# Brandeis University
# Grounds Management Plan

(April 2023)

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# Introduction

The Brandeis University Grounds Management plan is a document outlining the management practices of the grounds team to maintain Brandeis University's landscape. The grounds team is responsible for maintaining the campus lawns, landscapes, hardscapes, roadways, irrigation systems and athletic fields. This document offers guiding principles but is developed to be flexible. This document will outline tasks performed by the grounds staff throughout the year and timing of performing such tasks. The document will also outline procedures the grounds staff takes to perform each task as well as contractors and vendors used, if any, for applicable tasks.

The campus is divided into 4 maintenance priority areas Improved, Semi-improved A, Semi-improved B and Naturalized. Each area will be managed slightly different. Listed throughout the document will be ways these areas are maintained differently. On pg. 8 are the Grounds Standards describing how the priority areas are maintained differently.

This plan will be reviewed and updated accordingly every October by the Grounds and Fleet Manager.

In addition to this plan, there is the Integrated Pest Management Plan and an Inclement Weather Plan. These plans are used in conjunction to this plan.

IPM Plan - Brandeis University Integrated Pest Management (IPM) plan is available on the Brandeis University Facilities website. IPM Plan The IPM plan is a prevention-based strategy that provides a comprehensive, ecosystem-based approach focusing on long-term pest control, improved building conditions through a combination of properly timed techniques (biological control, habitat manipulation, and modification of cultural practices) and the use of resistant varieties to create healthier conditions for residents, faculty, staff, visitors and pets.

Inclement Weather Plan - The purpose of the inclement weather plan is to provide a consistent process and accountabilities for the management of snow and ice on Facilities Services managed properties at Brandeis University. Depending on the response necessary for the event, snow removal operations include Grounds Maintenance staff, Custodial staff, contracted plowing and contracted shoveling. The inclement weather plan is intended to ensure all resources, training, staffing and communications are in place prior to and throughout the snow season. The inclement weather plan is available by request.

# Definitions

| | |
|---|---|
| **Aeration** | Creating holes in an area of grass to alleviate thatch |
| **Annual Plants** | A plant which lives only on growing season |
| **Garden Bed** | an area which contains flowers, shrubs and/or trees |
| **Herbicide** | A chemical for destroying plants, especially weeds |
| **Line Trimming** | To trim edges of lawns utilizing a “weed whacker” or “line trimmer” |
| **Perennial Plants** | a plant which overwinters and lives more than one growing season |
| **Pesticide** | A chemical for destroying plant, fungi or insect/animal pests |
| **Pollinator** | An agent (such as an insect) that moves pollen from the male part of the4 flower to the female of a flower |
| **Preemergent** | Prior to seedlings emerging from the grounds |
| **Slice-Seeding** | Creating channels in the soil for grass seed to lay in |
| **Thatch** | A tightly intermingled layer of living and dead stems, leaves and roots. |
| **Topdressing** | The process of applying sand in a thin layer or the surface of grass |
| **Verticutting** | A process of removing thatch from an area of grass by utilizing a machine which has vertically rotating discs |

# Priority Areas

The campus is divided into 4 priority areas dictating how we care for the grounds and landscape in those areas. The 4 areas are *Improved, Semi-Improved A, Semi-Improved B, and Naturalized.* The locations of these different areas can be found on the Priority Map later in this document. The grounds standards identifying differences in each priority area is found on pg. 8.

Naturalized – Naturalized areas are areas that contain vegetation which is allowed to reproduce a population of native species through natural regeneration or specifically planted to receive minimal maintenance. Naturalized areas are designed around establishing plants which are native to New England. These areas are only maintained for safety and cleanliness. Grass in this area is mowed very infrequently (yearly or less often), there is not any irrigation, and weeds are allowed to grow naturally. Most naturalized areas on campus were planted to promote pollinators. Naturalized areas account for 1% of maintained areas on campus.

Improved – Improved areas are areas that hold the most value to the campus community. They are the most focal and most utilized areas on campus. The center of campus falls into this priority area. These areas receive the most grounds attention and are given the most inputs (fertilizers, seed, water, pesticides, labor) to create the highest turf and plant product and provide aesthetically pleasing landscape. All improved areas have irrigation, are expected to have lower weed instances, and the turf is mowed to the lowest height in regards to maintained areas. Improved areas account for 14.3% of maintained areas on campus

Semi-Improved A – Semi-Improved areas make up the rest of campus outside of Naturalized and Improved areas. These areas receive various levels of maintenance. We have divided our Semi-Improved areas up into two different sections. Semi-Improved A areas hold value to the campus community for its aesthetics and activity space, however often have some constraints (irrigation, topography, soil conditions) to be able to be classified as Improved. Semi-Improved A areas are areas which are stilled used significantly. Semi-Improved A areas offer some areas of programmability for activities. Some Semi-Improved A areas have irrigation. Grass will be allowed to be cut a little higher and weed instances are more forgiving. Semi-Improved A areas account for 20.3% of maintained areas on campus, the most out of the priority areas.

Semi-Improved B - The Semi-Improved B areas are given the least amount of inputs as far as regularly maintained areas on campus. These areas often have constraints (lack of irrigation and sunlight, poor soil, topography) to not allow higher maintenance standards. Semi-Improved B areas are not irrigated, allow a higher weed threshold and the turf areas are maintained at the highest grass height in regards to regularly maintained areas. Semi-Improved B areas account for 9.3% of maintained areas on campus.

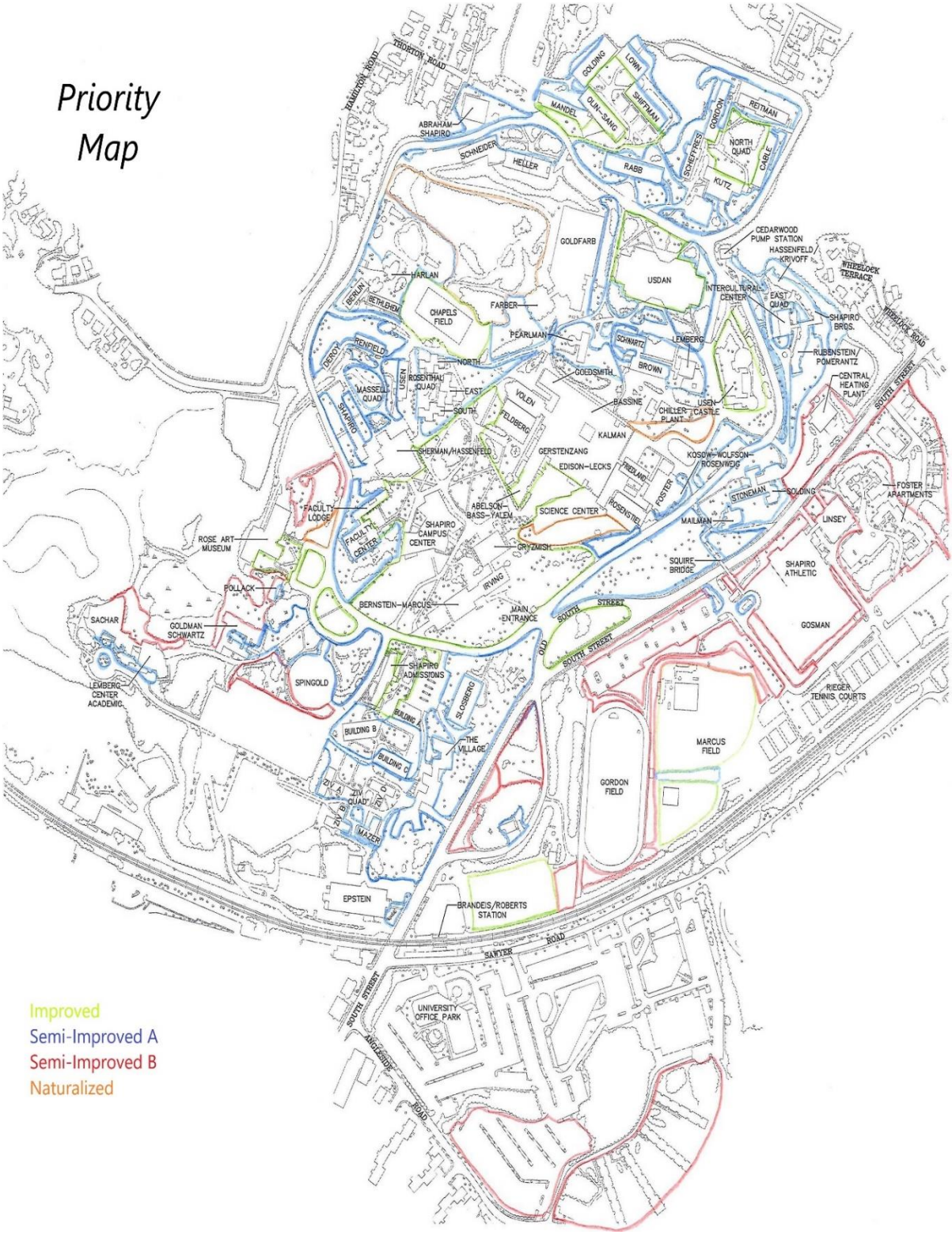
## Maintenance Areas

In addition to the priority zones, the campus is divided into 7 zones. The 7 zones are maintained by different employees to ensure fair workloads, instill a sense of pride and consolidate work for an efficient and productive work day. Each zone has 4 different maintenance areas. These maintenance areas are divided based upon priority (Improved, Semi-Improved A and Semi-Improved B). Each maintenance area (28 total) are inspected and scored monthly against the grounds standards, utilizing the appropriate inspection sheet (**Appendix I**) by the Manager, Grounds & Fleet and/or the Quality Assurance Lead. See the list below and the associated map.

