs, rinse and scrub nozzles with small hand brush after every use,

Paint sprayer use, set, tear down;
Set up;
Prime with paint, to remove water in lines from cleaning, set paint bucket on machine, set up empty bucket to the side, intake tube in the paint, spray nozzle tubes and cycling tube all into the empty bucket to receive the priming paint, with machine running, pull the trigger on the handle depress until water is expressed and paint is coming out, adjust sprayer for paint to run through spray nozzle, adjust setting for downward spray, set throttle to spray until paint is coming out, reassemble all components for field spraying, secure all parts to the machine,

Tear down same in reverse but with water and some diluted half strength detergent to remove from walls inside tubes, always take nozzle off take apart, immerse in water, scrub clean, leave disassembled in container on shelf to dry, never leave attached, must clean every time, dispose bucket of flushing water into RR toilet,

- Paint seasonal recreational sports lines;
- paint vendors, manufacturers,
- requisite colors per type of sport,
- locate markings,
- painting schedule,

Field dimensions set up: Grounds Fields staff paint sport lines once a year including, seasonal sport lines and requisite colors for training and game day

SUPK Intramural Sports, IM	**UREC Student Club practices and games**
7v7 US flag football; field lines orange (two 100 yd long field running N/S) 4v4 US Flag Football; field lines orange (similar length field as 5v5 soccer) Full size US Soccer yellow over the existing light green 5v5 US Soccer; field lines white (two SU Park width long fields running E/W)	M/W/Coed US Soccer M/W US Sports Lacrosse; Field lines: mens blue, womens red M/W USA Rugby; field lines purple US Sports Ultimate Roundnet (spikeball)

7v7 US Soccer; field lines white (Two 60foot fields running N/S) US Softball (played on Logan with support of Ath and Grounds for hoses) Kickball (played all over truly, no lines) Outdoor volleyball (typically played on the D area, but has also been on the N side, no lines)	

D. Scrubbing lines; line scrubbing *only* occurs when an upcoming event might require some of the regular rec sports lines be less visible. Other times could be to remove painted on logos or senior numbers *only* if needed and requested by athletics.

- Wet down lightly the lines to facilitate the paint striper from Beacon,
- Spray striper onto the lines using backpack sprayer 1:1 ration, bold colors need heavier dilution, white lines 1:1 ratio or less,
- 2 ppl, hose, striper, scrubber
    - Water, soap, and after spray
    - Scrubber
- Scrubber is slow, going slow and steady, need to walk very slow so brushes have time to scrub to lift the paint off the turf blade,
- after scrubber has passed over a line, hose spray again real good to dilute paint residue to wash off residue of diluted paint,
- Scrub bug is easy to use, easy maint, brushes should be replaced annually or bi-annually,
- Re-scrubbing only as needed for paint that has been on the field for a long time
- Stripper Product/vendor; EZ Strip,

E. Turf edge cleaning – removing buildup of infield dirt
Decision factors to clean the edge – safety-trip hazard; playability/performance - ball bounce; clean out right away when time and labor to avoid buildup

- Once a week, push broom and aluminum rake prong edge to rough up the infield dirt at/on the edge back onto the infield, the entire perimeter,
- Keep sharp division, define the edge raking or brooming, grass meets dirt at 90 degree angel; same process on the bull pens especially pitchers warm up, grub dirt away from turf edges,
- Build up happens by tracking on runners shoes, rain water running down slope sediment of infield dirt gathers at the edge

- Most effective Wash out build up with a hose push broom and rake, wash out before build up happens
- Schedule when field is warming up and drying out; APR-MAY
- Remove with hose, shovel, rake, scoop,
- When compacted into turf; use 3 pronged hard rake to scratch up compacted dirt up,
- Grubbing out dirt in season, not past field surface; off season scrub out deeper and backfill with crumb rubber
- Removing grubbed out dirt with shop vac all turf edges; grub out dirt then vac, park pro gator on field to empty shop vac, dispose in regular garbage dumpster,
- Field drainage - Outfield between 1st and 2nd base field drainiage carrying silt into the turf 20 ft past the edge– cleaning field dirt from turf, alluvial plane; develop interim material removal,
- After team practice, and dry weather, hose dirt back onto the infield, in wet use push broom, crumb rubber not a worry,
- Biggest accumulation 1st base dug out side access to field,

F. Restorative Maintenance; decompaction, tinning, brushing, gMAX testing

G. Equipment: grooming, painting, scrubbing,

Equipment: paint machine, litter kat grooming and debris removal, tining implement for decompaction, scrub-bug

H. Vendors and manufacturers: equipment, products,

Vendors and Resources

NCAA / US Sports for field dimensions for respective sport

Pioneer Athletics for paint and other supplies

https://pioneerathletics.com

Beacon athletics ballfield and dimensions and reference guide: https://beaconathletics.com

Shaw sport Turf, turf repair/replacement, gMAX testing

https://www.shawsportsturf.com/

Ewing sport field equipment and maintenance products and catalog:
https://secure.ewingsports.com

Contacts/Help:

GROUNDS	ATHLETICS
Grounds Manager: 206 296-6439 Athletic Fields Specialist Lead 206 296 6440	Director, UREC 206-296-6017 Assistant Director, UREC Competitive Sports 206-296-5907