- Lower Campus
    - Admissions & Front of Spingold Theater (Improved)
    - Ziv Quad (Semi-Improved A)
    - Epstein Building & Railroad lot (Semi-Improved B)
    - Ridgewood Quad & Sides of Spingold Theater (Semi-Improved A)
- Middle Campus
    - Great Lawn, Starr Plaza & Behind Guard Shack (Improved)
    - Fellows Garden, Faculty Club & Edison Lecks Courtyard (Improved)
    - Back of Faculty Club (Semi-Improved A)
    - Rosenthal Quad, Around Feldberg & Gzang courtyard (Semi-Improved A)
- East Campus
    - Around Usdan & Skyline (Improved)
    - Pearlman, Schwartz, Front & Usdan side of library (Semi-Improved A)
    - East Quad (Semi-Improved A)
    - Science Parking Lot, Crown & Foster (Semi-Improved A)

- North Campus
    - Mandel Quad & North Quad (Improved)
    - Chapels & Back of Library (Semi-Improved A)
    - ASAC, Heller & Rabb (Semi-Improved A)
    - Kutz, outside of Mandel Quad, outside of North Quad (Semi-Improved A)
- Along South St.
    - Main Entrance (Improved)
    - Front Entry Hill to Bridge (Semi-Improved A)
    - Bridge to Heating Plant (Semi-Improved A)
    - Charles River Apartments and J-Lot (Semi-Improved B)
- Athletics
    - Baseball Field, Softball Field & Club Field (Improved)
    - Lemberg Children's Center & Old South St. (Semi-Improved B)
    - Front of Gym & Front Parking Lot (Semi-Improved B)
    - Foster Mods, Front of Linsey Pool & Back Gym Parking lots (Semi-Improved B)
- West Campus
    - Rose Art Museum (Improved)
    - Massel Quad (Semi-Improved A)
    - IBS & Golding Schwartz (Semi-Improved A)
    - 60 Turner St./567 South St. (Semi-Improved B)

Priority Map



# Grounds Standards – In Season

| Grounds Standards | | | | |
|---|---|---|---|---|
| | **Improved** | **Semi Improved A** | **Semi Improved B** | **Naturalized** |
| **Grass Height** | 3-4.5" | 3.5-5" | 4-6" | Not applicable |
| **Turf Care (mowing practices)** | Visually Straight lines, no grass clumping <5sq. Ft. weeds/100 sq. ft. (5%) in lawn. Grass discharged away from garden beds, signs and air intakes. | No grass clumping <15 sq. ft. weeds/100 sq. ft. (15%) in lawn. Grass discharged away from garden beds, signs and air intakes | No grass clumping. Grass dishcharged away from garden beds, signs and air intakes. | Not applicable |
| **String Trim/weed whack** | Completed same day as mowing arounds trees, buildings, signs, walkways to leave grass the same height as machine mowed grass. Garden beds line trimmed with clean edge | Completed same day as mowing around trees, building, signs, walkways to leave grass same height as machine mowed grass. | Completed same day as mowing around trees, building, signs, walkways to leave grass same height as machine mowed grass. | Around Hydrants and access points monthly or to not exceed 12" in height |
| **Hardscapes (walkways, sidewalks, stone walls)** | Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Any sidewalk cracks larger than 1/4" filled | Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Any sidewalk cracks larger than 1/4" filled | Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Any sidewalk cracks larger than 1/4" filled | Blown off bi-weekly. Any sidewalk cracks larger than 1/4" filled |
| **Garden Beds** | Mulched yearly with >2" of mulch. <5sq. Ft. weeds/100 sq. ft. (5%) throughout garden bed. No weeds taller than 3" No Tree limbs in beds. | Mulched with >2" of mulch <15 sq. ft. weeds/100 sq. ft. (15%) throughout garden bed. No weeds taller than 5" No Tree limbs in bed. Grass clippings blown away from beds. | Mulched every other year. <30 sq ft. weeds/100sq ft. (30%) throughout garden bed. No weeds taller than 8". Grass clippings blown away from beds | Not applicable |
| **Trash Barrels** | Trash barrels picked up M-F during school year. 3x per week during summer. No trash on ground around barrels. Less than 10 bees around trash barrels | Trash barrels picked up M-F during school year. 3x per week during summer. No trash on ground around barrels. Less than 10 bees around trash barrels | Trash barrels picked up M-F during school year. 3x per week during summer. No trash on ground around barrels. Less than 10 bees around trash barrels | No barrels |
| **Loose Trash** | No trash that has been mowed over<br>No trash on ground longer than 24 hours | No trash that has been mowed over<br>No trash on ground longer than 24 hours | No trash that has been mowed over<br>No trash on ground longer than 24 hours | No trash on ground longer than 96 hours. |
| **Shrubs** | Trimmed once per year and for clearance as needed. Dead branches removed | Trimmed for clearance as needed. Dead branches removed. | Trimmed for clearance as needed. Dead branches removed. | Trimmed for clearance as needed. Dead branches removed. |
| **Trees** | Trimmed for clearance and health. Alive branches only removed for clearance or shape. Dead branches within 15' of the ground removed. Dead trees reported to grounds manager to schedule for removal. | Trimmed for clearance. Alive branches only removed for clearance. Dead branches and trees reported to Grounds Manager | Trimmed for clearance. Alive branches only removed for clearance. Dead branches removed which can be safely | Trimmed for clearance. Healthy branches only removed for clearance. Dead branches and trees reported to Grounds Manager |
| **Signs/Posts/Fence/ Barricades** | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. |
| **Irrigation** | Operating uniformly. No broken heads. | Operating uniformly. No broken heads. | Not applicable | Not applicable |
| **Moveable objects (Furniture, cigarette towers)** | All moveable objects will be placed in useable locations (not in mulch or on pavement for seating) after an area has been mowed. Unsafe furniture blocked off or removed and a work order placed. | All moveable objects will be placed in useable locations (not in mulch or on pavement for seating) after an area has been mowed. Unsafe furniture blocked off or removed and a work order placed. | All moveable objects will be placed in useable locations (not in mulch or on pavement for seating) after an area has been mowed. Unsafe furniture blocked off or removed and a work order placed. | Not applicable |
| **Vandalism** | Vanalism reported and removed within 48 hours | Vanalism reported and removed within 96 hours | Vanalism reported and removed within 96 hours | Vanalism reported and removed within 96 hours |
| **Pests** | Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass) and monitor for worsening damage. | Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass) and monitor for worsening damage. | Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass) and monitor for worsening damage. | Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass) and monitor for worsening damage. |

During the winter months the standards are modified throughout all the zones, to account for the snow and the different maintenance required. The winter standards also have an additional focus on safety concerns in regards to snow and ice throughout campus.

| Grounds Standards | |
|---|---|
| ***Non Growing Season Months*** | |
| | **Winter December 1-April 1** |
| **Safety Concerns** | Slippery Surfaces, icicles Ice/snow falling hazards etc. |
| **Fire Hydrants** | Clear & accessible. No snow 24" around hydrant. |
| **Machine Damage** | Any landscape or hardscape damaged during snow removal operations reported to grounds manager. Cleaned up or repaired within 72 hours if possible. |
| **Garden Beds** | No weeds taller than 5" No Tree limbs in bed. |
| **Trash Barrels** | Trash barrels picked up M-F during school year. No trash on ground around barrels. |
| **Loose Trash** | No trash on ground longer than 24 hours |
| **Shrubs** | Trimmed for clearance as needed. Dead branches removed. |
| **Trees** | Trimmed for clearance. Alive branches only removed for clearance. Dead branches and trees reported to Grounds Manager |
| **Signs/Posts/Fence/Barricades** | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. |
| **Roads, Sidewalks & Parking Spots** | Fully clear of snow with no excess salt piles (>36 sq. inches).<br>Storm drains cleared of debris, snow & ice |
| **Moveable objects (Furniture, cigarette towers)** | All moveable objects will be placed in useable locations (not in mulch or on pavement for seating). Unsafe furniture blocked off or removed and a work order placed. |
| **Vandalism** | Vanalism reported and removed within 96 hours |
| **Pests** | Report rodent activity and monitor for worsening damage. |

# Bed Preparation/Mulching

### *Objective and Reasoning*

- To clean garden beds of leaf litter and dead plant material which can harbor insects and disease around campus.
- Prepare garden beds around campus to create healthy plant conditions and aesthetically pleasing garden beds.
- To create a defined garden bed edge. Adding mulch to garden beds helps to retain moisture as well as keep weed growth down.
- **Appendix II** has a break down of location, size and amount of mulch needed for garden beds on campus. **Appendix II** along with **Appendix IV** (detailing plants and pruning) will give information on which plants are in each garden bed.
- Garden Beds account for 2% of maintained areas on campus.

### *Time Frame*

March 1 to May 1, August1-August 20

### *Procedure*

- Garden beds will be cleaned of leaves, needles and other debris via rakes, blowers and by hand.
- Beds will be edged to keep a clean crisp edge, and have no more than 1" of mulch removed.
- Old mulch, plant material, leaf litter debris and edging materials gathered in the process will be disposed of at one of two dump locations.
- Following bed preparation in the spring, garden beds in Improved and Semi-Improved A nonresident hall areas will be mulched with no more than 2" of mulch in order to keep weed growth suppressed and provide adequate moisture retention for the plants in the garden bed.
- Following bed preparation in the summer, garden beds in Improved and Semi-Improved A resident hall areas will be mulched with no more than 2" of mulch in order to keep weed growth suppressed and provide adequate moisture retention for the plants in the garden bed.
- Following bed preparation in the spring or summer, garden beds in all Semi-Improved B areas will be mulched every other year with no more than 2" of mulch in order to keep weed growth suppressed and provide adequate moisture retention for the plants in the garden bed.
- Current mulch used is an aged hemlock mulch obtained from Wagon Wheel Nurseries.
- Mulch is spread by use of front-end loaders, mulch blower, dump trucks, wheelbarrows, shovels and buckets depending on the site location.
- A preemergent herbicide (currently Crew) will be applied by a licensed pesticide applicator to garden beds in the spring after mulching for weed suppression. A follow up application will be made in July/August for season long weed suppression.

# Late Spring Plantings

### *Objective and Reasoning*

Spring annuals provide an aesthetically pleasing campus. **Appendix II** has an additional break down of spring annual planting locations as well as amount of plants needed dependent on spacing decided on. Spring annuals are planted in the ground at the following locations:

- Brandeis sign
- Lower South St. Entrance
- Upper South St. Entrance
- Shapiro Campus Center side entrance
- Near Peace Garden by Usdan
- Between Gryzmish and Science Center
- Under trees between Gryzmish and Shapiro Campus Center
- Behind benches in front of Usdan
- Entrance to International Business School
- North quad near trash barrels

Spring annuals will also be planted in containers at the following locations

- Usdan Student Center
- Faculty Club
- Lemberg Academic
- International Business School
- Spingold theater

### *Timing*

April 1-May 15

### *Procedure*

- After garden bed clean up and preparation, and after the risk of frost, the grounds team will begin installing spring annuals, typically pansies, that have been selected by the Grounds Manager & Horticulturalist into the above garden beds and planters.
- Annuals are stored by the Facilities garage and kept watered by the grounds staff until planting.
- Mulch in annual planting areas will be scraped back, a small hole will be dug in which the annual will be placed and soil packed around the annual.
- After the annual has been planted mulch will be spread back around the annual.
- Annuals will be watered as needed by either hose and nozzle or irrigation system.
- Annuals are planted in the above areas, consisting of locations in Improved and Semi-Improved A areas.

### *Selection and Placement*

Selection of annuals will be determined by the Grounds Manager and Horticulture specialist based on availability of plant material, color selection and planting site consideration (sun or shade). Pansies are the typical spring annual selected. Spring annuals will be purchased through Wagon Wheel Nurseries or Cavicchio Nurseries.

# Irrigation

Irrigation is important to Brandeis because it promotes a healthy and dense turf stand. Benefits of a healthy dense turf stand are:

- Reduce runoff and erosion and promote water filtration
- Improves are quality by removing CO2 and providing oxygen
- Regulates temperatures on surfaces
- Provides safety from falls providing a cushion over bare ground
- Deters insects and other pests

Brandeis irrigates areas that are highly visual and are regularly utilized and programmed for activities. Irrigation can be found in both the Improved and Semi-Improved A areas.

**Appendix III** is a map showing the areas on campus which are currently irrigated.

## Irrigation start up

### *Objective and Reasoning*

- Purge air out of the irrigation system prior to regular use.
- Test sprinkler heads and irrigation for proper operation prior to regular use.

In order to preserve the irrigation system from freezing, compressed air is forced through the irrigation system late every fall. In addition, the irrigation clocks are turned off and valves are closed. In the spring these irrigation systems need to be reverted back to their normal operational state, which includes turning clocks on, reopening valves and purging the system of air. During this time the sprinkler system is also checked for leaks and any other repairs deemed necessary.
Locations of the irrigation system lines can be found on the Irrigation map in the Appendix.

### *Time Frame*

March 20-April 15

### *Procedure*

- After the threat of temperatures falling below 32 degrees F for a prolonged time the process will begin to turn on the irrigation systems on campus.
- Currently this process is done by an outside contractor, Corbett Inc.
- The valves to the irrigation systems will be slowly turned on until pressurized.
- Irrigation clocks will be turned on and irrigation zones will be activated one by one until the air is purged and sprinklers have been checked for proper operation.
- Faulty sprinklers will be flagged and labeled with repair needed.
- Irrigation repairs will occur as soon as possible based upon scale of repair, location of repair and parts needed for repair.
- Monitoring of the irrigation system will occur monthly throughout the irrigating season by the grounds staff with needed repairs being reported to the Grounds Manager.

## In-season Irrigation

### *Objective and Reasoning*

During the growing season, campus lawns as well as garden beds will need to be irrigated depending on weather and growing conditions to keep a healthy campus landscape.

### *Time Frame*

April 30-October 30

### *Procedure*

- There are 26 irrigation clocks on the campus which all need to be scheduled independently at the clock location. Irrigation clocks are located at the following locations
    - Abraham Shapiro Academic Complex
    - Baseball Field
    - Bernstein-Marcus Administration #1 and #2
    - Browns Social Science Center
    - Cable Hall
    - Chapel Field
    - Crown Center
    - Edison Lecks
    - Faculty Club
    - Feldberg Communication #1 and #2
    - Mandel Center for Humanities
    - Practice Field
    - Ridgewood A (Admissions)
    - Rose Art Museum
    - Rosenthal North
    - Rosenthal South
    - Shapiro Campus Center
    - Shapiro Residence Hall
    - Skyline
    - Slosberg Music Center
    - Softball Field
    - Spingold Theater
    - Usdan Student Center #1 and #2
- Irrigation amounts will be determined based on the type of plant and its needs. Deep and infrequent watering is the preferred method to encourage deep and healthy roots.
- Irrigation clocks will be schedule to run the predetermined amount based on the above step. Irrigation will primarily run between the hours of 10pm and 6am when the plants are already wet due to dew, to discourage disease. Also in the overnight hours there is less outdoor activities.
- At times irrigation will be run during the day in certain situations. Some of these situations are; watering sod or seed, watering in fertilizer or pesticide and marking sprinkler heads to prevent damage.

**Irrigation shutdown**

*Objective and Reasoning*

- To protect the irrigation systems pipes, valves and sprinkler heads by replacing water, which could freeze overwinter, with compressed air.

*Time Frame*

November 1 to November 30

*Procedure*

- In late fall (November) dependent on weather conditions and irrigation need, irrigation systems throughout the campus will be turned off.
- After systems have been turned off, valves will be closed and the process of forcing compressed air through the irrigation systems will begin.
- Irrigation systems will be operated for a brief period of time in order to force air through the irrigation systems all the way to the sprinkler heads.
- Currently this is done by an outside contractor (Corbett Inc.), due to the number of systems throughout campus and the need for an air compressor.

# Mowing

*Objective and Reasoning*

Keeping the turf on campus cut at a manageable height will provide healthy and dense turf which in turn can result in less irrigation use, less pesticide uses and less instances of disease and insect damage.

*Time Frame*

April 1-November 30

*Procedures*

- Campus lawns will be maintained between 3” and 6” of height depending on priority area. Grass height in each select priority can be found in the Grounds Standards on pg. 8. During the summer months campus lawns will be mowed higher to reduce stress on the grass plants.
- Lawns will be mowed in different angles when possible to avoid wear damage from mower tires.
- During mowing, no more than 1/3 of the leaf blade will be removed to ensure healthy turf.
- Lawns will be mowed utilizing a variety equipment including riding mowers, stand-on mowers and push mowers. The machine used for each lawn will vary depending on size of lawn, weather conditions and height of grass among other variables.
- On the same day as mowing, line trimming and any blowing will occur to leave a clean lawn and landscape.
- Numerous variables factor into the frequency of mowing campus lawns, including type of grasses, priority area and weather/growth conditions.
- Lawns in the naturalized priority area will be mowed 0-1 times per year to promote pollinators.

# Aeration/Seeding

### *Objective and Reasoning*

Campus lawns in improved and semi-improved areas will be aerated at least once every year. In Semi-Improved B areas, it will be done at least once every other year. Aeration relieves compaction on turf, removes thatch (a buildup of organic matter) from the lawn, and allows gas exchange with the soil. Aeration is a process in which you perforate the soil with small holes, either removing the plug (core aeration) or piercing the soil (solid tine aeration). Due to creating holes, aeration is a great time to also incorporate seed into campus lawns.

Another option to incorporate desirable seed into campus lawns is slice-seeding. Slice-seeding is a process in which a small channel is sliced into the turf in which seed is dropped. When the seed is dropped directly into the soil, it has a much higher chance of growing.

Incorporating new seed into campus lawns is important to fill in bare spots to out compete weed growth as well as incorporating desirable plant material which is more resistant to disease, insect and drought stress.

### *Time Frame*

April 15-June 15 and/or September 1-October 31

### *Procedures*

- Campus lawns will be marked for existing sprinkler heads so they don't get damaged during aeration.
- Lawns will be aerated depending on location, turf conditions and events in the area.
- Following core aeration, left over plugs will be removed by blowers, rakes and mowers.
- Grass seed will be determined by location, turf conditions and availability and applied to aerated areas.
- Not all campus lawns will be aerated. Some considerations for not aerating will be location, irrigation depth, maintenance level and topography of location.
- Only current aerator on campus is a large tractor mounted aerator for large areas.
- An aerator will be explored for purchased for Ventrac machine to be able to aerate smaller areas or a stand-on aerator
- A smaller stand-on aerator, with seeder, is currently rented for one week from Richey & Clapper in September or October.

### *Seed Selection*

Grass seed used on campus will vary depending on site location. Grass seed will be selected by the Grounds Manager. A-List or TWCA certified grass seed will be chosen which has high drought tolerance and high levels of disease and insect resistance. These choices will aid in the reduction of pesticides and irrigation. Grass seed will be purchased from a variety of vendors including Tom Irwin Inc., Atlantic Golf & Turf, and SiteOne Landscape Supplies.

# Fertilization

### *Objective and Reasoning*

Campus lawns are fertilized throughout the growing season. A lawn that is fertilized will provide a denser, safer area for the end user. When a lawn is fertilized, the grass plant will be stronger to withstand the pressure from drought, insects, disease and traffic.
At times campus trees, shrubs and perennials will need to be fertilized as well in order for the plants to survive environmental stresses.

### *Time Frame*

April 1-December 1

### *Procedures*

- Campus lawns will be fertilized 0-4 times per year. Improved areas will be fertilized at least 3 times. Semi-Improved A areas will be fertilized at least 3 times. Semi-Improved B areas will be fertilized 0 to 1 time a year. Naturalized areas will not be fertilized.
- In April/May improved and semi-improved areas will be fertilized with a combination product which will also contain a pre-emergent herbicide for crabgrass and a post-emergent herbicide for broad leaf weeds.
- Fertilizer will be applied again in June, August and October in improved and semi-improved A areas as needed.
- Fertilizer selection will be based on season, turf conditions, weather conditions and availability.
- Fertilizer will be applied by properly calibrated walk behind spreader, ride on/tractor mounted spreader or contracted out.
- Any pesticide/herbicide, even when combined with a fertilizer, will be applied by a license pesticide applicator according to the label.

Campus trees, shrubs and perennials will be fertilized on an as needed basis. The type of fertilizer used will vary depending on the plant, soil condition and fertility needed. Fertilizer applications on landscape plants can vary from fertilizer spikes driven into the ground to granular products applied via small holes dug into the ground beside the plants to liquid drenches of the root system. Tree fertilization will be contracted out, currently Tree Tech Inc.

### *Fertilizer Selection*

Fertilizer used on campus will vary between applications. The time of year will dictate the fertilizer selected and if there will be a pesticide applied in conjunction. Fertilizer will be selected by the Grounds Manager. Fertilizer will be purchased from a variety of vendors including Tom Irwin Inc., Atlantic Golf & Turf, and SiteOne Landscape Supplies.