A. SUPK Reference materials:

Shaw Sport Turf Maintenance Manual:
T:\Finance_and_Business_Affairs\Facilities_Services\Administration\POLICY & PROCEDURE DROPBOX\700 O&M_GROUNDS P&P\712.07.00 AthleticFields

Sport Turf Managers Association; Natural and Synthetic Guide:
T:\Finance_and_Business_Affairs\Facilities_Services\Grounds\3_FIELDS\AthleticFields\STMA

Section 3 – Logan Field – Specialized Skinned Dirt Infield Maintenance

A. Venue: wear, damage, cleaning, dugouts,

B. Skinned Infield: grooming, clay packing, home plate, pitchers rubber,

Groom and repair infield dirt, repair and replace clay packing material, remove edge build up along the infield/outfield edge, clean turf edges adjacent to the infield remove infield dirt build up, clay pack and groom home base area, pitchers area, practice areas for batting and pitching,

In Pre-season Renovation and on pitchers/batters areas, use sponges and rapid-dry to obtain working conditions for working with clay. Use flat bar level and string level to re-establish finish grade.

	Home Plate, Pitchers circle, Bull pens	Outcome
Infield dirt	Remove buildup of turface, infield dirt, clay down to just clay, Nail drag, sharp rake, sweep, broom, remove infield material down to clay*, tamp level Level with string from home to 2nd Fill low spots using left over material from nail drag Water in and tamp	Infield is groomed clean, level, conditioned**, clay packed and ready for play

	Using a sod knife, clean and expose edges of home plate and pitchers rubber In bull pens clean turf edge clean and delineated, repair and level catchers spot	
	Home Plate, Pitchers circle, Bases* **	
Clay work	Rake out infield dirt down to clay to shave down high spots Sweep excess into a pile for removal Use whisk broom to clean and remove fine material Add very small amount of moisture to help new clay adhere Add fresh loose clay, build up a little high for packing Sweep and tamp Level with surrounding surface	Sufficient clay just below the infield dirt surface to firm and support play, prevent digging holes and insure safety
	Infield 3 times per season – Spring / Fall	
Turface	Add moisture to wet the field to just puddling, okay to stay on the surface will soak in, Add turface to condition surface for creating a layer between skin and athletes play 10-20 bags of turface each scheduled maintenance and depending on how much is still on the surface, doesn't break down, **Turface Pro-League Conditioner game day red and field natural tan**	Creates barrier between moisture and surface Keeps moisture in, acts as mulch barrier

*dispose non-reusable material, mix of dirt and turface, in clean green dumpster
** conditioned is moisture and turface added for balance of firm and moisture retentive playing surface
*** Runners bases; Clay work on the side of the base pointing toward the next base, 3 ft L x 1 ft W

Material:

- Communications and contacts
- Specialized Dirt field
    - Dimensions and Playability
    - Grooming
    - Chalk lining, materials, equipment, methods
- Nail drags of varying lengths and weights
- Moisture management
    - Adding in

- Take away
- Tarp maintenance and repair

C. Turf edge: remove dirt build up,

D. Batting and Pitchers warm up:

- Dugouts

E. Restorative Maintenance: infield conditioning, clay packing,

Renovation;
3x/season, Mar-Oct; beginning, mid and end
Full day to day and a half
Check moisture level for water conditioning needs for next steps
NAIL DRAG:

- Tow behind Heavy 4" weighted deep ***nail drag*** to dig down into the skin essentially plowing through, circling the field to till it up, stay out of pitchers circle and batters boxes, use lightly weighted hand nail drag 3" depth in these areas,
- Screen drag hand and/or tow behind, best to use hand screen drag, multiple times to redistribute and even out the grade, using observation for high and low spots needing attention
- Screen drag Material collects into the screen and drops into low spots
- Watering to condition the material that has been worked, deeply for moisture to condition, shiny too wet, step leaves mud too wet, be able to walk on without leaving muddy foot print, if look sandy or dusty is too dry
- Tow behind rolling repeatedly to compact to a firm playing surface, feels like standing on gym floor
- Finishing touches; moisture to wet the field to just puddling, okay to stay on the surface, but will soak in, then add **turface** to condition surface for creating a layer between skin and athletes play, creates barrier between moisture and surface; turface helps keep moisture in the skin, acts as a mulch barrier,
- 10-20 bags of turface depending on how much T is still on the surface, T doesn't break down,

- Turface Pro-League Conditioner game day red and field natural tan,

F. Game Day Preparation: infield conditioning, grooming, clay touch up, set bases, chalk, paint, List of Services:

	Task	**Staff hours**	**Materials**	**Qty**
Starting set	Infield conditioning (turface/watering)	2-3	Turface 50 lb bags	20

	Clay packing, watering, batters, pitchers, bullpens	4	Mounding clay 50 lb bags	10
	Rake infield	1		
	Clean dugouts	.5		
	Drag	1.5		
	Clean Logo	2	Simple green Gal, hose water	1
	Apply chalk lines, paint bases	1.5	Chalk, 20 Lb bag aerosol white paint 8 oz can	15 2
	Blowing	.5		
	Paint foul lines	1.5	Bright white paint, gal paint machine,	 2
	Sweep turf	1		
Between Games	**ONLY 30 minutes allowed**			
	Repair pitching, home plate	.5		
	Drag	.25		
	Re-Chalk	.25		
	Labor (OT)	5-10		

G. Equipment: grooming, clay packing, watering, absorbent, tarp,

E. Vendors and manufacturers: equipment, products, Reference materials,