# Pesticides

### *Objective and Reasoning*

On occasion, when mechanical and cultural practices cannot prevent disease, insect or weed occurrences, pesticides may need to be used to continue to provide an acceptable landscape. The IPM plan details procedure and protocols for the utilization of pesticides as needed.

### *Time Frame*

March 1-December 15

### *Procedures*

- When a situation arises, which requires the use of a pesticide, the pesticide will be applied according to the label by a licensed pesticide applicator.
- The decision on the pesticide to use on lawns and landscape will be made by the Grounds Manager, following the IPM plan and depending on the pest needed to be treated; for example, disease, insect or weed.
- The decision on the pesticide to use for indoor pests and outdoor nuisance pests (mice, rats) will be made by the Pest Control Contractor, currently UltraFast Pest Control, following the IPM plan and depending on the pest needed to be controlled.
- Efforts will be made to use the least hazardous chemical to control the disease, insect or weed.

This table shows where pesticides are currently applied based upon priority areas. It also a summary of ways to evaluate reducing pesticide use in different priority areas of campus.

| | **Improved** | **Semi-Improved A** | **Semi-Improved B** | **Naturalized** |
|---|---|---|---|---|
| **Summary** | Maintained to Brandeis University's highest standards. Most prominent areas and requires the most inputs. | Second level of Brandeis University's standards. Less curative pesticide use, due to higher thresholds. | Third level of Brandeis University's standards. Only preventive use of herbicides and curative use of organic insecticide. | Area at Brandeis University which has been planted or developed to be a minimal to no input area. |
| **Herbicide use** | Used preventatively for crabgrass. Used curatively if weed presence is greater than 5%. Used preventatively in garden beds. | Used preventatively for crabgrass. Used curatively if weed presence is greater than 15%. Used preventatively in garden beds. | Used preventatively for crabgrass. | None used |
| **Insecticide use** | Used preventatively for grubs. Used curatively if insect is at risk to kill at least 15% of grass or plant | Only used curatively if insect is at risk to kill at least 20% of grass or plant | Only used curatively with organic insecticide if insect is at risk to kill at least 25% of grass or plant | Only used for safety (bee/wasp/hornet nest near walkway or access point) |
| **Fungicide use** | Only used if disease is a risk to kill at least 15% of grass or plant. | None used | None used | None used |
| **Areas to reduce use** | Evaluate raising threshold before using curative pesticide. Utilizing organic insect control. | Evaluate raising threshold before using curative pesticide. Use organic insect control. | Evaluate the need for preventative crabgrass control | None |

# Fall Plantings

### *Objective and Reasoning*

In early fall, annuals are planted at various places on campus after removal of spring & summer annuals. Spring & summer annuals cannot handle the colder temperatures. In the late fall, bulbs will be planted in annual planting locations to ensure consistent blooming.

- Brandeis sign
- Lower South St. Entrance
- Upper South St. Entrance
- Shapiro Campus Center side entrance
- Near Peace Garden by Usdan
- Between Gryzmish and Science Center
- Under trees between Gryzmish and Shapiro Campus Center
- Behind benches in front of Usdan
- Entrance to International Business School
- North quad near trash barrels

Spring annuals will also be planted in containers at the following locations

- Usdan Student Center
- Faculty Club
- Lemberg Academic
- International Business School
- Spingold Theater

### *Time Frame*

*Fall Annuals* August 15-September 15 *Bulbs* November 15-December 15

### *Procedure*

- In the early fall, the grounds team will plant fall annuals, typically *sp.* Chrysanthemums (mums).
- In these areas the mulch will be scraped back, the fall annual planted. Soil will be packed around the fall annual and any mulch will be spread back around the annual or replaced/added.
- Fall annuals will then be watered as needed by either hose and nozzle or irrigation system.
- In the mid to late fall (November/December), the grounds team will begin removing the fall annuals and replacing them with spring bulbs in the same spot.
- In these areas the mulch will be scraped back, the fall annual dug up and removed and the bulb placed in the same spot.
- Soil will be placed back over the bulbs and mulch will be spread back over the bulbs.
- Spring bulbs will be planted in the fall but will not grow and bloom until the spring.
- Annuals are planted in the above areas (Improved and Semi-Improved A).

### *Selection and Placement*

Selection of annuals and bulbs will be determined by the Grounds Manager and Horticulture specialist based on availability of plant material, color selection and planting site consideration (sun or shade). Typical fall annuals planted are Chrysanthemums (mums) in various colors, purchased from Wagon wheel Nurseries or Cavicchio Greenhouses. Typical bulbs purchased are tulips and daffodils in varying colors. Bulbs are purchased through an online wholesaler Colorblends.com.

# Fall Debris Cleanup

### *Objective*

- To remove leaves, needles and other debris to create a safe and healthy landscape.

The removal of leaves, needles and other debris to create easier winter snow management as well as keeping storm drains and surface drains clear for storms as well as snow melt.

### *Time Frame*

September 1-December 31

### *Reasoning*

Insects and fungal spores can overwinter in leaf and pine litter potentially causing an increase in insect and disease occurrences in lawn areas, trees and shrubbery. Cleaning fall debris will result in a reduction of disease and insect damage, in turn creating healthier turf, shrubs and woody plant material.

### *Procedure*

- In the month of September, as minimal leaves fall onto the campus turf, the leaves will be mulched into the turf during normal mowing practices.
- Once leaves accumulate to a point in which areas are greater than 50 percent covered, generally in October, the grounds team will begin the process of cleaning leaf, needle and other debris around campus.
- Focus will vary depending of the accumulation of fall debris with the main focus being on interior areas of campus.
- Fall debris will be moved using leaf rakes, back pack blowers and cart mounted blowers depending on the location.
- Fall debris will be collected utilizing a variety of techniques including but not limited to, golf carts, trucks with leaf/debris vacuums and front-end loaders.
- Most substantial leaf cleanup will be completed prior to Thanksgiving break; however lingering leaf cleanup will continue after this point dependent on weather.

### *Removal*

Fall debris will be disposed of in a couple locations. One of which is located off Old South St., the other located behind The International School of Business. These sites will be monitored for needs of material removal or material composting.

# Pothole Repair

### *Objective and Reasoning*

- To repair potholes in asphalt surfaces to prevent damage to vehicles, reduce trip hazards and prevent further damage to asphalt surfaces.

### *Time Frame*

January 1-December 31

### *Procedures*

- When potholes in asphalt surfaces are deemed necessary to repair, the grounds team is dispatched to repair these holes.
- Potholes are cleaned out to remove all loose material.
- The holes will then be filled with at least 1" of cold patch.
- If more than 1" of cold patch is needed, the cold patch will be tamped every inch until at most 3-4" of cold patch is used.
- Every effort will be made to repair potholes in-house, however some potholes and asphalt damage may be deemed too large, deep or damaged for in-house repair.
- If a pothole cannot be repaired in house and it's deemed dangerous to people or vehicles, signage and cones will be used to deter traffic until it can be fixed appropriately.

### *Selection*

Current selection of patching material is Perma-Patch bags. Bags are purchased through Grainger or Pro Tool Supply.

# Tree Pruning

### *Objective and Reasoning*

Trees should be pruned for a variety of reasons. Trees can be pruned for safety, aesthetics, plant health, plant structure and clearance from obstacles.

### *Time Frame*

January 1-December 31 for safety and clearance, Oct 15-March 15 for regular maintenance

### *Procedure*

- The late fall, winter and early spring are the best times to prune trees.
- Trees will be pruned for the reasons stated above.
- In special circumstances such as safety or storm damage, trees will be pruned as needed throughout the season.
- As much as possible trees will be pruned in house using chainsaws and pole saws, however if needed an outside company will be utilized when the need of a bucket truck or tree climbers are required.
- Trees in Improved areas will be pruned for safety, clearance and tree health. Trees in all other areas are pruned for clearance and safety.

# Perennial and Shrub Maintenance and Pruning

*Objective and Reasoning*

- To cut perennials down at appropriate times to discourage disease and insects and encourage healthy new blooms yearly.
- To prune shrubs at appropriate times to remove damaged, diseased or dead wood. Allowing for air and sunlight to reach the middle of the shrub.
- **Appendix IV** has a listing of all shrubs and perennials on campus and appropriate times to prune.

Perennials to cut down in the fall

- Bearded Iris
- Bee Balm (Monarda)
- Phlox
- Lilies
- Gaillardia (Blanket Flower)
- Catmint (Nepeta)
- Columbine (Aquilegia)
- Daylily (Hemerocallis)
- Peony (Paeonia)
- Salvia
- Anemone
- Solomon's Seal (Polygonatum odoratum)
- Veronica
- Yarrow (Achillea)
- Hostas
- Astilbe

Perennials to cut down in the spring

- Coneflower
- Daisy
- Dianthus
- Coreopsis
- Black eyed Susan
- Sedum
- Butterfly Bush
- Ornamental Grasses
- Butterfly Weed
- Ferns
- Coral Bells
- Hydrangea (Annabelle, Limelight Varieties)

# Wetland Management

Brandeis University has seven (7) wetlands which are on or have buffer zones on campus, **Appendix V**. A buffer zone is the area of land within 100 feet of coastal banks, inland banks, freshwater wetlands, coastal wetlands, tidal flats, beaches, dunes, marshes, and swamps. Work in a wetland or its buffer zone is regulated by the Wetlands Protection Act. The highlights of this act are listed below:

### *Restricted activities*

- Any activity proposed within 100 feet of wetland resource areas (wetlands, ponds, or intermittent streams) or 200 feet from rivers and year-round streams must be reviewed by the Waltham Conservation Commission.
- For more information on wetlands, or on permit requirements, visit the Conservation Commission's website; Waltham Conservation Commission or call the Waltham Conservation Commission Office at (781) 314-3846.

### *Tree/branch removal*

- Trees within a wetland or buffer zone can only be removed by obtaining a permit through the Waltham Conservation Commission.
- Branches under 4" in diameter may be removed from the wetland. Any branch or limb larger than 4" needs approval by the Waltham Conservation Commission before removal.

### *Snow Management*

- All snow which is plowed will be stored as far away from a wetland as possible in each location. Snow will be moved to these locations during or immediately following a snow event.
- **Appendix VI** shows a wetland map of the Hassenfeld parking lot and a red box showing the location of snow storage.

### *Tree Planting*

- Native tree species must be used when planting within a wetland or buffer zone. A resource area planting list is included in **Appendix VII**.
- When planting along a river bank, there should be no digging of soil. Holes for trees and plants should be created using a pry bar so as to cause minimal disruption to the existing soil structure and ecosystem.

### *Invasive Species Management*

- Wetland resource areas, as well as all areas on campus, will be monitored routinely for invasive species. A list of invasive species found in Massachusetts can be found in **Appendix VIII**.
- Invasive species will be controlled by pulling by hand when at all possible. If an invasive species is unable to be controlled by that method in a wetland resource area, the Waltham Conservation Commission will be contacted.

# Athletic Field Maintenance

The athletic fields on the campus are maintained to a different standard then the rest of the campus. The athletic fields are classified as Improved areas, but have lower turf maintenance heights. For the purposes of aesthetics, playability and most importantly player safety, the athletic fields receive more inputs (fertilizers, seed, water, pesticides, labor) in order to keep them maintained appropriately.

## *Mowing*

The athletic fields are mowed with a reel mower vs. a rotary mower. A reel mower allows for lower cutting heights as well as resulting in a cleaner cut. The athletic fields are cut to a height of 1.5". Athletic fields are cut at least 2x per week in alternating directions to discourage mower wear and encourage upright turf growth.

***Time Frame*** **-** April 1-November 30, at least 2x per week

## *Irrigation*

The athletic field irrigation systems are started and shut down for the season similar to the rest of campus. The athletic fields will be irrigated deeply and infrequently to promote deep root growth.

***Time Frame*** **-** April 1-November 30

## *Cultural Practices*

- *Verticutting*

  Thatch management is important on the athletic fields. A process known as verti-cutting will occur throughout the growing season to remove excess thatch. Units will be put on our mower to vertically cut into the turf to remove excess thatch. The thatch will then be collected and disposed of. Verticutting will not occur in months of severe heat (July, August)

  ***Time Frame*** **-** First week of April, May, June, September and October

- *Aeration & Seeding*

  Core aeration will occur at least once a year on the athletic fields to also aid in thatch management as well as encouraging the exchange of gases to the root zone. In the process or right after aeration the athletic fields will be seeded. Seed used will be comprised of at least 80% Kentucky Blue Grass with no more than 20% Perennial Rye Grass. Seed will be purchased from Atlantic Golf & Turf or Tom Irwin.

  ***Time Frame*** **-** June, August, October

## *Fertilization*

The athletic fields will be fertilized using a granular fertilizer at least 4 times per year. The fields will also be supplemented with liquid foliar fertilizer applied via boom sprayer. All fertilizers for the athletic fields will be purchased from Atlantic Golf & Turf or Tom Irwin.

## *Pesticides*

The athletic fields will be treated for disease, insect and weed problems preventatively. Preventative applications are needed for player safety as any weak or thin areas could result in player injury. Any pesticide applied will follow the IPM plan located on Brandeis Facilities website. At times, an outside contractor, Green Haven Turf Care, will be utilized for athletic field applications. Pesticides will be purchased from Atlantic Golf & Turf or Tom Irwin.

# Grounds Maintenance Schedule

Below is an overall view of when the grounds team does certain tasks. These time frames are subject to change depending on factors such as weather, events and manpower.

## Brandeis University

### Grounds Maintenance Calendar

| Activity | Jan | | | | Feb | | | | Mar | | | | Apr | | | | May | | | | June | | | | July | | | | Aug | | | | Sep | | | | Oct | | | | Nov | | | | Dec | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mowing | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| Line Trimming | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| Fertilizer | | | | | | | | | | | | | | | | X | X | | | | X | X | | | | | | | X | | | | | | | X | | | | | | | | | | | | |
| Aerating | | | | | | | | | | | | | | | | | | | | X | X | X | | | | | | | | | X | X | X | X | X | X | X | | | | | | | | | | |
| Irrigation Start up | | | | | | | | | | | X | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Irrigation | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | |
| Irrigation Shut Down | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X | X | X | | | | |
| Over seeding | | | | | | | | | | | | | | | | | | | | X | X | X | X | | | | | | | | | X | X | X | X | X | X | X | X | | | | | | | | |
| Spring Clean up | | | | | | | | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mulching | | | | | | | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | X | X | | | | | | | | | | | | | | | | | | | |
| Fall Leaf cleanup | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Tree Pruning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Perennial Maintence | | | | | | | X | X | X | X | X | | | | | | | | | X | X | X | X | X | X | X | | | | | X | X | X | X | | | | | | | | | | | | |
| Shrub pruning | | | | | | | X | X | X | X | X | | | | | | | | | X | X | X | X | X | X | X | | | | | X | X | X | X | | | | | | | | | | | | |
| Spring Annuals | | | | | | | | | | | | | X | X | X | X | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fall Annuals | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X | X | | | | | | | | | | |
| Bulbs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X | X | | | | | |
| Potholes | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Snow & Ice Removal | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X |

## Inspections

All areas on campus are inspected regularly. At least monthly, the Manager, Grounds & Fleet and/or the Quality Assurance Lead will formally and randomly select areas on campus to inspect. Inspections are done to insure consistency across campus, to ensure that the campus is being maintained to our required grounds standards, and to make any corrections.

Inspections are done on standardized forms using standardize metrics. These forms are found in the **Appendix I**. For more details, see the Facilities Quality Assurance Plan

## Contacts

For further information, please call the Manager of Grounds and Fleet at the Facilities Administration Main line, 781-736-8500 between 7a.m. and 3:30. You can also visit the Facilities website Facilities Administration Website

# Appendix I-Inspection Forms

*Improved Inspection Form*

BRANDEIS UNIVERSITY GROUNDS
**IMPROVED**
INSPECTION SHEET

| | | | | | |
|---|---|---|---|---|---|
| Inspected by: | | | | | |
| Inspection Date: | | | | | |
| Zone: | | | | | |
| Area: | | | | | |
| Additional Area Description: | | | SCORE: | | 0 |

| Locations | Description | Pass | Fail | N/A | Comments |
|---|---|---|---|---|---|
| Turf Care (mowing practices) | 3-4.5". Visually Straight lines, no grass clumping <5sq. Ft. weeds/100 sq. ft. (5%) in lawn. Grass discharged away from garden beds, signs and air intakes. | | | | |
| String Trim/ Weed Whack | Completed same day as mowing arounds trees, buildings, signs, walkways to leave grass the same height as machine mowed grass. Garden beds line trimmed with clean edge | | | | |
| Hardscapes: (walkways, sidewalks & stone walls) | Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Any sidewalk cracks larger than 1/4" filled | | | | |
| Garden Beds | Mulched yearly with >2" of mulch. <5sq. Ft. weeds/100 sq. ft. (5%) throughout garden bed. No weeds taller than 3" No Tree limbs in beds. | | | | |
| Trash | Trash barrels picked up M-F during school year. 3x per week during summer. No trash on ground around barrels. Less than 10 bees around trash barrels | | | | |
| Loose Trash | No trash that has been mowed over. No trash on ground longer than 24 hours | | | | |
| Shrubs | Trimmed once per year and for clearance as needed. Dead branches removed | | | | |
| Trees | Trimmed for clearance and health. Alive branches only removed for clearance or shape. Dead branches within 15' of the ground removed. Dead trees reported to grounds manager to schedule for removal. | | | | |
| Signs/Posts/Fence/ Barricades | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. | | | | |
| Irrigation | Operating uniformly & No broken heads | | | | |
| Movable Objects: (Furniture, cig. Towers, etc) | All moveable objects will be placed in useable locations (not in mulch or on pavement for seating) after an area has been mowed. Unsafe furniture blocked off or removed and a work order placed. | | | | |
| Vandalism | Vanalism reported and removed within 48 hours | | | | |
| Pest | Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass) and monitor for worsening damage. | | | | |

| Work Orders: | | Notes: | | | |
|---|---|---|---|---|---|

Refer to the Grounds Management Plan for Detailed Descriptions and Additional Information

*Semi-Improved A Inspection Form*

BRANDEIS UNIVERSITY GROUNDS
**A SEMI-IMPROVED**
INSPECTION SHEET

| | | | | | |
|---|---|---|---|---|---|
| Inspected by: | | | | | |
| Inspection Date: | | | | | |
| Zone: | | | | | |
| Area: | | | | | |
| Additional Area Description: | | | SCORE: | | 0 |

| Locations | Description | Pass | Fail | N/A | Comments |
|---|---|---|---|---|---|
| Turf Care (mowing practices) | 3.5-5".No grass clumping <15 sq. ft. weeds/100 sq. ft. (15%) in lawn. Grass discharged away from garden beds, signs and air intakes | | | | |
| String Trim/ Weed Whack | Completed same day as mowing around trees, building, signs, walkways to leave grass same height as machine mowed grass. | | | | |
| Hardscapes: (walkways, sidewalks & stone walls) | Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Any sidewalk cracks larger than 1/4" filled | | | | |
| Garden Beds | Mulched with >2" of mulch <15 sq. ft. weeds/100 sq. ft. (15%) throughout garden bed. No weeds taller than 5" No Tree limbs in bed. Grass clippings blown away from beds. | | | | |
| Trash | Trash barrels picked up M-F during school year. 3x per week during summer. No trash on ground around barrels. Less than 10 bees around trash barrels | | | | |
| Loose Trash | No trash that has been mowed over. No trash on ground longer than 24 hours | | | | |
| Shrubs | Trimmed for clearance as needed. Dead branches removed. | | | | |
| Trees | Trimmed for clearance. Alive branches only removed for clearance. Dead branches and trees reported to Grounds Manager | | | | |
| Signs/Posts/Fence/ Barricades | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. | | | | |
| Irrigation | Operating uniformly. No broken heads. | | | | |
| Movable Objects: (Furniture, cig. Towers, etc) | All moveable objects will be placed in useable locations (not in mulch or on pavement for seating) after an area has been mowed. Unsafe furniture blocked off or removed and a work order placed. | | | | |
| Vandalism | Vanalism reported and removed within 96 hours | | | | |
| Pest | Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass) and monitor for worsening damage. | | | | |

| Work Orders: | | Notes: | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Refer to the Grounds Management Plan for Detailed Descriptions and Additional Information

*Semi-Improved B Inspection Form*

BRANDEIS UNIVERSITY GROUNDS
B SEMI-IMPROVED
INSPECTION SHEET

| | | | | | |
|---|---|---|---|---|---|
| Inspected by: | | | | | |
| Inspection Date: | | | | | |
| Zone: | | | | | |
| Area: | | | | | |
| Additional Area Description: | | | SCORE: | | 0 |

| Locations | Description | Pass | Fail | N/A | Comments |
|---|---|---|---|---|---|
| Turf Care (mowing practices) | 4-6" height. No grass clumping. Grass discharged away from garden beds, signs and air intakes. | | | | |
| String Trim/ Weed Whack | Completed same day as mowing around trees, building, signs, walkways to leave grass same height as machine mowed grass. | | | | |
| Hardscapes: (walkways, sidewalks & stone walls) | Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Any sidewalk cracks larger than 1/4" filled | | | | |
| Garden Beds | Mulched every other year. <30 sq ft. weeds/100sq ft. (30%) throughout garden bed. No weeds taller than 8". Grass clippings blown away from beds | | | | |
| Trash | Trash barrels picked up M-F during school year. 3x per week during summer. No trash on ground around barrels. Less than 10 bees around trash barrels | | | | |
| Loose Trash | No trash that has been mowed over. No trash on ground longer than 24 hours | | | | |
| Shrubs | Trimmed for clearance as needed. Dead branches removed. | | | | |
| Trees | Trimmed for clearance. Alive branches only removed for clearance. Dead branches removed which can be safely | | | | |
| Signs/Posts/Fence/ Barricades | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. | | | | |
| Movable Objects: (Furniture, cig. Towers, etc) | All moveable objects will be placed in useable locations (not in mulch or on pavement for seating) after an area has been mowed. Unsafe furniture blocked off or removed and a work order placed. | | | | |
| Vandalism | Vanalism reported and removed within 96 hours | | | | |
| Pest | Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass) and monitor for worsening damage. | | | | |

| Work Orders: | | Notes: | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Refer to the Grounds Management Plan for Detailed Descriptions and Additional Information

*Non-Growing Season Inspection Form*

**BRANDEIS UNIVERSITY GROUNDS**
**Non - Growing Season Months**
**INSPECTION SHEET**

| | | | | | |
|---|---|---|---|---|---|
| Inspected by: | | | | | |
| Inspection Date: | | | | | |
| Zone: | | | | | |
| Area: | | | | | |
| Additional Area Description: | | | SCORE: | | 0 |
| | **Description** | **Pass** | **Fail** | **N/A** | **Comments** |
| Safety Concerns | Slippery Surfaces, Ice/snow falling hazards (Icicles) etc. | | | | |
| Fire Hydrants | Clear & accessible. No snow 3 feet around hydrant. | | | | |
| Turf | Ruts created by snow removal, & Irrigation damage | | | | |
| Garden Beds | No weeds taller than 5" No Tree limbs in bed. | | | | |
| Trash | Trash barrels picked up M-F during school year. 3x per week during summer. No trash on ground around barrels. Less than 10 bees around trash barrels | | | | |
| Loose Trash | No trash on ground longer than 24 hours | | | | |
| Shrubs | Trimmed for clearance as needed. Dead branches removed. | | | | |
| Trees | Trimmed for clearance. Alive branches only removed for clearance. Dead branches and trees reported to Grounds Manager | | | | |
| Signs/Posts/Fence/ Rockwalls/Barricades | Broken signs, posts, fences and barricades removed, repaired or replaced within 30 days. Signs readable 10' away for every 1" of text height. Sign posts without signs removed or sign placed within 30 days. Damage reported to Grounds manager | | | | |
| Roads, Sidewalks & Parking Spots | Fully clear of snow with no excess salt piles (>36 sq. inches). Storm drains cleared of debris, snow & ice. | | | | |
| Movable Objects: (Furniture, cig. Towers, etc) | All moveable objects will be placed in useable locations (not in mulch or on pavement for seating). Unsafe furniture blocked off or removed and a work order placed. | | | | |
| Vandalism | Vanalism reported and removed within 96 hours | | | | |
| Pest | Rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass) and monitor for worsening damage. | | | | |
| Work Orders: | | Notes: | | | |

Refer to the Grounds Management Plan for Detailed Descriptions and Additional Information

# Appendix II-Garden Beds

| Garden Bed Information | | | | | | |
|---|---|---|---|---|---|---|
| Square Footage, Mulch amount, Annuals area, Plant Material | | | | | | |
| | Annual Area (in sq. ft.) | Bed Size (in sq. ft.) | 2" of Mulch amount (in yards) | Woody Shrub Location | Perennial Location | Plant Types |
| Units of Measure | 1 | | 1 | | | |
| **Areas** | | | | | | |
| 567 South St. | | 984 | 6 | x | | 80,42 |
| 60 Turner | | 569 | 4 | x | | 80,57 |
| Admissions | | 1972 | 12 | x | | 39,28,44,20 |
| Athletics | | 3425 | 21 | x | x | 8,58,42 |
| Bernstein-Marcus | | 6034 | 37 | x | x | 35,16,17,64,36,72,50,16,12,21,61, 24,71,26 |
| Brown/Schwarz | | 1040 | 6 | x | x | 73,59,33,64,13,16,49,21,42,1 |
| Chapels | | 7338 | 45 | x | x | 24,71,80,3,32,37,42,7,58,18 |
| East Quad | | 5574 | 34 | x | x | 26 |
| Epstein | | 2399 | 15 | | x | 35,17,36,39 |
| Faculty Club | 40 | 4707 | 29 | x | x | 80,58,42,23,17,25,49,8 |
| Fellows Garden | 600 | 7329 | 45 | x | x | 62,39,65,80,61,40 |
| Fine Arts | | 504 | 3 | | x | 80,36 |
| Foster | | 2728 | 17 | x | x | 79,50,40,63,77,70,10,36,4,29,32,16,66,24,14 |
| Foster Mod | | 1972 | 12 | x | | 17 |
| Gryzmish | | 9006 | 56 | x | x | 70,35,48,42,37,30,61,46,29,36,75,24,41,2,49 |
| Hasenfeld PL | | 1250 | 8 | | x | 53,21,58 |
| Heller | | 1340 | 8 | | | 19,42,3,30,75 |
| IBS | | 1830 | 11 | x | x | 67,37,42,45,60,13,35,47,18,11,36,24,20,21,72 |
| Lemberg Hall/Crown | | 3864 | 24 | | | 37,69,2,38,17,36,61,58 |
| Mandel Quad/Raab | | 2015 | 12 | | | 70,61,42,67 |
| Massell | | 2839 | 18 | x | x | 5,36,61,54,68,51,9,2 |
| North/Kutz | 52 | 9073 | 56 | x | x | 17,54,80,39,21,58,36,64,41,63,18,24,67,75 |
| Pearlman | | 813 | 5 | | | 50,1,27,24,76,61,3,36,74 |
| Ridgewood/Village | | 8525 | 53 | x | | 67,70,22,79,20 |
| Rose | | 690 | 4 | x | | 80,50,44,56 |
| Rosenthal | 75 | 1803 | 11 | x | x | 8,80,22,62,42,54,39 |
| Science PL | | 522 | 3 | | | 34 |
| Shapiro Academic | 12 | 1127.5 | 7 | | | 15,80,60,75,32,36,61,2,50 |
| Shapiro SC | | 1989 | 12 | | | 54,29,74,62,39,64,25,48,21 |
| Shaprio CC | 245 | 5733 | 35 | x | x | 80,62,64,39,56,17 |
| Sherman | | 2942 | 18 | x | x | 58,54,70 |
| Slosberg | | 365 | 2 | x | | 17,36,44,80,61,39,38,7 |
| South St. | 1732 | 5416 | 33 | x | x | 42,58,17,29,54,49,6,55 |
| Spingold | | 2481 | 15 | x | | 80,58,31 |
| Usdan | 163.28 | 4929 | 30 | x | x | 80,21,71 |
| Volen Plaza | 75 | 3580 | 22 | x | x | 58,61 |
| Goldman Schwartz | | 469 | 3 | | | 80 |
| Stoneman | | 949 | 6 | | | 29,24,80,52,58,17,22 |
| Landsman | | 234 | 1 | | | 80,44,67,19 |
| Mailman | | | 0 | | | 42,45 |
| Library | | 4266 | 26 | | | 45,58,29,70,61,54,23,42,7,41 |
| Skyline | | 3279 | 20 | | | 71,49,39 |
| Ziv | | 1142 | 7 | x | | 80,58 |
| **Total** | **2994.28** | **129047** | **797** | | | |

| Annual Spacing | #of plants needed |
|---|---|
| 6" | 11977.12 |
| 8" | 7485.7 |
| 10" | 4491.42 |
| 12" | 2994.28 |
| 15" | 1916.3392 |
| 18" | 1317.4832 |
| 24" | 718.6272 |

# Appendix III-Irrigation Map

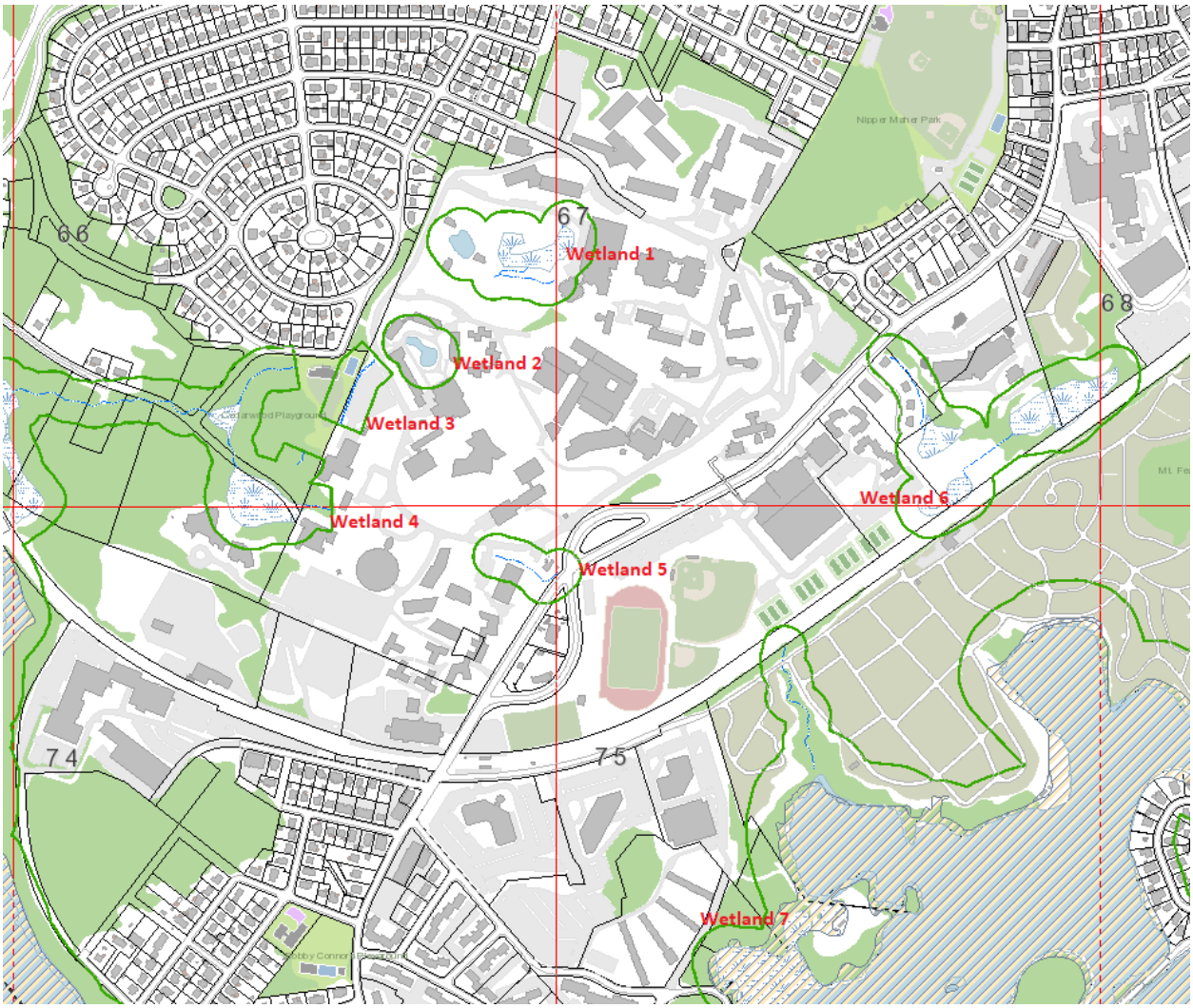
# Appendix IV – Type of Plants

| Plant # | Common Name | *Latin Name* | Pruning Notes |
|---|---|---|---|
| 1 | American Beauty Berry | *Callicarpa americana* | Later winter/early spring prune to 6" |
| 2 | Azaleas | *Rohdodendron spp.* | As needed after blooming |
| 3 | Bamboo | *Dracaena spp.* | Late summer/early fall |
| 4 | Bar Harbor Juniper | *Juniperus horizontalis 'Bar Harbor'* | Early spring if needed |
| 5 | Barberry | *Berberis thunbergii* | Prune for shape in winter or fall/trim dead wood in summer and winter if needed |
| 6 | Blue Fescue | *Festuca glauca* | Prune in spring close to ground |
| 7 | Blue Spruce | *Picea pungens* | Prune dead, diseased, broken branches in winter |
| 8 | Boxwood | *Buxus spp.* | Prune in spring or summer |
| 9 | Butterfly Bush | *Buddleja spp.* | Prune in spring as needed. Blooms on new growth |
| 10 | Catmint | *Nepeta x faasenii* | Prune in spring |
| 11 | Cinquefoil | *Potentilla spp.* | Minimal pruning needed |
| 12 | Concolor Fir | *Abies concolor* | Prune dead, diseased, broken branches in winter |
| 13 | Coneflower | *Echinacea spp.* | Prune in fall |
| 14 | coreopsis | *Coreopsis spp.* | Prune in fall |
| 15 | Cutleaf Stephanandra | *Stephanandra incisa* | Prune after flowering |
| 16 | Daisy | *Bellis perennis* | Prune in fall to 2" |
| 17 | Daylily | *Hemerocallis spp.* | Prune to ground in fall |
| 18 | Dwarf Alberta Spruce | *Picea glauca* | Pruning only as needed |
| 19 | Eastern Red Cedar | *Juniperus virginiana* | Pruning only as needed |
| 20 | Eastern Redbud | *Cercis canadensis* | Pruning only as needed |
| 21 | Emerald Arborvitae | *Thuja occidentalis* | Minimal pruning needed |
| 22 | English Ivy | *Hedera helix* | Trim along edges as often as needed |
| 23 | Euonymus | *Euonymus spp.* | Prune in early spring only if needed |
| 24 | Florida Dogwood | *Cornus florida* | Pruning only as needed |
| 25 | Forsythia | *Forsythia spp.* | Prune after flowering before mid July |
| 26 | Fortunes Spindle | *Euonymus fortunei* | Prune at the end of winter |
| 27 | fragrant sumac | *Rhus aromatica* | Prune in early spring for shape and size |
| 28 | Ginkgo tree | *Ginkgo biloba* | Prune in late fall-early spring as needed |
| 29 | Gold cypress | *Chamaecyparis spp.* | Prune only as needed |
| 30 | Gray birch | *Betula populifolia* | Prune only as needed |
| 31 | hawthorn | *Crataegus spp.* | Prune only as needed in spring |
| 32 | Hemlock | *Conium spp.* | Prune only as needed in late winter early spring |
| 33 | Hicks Yew | *Taxus x media 'Hicksii'* | Late winter |
| 34 | Honey Locust | *Gleditsia triaconthos* | Prune only as needed |
| 35 | Hosta | *Hosta spp.* | Prune in late fall to the ground |

| Plant # | Common Name | *Latin Name* | Pruning Notes |
|---|---|---|---|
| 36 | Hydrangea | *Hydrangea spp.* | Prune in early spring |
| 37 | Inkberry | *Ilex glabra* | Prune in early spring to maintain shape |
| 38 | Japanese andromeda | *Pieris japonica* | Prune after flowering |
| 39 | Japanese Holly | *Ilex crenata* | Prune in late winter or early spring |
| 40 | Japanese Iris | *Iris ensata* | Prune in fall |
| 41 | Japanese Maple | *Acer palmatum* | Prune in winter or summer as needed |
| 42 | Juniper Shrub | *Juniperus spp.* | Minimal pruning needed |
| 43 | juniper tree | *Juniperus spp.* | Minimal pruning needed |
| 44 | Kousa Dogwood | *Cornus kousa* | Prune in late fall or early winter as needed |
| 45 | kwanza cherry | *Prunus serrulata 'Kwanzan'* | Prune only diseased or dying limbs. Prune any limbs for shape after flowering |
| 46 | Larch | *Larix decidua* | Prune in winter or early spring if needed |
| 47 | Leucothe | *Leucothoe spp.* | Minimal pruning needed |
| 48 | Lilac | *Syringa vulgaris* | Prune after flowering |
| 49 | Lirope | *Liriope spp.* | Prune every couple years in fall |
| 50 | Mountain Laurel | *Kalmia latifolia* | Prune after flowering if needed |
| 51 | Mountain-ash | *Sorbus spp.* | Prune only as needed |
| 52 | Mugo Pine | *Pinus mugo* | Prune only in spring if needed |
| 53 | Norway Spruce | *Picea abies* | Prune as needed in late winter/early spring |
| 54 | Ornamental Grasses | *variety of species* | Prune to ground in late fall-early spring |
| 55 | Paperbark maple | *Acer griseum* | Prune as needed in late fall/early winter |
| 56 | Periwinkle | *Vinca minor* | Prune in early spring to 4" |
| 57 | Pin Oak | *Quercus palustris* | Prune in winter if needed |
| 58 | PJM Rhododendron | *Rhododendron x PJM* | Prune in summer after flowering |
| 59 | Plum Yew | *Cephalotaxus harringtonia* | Prune in late winter/early spring if needed |
| 60 | Red Twig Dogwood | *Cornus sericea* | Prune in fall-early spring. Prune to ground every couple years |
| 61 | Rhododendron | *Rhododendron spp* | Prune in summer after flowering |
| 62 | River Birch | *Betula nigra* | Prune in late spring, late fall and winter as needed |
| 63 | Rose of Sharon | *Hibiscus syriacus* | Prune in late fall or winter after leaf drop |
| 64 | Russian Sage | *Salvia yangii* | Prune in late winter/early spring to 6"-8" |
| 65 | Sages | *Salvia spp.* | Prune after flowering |
| 66 | Sedum | *Sedum spp.* | Prune as needed in late winter |
| 67 | Service berry | *Amerlanchier spp.* | Prune in late winter/early spring |
| 68 | Silver Birch | *Betula pendula* | needed |
| 69 | Sourwood | *Oxydendrum arboreum* | Prune in early spring |

| Plant # | Common Name | *Latin Name* | Pruning Notes |
|---|---|---|---|
| 70 | Spirea | *Spiraea spp.* | Prune in spring after flowering and fall-early spring |
| 71 | Star Magnolia | *Magnolia stellata* | Prune in late winter |
| 72 | Sweet Pepperbush | *Clethra alnifolia* | Prune in late winter-early spring |
| 73 | Tupelo Tree | *Nyssa sylvatica* | Prune in late winter/early spring as needed |
| 74 | Umbrella Pine | *Sciadopitys verticillata* | Minimal pruning needed |
| 75 | Viburnum | *Viburnum spp.* | Prune 1/3 of plant in late winter/early spring |
| 76 | Virginia Creeper | *Parthenocissus quinquefolia* | Prune as often as needed |
| 77 | Weigla | *Weigla spp.* | Prune after flowering, late spring |
| 78 | White birch | *Betula papyrifera* | Prune in late summer or early autumn as needed |
| 79 | Witchhazel | *Hamamelis spp.* | Prune after flowering, before summer |
| 80 | Yew | *Taxus baccata* | Prune in late winter/early spring if needed |

# Appendix V-Wetlands Map




Wetland 1-Chapels pond and Chapels field

Wetland 2-Massell pond

Wetland 3-Hassenfeld lot river

Wetland 4-Wetland behind Sachar and Goldman-Schwartz

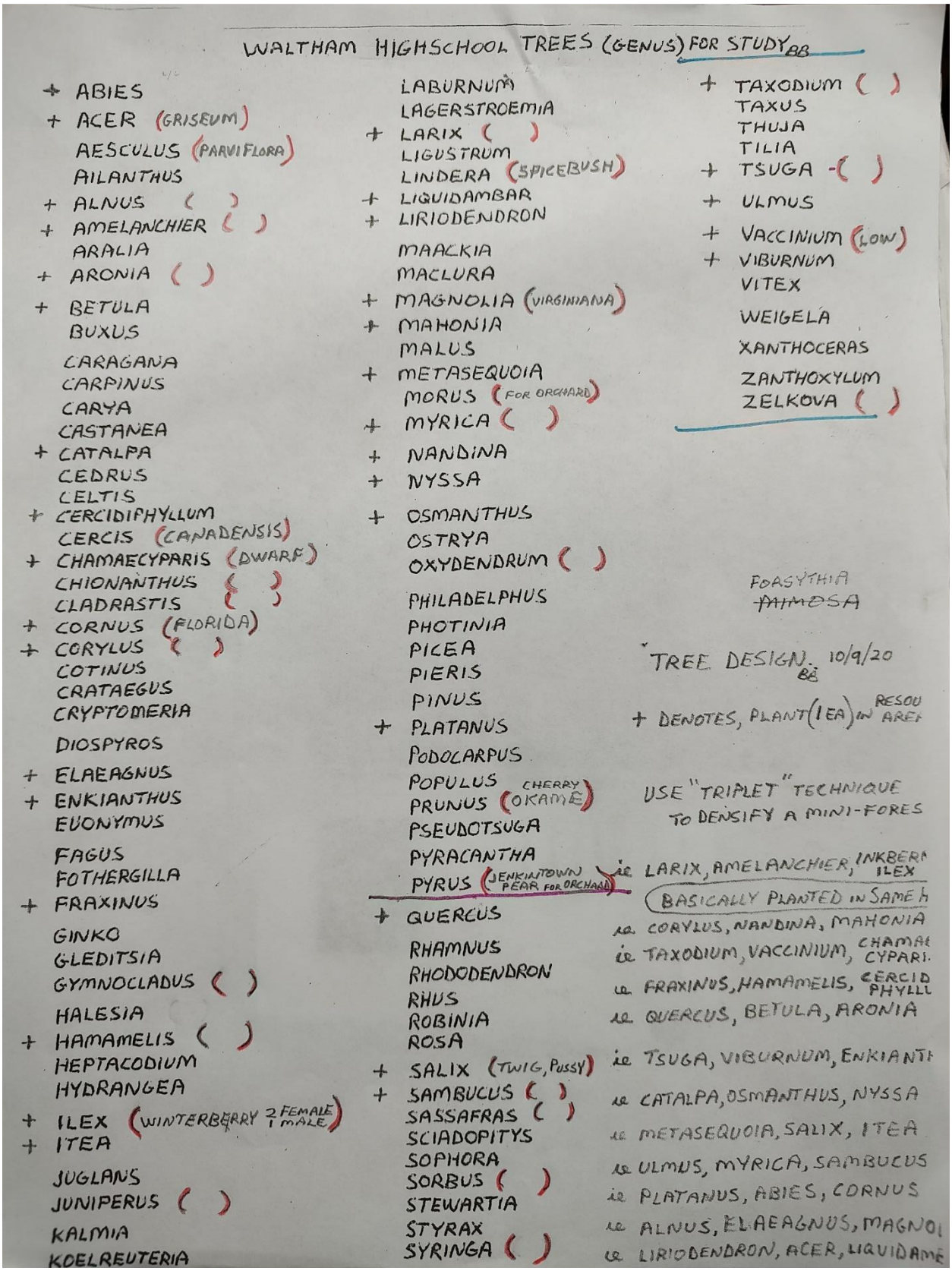
Wetland 5-Brook by Slosberg

Wetland 6-Wetlands behind Foster Mods

Wetland 7-Charles River

# Appendix VI-Hassenfeld Parking Lot Snow Storage

# Appendix VII-Resource Area Planting List



WALTHAM HIGHSCHOOL TREES (GENUS) FOR STUDY BB

+ ABIES
+ ACER (GRISEUM)
AESCULUS (PARVIFLORA)
AILANTHUS
+ ALNUS ( )
+ AMELANCHIER ( )
ARALIA
+ ARONIA ( )
+ BETULA
BUXUS
CARAGANA
CARPINUS
CARYA
CASTANEA
+ CATALPA
CEDRUS
CELTIS
+ CERCIDIPHYLLUM
CERCIS (CANADENSIS)
+ CHAMAECYPARIS (DWARF)
CHIONANTHUS ( )
CLADRASTIS ( )
+ CORNUS (FLORIDA)
+ CORYLUS ( )
COTINUS
CRATAEGUS
CRYPTOMERIA
DIOSPYROS
+ ELAEAGNUS
+ ENKIANTHUS
EVONYMUS
FAGUS
FOTHERGILLA
+ FRAXINUS
GINKO
GLEDITSIA
GYMNOCLADUS ( )
HALESIA
+ HAMAMELIS ( )
HEPTACODIUM
HYDRANGEA
+ ILEX (WINTERBERRY 2 FEMALE 1 MALE)
+ ITEA
JUGLANS
JUNIPERUS ( )
KALMIA
KOELREUTERIA
LABURNUM
LAGERSTROEMIA
+ LARIX ( )
LIGUSTRUM
LINDERA (SPICEBUSH)
+ LIQUIDAMBAR
+ LIRIODENDRON
MAACKIA
MACLURA
+ MAGNOLIA (VIRGINIANA)
+ MAHONIA
MALUS
+ METASEQUOIA
MORUS (FOR ORCHARD)
+ MYRICA ( )
+ NANDINA
+ NYSSA
+ OSMANTHUS
OSTRYA
OXYDENDRUM ( )
PHILADELPHUS
PHOTINIA
PICEA
PIERIS
PINUS
+ PLATANUS
PODOCARPUS
POPULUS
PRUNUS (CHERRY OKAME)
PSEUDOTSUGA
PYRACANTHA
PYRUS (JENKINTOWN PEAR FOR ORCHARD)
+ QUERCUS
RHAMNUS
RHODODENDRON
RHUS
ROBINIA
ROSA
+ SALIX (TWIG, PUSSY)
+ SAMBUCUS ( )
SASSAFRAS ( )
SCIADOPITYS
SOPHORA
SORBUS ( )
STEWARTIA
STYRAX
SYRINGA ( )
+ TAXODIUM ( )
TAXUS
THUJA
TILIA
+ TSUGA ( )
+ ULMUS
+ VACCINIUM (LOW)
+ VIBURNUM
VITEX
WEIGELA
XANTHOCERAS
ZANTHOXYLUM
ZELKOVA ( )

FORSYTHIA
~~PAIMOSA~~

TREE DESIGN. 10/9/20 BB

+ DENOTES, PLANT (1EA) IN RESOU AREA

USE "TRIPLET" TECHNIQUE TO DENSIFY A MINI-FORES

ie LARIX, AMELANCHIER, INKBERR ILEX
BASICALLY PLANTED IN SAME h
ie CORYLUS, NANDINA, MAHONIA
ie TAXODIUM, VACCINIUM, CHAMAE CYPARI
ie FRAXINUS, HAMAMELIS, CERCID PHYLLU
ie QUERCUS, BETULA, ARONIA
ie TSUGA, VIBURNUM, ENKIANTI
ie CATALPA, OSMANTHUS, NYSSA
ie METASEQUOIA, SALIX, ITEA
ie ULMUS, MYRICA, SAMBUCUS
ie PLATANUS, ABIES, CORNUS
ie ALNUS, ELAEAGNUS, MAGNOL
ie LIRIODENDRON, ACER, LIQUIDAME

# Appendix VIII-Massachusetts Invasive Species

| | |
|---|---|
| *Acer platanoides* | Norway maple |
| *Acer pseudoplatanus* | Sycamore maple |
| *Aegopodium podagraria* | Bishop's goutweed |
| *Ailanthus altissima* | Tree of heaven |
| *Alliaria petiolata* | Garlic mustard |
| *Berberis thunbergii* | Japanese barberry |
| *Cabomba caroliniana* | Carolina fanwort; fanwort |
| *Celastrus orbiculatus* | Oriental bittersweet; Asian or Asiatic bittersweet |
| *Cynanchum louiseae* | Black swallow-wort |
| *Elaeagnus umbellata* | Autumn olive |
| *Eragrostis curvula* | Weeping lovegrass |
| *Euonymus alatus* | Winged euonymus, burning bush |
| *Euphorbia esula* | Leafy spurge; wolf's milk |
| *Frangula alnus/Rhamnus frangula* | European buckthorn, glossy buckthorn |
| *Glaucium flavum* | Sea or horned poppy, yellow hornpoppy |
| *Hesperis matronalis* | Dame's rocket |
| *Iris pseudacorus* | Yellow iris |
| *Lepidium latifolium* | Broad-leaved pepperweed, tall pepperweed |
| *Lonicera japonica* | Japanese honeysuckle |
| *Lonicera morrowii* | Morrow's honeysuckle |
| *Lonicera x bella [morrowii x tatarica]* | Bell's honeysuckle |
| *Lysimachia nummularia* | Creeping jenny, moneywort |
| *Lythrum salicaria* | Purple loosestrife |
| *Myriophyllum heterophyllum* | Variable water-milfoil; two-leaved water-milfoil |
| *Myriophyllum spicatum* | Eurasian or European water-milfoil; spike water- milfoil |
| *Phalaris arundinacea* | Reed canary-grass |
| *Phragmites australis* | Common reed |
| *Polygonum cuspidatum / Fallopia japonica* | Japanese knotweed; Japanese or Mexican bamboo |
| *Polygonum perfoliatum* | Mile-a-minute vine or weed; Asiatic tearthumb |
| *Potamogeton crispus* | Crisped pondweed, curly pondweed |
| *Ranunculus ficaria/Ficaria verna* | Lesser celandine; fig buttercup |
| *Rhamnus cathartica* | Common buckthorn |
| *Robinia pseudoacacia* | Black locust |
| *Rosa multiflora* | Multiflora rose |
| *Salix atrocinerea/Salix cinerea* | Rusty Willow/Large Gray Willow complex |
| *Trapa natans* | Water-chestnut |